



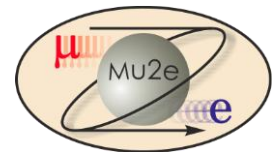
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# Construction Safety and Health Program WBS 3.0

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FESS SSO

10/22/2014



# Mu2e Vision

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**To construct the Mu2e Conventional Construction in a safe, environmentally respectful, cost efficient manner that meets our stakeholder's needs**

- Maintain a safe workplace for our workers, subcontractors, sub-subcontractors, site occupants and guests
- Protect human health within our boundaries
- Achieve and maintain compliance with applicable ES&H requirements

# ISM

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- We recognize that construction has an inherent potential for injury and accidents; Fermi has established the tools to mitigate these hazards.
- Fermilab's Integrated Safety Management (ISM) is well established.
  - ISM requirements are contractually mandated to subcontractor and sub-tiers
    - Project Activity Hazards Analysis
    - Site Specific Construction Safety Program
    - Job Safety Analysis
    - Plan of the Day (POD)
- Our goal to have ZERO accidents or incidents.
- Anyone can stop a work activity.

# ES&H Plans

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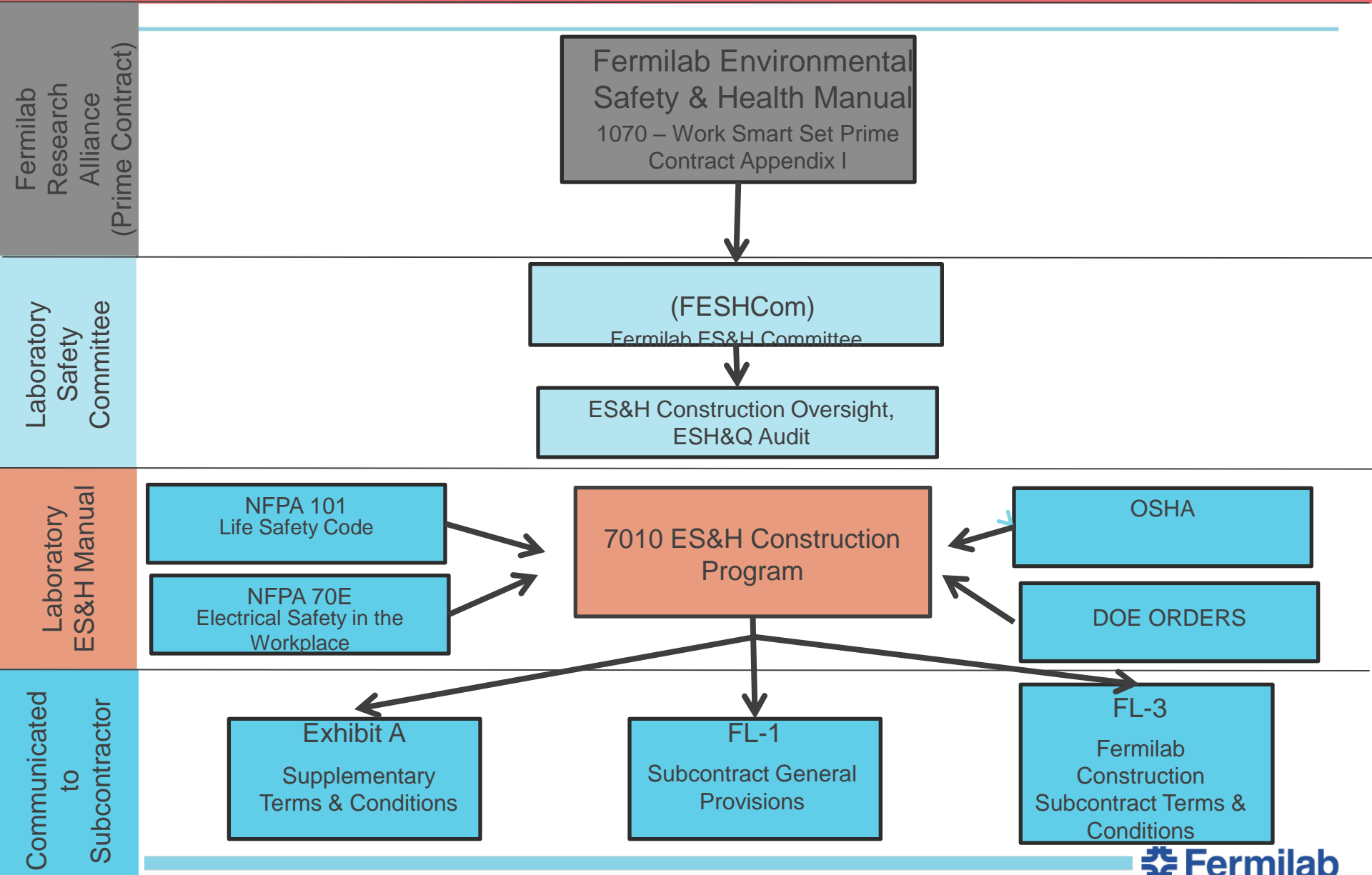
- **Mu2e Site Specific Construction Safety and Health Plan Principles for the Conventional Construction**
  - 10 CFR Part 851, Appendix A, Section 1(d)
    - Establish written safety and health policy and goals,
    - May require a comprehensive occupational medical program,
    - Provide mechanisms to involve workers in the safety and health program,
    - Establish procedures for workers to report hazards and stop work, and
    - Daily Pre-Work Coordination Meetings
    - Use qualified safety and health professionals
- Exhibit A and the FL's transmit these requirements to the Subcontractor

# Planned Oversight

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- Perform Work
  - Subcontractor's safety representative must be on site at all times work is being performed; must have relevant experience
  - Safety Representative must have OSHA 30 Hr.
  - Daily Work Plans - Each work crew
- Daily/Regular Safety Inspections by Subcontractor
  - Semi Month Safety Inspections by Subcontractor's Corporate Safety Officer
- Weekly Fermi/Subcontractor Inspection and coordination meeting
- Regular Safety-Walkabouts by Key and Supervisory Personnel
- Subcontractor will meet with sub-subcontractors weekly; agenda will include safety

# Fermilab's Construction (Flow Down)



# Fermilab Roles (Exhibit A)

## Fermilab Construction Manager

The Fermilab Construction Manager is a Fermilab person with overall responsibility for the construction phase of the project.



## Fermilab Construction Coordinator

The Fermilab Construction Coordinator is a Fermilab person specifically assigned to oversee the work of a project for conformance to the subcontract requirements. The Fermilab Construction Coordinator is the primary point of contact with the Subcontractor.

## Fermilab ES&H Coordinator

The Fermilab ES&H Safety Coordinator will make periodic construction site visits to provide support to the Fermilab Construction Coordinator for Laboratory oversight of the Subcontractor's safety program. Any deficiencies noted shall be brought to the attention of Fermilab Construction Coordinator for follow up with the Subcontractor. As noted in Exhibit A, Section 6.1, the ES&H 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.

# Required Subcontractor Roles (Exhibit A)

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## Subcontractor's Safety Representative Responsibilities

For this project a Project Manager that is dedicated to the successful completion of the work is required. This position is not necessarily full time nor does his/her office need to be on site. The Project Manager may function for both the Mu2e Conventional Facilities, project number 6-10-2 and the MC Beamline Enclosure, project number 6-10-22.

For this Project the Superintendent cannot serve as the Subcontractor's Safety Representative for the day to day ES&H oversight. The Superintendent may function for both the Mu2e Conventional Facilities, project number 6-10-2 and the MC Beamline Enclosure, project number 6-10-22.

Safety Representative: When Subcontractor's daily trade headcount exceeds 20, the Subcontractor shall engage one on-site, full time Safety Representative as defined in Exhibit A section 4.1, Subcontractor's Project Team. This person may not hold other duties. Days that the trade headcounts is 20 or less the Subcontractor may designate a worker as the identified Safety Representative. The headcount of trade personnel shall be based on the total for the two projects, Mu2e Conventional Facilities and MC Beamline Enclosure. The Safety Representative may function for both the Mu2e Conventional Facilities, project number 6-10-2 and the MC Beamline Enclosure, project number 6-10-22. The Safety Representative shall have complete the OSHA 30 Hour Construction Training Course.

The Subcontractor shall provide an individual, who is an employee of the Subcontractor but independent to the Project's field management, to provide supplementary qualified Safety Representation.

This individual is to participate in the preparatory phase meetings, assist in the safety aspects of planning the work activities and the development of hazard analyses.

Make site observations during the initial phases of work and perform bi-monthly site walk-through, providing a written report of issues and recommendation to his field superintendent and the FCC.

The subcontractor's ES&H representative is to assist in any investigations or corrective action planning as needed.

Appendix E has additional requirements that shall be included in the Project Specific Environment Safety and Health Plan to the requirements in Exhibit A Section 6. This plan is required after award.



# Subcontractor's Roles (Exhibit A)

## Field Superintendent

The Subcontractor shall, at all times during the progress of the work, provide a competent superintendent in accordance with FL-3, Section 10. In addition, the following requirements for the Field Superintendent are described below:

The Subcontractor shall provide a competent Field Superintendent, who is the Subcontractor's representative designated for the duration of the project to the running of the day-to-day operations of the work including safety, quality control and sub-tier subcontractor coordination responsibilities.

The Field Superintendent shall have knowledge and experience of Occupational Safety and Health Administration (OSHA) and other related safety standards, and has the authority to enforce such standards in the field.

The Field Superintendent must be present on the Fermilab project site whenever work activities are ongoing.

In the absence of the designated Field Superintendent, the Subcontractor shall identify an alternate individual with similar qualifications acceptable to Fermilab.

Should more than one work shift be required on this project, the Subcontractor shall identify and assign a designated individual meeting the above requirements for each work shift.

In the event that excavations are part of the project scope, the Subcontractor shall provide a competent person for excavation activities who meets the requirements of OSHA 29 CFR 1926.32 (f).

In the event that scaffolding is to be utilized during the execution of the project, the Subcontractor shall provide a competent person for scaffolding who meets the requirements of OSHA 29 CFR 1926.32 (f).

## Safety Representative

The Subcontractor shall employ a Safety Representative who acts as a properly authorized agent of the Subcontractor, responsible for safety activities of all work sites under this subcontract. Unless stated otherwise in **Section 4.1 of Addendum A**, the Subcontractor's Field Superintendent can function as Safety representative. The Safety Representative shall interface with the Fermilab Construction Coordinator on all safety matters, and assure the subcontractor does the following:

- Interface with Fermilab Construction Coordinator on all safety matters;
- Preparing and submitting Hazard Analyses including revisions and updates;

- Reviewing and accepting sub-tier safety plans and hazard analyses;
- Assuring all sub-tier contractors have accepted the ES&H Plan;

- Updating the ES&H Plan as required;

- Maintaining a list of Competent Persons;

- Assuring Hazard Analyses are understood and signed by all workers;

- Inspecting work in progress;

- Identifying, reporting and correcting deficiencies;

- Assuring personal protective equipment is available;

- Conducting tool box meetings;

- Conducting monthly safety meetings;

- Maintaining all safety records including minutes, training records, inspections, etc.

- Maintaining safety related signage;

- Assuring equipment inspections are performed;

- Attending weekly construction meetings;

- Coordinate permit applications with Fermilab Construction Coordinator;

- Investigating all incidents;

The Subcontractor's Safety Representative or the alternate shall be present at all meetings between the Subcontractor and Fermilab at which changes in construction methodology are discussed. The Subcontractor's Safety Representative shall approve these changes.

# Additional Oversight

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- Fermilab maintains Master Subcontracts with two professional safety consultants. The Mu2e Project plans on employing Environmental Resources Management (ERM) to augment the Fermi Construction Coordinator (FCC).
  - In the past the firm assigns a field representative that will make weekly field observation. All findings are discussed with the FCC and followed up with a written report.
  - The FC shares the information with the subcontractor and Fermi ES&H.

# Responsibility Matrix

## INTEGRATED PROJECT TEAM RESPONSIBILITY MATRIX

### Mu2e Conventional Construction

WORK PHASE	Mu2e PROJECT OFFICE					Mu2e CONVENTIONAL CONSTRUCTION INTEGRATED PROJECT TEAM						ORGANIZATIONAL PROCESS ASSETS										
	Project Manager (PM)	Project Budget Office	Project Controls (PC)	ES&H Office	Tech Board	FEISS/Engineering	Construction Manager	FEISS/Engineering	FEISS/Engineering	ES&H Section	Finance	Directorate	Business Services Section	Facilities Engineering Services Section	Facilities Engineering Services Section	Chargemaster Operations	Chargemaster Operations	Facilities Engineering Services Section	ES&H	Finance		
	R. Ray	D. Krapp	M. Gardner	D. Hahn		T. Lackowski	T. Lackowski	K. Lebl-Hick	R. Fouch	J. Cassidy	Name	Department	Department	E. Collins	K. Alber	E. McHugh	E. Arroyo	K. Watson	J. Cassidy	R. Fierherty		
Issue Request For Proposal						Initiate Construction Reception									Approve Request	Approve Request		Approve Request				
Pre-Proposal Meeting (if required)						Determine Necessity for Pre-Proposal Meeting					Participate in Pre-Proposal Meeting							Coordinates and Chair Pre-Proposal Meeting		Participate in Pre-Proposal Meeting		
Requests For Information						Coordinates RFI					receives RFI											
Amendments						Coordinates with Replies for RFIs					Prepares Replies for RFIs											
Proposal Evaluations						Concurs with Need for Amendment to SSP					Assemble Amendment Documentation							Determines Need for Amendments to SSP		Issues Amendment to SSP		
	Participate in Source Evaluation Team					Participate in Source Evaluation Team												Chair Source Evaluation Team				evaluate safety submittals
						Initiate Corporate Quality Control Plan					Participate in Source Evaluation Team							Participates in Source Evaluation Team	Provides Counsel as Requested			
Negotiations	Concurs on negotiation progress and status					Assist in Negotiations					Conduct Negotiations						Provides Counsel as Requested					
Subcontract Award											Award Subcontract						Provides Counsel as Requested				Review and Accept Safety Documentation	
Project Filing						Establish Project File Requirements					Maintain Project File											
<b>Construction</b>																						
Pre-Construction Meeting						Determine Necessity for Pre-Construction Site Tour												Coordinates and Chair Pre-Construction Meeting		Participate in Pre-Construction Meeting		Participate in Pre-Construction Meeting
Subcontractor Corporate Safety Plan					Monitor Process	Review Submittals															Review/Approve Safety and Health Submittals	
Subcontractor Quality Control Plan						Accept Subcontractor Corporate Safety Plan					Review Subcontractor Plan	Review Subcontractor Plan										
Storm Water Erosion Control Plan					Monitor Process	Accept Subcontractor Quality Control Plan					Review Plan	Review Plan									Review/Approve Environmental Submittals	
Hazard Analysis					Monitor Process	Accept Storm Water Erosion Control Plan					Review and Accept Hazard Analysis						Monitor Process				Assist Review as Requested	
Fermilab Permits					Monitor Process	Monitor Process					Obtain and Maintain Easements						Monitor Process				Provide Oversight and Support of Process	
Notice To Proceed					Monitor Process	Monitor Process					Assign Professionals as in Scope						Issue Notice To Proceed		Monitor Process			
Cost Loaded Schedule (CLS)	Approved Change Control				Replace Planning Postings with accepted planned work in P6 S&H table	Initiate Change control of Planning Postings with agreed upon as built activity dates and planned earned value					Accepts Baseline Schedule	Review CLS					Review and Comment on CLS					
Monthly Schedule Monitoring	Monitor Process	Monitor Process			Enter Access into P6, update submittals	Accept actual Earned Value Values					Review Actual Earned Values						Accepts status of work at scope					
Submittal List						Accept CLS					Review Submittal List	Review Submittal List										
A/E Support For Construction Phase						Determine need for in-process and A/E team support assignments					Prepare A/E SPP Memo	Review A/E SPP					Issue A/E SPP		Review workload assignments			
Execute Construction Phase						Initiate resolution for A/E input					Report progress to PM and PC	Monitor Process					Establish meeting protocol with A/E					
Inspections and Reports						Monitor QA program					Monitor Progress and Trends						Support as Requested	Support as Requested	Support as Requested		Support as Requested	

# Responsibility Matrix

INTEGRATED PROJECT TEAM RESPONSIBILITY MATRIX																			
MuZe PROJECT OFFICE					MuZe CONVENTIONAL CONSTRUCTION INTEGRATED PROJECT TEAM							ORGANIZATIONAL PROCESS ASSETS							
Project Manager (PM)	Project Budget Officer	Project Controls (PC)	ES&H Officer	Tech Lead	FESSE Engineering	Construction Manager	FESSE Engineering	FESSE Engineering	ES&H Section	Finance	Business	Business Services Section	Facilities Engineering Services Section	Facilities Engineering Services Section	Chemical Engineering	Chemical Engineering	Facilities Engineering Services Section	ES&H	Finance
					Fermilab Level 2 Manager	Fermilab Level 2 Manager	Fermilab Design Coordinator	Fermilab Construction Coordinator	Fermilab Design Coordinator	Procurement	Legal	Accounting	Section Head	FESSE Engineering Department Head	File / Sec. Admin Officer	File / Sec. Admin Officer	Environmental	Safety and Health	Security
	K. Ray	D. Knapp	M. Gardner	D. Hahn	T. Jackowski	T. Jackowski	R. Johnson	R. Foshell	J. Cavidy	W. Wang	Department	Department	K. Collins	R. Aber	E. Murligh	E. Arroyo	R. Walton	J. Cavidy	B. Flaherty
Labor Reporting								Obtain Mainframe Reports from Subcontractor		Review Data-Bacon Payroll Submittals									
Deficiency Log					Monitor Deficiency Log	Monitor Deficiency Log	Monitor Deficiency Log	Monitor Deficiency Log											
Submittals					Monitor Submittal Review Process	Monitor Submittal Review Process	Monitor Submittal Review Process	Monitor Submittal Review Process											
Engineering Changes					Issue and Approve Actions	Issue and Approve Actions	Issue and Approve Actions	Issue and Approve Actions											
					Initiate Engineering Change Request	Initiate Engineering Change Request	Initiate Engineering Change Request	Initiate Engineering Change Request											
	Approve Change Control Submittal	Review PS with approved Change Control		Review Change Control Submittal	Concur with Engineering Change Request - Initiate Change Control Board Submittal	Concur with Engineering Change Request	Concur with Engineering Change Request	Concur with Engineering Change Request	Develop Documentation for Engineering Change Request	Issue Engineering Change Request to Subcontractor				Issue Engineering Change Request to Subcontractor					
					Review Subcontractor Engineering Change Request Submittal	Review Subcontractor Engineering Change Request Submittal	Review Subcontractor Engineering Change Request Submittal	Review Subcontractor Engineering Change Request Submittal	Review Subcontractor Engineering Change Request Submittal	Review Subcontractor Engineering Change Request Submittal				Review / approve					
					Initiate Requestion	Initiate Requestion	Initiate Requestion	Initiate Requestion	Initiate Requestion	Initiate Requestion				Issue Supplemental Agreement					
Claim Review and Negotiations					Prepare Change Control Submittal	Lead Review and Negotiations	Assist Review	Assist Review	Assist Review	Assist Review and Negotiations	Provide counsel as requested		Approve Requestion	Approve Requestion		Approve Requestion			
Regulatory Agreements					Approve Agreements	Approve Agreements	Approve Agreements	Approve Agreements	Approve Agreements	Approve Agreements									
Non-compliance Notifications	Monitor Compliance				Issue Non-compliance Notification	Issue Non-compliance Notification	Issue Non-compliance Notification	Issue Non-compliance Notification	Issue Non-compliance Notification	Issue Non-compliance Notification	Provide Counsel as Requested								
Construction Meeting					Participate in Meetings	Participate in Meetings	Participate in Meetings	Participate in Meetings	Participate in Meetings	Participate in Meetings				Attend as Requested		Attend as Requested		Attend as Requested	
Weekly Project Team Meeting					Participate in Meetings	Participate in Meetings	Participate in Meetings	Participate in Meetings	Participate in Meetings	Participate in Meetings									Participate in Meetings
Project Reporting	Reviews Report				Monitor Design Progress and Costs							Provide Timely Cost Data to PPM							
Cost Tracking and Control					Accrue Costs	Monitor Construction Progress	Monitor Construction Progress	Monitor Construction Progress	Monitor Construction Progress	Monitor Construction Progress		Provide Timely Cost Data to PPM				Track All Invoices and FESSE Engineering Costs			
Subcontractor Progress Updates					Review and Comment on Subcontractor Update Submittals	Review and Comment on Subcontractor Update Submittals	Review and Comment on Subcontractor Update Submittals	Review and Comment on Subcontractor Update Submittals	Review and Comment on Subcontractor Update Submittals	Review and Comment on Subcontractor Update Submittals									
Invoice Approvals					Review Invoices	Review Invoices	Review Invoices	Review Invoices	Review Invoices	Review Invoices									
Punch List					Determine Punch List Status	Coordinate Customer Walkthroughs	Coordinate Customer Walkthroughs	Coordinate Customer Walkthroughs	Coordinate Customer Walkthroughs	Coordinate Customer Walkthroughs									
					Coordinate Customer Walkthroughs	Coordinate Customer Walkthroughs	Coordinate Customer Walkthroughs	Coordinate Customer Walkthroughs	Coordinate Customer Walkthroughs	Coordinate Customer Walkthroughs									
					Coordinate Customer Walkthroughs	Coordinate Customer Walkthroughs	Coordinate Customer Walkthroughs	Coordinate Customer Walkthroughs	Coordinate Customer Walkthroughs	Coordinate Customer Walkthroughs									
Beneficial Occupancy				Participates in walkthroughs	Participates in walkthroughs	Participates in walkthroughs	Participates in walkthroughs	Participates in walkthroughs	Participates in walkthroughs	Participates in walkthroughs									Participates in walkthroughs
					Approve Beneficial Occupancy	Approve Beneficial Occupancy	Approve Beneficial Occupancy	Approve Beneficial Occupancy	Approve Beneficial Occupancy	Approve Beneficial Occupancy				Approve Beneficial Occupancy		Approve Beneficial Occupancy			
Final Acceptance					Approve Final Acceptance	Approve Final Acceptance	Approve Final Acceptance	Approve Final Acceptance	Approve Final Acceptance	Approve Final Acceptance				Approve Final Acceptance		Approve Final Acceptance			
Incident Investigations				Assist as Required															
	Monitor Incident Response																		
					Issue Incident Report, Monitor Response	Issue Incident Report, Monitor Response	Issue Incident Report, Monitor Response	Issue Incident Report, Monitor Response	Issue Incident Report, Monitor Response	Issue Incident Report, Monitor Response				Monitor Incident Response	Monitor Incident Response	Monitor Incident Response	Monitor Incident Response	Monitor Incident Response	Monitor Incident Response
Lessons Learned					Assist as Required	Assist as Required	Assist as Required	Assist as Required	Assist as Required	Assist as Required									
Environment, Safety and Health Compliance	Monitor Compliance				Monitor Compliance	Monitor Compliance	Monitor Compliance	Monitor Compliance	Monitor Compliance	Monitor Compliance			Monitor Compliance	Monitor Compliance	assist on technical issues		Monitor Compliance	Monitor Compliance	
As-built Documentation					Interface with Subcontractor	Assist as Requested	Assist as Requested	Assist as Requested	Assist as Requested	Assist as Requested									Assist as Requested
Project Filing					Monitor Compliance	Monitor Compliance	Monitor Compliance	Monitor Compliance	Monitor Compliance	Monitor Compliance									
					Establish Project File Requirements	Establish Project File Requirements	Establish Project File Requirements	Establish Project File Requirements	Establish Project File Requirements	Establish Project File Requirements									