

BRIEFING MEMORANDUM

RE: UC Merced 2020 Project Delivery Options

Date: November 2015

The driving force for the 2020 Project is to develop and operate sufficient, high-quality facilities at UC Merced to accommodate 10,000 students in the most rapid and cost-effective manner possible.

This memorandum provides an overview of the delivery options analyzed for the delivery of significant amounts of academic, residential and student-support facilities by 2020.

A. Comparison of Delivery Options

The campus analyzed capital delivery models based on the following factors:

1. Delivery of the necessary facilities by 2020
2. Reduction of design and construction costs through economies of scale
3. Innovation in design and construction
4. Achievement of good performance of buildings throughout their lifecycle, including maintenance and operations of major building systems
5. Advancement of the University's sustainability agenda
6. Ability to share of performance and financial risk over the lifecycle of the facilities
7. Total cost of ownership
8. Term of contractual relationship(s)

B. Project Delivery Options and Projected Costs

The campus explored three delivery strategies for the development of the 2020 Project:

- I. Design-Bid-Build Contracts
- II. Design-Build Contract(s)
- III. Availability Payment DBFOM Contract(s) ("2020 Project")

I. Design-Bid-Build Contracts

Delivery in 2024; University Bears Full Risk for Operations, Maintenance and Capital Renewal

Design-Bid-Build is a procurement methodology that has been utilized to deliver new campuses in the past. In this process, the campus would hold all responsibility, including the financial and performance risks, associated with the development of the master plan, the procurement of design services and the procurement of construction services.

The University would need to procure design services for master planning, and subsequently for design and construction for the infrastructure, based upon the selected master plan. Following the construction of the infrastructure, the campus would need to procure design services and construction services for the most immediately needed “First Delivery Facilities.” Finally, it would procure design services and construction services separately for the remainder of the program, “Second Delivery Facilities.”

Lifecycle Costs in Design-Bid-Build

In a Design-Bid-Build model, the design and construction costs are budgeted on a project-by-project basis. The cost of the design and construction is amortized over the term of a bond financing and interest costs associated with those bonds represent the financing costs. The University would make payments for the cost of the building as construction proceeds, and in full, upon completion of construction. These payments would be funded with revenue bonds (tax-exempt or taxable) issued by the University.

The nature of the sequential procurement methodology, including the need to develop infrastructure based on a selected master plan before procurement of buildings, elongates the delivery time for the facilities. The campus estimates that the fastest possible time to deliver the 2020 Project infrastructure and all of the facilities is a minimum of eight years (2024). As a result, the design and construction costs are higher due to construction inflation and the separation of the projects through several separately managed phases.

The University would receive a two-year warranty upon substantial completion and a ten-year warranty for latent construction defects, but would otherwise need to plan and budget for ongoing costs of facilities operations and maintenance, including full responsibility for the building performance. Over time, the University would be responsible for managing capital renewal projects, which are typically contracted as separate projects.

Together, the annual cost of the amortization of design and construction, the cost of financing, and the estimated cost of ongoing operations and maintenance of the facilities represents the “Annual DBFOM Cash Flow Requirement of the Project,” as shown in the table below.

Design-Bid-Build	
	Multiple Phases
Phasing Approach	<ol style="list-style-type: none"> 1. Infrastructure 2. First Delivery Facilities 3. Second Delivery Facilities 4. Substantial Completion
Substantial Completion	2024
Estimated Annual DBFOM Cash Flow Requirement After Substantial Completion	\$119 million
Termination	Campus retains the discretion to proceed with each phase

Disadvantages of Design-Bid-Build Contracts

A Design-Bid-Build contracting strategy would not deliver the necessary facilities on a timely basis, and would not offer an opportunity to reduce design and construction costs through economies of scale.

The Design-Bid-Build process typically involves a separate procurement and project management process for each individual building. This approach demands a significant level of campus resources to successfully manage and coordinate multiple building projects, potentially with multiple contractors on the operating campus at the same time. This would add significant interface risk and pose project management challenges on the operating campus. Mitigation of these risks would require project delivery to be slower than assumed and/or further increase cost. *The Estimated Annual DBFOM Cash Flow Requirement for this case does not include additional contingency to mitigate this risk.*

The Design-Bid-Build strategy also has limitations on the warranties provided by each contractor. These limitations concentrate performance risk for the developed facilities on the University. Over time, the University would need to contract for capital renewal projects on a scheduled or deferred basis. The pricing of capital renewal projects would be subject to unknown future construction market conditions. In the event that buildings do not perform as designed and/or maintenance of capital renewal work is deferred, costs can become unpredictable and escalate rapidly. The Estimated Annual DBFOM Cash Flow Requirement for this case does not include additional contingency to mitigate this risk.

The campus retains financial risk associated with unforeseen events that may periodically render facilities unavailable to students, faculty and/or staff. Examples include, but are not limited to, failures of major building systems, a loss of electrical power, or a breakdown of air conditioning units that render a facility uninhabitable for a period of time. When these unfortunate events occur, the University still must make all payments associated with the amortization of the design and construction costs, financing, operations, and maintenance of the affected facility.

II. Design-Build

Delivery in 2020-2022; University Bears Full Risk for Operations, Maintenance, and Capital Renewal

Design-Build is characterized by a single point of responsibility for both design and construction activities. Design-Build is often chosen to transfer risk and coordination responsibility to one contracting party to ensure a higher level of coordination for these two critical components of project delivery. Utilization of a Design-Build strategy would enable development of the supporting infrastructure for the 2020 Project at the same time as the buildings, thereby streamlining design and construction of the facilities. As compared with a Design-Bid-Build process, Design-Build can combine facility delivery into one or two procurements.

In order to achieve the University's goal of delivering facilities by 2020, this strategy would combine design services for master planning and design with the construction of the infrastructure and facilities.

The University could procure the design and construction of the infrastructure and facilities in a single-phase procurement, with three delivery sequences. The contractor would be required to deliver the First Delivery Facilities by Fall 2018, the Second Delivery Facilities by 2019, and Substantial Completion by Fall 2020.

Alternatively, in a phased Design-Build procurement approach, the University would likely sequence the procurement of the subsequent facilities to follow the completion of the First Delivery Facilities, delaying substantial completion of the facilities until approximately 2022.

Lifecycle Costs in Design-Build

In a Design-Build model, the design and construction costs (under a single entity) are budgeted as a capital project. The cost of the design and construction is amortized over the term of a bond financing and interest costs associated with those bonds represent the financing costs. The University would make payments for the cost of the building as construction proceeds, and in full, upon completion of construction. These payments would be funded with revenue bonds (tax-exempt or taxable) issued by the University.

A single-phase procurement process would reduce project cost relative to a Design-Bid-Build or multiple-phase project, due to economies of scale and avoidance of construction cost inflation. In a multi-phase procurement approach, the 2020 Project would likely reach substantial completion in six years (2022). This approach would enable the University to "opt-in" to the development of the second phase of the 2020 Project. The economics of this approach would be expected to be substantially similar to a single procurement that incorporates a pre-development agreement for the second phase of the project. This scenario would be more cost-effective than Design-Bid-Build, but more costly than a single-phase Design-Build procurement.

The campus would receive a two-year warranty upon substantial completion and a ten-year warranty for latent construction defects, but would otherwise need to plan and budget for ongoing costs of facilities' operations and maintenance, including full responsibility for the building performance. Over time, the University would be responsible for managing capital renewal projects, which are contracted as separate minor or major capital projects.

Together, the annual cost of the amortization of design and construction, the cost of financing, and the estimated cost of ongoing operations and maintenance of the facilities represents the “Annual DBFOM Cash Flow Requirement of the Project,” as shown in the table below.

Design-Build (DB)		
	<u>Variant 1</u> Single-Phase DB Procurement	<u>Variant 2</u> Multi-Phase DB Procurement
Phasing Approach	Facilities are sequenced, with an integrated delivery of infrastructure	First Delivery Facilities and the associated infrastructure are procured and delivered. Following substantial completion, a second procurement is conducted for subsequent facilities and the associated infrastructure
Substantial Completion	2020	2022
Estimated Annual DBFOM Cash Flow Requirement After	\$105 million	\$113 million
Optional Termination	Contingent breakage that could also result in delay, with related costs	No additional costs or breakage that would result in delay

Disadvantages of Design-Build Contracts

A single-phase procurement strategy would be necessary to deliver the needed facilities on a timely basis and to maximize economies of scale.

Similar to Design-Bid-Build, the Design-Build strategy has limitations on the value of the warranties provided by each contractor. These limitations concentrate performance risk for the developed facilities on the University. Over time, the University would need to contract for capital renewal projects on a scheduled or deferred basis. The pricing of capital renewal projects would be subject to unknown future construction market conditions. In the event that buildings do not perform as designed and/or maintenance of capital renewal work is deferred, costs can become unpredictable and escalate rapidly.

The Estimated Annual DBFOM Cash Flow Requirement for this case does not include additional contingency to mitigate this risk.

The campus retains financial risk associated with unforeseen events that may periodically render facilities unavailable to students, faculty and/or staff. Examples include, but are not limited to, failures of major building systems, a loss of electrical power, or a breakdown of air conditioning units that render a facility uninhabitable for a period of time. When these unfortunate events

occur, the University still must make all payments associated with the amortization of the design and construction costs, financing, operations and maintenance of the affected facility.

Relative to a single-phase Design-Build procurement, a multi-phase Design-Build procurement entails separate procurement processes, elongating the time for substantial completion, as well as increasing costs. Costs would increase with construction-cost inflation, which would increase the annual amortization of design and construction cost, and increase financing cost due to a higher amount of debt. A multi-phase approach would require repeating the procurement process for additional phases, decreases economies of scale and the leveraging of volume, and increases mobilization and demobilization costs relative to a single-phase approach.

III. Availability Payment DBFOM Contract

Delivery in 2020; Ensures Funding of Operation, Maintenance, and Capital Renewal Over Facilities' Lifecycle

An Availability Payment DBFOM contract builds upon the concept of a single phase Design-Build approach in order to achieve the campus objective to implement a lifecycle financial model and risk profile for its facilities that preserves the value of University ownership of the facilities. The DBFOM approach creates private-sector competition for a contract that links the cost of long-term maintenance and operation of the facilities to their initial design and construction.

In this procurement methodology, the University would make two types of payments: (i) "milestone" payments, upon the delivery of the facilities; and (ii) "availability" payments, which are performance-based payments made over the lifecycle of the facilities.

Milestone payments would be made to finance approximately 50-75 percent of the cost of the facilities. These payments would be funded through the issuance of revenue bonds (tax-exempt or taxable). Like a Design-Build contract, the cost of the milestone payments is amortized over the term of the bond financing and interest costs associated with those bonds represent the financing costs.

Following the delivery of the facilities, over the term of a long-term contract (equivalent in length to a bond financing), the University would make availability payments, subject to the availability and performance of the facilities as specified in the Project Agreement. These availability payments are designed to pay for the amortization of the private financing portion of the design and construction costs, interest on financing, and the cost of maintenance, operation and renewal of the facilities. If the buildings do not perform up to the standards established in the Project Agreement, the availability payments are reduced. These availability payment reductions function to share the financial and performance risk of maintaining and operating facilities over time. The size of the availability payments is determined through a competitive procurement process.

This strategy differs from other long-term development contracts the University has historically undertaken. Under this strategy, the University would not transfer property rights to the counterparty. In short, the Project Agreement is not a lease. The University also would not assign

its revenue streams to a third party: the University will receive all revenue associated with the implementation of its programs.

Under an Availability Payment DBFOM contract, the Developer must not only design efficient facilities on the agreed-upon time schedule, it must properly maintain the major building systems in order to earn the agreed-upon availability payments. If any facilities are not available in accordance with the contract standards, the University is entitled to deduct an established amount from the availability payment. In addition, the transaction is structured to require the Developer to establish monetary reserves for capital renewal/compliance work, and for work related to handback requirements at the end of the agreement term. These reserves ensure a funding source for the Developer to return the buildings in a state of good repair, per the standards specified in the Project Agreement.

The Availability Payment DBFOM strategy helps ensure that the 2020 Project fits within a long-term financial model so that the campus can afford to maintain what it builds. By linking the cost of the long-term maintenance and operation of the facilities to their initial design and construction, the strategy promotes quality design and construction and good performance throughout the lifecycle of the buildings. This risk-sharing structure will enable the campus to focus on delivery of its core teaching, research and public-service mission by minimizing capital maintenance and operations risk.

Optional Termination Provisions (“Opt-Out”)

The Availability Payment DBFOM contract includes a provision that enables the Regents to terminate the contract at any time – an option to “opt-out”. Upon exercising this termination provision, the Regents would make a payment equal to the amount of outstanding Developer debt and equity, a “make-whole” plus contractor breakage costs. The impact of taking this action would be to change the risk profile and lifecycle cost of the Project from a single-phase project to a two-phase project. In other words, the Estimated Annual DBFOM Cash Flow Requirement would increase by approximately \$8 million.

If the University were to choose to opt-out, it would result in the need to refinance the portion of the design and construction costs originally financed by the Developer with debt issued by the Regents. In that event, the benefits of sharing financial and performance risk could be eliminated.

Lifecycle Costs in an Availability Payment DBFOM

In an Availability Payment DBFOM procurement, bidders enter into a bid process across all lifecycle cost elements. The bids are based on the estimated annual DBFOM cash-flow requirement after substantial completion, according to the terms of the Project Agreement, including the technical specifications and performance standards the Developer must meet.

The lifecycle methodology includes periodic capital renewal to ensure that the buildings continue to perform in accordance with the contractual standards throughout the life of the long-term contract. This avoids the need for the University to bid capital renewal projects at a point to-be-determined in the future. By its nature, this methodology provides performance guarantees that are not available in a Design-Bid-Build or Design-Build procurement approach.

In the Design-Bid-Build and Design-Build models, even if a facility becomes unavailable due to construction defects covered by the original warranty, the University's payments for the facilities would not be reduced in a manner similar to an availability payment. The University would be responsible for the cost of the repair. Experience also shows that maintenance and operations costs can be unexpectedly high, due to poor design or construction short of an actual defect or outside of the warranty period.

Because the price competition in an Availability Payment DBFOM procurement is based on lifecycle costs that include the design, construction, financing, operations, and maintenance, the proposers have the incentive to design preventative maintenance programs to ensure facility availability. The competition requires that decisions be made at the point of initial design to drive down design, construction, operations, and maintenance costs. These cost savings are estimated to exceed a marginally higher cost of capital. The net benefit is expected to be passed on to the University through the competitive process and is guaranteed under the Project Agreement.

C. Challenges to Delivering the Needed Facilities in Multiple Phases

The DBFOM approach proposed for the 2020 Project assumes the facilities would be delivered by a single developer under one contract, but in three sequences. The sequences would deliver critical facilities by fall 2018, fall 2019, and fall 2020. This strategy would include an optional termination provision that would enable the University to opt-out of the contract.

One alternative that has been proposed is to re-characterize the sequences envisioned in the 2020 Project DBFOM model into severable phases that the University would have an option to exercise. Under this "pre-development agreement" approach, the University would contract with a single developer to build the 2020 Project program, with an option requiring an affirmative action by the University to initiate the subsequent phases.

The goal of the pre-development agreement approach is to protect the University in the event the chosen developer does not perform adequately and the University does not want to proceed with the same developer for second phase. The developer would also have an incentive to perform well in Phase 1 to ensure that the University exercises its options.

In order to capture the benefits of the pre-development agreement model, it would be in the University's interest to delay moving forward with the second phase until there is work product to review from the first phase. A delayed start due to the need for additional approval processes would almost certainly mean subsequent phases would be completed after fall 2020.

Given that the timeframe for the execution of the pre-development agreement is unknown, bidders would price the subsequent delivery scope as a discrete project in the form of indicative pricing or subject to escalation. This could result in higher bids and would sacrifice economies of scale, resulting in a higher Annual DBFOM Cash Flow Requirement. These added costs would offset advantages that this approach might yield with respect to avoiding potential breakage and/or litigation costs that would occur if the University chose to terminate the DBFOM contract following delivery of the first phase facilities.

The optional termination provision in the Availability Payment DBFOM model provides similar protection as the pre-development agreement, while capturing the savings that result from economies of scale and the benefits of earlier delivery. This optional termination structure enables the University to terminate the contract in the event of poor performance or for any other reason. The cost of the option is incurred only when it is exercised. By contrast, the phased pre-development agreement approach builds in the “cost” of the option at the inception of the contract, through higher bids, sacrifice of economies of scale and later delivery. Moreover, in the event the University did choose to opt-out of the single procurement approach, the annual DBFOM Cash Flow Requirement would end up being equivalent to an approach that employs the use of a pre-development agreement.

Availability Payment DBFOM Contract		
	Single-Phase Procurement with Optional Termination (2020 Project Approach)	Single-Phase Procurement with Pre-Development Agreement
Phasing Approach	Facilities are sequenced, with an integrated delivery of infrastructure	First Delivery Facilities and the associated infrastructure are procured and delivered. At the same time, a pre-development agreement is entered into for development of subsequent facilities and the associated infrastructure
Substantial Completion	2020	2022
Annual DBFOM Cash Flow Requirement After Substantial Completion	<= \$105 million	<= \$113 million
Optional Termination	<p>University retains a right of optional termination at any time. Exercising this option would require a premium to be paid at the time of termination.</p> <p>Contingent breakage that could result in delay, with related costs</p>	<p>University retains a right of optional termination at any time. Exercising this option would require a premium to be paid at the time of termination.</p> <p>No additional costs or breakage that would result in delay</p>

Disadvantages of Design-Build-Finance-Operate Maintain Availability Payment Contracts

In order to hold the developer accountable for the performance of the buildings over their lifecycle, the term of the contract needs to extend through at least one capital maintenance cycle. Therefore, the University would be in contract with the developer for up to 39 years. The financial structure of the DBFOM model also results in a higher cost of capital to the University, estimated to be a difference of 0.75 percent to 1.25 percent. To offset these higher costs, the other components of lifecycle costs (design, construction, operations and maintenance) would need to be at least 5 percent less expensive. For this reason, the procurement process for the 2020 Project establishes a threshold, called the “upset limit”, to ensure that the financial bids result in lifecycle costs lower than the Design-Build approach.

D. Comparison of the DBFOM Approach with Design-Bid-Build and Design-Build Delivery Options

Among the delivery models, DBFOM and Design-Build have the fastest time to delivery and the best opportunity for economies of scale and innovation. Under the Design-Build method, the University would enter into a contract with a Developer who would design and construct all infrastructure and facilities. The DBFOM approach is based on the Design-Build method – but adds a long-term operations and maintenance component for major building systems.

In delivering the DBFOM model, the campus would seek a developer with expertise and demonstrated innovation in design, construction, and management, as well as the ability to maintain major building systems in a cost-effective manner. As discussed above, the developer is held accountable for the performance of the facilities. The DBFOM approach is best positioned to encourage innovation in a world-class competition around delivery and maintenance of the entire group of facilities and infrastructure.

Because the delivery strategy holds the developer accountable for facility performance over its lifecycle, the University can be less prescriptive and allow for greater innovation in design, construction, and facilities maintenance. Preventative maintenance on major building systems, which reduces cost over the building’s lifecycle, is built into the developer’s facilities management plan.

Relative to a Design-Build approach, the financial structure of the DBFOM model results in a higher cost of capital to the University. Notwithstanding the higher cost of capital, our analysis suggests this model will yield a net benefit for the University, because other components of lifecycle costs would be reduced to a greater extent. The use of an upset limit would ensure that savings are passed on to the University and guaranteed through the Project Agreement.

The value created by the DBFOM approach relies upon the ability to drive design, construction, operations, and maintenance costs lower to offset a relatively higher cost of capital. The value proposition is based on the premise that the developer will have a more efficient method of completing the project and ensuring building performance over time than the campus would expect to accomplish itself under more traditional delivery methods.

This premise will be tested through a competitive procurement process, whereby development teams must compete across all lifecycle costs, to win a contract that requires the winning team to provide long-term performance guarantees at the bid cost.

The proposed scope and strategy for the 2020 Project have received extensive modeling and evaluation. Based on that analysis, the DBFOM approach is viewed as the optimal solution to fulfill the 2020 Project program goals, because:

- The approach provides an advantage in **time to delivery**.
- Relative to a Design-Bid-Build approach, the approach achieves efficient and **cost-effective pricing of design and construction**, due to acceleration in the time to delivery and economies of scale.
- The DBFOM approach allows the University to be less prescriptive, thereby allowing greater innovation across design, construction, and facilities maintenance, enabling the proposers to **drive lifecycle costs lower, notwithstanding higher cost of capital**.
- The approach provides a long-term guarantee of building performance throughout their lifecycle that includes incentives for cost-effective **preventative maintenance**.
- **Transfer of significant non-core risks** from the campus to the developer during both construction and operations.
- A competitive procurement process for all lifecycle cost components will enable the University to **capture value**.
- DBFOM strategy achieves budgetary stability with respect to maintenance and operation for **35 years**.