ALL OHIO CONVOCATION

A risk management program for architects and engineers
September 7, 2019

The Evolution of Project Delivery in Ohio: Where Have we Been and Where are we Going?

An Interactive Discussion

Presented by:
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and
Managing Director, Project Management Consultants LLC

Introduction

Goals of Presentation:

- To answer these questions about Project Delivery in Ohio--
  - Where have we been?
  - What are the historic drivers of change?
  - What differentiates project delivery methods?
  - What trends have been established?
  - Where are we headed as an industry and what are the implications for your organization?
- To keep you awake and engaged. This is interactive!

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Demographics

- Who is here today?

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What is my organization?

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My work is:

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I have been in the design/construction/ development business:

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I am involved in project delivery decisions or evaluation for my organization:

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Have you observed (or participated in) a disappointing experience with project delivery selection or implementation. Check all that apply:

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In a few words, what was the problem?

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Why is project delivery important?

- From a Project Perspective:
  - Every Project begins with this question- What system should we use?
    - Proper decision requires full understanding of options and objective analysis.
    - Improper decision can lead to failure to meet critical project objectives.
- From a Company Perspective
  - Your organization may need to operate in different and evolving delivery systems
  - Current and future success may depend upon being trained and ready for evolving systems and methods
- Question: Is it <u>important</u> for **you** to have a thorough understanding of project delivery options and the selection process?
  - What is the A/E's responsibility under a standard AIA Contract?

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What is the A/E Responsibility for project delivery selection under a standard AIA B201 Agreement? Check all that are true:

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AIA B201 (2017) Standard Owner Architect Agreement

- §2.2 Schematic Design Phase Services
  - §2.2.2 The Architect shall prepare a preliminary evaluation of the Owner's program, schedule, budget for the Cost of the Work, Project site, the proposed procurement and delivery method… to ascertain the requirements of the Project. The Architect shall notify the Owner of… other….consulting services that may be reasonably needed for the Project."
  - §2.2.3 The architect shall present its preliminary evaluation to the Owner and shall discuss with the Owner alternative approaches to design and construction of the Project. The Architect shall reach an understanding with the Owner regarding the requirements of the Project.

Does this make sense from a timing perspective?

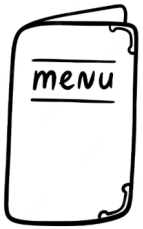
Can the A/E be found liable for failure to present and discuss alternate delivery options?

My Preferred Method for Project Delivery Selection: The Project Delivery Workshop

- Step 1: Educate owner regarding project delivery options
- Step 2: Review and prioritize critical project parameters
- Step 3: Identify absolute constraints that limit possible delivery options
- Step 4: Compare options based upon stakeholder priorities and select preferred option (factor analysis)
- Step 5: Implement special tools to enhance project delivery success

Step 1: Educate the Owner (and Ourselves!)

- Explain Delivery Options and "Typical" Advantages and Disadvantages
- The Standard Menu:
  - Design-Bid-Build
    - Single Prime
    - Multiple Prime
  - Construction Management
    - As Adviser
    - As Constructor (CM at Risk)
  - Design Build and EPC
    - Traditional
    - Progressive
    - Bridging
  - IPD Approaches
- How is the Standard Menu Evolving?
  - What has changed and why?
  - What will be added to the Menu in the future?



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Which of the following project delivery methods has your organization used (or been a sub trade or consultant for) during the past five years?

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•Place the 4 methods in order of your volume of work (high to low)

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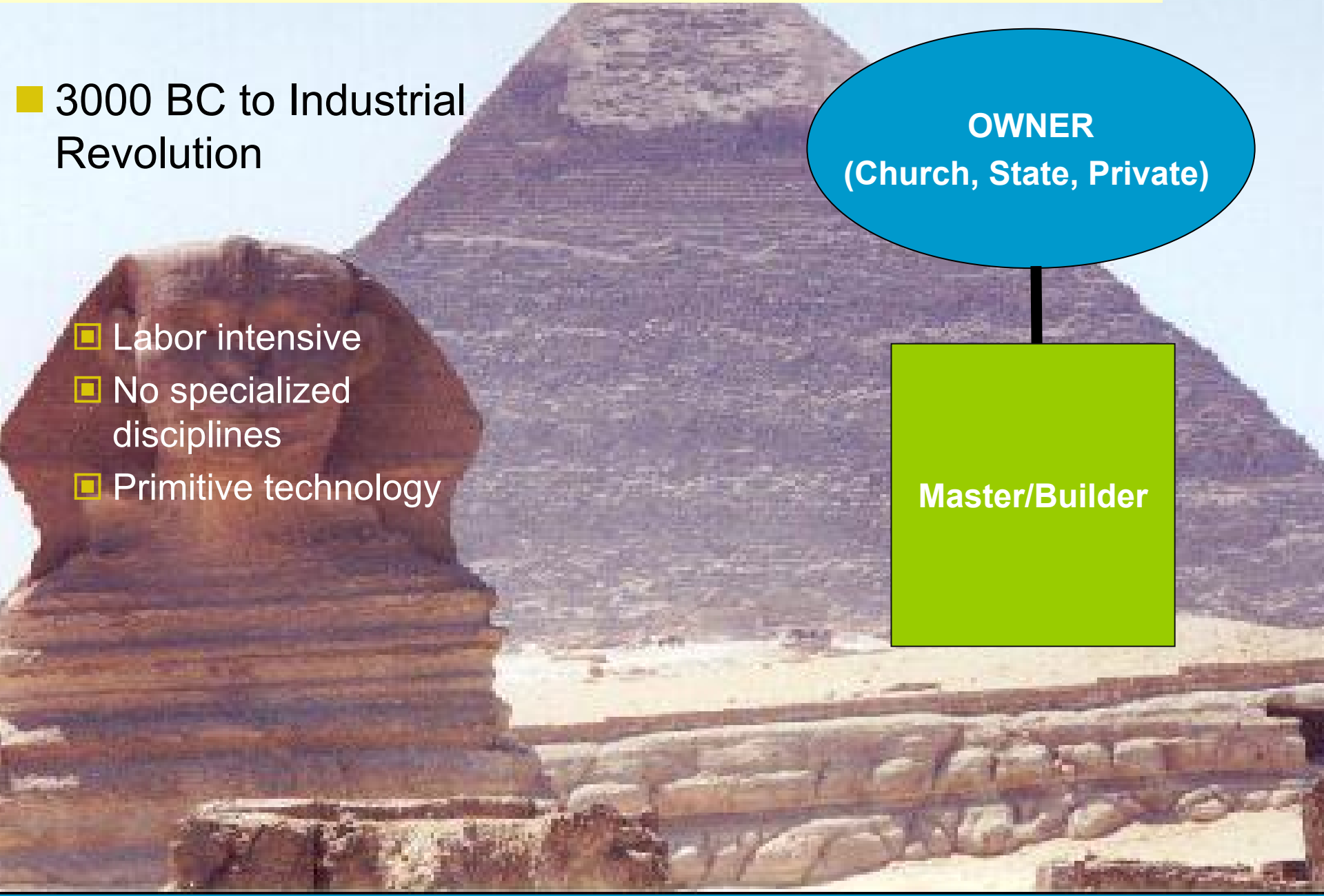
Historical Perspective

- The 4 Ages of Project Delivery History
  - A Highly Unbalanced View

"You have to know the past to understand the present"
— Carl Sagan

The First Age: Master Builder Format

- 3000 BC to Industrial Revolution
  - Labor intensive
  - No specialized disciplines
  - Primitive technology



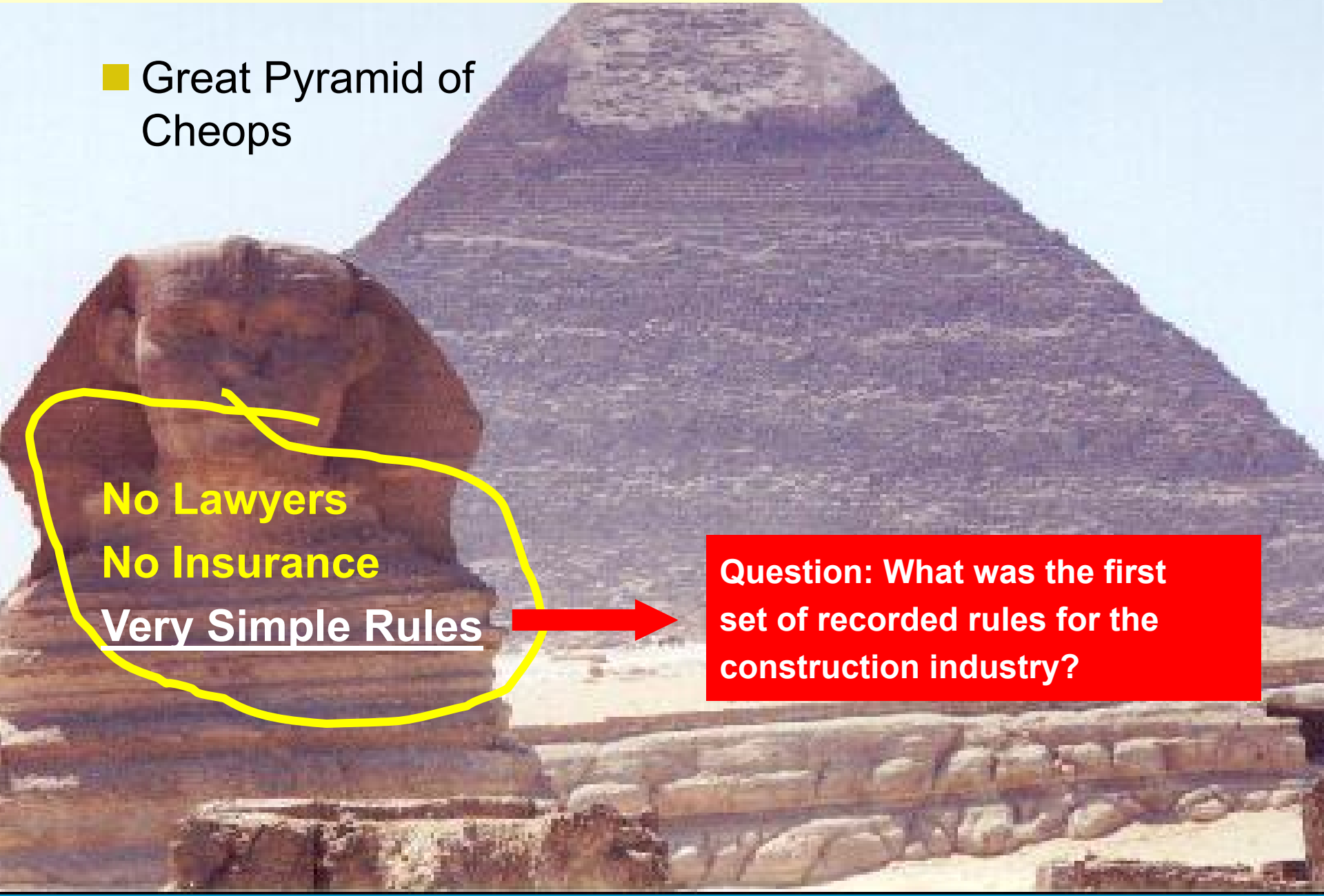
The First Age: Master Builder Format

- Great Pyramid of Cheops

- 2.6 Million Cubic yds
- 20,000-40,000 workers
  - Labor Strikes
  - Schedule Disruptions
  - Procurement Delays

No Lawyers
No Insurance
Very Simple Rules

The First Age: Master Builder Format



- Great Pyramid of Cheops

No Lawyers
No Insurance
Very Simple Rules

Question: What was the first set of recorded rules for the construction industry?

THE HAMMURABI CODE
3000 BC

228: If a builder build a house for a man and complete it, that man shall pay him two shekels of silver per sar (approx. 12 sq. ft.) of house as his wage.

→ **Payment (Cost plus)**

229: If a builder has built a house for a man and his work is not strong, and if the house he has built falls in an kills the householder, that builder shall be slain.

→ **Liability (including death penalties)**

230: If the son of the householder be killed, the son of that builder shall be slain.

→ **Good to be the daughter!**

231: If the slave of the householder be killed, he shall give slave for slave to the householder.

232: If goods have been destroyed, he shall replace all that has been destroyed; and because the house was not made strong, and it has fallen in, he shall restore the fallen house of his own material.

233: If a` has built a house for a man, and his work is not done properly and a wall shifts, then that builder shall make that wall good with his own silver.

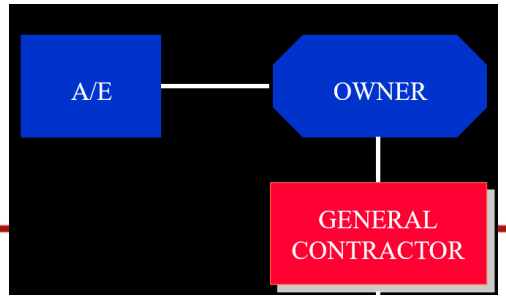
Note: All rules pertain to "Builder"–

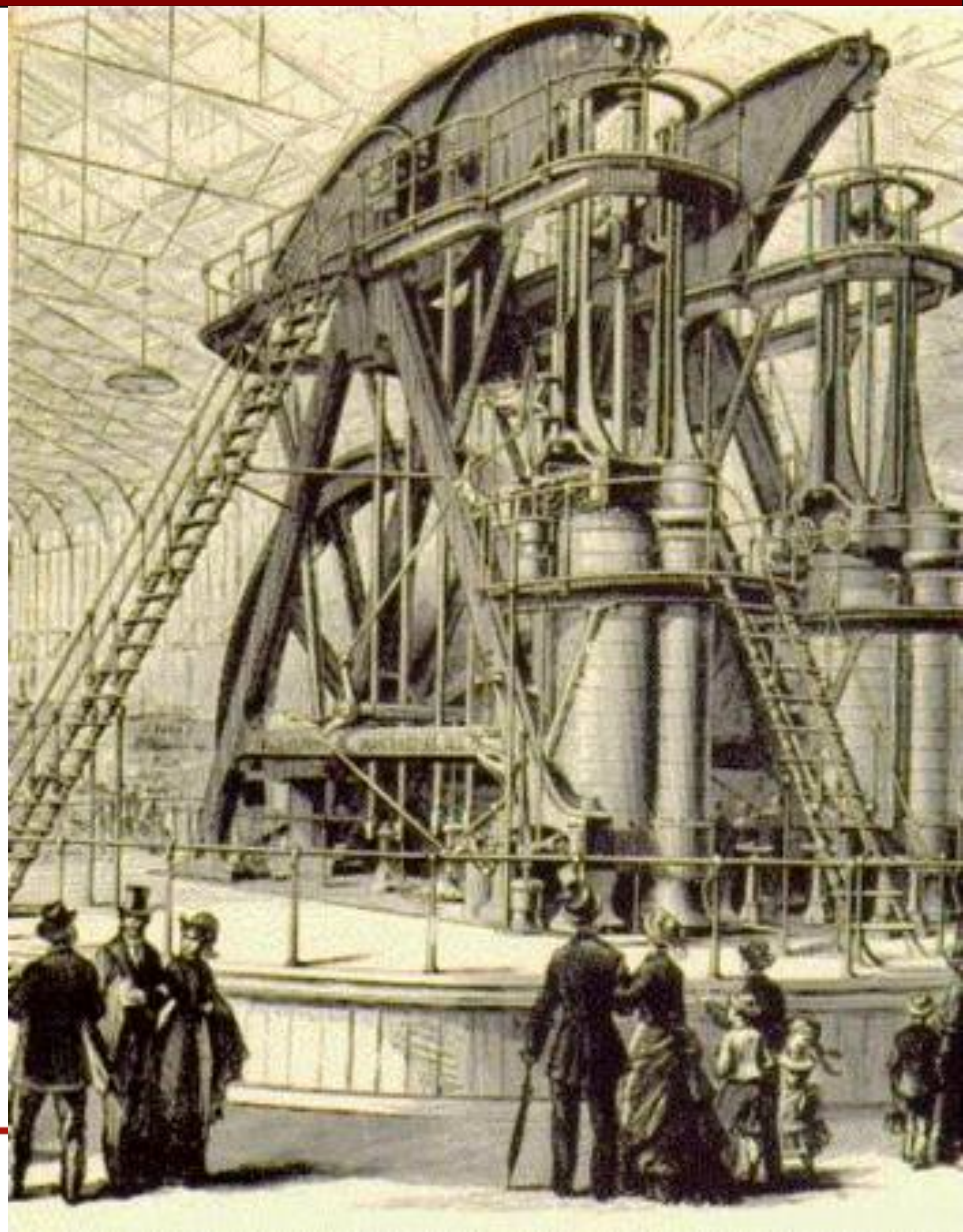
When did that Change?

- Leon Battista Alberti (1443)
  - First Printed book on architecture, "*De re aedificatoria. On the art of building in ten books*"
  - Role of independent architect begins to emerge

The Second Age: Traditional Design-Bid-Build

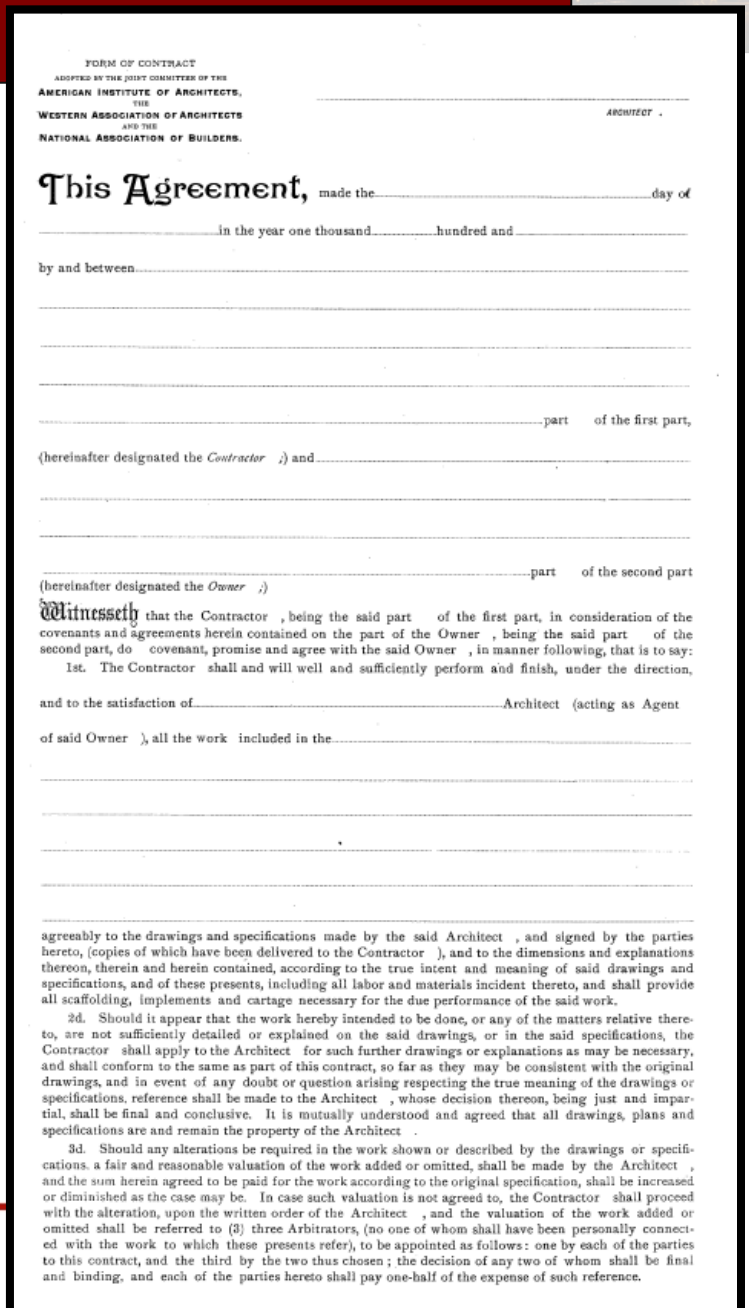
- Starts with Industrial Revolution: 1750-1850
- Age of Specialization
- Decisions are Driven by Production and Cost
- Technology Advances
- Master Builder Separates into “Component Parts”





Traditional "Design-Bid-Build" becomes Dominant

- First AIA Industry Document
  - 1888 -- Owner/Contractor Agreement-- (12 paragraphs)
  - 1911--First "General Conditions Document" 1911
  - 1917-- First Owner Architect Agreement



FORM OF CONTRACT
ADOPTED BY THE JOINT COMMITTEE OF THE
AMERICAN INSTITUTE OF ARCHITECTS,
THE
WESTERN ASSOCIATION OF ARCHITECTS
AND THE
NATIONAL ASSOCIATION OF BUILDERS.

Architect .

This Agreement, made the day of

in the year one thousand hundred and

by and between

part of the first part,

(hereinafter designated the *Contractor* ,) and

part of the second part

(hereinafter designated the *Owner* ,)

Witnesseth that the Contractor , being the said part of the first part, in consideration of the covenants and agreements herein contained on the part of the Owner , being the said part of the second part, do covenant, promise and agree with the said Owner , in manner following, that is to say:

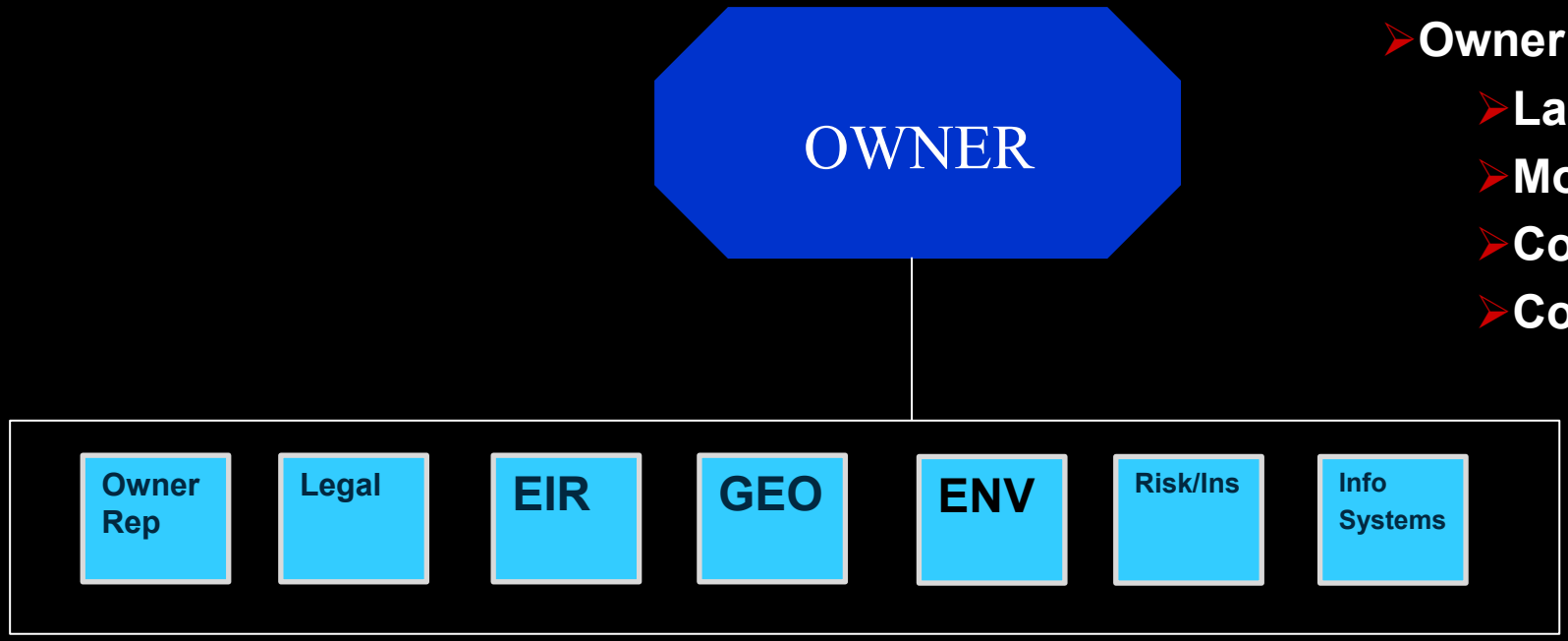
1st. The Contractor shall and will well and sufficiently perform and finish, under the direction, and to the satisfaction of Architect (acting as Agent of said Owner), all the work included in the

agreeably to the drawings and specifications made by the said Architect , and signed by the parties hereto, (copies of which have been delivered to the Contractor), and to the dimensions and explanations thereon, therein and herein contained, according to the true intent and meaning of said drawings and specifications, and of these presents, including all labor and materials incident thereto, and shall provide all scaffolding, implements and cartage necessary for the due performance of the said work.

2d. Should it appear that the work hereby intended to be done, or any of the matters relative thereto, are not sufficiently detailed or explained on the said drawings, or in the said specifications, the Contractor shall apply to the Architect for such further drawings or explanations as may be necessary, and shall conform to the same as part of this contract, so far as they may be consistent with the original drawings, and in event of any doubt or question arising respecting the true meaning of the drawings or specifications, reference shall be made to the Architect , whose decision thereon, being just and impartial, shall be final and conclusive. It is mutually understood and agreed that all drawings, plans and specifications are and remain the property of the Architect .

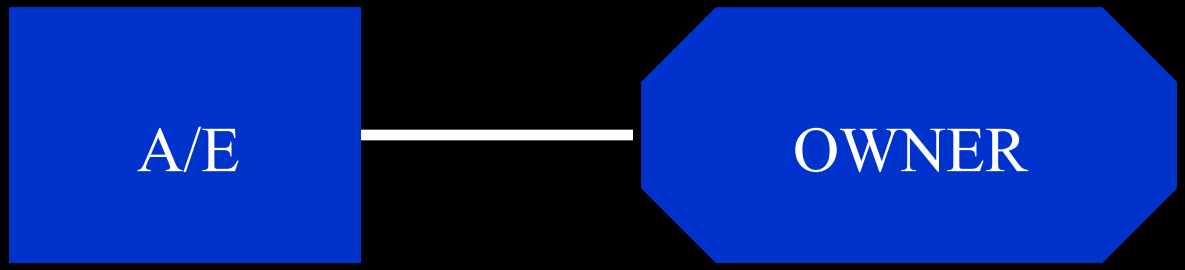
3d. Should any alterations be required in the work shown or described by the drawings or specifications, a fair and reasonable valuation of the work added or omitted, shall be made by the Architect , and the sum herein agreed to be paid for the work according to the original specification, shall be increased or diminished as the case may be. In case such valuation is not agreed to, the Contractor shall proceed with the alteration, upon the written order of the Architect , and the valuation of the work added or omitted shall be referred to (3) three Arbitrators, (no one of whom shall have been personally connected with the work to which these presents refer), to be appointed as follows: one by each of the parties to this contract, and the third by the two thus chosen; the decision of any two of whom shall be final and binding, and each of the parties hereto shall pay one-half of the expense of such reference.

General Contractor Approach



- Owner Brings:
  - Land
  - Money
  - Concept
  - Consultants

General Contractor Approach

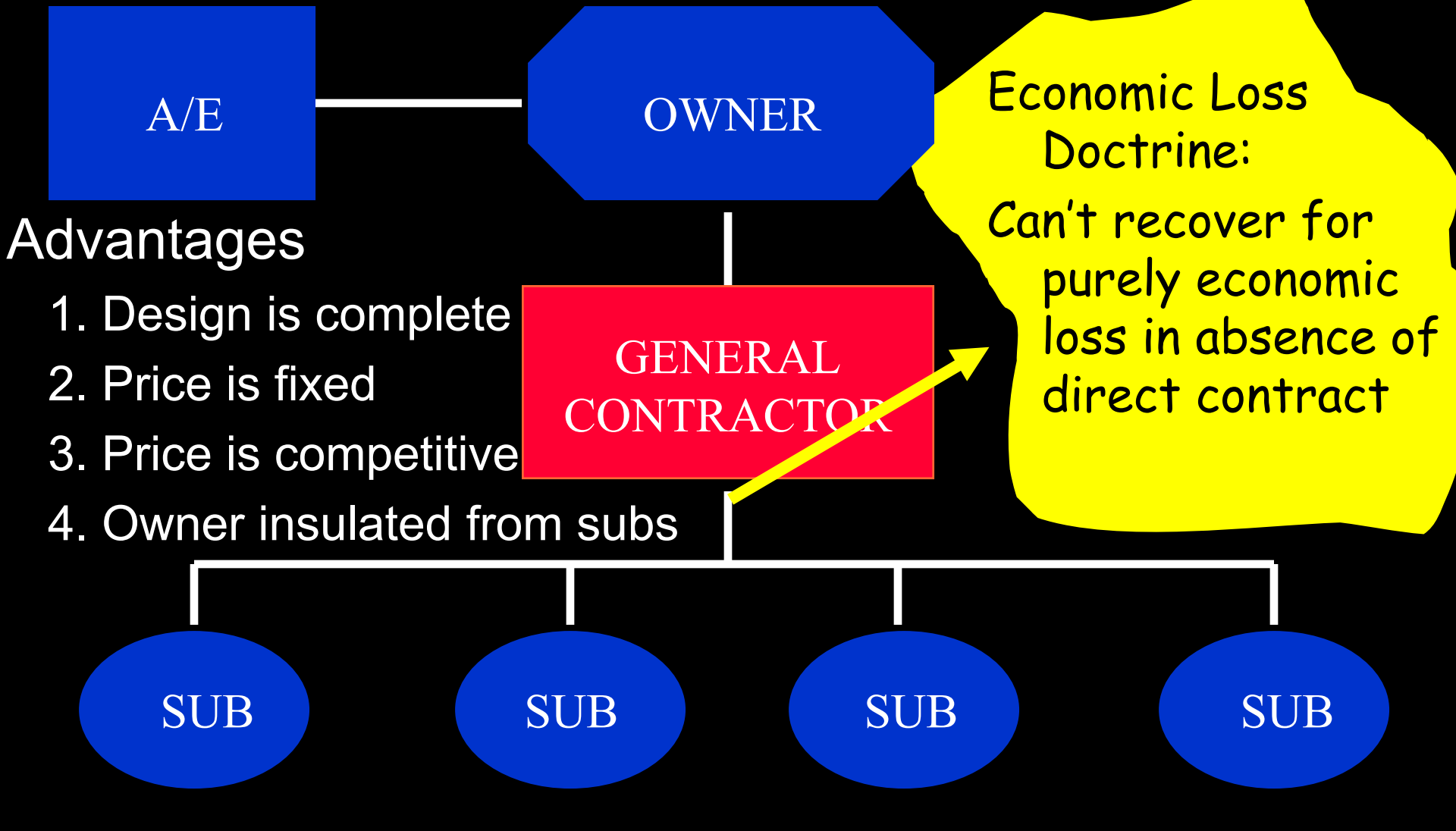


- Owner Brings:
  - Land
  - Money
  - Concept
  - Consultants

- **A/E Scope**
  - Design Phases (Introduced in AIA B-311 1958)
    - Programming (5%)
    - Schematic Design [SD] (10%)
    - Design Development [DD](20%)
    - Construction Documents [CD] (40%)
  - Bidding Phase (5%) (Introduced in AIA B131 1967)
  - Construction Administration (20%) (Replaces “supervision” AIA 1951 b.1.4)

Level of Design

General Contractor Approach



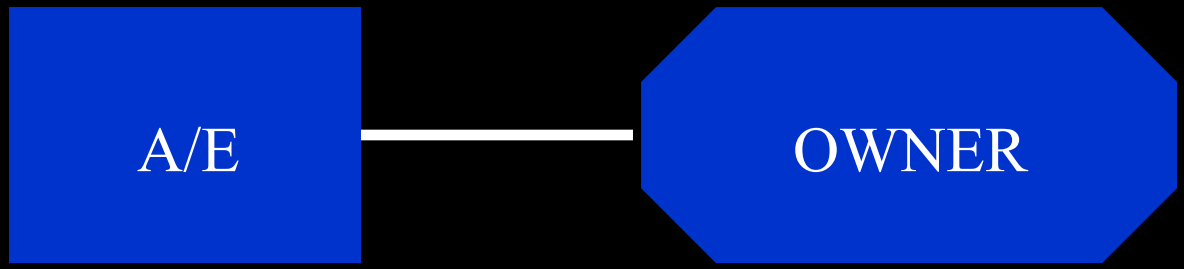
Advantages

1. Design is complete
2. Price is fixed
3. Price is competitive
4. Owner insulated from subs

Economic Loss Doctrine:

Can't recover for purely economic loss in absence of direct contract

General Contractor Approach

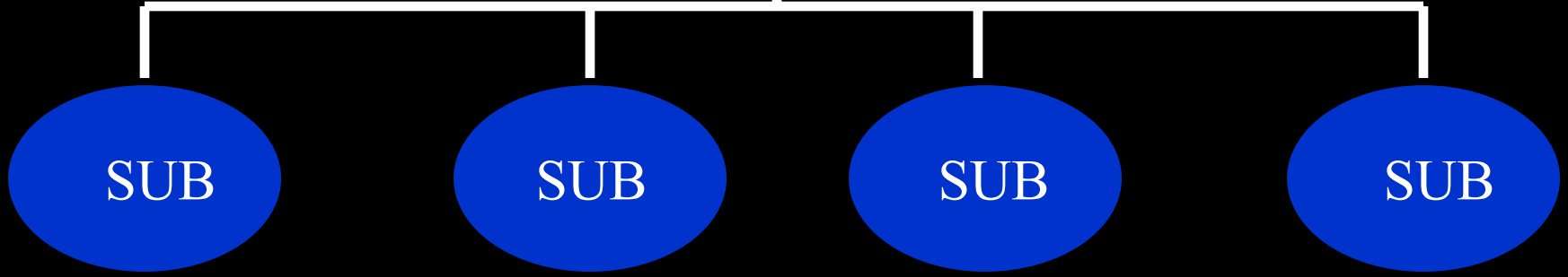


Advantages

1. Design is complete
2. Price is fixed
3. Price is competitive
4. Owner insulated from subs

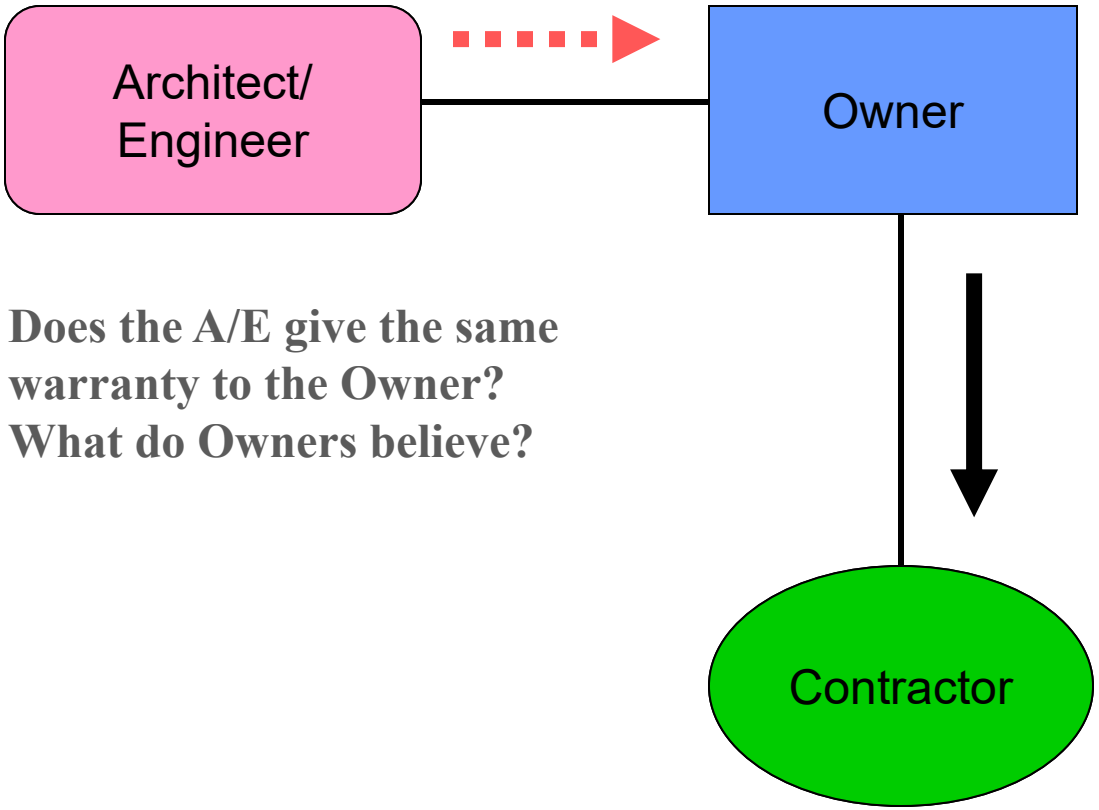
Disadvantages

1. Adversarial
2. The Spearin Gap



“ A Brief Detour to Discuss Design Responsibility”

The Spearin Rule



Does the A/E give the same warranty to the Owner? What do Owners believe?

The Spearin Rule:

“The Owner warrants (to Contractor) the adequacy of plans and specifications”

United States v. Spearin, 248 U.S. 132 (1918);

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Most Owners believe the following:

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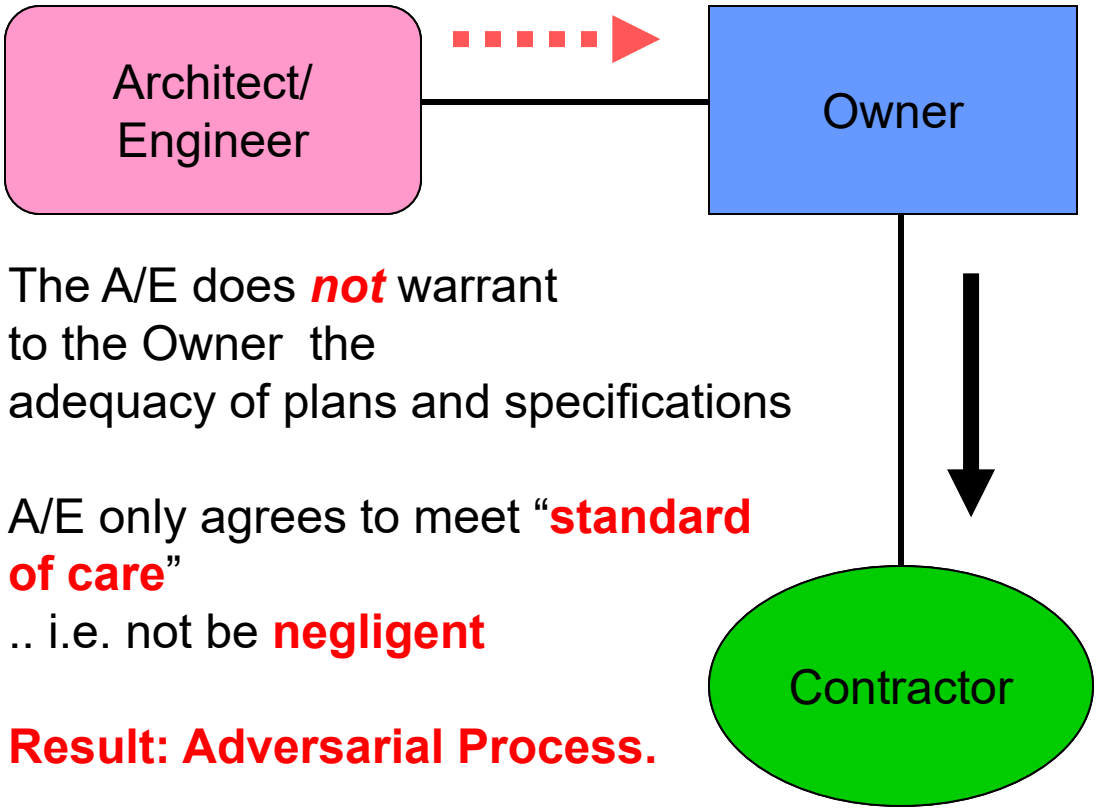
The Spearin Gap



The A/E does ***not*** warrant to the Owner the adequacy of plans and specifications

A/E only agrees to meet "**standard of care**"
.. i.e. not be **negligent**

Result: Adversarial Process.

The Spearin Rule:

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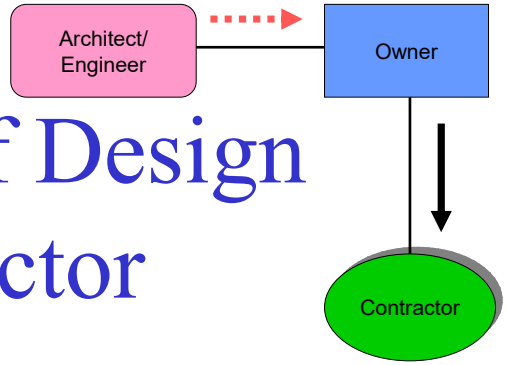
THOMPSON HINE



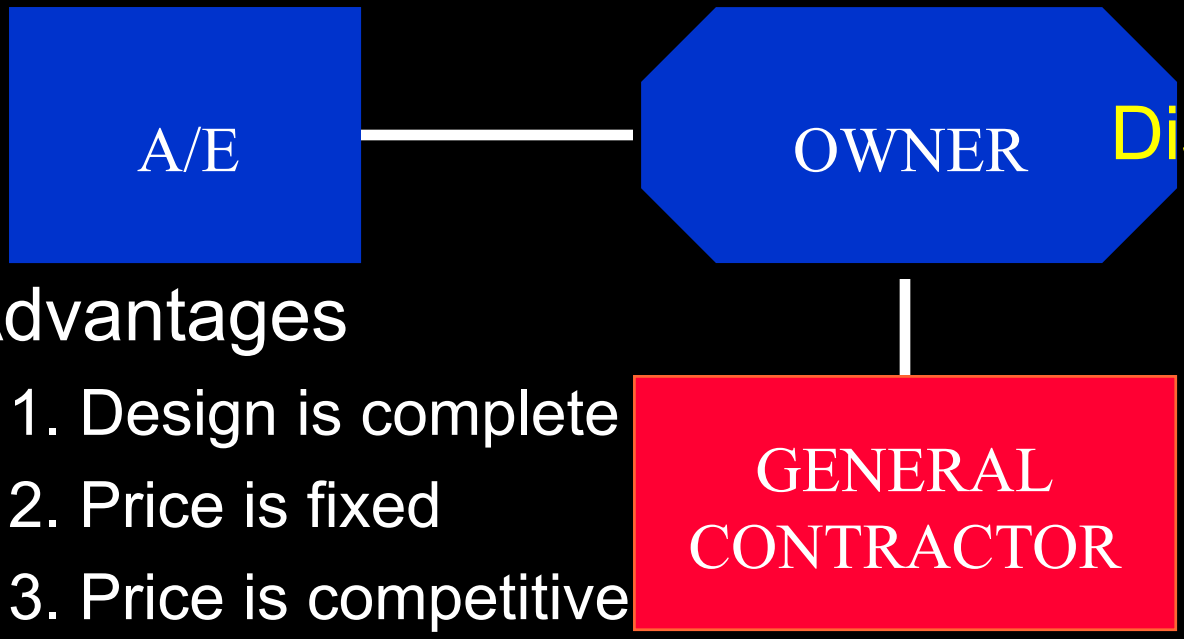
Spearin and Shifting Role of Design Professional and Contractor

- Design (at time of Spearin):
  - A discrete activity performed without contractor involvement and concluded at the time of bid and construction.
- Design (as evolved):
  - Post-World War II – – Escalation of prefabricated assemblies and increasing technological complexity of building systems.
  - Desired input of contractors and manufacturers earlier in design process.
  - Extension of design beyond time of bid/construction start.
    - Architect coordinates and integrates design contributions from contractors and system suppliers

- How does this impact project delivery?
- How can design and construction be better integrated from a risk and process perspective?
- How can parties address the Spearin Gap issue in a less adversarial fashion? [We will return to this]

THOMPSON HINE

General Contractor Approach



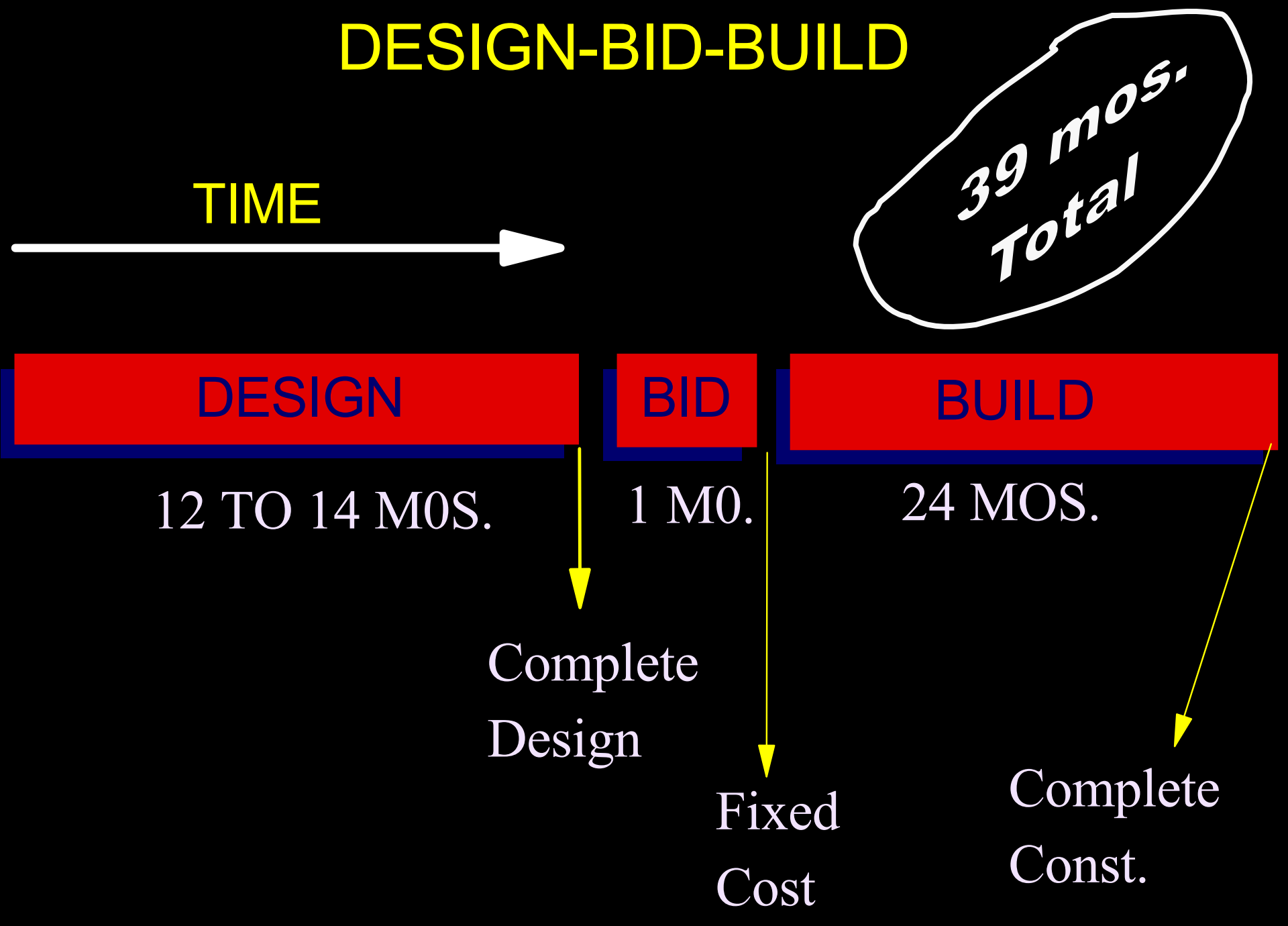
Advantages

1. Design is complete
2. Price is fixed
3. Price is competitive
4. Owner insulated from subs

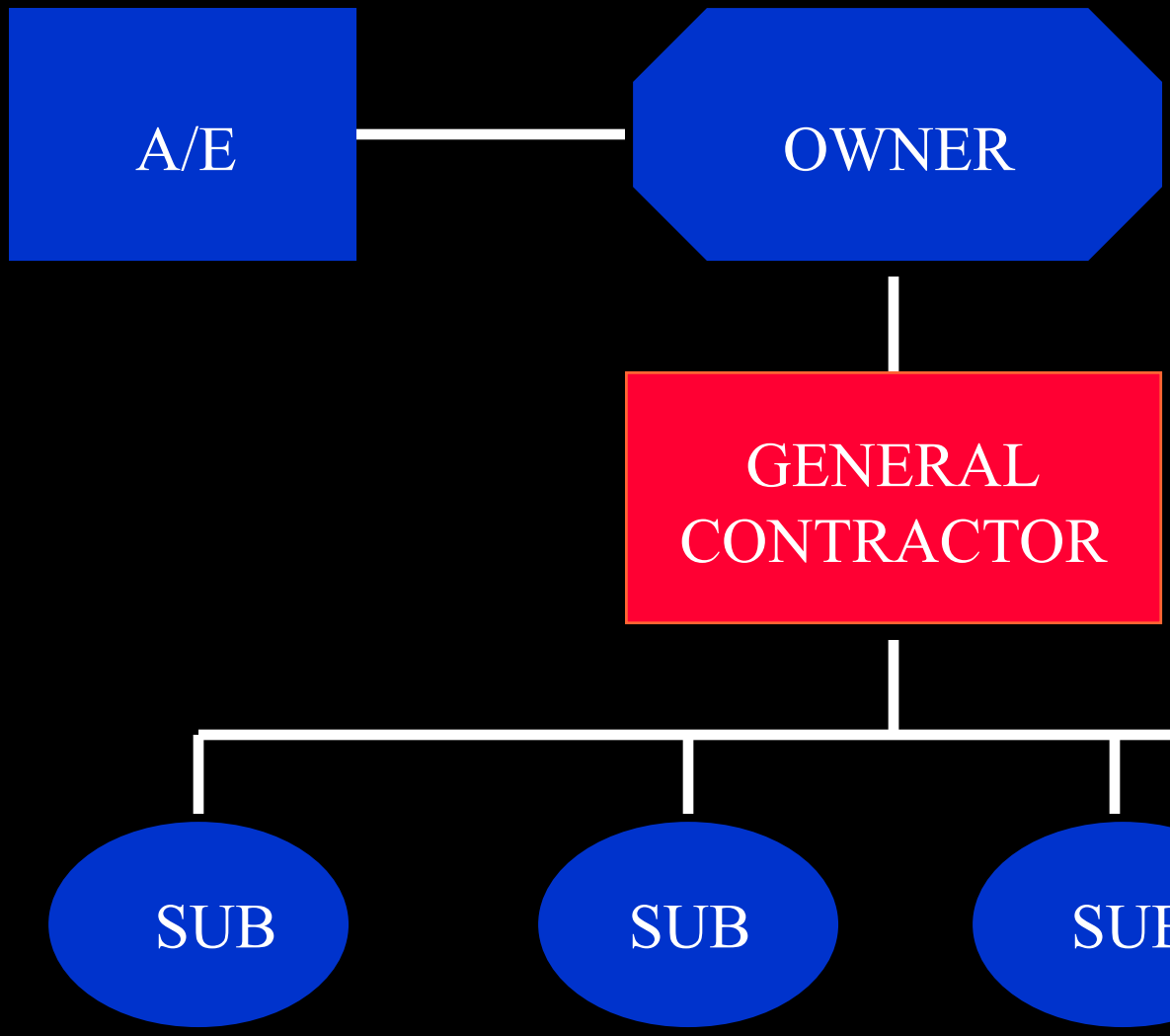
Disadvantages

1. Adversarial
2. The Spearin Gap
3. GC Markup
4. No Precon
5. Long Duration

DESIGN-BID-BUILD



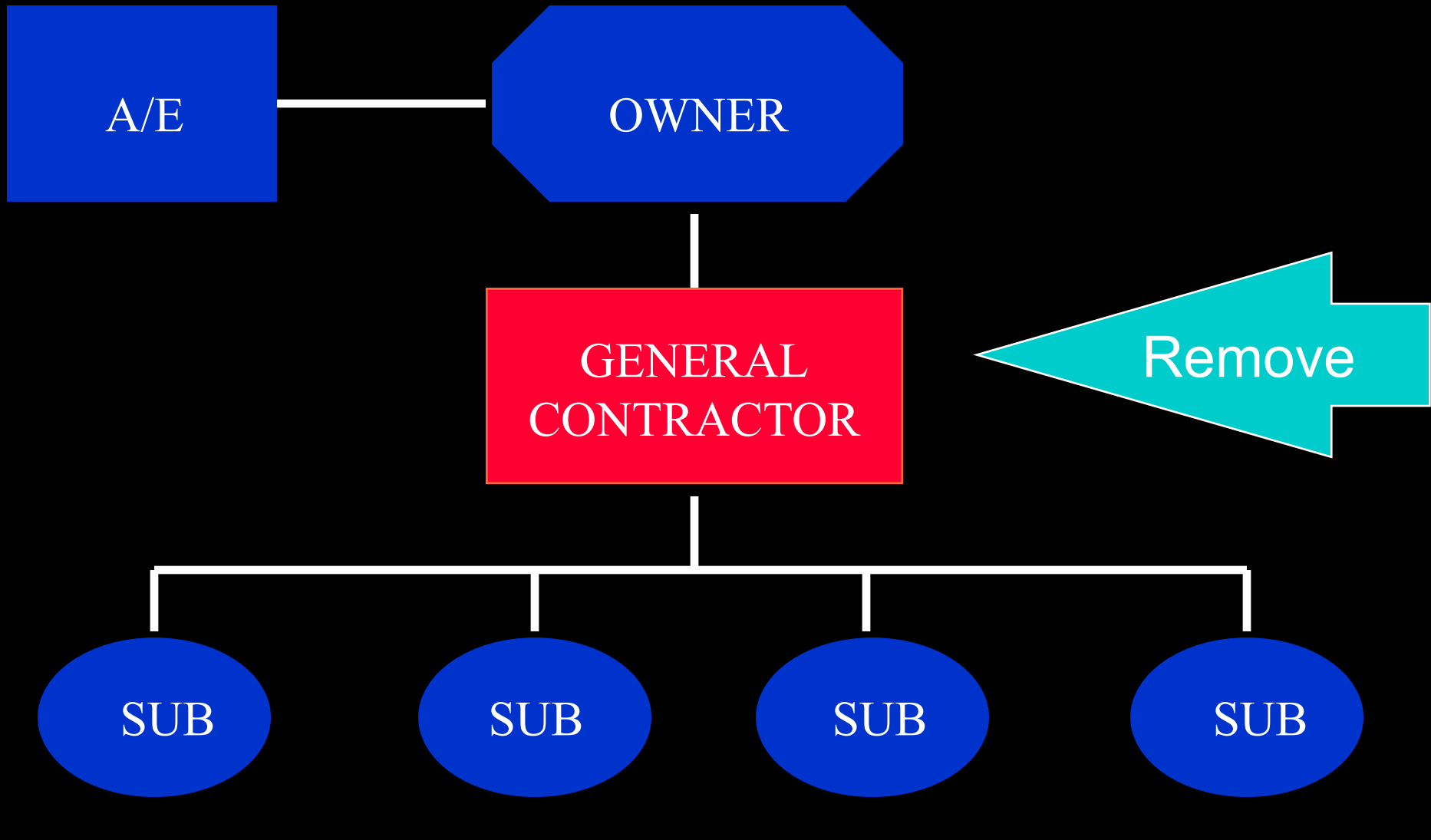
General Contractor Approach



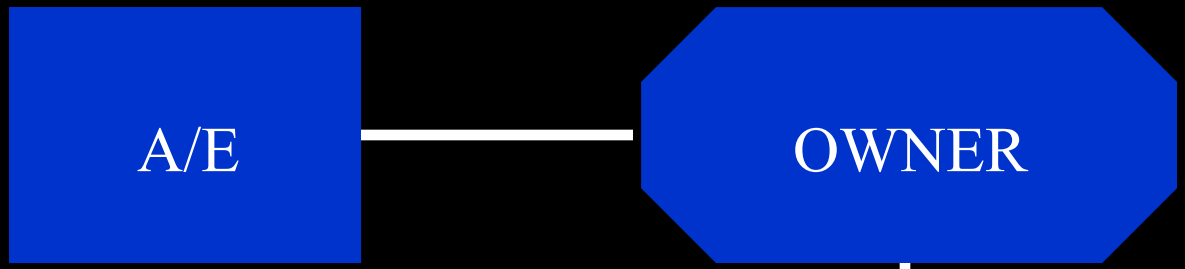
Public Sector Concern

- Bid Shopping w/ Subs
-
- Lack of Competition at Sub Level
- Sub direct access to Owner

General Contractor Approach

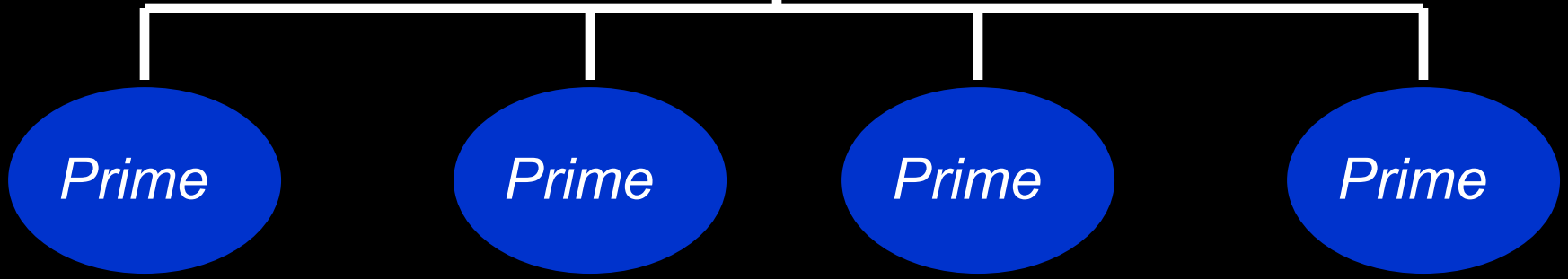


Multiple Prime Approach

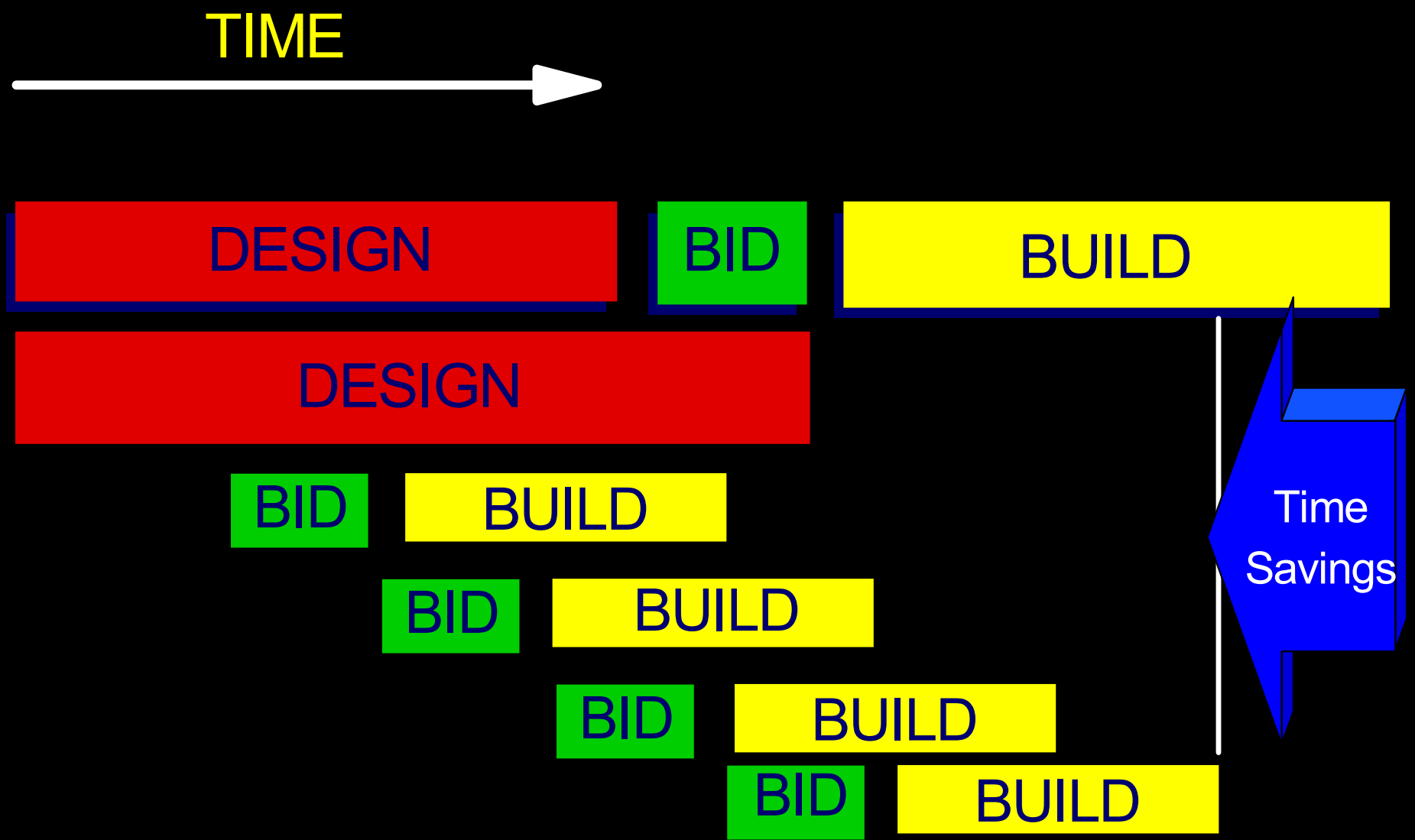


Advantages:

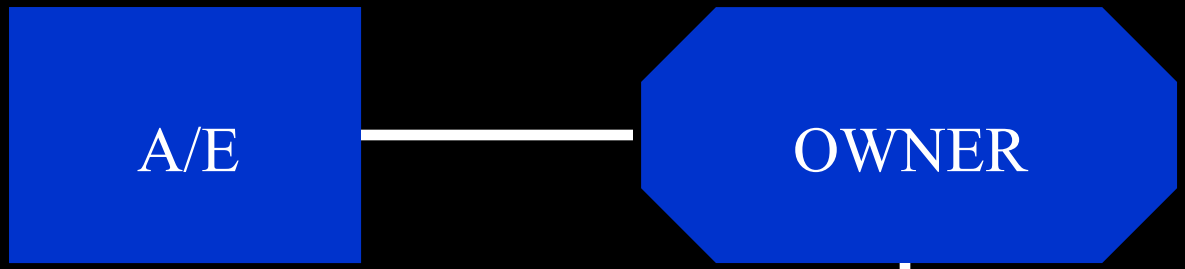
1. No General Contractor Fee
2. Controls “Bid Shopping”
3. Phased “Fast Track” option



"FAST-TRACK"
PHASED CONSTRUCTION



Multiple Prime Approach



Advantages:

1. No General Contractor Fee
2. Controls “Bid Shopping”
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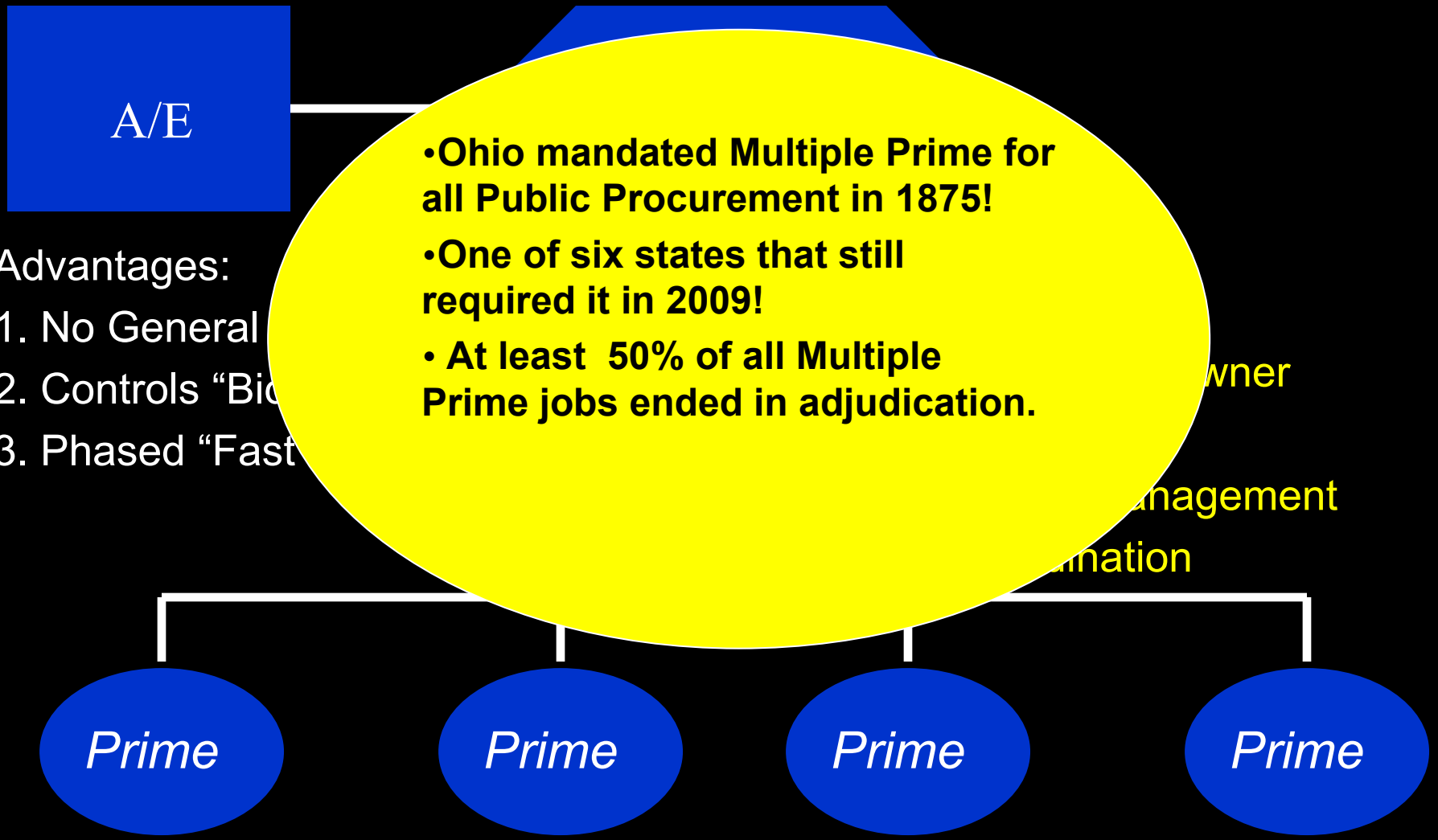
Disadvantages:

1. No fixed price
2. No insulation of Owner
3. Multiple disputes
4. No external management
5. Poor coordination

Multiple Prime Approach



Advantages:

1. No General
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Project Delivery Timeline

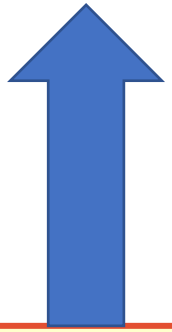
DBB- Multiple Prime

Ohio Public Contracting

1875 1977

DBB- Single Prime

Ohio Private Contracting



End of “Second Age”

Some More History: The Roots of Change are Planted.

- Washington Roebling is Engineer in Charge of Brooklyn Bridge(1869-1883)
- Suffers crippling illness; confined to bed in Brooklyn
- Oversees work with field glasses
- Develops reliable construction management and tracking techniques for time, quality and budget
- Field Management/Direct Communications all handled by:

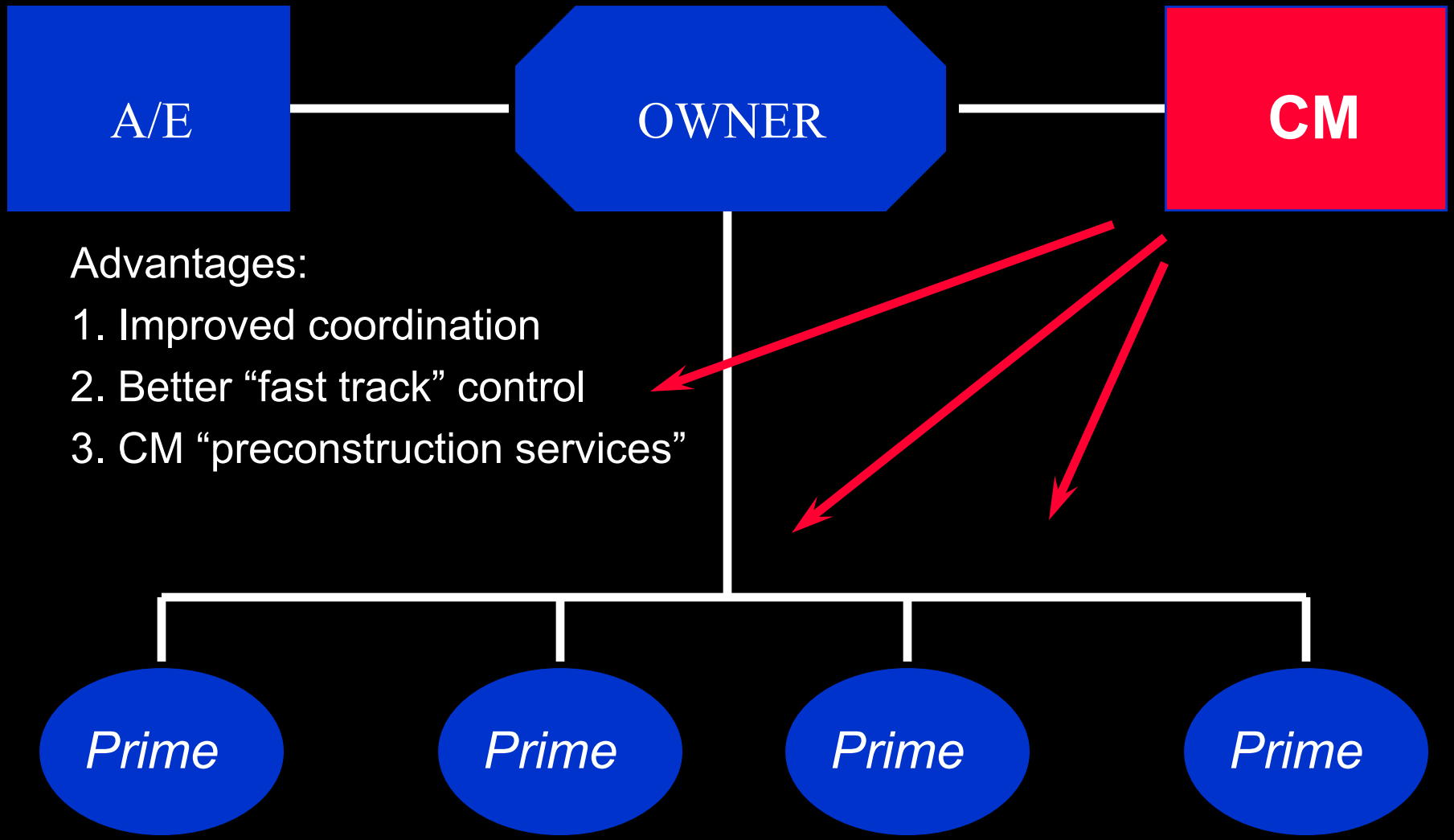
Washington Roebling

Elizabeth Warren Roebling

More History: Advances in Scheduling Methodology

- 1910—1915-- Gantt Chart
  - Hoover Dam
  - Interstate Highway System
- 1958 “PERT” (Project Evaluation Research Task--Polaris Sub Program) and “CPM” Scheduling Dupont/Remington Rand
  - 1966-CPM used for World Trade Center
- Prior to 1980s– Manual calculations or mainframe computer (e.g.,military projects)
  - 1981– IBM PC
  - Late 1980s– Primavera

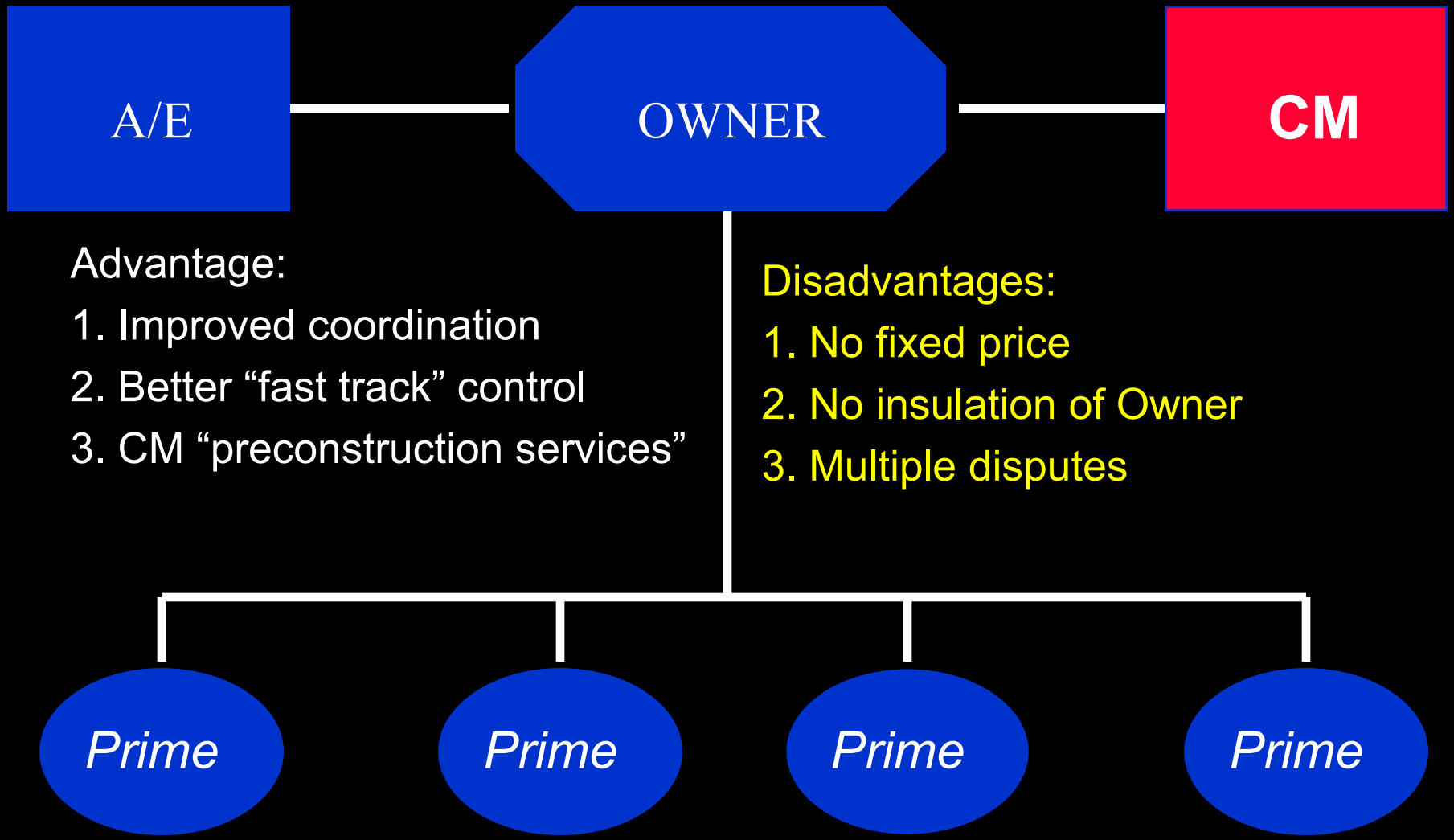
Construction Manager As Adviser



Advantages:

1. Improved coordination
2. Better “fast track” control
3. CM “preconstruction services”

Construction Manager As Adviser



Advantage:

1. Improved coordination
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Disadvantages:

1. No fixed price
2. No insulation of Owner
3. Multiple disputes

Project Delivery Timeline

DBB- Multiple Prime

DBB- Multiple Prime—CM as Advisor

Ohio Public Contracting

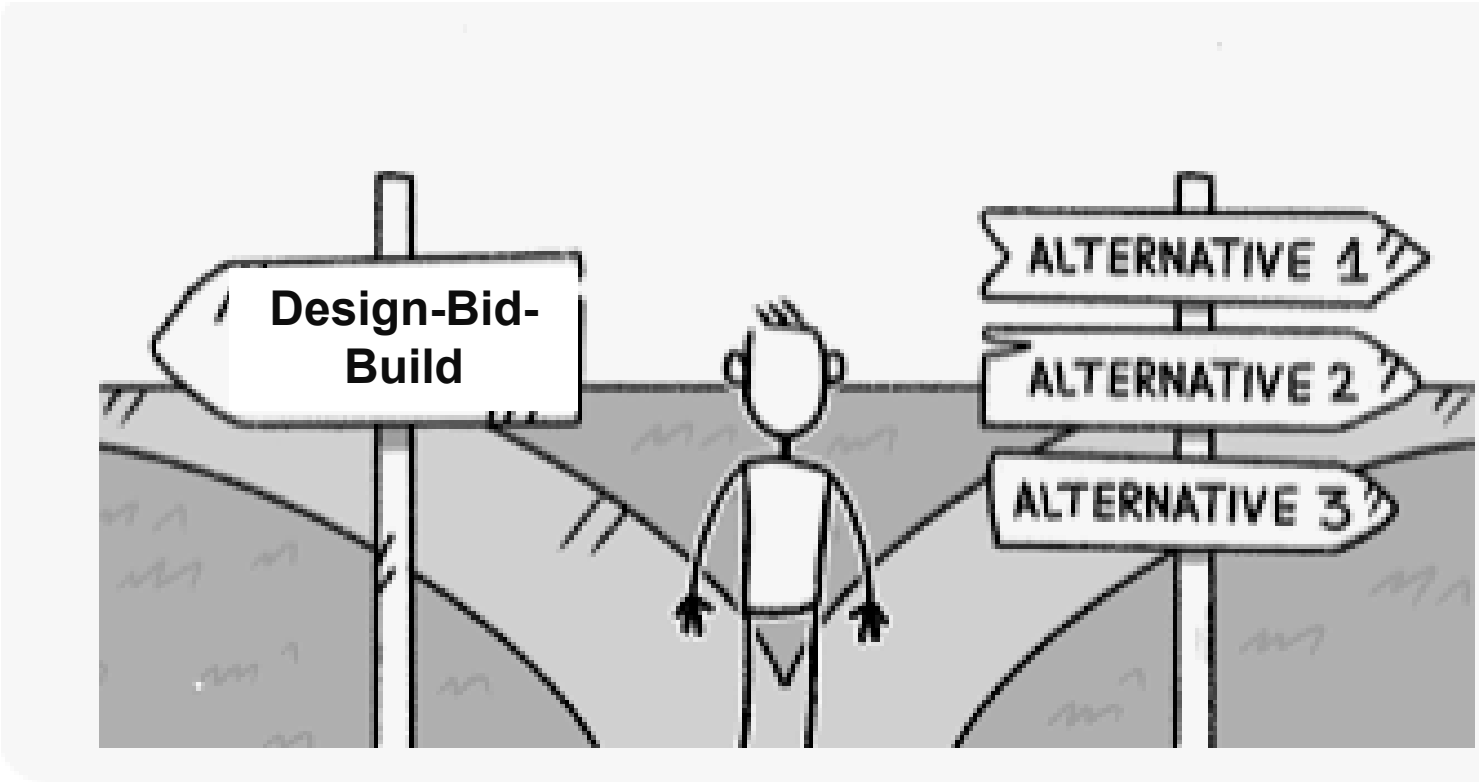
1867 1977

DBB- Single Prime

Ohio Private Contracting

Start of “Third Age”

The “Third Age”: Alternate Delivery Formats



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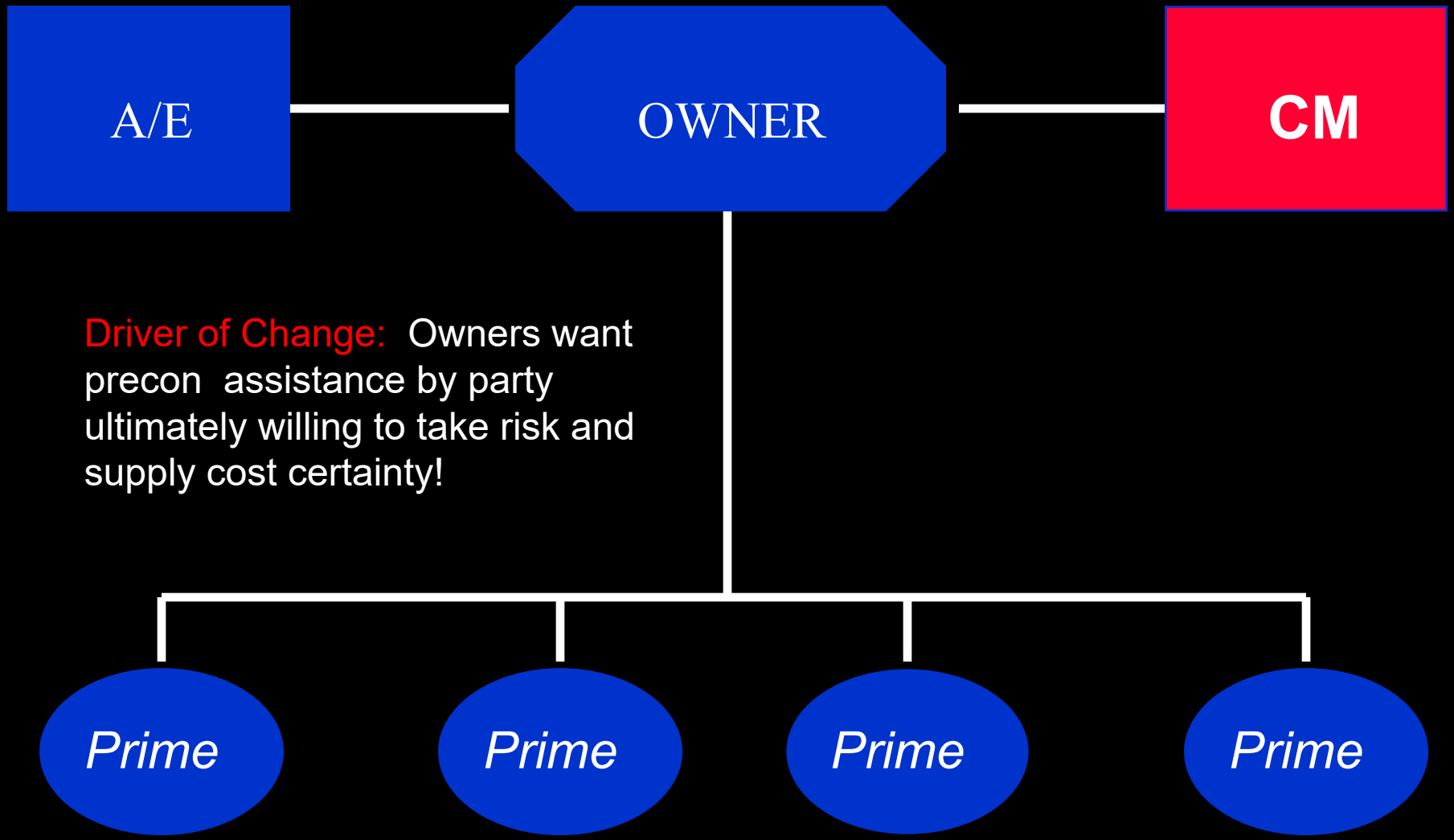
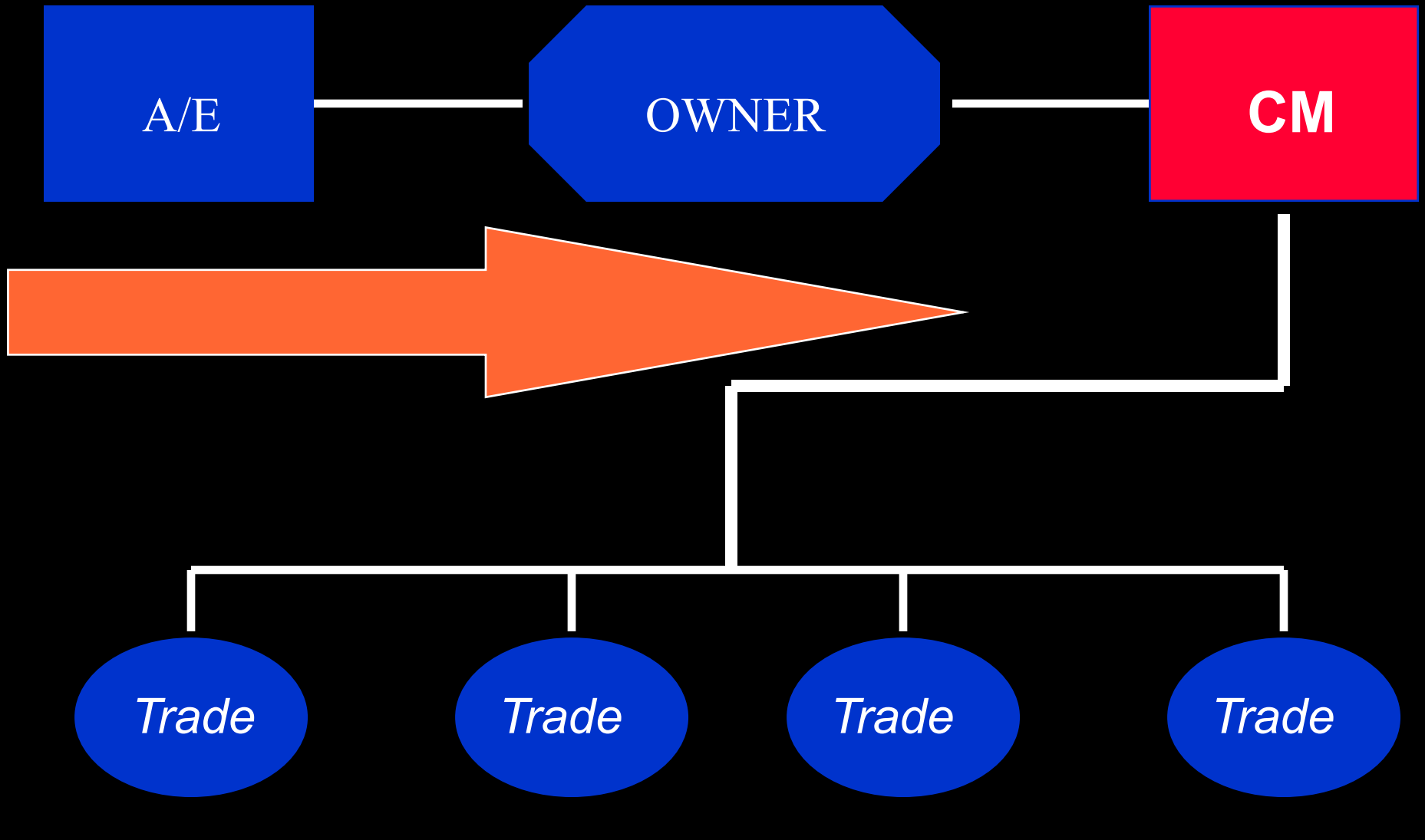
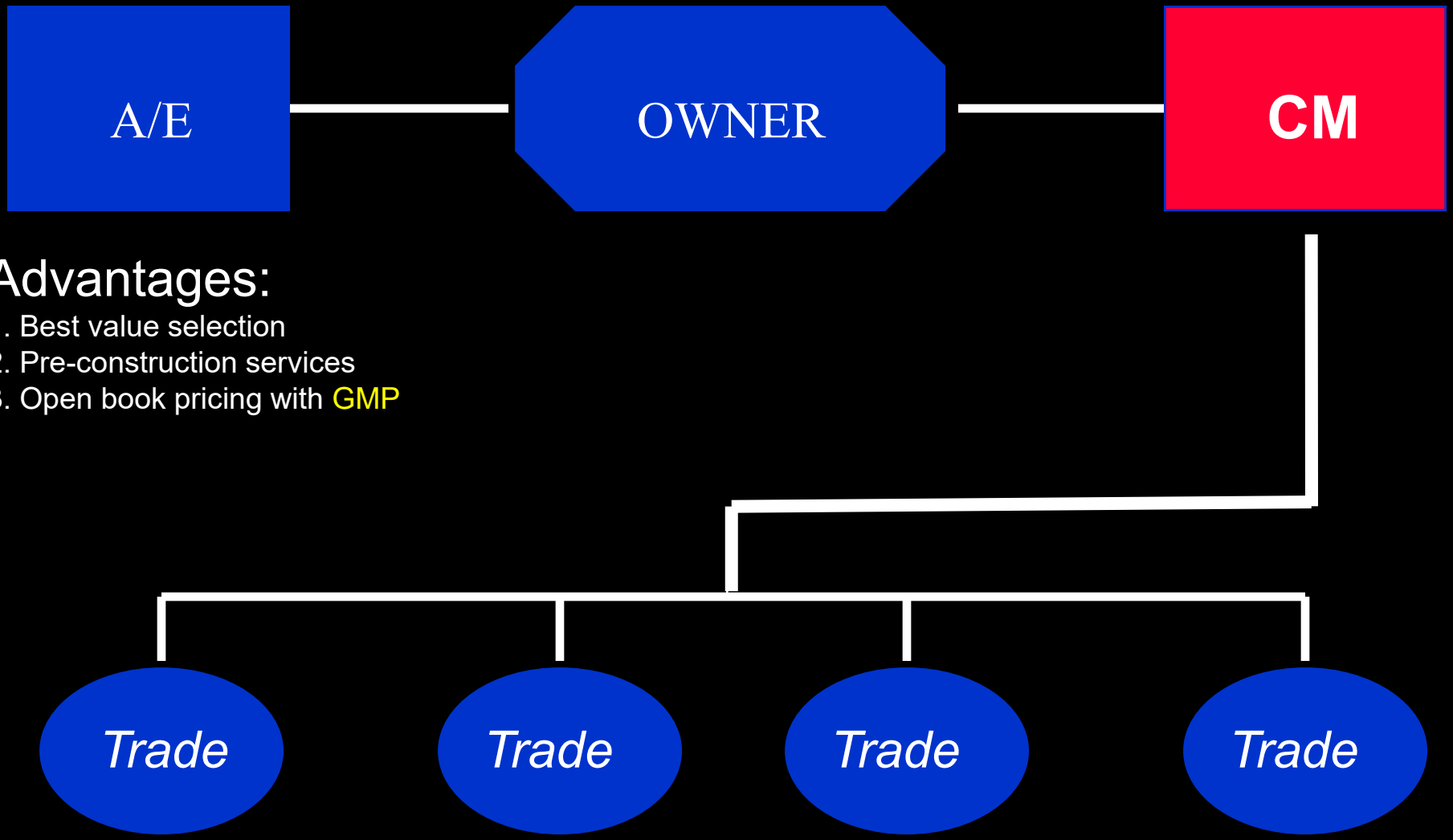
Construction Manager *Transforms*



Construction Manager
as Constructor



Construction Manager as Constructor



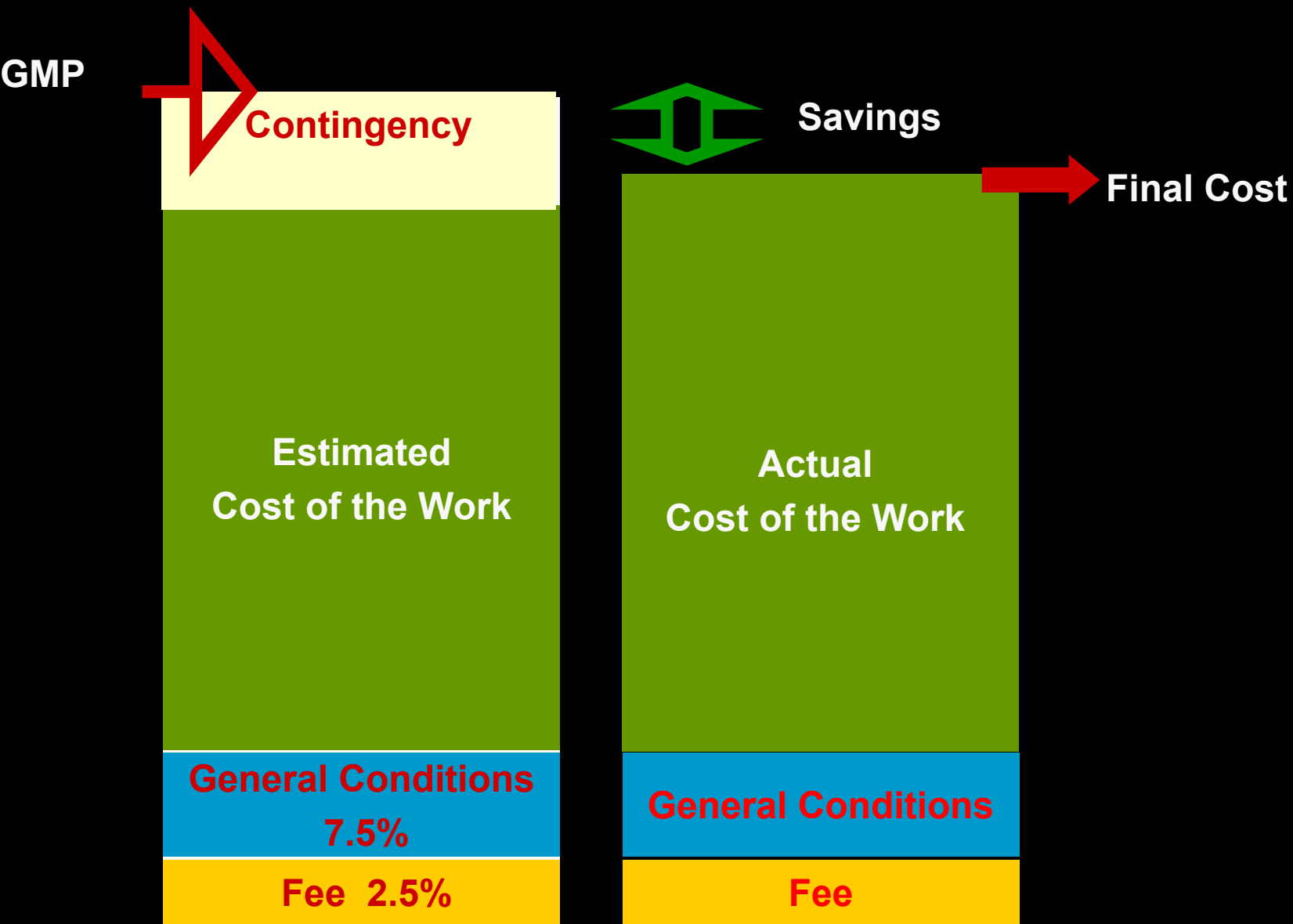
Advantages:

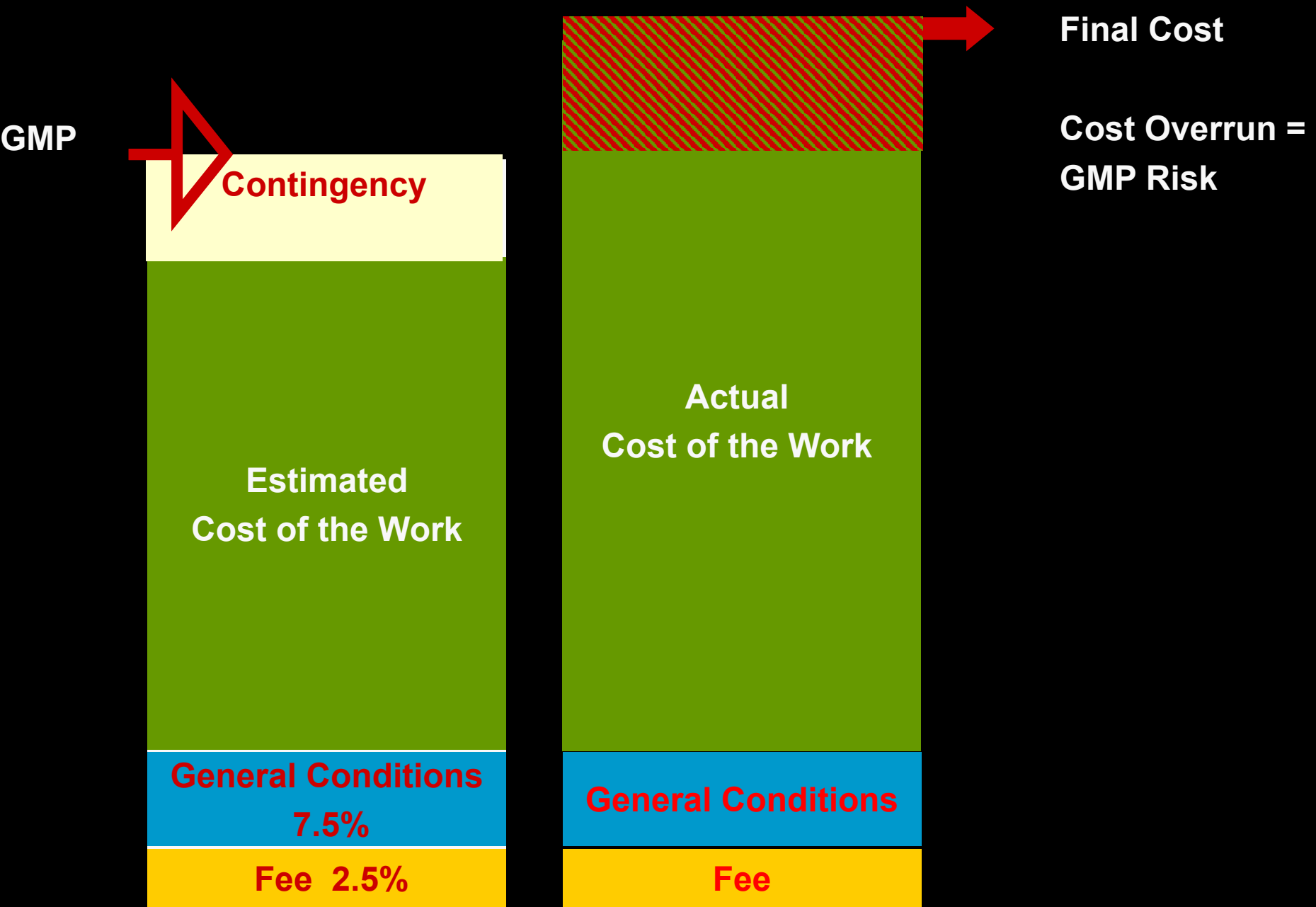
1. Best value selection
2. Pre-construction services
3. Open book pricing with GMP

Lump Sum Pricing

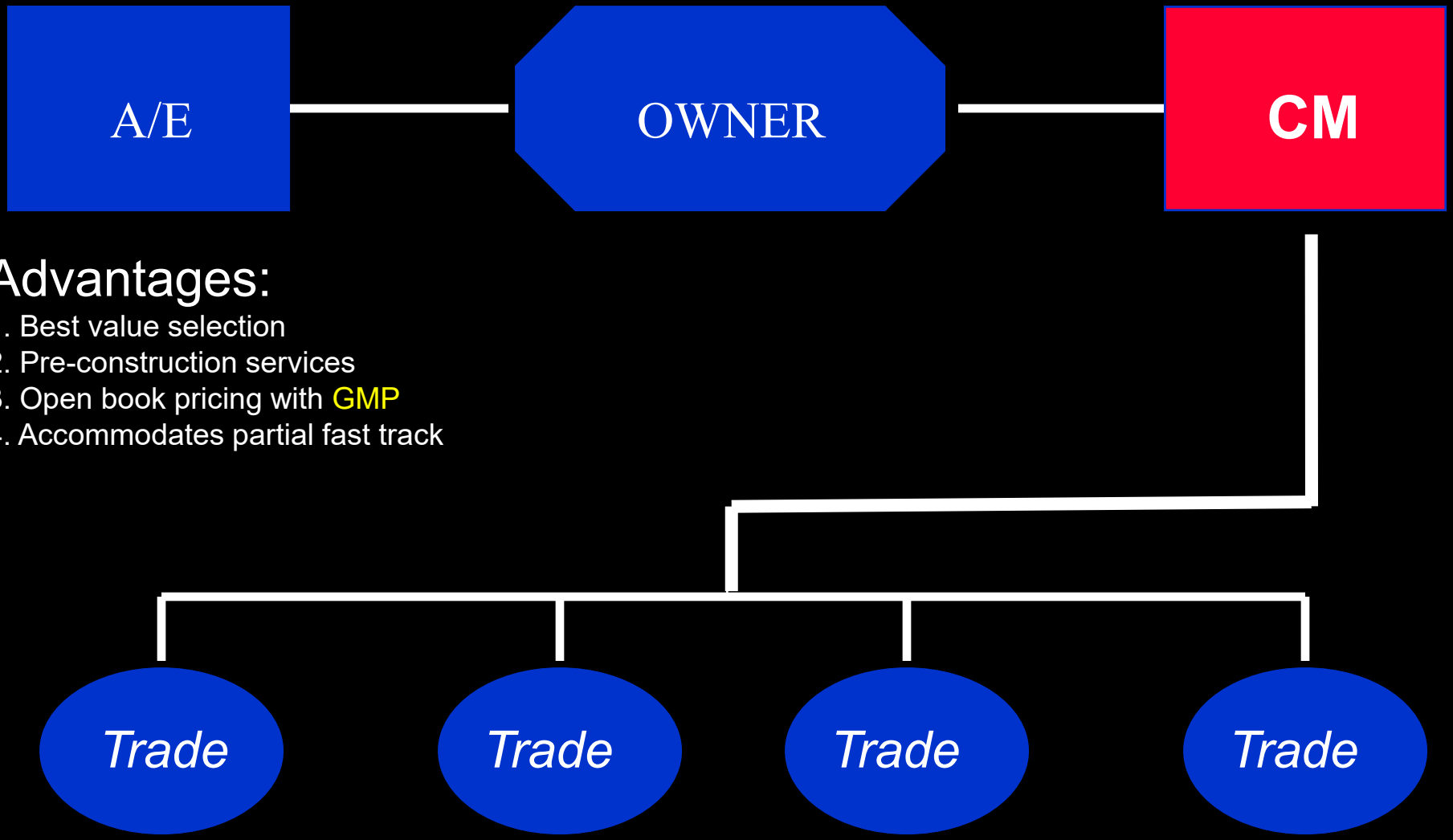
Lump Sum Pricing

- No transparency
- Paid on percentage completion
- No Owner involvement or collaboration in pricing
- No opportunity for cost savings or managed contingency


GMP
Contingency
Savings
Final Cost
Estimated
Cost of the Work
Actual
Cost of the Work
General Conditions
7.5%
General Conditions
Fee 2.5%
Fee


GMP
Contingency
Estimated
Cost of the Work
General Conditions
7.5%
Fee 2.5%
Actual
Cost of the Work
General Conditions
Fee
Final Cost
Cost Overrun =
GMP Risk

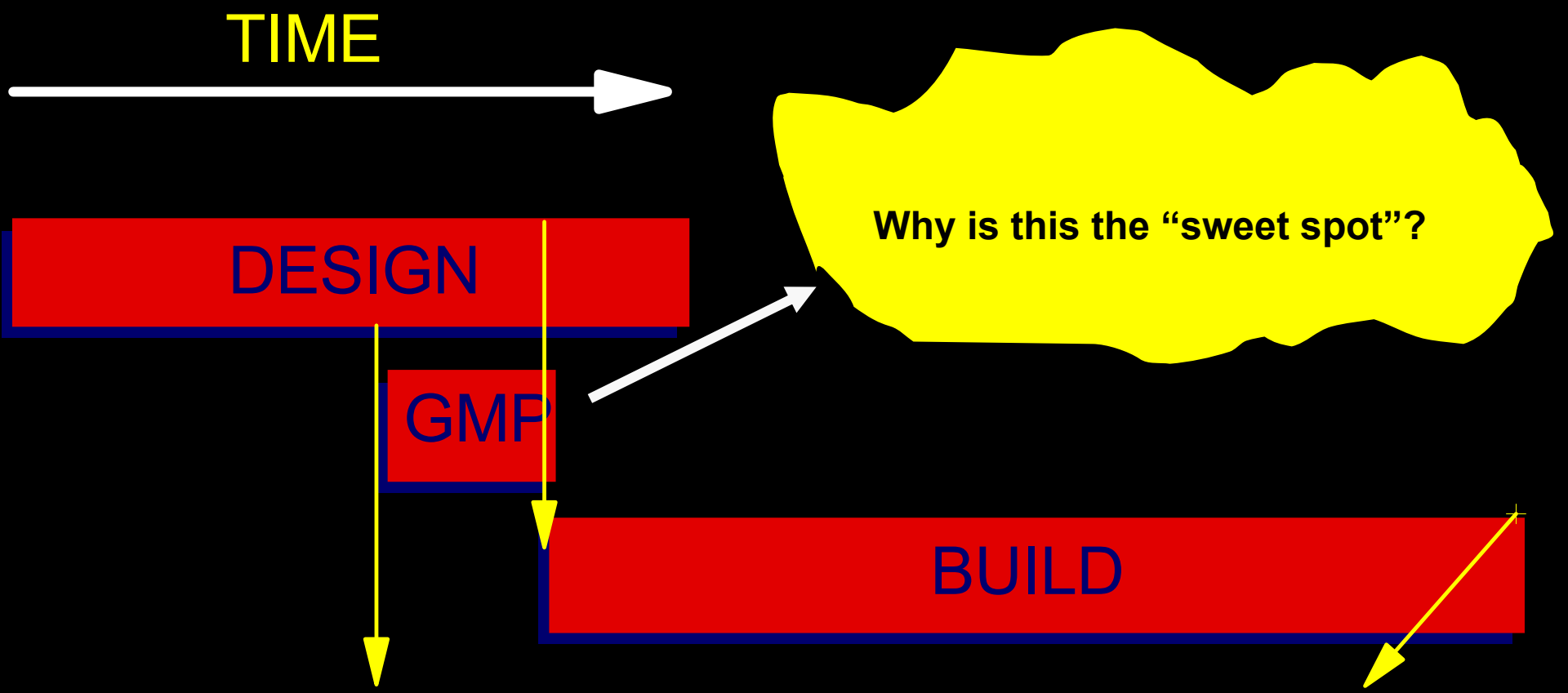
Construction Manager as Constructor



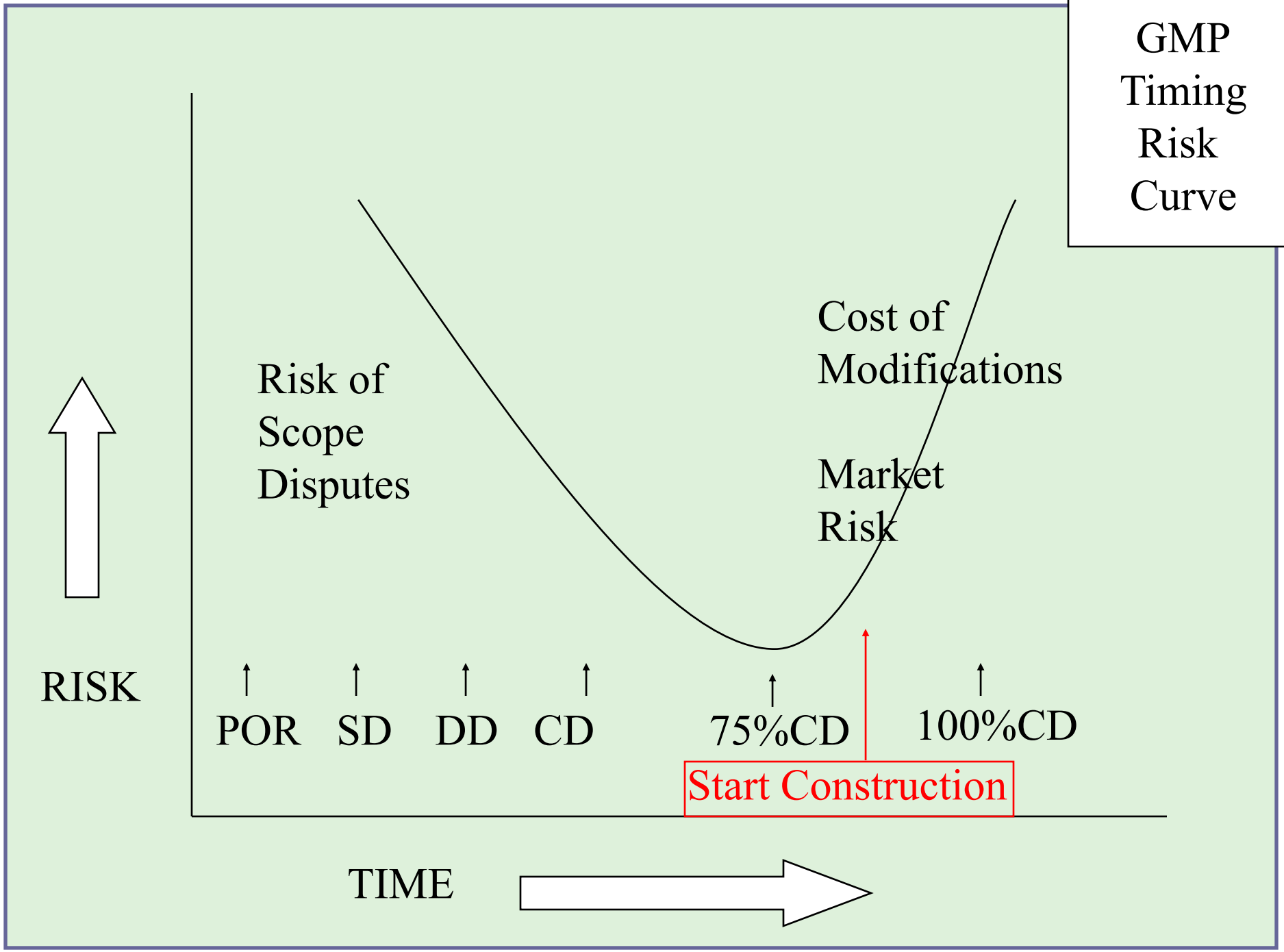
Advantages:

1. Best value selection
2. Pre-construction services
3. Open book pricing with GMP
4. Accommodates partial fast track

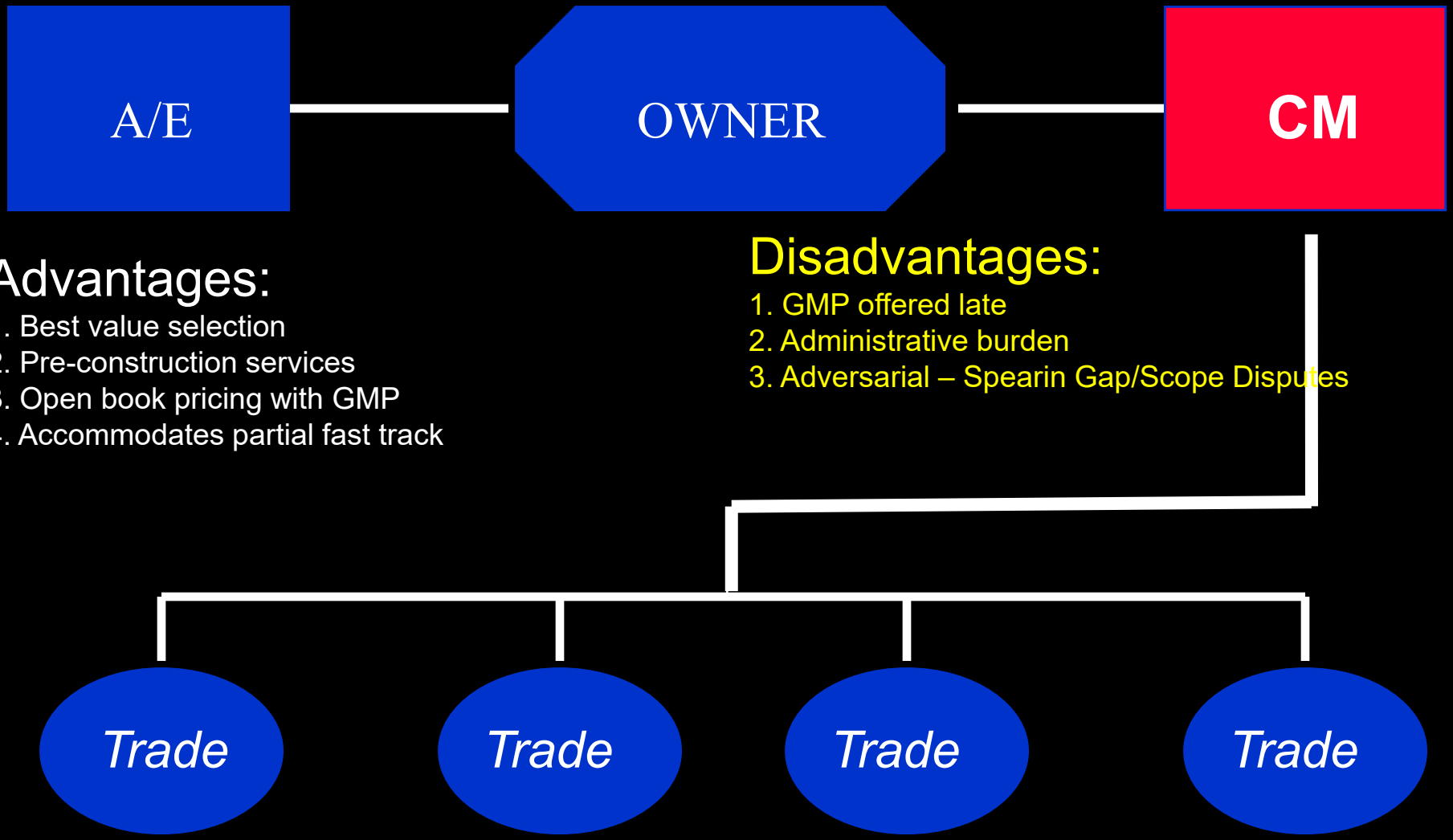
GMP BASED ON 75% CD's



GMP Timing Risk Curve



Construction Manager as Constructor



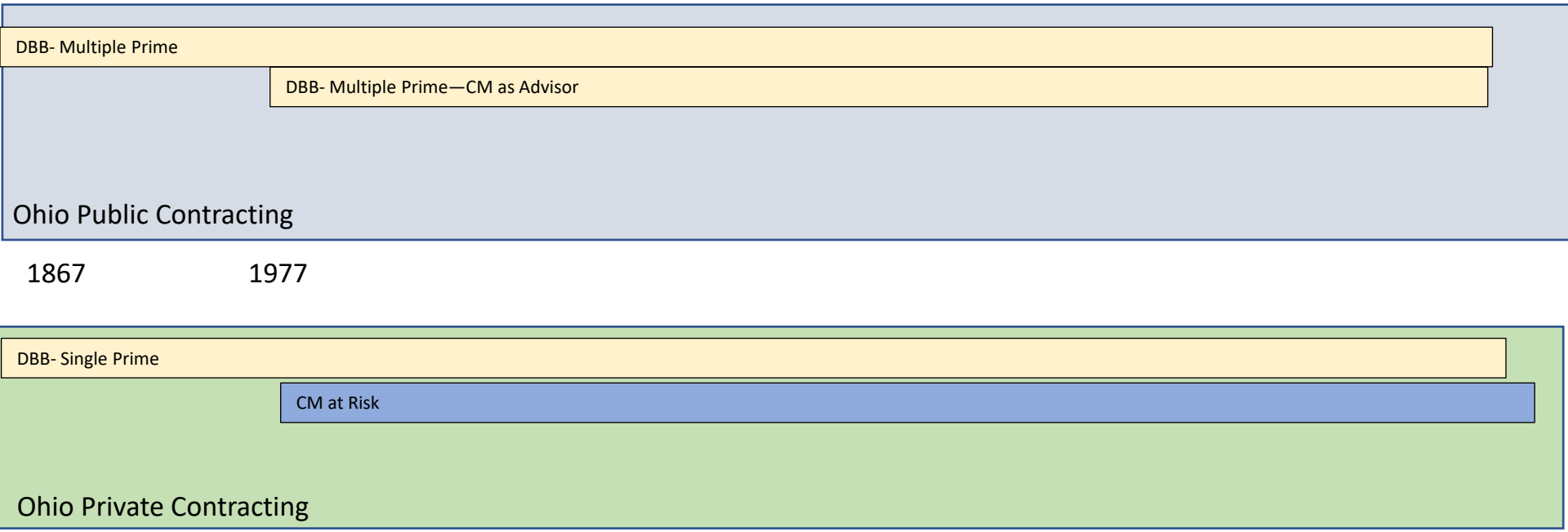
Advantages:

1. Best value selection
2. Pre-construction services
3. Open book pricing with GMP
4. Accommodates partial fast track

Disadvantages:

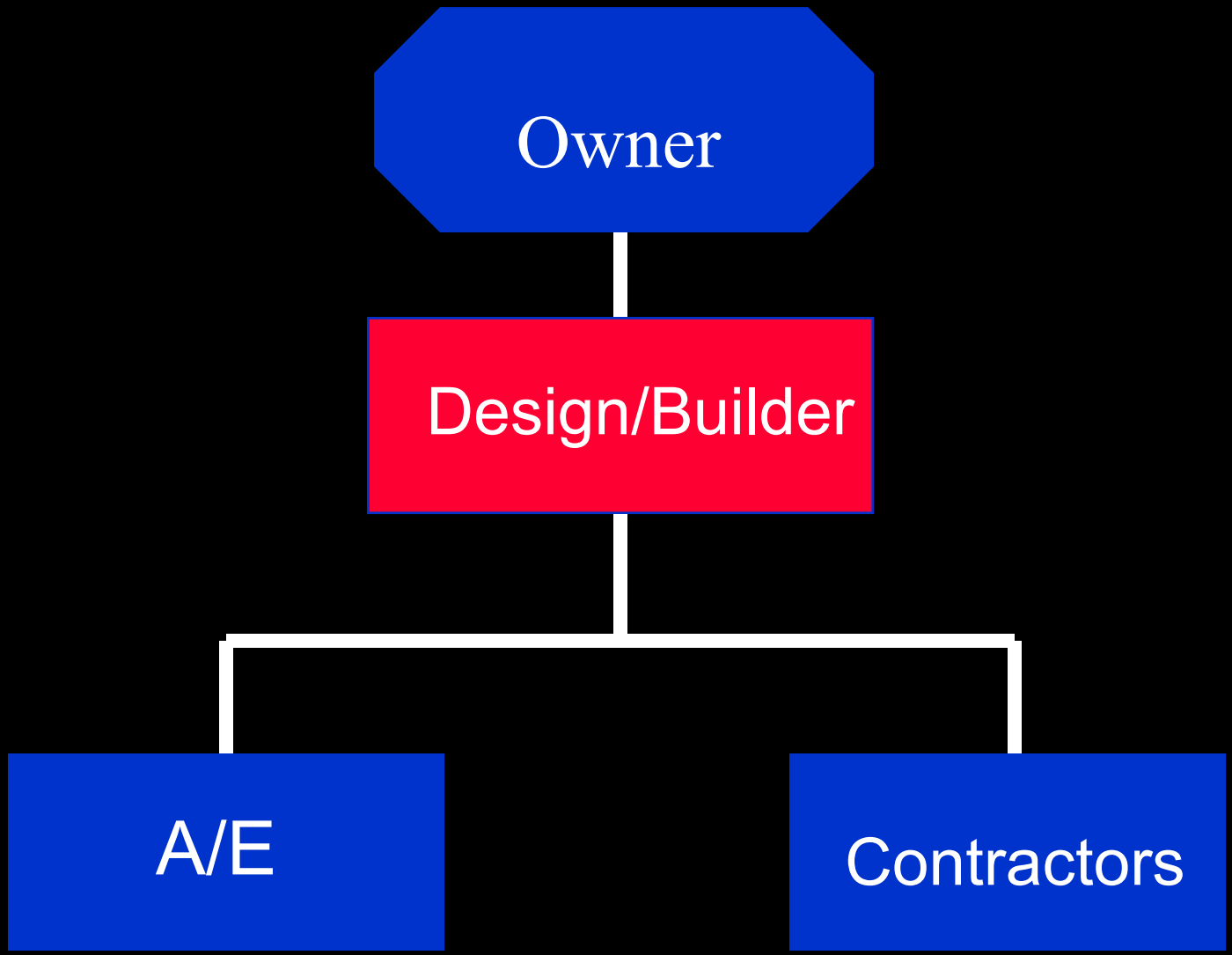
1. GMP offered late
2. Administrative burden
3. Adversarial – Spearin Gap/Scope Disputes

Project Delivery Timeline

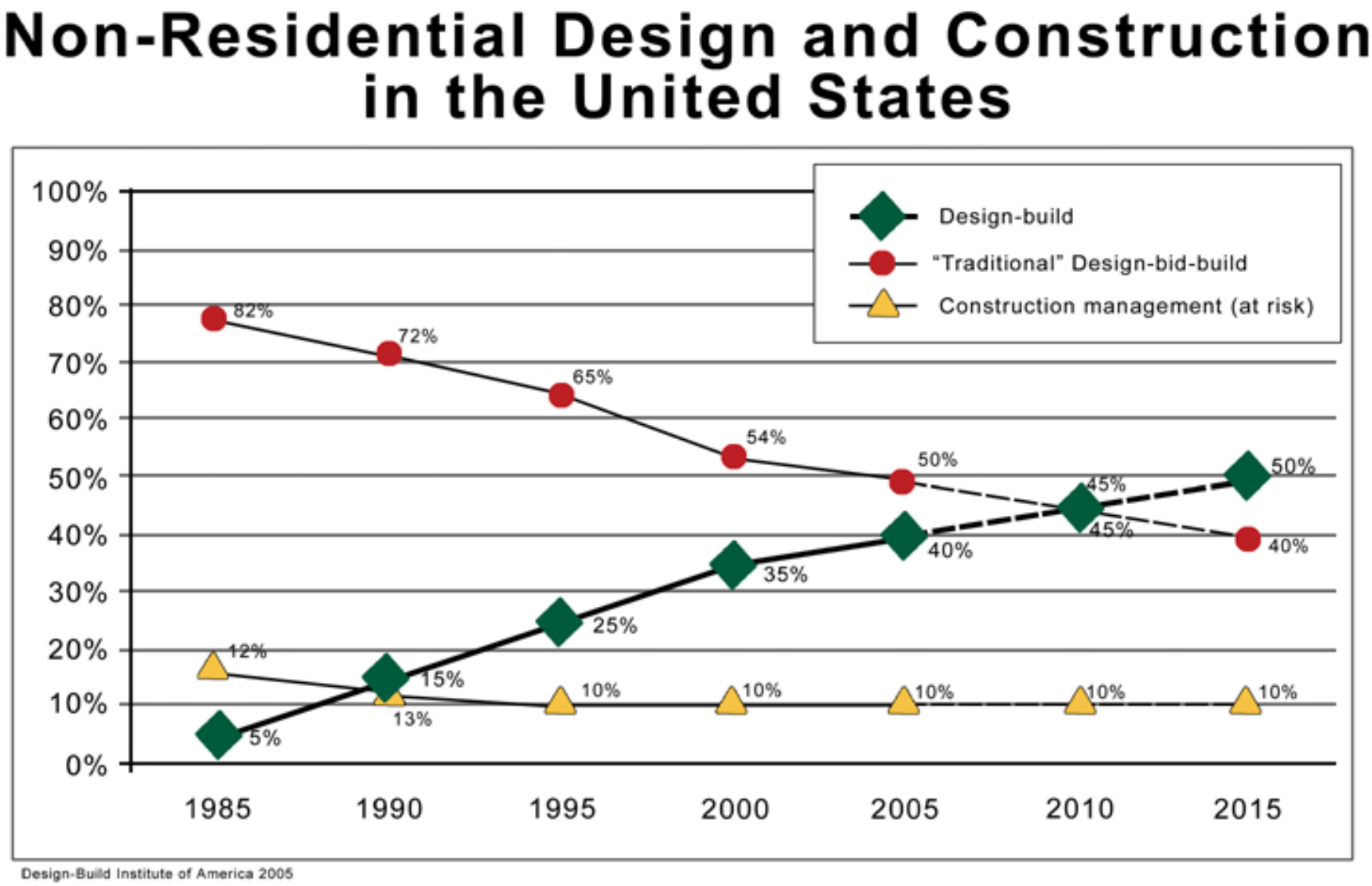


Third Age-
CMR Emerges (in Private Sector only in Ohio)

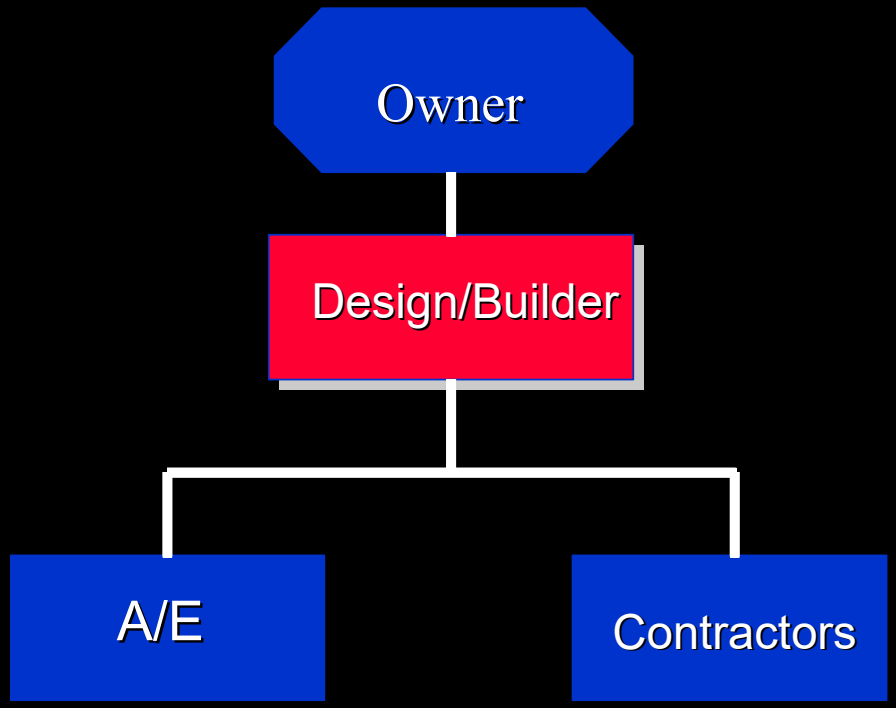
Design / Build Approach



Dramatic Growth of Design Build in US

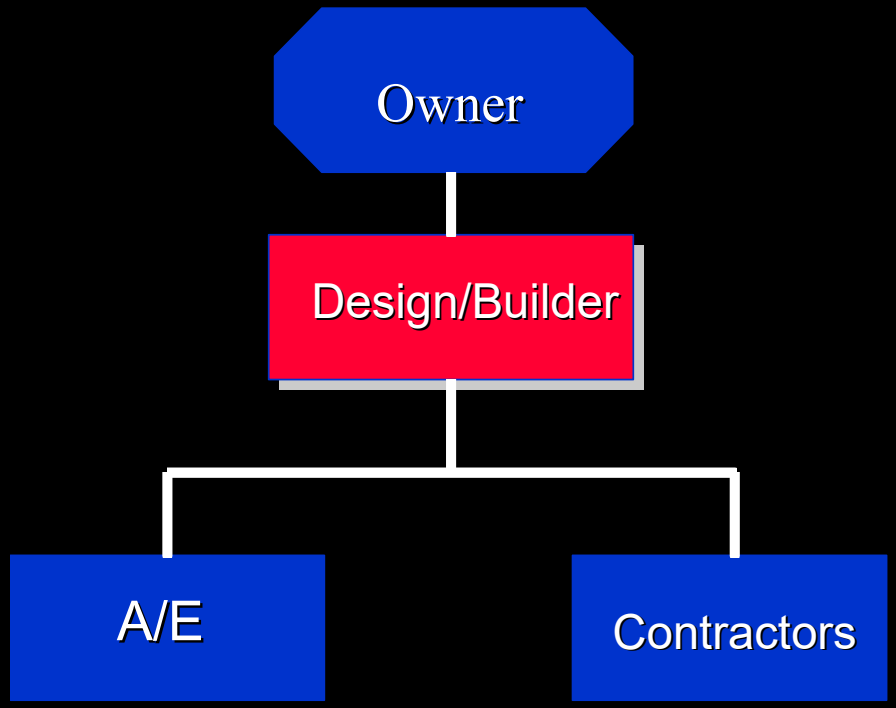


Design Build



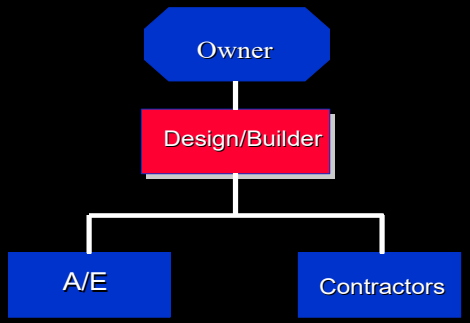
- Design/Build Entity
  - Integrated Design/Build Company
  - Joint Venture or LLC
  - Designer Led (rare)
  - Contractor Led (most common)

Design Build Variations



- Standard
- Progressive
- Bridging

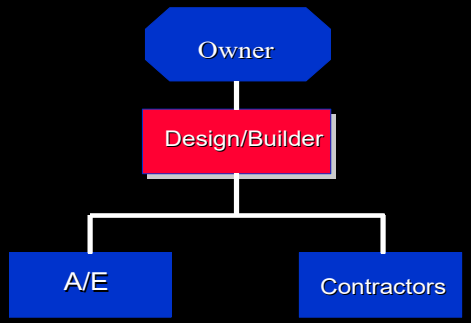
Advantages of Design/Build



- Sole source responsibility
- Single point of communication
- Efficient use of resources
- Facilitates fast track
- Claim reduction
- Opportunities for creative finance

- Owner avoids design liability (Spearin Solved!)
- Owner avoids A/E vs. contractor disputes

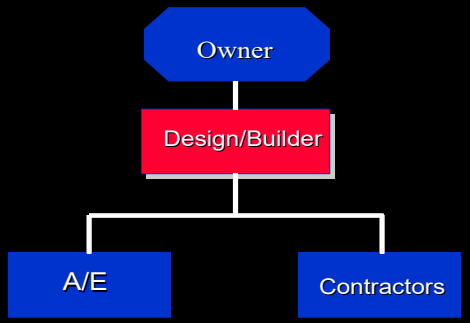
Advantages of Design/Build



- Sole source responsibility
- Single point of communication
- Efficient use of resources
- Facilitates fast track
- Claim reduction
- Opportunities for creative finance

- Design-build team speaks with single voice
- Owner not “caught in crossfire” between A/E and contractor

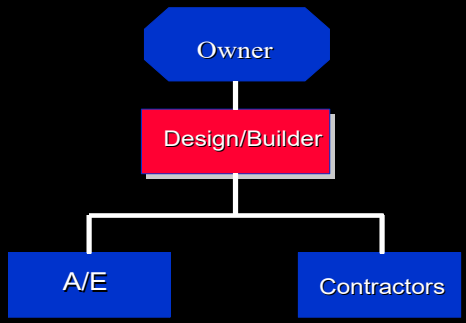
Advantages of Design/Build



- Sole source responsibility
- Single point of communication
- Efficient use of resources
- Facilitates fast track
- Claim reduction
- Opportunities for creative finance

- Reduction of Owner's administrative burden
- Elimination of paperwork
- Closer working relationship between contractor and A/E

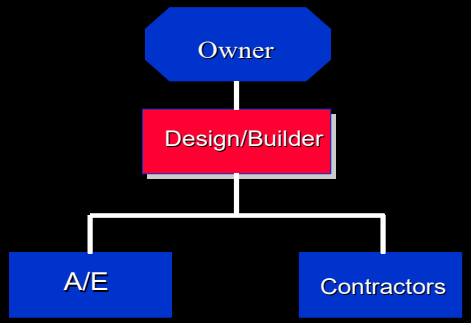
Advantages of Design/Build



- Sole source responsibility
- Single point of communication
- Efficient use of resources
- Facilitates fast track
- Claim reduction
- Opportunities for creative finance

- Earliest possible price guarantee
- Prompt and coordinated production of bid packages

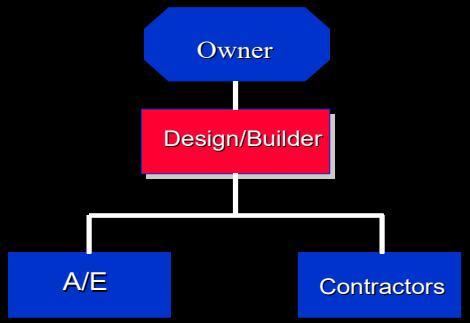
Advantages of Design/Build



- Sole source responsibility
- Single point of communication
- Efficient use of resources
- Facilitates fast track
- Claim reduction
- Opportunities for creative finance

- A/E and contractor "on same team"
- Design related claims minimized
- Efficient claims administration

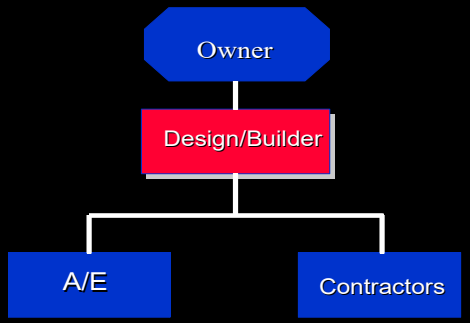
Advantages of Design/Build



- Sole source responsibility
- Single point of communication
- Efficient use of resources
- Facilitates fast track
- Claim reduction
- Opportunities for creative finance/ P3 applications

Turnkey -- The design-build entity provides financing (and perhaps land acquisition and development), turning the project over to the owner when construction is completed.

Advantages of Design/Build

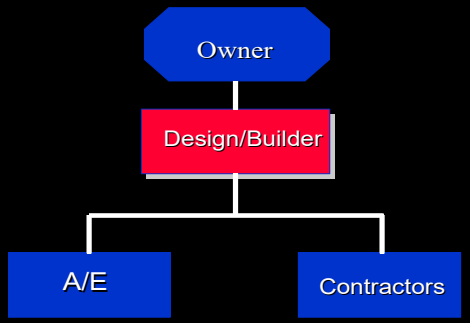


- Sole source responsibility
- Single point of communication
- Efficient use of resources
- Facilitates fast track
- Claim reduction
- Opportunities for creative finance/ P3 applications

Build-Operate-Transfer -

- The design-build entity owns and operates the project according to the client's requirements, receiving fees during the ownership period and transferring the project to the client at a specified future date.

Advantages of Design/Build

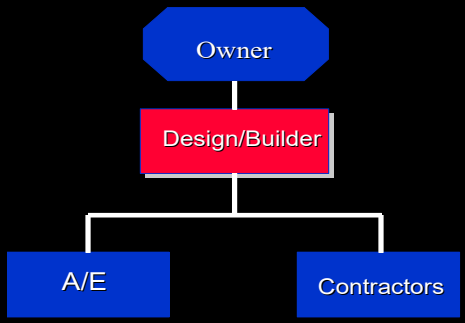


- Sole source responsibility
- Single point of communication
- Efficient use of resources
- Facilitates fast track
- Claim reduction
- Opportunities for creative finance/ P3 applications

Sale-Leaseback

The design-build entity retains ownership of the project, leasing it back to the client who commissioned it based on terms negotiated at the outset

Disadvantages of Design Build (Standard and Progressive)



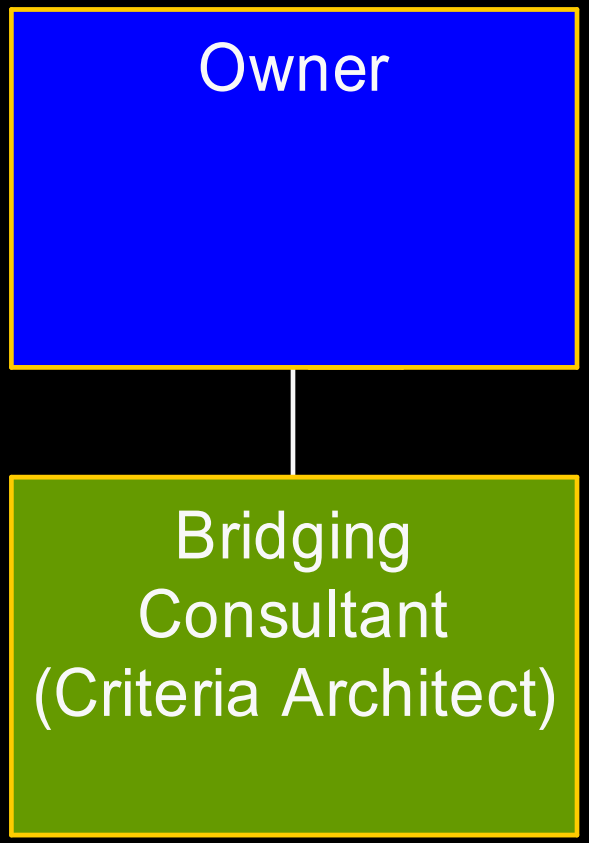
- Owner's Loss of Control Over Design
  - Design Professional No Longer Agent of Owner
  - Owner's Loss of Direct Communication with Design Professional
- Selection Criteria for Design Professional (Price vs. Qualifications)
- Inherent Conflicts of Interest
  - Design Decisions Improperly Influenced
  - Construction Oversight Improperly Influenced
- Disputes over Scope and Content
- Creation of Hidden Costs

One Solution: Bridging Approach to Design Build

- Observations:
  - Principle disadvantages of design build occur during conceptual stage
  - Principle advantages of design build occur during preparation of CDs and construction
  - Bridging preserves advantages while minimizing disadvantages

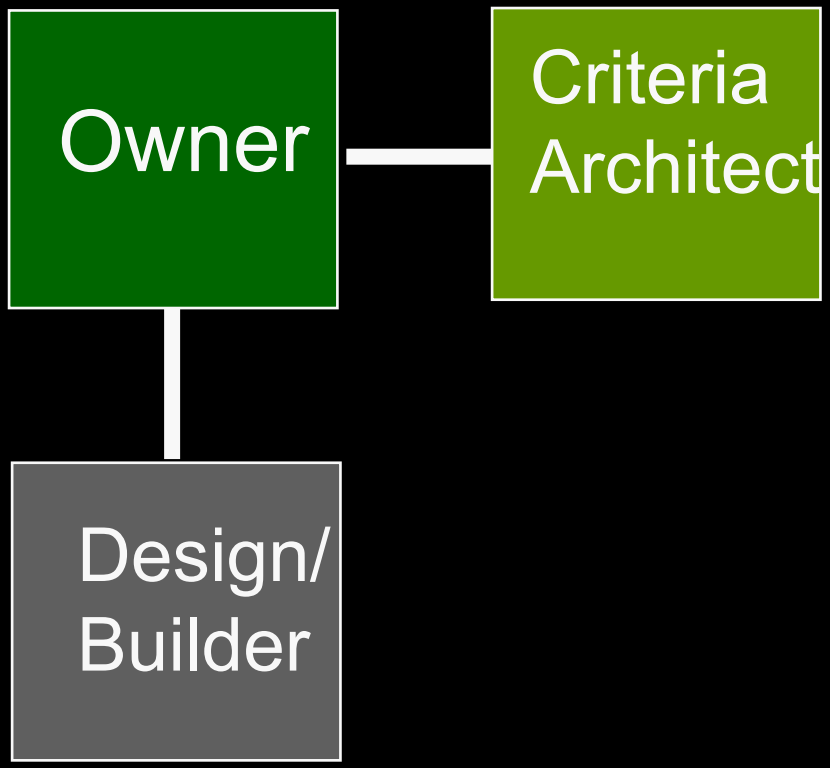
Bridging: A Design/Build Alternative

- Phase 1
  - Criteria Architect selected based on Quals
  - Preparation of 10 to 35% complete conceptual design package (Bridging Docs)
  - Design-Builder may be retained early based on Quals. and fee components
    - Provides input for cost & constructability review, etc.



Bridging: A Design/Build Alternative

- Phase 2
  - Design Build Contractor Negotiates GMP based on Bridging Documents
- Phase 3
  - Design/Builder completes working drawings and constructs
  - Criteria Architect monitors conformance with conceptual plans and may act as Owner's rep during construction



Advantages of Bridging

- Owner controls design
- Design/Builder bids, designs and builds to established criteria
- Quality control maintained
- Bridging Consultant protects Owner's interests
- Traditional advantages of Design/Build maintained during construction phase

Variations on Bridging Design Build

- Integrated Bridging Design Build (49ers Continuation Design Build Model)
  - Criteria Architect transfers to AOR

Project Delivery Timeline

DBB- Multiple Prime

DBB- Multiple Prime—CM as Advisor

Ohio Public Contracting

1867 1977 1993

DBB- Single Prime

CM at Risk

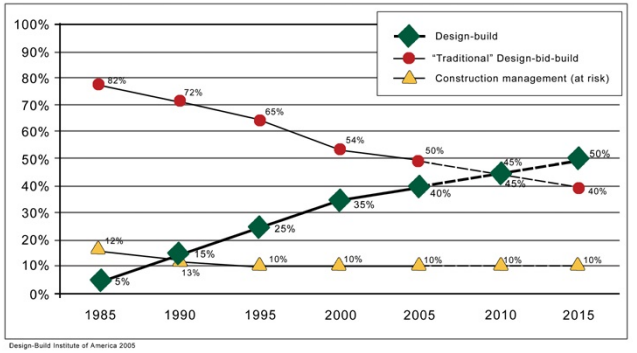
Design Build -- Bridging and Progressive

Ohio Private Contracting

Other than ODOT,
Public Construction still
has not entered the Third Era in Ohio!

Third Era-
Design-Build Emerges (Private Sector only in Ohio)

ntial Design and Construction
n the United States



Ohio Public Construction Lags Behind

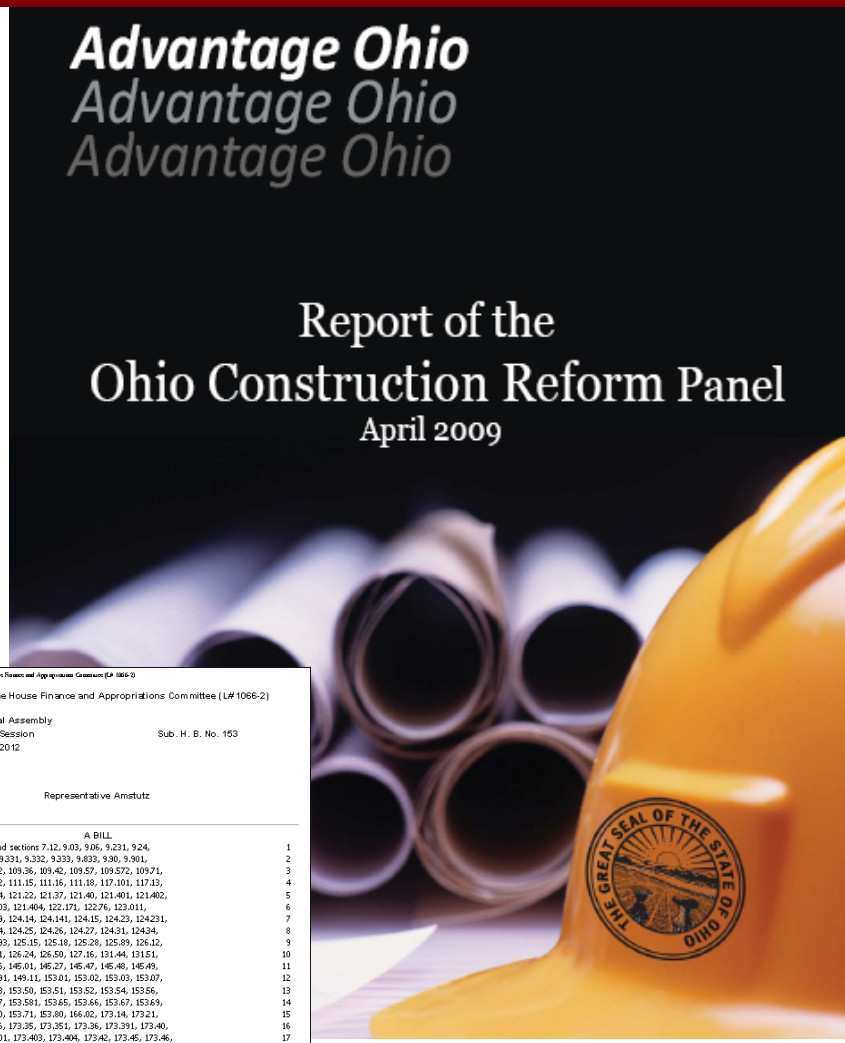
1875-2009

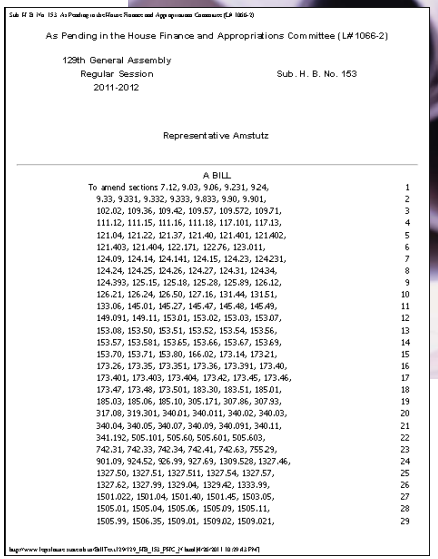
- Ohio was a Neanderthal State for Public Construction
- The method of procurement had not materially changed in 134 years.
- Ohio was one of a six states that still procured <u>exclusively</u> by multiple prime contracting

The Invention of Ohio Public Procurement

Ohio Construction Reform Panel --2009

- Recommendations include:
  - CMR
  - Bridging Design-Build
  - Single Prime Contracting
- Efforts at legislation succeed after 2 years!– HB 153 (2011)
- Ten Years of Transformational Change
  - Comprehensive suite of contracts
  - OAKS (Ohio Administrative Knowledge System)
  - Nearly complete transition away from Multi-Prime
-





As Pending in the House Finance and Appropriations Committee (L# 1066-2)

129th General Assembly
Regular Session
2011-2012

Sub. H. B. No. 153

Representative Amstutz

A BILL

To amend sections 7.12, 9.03, 9.06, 9.231, 9.24, 9.33, 9.331, 9.332, 9.333, 9.833, 9.90, 9.901, 102.02, 109.36, 109.42, 109.57, 109.572, 109.71, 111.12, 111.15, 111.16, 111.18, 117.101, 117.13, 121.04, 121.22, 121.37, 121.40, 121.401, 121.402, 121.403, 121.404, 122.171, 122.76, 123.011, 124.09, 124.14, 124.141, 124.15, 124.23, 124.231, 124.24, 124.25, 124.26, 124.27, 124.31, 124.34, 124.393, 125.15, 125.18, 125.28, 125.89, 126.12, 126.21, 126.24, 126.50, 127.16, 131.44, 131.51, 133.06, 145.01, 145.27, 145.47, 145.48, 145.49, 149.091, 149.11, 153.01, 153.02, 153.03, 153.07, 153.08, 153.50, 153.51, 153.52, 153.54, 153.56, 153.57, 153.581, 153.65, 153.66, 153.67, 153.69, 153.70, 153.71, 153.80, 166.02, 173.14, 173.21, 173.26, 173.35, 173.351, 173.36, 173.391, 173.40, 173.401, 173.403, 173.404, 173.42, 173.45, 173.46, 173.47, 173.48, 173.501, 183.30, 183.51, 185.01, 185.03, 185.06, 185.10, 305.171, 307.86, 307.93, 317.08, 319.301, 340.01, 340.011, 340.02, 340.03, 340.04, 340.05, 340.07, 340.09, 340.091, 340.11, 341.192, 505.101, 505.60, 505.601, 505.603, 742.31, 742.33, 742.34, 742.41, 742.63, 755.29, 901.09, 924.52, 926.99, 927.69, 1309.528, 1327.46, 1327.50, 1327.51, 1327.511, 1327.54, 1327.57, 1327.62, 1327.99, 1329.04, 1329.42, 1333.99, 1501.022, 1501.04, 1501.40, 1501.45, 1503.05, 1505.01, 1505.04, 1505.06, 1505.09, 1505.11, 1505.99, 1506.35, 1509.01, 1509.02, 1509.021,

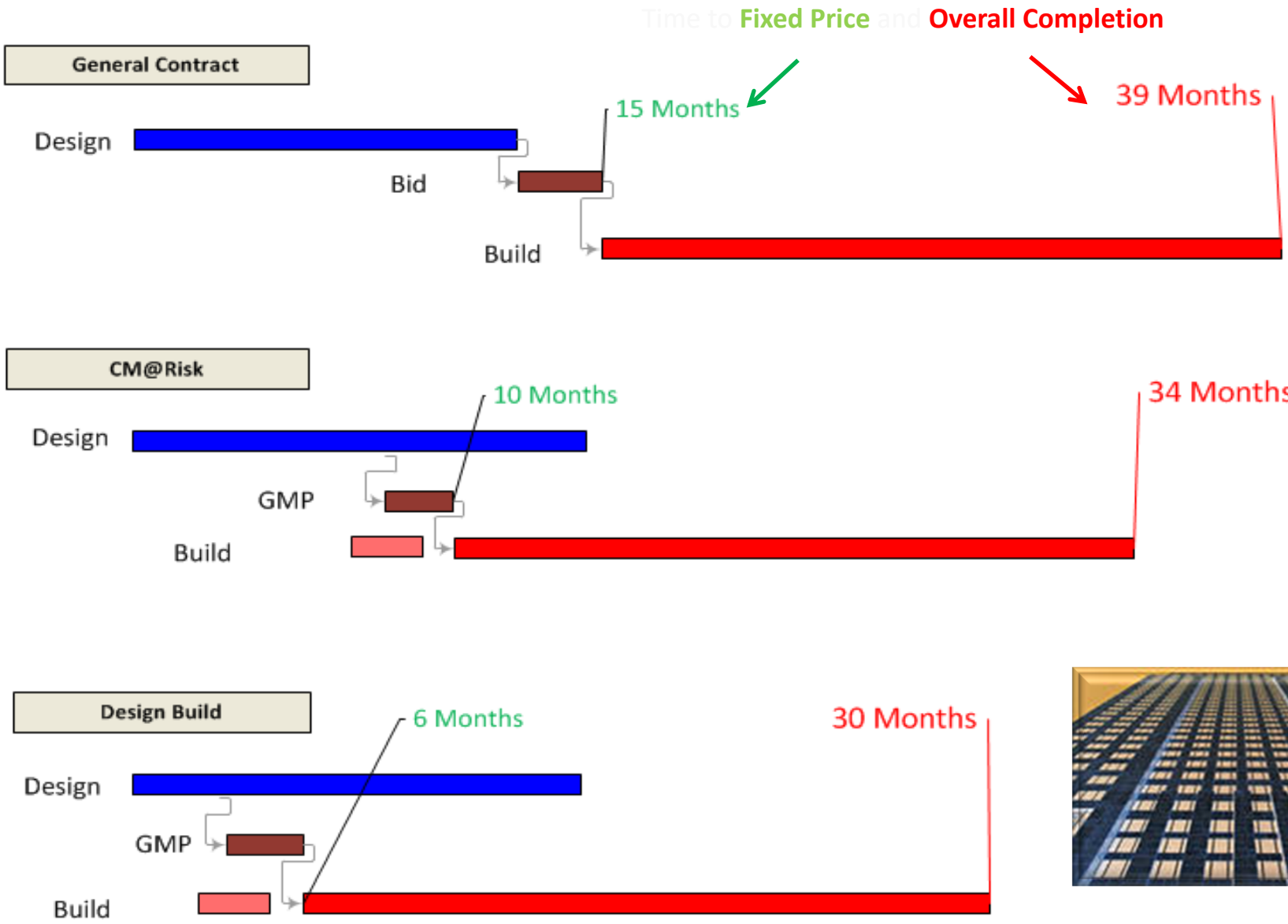
Construction Reform 2011

Ten years of Transformational Challenges

- CM Advisor to CM at Risk
  - Shift from professional service provider to at-risk contractor
  - Proper staff support– e.g., Superintendents that protect company's interests and manage aggressively
  - Acceptance of Financial Risk—e.g., pledge of assets to support surety bonds

- General Contractor to CM at Risk
  - Shift from complete self-interest to support owner's interests.
  - Shift from closed book to transparent open book

Comparison of “3d Age Options”– Schedule Analysis



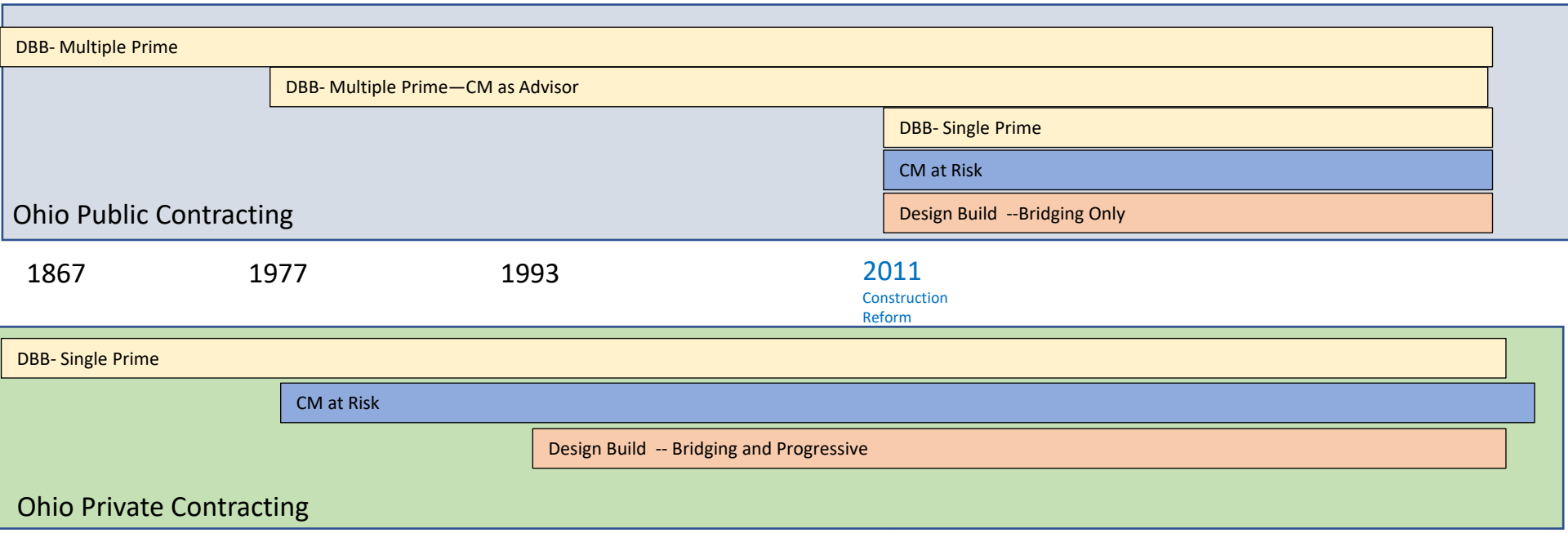
Comparison of "3d Age Options"

Metric	DB vs. D-B-B	CM@R vs. D-B-B	DB vs. CM@R
Unit Cost ($/SF)	6.1% lower	1.6% lower	4.5% lower
Speed of Construction	12% faster	5.8% faster	7% faster
Delivery Speed	33.5% faster	13.3% faster	23.5% faster
Cost Growth	5.2% less	9.2% more	12.6% less
Schedule Growth	11.4% less	9.2% less	2.2% less

"Comparison of U.S. Project Delivery Systems," Mark Konchar & Victor Sanvido, Journal of Construction Engineering and Management, Vol. 124, No. 6 (1998), pp 435-44)

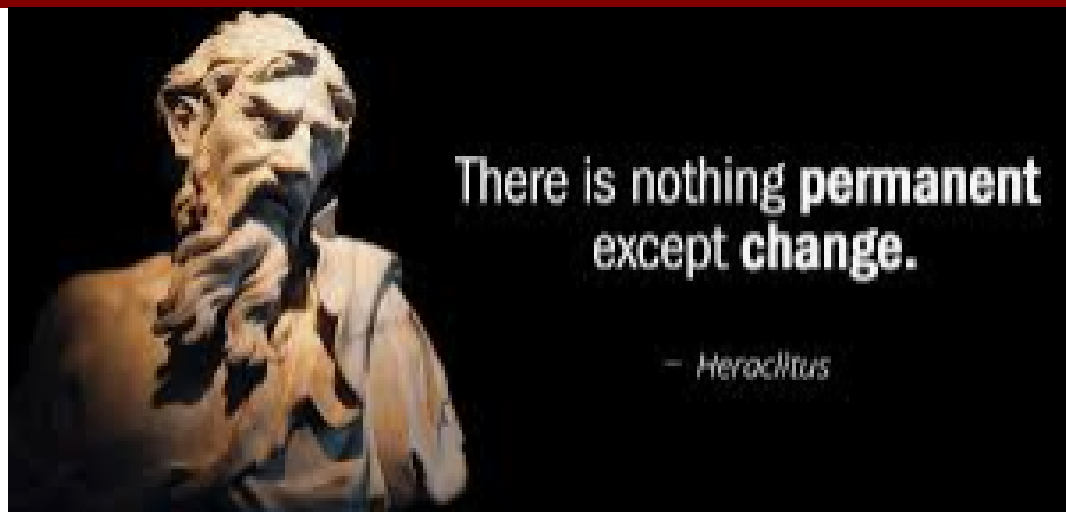
If the Owner can "put the pencil down" at the conclusion of conceptual design and turn over design control, DB is the most efficient system. The key is the ability to fully plan, communicate, reconcile (with budget) and obtain full understanding and approval of conceptual design before turnover. Not always possible (or even preferable).

Project Delivery Timeline



Third Age finally realized in Ohio

The 4th Age Begins…



- What has been driving change over the past several years?
- What will drive change over the next 20 years?

slido

What has been driving change in project delivery over the last several years? [Up to 3 answers/ a word or 2 phrase]

ⓘ Start presenting to display the poll results on this slide.

slido

What emerging factor will drive change over the next 10-20 years? (Up to 3 answers/a word or 2 phrase).

ⓘ Start presenting to display the poll results on this slide.

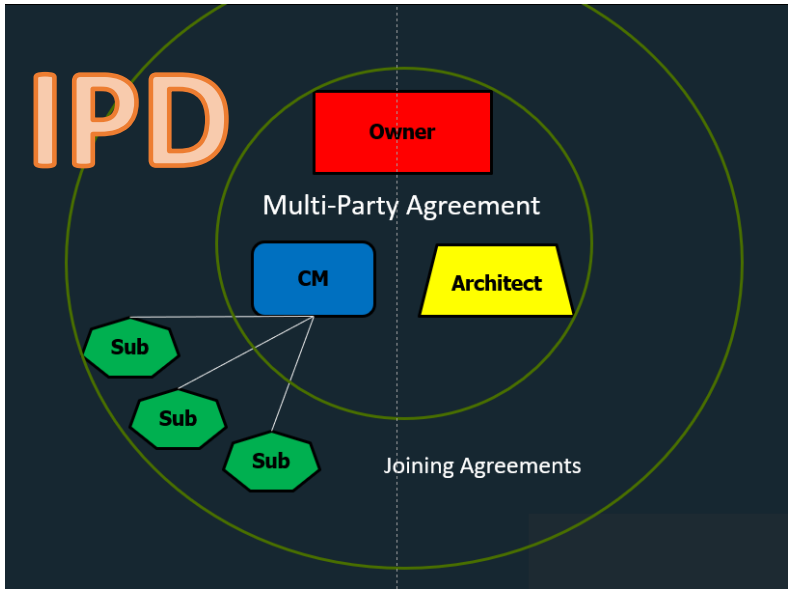
The 4th Age Begins…

- Recent Influences
  - Changes in Information Technology
    - BIM (up to 7D)
  - Digital Transformation
    - Laser Scanning
    - Drones
    - 3d Printing
  - Building Technology and Methods
    - Modular Construction
    - Lean Construction
  - Delegated Design
    - Design-Assist
  - Focus on Sustainability and Green Construction

- Emerging Drivers of Change
  - Artificial Intelligence
  - Availability of trained and skilled professionals and craft-persons
    - Prefab
  - Digitalization and BIM
    - Flow down to subcontractors
  - Investment in sustainability
  - ESG
    - Environmental
    - Social
    - Governance
  - Climate Change
    - Insurance and Risk Management

The 4th Age Begins…

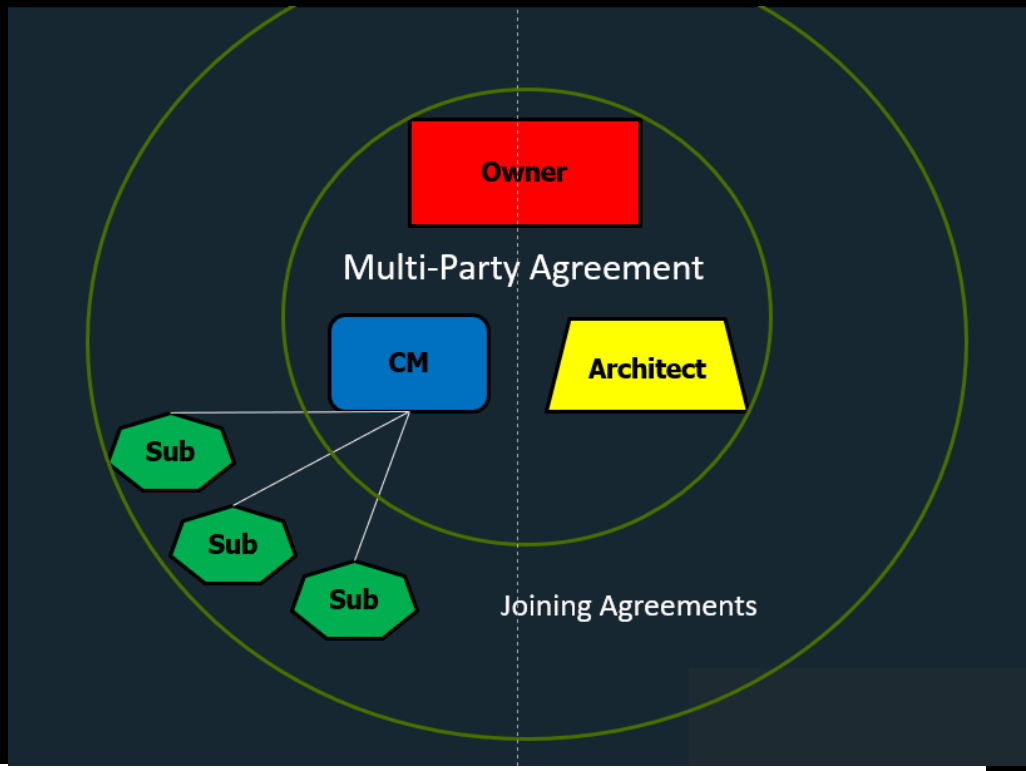
- New Approaches to Project Delivery
  - Adjustments to prior methods
    - Assignment of Design to Contractors
      - Delegated Design
      - Deferred Design
      - Assigned Design
      - Collaborative Design
        - Design-Assist
    - Enhanced P3 Methods
  - Integrated Project Delivery (IPD)

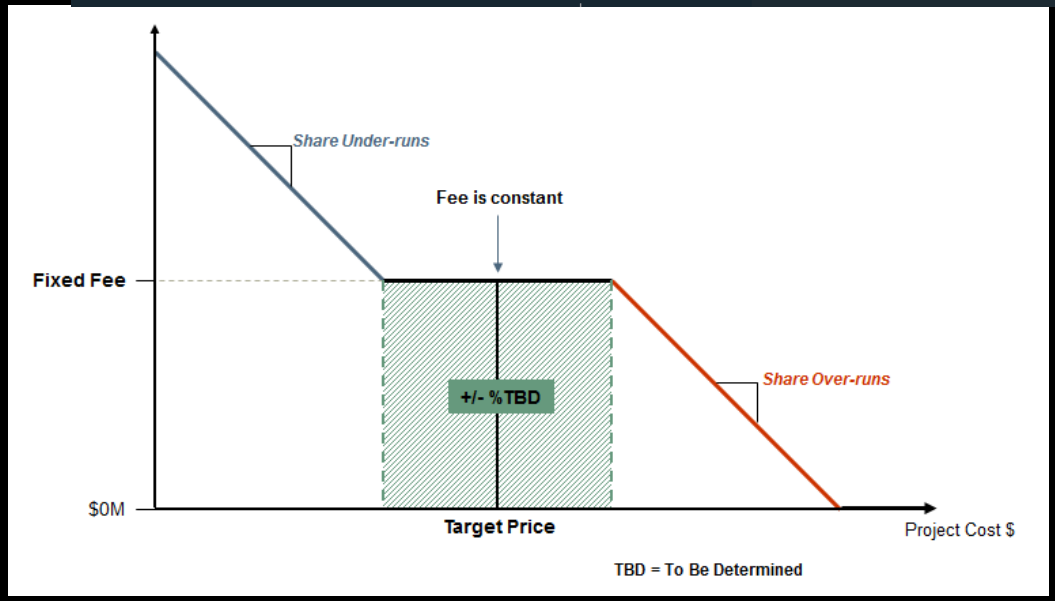


A "method that integrates people, systems, business structures and practices into a process that collaboratively harnesses the talents and insights of all participants to reduce waste and optimize efficiency through all phases of design, fabrication and construction" AIA Calif Council

IPD

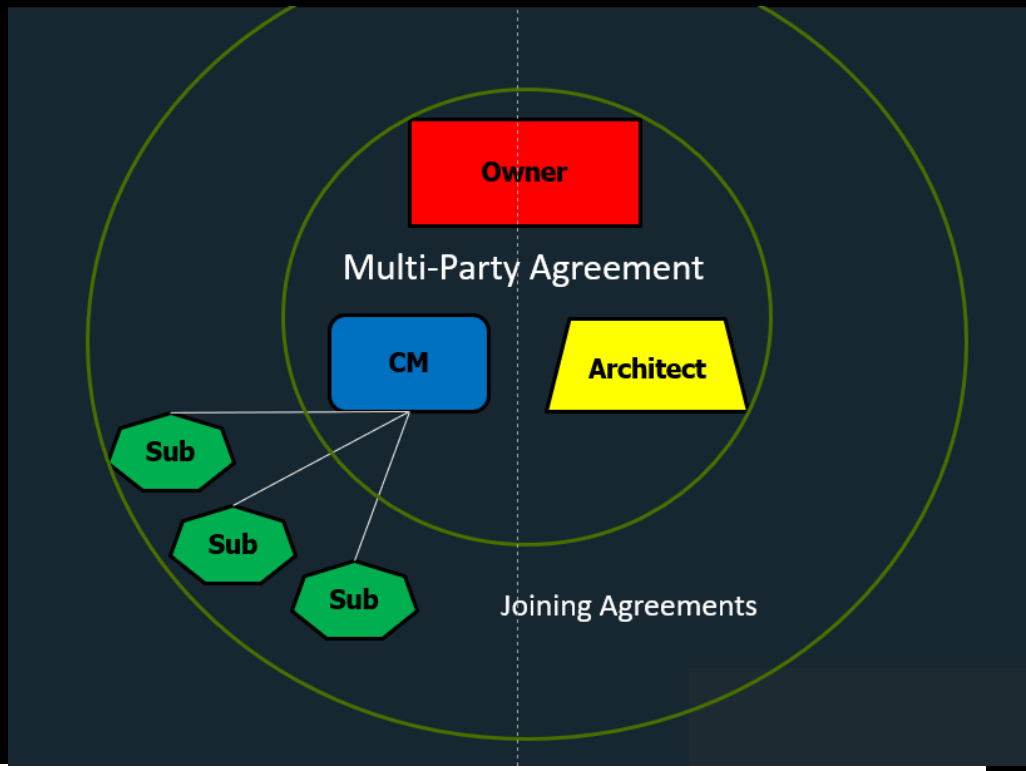
- Features/Advantages
  - Early involvement of key participants
  - Multi-Party Agreement
  - Collaborative decision-making and control
  - Jointly developed project goals
  - Shared risk and reward
    - Project Contingency
    - Risk Pool
  - Liability waivers among participants

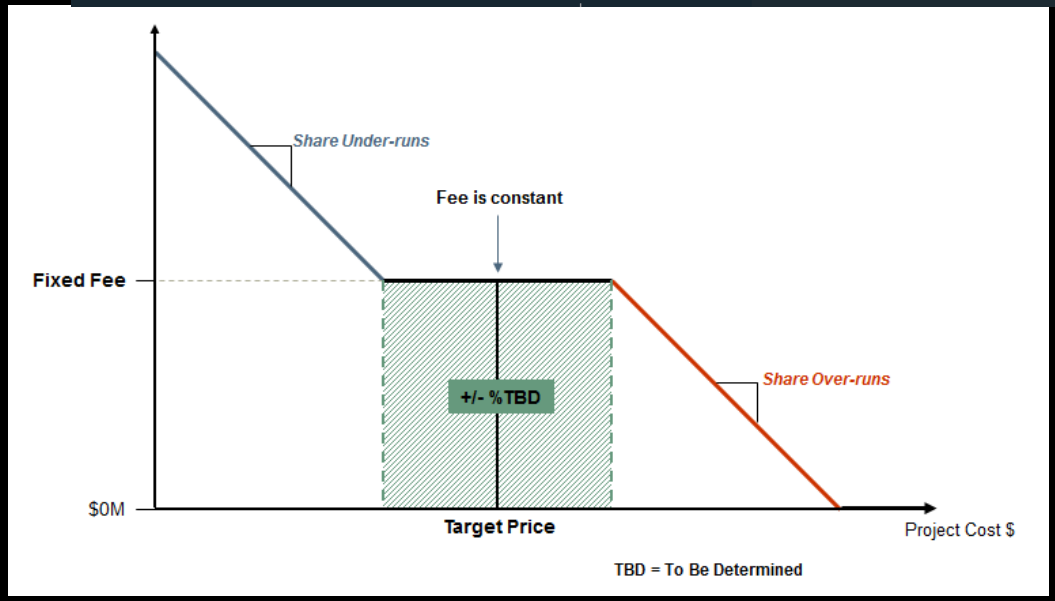




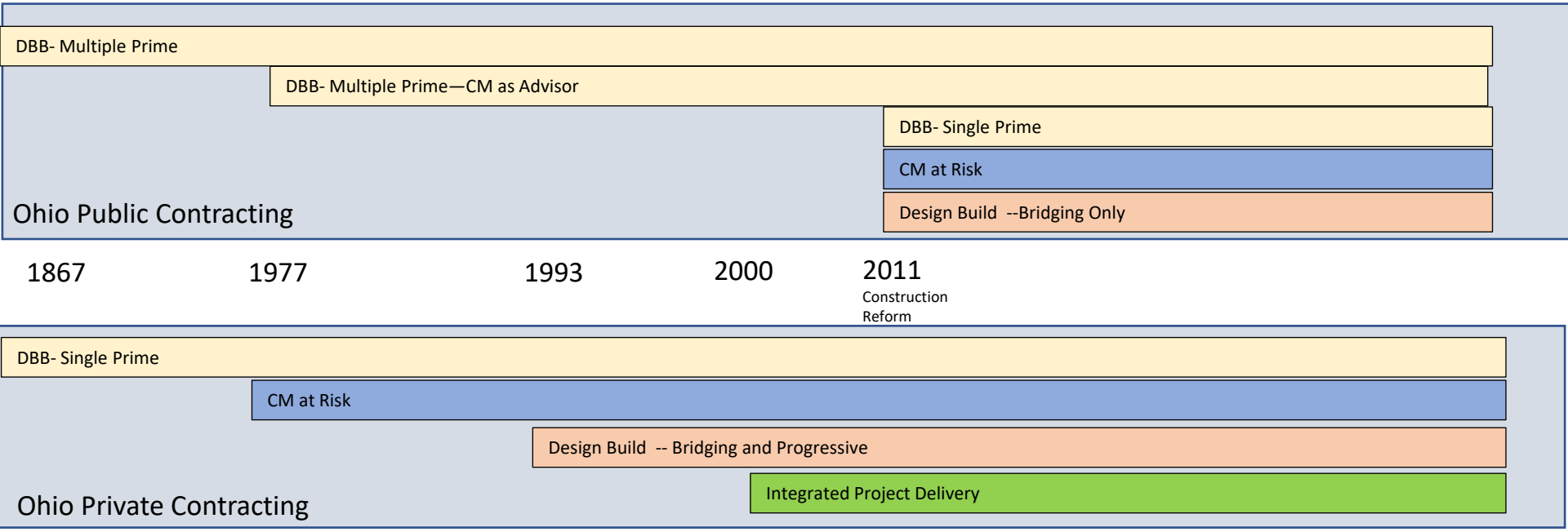
IPD

- Limitations
  - No guaranteed price
  - No public sector application
  - Slow start-up
    - Alignment of parties, cost model and insurance
  - Administration of cost model
  - Inexperience of parties with method
  - Limited/inadequate professional liability coverage
  - Owner acceptance of ultimate risk



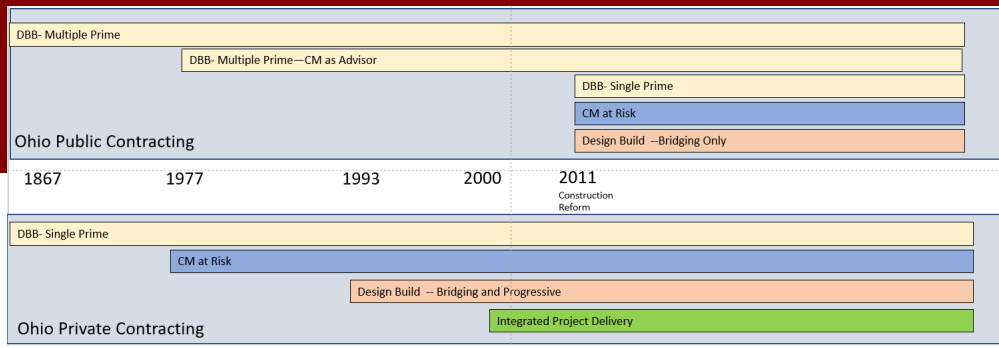


Project Delivery Timeline



Current Status

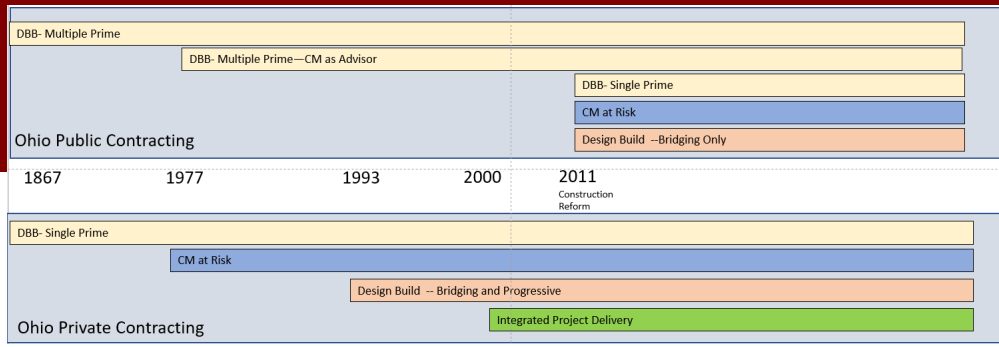
Trends over Time…



Positive Trends over Time

- Increased Structured Collaboration among Owner, Designers and Builders
  - DBB is Low; CMR is Moderate; **DB and IPD are High**
  - Primary Reasons:
    - Early involvement of contractors in design phase including increased reliance on design assist;
    - Use of BIM Model and other collaborative tools
    - Sharing of risk and reward and removing contractual barriers in DB and IPD
- Increased Pricing Transparency
  - DBB is Low; **CMR and DB (with open book pricing and GMP) and IPD are High**
  - Primary Reasons:
    - DBB is primarily lump sum bid; no transparency
    - CMR and DB (with open book pricing and GMP); is fully transparent (with some limitations on profit, OH and professional service fees)
    - IPD is fully transparent with even fewer limitations
- Improved Stakeholder Selection Process
  - DBB is Low; **other methods are high**
  - Primary Reasons:
    - DBB is based on sealed bids; lowest responsive responsible bidder
    - Other methods are based on best value using wholistic evaluation
- Effective Risk Management; Minimization of Claims/Disputes
  - DBB is Low; CMR is Moderate; **DB is High**; IPD is High (but constrained)
  - Reasons:
    - DBB is designed to be adversarial among 3 primary parties
    - CMR is still adversarial, but precon involvement of contractors; open book pricing with contingency management options reduces risk
    - DB further reduces risk by teaming Contractor with AOR
    - IPD teams all parties; pools contingency with Owner taking ultimate risk with target pricing methodology

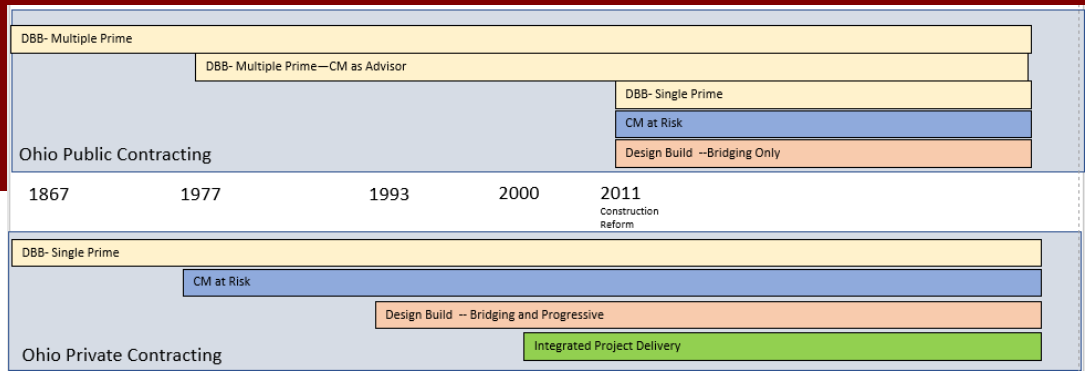
Trends over Time…



Limitations

- Administrative Burden
  - DBB is Low; DB is Moderate to High; CMR is High; **IPD is Highest**
- Insurance
  - Professional liability insurance is "fault based" and conflicts with IPD principles
- DB has certain limitations
  - Only can use Bridging DB for vertical Public Sector projects
- IPD has limited application
  - Public projects
  - Traditional project financing
  - Certain Owner risk profiles

Trends over Time…



- How will these trends be impacted by the following?
  - Increased pressure for schedule and budget efficiencies.
  - Future staffing and expertise concerns.
  - Increased opportunity for/ dependence on new building technology and information systems (including impact of AI).
  - Emergence of sustainability and ESG goals.

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One prediction for the future

ⓘ Start presenting to display the poll results on this slide.


Questions...