

TAKREER	RUWAIS REFINERY EXPANSION PROJECT EPC-4 TANKAGE AND ASSOCIATED INTERCONNECTING PIPING AGREEMENT No. 09-5578-E-4	DAEWOO E&C	
PROJECT No. 5578	Doc. No. 5578-E4-HSE-HU-00006	Rev. 0	Page 1 / 34

HEALTH, SAFETY & ENVIRONMENT PROCEDURE

SITE ESTABLISHMENT & PREPARATION

AGREEMENT NO. : 09-5578-E-4

PROJECT NAME : Ruwais Refinery Expansion Project
EPC-4: Tankage & Associated
Interconnecting Piping

COMPANY : Abu Dhabi Oil Refining Company (TAKREER)

PMC : Mott MacDonald Ltd.

CONTRACTOR : Daewoo Engineering & Construction Co., Ltd.

TAKREER	RUWAIS REFINERY EXPANSION PROJECT	DAEWOO E&C	
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	AGREEMENT No. 09-5578-E-4		
PROJECT No. 5578	Doc. No. 5578-E4-HSE-HU-00006	Rev. 0	Page 2 / 34

This page is a record of all revisions of this document. All previous issues are hereby superseded and are to be destroyed.

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NOTES:

- (a) Revisions are denoted by a vertical line placed in the right-hand margin against the revised text.
- (b) PREP = Prepared by, CHKD = Checked by, REVD = Reviewed by, APP'D = Approved by.
- (c) In case of conflict between any requirements stipulated in this document with the contractual requirements, the contractual requirements shall prevail.

TAKREER	RUWAIS REFINERY EXPANSION PROJECT	DAEWOO E&C	
	EPC-4 TANKAGE AND ASSOCIATED INTERCONNECTING PIPING		
	AGREEMENT No. 09-5578-E-4		
PROJECT No. 5578	Doc. No. 5578-E4-HSE-HU-00006	Rev. 0	Page 3 / 34

REVISION INDEX DETAILS

Rev	Location of Change	Brief Description of Change
0	4.2	Added "To monitor and assess the competence of staff and supervision & address any shortfalls"
0	4.3	Changed "occurrence" to "re-occurrence"
0	7.3	Added "Use ground guides for vehicle movements"
0	Appendix 4	Made a note that emergency numbers will be consolidated into a one call number ASAP.

TAKREER	RUWAIS REFINERY EXPANSION PROJECT	DAEWOO E&C	
	EPC-4 TANKAGE AND ASSOCIATED INTERCONNECTING PIPING	AGREEMENT No. 09-5578-E-4	
PROJECT No. 5578	Doc. No. 5578-E4-HSE-HU-00006	Rev. 0	Page 4 / 34

TABLE OF CONTENTS

1.	INTRODUCTION.....	6
	1.1 Project Overview	6
	1.2 Objectives	6
	1.3 Targets	6
	1.4 Regulatory requirements	6
2.	DEFINITIONS.....	7
3.	ORGANIZATION & RESPONSIBILITIES	9
	3.1 Project Manager	9
	3.2 Construction Manager	9
	3.3 Construction Engineer	9
	3.4 HSES Manager	9
	3.5 Safety Supervisor	10
	3.6 QA/QC Manager	10
	3.7 Material Manager	10
	3.8 Heavy Equipment Manager	10
	3.9 Administration Manager	10
4.	HSE POLICY.....	11
5.	HEALTH PLAN	12
	5.1 First Aid	12
	5.2 Medical Facility	12
	5.3 Sanitation	12
	5.4 Weather Monitoring	13
6.	SAFETY PLAN	13
	6.1 Responsibilities	14
	6.2 Training	15
	6.3 Communication	15
	6.4 Inspections	16
	6.5 Incident reporting and investigations	16

TAKREER	RUWAIS REFINERY EXPANSION PROJECT	DAEWOO E&C	
	EPC-4 TANKAGE AND ASSOCIATED INTERCONNECTING PIPING		
	AGREEMENT No. 09-5578-E-4		
PROJECT No. 5578	Doc. No. 5578-E4-HSE-HU-00006	Rev. 0	Page 5 / 34

6.6	Emergency Response	16
6.7	PPE	17
6.8	Fire Protection	17
6.9	Barricades & signs	17
6.10	Safety impediments and violations	18
6.11	Subcontractors	18
6.12	Excavation, trenching and shoring	18
6.13	Lifting and rigging	18
6.14	Permit to Work	19
6.15	Job Safety Analysis	19
6.16	Observation cards	19
7.	EQUIPMENT AND DRIVERS	20
7.1	Introduction	20
7.2	Driver protection	20
7.3	Safe driving practices	20
8.	TRAFFIC MANAGEMENT	22
8.1	Introduction	22
8.2	Roles and Responsibilities	22
8.3	Road temporary signage and traffic controls	22
9.	ENVIRONMENTAL PLAN	24
9.1	Waste Management	24
9.2	Housekeeping	24
10.	APPENDIX.....	25
10.1	Site establishment and preparation key team	25
10.2	Daewoo HSE Policy	26
10.3	Tool-box talk forms	27
10.4	Emergency Contacts	28
10.5	JSA format	29
10.6	Observation cards	30
10.7	Location Maps	32

TAKREER	RUWAIS REFINERY EXPANSION PROJECT	DAEWOO E&C	
	EPC-4 TANKAGE AND ASSOCIATED INTERCONNECTING PIPING		
	AGREEMENT No. 09-5578-E-4		
PROJECT No. 5578	Doc. No. 5578-E4-HSE-HU-00006	Rev. 0	Page 6 / 34

1. INTRODUCTION

Daewoo Engineering & Construction Ltd., Co. is committed in the implementation of health, safety and environment program in the project to help prevent any human distress, financial loss and to execute the project safely.

This safety program is intended to promote a safe working environment by educating and training the workforce in regards to the philosophy of safety being as important as production.

This various safety aspects described in the following sections shall be strictly observed and any violation shall be viewed seriously.

The Company requires that, the employees at all levels shall support the HSE program. The Project Manager shall ensure the effective implementation of this project specific Health, Safety and Environment program to achieve the target of **Zero Accidents** in this project.

All Contractor personnel support this HSE procedure under the guidelines and prevailing Rules and Regulations of TAKREER. This HSE procedure for site establishment & preparation can be seen as an interim HSE Plan until the Project HSE Plan, with all required procedures are complete and implemented.

1.1 Project Overview

The Ruwais Refinery Expansion Project (Project) will be executed from December 2009 up to February 2014 (50 months to Provisional Acceptance). The Project is located in the Ruwais Complex in the UAE. The client is Takreer and the scope of Daewoo E&C is the engineering, procurement, construction and commissioning of 76 tanks and associated piping.

1.2 Objectives

To protect the health & well-being of personnel during work site activities and ensure that safety is a prime consideration in the project execution by establishing and maintaining an injury and incident free culture in the workplace. To avoid contaminating the environments and worksite with hazardous substances that may result from construction activities.

1.3 Target

DEC will target to achieve Zero Fatalities, Zero Lost Time Injuries and Major Environmental Incident Cases. In order to complete this project without a lost-time accident and ensure our targets, the HSE Management System as described in this document, will be applied.

1.4 Regulatory requirements

Daewoo Engineering & Construction Co., Ltd (“DEC” hereafter) shall comply with all applicable laws, Company rules, standards and HSE guidelines, and any other requirements specified by the Client during the performance of work. The laws, rules, guidelines and standards from the client should be provided to all lower tier subcontractors and DEC shall be responsible for ensuring such compliance by subcontractors and employees, except in case where such compliance would be contrary to Law.

TAKREER	RUWAIS REFINERY EXPANSION PROJECT	DAEWOO E&C	
	EPC-4 TANKAGE AND ASSOCIATED INTERCONNECTING PIPING		
	AGREEMENT No. 09-5578-E-4		
PROJECT No. 5578	Doc. No. 5578-E4-HSE-HU-00006	Rev. 0	Page 7 / 34

2. DEFINITIONS

Accident	<p>Within the ADNOC Group it has been agreed that the term accident is synonymous with incident.</p> <p>The term accident has connotations of bad luck in common speech. For this reason the term <i>incident</i> is preferred by ADNOC and TAKREER and should be taken to embrace the concept of <i>accident</i>. DEC will adopt this philosophy throughout the project.</p>
ALARP	As Low As Reasonably Practicable (ALARP). Refer to section 3.4 for explanation of ALARP.
Aspect	Element of an organisations activities products or services that can interact with the environment
Audit	<p>An independent, systematic and documented process of objectively obtaining and evaluating verifiable evidence to determine that business controls:</p> <ul style="list-style-type: none"> • Are complete and consistent. • Are (cost) effective and efficient. • Safeguard DEC's resources and promote their effective use. • Provide, and protect the integrity of, required records and information. <p>Allow for compliance with policies, chosen standards, laws and regulations.</p>
Barriers	Elimination and prevention measures that remove or reduce the likelihood of realising a hazards potential for harm. Barriers may be physical (materials, protective devices, segregation, etc.) or non-physical (procedures, inspection, training, drills, etc.)
Continuous improvement	Process of enhancing the (HSE) management system to achieve improvements in overall (HSE) performance in line with the organisations (HSE) policy.
DEC	Daewoo Engineering and Construction Company Limited
Effect	An adverse impact on people, the environment, DEC's assets or reputation.
Hazard	The <i>potential</i> to cause harm , including ill health and injury, damage to property, products or the environment; production losses or increased liabilities
HSE Management System (HSE MS).	The company structure, responsibilities, practices, procedures, processes and resources for implementing health, safety and environmental management.

TAKREER	RUWAIS REFINERY EXPANSION PROJECT	DAEWOO E&C	
	EPC-4 TANKAGE AND ASSOCIATED INTERCONNECTING PIPING		
	AGREEMENT No. 09-5578-E-4		
PROJECT No. 5578	Doc. No. 5578-E4-HSE-HU-00006	Rev. 0	Page 8 / 34

HSE Policy	A public statement of the intentions and principles of action of the company regarding its health, safety and environmental effects, giving rise to its strategic and detailed objectives.
Incident	An event or chain of events which has caused or could have caused fatality, injury, illness and/or damage (loss) to assets, the environment, company reputation or third parties.
Inspection	A scheduled, structured examination of a work site with a specific focus on physical conditions and working practices in addition to normal supervisory duties.
Impact	Any change to the environment whether adverse or beneficial, wholly or partially resulting from DEC's activities.
Near Miss	An event or chain of events which could have caused injury, illness and/or damage (loss) to assets, the environment, company reputation or third parties.
Risk	The product of the measure of the likelihood of an occurrence of an undesired event and the potential adverse effects that this event may have on people, the environment, TAKREER's assets or reputation.
SMART	Objectives and targets shall be SMART (S pecific, M easurable, A chievable, R ealistic and T ime based).
Top Event	The release of a hazard. The undesired event at the end of the fault tree and at the beginning of the event tree. The centre point in the Bow Tie Diagram.
Task Risk Assessment (TRA)	A process of formal identification, assessment and recording of the risks involved in any particular operation so that appropriate controls can be introduced. TRA is synonymous with job safety analysis (JSA).
Threats	A possible cause that will potentially release a hazard and produce an incident. Examples include damage caused by thermal (high temperature), chemical (corrosion), biological (bacteria), radiation (ultraviolet), kinetic (fatigue), climatic condition (poor visibility), uncertainty (unknowns) or human factors (competence).

TAKREER	RUWAIS REFINERY EXPANSION PROJECT	DAEWOO E&C	
	EPC-4 TANKAGE AND ASSOCIATED INTERCONNECTING PIPING	AGREEMENT No. 09-5578-E-4	
PROJECT No. 5578	Doc. No. 5578-E4-HSE-HU-00006	Rev. 0	Page 9 / 34

3. ORGANIZATION & RESPONSIBILITY

All members of the Project Team are required to be fully aware of relevant HSE issues when carrying out the work of its respective discipline and/or team. The following key member's roles and responsibilities are highlighted during the initial site establishment and preparation period.

3.1 Project Manager

He is ultimately responsible for the HSE procedure for site preparation and establishment (hereafter, PLAN) and for ensuring that such activities are carried out as planned. In this, he is assisted by the HSE Manager, to whom he delegates responsibility for performance of the work of the HSE aspects.

3.2 Construction Manager

- He reports to the Project Manager and will initially be based in Seoul, South Korea.
- Responsible overall for Construction activities, including coordination with different disciplines as may be required.
- Provision of functional support for the site Construction Engineer for the efficient execution of his duties.
- Act as the focal point for any and all construction related activities.

3.3 Construction Engineer

- Reports to the Construction Manager, and will be based on site in Ruwais.
- Responsible to ensure the work is executed safely, of high quality and in a timely manner
- Overall responsibility for coordination and execution of site activities
- Issuance of PTW and daily revalidation as may be required
- Ensure that all required PPE, tools and equipment is available for execution of the work
- Coordinate with relevant 3rd parties as may be required
- Daily progress reporting to Head Office team.

3.4 HSES Manager

- He is responsible for establishment and implementation of the PLAN and all site HSES activities. He reports directly to the Project Manager and will initially be based in Seoul, South Korea.
- The HSES Manager will ensure that;
 - a) There is a strong, visible leadership commitment to HSES through communication of expectations, training and setting SMART targets for all levels of leadership on the Project.
 - b) The DEC HSE policy is implemented, complied with and communicated at all levels of the Project.
 - c) Sufficient support and guidelines is provided to project management to ensure that a suitable and sufficient organization is in place.
 - d) There is a structured and consistent approach to risk evaluation and management of hazards and their potential consequences.
 - e) The HSES action plan is implemented and followed, as well as being involved in all aspects of planning and to provide HSES input and guidance.
 - f) The HSES performance on the project is recorded and tracked to ensure that any potential high risk trends are indentified and mitigated effectively.
 - g) The DEC three (3) tier approach to audits and reviews are established and fully implemented

TAKREER	RUWAIS REFINERY EXPANSION PROJECT	DAEWOO E&C	
	EPC-4 TANKAGE AND ASSOCIATED INTERCONNECTING PIPING		
	AGREEMENT No. 09-5578-E-4		
PROJECT No. 5578	Doc. No. 5578-E4-HSE-HU-00006	Rev. 0	Page 10 / 34

together with tracking and follow up of action items.

- h) The DEC management review is carried out as part of the HSES continual improvement process.

3.5 Safety Supervisor

- He will be based on site in Ruwais and report functionally to the HSES Manager, and hierarchically to the Construction Supervisor.
- Provide support to the Construction Supervisor for issuance and validation of PTW
- Revise Job Safety Analysis as may be required during execution of works
- Monitor all aspects of site HSES during establishment as defined in the PLAN.

3.6 QA/QC Manager

- Reports to the Project Manager, based in Head Office (Seoul, Korea) with site QA/QC supervisor reporting to him.
- Establish, implement and update the Project Quality Plan.
- Establish and implement the Integrated Management System (IMS).
- Draw up IMS Audit Program as to pursue the corrective- and preventive actions.
- Inform input data of the IMS implementation to the Management Review.
- Establish and implement the Performance Improvement Program.
- QA Review of project execution documents according to the Project IMS Document Hierarchy.

3.7 Material Manager

- Ensure that all required material is provided to the site establishment team
- Coordinate with Construction supervisor the delivery schedule of materials
- Support the site establishment team as may be required

3.8 Heavy Equipment Manager

- Ensure that heavy equipment is provided for the execution of the works
- Coordinate with Construction supervisor for supply of heavy equipment
- Support the site establishment team as may be required
- Obtain relevant registration, certification and CNIA passes to enable use of vehicles and equipment on site
- Coordinate with Administration department to obtain drivers- and operators licenses

3.9 Administration Manager

- He will be responsible for all site Administration functions, and report to the Head of Administration in Seoul, South Korea.
- Coordinate mobilization of staff to Abu Dhabi, Ruwais.
- Ensure that visa's is obtained in a timely manner, and all flights, accommodation and reception of new staff is done.
- Obtain CNIA access passes for new staff as well as application for Abu Dhabi residence permits.
- Support the Heavy Equipment manager to obtain licenses for drivers and operators.

(Reference: Appendix 1 – Site establishment & preparation key team)

TAKREER	RUWAIS REFINERY EXPANSION PROJECT	DAEWOO E&C	
	EPC-4 TANKAGE AND ASSOCIATED INTERCONNECTING PIPING	AGREEMENT No. 09-5578-E-4	
PROJECT No. 5578	Doc. No. 5578-E4-HSE-HU-00006	Rev. 0	Page 11 / 34

4. HEALTH, SAFETY & ENVIRONMENT POLICY

The Daewoo E&C (herein referred to as “DEC) is committed to protect Health, safety and Environment (HSE hereafter) throughout all stages of its projects. To create an (Incident Free Environment” for all employees, continual improvements and preventative measures will be implemented in compliance with this policy.

DEC shall comply with the existing laws and regulation on HSE. All HSE issues raised by interested parties shall be passed to senior management for thorough consideration.

DEC will establish a HSE Management System based on OSHAS 18001/1999 and ISO 14001.2004.

For all projects, DEC shall comply with the environmental impact studies, in addition to identifying potential health and safety hazards. Each project will be subject to a ‘Zero-Accident” campaign to help educate employees about avoiding injuries, illnesses and property damage at the workplace and about protecting the environment from contamination.

HSE performance targets shall be set and these targets shall be annually reviewed by DEC’s corporate HSE Committee for continual improvement.

The health, safety and environment policy shall be communicated to all employees with the intent that employees are made aware of their individual HSE obligations. Each employee of DEC, including higher management, will participate in the implementation of the HSE policy.

(Reference: Appendix 2 - Daewoo HSE Policy)

4.1 It is therefore, the Daewoo policy to do all that is reasonably practicable to protect everyone, including third parties, as appropriate, from foreseeable work and health hazards.

4.2 In particular, the Company has a responsibility:

- To provide and maintain safe and healthy working conditions taking into account any statutory requirements.
- To provide training and instructions to enable employees to perform their work safely and efficiently.
- To make available all necessary safety devices and protective equipment and to supervise their use.
- To maintain through management a constant and continuing interest in Health and Safety matters applicable to Company activities;
- To review continually their Policy relative to changes in legislation, working practices and environmental conditions.
- To monitor and assess the competence of staff and supervision & address any shortfalls

4.3 Employees have a duty to perform in this objective;

- by working safely and efficiently
- by using all protective equipment provided and by meeting statutory obligations

TAKREER	RUWAIS REFINERY EXPANSION PROJECT	DAEWOO E&C	
	EPC-4 TANKAGE AND ASSOCIATED INTERCONNECTING PIPING		
	AGREEMENT No. 09-5578-E-4		
PROJECT No. 5578	Doc. No. 5578-E4-HSE-HU-00006	Rev. 0	Page 12 / 34

- by reporting, through their supervisor, incidents that have led or may lead to injury or damage;
- by adhering to all Daewoo Policy and procedures, jointly agreed on their behalf, for securing a safe workplace;
- By assisting in the investigation of accidents with the objective of introducing measures to prevent re-occurrence.

4.4 The Project Manager shall nominate a DEC Safety Supervisor who shall be fully responsible for maintaining safe and healthy working conditions and for making the necessary arrangements within the framework of the Daewoo Policy during the site establishment and preparation period.

5. HEALTH PLAN

During site establishment and -preparation, health control measures will be implemented in consideration of first aid, medical facilities, sanitation and adverse weather conditions. The following table lists the requirements of these aspects of health management as well as the responsibility for these control measures;

5.1 First Aid	Responsibility
1) First aid boxes shall be placed in the DEC site office and where necessary	Safety Supervisor
2) All first aid cases shall be recorded in a first aid treatment log.	Safety Supervisor
5.2 Medical Facility	Responsibility
1) Any injured or sick person working inside the Ruwais Refinery Project site, requiring medical attention shall be referred to ADNOC Hospital;	Construction Engineer/ Safety Supervisor
- ADNOC Hospital, 24 hours, +971 (0) 26022340	
- Ambulance service, +971 (0) 26022340	
2) Any injured or sick person not working inside the RRE project, but working in the Ruwais area, i.e. camps, shall be referred to Ruwais Hospital;	Construction Engineer/ Safety Supervisor
- Ruwais Hospital, 24 hours, +971 (0) 28027714	
- Ambulance service, +971 (0) 28027714	
5.3 Sanitation	Responsibility
1) Adequate cool drinking (potable) water shall be made available	Material Manager/

TAKREER	RUWAIS REFINERY EXPANSION PROJECT	DAEWOO E&C	
	EPC-4 TANKAGE AND ASSOCIATED INTERCONNECTING PIPING		
	AGREEMENT No. 09-5578-E-4		
PROJECT No. 5578	Doc. No. 5578-E4-HSE-HU-00006	Rev. 0	Page 13 / 34

to site by installing water coolers, and providing thermal flask.

Construction Engineer

2) Adequate toilettes at a ratio of 1/ 25 workers shall be provided as required.

Welfare Manager/
Construction Engineer

3) Toilette blocks shall be cleaned and sanitized frequently.

Welfare Manager/
Construction Engineer

4) Sewage water shall be disposed of regularly, and toilette water maintained.

Welfare Manager/
Construction Engineer

5) Adequate and suitable places for taking shelter and eating during interruptions of work shall be provided.

Construction Engineer

6) The eating place shall be kept clean and orderly.

Welfare Manager/
Construction Engineer

5.4 Weather Monitoring

Responsibility

1) The heat index shall be monitored, and communicated to site. Adequate rest periods, and consumption of water shall be done.

Safety Supervisor/
Construction Engineer

2) Wind speeds shall be monitored and no lifting operation shall take place in winds exceeding 10m/s.

Safety Supervisor/
Construction Engineer

3) Adverse weather conditions such as fog, strong winds and sand storms shall be monitored and actions taken as required.

Safety Supervisor/
Construction Engineer

6. SAFETY PLAN

As part of the Safety requirements during site establishment and -preparation there are some specific safety responsibilities for some of the key site personnel. These are listed below under section 6.1.

During this period safety control measures will also be implemented until the final HSE plan is fully implemented. Consideration will be made for the following safety aspects;

- Training
- Communication
- Inspections
- Incident reporting and investigation
- Emergency response
- Personal Protective equipment
- Fire protection
- Barricades and signs

TAKREER	RUWAIS REFINERY EXPANSION PROJECT	DAEWOO E&C	
	EPC-4 TANKAGE AND ASSOCIATED INTERCONNECTING PIPING		
	AGREEMENT No. 09-5578-E-4		
PROJECT No. 5578	Doc. No. 5578-E4-HSE-HU-00006	Rev. 0	Page 14 / 34

- Safety violations and impediments
- Subcontractors
- Excavation, trenching and shoring
- Lifting and rigging
- Permit to work
- Job safety analysis
- Safety Observation Cards

The following table below responsibilities (section 6.2 to 6.16) lists the requirements of these aspects of safety management as well as the responsibility for these control measures;

6.1 Responsibilities

6.1.1 Project Manager

- Overall review of Safety Plan and ensuring the application of the correct safety procedures

6.1.2 Construction Engineer

- Set a personal example on site at all times
- Fully understand and implement the PLAN and other reference requirements/ standards
- Ensure that the safety requirements are taken into consideration in all stages of planning and execution of the work
- Create safety awareness by promoting safety meetings and by implementing Safety Training.
- Issue and revalidate PTW as required, as well as revision of JSA's.

6.1.3 Safety Supervisor

A full time Safety Supervisor shall be appointed;

- To administer the PLAN throughout the duration of site establishment and preparation
- Promote public and project safety through general safety orientations, general tool-box talks, job specific tool-box talks and safety meetings, of which records shall be kept at all times
- Monitor job site working conditions and safety practices
- Ensure that first aid facilities and health programs are established and maintained
- To ensure that everybody, including subcontractors, shall comply with all safety requirements, PTW's, JSA's, etc.
- Ensure that all personal protective equipment is utilized as appropriate
- Conduct weekly site safety inspections in conjunction with the Construction Engineer
- Timely reporting of incidents to all relevant parties
- Investigate all incidents and make recommendations to prevent recurrence of the same
- Carry out general toolbox meetings at least once a week to the workforce and confirm that safety instructions are being passed from foreman to the workforce on a daily basis (attendance of which shall be recorded and kept for record purposes)

6.1.4 All Supervisory staff

- All supervisory staff shall set a personal example at all times
- Organize the site so that work is carried out to the required standard with minimum risk to

TAKREER	RUWAIS REFINERY EXPANSION PROJECT	DAEWOO E&C	
	EPC-4 TANKAGE AND ASSOCIATED INTERCONNECTING PIPING		
	AGREEMENT No. 09-5578-E-4		
PROJECT No. 5578	Doc. No. 5578-E4-HSE-HU-00006	Rev. 0	Page 15 / 34

- men, equipment, materials and the general public
- Ensure all personnel are in possession of the appropriate personal protective equipment (PPE), equipment and tools
- Conduct job specific tool-box talks with work crews prior to start of any new task
- Develop and implement a Job Safety Analysis (JSA) prior for any new task being carried out on site, and ensure that JSA is attached to PTW
- Co-operate with the Safety Supervisor and act upon his recommendations

6.1.5 Workers

- Use the correct tools and equipment for the job
- Use and take care of personal protective equipment provided
- Don't endanger themselves or their co-workers
- Report any incidents immediately to their supervisors
- Obey all posted warnings signs and recommendations received from the Safety Supervisor

6.2 Training

- 1) All DEC personnel and subcontractors shall attend Safety induction before entering the site (a pre-requisite for induction is a CNIA gate pass).
- 2) The Safety induction training module shall be made available for company review before implementation.
- 3) At least 5 of the site personnel shall be provided with basic fire fighting training.

Responsibility

- Safety Supervisor
- HSES Manager
- Safety Supervisor

6.3 Communication

- 1) General tool-box talks shall be carried out on a weekly basis. All relevant topics shall be covered as well as specific topics such as first aid, emergency response, fire fighting, incident reporting etc. (see appendix 3 tool-box talk format)
- 2) Job specific tool-box talks shall be carried out before the start of a new or hazardous activity. Record shall be kept of these tool-box talks, and if the work is taking place under PTW, the record shall be attached to the PTW for reference purposes.
- 3) Coordination meetings shall be carried out at regular intervals as may be required, however a formal Safety meeting with record of MOM shall be done at least on a bi-monthly basis.
- 4) Safety posters will be posted in the site offices, and as a

Responsibility

- Safety Supervisor/
Construction Engineer
- Supervisory staff
- Construction Engineer/
Safety Supervisor/
Supervisory staff
- Safety Supervisor

TAKREER	RUWAIS REFINERY EXPANSION PROJECT	DAEWOO E&C	
	EPC-4 TANKAGE AND ASSOCIATED INTERCONNECTING PIPING		
	AGREEMENT No. 09-5578-E-4		
PROJECT No. 5578	Doc. No. 5578-E4-HSE-HU-00006	Rev. 0	Page 16 / 34

minimum signs should be posted indicating the location of fire extinguishers and first aid kits. See also section on Security on Signs and barricades.

5) Safety alerts will be distributed amongst all site personnel, and other safety awareness documents such as monthly safety newsletters, best practices, lessons learnt shall be distributed to site personnel. Safety Supervisor

6) Emergency contact numbers and incident reporting flow charts shall be prominently displayed in the site offices and security access points. Safety Supervisor

6.4 Inspections

Responsibility

1) In order to ensure compliance to the PLAN daily inspections shall be carried out on work activities & tools and equipment. Deviations shall immediately be rectified and noted. Safety Supervisor

2) Weekly inspections shall be carried out to ensure compliance to PTW and JSA requirements. Safety Supervisor

3) Monthly inspections shall be carried out on fire extinguishers and first aid kits to ensure that they are well stocked/pressurized and in good working condition. The inspection shall be recorded on tags placed on the extinguishers & first aid kits. Safety Supervisors

6.5 Incident Reporting and Investigation

Responsibility

1) All incidents that occur on site have to be reported to DEC, PMC and Takreer. The verbal notification should be done immediately, the initial report within 24 hours and a formal incident investigation report should be issued within one (1) week of the incident. Safety Supervisor/
Construction Engineer

2) Incidents involving vehicles and equipment also have to be reported to the Critical National Infrastructure Authority (CNIA). Safety Supervisor/
Construction Engineer

3) The Takreer Incident Handling and Investigation procedure will be utilized for this purpose (CP27). Safety Supervisor/
Construction Engineer

6.6 Emergency Response

Responsibility

1) Minor first aid cases will be managed on site, by trained first aiders (at least 1 first aider for every 100 workers) Safety Supervisor/
Construction Engineer

TAKREER	<p style="text-align: center;">RUWAIS REFINERY EXPANSION PROJECT</p> <p style="text-align: center;">EPC-4 TANKAGE AND ASSOCIATED INTERCONNECTING PIPING</p> <p style="text-align: center;">AGREEMENT No. 09-5578-E-4</p>	DAEWOO E&C	
PROJECT No. 5578	Doc. No. 5578-E4-HSE-HU-00006	Rev. 0	Page 17 / 34
	<p>2) Serious first aid/ medical cases shall be referred to;</p> <ul style="list-style-type: none"> - ADNOC Hospital (for incidents inside the site) - Ruwais Hospital (for incidents outside the site) <p>3) Minor fires shall be managed by the site personnel. At least 5 of the site personnel shall be provided with basic fire fighting training. If the fire is not manageable by site personnel mutual aid from the fire department should immediately be called (see appendix 4 for emergency contact numbers).</p> <p>4) A muster point shall be installed in the site office area and emergency evacuation drills shall be carried out on a quarterly basis.</p>		<p>Safety Supervisor/ Construction Engineer</p> <p>Safety Supervisor/ Construction Engineer</p> <p>Safety Supervisor/ Construction Engineer</p>
<p>6.7 Personal Protective Equipment (PPE)</p>	<p>1) PPE shall be provided to personnel as required.</p> <p>2) The minimum PPE for entering the site is a hard hat, safety shoes, safety glasses and a coverall.</p> <p>3) Specific PPE shall be provided relevant to the work being performed. These should be identified within a JSA before the work starts. This may include, ear plugs, gloves, safety harness, welding mask etc.</p>	<p>Responsibility</p>	<p>Material Manager</p> <p>Construction Engineer/ Safety Supervisor</p> <p>Construction Engineer/ Safety Supervisor</p>
<p>6.8 Fire Protection</p>	<p>1) Fire extinguishers of suitable type, capacity and numbers shall be provided on site, near generators, compressors, electrical appliances and where any open flame work is being performed.</p> <p>2) All fire extinguishers shall be inspected on a monthly basis and be maintained periodically.</p>	<p>Responsibility</p>	<p>Construction Engineer/ Safety Supervisor</p> <p>Construction Engineer/ Safety Supervisor</p>
<p>6.9 Barricades and signs</p>	<p>1) Adequate protective barricades shall be provided as physical protection from falling as well as indicating a dangerous condition.</p> <p>2) Persons who violate warning signs and barricades may be removed from site.</p> <p>3) Appropriate signs shall be posted to provide warning and identify danger. Flashing lights shall be installed if and when</p>	<p>Responsibility</p>	<p>Safety Supervisor/ Construction Engineer</p> <p>Safety Supervisor/ Construction Engineer</p> <p>Safety Supervisor/ Construction Engineer</p>

TAKREER	RUWAIS REFINERY EXPANSION PROJECT	DAEWOO E&C	
	EPC-4 TANKAGE AND ASSOCIATED INTERCONNECTING PIPING		
	AGREEMENT No. 09-5578-E-4		
PROJECT No. 5578	Doc. No. 5578-E4-HSE-HU-00006	Rev. 0	Page 18 / 34

required.

6.10 Safety impediments and violations

- 1) Any person violating HSE requirements shall be issued a safety default notice and disciplinary action initiated against the defaulter;
 - First offence: Verbal warning with documentation
 - Second offence: Written reprimand with punishment
 - Third offence: Written termination

Responsibility

Construction Engineer/
Safety Supervisor

- 2) Depending on the severity of the offence a straight forward termination may be issued.

Construction Engineer/
Safety Supervisor

- 3) The following cases will be dealt with zero tolerance and will result in immediate termination and removal from site;
 - Fighting
 - Criminal Offences
 - Modification of scaffolding by non-scaffolders

Construction Engineer/
Safety Supervisor

6.11 Subcontractors

- 1) All subcontractors on the RRE project shall adapt to this HSE program and implement effectively, or submit their HSE program separately for approval.

Responsibility

Safety Supervisor/
Construction Engineer

6.12 Excavation, trenching and shoring

- 1) Excavations shall be planned properly and a PTW with excavation certificate shall be obtained before the start of any excavation.
- 2) The PTW shall include (but not limited to) the scope of work, equipment used, drawings indicating underground utilities, the dimensions of the excavation and the design of excavation. Relevant control measures shall also be noted such as barricades, sloping, shoring, benching, access points etc.
- 3) Once the work in the excavation is complete the area shall be reinstated and the PTW closed out.

Responsibility

Construction Engineer/
Safety Supervisor

Construction Engineer/
Safety Supervisor

Construction Engineer/
Safety Supervisor

6.13 Lifting and rigging

- 1) Lifting and rigging shall be done by trained personnel with 3rd party certification such as TUV.
- 2) All lifting equipment shall have a valid third party inspection such as TUV.

Responsibility

Safety Supervisor/
Construction Engineer

Safety Supervisor/
Construction Engineer

TAKREER	RUWAIS REFINERY EXPANSION PROJECT	DAEWOO E&C	
	EPC-4 TANKAGE AND ASSOCIATED INTERCONNECTING PIPING		
	AGREEMENT No. 09-5578-E-4		
PROJECT No. 5578	Doc. No. 5578-E4-HSE-HU-00006	Rev. 0	Page 19 / 34

- 3) All relevant control measures shall be implemented before the start of any lifting activities including (but not limited to), barricading the operating area of the crane, verifying the crane configuration against the load chart, attaching tag-lines to the load, not lifting in winds exceeding 10m/s.

Safety Supervisor/
Construction Engineer

6.14 Permit to Work

Responsibility

- 1) During site establishment and preparation the Takreer PTW system will be used for site activities (HSE CP21 Permit to Work).
- 2) Activities that will require a permit to work will include;
 - Excavations
 - Confined Space Entry
 - Critical lifts
 - Open flame work
 - Electrical works
 - Any high risk activity
- 3) Training will be carried out and Permit Receivers and Issuers will be appointed on an interim basis after completing the training course. Only these trained persons will be allowed to Issue or Receive permits.

Construction Engineer/
Safety Supervisor

Construction Engineer/
Safety Supervisor

Construction Engineer/
Safety Supervisor

6.15 Job Safety Analysis (JSA)

Responsibility

- 1) A job safety analysis shall be carried out before the start of any new activity, high risk activity or any activity controlled under a PTW.
- 2) The job safety analysis will list out the basic job steps, hazards and control measures. The intent of the JSA is to be a practical document that the field personnel can use, thus it should not be complicated, however it should be precise and cover the main hazards of the task at hand (see appendix 5 for JSA format).

Safety Supervisor/
Construction Engineer

Safety Supervisor/
Construction Engineer

6.16 Safety Observation Cards

- 1) Safety Observation cards will be distributed on site and the use of the cards will be covered in the site induction program (see appendix 6 for Observation Cards).
- 2) The information from the observation cards will be auctioned as required, and the data will be tracked for trending purposes.

Safety Supervisor/
Construction Engineer

Safety Supervisors/
HSES Manager

TAKREER	RUWAIS REFINERY EXPANSION PROJECT	DAEWOO E&C	
	EPC-4 TANKAGE AND ASSOCIATED INTERCONNECTING PIPING		
	AGREEMENT No. 09-5578-E-4		
PROJECT No. 5578	Doc. No. 5578-E4-HSE-HU-00006	Rev. 0	Page 20 / 34

7. EQUIPMENT AND DRIVERS

7.1 Introduction

The following section details some requirements that are necessary to help ensure the safe use of equipment on site. The typical equipment that will be used during site establishment and preparation are excavators, cranes, compact dumpers and trucks. Three common causes of heavy equipment accidents are:

1. Overturning on slopes and at the edges of excavations and embankments.
2. Inadequately maintained braking system.
3. Driver error due to lack of experience and training e.g. failure to apply the parking brake, switch off the engine and remove the keys before leaving the driver's seat.

7.2 Driver protection

Drivers need protection from the risks associated with the equipment rolling-over and from being hit by falling materials. Where there is a risk of equipments overturning and injuring the driver, roll-over protective structures (ROPS) and seat restraints should be fitted. Where drivers are at risk of being hit by falling materials the equipments should be fitted with falling-object protective structures (FOPS).

ROPS, seat restraints and FOPS need to comply with the essential health and safety requirements of the Supply of Machinery (Safety Regulations 1992) but do not need to be CE marked. Some models of compact dumpers as example may become unstable on slopes greater than 1 in 4, so it is important to follow the manufacturer's guidance regarding the capabilities of each specific vehicle. Where there is a risk of compact dumpers overturning during use, e.g. on steep gradients or rough ground, they should be fitted with ROPS to International Standard ISO 3471:1994 and seat restraints to ISO 6683:1981. Seat restraints must be worn where ROPS are fitted to prevent injury if the dumper overturns.

The DEC Managers play a key role in ensuring the safe use of equipment; and to ensure that safe vehicles are provided and that safe systems of work are planned and put into practice. DEC will ensure that all site vehicles and construction equipment are;

- Capable of safely performing the tasks they are expected to perform
- Are operated and maintained according to the manufacturer's instructions
- Have a valid CNIA permit to access the site
- Have valid government registrations and insurances (Photocopies of these must be kept for documentation and records purposes).
- And are driven by competent drivers, with Third Party Certificates as required.

7.3 Safe driving practices

Drivers have a key role to play in ensuring the safe use of equipments. Drivers should always:

- Read the manufacturer's instruction book before operating an unfamiliar vehicle
- Understand the differences in performance when loaded and unloaded, particularly relating to braking and stability on slopes
- Know the different handling and braking characteristics of the vehicle in wet or sandy conditions

TAKREER	RUWAIS REFINERY EXPANSION PROJECT	DAEWOO E&C	
	EPC-4 TANKAGE AND ASSOCIATED INTERCONNECTING PIPING		
	AGREEMENT No. 09-5578-E-4		
PROJECT No. 5578	Doc. No. 5578-E4-HSE-HU-00006	Rev. 0	Page 21 / 34

- Check tires, brakes, etc, to ensure vehicles/equipment are safe to use at the start of the working day
- Wear appropriate protective equipment, e.g. ear defenders, high visibility jacket, etc.
- Use seat belts at all times.
- Check that nobody is at risk of injury before moving off, particularly in the areas obscured by the equipment when going forward, and behind the vehicle when reversing
- Keep to designated vehicle routes and follow site rules and safe systems of work
- Drive at appropriate speeds for site conditions
- Follow directions given by traffic signs and traffic controllers.
- Load only on level ground with the parking brake applied
- Get off the equipment when it is being loaded and ensure that the equipment is not overloaded
- Check that loads are evenly distributed and that they do not obscure visibility from the driving position
- Stop, select neutral gear and apply parking brake
- Use ground guides for vehicle movements

Drivers should not:

- Drive on gradients steeper than those specified as Safe for the specific equipment in the manufacturers instruction
- Operate the equipment's controls unless seated in the driving position
- Carry passengers unless purpose built seats are provided
- Drive around site with the skip/ boom in the vertical discharge position; or
- Alter tire pressures outside the manufacturers recommendation

TAKREER	RUWAIS REFINERY EXPANSION PROJECT	DAEWOO E&C	
	EPC-4 TANKAGE AND ASSOCIATED INTERCONNECTING PIPING	AGREEMENT No. 09-5578-E-4	
PROJECT No. 5578	Doc. No. 5578-E4-HSE-HU-00006	Rev. 0	Page 22 / 34

8. TRAFFIC MANAGEMENT

8.1 Introduction

This section defines the basic safety measures and provides instructions to project employees pertaining to road traffic safety and traffic signs. This document describes the HSE&S procedure to be followed on or near the project construction site to ensure road safety and proper use of traffic signs and shall apply to all activities undertaken by DEC.

8.2 Roles & Responsibilities

8.2.1 Project Manager

- Shall be responsible for the implementation of this procedure on the Project.
- Provide all resources when executing traffic arrangement.

8.2.2 Construction Engineer

- He shall be responsible for the management of roads on work sites and other locations of the project in compliance with the relevant Authorities requirements (where applicable)
- He shall ensure, with the assistance of the Supervisors and foremen that all required traffic and safety signs are displayed and maintained in the designated locations, before, during and after work performed.
- Inform safety department when there is any traffic change or re-routing.
- Provide personnel to control the traffic.

8.2.3 Safety Supervisor

- Advice regarding road safety and supply necessary safety signs as required.
- He shall be responsible to disseminate the information in this procedure to all employees, especially those involved in working near or on roads and ensure training when necessary.
- Inspect and report hazards regarding traffic/road set up; and
- Review the plan when required.

8.2.4 Banksman

- Banksman shall control the flow of traffic in a safe manner, in cases where traffic flashlights are not used and on areas as needed.
- A banksman should be equipped with a safety vest (dust mask and ear plugs as needed), green and red flag or signage that indicates "STOP & GO".

8.3 Road Temporary Signage and Traffic Controls

8.3.1 Route visibility and illumination

The following items will be maintained to ensure adequate visibility;

- Illumination at junctions and bends by avoiding blind bends
- Use of reflective cones, signs, drums and lights to improve the level of visibility
- Flashing lights (or electric blinkers) shall be positioned alternately with traffic cones during the hours of darkness.

8.3.2 Speed limit

TAKREER	RUWAIS REFINERY EXPANSION PROJECT	DAEWOO E&C	
	EPC-4 TANKAGE AND ASSOCIATED INTERCONNECTING PIPING		
	AGREEMENT No. 09-5578-E-4		
PROJECT No. 5578	Doc. No. 5578-E4-HSE-HU-00006	Rev. 0	Page 23 / 34

Speed limit will be strictly implemented. The speed limits at each site are dependent on the final site layout of each work site location. The vehicle speed can be limited by using fixed features such as humps and narrowing roads, installation of speed limit signs and by speed monitoring.

8.3.3 Traffic signs and notices

- All Signs should be reflective or illuminated.
- The signs shall accurately reflect the situation that the driver or pedestrian will encounter when passing by or through the site.
- Use standardized signage for speed, hazards, etc. for familiarity with public road signage.
- Signs shall be written in English and Arabic language.
- Temporary signs should be maintained regularly throughout the duration of project (cleaning, maintenance of stands and replacement if needed).
- The position of the first sign and the spacing of the subsequent signs in advance of the hazard shall be related to speed of the passing traffic (not less than 100 meters on an operational road, and not less than 20 meters on site).

8.3.4 Personnel awareness and training

- All personnel entering the site are required to attend Site Induction before working on site.
- All heavy equipments (trucks, loaders, etc) entering the site shall be guided by trained banks men.
- All drivers & operators shall be given training on Defensive Driving.
- Ensure that all visiting drivers report their arrival and receive inductions about the site lay-out and regulations.

TAKREER	RUWAIS REFINERY EXPANSION PROJECT	DAEWOO E&C	
	EPC-4 TANKAGE AND ASSOCIATED INTERCONNECTING PIPING	AGREEMENT No. 09-5578-E-4	
PROJECT No. 5578	Doc. No. 5578-E4-HSE-HU-00006	Rev. 0	Page 24 / 34

9. ENVIRONMENTAL PLAN

9.1 Waste Management

- 1) All kinds of solid waste, unwanted construction material shall be disposed off at designated disposal sites thru the services of a TAKREER certified waste management provider. A log shall be maintained.
- 2) Trash containers / skips, shall be replaced on construction site for disposal of scrap materials and other construction generated debris and emptied regularly by a TAKREER certified service provider. This shall be recorded and documented
- 3) Disposal of used water from toilets, washing facilities, etc. and the waste material shall be carried out in accordance with environment regulatory standards of the TAKREER.
- 4) A record shall be maintained for all solid and liquid waste disposal services conducted, indicating date, amount and destination.

Responsibility

Safety Supervisor/
Welfare Manager

Safety Supervisor/
Welfare Manager

Safety Supervisor/
Welfare Manager

Safety Supervisor/
Welfare Manager

9.2 Housekeeping

- 1) Project Management team shall ensure that good housekeeping practices are followed through the contract duration.
 - Work areas, passageways and all other areas kept free of obstruction debris and materials.
 - Construction materials, tools, equipment shall be stored or placed in an orderly manner.
 - Construction waste removed and works areas cleaned by the end of the shift.
 - Temporary extension leads, wires, electrical cables and hoses etc. kept off the walking surfaces and routed in orderly manner.
- 2) Assign regular housekeeping helpers to keep all areas clean of construction debris and rubbish during and after work hours.

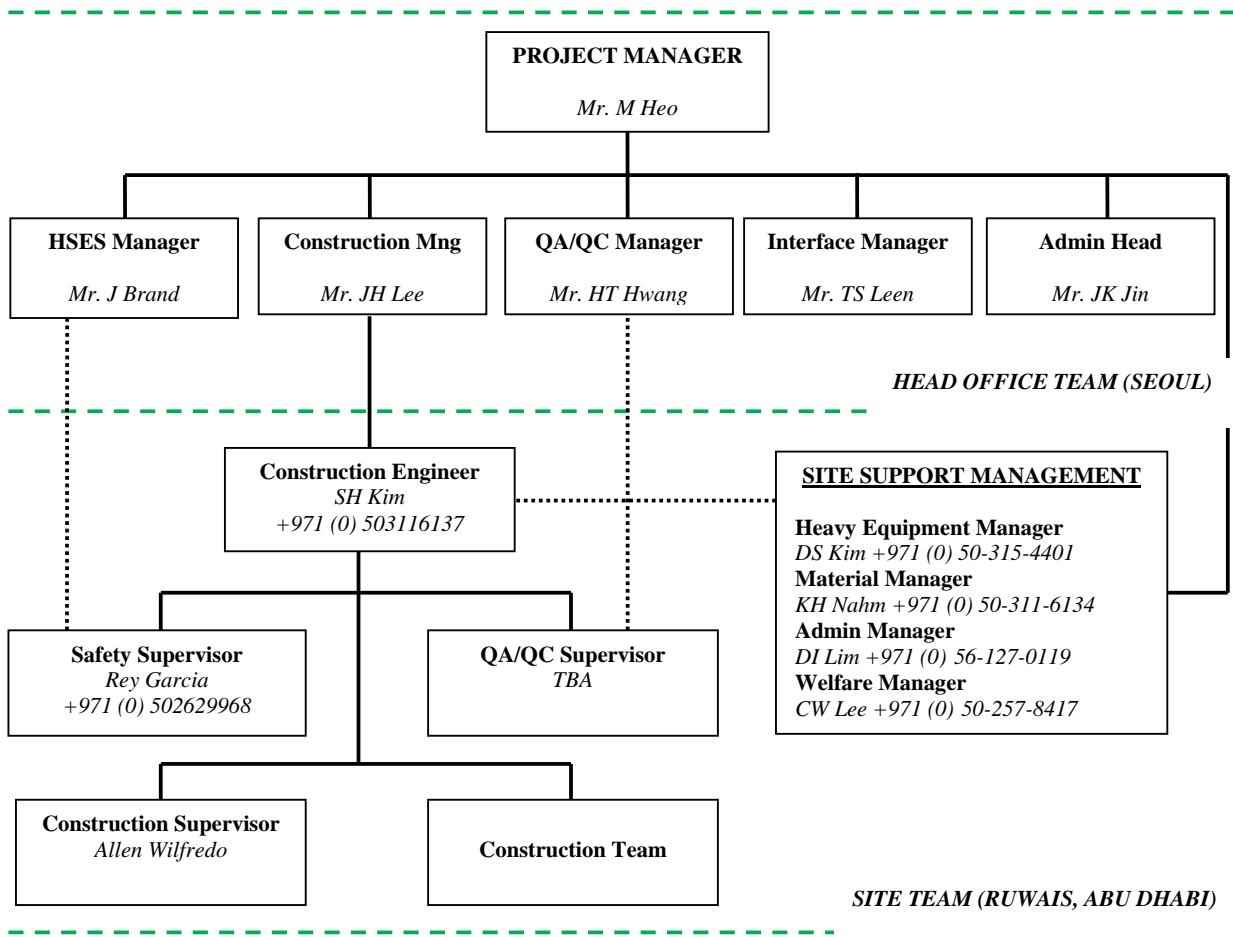
Responsibility

Construction Engineer/
Safety Supervisor

Construction Engineer/
Safety Supervisor

TAKREER	RUWAIS REFINERY EXPANSION PROJECT	DAEWOO E&C	
	EPC-4 TANKAGE AND ASSOCIATED INTERCONNECTING PIPING		
	AGREEMENT No. 09-5578-E-4		
PROJECT No. 5578	Doc. No. 5578-E4-HSE-HU-00006	Rev. 0	Page 25 / 34

Appendix 1: SITE ESTABLISHMENT & PREPARATION KEY TEAM



TAKREER	RUWAIS REFINERY EXPANSION PROJECT EPC-4 TANKAGE AND ASSOCIATED INTERCONNECTING PIPING AGREEMENT No. 09-5578-E-4	DAEWOO E&C	
PROJECT No. 5578	Doc. No. 5578-E4-HSE-HU-00006	Rev. 0	Page 26 / 34

APPENDIX 2: DAEWOO HSE POLICY

HSE Policy

The Daewoo E&C (herein referred to as "DEC") is committed to protect Health, Safety and Environment ("HSE" hereafter) throughout all stages of its projects. To create an "Incident Free Environment" for all employees, continual improvements and preventative measures will be implemented in compliance with this policy.


DEC shall comply with existing laws and regulations on HSE. All HSE issues raised by interested parties shall be passed to senior management for thorough consideration.

DEC will establish a HSE Management System based on OHSAS 18001/1999 and ISO 14001/2004.

For all projects, DEC shall comply with environmental impact studies, in addition to identifying potential health and safety hazards. Each project will be subject to a "Zero-accident" campaign to help educate employees about avoiding injuries, illnesses and property damage at the workplace, and about protecting the environment from contamination.

HSE performance targets shall be set and these targets shall be annually reviewed by DEC's corporate HSE Committee for continual improvement.

The health, safety and environment policy shall be communicated to all employees with the intent that employees are made aware of their individual HSE obligations. Each employee of DEC, including higher management, will participate in the implementation of the HSE policy.



Seo, Jong-Uk
President & CEO
Daewoo E&C

(2008, 11, 1)
Date

TAKREER	RUWAIS REFINERY EXPANSION PROJECT	DAEWOO E&C	
	EPC-4 TANKAGE AND ASSOCIATED INTERCONNECTING PIPING		
	AGREEMENT No. 09-5578-E-4		
PROJECT No. 5578	Doc. No. 5578-E4-HSE-HU-00006	Rev. 0	Page 27 / 34

APPENDIX 3: TOOL-BOX TALK FORM

Supervisor/Foreman:		Signature:	
---------------------	--	------------	--

Date/ Time:		Location:	
-------------	--	-----------	--

Task Description:	
-------------------	--

Topics Discussed:

1.	
2.	
3.	

Others:

ATTENDEES

Observed By: _____

Name & Signature

Discipline Supervisor/ HSE Supervisor

TAKREER	RUWAIS REFINERY EXPANSION PROJECT	DAEWOO E&C	
	EPC-4 TANKAGE AND ASSOCIATED INTERCONNECTING PIPING		
	AGREEMENT No. 09-5578-E-4		
PROJECT No. 5578	Doc. No. 5578-E4-HSE-HU-00006	Rev. 0	Page 28 / 34

APPENDIX 4: EMERGENCY CONTACTS

ADNOC Emergency Hospital	02 – 602 23 40
ADNOC ambulance service	02 – 602 23 40
Fire Brigade	02 – 602 22 02
Police Post (On-Shore)	02 – 809 66 66
Construction Engineer	050 – 262 9968
Safety Supervisor	050 – 311 6137

* Please note the emergency numbers will be consolidated into a one call emergency number ASAP.

TAKREER	RUWAIS REFINERY EXPANSION PROJECT	DAEWOO E&C	
	EPC-4 TANKAGE AND ASSOCIATED INTERCONNECTING PIPING		
	AGREEMENT No. 09-5578-E-4		
PROJECT No. 5578	Doc. No. 5578-E4-HSE-HU-00006	Rev. 0	Page 29 / 34

APPENDIX 5: JSA Format

Sequence of basic Job Steps	Hazards	Control Measures
1	1.1 1.2	1.1.1 1.1.2 1.2.1 1.2.2
2		
3		
4		
5		

TAKREER	RUWAIS REFINERY EXPANSION PROJECT	DAEWOO E&C	
	EPC-4 TANKAGE AND ASSOCIATED INTERCONNECTING PIPING	AGREEMENT No. 09-5578-E-4	
PROJECT No. 5578	Doc. No. 5578-E4-HSE-HU-00006	Rev. 0	Page 30 / 34

APPENDIX 6: OBSERVATION CARDS

<i>See cover page for instructions on completion of Observation Card</i>		
SAFETY OBSERVATION CARD		No.: 000000
		Date
<input type="checkbox"/> Safe Act	<input type="checkbox"/> Unsafe Act	<input type="checkbox"/> Near Miss
Observer Name: (not mandatory)		Time
Activity Description:		Company Code
		Area Code
		Craft Code
Description of Event:		Action Closed YES <input type="checkbox"/> NO <input type="checkbox"/>
Corrective Action Taken:		
ACTIVITY CATEGORY		RISKS
<input type="checkbox"/> Electrical	<input type="checkbox"/> Scaffolding	<input type="checkbox"/> Caught in or between objects
<input type="checkbox"/> Lifting & rigging	<input type="checkbox"/> Working at Height	<input type="checkbox"/> Noise/ vibrations
<input type="checkbox"/> Heavy Equip	<input type="checkbox"/> Vehicle unloading	<input type="checkbox"/> Ergonomics/ Body Position cramped
<input type="checkbox"/> Road Safety	<input type="checkbox"/> Supervision	<input type="checkbox"/> Falling / Fall from heights
<input type="checkbox"/> Stacking	<input type="checkbox"/> Storing equipment	<input type="checkbox"/> Slips/ Trips/ Falls (same level)
<input type="checkbox"/> Excavations	<input type="checkbox"/> Confined Space	<input type="checkbox"/> Temperature extremes (heat/ cold)
<input type="checkbox"/> Welding	<input type="checkbox"/> Cutting	<input type="checkbox"/> Asphyxiation (Chemical, fumes etc.)
<input type="checkbox"/> Grinding	<input type="checkbox"/> Hazardous Mat	<input type="checkbox"/> Toxic Effects (Chemical, fumes etc.)
<input type="checkbox"/> Blasting	<input type="checkbox"/> Painting	<input type="checkbox"/> Electrocutation
<input type="checkbox"/> Hand Tools	<input type="checkbox"/> Pneumatic Tools	<input type="checkbox"/> Strike against objects
<input type="checkbox"/> Power Tools	<input type="checkbox"/> Manual Handling	<input type="checkbox"/> Struck by (dropped) objects
<input type="checkbox"/> Hygiene	<input type="checkbox"/> Welfare facilities	<input type="checkbox"/> Cut by
<input type="checkbox"/> Sanitation	<input type="checkbox"/> Waste Mng	<input type="checkbox"/> Environmental damage
<input type="checkbox"/> Security	<input type="checkbox"/> Housekeeping	<input type="checkbox"/> Property damage
<input type="checkbox"/> Permit to work	<input type="checkbox"/> Method Statement	<input type="checkbox"/> Fire/ Explosion
<input type="checkbox"/> Toolbox Talk	<input type="checkbox"/> JSA	<input type="checkbox"/> Other
<input type="checkbox"/> Isolations	<input type="checkbox"/> LOTO	
<input type="checkbox"/> Opening/ Holes	<input type="checkbox"/> Edges	ROOT CAUSES
<input type="checkbox"/> Concreting	<input type="checkbox"/> Shuttering	Root cause code(s):
<input type="checkbox"/> Formwork	<input type="checkbox"/> Steel erection	Description of potential root causes
<input type="checkbox"/> Steel assembly	<input type="checkbox"/> Grating	
<input type="checkbox"/> Piping & fitting	<input type="checkbox"/> Insulation works	
<input type="checkbox"/> Duct works	<input type="checkbox"/> Cable works	
<input type="checkbox"/> Pressure tests	<input type="checkbox"/> Leak tests	
<input type="checkbox"/> NDT	<input type="checkbox"/> Blowing	
<input type="checkbox"/> Cleaning lines	<input type="checkbox"/> Flushing	
PPE: <input type="checkbox"/> Eyes <input type="checkbox"/> Feet <input type="checkbox"/> Head <input type="checkbox"/> Resp System <input type="checkbox"/> Face <input type="checkbox"/> Hand <input type="checkbox"/> Body <input type="checkbox"/> Ears <input type="checkbox"/> Fall Protection		

TAKREER	RUWAIS REFINERY EXPANSION PROJECT	DAEWOO E&C	
	EPC-4 TANKAGE AND ASSOCIATED INTERCONNECTING PIPING	AGREEMENT No. 09-5578-E-4	
PROJECT No. 5578	Doc. No. 5578-E4-HSE-HU-00006	Rev. 0	Page 31 / 34

LIST OF CODES

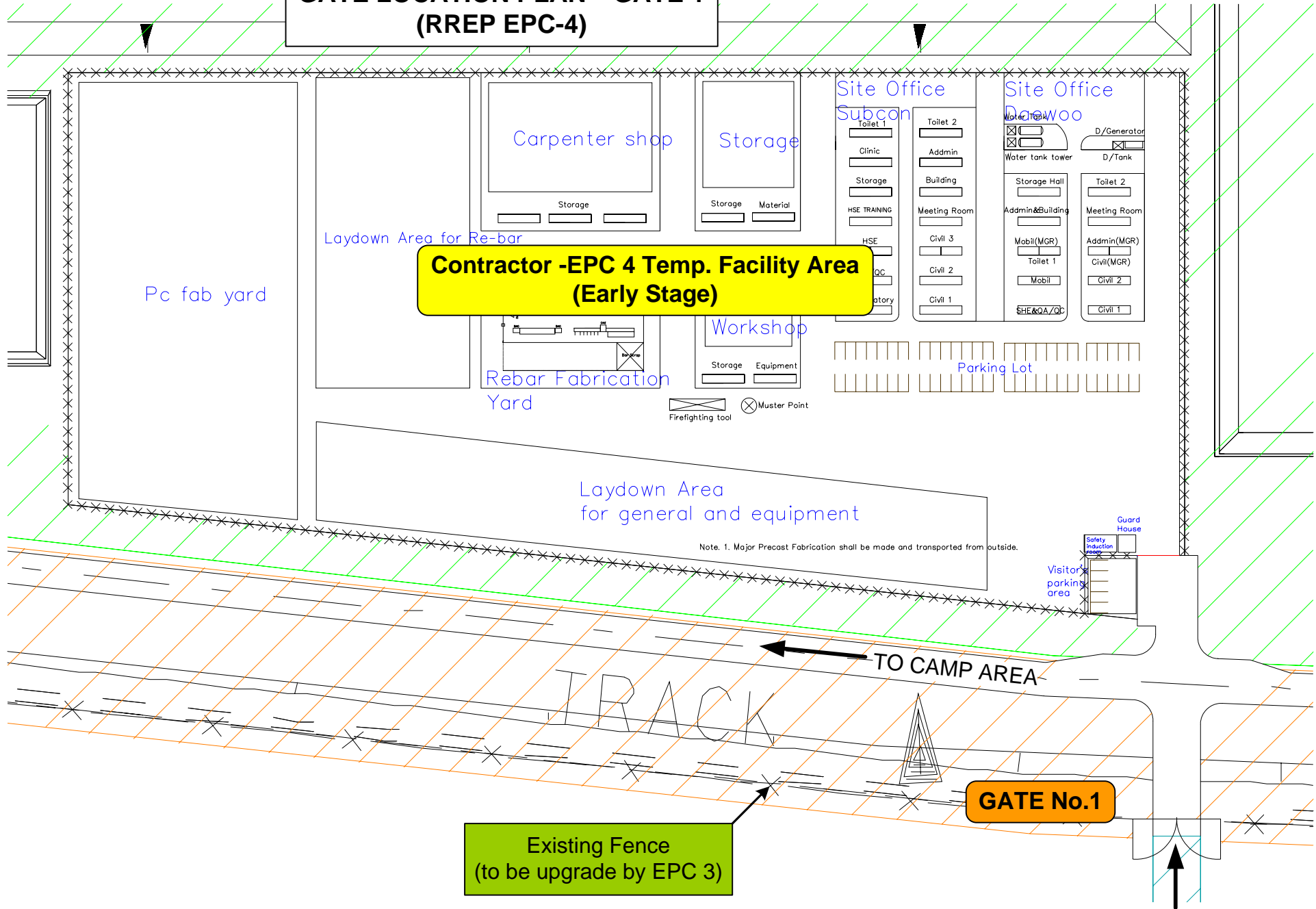
COMPANY	CODE
Mot MacDonald	1
Daewoo E&C	2
CBI	3
TBA	4
TBA	5
TBA	6
TBA	7
TBA	8
TBA	9
TBA	10
TBA	11

AREA	CODE
Gasoline 98 Storage (4-1)	1
Gasoline 95 Storage (4-1)	2
Gasoline 91 Storage (4-1)	3
Burner Oil Storage (4-2)	4
Jet Fuel Storage (4-3)	5
Alkylate Storage (4-3)	6
Crude Storage (4-3)	7
Gasoil Storage (4-4)	8
Naphtha Storage (4-4)	9
Intermediate Storage west (4-4)	10
Intermediate Storage east (4-4)	11

CRAFT	CODE
Electrician	1
Painter	2
Blaster	3
Grinder	4
Welder	5
Rigger	6
Banksman	7
Scaffolder	8
Carpenter	9
Surveyor	10
Steel worker	11
Civil worker	12
Pipe fitter	13
QA/QC & NDT	14
Equipment Operator	15
Driver	16
Security	17
General Labour	18
Foreman	19
Chargehand	20
Supervisor	21
HSE Officer	22
Engineer	23
Office worker	24
Other	

ROOT CAUSE	CODE
TOOLS & EQUIPMENT	
Wrong for the job	1
Used incorrectly	2
In unsafe condition	3
Not available	4
No inspection	5
PROCEDURES	
Procedures not followed	6
Procedures not understood	7
TRAINING	
No training	8
Training not understood	9
COMMUNICATION	
Coordination	10
No communication	11
Communication misunderstood	12
WORK DIRECTION	
Preparation	13
Selection of worker	14
Supervision during work	15
HUMAN ENGINEERING	
Work Environment	16

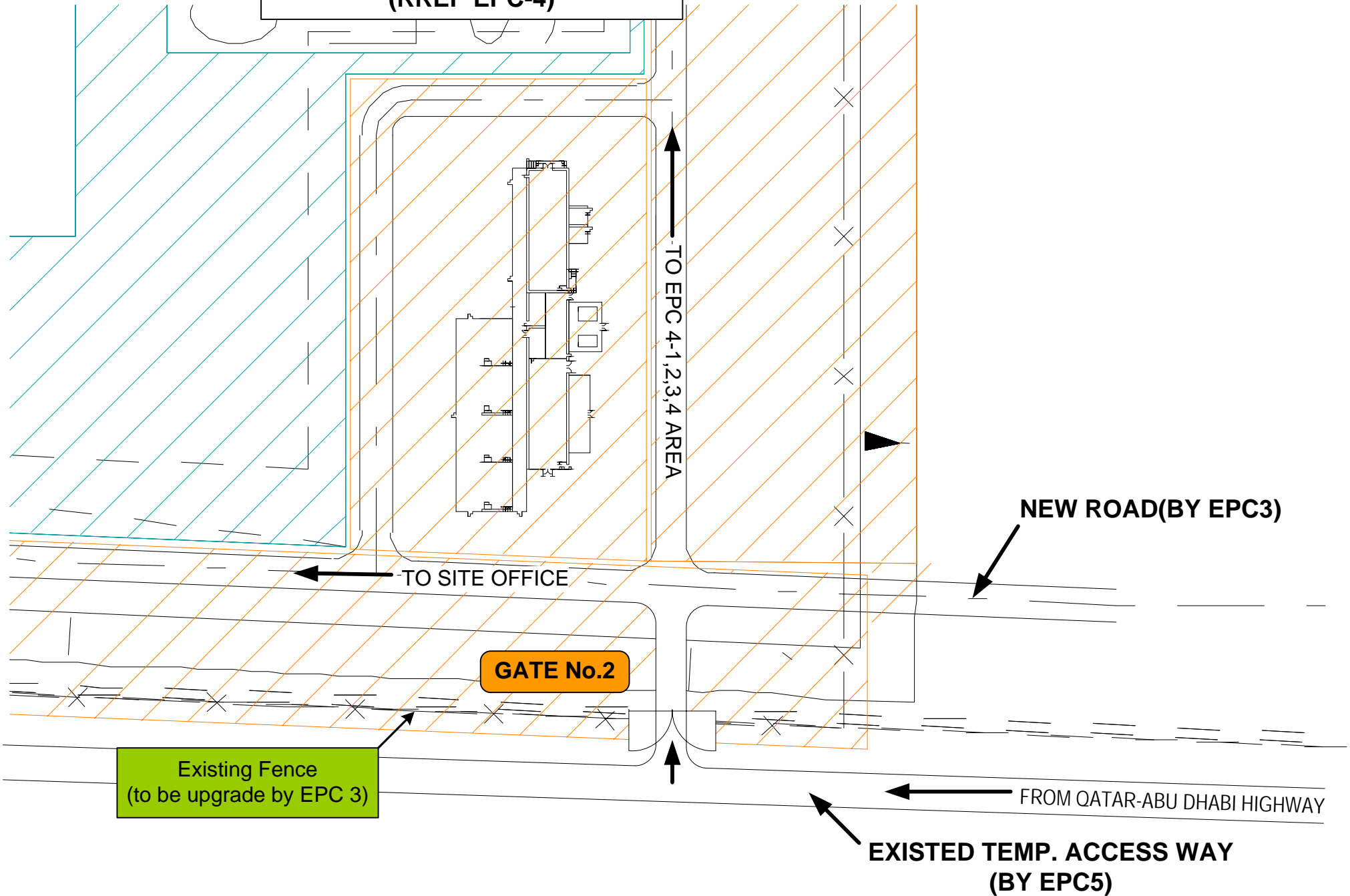
**GATE LOCATION PLAN – GATE 1
(RREP EPC-4)**



Note. 1. Major Precast Fabrication shall be made and transported from outside.

FROM QATAR-ABU DHABI HIGHWAY
(BY EPC5)

**GATE LOCATION PLAN – GATE 2
(RREP EPC-4)**



TO SITE OFFICE

TO EPC 4-1,2,3,4 AREA

NEW ROAD (BY EPC3)

GATE No.2

Existing Fence
(to be upgrade by EPC 3)

FROM QATAR-ABU DHABI HIGHWAY

EXISTED TEMP. ACCESS WAY
(BY EPC5)