DARKO CONSTRUCTIONS

HEALTH, SAFETY and ENVIRONMENTAL PLAN

FOR
Construction Of
Jotun Egypt

ISSUE NO. 01

ISSUE NO.	Date	Issue For	Prepared by	Reviewed by	Owner Approval
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Project Abbreviations

The Following Project Abbreviations will be used For Quality Control Reports , Submittals and Other related Documents.

Abb.	Title
DARKO	DARKO Construction (Main Contractor)
PM	Project Manager
CM	Construction Manager
HQAD	Head of Quality Assurance Department
HQCD	Head of Quality control Department
QA	Quality Assurance
QC	Quality Control
QCS	Quality Control Supervisor
QCM	Quality Control Manger
QCP	Quality Control Plan
HSEP	Health, Safety, Environmental Plan
SM	Safety Meeting
MM	Minutes Of Meeting
CAR	Corrective Action Report
NCR	Non Conformance Report
SDR	Safety Daily Report
SE	Safety Engineer
SO	Safety officer
PPE	Personal Protective Equipment

Scope and objectives of the Safety Plan

Aim of safety plan:

The aim of this plan is to create a safe environment in the working site, and saving the assets by avoiding dangerous situations that lead to harming people or spoiling assets.

Scope:

The Scope Of The Plan Covers The Site Activities Of All project Works, Employees, Direct Contractors, Subcontractors, Suppliers, And Visitors. It Also Extends To The Duty Of Care Required To Ensure Those Members Of The Consultants Team, Other Contractors Staff And The General Public Are Protected From Risks And Hazards Arising From The Building Process.

Objectives Of The Safety Plan Is:

- To Establish The Safety Management Structure For The Project.
- To Define The Responsibilities For Each Person Having Safety Management Duties .
- To Identify Arrangements To Minimise Risk.
- To Set Up Environmental Protection Controls.
- To Define The Security Procedures For The Project Work Location.

All Direct Contractors / Sub-Contractors And Their Contractors Shall Abide By The Safety Regulations Contained In This Safety Management Plan.

Safety Policy

Darko FOR CONSTRUCTION Fundamental Safety Rules:
Darko FOR CONSTRUCTION is a leading company in construction field and her mission is to reach to high class performance in construction field safely, reliably and efficiently, with due care for the environment. We will do this by having respect for the workers health and safety in site, also the local community and clients' requirements.

We take safety principles seriously and we expect all workers and sub-contractors to do the same. These rules as shown below:

1- Unauthorized removal of preventive guards.
2- Smoking in Unauthorized areas.
3- Having alcohol or illegal drugs.
4- Being under the influence of drugs or alcohol during the work.
5- Entry into Unauthorized areas.
6- Deliberate damage to company properties or client or others.
7- Deliberate damage to safety equipment.
8- Fighting during the work.

Any of workers or sub-contractors breaks any of the company Fundamental safety rules will be affected to punishment.

المبادئ الرئيسية للأمن والسلامة فى شركة داركو للانشاءات:
شركة داركو للانشاءات شركة رائدة فى مجال الانشاءات ومهتمها هى أن تصل الى مستوى اداء عالى فى مجال الانشاءات بطريقة آمنة و فعالة مع الحفاظ على البيئة والشركة تسعى لتحقيق ذلك عن طريق المحافظة على صحة وسلامة العاملين بالمواقع والمجتمع المحلى وتلبية متطلبات العملاء.
والشركة تراعى مبادئ الأمن والسلامة ونتوقع ذلك من جميع العاملين والمقاولين الالتزام بمبادئ الأمن والسلامة وهى كالتالي:

1- ازالة العوازل أو الحواجز بدون تصريح.
2- التدخين فى الأماكن المحظورة للتدخين.
3- وجود كحوليات او مخدرات بحوزة العاملين.
4- العمل تحت تأثير المخدرات أو الكحوليات اثناء العمل.
5- دخول المناطق الغير مصرح بدخولها.
6- التخريب المتعمد لممتلكات الشركة أو العميل أو الغير.
7- العبث بأجهزة الأمان أو المعدات.
8- الشجار والعراك اثناء العمل.

وعلى كل من يخالف ذلك من العاملين أو المقاولين فانه يعرض نفسه للمساءلة.

Safety Responsiblty

SAFETY RESPONSIBILITIES		
NAME	**JOB TITLE**	**SAFETY RESPONSIBILITIES**
	Site manager	Responsible for overall site Safety/Security and Compliance with safety policy, including compliance of sub-Contractors and material suppliers. He is also responsible for supplying proper equipments and sufficient personal protection tools to carry out the jobs. He is responsible for dealing with those who break safety and health instructions in the site.
	Site manager or Safety manager	Monitoring the Implementation and operation of the safety plan. Reporting of all Accidents and dangerous Occurrences, and Advising on Corrective Action to prevent recurrences.
	Engineers & Formen	Ensure All Employees are Made Aware of HAZARDS associated with tasks assigned to them. Ensure that the correct equipment is avaliable and in safe condition with necessary guards and to ensure safe working environment. Ensure that the workers abide by all the site safety rules & regulations. Prevent employees from taking unnecessary risks.

SAFETY RESPONSIBILITIES		
NAME	**JOB TITLE**	**SAFETY RESPONSIBILITIES**
	Storekeeper	Ensure that material coming to site is correct, stores securely and free of damage. Ensure that the stores layout provided meets the needs of the project. Monitoring receipt of materials especially potentially dangerous ones. Ensure that all personal safety equipment stocked/ isuued is within the safe working life period. Ensure that the power tools and equipment are in good condition when issued to site and when issued to workers before and after doing the job.
	Site Security	Ensure that all labours are equipped with head and foot protection. Prevent access to any persons not authorised. Ensure that all steel and wooden scrap are removed of site regularly.

Safety Surveillance

During periods of active work, project safety team and subcontractors' safety representatives must perform daily inspections of the operations, materials, and equipment on their project; identify hazards; and take corrective actions to eliminate them which will be documented in the form of " ***Corrective Action Report*** ".

If immediate corrective action is not possible, they must notify affected workers, post warning signs, and take interim control measures.
All inspections, findings, and corrective measures must be documented in the "***safety daily report*** " and be available for review at any time.

Procedures of formal surveillance will be as shown in the following SAFETY SURVEILLANCE SCHEDULE which covers the items, Activities, Responsibilities, How and when will be done.

SAFETY SURVEILLANCE SCHEDULE

Items	Activity	Responsibility	How	When
1)Management commitment	1.1 Safety ploicy will be displayed in all appropriate places	Safety manager	Display policy with a frame at site offices and locations.	Commencement date of the project.
	1.2 progress/safety meeting will address the safety as a separate point in the meeting agenda.	Project manager or safety manager.	Minutes of meeting.	According to the progress meeting schedule.
2) safety training	2.1 site induction	Site safety manager/officer	Site induction records.	Upon arrival of new workers to site.
	2.2 on the job training.	Site safety manager/officer	Training records.	On going process.
3) Site safety meetings	3.1 project safety meeting	Project manager/ construction manager or safety manager.	Minutes of meeting.	Every two weeks or monthly.
	3.2 client safety meeting.	Client representative	Minutes of meeting.	According to meetings schedule.
4) Site safety inspections	4.1 Site inspections.	Site Safety manager/ safety Officer.	Inspection report	As required (prefered daily).
	4.2 Hazaardous/ citical activities.	Sub-contractor safety manager.	Risk Assessment.	As required.
5) Accidents reporting & investigations.	5.1 all accidents investigated. The causes will be indicated in written report.	Site Safety manager/ Safety Officer.	Darko Standard Format	Upon Occurance.
6) Personal Protective Equipment (PPE).	6.1 No one will be allowed to work in site without correct (PPE).	Construction manager/ Site manager/ Engineers/ Formen/ Security.	Visual	Daily
	6.2 Special activities, suitable (PPE) will be provided.	Project manager/ Store man	Acc. To sub-contractor recommendations.	As required.

Items	Activity	Responsibility	How	When
7) Road Safety	7.1 control traffic when vehicles off-loading.	Safety officer/ Security	Safety watchers, signs and warning& danger tapes.	When required.
8) Environment and waste disposal.	8.1 Waste and harmful substances will be disposed to local disposals areas.	Construction manager/ Site manager.	Transport vehicles.	When required.
9) health and wefare	9.1 First Aid treatment	First Aider.		When an accident Occures.
10) Fire Protection & Fire Fighting.	10.1 Fire Fighting Equipment will be provided at the site and offices.	Project manager		Duration of the project.
	10.2 Locations of fire fighting equipments.	Safety manager.	Well displayed locations and signs.	Duration of the project.

CONTACT DATA TABLE

TITLE	NAME	HOME PHONE	CELL PHONE
PROJECT MANAGER			
SITE MANAGER			
SAFETY OFFICER			
CIVIL DEFENCE			
LOCAL POLICE STATION			
AMBULANCE			

Protection of public

Perimeter fencing:

DARKO will provide protection for the general public by erecting the suitable perimeter fence

Scaffold fence/ brick guards:

The establishment, changing and disassembly of the scaffoldings should be done by highly qualified personnel.
The used scaffoldings are metal made and used in building contruction and paint application.
Safety belts should be used when working higher than 2 m height.
Workers will be safely attached to suitable places all the time.
DARKO will provide all scaffolds with suitable fence and brick guards for shafts or slabs.
DARKO will provide a special training for new workers for working on scaffoldings.

Holes /edges and Openings

The safety team will be responsible for filling the holes with sand or covers avoiding fall.
All the openings, high roofs and edges must be surrounded by a protection guards.
All the opening of the open wells should be closed during working time in all floors
The edges of the top floors should be surrounded by a temporary wooden fence until wood logs are installed, alarming ribbons should be put to draw people's attention to the danger of falling.

Adequate signs:

All safety signs will be provided in the suitable locations.

Housekeeping

Site manager, Formen and Supervisors are responsible for housekeeping and site tidiness in their respective work areas.

DARKO will keep the site clear of waste materials.

DARKO will back charge sub-contractors for the removal of their offensive waste when failed to comply.

All laydown areas will be managed to ensure no hazards arise from poor housekeeping.

The site manager will be responsible to ensure a safe working site for all peronnel and sub-contractors also is responsible for environment protection.

Site Progress/Safety meetings

The project manager will attend a Safety monthly meeting with safety team to dicuss the Site progress during the last month.

The safety advisor may attend weekly meetings with site safety engineers and safety supervisors.

This meetings will be documented in safety minutes of meetings.

Sub-contractors and Suppliers

Information for sub-contractors:

The sub-Contractors and their representatives should know the following information; also should have a copy of the related documents and used forms:

Client Health and Safety requirements and policy.

Lotus Health and safety policy.

Name and contact data of the project manager.

Names and contact data of Site Safety Team (Safety adviser, Site Safety engineer, Site Safety Supervisors).

External Contacts (Emergency sevices, Statutory Authorities, Local Authority….)

Emergency sevices:

- Fire
- Police
- Ambulance

Statutory Authorities:

- Electricity
- Gas
- Water
- Telephone

Information from sub-contractors:

Sub-contractor Health and Safety policy.

Sub-contractor General Risk Assessment.

Name and contact data of sub-contractor executive responsible for safety.

Names and contact data of sub-contractor Site Safety Team (Safety adviser, Site Safety engineer, Site Safety Supervisors).

List of all activities for which sub-contractor is to submit Risk Assessments and or Method statements.

Accidents/Diseases/Dangerous Occurrences

All injuries will be recorded in the **SITE ACCIDENT BOOK** in addition to statutory reporting.

All notifiable injuries, diseases and dangerous occurrences will be reported immediately to the project manager to take the suitable action; also notification of the first aid accidents within 24 hours.

(*See Emergency procedure for accidents section).*

Fire Precautions/Evacuations

Spacing/construction of temporary accommodation/ stores:

Darko will ensure that they comply with the relevant statutory regulations for the spacing/ construction of temporary acommodation and stores.

Fire fighting equipments:

Darko will provide fire engough number of equipments for their offices, accommodation and work areas.

Fire alarm and emergency evacuation arrangements:

Darko will provide engough number fire alarm and emergency evacuation arrangements on site and training for all personal.

(*See Emergency procedure for Fire section).*

Welfare/First Aid Facilities

Darko will provide and maintain the following :

- shelter/accommodation
- washing facilities
- sanitary conveniences.

Darko will provide adequate and sufficient first aid facilities and equipment; First aid kits will be provided in all work areas.

SAFETY PROCEDURES & GUIDELINES

This Document Explains The Safety Procedures For Various Activities.
This Is To Be Used As The Base Document For Implementation To Promote A Safe Working Environment in this project. The Procedures Contained Herein Also Fully Applies To the Sub-Contractors And The Suppliers.

On Specific High Risk Tasks Where Additional Items Of Safety Are Required, The Responsible Sub-Contractor Will Submit A Risk Assessment To The Safety Manager For Approval.

It Is The Responsibility Of The Project manager/ Consstruction manager/ Safety Manager And All Senior Staff To Ensure That All Staff And workers Working At The Project Are Aware Of The Safety Procedures And Guidelines Given In This Document Before Carrying Out Any Activity At Site.

They Will Monitor The Effective Implementation Of The Safety Procedures And Guidelines. Any Deviation From These Procedures Is A Risk And Hence Must Be Discussed With The Project manager/ Construction Manager / Safety Manager To Arrive to an Alternative Solution So The Job Can Be Performed Safely.

PERSONAL PROTECTIVE EQUIPMENT(PPE) PROCEDURE

This Procedure Has Been Developed To Ensure That All Site Personnel Are Provided With, And Utilize Appropriate Personal Protective Equipment (PPE) To Protect Themselves Against Work Related Hazards Which May affect Their Health And Safety.

DARKO company working rules oblige staff to use the safety equipment made available to them.
This includes:

- Hear protection gear
- Ear protection gear
- Eye protection gear
- Face protection gear
- Work clothing /Insulated
- Breathing protection gear *I* Dust, gasses, fumes
- Hand protection gear
- Skin protection gear
- Foot protection gear
- Safety harness

The Site manager/Safety Manager Will Be Responsible For:

- Ensuring That Contractual Requirements Identify The(PPE) Policy Within The Safety Plan.
- Advising On The (PPE) Requirements When Site Conditions Change.
- Ensuring That All Personnel On the Site Are Fully Aware Of This Procedure And The (PPE) Policy.

Supervisors Shall Be Responsible For Ensuring The workers in The Project Are Trained enough to Use all the (PPE) Required For The Particular Task. Personnel Not Properly Equipped For Whatever Reason Shall Not Start Or Continue Work.

All Personnel Shall Wear The Appropriate (PPE) Supplied To Them At All Times While Working At Their Assigned Tasks. Supervisors Shall Apply Disciplinary Action In Accordance With The Projects Procedures To Any worker Who Fails To Comply.

Note:

The minimum (PPE) to be used in site is :

- Hard helmet.
- Safety footwear.

The wearing of these two items is mandator

ENVIRONMENTAL PROTECTION PROCEDURES

The following procedures will be followed for protection of the environment:

- Rubbish arising from the the site will be collected and transported from site periodicaly.
- Flammable and hazardous sustances will be stored as per manufacturer's instructions.
- Hazardous substances will be removed frome site.
- Dust will be controlled by water spray.
- Waste and sewage-water will be disposed through the existing sewage system.
- Smoking will be allowed in site during the work.
- Fire precautions will be carried for danger works.

EMERGENCY PROCEDURES

(ACCIDENTS)

In case of accidents, the following action will be taken by site manager:

- Warning others who might be subject to danger immediately.
- Nursing the injured after estimating the situation and securing the area.
- Call for the first aider to attend to the injured.
- If required the site manager call for the ambulance.
- Inform the project manager.
- Inform the client's representative if required.
- Write the suitable report.

EMERGENCY PROCEDURES

(FIRES)

In case of fire, the following action to be taken by site manager:

- Sound the alarm at entrances or otherwise inform pepole by shouting " Fire! Fire".
- With the minimum of personal risk, attack the fire with the fire extinguishers / water.
- Getting away any flamable materials to a safe area.

In the case the fire can't be extinguished or controlled, contact emergency services.

- The site manager should Instruct the workers as follows:
  a) Move away from the area of danger to a safe area near the exit.
  b) Do not use any lift/ hoist.
  c) Do not panic or rush.
  d) Report the site manager at once about your save arrival and your location.
  e) Do not put yourself at risk.
  f) Stay calm and quiet , await for further instructions.

HAND TOOLS & POWER TOOLS PROCEDURES

General:

- Hand And Power Tools Shall Be Adequate And Suitable For The Work To Be Done.
- They Shall Be Properly Inspected And Maintained So That They Are Safe To Use.
- Only Men Who Have Been Instructed In Their Use And Have The Ability To Use them Safely Shall Use Hand And Power Tools.
- Power Tools Which Have Exposed Rotation Parts Shall Be Switched Off And Held Until They Have Stopped Revolving Before reusing.
- All Moving Parts Of Power Tools, Except Those Parts which Must Remain Exposed For The Efficient Operation Of The Tool Shall Be Securely Guarded.
- All Tools Shall Be Disconnected From Power Supply (Air Or Electricity) Before Changing Bits, Saw Blades, Grinding Wheels Etc.
- Each Generator Shall Be Earth Grounded To Prevent Accidental Shock Hazard.

Electric Tools:

- Electric Hand Tools Shall Be Double Insulated.
- All Connections Shall Be Properly Insulated.
- Material To Be Drilled Shall Be Firmly Secured inorder Not Spin As The Drill Bites.
- Spring Loaded Guards And Trigger Switches Of Hand Power Saws Shall Be Maintained In Good Working Order.

ELECTRICAL CUTTING TOOLS PROCEDURES

GRINDERS:

1. Before using The Grinder From The Store Please Check:

- Check the Grinder Is In Good Condition And No Electrical Switches Are Broken.
- Check That The Electrical Cable In Equipped With Proper Plugs.
- Check That The Machine Is Equipped With A Properly Fitting Guard.
- The Grinding/Cutting Wheel Is Suitable and Correct For The Job.

2. Never Use The Grinder Without The Guard.

- Use The Proper Tools To Remove The Wheel Fasteners. Do Not Remove Them By Hammering It.
- Always Isolate The Power By Removing The Plug Before Changing The Disc Or Doing Maintenance To The Tool.
- End Nuts Should Hold The Wheel Firmly But Not Too Tightly. Remember That Incorrectly Mounting A Wheel Is the Cause Of Wheel Breakage.
- Make Sure That The Work Piece Is Properly Secured And The Working Area Is Clear Of Objects And Flammable Materials.
- Do Not Keep The Machine In Areas Where People Have To Move Around. Remove The Plug From Electrical Source And Keep It In A Safe Place When Not In Use.
- Make Sure That "Grinding Spark" Is Controlled By Placing Protective Screens Nearby Or With Fire Blankets And Any Flammable Materials Like Gas Cylinders, Paints, Thinner, Cotton Waste Etc Should Be Removed from The Working Area.
- In Case Of Electrical Problems Or Repairs, Call Electrician To Repair It. **(Do Not Attempt To Fix It Yourself).**
- Make sure that the correct (PPE) is used.

CONCRETE CONSTRUCTION & MASONRY WORK

General:

All Equipment And Materials Used In Concrete Construction And Masonry Work Shall Meet The Applicable Requirements For Design, Constructions, Inspection, Testing Etc.

All Employees Involved In Pouring / Vibrating Concrete Shall Wear The Correct PPE. Especially Safety Glasses And Safety Belts If working At Heights.

Concrete Placement:

All Formwork Scaffolds Supporting Decks Shall Be Correctly Braced And Inspected Before Concrete is Poured.

Personnel Not Engaged In The Pour Operation Shall Stay Clear Of The Pour Area.

No workers shall be permitted to work under surfaces during puring Concrete or after puring to a limited period determind by the safety engineer.

Forms And Shoring:

Formwork And Shoring Shall Be Designed, Erected, Supported, Braced And Maintained So That It Will Safely Support All Vertical And Lateral Loads That May Be Imposed Upon It During Placement Of Concrete.

Metal Frame Shoring:

All Locking Devices On Metal Frames And Braces Shall Be In Good Working Order; Coupling Pins Shall Align The Frame Or Panel Legs; Pivoted Cross Braces Shall Have Their Center Pivot In Place.

Devices For Attaching The External Lateral Stability Bracing Shall Be Securely Fastened To The Legs Of The Shoring Frames.

All Base Plates, Shore Heads, Extension Devices Or Adjustment Screws Shall Be In Firm Contact With The Footing Sill And Form Materials.

Masonry Construction:

All Masonry Walls More Than 2Am High Shall Be Adequately Braced To Prevent Collapse Unless The Wall Is Adequately Supported So That It Will Not Overturn Or Collapse. The Bracing Will Remain In Place Until Permanent Supporting Elements Of The Structure Are In Place.

SCAFFOLDS

ERECTION, ALTERING AND DISMANTLING OF SCAFFOLDS:

Scaffolds Shall Be Erected, Altered And Dismantled By Workmen Deemed Competent To Carry Out Such Activities.

Whenever Possible, Competent Workmen Erecting The Scaffold Will Work From The Minimum Of Two Boards. Safety Belts Will Be Worn And Secured To A Suitable Anchorage Point At All Times when working.

Ladders Will Be Secured Throughout The Vertical Height Of A Scaffold As It Progresses. Workmen, Erecting The Scaffold Will Use The Ladders To Gain Access To The Working Level.

Tubes Or Boards Being Used In The Construction Of The Scaffold Will Be Stored Flat In A Neat And Tidy Manner. They Will Not Be Stacked Vertically Against any Scaffold.

Loose Tubes Or Boards Will Not Be Left On Scaffolding After Its Completion.

Where A Scaffold Is Left In An Incomplete State, A Sign Will Be Secured To The Lower Lift Stating “Unsafe Scaffold Do Not Use”.

Where One Section Of A Working Platform Is Incomplete, Access May Be Gained To The Completed Section Provided That A Stop End, Preventing Entry, Is Placed Over The Working Platform At Guard-Rail Height. A Sign Stating “Unsafe Scaffold Do Not Use” Will Be Secured To The Stop End.

This Notice Will Be In The Appropriate Languages.

When Dismantling Scaffold, The Lowering Of Material Will Be Done Manually. Scaffold Material Must Not Be Thrown.

Inspection:

All Scaffolds Will Be Inspected Prior To Use And Periodically Thereafter.

Scaffold Users:

Scaffolds Will Be Used For The Purpose To Which They Have Been Erected. Under No Circumstances Will They Be Overloaded.

Scaffold Users Will Under No Circumstances Interfere With, Modify Or Remove Any Part Of the Scaffold (This Includes Scaffold Boards).

Scaffolds Requiring Modification Will Be Altered By The Appointed Scaffolders On The Instruction Of The Scaffold Supervisor.

If For Any Reason A User Considers A Scaffold To Be Unsafe, He Will Immediately Contact His Supervisor. The Supervisor Will Immediately Tag The Scaffold Unsafe And Will Then Notify The Scaffolding Supervisor.

LIFTING OPERATIONS

Genral:

This Procedure Is To Outline The Basic Requirements For Managing And Controlling Of Lifting Operations During Construction. And Applies To All Operations Involving The Use Of Cranes And Other Equipment Used For Lifting Materials.

The General Requirements For This Procedure Shall Apply To All Operations.

The site Manager/safety manager Will Be Responsible For The Following:

- Ensuring That Lotus Supervision And Subcontractors Are Familiar With This Procedure.
- That Any Lifting Activities/Operations Carried Out Is Covered By This Procedure.
- Ensure That The Lifting Equipment Is Correct For The Task.
- Regular Inspection And Maintenance Of Lifting Equipment And Recorded.
- The Arrangements For The Safe And Efficient Management Of the lifting Operations Set Out In This Procedure must be adhered To In Respect Of All lifting equipments Brought To Site.
- The Supervisor Will Be Responsible For The Following:
  - Supervision Of Any Direct Contractor, Sub-Contractor Carrying Out Lifting Operations.
  - Ensuring That Work Method Statements And Risk Assessments When Required Are Done.
  - Liaison With Sub-Contractor Management To Inform Them Of Any Lifting Operations Which May Effect Working Activities.
  - Ensuring Web Slings, Chain Slings And Other Rigging Equipment Are Of An Approved Type, In Good Condition And Correct For The Job.
  - Shall Review The Arrangements Put In Place By The Direct Contractor, Subcontractors And Satisfy Himself That Plant And Equipment Used On Site, Is To The Right Specification.

WELDING AND CUTTING SAFETY PROCEDURES

General:

Welding Process is the most common method for joining metals, the hazards of welding include but not limited to the following:

- Phiscal Impact (burns, eye injuries….).
- Harmful dust.
- Fumes.
- Heat.
- Visible Light and sparks.
- Invisible Ultravilote and infrared radiation.
- Electrical shock even though using low voltage.
- Fire and explosions.

The proper (PPE) can protect the welder and his helpers from these hazards, it includes but not limited to the following:

- Dry leather gloves.
- Rubber-soled shoes.
- Insulating layer such as dry board or a rubber mat.
- Welding helemt.
- Safety glasses.
- Hand shield with filter plate and cover for eye protection.
- Hearing protection.

Fire preventation and protection:

The arc welder is capable of producing heat and sparks in the work area,so the welding flame can cause fire or explosions, therfore it is important that the workplace be made safe by the following:

- Check The floor to be concrete or another fire resistant material.
- Keep Combustible floors wet, covered with damp sand or protected by fire-resistant shields. In this case Personnel operating arc welding or cutting equipment shall be protected from possible shock.
- Remove any flamable materials, trash, wood, paper, textiles, plastics, chemicals liquids and gases from the workplace.
- Use guards to protect immovable fire hazards if you cannot remove it.
- Do not performe welding/cutting on used drums, barrels, tanks or other containers untill they have been cleaned.
- Provide the workplace with fire extinguishers, water, hose and sand buckets.
- Fire watchers are required in workplace to prevent mior fire may develop and still watching for at least half hour after completion of welding/cutting operations.
- Train the fire watcher for using extinguishing equipment, sounding the fire alarm or shouting.
- Do not performe welding/cutting in cofined spaces without taking the suitable precautions.

SAFE OPERATION OF THE WELDER:

- It is important that anyone operating an arc welder be instructed on its safe use by a qualified person or welder.
- Because of their Potentially explosive nature, we strongly recommend that no welding, cutting, or hot work be attempted on used drums, barrels, tanks, or other containers under any circumstances.
- The welder cables should be positioned so that sparks and molten metal will not fall on them. They should also kept free of grease and oil and located where they will not be driven over.
- Only use cables that are free from repair or splices for3m from the electrode holder.
- Electric welders can kill by electric shock. If the welding operation must be done on steel or other conductive material an insulating mat must be used under the operator. If the welding area is wet or damp, then the welder should wear rubber gloves under the welding gloves.
- It is easier and safer to establish an arc on a clean surface than a dirty or rusty one. Therefore, metal should always be cleaned by wire brushing or other method prior to welding. When wire brushing the finished bead, the operator should always be sure to protect his eyes and body from flying slag and chips. Unused electrodes and electrode stubs should not be left on the floor as they create a slipping hazard.
- Hot metal should be handled with metal tongs. When quenching hot metal in water it should be done carefully to prevent painful burns from the escaping steam.
- Any metal left to cool should be carefully marked "HOT".
- When welding is finished for the day or suspended for any length of time electrodes should be removed from the holder.
- The holder should be placed where no accidental contact could occur, and the welder should be disconnected from the power source.

SAFETY PRECAUTIONS FOR ENGINE POWERED WELDERS:

- Always operate in an open well-ventilated area or vent the engine exhaust directly outdoors.
- Never fuel the engine while running or in the presence of an open flame.
- Wipe up spilled fuel immediately and wait for fumes to disperse before starting the engine. "Never" remove the radiator pressure cap from liquid cooled engines while they are hot to prevent injury yourself.
- Stop the engine before performing any maintenance or trouble shooting. The ignition system should be disabled to prevent accidental start of the engine.
- Keep all guards and shields in place.
- Keep hands, hair, and clothing away form moving parts.

FIRST AID:

The welding area in the site will always be equipped with a fIre blanket and a well stocked fIrst aid kit. The construction manager / site manager or safety manager is responsible of training one person at least to perform first aid to treat the minor injuries that may occur. All injuries, no matter how minor they may seem can become more serious if not properly treated by trained medical personnel.

ELECTRICAL WORKS SAFETY PROCEDURES

General:

Electricty is the most important part in our lives at home amd in work place, so we should take its power safely and granted.

A big ratio of work-related death in construction field resulted from electrocusion. Electrical accidents in workplaces can be avoided if we use safe electrical equipment and work practices.

To handle electricty safely including working with equipment, we need to now how the hazards presents and how those hazards can be controlled.

Basically, there are two kinds of electricty:

a) Static Electricity.
b) Dynamic Electricity.

Hazards of Electricity:

The primary hazards of electricty and its use are :

- Shock.
- Burns.
- Arc-Blast.
- Fires and Explosions.
- Falls.

Causes of Electrical Accidents:

Electricty can create conditions resulting in bodily harm, property damage, or both. It is important to you to understand how to avoid electrical hazards when you work with electrical power tools, maintain electrical equipment, or install equipment for electrical operation.

Accidents and injuries in working with electricty are caused by one or a combination of the following factors:

a) Unsafe equipment and/or installation.

b) Unsafe workplaces caused by environmental factors.

c) Unsafe work practices.

Preventing Electrical Accidents:

Protection of electrical hazards is one way to prevent accidents caused by electric current. Protective methods to control electrical hazards include:

- Insulation.
- Electrical protective devices.
- Guarding.
- Grounding.
- Personal Protective Equipment (PPE).
- Good work practices.

General Rules and Requirments For Using Electrical Equipments:

- Wear proper personal protective equipment (PPE).
- Provide adequate lighting fixtures for the safety of electrical workers when using electrical equiments above them with enough head room clearance (1m).
- Follow the instructions included on the listed or labeled equiment.
- Provide electrical equiments with durable marking showing voltage, current, wattage, or other ratings if it is not listed or labled.
- Enclose or separate electric equipments that produce arcs, sparks, flame from combustible materials.
- Be sure your electrical equipment is maintained properly. Regularly inspect tools, cords, grounds, and accessories. Be sure you use safely switches. Like three-prong plugs, double-insulated tools, and safety switches. Be sure machine guards are in place and that you always follow proper procedures.
- Make repairs only if you are authorized to do so or arrange to have equipment repaired or replaced immediately.
- Keep all connections such as breakers, fuses, or switches mounted on a accessible wall or insulated surface other than the back of the equiment, maintain a minimum space of (90cm) between the equiment and the surface free of storage of materials.

- Keep electric cables and cords clean and free fron injuries. Never carry equipment by its cords.
- Use extension cords only when flexibility is necessary:

a) Never use them as substitutes for fixed wiring.

b) Never run them though holes in walls, ceilings, floors, doorways, or windows to avoide cords injury.

c) Never use them where the are concealed behind walls, ceilings, or floors without test them.

- Don't touch water, damp surfaces, ungrounded metal, or any bare wires if you are not protected. Wear good rubber gloves when working with live wires or ungrounded surfaces, and wear rubber-soled shoes when working on damp or wet surfaces.
- Don't wear metal objects (rings, watches, etc.) WHEN working with electricity. They might cause arcing.
- Keep a good space in front of electrical equiment to avoid body contact.
- Keep a distance of 10 feets (3.5m) from power lines of 50 kilo-volts.