**2.2 QUALITIES AND CONCERNS IN CONSTRUCTION**

Quality control and safety represent increasingly important concerns for project managers. Defect or failure in constructed facilities can result in very large costs. Even with minor defects, re-construction may be required and facility operations impaired. Increased costs and delays are the result, in the worse case, failure may cause personal injuries of fatalities. Accidents during the construction process can similarly result in personal injuries and regulations are increasingly rapidly due to ensure these increased costs. Good project managers try to ensure that the job is done right the first time and that no major accidents occur on the project.

As with cost control, however, the most important decisions regarding the quality of a completed facility are made during the design and preliminary stages and component configurations, material specifications and functional performance are decided. Quality control during construction consists largely of insuring conformance to this original design and planning decision (ISO, 1981). While conformance to exiting design decisions is the primary focus of quality incorrect design decision or changes desired by an owner in the facility function may require re-evaluation of design decisions during the curse of construction. While these changes may be motivated by the concern for quality, they represent occasion for re-design with all the attendant objectives and constrains.

As a second case, some designs rely upon informed and appropriate decision making during the construction process itself. For example, some tunneling methods make decisions about the amount of shoring required at different locations based upon observation of soil conditions during the tunneling process. Sine such decisions are based on better information concerning actual site conditions, the facility design may be more cost effective as a result. Any special case of re-design during construction requires the various considerations of material specifications.

With the attention to conformance as the measure of the quality during the construction process, the specification of quality requirements with the design and contract documentation becomes extremely important. Quality requirement should be clear and verification, so that all parties in the project can understand conformation.

**2.3 SAFETY PRECAUTION IN CONSTRUCTION**

The safety during the construction project is influenced in large part by decision made during the planning and decision process. Some design or construction plans are inherently difficult and dangerous, where others, comparable plans may considerable reduced the possibility of accidents. For example, clear separation of traffic from construction zones during the road way rehabilitation can greatly reduce the possibility of accidental collision. Beyond those design decision, safety largely depend upon education, vigilance and cooperation during the construction process. Works should be constantly alert to the possibilities of accidents and avoid taken unnecessary risks.

Safety must be number one concern in the construction industry. The construction industry, by it is inherent nature is susceptible to potentially dangerous condition that affect the safety of all personnel working on construction project. As result, it is imperative in all planning; design, binding and implementation that safety be the one constant build into each project. The Associated General Contractor of America (AGCA), the America Sub-Contractor Association (ASA), is public against any potential hazard caused by construction operations. Every member of the construction team is responsible for the safety and should be head accountable for ensuring a safety and healthful worksite.

The foundation to executing a safety project is the early establishment and during of the project culture that is based on the value of good working relationship and candid communication. Without those values, the probability of safe project is likely to decreases. The development of the project team’s approach to safety is intertwined with the overall approach developed by the general contractor in partnership with the owner and architect and it consultation with major sub-contractors.

**2.4 ORGANIZING FOR QUALITY CONTROL AND SAFETY**

A variety of different organizations are possible for quality and safety control during construction. One common model is to have a group responsible for quality assurance and another group primarily responsible for safety within an organization. In large organizations, departments dedicated to quality assurance and to safety might assign specific individuals to assume responsibility to those functions on particular projects. For smaller projects, the project manager or an assistant might assume these and other responsibilities (Skibniewski and Hendrickson, 2009).

In either case, insuring safe and quality construction is a concern of the project manager in overall charge of the project in addition to the concerns of personnel, cost, time and management issue.

The inspectors and quality assurance personnel will be involved in a project to represent a variety for different organizations. Each of the parties directly concerned with the project may have their own quality and safety inspectors, including the owner, the engineer/architect, and the various construction firms. These inspectors may be contractors from specialized quality assurance organizations. In addition to on-site inspections, specialized laboratories to insure compliance will commonly test samples of materials. Inspectors to insure compliance with regulatory requirements will also be involved. Common examples are inspector for the local government’s building department, for environmental agencies’ and occupational health and safety agencies.

The United State Occupational Safety and Health Administration (USOSHA) routinely conducts site visits of work places in conjunction with approved state inspection agencies OHSA inspectors are required by law to issue citations for al standard violations observed. Safety standards prescribe a variety of mechanical safeguards and procedures; for example, ladder safety is covered by over 140 regulation. In cses of extreme non-compliance with standards, OHSA inspectors can stop work on a project. However, only OSHA inspectors visit a small fractions of construction sites and most construction site accidents are not caused by violations of exiting standards. As a result, safety largely the responsibility of the mangers on site rather than of public inspectors.

While the multitude of participants involved in the construction process require the services of inspectors. It cannot be emphasized too strongly that inspectors are only a formal check on quality control. Quality control. Employee participation in quality control should be sought are reward, including the introduction of new ideas. Most important of all, quality improvement can serve as a catalyst for improved productivity. By suggesting new work methods, by avoiding reword, and by avoiding long term problems, good quality control can pay for itself. Owners should promote good quality improvement can