

# CAPITAL PROJECT COSTS

# INTRODUCTION

All Capital Project Budgets have 2 basic components:

- **Construction**
- **Fees, Project Management, and Administration**

This presentation looks at

- **COST DRIVERS** that impact these 2 components  
  
and
- **COST MANAGEMENT** to reduce impact of **COST DRIVERS**

# INTRODUCTION: Capital Project Budget

UC Capital Project Budgets are divided into 9 line items

- **Construction**

- 0, 1, 2, 4 Construction

- **Fees, Project Management, and Administration**

- 5 A & E Fees *(external consultants)*
- 6 Campus Administration *(Fees, Project Management, Administration)*
- 7 Surveys, Tests, Plans, Specifications
- 8 Special Items *(CEQA, special consultants, permits)*
- 9 Construction Contingency *(5-7% of Line 0,1,2,4)*
- 3 Group 2/3 Equipment *(moveable equipment and furnishings)*

# INTRODUCTION: Capital Project Budget

Line 9 (Construction Contingency) is a percentage of Line 0, 1, 2, 4,  
Line 3 (Group 2/3 Equipment) is project specific and separate from Capital Project  
For these reasons, Line 3 and 9 are not part of this presentation.

- **Construction**

- 0, 1, 2, 4 Construction

- **Fees, Project Management, and Administration**

- 5 A & E Fees *(external consultants)*
- 6 Campus Administration *(Fees, Project Management, Administration)*
- 7 Surveys, Tests, Plans, Specifications
- 8 Special Items *(CEQA, special consultants, permits)*
- ~~9 Construction Contingency~~ *(5-7% of Line 0,1,2,4)*
- ~~3 Group 2/3 Equipment~~ *(moveable equipment and furnishings)*

# INTRODUCTION: Budget for Construction

## Construction (0,1,2,4)

- Usually **65 – 80%** of the cost of a Project
  - Line 0      Site Clearance
  - Line 1      Building Construction
  - Line 2      Exterior Utilities
  - Line 4      Site Development
- **Larger projects have a higher percentage of the Project Budget devoted to Construction (around 80%)**

# INTRODUCTION: Budget for Fees, Project Management, Admin.

## Fees, Project Management, and Administration (5,6,7,8)

- Usually **20% - 35%** of the cost of a project
  - Line 5           A & E Fees                           (*external consultants*)
  - Line 6           Campus Administration           (*Fees, Project Management, Administration*)
  - Line 7           Surveys, Tests, Plans, Specifications
  - Line 8           Special Items                       (CEQA, special consultants, permits)
- **Higher percentage of the Project Budget for small projects is devoted to these costs.** Past experience has shown they can be as high as 35% of the Project Budget (sometimes higher for unique or complex projects).

## **COST DRIVERS: Construction**

### **University as Owner, Builder, and Occupant**

*When comparing cost per square foot, cost per bed, or total project costs of apparently similar projects, it is important to know the scope of the projects in the comparison. **The scope of a public UC project is likely to be different than a similar project in the private sector.***

Some scope factors that affect UC projects:

- Occupancy by the Owner (UC)
- Program Complexity
- Long-term “investment” = Durability and Operational Efficiency
- Project obligation to support “Campus Infrastructure and Fabric”

**UC may expend greater initial COST to gain greater long-term VALUE**

## COST DRIVERS: Construction

### Public Contracting Requirements

(adds up to 8%)

- Compliance with statutory requirements of California Public Contracts Code
- Public Bidding required for projects over \$640,000
- Division One of Construction Documents
  - General Conditions (varies)
  - Payment and Performance Bonding (2%)
  - Prevailing Wage (5-6%)



## COST DRIVERS: Construction

### Other Regulations and UC Policies

(add'l cost varies)

- Environmental Regulation (UCSC the most rigorous UC system-wide)
- Americans with Disabilities Act (ADA)
- 2014 CA Energy Code (increase energy efficiency by 30% over 2010 code)
- 2014 Seismic Code (response design parameters increased 10-30%)
  - structural components usually around 15% of building construction cost
- Additional energy efficiency to be phased through Title 24, as well as UC Policy
- Compliance with UC Regent policies and procedures in UC Facilities Manual

# COST DRIVERS: Construction

## UC Santa Cruz Location

(add'l costs varies)

- Distance of Santa Cruz from Bay Area construction market (5-8%)
  - UCSC the “MOST REMOTE” of all UC campuses
- Physical challenges of campus (varies)
  - Topography
  - Geology
  - Hydrology
- Wet coastal environment requires more expensive exterior water proofing systems (varies)
- Site constraints and topography often require remote staging areas and shuttles for workers (varies)
- Over the 50 years of campus development, the easier sites have been taken – denser and denser “infill” sites are more costly (varies)

# COST DRIVERS: Construction

## Campus Values that Impact Cost

(add'l cost varies)

- Each project contributes to the Academic Mission, physical fabric, and Campus Life (varies)
- Support / improve existing infrastructure systems (varies)
- Protection of natural resources and landscape (varies)
- Sustainability and carbon reduction goals beyond current UC Policy (varies)
  - Campus on threshold of AB32 requirements.
  - Per square foot, it is cheaper to plan, design, and build in sustainability and carbon neutrality with a new project, than it is to upgrade an existing facility.

# COST DRIVERS: Fees, Project Management, and Administration

(add'l cost varies)

- **Campus and OP Processes**
  - All Projects must interface with campus infrastructure – requires full coordination and integration
  - Building Committee, customers, and multiple stakeholders consulted at each phase of Programming and Preliminary Design
  - Major Capital Projects undergo complex review and approval process with Office of the President
- **Planning**
  - Existing condition surveys, due diligence, and analysis
  - Environmental and regulatory review
- **Controls**
  - Seismic and Design peer review processes
  - Cost Estimates peer review (on major projects, independent review of architect's estimates and reconciliation +/- 5 times during design)
  - Development of contract documents for public bidding require highly detailed drawings and specifications for truly competitive bidding
  - Construction inspection for regulatory compliance and compliance with contract documents
- **Completion**
  - Commissioning of all systems at project completion
  - LEED certification with US Green Building Council

# COST MANAGEMENT: Project Phases

## Capital Project schedules have 4 distinct phases

*(can vary depending on construction delivery method)*

- **Pre-Design**
  - *Planning and Site Selection*
  - *Programming*
  - *Budget Forecast*
- **P Preliminary Plans**
  - *Schematics*
  - *Design Development*
- **W Working Drawings**
- **C Bidding and Construction**

The following slides cover the ways Project Cost is managed to stay within budget to the greatest extent possible, during each phase

# COST MANAGEMENT

## Pre-Design *(3 – 6 months, depending on scale of project)*

- PP&C and CPSM develop the **Program** (Detailed Project Program or other written document) to define the scope of work, which minimizes changes to the scope throughout the process
- Based on building type, scale, site, and program, PP&C and CPSM develop a **Budget Forecast** based on assumed project scope, schedule and other factors and for larger projects, a Business Case Analysis (BCA)
- Budget Forecasts for projects that take over a year to design and build include potential factors for **cost escalation** of materials and labor
- PP&C performs **early investigations** to understand existing site or building conditions to minimize surprises
- Build in **Design and Construction contingencies**, as well as other strategies, to cover the inevitable unforeseen circumstances

# COST MANAGEMENT

## Preliminary Plans and Working Drawings

*(1 - 2 years, depending on scale of project)*

- **Additional investigations** of existing conditions to limit surprises
- For larger projects, consultants use **3D modeling** of the structure and all its mechanical, electrical, and plumbing systems to minimize Change Orders during construction
- **Construction cost forecast is checked multiple times**
- On major projects, designer's estimates are checked against an **independent estimate**
- **2 Value Engineering** sessions are required for large projects to analyze opportunities for best use of funds available to achieve program objectives
- Excavation and/or foundations may be **fast tracked** to reduce effect of escalation
- PP&C and the design consultant work hard to ensure the **construction documents are detailed and thoroughly coordinated** among the trades

# COST MANAGEMENT

## Construction: Bidding

*(1 – 3 months, depending on scale of project)*

- PP&C and its consultants actively **outreach** to the contracting community to stimulate competition among potential bidders
- To prepare for the uncertainty of public bidding, PP&C often will include **alternate scopes** of work that either add or subtract from the basic scope
- PP&C may **pre-qualify potential bidders** to weed out “bottom feeders”
- Ultimately, however, number of competitive bidders, costs of materials, availability of labor, amount of other construction work, and other forces affect bid results
- When bids are opened, the prices for the basic scope and the alternates allow some flexibility in order to meet the funding available



# COST MANAGEMENT

## Construction

*(1 - 2 years, depending on scale of project)*

- Rigorous review of Change Proposal Requests prior to authorizing Change Orders. Each change is tracked as:
  - *Unanticipated condition*
  - *Document clarification*
  - *User request*
  - *Other owner request*
  - *Other*
- PP&C Project Managers and Inspectors are readily available to facilitate project schedule and work creatively with the Contractor to reduce costs

## **COST MANAGEMENT: Construction Delivery Method**

The contractual agreements between the University, Executive Design Consultant, and Construction Contractor are selected to determine who holds the “risks” at each phase. The selection is tailored the Project.

The Cost of Construction can vary somewhat between delivery methods, but not significantly on this campus.

### **3 Primary Options**

- Design-Bid-Build - “lump-sum”
- Construction Manager at Risk
- Design and Build - “Design-Build”

### **Other Delivery Methods**

- Best Value Pilot Program
- Public Private Partnership (P3)

# COST MANAGEMENT: Construction Delivery Method \*

	Advantages	Disadvantages
<b>CM at Risk</b>	<ul style="list-style-type: none"><li>• CM provides Preconstruction services</li><li>• Design completed prior to bidding</li><li>• Sub trades prequalified</li><li>• Good Owner-A/E-Contractor relationship</li></ul>	<ul style="list-style-type: none"><li>• State funding excludes Preconstruction services</li><li>• Costs more on bid day</li></ul>
<b>Design-Build</b>	<ul style="list-style-type: none"><li>• D/B provides Pre-con services</li><li>• Sub trades prequalified</li><li>• Cost effective – Awarded on Cost/Point Basis</li><li>• Good Owner-A/E-Contractor relationship</li></ul>	<ul style="list-style-type: none"><li>• Design NOT completed prior to bid</li><li>• Exact project components loosely defined</li></ul>
<b>Lump-Sum</b>	<ul style="list-style-type: none"><li>• Design completed prior to bidding</li><li>• Lowest cost on bid day</li></ul>	<ul style="list-style-type: none"><li>• No preconstruction services</li><li>• Sub-trades not prequalified</li><li>• Owner-A/E-Contractor Relationship may be stressed</li></ul>

*\* This is not a comprehensive list of possible ways to construct within UC*

# CONCLUSION

Public University projects represent long-term investments in the on-going development and re-development of campus buildings and infrastructure in support of the Academic Mission.

- Not a simple endeavor, because **we are here to stay**.
- Costs for equivalent scope - usually higher within the UC than for projects built by private developers.
- This presentation has tried summarize the reasons why this is the case

AND

- Because we are a public institution with limited resources and entrusted with public funds, PP&C does everything it can to mitigate overall Project Cost

**THE END**

questions ?