Contract Mechanisms for Containment Laboratories

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Merrick provides services to the Life Science Industry including:

- Specialized design of high containment and science facilities globally
- Commissioning and Validation Services
- Biosafety and Biosecurity (BS&S) Consulting Services
- Laboratory Transition and Operations Consulting
What makes design and construction of containment labs different?

- Containment Labs are complex, requiring high attention to detail in both design and construction.
- They require intensive coordination between the design disciplines and construction trades.
- Consequences of poorly performed work by designer or constructors can be catastrophic.

......It has to be right!
Four typical contracting mechanisms:

1. Design - Bid - Build
2. Design-Build
3. CM at Risk
4. Integrated Project Delivery
Contract Mechanisms for Containment Labs

Who are the players?

**Owner**
Scientific Program Staff
Administrators
Contracting Officers
Facility Engineers
Biosafety/Biosecurity Staff

**Designer**
Lab Planner
Architect
Mechanical Engineer
Electrical Engineer
Structural Engineer
Civil Engineer
Cost Estimator

**Constructor**
General Contractor
Cost Estimators
Mechanical Subcontractor
Electrical Subcontractor
Concrete Subcontractor
Earthwork Subcontractor
Vendors and Suppliers
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Design - Bid - Build
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**Design - Bid - Build**

- Owner hires a Designer, usually an Architect or AE firm to translate scientific requirements into a facility concept.
- Designer develops drawings and specifications and acts as the Owner’s technical advisor in later phases of the project.
- Owner puts documents out for bid to Constructors and hires based on some combination of price and qualifications, sometimes using a two-step process.
- Constructor builds the project.
- Designer acts as the Owner’s technical rep during construction.
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Design Bid Build
Pros and Cons

PRO: DBB is a well-understood contract type

PRO: Allows Owner to select Designer and Constructor separately.

PRO: The project design is totally complete before bidding, giving Owner best control over design.

PRO: Often yields the lowest price solution
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Design Bid Build
Pros and Cons

CON: Project timeline can be longer ...more sequential and fewer concurrent activities.

CON: More finger-pointing/less collaboration between Designer and Constructor leading to increased change orders and delays. Owner often plays referee.

CON: Strict interpretation of contract docs...very little “design intent” leniency.
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Design - Build
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• Owner hires “Designer A” to create Bridging Documents that define project concept and requirements.
• Owner puts the Bridging Documents out for bid and selects a DB team based on some combination of Qualifications and Price.
• DB team is comprised of a Constructor and a Designer (Designer B).
• Owner awards a single contract to the DB team who then designs and constructs the project.
• Designer A acts as the Owner’s technical advisor throughout the project.
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Design – Build Pros and Cons

PRO: Simplifies contracting for Owner ...all but eliminates finger pointing at this level and potentially reduces change orders.

PRO: Accelerates the project since DB team can work design and early construction activities concurrently.

PRO: Shifts design liability from the Owner to the DB team (assuming Bridging Documents are of high quality).
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Design – Build
Pros and Cons

CON: A portion of the design is left up to the DB team with less Owner control...may lead to unmet expectations.

CON: Owner gets a “package” deal with the DB team...cannot select team members independently.

CON: The Owner must “educate” the DB designers on the project after already getting the Bridging Doc designers up to speed...possible loss of efficiency on the project.
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CM at Risk
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- Owner hires a Designer to do programming and produce a conceptual design.
- At approx. 15% design, Owner hires a Construction Manager (CM) based on qualifications and some basic financial information (rates, overhead, profit).
- CM becomes part of the team, providing “Pre-construction Services”, including cost estimating, scheduling and constructability reviews.
- At approx. 75% design, Owner and CM enter into a contract for construction of the project for an agreed Guaranteed Max Price (GMP).
- Designer completes the design and provides technical assistance to the Owner throughout the project.
- CM constructs the project.
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CM at Risk
Pros and Cons

PRO: With CM on board early, greater assurance that price/schedule are accurate during design phase when scoping decisions are being made.

PRO: CM has a fuller understanding of design drivers and “why things are” ...allowing better early buy-in.
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**CM at Risk**

**Pros and Cons**

**CON:** Potentially less competitive pricing once the CM is “on board”.

**CON:** Final construction price (GMP) is agreed before design is finalized, leading to possible change orders.
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Integrated Project Delivery
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Integrated Project Delivery

- Owner selects Designer and Constructor based on qualifications and some financial information (hourly rates, overhead, profit).
- Owner, Designer and Constructor form a collaborative team to execute the project in three phases:
  - Validation
  - Design
  - Construction
- During validation, Designer does programming and advances the design sufficiently for all parties to agree that the project can be built for a “Target Price”.
- During Validation, all three parties work together physically in a “Big Room” under an preliminary agreement.
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Integrated Project Delivery

- During Validation, Designer and Constructor work at cost only (no profit). If all parties agree on Target Price, Owner retroactively pays profit for Validation work and all parties sign one contract – the IPD Agreement.
- If all parties cannot agree to the Target Price, then the Owner pays costs only (no profit) to the Designer and Constructor and the project dies.
- Assuming the project moves forward, Design completion and Construction proceed.
- The IDP contract provides for an Incentive Compensation Layer (ICL) that is shared by the Designer and Constructor. At the end of the project, if the project is delivered for the Target Price, the Designer and Constructor each get their share of profit from the ICL.
• If the project runs over the Target Price, the ICL is reduced to pay for it. It doesn’t matter who’s fault it is, everybody takes a hit.
• If the project is delivered under the Target Price, the ICL is increased by the savings – and everybody makes more money. The Owner also recoups some of the “extra” money.
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Integrated Project Delivery
Pros and Cons

PRO: Strong collaboration between Owner, Designer and Constructor; potentially less conflict within the team.

PRO: Fewer change orders likely.
Integrated Project Delivery
Pros and Cons

CON: May not be the most efficient schedule workflow during validation/design
...several design iterations possible.

CON: Currently not a well-understood model in the industry...may lead to unmet
expectations at some levels. (a poor performing contractor can be “voted
off the island”)

Contract Mechanisms for Containment Labs
# Contract Mechanisms for Containment Labs

## Contract Type Comparison

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<th>2 - 1</th>
<th>Less Likely</th>
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<td><strong>Likelihood of Successful Outcome</strong></td>
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<td>Design-Build-Build</td>
<td>Design Build</td>
<td>CM at Risk</td>
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<td>Schedule</td>
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<td>Owner control over design</td>
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<td>Technical success on complex projects</td>
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<td>Project “Happiness” Factor</td>
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So...what contracting mechanism should you use?

“IT DEPENDS...”

The optimal contracting mechanism for your organization will depend on:

- The complexity of your project
- The level of control you want/need in a precise outcome
- The sophistication of your contracting and in-house facilities folks in managing a project
- Your budget and schedule tolerance
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Q&A