Mini-Case Study 7

Progressive Design-Build (PDB)

Introduction

This case study explores the progressive design-build (PDB) project delivery method selected by the owner to develop a dam and reservoir expansion.

Learning Objectives

1. Understand the advantages of the PDB project delivery method.
2. Analyze the challenges in coordinating design and construction efforts in large-scale infrastructure projects.
3. Evaluate the regulatory and environmental considerations that impact the design and construction of dams.

Background

To effectively engage with this case study, students should familiarize themselves with the following concepts:

1. **Progressive Design-Build:** This project delivery method integrates design and construction services. In this approach, the contractor is involved early in the design process, allowing for better collaboration, cost control, and risk management (Check this information).
2. **Earth Embankment Dam:** A dam constructed from natural materials, primarily earth and rock. These dams are designed to hold back water and are characterized by their embankment structure, which relies on gravity for stability.
3. **Regulatory Agencies:** Organizations that oversee compliance with laws and regulations related to construction and environmental protection. In this case, the Division of Safety of Dams (DSOD) in California plays a crucial role in ensuring the safety and compliance of dam projects.

Case

The owner has an existing dam built in the 1930s that requires expansion to accommodate increased water demands due to reduced supply from other resources. The institution has engaged a PDB contractor to optimize the design and construction of the new dam while ensuring compliance with regulatory requirements.

Questions for students

1. What are the advantages of using a progressive design-build approach for this dam expansion project?
2. How can effective communication between the design and construction teams mitigate risks and control costs?
3. What regulatory challenges might the project face, and how can the team prepare to address them?

Students should work on these questions before continuing to the next page.

Approach

Approach to the questions

1. **Advantages of PDB:**
    a. Early contractor involvement allows for better communication and collaboration between design and construction teams, leading to innovative solutions and cost savings.
    b. The contractor can provide input on cost-effective design choices, helping avoid costly changes later in the project.
    c. By identifying potential risks early in the design process, the team can develop strategies to address them, reducing the likelihood of delays and budget overruns.
2. **Effective Communication:**
    a. Regular design task force meetings should be held to ensure all team members (including the design team and construction team) are aligned on project goals and design direction.
    b. Establishing clear communication channels allows for timely feedback and adjustments, ensuring the design remains within budget and meets operational needs.
    c. A preliminary risk matrix can help identify potential issues early, allowing the team to develop mitigation strategies collaboratively.
3. **Regulatory Challenges:**
    a. The project must comply with regulations set forth by the DSOD, which may include safety assessments and environmental impact studies.
    b. The team should engage with regulatory agencies early to understand requirements and streamline approvals.

c. Preparing for potential environmental concerns, even if minimal, is essential. This includes awareness of cultural resources and view shed considerations that may arise during construction.

Key Takeaways

- The PDB project delivery method fosters collaboration and innovation, leading to more efficient project delivery.
- Effective communication between design and construction teams is critical for managing costs and mitigating risks.
- Understanding and navigating regulatory requirements is essential for successfully executing infrastructure projects, particularly in sensitive environments like dam construction.

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