CSU The California State University
WORKING FOR CALIFORNIA

Design-Build Institute of America
CSU's Collaborative Design-Build Process

June 2015

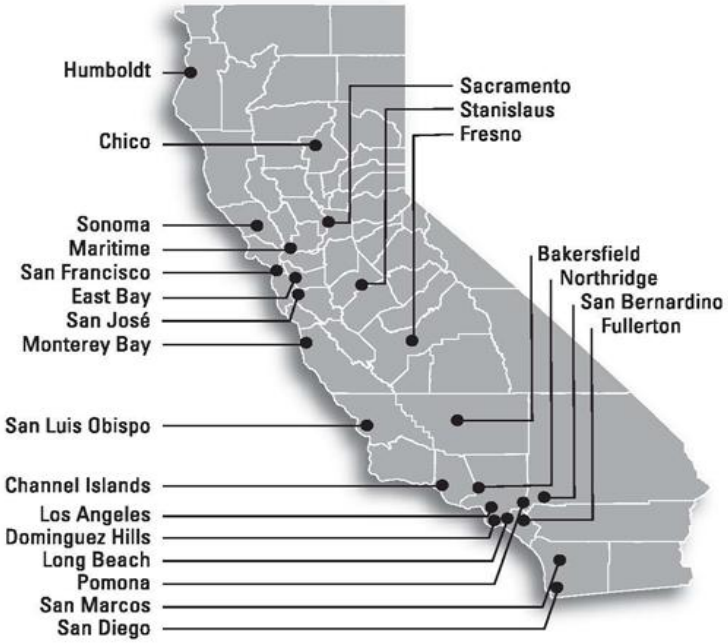
Session Agenda

- Overview of CSU System
- Assumptions – Prerequisites
  - ✓Understanding of CMAR
  - ✓Understanding of DB
- Collaborative Design Build(CDB)
- Question & Answers

CSU The California State University
WORKING FOR CALIFORNIA

The California State University

THE 23 OUTSTANDING CAMPUSES OF THE CSU



CSU The California State University
WORKING FOR CALIFORNIA

The 2015-16 Capital Program Budget is $404,000,000

(Includes $230,000,000 in Infrastructure Projects)

CSU/State Funded Capital Outlay Program 2015/16 Priority List

Cost Estimates are at Engineering News Record California Construction Cost Index ***6151*** *and Equipment Price Index* ***3202***

Rank Order	Category	Campus	Project Title	FTE	Phase	Project Budget	Funds to Complete	Cumulative Amount
1	IA	Statewide	Infrastructure Improvements	*0*	PWC	230,000,000		230,000,000
2	IA	Humboldt	Seismic Upgrade, Library	*N/A*	PWC	5,447,000		235,447,000
3	IA	Los Angeles	Seismic Upgrade, State Playhouse Theatre	*N/A*	PWC	1,156,000		236,603,000
4	IA	Humboldt	Seismic Upgrade, Van Duzer Theatre	*N/A*	PWC	7,604,000		244,207,000
5	IB	Los Angeles	Utilities Infrastructure	*N/A*	PWC	36,253,000		280,460,000
6	IB	Long Beach	Utilities Infrastructure	*N/A*	PWC	27,683,000		308,143,000
7	IB	San Bernardino	Utilities Infrastructure	*N/A*	PWC	34,429,000		342,572,000
8	IB	Pomona	Electrical Infrastructure	*N/A*	PWC	22,369,000		364,941,000
9	IB	Bakersfield	Faculty Towers Replacement Building (Seismic)	*N/A*	PWC	7,490,000	50,000	372,431,000
10	II	Monterey Bay	Academic Building III	*700*	PW	2,296,000	31,812,000	374,727,000
11	IB	San Francisco	Creative Arts Replacement Building ◇	*1,296*	P	1,704,000	42,652,000	376,431,000
12	IB	Sacramento	Science II Replacement Building, Ph. 2 ◇	*-1,583*	PW	4,558,000	82,445,000	380,989,000
13	II	San Diego	Engineering & Science Lab Replacement Bldg. ◇	*200*	P	517,000	29,483,000	381,506,000
14	IB	Dominguez Hills	Natural Sciences & Mathematics Building Reno.	*5*	P	1,235,000	50,648,000	382,741,000
15	IA	Fullerton	McCarthy Hall Renovation	*0*	PW	296,000	12,421,000	383,037,000
16	IB	Humboldt	Jenkins Hall Renovation	*15*	P	312,000	9,188,000	383,349,000
17	II	Channel Islands	Gateway Hall	*50*	PW	1,525,000	26,812,000	384,874,000
18	IB	East Bay	Library Renovation (Seismic)	*N/A*	PW	2,823,000	50,513,000	387,697,000
19	IB	Chico	Siskiyou II Science Replacement Building	*31*	P	2,690,000	84,144,000	390,387,000
20	II	Sonoma	Professional Schools Building	*513*	P	1,081,000	39,944,000	391,468,000
21	II	Maritime	Learning Commons/Library Addition	*N/A*	P	779,000	24,606,000	392,247,000
22	IB	San José	Nursing Building Renovation	*155*	P	456,000	15,594,000	392,703,000
23	II	San Luis Obispo	Academic Center and Library ◇	*843*	P	2,028,000	101,789,000	394,731,000
24	IB	Stanislaus	Library Reno./Infrastructure, Ph. 1 (Seismic)	*-15*	PW	3,419,000	45,753,000	398,150,000
25	IB	Northridge	Sierra Hall Renovation	*N/A*	PW	3,998,000	60,091,000	402,148,000
26	II	San Marcos	Applied Sciences/Technology Building	*545*	P	977,000	30,759,000	403,125,000
27	II	Fresno	Central Plant Replacement and Upgrade	*N/A*	P	819,000	29,381,000	403,944,000
			Totals	*2,755*		$403,944,000	$768,085,000	$403,944,000

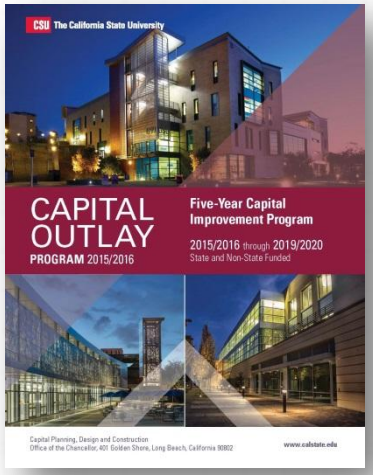
Categories: I Existing Facilities/Infrastructure
A. Critical Infrastructure Deficiencies
B. Modernization/Renovation
II New Facilities/Infrastructure

◇ This project is dependent upon state and non-state funding.
P = Preliminary plans W = Working drawings C = Construction

CSU The California State University
WORKING FOR CALIFORNIA

The CSU 2015-16 Five Year Capital Outlay Book can be found at:

- http://www.calstate.edu/cpdc/Facilities_Planning/documents/2015-16-Five-Yr-CapImprovementPgmBk.pdf



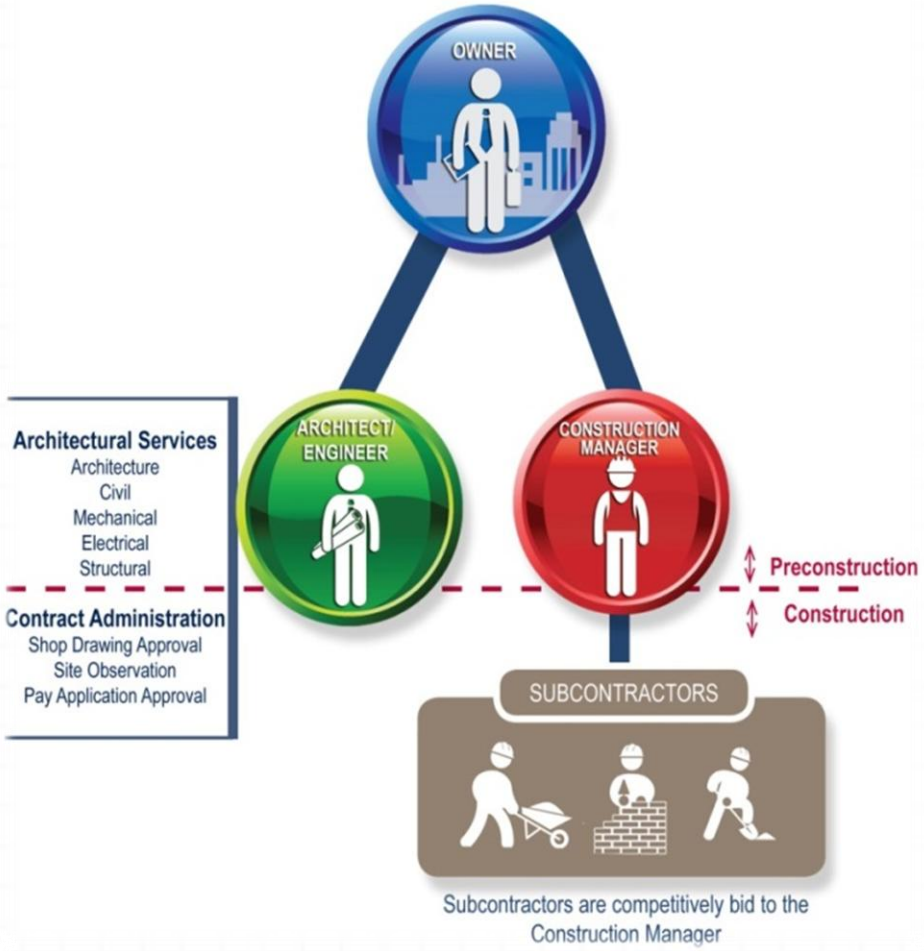
Basics of Construction Manager at Risk

(CSU has been using the CMAR project delivery method for over 10 years)

The Construction Manager at Risk process:

- Owner establishes program and soft criteria
- Select Architect based on qualifications (fees are set)
- Select CM based on qualifications and fees
- Separate design services contracts with CM and A/E for design (SD, DD, CD) and bidding. GMP from CM.
- Construction contract for construction
- Direct cost is based on subcontractor bids

CONSTRUCTION MANAGEMENT - AT RISK



CMAR Positives

- Collaboration A/E, GC, Trades, Owner
- Brainstorming design solutions and construction problems
- Open ended / no one locked in during design
- Selection is mostly on qualifications
- Contractor and trades involved in design phase for their knowledge, plan checking, estimating, planning, scheduling

Negatives with CMAR

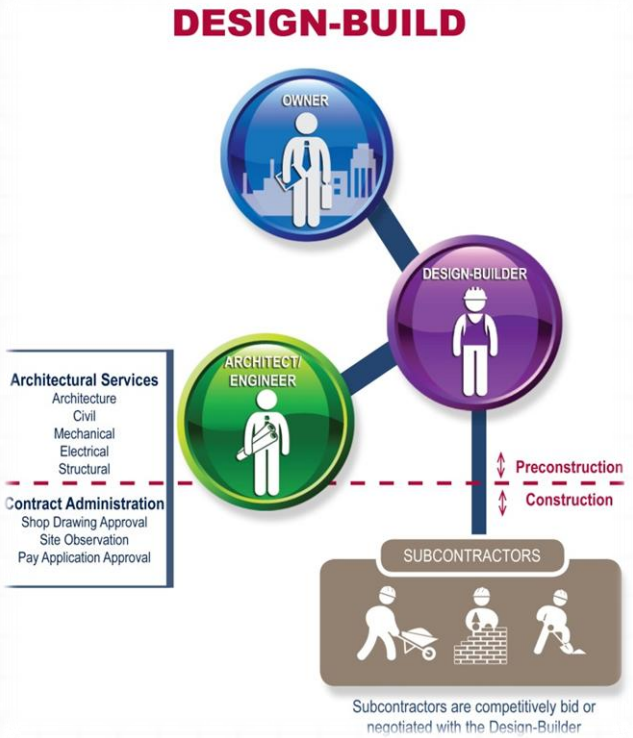
- GMP after design is complete
- Bids sometimes over budget – VE not good solution
- Potential insufficient use of DA and DB subs (they take work) will result in lack of trade input during design
- Constructability comments not addressed
- Rush to bid before ready
- Difficult to fast-track before GMP is funded
- Architect and CM may not form a team
- Need strong Owner project manager for A/E & GC

Design-Build

- Owner establishes hard Project Criteria and program
- RFQ / RFP
- Award a Design-Build Contract
- Complete design and construct

Design Build Team Selection

- RFQ – Qualifications
- Architect / Contractor teams
- RFP- Design Competition
- Quality and Cost
- Award Contract
- Stipends



CSU The California State University
WORKING FOR CALIFORNIA

D-B: The Money

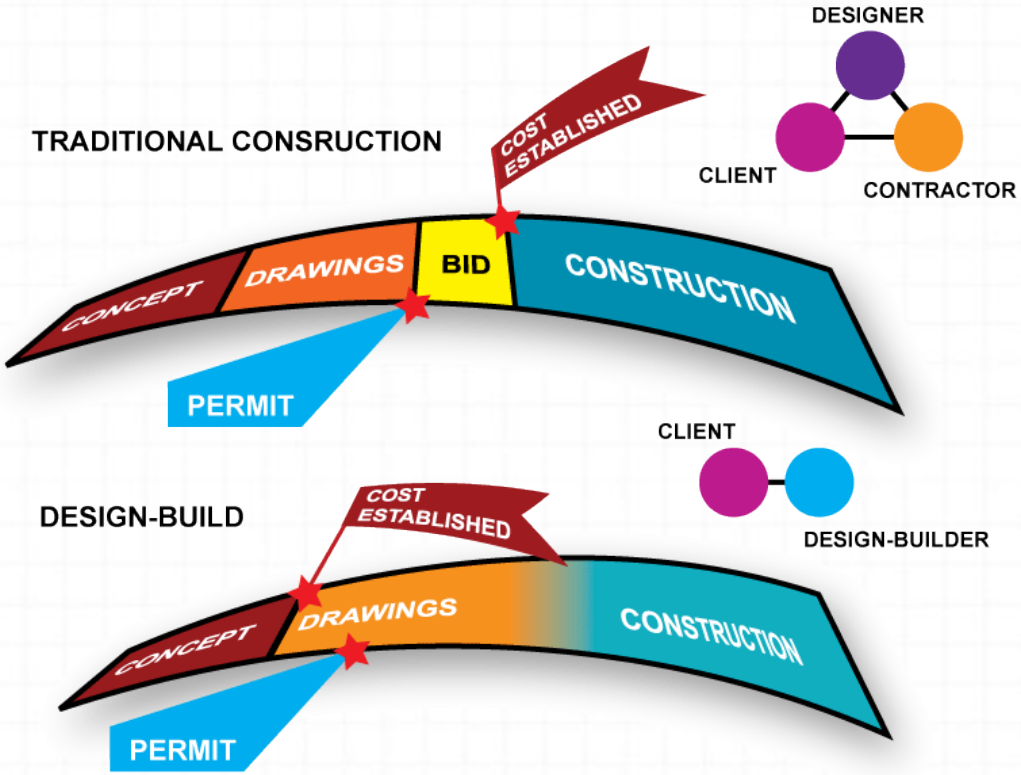
- Bid @ RFP Phase
- Cost Proposal = Cost/Unit Quality
- Quality Point Value
- No added contingency for DB
- Owner Contingency / Scope changes

CSU The California State University
WORKING FOR CALIFORNIA

D-B Positives

- Self selected Team
- Strong delivery team
- Transfer of Design Risk to DB
- More complete assumption of Constructability risks by DB
- Smaller Owner Contingencies
- Early GMP
- Ability to permit early phases

In Contrast


TRADITIONAL CONSRUCTION
COST ESTABLISHED
DESIGNER
CLIENT
CONTRACTOR
CONCEPT
DRAWINGS
BID
CONSTRUCTION
PERMIT
CLIENT
DESIGN-BUILD
COST ESTABLISHED
DESIGN-BUILDER
CONCEPT
DRAWINGS
CONSTRUCTION
PERMIT

D-B Negatives

- Program and Hard Criteria
- Design is a choice of 3 but not collaborative
- Competition – Expensive and time consuming –questionable value
- Stipend - not enough - limits participation

Collaborative Design-Build

- CMAR process modified
  - Owner establishes project criteria (same as CMAR)
  - A/E and CM team and selected on qualifications and fees to design and manage construction (team is new)
  - Design contract for SD, DD and GMP (GMP is early)
- Design-Build process modified
  - DB contract for CD and construction (same as DB)
  - Direct cost is based on subcontractor competitive bids (same as CMAR, different than DB)

Best of Both CMAR and DB

CMAR Positives

- Early Collaboration AE, GC, Owner
- Brainstorming design solutions
- Open ended / no one locked in

DB Positives

- Early GMP
- GC and AE are a team
- Ability to Fast track

Quick View - CMAR - CDB

CMAR

Service

- Program
- Architect
- CM
- Design Contract incl CD
- Bidding and GMP in Design
- Construction Contract

Collaborative Design–Build

Service & Product

- Same
- Selected with DB team
- Selected with DB team
- Design contract, SD, DD
- GMP based on estimate
- DB contract
  - CD and bidding
  - Construction

Project Criteria- CDB

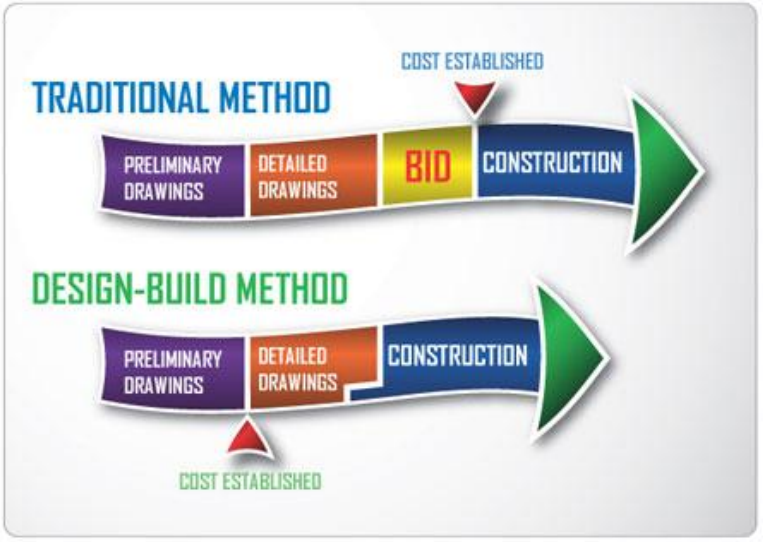
Owner defines the project

- Program
- Design criteria - soft - AE will specify for bidding
- Construction criteria
- Campus standards, system compatibility
- Budget
- Schedule
- Challenges - Risks

Schematic Design - CDB

- Service contract for SD and DD
- Program verification
- SD plans and specifications – 3 way collaboration
- DA and DB subs allowed – best value selection
- GMP
- Approval to award DB contract based on schematic design and GMP (Must go to BOT)
- Continue with DD while contract is approved and executed.

Design Assist and Design Build Subcontracts



- **D**esign **A**ssist and **D**esign **B**uild Trade Contractor Process
  - Use of DA & DB trade contractors is project specific
  - Maximize the use of DA & DB trade contractors
  - Good use for *MEP trades*, curtain walls, foundation, fire protection, fire alarms, security, IT, BMS, and specialties
  - Selection process similar to DB - Prequalification, Shortlist, RFP with performance criteria, proposal includes design approach (SD) and direct cost target, best value selection

Design-Build Phase - CDB

- Finish the design, CD, and permitting
- Prequalify subcontractors
- Bid trade packages
- Construction
- Closeout

Metric	Design-Build vs. Design-Bid-Build	Design-Build vs. CM@R
Unit Cost	6.1% lower	4.5% lower
Construction Speed	12% faster	7% faster
Delivery Speed	33.5% faster	23.5% faster
Cost Growth	5.2% less	12.6% less
Schedule Growth	11.4% less	2.2% less

Source: ConstructionIndustry Institute (CII)/Penn State Research comprising 351 projects ranging from 5K to 2.5M square feet. The study includes varied project types and sectors.

Contrast

Factor	CMAR	CDB
Criteria Docs	NA	Not Important
User input	During design	During criteria/design
Contract for	Service	Service & Product
Design options	Unlimited	Unlimited
Price Risk	Yes	No
Flexible	More flexible	Less flexible??
Leadership	CSU	CSU / DB

Contrast

Factor	CMAR	CDB
A/E Contract	CSU	Contractor
Scope creep	Yes	No
Enhancements	Yes	Yes
Const Admin 1-5	3	2 little less
Desired design **	Better	Very Good
Design details	OAC team	OAC Team
Successes	Yes	Yes

The Money -CDB

Fees for design and construction management per proposal.

- Lump sum (reward for cost reductions)

Direct construction cost max is GMP

- Actual cost is subcontract bids
- Unused portion of GMP returns to the owner

Contingency

- 5% of direct construction budget
- Contractor retains 30% of unused contingency

CSU The California State University
WORKING FOR CALIFORNIA

Collaborative D-B

Positives

- One Stop shopping
- Early design and budget control
- GMP comes in early
- Release packages ahead of design completion
- Shorter Construction duration

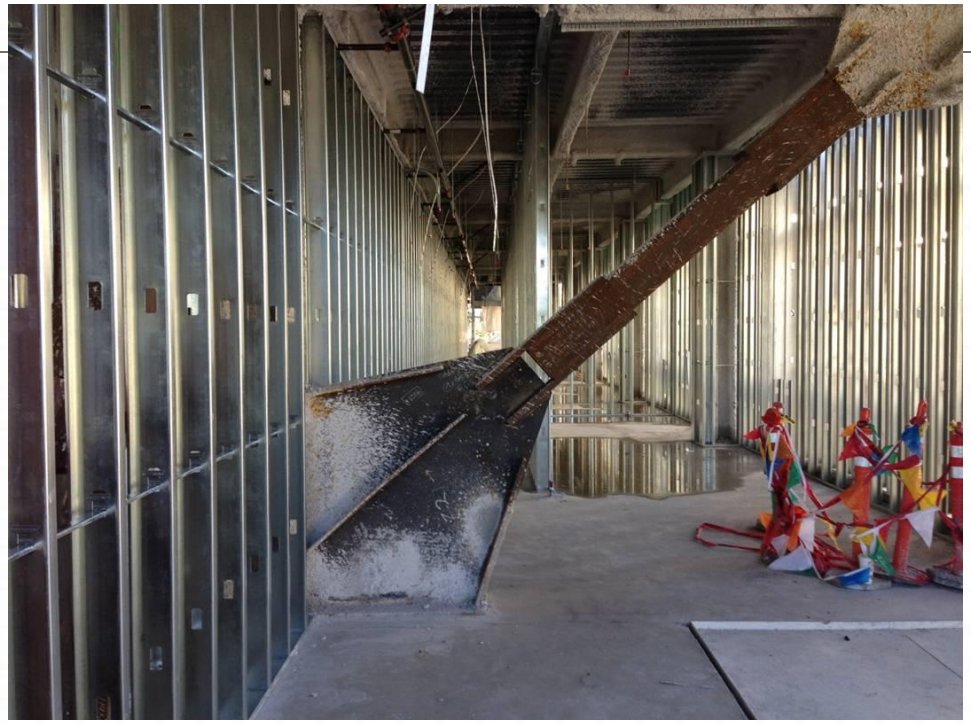
Negatives

- Less Design input after Schematics
- Fewer Checks and Balances
- Project Control for A/E team is more limited
- Some lack of quality control during construction

CSU The California State University
WORKING FOR CALIFORNIA

Construction

Use of Contingency



The brace section in a service hallway did NOT show up in the clash detection software. Which makes sense, the brace is in an open hallway, it isn't clashing with any other piece of the building.
It's just the intermittent presence of soft squishy humans that will run into it.
I guess every time we have a slam dunk solution to a construction problem, construction is plenty complex enough to leave us more work to do."

Bob Schulz re: SDSU Student Union 1/4/13

CSU The California State University
WORKING FOR CALIFORNIA

Results

- Highly qualified architects and contractors compete
- Selection is based mostly on quality
- Early trade involvement allows better design and price stability
- Everyone participates in design and construction
- Complete transparency

Lessons Learned

Best Practices

Which to Choose?

Collaborative Design Build is an evolution of CMAR and DB into a delivery method that has advantages over both methods. However, all three methods have their pros and cons.

When selecting a delivery method let the success criteria of the project guide your selection.

Questions-Discussion ?

CSU The California State University

Thank You

www.calstate.edu