

## **First Things First – “Pre-Construction” Safety Issues**

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### **Introduction**

Many construction companies still address safety at the point of contact – in the field. However, safety does not begin in the field; it takes planning and forethought to be effectively implemented in the field. Therefore, it is important for the safety manager or department to be involved at the procurement and pre-construction phases of projects. Additionally, the safety team can have a positive impact on the procurement process as well as on the company as a whole if the planning begins at the corporate level, even before procurement activities are initiated. Planning and goal setting as a means to affect positive safety performance at the project level must take place on both the corporate and the project levels. This paper will address goal setting and planning on the corporate level, safety’s input during the procurement and bidding stages of a project, issues that must be addressed before project mobilization, project safety planning, and daily planning activities.

### **Setting Goals**

Planning and goal setting work hand-in-hand in the business world. Goals help encourage growth and identify where the company should focus their energies. Goal setting on the corporate level involves understanding the company’s strategic plan and developing safety goals that correspond with that plan. Goal setting should also be incorporated into the project in order to achieve attainable project-specific safety objectives.

#### **Goal Setting on the Corporate Level**

As a safety professional, it is important to identify corporate goals and understand how they relate to safety. What are the long and short-term goals of your company? Do you work for a small company looking to grow? Does your company plan to seek work in another facet of construction? Does your company plan to increase self-performed work or delve into the construction management arena? These goals should be identified by the company’s executives and disseminated through the company’s strategic plan.

So what does this have to do with safety? How does this affect safety planning and behavior on the job? Understanding where the company is going and what type of work the company plans to pursue has an enormous impact on the safety professional. A company may decide that

they can make more money if they increase the amount of work they self-perform. This could mean an increased need for safety training, a need for additional money within the budget to spend on personal protective equipment, possibly a need for additional safety staff. If the company plans to expand their horizons and acquire work in a different state or outside the US, then some research needs to be conducted to identify potential issues such as stricter safety regulations and different insurance requirements.

Planning is necessary for establishing an effective corporate safety program and is addressed in both federal and international safety and health standards. ANSI/AIHA Z10-2005 discusses planning as a means to improve safety performance. Key issues in planning addressed in this standard include identifying and prioritizing safety and health issues and identifying risk reduction objectives (i.e. goals). The Guidelines on Occupational Safety and Health Management Systems, ILO-OSH 2001, identifies planning as a key aspect in developing an occupational safety and health management system. This planning is based on initial and subsequent reviews of the existing safety management system and includes identification of the organization's safety and health objectives, preparing plans and assigning responsibility for achieving these objectives, deciding on a measurement system, and assigning appropriate resources to achieve these objectives. Likewise, the OHSAS 18001:1999 Occupational Health and Safety Management Systems Specification addresses planning as it relates to setting company safety and health objectives and ongoing hazard identification, risk assessment, and risk control. Ongoing hazard identification and risk assessments must be planned to ensure it is a proactive activity rather than reactive. Companies who want to participate in OSHA's Voluntary Protection Program (VPP) are expected to have a safety management plan that includes goals and objectives for meeting those goals, these same issues are identified in OSHA's Voluntary Safety and Health Program Management Guidelines.

### Goal Setting at the Project Level

In addition to the broad goals and objectives set on the corporate level, planning and goal setting has its place on the project level as well. Goals for the project should be set and communicated with the entire project team prior to mobilization. Members of the project team, including subcontractors, should have input in this process, otherwise it will be ineffective. Some companies create a safety charter that is signed by the entire project team and the subcontractors. These goals can be as simple as "Zero Accidents" or a more complex series of expectations that will be upheld on the project. Whatever the goals are, they need to be realistic, applicable to the project and attainable by the workforce. Milestones help the project team to work towards a goal and track what has already been achieved.

## **Bidding and Procurement Issues**

During bidding and procurement activities, there are many occasions where safety comes into play. The safety manager may not be able to personally attend activities such as the pre-bid meeting or to review every word in the specifications, but those employees involved in the process should be trained on and aware of safety issues affecting the project. Safety related information can be gleaned from pre-bid meetings and contract specification requirements. The client may have special safety concerns and requirements that need to be considered in the bid. A hazard analysis can be created for the project based on this information can help identify particular safety issues that may come with a significant price tag. There should be separate line

items for safety costs in the bid and the budget. Finally, project team and subcontractor selection must be made with safety in mind.

### Pre-Bid Meetings

A lot of information can be gleaned from a pre-bid meeting. It is an opportunity to meet with the client and to walk the site to identify pre-existing conditions that could translate to potential safety issues. These pre-existing conditions may not be evident on the drawings; nearby power lines, difficult site access, or an elementary school across the street. At a pre-bid meeting, information such as the location and distance of emergency services as well as the client's existing emergency plans (if any) can be identified. Additionally, at a pre-bid meeting, the contractor can get an idea of what the client's safety expectations are, and how they are prioritized.

### Client Requirements

Many clients have particular safety concerns and requirements that are above and beyond OSHA requirements, such as 100% fall protection at 6 feet, full time safety staffing, rules concerning dust, noise, vibration and hot work, special training or certification requirements. Sometimes safety staffing requirements are identified in the quality control section of the specifications. A particular client may require that a CSP or CIH be present for the duration of certain activities, or simply be retained for the duration of the project to make periodic inspections as a part of the project's QA/QC plan.

### Hazard Analyses

A preliminary hazard analysis can be conducted after attending the pre-bid meeting and visiting the site to identify existing conditions as well as to uncover client needs and expectations, reviewing the specifications and the plans. Baseline hazard analyses for the site are identified as a requirement for participating in OSHA's Voluntary Protection Program (VPP). The hazard analysis can be used to help the estimating team identify needs such as guardrail systems or other fall protection systems, stair towers for access, and special fire protection or emergency rescue considerations. Some contractors require their sub-tier contractors to submit a hazard analysis with their bid. This practice can be used as a subcontractor selection tool and as a means to fully evaluate the scope of the subcontractor's bids. In developing the overall job hazard analysis, sometimes it is useful to look at similar projects and consider safety issues, accidents, or incidents that occurred to make sure those items are addressed before procurement.

### Line Item Safety (Bidding and Budgeting)

Some companies simply assign a dollar value for safety during the bid based on a percentage of the total dollar value of a project or on a dollars per square-foot basis. This approach does, at least, assigns a value to safety in the bid, however this value may be too small on some projects, possibly resulting in a bust, and too large on others, possibly resulting in the company not winning the job. Some projects may require a larger safety expense because of a need for public protection, ventilation, air monitoring, engineered fall protection systems, etc. Additionally, the money added to the bid for safety using this method often gets lost in the contingency or overhead line items, which generally are the first to be sacrificed when trimming down the bid. If the line items are broken down in the bid, they will be less likely to be slashed indiscriminately when the estimating team is looking for places to cut costs in a low-bid situation. In a negotiated bid situation, the line-item costs can demonstrate to the client that the contractor has evaluated the safety needs for the project.

On large projects, it is important for the estimating team to consider who is responsible for certain controls. If guardrails are needed, who will build and maintain those guardrails? Who is responsible for traffic control? Who will clean the mud off the streets? Often, contractors assume that someone else has included these costs in their bids, and find out later that no-one bid or budgeted for these items. Assigning responsibility for these items early in the bidding process has the dual effect of ensuring the cost is covered and that the same item is not picked up by more than one contractor. Pay careful attention to the language on the bid. Are the subcontractors bidding an entire scope of work or did they leave something out? Did the subcontractor exclude some major item such as fall protection or air monitoring? Some contractors are the low bidders because they excluded some significant portion of the work.

After winning the job, while buying out the job and setting up a budget, it is important to assign safety costs as one or more line items. In some cases, there may be a need for multiple safety line items – one for PPE, another for air quality control, yet another for special training, etc... If the cost assigned to safety can be supported and identified as line-items, they are less likely to be cut out indiscriminately. Some upper management execs are rather proud that “there is no budget for safety” as far as they are concerned, meaning that they do not put a limit on the funding available for safety items needed. If guardrails are needed, then guardrails are installed, regardless of the budget. Unfortunately, while this concept may be understood at the corporate level, the project team often sees it another way. Often, in the project management teams mind, “no budget for safety” means no money is available to spend on safety items, and they go without rather than break the budget. In order to avoid potential misunderstandings, budgets should be agreed upon by all parties and policy regarding safety spending should be clearly communicated.

### Safety Staffing/Project Team

Some projects may be complex enough to require full time safety staffing; others may not necessitate a full time dedicated safety staff. It is important to scrutinize the project and its requirements before the bid to identify potential safety staffing needs. Safety staffing requirements may be located in the specification section outlining the project team requirements, the safety and health requirements and/or the quality control requirements. Additional requirements may be scattered throughout the specifications, so it is important to do a thorough review during the bidding process. While bidding for a project, the need for a special scaffolding setup, engineered fall protection systems, or certain excavation protection systems may be discovered. In such a case, one or more professional engineers may be required by law (or by the specifications themselves) and should be considered when assembling the project team.

It is also important to carefully select a project team whose members are experienced enough to understand the particular safety issues inherent in that project type. The hazards inherent in building a bridge, water treatment plant, industrial facility or a commercial multistory building tend to be very different. Similarly, working occupied facilities, older buildings being renovated, or demolition projects are each very different from a ground-up construction project. Safety is indeed a team effort and the team members must be knowledgeable enough to be able to properly plan for and handle any hazards that may be present.

### Subcontractor Selection

The subcontractors selected for a project are a part of the project team and should be treated accordingly. The general or prime contractor should be wary of selecting subcontractors based

on price alone. If a subcontractor is chosen who is unsafe or has a cavalier attitude towards safety, the entire project can suffer in the way of hazards created as well as time and money lost due to the accidents or other problems they can create. Other subcontractors may not have experience in the type of building, demolition, or renovation project that they are bidding, and may simply be unaware of the hazards or special requirements for that project. Some form of subcontractor selection should take place before requests for bids are sent out. Some companies use their own past experiences with a subcontractor to determine whether to accept their bid on certain projects. Others require prospective subcontractors to complete a pre-qualification form and provide information such as their OSHA injury rates over a period of time and their EMR. Occasionally, a client will dictate certain pre-qualification requirements be met before allowing sub-tier contractors to work on their properties.

Whatever the prequalification requirements are, they must be clearly communicated prior to bid. Additionally, it is important to tell the subcontractor in the bid phase of the project what the safety expectations and requirements are. Following a 100% fall protection requirement may cost the subcontractor more in materials and equipment costs, and their bid will reflect those costs. Some subcontractors may not have insurance coverage that matches what is required by their contracts or may not be willing to agree to the hold harmless agreements included in the contract. A copy of the contract(s) used for a particular project should be included in the bid proposal in order to expedite the award and contracting process later.

## **Pre-Mobilization**

Once the project is awarded, many things must take place before work on site commences. Contracts must be awarded, the project specific safety plan, schedule, and site and facilities plan are developed, and the pre-construction meeting must be held. On many projects, training will also need to be scheduled in order to be prepared for certain tasks. Safety has an important place in each of these pre-construction activities.

### Contract Language

Safety expectations and requirements must be communicated in the contract language. Many companies will put specific safety requirements in the scope of work in addition to the body of the contract itself. Some companies limit the language to include only Federal, State and Local requirements, however, this leaves a lot of room for interpretation. As a company, you may have safety requirements that are stricter than OSHA's. If this is the case, then you should include those requirements in your subcontract language in order to ensure that all workers have the same protection and are following the same rules. This is particularly important where multiple trades are involved, as one trade may create a hazard (and a violation) for another.

Contracts must be written for any work on a project that involves labor since most basic purchase orders do not provide the contractor with the same protection as a full contract. Insurance requirements must also be appropriate to the work being performed and work location and be clearly communicated in the contract language. A signed contract and certificate of insurance should be required before work commences.

### Project Specific Safety Plans

Every project should develop a project specific safety plan (PSSP) that includes the safety issues relevant to that project. The PSSP will be different from the corporate plan in that it includes all local requirements, client requirements, and items identified in the preliminary JHA. The PSSP will only address site issues, so items in the safety plan that are not applicable to that project will be left out. Many clients require a PSSP (though they may call it something else) and it often is one of the first submittals to be prepared and delivered to the client. The PSSP should be sent to each subcontractor with their contract, which in turn should reference the plan. This plan is a good place to incorporate all the safety-related forms and checklists that are expected to be in use on the project. During the pre-construction meeting, the PSSP should be discussed with the subcontractor site personnel and may need to be distributed again. Copies of the plan need to be retained at the jobsite for reference and review. An important thing to consider when developing a JSSP is enforcement. If the contractor does not want to enforce a particular rule or policy, such as 100% eye protection, then it doesn't belong in the plan.

### Scheduling

The project scheduler should ensure that safety-related activities are appropriately accounted for in the project schedule. Activities such as installation of fall protection systems, design of protective systems for excavations, and construction of protective enclosures can take a significant amount of time. Additionally, there may be some activities that should not be conducted while there are other contractors or members of the public in the vicinity. Activities such as painting may introduce hazardous vapors into the work area. Especially noisy operations may need to be isolated from other activities. Activities that can impact public right-of ways take time to set-up and often require a permit and are restrictive concerning times of day or dates that the work is allowed to take place. Work activities and materials delivery should be scheduled as well as a means to mitigate mold damage. A delivery of drywall scheduled too far in advance of installation can be exposed to an excess of moisture and present problems in the future. Likewise, installation of drywall before the building is sufficiently "weathered-in" may be exposed to mold damage.

### Site Planning

Site plans need to be reviewed for emergency egress needs, traffic flow, material handling, and crane setup locations. This will be a process that continues throughout the life of the project as the site changes. Storage locations should be identified early in the project plan to minimize double-handling, damage to the materials due to moisture, and impact on the project's emergency egress routes.

### Pre-Construction Meetings

Pre-construction meetings are the time when the contractor can set the expectations for the project in regards to safety performance. This meeting is also likely to be the appropriate venue to address the safety charter, if used. Copies of the contract, specifications, plans and PSSP should be available during this meeting in the event that the attendees are unfamiliar with these documents and their requirements. Often, the person who signed the contract is not the one who is doing the work and details concerning safety and contract requirements are not always well communicated with the on-site personnel. At the pre-construction meeting, any questions or concerns can be brought to light. Perhaps one of the subcontractors has identified a potential safety issue that was not identified during the bid? This meeting can provide a venue to solve problems before they become major issues in the field.

### Education and Training

Additional education or training may be needed for some members of the project team before the project starts because of certain hazards that may be inherent to that project. Confined spaces, lockout-tagout, hazardous materials, air quality issues, and fall protection needs are some items that require project specific training before work begins. Many companies conduct a Site Specific Safety Orientation for each employee of each contractor before the work on site. A good orientation can help new contractors and employees adjust to working conditions on the site more quickly and will give them an opportunity to ask questions prior to work. OSHA requires certain types of training to be performed before employees are exposed to hazards: hazard communication, fall protection, scaffolding use, ladder use, confined space entry, steel erection, and forklift operation to name a few.

## **Project Planning Activities**

Once the project is mobilized and work begins, safety must become a daily issue. Before a particular work activity starts, an activity hazard analyses should be conducted by the contractor who will be performing that work. Regular coordination and progress meetings are a good place to disseminate information concerning new hazards or changes to site plans. Additionally, daily hazard analyses are used by each crew to ensure that the workers are aware of the hazards they may face on that particular day and how to avoid them.

### Job and Activity Hazard Analyses

Each contractor on site should conduct their own job hazard analysis addressing their work on the project. Some activities, such as steel erection, critical lifts, control of hazardous energy, and confined space entry require a very detailed hazard analysis prior to work in order to mitigate the hazards inherent to these activities. OSHA requires plans and hazard analyses for many work activities prior to their being performed.

Several clients and general contractors require their subcontractors to complete a job hazard analysis for review before their work activity begins. Occasionally this practice can be challenging as not all contractors are familiar with activity or job hazard analyses and how to construct useful ones. Often, the safety personnel for the prime or general contractor end up creating a job hazard analysis for their subcontractors and submitting it on their behalf. This practice may fulfill the requirement of the job, but is not as effective in controlling hazards for a lack of buy-in by the subcontractor and may involve direction of means and methods. One contractor has addressed this problem by creating boilerplate job hazard analyses, but with a blank column where the corrective action items are identified. They then meet with their subcontractor to tailor the boilerplate document to their work activity and have the subcontractor fill out the blank column to identify how they are going to avoid particular hazards. If, during the course of work, an accident or incident happens, then the hazard analysis needs to be reviewed as a part of the accident/incident investigation. This review will identify any flaws in the hazard analysis which should then be revised.

### Coordination and Progress Meetings

Coordination and progress meetings are important to the contractors working on a particular project because it allows all parties to work together to plan and coordinate their future activities. Often, safety is the first topic of discussion in these meetings. The safety discussion should be

applicable to the current and future activities and all affected contractors should provide input regarding their needs. Changes to the emergency plan and site access plan should be discussed in these meetings as the project develops. Special hazards that one contractor may create must be communicated to other affected contractors in order to minimize exposure to their employees.

### Daily Activity Hazard Analyses

Most work crews start their day with a “huddle.” This is a short meeting where the supervisor reviews the days activities with his crew, telling them where they will be working, what needs to be accomplished for that day, what tools they need, and what hazards may be present. This meeting can be boiled down to a short, written, activity hazard analysis that can be reviewed with and signed by the workers. If done effectively, a daily hazard analysis may eventually take the place of a toolbox talk. Reviewing the plan each day keeps safety fresh in the workers minds and changing work conditions can be addressed and clearly communicated. The information delivered is applicable to the work they are doing and reinforces expectations. If the plan for the day changes, for example if the crane breaks down mid-morning, then another “huddle” needs to be held before the alternate activities are performed.

## **Summary**

This paper has addressed construction safety from a planning perspective. Goal setting on the corporate level involves understanding the company’s strategic plan and developing safety goals that correspond with that plan. Goal setting can also be incorporated into the project as well to achieve certain project-specific safety objectives. Safety review and involvement during bidding and procurement is important to effectively plan and budget for safety activities. The safety manager may not be able to personally attend every pre-bid activity such as the pre-bid meeting or to review every word in the specifications, but those employees involved in the process should be trained on and aware of safety issues affecting the project. Safety related information can be gleaned from pre-bid meetings and contract specification requirements as well as from the client themselves. A hazard analysis can be created for the project based on this information. Addressing safety costs as separate line-items in the bid and budget can ensure accuracy. In addition, the project team and subcontractor selection must be made with safety in mind. Once the project is awarded, many things must take place before work on site commences. Contracts must be awarded, the project specific safety plan, schedule, and site and facilities plan developed, and the pre-construction meeting must be held. On many projects, training will also need to be scheduled in order to be prepared for certain tasks. Once the project is mobilized and work begins, safety becomes a daily issue. Activity hazard analyses can be performed by the contractors before their work activities begin. Regular coordination and progress meetings can be used to disseminate information concerning new hazards or changes to site plans. Additionally, daily hazard analyses are used by each crew to ensure that the workers are aware of the hazards they may face on any given day and how to avoid those hazards.



## Bibliography

Furst, Peter G. "Managing Risk through Pre-Operational Planning." *IRMI*. September 2006.  
[www.irmi.com](http://www.irmi.com)

*Guidelines on occupational safety and health management systems ILO-OSH 2001*. Geneva: International Labour Office, 2001.

*29 CFR 1926 OSHA Construction Industry Regulations*. Davenport, Mangan Communications, Inc., 2004

*Occupational health and safety management systems – Specification OHSAS 18001:1999*. Occupational Health and Safety Assessment Series. Geneva, Dansk Standard, 1999.

Nash, James L. "For Contractors, Safety Means Planning." *Occupational Hazards*. 05-25-05.  
[www.occupationsafetyhazards.com](http://www.occupationsafetyhazards.com)