



*Center for Local-Aid Support*

# Construction Manager /General Contractor



U.S. Department of Transportation

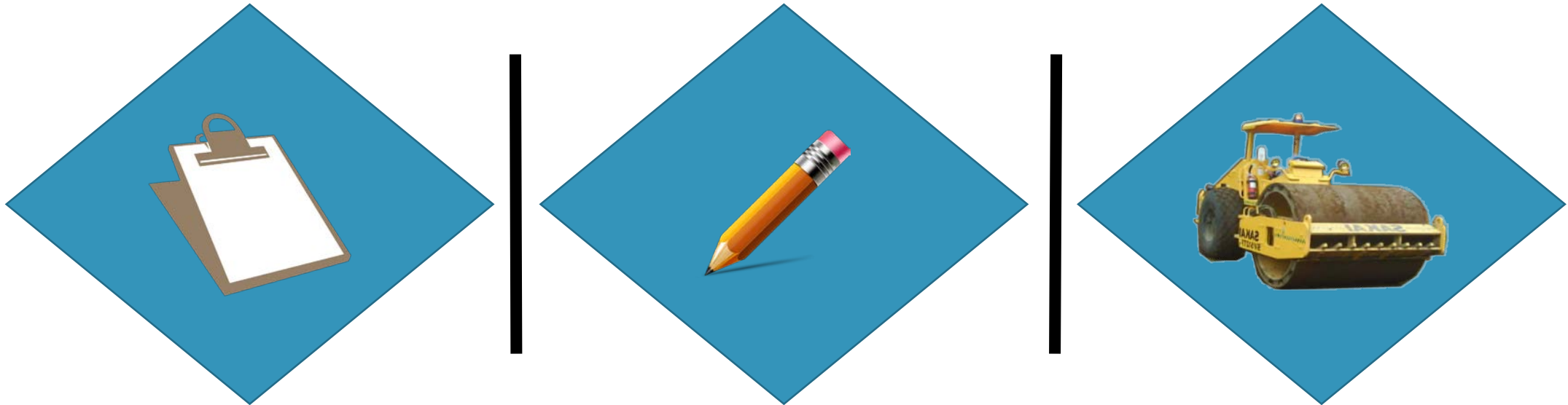
**Federal Highway Administration**

OFFICE OF INNOVATIVE PROGRAM DELIVERY

**Tribal Transportation Planning Organization**

October 2, 2018

# Traditional Contracting – 3 Stages



Contractors bid on jobs based on designs already prepared  
Owners select the lowest-bidder to do the work

# Delivery Methods

## Common

- Design-Bid-Build (D-B-B)
- Design-Build (D-B)
- **Construction Manager /General Contractor (CM/GC)**

## Less Common

- Multi-Prime Contracting
- Design-Sequencing
- Public-Private Partnership (P3)
- Warranties



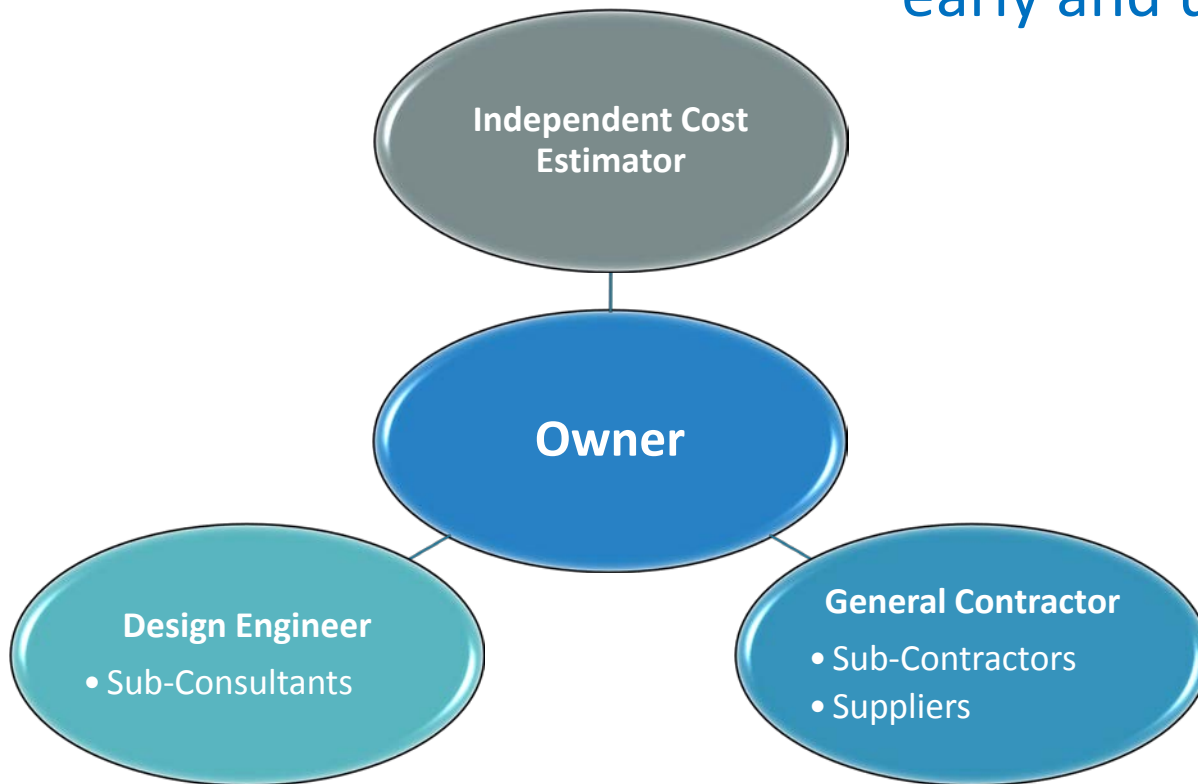
## States with Legislative Authority to use CM/GC



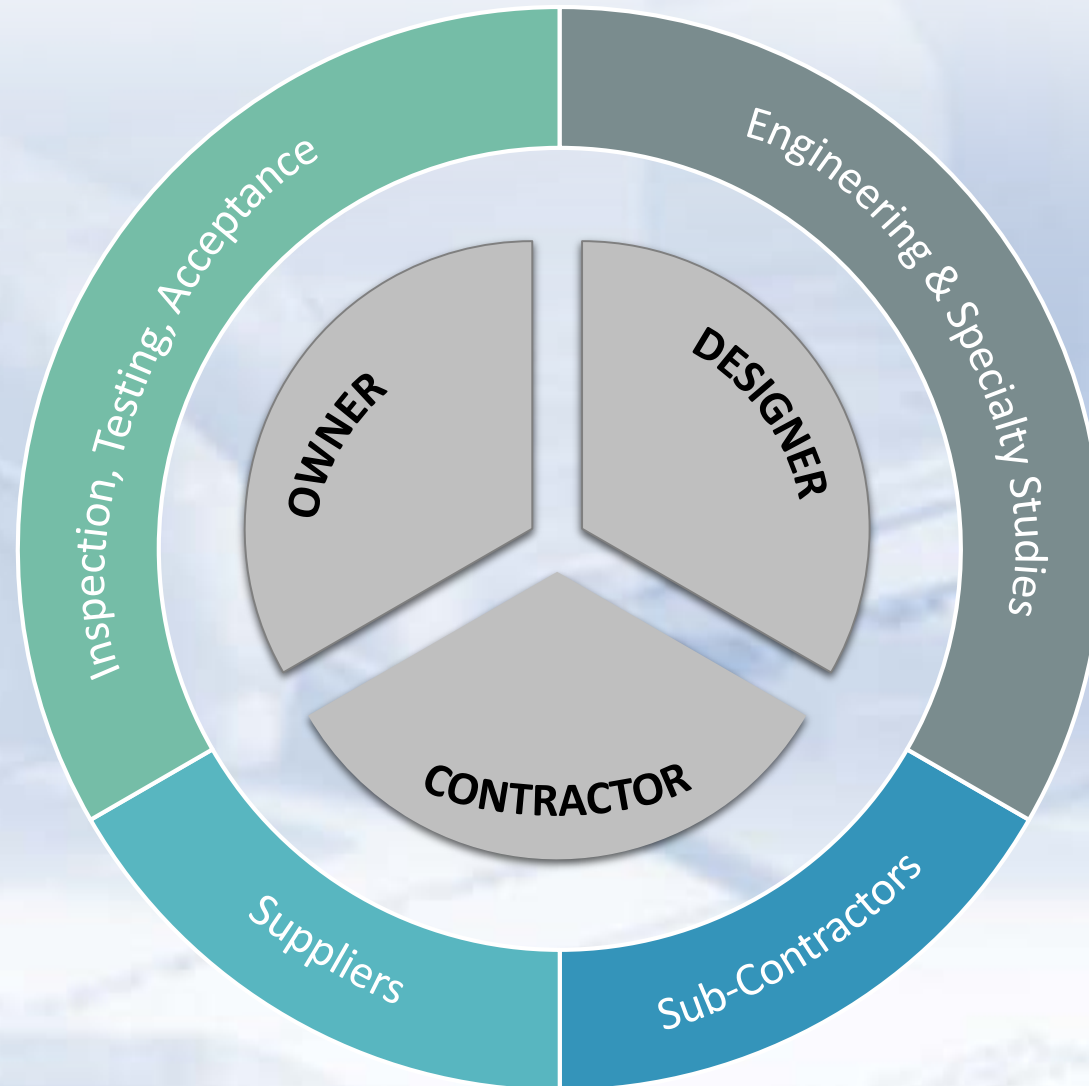


# CM/GC - An Integrated Approach

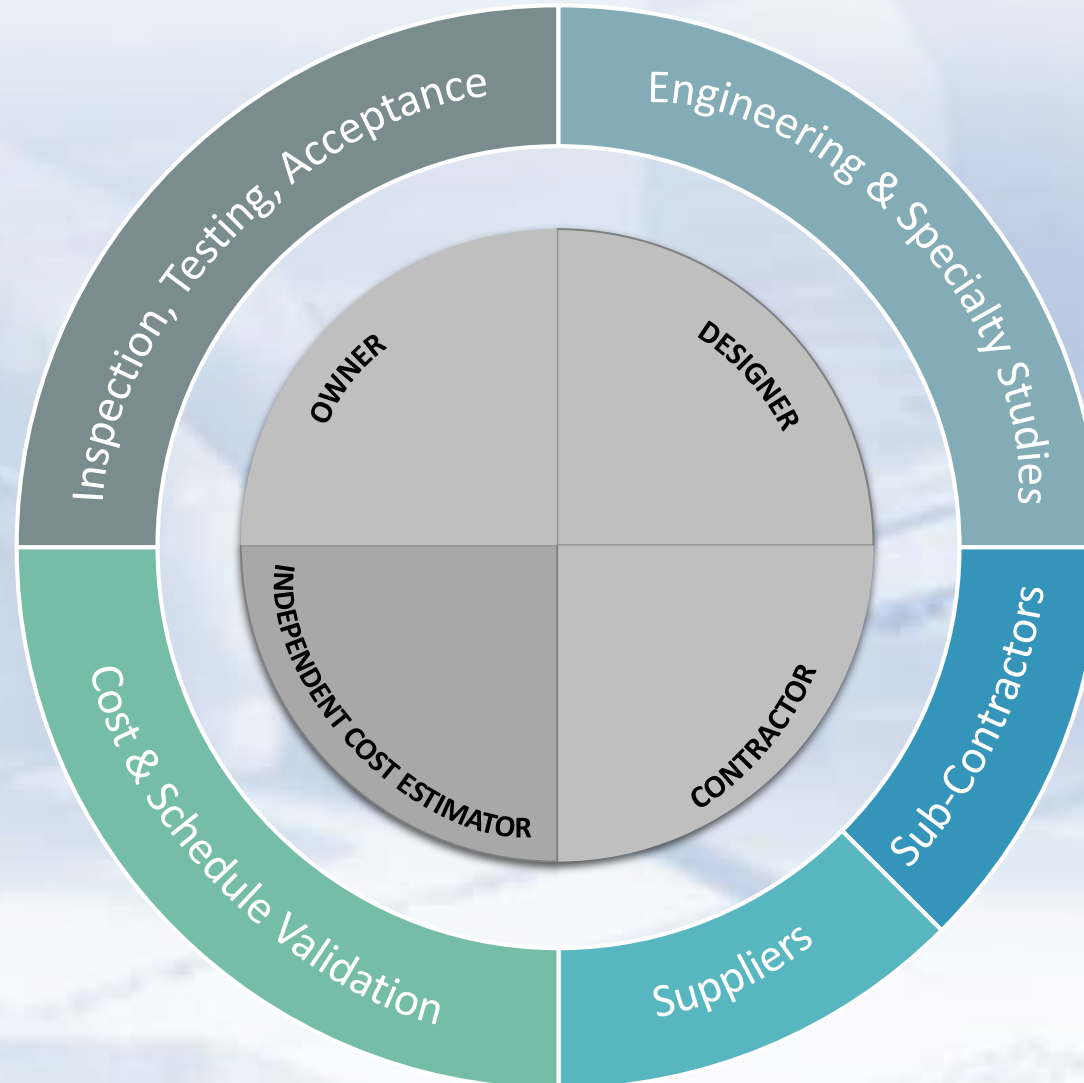
Owner, Designer & CM work collaboratively develop the project scope, optimize the design, improve quality, and manage costs to deliver projects early and under budget.



# Traditional D-B-B roles:



# CM/GC roles:





# Why are Owners Choosing CM/GC?







What types of Projects?



# What did we ask the team to do?

- ➡ Complete construction of all projects by June 2017
- ➡ Commit to a budget of \$6.9 M
- ➡ Hire locally from Cibola County
- ➡ Innovate to meet these goals
- ➡ Work as a team to deliver

**Deliver a 7-10 year program in  
18 months**





# What can we celebrate?

## Success Stories

- ➔ All projects, with exception of FEMA work and T-Intersection, completed in 10 months, including permitting and design
- ➔ Cumulative \$ 1.15 million in cost savings used to fund large portion of Pinsbaari Dr. Phase B
- ➔ Team overcame significant challenges by always working together on the solution verses pointing fingers
- ➔ First programmatic use of CM/GC on tribal lands
- ➔ CM/GC delivers big results when properly implemented!





## Schedule

- Team formed in January 2018

## Budget

- Stone Retaining Wall – 47% under budget

## Hire Local

- Contractor held 2 job fairs

## Innovate!

- Incorporated leftover block from past project

**Delivered a 7-10 year program in 18 months**

within 3 months

- Ribbon Cutting Ceremony on Dec 8, 2017

- Savings moved to Pinsbaari Road

for project

mobilization

- Using millings from Pinsbaari Rd for parking lots





# What did we learn?

- ➔ Make sure you have a Project Leader on day one of the project
- ➔ Clearly outline the minimum needs in the Request for Proposal
- ➔ Cost modeling needs to be discussed at pre-bid and kick-off meeting
- ➔ Be more inquisitive during hiring process
- ➔ Keep your stakeholders informed as team makes changes





*“With the Right Team, Anything is Possible.”*

- Kenneth E. Atkins, P.E., Public Works Magazine



# Parking Structure

## Estes Park, CO



# Sacaton Road Bridge

## Gila River Indian Community, AZ

- ✓ Innovation addressed during selection of CM
- ✓ Partnering session recognized as key to success
- ✓ Construction risks acknowledged and response planned during design

Reduced Traffic  
Impact

9 days +1  
weekend  
vs. 4-6  
Months

Reduced User  
Impacts

700K  
vehicle  
miles vs.  
6M to 9M

Reduced ABC  
slide costs

\$0.4M vs.  
\$0.9M to  
\$1.4M

ABC Cost vs. Fuel  
Only Cost

Savings  
\$0.8M to  
\$1.2M





# Osceola, FL - 7 Major Groundbreakings in 1<sup>st</sup> Year



*“The results were that within 1 year, 11 major roadway segments were ready to begin construction, achieving 55 times the production rate at 20% under budget.”*

- NCHRP 787





# Osceola County, FL - Results

*Fastest Economic Stimulus in the State*

*90% Local Participation*

*\$80+ Million Back in Local Economy in 1st Year*

*100+ Bid Packages tailored to the Locals.*

*“Living at risk is jumping off the cliff and building your wings on the way down.”*

*- Ray Bradbury*

# A Tale of Two Bridges



CM/GC Delivery

5 week schedule – 1 week ahead

10% **under** Budget

No change orders. No claims



D-B-B (low bid) Delivery

5 week schedule – 1 month behind

30% **over** Budget

Change orders and claims during construction







U.S. Department  
of Transportation  
Federal Highway  
Administration

**THE CONSTRUCTION WEEKLY** November 2, 2009 • enr.com The McGraw-Hill

**ENR**  
Engineering News-Record

**Low Carbon**  
Framework unveiled for urban energy retrofits

**Threatened**  
Hair-raising finish for Chicago's Block 37

**Road Te**  
Dodge h duty truck deliver p comfort

THE MAGAZINE FOR THE PEOPLE WHO BUILD NORTH AMERICA

**CONSTRUCTION** TODAY

BRAN POWER: ElieDon expands in Western Canada through R&D efforts.

SAFETY UPGRADE: A safety culture should be one you don't even know is there.

**A Strong**

THE VOICE OF PROFESSIONALS SERVING AMERICA'S COMMUNITIES / SEPTEMBER 2009 / WWW.PWMAG.COM

**Public Works**

hanley wood

**ENR AWARD OF EXCELLENCE**

**KENNETH E. ATKINS, P.E.**  
Public Works Administrator  
Osceola County, Florida

Osceola County, Fla., one of the nation's fastest growing counties, had fallen \$386 million behind in its roadbuilding and faced the prospect of returning impact fees to developers. Things changed quickly after the county hired Kenneth E. Atkins.

Atkins streamlined county public works

**In the Fast Lane**

FLORIDA'S OSCEOLA COUNTY RECENTLY TOOK ON A MASSIVE ROADS PROGRAM. BY KELLY MCGARE

Just a few years ago, Florida's Osceola County Public Works was a department that seemed to be overwhelmed. It had cumbersome construction delivery methods, which allowed it to finish only one to three projects a year. But today, after reorganizing into a very lean unit—some 200 in 1997—and adopting a project method of construction management at-risk, the department can do about 11 each year.

"We've changed the way public works does projects," Public Works Administrator Ken Atkins says. "Engineering is professional, as is inspection and surveying, and it allows us to use a lot of single-person consultants to do work very efficiently."

"We're doing a large number of projects in very rapid turnaround," Atkins says. "We're doing it faster than the county had ever seen—and one of the fastest in the country."

When the department was reorganized in 2007, the county had a goal to take a project from conception to construction in 18 months.

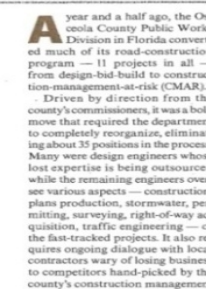
**Osceola County Public Works**  
- *County Engineer, Mr. Stephen 1997*  
- *Operating budget: \$55 million*  
- *"We're one of the fastest counties in the region with delivery major road projects."*  
- *Ken Atkins, public works administrator*

**Laying New Ground**  
Now that Osceola County Public Works is among the fastest in the region, the county is rethinking that new speed for an aggressive, 20-year

72

## Rapid deployment

Backlog prompts county engineers to switch project delivery methods.



October 2008: Work begins on isolating and relocating conflicting utilities.

A year and a half ago, the Osceola County Public Works Division in Florida converted much of its road-construction program—11 projects in all—from design-bid-build to construction-management-at-risk (CMAR). Driven by direction from the county's commissioners, it was a bold move that required the department to completely reorganize, eliminating about 35 positions in the process. Many were design engineers whose lost expertise is being outsourced while the remaining engineers oversee various aspects—construction, plans production, stormwater, permitting, surveying, right-of-way acquisition, traffic engineering—of the fast-tracked projects. It also requires ongoing dialogue with local contractors wary of losing business to competitors hand-picked by the county's construction management firm, the regional Florida office of Balfour Beatty Construction.

But it was the only way that Public Works Administrator Ken Atkins and County Manager Michael Freilinger felt the county could satisfy an extremely aggressive local ordinance. With nearly 18 project segments behind schedule, construction on nine to 11 of them had to begin in 2009 to get the program back on track. It's the greatest number of road projects nationwide to be delivered using construction-management-at-risk. In total, \$700 million worth of design and construction is scheduled to be completed within 10 years, and infrastructure managers throughout Florida are watching closely.

"While construction-management-at-risk is rather unconventional to use for road projects, we felt it was the most efficient way to handle the backlog that had developed over the past few years as development boomed," says Principal Project Manager Gregg Hostetler, PE. Since the county had used the project delivery method to design and build a new courthouse, emergency operations center, and training facility for the Houston Astros, the county attorney tweaked the contract language for those "vertical" projects to accommodate requirements specific to roadway construction.

The department would've considered design-build, but working out the legal details for a program delivery method the county hadn't used would've postponed start-up by half a year. So construction-management-at-risk it was.

**FROM THE ABSTRACT TO THE ACTUAL**  
Under standard construction management, the owner advertises for and retains the designer and construction manager directly, so both work together from the outset to identify and resolve potential problems before they burden the budget and schedule.

At-risk management goes a step further, with the construction man-






## TRIBAL NATIONS ARE LEADING IN THE EDC5 INNOVATION OF PROJECT BUNDLING USING CM/GC.

- **Acoma Pueblo:**
  - **First Contract: 9 bundled projects**
    - Bridges, road and parking lot paving, stabilization, retaining wall, FEMA repairs, intersection improvements
  - **Second Contract: 6 bundled projects**
    - Another mix of road, bridge, stabilization, and safety projects
- **Pawnee Nation: 13 bundled projects**
  - Bridge, lighting, signage, campground and trail improvements, fog seal and paving, building reroofing and another demolished, street safety improvements, added cultural porch and landing, and new playground
- **Confederated Salish & Kootenai Tribe: 8 bundled projects**
  - Sign installation and upgrades, new maintenance shop, guardrail upgrades, gravel road blading, paving and preservation, bridge replacements

1. Innovation
2. Reduction of Risk
3. Aggressive Delivery
4. Cost Control
5. Team Selection
6. Constructability
7. Streamlined Plans
8. Quality
9. Early Work Packages
10. Flexibility in Changing Project Scope



# Which method?



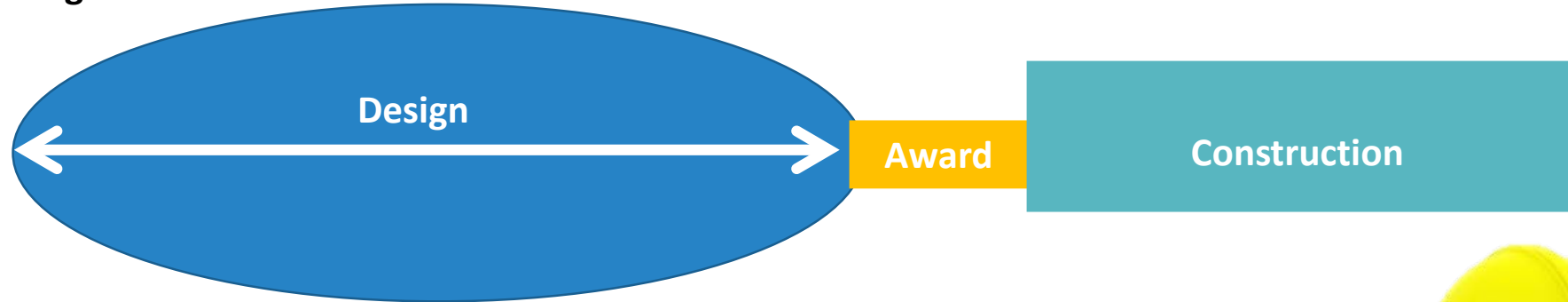
Owner: "I hope the bid's come in within budget. I hope the builder's qualified. I hope my contingency is sufficient. I hope the plans are constructable with few changes. I wonder what risks are looming? Did we do enough geotechnical exploration?"

- **Delivery Schedule**
- **Budget**
- **Project Complexity**
- **Innovation Needed**
- **Level of Design**
- **Risk or Unknowns**
- **Staff Experience**
- **Contractor Experience**
- **Level of Control**

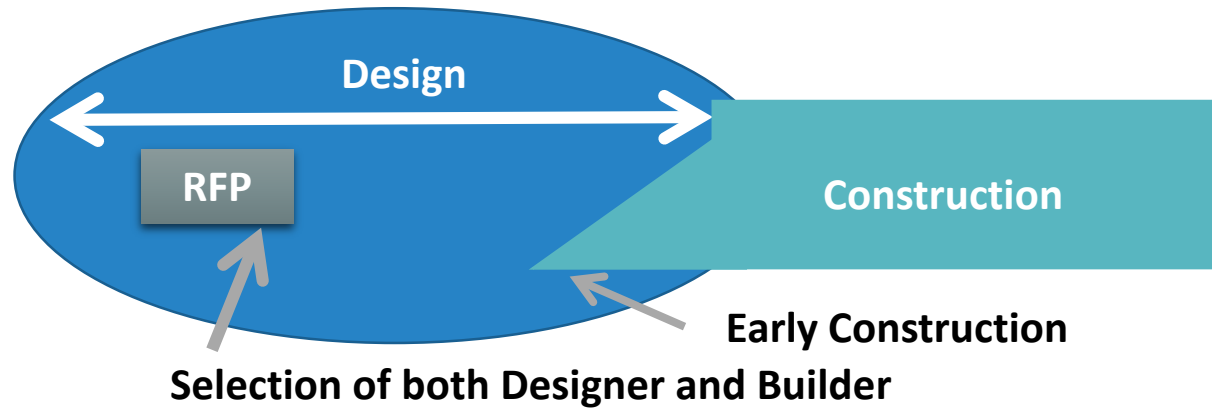




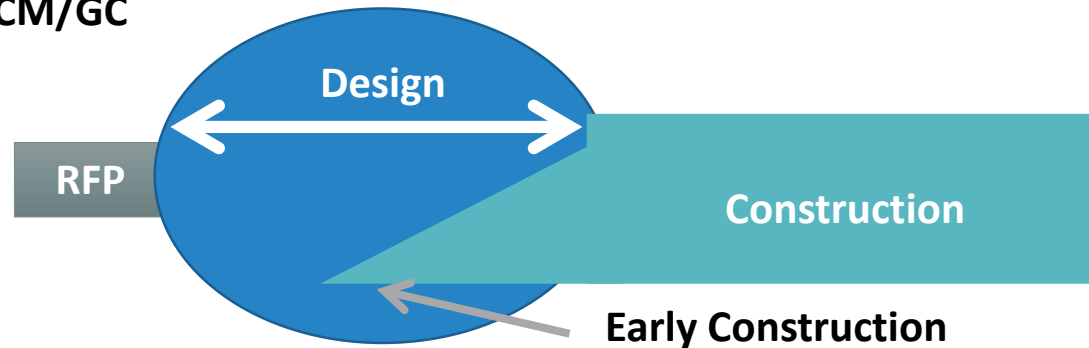
## Design Bid Build



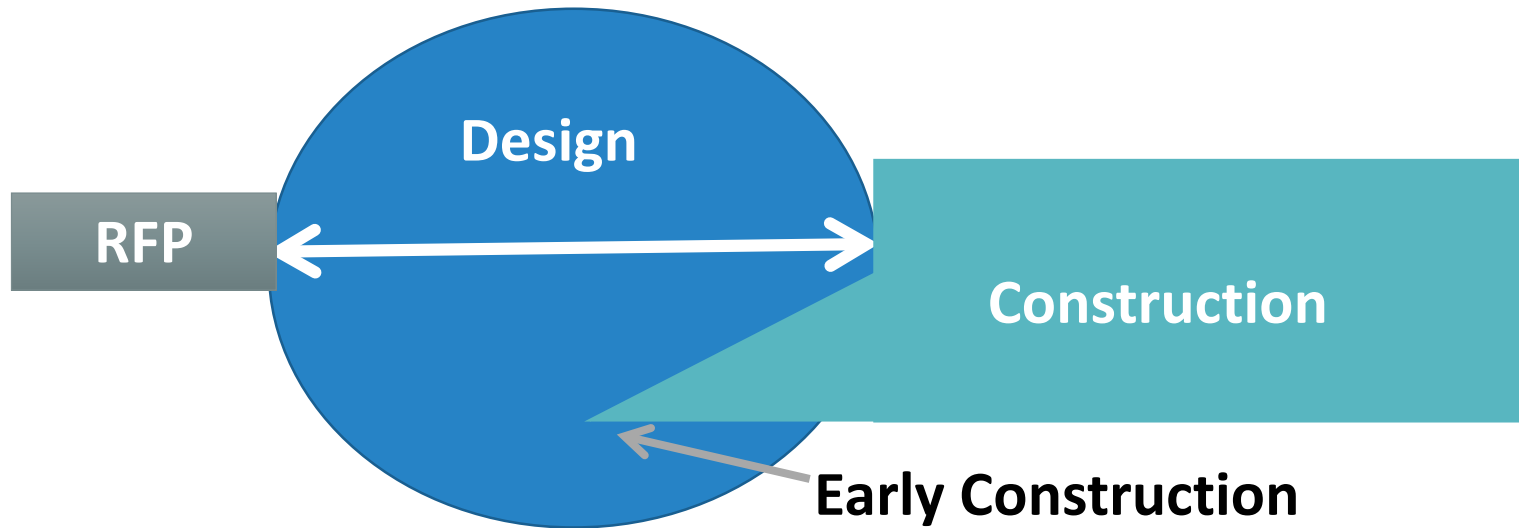
## Design Build




## CM/GC



# CM/GC



# Which method?



Owner: "I hope the bid's come in within budget. I hope the builder's qualified. I hope my contingency is sufficient. I hope the plans are constructable with few changes. I wonder what risks are looming? Did we do enough geotechnical exploration?"

- Delivery Schedule
- Budget
- Project Complexity
- Innovation Needed
- Level of Design
- Risk or Unknowns
- Staff Experience
- Contractor Experience
- Level of Control





Project Name	Priority	Estimated Cost <sup>(1)</sup>	Funding Sources	Design (% Complete)	NEPA Clearance Completed	ROW Needed	BIA Coordination	Construction Completed
SP 32 Pinsbaari Road	High	\$2.2 M	Federal	0	No	Maybe	Yes	March 2017
Riconado Bridge - M122	High	\$900K	Federal	0	Re-Eval	No	Yes	June 2016
Veterans Parking Lot	Med	\$90K	State	0	No	No	Yes	March 2016
E. Pueblo Road and Dichuuna Road T-intersection	High	\$286K	State, Federal	0	No	Yes	Yes	Dec 2016
FEMA 2013 and 2014 Projects	High	\$1,761K	Federal <sup>(2)</sup>	0	No	No	Yes <sup>(3)</sup>	June 2016
Stockyard Bridge (FEMA)	Med	\$300K	Federal <sup>(2)</sup>	90%	No	Yes	Yes <sup>(3)</sup>	Dec 2016
Parking Lot Reconstruction Project	Low	\$350K	Federal	0	No	No	Yes	June 2016
Road Stabilizing	High	\$450K	Federal	0	No	No	Yes	June 2016
Road Maintenance	High	\$550K	Federal	0	No	No	No	June 2017
Total		\$6,887M						
	(1) Includes all project development and construction costs							
	(2) Available funding cannot be combined with other projects							
	(3) (3) Consultation with NM DHSEM through Acoma							

# CM/GC School of Thought

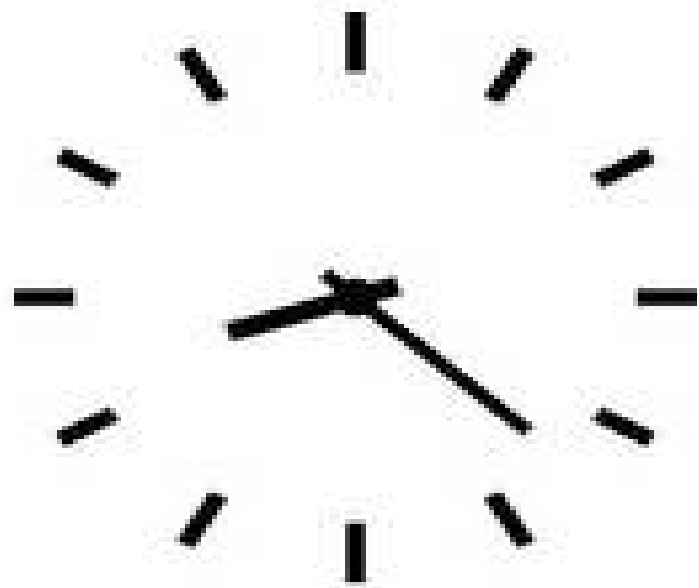
1) Design to Construct Under Budget



2) Provide More Construction for Set Budget







**Q & A time**



# ICE - This is not your Grandmother's Cadillac







# The Basics-Contract Phases

- **Preconstruction**

- CM oversees project's constraints to effectively manage the scope, schedule, and budget

Scheduling, Estimating, Bidding/Procuring Labor and Materials, Supporting Public Outreach, Coordinating environmental permits, or developing relocation plans for businesses and landowners.

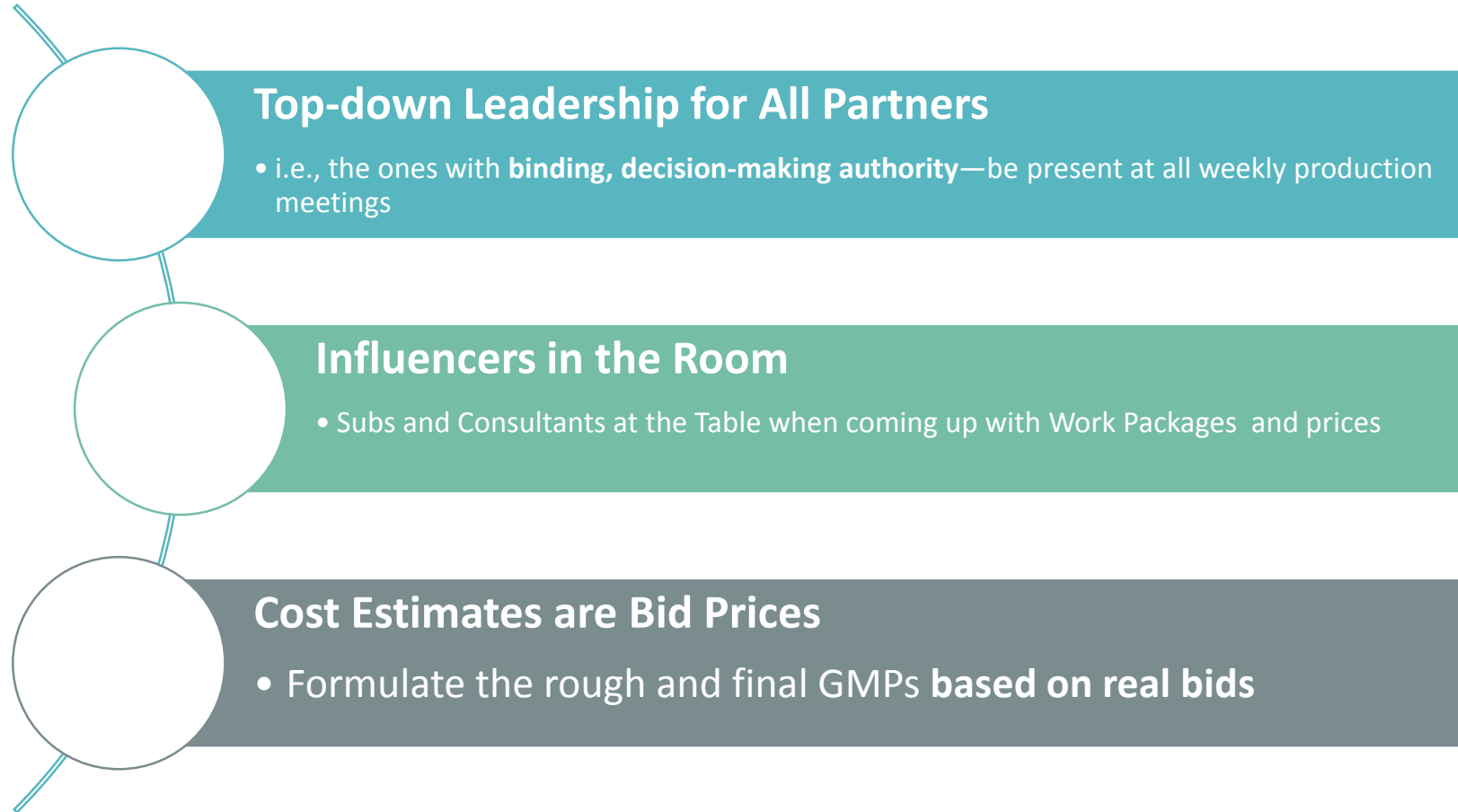
- **Construction**

- CM retains management
- Acts as prime Contractor (GC) delivering labor, equipment and materials to complete each work package

Purchasing, on-site and off-site construction, fabrication, contract administration, progress meetings, produces progress schedules, shop drawings, payment applications, record documents, and as-builts.



# CM/GC Essentials



# CM/GC Essentials



## Upfront Cost Control

- Layout cost of all cumulative GMPs prior to starting early work packages

## Budget for Contingencies and Allowances

- Enables real-time decisions to allow the project to move forward.

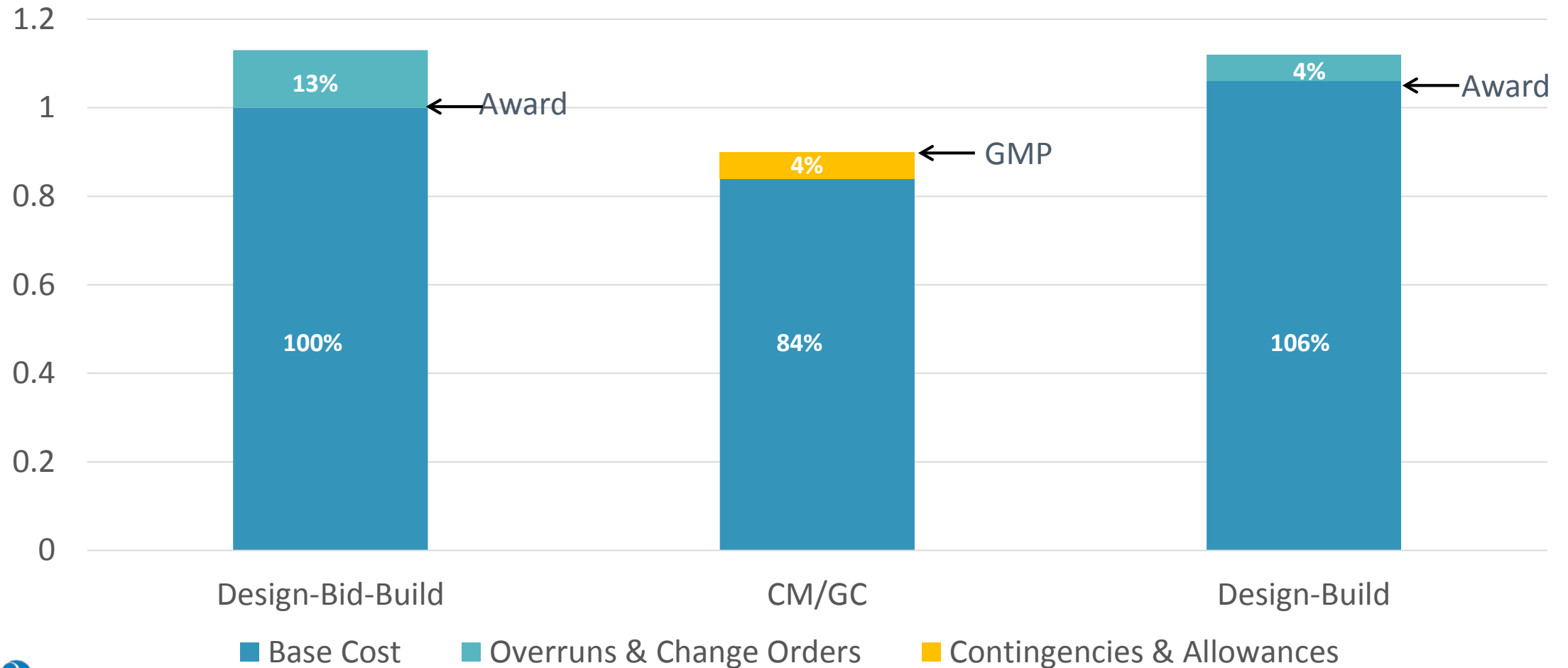
## Zero Tolerance for Change Orders

- Innovation is required to ensure no change orders and extra work is zeroed out.



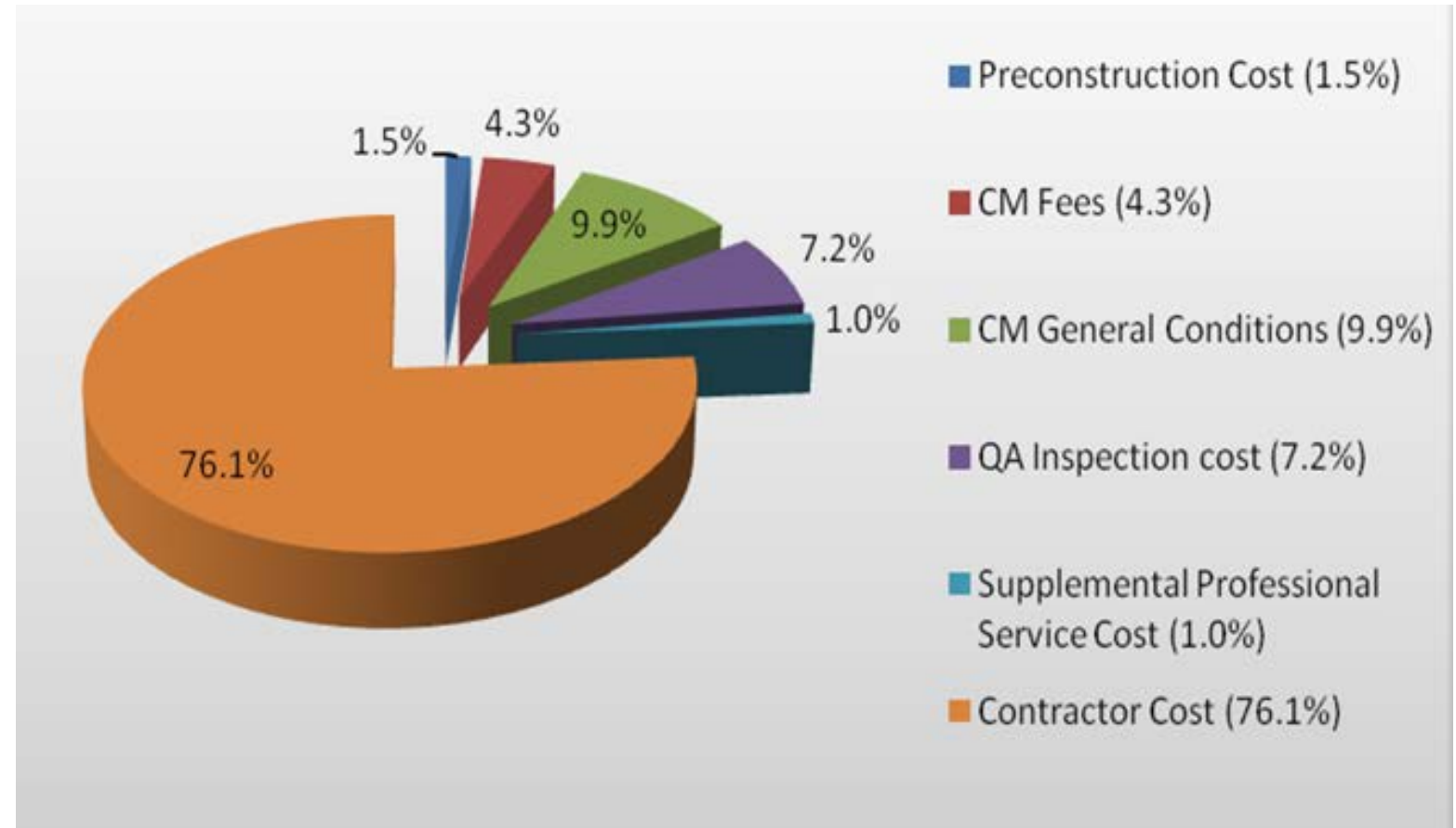


# Cost Comparison



# Contractor Fees

## Osceola, Florida Case Study Finding



# Project Goals & Objectives

- Use a “**no frills/bare bones**” approach to design plans to rapidly deliver a suite of quality projects under budget;
- Work cooperatively with Owner, the Design Consultants, and stakeholders to maintain an **aggressive and cost effective schedule**;
- Use innovation to provide improved quality and performance and **generate significant project savings**;
- Maintain a strong positive relationship with major stakeholders, **cultivate a partnering attitude**, promote a creative environment, and be proactive in addressing project needs;



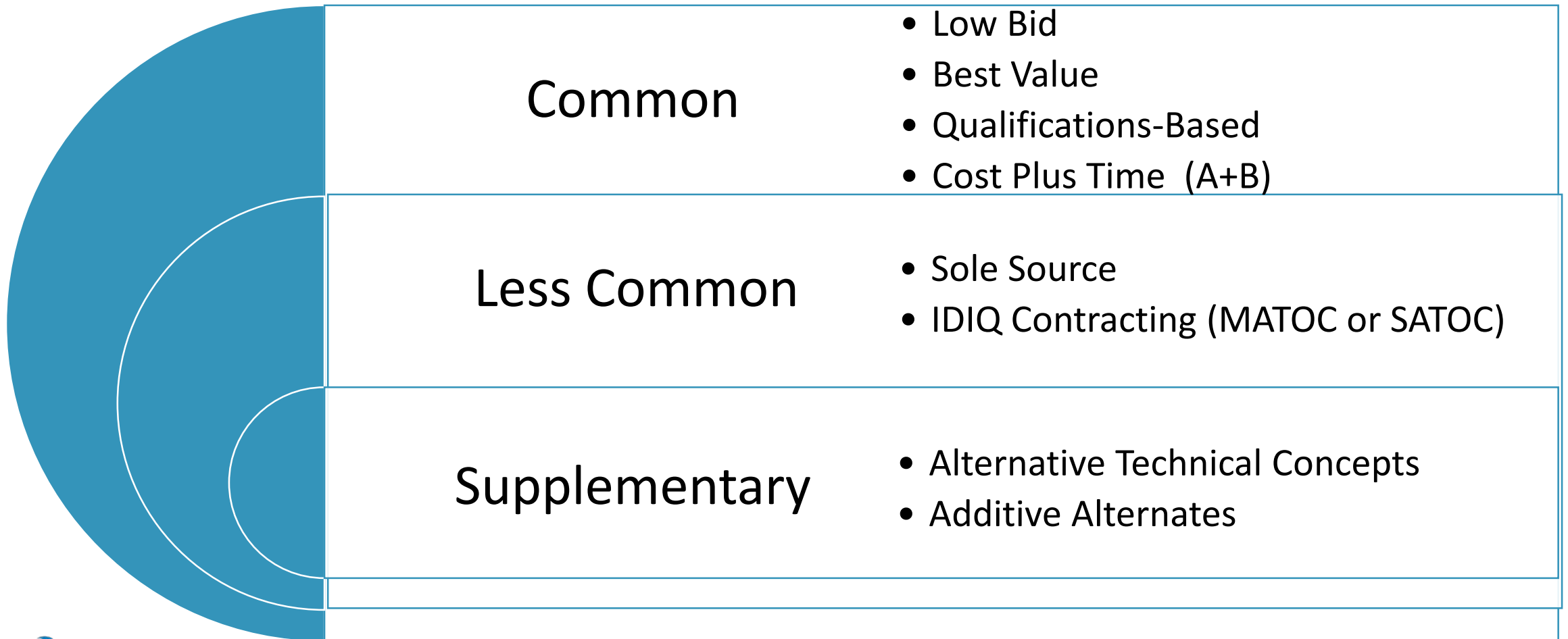


# Project Goals & Objectives

- Provide a **context-sensitive project** using smarter construction methods for low maintenance and long term performance;
- Provide a **safe working and traveling environment** that minimizes the potential for injuries to the public and construction workers;
- **Minimize inconvenience to the public** by minimizing construction time and delays; and
- Deliver early work packages to ensure early construction is underway two one month after Notice to Proceed and this suite of projects is **rapidly taken “off of the books”**.



# Procurement Procedures



# Procuring the CM

## Best Value Proposal

(Technical Evaluation + Price) – Must have a price component

- Brings the traditional mindset of bidding the work.
- Potential to obtain low bid Sub-Contractors.
- Qualifications can be compromised by price
- Responds to a partial design rather than asking how the CM would construct
- Best value focused on General Contractor



*Field the Right Team for All the Right Reasons*

## Qualifications Based Selection

(Professional Services) – Simplest and Fastest Method

- Owner not influenced by price; team selection based on qualifications and past performance
- A goal motivated team is more efficient than a price oriented team resulting in a need for significantly fewer staff
- Teams not initially tied to selection price components have greater latitude to use innovation, unique construction approaches, sustainable design, etc...
- QBS focused on the Construction Manager





# Delivery Method Comparisons

GENERAL SUITABILITY OF DELIVERY MODELS			
Project Traits	D-B-B	CM/GC	D-B
Risk Management	Very limited	Very effective	Best for risk shifting
Collaboration With Designer & Contractor	Very limited	Very collaborative	Moderate collaboration, contractual limitations
Price Certainty	None, subject to overruns and change orders	Very effective, early price certainty during project development	Very effective, early price certainty during project development
Schedule Acceleration/Compression	No ability to overlap design & construction, can accelerate construction with A+B	Ability to overlap design & construction, ability to optimize schedule not just accelerate	Ability to overlap design & construction, very effective for accelerating project delivery
Construction Quality	Low bid can compromise quality	Very beneficial to building a quality project	Very beneficial to building a quality project



**“We can’t solve problems  
by using the same kind of thinking  
we used when we created them.”**

Albert Einstein

