International Labour Office Training Programmes
Occupational Safety & Health for the Construction Industry

Construction OS&H

For clients of construction projects

ENFORCING GOOD OS&H PRACTICES AND PROCEDURES THROUGH PROCUREMENT AND CONTRACTS

Introduction

It is recognised that many measures are needed to improve safety and health in construction, including a strong legal and policy framework, an effective inspectorate and training of workers, supervisors, contractors and health and safety managers in construction. It is often argued that the monitoring and enforcement of health and safety regulations is solely the responsibility of public labour inspection. However, the large number and wide dispersion of construction sites and the scarce resources available for public labour inspection means that it is impossible to inspect all worksites. Therefore, linkages between employment law and procurement process and the terms and conditions of the contract can be used as complimentary mechanisms for ensuring compliance with legislation. Procurement procedures and contract documents act as important mechanisms to remind the parties to the contract of their obligations under the law. This can raise the standard of OS&H on individual projects and has the potential to raise standards in the industry more generally.

The ILO and organisations in the construction industry, notably the construction Trade Unions, have been advocating measures to improve OS&H through legislation and policy initiatives; improved training, skills certification and worker participation; better planning and coordination of construction projects, including better selection and control of subcontractors; and through the use of health and safety management systems. It is only in recent years that attention has begun to focus on achieving good OS&H performance starting "upstream" with the procurement process rather than trying to tackle it only during the construction phase itself.

Methods of contracting

The two main methods of letting contracts for construction projects in use throughout the world are 'single prime contractor' and 'design-build'.

Single prime contracts are the most common form of construction contracting. In this process, the contract documents are usually prepared by a consultant (architect/engineer/cost consultant) for the client (but this may of course be done by the client's own team). There is usually a direct contract between the client and the consultant(s). The contract documents are then made available to a number of qualified bidders, and the winning contractor enters into a 'prime contract' with the owner. The 'prime contractor' then enters into a series of subcontracts with other contractors in order to undertake the work. So, the client has a prime contract with the consultant and a separate prime contract with the prime contractor (sometimes referred to as the general contractor).

In a **design-build contract**, a single firm provides both the design and construction services. The client issues a contract to the firm to provide all of the design and construction services for the entire project. If a design-build contract is extended further to include the selection, procurement, and installation of furnishings and equipment, it is called a 'turnkey contract.' Once again, most of the work is done by subcontractors.

There are variations on these methods of contracting. For example, a client may employ a construction manager to handle the contract process and manage the whole project. The project manager enters into a series of contracts, including those with specialised contractors to carry out the work. Generally, the work is divided into 'work packages' which are reasonably distinct parts of a project: for example, ground-works, structure, cladding, etc.

In recent years, project owners in the construction industry have placed greater emphasis on contractor OS&H qualifications as a means for promoting construction site safety. Careful examination of safety issues in the bidding process has become more common. Increasingly, public procurement laws are being amended to allow the acceptance of other than the lowest bid, on the basis of 'best value', with a view to achieving better working conditions, health and safety and other social objectives. It is becoming more widely recognised that previous practices requiring acceptance of the lowest bid is no guarantee of value for money.

Regardless of the method of contracting, OS&H hazards must be identified, controls must be implemented and maintained, and records must be established in order to minimise injuries and illnesses and to ensure compliance with legal requirements.

OS&H in contract documents

It is increasingly common for clients with projects involving complex safety and health risks to incorporate preventative requirements into the contract administration process. These requirements often begin with the contractor pre-qualifying prior to bidding and then progressing through the aspects of actual construction work. The early integration of OS&H criteria into the contractual process has become relatively common today, at least in developed countries, but this has largely been the result of the efforts of progressive clients and construction firms. There has not been a specific, commonly used reference source that offers guidance on how to effectively accomplish this integration.

To best understand the opportunities to incorporate OS&H requirements into contract documents, the client should be familiar with their content and purpose, concentrating on the documents where OS&H requirements can be integrated. Clients must be familiar with terms like "technical specifications", "general conditions", "instruction to bidders," and other terms frequently used when discussing contract documents.

The Contract Documents generally comprise three parts:

1. Bidding Requirements. These describe any bid solicitation, Instructions to Bidders (instructions and procedures to be followed by bidders in preparing and submitting their bids, for use when competitive bids are solicited for construction of a project); Standard Bidding Documents (SBDs), which are the forms to be completed to submit bids), and

other information available to bidders. These are requirements that bidders must address in order to prepare and submit a responsive bid, and these can include Labour Clauses on H&S in the SBDs as well as client's requirements on H&S in the Instructions to Bidders.

2. Contracting Requirements. These describe the actual agreement between the client and the prime contractor, including certificates, General Conditions of Contract (this document is an integral part of the contract, setting forth the rights, responsibilities, and relationships of the owner, contractor, and architect); any supplementary conditions [Conditions of Particular Application (CoPA)] that may be imposed on a specific project, and the Bill of Quantities, itemising pay items. These documents can include H&S requirements in the CoPA and H&S pay items can be included in the Bill of Quantities (BoQ).

3. Construction Documents. These describe all plans, drawings, Technical Specifications, addenda, and other information associated with the actual construction of a specific project. This section of the Contract Documents is often referred to as the Plans and Specifications, and it is in the Technical Specifications where H&S requirements can be addressed in greater detail.

Standard forms of bidding and contract requirements

There are many bid and contract packages around the world, which have been assembled by individual Clients or procurement entities or in country procurement systems. Among the most widely used and internationally recognized forms of contract are those published by the International Federation of Consulting Engineers (Fédération Internationale des Ingénieurs-Conseils (FIDIC); see Organisation fror http://www.fidic.org/). More than 25,000 copies of FIDIC's contract forms are supplied every year. These are: Design, Build and Operate Projects; Plant and Design – Build; EPC Turnkey projects; Short Form of Contract; and, finally, Conditions of Contract for Construction, which is also known as the Red Book, and is used by the World Bank and other Multilateral Development Banks (MDBs) in their lending for infrastructure and development projects. These are drafted by Consulting Engineers in consultation with the UN, Organisation for Economic Co-operation and Development (OECD), MDBs, World Trade Organisation (WTO), the ILO, Contractors Associations, the BWI and others. They contain essential Labour Clauses concerning hours of work, wages and health and safety. These documents are used as the Works Contract at the end of the procurement process, and they establish the relationship between the client, the prime contractor and other contractors, and the role of the client's representative, or consultant.

However, the OS&H clauses contained in these bidding and contract documents are very basic and general and there is very little guidance on how to improve OS&H practices and performance throughout the procurement process, or on how to integrate OS&H into all the Contract Documents.

A contractual process for clients

The development of contract documents integrating OS&H and the range of options that could be considered for incorporation into the specific project is summarized briefly below. This follows the 'normal' process of construction projects.

First steps before tendering

From the initial inception of the project, the client should develop and disseminate a clear policy and strategy for safeguarding the safety and health of the workers on the construction project. The policy should be widely publicised so that procuring officers and potential bidders fully understand the client's priorities.

Selection of consultants

Consultants act on behalf of the client in planning and designing a project and in supervising its construction. They have a responsibility for ensuring that the project is designed, constructed and maintained with minimum risk to the health and safety of the workforce. It is important for the client to remind potential consultants of their responsibility and to set out clearly what will be expected of them.

In a call for expressions of interest, it is important to state the client's objectives for protecting health and safety throughout the design, construction, maintenance and use of the project. The evaluation criteria for short-listing should include objective measures of the consultant's understanding of the major causes of accidents and ill-health on construction sites, including qualifications, courses attended and experience, as well as knowledge of national health and safety legislation and international standards. Consultants should demonstrate their record of performance on past projects, and competence in undertaking risk assessments and identifying prevention measures.

Those submitting full proposals should show how they will meet these objectives in the planning, design and supervision of the project. This should include a proposal for a project-specific Health and Safety plan (HASP) at the design and planning stage and the system for evaluating and managing the OS&H performance of the prime contractor and subcontractors during the selection, bidding and construction phases of the project.

Design Phase

During the design phase, the consultant and other members of the team developing specifications begin the process of translating a vision into an actual construction project. The client will have to stipulate in detail to the contractor the range of acceptable conditions for every aspect of a project. In addition to the technical specifications, the contract must set out responsibilities, rights, and relationships of the client and contractor, and others that may be involved in the project.

Several H&S standards now address specific responsibilities of clients and consultants that must be met as part of the contracting process. These include Health and Safety Management Systems, Hazards Communication, Confined Space Entry and other Permit to Work systems for hazardous tasks, or hazard-specific matters such as working with asbestos, scaffolding or crane erection.

In the United Kingdom, the Construction Design and Management (CDM) Regulations issued in 1994 (see Knowledge Base), set out specific responsibilities for the owner, designer, general contractor, and subcontractors for all construction projects, except very small projects. Requirements include a Safety Planning Supervisor to be appointed to the project and a health and safety management plan to be developed during the design phase.

The consultant should consider OS&H issues during the design phase by incorporating health and safety requirements in the contract for construction and specifying these requirements in the technical specifications. By including OS&H requirements in the contract documents, the contractor is required to implement health and safety activities during construction. The technical specifications should detail the minimum health and safety requirements and the means by which the client verifies compliance during construction.

Procurement (or bidding) phase

Once the contract documents have been prepared, an invitation is made to contractors who may be potential bidders. The client may want to include key OS&H criteria in the Invitation to Bidders, such as contractor pre-qualification criteria (prequalification is explained below). Once an apparent lowest cost or best value responsible bidder is identified, the client may want to require contractor participation in a pre-award meeting so that OS&H performance standards and acceptance criteria are clearly understood before entering into the actual contract. OS&H considerations need to be included for the bid package and invitation to bid, pre-bid meetings, bid review, evaluation and contractor selection, and contract award.

Pre-Construction Phase

The client may require pre-project meetings of stakeholders; project specific risk assessments; and/or require that roles and responsibilities of key actors be defined during this phase. At this point, contractor OS&H submissions must be evaluated against the acceptance criteria incorporated in the specification. The client should decide before the bidding phase what level of activity to require during the Pre-Construction Phase, based upon the complexity and hazards of the project.

Construction Phase

All of the training, permits, submittals, meetings, reporting, job site inspections, and other activities necessary to verify that safety and health hazard controls will be implemented in the construction phase must be established in the contract documents. The contractor demonstrates that the detailed Health and Safety Plan outlined in the specification is being followed while performing the work, and that the selected approach achieves the goals in the specification. The contract documents must establish

the contractor's OS&H responsibilities and the client's right to observe the work and receive specified information.

Contractor pre-qualification and selection

In response to serious concerns and liabilities about OS&H, a growing number of construction clients are using qualification-based contractor selection, in which OS&H performance is increasingly considered a determining factor. Clients and construction managers are using contractor OS&H performance criteria in contracts in order to minimise liability, project delays, property damage, workers' compensation costs, and in response to corporate commitments to improve workers' health and safety. Clients should focus particular attention on these construction health and safety risks when initiating a construction project. Increasingly, such risk assessments are performed by contractors in response to requirements incorporated into the bid documents or as a client-required deliverable in the design-build process. Integrated design-build contracts as well as design-bid-build contracts can effectively incorporate many aspects of OS&H at the design phase.

The aim is to improve health and safety practices from design phase, through the bidding and construction phases, all the way to post-construction activities, such as cleaning and maintaining the building. The specific criteria appropriate in a given contract must be evaluated in the context of contractor arrangements and contracting methods. Within the public sector, procurement laws, public bidding laws and associated regulations can include a variety of standards.

Pre-qualification is the first step in identifying responsible candidates for inclusion on the list of firms to invite to bid on the project and may be conducted in two phases: general (relating to the organization as whole) and project specific.

Phase 1: General Pre-qualification

This type of prequalification addresses requirements that can be satisfied in advance of any procurement action. Potential contractors are pre-qualified based on certain general criteria, not specifically related to the services and activities involved in the actual work to be contracted. General pre-qualification usually includes information such as past performance indicators as:

- Injury and illness statistics
- Compliance or violations of OS&H laws and regulations
- Enforcement histories
- Insurance ratings
- 'Near miss' incident rates
- Inspection regimes

Phase 2: Project-Specific Pre-qualification

Project-specific prequalification reviews the contractor experience on identical or very similar projects doing essentially the same tasks that are anticipated. This includes their contractor's present capabilities, such as:

- OS&H management systems and programmes
- Project specific OS&H plans
- Safety training provided to management and workers
- Availability and qualifications of construction safety managers and staff
- Training to be provided
- Inspection processes

Detailed review of OS&H in contract conditions

The general conditions of the contract define the overall OS&H responsibilities and requirements for contractors. These provisions are contained in a separate Clause of the contract. In general, these OS&H conditions require the contractor to be responsible for initiating, maintaining, and supervising all safety precautions and programs, while complying with all applicable laws and regulations.

General Prime Contractor and Subcontractor OS&H Requirements

The prime contractor receives payment from the client for services rendered. The prime contractor may employ one or more subcontractors to perform some or all of the work. The client has a direct contractual relationship with the prime contractor, who then has individual contractual relationships with subcontractors. The general conditions of the contract between the client and the prime contractor, as well as the contract between the prime and lower-tiered subcontractors, must clearly define the OS&H responsibilities and requirements for each party. These 'flow down' provisions are requirements of the contract between the client and the prime contractor and must 'flow down' to all subcontractors. The prime contractor is responsible for implementing the overall health and safety programme for the construction project, verifying the implementation of the subcontractor's health and safety programme.

In no case shall the prime contractor be relieved of overall responsibility for compliance with the requirements for all work to be performed under the contract. To the extent that subcontractors agree to perform any part of the contract, they also assume responsibility for complying with the standards in this part of the work. In the case of subcontracted work, the prime contractor and any subcontractor or subcontractors have joint responsibility. For this reason, a common provision in the contract between the prime and subcontractors is that the subcontractor is responsible for OS&H compliance.

Therefore, the prime contractor's contract with the client should also include a provision that requires the prime contractor to conduct a health and safety selection process on subcontractors. The client's contract with the prime contractor should also contain the right to review OS&H documents and to visit the project site while work is ongoing.

Pre-construction and regular coordination meetings between the owner and the prime contractor, as well as between the prime contractor and lower-tiered subcontractors should be specified in the contract documents to allow for sufficient health and safety planning, risk assessment, and coordination during the course of the project.

OS&H work plans and schedules

The prime contractor should be required, in a clause clearly stated in the contract, to submit their company health and safety policy and a project specific health and safety plan (HASP) addressing all applicable OS&H requirements. The detail and complexity of the HASP will be dictated by the size and complexity of the project. Normally, the prime contractor is responsible for preparing the project-wide HASP that addresses potential hazards that may be present on the worksite (e.g fall protection risks and requirements). This project-specific HASP details the hazards posed by construction, the means and methods to be used for preventing or controlling them, and provides adequate safeguards for all construction workers. The prime contractor should require subcontractors to submit a project specific HASP addressing the tasks they will perform.

The specification for the HASP should also indicate how the contractor will address any specific hazards identified in the scope of work. Contractors that do not effectively assess hazards and protect their employees should be excluded from bidding by using safety and health performance and information as selection criteria.

To the extent possible the plan should include risk assessments for each phase or task of the work. This should address the basic steps to perform each phase of work, the hazards associated with each step and a description of how the contractor plans to prevent or control the risks.

On some projects, it is important that the contractor demonstrates they have written procedures to perform certain tasks or types of work. If the scope of work includes work activities such as confined space entry, use of hazardous chemicals, excavations, construction of scaffolds, etc., the contractor should be required to submit their operating procedures for the work.

In the contract, the prime contractor should also have a qualified safety officer at the project site responsible for implementing the HASP. The safety officer should be required to attend all project safety meetings and participate in all activities outlined in the HASP. The prime contractor should require subcontractors to designate a qualified safety representative at the project site with the responsibility for implementing each subcontractor's HASP.

The prime contractor should be required to provide a detailed schedule of work activities with their bid, with the duration of each work activity shown. The prime contractor should require similar schedules from its lower-tiered subcontractors and integrate these into a master schedule for the project. The prime contractor's schedule should be required in the contract documents to be maintained current with updated schedules provided to the client at regular intervals.

The proposed hours of operations and days per week the contractor is allowed to work on site is usually stipulated in the contract documents. OS&H issues should be considered in the overall project schedule, because the work schedule and construction sequence is likely to have heath and safety impacts. For example, the amount of night work and overtime should be kept to a minimum to better prevent incidents that can result from fatigue and inadequate lighting. Seasonal considerations should also be taken into account; health and safety concerns to consider may include heat stress, cold stress, inclement weather, biological hazards (e.g. poisonous plants, insects, and animals), and other concerns.

Another safety hazard that should be considered during schedule development is the prevention of falls. Timely erection of permanent stairways and handrails may prevent slips, trips, and falls associated with temporary stairs and scaffolds. The schedule should be designed so that a permanent stairway is constructed at the beginning, or as close as possible to the start of construction. The schedule could also specify that permanent handrails be erected along with the structural steel. The scheduled installation fire protection devices, such as automatic sprinkler systems, fire walls, and fire doors should be planned for the earliest possible time during construction. The permanent electrical systems and equipment should also be installed at the earliest time in the project to control hazards posed by temporary electrical systems.

Employees

The contractor should be required to submit the Curriculum Vitae (CVs) of key personnel identified in the specifications. Bidders should be required to submit CVs for key positions, such as:

- Site Supervisor. The CV should demonstrate that the person has appropriate training, experience, and qualifications to execute the project safely.

- OS&H specialist personnel. The CVs should demonstrate adequate training, experience, and qualifications to execute responsibilities.

- 'Competent Persons'. Some activities have to be supervised by 'competent persons'. These activities include scaffold erection, excavation work and confined space entries. 'Competent persons' for specific activities should be submitted for review, and should demonstrate training, experience, and authority on the project to carry out their responsibilities.

The prime contractor's employees and those of their subcontractors should be required to provide written documentation that they have completed all appropriate health and safety training before working on site. This will include health and safety orientation training, and any project-specific health and safety training and hazardous operation training.

The prime contractor and subcontractors should be required to hold regular safety meetings to instruct their employees on all project-related safety procedures and to provide appropriate personal protective clothing and equipment to their employees, provide training in its use and enforce the use of the protective clothing and equipment.

OS&H incidents

In the contract with the client, the prime contractor is usually required to notify the client immediately following any OS&H incident, with a detailed written report and to comply with reporting and record-keeping requirements. The prime contractor flows-down the accident notification and reporting requirement to subcontractors, so that all incidents that occur during the course of the project are reported and investigated in a timely manner.

OS&H Pay Items

Although the general costs of operating good OS&H should be incorporated in the contract costs, there will be items in many contracts that enable the contractors and sub-contractors to be paid for compliance. These 'pay items' should be specified in the contract documents, in particular the acceptance by the client of the prime contractor's HASP for the project. These pay items are usually paid as a lump sum, but may also be itemised in a Bill of Quantities.

OS&H pay items may include:

- Different hourly rates for personnel to work in upgraded levels of personal protective equipment (such as respiratory protection)
- A lump sum for providing a qualified full-time health and safety officer for the duration of the project
- A lump sum for establishment and proper functioning of an OS&H Committee
- A lump sum for contractors and personnel attending any required OS&H orientation training
- A unit rate or lump sum for specific air monitoring, air sampling and analysis required to implement industrial hygiene or air quality monitoring, as may be required by the technical specifications

Project Specific Hazards Information

In order to initiate effective OS&H processes and procedures during the contract, specific hazards should be identified in the contract documents. These may include:

- Areas where the work or a portion of the work is to be performed is defined as a confined space
- Any potential fire, explosion or possible release of toxic or hazardous materials associated with the work or in the area where the contractor will be working
- Information related to emergency response and evacuation plan, such as:
  - Alarm systems
  - Evacuation routes
  - Areas of safety and assembly points

- Any hazardous materials or chemicals that are used in the area the contractor may be working, signs and symptoms of exposure, special protective equipment requirements, and copies of specifications for those materials or chemicals

- Known or suspected areas that may have hazardous materials or hazardous contaminants that could affect the contractor's employees or others by the contractor's work, such as the presence of asbestos, lead-based paint, or soils contaminated with hazardous materials

- The presence of other contractors that may be performing work in the same area and any hazards associated with their work such as:
  - Welding or cutting
  - Use of heavy equipment
  - Heavy lifts or use of cranes

- The presence of underground pipes or cables, overhead electrical power-lines

- Construction or demolition activities in an existing structure that could pose a structural collapse hazard if the contractor is not made aware of the existing structure’s loading conditions and structural integrity

- Any health and safety requirements specified such as:
  - 100% fall protection
  - Use of hard hats, safety glasses, gloves, respiratory protection and safety footwear
  - Collection and maintenance of Material Safety Data Sheets for hazardous chemicals brought to the site

- Any special work permit requirements such as:
  - Hot work permits needed to coordinate use of spark and flame producing activities such as welding, grinding, or torch cutting
  - Excavation permits to coordinate excavations and ensure the contractor has all needed information for a safe excavation
  - Lock Out/Tag Out permits to coordinate the lock out or tag out of equipment
  - Scaffold erection and inspection to allow all contractors to understand the status of scaffolds present on a project
  - Lift permits to coordinate lifts with cranes
  - Chemical use permits that coordinate the use of chemicals or other materials on a project that could expose other site personnel to airborne hazards such as fumes, vapours, mists, dust, fire or explosion hazards

- The client or prime contractor should require contractors to document implementation of their health and safety programme and address requirements for personal protective equipment, chemical hazard communication, performing periodic health and safety inspections, emergency response procedures, tool and equipment inspections, fire protection, vehicle safety, and site security.

Licences, Certifications and Training Documentation

The contractor should submit copies of all licences, certifications, and training documents. These would include:

- Company and individual employee licenses for work as a general contractor, contractor or specialty work, such as asbestos abatement, crane and equipment operators, or other work that requires specific licenses

- Certificates of inspection for cranes or other heavy equipment

- Certificates of insurance indicating the contractor is adequately insured for general liability and workers' compensation

- Certification and training documentation in key areas such as welding, electrical work, confined space entry, hazardous waste, site health and safety, asbestos abatement, crane and equipment operations, scaffold erection, excavations, etc.

Implementing the OS&H requirements of the contract during the project

Induction

New employees and visitors to the project should be required to attend an initial OS&H induction that covers the site-specific rules and procedures that must be followed and the disciplinary action that may result if such procedures are not respected.

Inspections

The purpose of OS&H inspections is to ensure that the project is performed in accordance with established standards. There are different types of inspections: self-inspections, equipment inspections and formal safety and health audits. Each contractor on site should be required to perform daily OS&H inspections of their respective work area. In addition, the prime contractor should conduct a minimum of weekly walkthrough inspections of the entire work site and note problems that need to be corrected. These must be communicated to the respective sub-contractors and followed up to ensure that incidents of lack of compliance are corrected. All inspections need to be documented to provide a record of what was found and corrective actions needed or taken. Copies of all inspection reports and follow-up actions should be submitted to the client.

The contract documents should reflect that the client has the right to perform site inspections and observations of construction operations. The purpose of these types of inspections is typically for the owner to have a mechanism to ensure that contractual safety and health obligations are being satisfied throughout the performance of the work.

Site OS&H Meetings

Since conditions are constantly changing on site, regular site meetings are essential to the OS&H performance on the site. The contractor should conduct the meetings but the client will want to establish the right to attend these meetings to help monitor compliance with the contract.

Weekly safety meetings should be held by all contractors and sub-contractors on the site to review safety conditions and ensure any corrective actions are taken. The prime contractor should be required to be at all of these meetings to hear the concerns that are raised and to make sure they are addressed in a timely manner.

Safety Documentation

Numerous documents are created as part of OS&H processes. These documents are useful during the construction phase to monitor and continuously improve safety performance. Requirements for safety documentation must be incorporated into the contract documents.

Incident/injury reporting

Contractors and sub-contractors should be required to provide to the client immediate notification of incidents (including 'near miss-events') and injuries. The contractor should be required to conduct an investigation of the incident to identify the root causes and corrective actions to prevent further incidents (accidents). Submittal of the investigation report by the prime contractor should be required within 24 hours

Hazardous work permit system

Depending on the nature of the site, a hazardous work permit system may be instituted on site to ensure that essential precautions are followed when working in a hazardous area. Such permits may include confined space entry permits, hot work permits, or work at height permits. Such site-specific hazards and procedures should be included in the project specification and discussed in the initial project safety orientation meeting. Any applicable hazardous work permit system should be specified in the solicitation documentation.

[This section was drafted by Fiona Murie of BWI and edited by Richard Neale]