



# CONSIDERATIONS FOR DESIGN-BUILD EXPLOSIVES SAFETY PROJECTS

Leslie Duffy, KPFF Protective Design Group  
International Explosives Safety Summit and Exposition 2025





# Agenda

Explosives Safety Overview

DWESB Review Process

Design Process

Bid Phase

Case Studies

Key to Success

# Explosives Safety

Protecting personnel or equipment from an accidental explosion (detonation or deflagration) associated with hazardous material.



# Role of the Blast Engineer

Gather Information

Verify Quantity Distances

Design Protective Construction

Discipline Coordination

# DWESB Review Process

Preliminary  
Approval vs.  
Final Approval

Site Plans vs.  
Protective  
Construction

# Project Delivery Method



# Project Delivery Methods



Design-Bid-Build

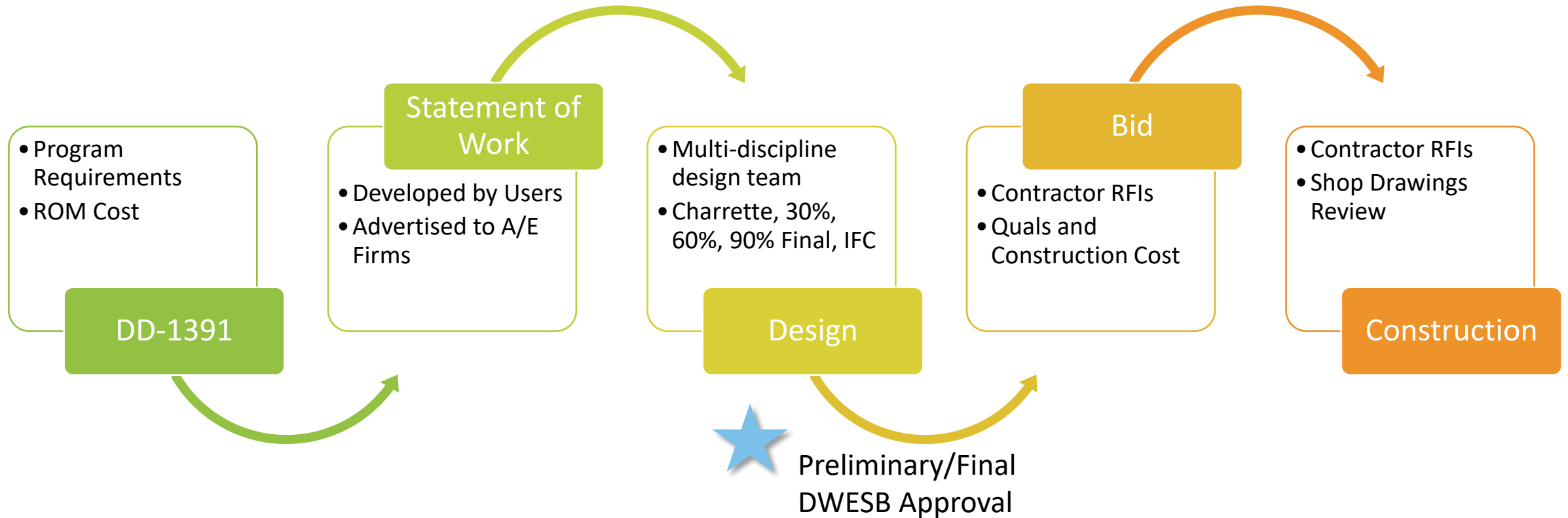
The diagram for Design-Bid-Build consists of a light gray rounded rectangle with the text 'Design-Bid-Build' inside. This rectangle is partially overlapped by a darker gray rounded rectangle on its top-left side. The entire graphic is enclosed within a thin blue rounded rectangular border.



Design-Build

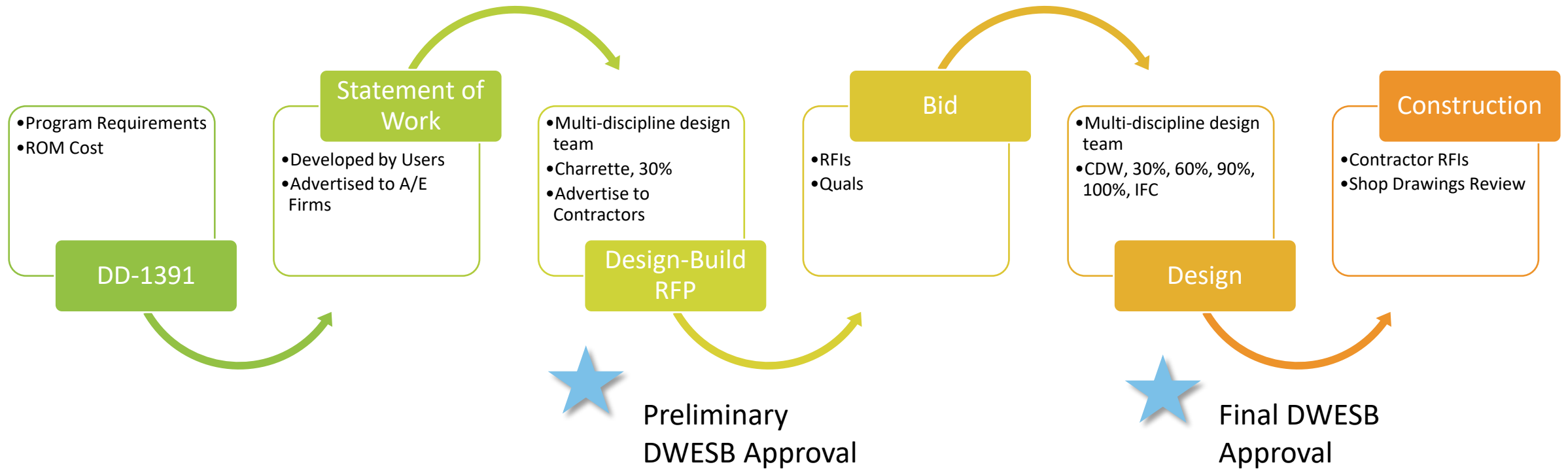
The diagram for Design-Build consists of a light gray rounded rectangle with the text 'Design-Build' inside. This rectangle is partially overlapped by a darker gray rounded rectangle on its top-left side. The entire graphic is enclosed within a thin blue rounded rectangular border.

# Design-Bid-Build

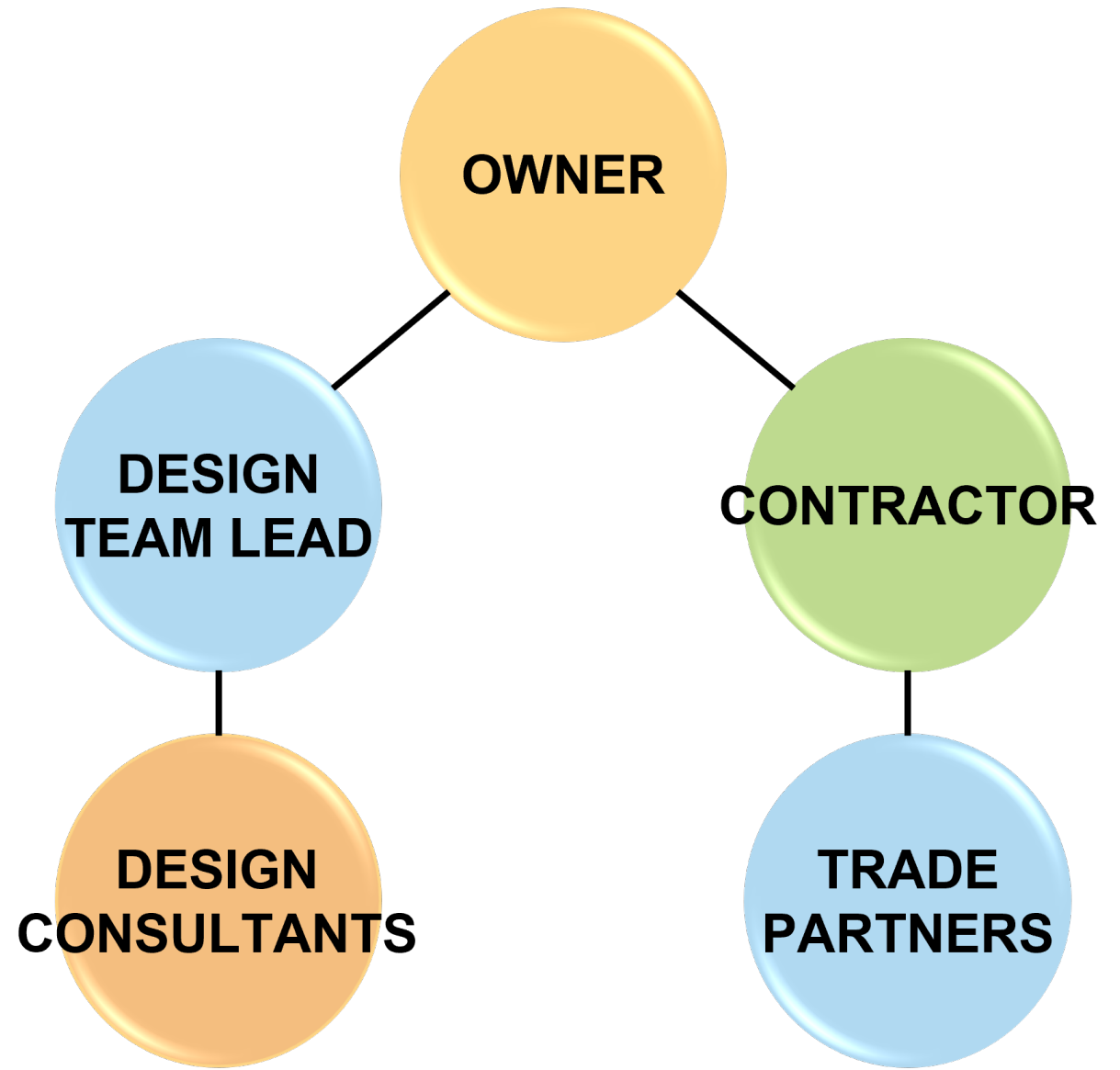




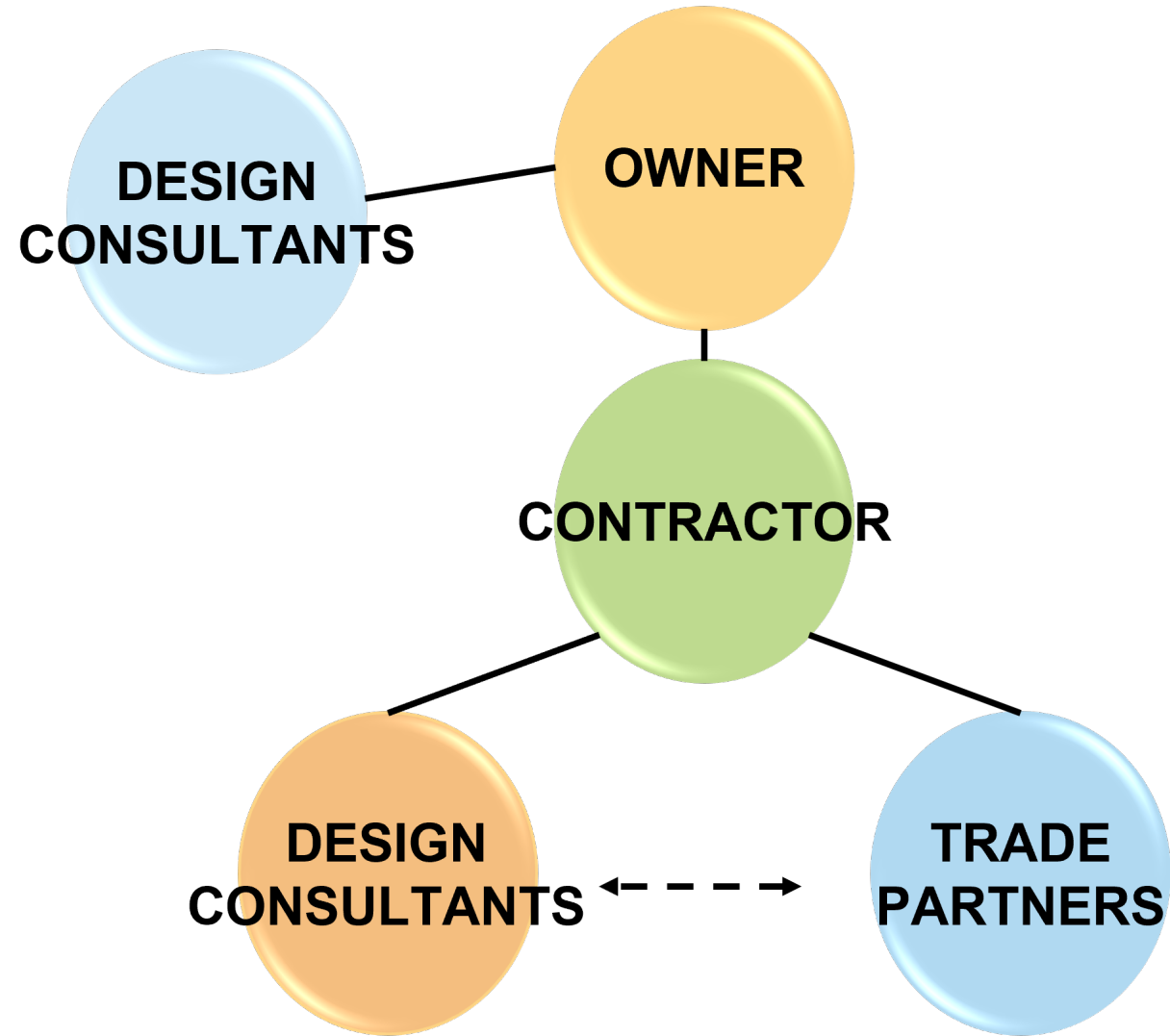
# Design-Build



# Design-Bid- Build



# Design-Build



# Design-Build





# Bid Phase

**1. How  
much will  
this cost?**

**2. When can  
we start  
building?**

# Case Studies

## Explosive Safety Challenges

# Project A -

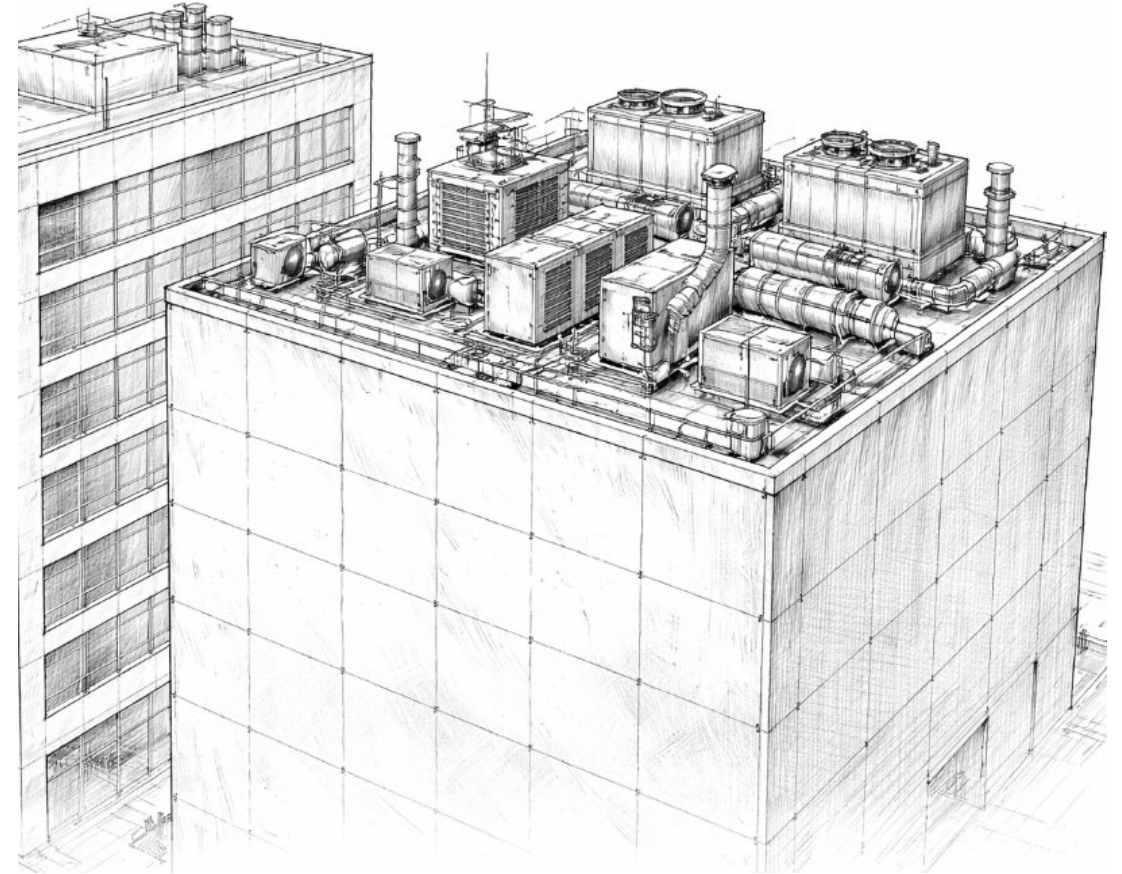
## Overview

- Explosive operating space built next to existing admin building
- Required protective construction to fully contain an explosive event

## Issue

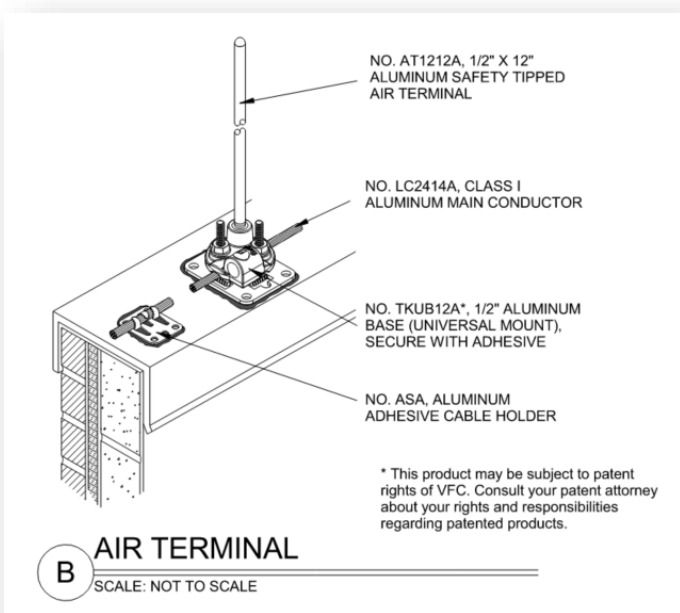
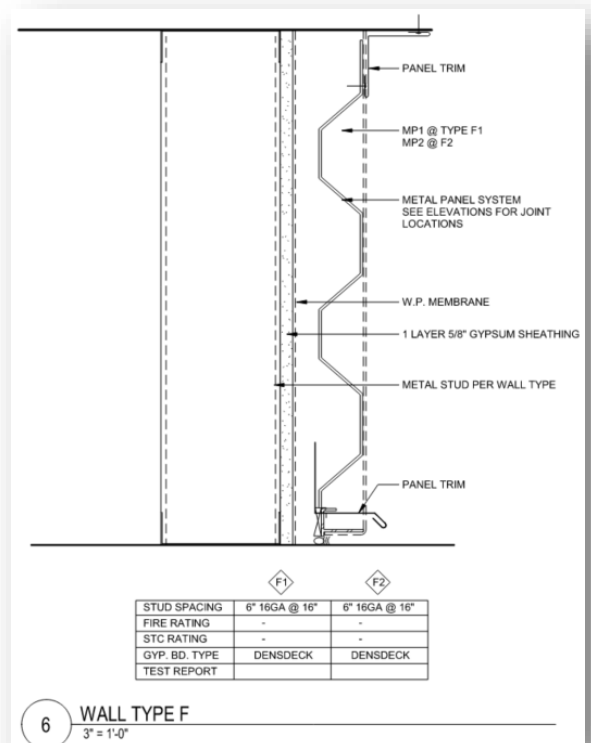
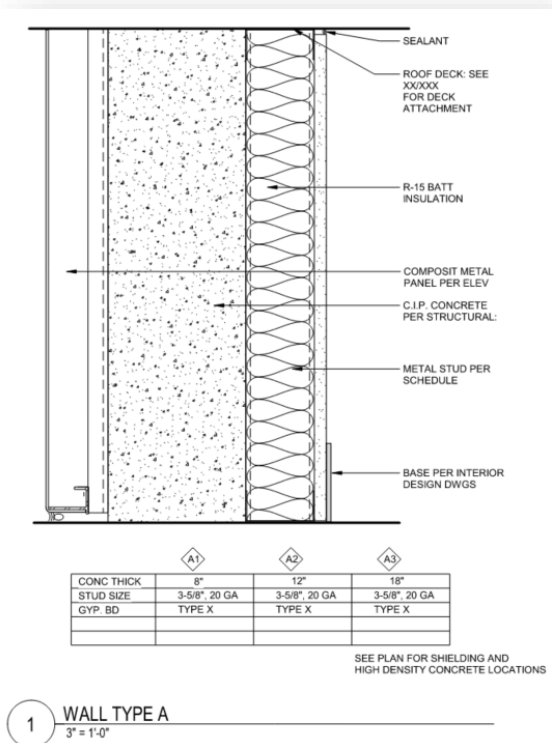
- Late design change added several roof penetrations
- Penetrations triggered: Increased roof height to meet exposure limits
- Re-evaluation of blast, fragment, and thermal passage
- Structural redesign of protective construction

**Result: ~10% increase in concrete + reinforcement volumes**



# Project B

## Design-Build





# Project C & D

## Design-Build

### Requirements

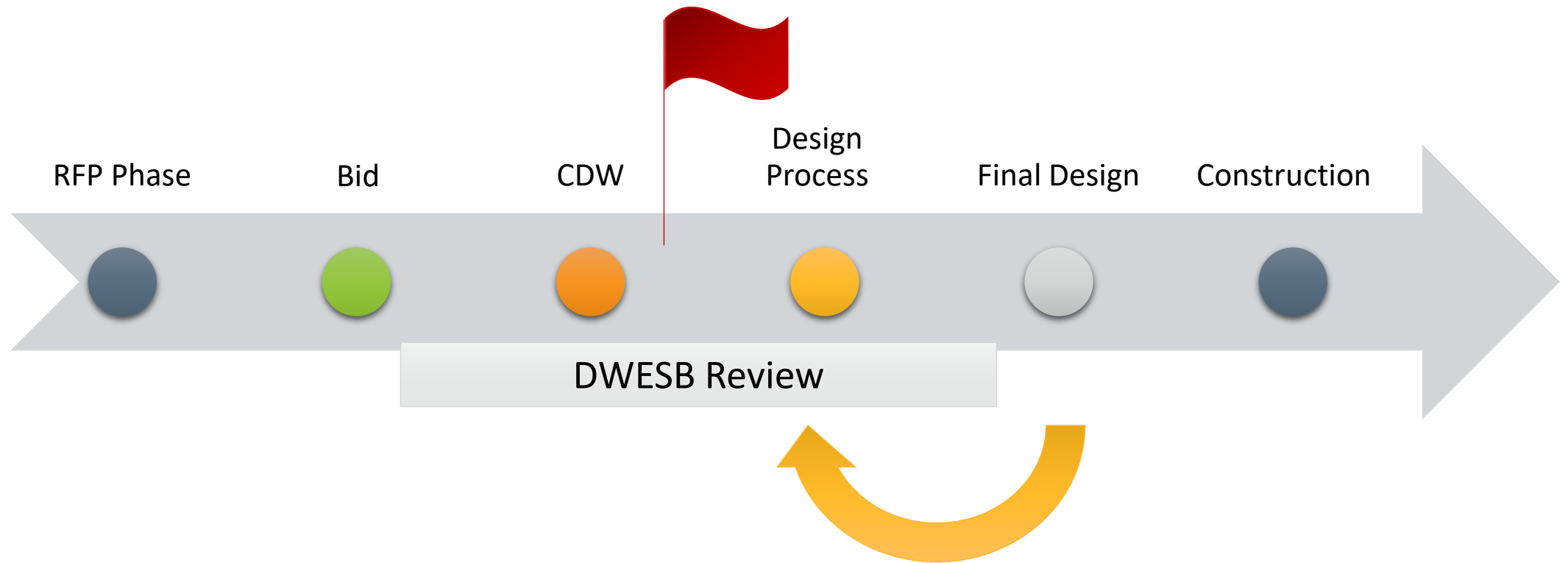
The project must meet [REDACTED] requirements and has been submitted to [REDACTED] for approval to mitigate the lengthy review process. Post award, the Design-Builder must support this process and provide additional information [REDACTED] may require. In order to be able to [REDACTED] government in this endeavor and to properly coordinate explosive safety [REDACTED] Build team as the design is developed and finalized, the Design-Builder must have relevant experience in design and construction of Safety Design and have relevant experience in design and construction of Safety facilities. Design approval is contingent upon [REDACTED] or changes to any of these elements [REDACTED] Builder.

**Skipped Preliminary Approval –  
Submitted for Final Approval at  
time of DB RFP**

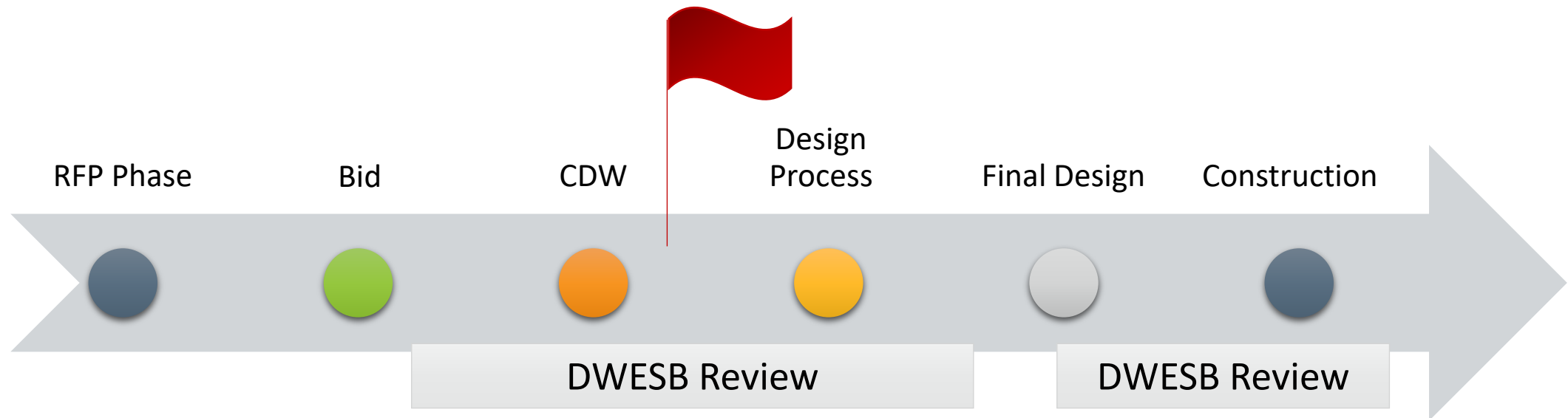
[REDACTED] walls, slabs and framing including strength, thickness, [REDACTED] variations [REDACTED] placement of openings in protective construction partitions, slabs, and walls [REDACTED] Protective Construction blast dampers, poppet valves, and sleeves

This concept design is proposed to the DB Contractor with programmatic elements developed to a level that is required for various governmental agencies' approval such as [REDACTED]. Any alterations to approved elements may put the project at risk of schedule delays due to approval processes and must be discussed with the KO prior to proceeding. If there are alterations or changes to any of these elements, the project must be resubmitted to [REDACTED] at the risk of the Design-Builder.

# Project C Timeline



# Project D Timeline



# Recommendations

Keys to Success



# Keys to Success

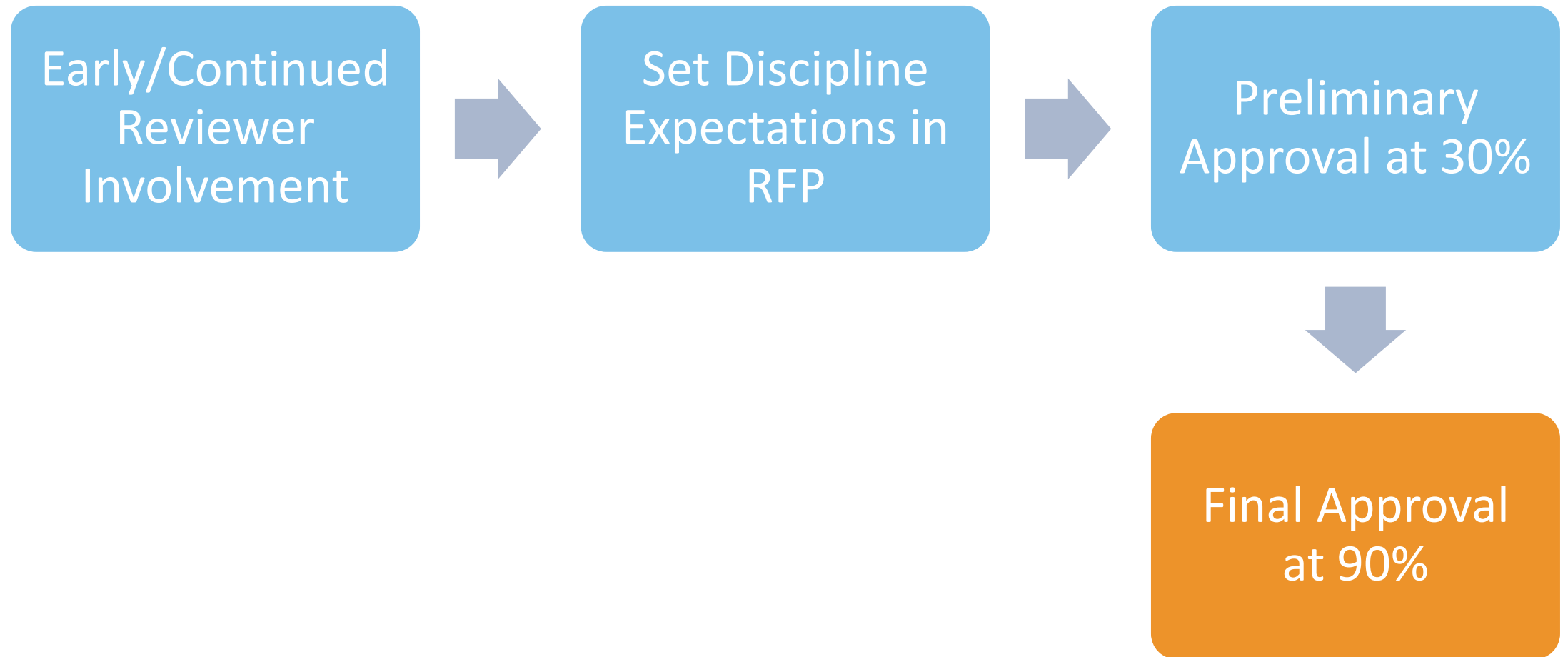
DWESB Reviewer Involvement

User Engagement

Reviewing Bids

Managing Expectations

# Review Process



# User Engagement



Information Gathering



Participate in Concept  
Design Workshop



Review Bids

# Reviewing Bids



Experience is critical. Require qualifications as part of bid process.



Review RFIs closely.



Take notice of low bids. Low bid = change orders.



Take notice of accelerated schedule. Sign of inexperience.



# Expectations



Change  
Orders

Schedule  
Delays



# CONCLUSION

---