

**ADOPTION AND IMPLEMENTATION OF PROJECT MANAGEMENT
PLANS (PMPs) FOR ABC PROJECTS: BENEFITS AND CHALLENGES**

**Quarterly Progress Report
For the period ending Aug 31, 2023**

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**ACCELERATED BRIDGE CONSTRUCTION
UNIVERSITY TRANSPORTATION CENTER**

Submitted to:
ABC-UTC
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Program Progress Performance Report
University Transportation Centers

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1. Background and Introduction

There are approximately 600,000 bridges dispersed throughout public roads in the United States, necessitating significant resource allocation for their maintenance. While the Accelerated Bridge Construction (ABC) approach has gained traction in certain states for expediting bridge construction, its implementation remains inconsistent across Departments of Transportation (DOTs). The reluctance of contractors to embrace ABC can be attributed to inadequate training, a lack of incentives, and the prevailing culture within DOTs favoring traditional methods. To address these challenges and promote wider adoption of the ABC approach, the development of a formal Project Management Plan (PMP) tailored specifically for ABC projects is essential. This PMP would provide guidance to contractors throughout the project lifecycle, facilitating the successful implementation of ABC and fostering greater acceptance of this innovative construction method.

In accordance with the 23 U.S. Code 106(h), major projects funded by federal assistance and with an estimated total cost of \$500 million or more are mandated to submit a Project Management Plan (PMP) to the Federal Highway Administration (FHWA). These major projects inherently possess a high level of complexity and require substantial resources for their execution. The PMP serves as a vital tool in effectively managing these resources and ensuring successful project delivery. It plays a crucial role in the planning and execution phases by providing guidance on stakeholder roles, outlining processes and procedures, and facilitating decision-making processes. Additionally, the PMP aids in the identification and documentation of strategies to address uncertainties, mitigating risks, and fostering trust and support throughout the project's lifespan.

The Strategic Highway Research Program 2 (SHRP 2) R10 study did not explicitly cover the incorporation of a Project Management Plan (PMP) in Accelerated Bridge Construction (ABC) projects. However, it is crucial to note that each of the five dimensions presented in the 5DPM framework holds equal importance and relevance for ABC projects. As ABC is a relatively new approach compared to traditional bridge construction methods, the adoption of a formal PMP can greatly benefit its implementation. The success of rapid construction in ABC projects heavily relies on a well-defined technical design, which necessitates active involvement from all stakeholders throughout the planning and execution phases. Therefore, the establishment of a formal PMP that clearly outlines the roles and responsibilities of each stakeholder is critical for the effective execution of ABC projects.

2. Problem Statement

Without the requirement to submit a Project Management Plan (PMP) to the Federal Highway Administration (FHWA) for most of the ABC projects (as they don't meet the threshold of \$500 million), it is left on the project team to prepare a formal PMP. As ABC projects are fast track projects, having a PMP is even critical for the project team to make decisions that keep the

project moving smoothly. Having developed the template to create PMP *for* ABC in the last phase, the researchers are set to identify the benefits and challenges of using the template to create PMPs in real projects. Generic information on the benefits of PMP is available, however, there is lack of information on the benefits of PMPs specifically to ABC type projects.

3. Objectives and Research Approach

The research team will build on the team's previously completed framework of PMP *for* ABC project for use by project teams to develop PMPs specifically for ABC projects. In this proposed project, the completed template will be piloted by the DOTs and contractors that the researchers will partner with. The resulting analysis will describe effective ways to use the previously developed PMP *for* ABC framework and, more importantly, effective ways to use the PMP as a reference for the successful completion of a project.

4. Description of Research Project Objectives

The goal of the proposed project is to document the benefits and challenges of implementing the PMP *for* ABC framework. As this framework is the first of its kind tailored for ABC projects, there will be challenges associated with its adoption. It is critical to document the challenges and take corrective actions to modify the PMP *for* ABC framework for wide-spread adoption in the future. There are documented benefits of using PMPs in construction projects; however, documenting explicit benefits of using PMP *for* ABC is equally critical as it will encourage more DOTs and contractors to adopt the framework. The research team will meet with project teams as they are in the planning phase of the pilot projects and will work with them as they use the new PMP *for* ABC framework to develop the PMPs for the projects. The research team will track along with the project teams as their projects progress and will gather information on how the PMP is used in various stages of construction.

The following is a description of tasks carried out to date.

Task 1 – Work with partner(s) to identify projects suitable for pilot studies

Proposed Task Description: The objective of this task is to identify ABC projects suitable for the use of the framework on the pilot basis. The research team will work closely with the project team members to develop the PMPs for their respective projects. The research team will attempt to accomplish the following:

- Identify ongoing or upcoming ABC projects that can be used to pilot for this research project
- Familiarize the members of the pilot project team with the PMP *for* ABC framework
- Guide the pilot project team to develop the PMP using the framework

Progress to Date: The identification of suitable Accelerated Bridge Construction (ABC) projects to pilot the PMP *for* ABC framework was a crucial step in this research project. All participating Department of Transportation (DOTs) from Phase I of the project, which involved framework development, were contacted. Initially, only one DOT showed interest in participating, but it was discovered that they did not have any upcoming ABC projects. To overcome this challenge, the research team modified the approach and decided to utilize a recently completed ABC project,

referred to as Project-A in this report, for piloting the framework. The project team associated with Project-A indicated that the transition from the initiation phase to the planning phase typically takes around two years or even longer. Considering the timing constraints of the research project, waiting for a project to reach the planning phase for testing the PMP *for ABC* framework was impractical. Instead, the research team opted to evaluate the framework using recently completed or ongoing projects, employing a retrospective approach. Further the research team identified three more projects for piloting the framework. Those projects are referred to as Project-B, C, and D in this report. Project-B and C are currently undergoing, and Project D is still in planning phase.

Task 2 – Develop project PMPs using the template and guide developed specifically for ABC projects

Proposed Task Description: After identifying ABC projects suitable for the use of the framework on the pilot basis, the research team will work closely with the project team members to develop the PMPs for their respective projects. The research team will offer workshop to the team members of the pilot projects to familiarize them with the framework of PMP *for ABC* and guide them develop the PMP for their projects. As the PMP requires input from multiple stakeholders, all the relevant members will be recruited to attend the workshops and guidance sessions for developing the PMPs.

Progress to Date: The prerequisite for this task is Task 1, which had to be modified as explained in the previous section. In line with the revised retrospective approach, the research team proceeded to gather and analyze the project management documents associated with Project-A. The objective behind this examination was to reconstruct a Project Management Plan (PMP) for Project-A utilizing the PMP for Accelerated Bridge Construction (ABC) framework. To facilitate this process, the research team conducted several virtual meetings with the members of Project-A's team. These meetings served three main purposes: (1) gaining a comprehensive understanding of the document's organizational structure, (2) resolving any uncertainties or ambiguities, and (3) obtaining additional information to address any gaps in the framework. The detailed case narrative developed for Project-A has been provided in Appendix-I and the recreated project management plan using the PMP *for ABC* has been provided in Appendix-II.

The research team is currently working on developing the case narratives of Projects-B, C, and D and creating their project management plans using the PMP *for ABC* framework.

Task 3 - Track projects during construction to assess use of PMPs

Proposed Task Description: Data from the pilot projects will be collected from two sources: examination of project documents and interview of project team members. Project documents such as cost report, schedule updates, safety report, and similar will be examined to measure the project performance. Semi-structured and open interviews will be conducted of the project participants to gather their feedback on the efficacy of the PMP for ABC framework.

Progress to Date: The prerequisite for this task, Task 2. Once task 2 is complete, then Task 3 would begin. Task 3 has undergone modifications in light of the retrospective approach adopted

for the preceding tasks. Rather than monitoring project progress, the research team has made the decision to shift the focus of the semi-structured interviews towards identifying the advantages and challenges associated with implementing formal project management plans for the current projects under investigation. The benefits and challenges identified from Project-A have been included in the case narrative (Appendix-I).

Task 4 - Analyze data gathered from projects and project teams

Proposed Task Description: Collected data will be analyzed using mixed method. The performance of the pilot projects will be measured using established and vetted metrics such as cost, schedule, safety, rework, scope change and compared with that of the other ABC projects without formal PMPs using quantitative methods. The collected interview data will be analyzed using thematic analysis to identify the emerging themes related to benefits and challenges to adopt PMP for ABC.

Progress to Date: The prerequisite for this task, Task 3. Once task 3 is complete, then Task 4 will begin.

5. Expected Results and Specific Deliverables

Quarterly reports are due.

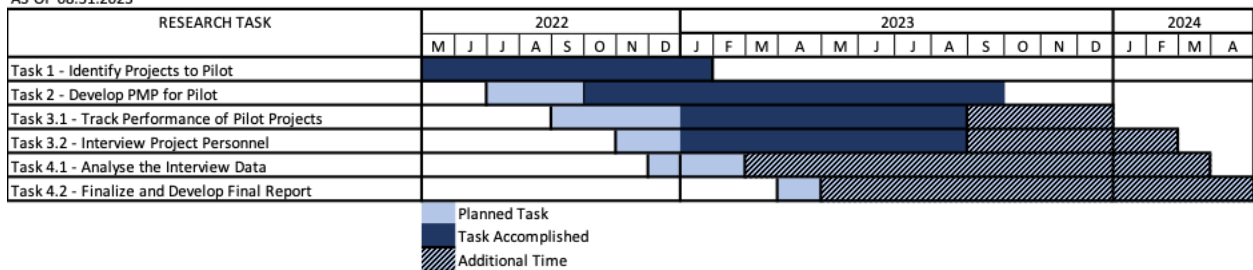
Final report is due on December 31, 2023.

6. Schedule

Progress of tasks in this project is shown in the table below.

Project	44% Completed
Task 1 – Identify projects to pilot the framework	100%
Task 2 – Develop PMP for pilot project	100%
Task 3 – Track pilot project performance & interview participants	75%
Task 4 – Analysis and Final Report	25%

AS OF 08.31.2023



7. Appendix I

Case Narrative: Project A

1. *Introduction:*

- Replacement of the dilapidated bridge structure on State Route in the City of Sacramento was the goal of the Sacramento County 21st Avenue Undercrossing (Br. No. 24-0154) project. The project's goals were to upgrade the road's safety and efficiency while also improving the infrastructure for traffic. An accelerated bridge construction strategy was used to reduce traffic delays and hasten construction.

0. *Project Background:*

- The 21st Avenue Undercrossing bridge needed to be replaced because it was beyond repair. For drivers, bicycles, and pedestrians, the bridge was essential in providing a fast and safe path. The project's objectives were to fix structural issues, increase safety features, and enhance the bridge's overall aesthetic appeal.

0. *Objectives:*

- The primary objectives of the project were to:
 1. Increase capacity: To meet present and anticipated traffic numbers, widen the existing route. This will ease congestion and enhance traffic flow.
 2. Improve Infrastructure: To ensure the long-term resilience and endurance of the roadway, upgrade its structural integrity, its bridges, and its drainage systems.
 3. Enhance Safety: Improve Road layout, target high-accident locations, and incorporate safety elements including wider lanes, better signs, and better lighting.
 4. Minimize environmental impact: Reduce the project's environmental impact by implementing sustainable techniques like stormwater management, erosion prevention, and habitat preservation.

0. *Key Activities:*

- Planning and Design
 1. Consulted with regional groups, interested parties, and environmental specialists to get their opinions and address issues.

2. Conducted extensive traffic analyses and research to ascertain the need for expansion.
 3. Developed thorough engineering concepts and plans that took both immediate and long-term requirements into account.
- Construction
 1. To safeguard the security of workers and commuters during construction, temporary traffic management measures were put in place.
 2. Roadway alignment was cleared, graded, and ready for widening.
 3. To increase capacity and traffic flow, extra lanes, interchanges, and auxiliary lanes were built.
 4. Installed updated lighting systems, rumble strips, and guardrails as new safety elements.
 - Environmental Mitigation:
 1. In order to safeguard local water bodies and delicate habitats, erosion control measures were put into place.
 2. Carried out routine inspection and upkeep of stormwater management systems.
 - Quality Assurance and Project Management:
 1. Maintained efficient channels of contact among project participants to address issues and give updates.
 2. Ensured adherence to codes, rules, and regulations for the sector.
 3. Throughout the course of the project, routine inspections and quality control procedures were carried out.
0. *Challenges faced:*
- Balancing construction activities with minimizing disruptions to traffic flow.
 - Managing public expectations and addressing concerns related to noise, dust, and temporary road closures.
 - Overcoming unforeseen site conditions, such as encountering underground utilities and unstable soil.
0. *Project Planning and Design:*
- The Sacramento County, Sacramento City, and other pertinent stakeholders worked together during the project's extensive planning and design phase. The choice of an

accelerated construction strategy that would reduce traffic interruption and shorten the project's timetable was a crucial factor.

0. *Prefabrication and Off-site Construction:*

- The project used a prefabrication technique to build the bridge's component parts off-site. A specialist off-site plant was used to create precast concrete components such as girders, deck panels, and parapets. This strategy made it possible to regulate the working environment, improve quality control, and speed up on-site work.

0. *Site Preparation and Foundation:*

- Numerous site preparation tasks, such as site clearing, utility relocation, and earthwork, were completed prior to the bridge's construction. In order to provide a solid and long-lasting footing for the bridge, the foundation work included excavation and the building of the substructure components.

0. *Bridge Superstructure and Installation:*

- To minimize the impact on traffic, the building of the superstructure for the bridge required carefully planned procedures. A variety of specialized tools, including cranes and large machines, were used to lift and place precast bridge components. The construction schedule was greatly shortened by this effective installation technique.

0. *Integration and Finishing:*

- The integration phase started after the installation of the superstructure components. In order to guarantee structural integrity and a seamless integration with the substructure, precast components were joined. The project required some finishing touches, including waterproofing, pavement markings, and lighting.

0. *Quality Assurance and Safety:*

- Rigid quality assurance methods were put in place throughout the project to make sure that the design requirements and industry standards were followed. During construction activities, safety precautions such as employee training, site security, and traffic control were used to protect both workers and the general public.

0. *Project Outcomes:*

- The 21st Avenue Undercrossing project benefited greatly from the expedited bridge construction method used. Because the project was finished earlier than expected, the community suffered less traffic delays and inconveniences. greater user experience and transportation efficiency resulted from the addition of better safety elements, greater aesthetics, and a more durable bridge construction.

0. *Lessons Learned and Best Practices:*

- Future projects can learn important lessons from the 21st Avenue Undercrossing project's effective use of faster bridge construction methods. Effective project management, stakeholder cooperation, and the advantages of off-site prefabrication are among the lessons learnt. Similar bridge construction projects can benefit from these best practices, allowing for quicker completion, lower costs, and higher quality.

0. *Conclusion:*

- The 21st Avenue Undercrossing (Br. No. 24-0154) project in Sacramento County is an excellent example of how rapid bridge construction methods may be used to great effect. The project was successful in achieving its objectives of enhancing transportation infrastructure while minimizing traffic disruptions thanks to meticulous planning, creative design, and the utilization of off-site prefabrication. The undertaking serves as a template for other bridge building initiatives

8. Appendix II

Bridge No.: 24-0154	Owner: California DOT
Project Description: The purpose of this project is to rehabilitate the bridge deck on 21st Ave UC on SR 99 in Sacramento County. The proposed work will replace the deck and extend the life of the bridge. This will delay the need for replacement of the structure.	

Template guide to creating ABC PMP

The questions below are provided as guidance for the elements to be considered when formulating a project management plan for ABC projects

1. Introduction

How is the Project Management Plan used for the Project?

- What is the purpose of the PMP?
 - *The PM will facilitate any scope, schedule, or cost changes and provide coordination of the CAT to ensure communications are timely and responsive. The PM will also work with stakeholders to provide project updates and to address concerns. The PM also identifies needed resources for all Transportation Management Plan measures and activities. The PM coordinates the development of the Transportation Management Plan with affected local and regional transportation stakeholders as needed.*
 - [21st Ave UC at SR 99 Communication Plan Last Updated 2021-06-04.docx - Google Docs](#) (Page 8)
- Who is the PMP completed by?
 - *Caltrans*
- Who is the PMP directed to or how is it distributed?
 - *The PMP is directed towards the project manager of the site and distributed from Caltrans to the team.*
- Have all the acronyms and the abbreviations been explained?
 - *There are no acronyms or abbreviations that need to be explained.*
- Where is the PMP stored and how can it be accessed?
 - *The PMP is stored in the 21st Ave UC Document, anyone with this document has access to the plan.*
 - [21st Ave UC at SR 99 Communication Plan Last Updated 2021-06-04.docx - Google Docs](#)

2. Goals, Objectives, and Metrics

What are the goals of the ABC project and how are they measured?

- List project goals

- *The bridge deck is in need of major deck rehabilitation due to the severity of the transverse and longitudinal deck cracks, concrete spalling, and high corrosion chloride content in the concrete deck surface. (Page 2)*
- List project objectives
- *The purpose of this project is to rehabilitate the bridge deck on 21st Ave UC on SR 99 in Sacramento County. (Page 2)*
- List the metrics to be used to track progress
- *The assumptions used to develop the cost and working days estimate are listed on the attached Advanced Planning Study. The proposed Alternative 1 refers to the RSC deck overlay and Alternative 2 refers to the replacement of the existing deck. Each alternative is presented with traffic staging options. It is the recommendation of Structure Design and Structure Maintenance with the District concurrence to select the Alternative 2 Stage Plan 3 deck replacement option. (Page 122 of 03-0h342)*

3. Project Organization

How is the Project Organization and Communication managed?

- Provide Project management team and list their responsibilities

Caltrans - Construction Advisory Team (CAT):

- Jeffrey Hamm - Area Construction Engineer (ACE)
- Howard Giang - Resident Engineer
- Hogni Setberg - Area Structures Construction Senior, BCE
- Brandon Miller - Structure Representative
- Angela DaPrato - Public Information Officer
- Isam Tabshouri - RTMC Chief
- Yemane Tekeste - District Traffic Manager Chief
- Wendy Bell - TMC Support
- Chandra Peterson - TMC Dispatch Supervisor
- Steven T Hardie - CT Maintenance Manager II
- Angelo R Gross - CT Maintenance Manager II
- Bipan Kaushal - Construction Safety Coordinator
- Tony Aoun - Construction Safety Coordinator
- Ed Yarbrough - Traffic Safety Advisor
- Darryl Chambers - Traffic Safety Advisor

Bridgeway Civil Constructors, Inc:

- Andrew Gehlert - Project Manager
- Emanuel Vasquez - Project Engineer
- Jim Wingo - Superintendent
- Rafael Jimenez - General Superintendent
- Steve Stroud - General Structures Superintendent
- Dan Baker - Construction Manager
- (21st Ave UC Page 3)

- Provide project management organization chart and team contact information

Caltrans - Construction Advisory Team (CAT):

- Jeffrey Hamm - (916)508-3716 (Cell)

- Howard Giang - (916)825-7987 (Cell)
- Hogni Setberg - (916)662-1777 (Cell)
- Brandon Miller - (916)505-6839 (Cell)
- Angela DaPrato - (916)826-3093 (Cell)
- Isam Tabshouri - (916)919-4139 (Cell)
- Yemane Tekeste - (916)296-9646 (Cell)
- Wendy Bell - (916)859-7908 (Office)
- Chandra Peterson - (916)859-7999 (Office)
- Steven T Hardie - (916)859-7920 (Cell)
- Angelo R Gross - (530)566-3894 (Cell)
- Bipan Kaushal - (530)741-4391 (Cell)
- Tony Aoun - (916)296-9692 (Cell)
- Ed Yarbrough - (530)741-5722 (N/A)
- Darryl Chambers - (530)741-5721 (N/A)

Bridgeway Civil Constructors, Inc:

- Andrew Gehlert - (661)205-9926 (Cell)
- Emanuel Vasquez - (510)646-6818 (Cell)
- Jim Wingo - (916)207-5963 (Cell)
- Rafael Jimenez - (707)430-3911 (N/A)
- Steve Stroud - (925)303-5773 (N/A)
- Dan Baker - (916)690-4625 (N/A)
- (21st Ave UC Page 3)
- Provide a communication plan for the project team
- *Caltrans will communicate directly with emergency responders and law enforcement, including CalFire, CHP, SCSO, SacOES, as well as the City of Sacramento, City of Elk Grove, and Sacramento Count.*
- *Caltrans has developed an extensive outreach list, consisting of contacts for the media, hospitals, emergency responders, housing associations and the media (see attachment).*
- *Caltrans PIO is coordinating the public and media outreach for the project through traffic alerts, media advisories, press releases, press releases and social media (Twitter, Facebook and Neighbors).*
- *Beginning the week of May 21 through June 16, Caltrans is planning to run an aggressive outreach campaign through paid media (which includes newspaper public notices, television advertisements and radio spots), social media (Facebook, Twitter and Neighbors) spots.*
- *Caltrans PIO is using external partner's websites and networking to inform the public about the four-day closure. As of May 25, Caltrans met with city and county officials and held three First Responders meetings, which included representatives from the local fire departments, police departments, sheriff unit, CHP and other first responders. In addition, Caltrans met with public information officers across the Sacramento region to inform them about the upcoming project.*

- Caltrans PIO is coordinating with Traffic Management to ensure changeable message signs will also be activated throughout the Sacramento and San Joaquin region.
- Caltrans PIO has coordinated with the Caltrans District 10 PIO staff to coordinate efforts regarding releasing information to the media and public about detours, project information and questions about the closure.
- (21st Ave UC Page 12)

Documents Searched:

State Highway Operation and Protection Program (SHOPP) Supplemental Project Scope Summary Report

SR 99 at 21st Avenue Undercrossing Bridge Deck Replacement Communication Plan

Searched Terms			
Kickoff	Learned	Change	
Kick off	Learn	Risk	
Meeting/Meetings	Brief	Contingency	
Status	Schedule	Traffic Control	
Progress	Quality		
Lesson	Security		
Lessons	Safety		

4. Project Communication

Who are the participants and what is the frequency of occurrence?

- Client Kickoff meetings
 - N/A
- Internal Kickoff meetings
 - PM to decide on attendees (internal and possibly external) based on the purpose of the PDT meeting. Send out invitations to remaining PDT members as a cc so they can stay apprised of project status and attend if they choose.
 - If externals will attend, schedule internal pre-meeting.
 - file:///C:/Users/snodgrassk/Downloads/PDT_Expectations_Memo.pdf (Page 4)
- Progress and Project Status meetings
 - PM to decide on attendees (internal and possibly external) based on the purpose of the PDT meeting. Send out invitations to remaining PDT members as a cc so they can stay apprised of project status and attend if they choose.
 - file:///C:/Users/snodgrassk/Downloads/PDT_Expectations_Memo.pdf (Page 4)
- Lessons Learned briefings
 - N/A

5. ABC Project Delivery

Is there a clear path for the project delivery?

- What is the Financial Plan?

- Does the information on PDF pgs. 12-13 and in Attachment K qualify as a Financial Plan?
- What are the Project Cost Estimates?
- Information in Attachment K (PDF pgs. 172-183). \$6,300,000 – 7,250,000. Total Cost of Structures = \$4,093,448 (PDF p. 181).
- Has the Project Schedule been designed to meet the ABC goals?
- PDF P. 13. Item 9C. PDF Pgs. 122-135 provide four different schedules based on alternative Stage Plans; however, none of them specifically utilizes ABC.

6. Project Controls

Are the controls adequate to keep track of the status of the project?

- Have cost, schedule, scope, quality, safety, and security controls been established?
- Most references to *Quality* have something to do with water quality control.
- How are project changes managed and reported?
- “If there is a change in the scope of the project or the order of work (schedule), please advise the TMP unit so that the data sheet may be revised.” (PDF P. 398)
- “The PM will facilitate any scope, schedule, or cost changes and provide coordination of the CAT to ensure communications are timely and responsive. The PM will also work with stakeholders to provide project updates and to address concerns. The PM also identifies needed resources for all Transportation Management Plan measures and activities. The PM coordinates the development of the Transportation Management Plan with affected local and regional transportation stakeholders as needed.” (Communication Plan, P. 8)

7. ABC Implementation

- What ABC Technique was used?

If **Prefabricated bridge elements and systems** are used, expand on the selection criteria and technique used to implement the technology. Some common techniques used in the implementation of PBES are listed below.

- Prefabricated Elements
- Prefabricated Systems
- Mentioned about furnishing and installing precast concrete box girders [pdf pg 130]. Could not find anything else.

8. ABC Project Considerations as per ABC technique selected for the project

The following section of the document will discuss the **quality, safety, and risk management** and **must be associated and specific to the ABC technology and techniques used**. *The sections below are in reference to items that are likely already addressed in other project documents. Review each item and elaborate on any items that might be missing. The questions and checklist items below are a continuation of the elements to be considered when formulating*

a project management plan for ABC projects. Ideally, these items below should be used as thinking/consideration points which should be explained or provided in the PMP in some form.

Question/Issue	Yes	No	N/A	Comments
Project Scope				
a. Are there effective scope reports detailing the list of activities for the successful completion of the project?			X	<i>Not found in the documents provided.</i>
b. Is there a clear traffic control plan during project construction?	X			<i>“Lane closures will be performed in accordance with Standard Plan Sheet T10, ‘Traffic Control System for Lane Closure on Freeways and Expressways’.” (PDF P. 322)</i>
c. Is there a clear project specific safety, and security plan?			X	<i>Not found in the documents provided.</i>
d. Does the project include an established safety policy for the ABC technique?			X	<i>Not found in the documents provided.</i>
e. Is there a clear project communication plan for the public and shareholders, project internal and external communication?	X			<i>The SR 99 Communication Plan provides some of this (external), but it does not detail internal communication requirements.</i>

Project Construction				
a. Are the bridge components built onsite? If so, expand on the technologies used to deliver the project.		X		<i>Not found in the documents provided.</i>
b. Are the bridge components built offsite? If so, expand on	X			The research team held a meeting with the project Caltrans where they

the technologies used to deliver the project.				stated that all components were built off site.
c. Do you have clear and defined ABC Project Schedule milestones? Expand on them.	X			<i>PDF Pgs. 122-135</i>
d. Have you identified items that require contingency plans? If not, why? If so, please give a summary of the contingency plans provided for those items	X			<i>Arguably, the APS provided in Pgs. 122-135 functions as a set of contingency plans.</i>
e. Is there an acquisition strategy to execute the project most efficiently? Right of way, Design, and construction.			X	“All work will be performed within the existing Right of Way. A Right Certification was obtained on March 10, 2020.” Page 10 of 03-0H342 File No amount for Right of Way in estimate
f. Have the necessary permits been secured? Provide a list of the permits which have been secured.			X	<i>Not found in the documents provided.</i>

Project Quality				
a. Are there clear goals and Objectives for Quality? Expand			X	<i>Not found in the documents provided.</i>
b. Is there a party responsibility for Quality? Expand			X	<i>Not found in the documents provided.</i>
c. Are there quality standards and plans for the project delivery?			X	<i>Not found in the documents provided.</i>
d. Has Quality Assurance been considered? If so, please expand on Design, construction, and operation?			X	<i>Not found in the documents provided.</i>
e. Is there a process for project quality review and owner verification			X	<i>Not found in the documents provided.</i>

Safety Plan				
a. Have safety requirements been identified?			X	<i>Not found in the documents provided.</i>
b. Has Personal Protection Equipment been provided?			X	<i>Not found in the documents provided.</i>
c. Have safety training or certification requirements been considered?			X	<i>Not found in the documents provided.</i>
d. Have the client / contractor safety requirements been considered and established?			X	<i>Not found in the documents provided.</i>
e. Is there a plan for safety briefings? How is it implemented?			X	<i>Not found in the documents provided.</i>

Project Risk Management				
a. Are there clear Objectives for Risk Management and a Risk Management Plan to execute the objectives? Expand.	X			<i>Yes. See PDF Pgs. 122-135.</i>
b. Is there a party responsibility for Risk Management? Expand.			X	<i>The Risk Register in Attachment N includes "owners" of each risk, is this sufficient?</i>
c. Have Risks to the construction schedule and options for mitigating them been considered? Expand.	X			<i>The information provided in PDF Pgs. 122-135 could fit the bill for this.</i>
d. What are the pivot/pull out/hard stop points to an ineffective project delivery plan or schedule?			X	<i>Not Found</i>

f. Did you consider a point where you bring in the contingency?	X			<i>There is a total Structures contingency of \$177,976 but there is no method described explaining how/when it should be used.</i>
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Bridge No.:	Owner: Iowa DOT (Appanoose Project)
Project Description: This project involves the replacement of the IA 5 bridge (Maint. No. 0415.2S005) over Cooper Creek, 1.5 miles north of IA 2.	

1. Introduction

How is the Project Management Plan used for the Project?

- What is the purpose of the PMP?
 - *The Project Manager, or designated representative, shall take and record item measurements and perform calculations to determine pay quantities for invoicing work performed.*
 - [Microsoft Word - SS-15008 \(iowadot.gov\)](#) (15008.04(A))
- Who is the PMP completed by?
 - *Iowa DOT*
- Who is the PMP directed to or how is it distributed?
 - *The PMP is directed to the awarded contractor for the project and is distributed through the Iowa DOT handbook.*
- Have all the acronyms and the abbreviations been explained?
 - *All acronyms and abbreviations have been explained in the Iowa DOT ERL library.*
 - [Section 1101 | Revised 10/18/2022 \(iowadot.gov\)](#)
- Where is the PMP stored and how can it be accessed?
 - *The PMP is stored in the Iowa DOT ERL library under the “Supplemental Specification” then under “Project Management”. This can be accessed through the hyperlink provided below.*
 - [Microsoft Word - SS-15008 \(iowadot.gov\)](#)

2. Goals, Objectives, and Metrics

What are the goals of the ABC project and how are they measured?

- List project goals

- *This bridge will be constructed on the existing vertical and horizontal alignment. New bridge approaches will be constructed. The existing guardrail will be replaced with updated guardrail and the shoulders will be paved 20 ft. beyond the ends of the guardrail. Class 10 will be necessary to flatten the existing foreslopes and to construct the new guardrail blisters. Class E revetment will be placed under the bridge for slope protection. New bridge end drains will be constructed on the north end of the bridge.*
- *(Appanoose Final Concept Page 5 of PDF)*
- List project objectives
 - *The existing 150 ft. x 28 ft. continuous I-beam bridge will be replaced with a 155 ft. x 44 ft., pretensioned prestressed concrete beam bridge. This bridge will be constructed using accelerated bridge construction (ABC), specifically the lateral slide method. The superstructure of the new bridge will be constructed just east of the existing bridge. When this is complete, the existing bridge will be removed and the new precast abutments will be set into place. The new superstructure will then be moved into position. Traffic will be detoured approximately 14 days during this process.*
 - *(Appanoose Final Concept Page 5 of PDF)*
- List the metrics to be used to track progress
 - *At the preconstruction conference, furnish the Engineer with a preliminary schedule. At least 5 calendar days prior to starting work; provide the Engineer with three copies of a satisfactory construction progress schedule. In the schedule include, as a minimum, a chronologically sequenced bar chart showing the proposed starting dates and durations, including the estimated number of weather delay days, for each item of work. Also in the schedule: 1) clearly show the controlling item of work for each day of the schedule, and the intended rate of production for each item of work; and 2) include project staging, project required milestones, and project suspensions that are 3 working days or longer.*
 - *(DS-15005 Page 1)*

3. Project Organization

How is the Project Organization and Communication managed?

- Provide Project management team and list their responsibilities
 - *Randall Schmidgall - ANR Pipeline Company*
 - *Field Engineer - Alliant Energy*
 - *Steve Hawkins - City of Centerville*
 - *Shannon Marlow - Iowa Communications Network*
 - *Jeff Klocko - Aureon Network Services*
 - *Scott Jackson - Rathbun Regional Water*
 - *Darrin Walker - Mediacom Cable*
 - *Locate Desk - Windstream Communications*
 - *(Appanoose Final Concept Page 12 of PDF)*
- Provide project management organization chart and team contact information
 - *Randall Schmidgall - (660)939-2145, randall.schmidgall@elpaso.com*
 - *Field Engineer - (800)255-4268, locate_IPL@alliantenergy.com*
 - *Steve Hawkins - (641)895-0164, publicworks@centerville-ia.org*

- Shannon Marlow - (800)572-3940, icnoutsideplantiowaonecall@iowa.gov
 - Jeff Klocko - (515)830-0445, jeff.klocko@areon.com
 - Scott Jackson - (641)647-1086, onecall@rrwa.et
 - Darrin Walker - (319)759-3786, dwalker@medi.comcc.com
 - Locate Desk - (800)289-1901, LOCATE>DESK@WINDSTREAM.COM
 - (*Appanoose Final Concept Page 12 of PDF*)
- Provide a communication plan for the project team
 - *The Administration rating applies to providing problem-free invoices with current format, referenced by the Agreement, as well as adherence to financial limits of the Agreement. Invoicing is also used as a communication mechanism to monitor progress throughout development. We anticipate receiving monthly progress reports or notification as to why not. Commentary on work completed to date and work anticipated should convey confidence that work is progressing relative to the percentage of completion.*
 - (iowadot.gov) (Page 14)

4. Project Communication

Who are the participants and what is the frequency of occurrence?

- Client Kickoff meetings
 - N/A
- Internal Kickoff meetings
 - N/A
- Progress and Project Status meetings
 - N/A
- Lessons Learned briefings
 - N/A

5. ABC Project Delivery

Is there a clear path for the project delivery?

- What is the Financial Plan?
 - N/A
- What are the Project Cost Estimates?

Bridge Items	<u>Estimated Costs</u>
New Bridge	\$ 1,432,000
Bridge Removal	29,400
Mobilization - 10%	146,140
M & C - 20%	<u>321,500</u>
Bridge Costs	\$ 1,929,040

Roadway Items	
Bridge Approaches	\$99,200
Removal of Pavement	5,600
Excavation Class 13 Waste	6,600
Excavation Class 20 Waste	5,400
Guardrail (Includes Removal)	14,600
Paved Shoulders for Guardrail	6,200
Class 10 for Guardrail Blisters	25,900
Bridge End Drains	6,800
Seeding and Fertilizing	4,000
Erosion Control	50,000
Possible Wetland Issues	10,000
Right of Way	10,000
Traffic Control - 5%	20,400
Mobilization - 5%	20,400
M & C - 30%	<u>122,200</u>
Roadway costs	\$ 407,300

Project Total **\$2,336,340**

- <https://drive.google.com/drive/folders/1ded-iGU8UpD8ncRT8vITXaeOqj4DdqB4>
- Has the Project Schedule been designed to meet the ABC goals ?
- N/A

6. Project Controls

Are the controls adequate to keep track of the status of the project?

- Have cost, schedule, scope, quality, safety, and security controls been established?
 - *Payment for Prefabricated Bridge Superstructure Temporary Works will be the Lump Sum contract price. Payment will be full compensation for furnishing a temporary support system for the prefabricated bridge superstructure and removal of temporary works for the support following the prefabricated bridge superstructure move. All the cost for engineering, equipment, labor and materials to complete the Prefabricated Bridge Superstructure Temporary Works shall be included in the contract price. (150925.05 BASIS OF PAYMENT)*
 - [Appanoose Co. ABC \(Lateral Slide\) - Google Drive](#)
- How are project changes managed and reported?
 - *The Engineer will use the progress schedule to identify controlling operations and as a check on the rate of progress. The Engineer will jointly review the schedule with the Contractor at least every 2 weeks to determine if progress is satisfactory. The Engineer may also request the Contractor revise the schedule for any of the following reasons:*
 - A. *The project completion or intermediate completion targets are delayed 10 working days or more.*

- B. *The Engineer determines that the progress of the work differs significantly from the current schedule such that it is unlikely the project will be completed within the contract period.*
- C. *A contract change order requires a revision of the Contractor's work sequence or the method of performing the work.*
- <https://drive.google.com/drive/folders/1ded-iGU8UpD8ncRT8vITXaeOqj4DdqB4>

7. ABC Implementation

- What ABC Technique was used?
- *Prefabricated Bridge Elements*

If **Prefabricated bridge elements and systems** are used, expand on the selection criteria and technique used to implement the technology. Some common techniques used in the implementation of PBES are listed below.

- Prefabricated Elements
 - *Furnish, erect and install a prefabricated bridge superstructure move system including temporary works. Move the prefabricated bridge superstructure constructed off of the existing alignment into its final position.*
 - *Include measuring equipment, procedures and locations of geometry control reference points on the superstructure and in the BSA. Establish longitudinal and lateral location reference points on the prefabricated superstructure that correspond to, or can be referenced to, appropriate longitudinal and lateral reference points at the erection site. (https://docs.google.com/document/d/1forlSNk6hBlxZ-M__Kvpj7VMrlzOuj0-C9-EfyfJB4I/edit)*
- Prefabricated Systems
 - *This specification is written assuming the Contractor will use a system to move the prefabricated bridge superstructure into its final position such as a guided slide of the bridge superstructure using temporary bearings and sliding track or a guided roll of the prefabricated bridge superstructure using heavy duty rollers and rolling track. (https://docs.google.com/document/d/1forlSNk6hBlxZ-M__Kvpj7VMrlzOuj0-C9-EfyfJB4I/edit)*

8. ABC Project Considerations as per ABC technique selected for the project

The following section of the document will discuss the **quality, safety, and risk management** and **must be associated and specific to the ABC technology and techniques used**. *The sections below are in reference to items that are likely already addressed in other project documents. Review each item and elaborate on any items that might be missing. The questions and checklist items below are a continuation of the elements to be considered when formulating a project management plan for ABC projects. Ideally, these items below should be used as thinking/consideration points which should be explained or provided in the PMP in some form.*

Project Scope

a. Are there effective scope reports detailing the list of activities for the successful completion of the project?			<input type="checkbox"/>	<i>Not found in the documents provided.</i>
b. Is there a clear traffic control plan during project construction?			<input type="checkbox"/>	<i>Not found in the documents provided.</i>
c. Is there a clear project specific safety, and security plan?			<input type="checkbox"/>	<i>Not found in the documents provided.</i>
d. Does the project include an established safety policy for the ABC technique?			<input type="checkbox"/>	<i>Not found in the documents provided.</i>
e. Is there a clear project communication plan for the public and shareholders, project internal and external communication?			<input type="checkbox"/>	<i>Not found in the documents provided.</i>

Project Construction				
a. Are the bridge components built onsite? If so, expand on the technologies used to deliver the project.			<input type="checkbox"/>	
b. Are the bridge components built offsite? If so, expand on the technologies used to deliver the project.	<input type="checkbox"/>			<p><i>"The intent for the method of moving is that it utilizes a guide system by which to provide guided means of maintaining and directing the move. This is understood to mean the use of a guide track or other such construction."</i></p> <p><i>https://docs.google.com/document/d/1forlSNk6hBlxZ-M__Kvpj7VMrlzOuj0-C9-EfyfJB4I/edit</i></p>

c. Do you have clear and defined ABC Project Schedule milestones? Expand on them.			<input type="checkbox"/>	<i>Not found in the documents provided.</i>
d. Have you identified items that require contingency plans? If not, why? If so, please give a summary of the contingency plans provided for those items			<input type="checkbox"/>	<i>Not found in the documents provided.</i>
e. Is there an acquisition strategy to execute the project most efficiently? Right of way, Design, and	<input type="checkbox"/>			<i>Bridge Staging Area (BSA) - a suggested BSA off of the existing alignment and within the Right of-Way and temporary easement for constructing the prefabricated bridge superstructure is shown in the plans. https://docs.google.com/document/d/1forlSNk6hBlxZ-M_Kvpj7VMrlzOuj0-C9-EfyfJB4I/edit</i>
f. Have the necessary permits been secured? Provide a list of the permits which have been secured.	<input type="checkbox"/>			<i>The Location and Environment Bureau has reviewed this bridge replacement project and based on preliminary desktop observations, it has determined that a Section 404 Permit may be required. It is expected that the work will be covered by Nationwide Permit 14. Possible wetlands are present in the project area and wetland mitigation may be required. Additional field work is required to determine if wetlands are present. https://docs.google.com/document/d/12Eyp3c7PwBUSIrfuwVpqfihUFVf8LYugbcQ3KmDrFI0/edit</i>

Project Quality

a. Are there clear goals and Objectives for Quality? Expand	<input type="checkbox"/>			<i>Replace existing bridge with a 155 ft. x 44 ft. pretensioned prestressed concrete beam bridge utilizing accelerated bridge construction, specifically, the lateral slide method. An off-site detour will be utilized</i>
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				<i>Replace existing bridge with a 184 ft. x 44 ft. pretensioned prestressed concrete beam bridge utilizing traditional bridge construction. An off-site detour will be utilized. https://docs.google.com/document/d/12Eyp3c7PwBUSIrfuwVpqfihUFVf8LYugbcQ3KmDrFI0/edit</i>
b. Is there a party responsibility for Quality? Expand	<input type="checkbox"/>			<i>Alternative 1 is the preferred alternative due to the shorter detour duration of 14 days for the ABC option, specifically the lateral slide, compared to approximately 180 days for traditional bridge construction. The estimated cost for Alternative 1 is \$2,336,340. Additional right of way may be required. Traffic will be maintained by an off-site detour. https://docs.google.com/document/d/12Eyp3c7PwBUSIrfuwVpqfihUFVf8LYugbcQ3KmDrFI0/edit</i>
c. Are there quality standards and plans for the project delivery?			<input type="checkbox"/>	<i>Not found in the documents provided.</i>
d. Has Quality Assurance been considered? If so, please expand on Design, construction, and operation?			<input type="checkbox"/>	<i>Not found in the documents provided.</i>
e. Is there a process for project quality review and owner verification			<input type="checkbox"/>	<i>Not found in the documents provided.</i>

Safety Plan				
a. Have safety requirements been identified?			<input type="checkbox"/>	<i>Not found in the documents provided.</i>
b. Has Personal Protection Equipment been provided?			<input type="checkbox"/>	<i>Not found in the documents provided.</i>

c. Have safety training or certification requirements been considered?			<input type="checkbox"/>	<i>Not found in the documents provided.</i>
d. Have the client / contractor safety requirements been considered and established?			<input type="checkbox"/>	<i>Not found in the documents provided.</i>
e. Is there a plan for safety briefings? How is it implemented?			<input type="checkbox"/>	<i>Not found in the documents provided.</i>

Project Risk Management				
a. Are there clear Objectives for Risk Management and a Risk Management Plan to execute the objectives? Expand.			<input type="checkbox"/>	<i>Not found in the documents provided.</i>
b. Is there a party responsibility for Risk Management? Expand.			<input type="checkbox"/>	<i>Not found in the documents provided.</i>
c. Have Risks to the construction schedule and options for mitigating them been considered? Expand.			<input type="checkbox"/>	<i>Not found in the documents provided.</i>
d. What are the pivot/pull out/hard stop points to an ineffective project delivery plan or schedule?			<input type="checkbox"/>	<i>Not found in the documents provided.</i>
f. Did you consider a point where you bring in the contingency?			<input type="checkbox"/>	<i>Not found in the documents provided.</i>

Bridge No.:	Owner: Iowa DOT (Mahaska Project)
Project Description: This project involves the replacement of the IA 92 bridge (Maint. No. 6278.0S092) over Muchakinock Creek, 1.3 miles west of IA 163. All three alternatives considered involve a grade raise of approximately 4.5 feet to reduce overtopping. Roadway overtopping occurs approximately every two years during heavy rainfall events:	

Template guide to creating ABC PMP

The questions below are provided as guidance for the elements to be considered when formulating a project management plan for ABC projects

1. Introduction

How is the Project Management Plan used for the Project?

- What is the purpose of the PMP?
 - *The Project Manager, or designated representative, shall take and record item measurements and perform calculations to determine pay quantities for invoicing work performed.*
 - [Microsoft Word - SS-15008 \(iowadot.gov\)](#) (15008.04(A))
- Who is the PMP completed by?
 - *Iowa DOT*
- Who is the PMP directed to or how is it distributed?
 - *The PMP is directed to the awarded contractor for the project and is distributed through the Iowa DOT handbook.*
- Have all the acronyms and the abbreviations been explained?
 - *All acronyms and abbreviations have been explained in the Iowa DOT ERL library.*
 - [Section 1101 | Revised 10/18/2022 \(iowadot.gov\)](#)
- Where is the PMP stored and how can it be accessed?
 - *The PMP is stored in the Iowa DOT ERL library under the “Supplemental Specification” then under “Project Management”. This can be accessed through the hyperlink provided below.*
 - [Microsoft Word - SS-15008 \(iowadot.gov\)](#)

2. Goals, Objectives, and Metrics

What are the goals of the ABC project and how are they measured?

- List project goals
 - *This project involves the replacement of the IA 92 bridge (Maint. No. 6278.0S092) over Muchakinock Creek, 1.3 miles west of IA 163.*
 - [6209201013 Mahaska Final Concept - Google Docs](#) (Page 1)
- List project objectives
 - *3 Alternatives:*
 - *1. The existing bridge will be replaced with a 242 ft. x 44 ft. prestressed beam bridge using an off-site detour. The estimated cost for this alternative is \$2,740,200.*
 - *2. The existing bridge will be replaced with a 242 ft. x 44 ft. prestressed beam bridge using accelerated bridge construction (ABC) methods. The new superstructure bridge will be constructed just south of the existing bridge and then slid into place. IA 92 will be closed and traffic detoured for 21 days. The estimated cost for this alternative is \$3,470,300.*
 - *The existing bridge will be replaced with a 242 ft. x 44 ft. prestressed beam bridge using a two-lane runaround on the south side of IA 92. The estimated cost for this alternative is \$4,789,800.*
 - [6209201013 Mahaska Final Concept - Google Docs](#) (Page 1)

- List the metrics to be used to track progress
- *During the life of the project, the Contractor shall review the CPM progress schedule with the Engineer biweekly unless otherwise specified. The Contractor shall submit a revised CPM progress schedule within 5 working days of the review meeting if the Contractor is behind schedule or if the schedule has been modified. All revised CPM progress schedules must be approved by the Engineer. For each revised CPM progress schedule, the Contractor shall submit three copies to the Engineer.*
- [Section 1110 | Revised 10/18/2022 \(iowadot.gov\)](#) (1110.04 (B))

3. Project Organization

How is the Project Organization and Communication managed?

- Provide Project management team and list their responsibilities
- N/A
- Provide project management organization chart and team contact information
- N/A
- Provide a communication plan for the project team
- *The Administration rating applies to providing problem-free invoices with current format, referenced by the Agreement, as well as adherence to financial limits of the Agreement. Invoicing is also used as a communication mechanism to monitor progress throughout development. We anticipate receiving monthly progress reports or notification as to why not. Commentary on work completed to date and work anticipated should convey confidence that work is progressing relative to the percentage of completion.*
- [\(iowadot.gov\)](#) (Page 14)

4. Project Communication

Who are the participants and what is the frequency of occurrence?

- Client Kickoff meetings
- N/A
- Internal Kickoff meetings
- N/A
- Progress and Project Status meetings
- N/A
- Lessons Learned briefings
- N/A

5. ABC Project Delivery

Is there a clear path for the project delivery?

- What is the Financial Plan?

Alternative 1 – Bridge Replacement with an off-site detour

Construction Cost - \$2,740,200
 User Costs \$837,000
 County Road Maint. \$55,000
Detour Signing \$10,000
 Total Cost \$3,642,200

Alternative 2- Bridge Replacement using ABC Construction

Construction Cost - \$3,470,300
 User Costs \$117,000
 County Road Maint. \$8,000
Detour Signing \$10,000
 Total Cost \$3,605,300

Alternative 3- Bridge Replacement with an on-site runaround

Construction Cost - \$4,789,800
 User Costs \$0
 County Road Maint. \$0
Detour Signing \$0
 Total Cost \$4,789,800

(https://docs.google.com/document/d/1DuWL_iQfJrrFszMOi45FYymXkK6FivzPsOYMON-Qq14/edit) (C. Recommendations)

- What are the Project Cost Estimates?
- <https://drive.google.com/drive/folders/1cedjRn8d3zTmx2Mm-Gpsadye2fphQln->
- Has the Project Schedule been designed to meet the ABC goals?
- N/A

6. Project Controls

Are the controls adequate to keep track of the status of the project?

- Have cost, schedule, scope, quality, safety, and security controls been established?
- Yes in 6209201013 Mahaska Final Concept C. Recommendations
- How are project changes managed and reported?
- N/A

7. ABC Implementation

- What ABC Technique was used?
- Prefabricated Bridge Elements

If **Prefabricated bridge elements and systems** are used, expand on the selection criteria and technique used to implement the technology. Some common techniques used in the implementation of PBES are listed below.

- Prefabricated Elements

- *Furnish, erect and install a prefabricated bridge superstructure move system including temporary works. Move the prefabricated bridge superstructure constructed off of the existing alignment into its final position.*
- *Include measuring equipment, procedures and locations of geometry control reference points on the superstructure and in the BSA. Establish longitudinal and lateral location reference points on the prefabricated superstructure that correspond to, or can be referenced to, appropriate longitudinal and lateral reference points at the erection site. (https://docs.google.com/document/d/1forlSNk6hBlxZ-M__Kvpj7VMrlzOuj0-C9-EfyfJB4I/edit)*
- Prefabricated Systems
 - *This specification is written assuming the Contractor will use a system to move the prefabricated bridge superstructure into its final position such as a guided slide of the bridge superstructure using temporary bearings and sliding track or a guided roll of the prefabricated bridge superstructure using heavy duty rollers and rolling track. (https://docs.google.com/document/d/1forlSNk6hBlxZ-M__Kvpj7VMrlzOuj0-C9-EfyfJB4I/edit)*

8. ABC Project Considerations as per ABC technique selected for the project

The following section of the document will discuss the **quality, safety, and risk management** and **must be associated and specific to the ABC technology and techniques used**. *The sections below are in reference to items that are likely already addressed in other project documents. Review each item and elaborate on any items that might be missing. The questions and checklist items below are a continuation of the elements to be considered when formulating a project management plan for ABC projects. Ideally, these items below should be used as thinking/consideration points which should be explained or provided in the PMP in some form.*

Question/Issue	Yes	No	N/A	Comments
Project Scope				
a. Are there effective scope reports detailing the list of activities for the successful completion of the project?			<input type="checkbox"/>	<i>Not found in the documents provided.</i>
b. Is there a clear traffic control plan during project construction?	<input type="checkbox"/>			<i>Traffic will be maintained on an off-site detour. It is anticipated the detour will be in place for approximately 150 days. The detour would follow County Road T17 at the junction of IA 92 and County Road T17, then north on County Road T17 to IA 163 then west to the junction of</i>

				<i>IA 92. Out of distance travel is 7.4 miles.</i>
c. Is there a clear project specific safety, and security plan?			<input type="checkbox"/>	<i>Not found in the documents provided.</i>
d. Does the project include an established safety policy for the ABC technique?			<input type="checkbox"/>	<i>Not found in the documents provided.</i>
e. Is there a clear project communication plan for the public and shareholders, project internal and external communication?			<input type="checkbox"/>	<i>Not found in the documents provided.</i>

Project Construction				
a. Are the bridge components built onsite? If so, expand on the technologies used to deliver the project.			<input type="checkbox"/>	
b. Are the bridge components built offsite? If so, expand on the technologies used to deliver the project.	<input type="checkbox"/>			<i>"The intent for the method of moving is that it utilizes a guide system by which to provide guided means of maintaining and directing the move. This is understood to mean the use of a guide track or other such construction." https://docs.google.com/document/d/1forlSNk6hBlxZ-M__Kvpj7VMrlzOuj0-C9-EfyfJB4I/edit</i>
c. Do you have clear and defined ABC Project Schedule milestones? Expand on them.			<input type="checkbox"/>	<i>Not found in the documents provided.</i>

<p>d. Have you identified items that require contingency plans? If not, why? If so, please give a summary of the contingency plans provided for those items</p>	<input type="checkbox"/>		<p><i>Bridge Items Estimated Costs Replacement Bridge \$ 1,301,100 Detour Bridge 198,000 Revetment 60,000 Excavation 13,500 Contingency Additive 252,000 Mobilization - 10% 157,300 M & C - 20% 396,400 Bridge Costs \$ 2,378,300 (https://docs.google.com/document/d/1DuWL_iQfJrrFszMOi45FYmXkK6FivzPsOYMON-Qq14/edit)</i></p>
<p>e. Is there an acquisition strategy to execute the project most efficiently? Right of way, Design, and</p>	<input type="checkbox"/>		<p><i>Bridge Staging Area (BSA) - a suggested BSA off of the existing alignment and within the Right of-Way and temporary easement for constructing the prefabricated bridge superstructure is shown in the plans. https://docs.google.com/document/d/1forlSNk6hBlxZ-M_Kvpj7VMrlzOuj0-C9-EfyfJB4I/edit</i></p>
<p>f. Have the necessary permits been secured? Provide a list of the permits which have been secured.</p>	<input type="checkbox"/>		<p><i>The Office of Location and Environment has reviewed this project and based on preliminary desktop observations, has determined that a Section 404 Permit will be required. It is expected that the work will be covered by Nationwide Permit 14 or Regional Permit 7. (https://docs.google.com/document/d/1DuWL_iQfJrrFszMOi45FYmXkK6FivzPsOYMON-Qq14/edit)</i></p>

Project Quality				
<p>a. Are there clear goals and Objectives for Quality? Expand</p>	<input type="checkbox"/>		<p><i>The existing 145° x 30* continuous concrete slab bridge will be replaced with a 2 span, 242* x 44* prestressed beam bridge. The existing grade will need to be raised a minimum of 4.5 ft. which will require approximately 1,450 ft. of roadway reconstruction. The grade raise will reduce roadway overtopping during heavy rainfall</i></p>	

				<p>events from a 2 year to a 100 year frequency.</p> <p>The typical cross section adjacent to the bridge will consist of a 24 ft. roadway with 10 ft. effective shoulders (4 ft. outside pavement, additional 6 ft. granular) and 6:1/3:1 foreslopes. The pavement will be 9.5" thick of PCC on 12" of modified subbase.</p> <p>(https://docs.google.com/document/d/1DuWL_iQfJrrFszMOi45FYmXkK6FivzPsOYMON-Qq14/edit)</p>
<p>b. Is there a party responsibility for Quality? Expand</p>	<input type="checkbox"/>			<p>New bridge approaches will be constructed. The existing guardrail will be replaced with new guardrail and the shoulders will be paved 20 ft. beyond the ends of the guardrail. Class 10 will be necessary to flatten the existing foreslopes and to construct the new guardrail blisters. Class E revetment will be placed under the bridge for slope protection. New bridge end drains will be constructed on the west end of the bridge.</p> <p>(https://docs.google.com/document/d/1DuWL_iQfJrrFszMOi45FYmXkK6FivzPsOYMON-Qq14/edit)</p>
<p>c. Are there quality standards and plans for the project delivery?</p>			<input type="checkbox"/>	<p>Not found in the documents provided.</p>
<p>d. Has Quality Assurance been considered? If so, please expand on Design, construction, and operation?</p>			<input type="checkbox"/>	<p>Not found in the documents provided.</p>
<p>e. Is there a process for project quality review and owner verification</p>			<input type="checkbox"/>	<p>Not found in the documents provided.</p>

Safety Plan				
a. Have safety requirements been identified?			<input type="checkbox"/>	<i>Not found in the documents provided.</i>
b. Has Personal Protection Equipment been provided?			<input type="checkbox"/>	<i>Not found in the documents provided.</i>
c. Have safety training or certification requirements been considered?			<input type="checkbox"/>	<i>Not found in the documents provided.</i>
d. Have the client / contractor safety requirements been considered and established?			<input type="checkbox"/>	<i>Not found in the documents provided.</i>
e. Is there a plan for safety briefings? How is it implemented?			<input type="checkbox"/>	<i>Not found in the documents provided.</i>

Project Risk Management				
a. Are there clear Objectives for Risk Management and a Risk Management Plan to execute the objectives? Expand.			<input type="checkbox"/>	<i>Not found in the documents provided.</i>
b. Is there a party responsibility for Risk Management? Expand.			<input type="checkbox"/>	<i>Not found in the documents provided.</i>
c. Have Risks to the construction schedule and options for mitigating them been considered? Expand.			<input type="checkbox"/>	<i>Not found in the documents provided.</i>
d. What are the pivot/pull out/hard stop points to an ineffective project delivery plan or schedule?			<input type="checkbox"/>	<i>Not found in the documents provided.</i>
f. Did you consider a point where you bring in the contingency?			<input type="checkbox"/>	<i>Not found in the documents provided.</i>

Bridge No.:	Owner: Oklahoma DOT
Project Description: <i>The Oklahoma Department of Transportation (ODOT) is presenting this application for Better Utilizing Investments to Leverage Development (BUILD) funding for the reconstruction of the structurally deficient multi-span pony truss bridge on current US-281 (old Route 66) over the Canadian River between Canadian and Caddo Counties in Oklahoma.</i>	

1. Introduction

How is the Project Management Plan used for the Project?

- What is the purpose of the PMP?
 - *The Project Management Division works directly with and assists the Field Division Engineers in the development of their respective Division's Construction Work Plan and in the subsequent daily management of the project development activities. [cwp_ffy2016-2023.pdf \(odot.org\)](#)*
- Who is the PMP completed by?
 - *The Director, Deputy Director and the Chief Engineer, in concert with the Director of Engineering, Director of Operations, Director of Capital Programs, the Programs Division, the Project Management Division and the Field Division Engineers work to fiscally constrained and balance the Construction Work Plan in accordance with the allocation requirements of the applicable Federal funding categories. [cwp_ffy2016-2023.pdf \(odot.org\)](#)*
- Who is the PMP directed to or how is it distributed?
 - *N/A*
- Have all the acronyms and the abbreviations been explained?
 - *N/A*
- Where is the PMP stored and how can it be accessed?
 - *Project Management Division: [cwp_ffy2016-2023.pdf \(odot.org\)](#)*

2. Goals, Objectives, and Metrics

What are the goals of the ABC project and how are they measured?

- List project goals
 - *The Oklahoma Department of Transportation (ODOT) is presenting this application for Better Utilizing Investments to Leverage Development (BUILD) funding for the reconstruction of the structurally deficient multi-span pony truss bridge on current US-281 (old Route 66) over the Canadian River between Canadian and Caddo Counties in Oklahoma. (Bridgeport Grant Application Page 1).*
- List project objectives
 - *The project proposed in this application will reconstruct the bridge on its current alignment with a 28-foot width. The reconstruction of the bridge will include replacing the substructure, deck and entire superstructure. The historic pony trusses will be re-attached to maintain the historic*

integrity of the original bridge. The bridge will also be repainted and restored to its original look. (Bridgeport Grant Application Page 6).

- List the metrics to be used to track progress
- N/A

3. Project Organization

How is the Project Organization and Communication managed?

- Provide Project management team and list their responsibilities
 - *Mark E. Willy - President*
 - *Kristin Magley - Equal Employment Officer*
 - *Greg Williams - Safety Officer*
 - *Reed Wood - Executive Superintendent*
 - *Riley Flatt - Project Manager*
 - *TBD - Bridge Foreman/Supt.*
- Provide project management organization chart and team contact information
 - *Mark E. Willy - Office: (405)263-7787, Mobile: (405)850-4713*
 - *Kristin Magley - Office: (405)844-4688*
 - *Greg Williams - Mobile: (405)627-6417*
 - *Reed Wood - Mobile: (918)781-9997*
 - *Riley Flatt - (405)245-5464*
 - *Bridge Foreman/Supt. - TBD*
- Provide a communication plan for the project team
 - N/A

4. Project Communication

Who are the participants and what is the frequency of occurrence?

- Client Kickoff meetings
 - N/A
- Internal Kickoff meetings
 - N/A
- Progress and Project Status meetings
 - *Contractor will provide an up-to-date schedule or show progress on the existing schedule at each progress meeting. Progress meetings will be held 2nd and 4th Thursdays of the month at 1:45 PM. (Bridgeport Documents Pre Work Agenda Page 3).*
- Lessons Learned briefings
 - *ODOT will apply lessons learned and use the same agency contacts and coordination methods that successfully delivered that project to completion on schedule. (Bridgeport Grant Application Page 29).*

5. ABC Project Delivery

Is there a clear path for the project delivery?

- What is the Financial Plan?
 - *In summary, ODOT is proposing to fund approximately \$12.9 million of the total future eligible project costs of \$34.9 million through obligated State sources and is requesting \$22 million in BUILD funds from USDOT. The contribution from ODOT's State match represents 37% of the total project cost, which it intends to use for construction of the project. Pre-construction costs are currently receiving other federal assistance and are not included in the funds eligible for BUILD assistance. (Grant Application Page 11).*
- What are the Project Cost Estimates?
 - *In summary, ODOT is proposing to fund approximately \$12.9 million of the total future eligible project costs of \$34.9 million through obligated State sources and is requesting \$22 million in BUILD funds from USDOT. The contribution from ODOT's State match represents 37% of the total project cost, which it intends to use for construction of the project. (Grant Application Page 11).*
- Has the Project Schedule been designed to meet the ABC goals ?
 - *N/A*

6. Project Controls

Are the controls adequate to keep track of the status of the project?

- *Have cost, schedule, scope, quality, safety, and security controls been established?*
 - *Contractor shall comply with all Federal, State, and local laws governing safety, health, and sanitation (Trench Boxes, Safety lanyards, PPE, etc...) 2. All Contractor vehicles working around traffic should have the Contractor name on vehicle and emergency/caution flashers. (Bridgeport Documents Pre Work Agenda Page 4).*
- How are project changes managed and reported?
 - *Immediately notify the Engineer verbally of any delay or differing site condition.*
 - *2. Within 7 days, submit a letter with details about any change in conditions, work, or delays per 104.06A. The Resident will have 10 days to review this letter. Unaffected work shall continue. (Bridgeport Documents Pre Work Agenda Page 6).*

7. ABC Implementation

- What ABC Technique was used?

If **Prefabricated bridge elements and systems** are used, expand on the selection criteria and technique used to implement the technology. Some common techniques used in the implementation of PBES are listed below.

- Prefabricated Elements
 - *The precast elements create an efficient system that is compatible with conventionally constructed abutment elements and are capable of carrying bridge loads with predictable and reliable performance. (Grant Application Page 22).*
- Prefabricated Systems
 - *The precast prefabricated abutment system is an innovation to help reduce bridge construction time (Figure 13). The technology consists of prefabricated precast abutment elements cast on or off-site utilizing standard materials. (Grant Application Page 22).*

8. ABC Project Considerations as per ABC technique selected for the project

The following section of the document will discuss the **quality, safety, and risk management** and **must be associated and specific to the ABC technology and techniques used**. *The sections below are in reference to items that are likely already addressed in other project documents. Review each item and elaborate on any items that might be missing. The questions and checklist items below are a continuation of the elements to be considered when formulating a project management plan for ABC projects. Ideally, these items below should be used as thinking/consideration points which should be explained or provided in the PMP in some form.*

Question/Issue	Yes	No	N/A	Comments
Project Scope				
a. Are there effective scope reports detailing the list of activities for the successful completion of the project?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
b. Is there a clear traffic control plan during project construction?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<i>Prime Contractor is responsible for all traffic control on the project, including all signage and traffic control performed by subcontractors. Signs and traffic control devices must conform to the Manual on Uniform Traffic Control Devices, Chapter 6 (current edition) and applicable ODOT Standard Drawings. (Pre Work Agenda Page 4)</i>
c. Is there a clear project specific safety, and security plan?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
d. Does the project include an established safety policy for the ABC technique?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

e. Is there a clear project communication plan for the public and shareholders, project internal and external communication?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<i>After additional Section 106 consulting party comments have been reviewed and preliminary engineering design is complete for the selected alternative, ODOT will schedule a public meeting to obtain input from the local residents, as well as interested parties and stakeholders. This meeting is planned for October 2020. (Grant Application Page 27).</i>
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Project Construction				
a. Are the bridge components built onsite? If so, expand on the technologies used to deliver the project.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
b. Are the bridge components built offsite? If so, expand on the technologies used to deliver the project.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<i>ODOT plans to employ several innovative and cost-effective design solutions which include pre-cast concrete components that can be constructed in large quantities off-site and can be easily delivered and assembled in sections according to a predetermined order and schedule. (Grant Application Page 21).</i>
c. Do you have clear and defined ABC Project Schedule milestones? Expand on them.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<i>The illustration of the major project milestones is outlined in the summary of schedule highlights below (see Figure 14), and the detailed project schedule is included in US-281 Bridgeport BUILD. The schedule shows the completion dates for design, permits, required approvals, and construction, meeting all BUILD-required milestones. (Grant Application Page 24).</i>

d. Have you identified items that require contingency plans? If not, why? If so, please give a summary of the contingency plans provided for those items	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<i>“Construction Estimate includes 15% Contingency” (Grant Application Page 11).</i>
e. Is there an acquisition strategy to execute the project most efficiently? Right of way, Design, and construction.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<i>Right-of-way acquisition and utility relocations are not anticipated. All necessary activities will be completed to allow BUILD funds to be obligated by late 2021, well in advance of the September 30, 2022 deadline, and for construction to be completed by 2023 in order to be open to traffic in advance of the Route 66 Centennial in 2026. (Grant Application Page 24).</i>
f. Have the necessary permits been secured? Provide a list of the permits which have been secured.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<i>The only permitting anticipated for the project is a Section 404 Permit, to be coordinated with the U.S. Army Corps of Engineers (USACE) in accordance with the Clean Water Act of 1972. (Grant Application Page 27).</i>

Project Quality				
a. Are there clear goals and Objectives for Quality? Expand	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<i>The Oklahoma Department of Transportation (ODOT) is presenting this application for Better Utilizing Investments to Leverage Development (BUILD) funding for the reconstruction of the structurally deficient multi-span pony truss bridge on current US-281 (old Route 66) over the Canadian River between Canadian and Caddo Counties in Oklahoma. (Bridgeport Grant Application Page 6).</i>
b. Is there a party responsibility for Quality? Expand	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
c. Are there quality standards and plans for the project delivery?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<i>The project will be constructed to avoid adverse environmental impacts to water quality, wetlands, and endangered species as much as</i>

				<p><i>possible. The Canadian River provides designated critical habitat for the Arkansas River Shiner, listed by U. S. Fish and Wildlife Service (USFWS) as a threatened species (Figure 10). Any construction within 300 feet of the ordinary highwater mark of the river is considered an impact to this habitat and requires formal Section 7 consultation with the USFWS. (Grant Application Page 29).</i></p>
<p>d. Has Quality Assurance been considered? If so, please expand on Design, construction, and operation?</p>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<p><i>Work in the river can be completed outside of the shiner spawning season (approximately May 1 – Aug 30), thus minimizing impact to the ongoing sustainability of this species and the water resources. ODOT will coordinate the USFWS consultation through its designated liaison, which will streamline the process while resulting in outcomes that protect the species and its habitat. (Grant Application Page 19).</i></p>
<p>e. Is there a process for project quality review and owner verification</p>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

Safety Plan				
<p>a. Have safety requirements been identified?</p>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<p><i>Safety is of primary concern in the planning, design and construction of all ODOT projects. ODOT's mission statement reads, in part, " ...to provide a safe, economical and effective transportation network for the people, commerce and communities of Oklahoma." (Grant Application Page 13).</i></p>

b. Has Personal Protection Equipment been provided?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<i>Contractor shall comply with all Federal, State, and local laws governing safety, health, and sanitation (Trench Boxes, Safety lanyards, PPE, etc...) (Pre Work Agenda Page 4).</i>
c. Have safety training or certification requirements been considered?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
d. Have the client / contractor safety requirements been considered and established?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
e. Is there a plan for safety briefings? How is it implemented?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

Project Risk Management				
a. Are there clear Objectives for Risk Management and a Risk Management Plan to execute the objectives? Expand.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<ul style="list-style-type: none"> - <i>To provide risk management services to all state entities and other entities provided by law.</i> - <i>To stabilize and lower insurance costs for the State of Oklahoma.</i> - <i>To manage the Risk Management Department's budget efficiently.</i> - <i>To have Total Continuous Improvement (TCI) in the Risk Management Department processes.</i> - <i>To provide opportunities for personal growth for all staff members of the Risk Management Department.</i> About (oklahoma.gov)
b. Is there a party responsibility for Risk Management? Expand.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<p><i>Risk Management's client base includes: all state agencies including higher education, rural fire districts, motor license agents, foster care parents and conservation districts.</i></p> About (oklahoma.gov)

c. Have Risks to the construction schedule and options for mitigating them been considered? Expand.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
d. What are the pivot/pull out/hard stop points to an ineffective project delivery plan or schedule?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
f. Did you consider a point where you bring in the contingency?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

Guidelines for Completing the Template

Project Introduction

This part of the project management plan provides background information. This information is intended to answer the question regarding the purpose, the author, the recipient, and accessibility of the PMP. This section is also going to provide an explanation of the abbreviations to be used in the PMP. The PMP could be completed by multiple authors.

Project Goals, Objectives, and Metrics

In this section, the questions which must be answered are, what are the goals of the ABC project and how are they measured? These goals, objectives and metrics may be in the form of design, construction, traffic control and delay minimization during construction, and other aspects involved in the delivery of the ABC Projects. This summary is meant to give the Project owner or manager a quick rundown of what to expect as the details of the report build up in later parts of the PMP.

Organizational Management and Communication

The project management team should be organized in such a way to achieve all of the stated project objectives and goals from managerial, technical, oversight, and decision-making perspectives. This section of the project management plan should outline the organizational structure for the project and define the roles and responsibilities of the agency leadership and the project team. The plan should explain how the project team members are expected to collaborate with each other throughout the course of the project implementation process. Examples of roles and responsibilities may include senior leadership, project managers, technical support or subject matter experts from Project Sponsors, consultants, contractors and partnering agencies. A graphical representation of the organization such as organizational chart should be included for clarity. A communication plan with the public and other shareholders should be considered and provided.

Project Controls

Project Controls is a process that encompasses the resources, procedures, and tools for the planning, monitoring, and controlling of all phases of the capital project lifecycle. This includes estimating, cost and schedule management, risk management, and change management

Project Scope

The scope document details the list of activities for the successful completion of the project. The scope is defined by understanding the project requirements and the client's expectations. The scope statement usually contains project deliverables. The scope should focus on the technical range of work to be completed for the delivery of the ABC project. This part of the project should include the traffic control, safety and security plans, and public and shareholder communication plans. Communicating with stakeholders. A proactive communication plan with stakeholders is essential to increasing awareness, minimizing traffic and economic disruption, building trust, and gaining project buy-in. The following can also be included, that is, Site Information- Need, Traffic, Design Criteria, Inspection Report Summary, Hydraulics, Utilities, Right of Way, Environmental Resources.

Project Delivery

Determining the appropriate method of ABC for a specific project is highly dependent on the Maintenance of Traffic requirements at the site, the site geometrics and project funding.

ABC methods are in two main categories:

1. **Offsite Construction.** Constructs the bridge outside of the final location using normal construction and/or prefabricated elements. Once construction is essentially complete, the bridge is moved into place.
2. **Onsite Construction.** Constructs the bridge in its final location using prefabricated elements to accelerate construction. Prefabricated elements range from localized use of prefabricated elements to structures entirely composed of prefabricated elements.

Onsite ABC Technologies

There are a variety of available ABC technologies which are classified under five different headings:

- Foundation and wall elements
- Rapid embankment construction
- Prefabricated bridge elements and systems (PBES)
- Structural placement methods
- Fast track contracting

The first four components focus primarily on methods designed to accelerate the actual on-site bridge construction. The fifth technology is primarily concerned with accelerating project delivery using contracting methods and language.

Offsite ABC Technologies

These are the following offsite techniques which are currently being used in the delivery of ABC projects. There are mainly 4 methods, and these are presented below.

- Lateral Slides

- SPMT moves
- Longitudinal Launches
- Crane Based

Project Quality

Specifications often specify construction tolerances for component dimensions and component placement. The tolerances in the Specifications may not be suitable for proper fit-up between prefabricated bridge elements and placement of prefabricated bridge systems. Additionally, the Specifications may not address construction tolerances that are important to the successful implementation of a particular ABC technology. There should be a careful consideration of the tolerances for a successful project. The project team should establish the party responsible for quality control during the delivery of the project. The project team completes quality project milestone reviews frequently with the owner. There should also be clearly stated project quality goals, standards to be followed, milestone reviews and processes which the owner can use to access project quality reports.

Safety Plan

The safety plan provided must be specific to the ABC technique selected for the project and must address safety requirements, the provision of Personal Protection Equipment, client / contractor safety requirements and plans for safety briefings.

Project Risk Management

Managing risks on projects is a process that includes risk assessment and a mitigation strategy for those risks. Risk assessment includes both the identification of potential risk and the evaluation of the potential impact of the risk. For example, risk to schedule can be managed through simplicity of design, clear detailing, proactive mitigation of risk items, work plans and communication with stakeholders. A simple design is easier and faster to construct. Prefabricated elements should be designed to avoid complex geometry and connections, account for tolerances, and sized to ensure economical transport and erection. Overly complicated designs have the inherent risk of fit-up issues in the field that can result in unwanted delays to the construction schedule.

Utility relocations, railroad coordination, environmental windows, temperature sensitive curing, and foundation type can also pose a significant risk to the schedule. Management of these risks requires proactive communication with stakeholders early in the project development. Construction activities with risks that cannot be effectively reduced or eliminated should be moved off the critical path in the construction schedule when possible. **Risks to the construction schedule and options for mitigating them should be included in the creation of the PMP.** The risk management plan should also include identifiers or pivot/pull out/hard stop points to an ineffective project delivery plan or schedule which allow for the implementation of the contingency plan.

