

4.4.4. Control of health and safety

CONSTRUCTION SAFETY

Accidents are expensive, not only to the project individually, but also the entire construction industry. Most accidents can be avoided by having a safe environment. For safety to be effective it needs to be seen to be of importance to top management. Safety programmes must be supported from the top. The project manager should require that a formal site safety program be prepared and is in place on each of the jobs. There must be a comprehensive safety orientation for all workers.

Safety programmes will also include the following duties, which have to be performed by the general contractor and the subcontractor.

Access

The general contractor should provide an adequate access and/or roads to the site of the structure if required. The general contractor should also provide and maintain at least one temporary or permanent access to each working elevation.

Hoisting Facilities

The general contractor and individual subcontractors should be responsible for providing hoisting of their own materials on construction floors. A tower hoist or other hoisting facility of suitable capacity to carry all normal items of material should be provided on a preagreed upon basis to subcontractors by the general contractor. Subcontractors should conform to a mutually agreeable schedule during normal working hours. Hoisting facilities should be maintained until the bulk of all materials are stored in the building. When materials exceed the capacity of normal hoisting facilities in either size or weight, or demand excessive time, the individual subcontractor should be required to make its own arrangements. The general contractor provides a suitable personnel elevator or manlift if the magnitude of the work force and the height of the work require it.

Guardrails, floor and wall openings and stairways

The general contractor should provide guardrails, handrails and covers for floor, roof and wall openings, and stairways installed and/or constructed by its own forces. If movement of these protective facilities is required for the subcontractor to perform his work, it should be the responsibility of that subcontractor to give prior notification to the general contractor and to replace the same in a satisfactory manner.

Trash

The general contractor should be responsible for providing trash receptacles on each floor of the building. Each contractor or subcontractor should be responsible for collecting and depositing its debris in such collection facilities. The general contractor should be responsible for the removal of all debris from the jobsite. Trash and debris should not be allowed to accumulate.

Sanitation Facilities

The general contractor should be responsible for furnishing adequate temporary toilet facilities on the job site.

Drinking Water

Potable drinking water on the job site should be provided free of cost to subcontractors, in convenient and accessible locations, by the general contractor, so long as the general contractor has personnel on the job requiring drinking water.

Fire Protection

The general contractor should provide the general temporary fire protection requirements. Subcontractors should be responsible for their own specialty requirements. Permanent fire protection equipment used for fire protection during construction should be the responsibility of the installing contractor.

Weather protection and temporary heat / ventilation

During construction, weather protection and heating / ventilation may be required for protection of workers and protection of construction:

- a. Before permanent enclosure of the building;
- b. After enclosure but before finishing operations; and
- c. During finishing operations.

Local agreements prior to bidding for use in the contract documents should establish the type, duration and level of requirements for heating / ventilating and weather protection. Generally, the general contractor should be responsible for providing general weather protection. The heating / ventilating contractor should be responsible for providing heating / ventilating of workers and construction after permanent enclosures have been installed and the permanent heating system is sufficiently completed to allow safe operation, as determined by the

architect / engineer and / or owner. Subcontractors having specific or unusual requirements should be responsible for their own requirements.

Storage

The general contractor should coordinate the allocation of storage areas to the various subcontractors.

Water Service

The plumbing contractor should furnish a temporary water supply at each floor of a building, and at other access points if indicated by the architect/engineer in the specifications, which should also indicate the size, quantity and pressure at the water outlets. During the course of construction the general contractor should pay the water bill. Any contractor or subcontractor whose water requirements are in excess of those specified should be responsible for his own facility.

Electrical Service

The electrical contractor should furnish and maintain temporary electrical service for both power and lighting, if indicated by the architect / engineer in the specifications. It should also indicate the type, quantity, wattage, amperage and voltage characteristics of temporary lighting, power circuits and outlets. But in any case the electrical contractor should provide at a minimum, amperage (state local practice), voltage (state local practice), and phase electrical receptacles (state local practice) at each floor of the building such that any point on all floors can be reached by a foot extension cord (state local practice). The general contractor should pay energy charges.

HEALTH AND SAFETY MANAGEMENT

The construction industry, by its inherent nature, is susceptible to potentially dangerous conditions that affect the safety of all personal working on construction projects. As a result, it is imperative in all planning, design bidding, and the implementation that safety be the one constant built into each project.

The most successful economies have demonstrated that workplaces designed according to good principles of occupational health, safety and ergonomics are also the most sustainable and productive. Furthermore, wide experience from countries show that a healthy economy, high quality of products or services and long-term productivity are difficult to achieve in poor working conditions with workers who are exposed to health and safety hazards.

Accidents are more expensive than many of us realize, because there are lots of hidden costs. Some costs are obvious, such as the worker's compensation claims, which cover medical costs and indemnity payments for an injured or ill worker. These are called direct costs of accidents.

But this does not take in consideration the costs to train and compensate a replacement worker, repair damaged property, investigate the accident and implement corrective action. Even less apparent are the costs related to schedule delays, added administrative time, lower morale, and poor customer relations. These are the indirect costs and like the bulk of an iceberg are buried below the surface.

Contractors that develop excellent construction safety management programs gain much more than the reductions in their costs of workers compensation and liability insurance premiums and the reductions in the hidden costs of accidents. They also gain very important positive benefits such as the morale of their supervisors and their workers from an excellent safety record and they also gain customers.

ACCIDENT CAUSATION

The causes of accidents can usually be grouped into five categories. Those are management, environment, material, task, and personal.

Management:

- Safety rules not communicated properly.
- Written procedures not available.
- Inadequate supervision.
- Hazards not identified.
- Maintenance of equipment not carried out.
- Safety inspections not carried out.

Environment:

- Poor weather conditions (Too hot or too cold).
- Inadequate light.
- Presence of toxic or hazardous gases, dusts, or fumes

Material:

- Equipment failure.
- Poor machinery design.
- Involvement of hazardous materials.

Task:

- Unsafe work procedures.
- Unavailability of appropriate tools and materials.
- None functioning of the safety devices.

Personnel:

- Poor physical and mental condition of people involved.
- Inexperience.
- Stress.
- Substandard raw material.

SAFETY AND HEALTH MANAGEMENT SYSTEMS

An effective safety and health management system includes the following elements: Management Commitment, Employee Involvement, Worksite Analysis, Hazard Prevention Control, and Safety and Health training.

Management Commitment:

Management demonstrates leadership by providing the resources, motivation, priorities, and accountability for ensuring the safety and health of its workforce. Management should regard worker's safety and health as a fundamental value of the organization and apply its commitment to safety and health protection. Enlightened managers understand the value in creating and fostering a strong safety culture within the organization.

During the implementation of a health and safety system, there are various ways by which the management can provide commitment and support to the employees.

Safety and health policy: A clear statement of management policy should be developed. This will help everyone involved with the worksite understand the importance of safety and health protection in relation to other organizational values. It also provides an overall direction or vision while setting a framework from which specific goals and objectives can be developed.

Goals and objectives: A clear goal for the safety and health program should be established and communicated and objectives for meeting that goal should be defined. This will ensure that all the members of the organization understand the results desired and measures planned for achieving them. The objectives should be made realistic and attainable, and should aim at specific areas of performance that can be measured or verified.

Visible top management leadership: There should be a visible amount of top management involvement in implementing the health and safety program. If employees see the emphasis that top management is putting on safety and health, they are more likely to emphasize it in their own activities.

Assignment of responsibility: Safety and health is not the sole responsibility of the safety and health professional. It is everyone's responsibility. Everyone in the workplace should have some responsibility for safety and health. Any realistic assignment of responsibility must be accompanied by providing adequate authority and resources to responsible parties so that the assigned responsibilities can be met.

Accountability: The managers, supervisors, and the employees should be held accountable for meeting their responsibilities. Reward progress and enforce negative consequences when appropriate. Accountability can be established through a variety of methods such as charge backs, safety goals and safety activities.

Program evaluation: The program operations should be reviewed at least annually to evaluate its success in meeting the goals and objectives. The evaluation should also identify weaknesses and areas where improvements can be made.

Employee Involvement:

The elements of management commitment and employee involvement are complementary and form the core of any safety and health program. The more the employees are involved in a variety of safety-related activities, the more they will appreciate the potential hazards that exist at the worksite, the more likely they will avoid unsafe behaviors, and the more likely that the overall safety culture of the organization will strengthen.

Worksite Analysis:

If employees are to be protected from workplace hazards, those hazards must be identified. A means of systematically identifying workplace hazard as they occur is needed so that the

hazards can be eliminated before accidents occur. Lack of awareness of a hazard stemming from failure to examine the worksite is a sign that safety and health policies are ineffective.

The following measures are recommended to identify all existing and potential hazards:

Routine inspection and comprehensive surveys: The top management, safety and health staff etc should conduct a routine walkthrough inspection. These inspections are a good audit of the program and can identify the areas that need to be addressed. This also helps the workers think about safety on the job, so that they don't begin to work routinely and automatically. A comprehensive baseline worksite survey for safety and health and periodic update surveys should also be conducted. A reliable system should be provided for the employees to notify the management personnel about conditions that appear hazardous without fear.

Routine job safety/hazard analysis: Make an accurate and complete list of the job safety/hazard analysis. This can be done by jointly analyzing each step in order of occurrence with the effected employee. The job safety/hazard analysis report should be made available to the employees. If an accident or injury occurs on a specific job, the job safety/hazard analysis report should be reviewed immediately to determine whether changes are needed on the job procedure.

Pattern analysis: A trend in the injuries caused during the construction process should be identified and analyzed. The trends can indicate the areas which are in need of attention.

Hazard Prevention and Control:

Redesigning the jobsite can often eliminate workplace hazards. The goal of a hazard prevention and control program is to make the workplace full proof, to the extent feasible. Where it is not feasible to eliminate such hazards, employees must control them to prevent unsafe and unhealthy exposure. The procedures to correct or control present or potential hazards are as follows:

Hazard controls: Changing, substituting, or redesigning the equipment to remove the source of hazard (such as noise, pollution, temperature etc). If you cannot eliminate a hazard and cannot even replace it with a less hazardous alternative, the next best control is enclosure. Protective clothing or equipment can also be used. This includes face shields, hard hats, respirators, steel-toed shoes, hearing protection, gloves and safety glasses.

Administrative controls: They can be used to reduce the duration of an exposure. Administrative controls include lengthened rest breaks and rotating workers through different jobs to reduce stress.

Safety and Health Training:

Training is an essential component of an effective safety and health program. It can help employees develop the knowledge and skills they need to understand workplace hazards.

Employee training: Design employee training programs to ensure all employees understand and are aware of the hazards to which they may be exposed and the proper methods for avoiding them.

Supervisory training: Train supervisors to understand the key role they play in jobsite safety and to enable them to carry out their safety and health responsibilities effectively.

Job orientation: The format of the orientation would depend on the complexity of the hazards and the work practices needed to control them. An orientation will consist of a run through of job tasks, a quick review of site safety and health rules and hazard communication training.

Evaluations: It helps to determine whether the training provided has achieved its goal of improving the employee's safety performance.