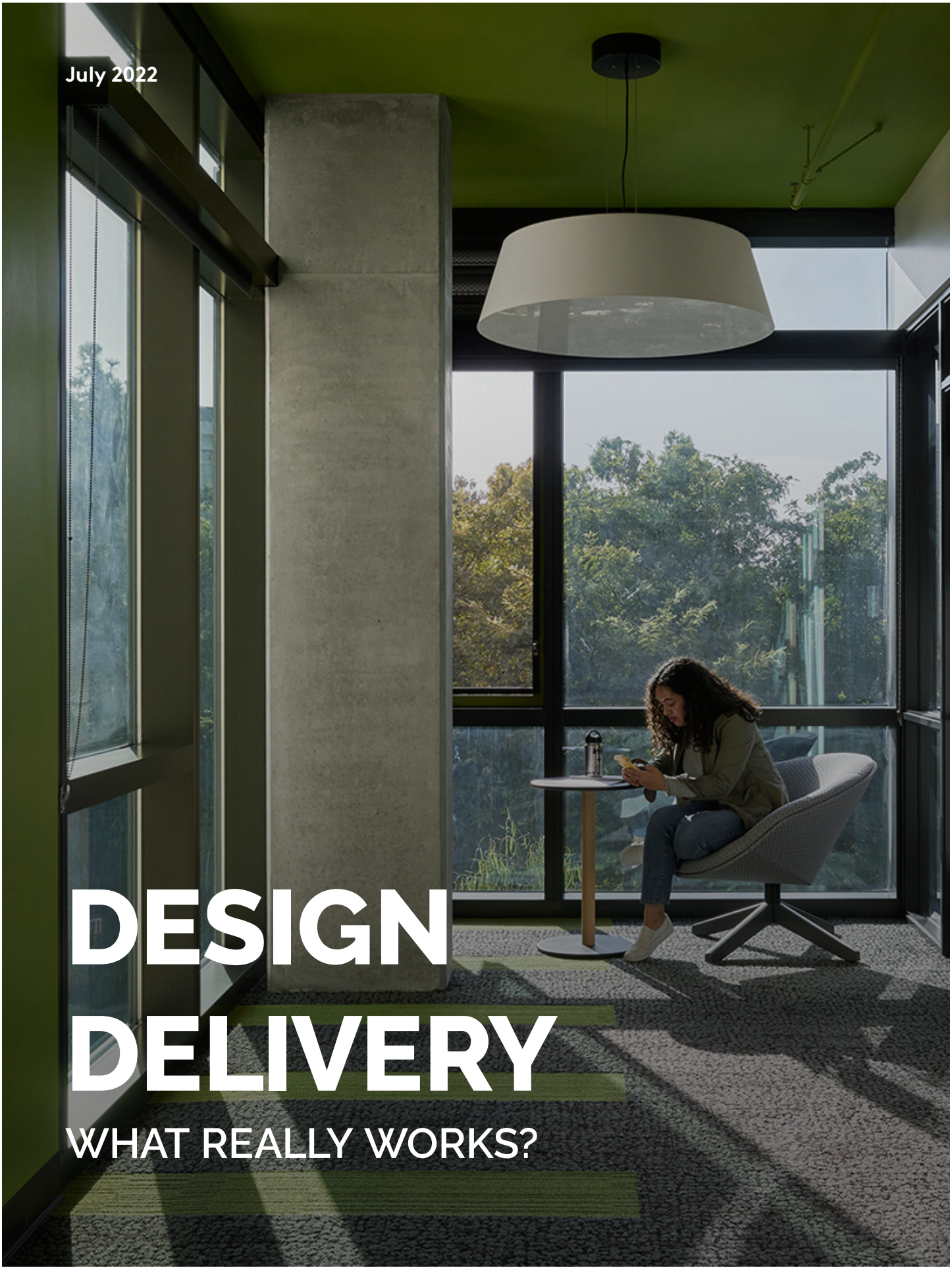
July 2022



DESIGN DELIVERY

WHAT REALLY WORKS?

Research Team

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Special Thanks
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University of California - San Diego
University of California - San Francisco
University of Washington
Washington State University

Andersen Construction
Fortis Construction
Hensel Phelps
Lease Crutcher Lewis
Webcor

Miller Hull
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SmithGroup
YGH Architects

Brailsford & Dunlavey

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Teri Randall

Land Acknowledgment

This research was conducted on the traditional and present land that touches the shared waters of the Duwamish, Puyallup, Suquamish, Tulalip, and Muckleshoot Nations, who have stewarded the land and waters since time immemorial. I gratefully honor the Indigenous communities of this land, stolen through colonial violence.

Research Proposal

In partnership with Mithun, this research is to look within the scope of a given project and determine, in accordance with the values of the different members of the project team, how the best project delivery method can be selected by looking at how "best value" can be achieved. It is not intended to determine a one-size-fits all approach for design and construction delivery. In terms of the scope, this research will be focused on higher education projects of new construction, primarily from the West Coast of the United States that fall within a project price range of $50 million to $150 million. Cost and schedule are traditional attributes of project delivery methods which are compared, however, this study will look further into the qualitative, or abstract variables involved in a project's "success" within the different project delivery methods. These include factors such as perceptions of project success, potential for lifecycle values, design-related values, and construction success.

Abstract

This research will focus on determining what the most appropriate project delivery method is for higher education projects according to select criteria for three unique delivery methods: CM at Risk (CM/GC), Traditional Design Build (TDB), and Progressive Design Build (PDB). This research aims to determine how these different delivery systems help achieve value for various project members, including the owner agency, design team, and general contractor.

How to Use this Guide

The intention of this research is to better understand the value of the three aforementioned project delivery methods for owner, architect, and contractor. By following the course of this research through a series of preliminary interviews, case study analyses and the final survey, one can gain a better understanding of advantages or disadvantages of each delivery method. Similarities or differences to their own projects can also be understood through various conditions such as project location, project cost, and schedule limitations. Finally, one can analyze how these findings may apply and relate to their unique project situations, helping to be one of the tools to help determine which delivery method may be the best for their project.

The preliminary interviews assist in better understanding the general traditional values (cost and schedule) and abstract values (i.e. familiarity, sustainability, team chemistry, etc.) considered by various key players in the delivery of a project. The case studies provided a narrower focus based on a specific project delivery method, as well as location, by state. And finally, the surveys help link location, profession, familiarity, etc. into a more tangible analysis of how these variables work together.

Cover Image/Chapter Images Source: Mithun
Project: Middle Earth - University of California , Irvine

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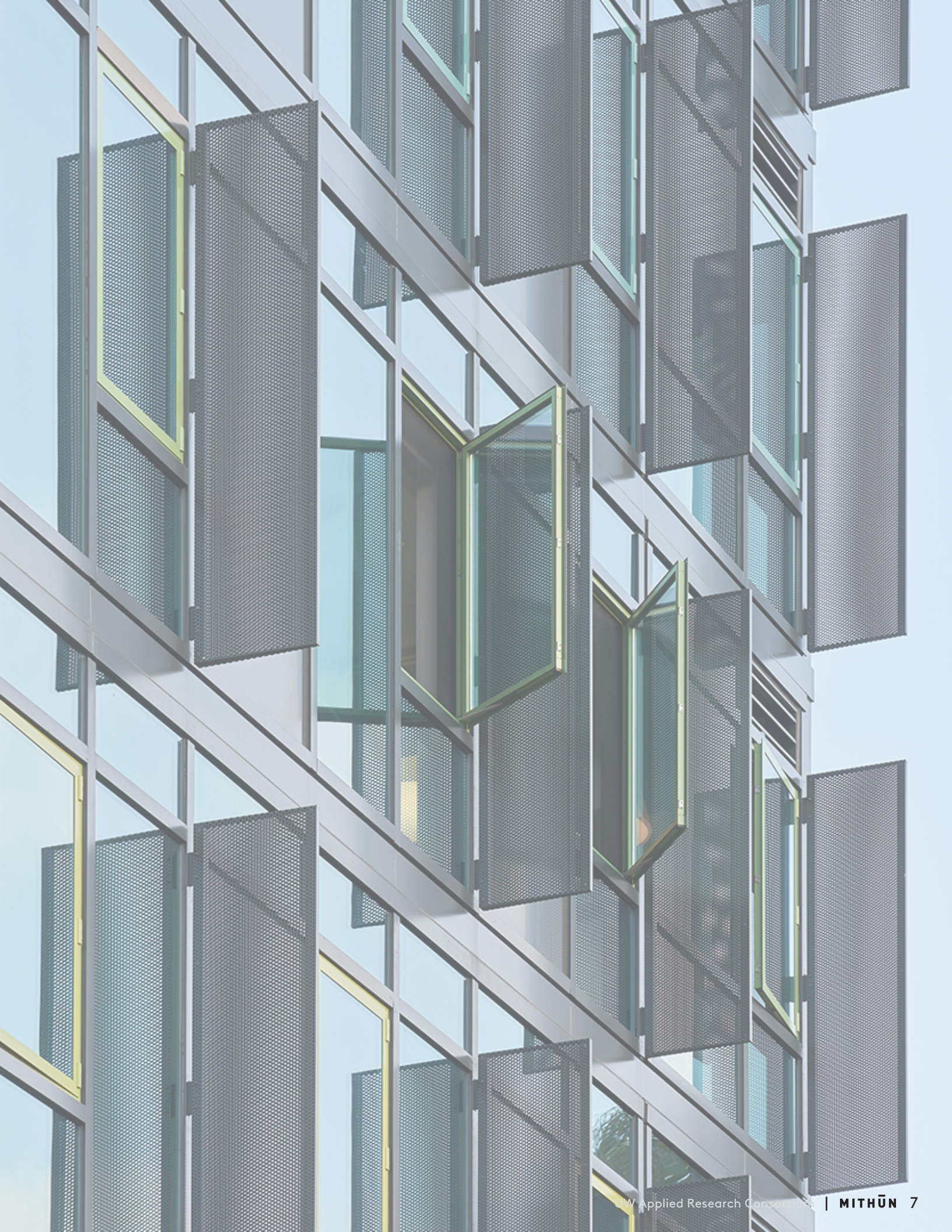
INTRODUCTION—



Understanding the Delivery Methods:

CM at Risk (CM/GC):

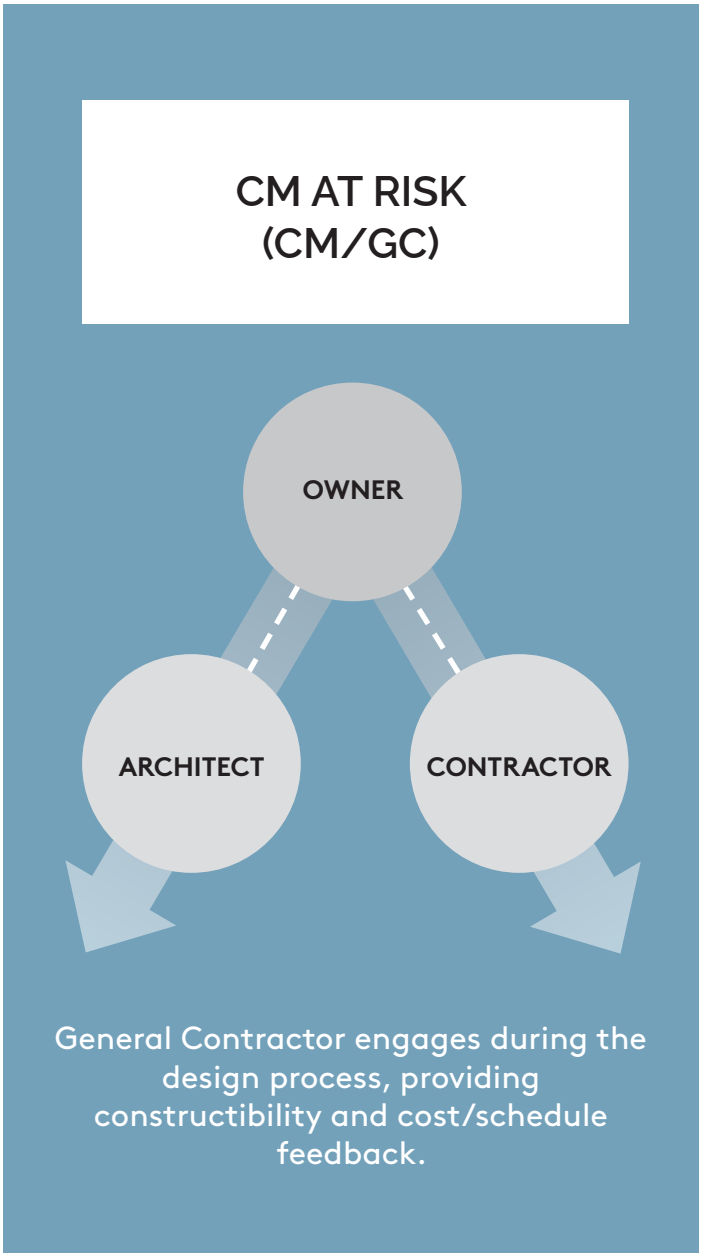
"This delivery method entails a commitment by the construction manager at-risk (CMR) for construction performance to deliver the project within a defined schedule and price, either a fixed lump sum or a GMP. The CMR provides construction and pricing input to the owner during the design phases and becomes the general contractor during the construction phase." (Source: DBIA)

Traditional Design Build (TDB) (aka. Stipulated Sum/Competitive Design Build):

"This method of project delivery includes ***one entity*** (design-builder) and a ***single contract*** with the owner to provide both architectural/engineering design services and construction." (Source: DBIA) A Basis of Design or Detailed Project Program (DPP) is used to solicit a Guaranteed Maximum Price (GMP) from design-builder. This becomes the contract value for the selected design-builder at the time of award.

Progressive Design Build (PDB):

"One application of design-build delivery is via a stepped, or progressive process (commonly referred to as Progressive Design Build or PDB). PDB uses a qualifications-based or best value selection, followed by a process whereby the owner then 'progresses' towards a design and contract price with the team (thus the term 'Progressive')." (Source: DBIA) This type of delivery includes one entity (design-builder) and a single contract with the owner as well.



It is important to understand how the contractual relationships work between the three key entities (owner, architect, and contractor), as well as the level of collaboration involved in each delivery method.

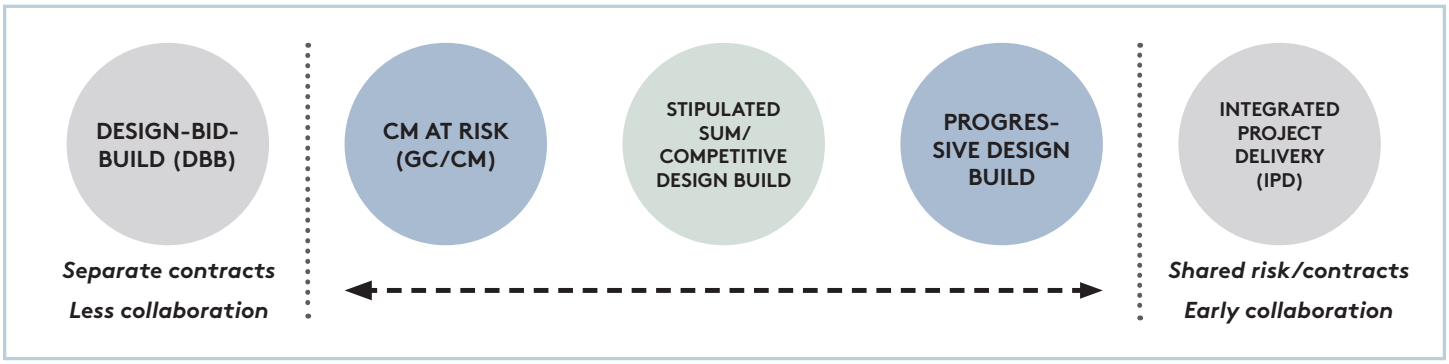
TRADITIONAL DESIGN BUILD

General Contractor engages at the commencement of the design process, guaranteeing the price at the end of the competitive period.

PROGRESSIVE DESIGN BUILD

Price guarantee typically happens at 60% Document Completion

General Contractor engages at the commencement of the design process, providing constructibility and cost/ schedule feedback.

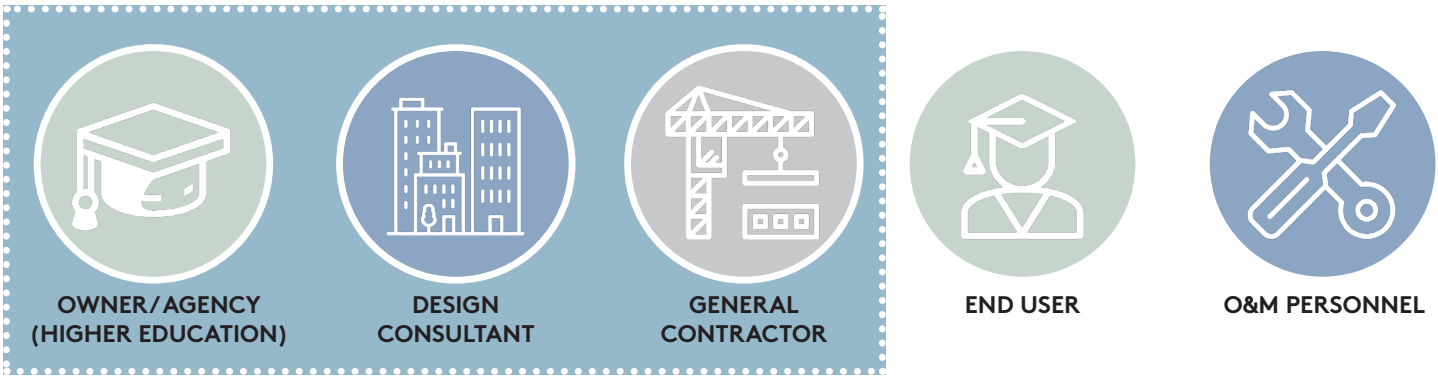


Note: Design-Bid-Build (DBB) and Integrated Project Delivery (IPD) fall on opposite ends of each spectrum.

Target Participants:

With a focus on speaking to the owner agencies, architects, and general contractors, it is imperative to get the feedback of these key players in order to get a full-perspective of the project delivery methods.

It should be noted that, although gaining the perspectives of the end users and O&M Personnel is a key in understanding the final production of a project, it wasn't within the scope of the research project to collaborate with these individuals for all phases of the research.



Target participants for:

- preliminary interviews

-case studies

Target participants for:

-survey

METHODOLOGY—

Methodology Overview

While some tasks were completed simultaneously with one another, some steps were completed in sequence to help build upon one another. It was imperative that this research methodology was referenced and maintained throughout the course of this project to help narrow the focus of the research and narrow the scope.

Literature Review

The Literature Review involved the review of various articles and primary resources to clearly understand the three different project delivery methods, and specifically see how each project delivery method performs alongside one another. A clear gathering of information during this step properly set the stage for the next steps in the research process, including setting up the survey and discerning what information could be gathered in a case study. The literature review also provided some insight into how a survey can be conducted, and which variables should be considered, whether they be qualitative or quantitative.

Preliminary Research Database and Research Criteria

After documenting information gathered from the literature review, it was essential to determine what variables were critical to measure and evaluate with the target members of project teams. This helped to inform the trajectory of interviews, surveys, and case studies so that there could be a clear focus when conducting the studies. In conjunction with establishing these "best value" variables, it was also important to formulate a project database of existing projects in the designated region of study. By consolidating this information gathered directly from specific contacts and data searches online, data such as project name, client/owner agency, location, price, and completion data were all consolidated in an appropriate table.

Preliminary Interviews

To begin the research, the preliminary interviews were integral in ascertaining the values critical to a successful project delivery by speaking to key players familiar with the project delivery methods. This helped build the framework for future interviews regarding the case studies and building the survey which was distributed at the final stage of the research.

Project Specific Interviews

Interviews were conducted with the clients/ owner agencies, the design team, and the general contractor on a specific project, in order to determine the satisfaction level of each team member throughout the project process. It was useful to determine a satisfaction criteria based on traditional and concrete values to understand the pros and cons of each project delivery method. The outcome of the interviews became an appropriate guideline for the survey. Because the primary focus of this research is to obtain quantitative data on qualitative values for the given project delivery methods, it was key that verbal clarification by the interviewees was gained to understand if the best value was attained throughout the project delivery process.

Case Study

In order to limit the broad scope that a case study can take, a single case study per each project delivery method in question (Traditional Design Build, Progressive Design Build, and CM at Risk) was planned. With a general focus on the West Coast of the US, other regions such as the Mountain States, East Coast, and SE (i.e. Florida) were not within the scope of the case study phase. It was found during the research that certain project delivery methods are more prevalent in certain areas of the United States, and although it would have been interesting to research which states are breaking the boundaries of their typical design delivery methods, the west coast academic campuses provided project examples for all three delivery method case studies. However, final step, the comprehensive survey opened up the opportunity for greater discussions of these trends outside of the West Coast. The case studies ultimately served as a method of determining a useful criteria for how the surveys could be conducted.

Comprehensive Survey

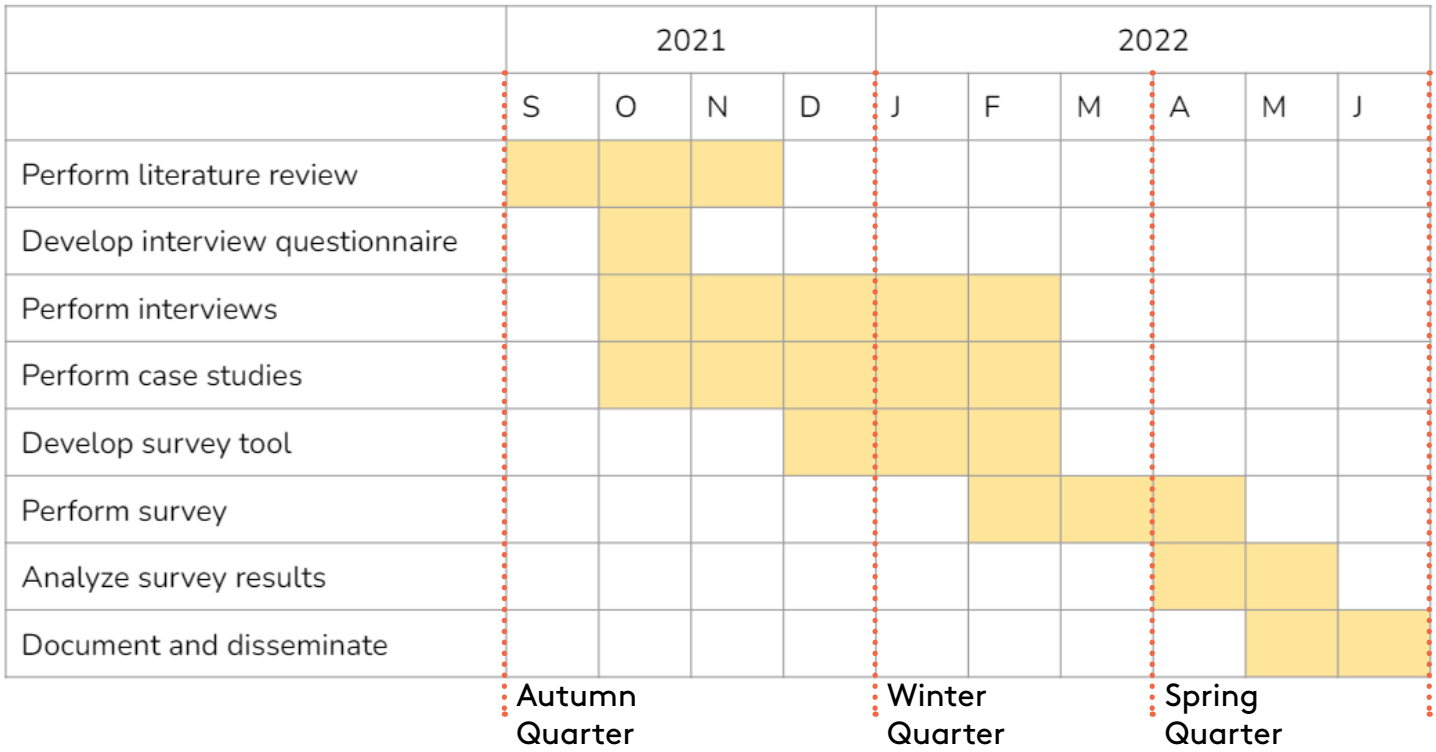
The survey was distributed to former interviewees and larger agencies, including the American

Institute of Architects (AIA) and the Associated General Contractors of America (AGC), to collect information and raw data that was able to be documented in a chart format or a data table. The survey was conducted through an online format on Google Forms with a Likert satisfaction rating survey. Establishing a quantitative versus an abstract or qualitative standard of evaluation was key in determining which variables would like to be considered in a survey, and how these questions would want to be categorized. The qualitative portion of the survey assessed the effectiveness rate of the abstract values outside of cost and schedule according to the three major project delivery methods in question. The quantitative portion of the survey included questions such as average cost and square footage by project delivery method. These questions allowed for the concrete values of cost and schedule to be evaluated against the abstract values, which included team chemistry, lifecycle value, etc.

Final Dissemination of Data

Disseminating and analyzing the data collected from the preliminary interviews, case studies, and comprehensive survey was the methodology used to come to an understanding of the correlation between the varied project delivery methods and how these methods affected both concrete and abstract values related to project design and construction. This process involved an analysis of the data collected from the comprehensive survey, and then an assessment, using pie charts, line graphs, and other visual tools to visually disseminate and understand the raw data. Parallels were then made between the data collected by linking the information with the content collected in the preliminary interviews and case studies. This, in particular, was a key element of the research which was critical in seeing if the data collected in the surveys aligned with the information provided in the interviews. Any differences in information were further analyzed to see which variables may have contributed to an outcome outside of what was expected according to the survey results.

Research Timeline



Preliminary Interviews - Detailed Overview:

In order to gain a clearer understanding of the specific values assessed under the different project delivery types, a series of interviews were conducted with team members from the Capitl Projects department of various universities as well as contractors and owner's representatives/project managers who have worked with higher education institutions. This step aimed to assess what abstract values and goals exist outside of the traditional goals of meeting cost and schedule requirements in a project. The organizations that participated in the preliminary interviews are as follows:

UNIVERSITY	
WASHINGTON	UNIVERSITY OF WASHINGTON
	WASHINGTON STATE UNIVERSITY
OREGON	OREGON STATE UNIVERSITY
CALIFORNIA	UNIVERSITY OF CALIFORNIA - SAN DIEGO
	UNIVERSITY OF CALIFORNIA - IRVINE

GENERAL CONTRACTOR

FORTIS
CONSTRUCTION

CONSULTANT

BRAILSFORD &
DUNLAVEY

Assessing Values:

After completing the preliminary interviews, the team determined which key values were consistent and prevalent across all participants. Concrete values such as cost predictability and a shorter/ expedited schedule were a given. However, the interviews confirmed which abstract values were important to continue assessing, eventually informing how the survey framework was created. The list of values selected for the survey are as follows:

CONCRETE VALUES

COST PREDICTABILITY

SHORTER/EXPEDITED SCHEDULE

ABSTRACT VALUES

ABILITY TO MEET OWNER'S GOALS

TEAM CHEMISTRY

LIFECYCLE VALUE

INNOVATIVE THINKING

INDUSTRY AWARDS

SUSTAINABLE DESIGN

HEALTH & WELLNESS FOR BUILDING OCCUPANTS

AESTHETICS

RESPONDING TO CAMPUS ENVIRONMENT

CASE STUDY—

Case Studies:

The following section features projects from Washington, Oregon and California. The intent of these case studies is to present projects across the West Coast in the three project delivery methods.

These case studies allowed the research to dive into deeper detail about requirements and constraints for each delivery method.

CM AT RISK (CM/GC)

OREGON STATE UNIVERSITY

MARINE STUDIES INITIATIVE BUILDING

CLIENT: OREGON STATE UNIVERSITY

ARCHITECT: YGH ARCHITECTS

CONTRACTOR: ANDERSEN CONSTRUCTION

TRADITIONAL DESIGN BUILD

UNIVERSITY OF CALIFORNIA - IRVINE

MIDDLE EARTH - STUDENT HOUSING

CLIENT: UNIVERSITY OF CALIFORNIA, IRVINE

ARCHITECT: MITHUN

CONTRACTOR: HENSEL PHELPS

PROGRESSIVE DESIGN BUILD

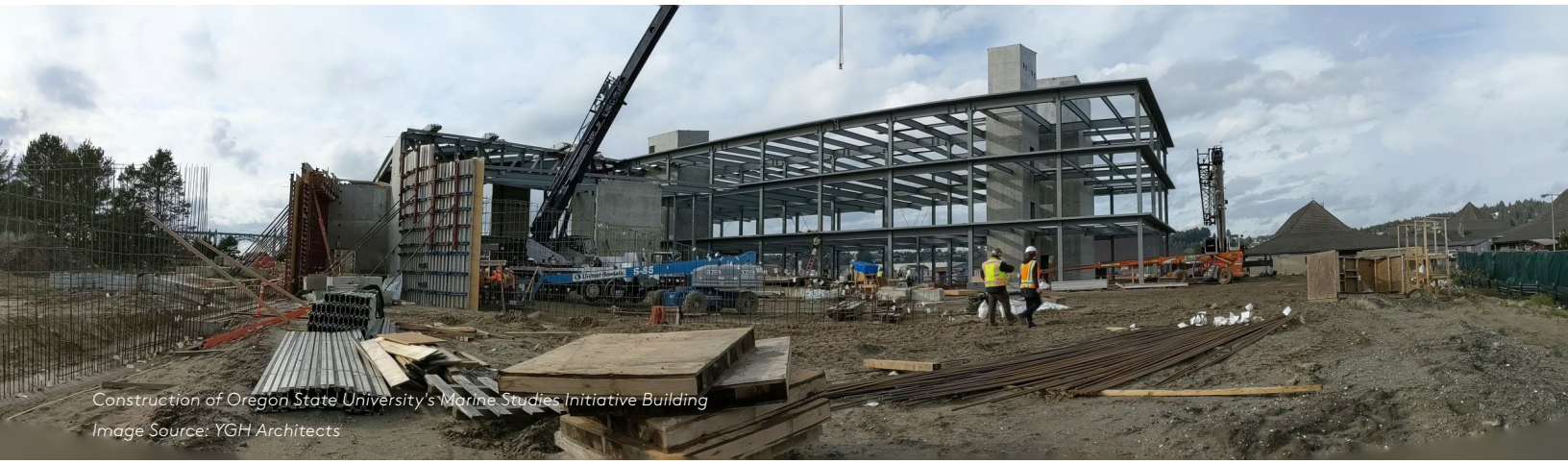
UNIVERSITY OF WASHINGTON

HANS ROSLING CENTER FOR POPULATION HEALTH

CLIENT: UNIVERSITY OF WASHINGTON

ARCHITECT: MILLER HULL

CONTRACTOR: LEASE CRUTCHER LEWIS



Construction of Oregon State University's Marine Studies Initiative Building
Image Source: YGH Architects

MARINE STUDIES INITIATIVE BUILDING

IMAGE SOURCE: YGH ARCHITECTS

BACKGROUND

LOCATION
Newport, Oregon

SCHEDULE
March 2018 - January 2020

CONSTRUCTION COST
$61,700,000

CLIENT
Oregon State University

ARCHITECT
YGH Architecture

GENERAL CONTRACTOR
Andersen Construction

PROJECT CRITERIA

PROJECT DELIVERY METHOD
CM at Risk (CM/GC)

PROJECT DESCRIPTION
Established as a lab and classroom building at the Oregon State University (OSU) Hatfield Marine Science Center in Newport, Oregon, the Marine Studies Initiative (MSI) Building is a center for OSU students, faculty, and staff to work in an interdisciplinary environment. With assistance from various federal government agencies, EPA, and the USGS, the MSI Building is an example of an ambitious architectural design which is designed to withstand the impact of tsunami waters, allowing vertical evacuation.

(SOURCE: YGH ARCHITECTS)

PROJECT DELIVERY METHOD SELECTION

SELECTION CRITERIA

With CM at Risk being the primary project delivery method selected by OSU, familiarity played an integral role in the selection of the delivery method for this project. Strict budget limitations have made CM at Risk an appropriate delivery method of choice in a majority of the projects at OSU, and with its frequent use, CM at Risk was selected as an efficient delivery method.

With a CM at Risk delivery method, OSU and other key stakeholder, including YGH Architects and Andersen Construction, felt that this delivery method was a good choice in terms of creating a positive and collaborative team environment. There was a sense that CM at Risk would provide more contractual clarity than a Design Build model, and that it allows the three different major entities in the contract to stretch themselves more.

Given the nature of this project being federally funded, the funding was actually provided 4-5 years prior to the onset of design and construction. The early deployment of funding created issues in designing the project within the scope of the cost, as well as meeting all of the parameters of the project program under these limitations. The goals of the project were relatively ambitious, which meant that the team involved on the project had to be tactful in how they approached the design and construction of the MSI Building.

Familiarity played a key role in the selection criteria of this project. With OSU's projects being primarily under the CM at Risk project delivery type, YGH Architects and Andersen Construction were familiar with OSU's use of this delivery method. While YGH Architects and Andersen Construction had not worked together in the past on a project, selection of CM at Risk as a delivery method did not impede the ability of these teams to collaborate and helped foster a healthy team environment.

PROJECT PERFORMANCE

KEY VALUES

The value assessment from the key players involved in the MSI Building, the major considerations from the owner (OSU), architect (YGH Architects), and general contractor (Andersen Construction) are as follows:

Owner - OSU:
Design involvement; abiding by federal regulations; meeting cost and schedule goals; serving the needs of the people utilizing the facilities on the site and fostering a sense of community; sustainability

Architect - YGH Architects:
Meeting the design requirements for the project being located in a tsunami and major seismic zone; acknowledging the values of others on the team to foster positive team chemistry, especially contractors and subcontractors

General Contractor - Anderson Construction:
Meeting schedule demands; highly collaborative team; meeting guaranteed maximum price (GMP); satisfaction of the client and end-user with the final design and construction of the project

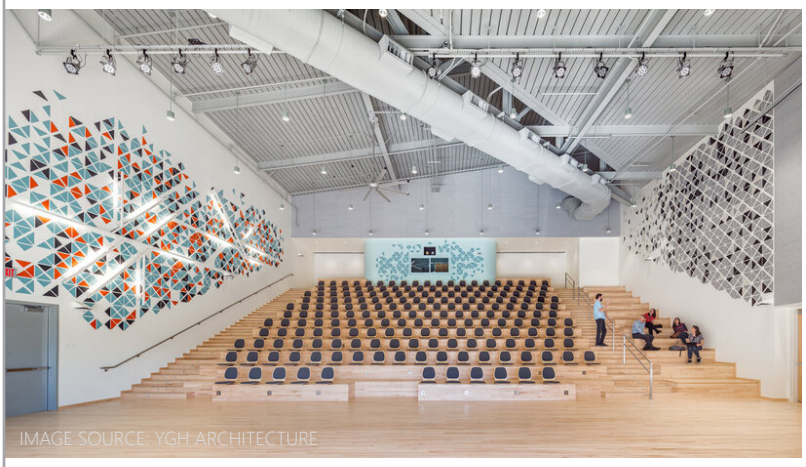


IMAGE SOURCE: YGH ARCHITECTURE


IMAGE SOURCE: YGH ARCHITECTURE

KEY VALUES (CONT.)

In working towards a common goal of designing and building a successful project where students and researchers can work together in a collaborative environment, the strong sense of team chemistry amongst the team members allowed for a successful final project. Healthy collaboration between the architect and contractor allowed for more seamless design decisions to occur. However, with a Progressive Design Build (PDB) model, there could have been increased opportunities for more sub-contractor involvement in the project.

Having an open discussion about points of conflict allowed for a more healthy work process to work past challenges throughout the design and construction process. With OSU trying to balance the politics between their needs and governmental regulations, the general contractor balancing time and schedule constraints, and the architects trying to balance the design and limitations of the project scope, through a healthy and collaborative environment, the team was able to work together effectively, even with multiple pressures by having a healthy team chemistry.

LEARNING OUTCOMES

In its entirety, the MSI Building was a project that was completed successfully, and met the requirements of the project budget and scope effectively. Despite having to work with a site that is in danger of tsunami and seismic damage, through the CMR delivery method, the team was able to foster a collaborative work environment to solve site limitations that implied very innovative design solutions. The teams were able to collaborate effectively with federal agencies outside of OSU, gaining guidance from federally funded sources, compromising successfully between the needs of the client, the design suggestions posed by the architect, the construction guidance from the contractor, and the needs of the end-user.

SUCCESSES

- Very positive team environment
- Project met stringent design requirements
- Design responded appropriately to budget limitations and the surrounding context of the site.

CHALLENGES

- Site limitations = innovative design solutions
- Strict budget with a limited project scope

WE WOULD LIKE TO THANK THE FOLLOWING FOR THEIR CONTRIBUTION TO THIS CASE STUDY:

OSU Oregon State University · YGH ARCHITECTURE · ANDERSEN CONSTRUCTION


IMAGE SOURCE: YGH ARCHITECTURE


IMAGE SOURCE: YGH ARCHITECTURE


IMAGE SOURCE: YGH ARCHITECTURE

MIDDLE EARTH TOWERS

IMAGE SOURCE: MITHUN

BACKGROUND

LOCATION
Irvine, California

SCHEDULE
June 2017 - July 2019

CONSTRUCTION COST
$102,000,000

CLIENT
University of California - Irvine

ARCHITECT
Mithun

GENERAL CONTRACTOR
Hensel Phelps

PROJECT CRITERIA

PROJECT DELIVERY METHOD
Traditional Design Build (TDB)

PROJECT DESCRIPTION
Designed as student housing dedicated primarily to incoming Freshman college students, the University of California Irvine (UCI) Middle Earth Tower complex is a 215,000 sqft building located along the central campus Ring Road. This housing complex features 495 student beds in various unit types, a 750-seat dining center, lounges, study rooms, resource center, and a smart classroom. The Link Lounge is a key feature of the building which serves as the central gathering space between each of the residential floors.

(SOURCE: MITHUN)

PROJECT DELIVERY METHOD SELECTION

SELECTION CRITERIA

UCI has a strong history of selecting TDB projects which made the selection of this project delivery method simple when it came to the Middle Earth project. Because this type of Design Build has been successful for nearly 20 to 25 years at UCI, it has proven to be a tried and true method for the university. It has been a method that has demonstrated its effectiveness at meeting cost and schedule demands and at reducing litigation issues. Additionally, this method has provided a route to the level of design quality that UCI aspires to, giving them both qualitative and quantitative certainty.

For project success, UCI develops a program document called the Detailed Project Program (DPP), which outlines the key goals and values. When selecting their design and construction teams, they evaluate their designs and performance based on their ability to meet their goals in terms of their DPP. Because there is typically a stringent budget dictated through this delivery method through a guaranteed maximum price (GMP), what made this project successful was the ability to design an innovative project within the stipulations of the DPP and the constraints of the GMP.

Just as familiarity with the delivery method made a substantial impact on the project, having a strong DB team was also imperative to the project's success. The previous experience of UCI with Mithun and Hensel Phelps helped bolster team chemistry throughout the course of the project. Although UCI had a very strict set of guidelines to follow the DPP played a significant role in clarifying the values that were most important to them, and helped guide the design build team accordingly.

PROJECT PERFORMANCE

KEY VALUES

The value assessment from the key players involved in the Middle Earth Project, the major considerations from the owner (UCI), architect (Mithun), and general contractor (Hensel Phelps) are as follows:

Owner - UCI:
Meeting design goals in terms of achieving a housing aesthetic that fits with the existing academic core; meeting cost and schedule goals; striving for LEED Platinum status; achieving a healthy synergy between the designers and builders

Architect - Mithun:
Achieving the design goals of the university while reflecting the design values of the firm; maximizing lifecycle value while trying to meet LEED; designing a project that responds to the campus fabric as a whole

General Contractor - Hensel Phelps:
Meeting cost and schedule demands; maintaining a safe job-site; maintaining a positive relationship with UCI, which allows for the recruitment of more team members
Because the final expectation is a high-end product,


IMAGE SOURCE: MITHUN


IMAGE SOURCE: MITHUN

KEY VALUES (CONT.)

a TDB project delivery method allowed for UCI's high expectation to be met within the fixed budget constraints. Although this put a significant amount of pressure on the DB team, Mithun welcomed the challenge by developing innovative design solutions within the limitations of the budget.

Creating a balance between achieving "soft" and "hard" values was imperative to the success of this project. "Hard" values included those which could be measured, such as achieving sustainability standards, including LEED certification, or meeting square footage and program requirements. "Soft" values were those which are less tangible, such as the experiential quality of the space and designing a project which fits into the campus fabric.

Responding to student feedback through mock-up installations was also another method for UCI to better understand the needs and desires of their students, who ultimately were becoming the end -users of the building. Additionally, to improve student life on campus, it was of utmost importance to UCI that the project be completed by the start of the academic year to minimize disruptions to student life on campus.

LEARNING OUTCOMES

Coming as no surprise for UCI, the project was completed successfully under the TDB project delivery method. Because of the university's repeated use of this method for a majority of their projects on campus, their familiarity with the delivery method allowed for a relatively seamless completion of the Middle Earth project. As with all projects at UCI, the DPP established by the university maintained effective responsiveness to the changes in the campus environment and the ever-evolving needs of the students. With UCI's high level of design requirements, it became an imperative point for all team members that the level of detail in drawings be elevated to match those requirements.

SUCCESSES

- Project responded to the student needs
- DPP assisted in the clarification of campus goals
- Middle Earth was completed on time for the start of the academic school year and within budget
- Innovative and high quality design solutions within the scope of the GMP

CHALLENGES

- Complexity of drawing packages in order to meet schedule meant added coordination needed with plans reviewers.

WE WOULD LIKE TO THANK THE FOLLOWING FOR THEIR CONTRIBUTION TO THIS CASE STUDY:

UCI MITHUN HENSEL PHELPS Plan. Build. Manage.

IMAGE SOURCE: MITHUN


IMAGE SOURCE: MITHUN


IMAGE SOURCE: MITHUN

HANS ROSLING CENTER FOR POPULATION HEALTH

IMAGE SOURCE: MILLER HULL

BACKGROUND

LOCATION
Seattle, Washington

SCHEDULE
June 2017 - October 2020

CONSTRUCTION COST
$230,000,000

CLIENT
University of Washington

ARCHITECT
Miller Hull

GENERAL CONTRACTOR
Lease Crutcher Lewis

PROJECT CRITERIA

PROJECT DELIVERY METHOD
Progressive Design Build (PDB)

PROJECT DESCRIPTION
Located at the entry to the University of Washington (UW) campus, the Hans Rosling Center for Population Health is one of the largest projects on the UW campus dedicated to creating an interdisciplinary collaborative work space. Here scientists, researchers, and faculty work together to address the health issues plaguing the world today, and is an initiative supported by the Gates Foundation.

PROJECT DELIVERY METHOD SELECTION

SELECTION CRITERIA

Progressive Design Build (PDB) was chosen by the university in order to facilitate a delivery method that functions as close to an Integrative Project Delivery (IPD) model as possible. Due to limitations in Washington State legislation, IPD is not permitted as an official delivery method in the state, however, PDB allowed for a shared risk-reward system similar to IPD.

Under this PDB model, the contractual agreement was established between UW and the General Contractor, Lease Crutcher Lewis. Subsequently, The Miller Hull Partnership was selected as the project's Architect. Although the prime contractual relationship was directly between the owner and general contractor, all three parties (i.e. owner, architect, and contractor) were equally involved and represented in the entirety of the project timeline, making decisions together for the Hans Rosling Center for Population Health Project.

UW was also driven to select the PDB model so that they were not locked into an early design approach as would happen in a Traditional Design Build (TDB) process. Although UW is familiar with PDB as a model for their other projects on campus, The shared risk reward system (more similar to IPD) was foreign to all of the involved parties in the project. Therefore, communication and established shared goals were integral to the success of this project.

Additionally, an incentive pool was created that was to be shared amongst all of the responsible members of the project, including the owner, architect, general contractor, and other key subcontractors. This alignment of financial interests among the project parties was intended to improve the delivery of the project, which had its desired outcome with the Hans Rosling Center for Population Health Building.

PROJECT PERFORMANCE

KEY VALUES

The value assessment from the key players involved in the Hans Rosling Center for Population Health, the major considerations from the owner (UW), architect (Miller Hull), and general contractor (Lease Crutcher Lewis) are as follows:

Owner - UW:
Design involvement; predictability of cost and schedule; LEED certification

Architect - Miller Hull:
Meeting the design requirements; acknowledging the values of others on the team to foster positive team chemistry

General Contractor - Lease Crutcher Lewis:
Meeting schedule demands; highly collaborative team; meeting budget; achieving high level of quality


IMAGE SOURCE: MILLER HULL


IMAGE SOURCE: MILLER HULL

KEY VALUES (CONT.)

In trying to achieve a successful outcome for the project, the Progressive Design Build model allowed for the key players of the project to collaborate effectively and have everyone, including subcontractors, be involved in the full extent of the design and construction process. This was encouraging for all of the key players because their voices were heard and there was a sense of equal investment in the design and construction process. With cost and schedule being pushed heavily by the Gates Foundation, there was considerable pressure put on the teams to execute the project in a manner which would meet the standards of the foundation.

To successfully complete the PDB model, frequent communication and collaboration, through co-location was required, which was out of the ordinary for a considerable amount of the team. However, by organizing team meetings with all involved members at the Miller Hull office during the design phase and later on the UW Campus at the start of construction developed a strong team chemistry. Establishing co-location meeting places allowed the key stakeholders to be more engaged in the design and construction process and helped them feel heard, with their input implemented throughout the project.

Through the incentive program established for this project, a contingency was created and the key members were able to receive back a considerable portion of this contingency upon successful completion of the project. The university decided to utilize their portion of the return towards the initiatives driven by the Gates Foundation and the Population Health Department.

LEARNING OUTCOMES

The Hans Rosling Center for Population Health is an excellent example of how a collaborative team environment and a willingness to problem-solve together, even through uncertainty, can still be successful. This was a project that adapted a known delivery method (PDB) with components of a less familiar delivery method (IPD), which was unfamiliar to many of the key players and stakeholders of this project. However, through intensive collaboration efforts, by providing co-location meeting spaces and advocating for each other, a sense of equal investment in both the design and construction of the building was encouraged. This demonstrates that familiarity with a project delivery method isn't necessarily a prerequisite to project success.

SUCCESSES

- Very positive team environment
- Completed ahead of schedule
- Finished under budget

CHALLENGES

- IPD-like contract foreign to most
- Strict timeline due to funding source

WE WOULD LIKE TO THANK THE FOLLOWING FOR THEIR CONTRIBUTION TO THIS CASE STUDY:

IMAGE SOURCE: MILLER HULL

IMAGE SOURCE: MILLER HULL

Case Study Analysis:

When evaluating each of the case studies, certain themes arose, especially when relating the findings back to the 11 core values listed on page 18. The general theme present throughout the three case studies were that familiarity with the delivery methods played a critical role in the successes of each of the case study projects. University of Washington (UW) has historically used Progressive Design Build (PDB) for many years, just as Oregon State University (OSU) has used CM at Risk, and University of California, Irvine (UCI) with Stipulated Sum/Competitive Design Build. While familiarity with the project delivery methods was a primary reason for staying with a given method, OSU explained through both the case study interview and the preliminary interview that the limitations in state funding prevented them from trying a new delivery method. For an institution, like OSU, familiarity means lower risk in a project hitting any roadblocks throughout the project delivery process.

An unexpected response by the team at UCI for their Middle Earth project was that despite there being a fixed budget stipulated by the guaranteed maximum price (GMP) at the end of the schematic design phase, the final design was not hindered and an innovative design solution was realized. The architect commented that the stipulated sum presented the opportunity to be more creative in the placement and selection of materials and allowed them more creativity to come up with unique design solutions. However, with the Hans Rosling Center for Population Health at UW, having less restrictions on the budget and creating a shared risk-reward system on the project encouraged the team to collaborate closely, which ultimately resulted in finishing under-budget since there was a shared incentive to prevent going above the set budget.

What came as a challenge during the case study interviews was the interviewees' trepidation to state deep concerns or major challenges associated with the project delivery methods selected for the buildings. A consistent challenge stated across the three projects were occasional disagreements with specific team members on the projects, regardless of project delivery method. At times challenges arose involving people on the university committees whose expectations were outside of the scope of the project. However, a common thread amongst the three projects were that disagreements could often be resolved through continued collaboration efforts, as well as having the ability to meet on site. Having a dedicated trailer on site for interdisciplinary meetings, most importantly between the owner, architect, and general contractor was a factor of the project delivery process which was critical to the overall success of all projects. By collaborating in these meetings, team chemistry was able to be enhanced considerably, and getting to know team members beyond the limitations of the office meant that team members could experience a deeper level of commitment to the project. Because both the projects at UW and OSU were completed during the pandemic, the interviewees stated that the lack of ability to meet in person hindered this collaboration slightly as well as the progress and flow of the projects.

SURVEY FINDINGS—


EMBER
BRANDYWINE

Findings Overview:

This section outlines the content and structure of the survey which was conducted at the end of the research process. The structure of the survey was determined by the responses received during the preliminary interview and case study interview processes.

The survey was distributed to those who participated originally in the preliminary interviews, and those individuals were encouraged to distribute the survey to their colleagues within their firms and offices. Professional organizations, such as the American Institute of Architects (AIA) and the Associated General Contractors of America (AGC) were also contacted and encouraged to distribute the survey to their member companies.

Survey Structure:

The scope of the survey was extended to a national level to get a more holistic view of the opinions and values across America. Sub-contractors were also included as participants in this survey to gain more perspectives within the industry. By extending the location and including more professions within the scope of the survey, the final analysis of the results were assessed based on location and by profession.

Based on the 11 concrete and abstract values determined during the Preliminary Interviews, these values served as the basis of the survey. Respondents were asked how effective, TDB, PDB, and CM at Risk, were in achieving those 11 values. The effectiveness of each of the values ranged from very ineffective to very effective. The responses were then translated in a 1 to 5 scale for quantitative visualizations of the data, 1 representing very ineffective to 5 as very effective.

CONVERTING LIKERT SCALE TO NUMERICAL VALUES:

- **VERY EFFECTIVE** — **5**
- **SOMEWHAT EFFECTIVE**
- NEUTRAL / NO IMPACT
- SOMEWHAT INEFFECTIVE
- VERY INEFFECTIVE — 1

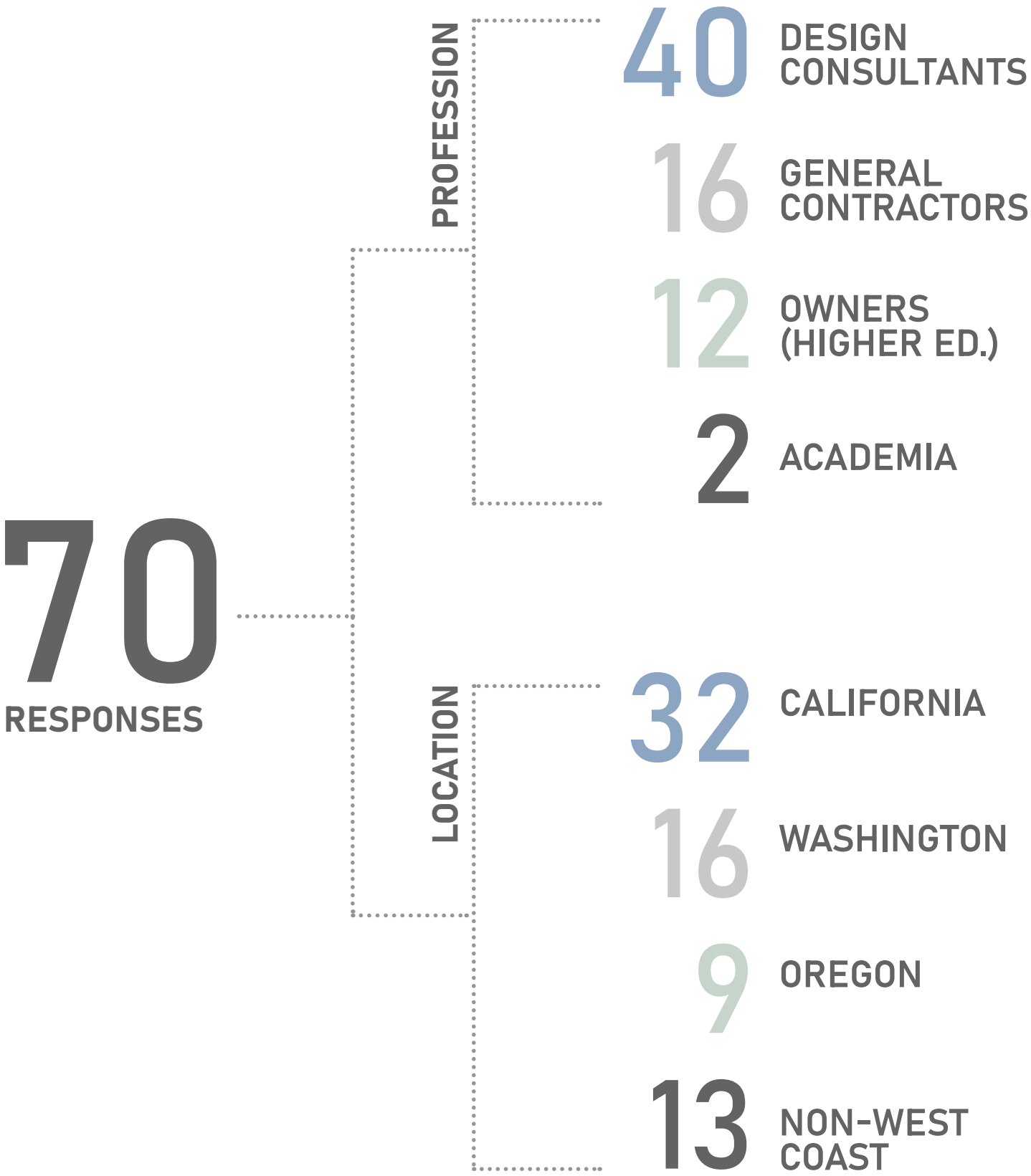
Individual Findings:

By looking at the data by location, profession, and project delivery method, certain patterns can be ascertained. Because there was an inconsistent response rate across the various defined test groups, it is important to assess this data accordingly. The responses may be potentially skewed due to the ratio of responses by profession types and inconsistencies in location.

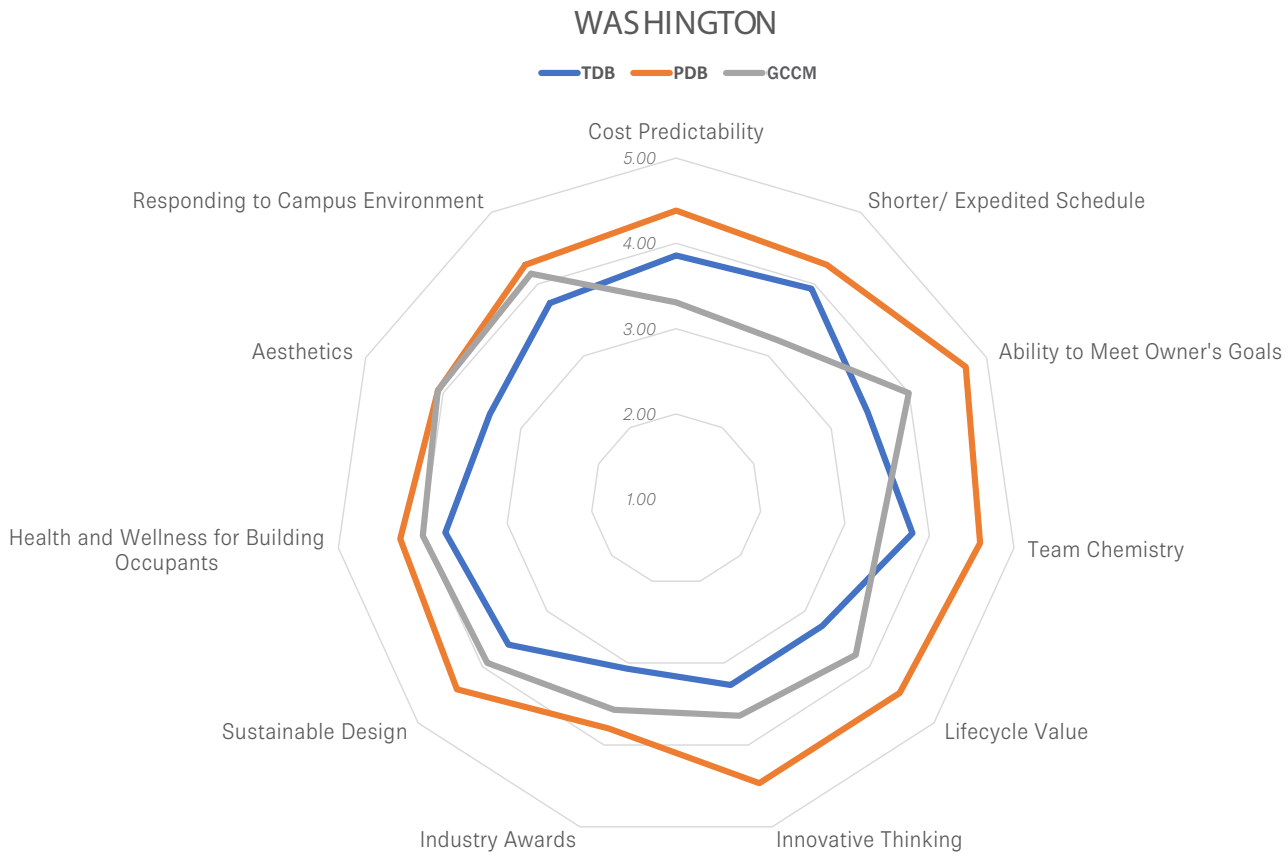
This data was specifically assessed based on:

- Location (Washington vs. Non-Washington)
- Profession (Design Consultant (DC), General Contractor (GC), and Owner (O))
- and Project Delivery Method (TDB, PDB, CMAR).

Because Academia responses were considerably low, for purposes of this data analysis, those responses were excluded from the overall analysis.


70
RESPONSES
PROFESSION
40
DESIGN CONSULTANTS
16
GENERAL CONTRACTORS
12
OWNERS (HIGHER ED.)
2
ACADEMIA
LOCATION
32
CALIFORNIA
16
WASHINGTON
9
OREGON
13
NON-WEST COAST

BY LOCATION

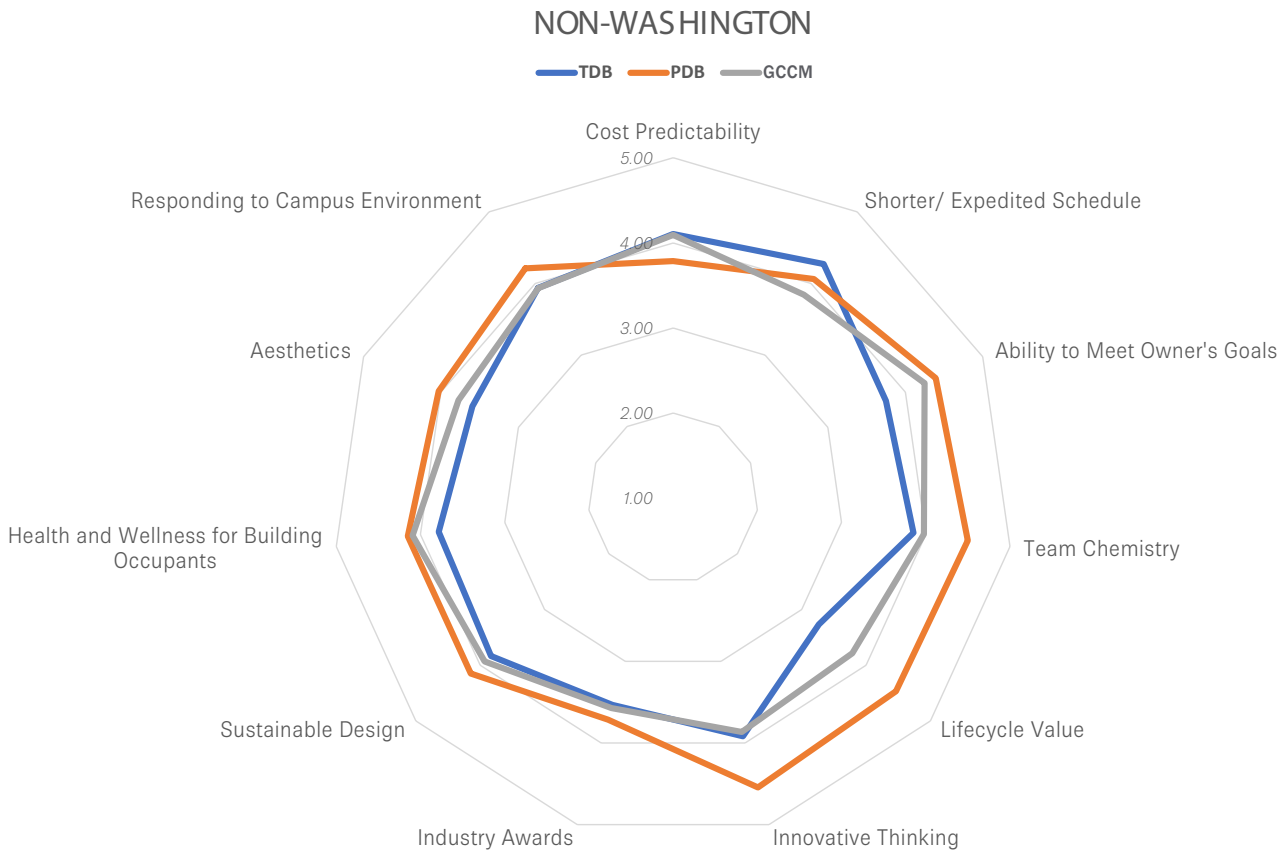


Washington Findings:

Particularly, because this research was being conducted in the state of Washington, it is important to view the data results of the survey in relation to Washington State against the rest of the nation. Washington has been an active participant in using PDB as a delivery method of choice, which has been seen, in particular, at the University of Washington. Looking at the response rates of familiarity with the delivery methods (p.46) between Washington State and Non-Washington states, Washington State respondents claimed to be more familiar with PDB than the Non-Washington states. It may be for this reason that the Washington responses display higher effectiveness rates in the 11 value categories above in PDB.

When comparing the effectiveness of TDB in comparison to PDB within Washington, the trends between the particular values are in parallel to one another, but TDB is received as less effective than PDB. Where CMAR struggles compared to PDB and TDB is its ability to meet cost predictability and schedule demands.

The results seen between Washington State and the Non-Washington states are in stark contrast to one another. Within Washington, each delivery method performs differently in comparison to one another. However, with the Non-Washington states, they are not clearly differentiated other than with specific values, such as Lifecycle Value and the Ability to Meet the Owner's Goals. It could be surmised that these differences in trends could be related back to project delivery method familiarity, and the frequency of use of the different delivery methods across the nation.



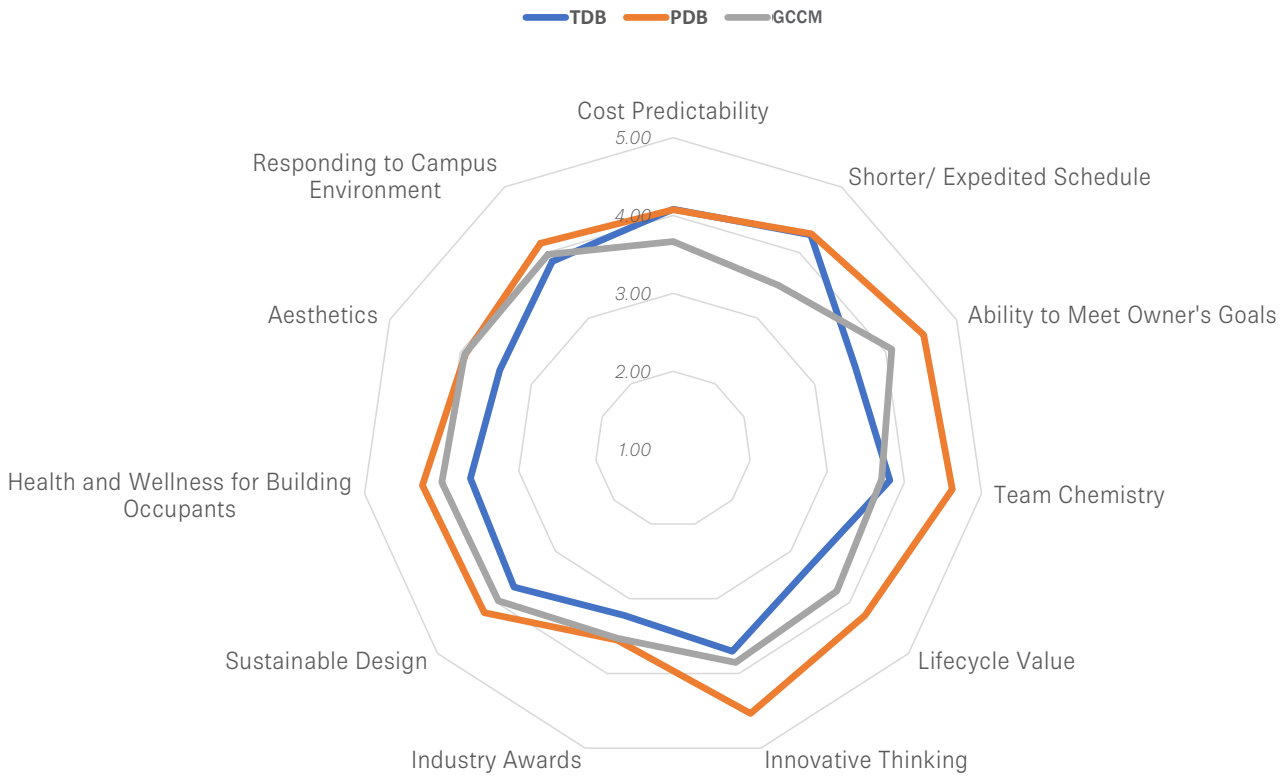
Non-Washington Findings:

The results of the survey received from Non-Washington states (such as California, Oregon, etc.) showed a similar response mostly across the board in terms of project delivery method performance. Where strong differences could be noted are in the Traditional Design Build performance in terms of Lifecycle Value and the Ability to Meet Owner's Goals. In comparing this data with interviews conducted for the Preliminary Interviews and Case Study Interviews, this could be primarily due to the fact that there is a guaranteed maximum price (GMP) determined prior to the design phase. This factor may limit the ability to meet lifecycle value requirements and owner's goals since the project budget is predetermined by the owner prior to the start of design, which can limit design flexibility and the ability to utilize higher quality materials.

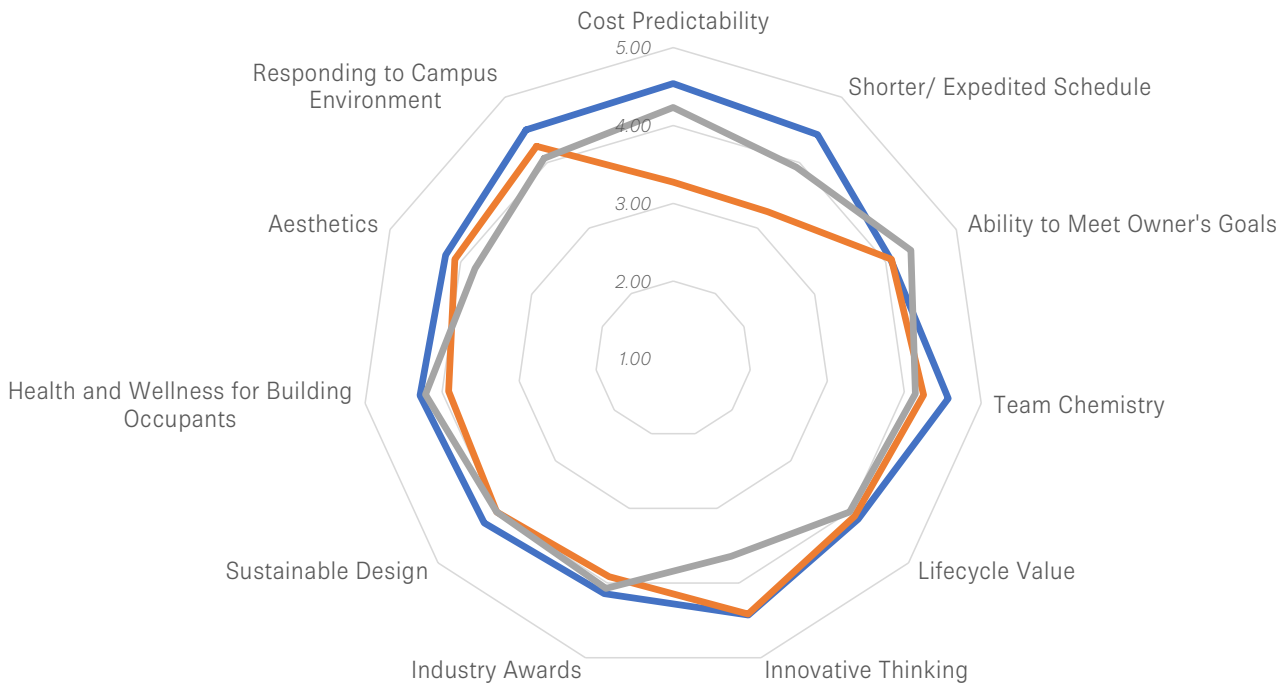
A compelling trend seen between both the Washington and Non-Washington states is that the PDB value assessments share a similar relationship to one another. Despite the Non-Washington States having less familiarity with PDB, this project delivery method is perceived similarly by both parties. Both regions also rate PDB as being more effective in its ability to meet the 11 assessed values. Additionally, both diagrams confirm the information collected during the preliminary interviews and case study interviews, in that team chemistry and the ability to meet the owner's goals can be better achieved with PDB. As was mentioned during the interviews, PDB allows for equal engagement of all team members during the project delivery phase, and it is the prioritization of collaboration which allows for more innovative design solutions. These innovative solutions, in turn, lead to the increased effectiveness of the values outside of cost predictability and a shorter/expedited schedule.

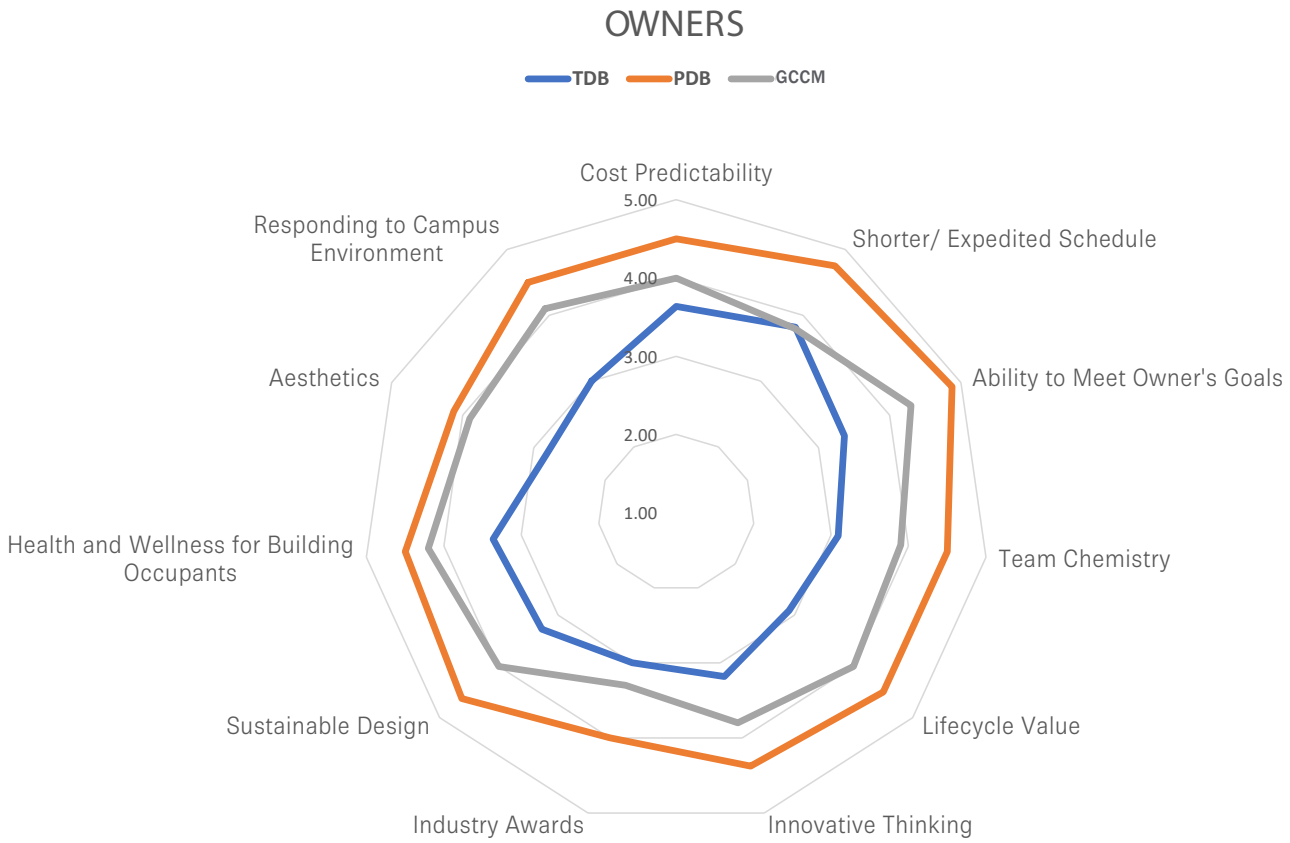
BY PROFESSION

DESIGN CONSULTANTS



GENERAL CONTRACTORS





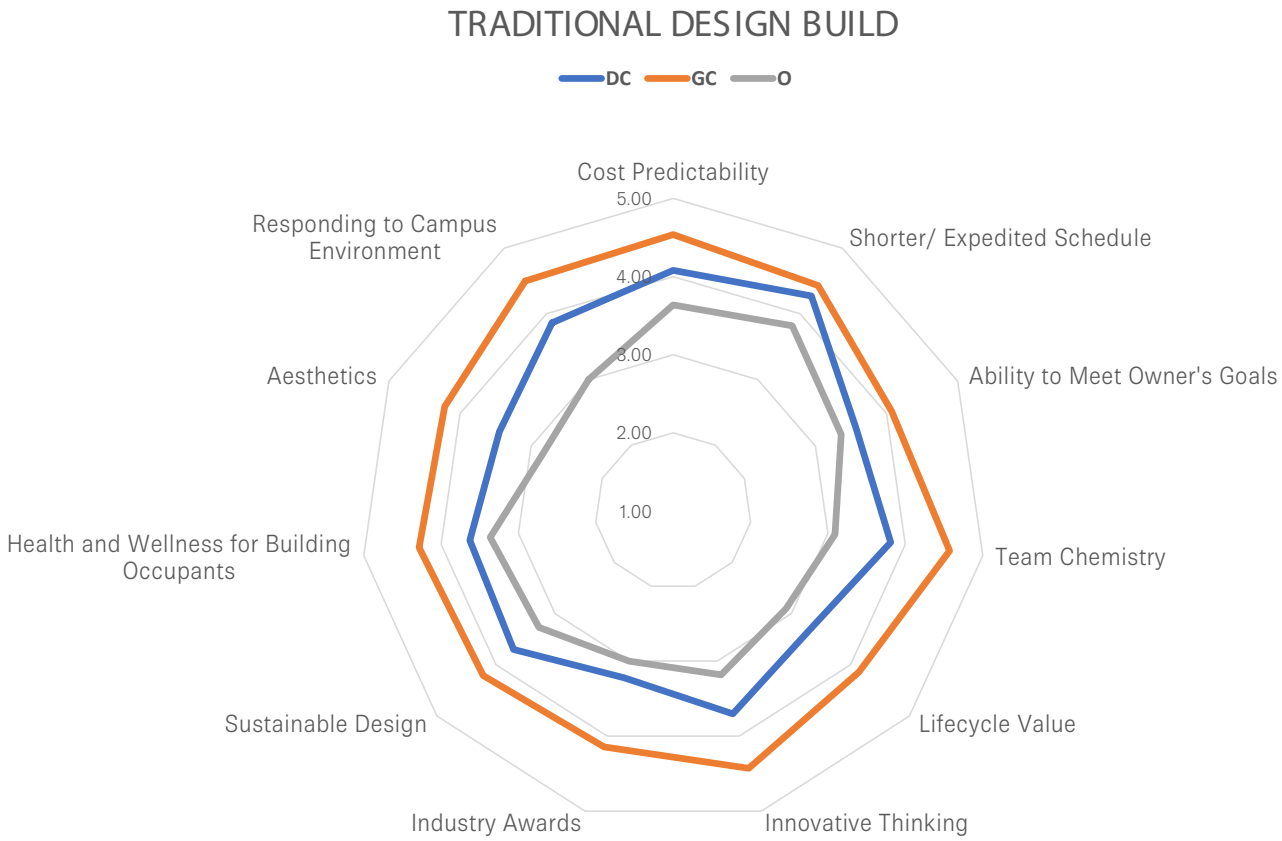
Profession Findings:

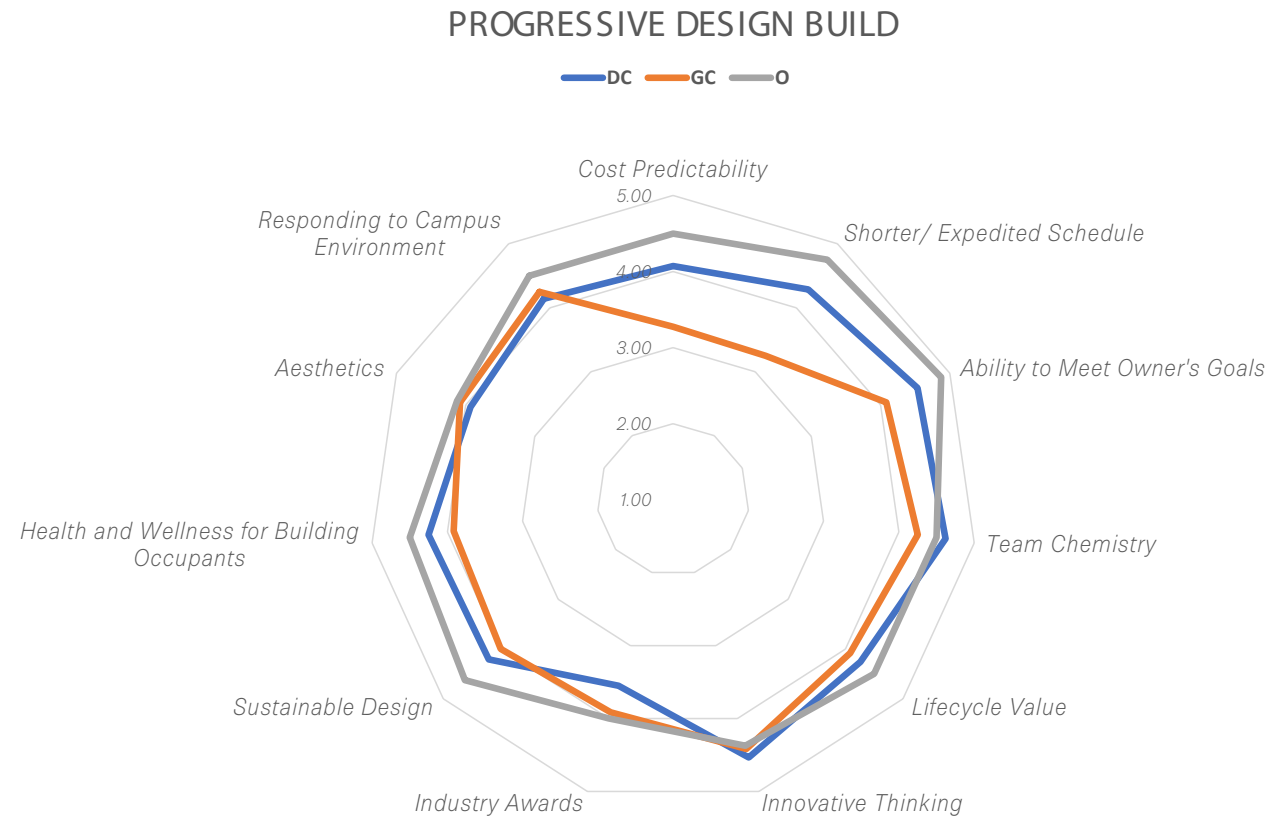
When breaking down the results by profession, the results respond accordingly in terms of perception of design controllability as well as concrete factors including cost predictability and a shorter/expedited schedule. Progressive Design Build (PDB) tends towards heavier team collaboration efforts and more design controllability in the hands of the owners.

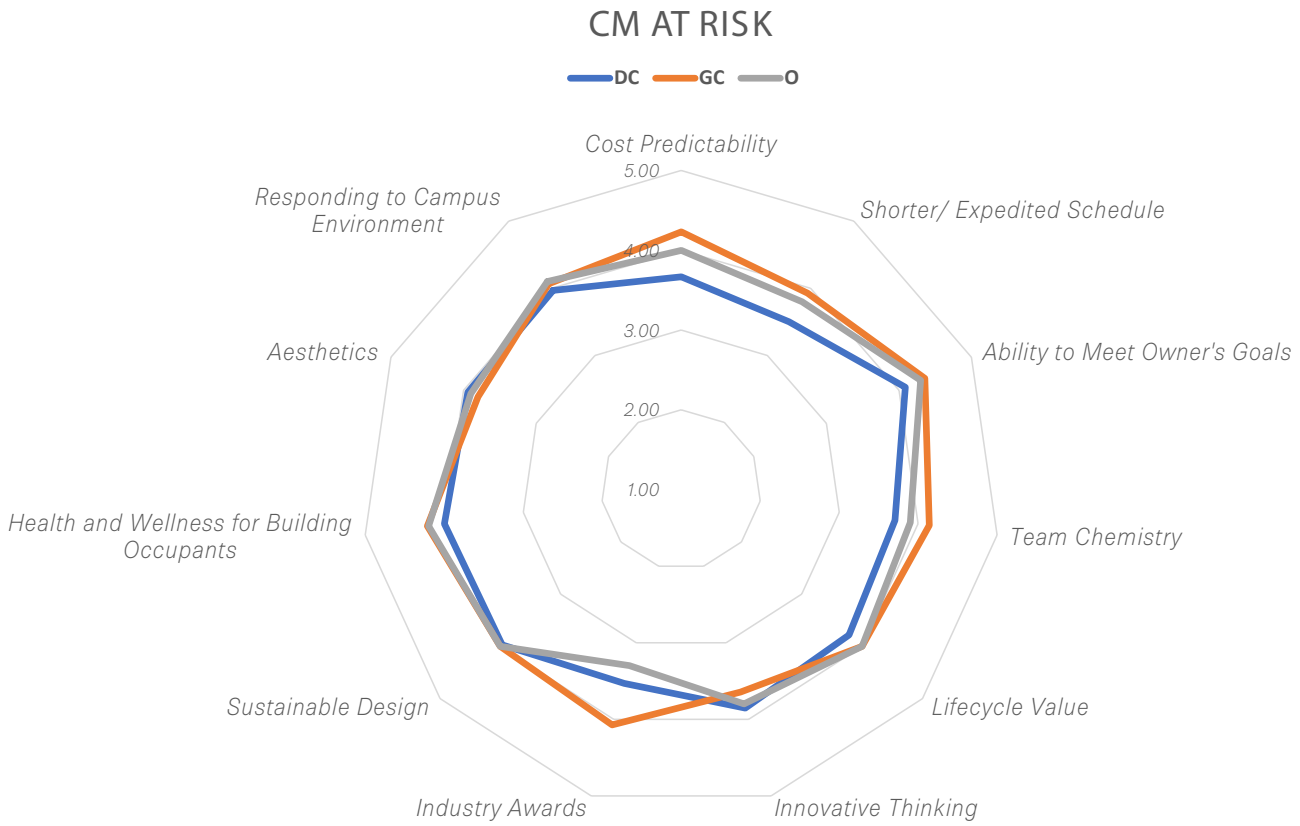
A trend that can be seen with the GCs, in particular, is how their viewpoint of the different delivery methods show more variance when looking at the concrete values of cost predictability and a shorter/ expedited schedule. GC's did not reflect that PDB provides as much surety on cost and schedule. Additionally, the GC viewpoint that PDB lacks in effectiveness particularly in cost predictability was also confirmed in the preliminary and case study interviews.

The owner perspective is of interest, particularly because they are the ones who ultimately select the project delivery method. Compared to the design consultants and GCs, the owners were the only group who had effectiveness ratings that closely approached 5. Their response to PDB is very optimistic and far exceeds the performances of CMAR and TDB. The drop in effectiveness of aesthetics and response to campus environment in TDB is likely due to limited owner engagement and the speed of the procurement process. PDB may also be perceived more optimistically by the owner, as well, due to the project delivery method's encouragement of collaboration across disciplines and ability to iteratively develop the design to work with the budget.

BY PROJECT DELIVERY METHOD



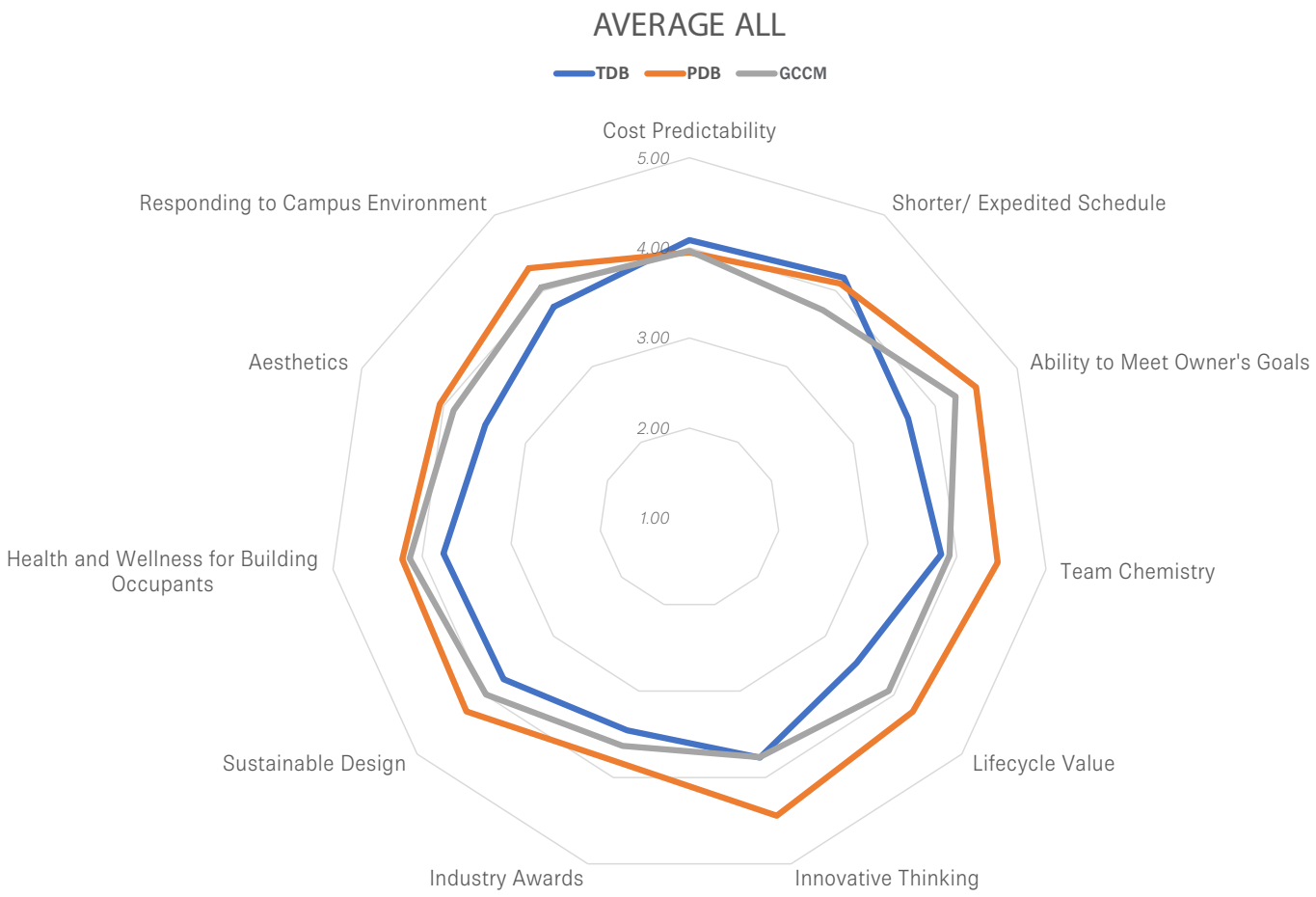


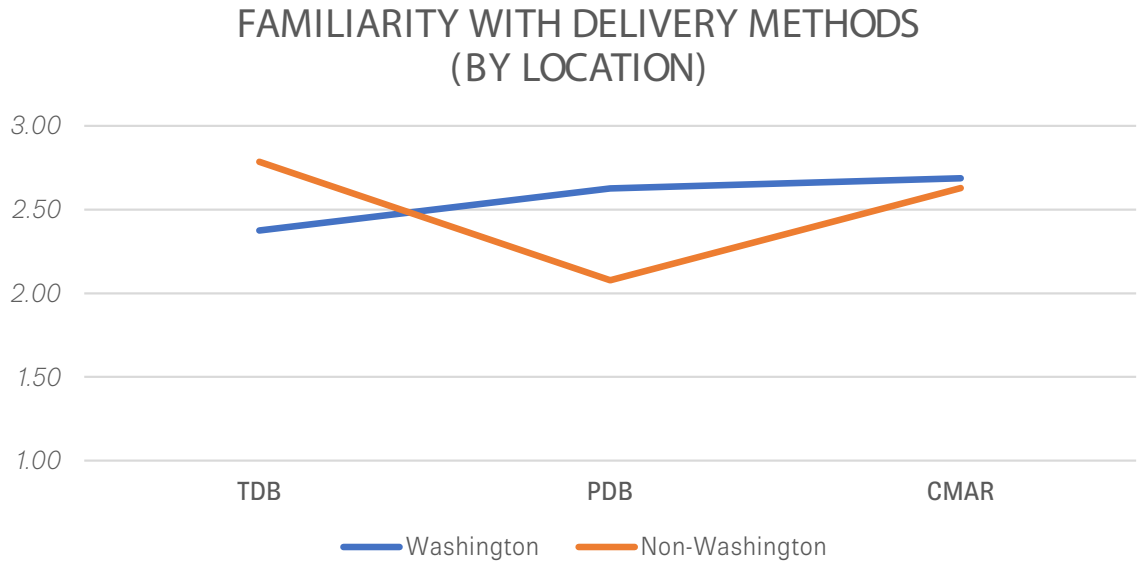


Delivery Method Findings:

When arranged solely by project delivery methods, certain trends can be detected by each method as a whole, as well as by profession. CM at Risk is received very similarly amongst design consultants, general contractors, and owners. When reading this information from a 1 to 5 scale, the respondents claimed that CM at Risk performs at a 4 level, which means that they believe that the 11 given values are mostly effective. However, Traditional Design Build (TDB) demonstrates significant variances between the professions. Especially, by viewing this information under the lens of design controllability, because of the constraints of a stipulated sum or a guaranteed maximum price, this may be why owners feel that TDB under-performs in terms of the 11 values. General Contractors' (GC) lack of preference for Progressive Design Build (PDB) in terms of cost predictability and shorter/expedited schedule may be due to the fact that cost is not clearly determined or outlined before the conception of the design. This may be an additional factor that can affect having a shorter/expedited schedule.

What is particularly interesting amongst the three diagrams is seeing how the traditional values of cost predictability and a shorter/expedited schedule align with the other abstract values that were evaluated. When looking at PDB, despite the GC perspective of it having less reliability in terms of cost and schedule, they responded that the remaining abstract value effectiveness was not hindered by this variable. However, TDB, despite having a better response by owners in terms of cost and schedule, felt that the remaining abstract values underperformed, particularly aesthetics and the building response to the campus environment. When relating these findings back to the interviews conducted, this may be due to the fact that the time to create the design and set the fixed GMP price is limited in TDB. As can be seen on the TDB diagram, the Design Consultants and GC's also demonstrate a similar drop with Aesthetics and another factor like, Lifecycle Value. These values can be easily sacrificed when there is a fixed budget and limited time and collaboration with the owner.





Familiarity was converted from a scale of no familiarity to very familiar to a 0 to 3 scale.
0 was excluded from the chart for the purposes of visual clarity.

Findings from Average of All:

In looking at the Average All of the findings, it can be seen that amongst the three project delivery methods, they all tend to trend similarly to one another. Although some differences can be detected in factors, such as Innovative Thinking, Lifecycle Value, Team Chemistry, and Ability to Meet Owner's Goals, they are only slight differences. The averaged findings take into account the viewpoints of the three categories of people who were surveyed, and by knowing this fact, it is clear that a factor, such as cost predictability is something that is consistently regarded as effective across the three project delivery methods.

Primary Conclusions:

Particularly because this research aimed to investigate variables outside of the traditional values generally acknowledged in project delivery, it produced meaningful findings as to how these abstract values were interpreted within the context of TDB, PDB, and CMAR. An owner at a higher education institution can review this information to clearly identify their goals and values. If collaboration across the various professions involved in a project is not a critical factor, a delivery method such as PDB may not necessarily be an appropriate project delivery choice, since factors such as lower cost predictability and lack of consistency in schedule may be factors that are not worth sacrificing. Similarly, if thinking innovatively and having higher building performance in terms of lifecycle value and sustainability in design are important factors, then PDB may be the direction to move towards when selecting a new project delivery method.

Moving forward from this research, it is important for owners of higher education institutions to look beyond familiarity with a delivery method to see which delivery method best aligns with their values. Confirmed in the project-specific analysis, through the Case Studies, familiarity played a critical role in maintaining a certain system through delivery method selection. Particularly when familiarity with project deliveries are assessed by Washington vs. Non-Washington States, the disparities in familiarity in PDB are evident between the two regions. However, by reviewing the data presented in the "Average All" diagram, Owners can prioritize essential values that are imperative to project success if they would like to choose to change delivery methods.

Although a project delivery method is ultimately the choice of the higher education institution, assessing the method performance through the lens of design consultants and general contractors is critical. This is a factor, because the general outlook of these groups on the different project delivery methods can be affected, especially when evaluating team chemistry and creating a high performing team.

Survey Limitations and Next Steps:

In assessing the responses received from the survey, a next step that could help bolster the data set is to have the time dedicated to the survey be extended. Due to time limitations, responses by individuals in the field of Academia were limited. Additionally, by allotting more time to the survey, the opportunity to gain a more national response for the survey could have been achieved. Although the research is based in Washington State, getting a national response can assist in better understanding a more national perspective in project delivery method trends. By doing so, regions in the survey could be divided by greater national regions, such as West Coast, Mid-West, Southwest, East Coast, etc.

Another survey limitation that should be considered when assessing the data is being aware of the institutions the responses are coming from. For example, the University of Washington, as noted in the preliminary interviews and case study, have consistently used PDB as a project delivery method for a majority of their campus projects. When relating this information back to the Familiarity with Delivery Methods by Location, if a majority of the Washington-State responses are from the University of Washington, or companies that have worked with them, this may be a significant factor that affects the responses for PDB-related questions. It is for this reason that having a more diverse and large test group could enhance the findings.

Introducing project size and scale could have also been an interesting factor to have included in the survey. This could help to better understand how project delivery method selection can be driven by project size, and how effectiveness of each of the values changes with each project delivery method in relation to the scale of the project.

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APPENDIX—

Preliminary Interview Outline

Case Study Interview Outline

Survey

Preliminary Interview Outline

The goal of this research is to compare the value delivery of three project delivery methods, Stipulated Sum/ Competitive Design Build, Progressive Design Build, and CM at Risk/CM GC, in higher education projects. To achieve this goal, we would like to identify (1) what abstract values we can use to determine the levels of value delivery in each of the methods; (2) what criteria would you use when selecting a delivery method for a new project?

Introduction

1. Please introduce your organization and your role.
2. What is your experience with each of the three different project delivery methods?
    a. Stipulated Sum/ Competitive Design Build
    b. Progressive Design Build
    c. CM at Risk/GC CM

Project Performance

3. How do you define success in a higher education project?
4. What values are of utmost importance to you during the project delivery process? (e.g., cost, schedule, design quality, teamwork, etc.)
5. What abstract values do you use to determine project success of a higher education project? (e.g., sustainability, aesthetics, maintenance, etc.)
    a. How do you measure these (metrics)?
    b. How do you measure these from the perspective of users (or any other key stakeholders)?

Selection Criteria for Project Delivery Method

6. What internal/external factors influence a project delivery method selection for your institution?
7. What is an optimum project size and typology that best aligns with each of the three project delivery methods?
8. Does familiarity with a project delivery method affect project success?

Case Study Request

9. Can you provide a case study or two we can use for our research?

Case Study Interview Outline

The goal of this research is to compare the value delivery of three project delivery methods, Stipulated Sum/ Competitive Design Build, Progressive Design Build, and CM at Risk/CM GC, in higher education projects. To achieve this goal, we would like to use your project as a case study. In particular, we would like to identify (1) what values you used to measure the success of your project; (2) what aspects of the project worked well (or didn't work well) given the specific delivery method chosen for the project.

Introduction

1. Please introduce your organization and your role in the project.
2. What was the project delivery method chosen for this project, and why?

Project Performance

3. How do you define success in a higher education project? Did this project meet that standard?
4. What values were of utmost importance to you during the process of design and construction of this project? (e.g., Traditional values such as cost, schedule; Abstract values such as design quality, teamwork, sustainability, aesthetics, maintenance, etc.)
    a. How did you measure these (metrics)?
    b. Did you assess these values from the perspective of users (or any other key stakeholders)?
5. Did your project perform as expected from a cost and schedule standpoint?
6. What aspects of the project worked well (or didn't work well) given the specific delivery method chosen for the project?
7. How did the chosen project delivery method facilitate or impede the ability of the project to proceed smoothly throughout the design process?
8. What was the team chemistry like throughout the project? Do you think the chosen project delivery method helped achieve a high-performing team? If yes, why? If not, why not? Any lessons learned?

Selection Criteria for Project Delivery Method

9. What internal/external factors influenced the project delivery method selection for this project?
10. Did your familiarity with the project delivery method affect the project's success?
11. Lastly, what were the learning outcomes of this project, which can be considered for a future project delivered with the same project delivery method?

What Delivery Systems Work Better for Higher Education Projects?

Purpose: The goal of this research is to compare three project delivery methods, Stipulated Sum/ Competitive Design Build, Progressive Design Build, and CM at Risk (CM/GC, GC/CM), in **higher education projects**. To achieve this goal, we would like to identify (1) which abstract project components can be used to determine the levels of value in each of the delivery methods; (2) what criteria would you use when selecting a delivery method for a new project.

Activities: The study activities include a series of survey questions meant to evaluate qualitative and quantitative perspectives of different team members associated with the design delivery of a higher institution project. This includes but is not limited to: the owner/agency, architect, contractor, and sub-contractors. The survey will primarily ask the participant about their experience with the different design delivery methods and strive to determine what abstract values are taken into consideration during the process of design delivery at a **higher education institution**.

Time: Your participation in this study will last about **15 minutes**.

Confidentiality: Your identity will not be published. This survey is meant to only gain a broad perspective on the goals and general opinions regarding the three primary project delivery methods focused on in this research.

Study contacts: If you have any questions about this research project, please contact **Azita Footohi at (360) 989-8203 or by email at** afootohi@uw.edu. If you have questions about your rights or welfare as a participant, please contact the University of Washington Institutional Review Board (IRB) Office, at (206) 543-0098 or by email at hsdinfo@uw.edu

Please answer all of these questions based on your personal experience/perspective in a higher education setting, but not based on a specific project.

* Required

Background Information

Please use this section to answer questions about yourself and your organization.

1. What is the name of your Organization?

_____

2. Describe your type of Organization: *

Mark only one oval.

- ◯ Owner (Higher Education Institution)
- ◯ Design Consultant
- ◯ General Contractor
- ◯ MEP Consultant
- ◯ O&M Personnel
- ◯ Other: _____

3. How many years of experience do you have in your trade? *

Mark only one oval.

- 1-5 Years
- 5-10 Years
- 10-20 Years
- 20 Years +

4. In which state do you have most of your higher education project experience? *

Project Delivery Method Information

Outlined here are the definitions for the different project delivery methods for your reference. Terms can often be interchangeable between states, and so, the terms are defined below.

Stipulated Sum/Competitive Design Build (aka Traditional Design Build)

"This method of project delivery includes **one entity** (design-builder) and a **single contract** with the owner to provide both architectural/engineering design services and construction." (Source: DBIA) A Basis of Design or Detailed Project Program (DPP) is used to solicit a Guaranteed Maximum Price (GMP) from design-builder. This becomes the contract value for the selected design-builder at the time of award.

Progressive Design Build

"One application of design-build delivery is via a stepped, or progressive process (commonly referred to as Progressive Design Build or PDB). PDB uses a qualifications-based or best value selection, followed by a process whereby the owner then 'progresses' towards a design and contract price with the team (thus the term 'Progressive')." (Source: DBIA) This type of delivery includes one entity (design-builder) and a single contract with the owner as well.

CM at Risk (aka CM/GC or GC/CM)

"This delivery method entails a commitment by the construction manager at-risk (CMR) for construction performance to deliver the project within a defined schedule and price, either a fixed lump sum or a GMP. The CMR provides construction and pricing input to the owner during the design phases and becomes the general contractor during the construction phase." (Source: DBIA)

Professional Experience

Please use this section to answer questions relating to your familiarity with the three project delivery methods at hand: Stipulated Sum/Competitive Design Build, Progressive Design Build, CM at Risk (CM/GC, GC/CM). Please consider these questions within a HIGHER EDUCATION context.

5. What is your level of personal experience with the following Project Delivery Methods? *

Mark only one oval per row.

	Not Familiar	Somewhat Familiar	Very Familiar
Traditional Design Build	⬭	⬭	⬭
Progressive Design Build	⬭	⬭	⬭
CM at Risk (CM/GC; GC/CM)	⬭	⬭	⬭

6. If you are an owner, what project delivery method(s) do you use primarily amongst the three options below?: *

Check all that apply.

Check all that apply.

- ☐ Traditional Design Build
- ☐ Progressive Design Build
- ☐ CM at Risk (CM/GC; GC/CM)
- ☐ I am not an Owner

7. What has been the CONSTRUCTION COST range of projects you have engaged with at HIGHER EDUCATION institutions for the following delivery methods? *

Select all that apply.

Check all that apply.

	Less than $50 M	$50 M - $100M	$100 M - $250 M	$250 M - $500 M	$500 M+	Do not have this experience
Traditional Design Build	☐	☐	☐	☐	☐	☐
Progressive Design Build	☐	☐	☐	☐	☐	☐
CM at Risk (CM/GC; GC/CM)	☐	☐	☐	☐	☐	☐

8. What are the typical square footage ranges for projects you have involvement with at HIGHER EDUCATION institutions for the following delivery methods? *

Select all that apply.

Check all that apply.

	Less than 50,000 sqft	50,000 - 100,000 sqft	100,000 - 150,000 sqft	150,000 - 300,000 sqft	300,000+ sqft	Do not have this experience
Traditional Design Build	☐	☐	☐	☐	☐	☐
Progressive Design Build	☐	☐	☐	☐	☐	☐
CM at Risk (CM/GC; GC/CM)	☐	☐	☐	☐	☐	☐

9. How likely is your organization to try a new project delivery method that they are unfamiliar with? *

Mark only one oval.

- ◯ Very unlikely
- ◯ Somewhat unlikely
- ◯ Somewhat likely
- ◯ Very likely
- ◯ Don't know

ABSTRACT VALUES ANALYSIS

In this section, questions will be asked relating to how abstract values in project delivery method selection can be compared across the three project delivery methods at hand: Stipulated Sum/Competitive Design Build, Progressive Design Build, and CM at Risk (CM//GC, GC/CM). Please consider these questions within in a HIGHER EDUCATION context.

10. Of the following qualitative goals below, select the TOP 4 goals that matter most in HIGHER EDUCATION building projects. *

Please select the top four options.

Check all that apply.

- ☐ Ability to meet owner's goals
- ☐ Team chemistry
- ☐ Lifecycle value
- ☐ Innovative thinking
- ☐ Industry awards
- ☐ Sustainable design
- ☐ Health and wellness for building occupants
- ☐ Aesthetics
- ☐ Responding to campus environment

Value Assessment - Rate each project delivery method in terms of which achieves each of the following goals more effectively.

Rate each project delivery method in terms of which achieves each of the following goals more effectively.

11. Cost predictability *

Mark only one oval per row.

	Very effective	Somewhat effective	Somewhat ineffective	Very ineffective	No impact	Unfamiliar with this delivery method
Traditional Design Build						
Progressive Design Build						
CM at Risk (CM/GC, GC/CM)						

12. Shorter/expedited schedule *

Mark only one oval per row.

	Very effective	Somewhat effective	Somewhat ineffective	Very ineffective	No impact	Unfamiliar with this delivery method
Traditional Design Build						
Progressive Design Build						
CM at Risk (CM/GC, GC/CM)						

13. Ability to meet owner's goals *

Mark only one oval per row.

	Very effective	Somewhat effective	Somewhat ineffective	Very ineffective	No impact	Unfamiliar with this delivery method
Traditional Design Build						
Progressive Design Build						
CM at Risk (CM/GC, GC/CM)						

14. Team chemistry *

Mark only one oval per row.

	Very effective	Somewhat effective	Somewhat ineffective	Very ineffective	No impact	Unfamiliar with this delivery method
Traditional Design Build						
Progressive Design Build						
CM at Risk (CM/GC, GC/CM)						

15. Lifecycle Value *

Mark only one oval per row.

	Very effective	Somewhat effective	Somewhat ineffective	Very ineffective	No impact	Unfamiliar with this delivery method
Traditional Design Build						
Progressive Design Build						
CM at Risk (CM/GC, GC/CM)						

16. Innovative thinking *

Mark only one oval per row.

	Very effective	Somewhat effective	Somewhat ineffective	Very ineffective	No impact	Unfamiliar with this delivery method
Traditional Design Build						
Progressive Design Build						
CM at Risk (CM/GC, GC/CM)						

17. Industry awards *

Mark only one oval per row.

	Very effective	Somewhat effective	Somewhat ineffective	Very ineffective	No impact	Unfamiliar with this delivery method
Traditional Design Build						
Progressive Design Build						
CM at Risk (CM/GC, GC/CM)						

18. Sustainable design *

Mark only one oval per row.

	Very effective	Somewhat effective	Somewhat ineffective	Very ineffective	No impact	Unfamiliar with this delivery method
Traditional Design Build						
Progressive Design Build						
CM at Risk (CM/GC, GC/CM)						

19. Health and wellness for building occupants *

Mark only one oval per row.

	Very effective	Somewhat effective	Somewhat ineffective	Very ineffective	No impact	Unfamiliar with this delivery method
Traditional Design Build						
Progressive Design Build						
CM at Risk (CM/GC, GC/CM)						

20. Aesthetics *

Mark only one oval per row.

	Very effective	Somewhat effective	Somewhat ineffective	Very ineffective	No impact	Unfamiliar with this delivery method
Traditional Design Build						
Progressive Design Build						
CM at Risk (CM/GC, GC/CM)						

21. Responding to campus environment *

Mark only one oval per row.

	Very effective	Somewhat effective	Somewhat ineffective	Very ineffective	No impact	Unfamiliar with this delivery method
Traditional Design Build						
Progressive Design Build						
CM at Risk (CM/GC, GC/CM)						

Thank you for participating!

22. If you are willing, can you provide your email to contact you in the future for any additional follow-up questions?

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