Project Management Planning

FE302 Advanced Facility Engineering
Lesson 6

Objectives

Given project management plan documentation, assess the adequacy of selected portions of a project management plan in support of construction projects

- Determine the necessary constituency of selected elements of the project management plan (including the communications plan, quality assurance plan and safety management plan) appropriate to the nature of the project
- Given a proposed change management plan, be able to create a change management method to account for changes to the project.
- Discuss the current trends in construction management

Project Management Planning Introduction

"Long range planning does not deal with future decisions, but the future of present decisions." Peter Drucker (1909 – 2005)

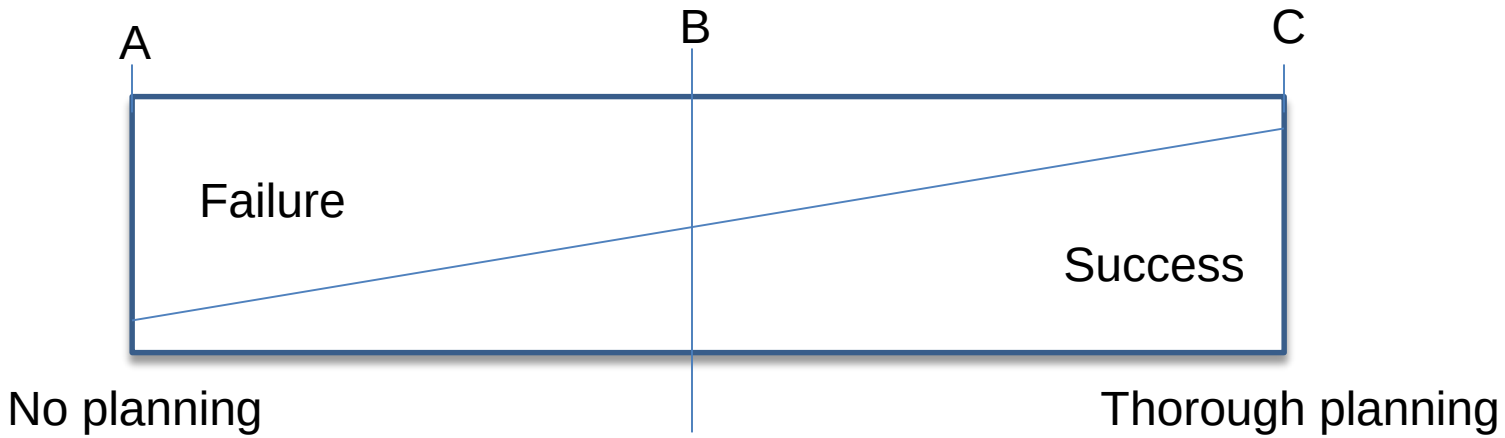
"Acquisition planning" means the process by which the efforts of all personnel responsible for an acquisition are coordinated and integrated through a comprehensive plan for fulfilling the agency need in a timely manner and at a reasonable cost. It includes developing the overall strategy for managing the acquisition. (FAR 2.101)

The process of defining, preparing and coordinating all subsidiary plans and integrating them into a comprehensive project management plan. The key benefit of this process is a central document that defines the basis of all project work. (PMBOK Guide) – 5th Ed. p. 72)

“Plans are nothing; planning is everything.”
Dwight D. Eisenhower

Project Management Plans

Why Plan?



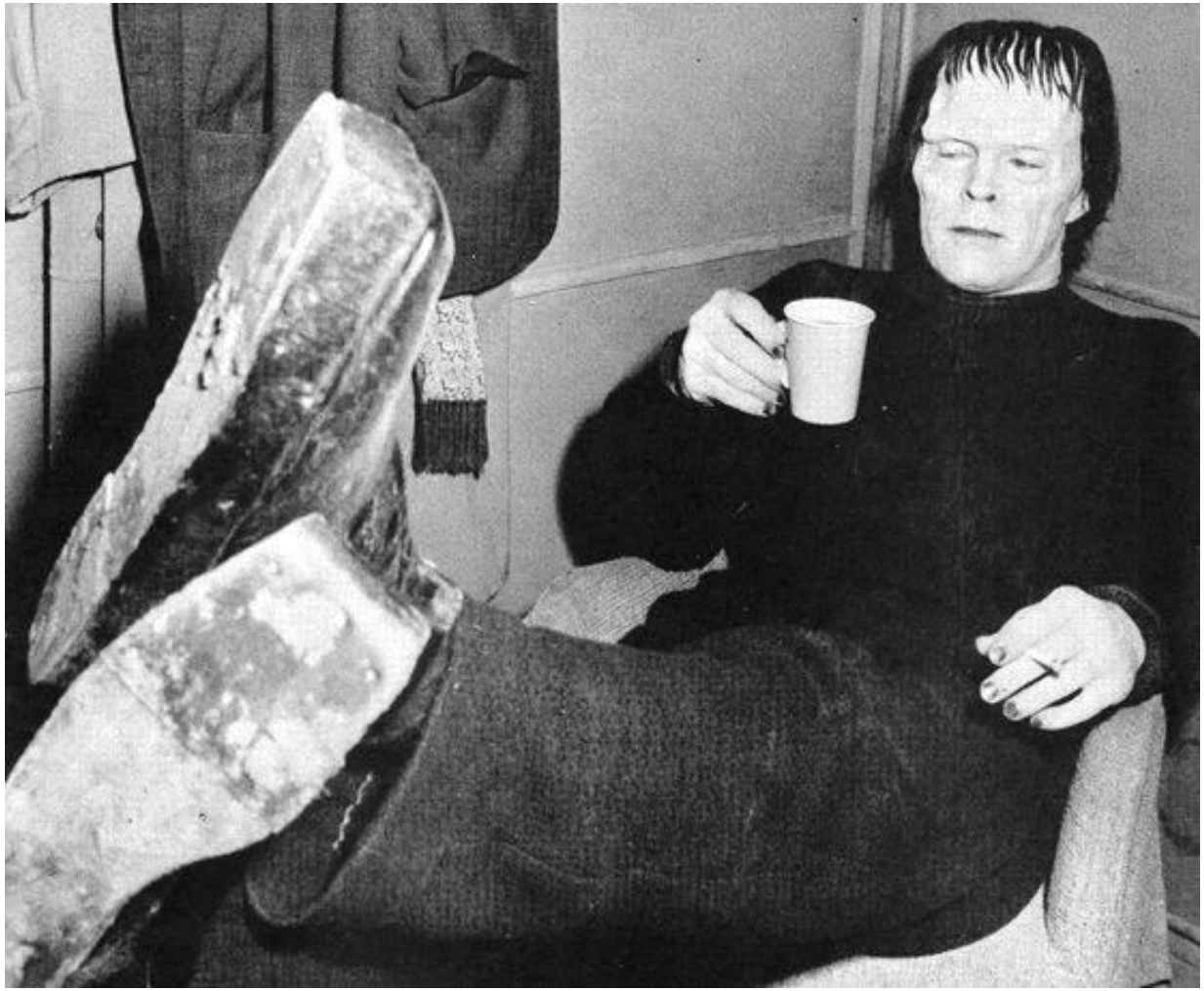
What are the likely outcomes at no planning at point A?
What about some planning? (B)
What are the likely outcome of thorough planning at point C?

Project Management Plan?

- Establishes the framework for executing a project: design, procurement and construction
- Establishes project scope, budget, design, resource requirements, roles and responsibilities of the interfacing agencies
- Technical performance requirements; milestones, schedule
- Defines milestones, tasks and activities
- Describes commitments of participants

"It's ALIVE!!!!!!!!!!"

The PMP – “IT’S ALIVE!!!!”



The Project Management Plan (PMP)

Outlines the project scope, budget, design, construction resource requirement and roles and responsibilities of the parties

It is a living document that is changed to meet the needs of the project

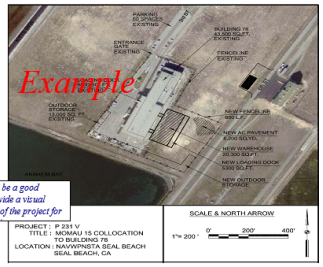
It is the general framework, and establishes specific strategies and milestones for executing projects.

It is required by FAR Part 7.104, each and each service details.

The references for preparing PMPs are available in Blackboard

PMP Samples and Formats

P-XXX PROJECT TITLE
(FYXX MCON)
PROJECT LOCATION



(The cover can be a good location to provide a visual representation of the project for

PROJECT : P 231 V
TITLE : MOMAU 15 COLLOCATION TO BUILDING 79
LOCATION : NAVWPNSTA SEAL BEACH SEAL BEACH, CA

SCALE & NORTH ARROW

PROJECT MANAGEMENT PLAN *(Template)*

(The purpose of the Project Management Plan (PMP) is to provide a consistent and coherent means t successful development, control and delivery of a project (or "phase" of a project). The PMP should planning assumptions and decisions, facilitate communication among stakeholders and document pro tives and risks. The plan can be scaled up or down depending upon the complexities of the project an sires of those involved with the management of the project. This template is a suggested starting point serve to facilitate, rather than preclude, the thoughtful, creative, comprehensive problem solving that for the successful outcome of a project. PMP's should be developed/ upgraded in whatever manner th tates the planning and development of a specific project. The plan should be a "living" document tha with the development of the project. Because team members can come and go during the developme ject, current/updated versions of the plan must be attached to the project in EPG so that valuable proj tions and decisions are not lost. While this template is focused upon the Region/FEC Team 1391 phas justed to be a valuable tool at earlier stages of the project and/or through to the final construction of t

SECTIONS:

1. Scope Statement
2. Work Breakdown Structure
3. Quality Assurance Plan
4. Communication Management Plan
5. Risk Management Plan
6. Orientation Package/ Technical Partnering Plan
7. Acquisition Plan

Project Management Plan
William Beaumont Medical Center

Revision 6
18 Nov 2014

PROJECT MANAGEMENT PLAN

FOR
WILLIAM BEAUMONT MEDICAL CENTER
FY10 NDAA DODM PN-72481
Fort Bliss, Texas

Revision #6 Dated: 18 Nov 2014

U.S. Army
Corps of Engineers
FORT WORTH DISTRICT

Page 1 of 64

United States Air Force Project Managers' Guide for Design and Construction

WBDG a program of the National Institute of Building Sciences
WHOLE BUILDING DESIGN GUIDE

DESIGN GUIDANCE | PROJECT MANAGEMENT | OPERATIONS & MAINTENANCE | DOCUMENTS & REFERENCES | TOOLS | CONTINUING EDUCATION

DELIVERY TEAMS
RISK MANAGEMENT
BUILDING COMMISSIONING

Home > Project Management

Project Planning, Delivery, and Controls
Last updated: 11-07-2014

OVERVIEW

Within This Page
- Overview
- Major Resources

Excellence in Project Management is achieved through a structured process that includes multiple phases:

- Initiating
- Planning
- Executing
- Monitoring and Controlling
- Closing.

The process balances the key project constraints and provides a tool for making decisions throughout the project based on stakeholder values, performance metrics, established procedures and project goals.

Effective project management includes strategies, tactics, and tools for managing the design and construction delivery processes and for controlling key factors to ensure the client receives a facility that matches their expectations and functions as it is intended to function. Improvements in building quality directly contribute to reduced operational costs and increased satisfaction for all of the stakeholders. Successful project delivery requires the implementation of management systems that will control changes in the key factors of scope, schedule, budget, resources, and risk to optimize quality and, therefore, the investment. This section offers guidance for the entire team to successfully and effectively optimize the quality of a high-performance building project.

Available in L1 References

Elements of the PMP

MILCON	Civil Works	WBDG	PMP TOPIC
X	X		Management Control Plan
X	X	X	Team identification (PDT)
X	X		Work Scope
X	X	X	Schedule
X	X	X	Budget/Cost Estimate
	X	X	Project Cooperation Plan
X	X	X	Real Estate, Relocations
	X		Cultural Resources Plan
X	X	X	Environmental Plan
	X		Operating & Maintaining
X	X	X	Acquisition Plan
X	X		Quality Assurance
	X		Change Control Plan
	X		Risk Management Plan
X	X		Safety Plan
	X		Value Engineering plan
	X		Communication Plan
	X		Implementation Review Plan
X			System Commissioning
X		X	Construction Support
X		X	Design
X			Management Status
X			Construction
X			Closeout
X		X	Turnover at Completion
X			Operation Instructions
X		X	Training
X		X	Manuals
		X	Contract type
		X	Partnering
		X	Testing
		X	GFE

This chart shows a table of contents comparing a PMP for a MILCON project, a civil works project, and WBDG PMP recommendations.

It indicates that elements are selected based on the nature of the project, its complexity and the areas that must be addressed toward achieving project success.

It shows that the PMP can be tailored to the project to include areas that must be highlighted to achieve project success

Project Delivery Team (PDT)

Providing a quality project on schedule and within budget is the primary objective for all Project Delivery Team (PDT) members. The PDT roles and responsibilities will establish a clear understanding and agreement on the technical and functional office that is the principal responsible during design and construction. The primary areas of responsibility are as noted below with the specific descriptions provided for each office. The PDT may include the design team, the customer, the installation, design agent and other parties essential for project delivery.

PDT composition changes throughout the life of the project. In the planning and design phase, there may be no designer (A/E) or prime contractor designated. As these key elements are determined, the PDT composition changes so that the important players are engaged in the project at the appropriate time.

wbdg

Key Roles - NAVFAC

- NAVFAC Project Manager
  - Overall project lead starting at planning stage
  - Manages project including updates schedule and funding
  - Manages A-E contracts

- Design Manager
  - Coordinated design effort on DBB
  - Leads RFP development and design review
  - Customers primary POC during design
  - Ensures customer requirements are in the plans and specs
  - Provides support during construction

- Construction Manager
  - Leads the project during construction beginning at contract award
  - Ensure construction is completed IAW plans and specs
  - Change manager (May have ACO authority)

- Others include Construction Engineering Technician (ET); contract specialist (CS) and contracting officer (KO)

Key Roles for USACE

- Construction Manager (CM)
  - Reports to Resident Engineer (ACO)
  - Also serves as COR
  - Identifies cost and time growth; modifications; updates customer and PM
- Contracting Officer Representative (designated by letter)
- Architect-Engineer
- Construction Contractor

The “Winter” castle

A Closer Look Into Some Plans

The PMP consists of many plans.

We will examine the communications; quality; safety; and change management plans

Communications Plan

- Define strategic communications objectives of the project
- Communicate with public
- Build awareness to those affected
- Involve stake holders

STAKEHOLDERS LIST *(Example)*

(If not already provided in EPG, contact the responsible PWD to provide the initial Stakeholders List. Consider including all key players identified on the MTP3 chart. To reduce redundancy of effort, consider updating this data in eProjects and just providing a print-out in this section.)

Name	Role	Organization	Phone No.	Email
First Lastname	IPT Project Manager	FEC IPT	(xxx) xxx-xxxx	First.Lastname@navy.mil
First Lastname	IPT CIBL Team Leader	FEC IPT	(xxx) xxx-xxxx	First.Lastname@navy.mil
First Lastname	IPT Facility Planner	FEC IPT	(xxx) xxx-xxxx	First.Lastname@navy.mil
First Lastname	NEPA/ Environmental Planner	FEC IPT/ Core	(xxx) xxx-xxxx	First.Lastname@navy.mil
First Lastname	Cultural Resource Specialist	FEC IPT/ Core	(xxx) xxx-xxxx	First.Lastname@navy.mil
First Lastname	Natural Resource Specialist	FEC IPT/ Core	(xxx) xxx-xxxx	First.Lastname@navy.mil
First Lastname	Engineer/ Functional Expert (Architect, Civil, Mech., Elec., Landscape, Cost Engineer, etc.)	FEC IPT/ Core	(xxx) xxx-xxxx	First.Lastname@navy.mil
First Lastname	Engineer/ Functional Expert 2	FEC IPT/ Core	(xxx) xxx-xxxx	First.Lastname@navy.mil
First Lastname	Engineer/ Functional Expert 3, etc.	FEC IPT/ Core	(xxx) xxx-xxxx	First.Lastname@navy.mil
First Lastname	Contract Specialist	FEC IPT	(xxx) xxx-xxxx	First.Lastname@navy.mil
First Lastname	Operator/ End User (Senior Member)	Installation Unit	(xxx) xxx-xxxx	First.Lastname@navy.mil
First Lastname	Operator/ End User (Project Lead)	Installation Unit	(xxx) xxx-xxxx	First.Lastname@navy.mil
First Lastname	Operator/ End User (Others)	Installation Unit	(xxx) xxx-xxxx	First.Lastname@navy.mil
First Lastname	Public Safety/Security/ AT/FP Rep.	Installation	(xxx) xxx-xxxx	First.Lastname@navy.mil
First Lastname	Site Access Liaison	Installation	(xxx) xxx-xxxx	First.Lastname@navy.mil
First Lastname	Ordnance Rep.	Installation	(xxx) xxx-xxxx	First.Lastname@navy.mil

Customer Relations and Communication Plan

- Most important element of construction management on large projects
- Include stakeholders as members of the project delivery team
- Open communication is essential to successful project delivery
  - Establishes trust
  - Bad news does not get better with age
- Communicates purpose of the project to all involved

Communications Plan – Key Players

- Media relations
- Public affairs office
- Congressional relations
- Web site
- Brochures
- Technical and professional papers
- Internal communications
- Vertical integration calls with customer/leaders
- PDT, review boards, site visitors, etc.

Quality Assurance and Safety Exercise 1 Instructions

Time Limit: 15-20 minutes to complete and 10 minutes to present.

Read the case exercise and provide the following:

- What are the Safety Management risks/concerns?
- What are the Quality Management risks/concerns?
- Be prepared to discuss your team findings

Exercise 1

Introduction: You are a project engineer for the government project office at a joint base on the Eastern seaboard of the US. You are executing a military construction project to replace the existing hazardous material storage building. The existing building is 2,000 SF and was built in the 1950s as a general purpose storage facility. It was repurposed as a hazardous waste facility in the mid-1980s, but it does not meet current operational needs or criteria. The need to properly manage hazardous waste in accordance with current state and federal laws and regulations dictate that a new hazardous waste facility to be constructed.

Background: The new facility is to be 4,000 SF, spill resistant concrete slab, masonry walls, 5 ton portal crane, sprinkler system, alarm system, security fencing, and other definable features. The project will be constructed on a "green site", and all required utilities and infrastructure systems are readily available and adequate. The construction contract for this new facility was executed by the command as a design-bid-build procurement. The design was completed by an architect-engineer firm under a task order contract. The facility design was done in accordance with the Unified Facilities Criteria 4-451-10N Design: Hazardous Waste Storage dated 16 January 2004.

The $1.5M contact was competitively awarded to Islay's Best Construction Company, an 8(a) firm that has constructed many similar private sector projects, but few federal government projects and no previous projects for your command. The contact includes the standard FAR clauses 52.246-12 -- Inspection of Construction and 52.236-13 Accident Prevention. Also the requirement to use the EM-385-1, USACE Safety Manual.

Exercise 1 (Cont.)

Tasking:

The contract requires the contractor to prepare and submit a quality control plan and safety plan (Accident prevention Plan) for government review and approval prior to starting work. The contract also requires the government to process these plans within 15 working days

Due to the inadequate nature of the existing facility, it is critically important to the installation that the new facility be completed and turned over as quickly as possible. In addition, the contract was awarded at 125% of the Programmed Amount. Additional funds beyond the project contingencies (5%) are not available without a Congressional reprogramming action. It is important to get this contract off in the right direction, so you want to be prepared to start the government review of the QC plan and safety plan as soon as they arrive and complete within the contractual processing time - we sure don't want any government caused delays or costs at the beginning of the contract. In preparation for your government review of the QC plan and the safety plans, you will prepare a checklist to ensure the contractor's plans are complete. What are the major elements in your checklists?

Exercise 1 Response Formats

Quality Plan Element	Quality Concern - Why is it a concern?
Quality Organization	Organization Chart – ensure quality does not report to operations

Select the major elements (areas) of concern and a brief description of the area of concern

Safety Plan Element	Safety Concern - Why is it a concern?
Quality Manager	Qualified to the type of work performed; compliance with contract requirements
Etc.	

Quality Management Planning

- Construction contractor is responsible for construction Quality Control (QC)
  - Contractor QC requirements contained in the contract
  - Develops and executes QC program to insure quality required by the contract is achieved
- Government is responsible for Quality Assurance (QA)
  - Makes sure Contractor's Quality Control System is adequate and has controls in place to deliver the quality required by the contract
  - Performs quality assurance inspections and testing to make sure Quality Control system is functioning properly (usually 10% of contractor tests and inspections)
- QA + QC = Quality management

Quality Control and Assurance Plans

- Quality Control Plan (Contractor) – an outline of contractor's procedures, defines
  - QC organization
  - Personnel qualifications
  - QC responsibilities
  - Identifies responsible points of contact
- QC Reports – type of work; location of work; test results and activity ID
- Quality Assurance Plan (Government) –
  - Describes how Government personnel will evaluate and assess the contractor performance
  - Described how project performance will be measured and assessed against performance standards
- Contractor, not Government is responsible for controlling managing quality

Quality Control Organization

- QC organization
  - Independent of on-site supervision
  - Reports to home office
  - Difficult to enforce
- Varies by size and complexity of the project
- Typical organization for a large contract:
  - Chief of Quality Control
  - Submittal Manager
  - Civil/Site QC
  - Mechanical QC
  - Electrical QC
  - Architectural QC
  - Others as required by unique contract requirements

Corrective Action

- Non-Conformances documented on a Corrective Action Request (CAR). Three types on Non-Conformances
  - Critical – likely result in hazardous or unsafe condition. Written response within 24 hours to CAR.
  - Major – likely to result in failure of the supplies or services for their intended purposes. Written response within 5 business days to CAR.
  - Minor – not likely to materially reduce the usability of the supplies or services for their intended purpose. Written response with 15 business days to CAR.

3-Phase QC Inspection System

- Preparatory Inspection
- Initial Inspection
- Follow-up Inspection
- Final Inspection

Preparatory Inspection

- A preparatory inspection is held for every major phase of work
- Meeting conducted by the contractor's QC staff
- Attended by a government representative
- Attended by foremen who will execute the work
- Review standard of required quality
- Review required submittals to insure all have been submitted and approved
- Review Activity Hazard Analysis (AHA) to insure a plan is in place to execute the work safely

Initial Inspection

- Joint QC/QA inspection
- Conducted after a representative sample of the work has been performed
- Confirms required level of quality is being achieved
- Identifies deficiencies early
- Avoids major tear-out and rework

Follow-up Inspections

- Conducted periodically during the construction of a phase of work
- Confirms required level of quality is being achieved
- Deficiencies can be identified and corrected before the completion inspection

What are the 4 top safety accidents?

- Electrical Incidents
  - Contact with power lines; Improper equipment use; Extension cords
- Falls
  - Unprotected sides; bad scaffold; ladders

Accidents (continued)

- Struck-by – unanticipated contact with heavy equipment
- Trenching and excavation

Safety Management Planning Intro

What does the construction industry say about positive impacts of a strong safety program?

Return on investment?

73% report increase in project ROI by 1%

Project budget decrease?

73% report decrease of more than 1%

Project Schedule decrease?

50% report a decrease in schedule by one week or more

Improved reputation

82%

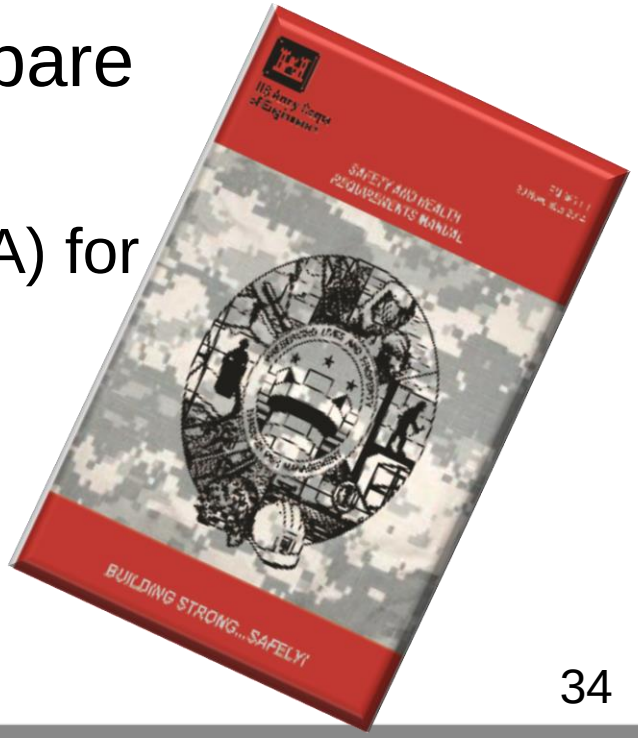
Ability to capture new work and improved quality?

66%

Safety Management Plan

Objective: Complete the project with no lost time accidents

- Contractors required to comply with OSHA and/or EM 385-1-1, Safety Manual (2014)
- Contractors required to prepare
  - Site Specific Safety Plan
  - Activity Hazard Analysis (AHA) for each major phase of work



Safety Management Philosophy

- Old paradigm:

  Government focused on compliance and punishment for non-compliance.

- New paradigm:

  Government focused on partnering with contractors to provide safe working conditions. Focus is on rewarding good behavior and good safety records. Punishment used as a last resort.

Site Specific Safety Plan

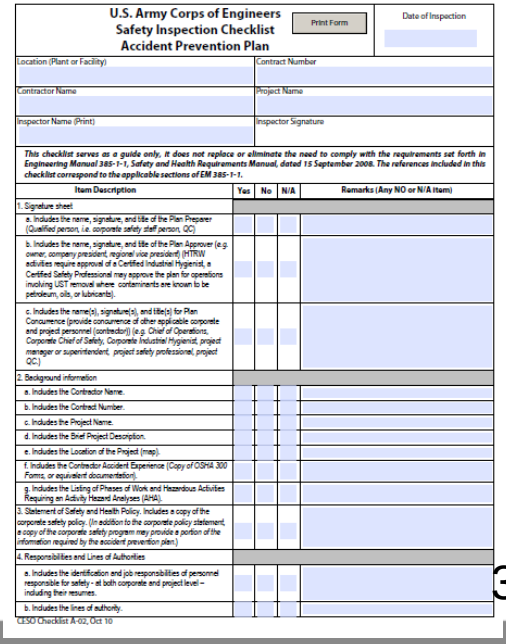
- Should address the specific hazards and safety procedures associated with the specific project
- Avoid generic plans that just “check the block”
- Avoid excessive “boiler plate” that does add value
- Make sure plan is reviewed periodically and is a living document

Enforced by FAR 52.236-13 Accident Prevention to be used by prime and subs alike

Activity Hazard Analysis

- Identifies specific hazards associated with each phase of work
- Identifies specific mitigation/risk reduction strategies for each hazard
- FE reviews at the Preparatory Inspection stage for each phase of work
- Discussed at PRECON

EM 385-1-1
Tools to assist



U.S. Army Corps of Engineers
Safety Inspection Checklist
Accident Prevention Plan

Print Form | Date of Inspection

Location (Plant or Facility) | Contract Number

Contractor Name | Project Name

Inspector Name (Print) | Inspector Signature

This checklist serves as a guide only. It does not replace or eliminate the need to comply with the requirements set forth in Engineering Manual 385-1-1, Safety and Health Requirements Manual, dated 15 September 2008. The references included in this checklist correspond to the applicable sections of EM 385-1-1.

Item Description	Yes	No	N/A	Remarks (Any NO or N/A Item)
1. Signature sheet				
a. Includes the name, signature, and title of the Plan Preparer (Qualified person, i.e. corporate safety staff person, QC)				
b. Includes the name, signature, and title of the Plan Approver (e.g. owner, company president, regional vice president) (HTRW activities require approval of a Certified Industrial Hygienist, a Certified Safety Professional may approve the plan for operations involving UST removal where contaminants are known to be petroleum, oils, or lubricants).				
c. Includes the name(s), signature(s), and title(s) for Plan Concurrence (provide concurrence of other applicable corporate and project personnel (contractor)) (e.g. Chief of Operations, Corporate Chief of Safety, Corporate Industrial Hygienist, project manager or superintendent, project safety professional, project QC.)				
2. Background information				
a. Includes the Contractor Name.				
b. Includes the Contract Number.				
c. Includes the Project Name.				
d. Includes the Brief Project Description.				
e. Includes the Location of the Project (map).				
f. Includes the Contractor Accident Experience (Copy of OSHA 300 Forms, or equivalent documentation).				
g. Includes the Listing of Phases of Work and Hazardous Activities Requiring an Activity Hazard Analyses (AHA).				
3. Statement of Safety and Health Policy. Includes a copy of the corporate safety policy. (In addition to the corporate policy statement, a copy of the corporate safety program may provide a portion of the information required by the accident prevention plan.)				
4. Responsibilities and Lines of Authorities				
a. Includes the identification and job responsibilities of personnel responsible for safety – at both corporate and project level – including their resumes.				
b. Includes the lines of authority.				

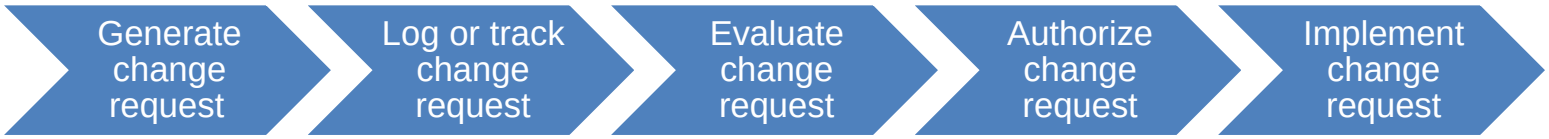
CESO Checklist A-02, Oct 10

Change Management Plan

- USACE Perspective
- NAVFAC Perspective
- Tracking changes
- Forms and descriptions of tools

Change Management Track

Change management is handled differently by different agencies, but overall it follows this track:



Change control boards approve changes based on the levels defined in the PMP.

Contents of the Change Logs

Priority	Description
High	<Insert a description that defines high priority>
Medium	<Insert a description that defines medium priority>
Low	<Insert a description that defines low priority>
Other	<Insert a description that defines another priority>

Status	Description
Open	Entered/Open but not yet approved or assigned
Work in progress	CR approved, assigned and work is progressing
In Review	CR work is completed and in final review prior to testing
Testing	CR work has been reviewed and is being tested
Closed	CR work is complete, has passed all tests, and updates have been released
<status type>	<define this status type CR>

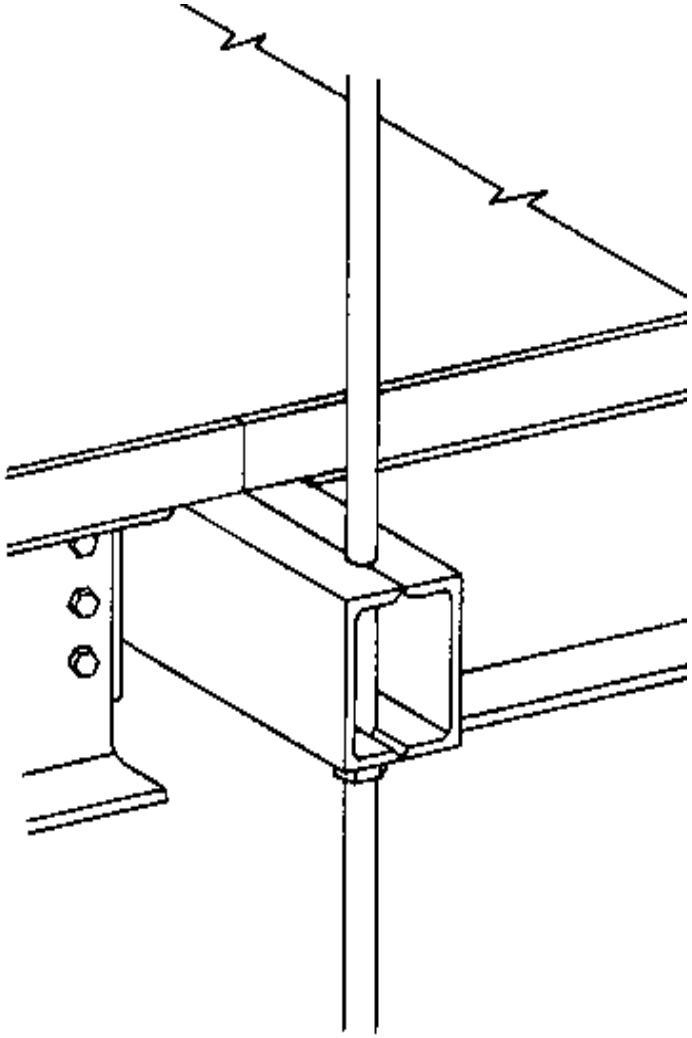
Priority	Description
Scope	Change affecting scope
Time	Change affecting time
Duration	Change affecting duration
Cost	Change affecting cost
Resources	Change affecting resources
Deliverables	Change affecting deliverables
Product	Change affecting product
Processes	Change affecting processes
Quality	Change affecting quality
Other	Change affecting another aspect

Exercise 2 Field Change?

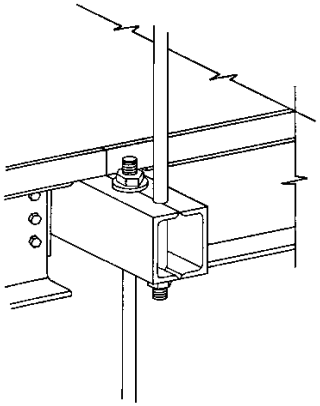
Situation: 17 Jul 1981, two suspended walkways within the atrium area of the Hyatt Regency Hotel in Kansas City, MO collapsed leaving 113 people dead and 186 injured. Three suspended walkways spanned the atrium at the second, third and fourth floor levels. The second floor walkway was suspended from the fourth floor walkway which was directly above it. The fourth floor walkway was suspended from the atrium roof framing by a set of six hanger rods. The third floor walkway was offset from the other two and was independently suspended from the roof framing by another set of rods. In the collapse, the second and fourth floor walkway came to rest on top of the lower walkway.

Making the Right Decision Effects Safety:
The effect of design

A

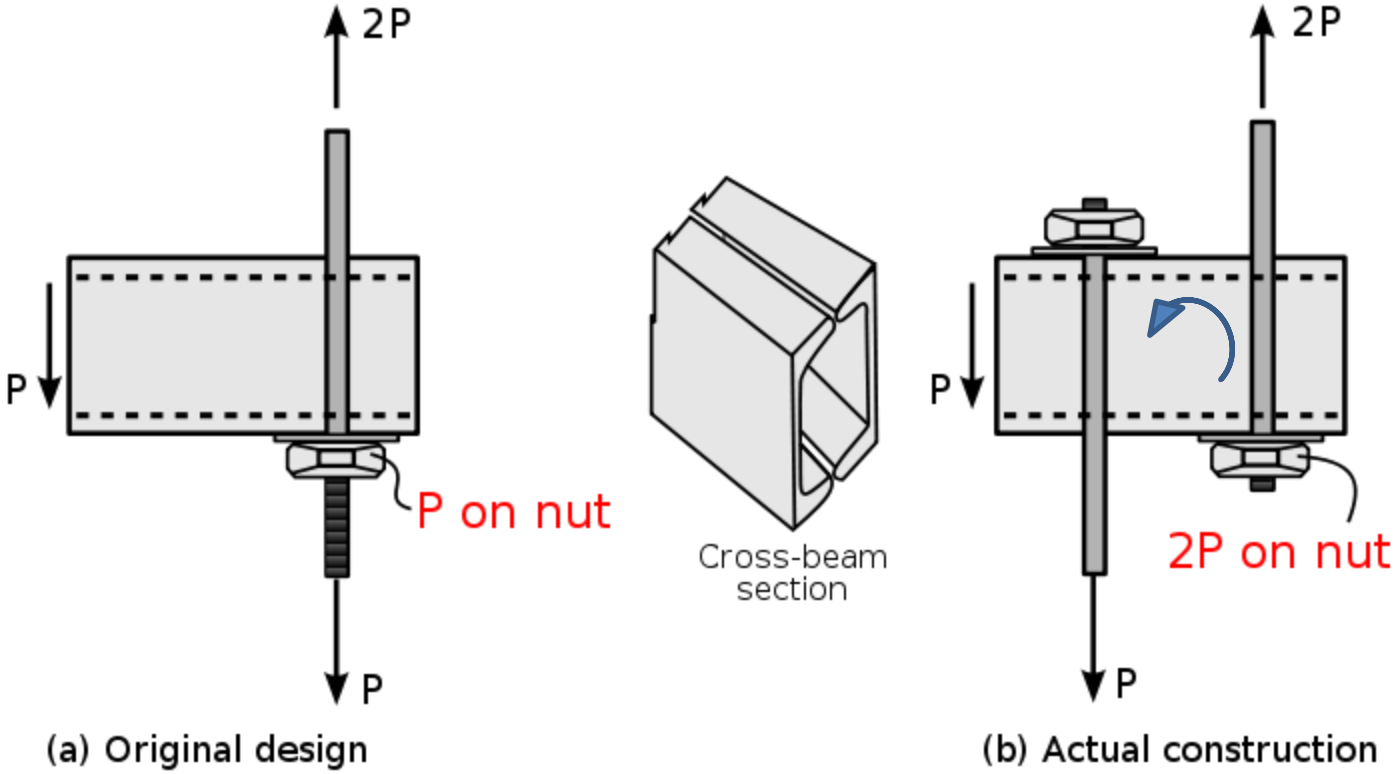


Original Design

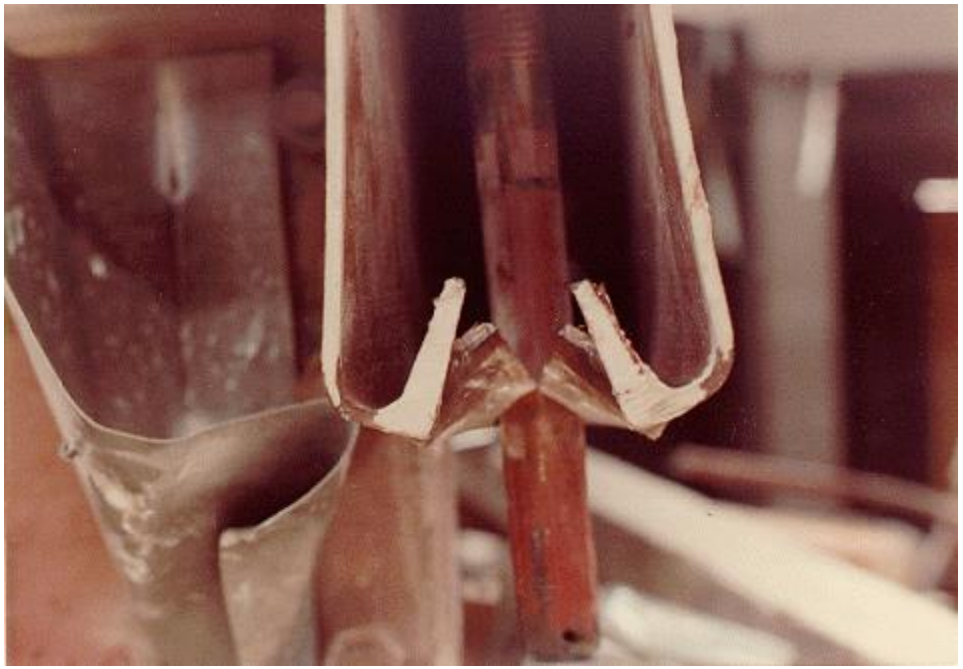


As Built

Field Change?



After the Party



Note: the single flyways are still standing. All of the multi-level flyways fell

TRAGEDY PREVENTION?

True or False:

- **It is the unique assemblage of the materials on a specific site (regardless of the materials used), which makes construction unique?**

Discussion:

- **When changing the specified design (in a seemingly minor way) how may you change the project?**

Good change order management might prevent this:

Trends in Construction Management

- Partnering
- Increased Use of Building Information Modeling (BIM)
- Use of LEAN Construction techniques
- Six Sigma
- ISO 9000
- Increased need personnel safety and security
- Net Zero Energy Buildings

Partnering

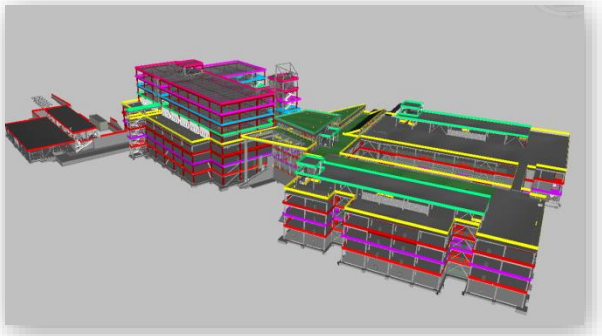
- Concept not that new
  - First USACE partnering project Oliver Lock and Dam (1988)
- Principles
  - Commitment to work together as a team
  - Open communications are key
  - Find common goals
  - Contractors treated as members of the team, not adversaries
  - Acknowledge mistakes, resolve them, and move on
  - Early dispute resolution (Don’t let problems fester)
  - Partnering is hard work and requires constant maintenance
  - Partnering has to be a way doing business

BIM (Business Information Model)

"…*is a digital representation of physical and functional characteristics of a facility*; *generating and managing building data during its life cycle*"

- Computer model of entire building including all systems are possible
- Can be used to fabricate duct, plumbing, conduit racks, etc. off-site allowing for increased production
- Greatly reduces conflicts between building trades
- Can be used to locate pipe/duct/conduit hangers below concrete decks prior to concrete placement
  - Improves efficiency
  - Improves safety by eliminating overhead drilling
- Can be used by Owners for building maintenance and operation post-occupancy

The BIM approach on Fort Benning Hospital



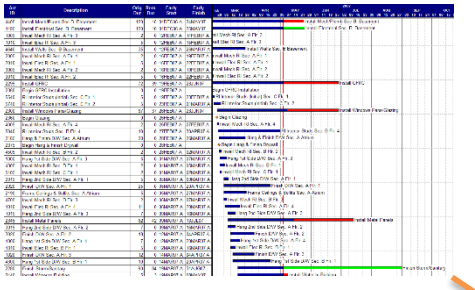
Used:

- As a visualization tool for the proposal development effort
- For design studies and progression
- To produce the construction documents-Drawn in 3D from the start
- Decision to use “whole building” model, not just limited elements
- To study and plan safety and logistics
- Animation to communicate execution plan for daily management
- To coordinate the work and enable prefab of building elements

BIM provided a “whole building model not must limited elements

The BIM approach on FB Hospital

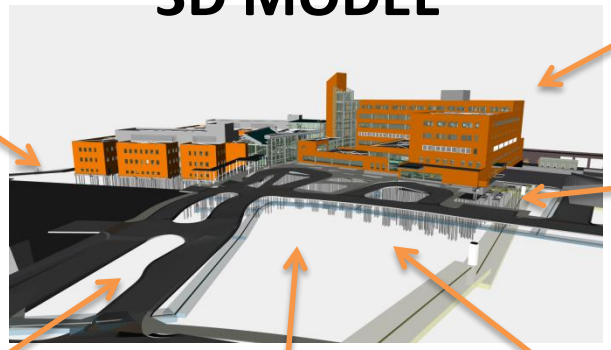
Definition of BIM



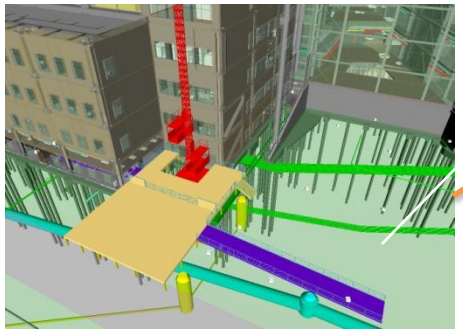
Schedule Simulation

BIM to Field Layout

3D MODEL

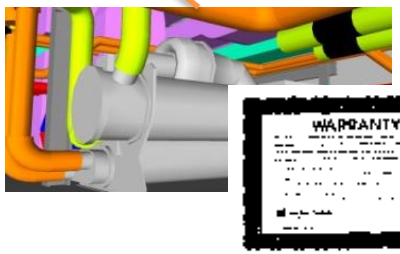


3D Coordination



Site Logistics Planning

Construction Drawings



Facilities Management

BIM Challenges

- Requires significant investment to include all building systems in the model
- Requires buy-in from subcontractors
- Most owners are not sophisticated enough to use the model to manage maintenance after construction (i.e., the Government)

Lean Construction

- Reduces waste and wasted effort
- Employs the Total Quality Management (TQM) Cycle
  - Plan
  - Do
  - Check
  - Act
- Strives for Continuous Improvement
- When combined with other techniques (BIM, etc.) can result in significantly improved efficiency
- Could be a separate class

Lean Principles

- Eliminate waste
- Streamline processes
- Standardize to the maximum extent possible
- Requires just-in-time (JIT) planning
- Pull planning concepts (paradigm shift)
  - Prime contractor does not dictate schedule
  - Subs participate in planning and make commitments
- Delegate to the lowest level possible
- Hold subs accountable for their commitments

Lean Challenges

- Takes a strong commitment from management and tradesmen
- Requires a culture change for many companies
- Difficult to implement in construction due to non-standard nature of the trades. Every project is different.

Quality Management Systems

Six Sigma –

- Continuous efforts to reduce variation in process outputs (e.g., goal is 3.4 defects per million)
- Processes are:
  - Measured
  - Analyzed
  - Controlled
  - Improved

Quality Management Systems

ISO 9000 – A set of procedures for key processes

- Regular reviewing individual processes and the quality system itself for effectiveness
- Checking output for defects, with appropriate and corrective action where necessary
- Keeping adequate records
- Facilitating continual improvement

Security and Safety

- Post 9/11 concern for occupant safety to visitors and workers in public facilities
- Enhanced safety measures desired
- Commissioning and integrating systems into existing IT systems is a challenge
- Trend (and complexity) expected to increase in all public and corporate facilities

Net Zero Energy Strategy

- According to statistics buildings are the primary energy consumer in the US.
- The concept of Net Zero Energy Building (NZEB) is one that produces as much energy as it uses over the course of a year.
- EO13514:
  - Outlines allowable energy strategies (e.g., solar, geothermal, wind farms)
  - Requires new Federal buildings to be designed to achieve zero-net-energy by 2030
  - Requires 15% of existing buildings over 5,000SF to meet increased standards of energy efficiency

Net Zero Energy Strategy

In 2008, DOD and DOE defined a joint initiative to address military energy use to reduce energy demand and increase renewable energy.

All services have installations engaged in this effort coordinated by DoE's National Renewable Energy Lab.

FT Carson is the US Army's flagship installation for the Army's Net Zero Initiative. It set goals for net zero energy (water and waste) for the entire base by 2020.

US Army Net Zero Energy Hierarchy

Summary

- Discussed project management planning, concentrating on:
- Communication plans,
- Quality assurance management plans
- Safety management plans
- Change management plans
- Trends in construction

Plans are not all the same but are changed based on the nature of the work and the stage of completion. They should be “living” documents.

The PMP – Remember……..

…is Alive !!!!