AGC EDUCATION & RESEARCH
FOUNDATION

Catalog of Construction Case Studies

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The Associated General Contractors of America Education and Research Foundation has funded the development of a series of construction case studies that can be used by faculty members in college and university construction education programs and construction contractors in professional education programs. These case studies are intended to supplement primary instructional materials to provide students with opportunities to engage in critical thinking, analysis, and decision-making related to issues associated with the planning and management of construction operations.

These case studies are available for download at no cost on the AGC Book Store website (https://store.agc.org/Store/CSI/Store/Product_List_Education_Foundation.aspx). Each case study consists of two documents. The first document is the actual case study to be used by students, and the second document contains notes for the case study instructor or facilitator.

1. Allied Constructors: Ethics in Construction

This case study exposes students to situations in construction that require ethical decision-making. It builds upon knowledge acquired through construction management education and practice. In the case study, Allied Constructors has received a contract for the construction of a laboratory building on a university campus. Several ethical dilemmas are presented together with the responses of parties involved, and students are asked to analyze the situations and propose solutions. The individual situations are grouped into four major project phases: (1) preconstruction, (2) subcontract solicitation and award, (3) project execution, and (4) project close-out. Instructor Notes are provided to assist in using the case study.

2. Lean Practices in Project Management

This case study is divided into two parts. Section 1 provides a basic introduction to the principles of lean construction, while Section 2 describes a project in which lean construction processes were implemented. If students have a basic understanding of lean construction, users of the case study may wish to skip Section 1. In Section 2 of the case study, J. E. Dunn Construction has a contract for the renovation of three student housing buildings at Pittsburg State University. Situations are presented during preconstruction and project execution. Topics addressed are supplier and subcontractor procurement, just-in-time delivery of materials, off-site prefabrication, pull planning, and analysis of the weekly work plan. Instructor Notes are provided to assist in using the case study.

3. Preconstruction Planning: Leading a Collaborative Team

This case study focuses on Oneglia Construction Company's preconstruction management process and project team collaboration. The context for the case study is the renovation of the Naugatuck Valley High School that is occupied throughout the project. The renovation must take place in phases, with part of the building occupied and part a construction zone fully separated from the building users. Representatives from the Owner, Architect, and Construction Manager describe their priorities and perspectives regarding the project. The primary teaching objective is the role of collaboration and the factors that contribute to successful collaboration. A secondary objective is practicing typical preconstruction activities which are performed collaboratively. Instructor Notes are provided to assist in using the case study.

4. Subcontractor Management

This case study involves the construction of a major academic building on a university campus. Because of the design of the building envelope, a major subcontractor on the project is the masonry subcontractor. The case study covers subcontractor risk management from prequalification to termination and dispute resolution. It focuses on the masonry subcontractor's failure to perform and the general contractor's actions to address the masonry subcontractor's lack of performance and to mitigate the impact on the project. Topics addressed are: subcontractor prequalification, subcontractor bid evaluation and selection, subcontractor performance, surety bonds, subcontractor payment, and dispute resolution. Instructor Notes are provided to assist in using the case study.

5. Leveraging Collaborative Teamwork in Project Delivery

This case study focuses on efforts to form and lead a collaborative team of diverse professionals to ensure successful project outcomes. The context for the case study is the expansion and renovation of a hospital in Las Vegas, NV. Strategies are presented to provide insight into trends that the design and construction industry is adopting to eliminate waste and increase value during construction. A detailed description of the project setup and team development approach is provided. Group exercises are imbedded in the case study to provide opportunities for students to apply the strategies described and reflect on what they learned in the case study. Instructor Notes are provided to assist in using the case study.

6. Sustainable Construction

This case study involves the construction of a student center for a major university for which the primary goal was to deliver a highly energy-efficient facility that incorporated innovative technologies. The case study focuses on a project with aggressive goals for Energy Use Intensity, LEED certification, and Net-Zero targets. The timeframe for the case study is during preconstruction after the construction manager has been engaged. Students are exposed to the challenges of optimizing multiple sustainability and cost objectives. The case study includes multiple learning modules enabling instructors to select those most relevant for their instructional settings. Instructor Notes are provided to assist in using the case study.

7. Mobile Technology in Construction Project Management

This case study consists of six scenarios related to the use of mobile technology to manage construction operations. The scenarios are based on actual examples of different uses of mobile technology on two different construction projects carried out in two mountain resorts towns (with three scenarios from each

project). Each scenario is followed by a set of questions related to that particular scenario. The case study is divided into two project phases where the mobile technology is most frequently used: project execution and project closeout. The ultimate goal of the case study is to develop critical thinking skills related to the use of mobile technology to manage construction operations. Instructor Notes are provided to assist in using the case study.

8. Building Information Modeling (BIM) Applications in the Field

This case study involves the use of building information modeling (BIM) in a complex mechanical retrofit of a life science building on a university campus. Three specific field applications of BIM models are demonstrated. Activity 1 discusses the use of a BIM model in developing quantity takeoff and demonstrates the advantages of using it over manual methods. Activity 2 describes the use of a BIM model to identify design coordination issues or clashes among various design disciplines. Activity 3 demonstrates the use of a BIM model for constructability analysis. The primary learning outcome is for students to learn the value of using BIM models in managing a construction project. Instructor Notes are provided to assist in using the case study.

9. Dynamic Construction Site Planning

This case study involves the construction of a major project located in a congested urban setting. The project includes a new city hall, a performing arts center, a massive parking structure, public spaces, and two multifamily residential structures. Activity 1 involves development of a site logistics plan for the originally contracted scope of work. Activity 2 involves the revision of the site logistics plan due to a major change in the scope of work and introduction of a second general contractor. Activity 3 involves development of strategies for addressing an unexpected construction material shortage issue. The primary learning outcome is for students to think creatively in solving complex problems. Instructor Notes are provided to assist in using the case study.

10. Construction Site Logistics Planning

This case study involves site logistics planning for the construction of an ultra-high-end commercial structure called the Moving Picture Preservation Center. The case study contains four separate student activities. In Activity 1, students are given three alternative site logistics plans and asked to select the one that would best serve the project. In Activity 2, students are asked to analyze the site topography and describe how the terrain conditions influence site logistics planning. In Activity 3, students are asked to select the best crane and crane placement for the project. In Activity 4, students are asked to select the best option for on-site storage of interior finish construction materials. Instructor Notes are provided to assist in using the case study.

11. Construction Financial Management

This case study involves the analysis of the financial condition of a construction company and the identification of issues that should be addressed to improve the company's financial condition. The case study focuses on the company's evolving strategic direction, a changing product mix, and aggressive goals for revenue growth and geographical expansion. The timeframe for the case study is approximately a 30-year period with a primary focus on performance over the past five years. The impacts of the company's strategic initiatives are investigated, the financial performance of the company is analyzed, and actions to enhance performance are explored. Instructor Notes are provided to assist in using the case study.

12. Prefabrication and Modularization of Façade Systems

This case study examines the challenges that general contractors face and the decisions that they need to make when implementing prefabrication and modularization processes on ptojects. The specific application addressed is the selection, fabrication, and installation of façade systems for a new retail-apartment building. The façade system used is a mix of curtain wall, window wall, and storefront installed by a design-build façade subcontractor. The case study starts with a description of types of façade systems and their construction and concludes with a discussion of project management and coordination issues. Instructor Notes are provided to assist in using the case study.

13. Development of Construction Site-Specific Safety Plan

This case study involves the development of a site-specific safety plan for a multistory commercial building being constructed in a major urban setting. The case study starts with a discussion of the organization of a site-specific safety plan including the need to identify hazards and select controls that should be implemented to lower safety risks. Then specific safety concerns related to the case study project are presented. Students are asked to address a series of issues related to each identified safety concern. Then the students are asked to complete a hazard assessment for one of the identified safety concerns. Instructor Notes are provided to assist in using the case study.

14. Construction Safety

This case study involves an analysis of a hypothetical scenario involving a fall-from-height incident. In addition to presenting a commonly experienced incident (fall from height), the case study addresses challenges such as language barriers, management of safety on a multi-employer worksite, and relevance of safety regulations and the law as they relate to construction safety. The case study starts with a description of the incident, the parties involved, the contractual relationships, the setting prior to the incident, and the relevant contextual factors. Students are asked to respond to a series of questions related to the incident. Instructor Notes are provided to assist in using the case study.

15. Reacting to Project Scope Reduction during Preconstruction Planning

This case study involves the construction of two separate high-rise construction projects that were delivered using a design-build method of project delivery. Both projects encountered scoping challenges, but the approach used to resolve these challenges was different. Through a comparison of the two projects, this case study exemplifies how and when project teams should make key design decisions and why early collaboration between design and construction teams is essential. Students are asked to respond to a series of questions related to the delivery of each project and to compare them. Instructor Notes are provided to assist in using the case study.