

ES&H PROGRAM FOR CONSTRUCTION

1.0 INTRODUCTION

At Fermilab the health and safety of all who work here is paramount. We believe that the most effective and least costly way to accomplish our goals is to do so safely, without injury to workers, the public, or the environment. We believe that the most effective, well-managed businesses are those that share our view of the importance of working safely. Working safely and in an environmentally sound manner is simply good business. We will only engage subcontractors and their sub tier contractors to work on the Fermilab site who share the view that working safely cannot be an afterthought or an added cost.

This chapter describes Fermilab's program, procedures and safety requirements for all construction work. Construction tends to have greater exposures to hazards and thus higher injury and property damage rates. However, experience has shown that careful planning and review can reduce the rate at which accidents occur.

This chapter also describes requirements for Fermilab employees who will be entering construction areas or who oversee subcontractor construction activities.

The level of Fermilab review and oversight of construction activities is commensurate with the risk and complexity of the work activity. A basic distinction is made between construction work which is fully specified and documented and that which is conducted on a progressive basis, with more reliance on field decision making. In the former case the construction work is considered "coordinated" by a Construction Coordinator (CC). When construction is subcontracted with less formal definition, it may be managed on a "task basis" by a Task Manager (TM). The common occurrence of task management is with Time and Material construction contracts.

The significant difference between the two oversight roles lies in the assignment of responsibility for safety planning and hazard assessment. Task Managers must understand the detailed nature of work assignments for tradesmen. They serve to specify Fermilab requirements as a job progresses, working closely with subcontractors, supervisors, and workers.

A Construction Coordinator oversees or coordinates construction when supervision and management is included in the subcontract scope and the work processes and required outcomes are well understood. The CC relies on the subcontractor to plan the means and methods to safely and effectively accomplish construction objectives.

While the majority of the Fermilab procedures in Section 5 below are based on the construction coordination model, the Task Manager is also responsible for complying with the permitting, coordination, documentation, and other requirements. Construction Coordinators may have additional responsibilities identified in the procedures, Section 5.

2.0 REFERENCES

29 CFR 1926- Construction Industry Regulations
NFPA-70E (2004)- Standard for Electrical Safety in the Workplace
10 CFR Part 851- Worker Safety and Health Program
Appendices found at the end of this chapter

3.0 DEFINITIONS

Competent Person- One who is capable of identifying existing and predictable hazards on the surroundings, or working conditions which are unsanitary, hazardous, or dangerous to employees, and who has the authorization to take prompt corrective measures to eliminate them.

Construction - means construction, alteration, demolition, or repair (including dredging, excavating, and painting) of buildings, structures or other real property. For purposes of this definition, the terms “buildings, structures, or other real property” include, but are not limited to, improvements of all types, such as bridges, dams, plants, highways, parkways, streets, subways, tunnels, sewers, mains, power lines, cemeteries, pumping stations, railways, airport facilities, terminals, docks, piers, wharves, ways, lighthouses, buoys, jetties, breakwaters, levees, canals, and channels. Construction does not include the manufacture, production, furnishing, construction, alteration, repair, processing or other kinds of personal property.

Construction Coordinator (CC) - A person specifically assigned to oversee the work of a construction subcontract for conformance to the subcontract agreements/ documents. Construction Coordinators serve as the primary construction point of contact between the Subcontractor and the Laboratory. However, the Construction Coordinators do not directly supervise subcontractor employees or direct construction work, as is the case for Task Managers.

Note: The FESS Engineering Department primarily furnishes Construction Coordinators, which is at times supported by outside A/E personnel under FESS direction.

Construction Manager (CM) - The individual with overall responsibility for the construction phase of the project, including baseline, schedule, budget, quality, and

ES&H. The CC assumes the responsibilities of the CM if a CM is not assigned to the project.

Environment, Safety, and Health (ES&H) Audit - a formal review of a line management and subcontractors' activities, documentation, and management systems to verify compliance with the ES&H program as defined by their accepted ES&H Plan and the contract.

ES&H Construction Oversight - Activities of ES&H personnel aimed at assessing a project to verify compliance with laws and regulations as well as Fermilab policies and procedures, contract requirements and the accepted subcontractor's ESH plan. Oversight includes audits of the activities of all line management in support of Fermilab's safety efforts.

ES&H Inspection - an on-site review of construction work activities using the established subcontractor ES&H plan and the contract as review criteria

Excavation - Any man-made cut, cavity, trench, or depression in the earth's surface formed by earth removal, where employee exposure can be reasonably anticipated and employee entry into the excavation is a requirement of the work activity.

Government Property - Property that is owned by the government, in custody of the Laboratory, both equipment and expendable, exclusive of plant equipment (i.e. utilities) and real property (i.e. roads, buildings, land).

Hazard Analysis (HA) - The process by which hazards and controls are identified and formally documented for all anticipated phases of work.

Imminent Danger - any condition or practice that could reasonably be expected to cause death or serious physical harm (permanent or prolonged impairment of the body or temporary disablement requiring hospitalization) to employee or the public, or irreparable environmental harm unless immediate actions are taken.

Integrated Project Team (IPT) - Multi-organizational team of staff members brought together to manage a specific project through design, procurement, and construction. The IPT is formally established for a plant-funded project in the Project Execution Plan.

Integrated ES&H Management - The Fermilab process which systematically integrates excellence in environment, safety, and health into the management and work practices of all activities at all levels so that the mission is achieved while protecting the public, the workers, and the environment.

Landlord - The Division/Section/Center (D/S/C) responsible for the facility or space where work is planned or occurring.

Mobile Crane – A crane consisting of a rotating superstructure, operating machinery, and operator’s station and boom; mounted on a crane carrier equipped with axles and rubber-tired wheels for travel, a power source(s), and having either a single or separate stations for operating and driving. Its function is to lift, lower and swing loads with boom raising and lowering capabilities and a superstructure that can rotate 360 degrees.

Pre-Construction Meeting - The meeting chaired by the Procurement Department with the subcontractor, CM, CC, Project Manager, ES&H, Security, and any interested Laboratory personnel prior to construction start.

Procurement Administrator (PA) - The Business Services Section procurement representative, with Laboratory signature authority, is responsible for the negotiation and administration of subcontract terms and conditions.

Project ES&H Support – Individual(s) designated to provide ES&H support services to the Project Manager and the Integrated Project Team. If no Project ES&H Support is assigned in the Project Execution Plan, the responsibilities of this individual revert to the ESH Section.

Project Execution Plan (PEP) - A document created by the Project Manager in which the roles and responsibilities for the Integrated Project Team, including ES&H management are identified. Expectations for inspections, reports, etc. are addressed in this report.

Project Manager (PM) - The line management individual directly involved and accountable for overall project control and the application of specific control measures to ensure successful completion of project objectives.

Requisitioner – The person or organization responsible for developing the written scope of work and submitting it to the Procurement Office.

Reviewing Official (RO) - The individual who has the final signature authority on the subcontractor performance evaluation. That signature authority is given to the Head, Business Services Section.

Senior Safety Officer (SSO) - An individual who is assigned duties as the principal ES&H advisor to the division/section head.

Task Manager (TM) – A Division/Section/Center designated individual specifically assigned to oversee and direct construction work activity. The Task Manager has responsibility for assuring that hazard assessments are developed for the work, as prescribed in FESHM [2060](#) – Work Planning and Hazard Analysis. An approved TM list indicating individual experience and competency to direct specific work activities can be found at <http://esh.fnal.gov/xms/Audience-Pages/TM-CC-SC>

T&M Manager – The individual assigned to oversee a set of trade specific subcontracts from which Fermilab supervised labor and other work can be ordered. The T&M Manger is responsible for the overall contract compliance effort and operating procedures for specific contracts. This individual serves as the focal point for administration of the assigned contracts.

4.0 RESPONSIBILITIES

The Chief Operating Officer is responsible for updating the TM list on an annual basis.

The Division/Section/Center (D/S/C) Head is responsible for ensuring implementation of the requirements of this chapter for those construction activities managed by his/her staff. The D/S/C head is also responsible for ensuring a qualified CC/TM is assigned.

The Project Manager (PM) is responsible for:

- Completing scope of project on time, within budget, safely, and in an environmentally responsible manner.
- Assembling the IPT.
- Developing the PEP.
- Arranging for the Project ES&H Support personnel, as appropriate.
- Reviewing incident reports.

The Construction Manager (CM) is responsible for:

- Reviewing/accepting the subcontractor ES&H plan, including revisions, on behalf of the Laboratory.
- Acting as the single point of communication with the subcontractor on safety issues.
- Monitoring subcontractor and sub-tier contractor ES&H performance, including elements of the subcontract that address Integrated Safety Management.
- Participating in the Preconstruction Meeting to establish ES&H expectations for the project.
- Approving the Notice to Proceed.
- Monitoring the Construction Coordinator's Deficiency log.
- Reviewing the subcontractor's excavation work plan.
- Making weekly safety inspections of projects and documenting the inspection results.
- Identifying the need for and schedule of the Multi-Organization Walk-through (TA 7010-1).
- Issuing noncompliance memos to the subcontractor.

- Chairing weekly meeting with the subcontractor to review progress, including ES&H performance.
- Developing a call tree for incident reporting.
- Issuing the incident report.
- Participating in the subcontractor performance review at completion of the contract.

The Construction Coordinator (CC) is responsible for:

- Serving as first line of contact with the subcontractor field organization.
- Monitoring and enforcing subcontractor compliance with their ES&H Program (or ISM plan, if required), the ES&H requirements in contract, and the hazard assessments for the scope of work.
- Reviewing and accepting the subcontractor hazard analysis, providing input as needed.
- Ensuring that no work is performed by the subcontractor or sub-tier contractor until the hazard analysis has been accepted, and reviewed and signed off by each subcontractor and sub-tier contract employee on the job.
- Obtaining the required work permits.
- Preparing and distributing the Work Permit/Notification form.
- Participating in Preconstruction meetings to establish ES&H expectations.
- Ensuring that all subcontractor and sub-tier contractor employees attend Fermilab's Subcontractor Orientation and other Fermilab-provided training.
- Documenting noncompliance and drafting related memos for the Construction Manager.
- Participating in weekly construction progress meetings with subcontractor.
- Ensuring that goods and services meet specifications.
- Initiating call tree upon subcontractor report of an incident.
- Obtaining incident report from the subcontractor.
- Preparing independent incident report for the Construction Manager.
- Tracking and reporting to ES&H subcontractor and sub-tier contractor work hours by the seventh day of the month following the end of the quarter.
- Attending the subcontractor's daily planning meetings, weekly toolbox meetings, and monthly ES&H training.
- Participating in subcontractor performance review at end of the subcontract.
- Reviewing the condition of mobile cranes used as part of the project, using the guidance in TA 7010-2, "Mobile Crane - Safe to Operate Review Items".
- Verifying the training of those involved in high hazard activities with specific training requirements identified in Section 5.7.
- Additional training verification may be required based on the phases of work in the HA.

The Task Manager (TM) is responsible for overseeing all aspects of the construction activity assigned. ES&H Responsibilities include:

- Planning and directing all work activities.
- Assisting the subcontractor in preparing the HA, and obtaining all required reviews and acceptances (ref FESHM [2060](#)).
- Reviewing HA with subcontractor employees, seeking their input, and making changes as appropriate.
- Assuring that all subcontractor employees sign the HA.
- Assuring that the subcontractor performs no work until the HA has been accepted, reviewed and signed off by each employee.
- Acting as competent person for the job.
- Assuring subcontractor employees have received all appropriate training.
- Obtaining the required work permits.
- Preparing and distributing the Work Permit/Notification (WPN) form.
- Conducting pre-job work planning meeting with subcontractor employees to assure they understand the work activity, ES&H hazards, and mitigation measures.
- Notifying the Senior Safety Officer (SSO) of any employee injuries.
- Coordinates and contributes to subcontractor incident investigations.
- Informing the Senior Safety Officer (SSO) of ES&H noncompliance issues.
- Submitting subcontractor performance review when requested (<http://esh.fnal.gov/xms/FESHM>).
- Reviewing the condition of any mobile crane used as part of the project, using the guidance in FESHM TA 7010-2.
- Conducting and documenting daily inspections of excavations.

The FESS T&M Manager oversees the overall effort on FESS T&M contracts.

Responsibilities include:

- Developing contract and operating procedures.
- Auditing subcontractor performance.
- Arranging for Subcontractor Orientation and General Employee Radiation Training (GERT) for T&M subcontractor employees.

The Project ES&H Support, if assigned, is responsible for providing consultation and interpretation support to the Integrated Project Team. If no project ES&H Support is identified in the Project Execution Plan, these responsibilities will be carried out by the ES&H. These include:

- Assisting in the preparation of the PEP, as requested.
- Participating in proposal conferences, as requested.
- Participating in Preconstruction meeting, as requested.
- Assisting the CC with the review of the hazard analysis, as requested.
- Providing field ES&H consultation to the CC, as requested.

- Attending weekly construction meetings, as requested.
- Participating in weekly project team meetings, as requested.
- Reviewing investigation reports for completeness. Assist as requested.
- Notifying the Medical Department of any subcontractor or sub-tier contractor injuries with 24 hours of being informed of the incident.
- Inputting incident investigation information into Computerized Accident Investigation Reporting System (CAIRS) as required.
- Developing Lessons Learned and submitting them to ES&H Section for posting on web page.
- Conducting ES&H inspections as requested by the Integrated Project Management Team.
- Participating as a team member in the evaluation of the subcontractor

The Senior Safety Officer (SSO) is responsible for:

- Reviewing purchase requisitions to ensure appropriate safety requirements are identified (See FESHM [5010](#)).
- Providing support and oversight of construction projects under \$25, 000, including communicating observations to the CC.
- Negotiating with the ESH Section as to oversight and support responsibilities for projects under \$25K. Notifying the CC of the negotiation.
- Assisting the CC with the review of the HA, as requested.
- Reviewing and approving the Work Permit and Notification form (see FESHM [2020](#)).
- Assisting the CC in conducting incident investigations, as requested.
- Participating as a team member in the evaluation of the subcontractor.

The ES&H Section is the authority for construction safety policy. Although subcontractor safety is a line responsibility, the ES&H Section will provide support to the construction manager, project manager, and construction coordinator upon request, as well as oversight of the construction safety management for construction projects awarded greater than \$25K in cost. For the projects less than \$25K in costs, support and oversight will be negotiated between the Division/Section/Center Senior Safety Officer (SSO) and the ES&H Section. Responsibilities include:

- Proposing construction safety policy.
- Evaluating/ accepting the subcontractor safety submittal as part of the initial proposal.
- When requested, reviewing the subcontractor ES&H plan for the construction manager and making recommendations regarding compliance with 10 CFR 851 Subpart C,
- Maintaining file copies of the subcontractor ES&H plan.

- Providing Subcontractor Orientation, including the principles and core functions of Integrated Safety Management to subcontractor and sub-tier employees and providing proof of attendance.
- Providing other Fermilab-specific training to subcontractor and sub-tier contractor personnel, as requested by the CC. This includes hazard analysis training.
- Conducting documented ES&H inspections and audits of construction activities on site. Observations will be provided verbally and in writing to the CC for disposition. Construction activities include weekly construction meeting with subcontractor, work planning meetings, toolbox and monthly ES&H meetings, preconstruction meetings, reviewing incident investigation reports and lessons learned documents.
- Interpreting OSHA requirements for construction work, as requested.
- Assisting the construction coordinator in the review of the hazard analysis, as requested.
- Participating in subcontractor performance reviews as necessary.
- Providing additional field support when requested.

The Procurement Administrator (PA) is responsible for:

- Administering all contractual requirements.
- Obtaining the Fermilab Subcontractor Safety Information Questionnaire Form from potential bidders and submitting it to ES&H Section for review and acceptance.
- Obtaining from the subcontractor a minimum of two copies of their ES&H Plan for distribution to the ES&H Section and the CM.
- Incorporating the Subcontractors ES&H Plan as part of the contractual requirements.
- Issuing the Notice to Proceed after all safety and contractual requirements are satisfied.
- Notifying subcontractors of the requirement to attend the construction safety orientation and any other Fermilab required training.
- Chairing pre-construction meetings.
- Completing the applicable section of the Subcontractor Performance Evaluation form (ES&H Admin Form #15).
- Coordinating, and chairing the meeting to complete the Subcontractor Performance Evaluation process.
- Notifying the subcontractor of issues and concerns.
- Closing out the Subcontract.

The Requisitioner is responsible for:

- Preparing a scope of work and the contract specifications that clearly describes the work. Information required in the, Appendix 4 entitled Addendum A to Exhibit A shall be completed and the Exhibit appended to the requisition. Exhibit A Addendum is found at the end of this chapter.

5.0 PROCEDURE

5.1 Qualification of Subcontractors

The subcontractor must have their past safety performance evaluated and accepted before any construction contract can be awarded. The subcontract documents shall prescribe which submittals are required. Specifically, the subcontractor's past safety performance will be evaluated against any or all of the following criteria when the information is available;

- a. Fermilab Subcontractor Safety Information Questionnaire form, and/or;
- b. Subcontractor experience modification rate (EMR), and/or;
- c. On-site safety performance as documented. See the "Subcontractors Evaluation" procedure in this document.

The PA sends the completed form (Fermilab Subcontractor Safety Information Questionnaire Form ES&H Admin Form #16 - <http://esh.fnal.gov/xms/FESHM> and supporting documentation to ES&H Section for review and acceptance. ES&H Section will review and provide comments and acceptance to the PA within 3 working days.

The subcontractor must show an experience modification rate (EMR) of less than one (1) and a three-year safety record equal to or less than 85% of the most current U. S. Department of Labor-Bureau of Labor Statistics General Construction statistics for Total Recordable Case Rate (TRC) and Days Away, Restricted, or Transferred (DART) Case Rate as reported in the [BLS Occupational Injury and Illness Data](#). The subcontractor's on-site performance, as documented in formal evaluations provided to Procurement, will be considered as well. ESH-SEP will contact Procurement to review any evaluations they may have on file.

5.2 ES&H Plan Review and Acceptance

If requested in the subcontract documents, the subcontractor shall submit two (2) copies of a plan that describes the company's ES&H Program for evaluation to determine if the subcontractor safety policies and procedures meet the expectations of Fermilab management. If no ES&H program is requested the subcontractor shall submit a document that include;

- a. The name of the Competent Person for the project and his/her qualifications.

- b. The name of the competent person and qualifications for excavations if an excavations is part of the activities, or;
- c. The name of the competent person for scaffold construction and qualifications if scaffolds are to be used.
- d. A list of the project activities for which hazard analyses will be written and submitted.

Note: For small simple jobs an HA may be all that is required to meet requirements. For larger or complex projects, multiple HAs may be required as discussed in the "Hazard Analysis" section below. In those cases, a listing of all activities for which separate HAs will be submitted is required.

The PA shall not issue a Notice to Proceed (NTP) until the subcontractor has submitted an acceptable plan if one is needed or, in lieu of a plan the information in (a) to (d) above.

When ES&H Section notifies the PA of acceptance of the subcontractor's safety record, the requirement for a written ES&H program plan will be identified. If a written plan is not required, the CM may proceed directly to the HA requirement.

The PA distributes the plans to the CM and ESH Admin. The copy of the plan distributed to the CM is for review and acceptance purposes.

<http://esh.fnal.gov/xms/FESHM>.

This plan copy will be used by ES&H Section to perform a review upon request from the CM and make recommendations and to verify compliance during oversight visits to the construction project. Acceptance of the ES&H Plan is for a three-year period; however the CM will review the plan for completeness with each new project.

ES&H Section shall keep the subcontractor ES&H Plan during the construction phase, or for three years, whichever is longer. The copy provided to the CM will be filed with the project files when construction is completed.

There may be conditions under which a modification to the subcontractor ES&H Plan is justified. Examples include, but are not limited to:

- Change in work scope not addressed in the accepted plan;
- A new OSHA standard has become effective;
- New equipment has come to market with better technology; or
- A best practice not previously considered.

In any of these cases, the subcontractor shall submit a written memo to the PA. This memo must state the section of the plan proposed for revision, justification for the change, supporting documentation available and the proposed wording to be inserted

in the plan. The PA will forward a copy of the memo to the CM and ES&H Section. If the modifications are accepted, the CM will issue an acceptance letter to the PA with a copy to ES&H Section. ES&H Section will keep a copy of the request and documentation with the subcontractor's ES&H plan.

5.3 Hazard Analysis

A written HA (<http://esh.fnal.gov/xms/FESHM>) is required for all construction work, regardless of who performs the work. The HA document shall identify all hazards associated with each phase of work, and the work processes to be employed to eliminate or reduce those hazards. Each identifiable feature within a project requires a written hazard analysis. Work will not proceed on that feature until the task manager/construction coordinator has assured an HA has been prepared, reviewed, and accepted. New or unanticipated hazards encountered with each project phase or change in specific operations within that phase must be addressed and added to the HA as the project develops.

The HA must identify the construction oversight process used by Fermilab. Construction Coordination is appropriate when the contractor has accepted responsibility for work supervision and management, and the work processes and required outcomes are well understood. Task management is appropriate when a Fermilab approved Task Manager accepts responsibility for planning and directing work activities, and acts as the competent person for the work.

Task Managers have the primary responsibility for preparing an HA in accordance with the requirements of FESHM [2060](#).

The CC must assure that the subcontractor understands the HA process and is able to conduct a thorough hazard assessment and prepare a hazard analysis.

HAs submitted by the subcontractor or sub-tier contractor (via the Subcontractor), reviewed and accepted by the CC. It is recommended that the CC consult with the Project ES&H Support and/or the ES&H Section. The PA will not issue the Notice to Proceed (NTP) until the CM sends notification of the hazard analysis acceptance to the PA. For large projects, only the initial HA is required to be accepted prior to NTP.

Change orders give rise to new hazards for the workers or may cost the Laboratory greatly if property damage is the end result of an accident. If new hazards are present due to new work activity, the HA must be revised. The HA must be reviewed with the subcontract personnel due to the additional risks that may be introduced.

If there will be two or more groups (subcontractors and/or employees) working in the same area, and yet operating under different HAs, the TM/CC must coordinate activities with the other TM/CC/supervisor. Any conflicts between the two HAs must

be resolved before work begins. Both working groups must review and sign each other's HA.

For projects involving only electrical work less than 600 volts, the Electrical Hazard Analysis/Work Permit form found in FESHM Chapter 5042 (<http://esh.fnal.gov/xms/FESHM>) is sufficient as long as all hazards including electrical hazards are identified and dealt with.

The completed HA form with the signature page must be posted at the jobsite. This can be accomplished through a variety of means, including use of the subcontractor's bulletin board or a clipboard. If posting is not feasible, due to the location of the work, the HA should be located in a place so that it is easily available to all affected employees (subcontractors, sub-tier employees, Fermilab employees). If the jobsite conditions are such that the HA could get destroyed, the original should be saved and a copy posted.

HA records are to be retained until the dismantlement or disposal of the facility, equipment, system, or process.

5.4 Pre-Construction Meeting

All construction projects equal to or greater than \$100,000 require a pre-construction meeting. For projects under \$100,000, a meeting may be held at the request of the CM or CC chaired by the PA. The ES&H Section representative will attend this meeting in an advisory capacity to the CM. The Project ES&H Support personnel and/or division/section Senior Safety Officer will attend to ensure that local ES&H considerations are conveyed to the subcontractor. The subcontractor's competent person or owner must attend as well. The CM will use ESH Admin Form #19 - Pre-Construction Checklist (<http://esh.fnal.gov/xms/FESHM>) to review contractual ES&H requirements with the subcontractor.

5.5 Training of Task Manager/Construction Coordinator

Assignment of a TM/CC is an important link in the subcontractor safety program. The TM/CC is the ES&H presence in the field, as well as the quality control and field technical representative to the CM. Before assignment as a TM/CC, an employee must, at a minimum, complete training as follows:

- OS000009/CR OSHA Construction Safety 30 Hour
- FN000303- Construction Management & Safety (mandatory)
- Excavation Competent Person (mandatory if an excavation is part of the construction activities).
- Training required by the areas where the work will be performed and/or the nature of the activity (e.g. Radiation Worker, ODH, Controlled Access).

- Scaffolding Competent Person (mandatory if a scaffold erection is part of the construction activities).

For additional information on availability of courses contact the [ESH Section](#).

5.6 Task Manager/Construction Coordinator Qualification Criteria

The table below compiles the qualification criteria and maintenance of qualifications requirements for employees involved in construction management under the construction specialties.

Table 1
TM/CC Qualification Criteria

Category	Education/Experience	Training	Mentoring	Continuing Education
General Construction	- 2 yr. Degree in construction related field; or, - 3 yrs. Experience in construction related trade	- OSHA 30-Hr - Modified Construction Management and Safety - LOTO II (See ITNA) - NFPA 70E	Yes, mentor discretion on length	- 8 hours/yr Seminars, class or trade shows - Quarterly updates
Excavation	Manage 1+ excavation Per year	- OSHA 30 Hr - Modified Construction Management & Safety - OSHA Competent Person for excavation	Yes (mentor discretion on length)	- 8 hours/yr Seminars, class or trade shows - Quarterly updates
Rigging	BS Engineering or 5+ years of experience	- OSHA 30 HR - Modified Construction Management & Safety - Rigging course	Yes (mentor discretion on length)	- 8 hours/yr Seminars, class or trade shows - Quarterly updates
Piping	BSME, BSCE Or 5-years experience	- OSHA 30 Hour - - Modified Construction Management & Safety - Pressure vessel orientation	Yes (mentor discretion on length)	- 8 hours/yr Seminars, class or trade shows - Quarterly updates
HVAC	BSME Or, 5-years experience	- OSHA 30 Hour - Modified Construction	Yes (mentor discretion on length)	- 8 hours/yr Seminars, class or trade shows

		Management & Safety - NFPA 70E (See ITNA)		- Quarterly updates
Electrical	BSEE or 5-years exp.	- OSHA 30 Hour - Modified Construction Management & Safety - LOTO II (See ITNA) NFPA-70E (See ITNA)	Yes (mentor discretion on length)	- 8 hours/yr Seminars, class or trade shows - Quarterly updates

5.7 Training of Subcontractor Personnel

All subcontractor employees who will not be escorted by a trained Fermilab employee are required to attend a safety orientation before start of work. The ES&H Section will provide this orientation daily at 0730 AM. The training will be documented with an attendance sheet and a card that the subcontractor employee must carry at all times while working at Fermilab. If the subcontractor employee is unable to produce the card, the employee will be required to stop work until the card can be produced or until the subcontractor employee attends the orientation again. The orientation expires two (2) years from the date of attendance.

TM/CC whose subcontractor needs to enter radiological controlled areas or radiation areas must coordinate training in advance by sending an e-mail to GERT@fnal.gov with the number of people needing training, date training needed, and company affiliation. This information must be sent one working day in advance for GERT (no later than 3 pm), and 1 week in advance for Radiological Worker.

The subcontractor shall be responsible to assure that employees (including sub-tier contractor employees) are able to understand Fermilab's ES&H requirements. ES&H Section has produced a Spanish version of both Subcontractor Orientation and GERT. It is up to the TM/CC to arrange for this specialized training, either through their division/section or through ES&H Section.

All subcontractors and sub-tier contractors performing work on Fermilab shall provide safety training, medical surveillance, and safety equipment, including personal protective equipment (PPE) for their employees. Exceptions involve hazards that are unusual due to the nature of work at Fermilab. In particular, the Laboratory will provide training, medical surveillance, and equipment for subcontractors working in

radiation areas or in buildings/spaces designated as oxygen deficiency hazard (ODH) areas. Additional training, surveillance and equipment will be provided as stipulated in the contract documents.

All subcontracts shall contain a statement formally notifying the subcontractor and all sub-tier contractors that they are required to maintain records of training completed by all personnel working on the Fermilab site. Training needs shall be based upon statutory requirements, Fermilab requirements, the nature and complexity of the work, and/or the associated hazards. These training and associated medical records will be subject to audit and verification by Fermilab. Training records for certain high hazard activities shall be inspected prior to exposing employees to the respective hazard. The activities that require verification of training prior to execution of work are:

- Entry into a permit-required confined space.
- Entry into a facility or area classified as ODH.
- Entry into a radioactive or controlled work area.
- Lead and asbestos work.
- Use of respiratory protection when potential exposure levels will be above established limits (medical clearance, fit testing, and training).
- Fall Protection.
- Lockout/Tagout.
- Electrical activities that require compliance with NFPA 70E.

The TM/CC should audit other types of ES&H training such as erecting and using scaffolding, excavations and other training at random.

5.8 Work Permit and Notification (WPN)

The TM/CC is responsible for completing the WPN and submitting it for review and approval as described in FESHM 2020 (<http://www-esh.fnal.gov/FESHM/2000/2020.pdf>). The TM/CC is responsible for securing all permits required for the work activity.

5.9 Delivery Personnel

Delivery personnel coming to construction sites are required to use PPE applicable to their own activities. When outside their vehicle, they must wear PPE as specified in the HA when within the construction designated area. Subcontractors are responsible for notifying delivery personnel of PPE requirements or providing delivery personnel with the personal protective equipment required by the hazard analysis.

5.10 Emergency Services

Occasionally, it is necessary for subcontractors to provide emergency repair services on site, but timing may not allow the subcontractor to submit a safety program. In these cases, an HA is required to be prepared by the TM/CC with the subcontractor. This may be accomplished in the field. The subcontractor must agree to comply with Fermilab ES&H regulations for the duration of the subcontract. Under no circumstances shall an emergency serve as exemption from complying with safety requirements.

5.11 Inspection of and Visitors to Construction Sites

All persons entering a construction site must notify the CM or TM/CC and immediately review and sign the HA. All persons entering a construction site must wear the work clothing as well as the PPE defined in the HA.

The CM/CC is responsible for conducting and documenting ES&H inspections of the work activity and monitoring the subcontractors' performance to verify compliance with the ES&H plan and adherence to the HA. The frequency of these visits should be sufficient to regularly identify and correct safety concerns. The frequency will be based upon the complexity of the project or specific activities, hazard level, and the subcontractor's demonstrated level of compliance. Regardless of the frequency of inspections, the CM/CC must contact the subcontractor daily to review the work planned for the day.

The CM will determine whether a formal evaluation/assessment process is an appropriate tool to use for conducting oversight inspections of the construction activities. The CM will follow the Multi-Organization Construction Site Safety Walkthrough procedure (TA 7010-1). This requirement shall be documented in the PEP.

ES&H Section, the project ES&H Support personnel (if assigned), and/or the landlord D/S/C SSO will perform oversight inspections of construction sites as well. The frequency of inspections shall be determined based upon the complexity of the project or specific activity, hazard level, and the subcontractor's demonstrated level of compliance. Inspection of the jobsite should include a review of site conditions, work activities, review of subcontractor's inspection results, follow-up (site and equipment inspections for themselves and sub-tier activities), and spot-checking of equipment, including heavy equipment. All inspection activities must be documented, discussing both good and less than adequate work practices. Copies of the documentation shall be distributed to the TM/CC, the ES&H oversight personnel, CM, PM, and PA.

5.12 ES&H Audits of Subcontractor's Program

For most projects, conducting an audit of the subcontractor's ES&H program is not necessary. However, for projects that are scheduled to last more than 12 months, an ES&H audit is required at six-month intervals. The ES&H Section will conduct these audits. Additional audits may be conducted at PM or CM request. Commitment to these audits should be incorporated into the PEP.

5.13 Stop Work Activity Authority

Fermilab employees have the authority to stop construction activities if an imminent danger condition is noted or perceived. After the work activity is stopped, whoever stopped the work activity shall contact the TM/CC; who will gain consensus from the subcontractor on restart conditions. This is an informal process designed to stop work, quickly abate the hazard, and restart the work.

Occasionally, a more formal work stoppage process must be invoked. If exposure to the hazard cannot be abated quickly, or if consensus cannot be reached as to the corrective action, the CM/CC shall stop the associated work using the Subcontractor ES&H Stop Work Order Form (http://www-esh.fnal.gov/FESHM/7000/7010TA_Form5.pdf). Refusal by the subcontractor to stop the work activity when requested may result in termination of the subcontract. It must be noted that the stop work activity authority is to stop a specific activity within a project and not an entire project.

Authority to restart an activity after a formal Stop Work Order has been issued resides with the D/S/C head after consultation with other appropriate organizations and individuals, such as the PM, CM, CC, D/S/C SSO, ES&H, and PA. The Subcontractor ES&H Stop Work Order (http://www-esh.fnal.gov/FESHM/7000/7010TA_Form5.pdf) will be used to restart work.

Just as Fermilab employees have a duty to safely resolve dangerous conditions, so do subcontractor employees. This duty should be addressed in the subcontractor ES&H plan.

5.14 Work Clothing on Construction Sites

Anyone entering a construction area must wear sturdy work type shoes or boots that cover the ankle. Tennis or canvas shoes, sandals, shoes with open toes or heels, or shoes with narrow high heels cannot be worn on the job site. Long trousers and short sleeve shirts covering the ball of the shoulder must be worn as well. Tank tops, mesh shirts, cutoff shirts, and sleeveless shirts are not allowed. Clothing must not hang loose to the point where it may be caught in moving machinery, or snag onto dangerous objects.

For construction personnel who perform welding and cutting, operate rotating machinery, or are exposed to chemicals, fire or other such hazards, must contain their

hair to a point where there is no danger of their hair catching fire, dipping into toxic chemicals, acids, or being caught in rotating machinery.

Besides the mandatory work clothing stipulated above, the HA must specify other types of PPE that may be needed to address hazards. Hardhats, safety glasses with rigid plastic side shields, gloves and any other personal protective equipment needed to protect workers and employees must be identified in the HA. When hardhats are specified as mandatory in the hazard analysis these hats must be worn with the brim in a forward position. The construction hard hat must be easily recognized as such.

5.15 Electrical Safety

Fermilab is required to follow NFPA 70E and has flowed these requirements down to their subcontractor through contract documents. Subcontractor employees who may be exposed to energized conductors within the flash protection boundary must meet the training requirements stated in Art. 110.6 of NFPA-70E and wear FR clothing and protective equipment suitable for the exposure. Proof of training shall be provided to the construction coordinator prior to any energized work or work under lockout/tagout.

Relocatable power taps (RPTs) also referred to as “power taps” are not allowed in a construction area or similar locations.

Ground Fault Circuit Interrupters (GFCIs) are the only accepted method to protect construction workers from the hazard of electrocution when hand held power tools are used. Subcontractors and their sub-tier contractors shall supply portable GFCIs for the use of their work force if GFCI protected circuits are not available at the point of use.

5.16 Excavations

Excavations shall be carried out in compliance with 29 CFR 1926.650, FESHM [7030](http://www-esh.fnal.gov/FESHM/7000/7030.pdf), “Utility Identification and Permit Program” (<http://www-esh.fnal.gov/FESHM/7000/7030.pdf>), and FESHM 8012, “Sedimentation and Erosion Control Planning” (<http://www-esh.fnal.gov/FESHM/8000/8012.htm>). The subcontractor’s competent person must be present at all times when the ground is being excavated. Daily inspections are required and must be documented.

5.17 Loaning of Fermilab Tools and Tool Inspections

Fermilab does not loan tools and equipment unless the tool or equipment is specifically authorized in the subcontract. Excluded from this policy are non-powered hand held tools and lockout/tagout locks and tags.

Conditions may arise where a TM/CC finds it absolutely necessary to loan power tools or a piece of equipment. In these instances the tool or equipment may be loaned but under very strict conditions. To loan a tool or equipment:

- a. There must be a compelling reason.
- b. The subcontractor and the TM/CC must inspect the loaned item.
- c. The subcontractor superintendent whose employee will be using the tool or equipment must certify in writing that the employee had training in the use of the tool or equipment.
- d. The subcontractor superintendent releases Fermilab in writing of any liability if an injury occurs to the subcontractor employee while using the tool or equipment owned by Fermilab.
- e. The subcontractor superintendent accepts the tool for the intended use.

ES&H Form #20 (http://www-esh.fnal.gov/FESHM/7000/7010_Form20.pdf) shall be used for this purpose. The original shall be sent to the PA after the tool is returned to Fermilab control.

5.18 Tool Inspections

Tool inspections of subcontractor owned tools are the responsibility of the subcontractor. Random inspections to verify compliance may be conducted by the TM/CC and ES&H Section construction safety personnel.

Heavy equipment such as mobile cranes are unique pieces of equipment whose maintenance and operation are covered by the ANSI standards which are part of the Laboratory's Work Smart Set of standards. This equipment must be inspected by the subcontractor or sub-tier contractor before use on site. The TM/CC is responsible for assuring this inspection has been completed and any corrective actions taken before the equipment is used.

If a crane is being used on site, the TM/CC must also review the condition of the crane, using the guidance, "Mobile Crane - Safe to Operate Review Items" (TA 7010-2). ES&H Section is available to assist the TM/CC with these inspections

5.19 Tool Box Meetings

Subcontractors will conduct, as minimum, weekly and monthly toolbox meetings. It is intended that the subcontractor and sub-tier contractors use these meetings to address safety issues of the current construction phase of work. The weekly five-minute safety

meeting discussion shall be documented with an attendance sheet and a thorough description of the topic. The monthly meeting shall be approximately one hour long and shall be used to emphasize special job conditions, procedures and applicable standards. The monthly meeting will be documented in the same fashion as the weekly meeting. Minutes of the meetings will be submitted to the CC for filing in the construction project file.

5.20 Accident Investigation and Reporting

All incidents and near misses will be reported to the TM/CC who will in turn notify the CM, PM, Project ES&H Support personnel or the D/S/C SSO, the ES&H Section, and PA. Subcontractors are expected to conduct a thorough investigation and submit a report within two working days of the occurrence or near miss. The subcontractor will use their internal accident/incident report forms found in their ES&H Plan. The subcontractor will identify root causes and corrective actions in the report.

The CM shall have the report submitted to the project ES&H support personnel for entry into CAIRS within six (6) calendar days of report of the incident.

All incident and near miss reports shall be sent to ES&H Section within six (6) calendar days of generation of the report.

The Project ES&H Support personnel or the D/S/C SSO is responsible for the development of lessons learned. All incidents entered into the CAIRS database, must have lessons learned determined. Development of lessons learned for near misses is at the discretion of the project ES&H support personnel or the D/S/C SSO. Any lessons learned developed shall be sent to ES&H Section for information and possible distribution site wide.

5.21 Close Out of Subcontracts

The PA will retain funds until the subcontractor has satisfied all terms and conditions of the subcontract, which includes submittal of any ES&H related documents or reports.

5.22 Subcontractor Evaluations

Each completed project equal to or greater than \$100,000 shall be reviewed for quality of work, adherence to the schedule and cost, and the effectiveness of the subcontractor's ES&H program. This overall assessment will be used as a basis for future solicitations. Subcontractors will be informed at the pre-construction meeting that they are responsible for safety performance and that an evaluation will be performed at the completion of the contracted work.

The PA will chair the meeting and bring all interested parties together to complete the evaluation. As a minimum, invited personnel will include the CM, PM, CC, D/S/C SSO, and ES&H Section. Fermilab Subcontractor Performance Evaluation Form-Construction (http://www-esh.fnal.gov/FESHM/7000/7010_Form15.pdf) will be used for this purpose. Completed evaluations forms shall be retained in the Procurement Section and a copy sent to ES&H Section.

Projects less than \$100,000 may be evaluated at the discretion of the interested parties using ESH Form #21. If an evaluation is requested, the PA will conduct the meeting as described above.

The PA may issue an interim Subcontractor Evaluation any time performance is determined to be less than satisfactory.

ES&H PROGRAM FOR CONSTRUCTION TECHNICAL APPENDIX 1

Multi-Organization Construction Site Safety Walkthrough

1.0 Background and Purpose

Background: The vast majority of incidents happen when barriers are bypassed, procedures are not followed or there are departures from safe behaviors by workers. Unsafe conditions have historically been a small percentage of the causes of accidents whereas behaviors or unsafe acts are the bulk of the causes. In order to eliminate these incidents from the workplace we must concentrate our efforts to those actions that will have the biggest return on “investment” such as the elimination of unsafe behaviors and the evaluation of work processes and barriers to determine conformance with accepted practices.

Purpose: To establish a process for conducting formal safety program evaluations and field assessments through site safety walkthroughs for construction activities. These assessments should consider management systems, employee behaviors, conformance to the subcontractor safety plan, and performance to Fermilab requirements as expressed in contractual documents, pre-bid and pre-construction meetings.

2.0 Scope

This procedure applies to all active construction activities that require a multi-organizational scrutiny as designated by the Chief Operations Officer.

3.0 Responsibilities

3.1 Construction Manager

- Determine the frequency of walkthroughs based upon input received from the Chief Operations Officer and the Project Manager. Frequency should be identified in the Project Execution Plan (PEP).
- Identify walk-through team members. The team should be kept to a reasonable size and may include the Construction Manager, Construction Coordinator, Subcontractor Superintendent, a representative from the Fermilab ESH Section, a representative from the Department of Energy Fermi Site Office if requested, and Project ESH Support, if one is assigned.

- Conduct a closeout meeting as described below.

3.2 Construction Coordinator and/or Task Manager

Assist the Construction Manager in the walkthrough process as requested. Such requests may include:

- Transmit all concerns to the Sub-Contractor for resolution and provide copies to all team members.
- Review corrective action responses from the Sub-Contractor and provide feedback to the Construction Manager and the Project ES&H Support.
- Track responses to action items (in a formal database, daily/weekly logs or construction meeting minutes).
- Document & distribute closeout-meeting minutes.

3.3 ES&H Section Representative

- Provide technical support relative to safety issues.

3.4 Project ES&H Support

- Participate in walkthroughs focusing on safety issues that would impact installation and operational activities that will follow construction.
- Provide feedback from walkthroughs and closeout meetings directly to the Project Manager.

4.0 Procedure

4.1 The Construction Manager (CM) will identify the time and frequency of the walkthrough.

4.2 The CM will develop an agenda for the walk-through and identify any specific areas to focus on using Appendix A as guidance. Trying to cover a broad spectrum of programs or activities may result in specifics being missed. This is especially true for a larger project, or one covering more than one work site. Interviews with subcontractor employees are encouraged.

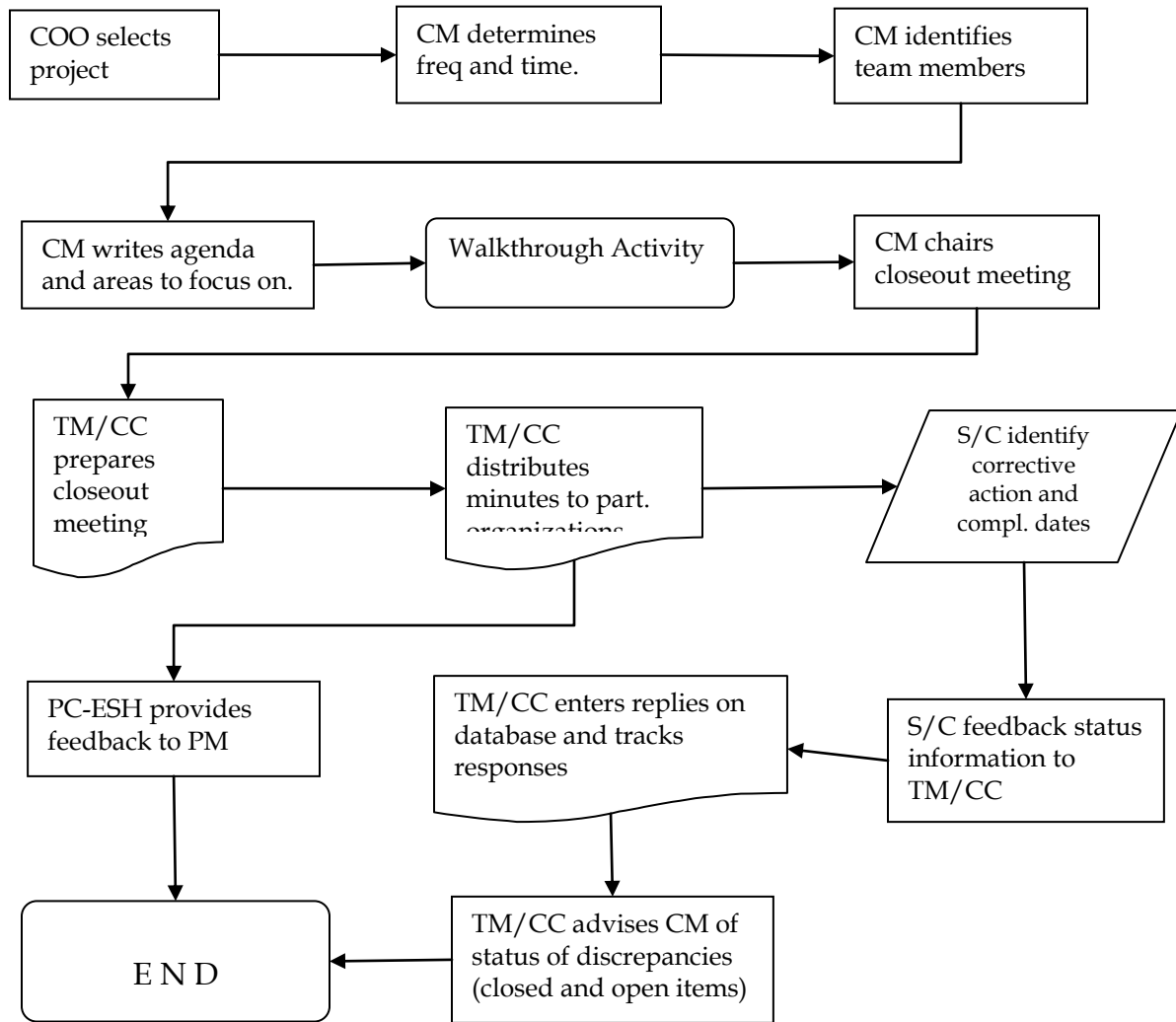
Note: Field observations from one visit may give rise to focused assessments at a future date or provide justification for a formal audit.

- 4.3 CM will complete a closeout meeting with all participating organizations to discuss results of the walkthrough and to discuss suggestions for possible corrective actions.
- 4.4 Document walkthrough results through meeting minutes that will be distributed to all participating organizations.
- 4.5 Enter concerns and corrective actions into a database created for the specific project.

5.0 Corrective Actions

- 5.1 The walkthrough report shall be provided to the subcontractor for action.
- 5.2 The subcontractor shall identify corrective actions and completion dates. Corrective actions shall be completed as quickly as possible.

Multi-Organizational Safety Walkthrough
Flow Diagram



Abbreviations:

COO	Chief Operating Officer
CM	Construction Manager
TM/CC	Construction Coordinator and/or Task Manager
PC-ESH	Project ES&H Support
PM	Project Manager
S/C	Subcontractor

ESH Assessment Guidance- Areas of Inquiry

Injuries or Illnesses

1. General
 - Housekeeping
 - Garbage Containers
 - Emergency Phone #s Posted
 - Emergency Communication
 - Fence Condition
 - Gates
 - Signage on Fences and Gates
 - Whip Checks
 - Electrical Cords
 - GFCI's
 - Gas Test Log
 - Machine/Equipment Guards
 - Lighting
 - Ladders
 - Explosive Storage
 - Oxy/ Acetylene Storage
 - Scaffolding

2. Traffic Control
 - Barricades
 - Traffic Signs
 - Flag Person
 - Vests
 - Flag

3. Shafts & Tunnels
 - Hand held lights/Miners Lights
 - Lighting
 - Communication
 - Ventilation
 - Self Rescuers Present
 - Housekeeping
 - Air/Noise Testing
 - Signage
 - Barricades

ESH Assessment Guidance- Areas of Inquiry (Continued)

4. Emergency Equipment
 - Fire Extinguishers
 - First Aid Kits
 - Oxygen
 - Blankets
 - Eye Wash
 - Infection Control
 - Medical Emergency Teams
 - Rescue Teams

5. Personal Protective Equipment
 - Hard Hats
 - Eye Protection
 - Hearing Protection
 - Foot Protection
 - Respiratory Protection
 - Hand Protection
 - Fall Protection Harness/Lanyard
 - Face Protection
 - Barrier Cream

6. Cranes
 - Inspections
 - Certifications
 - Anti-Two Blocks
 - Hook Latches
 - Perimeter Barricades
 - Glass
 - Horn
 - Fire Extinguisher
 - Rigging Equipment

7. Equipment
 - Daily Inspections
 - Glass
 - Back-Up Alarm
 - Fire Extinguishers
 - Hydraulic Oil Leaks

Appendix - 2

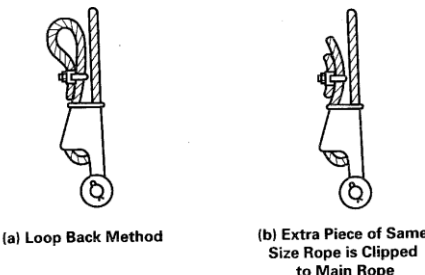
ESH Assessment Guidance- Areas of Inquiry (Continued)

8. Work Planning
 - H/A for Tasks Performed
 - Daily work Planning Meeting
 - Tool Box Meetings
 - Monthly ESH Meetings
 - Records/Log Reviews
 - LOTO

ES&H PROGRAM FOR CONSTRUCTION
TECHNICAL APPENDIX 3

Mobile Crane - Safe To Operate Review Items

Third Party Inspection	This inspection can be verified by looking in the cab (drivers or operator's) for a metal plate that will show the name of the inspecting company, the serial number of the crane and the date it was inspected in accordance with ANSI B30 standard. If this plate cannot be found, have the operator show the paperwork from the third party that proves that the crane was inspected in the last 12 months from the date it is in operation at Fermilab. <i>Note: Pay particular attention to the paperwork to see it has not been altered with white out Some crane rental companies have been caught doing just that.</i>
Operator's Qualifications <ul style="list-style-type: none"> ▪ City of Chicago Operator's License, or ▪ Local 150 card 	<ul style="list-style-type: none"> ▪ Best gauge of the operator's skills. The City of Chicago makes operator's take a written exam and a practical test. If they have a license to operate in Chicago that is good enough for Fermilab work. ▪ If they are a Journeyman from local 150 of the Operating Engineers Union it means that they have undergone an apprenticeship and journeyman training that is suitable for Fermilab. ▪ If neither of the two conditions above is met the subcontractor must provide documentation of training and qualifications for evaluation by the CC and/or the ES&H Section. Call Safety for assistance (J. Cassidy Ext 8223 or Bob Arnold Ext 8001).
Condition of Equipment	Some of these checks are performed by climbing in the operator's cab and looking around. They are identified by an asterisk (*)
Anti-two block device installed	This is a safety device that prevents the block from bringing the boom over the maximum vertical angle and breaking or damaging the load.
Hook and Latch	Look for visible deformation.

<p>Wire rope in wedge socket (Becket) installed correctly</p>	<p>Nothing should be attached to the load side. The operator may loop the dead side around and attach it to itself with a Crosby clip or may take a piece of wire rope and attach it to the dead side with a Crosby clip. (As shown in the illustrations below).</p> <div style="text-align: center;">  <p>(a) Loop Back Method (b) Extra Piece of Same Size Rope is Clipped to Main Rope</p> </div>
<p>Wire rope for gross damage or distortion</p>	<p>Just look at the wire rope for broken strands. If it does not look right it probably is not. Consult with Safety personnel.</p>
<p>Windshield free of cracks and clean</p>	<p>You need to check only the cab where the operator controls the clean crane while lifting. The windshield must be free of cracks, clean and free of distortion.</p>
<p>Operators Manual onboard and in readable condition.</p>	<p>Look at the manual and make sure it is readable and that pages are in readable condition not torn off the book. If in bad condition reject the crane. The operator needs the book as a reference and it should be readable and in good condition.</p>
<p>Load charts onboard and in readable condition</p>	<p>These charts are normally placed on the operator's cab fixed to the walls. They are laminated or printed on metal. Again, they must be readable. If unreadable, reject the crane and DO NOT OPERATE.</p>
<p>Operating controls clearly marked regarding their function.</p>	<p>Each control must be clearly marked as to the type of action that will happen when moved. Each degree of movement must be clearly and understandably marked. You must make a subjective decision if the markings are not legible or scratched</p>
<p>* Equipment fire extinguisher on board and charged.</p>	<p>Look at the fire extinguisher in the cab and check the gauge. It MUST be in the green arc. If there is no fire extinguisher you have a decision to make.</p>
<p>Crane boom angle device operating and readable.</p>	<p>Look outside on the boom to see the boom angle indicator. When the crane arrives and the boom is horizontal it must read zero. When the boom is lifted it must show something other than zero. Some newer crane designs have a digital readout on the operator's panel. If the angle indicator is not working DO NOT OPERATE THE CRANE. DO NOT LIFT OUR PROPERTY.</p>

Check rope reeving in drum.	As you walk behind the crane look up at the drum. The wire rope should be reeving smoothly and each lay of the wire rope should be spooling next to the previous one and in the grooves of the layers below. Any crossovers mean trouble. Reject the crane.
Hand signal placard on the outside of the crane cab	Self-explanatory. If the operator is not using the standard signals, the operator and signalman must get together and agree on the signals.
Visual indications of hydraulic leaks from hydraulic hoses, particularly those that flex in normal operation.	If you see a lot of hydraulic fluid chances are there is, a problem when the crane is loaded. Again, this is subjective on your part.

During Operation	
Tire inflation	Make sure that all the tires look the same regarding inflation. Only take action if a tire is under-inflated and you are operating "on the rubber". If using outriggers do not be concerned about the tire inflation.
If on outriggers, check they are fully extended	Normally crane manufacturers mark the full extension of the outrigger. If the operator is on outriggers and you cannot see the indicator STOP the lift. The crane lifting capacity is predicated on outriggers fully extended. There are no tables made for operating at less than full extension.
If on outriggers, check that all tires are completely off the ground	If any tire is even barely touching the ground, the operator must use the "on the rubber" charts. Once the crane is lifted check that there is empty space between the tire and the ground.
Check that loads are not swung over personnel	Any operator who swings loads over people "IS NOT" a good operator. This is grounds for stopping the lift and getting someone else because this is an accident waiting to happen. A well trained and experienced operator WILL NEVER swing over people.

APPENDIX - 4
EXHIBIT A
SCHEDULE AND SUPPLEMENTARY TERMS AND CONDITIONS

Name of Facility or Project

ADDENDUM A to EXHIBIT A

SUBCONTRACT SUMMARY

Subcontract Term: The term of this Subcontract shall be _____.

Site Location: The contract work area will be _____.

General Work Outline: The Subcontractor shall furnish all properly qualified management, supervision, personnel, materials, supplies, tools, transportation, loading and unloading, and equipment with appropriate accessories (except as provided by Fermilab) and shall plan, schedule, coordinate and assure effective performance of all services described herein. The Subcontractor shall _____

_____.

Illustrations, Designs, or Drawings: Not applicable, or in Paragraph 20 and attached to this document.

Material/equipment Furnished by Fermilab: All material, supplies, tools, equipment, and vehicles shall be furnished by the Subcontractor, except the following: _____

_____.

Services Furnished by Fermilab: Fermilab will supply site specific training such as Subcontractor Site Orientation, Oxygen Deficiency Hazards, Radiation Worker, and General Employee Radiation Training. In addition Fermilab personnel may be required to disable and restore utility systems.

Fermilab actively supports recycling of construction and demolition waste. Small quantities (less than 5 cubic yards) generated by a project can usually be disposed in a designated Fermilab provided recycling dumpster. Large quantities of metals can usually be disposed through the Fermilab metal recycling program.

Shop Drawings, Maintenance Manuals, and Bills of Material: Shop drawings, plans, procedures, as-builts

(equipment model, serial number, and ratings, raceway type and length, wire length and gauge, and copies of revised panel legends), maintenance manuals, Bills of Material (including purchased as well as Fermilab supplied materials), and other submittals shall be provided for Fermilab approval as requested. Adequate time shall be allowed for approval prior to commencement of work.

Inspection Visits and Technical Questions: Arrangement of inspection visits and the answering of technical questions should be directed to _____.

Access to the Work Site: Access to the Project area shall be through the Wilson Street Fermilab entrance located off Kirk Road, _____.

Facilities: 120v single phase and 208v (20a) three phase power is (not) available _____.

No remote storage or staging area(s) shall be provided by Fermilab.

Drinking Water and Toilet Facilities: Drinking water and toilet facilities are (not) available _____.

Items affecting Work Planning:

- a. All subcontractor employees will be required to successfully complete a 1.5 hour Fermilab provided contractor orientation and general employee radiation training.
- b. No work shall be initiated until a hazard analysis (HA) has been completed (ref. ¶13.4).
- c. The subcontractor is restricted from using the Wilson Hall elevators for moving materials and equipment during the hours of 7:30 a.m. - 9:00 a.m. and 11:30 am -1:00 p.m.

Environmental Issues Particular to this Project: _____.

Project Duration, Schedule, and Milestones: _____.

APPENDIX - 4
EXHIBIT A
SCHEDULE AND SUPPLEMENTARY TERMS AND CONDITIONS

Name of Facility or Project

Subcontractor's Field Superintendent, Foreman, Working Foreman, or a Tradesman, if qualified, may serve as the Field Superintendent, Safety Officer and/or Competent Person for the work.

Technical Specifications: Specifications for the project Subcontract are contained as an attachment at Paragraph 20.0 below, and include: _____

_____.

EXHIBIT A

1.0 SITE LOCATION

The contract work area is located on the Fermi National Accelerator Laboratory (Fermilab) Site, approximately three (3) miles east of the city of Batavia in DuPage and/or Kane County, Illinois. Refer to the ADDENDUM A, SUBCONTRACT SUMMARY for the exact project location on the Fermilab site.

2.0 SCOPE OF WORK

2.1 THE SUBCONTRACTOR SHALL FURNISH all supervision, labor, materials, tools, equipment, and appurtenances (except as described in **Section 3.0 & 4.0** herein) necessary to perform diligently and fully all work as described in the drawings and/or technical specifications listed in the ADDENDUM A, SUBCONTRACT SUMMARY.

2.2 JOB COORDINATION on the job site at Fermilab is accomplished through the Coordinator, or Construction Coordinator (CC), including direction regarding safety.

All modifications to the Subcontract shall come from the procurement administrator (PA), or designee, in writing. The PA or designee is the sole entity that can modify the contract or initiate change orders.

2.3 DRAWINGS and TECHNICAL SPECIFICATIONS governing the work are listed in the ADDENDUM A, SUBCONTRACT SUMMARY.

2.4 GENERAL WORK OUTLINE: refer to the ADDENDUM A, SUBCONTRACT SUMMARY for

a brief outline of the work to be completed under this Subcontract.

2.5 THE SUBCONTRACTOR'S RESPONSIBILITY is in no way limited to the general work outline under the ADDENDUM A, SUBCONTRACT SUMMARY. The Subcontractor shall perform all work required to complete the work in accordance with drawings, specifications, or other Fermilab directions.

2.6 DESCRIPTIONS and QUANTITIES LISTED in the ADDENDUM A, SUBCONTRACT SUMMARY are general in nature and are only intended to describe the range and complexity of this scope of work. They are not to be used as the basis for establishing a bid price. Specific quantities and definitions of the scope of work for bidding purposes shall be based solely on estimates from the drawings, specifications and information obtained from examination of the work site.

3.0 FERMILAB FURNISHED MATERIALS

3.1 MATERIALS FURNISHED BY FERMILAB: refer to the ADDENDUM A, SUBCONTRACT SUMMARY for information regarding materials furnished by Fermilab.

3.2 THE SUBCONTRACTOR shall be responsible for loading, transporting and unloading Fermilab furnished material at the locations as directed or indicated on the drawings and/or in the specifications.

4.0 SERVICES FURNISHED BY FERMILAB

4.1 SERVICES FURNISHED BY FERMILAB: refer to the ADDENDUM A, SUBCONTRACT SUMMARY for information regarding services furnished by Fermilab.

4.2 FERMILAB FURNISHED SERVICES which must be coordinated with the Subcontractor's work, such as requests for de-energizing electrical equipment or any utility shutdown (electrical, mechanical ducts, sprinklers, alarms, water, etc.), shall be arranged through Fermilab with at least two (2) full work days advance notice from the Subcontractor, except for use of radiography sources, which will require five (5) full work days advance notice.

4.3 ELECTRONIC VERSIONS of drawings or specifications, if available, may be provided by

APPENDIX - 4
EXHIBIT A
SCHEDULE AND SUPPLEMENTARY TERMS AND CONDITIONS
Name of Facility or Project

Fermilab to the Subcontractor for use in preparation of shop drawings or submittals. Fermilab assumes no responsibility for the information contained on the drawings, including but not limited to drawing scale, dimensions, and details.

5.0 JOB CONDITIONS

5.1 INSPECTION VISITS and TECHNICAL QUESTIONS may be directed to the Fermilab representative listed in the ADDENDUM A, SUBCONTRACT SUMMARY.

5.2 ACCESS TO the WORK SITE: refer to the ADDENDUM A, SUBCONTRACT SUMMARY for site access information.

5.3 SITE ACCESS and HAULING shall be subject to the following conditions:

- a. All roads shall remain open to emergency traffic at all times.
- b. All equipment and vehicles shall be confined to operating along defined construction roads and access routes. No overland hauling or off-road travel shall be permitted in order to avoid damage to wetland areas, wooded areas, archaeological sites, survey monuments or other areas to be preserved in their natural state.
- c. Interruption of normal traffic patterns or temporary road closings necessitated by movement of equipment or delivery of materials or utility installations shall require advance notice as outlined in Section 6.6, and shall require proper barricades, signage and flag persons to safely divert normal traffic.
- d. Traffic on paved roads shall be restricted to rubber-tired vehicles. Where crawler mounted equipment is required to cross paved roads or areas, the pavement shall be suitably protected from damage to the satisfaction of the CC.
- e. Upon project completion, the Subcontractor shall restore damaged areas to original conditions, including repairs to landscaping, structures, culverts, fencing, or utilities.
- f. Debris and litter on any roads caused by the Subcontractor's operations shall be removed immediately by the Subcontractor to the satisfaction of the CC.

- g. Illinois Rules of the Road shall apply to the Subcontractor's use of all existing roads.

5.4 TRANSPORTATION of EQUIPMENT and MATERIALS used by the Subcontractor at the job site shall be furnished by the Subcontractor at his own expense. The Subcontractor shall also be responsible for minimizing any interference with local traffic, other Subcontractors, or Fermilab operations. The Subcontractor shall work with Fermilab to establish a schedule for major material deliveries and site hauling of excavated materials. No material shall be stored beyond the project limits unless prior written arrangements have been made with Fermilab.

5.5 PARKING of the Subcontractor's and the Sub-tier contractor's vehicles shall be confined to the Subcontractor's project area or general public parking spaces.

5.6 TEMPORARY SERVICES and FACILITIES during the project period shall be furnished, installed, and paid for by the Subcontractor. The Subcontractor shall plan, organize, layout, and maintain the project site in a manner to insure an environmentally healthful working area. The Subcontractor shall be responsible for the work areas of his/her subcontractors and shall enforce similar conditions on them.

All temporary installations shall be subject to Fermilab approval.

- a. Temporary lighting shall be installed throughout the project to provide safe access and exit conditions and adequate lighting for the various work operations. The installation shall comply with the National Electrical Code (NFPA 70).
- b. Telephone service may be available at the work area. Dedicated or additional telephone service, if required by the CC for the project, will be provided by and paid for by the Subcontractor.
- c. Electric power may be furnished by Fermilab for the Subcontractor's use. Refer to the ADDENDUM A, SUBCONTRACT SUMMARY for site specific service. Installation of Subcontractor's electrical power distribution, when required, shall include ground-fault circuit protection and shall be subject to Fermilab approval.

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- d. Drinking water and toilet facilities shall be supplied by the Subcontractor unless specifically provided for by Fermilab in the ADDENDUM A, SUBCONTRACT SUMMARY. Subcontractor provided drinking water shall be adequate and clean and shall be dispensed from a fully enclosed sanitary water container with individual paper drinking cups. The Subcontractor shall provide an adequately serviced chemical toilet for every twenty (20) personnel on the project. Drinking water supply, toilet type, and locations shall be approved by Fermilab.
- e. Temporary fire protection shall be in accordance with the ANSI and AGCA protection requirements A10.2. An approved fire extinguisher shall be provided by the Subcontractor on all trucks and similar equipment, at all enclosures, and at on-site project offices. Each extinguisher shall be inspected monthly and a date tag certifying adequacy of the charge and workability of the extinguisher shall be affixed. The Subcontractor shall remove the extinguishers at the conclusion of the job.
- f. Temporary ventilation shall be sufficient to provide a safe working environment for project personnel. Subcontractor shall provide exhaust and supply air fans, ducting and other equipment as needed.
- g. Temporary heating shall include heating devices, protective coverings and temporary enclosures as necessary to protect the work and to provide a safe working environment for personnel. Coal or kerosene type salamanders, pots or open fires shall not be permitted. Where permanent heating equipment has been installed and made operational prior to completion of the project, the Subcontractor may request temporary use of such equipment, at no cost, provided it is properly maintained by the Subcontractor and that all required warranties are extended to include the period of use by the Subcontractor prior to Final Acceptance of the project by Fermilab.
- h. Temporary drainage shall be sufficient to remove standing water and prevent flooding within the work limits. Subcontractor shall furnish pumping equipment and other

dewatering equipment as needed. Pump discharges shall be intercepted by silt removal or sedimentation basins before being directed to natural drainage courses and away from adjacent work limits of other subcontractors.

- i. Temporary closures, dust partitions, or solid barriers shall be constructed of fire resistive or noncombustible materials, or treated or coated with fire retardant material as specified in the Fermilab Environment, Safety, and Health Manual (FESHM) Chapter 6040.1.

5.7 OFF-SITE DISPOSAL of trash, debris, demolished material, pallets, crates, rubbish and all waste material, except as stated otherwise, shall be the responsibility of the Subcontractor. The Subcontractor shall practice waste minimization where possible. He/she shall furnish all necessary dumpsters or similar containers to prevent dispersion of project debris both within and outside of the project site. All disposals shall be in accordance with FL-3, Fermilab Construction Subcontract Terms and Conditions, and shall be consistent with the requirements set forth by the Resource Conservation and Recovery Act (RCRA), Toxic Substance Control Act (TSCA), 40 CFR Parts 262-265 and Illinois Administrative Code Title 35, Sub-title G-Waste Disposal. Where waste streams are generated that are classified as special waste and/or hazardous waste, the Subcontractor shall provide the names, addresses, and USEPA identification numbers for both the waste transporter and the treatment, storage, and disposal facility. A certification of receipt shall be furnished to Fermilab assuring that all hazardous and toxic waste has reached the designated disposal facility.

6.0 ITEMS AFFECTING WORK PLANNING

6.1 EXISTING STRUCTURES & EQUIPMENT shall be carefully protected by the Subcontractor during all phases of the project work. The Subcontractor shall exercise extreme care during the entire project and shall work in full and close cooperation with Fermilab to protect the adjacent structures, equipment, and particularly the occupants.

6.2 EXISTING UTILITIES shall be protected by the Subcontractor during all phases of the project work.

6.3 WORK BY OTHERS: Fermilab personnel and other Subcontractors may be working in the vicinity of the work of this Subcontractor. In these

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instances, the Subcontractor will be required to coordinate work with others to avoid interferences or delays.

6.4 ITEMS AFFECTING WORK PLANNING include, but are not limited to: Subcontractor employee orientation training, limited project site access, radioactive material handling, survey control by Fermilab, subcontractor use of nuclear density meters or other radiographic testing equipment, and testing of materials and or assemblies by Fermilab. Items particular to this project will be found in the ADDENDUM A, SUBCONTRACT SUMMARY.

6.5 ENVIRONMENTAL ISSUES AFFECTING THE WORK

a. Soil erosion and sediment control plan (SESCP): On all projects involving excavations, the following requirements apply.

1. Erosion control structures: Subcontractor shall have all required erosion control devices required by the SESCO (if required) and as shown on the drawings, in place prior to commencing any work for which they are required. As the work evolves, additional interim control structures may be required in order to protect waterways and/or comply with permit terms and conditions. Costs for installation and maintenance of these structures shall be considered incidental to the project and included in the original proposal. The Subcontractor shall install all such structures within one day of notification by Fermilab.
2. Maintenance of erosion control structures: Subcontractor shall be required to perform inspections of all control structures and to maintain all control devices until final stabilization of all disturbed areas.
3. Temporary and permanent seeding and stabilization: The Subcontractor shall be required to follow seeding dates and requirements as specified and in accordance with the Illinois Urban Manual. The Subcontractor shall be responsible for providing vegetated surfaces as outlined or specified by

Fermilab. Erosion control structures shall not be removed until final acceptance of vegetation by Fermilab.

b. Environmental issues particular to this project will be found in the ADDENDUM A, SUBCONTRACT SUMMARY.

6.6 ADVANCE NOTICE of 48 hours minimum (i.e. 2 workdays) shall be given to Fermilab in writing prior to the following actions. Subcontractor notification to Fermilab shall not imply permission by Fermilab to begin work activity.

- Interruption of road traffic
- Closure of any roads
- Connection to or interruption of any existing underground utility
- Intended use of ICW from any hydrant
- Connection to temporary electric power sources
- Intended activity beyond the specified project limits
- Intended access to or work within a confined space
- Connection to or interruption of any existing 13.8kV power system
- Sawcutting or core drilling at manholes, foundation, and paved areas
- Excavation

6.7 SUBCONTRACTOR USE OF RADIOACTIVE SOURCES FOR TESTING is subject to monitoring and oversight by Fermilab: Five day advanced notice is required prior to on-site use.

6.8 EMPLOYEE IDENTIFICATION BADGING may be required for subcontractor employee access onto the Fermilab site. Subcontractor employees must complete a form and take a photo to obtain an ID card. Once badges are obtained, they shall be worn in accordance with Fermilab requirements including at all times while on the Fermilab site.

7.0 COMMENCEMENT, PROSECUTION and COMPLETION OF THE WORK

7.1 THE SUBCONTRACTOR SHALL COMMENCE WORK under this Subcontract when directed to do so by Fermilab, prosecute the work with diligence and energy, and complete the work as specified.

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7.2 Fermilab will award the Subcontract as soon as feasible after the bid date. Within ten working days after award, the Subcontractor shall submit the following to Fermilab for acceptance:

- Hazard Analysis for typical work of the trade
- Soil Erosion and Sediment Control Plan (if required by Section 6.5)

Initial versions of these documents must be accepted by Fermilab prior to commencement of work. These documents will continue to evolve throughout the work process with additions and changes.

The requirements for each of these are outlined in subsequent sections of this Exhibit.

7.3 A DETAILED SCHEDULE, if required by Fermilab, shall be submitted for the entire project by the Subcontractor and updated during the course of the subcontract.

7.4 FERMILAB CLOSURE: The Fermilab site closes for major holidays and limited project activity occurs on these days:

The following days are Fermilab Holidays.

- New Year's Day
- Martin Luther King's day
- Memorial Day
- Independence Day
- Labor Day
- Thanksgiving Day
- Day after Thanksgiving
- Christmas Eve (half-day)
- Christmas
- New Year's Eve (half-day)

If any of these holidays fall on a weekend day, a weekday will be used for the holiday. Consult the CC for the exact dates. Fermilab will not normally utilize the Subcontractor's tradesmen on Fermilab holidays. The Subcontractor will not be reimbursed for any non-work days.

7.5 ACCEPTANCE shall be made by Fermilab after completion of all work as directed or required by the Drawings and/or Technical Specifications.

8.0 PAYMENT

Invoicing and payment provisions (including progress payments when applicable) shall be contained in the subcontract documents, and reviewed with the CC before commencement of work.

9.0 THEFT

9.1 THE SUBCONTRACTOR SHALL BE RESPONSIBLE FOR necessary precautions to safeguard material and equipment at the job site.

9.2 IN THE EVENT OF THEFT OF SUBCONTRACTOR PROPERTY, Fermilab property, and/or Government property, the Subcontractor shall immediately notify Security Dispatch by telephone (630) 840-3414 and the CC.

9.3 A WRITTEN REPORT shall be sent to Security, MS-326, as soon as possible. This report shall include:

- a. Name and phone number of person making report.
- b. Description of missing property; i.e., make and color (if available), model number, serial number and value. Indicate ownership; and if Government, furnish Government identification number.
- c. Date and time theft took place or was discovered.
- d. Date and time property was last known to be in its proper place.
- e. Any other information, which may be pertinent.
- f. Submit a copy of the report to the CC.

10.0 AS-BUILT DRAWINGS

IN LIEU OF THE AS-BUILT SHOP DRAWINGS specified in the FL-3, **Fermilab Construction Subcontract Terms and Conditions**, the Subcontractor shall maintain and provide As-Built drawings for all projects with drawings used to define the work scope, or as directed by the Construction Coordinator.

11.0 SPECIFICATIONS and DRAWINGS

When drawings define the work scope, Fermilab will provide no more than 5 copies of conformed (project) drawings and Technical Specifications. Additional copies will be the responsibility of the Subcontractor.

12.0 SUBMITTALS, SHOP DRAWINGS and MATERIAL SAMPLES

SHOP DRAWINGS, MATERIAL SAMPLES, and OPERATION and MAINTENANCE MANUALS shall be submitted for all materials and assemblies

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used on the project which are normally required in the industry, or are required by Fermilab for clarification of the sourced items

13.0 INTEGRATED SAFETY MANAGEMENT

13.1 OVERVIEW: Fermilab subscribes to the philosophy of Integrated Safety Management (ISM) by following the program outlined in this section. Fermilab requires its subcontractors and sub-tier subcontractors to do the same. ISM is a system for performing work safely and in an environmentally responsible manner. The term “integrated” is used to indicate that the Environment, Safety & Health (ES&H) management systems are normal and natural elements of doing work. The intent is to integrate the management of ES&H with the management of the other primary elements of project: quality, cost, and schedule.

13.2 ES&H PROGRAM: The subcontractor shall have an ES&H program that is commensurate with the complexity and nature of the work activities. When required by Fermilab, or on all subcontracts that require performance bonding (usually projects > \$100,000), the subcontractor shall submit to Fermilab three (3) copies of the ES&H Plan. This Plan is to describe the Subcontractor’s overall commitment to safety and measures that will be taken specific to this project work scope and site.

A standard company ES&H plan submitted in response to proposal requirements may require modification after subcontract award (paragraph 13.3 below). The modified plan shall consider the nature of work or hazards unique to Fermilab. It shall be submitted for approval to the Fermilab Procurement Administrator within ten (10) days of award of the subcontract. Once approved by Fermilab, the Subcontractor is required to comply with the requirements set forth in their plan.

The ES&H Plan is to address the Subcontractor’s commitment to each of the following principals. A brief explanation and key elements to be addressed follows each:

a. Line management responsibility for safety

Line management shall be responsible and accountable for the protection of the employees, the public, and the environment.

Examples of expected items to support this statement are:

- Statement of ES&H policy and goals;
- Workforce is held accountable for strict compliance with subcontractor’s ES&H plan;
- Process for progressive discipline;
- Means of holding sub-tier contractors accountable for compliance with ES&H requirements;
- Evidence of worker participation;
- Participation of management in safety meetings, inspection, and documentation;
- Process for employees to identify and help resolve ES&H issues quickly, including stop work authority; and
- Management support without hint of retribution or harassment.

b. Clear roles and responsibilities. The roles and responsibilities, and authority at all levels of the organization, including potential sub-tier subcontractors are clearly identified.

Examples of expected items to support this statement are:

- ES&H and Quality Control responsibilities for principals, field superintendent, foremen, competent person, ES&H officer, and workforce are documented; and
- Stop work authority.

c. Competence commensurate with responsibility. Personnel possess the experience, knowledge, skills, and abilities that are necessary to discharge their responsibilities.

Examples of expected items to support this statement are:

- Identification of required training & experience of field superintendent, foremen, competent person, ES&H personnel, and workforce;
- Identification of process for documenting completion of training;
- Process for assuring sub-tier contractors are adequately skilled to perform their work activities; and
- Training for employees and sub-tiers employees on Integrated Safety Management and hazard analysis.

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d. Balanced priorities: Resources are effectively allocated to address safety, programmatic, and operational considerations. Protecting the public, the workers, and the environment shall be a priority whenever activities are planned and performed.

Examples of expected items to support this statement are:

- Management commitment of resources to adequately implement their ES&H program;
- Selection process for sub-tier contractors that include cost, quality, schedule adherence, and safety performance; and
- Process for subcontractor to authorize start of work by sub-tier contractors.

e. Identification of safety standards and requirements. Before work commences, the associated hazards are evaluated and an agreed upon set of safety standards and requirements are established which will provide adequate assurance that the public, the workers, and the environment are protected from adverse consequences.

Examples of expected items to support this statement are:

- Subcontractor ES&H Program Plan, by reference;
- Subcontractor QC Program Plan, by reference; and
- Hazard analysis process which includes defining scope of work, analysis of hazards, identification of hazard controls, requirement to perform work within these controls, and means to provide feedback and improvement.

f. Hazard controls tailored to work being performed. Administrative and engineering controls, tailored to the work being performed, are present to prevent and mitigate hazards.

Examples of expected items to support this statement are:

- Hazard analysis process;
- Subcontractor ES&H Program Plan, by reference;
- Planning and selection of appropriate and effective protective measures;

- Active regimen of workplace inspections and prompt abatement of identified hazards; and
- Inspections, assessment, and audits of sub-tier contractor's adherence to ES&H and QC program.
- Daily work planning and hazard reviews at the worker level.

g. Operations authorization. The conditions and requirements to be satisfied for operations to be initiated and conducted are clearly established and understood by all.

Examples of expected items to support this statement are:

- Process to assure workers are informed of hazards and required protective measures before work is allowed to begin;
- Process to assure workers, including sub-tier contractors are appropriately trained to do their job safely;
- Process to assure that when an incident occurs, the scene is secured until the incident investigation is complete.
- Investigation process includes analysis, examination of trends and lessons learned, and a means to report to Fermilab in a timely manner.
- Process to assure that applicable Fermilab permits are in place prior to allowing work to commence.

13.3 The ES&H PLAN SHALL INCLUDE site-specific information of the Subcontractor's activities at Fermilab. The ES&H Plan shall encompass all applicable aspects of 29 CFR 1910, "OSHA Safety and Health Standards for General Industry" and 29 CFR 1926, "Safety and Health Regulations for Construction". In addition, the plan should describe the following:

- a. Basic safety and health provisions
- Emergency Action/Response Plan
 - Accident Investigation Program
 - Recording and Reporting of Injuries
 - Housekeeping
 - Hazard Communication Plan
 - Personal Protective Equipment
 - Fire Protection And Prevention

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- b. Hazard analysis process
- How hazards are identified and analyzed
 - Preventive controls
 - Periodic inspection program
- c. Waste handling and disposal
- Characterization of waste
 - Packaging and labeling requirements
 - Assurance that appropriate transportation and handling facilities will be used
- d. Erosion control & environmental protection
- Stormwater Pollution Prevention Plan (SWPPP) - when required
 - Erosion/Sediment Control Plan(s).
- e. Other programs (as dictated by the scope of this work)
- Control of Hazardous Energy (Lockout/Tagout)
 - Confined Space Entry
 - Hearing Conservation
 - Ionizing Radiation
 - Nonionizing radiation
 - Lead, Beryllium, or Other Metals
 - Electrical (including Power Transmission And Distribution)
 - Welding And Cutting
 - Scaffolds
 - Fall Protection
 - Excavations
 - Signs, Signals, And, Barricades
 - Tools - Hand And Power
 - Ladders & Stairways
 - Commercial Diving Operations
 - Motor Vehicles, Mechanized Equipment, And Marine Operations
 - Cranes, Derricks, Hoists, Elevators, And Conveyors
 - Steel Erection
 - Demolition
- This program description (“ES&H Plan”) shall be submitted to the Procurement Administrator within 10 days of award of the contract. The authorization to start work will not be issued until this plan has been accepted by Fermilab.

This document is a living program and updates that reflect changes to processes and plans shall be submitted as changes are made. Changes may be required for acceptance of the plan by Fermilab prior to starting work. Once accepted by Fermilab, the Subcontractor shall be required to comply with the requirements set forth in their plan. Once accepted, all revisions shall be submitted to Fermilab for review and acceptance.

Any sub-tier subcontractors employed by the Subcontractor must either agree in writing to follow the Subcontractor’s ES&H Program Plan or submit to the Subcontractor for acceptance (2) copies of the Sub-tier subcontractor’s ES&H Plan. A copy shall be provided to Fermilab for information.

13.4 PROJECT SPECIFIC ES&H

- a. Hazard analysis (HA)
1. The Fermilab Hazard Analysis (HA) process is based on the 2002 OSHA 3071 publication: Job Hazard Analysis (JHA)
<http://www.osha.gov/Publications/osh3071.pdf>. Fermilab’s HA process differs from the OSHA JHA by requiring a review of the environmental impacts and their mitigation with the work hazard analysis. The Fermilab form for recording the HA is available at PDF http://www-esh.fnal.gov/FESHM/2000/2060_FormHA.pdf or WORD http://www-esh.fnal.gov/FESHM/2000/2060_FormHA.doc.
 2. Hazard analysis development requires input from both the Subcontractor performing project work, knowing and understanding the typical hazards associated with each specific trade, and the Fermilab CC, familiar with local hazards, environmental concerns unique to the project area, and other concurrent activities.
 3. Subcontractors shall develop HA’s, incorporate Fermilab specific input, and submit and retain HA records in the

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- standardized format. The initial HA must be accepted by Fermilab prior to commencement of work. It shall include typical, anticipated work tasks.
4. The HA details the specific hazards or environmental impacts associated with the work activities and mitigating actions (including PPE) that the subcontractor and Sub-tier subcontractors shall take to reduce or eliminate the risk of injury or other damage. Material Safety Data Sheets (MSDS) of products that may significantly impact the safety of Fermilab or subcontractor personnel are to be submitted as part of this analysis. An accepted HA shall be required for all work activities.
5. Fermilab will review the HA of each new work task for completeness and conformance with OSHA, industry, and environmental standards. The Subcontractor shall incorporate any necessary changes.
6. Alterations to the work process due to changing work or environmental conditions shall be included in the HA process. The HA must be revised and reviewed by the Subcontractor Competent Person for each activity.
7. Specific procedures in the areas of fall protection, excavation, confined space, hoisting and rigging, lockout/tagout, and use of hazardous material may be required as job conditions dictate.
8. The subcontractor shall provide a job-specific safety orientation to all subcontractor and sub-tier subcontractor employees based upon the current project HA. Each employee will sign the HA to indicate having received the orientation. As the HA is updated, the subcontractor and sub-tier subcontractor employees shall be advised of the new information and re-sign the document.
- b. Stop work authority: Any Fermilab employee may stop a work activity if there is imminent danger of serious injury, fatality, or major environmental release. If the hazard cannot be abated in a timely manner, the work activity shall be stopped through the use of a Stop Work Order. Work shall not be permitted to continue until the hazardous situation has been eliminated and Fermilab has issued a Restart Work Order.
- c. Competent person. The subcontractor shall identify a Competent Person as the designated Subcontractor employee with the knowledge of OSHA and other related safety standards and who has the authority to enforce such standards in the field. Should more than one work shift be required on this project, the Subcontractor shall identify and assign a Competent Person for each shift. Fermilab requires that the Competent Person or alternate (should it be necessary for the identified Competent Person to be absent) shall be available on the Fermilab site at all times during which work activities are taking place, to support the ES&H program. Duties related to ES&H shall take precedence over other duties.
1. The Subcontractor Competent Person shall attend the pre-project meeting and all other safety related meetings.
 2. The Subcontractor Competent Person shall maintain a list of alternate Competent Persons in the event he/she is not present on site. The alternate Competent Person shall have the qualifications as required in the above paragraph.
 3. A separate competent person may be assigned by the Subcontractor or by sub-tier contractors for specific activities, such as excavations or scaffolding. The competent person for these individual activities must meet the requirements established in the OSHA definition. The Subcontractor's Competent Person shall maintain a list of the names of the Sub-tier subcontractor competent persons for specific activities. The Fermilab Coordinator shall be notified of changes and additions 24 hours in advance. The list shall be continually updated no later

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than 24 hours after the change or addition of the competent person on this project site. The list shall be submitted to the Fermilab Coordinator in writing and is to be posted at the project site.

Depending on the complexity and requirements of the project, the Competent Person may also serve as the project superintendent and/or Safety Officer. See the ADDENDUM A, SUBCONTRACT SUMMARY.

d. The Subcontractor shall ensure and demonstrate that Sub-tier contractor personnel are aware of the ES&H requirements of the job. The Sub-tier subcontractors working for the Subcontractor shall follow and perform all required ES&H programs defined by the Subcontractor's approved and accepted ES&H program for the job site.

e. Fermilab coordinators and safety:

1. Coordinator, or Construction Coordinator (CC). The CC shall be the first line contact with the Subcontractor's field organization on behalf of Fermilab. The CC shall be responsible for ensuring that the Subcontractor is in compliance with the provisions of this subcontract, follows the established and accepted ES&H program for all work at the site, and that specific features of work are performed in accordance with the precautions listed in the hazard analysis for that work activity.
2. Not used.
3. ES&H Safety Coordinator: The ES&H Safety Coordinator may make project site visits to provide support to the CC for Laboratory oversight of the subcontractor's safety program. Any deficiencies noted shall be brought to the attention of the CC for follow up with the Subcontractor. As noted in this Exhibit, Section 13.4.b, the ES&H Safety Coordinator has authority to stop work activities for imminent danger, fatality, or major environmental release, but does not have authority to direct

changes in the work scope of the project or the Subcontractor's means and methods of construction. All such direction must be from the CC.

f. Reporting requirements

1. All emergencies and accidents occurring at the Fermilab site must be reported immediately by dialing extension 3131 from a Fermilab phone or 630-840-3131. The accident must be reported immediately to the CC. The types of emergencies to be reported include: fire, explosion, and injury/illness. Security incident, vehicle accident, radiation incident, utility failure, tornado sighting, and hazardous material spill or release should also be reported.
2. All incident scenes involving injuries shall be preserved and secured by the Subcontractor to enable Fermilab and DOE to conduct any necessary investigations. After any necessary emergency response is made, the scene shall be left unchanged and protected until the CC is notified and releases the incident site for work to continue.
3. The Subcontractor must investigate all incidents. The Subcontractor shall submit, within 48 hours of an incident, a written report of an investigation. Fermilab shall provide the Subcontractor with the specific report forms that are to be completed.

g. Subcontractor Training:

1. All Subcontractors working at Fermilab shall attend Subcontractor Orientation. Subcontractor Orientation is a forty-five minute presentation conducted weekdays at 7:30 a.m. All Subcontractor employees will receive a card documenting attendance. This training must be repeated every two years.
2. The Subcontractor shall be responsible for assuring that their employees and sub-tier Subcontractor employees, who do not speak English, understand all ES&H requirements. The Subcon-

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tractor must be able to communicate any necessary instructions to those employees.

3. Subcontractors shall maintain and provide to Fermilab upon request any and all records related to ES&H training that was provided by the Subcontractor or others and received by Subcontractor employees performing subcontractor activities at Fermilab. Records of safety meetings, which include training, shall also be maintained by the Subcontractor and provided to Fermilab.

4. All Subcontractors performing work at Fermilab shall provide to their employees any necessary ES&H training as may be required by Federal/State regulations and as appropriate for their Subcontract activities at Fermilab. Exceptions involve hazards, which are unusual for the trade of the Subcontractor's employees. In particular, Fermilab normally provides appropriate training for Subcontractors working in radiation areas or oxygen deficient hazard areas, and expected emergency response.

- h. The Subcontractor's Field Superintendent has daily line responsibility for implementing and enforcing the Subcontractor's ES&H program at the job site. He/she shall correct unsafe practices, enforce appropriate safety regulations, assure proper safety training for all personnel and conduct required safety meetings of field personnel. He/she shall inspect the job site regularly to ensure compliance with OSHA and company regulations. The Field Superintendent or designee must be present on the Fermilab site whenever work activities are ongoing. See the ADDENDUM A, SUBCONTRACT SUMMARY for additional responsibilities.

13.5 SUBCONTRACTOR SAFETY and HEALTH RECORDS

- a. Subcontractors shall maintain and provide to Fermilab upon request, any and all occupational safety and environmental records. Such records include, but are not limited to, the records required to be maintained by

federal/state regulation. Such records include OSHA injury/illness logs, training records, inspection records, safety meetings, and accident investigations. Additional records appropriate for the Subcontractor's activities shall also be maintained and provided to Fermilab upon request (e.g., crane inspections, welding certifications, etc.).

- b. If the Subcontractor intends to administer first aid or Cardio Pulmonary Resuscitation (CPR), the Subcontractor must comply with 29 CFR 1926, and have available the list of names of any employee who will administer first aid or CPR, along with current certifications.

14.0 ES&H WORK PROCEDURES

14.1 PRE-AWARD MEETING: Prior to Subcontract award Fermilab may hold a meeting with the Subcontractor. The Subcontractor's Supervisory and Competent Person(s) are expected to attend. If the HA has not been submitted for review, it is to be submitted at this meeting. Fermilab will award the contract after all contractual submissions and approvals have been satisfactorily completed.

14.2 ONGOING INSPECTIONS: After the start of work and throughout the entire project period, the Subcontractor shall monitor and inspect its work area and operations for compliance with his/her approved ES&H plan. Field superintendents and Competent Persons for both Subcontractor and Sub-tier contractor personnel are expected to conduct these inspections and correct any deficiencies found. These inspections shall be documented. Records shall be available for review upon request.

14.3 JOB-SITE ES&H MEETINGS:

- a. Daily work planning meetings in the form of daily briefings shall be conducted by the Subcontractor with his employees to discuss the planned work activities, review the applicable hazard analysis, and allow for employee questions and feedback regarding the work activity.
- b. Weekly toolbox meetings of approximately five minutes duration shall be conducted at the job site by the various area/job foreman or superintendents for their specific crafts. These meetings shall emphasize the current project operations and provide an opportunity for

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inspection of tools and personal protective equipment.

- c. d. The CC shall be invited to weekly meetings and documentation of these meetings shall be submitted by the Subcontractor to the CC within two days of the meeting date, if requested.

14.4 WORK COMPLETION and CLEAN-UP: All contractor work shall be completed by the Subcontractor and all clean-up operations shall be in compliance with their ES&H program. Requested documentation for all aspects of the ES&H program shall be complete and in place before Subcontract close-out. All excess materials, equipment, waste materials and rubbish shall be properly disposed of from the project site.

14.5 NOTIFICATION OF NON-COMPLIANCE: The Coordinator will notify the Subcontractor of deficiencies in the ES&H aspects of the work. The Subcontractor shall take immediate corrective action after receipt of such notice.

15.0 SPECIFIC ES&H REQUIREMENTS AT THE CONSTRUCTION SITE

15.1 FERMILAB CONSTRUCTION PERMITS: Fermilab conducts work through the use of on-site permits. All required permits will be identified to the Subcontractor by Fermilab, who will arrange for all necessary permits. There is no cost to the Subcontractor for any Laboratory permits. No work activity shall be performed without the required permits. Activities requiring permits include, but are not limited to, work notification, electrical work, cutting and burning, excavation, modification to drinking water or sewer systems, long term fire protection system disablements, bringing radioactive sources on site, working with/on radioactive material, working in radiological areas, and moving government or Fermilab property off site. (Fermilab confined space entry permits are required only when Fermilab employees or scientific users enter the space or serve as Entry Supervisor. Otherwise, subcontractors use their own permits as specified in their program.) The Subcontractor will comply with all restrictions or provisions listed on permits. All requests for permits shall be made 48 hours (or at least 2 working days) prior to the need for the permit.

- a. Excavation Permit: An Excavation Permit from Fermilab is required before any digging

can begin at a project site. Existing known HIDDEN utilities shall be located by Fermilab in advance of excavation activities. The Subcontractor shall request such locating service through the CC. Requests for location marking are fulfilled on a weekly basis; the submittal deadline is close of business Monday, and signed permits are available on Friday. The Subcontractor shall plan his work accordingly. No excavation shall proceed without an Excavation Permit, signed by the Subcontractor Competent Person and attached to the HA. This locating service does not relieve the Subcontractor of his responsibility to use proper excavating techniques to find hidden utilities prior to excavating.

- b. Burning/Welding Permit: The CC will contact the Fermilab Fire Department (FFD) and secure the Burn Permit. Members of the FFD will meet with the CC (and possibly the Subcontractor), examine the proposed operation, prescribe precautions, assure appropriate instruction has been completed, and then issue a written Burn Permit.

Fire watches must be maintained during burning, welding, or other fire or spark generating work and for a minimum of thirty minutes after work is complete.

It is the Subcontractor's responsibility to furnish the proper number and type of fire extinguishers for any welding, cutting, or brazing activities as specified in the Burn Permit. The extinguishers must be located in clear sight and no farther than 50 feet from the work areas.

All welding shall be in accordance with the requirements of the American Welding Society (AWS) Standard: Safety in Welding, Cutting, and Allied Process (ANSI/ASC Z49.1-94).

UL or FM listed check valves shall be installed on oxygen-fuel torch cutting equipment.

No alarms, safety devices, etc., will be disabled without prior approval of the Coordinator. The Subcontractor shall make a specific request to the Coordinator at least 48 hours before disablement.

- 15.2 WORK ON EXISTING UTILITIES:** No work shall be performed on existing in-service piping

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systems without prior approval and coordination of the system outage. Requests for such outages shall be made at least 48 hours in advance. Pressure shall be relieved on all piping systems before opening up and starting work. Lockout/tagout shall be used as required by the Fermilab Environment, Safety, and Health Manual (FESHM) Chapter 5120. "Hot Tap" connections shall not be permitted unless specified by the job and specific procedures have been submitted and accepted by Fermilab.

15.3 PERSONNEL PROTECTIVE EQUIPMENT must be provided in accordance with OSHA and NFPA, including NFPA 70E.

- a. Hard hats shall be furnished by the Subcontractor and shall be worn in the project work areas as designated in the Hazard Analysis and/or applicable OSHA standards. Hard hat shall meet the ANSI Z89.1 standard as required by 29 CFR 1926.100 and bear the "Z89.1" designation. Hard hats shall be worn with the brim facing forward. "Cowboy type hard hats" are not allowed. High voltage exposure work requires hard hats that meet the ANSI Z89.2 standard and bear the "Z89.2a" designation.
- b. Safety glasses with side shields shall be furnished by the Subcontractor and shall be worn in the project work areas as designated in the Hazard Analysis and/or applicable OSHA standards. Safety glasses shall meet the ANSI Z87.1 standards.
- c. Clothing suitable for the work and weather conditions is required. In construction areas, the minimum shall be short (1/4 length) sleeve shirt, long trousers, and hard sole leatherwork boots providing ankle protection. In addition, any work that presents a greater hazard to the feet or toes requires the use of steel toes or metatarsal guards. Canvas, tennis, or deck shoes are not permitted within the construction work area.
- d. NFPA 70E identifies specific protection required based upon the arc-flash potential of exposed electrical components.

15.4 WORK IN CONFINED SPACES:

- a. Fermilab shall identify all existing confined work spaces to the Subcontractor.

- b. If a Subcontractor is required to enter a permit-required confined space as part of their contract with Fermilab, the subcontractor shall provide Fermilab with the following at the pre-construction meeting or at least 1 week prior to entry:
 1. A written copy of their confined space entry program.
 2. Training records for potential entrants, attendants, and entry supervisors.
 3. Evidence that all air monitoring equipment is properly calibrated within the calibration period specified by the subcontractor's program or manufacturer's instructions. This may be in the form of a calibration log, certification indicator on the instrument, or other means. It is imperative that the equipment used by the Subcontractor be capable of monitoring for the contaminants associated with the confined space to be entered.
- c. It will be the Subcontractor's responsibility to provide all of their own personal protective equipment (PPE), such as lifelines, harnesses, respirators, tripods, ventilators, etc., as specified by the entry permit.
- d. In addition to complying with the permit space requirements listed above, each Subcontractor retained to perform permit-required confined space entry operations shall:
 1. Obtain any available information regarding permit space hazards and entry operations from the CC.
 2. Coordinate entry operations with Fermilab, when both Fermilab personnel and Subcontractor personnel will be working in or near permit spaces.
 3. Prior to entry, inform Fermilab of the specific permit space procedures the Subcontractor will follow.
 4. Inform the Fermilab Fire Department and the CC prior to entering the space.
 5. Inform Fermilab of any unanticipated hazards encountered during confined space entry.

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6. Provide Fermilab with a copy of the Subcontractor's confined space permit, reclassification form or written certification once the work has been completed.

15.5 OPEN BURNING, fire barrels, coal or kerosene type salamanders, or open flame heating devices that have exposed fuel below the flame shall be prohibited. Spark arresters shall be provided on all stacks or burning devices having forced drafts. Temporary heating devices, used in any enclosed building, room, or structure, shall be 1) listed by UL, FM, ETL, or other approval-testing laboratory and 2) vented to the outside. Flammable liquid fixed heaters shall be 1) listed by UL, FM, ETL, or other approval-testing laboratory and 2) equipped with a primary safety control to stop flow of fuel in the event of a flame failure. Barometric or gravity oil feeds are not acceptable primary safety controls.

15.6 SMOKING IS PROHIBITED in locations where flammable and/or combustible materials are stored. "No smoking" signs shall be posted in these areas. Smoking is prohibited in all Fermilab buildings except in designated areas.

15.7 LOCKOUT/TAGOUT PROCEDURES shall be enforced. Subcontractor personnel must be trained in lockout/tagout prior to participating in lockout/tagout of hazardous energy sources and working on lockout/tagout systems or equipment. The Subcontractor's employees and sub-tier contractor's shall comply with the requirements of NFPA 70E

15.8 GROUND FAULT CIRCUIT INTERRUPTER protection shall be provided for electric hand held tools, portable generators, temporary electrical extension cords and other wiring, etc. The assured equipment-grounding program is not an acceptable alternative.

15.9 THE USE OF EXPLOSIVES IS NOT PERMITTED without prior written approval of the Fermilab Director or his designee.

15.10 VEHICLES AND EQUIPMENT:

- a. Operators must have an appropriate, valid driver's license when operating vehicles on site. Seat belts are required to be provided and worn for the operators and passengers of all vehicles. Cell phones and other electronic

equipment shall not be used while vehicles are in motion.

- b. All vehicles and mobile powered equipment, except automobiles and pickup trucks, shall have reverse signal alarms (a.k.a. backup alarms) audible above the surrounding noise level. If backup alarms are not present on the equipment, a spotter (other than the driver of the vehicle) must be present to warn pedestrians and the drivers of other moving equipment.
- c. If required by the equipment manufacturer, roll over protection structures shall be provided.
- d. The equipment manufacturer must approve any modifications to lifting and hoisting equipment.
- e. Above ground fuel storage tanks for vehicles shall not be permitted on the Fermilab site. Fuel tanks mounted on pick-up trucks shall conform to the requirements of the Illinois State Fire Marshall's Office. Such vehicles shall be removed from the Fermilab site at the end of each workday. Refueling of equipment while the motor is running is prohibited. During refueling from truck-mounted fuel tanks or with portable fuel cans, etc, a 20-pound (minimum) A-B-C dry chemical fire extinguisher must be present. Maintenance and fueling areas used by the Subcontractor shall be properly graded and maintained and shall be located a minimum of 100 feet away from a wetland or water body boundary so that no adverse effect on the environment is done.
- f. All hand and power tools must be checked prior to use on each shift to assure that they are maintained in a safe condition. Any deficiencies shall be repaired, or defective parts replaced, before continued use.

The Subcontractor must inspect all heavy equipment before use on site, prior to use on each shift, and during use to make sure it is in safe operating condition. Defective equipment shall be removed from service. The Subcontractor is to assure that inspection records are complete and up-to-date and that operating manuals are available. No modifications or additions, which affect the capacity or safe operation of the equipment,

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shall be made without the manufacturer's written approval. If such modifications or changes are made, the capacity, operation, and maintenance instruction plates, tags, or decals shall be changed accordingly. In no case shall the original safety factor of the equipment be reduced.

- g. All tools and equipment brought on site by the Subcontractor are subject to inspection by Fermilab. Items found to be out of compliance shall be immediately removed from service, tagged out of service, and taken off the site by the Subcontractor by the end of the work shift.

15.11 OXYGEN DEFICIENT HAZARDS (ODH): Fermilab has policies and procedures governing work in ODH areas, and will communicate specific requirements and work practices to the Subcontractor.

Subcontractor and sub-subcontractor personnel who must enter designated Oxygen Deficient Hazard areas must have a level of medical fitness acceptable to Fermilab prior to entry. This assessment is part of Oxygen Deficiency Hazard Training. Fermilab will provide training, oxygen monitoring, and emergency evacuation equipment.

15.12 RADIATION PROTECTION: Fermilab has policies and procedures governing radiological work, and will communicate specific requirements and work practices to the Subcontractor.

Fermilab will provide subcontractor personnel radiological training (for T&M contracts this can be billed at the current rate for normal working hours), radiation dosimeters, protective clothing, and disposal of such clothing and other materials removed from radiological work areas. All potentially exposed material must be surveyed prior to removal from site.

15.13 EMERGENCY EGRESS ROUTES shall be kept clear at all times. Emergency shelter locations and specific evacuation procedures will be provided by the CC. The Subcontractor shall communicate this information to his employees and all sub-subcontractors. Unless otherwise directed by the CC, the Subcontractor personnel shall participate in emergency drills.

15.14 SPECIFIC HEALTH and SAFETY REQUIREMENTS (INCLUDING TRAINING), if any, particular to this project will be found in the ADDENDUM A, SUBCONTRACT SUMMARY.

16.0 ENVIRONMENTAL PROTECTION

All construction work on the Fermilab site shall comply with all applicable environmental executive orders, laws, regulations, and permits. All Subcontractors and sub-subcontractors shall conduct their activities in an environmentally sound manner that limits the risks to the environment and protects the public health.

16.1 PREVENTIVE MEASURES

- a. Erosion and sedimentation shall be controlled for any project involving excavation. Erosion controls shall be in place where applicable, and installed in accordance with Illinois Urban Manual specifications.
- b. Excavation at or adjacent to streams tributaries, or other drainage outfalls shall be done only after notification to the Coordinator. The Coordinator will inform the Subcontractor if any wetlands are present in work area and what protective measures are necessary.
- c. Unexpected environmental impacts shall be immediately reported to Fermilab and quickly mitigated by the Subcontractor.
- d. Flammable and/or combustible liquids, fuels, and oils shall be in secondary containment adequate to contain 100% of the contents of the container. Storage of these materials, plus maintenance and fueling areas used by the Subcontractor, shall be properly graded and maintained and shall be located a minimum of 100 feet away from a wetland or water body boundary so that adverse effects on the environment are eliminated. Liquid transfers shall be carried out in such a way as to ensure that no contamination of ground surfaces occur.
- e. The Subcontractor shall make routine inspections to assure that all motorized equipment is free of leaks of petroleum and other toxic or hazardous materials. The Subcontractor shall keep sufficient cleanup supplies on hand (e.g. oil dry, absorbent booms, etc.) to contain/absorb any spill or leak of fuels, oils, etc. that could potentially leak from his equipment. If a spill or leak should occur, the Subcontractor should immediately take appropriate steps to contain spills, move equipment out of sensitive areas (near wetland

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or water body) and immediately notify Fermilab at phone x3131.

16.2. AT THE CLOSE OF EVERY WORKDAY, the Subcontractor's Field Superintendent shall inspect the complete project site to insure that all erosion controls, drainage patterns, excavations and staging areas are in environmentally sound condition for the weather conditions anticipated.

16.3 SPECIFIC ENVIRONMENTAL PROTECTION REQUIREMENTS (including training) particular to this project will be found in the ADDENDUM A, SUBCONTRACT SUMMARY.

17.0 VARIANCES: Requests for exceptions of the environmental, safety and health conditions specified in Paragraphs 13 – 16 must be submitted in writing to Fermilab.

18.0 NOT APPLICABLE

19.0 QUALITY CONTROL: The Subcontractor is responsible for all activities necessary to manage, control, and document work so as to ensure compliance with the Subcontract documents. The Subcontractor's responsibility includes ensuring adequate Quality Control services are provided for work accomplished on- and off-site by his/her organization, suppliers, sub-tier contractors, technical laboratories, and consultants. The work activities include safety, submittal management, testing and inspection, and all other functions relating to the requirement for quality construction.

19.1 IMPLEMENTATION: The Subcontractor shall ensure that the project, including work by sub-tier contractors and suppliers, complies with the requirements of the subcontract.

19.2 WEEKLY COORDINATION MEETINGS: During the progress of the project, weekly coordination meetings may (at Fermilab's discretion) be held with the Subcontractor and other interested parties from Fermilab. During these meetings work completed will be reviewed, work planned for the coming week will be discussed, and ES&H issues will be resolved.

19.3 TESTING: The Subcontractor shall perform specified or required tests to verify that control measures are adequate to provide a product which conforms to Subcontract requirements.

19.4 COMPLETION INSPECTIONS

- a. **Beneficial use inspection:** This Fermilab inspection will coincide with any Fermilab beneficial use milestone dates. The Subcontractor's deficiency list with status noted shall be attached to the Beneficial Use documentation. The Subcontractor shall provide a 10-day notice to Fermilab before this inspection is performed.
- b. **Punchlist inspection:** Once the Subcontractor believes the work is substantially complete, he shall update his deficiency list. With a 10-day notice the Fermilab representatives will convene for a Punchlist Inspection, to verify that the Subcontractor's deficiency list is accurate, and to add items if necessary.
- c. **Final acceptance inspection:** The Subcontractor's Quality Control Inspection personnel, plus the superintendent or other primary management person shall be in attendance at this inspection. Additional Fermilab personnel may also be in attendance. The Subcontractor shall give at least 5 days notice prior to the Final Acceptance Inspection, which will be formally scheduled by Fermilab.

19.5 DOCUMENTATION

- a. **Daily Report:** The Subcontractor shall maintain current records providing factual evidence that required activities and/or tests have been performed. These records shall be submitted at the coordination meeting. These records shall include the work of sub-tier contractors and suppliers.
- b. **Periodic coordination minutes:** Depending on the scale and scope of the subcontract effort, Fermilab will conduct periodic coordination meetings, and will prepare minutes, including a list of deficient items, corrective actions, and status of these items. These minutes will be signed by the Subcontractor, and will become part of the Fermilab project file.
- c. **Deficiency list:** As segments of the work are completed, the Subcontractor shall update the list of outstanding deficient items which do not conform to the approved subcontract documents and their current status. This list will be kept current during the project and made part of the Periodic Coordination

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Minutes (see above). The final version of this list will be prepared by the Subcontractor prior to notifying Fermilab to perform the Punchlist inspection.

- d. Fermilab will add to the Subcontractor's deficiency list during the Punchlist inspection and transmit this to the Subcontractor for corrective action.

19.6 NOTIFICATION OF NONCOMPLIANCE:
The CC will notify the Subcontractor of deficiencies in the quality of the project. The Subcontractor shall take immediate corrective action after receipt of such notice.

20.0 ATTACHMENTS: *Appendix 1 – Fermilab Hazard Analysis Form Add place for Plans and spec listing*