

The Silver Bullet: U.S. Army Corps of Engineers EM 385-1-1 Construction Standard

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Introduction

Twenty-five states and two territories of the United States of America have approved Occupational Safety and Health Administration (OSHA) State Plans in place. As such, these states and territories are approved to administer a hybrid OSHA occupational safety and health program. Per OSHA, a state plan state or territory: *“Must set job safety and health standards that are at least as effective as comparable federal standards.”* Under the Occupational Safety and Health Act, Section 5(a)(1), Each Employer (General Duty Clause), states: *“Each employer – shall furnish to each of his employees employment and a place of employment which is free from recognized hazards that are causing or are likely to cause death or serious physical harm to his employees.”* To this end, each and every employer is charged with a level of care that is effective. The US Army Corps of Engineers (USACE) has developed, implemented and continues to improve a construction safety and health standard that is considered by the industry to be, by-in large, *“more than effective”* in comparison to the OSHA 29 CFR 1926, Construction Regulations. That standard is the Engineering Manual 385-1-1 (EM 385-1-1) Safety and Health Requirements manual. The true merit of adopting the USACE EM 385-1-1 manual is the “standardization” of safety and health practices and programs that a decentralized, multi-state and/or territory, general or trades contractor may realize, regardless of where they are doing business; private sector, government or otherwise. With minor adjustments, an employer can do business in a Federal OSHA state, an OSHA State Plan state, a military installation, or other government contract. To date, many Federal Government agencies have adopted the USACE EM 385-1-1 manual. It is expected that more government agencies will do the same.

This paper will give the reader a history and overview of the USACE EM 385-1-1 manual. A comparison will be made of the OSHA 29 CFR 1926 regulation to the USACE EM 385-1-1 manual. Best practices for implementation of a USACE EM385-1-1 based program will be presented, including best practices, resources and learning barriers.

History

The history of United States Army Corps of Engineers can be traced back to June 16, 1775, when the Continental Congress organized an army with a chief engineer and two assistants. George Washington appointed the first engineer officers of the Army during the American Revolution. Army engineers, including several French officers, were instrumental in some of the hard-fought

battles of the Revolutionary War including Bunker Hill, Saratoga, and the final victory at Yorktown. Colonel Richard Gridley became General George Washington's first chief engineer; however, it was not until 1779 that Congress created a separate Corps of Engineers (See Fig. No. 1). Engineers have served in combat in all subsequent American wars. The Army established the Corps of Engineers as a separate, permanent branch on March 16, 1802, and gave the engineers responsibility for founding and operating the U.S. Military Academy at West Point.

At the end of the Revolutionary War, the engineers mustered out of service. In 1794, Congress organized a Corps of Artillerists and Engineers, but it was not until 1802 that it reestablished a separate Corps of Engineers. The Corps' continuous existence dates from this year. At the same time, Congress established a new military academy at West Point, New York. Until 1866, the superintendent of the academy was always an engineer officer. The first superintendent, Jonathan Williams, also became the chief engineer of the Corps. During the first half of the 19th century, West Point was the major and for a while, the only engineering school in the country.

Fast forward to the middle of the 20th century. The military construction mission of the U.S. Army Corps of Engineers dates from just prior to World War II. Until that time, the Quartermaster Department built almost all facilities for the U.S. Army. By 1940, it was clear that this arrangement could not continue. Quartermaster resources were inadequate for the large mobilization job ahead. Furthermore, the engineers' civil works organization and experience provided the basis for absorption of the new assignment. The shift was implemented piecemeal. After the Destroyers for Bases Agreement of September 1940, the chief of staff, General George Marshall, assigned the Corps the job of constructing air bases in the string of British Atlantic territories from Newfoundland to British Guiana, thereby initiating a program of overseas base construction by the Corps of Engineers that long remained one of its most important functions.

In November 1940, the War Department chose the Corps to build facilities for the Army Air Corps. Marshall ordered the transfer to the Corps of Engineers of all air base construction in the United States, excluding the Canal Zone. Finally, in December 1941, Congress transferred to the Corps the responsibility for real estate acquisition, construction, and maintenance for Army facilities, including training camps, government-owned munitions plants, air bases, depots, and hospitals. Thirteen months later, the Corps of Engineers undertook all construction for the U.S. Army's war effort. Shortly before the United States entered World War II, Congress and the War Department approved the transfer of military construction responsibilities from an overtaxed Quartermaster Corps to the Corps of Engineers. On the home front, an engineer officer headed the construction of the largest office building in the world, the War Department's headquarters, known as the Pentagon (See Fig. No. 2).

Four months after the War Department chose the Corps to build facilities for the Army Air Corps, the first issue of the Safety Requirements for Excavation, Building, and Construction was issued. This was a legacy of the Office of the Quartermaster and was printed on 01 March 1941. The manual, produced under the War Department, Office of the Quartermasters, General Construction Division, which more closely resembled a booklet, was approximately sixty (60) pages in total. The first revision of the US Army Corps of Engineers safety manual would take place on 15 September 1941, just six (6) months after the first printing of the Safety Requirements for Excavation, Building, and Construction booklet (See Fig. No. 3 typical). The USACE's development, implementation, and administration of a standardized safety and health program had begun.

Industrial accidents and injuries at the turn of the 20th century were on the rise. The 25 March 1911, Triangle Waist Shirt Company fire, was the final catastrophe in a history of industrial accidents and injuries that had maimed, disfigured, and killed Americans, most newly immigrated. 146 souls perished in the Triangle Waist Shirt Company fire. The nation was appalled by the apparent willful disregard of business owners for life and limb of those they had stewardship for and over. Between 1881 and the end of World War 1, immigrants to the United States of America averaged two hundred (200) per day. It was estimated that one hundred or more Americans died on the job every day in the second decade of the 1900s.

One (1) year previous to the Office of the Quartermaster's publication of the Safety Requirements for Excavation, Building, and Construction booklet, 1940, the workforce in the US numbered 55,588,000, with 9,480,000 unemployed. 17.2% of the employable were without a job. At year's end 1940, the unemployment rate had dropped by six tenths of one percent (.6%) with 592,000 ^[1] entering or reentering the workforce. Women were entering the workforce at an increasing annual rate of just under 2%. The gender of the average laborer was changing. Our sisters, wives, and mothers were toiling to meet the insatiable appetite of the leader of the industrial world and a soon-to-be decisive power in "the war to end all wars," WWII. This was the state of the union in 1940. It was also the year in which, per ASSE, "The American Society of Safety Engineers had 2,000 members in 11 chapters. Data sheets, pamphlets, and safety training materials were developed. More public concern for on-the-job health emerged as solvents appeared in the workplace. The National Committee for Conservation of Manpower in Defense Industries formed and conducted over 100 training classes. Safety and health practitioners investigated accidents and trained employees. Research into plastic eye protection, safety belts, harnesses and accessories accelerated, while at the same time the costs of workplace accidents were rising." ^[2]

Overview of the USACE EM 385-1-1 Manual

The United States of America, Department of the Army, U.S. Army Corps of Engineers, Engineering Manual 385-1-1 is exactly that, a manual developed, printed and administered by the USACE. Presently, it is titled as US Army Corps of Engineers, EM 385-1-1, Safety and Health Requirements Manual. The Preface of the EM 385-1-1 merits close inspection as it states the purpose of the manual, other referenced federal regulations/orders, and how changes are made to the standard, among other things.

The print architecture and nomenclature of the manual is similar to that of the OSHA regulations, with a few variations. Specifically, each main topic is confined to its relevant section, so indicated with a unique section heading, e.g., Section 5, Personal Protective and Safety Equipment. Subsection and subpart sections are as utilized to organize and reference standards language. For example, hi-vis clothing is covered under Section 05.F. Subsection 01.a addresses workers exposed to vehicular traffic at speeds up to 45 mph. So the callout nomenclature would for this subsection would be Sect 05.F.01.a.

In the current version of the EM 385-1-1 there is a preface, table of contents, thirty four (34) standards sections, a set of defined acronyms, twelve (12) appendices, thirty eight (38) figures, fifty two (52) tables, and a cross-referenced index. The materials are structured in such a way that it is user-intuitive and easily referenced. One inherent disadvantage of utilizing the EM 385-1-1

as prepared, for non-government contracted work, is the sections of the standard that, for the vast majority of private sector projects, are not applicable. Consider Section 32, Airfield and Aircraft Operations or Section 33, Munitions and Explosives Concerns (MEC) Encountered During USACE Activities. It is not to say that these and other such sections may not have value to a private sector contractor, but, it will most likely be the exception. Appendices have similar value and limited application. Of the two hundred and one (201) pages of appendices, like the standards sections, there are several which are typically not of benefit to a non-government contractor. For example, Appendices O, Manning Levels for Dive Teams is such an appendix. However, Appendix A, Minimum Basic Outline for Accident Prevention Plan, Section 11, may be extremely beneficial for projects that are deemed smaller in size and less complex in scope.

Comparison of OSHA 29 CFR 1926 vs. USACE EM 385-1-1

15 September 2008 is the current version of the USACE EM 385-1-1. Included in the current EM 385-1-1 manual's Preface, Section 1, Purpose, is an explanation of its intended purpose, as follows: "This manual prescribes the safety and health requirements for all Corps of Engineers activities and operations. " In comparison, the OSHA 29 CFR 1926 purpose is stated in Subpart A Section 1, Subsection (a) (29 CFR 1926.1(a), Purpose and scope, states: " This part sets forth the safety and health standards promulgated by the Secretary of Labor under section 107 of the Contract Work Hours and Safety Standards Act. The standards are published in Subpart C of this part and following subparts."

Section 3 of the Preface titled, References, cites the applicable federal codes, standards and regulation that are adopted in part or in whole by the EM 385-1-1 manual. Included in this list are Title 29, Code of Federal Regulations (CFR), Part 1910, General Industry Regulations and 29 CFR 1926, Construction Industry Regulations. For most private sector (non-government) construction contractors, these two federal regulations constitute the majority of the safety and health regulatory requirements they are mandated to meet as an employer. These two regulations, referred by themselves as "standards," are the work product of the United States Department of Labor and are promulgated by the Secretary of Labor (see 29 CFR 1926.1(a)). For those 25 states and 2 territories of the United States of America which have approved Occupational Safety and Health Administration (OSHA) State Plans in place, additional requirements to those found in the 29 CFRs are set forth, usually in the form of legislated State/Territory Rules, Laws, and/or the like.

Conflicts between subparts of the OSHA regulations are addressed by compliance with the more comprehensive or "restrictive" standard. The EM 385-1-1 has a similar statement found in the Preface, Section 4.a, General, which states: "The provisions of this manual implement and supplement the safety and health standards and requirements above (Section 3, References). Where more stringent safety and occupational health standards are set forth in these requirements and regulations, the more stringent standards shall apply." This statement by the EM 385-1-1 captures the essence of this paper when considered in light of the Occupational Safety Health Act of 1970, Public Law 91-596, 84 STAT. 1590, 91st Congress, S.2193, December 29, 1970, as amended through January 1, 2004. States are extended the option of administering a State Plan OSHA program which, "provides for the development and enforcement of safety and health standards relating to one or more safety or health issues, which standards (and the enforcement of which standards) are or will be at least as effective in providing safe and healthful employment and places of employment as the standards promulgated under section 6 which relate to the same

issues, and which standards, when applicable to products which are distributed or used in interstate commerce, are required by compelling local conditions and do not unduly burden interstate commerce,”^[3]

An example of similar standards language exists with, EM 385-1-1 Section 15.A.07 Rigging, Inspection and Use, which states: “Custom designed grabs, hooks, clamps, or other lifting accessories (i.e., equalizing beams, lifting or spreader beams, etc.) for such units as modular panels, prefabricated structures, and similar materials shall be marked to indicate the safe working loads and shall be proof-tested before use, to 125% of their rated load.” Now, compare the EM385-1-1 language with a similar section from the 29 CFR 1926.251(a)(4), Rigging equipment for material handling, which states: “Special custom design grabs, hooks, clamps, or other lifting accessories, for such units as modular panels, prefabricated structures and similar materials, shall be marked to indicate the safe working loads and shall be proof-tested prior to use to 125 percent of their rated load.” The differences are minimal. The lead-ins vary with the word “Special” omitted by the EM385-1-1 standard. The example of types of rigging is omitted from the OSHA standard. A comma is added to the EM385-1-1 standard after “prefabricated structures,” as is one added to the OSHA standard after “similar materials.” The use of “before” in EM385-1-1 verses “prior” is noted. One last comma is omitted from the OSHA standard after “before use.” And, finally, the variation of text verses symbol for percentage is present. Insignificant punctuation, synonymous language, and the use of symbology account for the minor variation noted, with no difference in interpretation.

Stilts use on construction sites is not uncommon. They provided added mobility and reduce the set-up and usage time. With this example, a comparison is made of the USACE EM385-1-1, OSHA 29 CFR 1926 and a state plan state rule legislated and promulgated by the State of California. The Fall Protection section of the EM385-1-1, 21.A.03, states: “When using stilts, or raised platforms, workstands or floors above a walking/working surface that exposes workers to a fall of 6 ft (1.8 m) or more in areas protected by guardrails, the height of the guardrail must be raised accordingly to maintain a protective height of 42 in (107 cm) above the stilt, raised platform, workstand or floor height.” OSHA 29 CFR 1926.452(y), states:” (1) An employee may wear stilts on a scaffold only if it is a large area scaffold., (2) When an employee is using stilts on a large area scaffold where a guardrail system is used to provide fall protection, the guardrail system shall be increased in height by an amount equal to the height of the stilts being used by the employee. (3) Surfaces on which stilts are used shall be flat and free of pits, holes and obstructions, such as debris, as well as other tripping and falling hazards, and (4) Stilts shall be properly maintained. Any alteration of the original equipment shall be approved by the manufacturer.” In a Letter of Interpretation dated October 21, 1974, regarding the use of stilts in construction, Mr. David Hadden, Safety Specialist, Construction Standards, OSHA, stated: “The Occupational Safety and Health Rules and Regulations for Construction do not ban the use of stilts. When we are asked about them, we state this fact but cautions that there may be situations, such as on rough surfaces, when their use may present a hazard.” Cal/OSHA, on the other hand, specifically prohibits the use of stilts on job sites in their Construction Industry Safety Orders, Title 8, Subchapter 4. Construction Safety Orders Article 21. Scaffolds--General Requirements §1637, section (j) that states: “Prohibited Types of Scaffolds. Lean-to or jack scaffolds, shore scaffolds, nailed brackets, loose tile, loose brick, loose blocks, stilts, or other similar unstable objects shall not be used as working platforms, or for the support of such platforms.” While the EM385-1-1 met or exceeded the federal OSHA regulation, it was deficient and less effective when compared to the Cal/OSHA standard. This serves as a word of caution. DO NOT ASSUME

THAT THE EM385-1-1 STANDARD WILL SATISFY ALL OTHER REGULATORY STANDARDS. Each employer is responsible for knowing, understanding and appropriately applying and complying with all applicable standards.

Ergonomics and Muscular Skeletal Disorders are currently a hot topic among safety and health professionals. In order to illustrate the advantage of adopting the USACE EM 385-1-1 Safety and Health Requirements Manual, consider this. In Section 06.J CUMULATIVE TRAUMA PREVENTION, 06.J.01 it states: "Work activities that require employees to conduct lifting, handling, or carrying; rapid and frequent application of high grasping forces; repetitive hand/arm manipulations; tasks that include continuous, intermittent, impulsive, or impact hand-arm vibration or whole body vibration; and other physical activities that stress the body's capabilities shall be evaluated by a competent person to ensure the activities are designed to match the capabilities of the employees." EM 385-1-1 goes on to state in 06.J.02: "When work activities that stress the body's capabilities are identified, the employer shall incorporate it in the AHA and identify it as a hazard in the SSHP/APP. The plan shall incorporate processes that recognize cumulative trauma hazards, isolate causative factors, inform and train employees, and implement controls. And lastly, EM 385-1-1 06.J.03 states: "Control measures to minimize hand-arm vibration shall include: the use of anti-vibration tools and/or gloves; implementation of work practices that keep the employee's hands and body warm and minimize the vibration coupling between the employee and the vibration tool; application of specialized medical surveillance to identify personnel susceptible to vibration and adherence to the TLV guidelines as specified in the ACGIH in "Threshold Limit Values and Biological Exposure Indices"

On 16 January 2001 the OSHA standard on ergonomics took effect. By 06 March 2001, the Senate acted first, voting 56-44 to approve Senate Joint Resolution 6, which proposed the repeal of OSHA's ergonomics rule on job-related repetitive motion stress injuries. Congress passed, and President Bush signed, Senate Joint Resolution 6, which rescinded the original ergonomics rule, under the Congressional Review Act (an Act that had never been used in its five years of existence and marked the precedence setting event of an OSHA promulgated regulations appeal and rescission). Not only did this eliminate the existing rule it also prohibits OSHA from issuing a rule that is substantially the same as the former one.^[4]

Implementation of a USACE EM385-1-1 Based Program

The American National Standards Institute or ANSI has produced a document that is invaluable for designing a procedure to implement the USACE EM 385-1-1 based safety and health program. Once the program is designed, ANSI Z10 outlines how to facilitate the critical activities a "learning organization" must have for continual improvement to take place. The four step, "Plan, Do, Check, Act," process is a simple yet effective framework to build a successful safety and health program on. Under arching an ANSI Z10 program are five essential activities: 1. Policy, management leadership and employee participation, 2. Planning, 3. Implementation and operation, 4. Evaluation and correction, and 5. Management review. The combination of this four step process and the five essential activities create an open architecture that any employer can design a successful and effective safety and health program with. (See Fig. No. 4) OSHA's emerging Injury and Illness Prevention Program or I2P2 has means and methods that are easily adopted, implemented and managed. It is a given that no employer will be able to divorce

themselves from compliance with OSHA. I2P2 may facilitate the cohesion of regulations, resources, and employer/employee needs. Shoring up the ANSI Z10 and OSHA I2P2, is an effective hazard identification and assessment tool.

OSHA's proposed Injury and I2P2 is comprised of three main guiding principles: 1. Management commitment, 2. Employee engagement, and 3. Hazard recognition program. During the 2010 ASSE Annual Conference, Assistant Secretary for OSHA, David Michaels, announced the promulgation of a standard intended to assist employers and employees in preventing their workplace injuries and illnesses. In a letter addressed to The Honorable Darrell E. Issa, Chairman, Committee on Oversight and Government Reform, dated February 4, 2011, the ASSE stated: "Enclosed is a letter ASSE recently sent to Assistant Secretary for OSHA David Michaels applauding him for beginning I2P2 rulemaking and stating ASSE's principles for engaging in that rulemaking. ASSE has long encouraged OSHA to promulgate an I2P2 standard. The reason is that our members succeed in helping employers protect their workers and workplaces by first identifying potential occupational safety and health risks and then establishing a plan to prevent or control those risks, which is essentially what an I2P2 is and what an I2P2 standard would make sure all employers accomplish if the standard is written effectively.

An I2P2 is the foundation upon which our members help build an organization's commitment to safety. The largest and best companies in this nation achieve safe and healthy workplaces based on SH&E professionals' expertise and experience in establishing I2P2s for them. Not only does the good safety and health that results save lives and prevent injuries and illnesses, it also saves those companies money, as a variety of resources on ASSE's Business of Safety Committee's website indicate."

With the advent of assessment and assistance tools such as OSHA's Job Hazard Analysis (JHA) for not only the safety and health professional, but also the entry level laborer, the application of lessons learned from root cause analysis, leading indicators, etc., the effectiveness of our safety and health programs have arguably improved. To illustrate the administrative benefits of the EM 385-1-1 manual, a comparison of OSHA's JHA with the USACE's Activity Hazard Analysis (AHA) is in order.

OSHA

OSHA, Document No. 3071 2002 (Revised), Job Hazard Analysis, outlines what a JHA is, how it is created, and to use it. Per this document, OSHA gives this definition of a JHA: "A job hazard analysis is a technique that focuses on job tasks as a way to identify hazards before they occur. It focuses on the relationship between the worker, the task, the tools, and the work environment. Ideally, after you identify uncontrolled hazards, you will take steps to eliminate or reduce them to an acceptable risk level." The suggested steps to eliminate or reduce uncontrolled hazards are: 1. Involve your employees, 2. Review your accident history, 3. Conduct a preliminary job review, 4. List, rank, and set priorities for hazardous jobs, and 5. Outline the steps or tasks.

See Fig. No. 5 for a sample JHA form.

USACE

EM385-1-1, Section 01.A.13.a-d Contractor-Required AHA. "Before beginning each work

activity involving a type of work presenting hazards not experienced in previous project operations or where a new work crew or subcontractor is to perform the work, the Contractor(s) performing that work activity shall prepare an AHA. (See Fig. No. 6 and 7)

- a. AHAs shall define the activities being performed and identify the work sequences, the specific anticipated hazards, site conditions, equipment, materials, and the control measures to be implemented to eliminate or reduce each hazard to an acceptable level of risk.
- b. Work shall not begin until the AHA for the work activity has been accepted by the GDA and discussed with all engaged in the activity, including the Contractor, subcontractor(s), and Government on-site representatives at preparatory and initial control phase meetings.
- c. The names of the Competent/Qualified Person(s) required for a particular activity (for example, excavations, scaffolding, fall protection, other activities as specified by OSHA and this manual) shall be identified and included in the AHA. Proof of their competency/qualification shall be submitted to the GDA for acceptance prior to the start of that work activity.
- d. The AHA shall be reviewed and modified as necessary to address changing site conditions, operations, or change of competent/qualified person(s).
 - (1) If more than one Competent/Qualified Person is used on the AHA activity, a list of names shall be submitted as an attachment to the AHA. Those listed must be Competent/Qualified for the type of work involved in the AHA and familiar with current site safety issues.
 - (2) If a new Competent/Qualified Person (not on the original list) is added, the list shall be updated (an administrative action not requiring an updated AHA). The new person shall acknowledge in writing that he or she has reviewed the AHA and is familiar with current site safety issues.”

EM385-1-1, Section 01.A.14.c USACE-Required AHAs declares the USACE’s objective for utilizing the AHA program, when it states: “The Government uses this process to assess and manage the risks associated with the project.”

The EM 385-1-1 reference to the “GDA” translates to the “Government Designated Authority.” The equivalent of the GDA on a private sector construction project could be the General Contractor, one of the GC’s of a joint venture team, the Owner, or perhaps the Owner’s Representative. The commonality of each of these positions is exactly that, position. It is the person who is designated as being in the best position to manage the risks of a project. In comparison to OSHA’s JHA, EM 385-1-1’s AHA establishes the qualification of persons involved in the development, implementation, and evaluation of an AHA. Determining competencies and qualifications is essential.

Conclusion

It is now up to you to assess the capabilities and “good fit” of a USACE, EM 385-1-1, Safety and Health Requirements manual program for your organization. Like all we do, knowledge and experience should be the means of making a sound decision. Ask an inordinate amount of questions and obtain as much training in this standard as possible. New tools of the trade are being forged. Safety and health professionals are and should be optimistic as to the direction our government, employers and the nation’s workforce are moving. This “consensus” of civil servant, business owner and laborer has the potential to revolutionize our industry. It is a privilege to stand with those who are and will make a difference.

So, “Is the USACE EM 385-1-1, the silver bullet?”

May your efforts result in “*each employee’s employment and place of employment being free from recognized hazards that are causing or are likely to cause death or serious physical harm.*”

Endnotes

[1] US Bureau of the Census; Bicentennial edition, Part 2, Chapter

[2] American Society of Safety Engineers, A BRIEF HISTORY OF THE AMERICAN SOCIETY OF SAFETY ENGINEERS 'A Century of Safety',
<http://www.asse.org/about/history.php>

[3] United States Code 29 USC 667, Section 18, State Jurisdiction and State Plans, (c)(2)

[4] Occupational Safety and Health Administration, Ergonomics: Enforcement
(<http://www.osha.gov/SLTC/ergonomics/faqs.html>)

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Von Drehle, D. *Triangle. The Fire That Changed America*. New York: Grove Press, 2003.

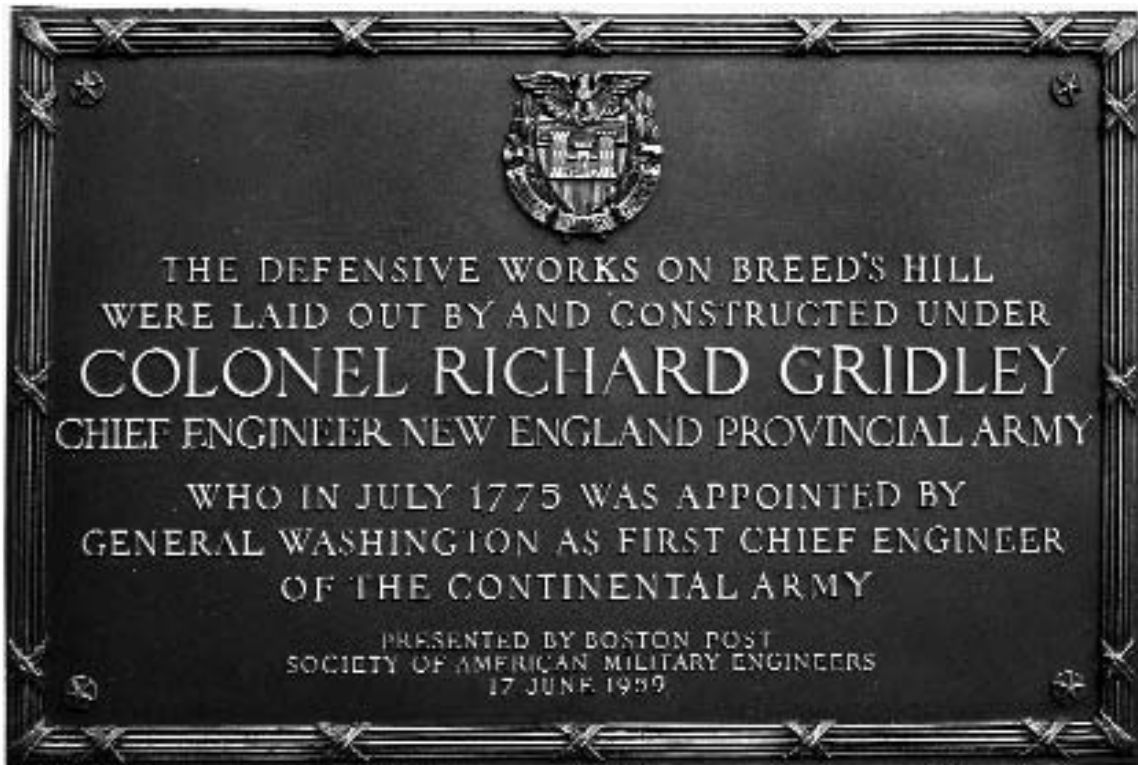


Fig. No. 1: Society of American Military Engineers plaque honoring Col. Richard Gridley's actions at Breed's Hill.



Fig. No. 2: The Pentagon under construction.

Publication Number: EP 870-1-68

Title: The U.S. Army Corps of Engineers: A

History

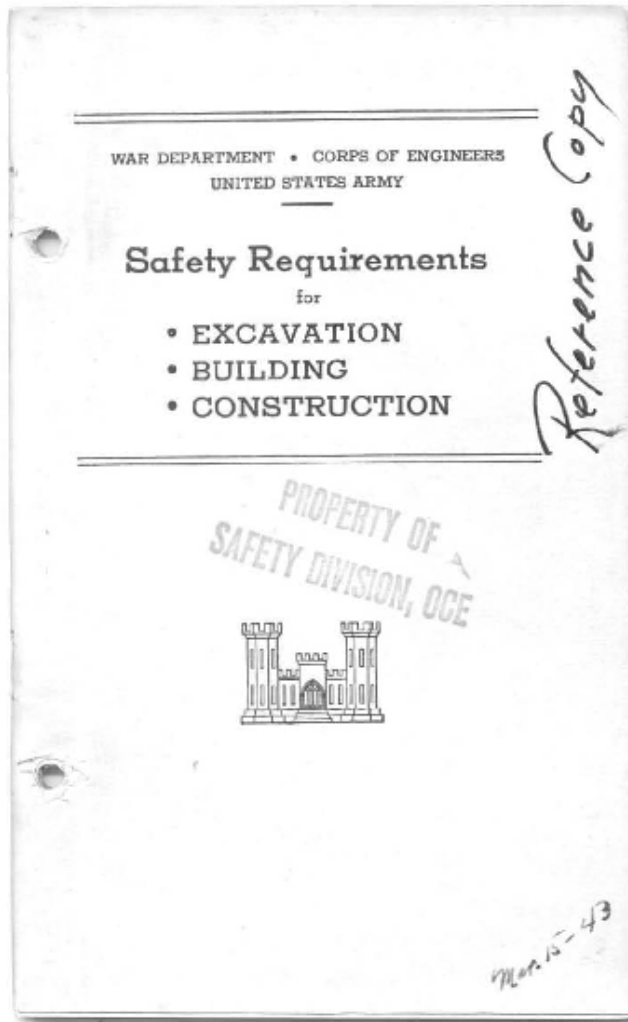


Fig. No. 3: United States of America, War Department, Office of the Quartermasters, General Construction Division.

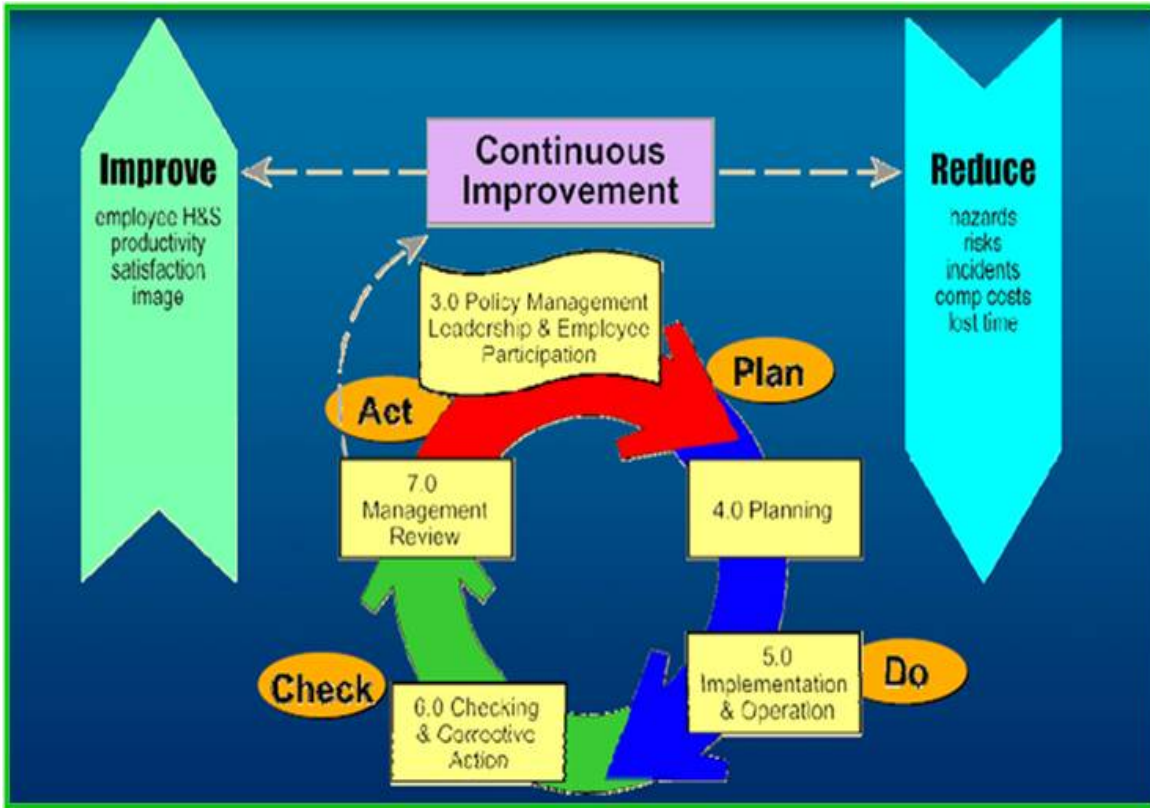


Fig. No. 4: American National Standards Institute, ANSI Z10 - 2005, American National Standard for Occupational Health and Safety Management Systems flow chart.

Job Title:	Job Location:	Analyst	Date
Task #	Task Description:		
Hazard Type:	Hazard Description:		
Consequence:	Hazard Controls:		
Rational or Comment:			

Fig. No. 5: Sample Job Hazard Analysis (JHA) form.

ACTIVITY HAZARD ANALYSIS (AHA)

Date Prepared: _

Project Location:

Prepared By: __

Job/Task: _____

Reviewed By: _

JOB STEPS	HAZARDS	CONTROLS	RAC
Identify the principal steps involved and the sequence of work activities.	Analyze each principal step for potential hazards.	Develop specific controls for potential hazards.	Assign Appropriate Risk Assessment Code (RAC) per AR 385-10.
EQUIPMENT	TRAINING	INSPECTIONS	
List equipment to be used in the work activity.	List training requirements.	List inspection requirements.	

Fig. No. 6: Activity Hazard Analysis (AHA) form.

Activity Hazard Analysis

<i>Activity/Work Task:</i>		Overall Risk Assessment Code (RAC) (Use highest code)					
<i>Project Location:</i>		Risk Assessment Code (RAC) Matrix					
<i>Contract Number:</i>		Severity	Probability				
<i>Date Prepared:</i>			Frequent	Likely	Occasional	Seldom	Unlikely
<i>Prepared by (Name/Title):</i>		Catastrophic	E	E	H	H	M
		Critical	E	H	H	M	L
<i>Reviewed by (Name/Title):</i>		Marginal	H	M	M	L	L
		Negligible	M	L	L	L	L
Notes: <i>(Field Notes, Review Comments, etc.)</i>		Step 1: Review each “ Hazard ” with identified safety “ Controls ” and determine RAC (See above)					
		“ Probability ” is the likelihood to cause an incident, near miss, or accident and identified as: Frequent, Likely, Occasional, Seldom or Unlikely.				RAC Chart	
		“ Severity ” is the outcome/degree if an incident, near miss, or accident did occur and identified as: Catastrophic, Critical, Marginal, or Negligible				E = Extremely High Risk	
		Step 2: Identify the RAC (Probability/Severity) as E, H, M, or L for each “Hazard” on AHA. Annotate the overall highest RAC at the top of AHA.				H = High Risk	
				M = Moderate Risk			
				L = Low Risk			
Activity Steps		Hazards		Controls		RAC	
Equipment to be Used		Training Requirements/Competent or		Inspection Requirements			

	Qualified Personnel name(s)	

This form must be completed as a requirement of the Project Safety Program. It is meant to be used as a safety training and planning tool. It must be filled out and reviewed by BDB before starting the activity. The information should then be used to train workers about the hazards of the activity they are to perform. This form may also be required for a *specific* task as determined by the Supervisor and/or BDB. Clean-up/housekeeping for each task should be addressed to include who cleans up what, and when. **Key to value for AHA process: Focus less on general safety and training, and more on activity specific hazards and challenges, and the solutions for same.** General Training and Safety Issues should be addressed before and aside from the AHA Process.

INSTRUCTIONS FOR COMPLETING THE ACTIVITY HAZARD ANALYSIS FORM

Activity Hazard Analysis (AHA) is an important accident prevention tool that works by assisting with hazard identification, elimination and control methods before an activity is started. Use AHA for activity clarification and hazard awareness, as a guide in new worker training, for retraining of experienced workers, as a refresher on activities performed infrequently, and as an accident investigation tool. Set priorities for doing AHA's: activities that have a history of incidents, activities with high potential for injury, and new or non-routine activities. **Key to value for AHA process: Focus less on general safety and training, and more on activity specific hazards and challenges, and the solutions for same. General Training and Safety Issues should be addressed before and aside from the AHA Process.**

Select an activity to be analyzed. Before filling out this form, consider the following: The purpose of the activity - What has to be done? Who has to do it? - How is it done?

In summary, to complete this form you should consider the purpose of the activity, the potential related hazards, and actions to eliminate or control the hazards. If you are not familiar with a particular activity or operation, interview a worker who is. In addition, observing a worker performing the activity or "walking through" the operation step by step may give additional insight into potential hazards. You may also wish to videotape the activity and analyze it. Here's how to do each of the three parts of an Activity Hazard Analysis (AHA).

<p align="center">SEQUENCE OF BASIC STEPS OF ACTIVITY</p>	<p align="center">POTENTIAL HAZARDS</p>	<p align="center">RECOMMENDED ACTION OR PROCEDURE</p>
<p>Examining a specific activity by breaking it down into a series of steps or tasks, will help enable you to identify potential hazards workers may encounter.</p> <p>Each activity or operation must consist of a set of steps or tasks. For example, the activity might be to move a box from a conveyor in the receiving area to a shelf in the storage area. To determine where a step begins or ends, look for a change of activity or change in direction or movement.</p> <p>Picking up the box from the conveyor and placing it on a hand truck is one step. The next step might be to push the loaded hand truck to the storage area (a change in activity). Moving the boxes from the truck and placing them on the shelf is another step. The final step might be returning the handtruck to the receiving area.</p> <p>Be sure to list all the steps needed to perform the activity. Some steps may not be performed each time; an example could be checking the casters on the hand truck. However, if that step is generally part of the activity, it should be listed.</p>	<p>A hazard is a potential danger. The purpose of the Activity Hazard Analysis is to identify ALL hazards, both those produced by the environment or conditions and those connected with the activity procedure.</p> <p>To identify hazards, ask yourself these questions about each step:</p> <p>Is there a danger of the worker striking against, being struck by, or otherwise making injurious contact with an object?</p> <p>Can the worker be caught in, by, or between objects?</p> <p>Is there potential for slipping, tripping, or falling?</p> <p>Could the worker suffer strains from pushing, pulling, lifting, bending, or twisting?</p> <p>Is the environment hazardous to safety and/or health (e.g. toxic gas, vapor, mist, fumes, dust, heat, or radiation)?</p> <p>Close observation and knowledge of the activity is important. Examine each step carefully to find and identify hazards -- the actions, conditions, and possibilities that could lead to an accident. Compiling an accurate and complete list of potential hazards must allow you to develop the recommended safe activity procedures needed to prevent accidents.</p>	<p>Using the first two columns as a guide, decide what actions or procedures are necessary to eliminate or minimize the hazards that could lead to an accident, injury, or occupational illness.</p> <p>Begin by trying to: 1) engineer the hazard out; 2) provide guards, safety devices, etc.; 3) provide personal protective equipment; 4) provide activity instruction training; 5) maintain good housekeeping; 6) insure good ergonomics (positioning the person in relation to the machine or other elements in such a way as to improve safety).</p> <p>List the recommended safe operating procedures. Begin with an action word. Say exactly what needs to be done to correct the hazard, such as, "lift using your leg muscles". Avoid general statements, such as, "be careful". List the required or recommended personal protective equipment necessary to perform each step of the activity.</p> <p>Give a recommended action or procedure for each hazard. Serious hazards should be corrected immediately.</p> <p>The AHA should then be changed to reflect the new conditions.</p> <p>Finally, review your input on all three columns for accuracy and completeness. Determine if the recommended actions or procedures have been put in place. Re evaluate the activity hazard analysis as necessary.</p>

Fig. No. 7: Activity Hazard Analysis (AHA) with Risk Assessment Code (RAC) Matrix.