Construction Phase Plan

Program for Health, Safety and Environmental Protection

3710 A1E6
Teesside 01

This construction phase plan (also known as “Construction Phase Plan”) is prepared to meet the requirements of the Construction, Design and Management (CDM) 2015 Regulations part 3, Regulation 12. Principal Contractor is responsible for communication of this document to those named as duty holders prior to commencement of the construction phase. If the Principal Contractor fails to provide this document and any associated supporting information in good time, both the Principal Contractor and Client will be in breach of CDM 2015 Regulations and liable to prosecution from the enforcing authority. This document shall be reviewed frequently to take in to account any changes and re-issued as required as the construction phase develops.

All key CDM duty holders are required to review this document and associated referenced documents to plan their own works and meet their own statutory duties.

The Project is within scope of the CDM Regulations 2015 and has also been notified to the Health & Safety Executive (HSE). Principal Contractor shall display a copy of the latest F10 in the site office throughout the Construction Phase.

IFC	02	23-11-2023	A. Brown	S. Vogel, CN	M. Schmidt, PM	New doc. version
X	01	09.06.2021	S. Vogel, ENN	C. Strobel, ENN	D. Jarmus, PM	-
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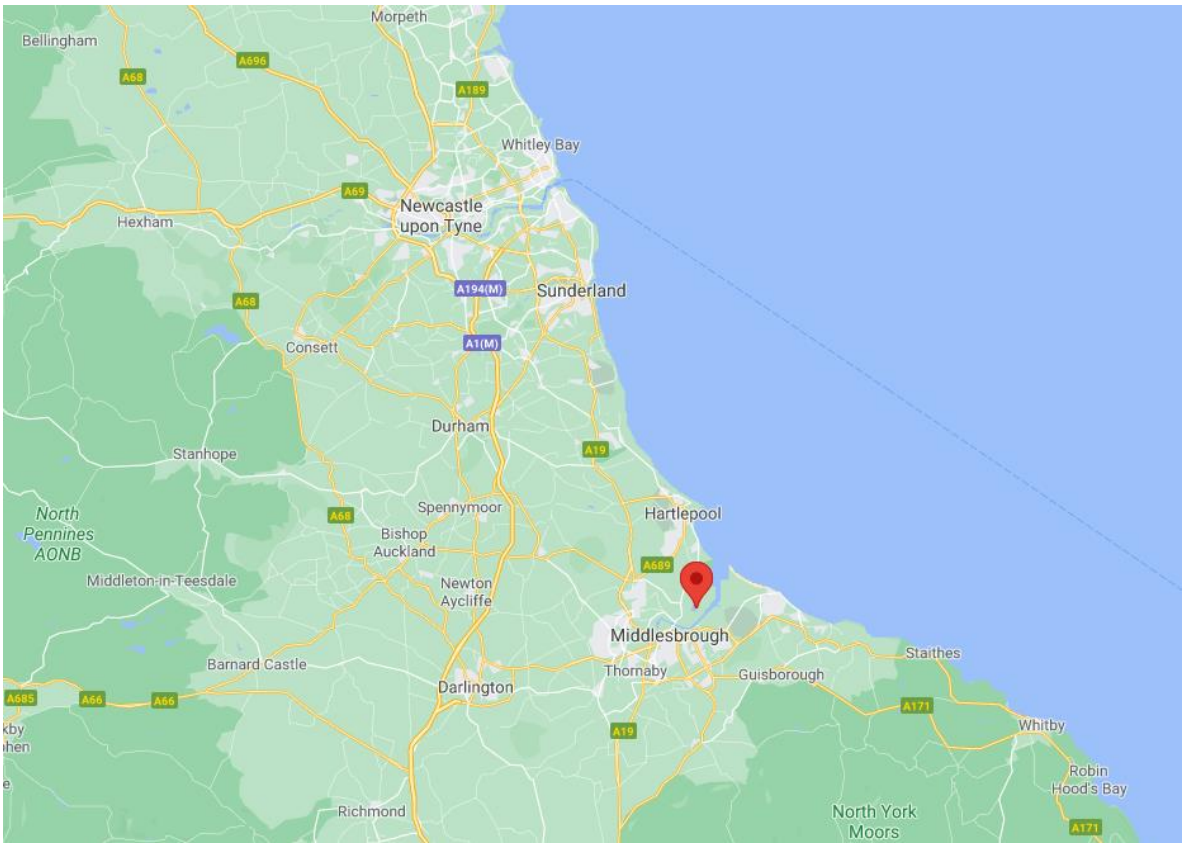
Contents

1 Introduction

1.1 General

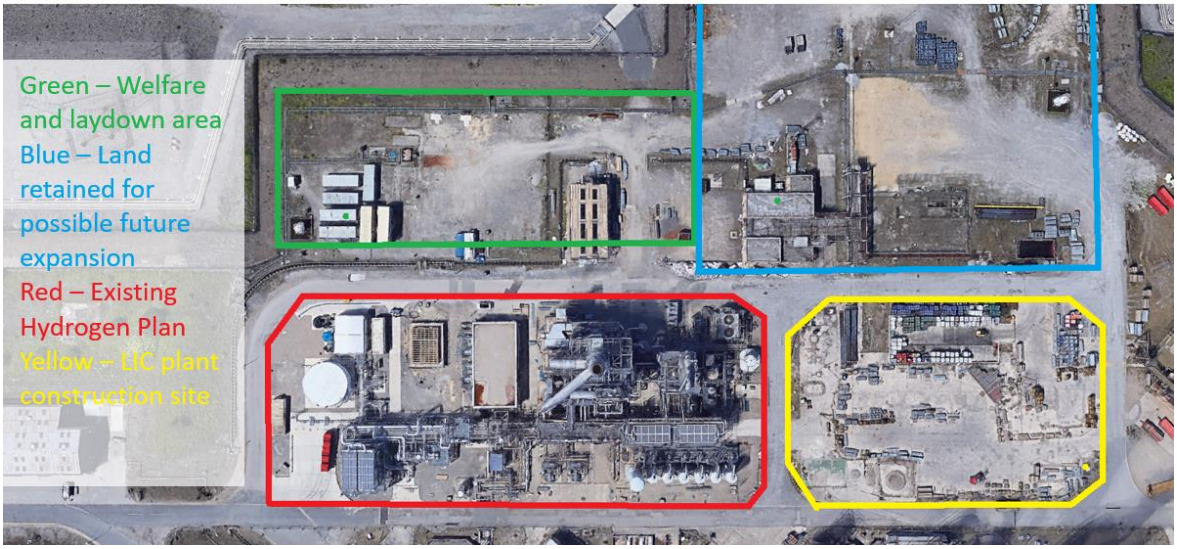
This Construction Phase Plan was prepared for the CO2 Plant Project of BOC UKs Site in Teesside, United Kingdom. The site project is running from November 2023 to March 2025.

Picture 1: Location of Teesside



Picture 2: Location of plant

Picture 3: Construction Site



1.2 Purpose

This document defines the applicable occupational Health, Safety, Environmental protection principles to which the Project must adhere to transition all project lifecycle phases.

The Construction Phase Plan is established to ensure that the project related HSE aspects are thoroughly understood, considered, planned, implemented and executed in the Project Teesside 01 at the Linde Engineering Dresden GmbH (LEDD).

It outlines planned activities to ensure that the HSE requirements given by authorities, PRINCIPAL CONTRACTOR and CONTRACTOR will be fulfilled.

Nothing in this Construction Phase Planmust be used to release the various CONTRACTORs out of their genuine responsibility with regard to statutory regulations and rules. In case of any conflict with relevant regulations, CONTRACTOR must inform PRINCIPAL CONTRACTOR without delay.

PRINCIPAL CONTRACTOR will have the overall responsibility within its scope of work towards CLIENT and coordinate Contractors' interfaces with respect to HSE.

Every CONTRACTOR is responsible for its SUB-CONTRACTORs and must transfer the requirements of this Construction Phase Plan to its SUB-CONTRACTORs.

This Construction Phase Plan will be reviewed and updated as the project transitions all project phases or in case of significant changes or new HSE requirements. It will also seek to improve and provide actual site conditions up to the commissioning phase.

1.3 Scope and Validity

This Construction Phase Plan is valid during the construction, pre-commissioning and commissioning phase of CO2 Plant at BOC UKs Site in Teesside, United Kingdom

These HSE requirements are part of the contract between CONTRACTOR and PRINCIPAL CONTRACTOR. They are attached to Exhibit E.

The Construction Phase Plan for PRINCIPAL CONTRACTOR is based on its IMS-Management System and its related documents as well as the contract with CLIENT.

1.4 "Must" and "Should"

Within this Construction Phase Plan, the terms "must" (as well as "must not" and "shall not") indicates a mandatory requirement. The term "should" indicate best practice.

2 Definitions and Abbreviations

Description / Abbreviation	*Definition*
BeSafe Index (BSI)	A combination of 26 leading HSE indicators, reported and calculated in PRINCIPAL CONTRACTOR's Monthly HSE Report
Bump Test	Test to verify the performance of the gas detector and ensure that sensors are responding to their target gas. A bump test does not calibrate the sensors.
Calibration test	A test to evaluate and adjust the reading precision and accuracy of measurement instruments. (It is not a bump/functional test)
CLIENT	BOC Teesside Hydrogen
CM	PRINCIPAL CONTRACTOR's Construction Manager
CMM	PRINCIPAL CONTRACTOR's Commissioning Manager
PRINCIPAL CONTRACTOR	Linde Engineering Dresden (LEDD)

Principal Contractor	Linde Engineering Dresden (LEDD)
CONTRACTOR	Non-Linde third party performing work for the Engineering Division on one of its LE Entity Sites or Project Construction Sites. Couriers providing a delivery service (for example DHL, UPS or FedEx) are not regarded as Contractors.
Exhibit E	Part of the Contract agreement of CONTRACTOR and PRINCIPAL CONTRACTOR
EIFR	Environmental Incident Frequency Rate. EIFR = Serious, Moderate & Minor environmental incidents per 200.000 hours worked.
HSE	Health, Safety and Environment
MSDS	Material Safety Data Sheet
NDT	Non-destructive Testing
OEM	Original Equipment Manufacturer
OWNER	The OWNER is the operator and/or owner of the [e.g. Petrochemical Complex, Steel Mill] wherein CLIENT's construction site is located.
PM	PRINCIPAL CONTRACTOR'S Project Manager
PPE	Personal Protective Equipment
RCD	Residual Current Protective Device
R&CM	Recognition and Consequence Management
SM	PRINCIPAL CONTRACTOR's Site Manager
SUB-CONTRACTOR	Non-Linde third party performing work for the Engineering Division under a contractual agreement with one of its Contractors
TRCR	Total Recordable Case Rate. TRCR = Recordable Injury and Sickness Cases per 200.000 hours worked.
VENDOR	Non-Linde third party delivering a product (as applicable including related services) to the Engineering Division
VISITOR	Visitors are all persons not working for PRINCIPAL CONTRACTOR, CLIENT or CONTRACTOR on site.
FIRST AIDER	The term relates to a person who is qualified (and holds a current certificate) in first aid at work within 3 years of completion.
CONSTRUCTION PHASE PLAN	Refers to this document. Where other supporting and referenced documents in this plan refer to “HSE Program Site”, it shall mean this Construction Phase Plan.
PRE-CONSTRUCTION INFORMATION	Document provided by Client as required by Construction, Design & Management (CDM) Regulations 2015. Key information from this document is also communicated as part of this plan to all those working on the project to enable suitable planning.

In the following referenced document numbers with the originator code "&A?" in this project always refer to project documents with entity originator code of this document.

3 References

3.1 HSE Legislation

For PRINCIPAL CONTRACTOR's employees working abroad, the home country's HSE legislation will also apply, in addition to the project implementation country’s HSE legislation.

The applicable home country HSE legislation can be obtained from the following referenced sources. If the required HSE legislation cannot be obtained, PRINCIPAL CONTRACTOR's Lead Construction & Commissioning HSE should be contacted for further assistance and check on alternative sources of information.

UK / BOC.	**Sources for HSE Legislations (non-exhaustive list)**
United Kingdom	• The Health and Safety at Work Etc Act 1974. • The Construction, Design & Management (CDM) Regulations 2015. • The Health & Safety (First Aid) Regulations 1981. • The Personal Protective Equipment Regulations 2022. • The Manual Handling Operations Regulations 1992. • The Reporting of Injuries, Diseases and Dangerous Occurrences Regulations (RIDDOR) 2013. • The Electricity at Work Regulations 1989. • The Gas Safety Regulations 2021. • The Control of Vibration at Work Regulations 2005. • The Control of Noise at Work Regulations 2005. • The Health & Safety Signs and Signals Regulations 1996. • The Confined Spaces Regulations 1997. • The Provision and Use of Work Equipment Regulations 1998. • The Lifting Operations and Lifting Equipment Regulations 1998. • The Management of Health & Safety at Work Regulations 1999. • The Regulatory Reform (Fire Safety) Order 2005. • The Control of Asbestos Regulations 2012. • The Control of Lead at Work Regulations 2002. • The Control of Substances Hazardous to Health Regulations 2002. • The Dangerous Substances and Explosive Atmospheres Regulations (DSEAR) 2015. • The Working at Height Regulations 2005. • The Hazardous Waste Regulations 2005. • The Supply of Machinery (Safety) Regulations 2008. • Ionising Radiations Regulations 2019. • The Corporate Manslaughter and Corporate Homicide Act 2007.

3.2 CLIENT's HSE Requirements

No.	*Title*
MS-63464	Management System and Standards for RBU UK and Ireland
MS-18416	General Health and Safety Rules
MS-22878	Permit to Work
MS-23037	Mechanical Lifting Operations
MS-60540	Manual Handling
MS-62201	Noise Management and Hearing Conservation Programme UK & Ireland
MS-63474	Waste Administration
MS-62187	Waste Storage, Drainage and incidents
MS-18471	Incident Investigation and Reporting in RBU UK and Ireland
MS-21729	Site Emergency Plan for TH2
MS-5984	Portable Electrical Tools
MS-63418	Minimum Standards for Employee Protection from Welding Hazards and Fume
MS-59822	Global Health, Safety and Environment (HSE) Policy
MS-23044	Confined Space Standard
MS-22894	Elevated Work
MS-23040	Physical Isolation
MS-23273	Asbestos Management on BOC Sites
MS-63415	Drug and Alcohol Abuse
MS-60540	Manual Handling
MS-22888	Contractor Control
MS-18438	Risk Assessment
MS-59831	LV Electrical Safety Rules
MS-59790	HV Electrical Safety Rules
MS-59842	Portable Electrical Equipment
NT-606671	Cumene Plant Drawing

3.3 Contractual Deliverables

Following HSE deliverables shall be produced during the Project:

No.	*Title*
1	No significant chemical spillages.
2	All waste is managed in accordance with legislative requirements in terms of the process and documentation.
3	No environmental nuisance complaints.
4	No Lost Time Incidents
5	No Major Event or Noteworthy cases in accordance with CLIENT standard MS-18471

3.4 Scope of work

The scope of this work is as follows:

OSBL (establishment of battery limit):

- Electrical tie in works
- Crane lifting
- Lagging installation
- Heat tracing installation
- Mechanical installation

- Instrument installation

ISBL - Linde scope: Completion of LIC plant:

- Civil preparation work
- Electrical installation
- Crane lifting
- Lagging installation
- Heat tracing installation
- Mechanical installation
- Instrument installation

Note: No work is to be undertaken unless it incorporates the requirements contained in this document and agreed Principal Contractor documentation. In the event of any unforeseen eventualities arising during the project which require significant changes or affect the resources required the following actions are mandatory:

- The Principal Contractor is to be advised immediately.
- Details of the health and safety issues and resulting eventualities are to be submitted to the Principal Contractor as soon as possible.

3.5 Project description

BOC (Client) own and operate a steam methane reformer on the SABIC North Tees petrochemical site on Huntsman drive which is located in the North East of England. BOC intend to construct a new CO2 Capture and Liquefaction Plant (LIC) with 144tpd capacity and integrate this with the existing BOC Steam Methane Reformer (SMR) Hydrogen Plant in Teesside. This will be built to the north of the existing plant. When commissioned, the new plant will capture 20% of the CO2 from SMR Syngas which would normally be vented to atmosphere.

The duration of the Construction phase is anticipated as 12 months between the following dates:

November 2023 - Estimated Construction Phase start date

November 2024 - Estimated Construction Phase finish date

BOC Teesside Hydrogen is a well-established operational site within the main SABIC petrochemical site.

The Principal Contractor is responsible for liaison with site operational personnel during the Project and maintaining goodwill at all times. Project personnel shall ensure regular liaison meetings are in place (formal and informal) with the Principal Contractor management team to prevent disruption of site operations.

3.6 Anticipated working periods

The existing Teesside Hydrogen plant is operated on a 24-hour basis, 7 days per week. However we anticipate core working hours within the project, to enable maximum Client support, to be between the hours of:

- 08:00 hours to 18:00 hours weekdays

- 08:00 hours to 14:00 hours Saturday or Sunday

3.7 Time allocated for each stage of the project.

The following time has been allocated for the project. This reflects the current planning stage and may be amended in cooperation with the Client.

3.7.1 Overview

Task	Scheduled start	Scheduled end
Establishment of site set up and welfare	10th November 2023	21st November 2023
Traffic management	10th November 2023	21st November 2023
Civil works	8th January 2024	14th June 2024
Installation of major equipment (crane)	29th March 2024	30th August 2024
Mechanical installation	8th March 2024	1st November 2024
Electrical and Instrument installation	29th April 2024	30th September 2024
Pre-commissioning	14th October 2024	1st November 2024
Commissioning	21st August 2024	27th January 2025
Operational readiness	Post February 2025	TBC at a later date

3.8 Main CDM Dutyholders

- Client

BOC Teesside Hydrogen, North Tees, TS2 1TT

Email: miranda.cupit@boc.com

Telephone: 07469418857

- Principal Designer

Linde GmbH, Linde Engineering, Bodenbacher Str. 80, 01277 Dresden, Germany

Email: Michael.Schmidt@linde.com

Telephone: +49 89 7445 2675

- Principal Contractor

Linde GmbH, Linde Engineering, Bodenbacher Str. 80, 01277 Dresden, Germany

Email: cameron.innes@boc.com

Telephone: 07544507320

- Consultant/others

North Durham Safety Limited, Station View B, Delves Lane, Consett, Co. Durham, England, DH8 7JS

Email: andrew.brown@boc.com

Telephone: 07707044630

3.9 Site access and egress arrangements

Project construction traffic will primarily be associated with delivery of construction materials and collection of waste materials including spoil from excavations and waste, delivery of storage vessels and major equipment, electrical equipment and other construction materials. It is anticipated that the majority of these materials will be transported to and from the site by Large Goods Vehicles (LGV)s. Other vehicles associated with construction on site can be expected from construction workers and other site personnel accessing the site.

All project construction traffic visiting the project site need to first access the SABIC site and shall enter by the main gate which is accessed from Huntsman Drive shown below.

All site visitors including those involved with the project and deliveries shall be notified to the Principal Contractor in advance for security reasons and to register their presence on site. Unless pre-arranged and agreed by Principal Contractor it is unlikely anyone will be successful at gaining access to site.

Visitors and deliveries must not engage in any site works and where it is not practicable to induct persons, their host is fully responsible for ensuring they are escorted at all times and follow site and project rules including adherence to Personal Protective Equipment (PPE) requirements.

Please note: All persons (including deliveries and visitors) arriving at site MUST be in possession of valid government issued photo identification to gain access.

All contractors will be monitored to ensure they follow the correct access route identified and all routes will be clearly signposted. Temporary warning signage and directional signage will be installed by the Principal Contractor on the route to the site in order to prompt delivery drivers to use the correct route to the site.

You are only permitted to access the project site and are not permitted to enter any other areas of SABIC.

Those leaving the project site in vehicles must follow the same route they entered, driving in the direction they used to access TH2, once they get to the left turn before the fire station (Highlighted in red below) they must follow the one way system to exit the site via the gatehouse.

Remember that SABIC are permitted to search vehicles.

See below entry and exit routes for all vehicles accessing the project site.

Green – Approach and exit from Teesside Hydrogen.
Red – One way system – turn left when existing Teesside Hydrogen at this point and follow one way system.
Note: Alternate route may be required for larger vehicles and this will need planned and approved with SABIC in advance.

The following are SABIC and North Tees Limited (NTL) minimum expectations for deliveries:

Deliveries of large equipment – NTL must be informed in advance and agree Tier 1 and 2 type deliveries with Client/Principal Contactor. Specific communications and traffic management measures are required prior to arrival. For the purpose of clarity the below defines these types of deliveries:

- Tier 1 Abnormal Load" a vehicle that has:
  - a weight of more than 44,000kg but not exceeding 80,000kg;
  - an axle load of not more than 10,000kg for a single non-driving axle and 11,500kg for a single driving axle;
  - a width of not more than 2.9 metres;
  - a rigid length of not more than 18.65 metres.
- Tier 2 Abnormal Load" a vehicle that has any of the following:
  - a weight of 80,000kg or greater
  - an axle load of more than 10,000kg for a single non-driving axle and 11,500kg for a single driving axle;
  - a width of more than 2.9 metres;
  - a rigid length of more than 18.65 metres.

  or such other specification and/or standard of an abnormal load from time to time defined by the Highways Authority.

Standard requirements – all vehicles

- Deliveries must be between the hours of 8am and 4pm pre and post the Construction Phase;
- For unloading activities, the ignition must be switched off, handbrake applied and the driver out of the cab at a safe distance;
- Only diesel vehicles are allowed on site;
- Delivery vehicle keys to be held by the forklift driver during loading/unloading;

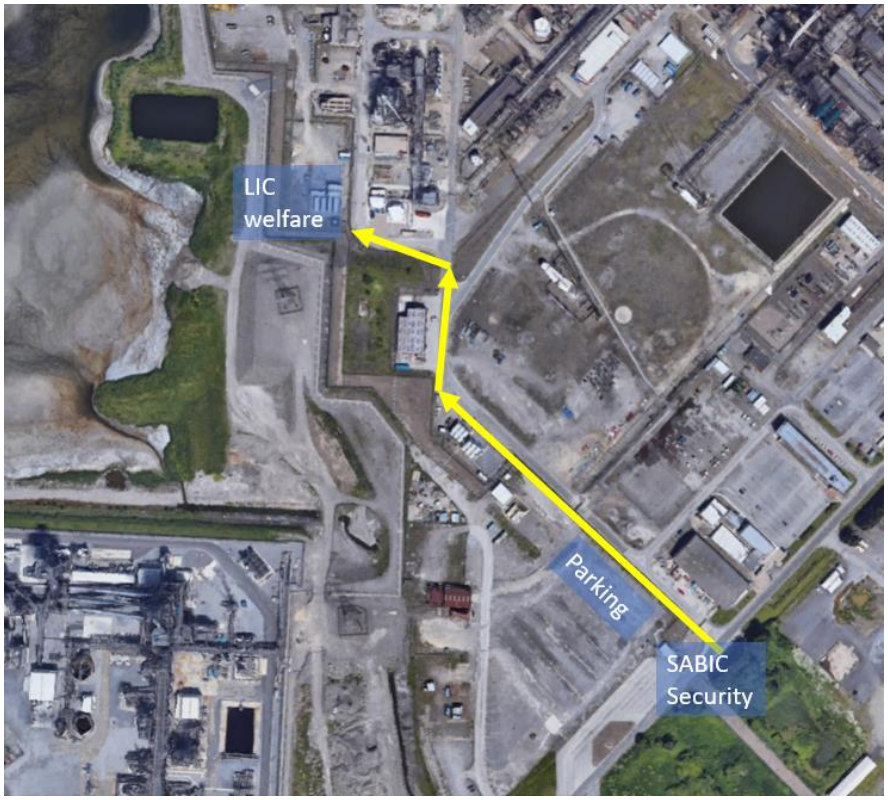
- Drivers must have safe means of access/egress on the vehicle that minimise risk of fall which must be clear during loading/unloading activities. Vehicles without suitable fall prevention methods will not be accepted on site;

Where it is not practicable to fully induct delivery drivers it will be the responsibility of the host accepting the delivery to ensure compliance with project and site rules while on site, to provide close supervision and ensure the correct use of Personal Protective Equipment (PPE). In this case a SABIC induction will still be required at the SABIC gatehouse.

Small vehicle parking and pedestrian access
Parking is located off Huntsman Drive on the left on the lead up to the SABIC gatehouse. Reverse parking to be observed.

Proceed to the security cabin marked SABIC Security below where you will complete a short SABIC induction. You will need photographic government issued identification. Note as a reminder you must notify Principal Contractor in advance (3 days) prior to arrival. Upon notification, Principal Contractor will complete a short form. See appendix ***Form MP1222-05*** to notify SABIC of arrival.

From here you will be directed on foot to the project welfare area. See below image, route highlighted in yellow. You will need high visibility clothing which must be worn at all times when inside the SABIC gate.



4 Leadership and Commitment

4.1 "BeSafe"

BeSafe is a PRINCIPAL CONTRACTOR behaviour-based safety program that focuses on workers' behaviour as an important aspect for the prevention of work-related injuries and illnesses. It is based on solid principles about engaging, motivating, assisting, reinforcing, and sustaining safe behaviours. It is a tool that will enhance the effect of already existing practices and will allow for an objective measurement of the CONTRACTOR'S safety performance in the workplace.

PRINCIPAL CONTRACTOR's safe work procedure &AE-W-SC 9620 "BeSafe Program" must be applied.

4.2 Incentive Scheme/Program

PRINCIPAL CONTRACTOR will implement the CONTRACTOR's Incentive Scheme/Program as defined in &AE-W-SC 9620 "BeSafe Program" at the site to increase awareness and promote a safety culture.

4.3 Recognition and Consequences Management

The Recognition and Consequences Management (R&CM) must be applied to CONTRACTOR when there is a behaviour or action identified that either exceeds or falls below expectations as defined by PRINCIPAL CONTRACTOR rules, policies, procedures, operating instruction, etc. The R&CM principles must be applied to advance the site safety culture.

The PRINCIPAL CONTRACTOR's flowchart of Recognition & Consequence Management (Refer to Attachment 1) provides:

- a series of questions relating to observed behaviours to qualify them into preliminary behaviour category.
- a series of qualification check questions to determine whether the preliminary behaviour is specific to a single incident/event or relates to routine/repeat findings.
- a range of consequences (positive and negative) that can be applied depending on the categorisation of the observed behaviour.

5 Policies and Objectives

5.1 Policies

5.1.1 PRINCIPAL CONTRACTOR HSE Policy

The Linde Engineering HSE Policy (&AX-Q-QP 1041 (EN)) is the basis for development of Linde tools and processes that will help guide thinking and actions. Over time, the policy will influence behaviours, embed the desired HSE culture at Linde and help to remind of Linde personal responsibilities. (Refer to Attachment 2: Linde Engineering HSE Policy and Linde Safety Principles)

5.1.2 PRINCIPAL CONTRACTOR's Life Saving Rules

The Linde Life Saving Rules (&AX-Q-QP 2002) aim to prevent serious injuries and fatalities, and to support the journey towards a Leading HSE performance and culture. They are based on incidents and experiences within Linde and reflect legal requirements that apply in many of the countries in which Linde operates. The Life Saving Rules reinforce those critical areas of our existing management system that present a high risk of serious injury or fatality if not followed. Disregard of the lifesaving rules will be dealt with by the management and HR in the same manners as any other serious misconduct or breach. (Refer to Attachment 3: Linde Life Saving Rules.)

5.1.3 The Golden Rules of Information Security

These are guiding principles for users focusing on Information Systems security and safe behavioral practices. They aim at raising user awareness and adopting important IS security practices both at work & at home. (Refer to Attachment 4: The Golden Rules of Information Security)

5.2 Project Objectives & Indicators

5.2.1 Overall Project Objectives

The implementation of the Construction Phase Plan should help in achieving following objectives:

Linde Global Construction HSE Objectives must be updated for the current year.

	Type	Objectives	Measures
PRINCIPAL CONTRACTOR	**Leadership & Commitment**	Personal ownership for HSE through visible, demonstrated HSE leadership and accountability at all levels	BeSafe Index = 1900 LeadSafe Engagement Quality check on PRINCIPAL CONTRACTOR Managers/Supervisors = 100% / Month HSE activities by PRINCIPAL CONTRACTOR Managers/Supervisors = 25 / Month Implementation of LFIs > 98%
	Occupational Health & Safety	Zero Accidents	TRCR < 0.31 (Global Execution EMEA (incl LEHQ, LEI) Major Events = 0 Lost Workday Cases from Injury and Sickness Cases = 0 Human Factor Engineering issues reported during construction & commissioning > 2
	Environmental stewardship	Environmental stewardship ensured in the development and use of resources, products and services.	EIFR < 0,23 (all severity levels) Serious Environmental Incidents = 0 Environmental site inspections = 4 / Month
	HSE Assurance	Comply with applicable legal, regulatory requirements	HSE Audit Compliance > 98% HSE Audit Close-out (in time) > 95% Environmental breaches / infringements (not incident related) = 0
	Social performance	Work with our business partner to actively promote and enforce HSE specifications	Written complaints / Non- conformities (Client, authorities, Contractors, etc.) = 0

5.2.2 CONTRACTOR HSE Key Performance Indicators

CONTRACTOR's HSE performance will be evaluated during the weekly progress meeting. Following key HSE indicators will be considered:

- Recordable Cases > 1 and TRC-Rate* > 0.2
  *Recordable Cases per 200.000 hours
- Environmental Incidents > 1 and Environmental Incident-Rate* > 0.2
  *Environmental Incidents per 200.000 hours
- SIF Potential Cases* > 3 and SIF Potential-Rate** > 0.6
  *SIF Potential Case: Unsafe acts or conditions or incidents with the potential for serious injury or fatality
  **SIF Potential Cases per 200.000 hours
- Not reporting a recordable or environmental incident to PRINCIPAL CONTRACTOR

- HSE Interactions* per 1.000 hours < 10
  *HSE Interactions: Toolbox Talks, BeSafe Daily Talks, Safety Dialogues and similar
- HSE Audit Compliance < 80% in 2 subsequent audits
- Weekly Management Safety Walk-Through Close-out (in time) < 90% in 4 subsequent weeks
- Incident Investigation Action Close-out (in time) < 100% in 2 incident cases

In case the HSE performance achieved by CONTRACTOR for any of these HSE key performance indicators is not satisfying, PRINCIPAL CONTRACTOR may decide to initiate the actions defined below :

- CONTRACTOR must proposed an improvement plan within one week after progress review was completed and it must be approved by Principal Contractor.
- PRINCIPAL CONTRACTOR is entitled to provide the site with additional PRINCIPAL CONTRACTOR supervision personnel in case - due to reasons attributable to CONTRACTOR - CONTRACTOR's performance of the work is not as per any of the defined HSE key performance indicators and CONTRACTOR does not take appropriate actions as deemed necessary and approved by PRINCIPAL CONTRACTOR.
- CONTRACTOR shall bear the costs for such additional PRINCIPAL CONTRACTOR's supervision, as well as for other appropriate monitoring and control measures with remuneration in this regard being paid based on the usual market hourly rates.
- PRINCIPAL CONTRACTOR shall also be entitled to request CONTRACTOR to exchange key site personnel of CONTRACTOR (of all levels as deemed necessary by PRINCIPAL CONTRACTOR).

6 Project Organisation and HSE Responsibilities

6.1 PRINCIPAL CONTRACTOR

6.1.1 PRINCIPAL CONTRACTOR's Project Manager

The Project Manager (PM) is responsible for HSE aspects in the project and should perform HSE management in such a manner that this activity is coordinated with the other project activities.

HSE management comprises the systematic effort to ensure that all activities executed will be performed according to applicable HSE rules and regulations. This includes establishment and updating of the Construction Phase Plan, implementation of HSE requirements in the project execution and allocation of necessary resources for implementation, documentation and verification in accordance with the HSE Program.

During Detail Engineering the PM initiates the preparation of this project-specific Construction Phase Plan. He/she contributes to clarify the CLIENT's and locally applicable country HSE specific requirements.

Consultation of the Project Management in matters of HSE is provided by the Lead Construction & Commissioning HSE.

For other tasks, refer to the job description for PM (section 9)

6.1.2 PRINCIPAL CONTRACTOR's Project Construction Manager and Discipline Lead

The Project Construction Manager (PCM) and the Discipline Leads are responsible for HSE aspects related to his/her discipline. During execution of the assigned tasks he/she must ensure that legal, contractual and internal HSE requirements are observed.

The PCM is responsible for the approval of all general HSE documents.

For other tasks, refer to the job description for PCM and Discipline Lead (section 9).

6.1.3 PRINCIPAL CONTRACTOR's Site Manager

The Site Manager (SM) has the overall HSE responsibility during the execution of the work on the work site. He/she is also the coordinator with regard to safe cooperation of all companies at construction site during construction. He/she has the duty to ensure that the HSE requirements are implemented in accordance with this project-specific Construction Phase Plan. In general, this encompasses the following tasks:

- Forwarding the requirements to all the disciplines and involved parties.
- Instructing new employees and ensuring the instruction of the CONTRACTORs' employees by their superior on the local and project-specific health and safety precautions, health and environmental measures, alarm and contingency plans and required response in the case of emergency alarms (7.9).
- Checking and issuing the work permits (if not assigned to PRINCIPAL CONTRACTOR's Site Superintendents or Site Supervisors) (See 7.1.6)
- Reviewing the implementation of the work permit system (section 7.1.6) and of the implementation of protective measures against hazards on site (section 7.2)
- Preparing the monthly HSE report (section 7.10.3).
- Preparing an HSE Coordination Plan (Attachment 8)
- Carrying out Risk Assessments for all activities performed by PRINCIPAL CONTRACTOR's personnel (section 7.1).
- Implementing the safety measures defined in the Risk Assessment Construction Site for PRINCIPAL CONTRACTOR's personnel.
- Coordinating the interfaces with respect to HSE aspects.
- Compiling a list of all First Aider (Attachment 6) and other required HSE support functions and making it available to all people at site.
- Preparing a list of hazardous chemicals present at site (section 7.4.10).
- Monitoring the adherence to the HSE requirements; organising regular meetings to discuss HSE issues; performing regular construction site inspections along with the recording of HSE issues (sections 7.10 and 7.11).
- Taking responsibility for reporting and investigation of incidents and accidents of PRINCIPAL CONTRACTOR's personnel, external employees and of CONTRACTOR's personnel (section 7.10.5).
- Approving the CONTRACTORs' HSE Plans (section 6.2.2)
- Implementing and operating the waste management plan, including observing environmental regulations and requirements (section 7.8).
- Updating the Construction Phase Plan if requirements must be modified and communicating the modifications to PRINCIPAL CONTRACTOR's and CONTRACTORs' personnel at site and to PRINCIPAL CONTRACTOR's Lead Construction and Commissioning HSE.
- Updating the “Assignment of HSE Responsibilities” (&AZ Q-QB 1050.020.002) as responsibilities are handed over to a new PRINCIPAL CONTRACTOR Site Manager (e.g. when commissioning manager takes over)
- Participate in audits, inspections and safety walks.

For other tasks, refer to the job description for SM.

SM may transfer responsibilities that have been assigned to him/her to another person, e.g. the Construction Manager or the Commissioning Manager but the overall accountability remains by SM at any time.

The working relationships with the unions, any employer liability insurance association or similar organizations are to be organised and controlled by the SM or by the Site HSE Manager in agreement with the CLIENT; regular construction site inspections are to be arranged with the applicable entity (e.g. authorities), if necessary.

6.1.4 PRINCIPAL CONTRACTOR's Construction Manager

The Construction Manager (CM), who is deployed, performs either some or all HSE duties of the SM. He/she is responsible for the HSE interests in the range of his/her special field of activities on site. For other tasks, refer to the job description for CM (section 9).

6.1.5 PRINCIPAL CONTRACTOR's Commissioning Manager

The Commissioning Manager (CMM) has the responsibility for HSE during the Commissioning if a SM has not been assigned.

If a SM is not assigned or if SM is handing over the Site to CMM, CMM has the same rights and duties like the SM.

For other tasks, refer to the job description for CMM (section 9).

6.1.6 PRINCIPAL CONTRACTOR's Lead Construction & Commissioning HSE

The Lead Construction & Commissioning HSE executes the tasks necessary for the compilation of the Construction Phase Plan. As far as HSE aspects are concerned he/she is the contact person for CLIENT, PM, PCM, SM, CM, CMM and PRINCIPAL CONTRACTOR's Construction organisation. He/she also coordinates the review of the implementation of the Construction Phase Plan.

For other tasks, refer to the respective job description for Lead Construction & Commissioning HSE (section 9).

6.1.7 PRINCIPAL CONTRACTOR's Site HSE Manager

To support the Construction Site Management personnel with regard to HSE, a full-time Site HSE Manager will be assigned.

The main responsibilities and functions of the Site HSE Manager are:

- Support of the Site Manager in fulfilling his/her HSE tasks.
- Provision of assistance to functional departments in HSE aspects.
- Co-ordination of HSE planning. Set up, implementation and management of the Construction Phase Plan for all phases of construction and commissioning. This includes also the co-ordination of the different CONTRACTORs with regard to HSE
- Review and verification of critical aspects with regard to HSE. Initiation of studies, verifications, reviews or audits when deemed as necessary.
- Co-ordination of documentation, and when relevant, participation in meetings with authorities.
- Co-ordination of the HSE efforts in the project,
- Monitoring and reporting HSE performance
- Ensuring that the inspection processes for equipment that require them are in place
- Facilitate investigation of incidents and accidents
- Prepare project specific and review existing training materials and support PRINCIPAL CONTRACTOR's and CONTRACTOR's personnel regarding trainings on HSE topics.
- Support in defining task specific safety measures and personal protective equipment.

For other tasks, refer to the respective job description for Site HSE Manager (section 9).

6.1.8 PRINCIPAL CONTRACTOR's Site HSE Engineers / Supervisors

Site HSE Supervisors will be assigned

- when the contractors' overall manpower exceeds 200 persons
- in a ratio of 1 HSE Engineer/Supervisor per 500 persons on site.

6.1.9 PRINCIPAL CONTRACTOR's Site Superintendent

The tasks of the Site Superintendent follow PRINCIPAL CONTRACTOR's internal Task Description. He/she is responsible for a specific field of activity on site including all HSE relevant aspects. He/she (or PRINCIPAL CONTRACTOR's Site Supervisor) checks and issues the work permits applicable in the respective discipline (see 7.1.6).

For other tasks, refer to the respective job description for Site Superintendent.

6.1.10 PRINCIPAL CONTRACTOR's Site Supervisor

If it is necessary to classify a specific field of activity, every classified field is lead by a dedicated Site Supervisor. He/she is responsible for the designated field activities on site including all HSE relevant aspects. He/she (or PRINCIPAL CONTRACTOR's Site Superintendent) checks and issues the work permits applicable in his/ discipline (see 7.1.6).

6.2 CONTRACTOR

6.2.1 General responsibilities

CONTRACTORs are responsible for managing all Health, Safety and Environmental aspects of their own work in accordance with their contracts.

CONTRACTORs are responsible for implementing an overall HSE Management System and to ensure that their HSE Policy and Regulations match the HSE requirements of local authorities, CLIENT and PRINCIPAL CONTRACTOR. CONTRACTOR's HSE management system must cover Health, Safety and Environment activities and requirements necessary for the protection of people, environment and material assets during procurement, fabrication, construction and commissioning / start-up of the contracted work and of the work contracted to all SUB-CONTRACTORs. The CONTRACTORs are required to plan and arrange their work execution in a manner that minimise risks to the maximum extent reasonably practicable.
It is the responsibility of the senior management of all CONTRACTORs to adapt and take ownership to the overall HSE management system and to follow the leadership principles set forth in the project for their contract work.

CONTRACTOR´s Management must be competent and authorised to deal with all matters and decisions to give instructions regarding commencement of the work in an HSE acceptable mode.

CLIENT and PRINCIPAL CONTRACTOR reserve the right to increase or modify HSE requirements and procedures as work will progress, but nothing in those given regulations and procedures are to be construed as relieving the CONTRACTOR of its obligations under the contract or of its obligations under any applicable municipal, local or governmental regulations or codes. Those requirements and procedures will assist CONTRACTORs in establishing their own procedures to manage their work. PRINCIPAL CONTRACTOR and/or CLIENT will handle and coordinate all applications, notifications and contact with the authorities if not otherwise specified in the contract or the Construction Phase Plan.
CONTRACTORs must not contact authorities (unless required by law) without prior written consent from PRINCIPAL CONTRACTOR and CLIENT.

CONTRACTOR is obliged to report any incidents and accidents to PRINCIPAL CONTRACTOR's site management in a timely manner. Relevant incidents need to be investigated (see 7.10.5).

Prior to start of the activities on site, CONTRACTOR shall provide the PRINCIPAL CONTRACTOR with all necessary documentation described in this Program as well as in the document &AZ-W-LF 9603 "HSE documents to be prepared by Contractor". PRINCIPAL CONTRACTOR will give the authorisation to start once the documentation has been reviewed and approved according to the document &AZ W-LF 9608 "Readiness to Start Matrix".

6.2.2 CONTRACTOR's HSE Plan

CONTRACTORs must establish, provide and implement their own HSE Plan valid for their scope of work to assure commitment throughout all levels within the organisation concerning local, CLIENT's and PRINCIPAL CONTRACTOR's requirements. CONTRACTOR's HSE Plan must comply with PRINCIPAL CONTRACTOR's Construction Phase Plan.

CONTRACTOR's HSE Plan for the construction site activities must comprise as a minimum the following aspects and documents:

- HSE policy, showing commitment to Health, Safety and Environmental Protection
- Organisation chart showing HSE responsibilities and HSE organisation at site
- Training and individual qualification including records of regularly conducted safety training and evidence of special qualifications for personnel performing specialised tasks
- HSE requirements for SUB-CONTRACTORs

- Detailed work instructions for CONTRACTOR's scope of work
- Emergency response including a project specific emergency response plan
- Fire safety plan
- Documented Risk Assessment / Risk Evaluation / Job Safety Analysis for CONTRACTOR's scope of work
- Handling of hazardous materials including material safety data sheets (MSDS) and a list of hazardous chemicals used on site, see **Fehler! Verweisquelle konnte nicht gefunden werden.**)
- Organisation of first aid including a list of First Aiders
- Organisation of tools & equipment certification and inspection process including relevant inspection records
- Occupational health and environmental aspects including records of medical examinations as far as reasonably practicable under local legislation to prove the worker's fitness to work.

see also &AZ-W-LF 9603 "HSE documents to be prepared by Contractor".

CONTRACTOR's HSE Plan must be approved by PRINCIPAL CONTRACTOR before commencing work.

The HSE Plan must be updated by CONTRACTOR in case of any modifications of local, CLIENT's and PRINCIPAL CONTRACTOR's requirements and be re-approved by PRINCIPAL CONTRACTOR afterwards.

The CONTRACTORs must define and document their methods for bringing their policy statement and HSE plan to the attention of their personnel, as well as their requirements for advising personnel of any changes to the policy and the HSE plan.

CONTRACTOR must verify the implementation of its HSE Plan by:

- monitoring HSE performance at the different work places
- monitoring the handling and efficiency of the established Work Permit System
- checking Risk Assessments and job safety analyses
- having a close follow-up in the different work areas to ensure the conformity with valid laws and regulations
- conducting safety inspection walks (see 7.11)
- participating in HSE inspections arranged by PRINCIPAL CONTRACTOR and/or CLIENT's Site management (see 7.11)
- performing and/or organising HSE training and Tool-box meetings (see 7.4.2, 7.11)
- participating in safety, coordination and construction meetings (see 7.11)
- establishing an HSE information and instruction system on Site to ensure that necessary HSE-information is routed to all concerned parties without delay
- maintaining an effective cooperation with PRINCIPAL CONTRACTOR's HSE organisation and other CONTRACTORs in all HSE related matters
- conducting investigation and reporting of all incidents and accidents.

The CONTRACTOR must take responsibility of implementation of these requirements also for SUB-CONTRACTORs.

6.2.3 CONTRACTOR's Management

The CONTRACTOR management team(s) must be personally and directly involved by participating in relevant meetings, HSE audits, HSE inspections and show visible leadership. HSE is a line responsibility, and this principle is vital for the implementation of an effective HSE organisation.

6.2.4 CONTRACTOR's Construction Manager

The Construction Manager is responsible for CONTRACTOR's personnel and the implementation of PRINCIPAL CONTRACTOR's and CONTRACTOR's HSE Plan.

6.2.5 CONTRACTOR's Site HSE Manager

CONTRACTOR must nominate an authorised Site HSE Manager who is integrated into the project team and must give support to the implementation of all procedures on site. CONTRACTOR's Site HSE Manager must be approved by PRINCIPAL CONTRACTOR's Site Manager and PRINCIPAL CONTRACTOR's Site HSE Manager. The authorised Site HSE Manager must be a person who is competent and trained in HSE and who has a minimum working experience of 5 years in the respective field of construction and in the implementation and follow up of HSE requirements with regard to the CONTRACTOR's scope of work. Training certificates and a resume must be submitted to PRINCIPAL CONTRACTOR.

The minimum requirement of the presence of CONTRACTOR's Site HSE Manager on the construction site is as follows:

CONTRACTOR's Manpower

(including SUB-CONTRACTORs)	Attendance on site
1 – 50 employees	required on demand (e.g. for incident investigation)
> 50 employees	full time

CONTRACTOR's Site HSE Manager must not perform non-HSE related tasks during this time.

PRINCIPAL CONTRACTOR reserves the right to instruct CONTRACTOR to increase the number of its Site HSE Managers or to exchange the assigned personnel in case of continuous disregards of the regulations stated in this Construction Phase Plan or if the HSE performance of CONTRACTOR puts the achievement of the project objectives at risk. This will be at no additional cost to PRINCIPAL CONTRACTOR.

6.2.6 CONTRACTOR's Safety Officers

The CONTRACTOR must deploy Safety Officers in an amount described as follows:

CONTRACTOR's Manpower

(including SUB-CONTRACTORs)	Safety Officers
91 - 150 employees	1
151 – 210 employees	2
every further 60 employees or part thereof	1 more

CONTRACTOR's Safety Officers may be selected from the worker (not supervisor or management) level and perform their HSE related tasks during their normal duties.

Safety Officers will assist the CONTRACTOR's Authorised Site HSE Manager in his duties and tasks by liaising / working directly with field supervisors, craft and workers.

They play an active role in daily field monitoring and advice to supervisors, craft and workers on safe practices and recommend on-the-spot corrective actions when needed. The Safety Officers must be approved by PRINCIPAL CONTRACTOR.

The Safety Officers must be trained appropriately in HSE and have a minimum working experience of 3 years in the respective field of construction and in the supervision of HSE requirements regarding the CONTRACTOR's scope of work. Training certificates and a resume must be submitted to PRINCIPAL CONTRACTOR.

Newly degreed safety professionals should be enrolled in a safety mentorship program once on site for continuous learning purposes.

The described numbers of Safety Officers must be available during all time work is carried out.

PRINCIPAL CONTRACTOR reserves the right to instruct CONTRACTOR to increase the number of its Safety Officers or to exchange the assigned personnel in the case of continuous disregards of the requirements stated in this Construction Phase Plan or if the HSE performance of CONTRACTOR puts the achievement of the project objectives at risk. This will be at no additional cost to PRINCIPAL CONTRACTOR.

6.2.7 CONTRACTOR's Supervisor

Supervisors are necessary if a CONTRACTOR has more than one worker on site. Supervisors must coordinate work of CONTRACTOR's personnel. On the construction site, it is the supervisor who performs or arranges the task-related HSE instruction to be performed. The supervisor requests the work permits for CONTRACTORs.

6.2.8 CONTRACTOR's SUB-CONTRACTORs

SUB-CONTRACTORs must organise their HSE processes like the CONTRACTORs.

6.3 VENDOR

VENDORs are responsible for managing all Health, Safety and Environment aspects of their own work in accordance with local legislation, their contracts and the HSE requirements of this Construction Phase Plan.

VENDOR's delegated employee(s) must present the following to PRINCIPAL CONTRACTOR prior commence of any activities at site:

- Evidence of participation in CLIENT's/OWNER's safety induction
- Documentation of risk assessment covering the activities related to the contractual work
- Evidence of having received a corporate safety instruction or training on HSE related aspects of the activities to be carried out (e.g. mechanical work, working at height, use of PPE etc.)
- Evidence of medical fitness to work regarding the activities to be carried out (e. g. for working at height, use of breathing apparatus, working in noisy environment ('noise zones') etc.)
- List and Material Safety Data Sheets of hazardous materials that will be applied
- Proof of equipment inspection or certifications by a competent person or third party
- PRINCIPAL CONTRACTOR must check and approve the documentation and request remedial actions in case of any deficiencies.

VENDOR staff must:

- perform their work according to the contract, local legislation, VENDOR's risk assessment and the site HSE regulations defined by CLIENT
- fulfil the HSE requirements for VENDORs and its personnel as defined in the contract with the VENDOR (reference is made to &AZ W PE 9607 ‘HSE Requirements for Vendors on Construction Sites’)

6.4 Employees and Personnel

All personnel of PRINCIPAL CONTRACTOR and CONTRACTOR shall perform their work according to the project HSE requirements. Personnel must report immediately to their supervisor any observed HSE incidents with low hazard potential (e.g. unsafe acts or conditions, near miss) or higher hazard potential (e.g. Lost Time Injury, Medical treatment case, incident with potential for a severe injury or fatality, environmental incidents etc). Personnel must be familiar with the HSE relevant aspects related to their workplace and project activities.

6.5 First Aider

A First Aider is a person who provides first aid in case of an accident. First Aider must be trained appropriately (e.g. according to local regulations or if not existing any recognised standard). The minimum requirement of available First Aiders at the construction site at all times work is ongoing is as follows:

A list of all project First Aiders must be established, maintained up-to-date and visibly displayed at the construction sites.

PRINCIPAL CONTRACTOR's/CONTRACTOR's Manpower (present at site)	First Aider
2 - 29 employees	1
> 29 employees	5 % (at least 2)

In addition to the above, Client utilises a site-based emergency services provider for all medical treatment cases. Any incidents causing personal injury, however minor, should be reported immediately to the BOC permit issuing station, who will call for medical assistance as necessary.

6.6 Fire Watch

The Fire Watch is a trained person who ensures that according to the hot work permit proper firefighting equipment is readily available; He/she carries out gas measurements, records the measurement results and signs off the hot work permits. He/she stays permanently at the workplace.

In case of fire he/she must extinguish fire only within his/her capabilities and without self-endangerment. The Fire Watch stays on watch as long as defined in the work permit after hot work has been completed or after fire has been extinguished.

The necessity of a Fire Watch is defined in the work permit. For hot work with low fire hazard, the person carrying out work can be appointed as Fire Watch.

6.7 CLIENT

6.7.1 CLIENT's Project Manager

CLIENT's Project Manager is a nominated person by CLIENT. He/she is representing CLIENT in all aspects including HSE. He/she is the contact person for PM and SM.

CLIENT's Project Manager has the overall HSE responsibility for the project. CLIENT's Project Manager will follow-up the HSE status at site, initiate corrective actions if required and provide support to Principal Contractor.

6.7.2 CLIENT's Plant Manager

CLIENT's Plant Manager is a person nominated by CLIENT. He/she is the responsible person for the plant operation.

6.7.3 CLIENT's Regional SHEQ Advisor

CLIENT's Regional SHEQ Advisor is a person nominated by CLIENT. He/she supports CLIENT's Project Manager in all HSE matters.

6.7.4 CLIENT's Site HSE Coordinator

CLIENT's SHEQ Consultant is a person nominated by CLIENT. He/she prepares the CLIENT's Pre-Construction information, reviews and, if necessary, updates it. The CLIENT's Pre Construction Information document is the basis to carry out work safely in the construction and commissioning phase. The Principal Contractor HSE Manager works towards the implementation of requirements and instructions regarding safe cooperation of all companies at construction site.

6.8 Site Organisation

See Attachment 5: Site Organisation

6.9 Hand-over of HSE Responsibilities

In general, HSE responsibilities are always part of the overall responsibility of any individual or party performing, supervising or managing a certain task. Due to the nature of any project, changes in responsibilities which include the handover of HSE responsibilities will occur. It must be ensured that these changes and handovers are properly executed, documented, understood and communicated, so any unclarities or misunderstandings are avoided.

- Change of PRINCIPAL CONTRACTOR Site Manager role (typically when commissioning manager takes over)
  - the site organisation chart must be updated accordingly
  - the “Assignment of HSE Responsibilities” (&AZ Q-QB 1050.020.002) must be renewed
- PRINCIPAL CONTRACTOR internal handover
  - HSE responsibilities are part of the overall responsibility of the party (construction or commissioning) currently “owning” a handover system (HOS).
  - The assignment of HSE responsibilities follows the split of work into HOS.
  - HSE responsibility for a HOS includes:
    - Duty to ensure that the parts of the HSE management system relevant for the HOS are implemented (e.g. trainings, inspections, incident investigations, LeadSafe Engagements, permit to work system, etc.)
    - The role of the “permit issuer” for all work being executed on the HOS
  - System handover in this project will occur at status RFPC or RFC or … *[as per ‘MC Engineering‘ (&AZ Q-PP 2410.050.010) and ‘Mechanical Completion (MC) Certificate’ (&AZ W-RA 9202.003) handover of HOS is defined to occur at status “RFC”]*.
  - To ensure a systematic and structured handover of a HOS, an appropriate certificate [*for handover at status “RFC:* ‘Mechanical Completion (MC) Certificate’ (&AZ W-RA 9202.003), *for handover at status “RFPC”:* ‘Release for Pre-Commissioning‘ (&AZ W-RA 9202.002)] shall be used confirming the status of the HOS and the transfer of HSE responsibilities from construction to commissioning.
  - When all HOS have reached status “RFC”, the ‘Plant Mechanical Completion Certificate’ (&AZ W-RA 9202.004) will be signed and issued and site management is handed over to the commissioning manager, who will assume the role of PRINCIPAL CONTRACTOR’s Site Manager.
- Handover to CLIENT
  - With transfer of “operational control”, care and custody of a system or plant is transferred to CLIENT.
  - HSE responsibilities are always transferred with the operational control.
  - Typical HSE responsibilities & tasks taken over by CLIENT include:
    - Establishment of a HSE management system, appointment of HSE staff
    - Permit to work system
    - Emergency preparedness and response
    - Plant security and access management, incl. HSE induction
    - Incident management
  - Typical HSE responsibilities & tasks remaining with PRINCIPAL CONTRACTOR, for its own scope of work, include:
    - Preparation or review of HSE risk assessments or Job Safety Analysis
    - Contractor/vendor management incl. monitoring, inspections
    - Active participation in CLIENT’s HSE management system, e.g. incident reporting, participation in incident investigations, HSE meetings, HSE safety walks, etc.
  - Plant handover in this project will occur at status MC or RFSU or RFO or PA

- If not specified otherwise in the contract, the template “Plant Handover Certificate” (&AZ W-QA 9602) shall be used. In case other templates must be used, it must be ensured that these also include a clear description of the HSE responsibilities/tasks being transferred.

7 HSE Processes Management

7.1 HSE Risk Management

7.1.1 Method Statements (MS)

Method Statements help to clarify the execution of given activities by identifying and listing the basis structure of all tasks necessary for the execution so that supervisors, workers and any other persons at the workplace understand the requirements that have been established to carry out the works or tasks safely.

Method Statements must be prepared for any work as specified in the applicable legislation or contractual specifications/exhibits. Method Statements must also be prepared for activities involving 'High Risk Activities' listed in LS 940-03 "List of hazardous work" (e.g. roof installations on tanks and machine houses) upon request of PRINCIPAL CONTRACTOR's Site Manager.

Method Statements must include, at least, the following elements:
1. Short description of work to be carried out
2. information about the location where the work shall be carried out
3. information about the equipment to be used
4. information about the manpower required (trade, approx. number)
5. Detailed description of the main activities (incl. short description of side activities) according to logical sequence break down
6. Indication on structural or environmental limitations

The MS form can be according to CONTRACTOR's standard Method Statements form. For each Method Statements an HSE Risk Assessment must be prepared (Refer to 7.1.2)

When required, CONTRACTOR must submit method statements, at least 2 weeks ahead of a scheduled project work activity for review and approval by PRINCIPAL CONTRACTOR.

7.1.2 HSE Risk Assessment (General)

An HSE Risk Assessment must be carried out by all parties (PRINCIPAL CONTRACTOR and CONTRACTORs) to identify the significant hazards and control measures required to prevent injury, ill health or environmental impacts whilst carrying out the routine work and standard activities. It must be completed before starting work (see Attachment 7: Risk Management Concept).

The HSE Risk Assessment must be based on typical hazards and potential risks present at site and must define related control measures considering the requirements specified by CLIENT or project specific HSE studies.

CONTRACTORs are responsible for carrying out project specific HSE Risk Assessments for their own work and activities.

HSE Risk Assessments must be prepared for each and every construction and (pre-) commissioning activity (e.g. scaffolding, excavating, crane operation, forklift truck operation, pressure testing, etc.). If a method statement is required for a specific activity, the HSE Risk Assessments must be attached to that method statement (refer to 7.1.1).

CONTRACTOR's HSE Risk Assessment for a specific activity must include, at least, following steps:

1) Definition and description of the activity (task, personnel, equipment, process or work steps, workplace, environment, surrounding, etc.).
   This must include a description of side tasks directly related to the activity such as assembly, mounting, preparing, maintaining (e.g. regular flushing, cleaning), inspecting and any abnormal operations that can potentially become necessary due to unplanned events (e.g. removing blockages, dealing with disfunctions etc.)
2) Identification of HSE hazards related to the activity
3) Evaluation and assessment of risks
4) Identification and evaluation of necessary control measures

CONTRACTOR must plan and arrange the execution of its work so that risks are ALARP (As Low As Reasonably Achievable) by:
- eliminating the hazards,

- substituting the sources of hazards
- engineering controls to isolate hazards (e.g. collective protective equipment)
- providing administrative controls (e.g. procedure changes, employee training, and installation of signs and warning labels
- providing Personal Protective Equipment (e.g. PPE, training, labeling etc.)

The HSE Risk Assessment form can either be according to CONTRACTOR's standard or PRINCIPAL CONTRACTOR's standard (see &A?-W-QR 9602 'Risk Assessment – General' '). The Risk Assessment must be handed over to the Site HSE Manager for approval. The approval is a mandatory prerequisite to start work.

7.1.3 Job Safety Analysis (JSA)

Job Safety Analysis (JSA) detailing step by step how a job/task is to be carried out safely, must be carried out when planning hazardous works or tasks with high risks (see 'High Risk Activities' listed in LS 940-03 "List of hazardous work") or as required when issuing a work permit (see 7.1.6). If a method statement is required for a specific High Risk activity, the JSA must be attached to that method statement (refer to 7.1.1).

Whilst a HSE Risk Assessments (section 7.1.2) can cover the execution of a specific activity during the whole project period (e.g. piping works), a JSA must be time specific for the relevant activity (e.g. confined space entry into a specific tank, with a specific task, at a specified point of time, with a specified team of workers etc.)

A JSA must include at least the following stages:

1. Defining the job or task to be analysed (*e.g. confined space entry of LIN tank*)
2. Breaking the task down into a sequence of steps
3. Identifying potential hazards related to each step
4. Listing preventive measures to overcome identified hazards.

The JSA form can either be according to CONTRACTOR's standard or according to PRINCIPAL CONTRACTOR's Job Safety Analysis form (see &AZ-W-QR 9604 'Job Safety Analysis').

7.1.4 Risk Assessment of Interfaces and Coordination of Work

In addition to the prevention of risks specific to PRINCIPAL CONTRACTOR and each CONTRACTOR, there are additional risks related to the interference between PRINCIPAL CONTRACTOR and/or all CONTRACTORs present and working simultaneously at site that must also be assessed and mitigated prior work/activities start. The same might apply for CLIENT operations with simultaneous construction and/or commissioning activities.

For the coordination of works the following steps will be carried out:

- Implementation of a Permit to Work System (refer to 7.1.6)
- Regular meetings for HSE, coordination etc. (refer to 7.10)
- Risk Assessment of Simultaneous Operations SIMOPS (refer to 7.1.5)
- HSE Coordination Plan (as soon as two or more contractors work in the same area)

The HSE Coordination Plan (see Attachment 8) must be prepared by PRINCIPAL CONTRACTOR in cooperation with CONTRACTORs' Site Managers and updated regularly as project construction work is progressing and additional CONTRACTORS are joining. The plan must comprise a plot plan and a table:

- The plot plan gives information about the disciplines working simultaneously on the construction site in the validity period of the plan. Each discipline will be assigned to a different colour. Areas where different disciplines work at the same time will be marked by the colours of the different disciplines in this area.
- The table will give information about timing of work, hazards and planned control measures.
- Only major tasks will be considered. Single tasks must be managed in the daily coordination meetings.

Additionally, radiographic testing/NDT activities must be displayed in a regularly updated NDT Coordination Plan by CONTRACTOR in addition to the HSE Coordination Plan.

7.1.5 Risk Assessment of Simultaneous Operations (SIMOPS)

Simultaneous Operations (SIMOPS) are activities conducted in parallel and simultaneously, e.g. parallel construction and pre-commissioning activities, or construction and plant operation.

Regular meetings of the construction and commissioning managers and/or teams (incl. CLIENT operations at a later stage) must be held to address at an early stage prior start of pre-commissioning the significant interfaces and interferences resulting from simultaneous works/operations planned to be executed by different teams (construction, commissioning and/or operations).

Depending on the complexity, the identified risks and the extent of SIMOPS, they shall be dealt with in specific task forces or so called SIMOPS studies upon decision of PRINCIPAL CONTRACTOR's Site Manager.

7.1.6 Permit to Work System

PRINCIPAL CONTRACTOR's construction specification &A?-W-SC 9601 "Permit to Work System" must be applied for all works on the construction site area with the exception of where works overlap with CLIENT operations or could impact customer operations. When commissioning begins, CLIENT permit to work system shall be used and this shall be managed by CLIENT. According to this specification the following work permits are necessary during construction and only in the specified construction areas.:

- General Work Permit
- Special Work Permits (applicable for any 'High Risk Activities' as per LS 940-03 "List of hazardous work")
- Photography Permit

CONTRACTOR needs to request a permit at least 72 hours in advance.

7.1.7 CLIENT permit to work system for activities in close proximity or with potential impact to operational Hydrogen Plant

Where work is expected to encroach near or within the Hydrogen plant the Principal Contractor must agree these works in advance with the Client and the permit to work responsibility will be managed by the Client site in accordance with Client standard MS-22878 Permit to Work.

When contractors are required to work under the Client permit to work system individuals are required to attend and pass CLIENT Permit Acceptor training. A trained Permit Acceptor will be required to sign for permits issued to them. In doing so they are confirming that work will be carried out in accordance with the requirements of the permit and associated RAMS. It is advisable when requesting permit acceptor training for each contract Principal Contractor to provide for two permit acceptors in case of unforeseen circumstances such as sickness.

Only one person will be allowed access at a time to the CLIENT permit to work office so please be courteous at all times.

It is the Permit Acceptor's responsibility to brief contracting personnel on the requirements of the permit. All personnel briefed are required to sign the back of the permit to confirm they have received and understood the briefing and acknowledge reading and understanding the relevant Risk Assessment and Method Statement (RAMS) for the task that the permit is issued for.

Client representatives and key SHEQ personnel will monitor compliance to the Permit to Work issued to ensure that the contractor is meeting the requirements of the Permit. Details of this monitoring will be recorded on the reverse of the Permit, which is displayed in the work area.

Note: The Client permit to work system shall be used for all activities potentially impacting the live plant.

Both the Client and Principal Contractors permit to workstations shall remain in frequent communication and cooperation during the project period as required.

Risk Assessment and Method Statement (RAMS) process for CLIENT permit to work system

For construction work being carried out under the CLIENT permit system, task specific RAMS will be required for all tasks being undertaken. These must be submitted in sufficient time in order to plan the works. The late receipt of RAMS can result in standing time for which CLIENT will not be liable.

Once the RAMS have been agreed by the Client and accepted, no changes to working methods can be made without reference to and the agreement of the RAMS approver(s).

An acceptable risk assessment and method statement will include:

- a clear description of how the work is to be carried out
- a clear outline of the sequence of the stages of the work
- the control measures to be implemented in order to manage the identified risks presented by the specific task, which may include:
- safe means of access to and from the work location, including permanent platforms, scaffolds (handrails, toe boards, etc.), mobile towers
- barriers and notices to limit access to safe areas
- identification of the safe access routes for plant and equipment, especially in congested areas and considering the need to maintain emergency access routes
- specification of the personal protective equipment and safety equipment to be used, e.g. safety harnesses to be worn whilst aloft are adequately secured
- equipment required to carry out the work, how it will be provided and what inspections need to be carried out, including temporary electrical equipment, crane slings etc.
- consideration for the impact of weather and limitations of working in adverse conditions.

The associated risk assessment must clearly demonstrate residual risks to be at an acceptably low level.

Note: It is the Contractor Supervisor/Permit Acceptors responsibility to brief all contractor personnel working on the task in accordance with the RAMS.

Client standard MS-18438: Hazard Identification & Risk Assessment applies.

The below image demarcates the permit responsibilities throughout as follows:

Existing TH2 Plant Operational Permit to workstation - Blue shaded

LIC Plant Project Permit to work – Yellow shaded

7.1.8 Management of Temporary Works during the project

Temporary works are: “Any works that are required for the construction of the permanent works, which will normally be removed from the site on completion”.

The term “Temporary Works” does not cover temporary ventilation, water and electricity supplies, lighting, lightning protection and items necessary for the maintenance of the structure.

Permanent works in an incomplete state and permanent works which are used to provide temporary support are also classified as Temporary Works.

Temporary Works is an ‘engineered solution’ forming part of the works that allows or enables construction, protection, support or access to the permanent works and which might or might not remain in place at the completion of the works. Some examples of temporary works are:

- Excavations
- Formwork
- False work
- Access/Egress
- Scaffolding
- Piling Platforms etc.
- Pipe Support Systems
- Support Structures
- Hoarding and Fencing
- Lifting Studies
- Pressure Testing

The Health and Safety Executive (HSE) is Britain's national regulator for workplace health and safety.

Local legislation requires that all temporary works are managed to minimise risk. The Health and Safety Executive benchmark against BS 5975 2019 (Temporary Works) as the recognised approach to managing temporary works. Principal Contractor shall ensure implementation of a suitable system prior to and during the project.

The Designated individual for the project has appointed a competent Temporary Works Coordinator to enable full control of the temporary works at site. All works including any of the above activities shall require approval by the Temporary Works Coordinator prior to starting.

Full details of the Temporary Works management is contained in TBC

7.1.9 BeSafe Daily (BSD) and Daily Pre-Start Risk Assessment

The BeSafe Daily (BSD) or Daily Pre-Start Risk Assessment must be prepared daily by CONTRACTOR’s supervisors and discussed with their respective teams daily before start of work.

The purpose of this BSD is to collect the relevant information based on established permits to work, risk assessments etc. under consideration of all actual circumstances having a potential impact on the safe task execution and raise the workers’ awareness of tasks to be completed, involved challenges, hazards and risks as well as required controls.

The BeSafe Daily Card and Daily Pre-Start Risk Assessment can either be according to PRINCIPAL CONTRACTOR's form (see &AE-W-QR 9607 “BeSafe Daily”) or to CONTRACTOR's standard.

7.1.10 Critical Temporary Systems

A critical temporary system is any potential high-hazard/energy-containing installation or device that is not part of the final design; it is used during construction/check-out or commissioning and it is removed once the intended purpose for installing them has been completed.

CONTRACTORs shall maintain a critical temporary system log according to document “Critical Temporary System Log” (&AE W-LX 9605 (EN)).

The CONTRACTOR who is required to setup the temporary system shall prepare a work package in sufficient detail to allow for a thorough review and approval before the installation by PRINCIPAL CONTRACTOR (to be documented in the “Critical Temporary System Log” (&AZ W-LX 9605 (EN)). The work package shall include its safety issue and a risk elimination plan. Each CONTRACTOR is required to initial the work package to indicate they are aware and understand the hazards. The CONTRACTOR shall share this information with their on-site workers.

It is the responsibility of the CONTRACTOR to mark-up drawings such as plot plans or as-builts to support the approval of the specific procedures that may be required and to submit the recommendations for temporary underground protection against ground penetration work, like the use of lean red concrete or other methods that are subject to approval of the temporary system. Another example for marking of the location of underground utilities could be to indicate them clearly by the use of plastic barrels filled with either water or sand, along with appropriate signage.

Note: Installation and removal of these critical temporary system needs to follow the permit to work process as defined in &AE W-SC 9601 (EN).

Critical temporary systems can only be used after they have been formally approved after installation by PRINCIPAL CONTRACTOR (verification to be documented in the “Critical Temporary System Log” (&AE W-LX 9605 (EN)).

Changes to approved critical temporary systems are not allowed at job site unless a thorough review and a formal approval by PRINCIPAL CONTRACTOR Site Manager or Construction Manager has been performed (changes to be documented in the “Critical Temporary System Log” (&AE W-LX 9605 (EN)).

Once the intended purpose for the installed temporary system is complete, it shall be removed from service following applicable safety procedures. The site manager shall be notified to verify that the system is completely removed (Removal to be documented in the “Critical Temporary System Log” (&AE W-LX 9605 (EN)).

Examples of critical temporary systems include (but are not limited to):

Temporary Electrical System:

- Temporary construction power (380 V and more)
- Temporary generators or batteries tying into a permanent system
- Temporary grounding for switchgear, panels and equipment (380 V and more)
- Motor winding heaters for rotating equipment
- Temporary heaters connected to a permanent system
- Permanent heaters connected to a temporary system

Inert Gas and Compressed Air Use:

- Using inert gasses for drying, purging, preservation (any other use than welding)
- Using inert gas for welding when the quantity of gas is larger than 3 PG 45’s or equivalent capacity (i.e. 150 liters capacity cryogenic cylinders), joined as one large supply. •
- Compressed gas for stroking valve actuators
- Dry air gas preservation or purging with a supply pressure above 25 PSI

Pressure testing

- Inert pneumatic pressure test media

Other Critical Temporary System

- Ventilation for hazardous atmosphere or confined spaces
- Temporary system setup for commissioning i.e. tank purging, LR tank cool down

Temporary underground utilities (water, gas, power)

Temporary underground utilities need to be protected against ground penetration work. The temporary system procedure will include how this will be achieved. The location of underground utilities must be indicated clearly with signage.

Example workflow:

- work package submitted by CONTRACTOR
- work package review and approval by PRINCIPAL CONTRACTOR
- installation confirmed by CONTRACTOR
- installation verified by PRINCIPAL CONTRACTOR
- changes approved by PRINCIPAL CONTRACTOR
- installation removed by CONTRACTOR
- removal confirmed by PRINCIPAL CONTRACTOR

7.1.11 Environmental Impact Assessment (EIA)

PRINCIPAL CONTRACTOR's Environmental Impact Assessment (EIA) provides an overview of potential changes to the Environment, whether adverse or beneficial, wholly or partially that can result from the project construction activities or elements interacting with the Environment. (see &AZ-Q-LX 1050.400B (EN) 'Environmental Aspect Register & Environmental Impact Assessment (EIA) - LE Construction & Commissioning').

Risks related to PRINCIPAL CONTRACTOR's significant environmental impacts are addressed in PRINCIPAL CONTRACTOR's 'Risk Assessment – General' (see &AE W QR 9602 (EN)).

CONTRACTORs must report their risks related to Environment either in an Environmental Impact Assessment or directly in their CONTRACTOR Risk Assessments or Job Safety Analysis.

7.1.12 Pre-Start-Up Safety Review (PSSR)

To ensure that introduction of hazardous media can be performed safely and/or the plant or parts of it can be put into sustainable operation safely, a Pre-Start-up Safety Review must be performed as per &AZ-P-PE 2800.

7.2 Pre-/Commissioning & Start-Up Specific Requirements

Following elements specific for pre-/Commissioning and Start-up activities are listed below to provide a summary of the relevant chapters where they are addressed:

Pre-/Commissioning and Start-up related topics	Corresponding chapters in this document
1.Definitions	2 Definitions and Abbreviations
2.Site Organisation	6 Project Organisation and HSE Responsibilities
3.Handover of responsibilities (incl. HSE)	6 Project Organisation and HSE Responsibilities
4.Permit to Work & HSE Risk Management	7.1.6 Permit to Work System 7.1 HSE Risk Management
5.Lock out / Tag out (LOTO)	7.4.11 Control of Hazardous Energies
6.Tagging, Marking & Barricading	7.4.25 Tagging, Marking & Barricading
7.(Pre-)Commissioning Notice	7.10.9.1 Pre-/Commissioning Notices (PCC Notices)
8.Simultaneous Operations (SIMOPS)	7.1.5 Risk Assessment of Simultaneous Operations (SIMOPS)
9.Pre-Start-Up Safety Review (PSSR)	7.1.12 Pre-Start-Up Safety Review (PSSR)

10.Pre-/Commissioning relevant HSE Trainings on site	7.4.2 HSE Training
11.Emergency Preparedness	7.9.4 Emergency Preparedness and Response (EPR)

7.3 Project Specific Hazards & Requirements

7.3.1 Major Hazards for Construction Site

7.3.1.1 Falls from height

Falls from height are a major cause of industrial injury, as such where any work has to be carried out at height the contractor must confirm how falls of people and material will be prevented. For the avoidance of doubt, in the United Kingdom, Work at height means work in any place where, if precautions were not taken, a person could fall a distance liable to cause personal injury. This includes vehicle trailers where precautions are also required. Note: *There are no specific height stated within the UK Regulations.*

The criteria for selection and use of safeguards such as scaffolding, man riding cages, harness etc, must be fully detailed and explained within the RAMS.

To reduce the risk of falling tools and equipment the use of bolt boxes, bags for hoisting equipment and the securing of loose materials (against high winds) will be required. Fall exclusion zones will require creation as required.

All scaffolds must be erected by competent persons and are required to be close boarded with toe boards, intermediate rails and top rails. They must be used in accordance with the design and not be overloaded on the platforms.

The utilisation of a suitable tagging system is required to indicate that the scaffold is suitable for use. Scaffolds must be re-inspected every 7 days as a minimum by a competent person. Only competent approved scaffolders are allowed to modify structures.

All workplaces at height must be subject to good housekeeping before, during and following the task. A suitable and sufficient mean of access and egress to all workplaces at height is also required.

In all cases work at height activities must comply with The Work at Height Regulations 2005.

*Client standard **MS-22894** applies to all elevated work activities on BOC live operational plant.*

7.3.1.2 Mechanical lifting operations

All mechanical lifting operations are subject to the requirements of the Lifting Operations and Lifting Equipment Regulations 1998 (LOLER) The Principal Contractor shall confirm details of specific procedures for controlling the safe execution of any mechanical lifting operations on site. These procedures will cover all aspects of lifting including, where applicable, the use of mobile cranes, tower cranes, lifting tackle, forklift trucks and lorry loaders, and the selection and training of operatives. All mobile crane lifts during the Project must be classified as “Contract Lifts” in accordance with BS 7121.

The Principal Contractor must agree all lifting operations with the Client where lifting activities are carried out adjacent to live operational areas.

The lifting area in certain locations may be soft and as such spreader mats must be used under outrigger feet of mobile cranes and man lifts at all times. During the planning of lifts, the crane Principal Contractor will carry out a site survey to confirm conditions are suitable not only in the proposed lift areas but also the route to and from site with loads. As part of this process, Client shall provide confirmation that the ground conditions are suitable for the intended loads placed on them. Principal Contractor shall carry out investigations as part of their own temporary works management to confirm ground loadings are suitable and approved prior to any crane lifts.

*Client standard **MS-23037** applies for all lifts carried out on the existing BOC live operational plant.*

7.3.1.3 Confined space working

Confined space working shall be minimised as far as possible and strictly controlled however where confined space working cannot be avoided, it is required to be undertaken in accordance with the “Confined Spaces Regulations 1997” and associated approved code of practice “L101”.

Each confined space entry requires a management plan which consists of the confined space information, specific RAMS and a rescue plan. All confined space working is subject to a permit to work. Contractors are required to consider the details provided in the confined space information when planning their own safe system of work, ensuring that hazards such as asphyxiation due to oxygen deficiency are considered and suitably controlled.

Before personnel are permitted to enter a confined space, they must be competent to do so and confirm their fitness to enter with the Principal Contractor.

*BOC standard **MS-23044** applies for all confined space work carried out on the existing BOC live operational plant.*

7.3.1.4 Working in potentially hazardous atmospheres

Where work involves potential exposure to hazardous atmospheres the Principal Contractor will be responsible for obtaining, issuing and training workers in the use of personal gas analysers. Specific controls must be in place and specified via the permit to work for Confined space working, hot work and during any line breaks.

Where activities are being carried out on BOC live operational plant, BOC authorised personnel will provide instruction in the use of such monitors and issue as required.

*The Client standard **MS-22878** applies for all work carried out on the existing BOC live operational plant.*

7.3.1.5 Hot work

Hot work consists of tasks that involve the generation of heat, sparks or a flame and are being carried out in a non-designated area. The Principal Contractor shall manage this activity via a suitable permit to work system within the project areas.

All hot work performed on the BOC live operational site will be subject to a “Supporting Certificate of Hot Work” and Permit to Work.

Contractors are required to make known any hot work requirements to the Principal Contractor as part of the pre-project planning process and provide a risk assessment and method statement for such work. The equipment used for hot work is required to be in a suitable condition and the intention to use this type of equipment must be made known.

No hot work is permitted without a permit to work being issued.

*Client standard **MS-22878** applies to BOC live operational plant.*

7.3.1.6 Work on or near excavations

Work below ground level is prohibited on the BOC Teesside Hydrogen site due to ground contamination under normal operation.

Any excavation work or ground penetration will require approval by the Client and landowner prior to starting.

*Client standard **MS-22878** applies to BOC live operational plant.*

7.3.1.7 Physical isolation

The Principal Contractor has a suitable system for energy isolation in place prior to any livening up of plant and work on live lines within project areas. “HSG253 The safe isolation of plant and equipment” is the current UK guidance and shall be referred to by the Principal Contractor in deciding suitable protective measures.

All isolations must be controlled under a suitable permit to work.

Where isolations are required on the BOC live operational plant this will be managed by the Client via the BOC permit to work system.

Isolations will be made in line with Client standard **MS-23040** and will be managed by the Client Authorised Person.

Contracting personnel should assume that plant and pipework are live unless they have a current Supporting Certificate of Physical Isolation or equivalent.

Before a certificate is issued, the required isolation integrity is to be determined and confirmation obtained that the required integrity can be implemented. If the required isolation integrity is not available, then a risk assessment must be completed and authorisation additional to that from the Authorised Person for Physical Isolation will be required from the BOC Operating Unit Manager and SHEQ Advisor.

Lock out/Tag out controls must be in place as they are required for work carried out on BOC live operational plant.

7.3.1.8 Occupational & Environmental noise

Contracting personnel may be exposed to noise on the project above the exposure action values specified in the Control of Noise at Work regulations, therefore measures must be taken to reduce exposure to below these values.

Where noise cannot be reduced below the levels using engineering measures, personnel will be required to wear hearing protection.

The location of the areas of the site that require the wearing of hearing protection is detailed in the site induction and by local signage.

Contractors using tools with a noise level above the threshold must consider this as part of the task RAMS and are required to have adequate protection in place.

The Principal Contractor will control the work such that unacceptable, unsociable noise that could be construed as an off-site nuisance is not created.

7.3.1.9 Plant and machinery

All plant and machinery used on the Project by any contractor must be properly selected and fit for purpose. The appropriate certification for all plant and machinery must be available on site for inspection by the Principal Contractor or Client. All operators of plant and equipment must be properly trained and must hold the appropriate licence to operate.

The Permit to Work issuer shall check that contractor equipment and mobile plant, whether owned or hired by their employees or sub-contractors, have been subject to inspection prior to use by checking relevant certificates and test labels. This is to ensure that such equipment is properly maintained, is safe, and meets the manufacturers and statutory requirements.

Contractors using the equipment are responsible for carrying out pre use checks prior to use.

Portable tools must be rated to 110 volts and centre tapped to earth. The management of equipment cables is essential to prevent trip hazards and cable damage. *Client standard **MS-5984** applies*.

7.3.2 Mitigation of Risks from Neighbouring Plants

Following neighbouring and surrounding plants or activities are to be considered:

- Live operational Steam Methane Hydrogen Reformer Plant

- Chemical deliveries to Hydrogen plant
- Landlord site – fully operational during project

Hazards and risk resulting from operation of plants or activities are listed below:

- Collision with live plant
- Damage to plant infrastructure
- Collision with non-construction vehicles or personnel
- Personnel exposed to risks from other activities beyond the construction site
- Construction persons exposed to emergency event from main site

Mitigating actions:

- Restricted access to other areas of the site, i.e. With the exception of access and egress to the welfare and construction site all other areas are prohibited
- Suitable lighting shall be in place to cover all construction activities
- All activities carried out on the Hydrogen plant, or which could have an impact on the hydrogen plant are managed under the CLIENT permit to work system
- Daily coordination meetings between CLIENT and PRINCIPAL CONTRACTOR and between Principal Contractor and CONTRACTOR
- Personnel are briefed on emergency actions during inductions

There hazards, risks and mitigating actions must be considered by CONTRACTOR while carrying out Risk Assessments and Job Safety Analysis.

Potential emergency cases resulting from neighbouring plants or activities (normal or abnormal conditions) are to be included in Attachment 6 ‘Emergency Response & Evacuation Plans’.

7.3.3 Risk of Prejudice of 3rd parties’ rights and interests

CONTRACTOR must immediately notify PRINCIPAL CONTRACTOR if it has reason(s) to believe that rights of neighbouring plants or other 3rd parties are prejudiced by the execution of the work at project’s site in such a way that there may be a need for measures that are not provided for in the contract.

CONTRACTOR must submit a Variation Order Request (VOR) for executing these measures and show their impact on the contract value and schedule.

7.4 Personal Safety

7.4.1 Working Schedule

Working hours must comply with local legislation and PRINCIPAL CONTRACTOR's regulations as given below.

PRINCIPAL CONTRACTOR's Project Manager and Site Manager will decide on the working schedule. Changes and modifications need to be agreed with them and if necessary with the relevant authorities.

Lengthening of CONTRACTOR's working hours or similar modifications must comply with the local legislation and always must be decided based on a risk assessment or a Job Safety Analysis (see 7.1.3) due to the increased risk of incidents. If necessary risk mitigating actions must be defined.

The working schedule is defined as follows:

	PROJECT SCHEDULE	STATUTORY REQUIREMENTS
Working Time (Daily)	10 hours (maximum of 6 hours on day six with a minimum of 24 hours rest in between the next cycle).	Working Time Regulations - https://www.gov.uk/maximum-weekly-working-hours
Night Working Time	Not scheduled	Not scheduled

	Note: when overtime is needed and expected during pre/commissioning, start-up and troubleshooting, Site Manager *must plan this overtime in due time* with CLIENT/OWNER *to ensure a sound working schedule respecting local requirements and prevent any risks related to lack of rest or fatigue management.*	
Working on Sundays and Public Holidays	Not scheduled	Working Time Regulations - https://www.gov.uk/maximum-weekly-working-hours
Rest breaks	Worked hours 6-9 hrs: 30 minutes Worked hours > 9 hrs: 45 minutes not allowed to work more than six hours without a break, Break times shall not be split into parts smaller than 15 minutes	Working Time Regulations - https://www.gov.uk/maximum-weekly-working-hours
Minimum Rest Period	11 hours	Working Time Regulations - https://www.gov.uk/maximum-weekly-working-hours
Targeted Groups of Workers	Not scheduled	Working Time Regulations - https://www.gov.uk/maximum-weekly-working-hours

7.4.2 HSE Training

7.4.2.1 General Training Requirements

The training and motivation of personnel are one of the most important subjects of each Construction Phase Plan to achieve HSE objectives.

HSE Training must take place depending on qualification and awareness of personnel to meet all project HSE requirements.

Employer (PRINCIPAL CONTRACTOR and CONTRACTOR) must only hire workers who can attest and document that they have completed a training program that satisfies specific requirements with regard to skills or knowledge. It is also required that the person who is in charge of the training must satisfy specific qualification or certification requirements.

Before work operations are executed it is mandatory that the personnel are qualified, skilled, trained and instructed by their supervisor regarding hazards, risks and relevant safety controls related to their job duties.

HSE trainings are required for following activities and /or personnel (non-exhaustive list):

- Emergency Response
- Environmental Emergency Response (incl. use of spill kits)
- Fire Watches
- Banksmen
- Use of Personal Protective Equipment
- Use of Fire Extinguishers
- Use of Hazardous Substances
- Sand/Grit Blasting
- Hot Work
- Lifting, Rigging
- Piling
- Radiographic Inspections
- Use of specific tools and equipment, e.g. grinders, drill, bending/cutting machines, winches, hoist, (mobile) fuel filling stations, etc.
- Scaffolding
- Work at height (incl. ladders, scaffolds, use of PPE, rescue team members, MEWPs)
- Heat Stress, Cold Stress (if applicable)

Records of participation must be submitted to PRINCIPAL CONTRACTOR upon request. Last training dates shall not be older than 12 months.

PRINCIPAL CONTRACTOR employees and external staff (e.g. freelancers, agency staff) must have completed all relevant trainings as defined in &AE W-LX 0001 “GC HSE Training Profile” Missing trainings must be completed without any further delay.

7.4.2.2 Qualifying Training Requirements

Special attention must be drawn on personnel carrying out activities that require qualifying trainings either for certification, qualification or authorisation purposes as stipulated by local regulations. These qualifying trainings ensure that employees have acquired the required competencies to perform their activities.

Qualifying trainings are required for following activities and /or personnel (non-exhaustive list):

- *list any specific HSE training requirements for the region, as necessary e.g. OSHA, 10hr, TWIC, SCC, Blue Card*
- First aid at work (3 day course).
- Temporary Works Coordinator.
- Operators of
  - Mobile or tower cranes
  - Forklift trucks
  - Mobile elevated work platforms (MEWPs)
  - Mobile construction site equipment (e.g. excavators)
- Supervisors for
  - Scaffolding work
  - Excavation work
  - Lifting operations
- Electricians
- Inspectors of tools and equipment (incl. PPE)
- Radiographic Supervisors/Radiation Safety Officer
- Drivers when driving on public roads for site purposes (e.g. to/from pre-fab yards) and for mass transportation (e.g. buses) (Refer to 7.6)

Copies of attest of competencies (Certification, Authorisation or Qualification) must be submitted to PRINCIPAL CONTRACTOR upon request.

Additionally, all drivers for mobile construction site equipment must be specifically assigned for the type of vehicle(s) he/she is going to use.

7.4.2.3 Additional Training Requirements on Site

In addition, the following trainings are required:**TRAINING**	**TRAINER**	**FREQUENCY**	**PARTICIPANTS**	**CONTENT / REF.**
SABIC worker, visitor or delivery Induction	SABIC security	Once after arrival at site	All	General site access – must be requested from Principal Contractor at least 3 days in advance of arrival.
BOC Teesside Hydrogen Induction (s)	Online	Once after arrival at site	All	Hazards/Controls and emergency actions
BOC Permit acceptor training	Online	Once after arrival at site	Permit to work acceptors	BOC permit to work acceptor
HSE Site Induction	PRINCIPAL CONTRACTOR's Site HSE Manager	Once after arrival at site	PRINCIPAL CONTRACTOR's personnel, CONTRACTOR's workers, VENDOR's personnel, CLIENT's personnel involved in commissioning VISITORs	&AE-W-WM 9601 Comprehension Check: &AZ-W-LF 9609
HSE Site Onboarding	PRINCIPAL CONTRACTOR's Site HSE Manager	once after arrival at site	PRINCIPAL CONTRACTOR's personnel	Familiarization with specific HSE requirements, expectations and challenges as well as local specifics (incl. public road traffic)
BeSafe - Worker Participation Program ('TellMe')	PRINCIPAL CONTRACTOR's Site HSE Manager	once after arrival at site	CONTRACTOR's workers	BeSafe Program Incentives & Awards
HSE & BeSafe Kick-Off Workshop	PRINCIPAL CONTRACTOR's Site HSE Manager and/or Lead Construction HSE	once, during first month after start of site activities	PRINCIPAL CONTRACTOR's personnel	Implementation of core aspects of HSE and BeSafe Programs
BeSafe / Safety Leadership Development Training *requirement to be agreed with PCM (usually when >10 Linde staff)*	PRINCIPAL CONTRACTOR's certified coach	once, after mobilisation of most/all key personnel	PRINCIPAL CONTRACTOR's site management team (selected team members) CONTRACTOR's management team (selected team members) – *requirement to be agreed with PCM*	Demonstration of visible leadership with safety coaching (2days)

Pre-Commissioning/ Commissioning HSE Training/Workshop	PRINCIPAL CONTRACTOR's Site HSE Manager	once before start of pre- / commissioning	PRINCIPAL CONTRACTOR's Site Manager and Pre- /Commissioning & Start-Up Team members	&AE W-WM 9618
Pre-Commissioning / Commissioning Hazards Training	PRINCIPAL CONTRACTOR's Site HSE Manager	once before start of pre- / commissioning	CONTRACTOR's workers, VENDOR's personnel, CLIENT's personnel involved in commissioning	Presentation
Crane Driver Awareness Training	PRINCIPAL CONTRACTOR's Site HSE Manager	once before start of crane operations	CONTRACTOR's Crane Operators	&AZ-W-WM 9605
Permit to Work Training	PRINCIPAL CONTRACTOR's Site HSE Manager	once before being Authorised to issue or receive work permits	PRINCIPAL CONTRACTOR's, CONTRACTOR's, VENDOR's Permit to Work Issuers, Endorsers, Coordinators, Holders	&AX- Q-WM 1006
Confined Space Entry Training	PRINCIPAL CONTRACTOR's Site HSE Manager	once before entering confined spaces	PRINCIPAL CONTRACTOR's CONTRACTOR's VENDOR's Permit Issuers, Endorsers, Reviewers, Holders, Entrants, Supervisors, Manhole Watches, Gas Testers, Rescue team members.	Presentation
Lockout /Tagout Training	PRINCIPAL CONTRACTOR's Site HSE Manager	once before energisation of first system	PRINCIPAL CONTRACTOR's, CONTRACTOR's, VENDOR's authorised and affected Persons, Supervisors and Permit to Work Issuers, Endorsers, Reviewers, Holders	Presentation
Special Health Hazards Trainings (e.g. Hazardous Material, Dengue Fever, etc.)	PRINCIPAL CONTRACTOR's Site HSE Manager	once before start of work or when relevant	PRINCIPAL CONTRACTOR's personnel, CONTRACTOR's workers,	Presentation

[in case of oxygen service]: Construction Oxygen / GMP Awareness Training	PRINCIPAL CONTRACTOR's QA/QC Manager	once before mechanical installation	PRINCIPAL CONTRACTOR's, CONTRACTOR's and CLIENT's Site Manager, site supervisors, and site personnel performing pre-fabrication and assembly work on process piping systems (pipes, valves, fittings, etc.) and flat bottom tanks (erected on site) with oxygen enriched media.	&AZ-W-WM 9521.OXY

Each training (7.4.2) of CLIENT, PRINCIPAL CONTRACTOR's, CONTRACTOR's or VENDOR's personnel must be documented (e.g. by use of &AZ-W-RX 9602 "HSE Training Record").
Records must contain at least:

- the date of the training,
- the name of the trainer,
- the topic of the training,
- the participants' names and signatures.

CONTRACTOR's records must be submitted to PRINCIPAL CONTRACTOR upon request. The records must be kept by PRINCIPAL CONTRACTOR until the end of the construction and/or commissioning period.

7.4.3 Lone Workers

Lone workers are those who work by themselves without close or direct supervision. This includes e.g. a person who works alone on the construction site or works separately from others ("unaccompanied worker").

Working alone:

- is not permitted when no one else is present on site (e.g. at construction site)
- is not permitted when an unaccompanied worker is performing "Hazardous Work" as defined in LS 940-03. At least 2 persons must be present at the job location.
- Is possible **only** when an unaccompanied worker is performing Non-Hazardous Work (e.g. working in pre-fab workshop, remote area on site etc) for which a separate and specific HSE risk assessment has been carried out and where appropriate and specific controls have been defined for emergency situations and emergency reporting devices.

Emergency reporting device must be selected with consideration given to the emergency response time and to the capability of the injured person (IP) to help themselves to contact emergency services without delay and direct them to the incident location.

The table below indicates the recommended emergency reporting device versus the potential injury severity:

Recommended Emergency Reporting Devices	**Potential injury severity**		
	Light *IP is able to help themselves*	**Moderate** *IP has limited capability to act*	**Severe** *IP is not able to act*
Landline phone Stationary call system	x		
Walkie-talkie Timed control calls	x	x	
Dead man´s switch Constant camera surveillance Personal alarm signal system	x	x	x

7.4.4 Personal Protective Equipment

PRINCIPAL CONTRACTOR's construction specification &A?-W-SC 9603 "Personal Protective Equipment on Construction Sites" must be applied.

PPE protects the body from some of the dangers of work, but it is not substitute for eliminating the risk and shall be regarded as a last resort.

Where close fitting Respiratory Protective Equipment (RPE) is required a face fit test will be required to ensure that the correct seal can be achieved on the user's face. This is evidenced by a suitable certificate issued by a competent person.

The Principal Contractor is responsible for ensuring that where PPE has been specified as a control measure, that it has been provided and is suitable and appropriate to the work being carried out and persons trained in its use.

PPE is required to be stored in a suitable location such that it remains fit for purpose.

The minimum PPE required on the Client site is:

- Hard hat;
- Hi-visibility clothing in all traffic areas inside SABIC boundary;
- Ankle protected safety boots;
- Light eye protection;
- Flame retardant/Anti-static overalls
- Gloves (must be on the person and used as required).
- Hearing protection (must be on the person and used as required).
- Personal atmospheric monitor must be worn when working in OSBL areas or during certain activities in ISBL areas (will be defined by permit to work).

Other PPE required as part of an individual safe system of work will be identified and agreed by the Principal Contractor at the planning stage prior to works.

7.4.5 Pedestrian Traffic and Prevention of Slips, Trips, Falls

CONTRACTORS and all other personnel must manage work so that people can move safely around the site by keeping it in a clean and orderly condition so as to reduce the chance of injury through slips, trips and falls.

- Safe walkways must be maintained:
  - walkways must be in good and safe conditions and provided with adequate lighting (as and when required).
  - uneven, wet and/or slippery surfaces must be prevented as far as reasonably practicable.
  - slippery surfaces must be treated with stone (mud) or grit (for ice), covered temporarily and/or be signposted
  - depending on the risks due to traffic, excavations, uneven surfaces, stored material etc., walkways must be clearly designated by means of fences, barricades and/or signposts.
  - holes and openings must be closed or have covers or railings and be signposted or barricaded.
- Obstacles must be prevented:
  - everyone must keep their work and storage areas tidy and perform regular housekeeping
  - areas for waste collection will be designated, providing skips and bins where needed and making clear the responsibilities for waste removal.
  - material and equipment must be stored safely (e.g. boxes or other containers) and outside of pedestrian traffic areas.
- Risks caused by hoses and cables must be mitigated:
  - cordless tools should be preferred when available and practicable.
  - cables and hoses must be protected against damage and secured overhead or laid in such a manner that passage and traffic ways are not obstructed.
- Changes in level must be prevented:
  - where small changes in level cannot be avoided, such as in doorways, installation of ramps must be considered and if not possible, signs, marks or labels must be used to warn workers to look out for the change in level.
- Behavioural requirements:
  - when using stairs, handrails must be used, (three points of contact at all times).
  - suitable footwear with a good grip must be worn
  - mechanical lifting aids should be used rather than carrying unwieldy or large loads that block the view ahead.

7.4.6 Tools, Machinery and Equipment

Tools, machinery and equipment must be inspected by a competent person on a regular basis and before first use on site. Certifications by Third Parties must be carried out additionally according to legislative requirements. Records of inspections and certificates must be submitted to PRINCIPAL CONTRACTOR upon request.

Inspected equipment must be labelled or marked clearly and in a way that it can be recognised that the necessary inspection has been conducted. The availability of the mark or labelling must be checked before commencing of work by each worker. Additionally, the worker must check the tool, machinery and equipment for any damage or hazard is noticed and isolate equipment and report without using.

7.4.7 Grinding

- Grinders must be equipped with an automatic stop.
- Grinders must be used with all guards on place.
- Grinders shall not be used with cutting discs since not meant to be subjected to any lateral pressure.
- Accessories used with grinders must respect, at least, the maximum grinding-disc diameter and diameter of the central hole in the grinding disc must fit the inner flange without any play. Adapters or reducers shall not be used.
- Grinders must be inspected before each use to ensure cutting edges are sharp, the on and off switch works, the clamp nut is in place and secure, ventilation openings are clear, thread in the disc is long enough for the spindle, the disc is not contaminated or has been subject to impact, alignment, moving parts are not in a binding situation and the disc is within use by date. Those altering grinders or changing abrasive wheels must be trained and competent.
- CONTRACTORs using grinders must be trained (section 7.4.2).

7.4.8 Piling

Consideration must be given to the appropriate method of piling and the effect that the operation of bored or driven piles will have on the safety of adjacent structures both buried and standing.

Whatever the method of piling to be used, no work shall be undertaken until the piling CONTRACTOR has produced a method statement (section 7.1.1) and a risk assessment (section 7.1.2) with the job specific conditions and circumstances as well as the following minimum requirements:

- All underground services must be located and made safe. A careful investigation must be undertaken to ensure there are no cellars, underground water courses, or ground conditions, which could lead to hazardous situations.
- Minimum clearance from underground, overhead lines and structures must be maintained.
- Placement of augering or drilling equipment on stable ground and proper anchoring must be ensured.
- All workers on the operation must be trained in the specific method statement to be used.
- Signs and barricades must be set up to demarcate the hazardous area and to prevent unauthorised access.
- All cranes, lifting appliances and lifting gear must have appropriate test certificates proving periodic statutory examination and must be adequate for the job in hand.
- Such equipment must be placed on a firm level base and /or crane mats used.
- Consideration must be given to the risk of damage to lifting gear from sharp edges.
- Noise and vibration are particular hazards and all persons associated with the operation must wear the appropriate protective clothing and equipment such as hard hats, eye and hearing protection (section 7.4.4).
- Where it is necessary to raise or lower workers by crane such cranes must be fitted with a dead man's handle and all lowering must be done under power. The workers must be carried in properly constructed cages which cannot spin or tip.
- Wire ropes must be duly checked during erection and maintained on a weekly basis.
- Workers climbing the rig for maintenance, sling removal or concrete pouring must use personal fall protection.
- Before moving the rig sufficient wooden logs in good condition must be placed and ground must be levelled.
- Hazards and necessary actions related to maintenance, repair and dealing with unplanned events (e.g. clearing a clogged augers) must be considered.

Note: There are specific details/approval detailed and recorded in section 5 of &AE-W-SC 9622 (EN) "Environmental Management Plan" which must be followed prior to any piling starting.

7.4.9 Electrical Safety

7.4.9.1 General

- If work must be conducted on electrical services during the construction phase of a project, the PRINCIPAL CONTRACTOR "Control of Hazardous Energy (Lockout/Tagout), must be used.
- All portable electrical equipment being used on the construction site must be rated to 110 volts and centre tapped to earth.
- An emergency shut-off switch for electrical supply must be available at all times.
- All temporary electrical installations carried out on the site must be in accordance with the local requirements and specifications.
- The installations must be inspected regularly by a competent person (e.g. electrician) to ensure that they are in safe condition and working properly.
- Each operation of electrical equipment must be under protection of a Residual Current Protective Device (RCD)
- Additionally, hand-held power tools used on site must have protective insulation ("double insulation").
- All electrical machines, tools and appliances must be inspected regularly by a competent person (e.g. electrician) to ensure that it is in a safe condition and working properly. To confirm that the inspection was conducted the equipment must be labelled or marked clearly and registered. The documentation must be submitted to PRINCIPAL CONTRACTOR upon request. This is otherwise referred to ask "Portable Appliance Testing" (PAT).
- All wiring for electric light and power must be raised at least 2m above ground or laid protected against mechanical impact out of the walkways and must be kept as far as possible from telephone wires, signal wires, and wires used for firing blasts.
- Extension cords used must be of a three wire type and must be suitable for requirements covering construction sites.
- All flexible cords and cables must be protected from damage and sharp corners and projections shall be avoided.
- Only authorised persons may enter the sub stations, motor rooms, switch rooms, control rooms or cable ducts. Should the CONTRACTOR need to enter such areas, it needs to obtain a work permit from PRINCIPAL CONTRACTOR or CLIENT (See 7.1.6).

7.4.9.2 Usage of electrical equipment with increased electrical risk

When using electrical equipment in an environment with electrical conductivity (e.g. in confined spaces like containers, towers, furnaces or in similar metallic surroundings) the voltage used may at maximum be 50 Volt AC fed from a safety low voltage transformer or electrical power must be supplied by an isolating transformer (passing of an electric current through human body is not possible).

7.4.10 Chemical Safety

7.4.10.1 Operational Supplies for Construction and Commissioning Activities

It is to ensure that any hazardous substance, preparation or article containing them present at site are compliant with the requirements of the EU chemical legislation REACH (Regulation (EC) No. 1907/2006, OJ L 396, 30.12.2006, p. 1) – hereafter referred to as "REACH". PRINCIPAL CONTRACTOR shall not be obliged in any way to carry out the (pre)registration of any hazardous substance, preparation or article containing. CONTRACTOR is aware that the hazardous substance, preparation or article containing cannot be used if the requirements of REACH are not completely and properly complied with.

Any hazardous materials delivered to site shall be appropriately labelled based on their classification with labelling and packaging information and supplementary provision(s) as defined locally. For each hazardous material delivered to site, a Material Safety Data Sheet (MSDS) must be available. MSDS's should not be older than 3 Years.

CONTRACTOR must hand over a list of all hazardous substances according to the form &AZ-W-LH 9601 'List of Hazardous Materials - Construction' and the MSDS and associated COSHH risk assessment in good time prior to start of work to PRINCIPAL CONTRACTOR. This list must cover the following information:

- Substance / material (ingredients, characterization)
- Storage area / work area
- Quantity (maximum on site)
- MSDS and COSHH risk assessment availability
- Instruction to workers carried out
- Operating instructions / work procedures available
- Duration of use

For commissioning activities PRINCIPAL CONTRACTOR must prepare a list of hazardous substances according to the form &AZ-W-LH 9602 'List of Hazardous Materials - Commissioning'.

Any activities (e.g. use, storage transfer or transport) involving, generating or releasing hazardous materials must be considered in the Risk Assessment. The protective measures must be documented and brought into action.

For hazardous substances, a work instruction (procedures for handling of chemicals) must be prepared when applicable according to local legislation. The CONTRACTOR's procedure/work instruction for handling of chemicals must include:

- Hazards of the substances
- Storage of substances
- Working with and handling of substances
- Protective measures
- Disposal of waste (packages, containers, residue)
- Actions required in case of an incident

Conditions of use of the hazardous materials must be verified towards any locally applicable restriction(s) and prohibition(s) pertaining to use as well as any notification / permit requirements. Personnel working with hazardous substances must be trained according to local law and to the risk assessment performed for these chemicals, handling of them and the proper use of the respective Personal Protective Equipment (PPE).

Conditions of storage of hazardous materials must be verified towards any storage compatibility requirements as specified locally or in the MSDS.

Storage areas for hazardous materials must be released by PRINCIPAL CONTRACTOR and be subject of PRINCIPAL CONTRACTOR's and CONTRACTOR's inspections on a regular basis.

They are restricted to authorised personnel and must be posted with hazard identification labels complying with local law.

All containers of oil or other hydrocarbons must be stored in appropriately contained facilities or in accordance with local requirements on flammable and combustible liquids standards.

At the physical work location hazardous substances must be stored in quantity no greater than the quantity required for daily use and must be contained in approved portable containers. Where hazardous liquids are stored, appropriate suitably sized secondary containment must be installed and protected from rainwater.

Conditions of transfer and transport of hazardous materials must be verified within risk assessment towards any locally applicable or CLIENT's requirements.

For conditions of disposal of hazardous materials refer to 7.4.10.

7.4.10.2 Process Chemicals

Before starting work on existing/operating plant systems containing hazardous materials, a cleaning procedure according to CLIENT's requirements must be followed. The number of personnel working in this area must be minimized. Personnel working in the plant during times when hazardous materials are present or cleaning procedures are carried out must be specially trained in the risks and measures to take in the event of contact with the hazardous process chemicals.

Special protective measures will be subject to the work permit (See 7.1.6).

7.4.10.3 Gas Cylinders

The handling of gas cylinders must comply with local requirements and PRINCIPAL CONTRACTOR's requirements as per particulars given below:

- Gas cylinders must be stored protected from excessive heat, fire, dangerous corrosion, mechanical damage or access by unauthorised persons.
- Gas cylinders shall not be stored together with flammable materials.
- Gas cylinders must be secured to prevent them from falling over. Special precautions are not necessary if the gas cylinders are sufficiently secured as a result of their construction (e.g. 11 kg / propane cylinders), the type of storage (e.g. in closed pallets) or placement in large groups that can be secured together.
- Gas cylinders containing liquid gas (e.g. propane, butane) must be operated upright.
- Gas stores must not be set up in critical areas such as stairways, corridors, emergency routes, garages or passages for persons or vehicles.
- Where a combination of oxygen/flammable mixture is required for heating and welding suitable approved flashback arrestors must be installed. Evidence of an annual inspection in accordance with the British Compressed Gas Association (BCGA) Code of Practice 7 (CP7) requirements must be available.

7.4.10.4 Inert Gas

After some cleaning operations (e.g. pipes, tank, etc.), inert gases (e.g. nitrogen, argon, etc.) can be used to purge, inert or reduce the concentration of hydrocarbon gas or other gas inside the equipment atmosphere. The inert gas will then reduce or eliminate the Oxygen concentration to a volume that presents a life-threatening hazard (e.g. asphyxia, suffocation).

Operations with inert gas must comply with PRINCIPAL CONTRACTOR's work procedures and a work permit (see 7.1.6) must be required to define and implement special control measures.

Where inert gases are being used for welding purposes, eevidence of an annual inspection in accordance with the British Compressed Gas Association (BCGA) Code of Practice 47 (CP47) requirements must be available.

7.4.10.5 Pickling

Pickling is a frequently used surface treatment of metal (e.g. stainless steel) to recover its corrosion resistance after operations such as welding, annealing, bending etc. It is usually done with a strong acidic solution that can be dangerous to both people and the environment. Chemical reactions can take place during the pickling that release dangerous vapours. The pickling process results in waste in the form of rinsing water and exhausted pickling solutions.

Therefore, to reduce the risk of hazardous situations arising or accidents occurring, pickling must comply with PRINCIPAL CONTRACTOR's work procedures and a work permit (see 7.1.6) must be required to define required PPEs and implement special control measures. Pickling waste flows must be treated as dangerous waste and must never be released to the ground without approval from CLIENT.

7.4.11 Control of Hazardous Energies

Control of hazardous energies refers to specific practices and procedures to safeguard workers from the unexpected energization or start-up of machinery and equipment, or the release of hazardous energy during operation activities (Lockout/tagout) as well as to a process to safely liven up equipment.

Working on energy-carrying machinery and equipment must only be carried out after the issue of a work permit by CLIENT or PRINCIPAL CONTRACTOR (see 7.1.6) and can only be done by authorised personnel who has been appropriately trained.

A "Lock-out/Tag-out" and "Livening Up" process according to &AE W-SC 9609 "Control of hazardous energies" and &AA W-SC 3304 "Electrical Energy Control Procedure" must be in place and agreed between PRINCIPAL CONTRACTOR and CONTRACTOR before energizing the first process system (incl. temporary power supply).

7.4.12 Hot Work

Any CONTRACTOR executing hot work operations must ensure that there is appropriate fire protection on site.

The following safety precautions must be implemented:

- Any hot work (welding, cutting or grinding) must only be performed by individuals trained to do so.
- All oxy-acetylene welding/cutting equipment must be fitted with flash-back arrestors.
- Firefighting equipment (blankets, extinguishers, hoses) will be placed near all hot work.
- If hot work is being conducted at an elevated level appropriate precautions must be taken to protect those working below from sparks, slag etc.

The description of further protective measures and necessity of a fire watch is indicated in the hot work permit (see 7.1.6). If a fire watch is required in the hot work permit, they must inspect the location up to 30 minutes after the hot work has been finished on site.

7.4.13 Confined Space

PRINCIPAL CONTRACTOR's safe work procedure &A?-W-SC 9612 "Confined Space Entry" must be applied.

7.4.14 Scaffolding

PRINCIPAL CONTRACTOR's safe work procedure &A?-W-SC 9610 "Scaffolding - HSE Requirements for Erection, Dismantling & Modification" must be applied.

7.4.15 Working at Height

PRINCIPAL CONTRACTOR's safe work procedure &A?-W-SC 9606 "Working at Height" must be applied.

7.4.16 Lifting Operations

PRINCIPAL CONTRACTOR's safe work procedure &A?-W-SC 9607 "Lifting Operations" must be applied.

7.4.17 Material Transportation and Handling

Transportation and handling must be carried out according to the applicable local and PRINCIPAL CONTRACTOR's requirements.

CONTRACTOR must ensure that there is no risk of personal injury attributable to the method of packing, transporting or loading of the material. If there are any risks or special transport or handling requirements relating to lifting, stacking, unloading, unpacking, or storage that may affect the safety, CONTRACTOR must provide in due time a written notification to CONTRACTOR's Site Manager or PRINCIPAL CONTRACTOR, if unloading is not performed by CONTRACTOR's site team.

CONTRACTOR must ensure proper cargo securement so that:

- the load is safely stacked, especially for pipes or any cylindrical loads
- the load is secured and cannot fall or slip off the vehicle during loading, unloading and transport by use of appropriate load securing system (e.g. wedges, lashing chains or belts, ratchets etc). When securing cylindrical items, practical consideration should be given to how the load is to be unloaded in a safe and controlled manner.(e.g. sufficient space in-between pipes to place or modify slings, etc.)
- the centre of gravity of the load is as low as possible;
- the load does not protrude from the front or sides of the vehicle;
- the load has a clearly visible sign if it protrudes more than 1 m behind the vehicle;
- the vehicle is not overloaded and is stable.

Full caution must be exercised in the movement of heavy or bulky equipment on the construction site. Trained Banksmen must be provided by CONTRACTOR in front of and behind heavy moving loads to ensure safe movement of this equipment, the safety of other plant traffic, protection of plant power lines, pipe lines, supports and other operating equipment along the roadways.

7.4.18 Non- Destructive Testing

Purpose of Non- Destructive Testing is the detection of internal defects and flaws of the checked plant component without damaging it. The requirement for any form of NDT shall be communicated and agreed in advance with CLIENT.

7.4.18.1 Radiographic Inspections

PRINCIPAL CONTRACTOR's construction specification &AE-W-SC 9604 "Radiation and Radiographic Safety" must be applied.

Special protective measures will be subject to work permit (See 7.1.6).

7.4.18.2 Pressure Testing

Pressure testing must be performed in accordance with PRINCIPAL CONTRACTOR's standard LS 133-02 "Pressure Test of pressure vessels and piping on construction sites".

Pressure testing must only be performed after completion of all operations on the pressure-retaining wall and after inspection and release by the inspection agency. Approved documentation must be available.

Pneumatic pressure testing must not be carried out during normal construction working hours, if possible.

All impacted employees will receive proper instructions on the hazards of pressure testing in that area (e.g. in Toolbox Meetings). Employees performing the actual work must be given detailed instructions.

All equipment, gauges and relief devices must be certified as specified and equipped with operating instructions and safety precautions.

The area(s) where the pressure testing will be performed must be clearly marked with signs stating, "Pressure Testing in Progress."

The area(s) where pneumatic testing will be performed must also be evacuated until such time the test is complete and the pressure relieved.

The tested system area must be cordoned-off for pneumatic pressure tests depending on the volume and pressure. Required safety distances are indicated in LS 133-02.

Special protective measures will be subject to the work permit (see 7.1.6).

7.4.19 Tie-Ins

Tie-Ins (mechanical connections to existing piping system) require special precautions and coordination therefore, it must only be executed in close cooperation with PRINCIPAL CONTRACTOR and CLIENT and requires the issue of a work permit by CLIENT (see 7.1.6).

Conducting hot tap (connection into an existing pipe or vessel which is still under pressure or live) may damage the tool, cause catastrophic rupture of the piping, and cause injury or death to the operator or other personnel in the vicinity). Therefore Hot-Tapping must be avoided in the first instance.

7.4.20 Storage of Goods

Storage of goods is only allowed in the defined storage and lay down areas. If in doubt ask the Principal Contractor.

Storage buildings, store rooms, and storage equipment like storage racks, drip trays etc. must comply with local requirements. Access must only be given to Authorised personnel.

CONTRACTORs' storage areas must be released by their Authorised HSE Manager / Safety Officer and by PRINCIPAL CONTRACTOR.

7.4.21 Excavations

Excavations must comply with local legislation and PRINCIPAL CONTRACTOR's regulations doc. &A?-W-SC 9613. Most important are given below:

- Before commencing excavation works a thorough search by appropriate means for buried services must be conducted
- The sides and the ends must be sloped to a safe angle or supported with timber, sheeting or support systems if the depth of excavations exceeds 1.2 m to prevent them from collapsing.
- As a minimum requirement, the maximum allowable slopes are defined depending on the soil type as follows:
    - stable rock: 80 Degrees
    - stiff, cohesive soil (i.e. clay, silty clay, sandy clay, clay loam): 60 Degrees
    - granular cohesionless or soft, cohesive soil (i.e. gravel, sand, and loamy sand, angular gravel (similar to crushed rock), silt, silt loam, sandy loam): 45 Degrees
- It is prohibited to go into unsupported excavations.
- The edges of the excavations must be protected against falling into the excavation and against falling materials where there is a significant risk of injury and the angle of repose exceeds 60°. Therefore, the excavation must either be barricaded in a distance of 2m from the edges or a solid guardrail with hand- and mid-rails must be installed at the edges of the excavation. Provision of toe boards could be necessary.
- Equipment and materials piled, grouped or stacked and soil pile must have a minimum distance from the edge of the excavation of at least 0.60m.
- Cranes, vehicles and other heavy equipment must have a distance of at least 1 m from the edge of the excavation (Weight > 12 tonnes: Distance at least 2m)
- In case mobile construction equipment or vehicles must be operated close to the edge of excavations, trenches, dykes etc. appropriate controls must be defined and implemented to prevent them from tipping over and falling/rolling down. This might include but not limited to:
    - safe operating distances based on
        - machinery weight,
        - height of road or work area,
        - slope and soil type
    - work monitoring

- barricading, signage, signalling
- instruction to turn perpendicular to slope beyond a defined point.

- Good ladder access (necessarily starting from a depth of 1.2m) or other safe ways of getting in and out of the excavations must be provided at least every 7.5metres.
- A competent person must supervise the installation, alteration or removal of excavations support. Everyone carrying out the work must know about safe digging practices and emergency procedures.

Special protective measures will be subject to the work permit (section 6.3).

Additionally, a work permit is required by CLIENT before the start of excavation work.

7.4.22 Flushing

Flushing and purging must comply with PRINCIPAL CONTRACTOR's work procedure and following control measures must be implemented:

- Evacuation and cordoning off of affected areas
- Wearing of safety glasses (and dust mask if necessary) against particles and dust
- Wearing of hearing protection against noise
- Installation of shields to protect sensitive parts and equipment of plant
- Fixation of lines to be blown or flushed out
- Monitor working areas by O2 meter (if inert gas e.g. Nitrogen is used)

For control measures specific to the use of inert gas (e.g. nitrogen) refer to “inert Gas” (7.4.10.4).

7.4.23 Sand Blasting and Painting

CONTRACTOR must ensure that the plant and equipment used by the operators during spray painting and sand blasting operations comply with local laws and PRINCIPAL CONTRACTOR's requirements as shown below:

- Operators must be properly trained, and records must be submitted upon PRINCIPAL CONTRACTOR's request.
- Compressors providing air to airline respirators must be constructed in accordance with the local requirements.
- Hoses must have whip preventers installed at all joints to prevent injuries from lines that could whip around under pressure. Compressors must have filters in the delivery hose to continually remove moisture, oil and particulate. The filters must be renewed periodically, and the date of the renewal will be identified on the outside of the filter. It must have a Carbon Monoxide (CO) monitor and alarm between the oil lubricated compressor and the respirator air intake.

7.4.24 Human Factor Engineering

Human Factor Engineering (HFE) refers to the integration of human characteristics into the design of work system to optimise performance. This can be related to equipment design or fabrication, workstation / console, workplace layout, maintenance access and ease of access, screen design, working environment such as floor elevation, ladder rungs, climate, lighting, noise, etc.

When during project construction, pre-/commissioning and start-up (incl. shutdown, emergency operations, and maintenance) deficiencies related to HFE are observed in layout or design of work systems, CONTRACTOR must

- report these HFE’s deficiencies to PRINCIPAL CONTRACTOR to prevent any incident with severe consequences to personnel, environment or material,
- identify, demarcate or barricade areas with HFE deficiencies as appropriate,
- ensure that during the carry out of pre-start inspection of work area, hazards related to HFE such as deficiencies in layout and design of work areas are considered.

Reporting of Human Factor Engineering (HFE) issues must follow PRINCIPAL CONTRACTOR's specification &A?-W-SC 9624.

7.4.25 Tagging, Marking & Barricading

Geographically distinct and limitable hazardous areas (resulting from pre-commissioning/ commissioning activities) that are reasonably accessible must be surrounded by coloured barricades and shall have warning signs erected depending on the level of risk they constitute.

Risk Level	Barricading distance/limit	Example
Low	none	• Areas along lines that are tagged/marked
Medium	Minimum 5' (1.5m) Exclusion Zones	• Aqua Milling water hose route
High	Minimum 10' (3m) Exclusion Zones	• Water flush drain exit point (<60°C, 140 F) • Aqua Milling equipment and water exit point • Bulk Material Loading access and egress point
Extreme	Minimum 20' (6m) Exclusion Zones	• Air blowing exit points • Water flush drain exit point (>60°C, 140 F) • Aqua Milling pipe entry location • Hazardous Bulk Material Loading access and egress point • Steam blowing muffler exhaust location • Rupture disc blowing exit point

If handed over systems areas are NOT geographically limitable & NOT barricaded:

- handover systems must be demarked and signposted/labelled, at reasonably accessible locations and depending on the level of risk they constitute (see table below)
- Safety critical instrumentation needed during pre-commissioning activities must be marked with coloured labels (e.g. level, pressure or temperature high switches).
- Local hand switches on rotating equipment, which is used during pre-commissioning must be marked with coloured labels (e.g. for flushing, blowing or test run).

Risk Level	Tagging/marking	Example	Systems with following mediums in service
Low	Valves must be tagged with coloured stickers	• Lines under air blowing, water flushing, aqua milling, rupture disc blowing, cooling water lines • Non-insulated lines (<10 bar, 145 psi)	Potable water, plant air, instrument air, service water, demin water, raw water, fire water
Medium	Signboards "Live Line" or similar; for process lines: coloured labels (max. 10m, 30 ft. distance), Distribution panel (powered up): mark with coloured label;	• Energized electrical cables, instrument air line • Insulated steam lines (<10 bar, 145 psi)	Lube oil, chemicals, LP-steam and condensate
High	Coloured marking and tagging of valves, vents and drains (if accessible)	• Lines under pressure >10 bar or 145 psi (e.g. pressurized upstream systems during air blows) • Non-insulated steam lines (<10 bar, 145 psi)	Boiler feed water, VHP-, HP-, MP-steam and condensate

Extreme	100% coloured ribbon (if accessible)	• Hydrocarbon, nitrogen service and inertization • Hazardous chemical service	Fuel gas (if applicable), nitrogen, acid, caustic

7.5 Health

7.5.1 Medical Health Examinations

PRINCIPAL CONTRACTOR's and CONTRACTOR's employees who will perform work on site and may be exposed to any hazards to their health shall undergo medical health examinations (as defined in 7.5.1.1. and 7.5.1.2) as far as reasonably practicable under local legislation to prove the worker's fitness to work.

The CONTRACTOR must provide evidence of medical health examinations by submitting it to PRINCIPAL CONTRACTOR upon request.

Medical Health Examinations for PRINCIPAL CONTRACTOR's personnel are defined in "Health Screening and Occupational Medical Examinations" (&AA-Q-PP 3080.250.010), &AA W LX 9603 "List of medical health examination for construction & commissioning activities".

7.5.2 Fitness Examinations

Fitness Examinations include pre-medicals, annual routine and exit medicals according to legal standard and CLIENT's procedures.

Each CONTRACTOR is responsible for checking its employee's fitness for work and performing the necessary medical pre-examinations according to their works.

7.5.3 Asbestos and Refractory Ceramic Fibres

Asbestos or Asbestos Containing Material (ACM) are prohibited at site and all forms of asbestos have been banned in England since 1999.

Refractory Ceramic Fibres shall be used only upon beforehand written notice to PRINCIPAL CONTRACTOR and written approval from CLIENT.

In the case of locating Asbestos or other hazardous mineral fibres unexpectedly, the handling of these substances must comply with local or PRINCIPAL CONTRACTOR's regulations regarding safety requirements for demolition, reconstruction or maintenance work with the presence of Asbestos or hazardous mineral fibres.

Asbestos containing materials (ACM's) have been identified by CLIENT following ground surveys in the drains and have been communicated to those required to modify drainage system.

It is a pre-requisite requirement that persons who could come into contact with asbestos have been suitably trained to identify Asbestos Containing Materials (ACM's).

7.5.4 Physical Health Hazards

7.5.4.1 Noise

In areas where the noise exposure level of 80 dB (A) over an 8-hour Time Weighted Average or the peak level of 135 dB (C) is exceeded, CONTRACTOR must provide hearing protection and implement a hearing conservation plan for its own employees.

In areas where the exposure level of 85 db (A) or the peak level of 137 db (C) is exceeded, ('high noise areas') employees must wear hearing protection continuously.

Usually the rating level above 85 db (A) occurs in areas where such operations as sand blasting, metalwork, grinding, welding and cutting are conducted, or where compressors, diesel power generators etc. are in operation.

In front of or around stationary 'high noise areas' warning signs must be installed (e. g. sand blasting area, diesel power generators, operational plant) 'Stationary' means that the relevant equipment or plant is operated at least one day/shift at the same location.

7.5.4.2 Laser

Laser can be used for survey and scanning activities at site or construction site.

On the construction site, only Lasers of class 1-3 A and Lasers of class 3 B under defined technical characteristics are allowed. Class 3B Laser must have a wave length of 400-700 nm as a maximum while not exceeding power of 5mW. Lasers must be adjusted and secured in such a way as to cause no harm to the eyes.

Personnel must wear the appropriate PPE for the kind of laser being used.

Areas where survey work is carried out must be clearly marked by warning signs and if necessary cordoned off. This warning sign must display 'Caution Laser!', who performs the work (name/ telephone number/date) and how long work will last.

For survey work in areas with an increased risk of fire and/or explosion a hot work permit must be requested (See 7.1.6), since laser can be an effective ignition source.

In case of any incident to eyes, the injured person must immediately be treated by a medical eye specialist.

7.5.4.3 Illumination, Lighting

When work is performed in darkness or in areas where daylight is obscured, CONTRACTOR must at its own expense provide artificial light to carry out work efficiently, satisfactorily and safely, and to permit thorough inspection. The access to the place of work must also be clearly illuminated, however Principal Contractor shall ensure access and egress are suitably lit including access to the construction site and welfare areas.

7.5.5 Biological Health Hazards

7.5.5.1 Food

Nutrition must consider weather, local and working related conditions.

7.5.5.2 Drinking Water

Industrial water will be provided by CLIENT. Drinking water shall be supplied as part of the welfare arrangements by Principal Contractor.

Portable containers for drinking water must be tightly closed and equipped with a tap. Water must not be dipped from containers. Drinking water containers must be clearly labelled as to the nature of its contents and must not be used for any other purpose.

Drinking water containers must not be opened in the field by anyone other than employees designated to service and maintain the containers. Non-potable water outlets must be clearly labelled as being unsafe for drinking or washing purposes.

Portable water containers must be cleaned weekly, using appropriate disinfecting agent e. g. bleach wash and baking soda rinse. Single use drinking pots/cups must be provided at each water container. Adequate trash containers must be provided to dump the single use drinking pots/cups. The shared use of a drinking cup will not be permitted. Personnel are not permitted to drink directly from the container.

7.5.5.3 Toilet and wash basin facilities

Toilet and was basin facilities shall be provided in accordance with Workplace (Health, Safety and Welfare) Regulations 1992 (Regulation 21 Washing facilities)

Sanitation is provided by PRINCIPAL CONTRACTOR. Wastewater quality shall comply with the local drainage requirements. All contractors must make known, numbers of persons so that Principa Contractor can suitably plan for adequate arrangements.

7.5.5.4 Cleaning of Site Facilities

Principal Contractor has arranged suitable regular site/welfare cleaning and waste disposal. Each welfare user is responsible for cleaning personal cutlery and crockery used and for maintaining tidy welfare conditions within. Users of welfare must use waste bins provided.

7.5.6 Infectious Diseases of High-Consequence (IDHC)

IDHCs constitute serious human health threats. Persons with such diseases typically develop severe symptoms and require a high level of care and the case-fatality rates can be high. Several IDHC are (contact or airborne) transmissible from person to person and therefore require healthcare employees to take precautions to prevent transmission. Examples of high-consequence infectious diseases include:

Airborne IDHC: Middle East respiratory syndrome (MERS), Severe acute respiratory syndrome (SARS), Avian influenza (H1N1), coronavirus disease (COVID-19), etc.

Contact IDHC: Ebola virus disease (EVD), etc.

In case project site is located in an area identified or confirmed by the authorities as an area where an ongoing transmission from person to person can be suspected, CONTRACTOR must immediately report the information to PRINCIPAL CONTRACTOR and an IDHC management plan must be established and implemented.

PRINCIPAL CONTRACTOR's construction specification &A?-W-SC 9623 " Infectious Diseases of High-Consequence (IDHC) Management Plan" must be applied,

7.6 Driving and Traffic Safety

7.6.1 Traffic on Public Roads

Following requirements apply to CONTRACTOR’s, VENDOR’s and PRINCIPAL CONTRACTOR's personnel when driving on public roads for project business purposes (e.g. driving to/from pre-fabrication workshops, equipment suppliers etc.) as well as mass transportation of CONTRACTOR workers to/from site with buses or similar.

These requirements do not apply for services provided by CONTRACTORS for the transport of products and goods to site, for public transport and commuting to/from site (except for mass transportation in buses – see above).

Vehicle requirements apply when being used for a.m. purposes. Vehicles include passenger cars and light vehicles (cars, pick-ups and small service engineer type vans), motorcycles, motor trikes, trucks and buses. These do not apply to forklift trucks, cranes and similar lifting mobile equipment when being operated on public roads.

7.6.1.1 Driver Safety

CONTRACTOR’s driver must

- have a current driving license that is valid for the location, type of vehicle and, where applicable, the cargo.
- have a driving license checked by CONTRACTOR before being permitted to drive a PRINCIPAL CONTRACTOR's or CONTRACTOR's vehicle or a personal or hired vehicle or a pool car on business.
- be physically and mentally capable of operating the vehicle and rested and alert to maintain attention throughout the trip.

- have received a “General Driving Safety Training” at least once a year, or after involvement in a vehicle related incident.
- have attended a Defensive Driving Training course (DDT) at least every 4 years.
- comply with all relevant local, country or state driving regulations
- daily visually inspect the vehicle for roadworthiness, including tires and windscreen (windshield)
- make a rest after every 4 hours (as a minimum).
- stop the vehicle and take a rest break if attention is lost.
- not operate a vehicle while under the influence of alcohol, drugs, narcotics, or medication that could impair driving ability.
- wear a helmet when using a motorcycle (driver and all passengers).
- not use head/earphones whilst driving
- not make a call or answer a mobile phone or pager, send or read a text message, or use a hands-free mobile phone device while driving a vehicle.
- retain at least one hand on the wheel at all times and not handle or consume any food or drink that can cause a loss of control
- not allow unauthorised passengers in the vehicle, not offer a lift to hitchhikers
- wear the seat belt and require passengers to use seat belt at all times.

7.6.1.2 Vehicle Safety

CONTRACTORS’ vehicles must be

- suitable for the type of transport, i.e. transportation of personnel only in suitable vehicles with seats for the driver and each passenger
- equipped with:
  - three-point seat belts (two-point seat belts in buses) and head restraints for all seating positions
  - anti-lock braking systems (ABS) on all new purchased vehicles,
  - tyres with min. tread depth of 2mm (0.078’’) and adapted to weather conditions (e.g. winter tyres when outdoor temperature is below 7°C).
- maintained and serviced in accordance with manufacturers' guidelines, with OEM or OEM approved equivalent parts used.

The required additional PPE and safety equipment according to national law of the respective country must be retained in the vehicle. Where such equipment is required, drivers shall ensure it is located and maintained correctly.

All plant equipment for use on construction site must be fitted with reversing sounder and flashing beacon and have either reversing camera or mirrors installed to show blindspots.

7.6.1.3 Vehicle Incident Reporting

In addition to the local legislation governing the reporting of motor vehicle incidents, all drivers and passengers involved in a road traffic incident shall report all incidents to PRINCIPAL CONTRACTOR, at the earliest opportunity.

7.6.2 Traffic on Site

CONTRACTOR must organise traffic on site to minimize hazards to personnel and equipment. Traffic must take place only in designated areas. Traffic requirements from CLIENT and PRINCIPAL CONTRACTOR and listed hereafter must be strictly obeyed.

7.6.2.1 All Vehicles

All vehicles include road vehicles (trucks, passenger cars, vans etc.) and mobile construction site equipment (fork lift trucks, excavators, rollers etc.) must:

- be fit for purpose and meet the required specification for the task to be performed.
- have appropriate seating available for all occupants.
- transport passengers when seating in passenger seats only and co passengers shall be transported on any vehicle or equipment
- have a daily visual inspection before use.
- be secured against unauthorised use. Keys shall not be left in parked vehicles.
- be adequately ventilated when used for transporting cylinders.
- be used according to and not exceeding the vehicles or equipment load design capacity and/or legal requirements.

The access road must

- not be used for storage of materials and equipment.
- not be used for loading or unloading operations without written approval by PRINCIPAL CONTRACTOR.
- not be obstructed by broken down vehicles or equipment without written approval by PRINCIPAL CONTRACTOR.

Drivers of all vehicles being used for PRINCIPAL CONTRACTOR's or CONTRACTOR's business, and PRINCIPAL CONTRACTOR's or CONTRACTOR's vehicles being driven on non-work related activities, must:

- not use any in-vehicle communication device (e.g. mobile phone, CB radio, two-way device) unless the vehicle is legally and safely parked with engine switched off.
- In an emergency situation, stop and park before making the call. However, it is the driver's judgement to make the right decision at that time.
- observe the posted speed limits

7.6.2.2 Road vehicles (incl. trucks, passenger cars, vans, etc.)

- Three-point seatbelt from the Original Equipment Manufacturer (OEM or OEM approved) must be available for all occupants and in good working order.
- Three-point seatbelts must be worn by the driver and all occupants at all times, with the exception of when the vehicle is safely parked.
- The number of occupants in the vehicle must not exceed the manufacturer's design and specification, number of seats and/or available three-point seatbelts.
- All tyres must have a minimum tread depth of 1.6 mm (or greater if required to meet local legislation).
- Only new tyres must be fitted to steering axle as replacements. Any re-tread must be from OEM-approved sources.
- Braking and steering systems on heavy trucks (all commercial vehicles over 3.5 tonnes unladen weight must be tested for efficiency at least once every year by an experienced/qualified vehicle mechanic.
- All vehicles must undergo local required inspections, carried out by a certified authority or workshop.
- All drivers must have the appropriate licence for the class of vehicle being driven on the road, appropriate certification for product being carried and the correct level of training and competency to operate the vehicle and the associated equipment.
- Drivers must not transport any unauthorised personnel in project vehicles.

- Driving licence must be checked by PRINCIPAL CONTRACTOR/CONTRACTOR before a driver is permitted to drive a PRINCIPAL CONTRACTOR's or CONTRACTOR's vehicle or a personal or hired vehicle or a pool car on PRINCIPAL CONTRACTOR's or CONTRACTOR's business.

7.6.2.3 Mobile construction site equipment (fork lift trucks, excavators, rollers etc.):

- All drivers for mobile construction site equipment must have passed orientation training (including main item points from the 'Traffic on site' section) and a specific assignment for the type of equipment intended to be used (see also specific training requirements 7.3.2).

7.6.2.4 Backing up/ Reversing

- Reversing vehicles or mobile construction site equipment are by exception. This has been considered during the planning of travel routes, the scheduling of deliveries and the allocation of work and storage areas.
- Where there is a requirement to reverse plant equipment or manouver in tight spaces a trained and competent banksman must be used to control the vehicle movement.
- All trucks and mobile construction site equipment must be equipped with an audible reversing alarm.
- CONTRACTOR must have a system in place to ensure that no vehicle or mobile construction site equipment can reverse without having a banksman positioned behind the truck/vehicle including:
  - having a procedure in place to systematically ensure that a banksman is promptly available whenever a vehicle or mobile construction site equipment must reverse, e. g. by assigning a dedicated banksman to each vehicle or mobile construction site equipment upon arrival at the site gate or by holding available a sufficient number of banksmen on site that can guide a reversing vehicle or mobile construction site equipment upon request.

  NOTE: Relying only on the driver or operator and his duty to look out for a banksman before reversing a truck is not sufficient. Also, the availability of audible and/or visual reverse alarms can only be regarded as an additional precaution. An additional banksman is mandatory in every case.
  - having ensured that all drivers and operators are informed about the safety procedures upon arrival especially that it is not allowed to reverse a truck without a banksman being present.
  - having ensured that all banksmen are trained in their duties (incl. correct signals and positioning).
  - having ensured that all banksmen wear a high-visibility vest of a different colour to other site workers, to help distinguish them.
  - having ensured that all site personnel receive a training or toolbox talk regarding the respective safety measures and their duty to take action and report to their supervisor in case of non-compliance.
  - taking disciplinary action in case of a truck driver not adhering to the respective regulations.

7.7 Security

The SABIC site as a whole is surrounded by high security fencing and is monitored by close circuit TV. Site has a 24 hour permanent security team controlling access and egress on site. Security shall frequently carry out vehicle and personnel searches.

Principal Contractor shall ensure that all temporary buildings and plant equipment are secured with keys removed when the construction site is closed and all persons shall abide by existing security arrangements.

All persons are responsible for security of personnel effects and personal security within their own vehicles and Client, SABIC or Principal Contractor shall not be responsible for any loss.

7.7.1 General

CONTRACTOR will be responsible for the Security of their own facilities including material, equipment, tools and any other belongings.

VISITORs to Site must have a clear purpose for their visit and must have made arrangements for their visit with a contact person on Site prior their arrival. VISITOR's contact person must be available during the visit and must guide the VISITOR. VISITOR's contact person is responsible that the VISITOR complies with all HSE and Security rules while on Site.

Parking is only allowed in designated areas. Traffic near the Site is very restricted. Parking in the road or in the construction area will not be tolerated except industrial vehicles while operating, installation work like material transport, lifting activities, etc.

It is not permitted to take film or photo equipment inside the Site, existing process plant or any prefabrication shops without written permission from PRINCIPAL CONTRACTOR.

Smoking, lighting a fire or doing anything else which could ignite a fire on site is prohibited.

7.7.2 Illegal Drugs, Alcohol and Firearms Policy

Policy regarding illegal drugs and controlled substances, alcoholic beverages, and firearms is:

- The use, possession, distribution, purchase or sale of any illegal drugs, alcohol or other controlled substances by any person while on CLIENT's / PRINCIPAL CONTRACTOR's / CONTRACTOR's premises or in areas of CLIENT's / PRINCIPAL CONTRACTOR's / CONTRACTOR's operations, engaged in CLIENT's / PRINCIPAL CONTRACTOR's / CONTRACTOR's business or operating CLIENT's / PRINCIPAL CONTRACTOR's / CONTRACTOR's equipment is prohibited.
- The use of any illegal drug or other controlled substances or alcohol that cause or contributes to unacceptable job performance or unusual behaviour, even if consumed outside working hours, is prohibited.
- The use, possession, transportation or sale of explosives, firearms or other weapons by persons while on CLIENT's / PRINCIPAL CONTRACTOR's / CONTRACTOR's premises, engaged in CLIENT's / PRINCIPAL CONTRACTOR's / CONTRACTOR's business or while operating CLIENT's / PRINCIPAL CONTRACTOR's / CONTRACTOR's equipment is prohibited.

All Personnel at site must abide by this policy. Any person violating this policy shall be removed from CLIENT's / PRINCIPAL CONTRACTOR's / CONTRACTOR's premises and will be denied future access to CLIENT's / PRINCIPAL CONTRACTOR's / CONTRACTOR's premises.

CONTRACTOR will be responsible for ad-hoc drug and alcohol testing of their employees prior and during mobilization of the employees.

Principal Contractor and CLIENT reserve the right to carry out drug or alcohol testing following an incident or if they suspect drug or alcohol abuse.

7.7.3 Drone Flights

Any Drone or unmanned aircraft's operations (e.g. progress photography and mapping, 3D modelling, surveying, etc.) must be construction or commissioning activities related and comply at least with following requirements:

7.7.3.1 Drone Pilot's Requirements

- CONTRACTORS or PRINCIPAL CONTRACTOR's employees piloting drone flights must
  - have proven experience within operating drones in industrial facilities and be approved by PRINCIPAL CONTRACTOR Site Manager
  - receive all site inductions & safety briefings, see chapter 7.4.2 on training
  - designate with PRINCIPAL CONTRACTOR the need for escorting during the flight operation.

- CONTRACTOR must have a current certificate of liability insurance on file before any flight can be performed.
- PRINCIPAL CONTRACTOR Pilots are covered by PRINCIPAL CONTRACTOR Insurance for 3rd party damages.
- PRINCIPAL CONTRACTOR insurance covers PRINCIPAL CONTRACTOR drone equipment.

  PRINCIPAL CONTRACTOR insurance does **Not** cover:
  - Private drone equipment used or stored at site for operations not related to construction or commissioning activities
  - Damages/injuries resulting from private drone equipment operated at site for activities not related to construction or commissioning
  - Drone operations violating any site and legal requirements stated in the chapter “Flying Safety”, see 7.7.4.4.

7.7.3.2 Drone Equipment Requirements

- Drones flying at site must weigh between minimum 0,25kg/0.55lbs and maximum 25kg/55lbs
- Drone equipment must be labelled with a secured fireproof plate including name and address of owner. For flights with drones heavier than 5kg, a permission from the locally competent air traffic control authority must be obtained

7.7.3.3 Flight Plan

- CONTRACTOR or PRINCIPAL CONTRACTOR’s pilot must prepare a flight plan to be approved by PRINCIPAL CONTRACTOR Site Manager and including at least:
  - A site plot plan showing ‘No Fly Zones’ and marked up flight path and areas with potential hazards (e.g. flares, process vents, power lines, etc.) identified and agreed between PRINCIPAL CONTRACTOR and CONTRACTOR
  - A simple description of potential hazards and mitigation measures (e.g. hazard analysis).
  - Identification of explosive atmosphere classified zones 1 & 2
  - A written permission obtained from any fence line neighbours that could be captured (video, pictures)
  - Verification with local law enforcement to ensure compliance with local authorities, must be discussed with the PRINCIPAL CONTRACTOR and CLIENT project site team before starting the flights.
- CONTRACTOR or PRINCIPAL CONTRACTOR’s pilot must obtain express consent / special permit from PRINCIPAL CONTRACTOR Site Manager and CLIENT prior start of flight.
- CONTRACTOR or PRINCIPAL CONTRACTOR’s pilot must send approved flight plan to PRINCIPAL CONTRACTOR HSE Manager for record.

7.7.3.4 Flying Safety

- Pilot must inspect the drone prior each operation to ensure the functionality, maintenance and calibration, by following the manufacturer’s instructions and all applicable local rules and regulations.
- CONTRACTOR or PRINCIPAL CONTRACTOR’s pilot must notify personnel (via e-mail, whatsapp…) on site prior to launching a drone to ensure the safety and cooperation of individuals that may be affected by the drone flight path,
- Pilot must comply with the drone operational limitations:
  - Only fly one drone at a time and maintain the visual line-of-sight with naked eyes (not using binoculars or watching a video screen).
  - Drone must yield right of way to manned aircraft.
  - Drone may not operate over any persons; unless they are under a covered structure or inside a stationary vehicle that can provide reasonable protection from a falling drone.

- Flights must occur under good weather conditions, only during the day (between sunrise until sunset), with minimum visibility of 3miles/4,8km from the control station. No flight is allowed under fog, cloud, heavy rain or high wind conditions.
- Maximum flight altitude must be within 400ft/120m
- No live video streaming to the internet during flight is allowed.
- All recorded pictures data must be treated confidentially and for PRINCIPAL CONTRACTOR internal use only.
- No focused recording of persons, all persons recorded shall not be identifiable
- CONTRACTOR or PRINCIPAL CONTRACTOR's pilot must report any incident to PRINCIPAL CONTRACTOR Site Manager

7.8 Environmental Protection

PRINCIPAL CONTRACTOR's safe work procedure &AE-W-SC 9622 "Environmental Management Plan" must be applied.

7.9 Emergency Preparedness and Response (EPR)

7.9.1 Emergencies

An emergency is defined as a real or developing situation that poses, or potentially poses, an immediate risk to health, life, property, environment, or reputation. Emergencies require urgent evaluation and appropriate intervention to prevent a worsening of the situation, and to protect people, the environment, property, and reputation.

Emergencies, which have the potential to occur during the course of the project, are as follows:

- Fire and Explosion
- Medical Emergencies
- Environmental Emergencies
- Severe Weather
- Contact with High Voltage Equipment
- Damage to Underground Services
- Rescue from Height
- Rescue from Confined Space
- Offsite or Neighbouring Emergency
- Site Lock Down
- Terrorist attack (see Attachment 6)

Emergency preparedness and responses during the construction and commissioning phase will be prepared and managed by PRINCIPAL CONTRACTOR as and the detail is contained in the specific Project HSE induction.

CONTRACTORs must prepare Emergency Preparedness & Response Plans for at least those potential emergencies listed above and if necessary, for special activities at site not addressed by PRINCIPAL CONTRACTOR. The EPR plans must be reviewed / updated and agreed with PRINCIPAL CONTRACTOR.

7.9.2 Potential Crisis Scenarios

For any of the following emergencies, CONTRACTOR's and PRINCIPAL CONTRACTOR's employees must **immediately** inform PRINCIPAL CONTRACTOR's Site Manager or Site HSE Manager who will notify CLIENT / OWNER and PRINCIPAL CONTRACTOR's Crisis Management Team as per the "Emergencies Escalation Communication Matrix" (Attachment 6):

- Pandemic or absence of >40% of workers
- Terrorist attack (direct targeting)
- Bomb Threat
- Network Outage
- Natural Disaster - Earthquake - Tsunami
- Kidnapping
- Large Scale Traffic Accident
- Cyber Attack

- Loss of IT-Network (long-standing)
- Negative Media attention
- Accident resulting in (multiple) fatality
- Political Unrest
- Significant Stop of Work
- Fraud against / by PRINCIPAL CONTRACTOR
- add additional crisis scenarios if defined by CLIENT

7.9.3 Emergency Response Teams

7.9.3.1 First Aiders

Description of personnel for First Aid is given in section 6.5.

PRINCIPAL CONTRACTOR's and CONTRACTORs Site Manager or Site HSE Manager must establish and maintain up-to-date a list of all First Aiders (Attachment 6) and make it available for all staff on site.

A first aid book is available in the Principal Contractors office and any records taken shall only be done so in line with General Data Protection Regulations (GDPR).

7.9.3.2 Hospital

The nearest appropriately equipped and staffed hospital (incl. oxygen chamber treatment in case of asphyxiation accidents) is:

- University Hospital Of North Tees, address is Hardwick Road, Stockton-On-Tees TS19 8PE, approximately 8 miles away (20 minutes journey time) and;
- The James Cook University Hospital, Marton Road, Middlesbrough, TS4 3BW, approximately 9 miles away (23 minutes journey time.
- CLIENT 3rd party emergency response vehicles are located on site.

7.9.4 Emergency Response Facilities and Equipment

7.9.4.1 Emergency facilities

Special facilities such as eye showers and emergency showers are available if required on CLIENT Hydrogen Plant and are available by contacting CLIENT in an emergency.

Eyewash bottles shall be placed in close proximity to locations with hazardous chemicals (e.g. stationary transfer locations). Eyewash plastic bottles of mineral water must remain sealed until used and they shall be routinely inspected and replaced if damaged or used.

First-Aid kits equipment is located at the LIC plant permit to work station. First aid kits must be arranged by PRINCIPAL CONTRACTOR and CONTRACTOR. In the case of hazardous works with significant or high risk are carried out where no emergency kit is close-by an additional first aid kit must be present.

7.9.4.2 Emergency and Rescue Equipment

CLIENT have an on-site 3rd party dedicated emergency response service provider for rescue and response to incidents or medical treatment cases. All plans for potential rescue must be submitted to Principal Contractor in advance for review with the 3rd party emergency response provider.

All emergency situations must be alerted immediately to Principal Contractor permit to work issuer who will necessary contact for site support.

Scaffolders must be trained and competent for self-rescue in the first instance.

- An automated external defibrillator (AED) is available in CLIENT control room building.

The records of training must be submitted to PRINCIPAL CONTRACTOR upon request.

7.9.4.3 Firefighting equipment

PRINCIPAL CONTRACTOR shall equip temporary site facilities with fire extinguishers. Contractor shall provide suitable fire extinguishers for use during hot work activities.

Type, number, use, and location of fire extinguishers shall be decided by Principal Contractor who has completed a fire risk assessment for temporary facilities.

7.9.4.3.1 Training

An appropriate number of personnel must be trained in the use of fire extinguishers. (see 7.4.2)

7.9.4.3.2 Inspections

The fire extinguishers shall be inspected before every use and annually by a competent person. Additionally, CONTRACTOR shall ensure that fire extinguishers are visually inspected at least monthly by assigned personnel.

7.9.5 Emergency Exercises

Emergency exercises must be conducted and documented to identify and correct any deficiencies in the EPR plans or their implementation. Emergency exercises can be conducted jointly with CLIENT / OWNER and can also be combined with Crisis Scenario exercises.

CONTRACTORs must participate in the following emergency exercises scheduled and executed by PRINCIPAL CONTRACTOR:

Emergency Exercise Types	Description	Frequency
Site Evacuation - Partial	Area specific headcount evacuation, or Contractor specific drills, etc. Annual complete project site evacuation drills should be considered	Every 6 months
Hazardous spill / leak / release		Every 6 months
Rescue from height / confined space rescue	Assigned rescue team shall be contacted by Principal Contractor in advance of activities requiring potential rescue which includes work at height and confined space entry. The 3rd party rescue team are knowledgeable of the site but may still require to visit and carry out pre-rescue review of activity in advance.	Prior to activity commencing

7.10 Communication and Reporting

7.10.1 HSE Meetings

HSE must be a permanent subject and the first topic within all regular meetings. Meetings must be scheduled as follows:

Meeting	*Frequency*	*Participant*	*Agenda*	*Documentation*
Kick off Meeting (with CLIENT)	Before start of construction	• PRINCIPAL CONTRACTOR's Participants: • Project Manager • Site Manager • Lead Construction & Commissioning HSE • Site HSE Manager	Site HSE responsibilities, Site HSE Management System, Handover of construction area	Handover Protocol, MoM

		• CLIENT's Participants • Project Manager • Operations • HSE Manager	(if applicable)	
Kick Off Meeting (per CONTRAC-TOR)	once before the start of work	• PRINCIPAL CONTRACTOR's Site Manager • PRINCIPAL CONTRACTOR's Construction Manager • PRINCIPAL CONTRACTOR's Site HSE Manager • PRINCIPAL CONTRACTOR's Disc. Site Superintendent • CONTRACTOR's Construction Manager and Supervisors • CONTRACTOR's HSE Manager, • CLIENT's Project Manager* • CLIENT's HSE Manager* • CLIENT's Site HSE Coordinator* • Further personnel on demand	HSE (amongst others)	According to checklist &AZ-W-LF 9601 Presentation &A?-W-WM 9603
Coordination Meeting	daily (before start of work)	• PRINCIPAL CONTRACTOR's Site Manager • PRINCIPAL CONTRACTOR's Construction Manager • PRINCIPAL CONTRACTOR's Site HSE Manager • PRINCIPAL CONTRACTOR's Disc. Site Superintendent • CONTRACTOR's Construction Manager/ Supervisor • Further personnel on demand	Coordination of work for the day: • information on the basis of the Co-ordination Plan • HSE measures • work permits	-
Contractor HSE Meetings (per CONTRAC-TOR)	weekly	• PRINCIPAL CONTRACTOR's Disc. Site Superintendent • PRINCIPAL CONTRACTOR's Site HSE Manager • CONTRACTOR's Construction Manager/ Supervisor • CONTRACTOR's HSE Manager	HSE, HSE-Findings (can also be part of regular meetings with contractors)	MoM
Toolbox-Meetings (per CONTRAC-TOR)	weekly (and on demand)	• CONTRACTOR's Construction Manager/ Supervisor • CONTRACTOR's HSE Manager/Safety Officer • CONTRACTOR's personnel	HSE, HSE-Findings	Record according to &AZ-W-RX 9603
HSE Team Meeting	weekly	• PRINCIPAL CONTRACTOR's Site HSE manager • CONTRACTOR's HSE Manager/Safety Officer • CLIENT's HSE Manager* • CLIENT's Site HSE Coordinator* • Further personnel on demand	HSE-Findings, Measures, Specials, Incidents	MoM
HSE Committee Meeting	monthly	• PRINCIPAL CONTRACTOR's Site Manager • PRINCIPAL CONTRACTOR's Construction Manager • PRINCIPAL CONTRACTOR's Construction Manager • PRINCIPAL CONTRACTOR's Commissioning Manager • PRINCIPAL CONTRACTOR's Site HSE Manager • CONTRACTOR's Construction Manager/ Supervisor • CONTRACTOR's Site HSE Manager • Further personnel on demand	HSE-Findings, Measures, Specials, Incidents	MoM
BeSafe Daily	Refer to 7.1.9			

*) optional participation

7.10.2 Manpower Report

CONTRACTOR must report on a daily basis prior to each work shift a list of workers present at site to PRINCIPAL CONTRACTOR's Site Manager.

7.10.3 Monthly HSE Report

PRINCIPAL CONTRACTOR's Site Manager supported by PRINCIPAL CONTRACTOR's Site HSE Manager must prepare the monthly Site HSE report using the form &AZ-W-RA 9601. He/she must submit this report to PRINCIPAL CONTRACTOR's Project Manager, the Project Construction Manager and the Lead Construction & Commissioning HSE.

The report must include a presentation of the status of the HSE performance based on defined leading and lagging indicators, e.g. the BeSafe Index and incident rates. Corrective and preventive measures, which have been initiated, or implemented, must be briefly described.

CONTRACTOR must report direct and indirect construction man hours, including management/supervision (but excluding standard engineering hours) and offsite fabrication, construction and installation work (in case PRINCIPAL CONTRACTOR defines this as part of the project scope) to the author of the Monthly HSE Report including additional information as requested (e.g. HSE activities, type and number of incidents) by the end of the first working day of the next month.

7.10.4 Final Construction and Commissioning Reports

PRINCIPAL CONTRACTOR's Site Manager supported by PRINCIPAL CONTRACTOR's Site HSE Manager must prepare a Final Construction Report. He/she must submit this report to Project Manager, the responsible head within PRINCIPAL CONTRACTOR's construction organisation and the Lead Construction & Commissioning HSE. The report must include comments on:

- Effectiveness of the HSE Program
- Problems which were not anticipated – how they were overcome and recommended future approach
- Successful positive aspects that should be considered for future activities
- Any damage to equipment and recommendations for how to avoid similar damage in future operations
- Suggested work routine improvement
- Incidents

CONTRACTOR must report to the author of the Final Construction Report the necessary information within 15 working days of the completion of project.

The report should contain leading and lagging indicators and an assessment of safety performance of all CONTRACTORs and SUB-CONTRACTORs.

7.10.5 Incident Reporting and Investigation

Incidents include Unsafe Working Conditions or Practices, Near Misses, First Aid Cases, Medical Treatment Cases, Restricted Work Cases, Lost Workday Cases, Fatalities, Sickness Cases, Commuting Incidents, Environmental Incidents, Damages to Property, Process Safety Events, Commercial and Non-commercial Vehicle Incidents, Fatality Potential Events and Major Events (for detailed definitions see &AX-Q-PR 1050.520.011 "Incident Detailed Definitions").

Each incident by CONTRACTOR must immediately be reported to PRINCIPAL CONTRACTOR's Site Manager or the Site HSE Manager by the use of the form "Internal Notice of Incident" &AX-Q-PR 1050.520.012 or similar. Exception: Unsafe working conditions or practices must be addressed immediately. If the unsafe situation remains after being addressed, the deficiencies must be documented in the "Internal Notice of Incident" &AX-Q-PR 1050.520.012 or other appropriate forms (e.g. safety observation reports, LUCAS reports).

Each incident of Severity Level 1, 2 and incidents categorized as Restricted Work Case (RWC) or Medical Treatment Case (MTC) must be investigated and an incident investigation report according to &AX-Q-PR 1050.520.028 "Incident Causal Tree" or similar must be prepared. All other incidents need to be investigated only upon decision of PRINCIPAL CONTRACTOR's Site Manager, Site HSE Manager or Lead Construction & Commissioning HSE.

The tasks of PRINCIPAL CONTRACTOR's personnel in the Incident Reporting and Investigation processes are described in &AX-Q-PR 1050.520.010 "Incident Reporting" and &AX-Q-PR 1050.520.020 "Incident Investigation".

The investigation of incidents must be led by PRINCIPAL CONTRACTOR. CONTRACTORs must participate in the investigation.

7.10.5.1 Guidance on the Recordability of Incidents

PRINCIPAL CONTRACTOR or CONTRACTOR must ensure that an injured worker is accompanied to the physician or other licensed health care professional or hospital, etc. by a PRINCIPAL CONTRACTOR or CONTRACTOR's assigned and "knowledgeable" person.

CONTRACTOR first aiders and supervisors who acPrincipal Contractor injured workers should *legally and ethically* support medical providers to minimize their impact on PRINCIPAL CONTRACTOR's recordable rate by paying careful attention to the subtle nuances between *recordable* and *non-recordable* injuries.

At a minimum following guidance on "recordability" principles must be adhered to:

- First Aid shall not be over treated when less treatment will provide proper care. However, if the first physician or other licensed health care professional writes a prescription, the case is considered recordable once the prescription is issued. An authoritative provider or physician cannot override prescriptions, even if they are never filled or taken. It is important that the first physician does not over treat.

  Examples: Over the counter (OTC) medication instead of prescriptions, butterfly bandage instead of dermal adhesive / suture, support device instead of immobilization.

- CONTRACTOR's medical staff should receive training/information on the treatments that constitute a recordable case.

- Regarding lost workdays, CONTRACTOR's injured worker taken off by a physician or other licensed health care professional should be seen by a second provider selected by PRINCIPAL CONTRACTOR or CONTRACTOR for a second opinion if deemed appropriate (e.g. this can be another local physician, when available). PRINCIPAL CONTRACTOR and CONTRACTOR's employer may determine which recommendation is the most authoritative and record on that basis.

  Example: If CONTRACTOR's worker was removed from work by a personal doctor, PRINCIPAL CONTRACTOR's or CONTRACTOR's occupational physician or another selected physician may send the injured worker back to work but advise a work on restricted duties. This is no Lost Workday Case.

- If CONTRACTOR's workers feel safe reporting off-the-job injuries, theses can be compiled as evidence that will help avoiding potential aggravation of these conditions.

  Example: A worker injures his back during a softball tournament. If this personal injury is unreported, the worker may work at full duty and may aggravate the injury. At that point, the injury will likely become recordable. If the worker had reported the injury, one could have modified his duty to allow healing time, thus avoiding the potential aggravation.

- Workers must be instructed to report immediately any work-related injuries while at work, so the PRINCIPAL CONTRACTOR's or CONTRACTOR's occupational medicine provider or selected physician may offer conservative, medically appropriate treatment that may not be recordable.

- An injured worker should be able to use the day of the injury to allow to recover or be sent home for rest or be provided with light duty for the remainder of the shift. This time may be enough to allow the worker to return to normal duties, avoiding a potential recordable. As long as the worker can return to routine duties the next calendar day, at least no Lost Workday Case is rendered.

- The physician's opinion should be documented. Recordability is based on the physician's opinion, not the worker's actions. If a medical provider states that a worker can work, but the worker chooses to stay home anyway, the case is not recordable.

7.10.6 Lessons from Incidents

Lessons from Incidents (LFIs) will be shared and distributed to all Project Sites via email to PRINCIPAL CONTRACTOR's Site Manager.

CONTRACTORs must perform tool box talks or similar to discuss any LFI relevant to their activities and received from PRINCIPAL CONTRACTOR.

The implementation of the LFI specific preventive actions will be tracked and must be confirmed in written by PRINCIPAL CONTRACTOR's Site Manager.

Past LFIs are available on the LE Sharepoint Page under following Safety Moments, Safety Topics & Lessons From Incidents (sharepoint.com)

7.10.7 HSE Campaigns and Initiatives

PRINCIPAL CONTRACTOR and CONTRACTORS shall regularly organise HSE awareness raising campaigns or initiatives to develop and maintain a positive safety culture around site's activities. It is recommended to use high-impact topics aligned with actual site activities and conditions (e.g. emphasize "heat stress prevention" before and during extreme heat periods; "LOTO" before and during the energizing of systems, etc.). In addition to work-related topics, HSE information that employees can benefit from away from work should also be communicated (e.g. driving safety, fire protection, sun protection, home and leisure accidents, etc.). with a recommended ratio of max. 1/3 of information related to outside the job and the rest to field impact issues.

7.10.8 HSE Information Board

Important HSE Information must be announced on an HSE Information Board to be provided by PRINCIPAL CONTRACTOR, e. g.

- HSE Performance of the project (e.g. relevant leading and lagging indicators)
- BeSafe Dashboard
- Winner of safety award
- HSE Coordination Plan (Attachment 8)
- List of all First Aiders
- Important phone numbers
- Emergency Plan

7.10.9 Notifications

7.10.9.1 Pre-/Commissioning Notices (PCC Notices)

PCC Notices also called 'Electrical/Commissioning Livening Up Notice' (as defined in "Control of Hazardous Energies" - &AZ W-SC 9609) indicate what system or parts thereof is being pre-/commissioned (e.g. under pressure or filled with hazardous substances).

PCC Notices must be used as safety information for all involved parties and must provide information at least on:

- the tagging, marking or barricading that will be applied
- specific requirements for PPE
- specific requirements for tools and equipment (e.g. explosion-proof)
- any other specific HSE requirements

PCC Notices must be prepared by the PRINCIPAL CONTRACTOR Pre-/Commissioning Manager with support of Site HSE Manager before start of any PCC activities.

PCC Notices must be distributed to all relevant parties (including CLIENT) before start of any PCC activities.

7.10.9.2 Regulatory Notifications

CONTRACTORs must inform and involve PRINCIPAL CONTRACTOR for any notification of various regulatory bodies following an emergency event or incident occurring on site. PRINCIPAL CONTRACTOR will inform CLIENT / OWNER as required.

CONTRACTORs are responsible for ensuring that following an emergency event or incident occurring the necessary information is prepared for regulatory bodies within the required timeframes and with sufficient detail as requested by the regulator.

7.11 HSE Assurance (Inspections and Verifications)

7.11.1 Safety Walks

The implementation of all requirements, procedures and measures on site will be checked by regular safety walks.

Inspection	***Frequency***	***Participants***	***Focus on***	***Documentation***
Safety walk	each day on site	PRINCIPAL CONTRACTOR's Site HSE manager	inspection of construction site safety measures work permits	&AZ-W-RF 9601
Environmental Inspection	weekly	PRINCIPAL CONTRACTOR's Site HSE manager	inspection of construction site for environmental performance and compliance	&AZ-W-RF 9603
Safety walk (per CONTRACTOR)	daily	CONTRACTOR's HSE Manager/Safety Officer	inspection of construction site safety measures work permits	&AZ-W-RF 9601
Management Safety walk (followed by a wrap-up meeting)	weekly	PRINCIPAL CONTRACTOR's Site Manager, PRINCIPAL CONTRACTOR's Construction Manager, PRINCIPAL CONTRACTOR's Site HSE Manager CONTRACTOR's Construction Manager CLIENT's Project Manager*, CLIENT's Site HSE Coordinator* further personnel on demand	inspection of construction site	&AZ-W-RF 9601

*) optional participation

All Safety Walks must be documented appropriately. If necessary, reports of Safety Walks will be handed over from PRINCIPAL CONTRACTOR to CONTRACTOR.

The documentation and reporting system must include:

- Responsible persons (supervisors, superintendents, construction managers etc.) must be involved in this process.
- Clear definition of responsibilities and timing for measures to be taken
- Well-defined workflow:
- Identify discrepancy and notify responsible persons (supervisors, superintendents, construction managers etc.)
- Responsible person takes action
- Close issue

Each of the above-mentioned steps must be confirmed by signatures

7.11.2 LUCAS

n.a.

7.11.3 Audits and Reviews

The implementation of HSE specifications and requirements will be checked by means of audits and reviews.

An HSE Site Review will be conducted after completion of main foundations and before start of steel structure erection and equipment installation (around project gate "H") by PRINCIPAL CONTRACTOR acc.to &AZ-Q-PP 2020.060.021 "Design and Site Review Program" to verify the implementation of the site safety procedures.

In case of increased incident frequency and severity on site or other critical observations, additional HSE Reviews should be conducted.

Internal audits will be performed acc. to &AZ Q-PP 1050.040.010 "Conducting Internal Audits" by PRINCIPAL CONTRACTOR approximately every 6 months after the initial HSE Site Review. The timing of the audits should be adjusted to HSE critical project phases (e.g. start of (pre-)commissioning, mobilisation of new contractors, etc.).

Additionally, PRINCIPAL CONTRACTOR may carry out HSE audits of CONTRACTORs after sufficient notice has been given (at least 2 weeks ahead).

7.11.4 Management Reviews

This Construction Phase Plan must be checked periodically by PRINCIPAL CONTRACTOR and/or Project Management towards the status and adequacy of its implementation, necessary changes of objectives and regulations resulting from changing circumstances with view to improvement. Any significant revisions of the plan shall be communicated to all relevant participants.

7.11.5 Authority Inspection

Authority inspections will be performed under the terms of local law. Authority inspections of CONTRACTOR's work must be reported to PRINCIPAL CONTRACTOR immediately.

8 Health and Safety file

The health and safety file which is aligned and bespoke to this project, contains relevant health and safety information to be considered during any subsequent project.

The file must contain information about the current project likely to be needed to ensure health and safety during any subsequent work, such as maintenance, cleaning, refurbishment or demolition. When preparing the health and safety file, information on the following should be considered for inclusion:

- a brief description of the work carried out
- any hazards that have not been eliminated through the design and construction processes, and how they have been addressed (e.g. surveys or other information concerning asbestos or contaminated land)
- key structural principles (e.g. bracing, sources of substantial stored energy including pre- or post-tensioned members) and safe working loads for floors and roofs
- hazardous materials used (e.g. lead paints and special coatings)
- information regarding the removal or dismantling of installed plant and equipment (e.g. any special arrangements for lifting such equipment)

- health and safety information about equipment provided for cleaning or maintaining the structure
- the nature, location and markings of significant services, including underground cables; gas supply equipment; fire-fighting services etc
- information and as-built drawings of the building, its plant and equipment (e.g. the means of safe access to and from service voids and fire doors)

There should be enough detail to allow the likely risks to be identified and addressed by those carrying out the work. However, the level of detail should be proportionate to the risks. The file should not include things that will be of no help when planning future construction work such as pre-construction information, the construction phase plan, contractual documents, safety method statements etc. Information must be in a convenient form, clear, concise and easily understandable.

Principal Designer - The Principal Designer is responsible for initiating the file and for the ongoing contribution to it. The Health and Safety file shall be provided to the Client on handover and completion of the project.

Designer(s) - Where it is not possible to eliminate health and safety risks when preparing or modifying designs, designers must ensure appropriate information is included in the health and safety file about the reasonably practicable steps they have taken to reduce or control those risks. This will involve liaising with:

- The Principal Designer, in helping them carry out their duty to prepare, update, review and revise the health and safety file. This should continue for as long as the Principal Designer's appointment on the project lasts; or
- The Principal Contractor, where design work is carried out after the Principal Designer's appointment has finished and where changes need to be made to the health and safety file. In these circumstances, it will be the Principal Contractor's duty to make those changes, but the designer must ensure that the Principal Contractor has the appropriate information to update the file. This information should be provided to the Principal Designer and Principal Contractor as early as possible before the designer's work ends on the project.

9 Documentation and Records

This document and relevant records shall be controlled as defined in "Preparation of Internal Documents" (&AZ-Q-PP 1050.060.010 (EN)), "Distribution of Documents" (&AZ-Q-PP 1050.063.010 (EN)) and "Archiving of Documents" (&AZ-Q-PP 1050.066.010 (EN)).

9.1 PRINCIPAL CONTRACTOR's Documents

9.1.1 Applicable to PRINCIPAL CONTRACTOR's personnel only

No.	Title (English)
&AE W-LX 0001	GC HSE Training Profile
&AA-Q-PP 3080.250.010	Health Screening and Occupational Medical Examinations
&A? W-LH 9602	List of hazardous material – Commissioning
&A? W-WM 9601	HSE Site Induction Training
&A? W-WM 9603	HSE Kick-Off Meeting
&AX Q-PR 1050.520.010	Incident Reporting and Investigating
&AX Q-PR 1050.520.013	Internal Notice of Major Event (ME)
&AX Q-PR 1050.520.020	Incident Investigation
&AX Q-PR 1050.520.021	Classified list of causes
&AX Q-PR 1050.520.028	Incident Causal Tree
&AX Q-PR 1050.520.029	Reporting Timeline and Addresses - Major Event at Project Site
&AX Q-PR 1050.520.030	Reporting Timeline and Addressees - Incident at Project Site
&AX Q-PR 1050.520.22A	MIR Progress Update Report
&AX Q-RX 1050.520.12A	HSE Update & Lessons from Incident
&AZ P-PE 2800	Pre-Start-up Safety Review
&AA-0100 A-RM 1065	Minute of Meeting - Plant Safety & Start-up Review (PSSR)
&AZ Q-PP 1050.040.010	Conducting Internal Audits
&AZ Q-PP 2020.060.021	Design and Site Review Programs
&AZ Q-QB 1050.020.002	Assignment of HSE Responsibilities
&AZ Q-SR 0201	(Global) Project Manager (PM)
&AZ Q-SR 0230	Site Manager (SM)
&AZ Q-SR 0231	Site HSE Manager
&AZ Q-SR 0240	Construction Manager (CM)
&AZ Q-SR 0241	Site Superintendent (SSI)
&AZ Q-SR 0242	Site HSE Engineer
&AZ Q-SR 0251	Site HSE Supervisor
&AZ Q-SR 0256	Project Construction Manager (PCM)
&AZ Q-SR 0260	Commissioning Manager (CMM)
&AZ W-PE 9603	Safety Walk-Throughs on Construction Sites
&AZ W-PE 9604	Asbestos on construction sites managed by PRINCIPAL CONTRACTOR
&AZ W-PE 9607	HSE Requirements for Vendors on construction sites

9.1.2 Applicable to All Personnel

No.	Title (English)
&AX Q-PP 1030.275.010	Recognition and Consequence Management Framework
&AX Q-PR 1050.520.011	Incident Detailed Definitions
&AX Q-PR 1050.520.012	Internal Notice of Incident
&AX Q-QP 1041	Health, Safety and Environment (HSE) Policy
&AX Q-QP 2002	Linde Life Saving Rules
LS 133-02	Pressure Test of Pressure Vessels and Piping on Construction Sites
LS 940-03	List of hazardous work

9.2 Project Documents

9.2.1 Applicable to PRINCIPAL CONTRACTOR's personnel only

No.	Title (English)
&AA W LX 9603	List of medical health examination for construction & commissioning activities
&AA W-RX 9604	Test Report for Gas Detectors
&AZ Q LX 1050.400B	Environmental Aspect Register & Environmental Impact Assessment (EIA) - LE Construction & Commissioning'
&AZ W-LF 9601	HSE Checklist Kick-Off-Meeting
&AZ W-LF 9608	Contractor Readiness to Start Checklist
&AZ W-LF 9609	HSE Site Induction Training Comprehension Check
&AZ W-LF 9613	Construction & Commissioning HSE Activities Register - EPC(M) / EP projects
&AZ W-LH 9602	List of Hazardous Materials – Commissioning
&AZ W-RA 9202.002	Release for Pre-Commissioning
&AZ W-RA 9202.003	Mechanical Completion (MC) Certificate
&AZ W-RA 9202.004	Plant Mechanical Completion Certificate
&AZ W-RA 9601	Monthly HSE Report
&AZ W-RF 9601	Safety Walk-Through Record
&AZ W-RF 9602	LUCAS
&AZ W-RF 9603	HSE Checklist & Record for Environmental Inspection
&AZ W-RX 9602	HSE Training Record
&AZ W-QA 9602	Plant Handover Certificate

9.2.2 Applicable to All Personnel:

Attachment 1: Flowchart of Recognition & Consequence Management
Attachment 2: PRINCIPAL CONTRACTOR HSE Policy
Attachment 3: PRINCIPAL CONTRACTOR Life Saving Rules
Attachment 4: The Golden Rules of Information Security
Attachment 5: Site Organisation
Attachment 6: Emergency Response & Evacuation Plans
Attachment 7: Risk Management Concept
Attachment 8: HSE Coordination Plan
Attachment 9: Germany: Notification of civil and construction works
Attachment 10: CLIENT's HSE Policy
Attachment 11: Project Site Specific HSE Policy
Attachment 12: CLIENT Life Saving Rules

No.	Title (English)
&A? W-LF 9603	HSE documents to be prepared by Contractor
&A? W-LH 9601	List of Hazardous Materials – Construction
&A? W-LX 9605 (EN)	Critical Temporary System Log
&A?-W-QR 9602	Risk Assessment (General)
&A? W-QR 9604	Job Safety Analysis
&A? W QR 9607	BeSafe Daily (BSD) & Daily Pre-Task Risk Assessment
&A? W-RX 9603	Toolbox Meeting Record
&A? W-SC 9601	Permit to Work System
&A? W-SC 9601.001	General Work Permit
&A? W-SC 9601.002	Hot Work Permit
&A? W-SC 9601.003	Confined Space Entry Permit
&A? W-SC 9601.004	Lifting Permit
&A? W-SC 9601.005	Work At Height Permit
&A? W-SC 9601.006	Energy Control Permit
&A? W-SC 9601.007	Pressure Testing Permit
&A? W-SC 9601.008	Hazardous Substances Permit
&A? W-SC 9601.009	Excavation Permit
&A? W-SC 9601.010	Radiography Permit

&A? W-SC 9601.011	Specific Hazard Work Permit
&A? W-SC 9601.012	Photography Permit
&A? W-SC 9601.013	Entry Logbook
&A? W-SC 9601.014	Atmospheric Testing Record
&A? W-SC 9601.015	Permit Logbook
&A? W-SC 9602	Heat Stress
&A? W-SC 9603	Personal Protective Equipment on Construction Sites
&A? W-SC 9604	Radiographic Inspection Safety
&A? W-SC 9606	Working at Height
&A? W-SC 9607	Lifting Operations
&A? W-SC 9609	Control of Hazardous Energies
&A? W-SC 9610	Scaffolding
&A? W-SC 9612	Confined Space Entry
&A? W-SC 9613	Excavation
&A? W-SC 9615	Security Program Site
&A? W-SC 9617	Site Evacuation Plan
&A? W-SC 9620	BeSafe Program Construction
&A? W-SC 9622	Environmental Management Plan (EMP)
&A? W-SC 9624	Human Factor Engineering (HFE)
&AA W-SC 3304	Electrical Energy Control Procedure
&AZ W-WM 9605	Crane Driver Awareness Training
&AZ W-WM 9606	Permit to Work Training

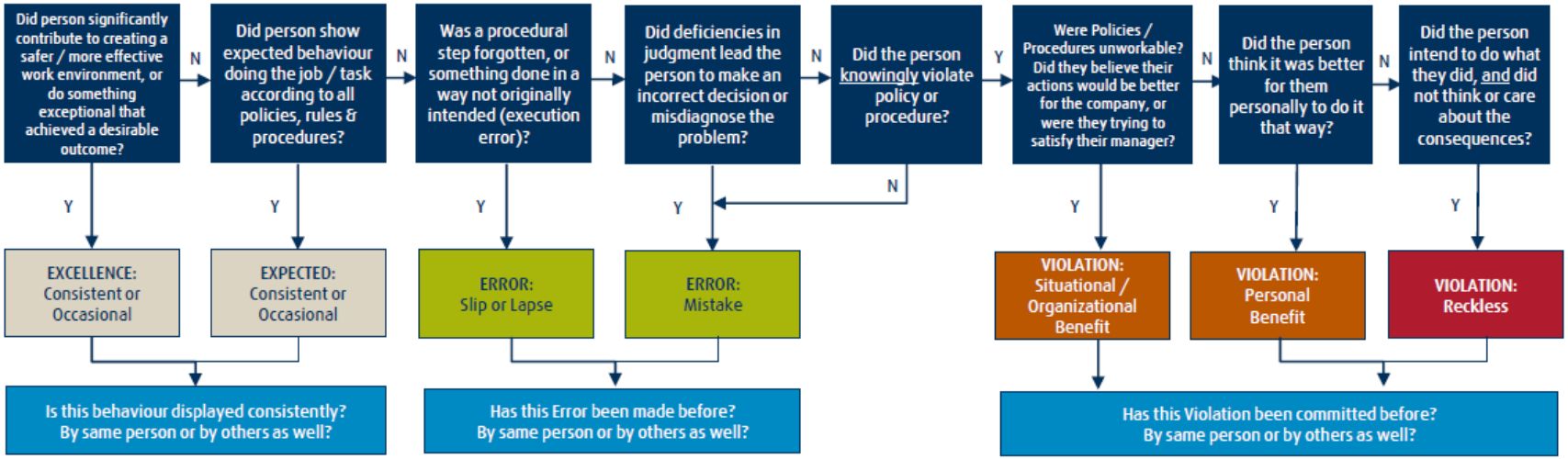
10 Revisions

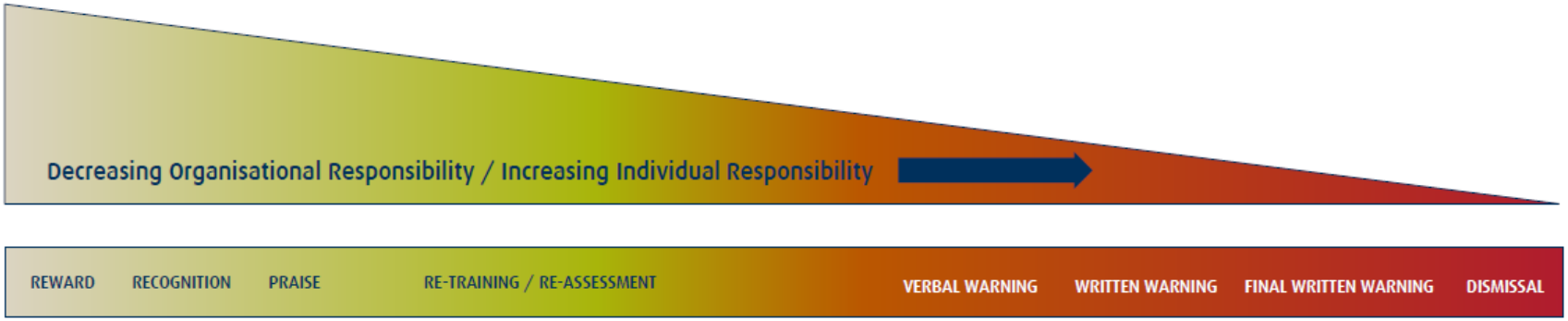
Proposals for revisions of this document should be forwarded in writing to the Global Construction functional unit 'Construction and Commissioning HSE'.

11 Distribution

This document will be administered and distributed by the Global Construction department 'Construction and Commissioning HSE'.

Attachment 1: Flowchart of Recognition & Consequence Management



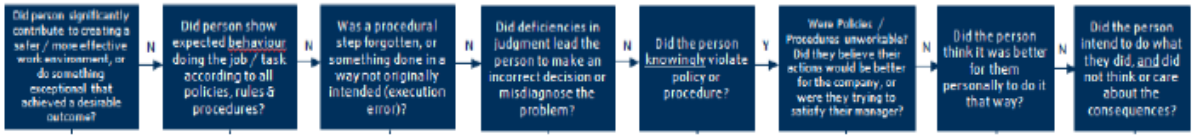


Consult HR / SHEQ / Comms for support with reward / recognition, coaching, retraining, communicating good practices & positive examples, etc.

Consult HR in **ALL** cases requiring disciplinary action. Consult other functions dependent on type of case (safety, legal compliance etc.).

1

Preliminary Behavioural Categorisation:



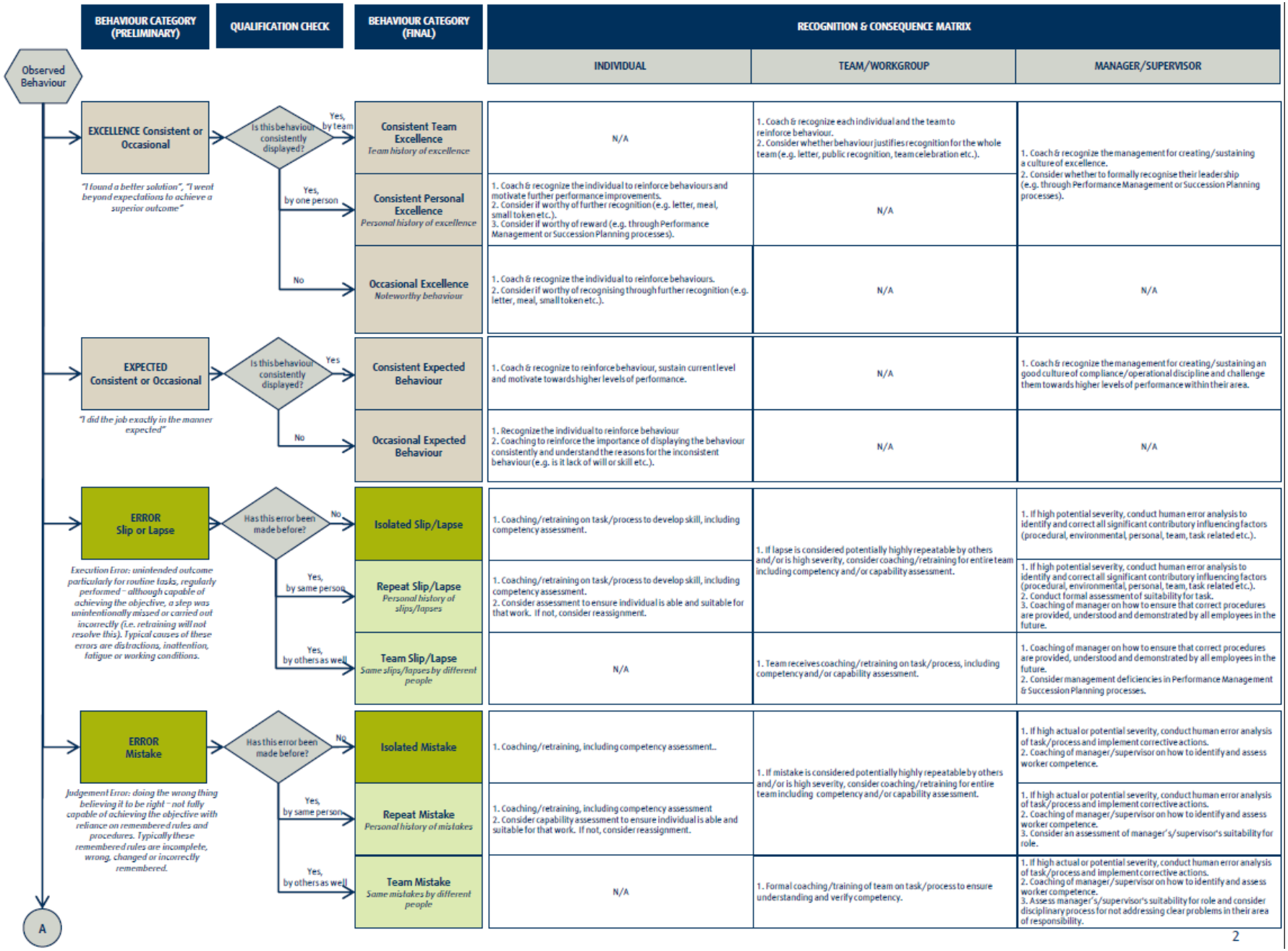
Question	Further Explanation
Did person significantly contribute to creating a safer / more effective work environment, or do something exceptional that achieved a desirable outcome?	Yes – if the person exhibited excellence in risk identification, planning and management of a task or activity. Making a significant contribution to creating a more effective or safer work environment, or effective sharing of experience / learning, giving genuine benefit to others.
Did person show expected behaviour doing the job / task according to all policies, rules & procedures?	Yes – if the person demonstrated behaviour normally expected / required for the specific task or job role. Could also include expected actions or interventions (e.g. intervening in a potentially problematic or unsafe situation) and being receptive to, or acting on, others' ideas / instructions / interventions etc.
Was a procedural step forgotten or was something done in a way not originally intended?	Yes - if there was a defined plan of action, the intent was to follow procedure, but something was executed incorrectly, forgotten or done out of order. There was no deliberate mal intent.
Did deficiencies in judgment lead the person to make an incorrect decision or misdiagnose the problem?	Yes - if the plan of action was incorrect due to a misdiagnosis or misunderstanding of the actual situation. This can be caused by a misdiagnosis, calculation interpretation other perception or judgement error.
Did the person knowingly violate policy or procedure?	Yes - if the person was fully aware of the rule, policy or procedure (implicitly or explicitly) and still made a conscious choice (intention) to take action that violated the accepted/expected behavior.
Were Policies & Procedures un-workable? Did the person believe their actions would be better for the company, or were they trying to satisfy their manager?	Yes – either: i) If the job/task could not have been done properly/safely if they had followed procedure, or if they had not been provided the tools, training, means and necessary resources to effectively carry out the procedure as expected. ii) if the person thought that their actions were in the best interest of the company (cost, efficiency, productivity etc.) or if they chose their actions to satisfy their manager / supervisor.
Did the person think it was better for them personally to do it that way?	Yes - if the actions were chosen for personal advantage or shortcut which compromised the organization (i.e. quicker, easier, less stress, advance their position or gain reward / recognition etc.)
Did the person intend to do what they did, and did not think or care about the consequences?	Yes - if this was an act of gross negligence, willful or destructive behavior, an impulsive act, violence, revenge, etc. without consideration of the consequences (actual or potential).

Qualification Check: | Is this behaviour displayed consistently? By same person or by others as well? | Has this Error been made before? By same person or by others as well? | Has this Violation been committed before? By same person or by others as well?

After initial analysis is complete and the Behavior type is identified for the specific situation, further analysis is required to determine if the behavior is of a Routine or Repeat nature and / or by the individual only or the team. This further analysis will determine the exact nature of the consequences, in terms of severity and target.

- If the answer to systemic questions is "No", apply appropriate consequences related to incident specific findings.
- If the answer to systemic questions is "Yes", apply appropriate consequences related to Routine/Repeat findings.

Question	Further Explanation
Is this behaviour displayed consistently? By same person or by others as well?	• "Yes, by one person": if this person consistently demonstrates excellent behaviour exceeding expectations / personal history of achieving exceptional / desirable outcomes. • "Yes, by team": if one or more members of the team / workgroup display same consistent behaviour above expectations. Note: Expected Behaviour really only relates to individual behaviour, not team.
Has this Error been made before? By same person or by others as well?	• "Yes, by the same person": if this is a repeat error made by this individual and others have not made the same error. • "Yes, and by others as well": if this is a common error made by people other than the person involved.
Has this Violation been committed before? By same person or by others as well?	• "Yes, by the same person": if the individual has a history of violation and disregard for policy and procedure and others have not committed the same violation. • "Yes, and by others as well": if this is a common violation made by people other than the person involved. Note: For Situation al/Organizational Benefit Violations consider if other people with similar training and experience have/would have done it in the same way.


BEHAVIOUR CATEGORY (PRELIMINARY)
QUALIFICATION CHECK
BEHAVIOUR CATEGORY (FINAL)
RECOGNITION & CONSEQUENCE MATRIX
INDIVIDUAL
TEAM/WORKGROUP
MANAGER/SUPERVISOR
Observed Behaviour
EXCELLENCE Consistent or Occasional
"I found a better solution", "I went beyond expectations to achieve a superior outcome"
Is this behaviour consistently displayed?
Yes, by team
Yes, by one person
No
Consistent Team Excellence
Team history of excellence
Consistent Personal Excellence
Personal history of excellence
Occasional Excellence
Noteworthy behaviour
N/A
1. Coach & recognize each individual and the team to reinforce behaviour.
2. Consider whether behaviour justifies recognition for the whole team (e.g. letter, public recognition, team celebration etc.).
1. Coach & recognize the individual to reinforce behaviours and motivate further performance improvements.
2. Consider if worthy of further recognition (e.g. letter, meal, small token etc.).
3. Consider if worthy of reward (e.g. through Performance Management or Succession Planning processes).
1. Coach & recognize the individual to reinforce behaviours.
2. Consider if worthy of recognising through further recognition (e.g. letter, meal, small token etc.).
1. Coach & recognize the management for creating/sustaining a culture of excellence.
2. Consider whether to formally recognise their leadership (e.g. through Performance Management or Succession Planning processes).
EXPECTED Consistent or Occasional
"I did the job exactly in the manner expected"
Is this behaviour consistently displayed?
Yes
No
Consistent Expected Behaviour
Occasional Expected Behaviour
1. Coach & recognize to reinforce behaviour, sustain current level and motivate towards higher levels of performance.
1. Recognize the individual to reinforce behaviour
2. Coaching to reinforce the importance of displaying the behaviour consistently and understand the reasons for the inconsistent behaviour (e.g. is it lack of will or skill etc.).
1. Coach & recognize the management for creating/sustaining an good culture of compliance/operational discipline and challenge them towards higher levels of performance within their area.
ERROR Slip or Lapse
Execution Error: unintended outcome particularly for routine tasks, regularly performed – although capable of achieving the objective, a step was unintentionally missed or carried out incorrectly (i.e. retraining will not resolve this). Typical causes of these errors are distractions, inattention, fatigue or working conditions.
Has this error been made before?
No
Yes, by same person
Yes, by others as well
Isolated Slip/Lapse
Repeat Slip/Lapse
Personal history of slips/lapses
Team Slip/Lapse
Same slips/lapses by different people
1. Coaching/retraining on task/process to develop skill, including competency assessment.
1. Coaching/retraining on task/process to develop skill, including competency assessment.
2. Consider assessment to ensure individual is able and suitable for that work. If not, consider reassignment.
N/A
1. If lapse is considered potentially highly repeatable by others and/or is high severity, consider coaching/retraining for entire team including competency and/or capability assessment.
1. Team receives coaching/retraining on task/process, including competency and/or capability assessment.
1. If high potential severity, conduct human error analysis to identify and correct all significant contributory influencing factors (procedural, environmental, personal, team, task related etc.).
1. If high potential severity, conduct human error analysis to identify and correct all significant contributory influencing factors (procedural, environmental, personal, team, task related etc.).
2. Conduct formal assessment of suitability for task.
3. Coaching of manager on how to ensure that correct procedures are provided, understood and demonstrated by all employees in the future.
1. Coaching of manager on how to ensure that correct procedures are provided, understood and demonstrated by all employees in the future.
2. Consider management deficiencies in Performance Management & Succession Planning processes.
ERROR Mistake
Judgement Error: doing the wrong thing believing it to be right – not fully capable of achieving the objective with reliance on remembered rules and procedures. Typically these remembered rules are incomplete, wrong, changed or incorrectly remembered.
Has this error been made before?
No
Yes, by same person
Yes, by others as well
Isolated Mistake
Repeat Mistake
Personal history of mistakes
Team Mistake
Same mistakes by different people
1. Coaching/retraining, including competency assessment..
1. Coaching/retraining, including competency assessment
2. Consider capability assessment to ensure individual is able and suitable for that work. If not, consider reassignment.
N/A
1. If mistake is considered potentially highly repeatable by others and/or is high severity, consider coaching/retraining for entire team including competency and/or capability assessment.
1. Formal coaching/training of team on task/process to ensure understanding and verify competency.
1. If high actual or potential severity, conduct human error analysis of task/process and implement corrective actions.
2. Coaching of manager/supervisor on how to identify and assess worker competence.
1. If high actual or potential severity, conduct human error analysis of task/process and implement corrective actions.
2. Coaching of manager/supervisor on how to identify and assess worker competence.
3. Consider an assessment of manager's/supervisor's suitability for role.
1. If high actual or potential severity, conduct human error analysis of task/process and implement corrective actions.
2. Coaching of manager/supervisor on how to identify and assess worker competence.
3. Assess manager's/supervisor's suitability for role and consider disciplinary process for not addressing clear problems in their area of responsibility.
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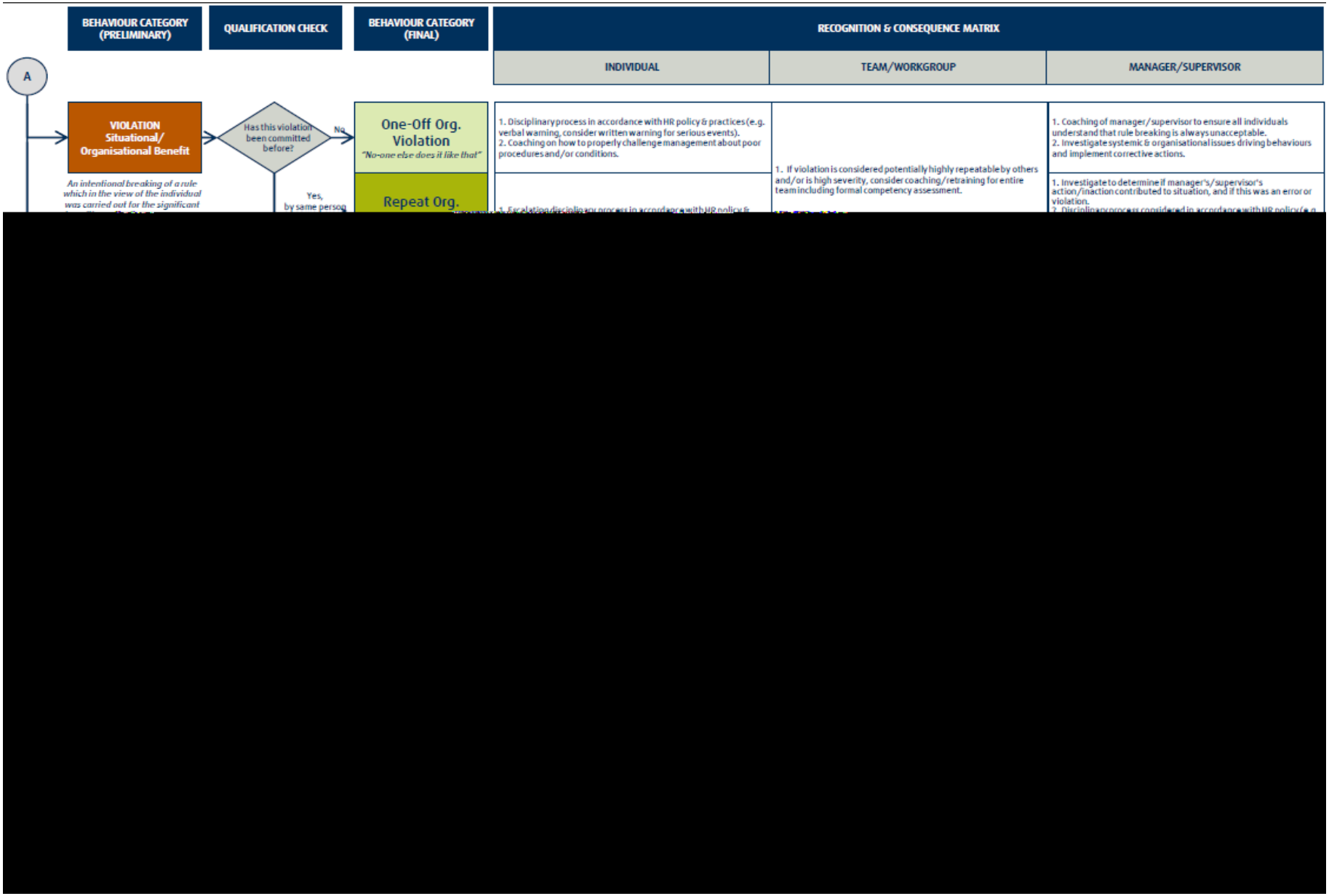

BEHAVIOUR CATEGORY (PRELIMINARY)
QUALIFICATION CHECK
BEHAVIOUR CATEGORY (FINAL)
RECOGNITION & CONSEQUENCE MATRIX
INDIVIDUAL
TEAM/WORKGROUP
MANAGER/SUPERVISOR
A
VIOLATION Situational/ Organisational Benefit
An intentional breaking of a rule which in the view of the individual was carried out for the significant
Has this violation been committed before?
No
Yes, by same person
One-Off Org. Violation
"No-one else does it like that"
Repeat Org.
1. Disciplinary process in accordance with HR policy & practices (e.g. verbal warning, consider written warning for serious events).
2. Coaching on how to properly challenge management about poor procedures and/or conditions.
1. If violation is considered potentially highly repeatable by others and/or is high severity, consider coaching/retraining for entire team including formal competency assessment.
1. Coaching of manager/supervisor to ensure all individuals understand that rule breaking is always unacceptable.
2. Investigate systemic & organisational issues driving behaviours and implement corrective actions.
1. Investigate to determine if manager's/supervisor's action/inaction contributed to situation, and if this was an error or violation.

Attachment 2: PRINCIPAL CONTRACTOR HSE Policy and Safety Principles

Making our world more productive

Health, Safety and Environment (HSE) Policy.

Our Goal

At Linde we are driven to ensure no harm comes from our actions to people, the environment or the communities in which we operate.

Our Values & Commitments

- Safety and environmental responsibility are core values at Linde and integral in all that we do.
- Compliance with applicable laws, regulations, and Linde policies is a license to operate for our employees, contractors, suppliers and partners.
- HSE Ownership through visible, demonstrated leadership across the organization.
- Collaboration with the industry and other professional associations to continuously advance the safe management of our products and installations.

Our Safety Principles

At Linde we believe that:

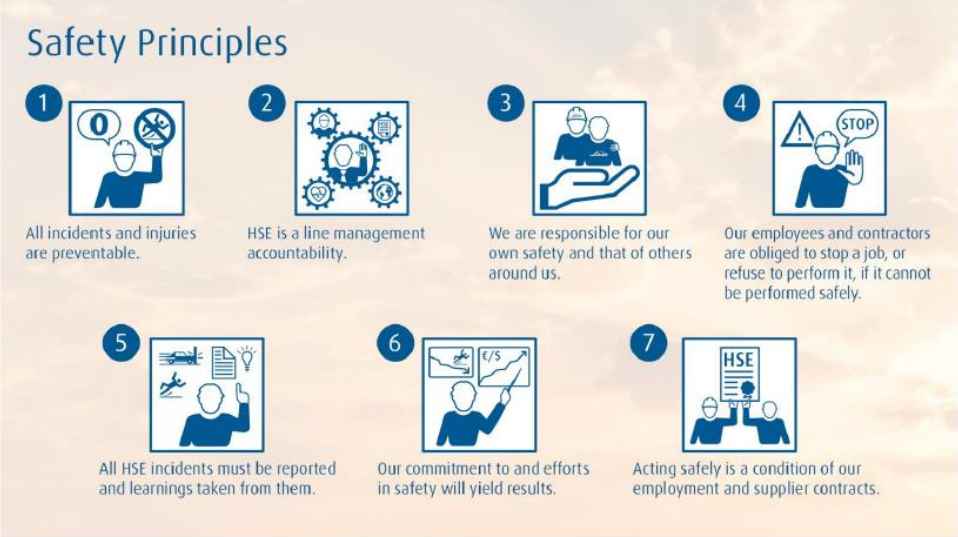
1. All incidents and injuries are preventable.
2. HSE is a line management accountability.
3. We are responsible for our own safety and that of others around us.
4. Our employees and contractors are obliged to stop a job or refuse to perform it, if it cannot be performed safely.
5. All HSE incidents must be reported, and learnings taken from them.
6. Our commitment to and efforts in safety will yield results.
7. Acting safely is a condition of our employment and supplier contracts.

We expect our employees, contractors and partners to embrace these principles and reflect them in every aspect of work they perform.

This policy is integral to the Linde business strategy. The Management Committee and Linde's global leadership is committed to the full implementation of this HSE policy.

Danbury, February 2019 // Global Policy, Version 1.00

Linde Safety Principles



Attachment 3: PRINCIPAL CONTRACTOR Life Saving Rules

Life-Saving Rules

Making our world more productive

1. Driving and Vehicles
We will operate our vehicles safely and responsibly at all times and use the safety equipment provided.

2. Permit to Work
We will use the Permit to Work / Hazardous Work Permit System where necessary to ensure hazards and risks are understood and controlled.

3. Lock-Out/Tag-Out (LOTO)
We will use LOTO to verify energy/equipment isolation when servicing or maintaining equipment.

4. Hazardous Atmospheres
We will be aware of the potential for hazardous atmospheres and take the appropriate actions to detect, mitigate and eliminate atmospheric hazards at all times.

5. Elevated Work Activities
We will work at height only when the required safety measures to prevent falls are in place and we will ensure lifting operations are carried out safely.

6. Contractor Management
We will select and monitor our contractors to ensure they meet Linde safety requirements.

7. Management of Change (MoC)
We will implement changes to plant/equipment and work processes only when a MoC process addressing the safety risks has been completed.

8. Personal Protective Equipment (PPE)
We will wear properly selected, maintained and task/hazard specific PPE at all times when required.

9. Safety Equipment and Devices
We will maintain the integrity of safety equipment and devices and never modify, impair or override them unless properly reviewed and authorized through MoC or Permit to Work.

Attachment 4: The Golden Rules of Information Security

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The Golden Rules of Information Security.
Securing Digital Identity, Data and Devices.

Report security incidents.

- Promptly report unusual or suspicious activities as security incidents to your local IS help desk.
- These could include hardware damage; loss or theft; misuse or loss of data; misuse of access rights or compromised login credentials or any suspicious system, email, website or other behaviour.

Protect your digital identity.

- Keep your passwords, login ID's, smart cards, tokens secure and do not share them.
- Use different passwords for different accounts, choose strong passwords and change them regularly.
- Lock your computer screen when going away.

Protect your data.

- Prevent loss or theft of data and unauthorised access; ensure your data is backed up/encrypted.
- Delete data if no longer needed e. g., if you dispose of a device.
- Classify your data based on the data classification policy and treat it accordingly.
- Promptly remove printouts, clean your desk & lock documents when leaving, shred sensitive information.
- Do not upload or otherwise disclose information to web based services unless approved by Linde.

Protect your equipment.

- Keep your device (Notebook/Mobile/Tablet/USB drive, etc.) with you or secure it properly.
- Do not leave your device where it can be an easy target for thieves.
- Keep your device locked up when not in use.

Use approved software, mobile applications.

- Do not download, run executables or install software or mobile applications from the Internet or other untrustworthy sources.
- If you need additional software or mobile applications to perform your job request through your local IS help desk.

Avoid becoming a victim, think before you act.

- Refrain from opening links or attachments in suspicious emails and do not use unknown USB drives.
- Avoid websites that are likely to contain malicious content e. g., illegal software websites.
- Before revealing confidential information verify identity and validity of the recipient.
- Be aware of "social engineering" attempts, i. e. people trying to trick you into breaking security rules.

Respect laws and behave ethically.

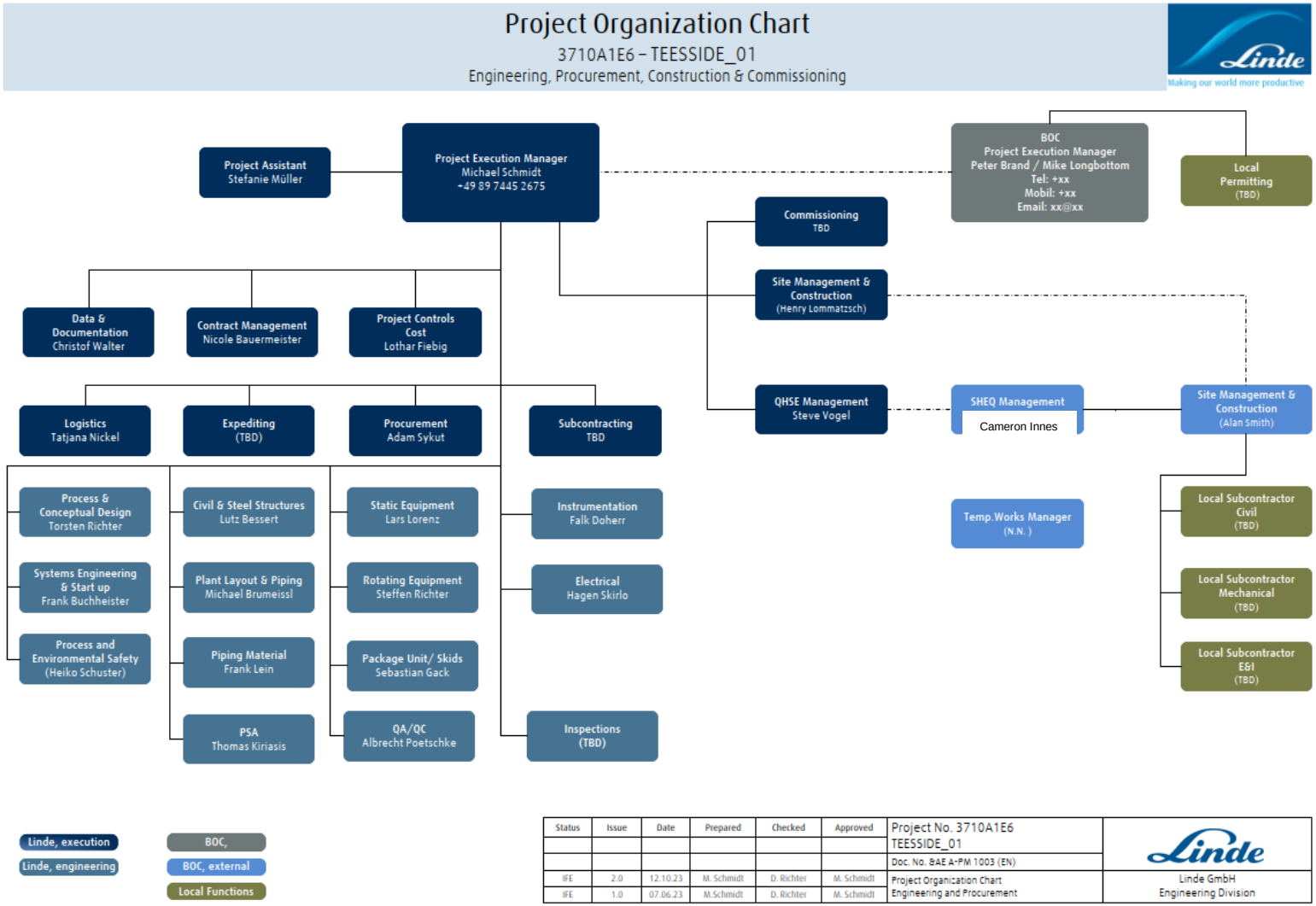
- Do not violate intellectual property rights.
- Comply with data protection laws and regulations.
- Do not store, download, or distribute data that may be inappropriate or illegal e. g. insulting, harassing, racist, abusive, sexist, or obscene.

If in doubt or if you learn about a mistake, please report any issue for mitigation or avoidance of risks and lessons learned.
Encourage your family members to follow "safe & secure" IT behaviour.

Stay informed of the Linde Security Policies & Guidelines:
intranet.linde.grp/ISPolicies

Data Classification – Internal

Attachment 5: Site Organisation



Attachment 6: Emergency Response & Evacuation Plans

Shall be detailed in Project HSE induction

Incident Reporting Timelines

PRINCIPAL CONTRACTOR Incident Reporting Timeline:

- &AX-Q-PR 1050.520.029 (EN) Reporting Timeline and Addresses - Major Incidents at Construction Site
- &AX-Q-PR 1050.520.030 (EN) Reporting Timeline and Addresses - Incident at Construction Sites

Reacting in the event of a Terrorist Attack

In the event of a terrorist Client and SABIC have a dedicated emergency response plan which shall be enacted.

Emergencies Escalation Communication Matrix

For any of the following emergencies, PRINCIPAL CONTRACTOR Site Manager or Pre-/Commissioning Manager or Site HSE Manager must **immediately** notify:

	TYPE OF EMERGENCIES	**NOTIFY PRINCIPAL CONTRACTOR**					**NOTIFY CLIENT / OWNER**		
		Project Manager / Director	Project Entity Managing Director / Region Head	Head of IT – U. Hoffmann +49 160 9723 4547 uli.hofmann@linde.com	Division Crisis Manager – Stefan Liese +49 160 9723 4541 Stefan.Liese@Linde.com	Communication Manager – E. Kateva +49 173 4204 003 elitsa.kateva@linde.com	BOC Teesside Hydrogen, North Tees, TS2 1TT Email: miranda.cupit@boc.com Telephone: 07469418857	N/A	N/A
(identified by PRINCIPAL CONTRACTOR)	• Cyber Attack • Loss of IT-Network	X	X	X	X		X	X	X
	(*) Kidnapped employee (*) Incident resulting in (in significant bodily harm or death of an employee (*) Attempted or actual terrorist act perpetrated against PRINCIPAL CONTRACTOR • Pandemic or absence of >40% of workers • Natural Disaster - Earthquake - Tsunami • Political Unrest • Large Scale Traffic Accident • Bomb Threat • Significant Stop of Work • Fraud against / by PRINCIPAL CONTRACTOR	X	X		X		X	X	X
	(*) Negative media attention	X	X		X	X	X	X	X
	(*): Type of Emergencies marked with (*) are Major Event (ME) and must be reported, in addition, as per the &AX-Q-PR 1050.520.029 (EN) "Reporting Timeline and Addresses - Major Event at Project Site".								
(identified by CLIENT / OWNER)	BOC Teesside Hydrogen, North Tees, TS2 1TT Email: miranda.cupit@boc.com Telephone: 07469418857	X	X	X	X	X	X	X	X

Attachment 7: Risk Management Concept

Risk Management Concept (1/2)

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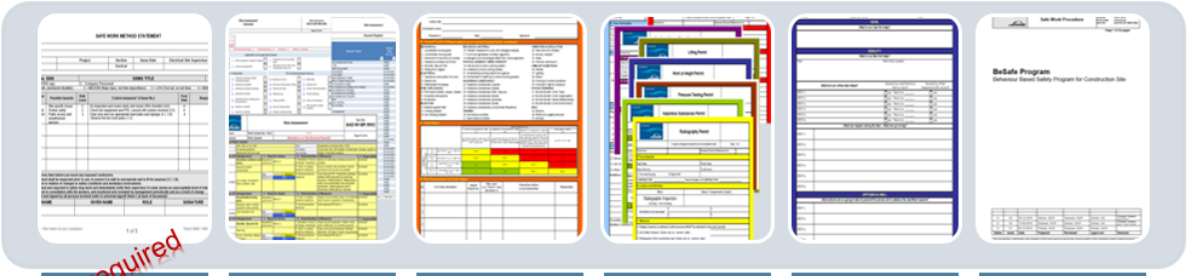
HSSE hazards and environmental impacts are systematically identified and evaluated through all project phases via:



If required

Method Statement (MS)

MS helps to clarify the execution of given activities by identifying and listing the basis structure of all tasks necessary for the execution

Risk Assessment (RA Gnl)

RA identifies the significant hazards and control measures required to prevent injury, ill health or environmental impacts whilst carrying out the routine work and standard activities

Job Safety Analysis (JSA)

JSA identifies the risks and control measures from hazardous works or high risk activities

Permit to Work (PtW)

PtW applies for general activities and special PtW apply to High Risk Activities

BeSafe Daily (BSD)

BSD must be prepared daily before start of work to compile all relevant info from existing permit to works, risk assesments, JSAs, etc. to raise the safety awareness of workers.

HSE Competency & Awareness

Technical HSE Trainings and 'BeSafe' a behaviour-based safety program focusing on workers' behaviour help preventing work-related injuries and illnesses.

Risk Management Concept (2/2)

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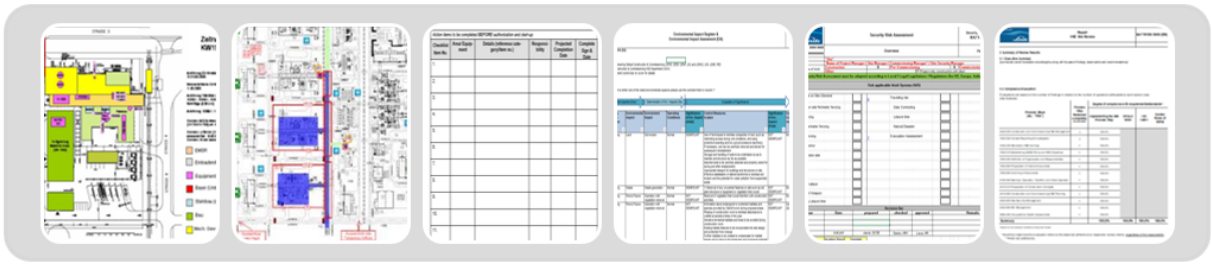

HSE Coordination Plan

It identifies the risks related to theinterfaces and interferences between COMPANY and/or all CONTRACTORs present and working at site.

Risk Assessment of Simultaneous Operations (SIMOPS)

It identifies the risks related to the activities conducted in parallel and simultaneously at site.

Pre-Start-up Safety Review (PSSR)

PSSR ensure that introduction of hazardous media can be performed safely and/or the plant or parts of it can be put into sustainable operation safely.

Environmental Impact Analysis (EIA)

EIA provides an overview of potential changes to the Environment that can result from the project construction activities or elements interacting with the Environment.

Site Security Assessment

It identifies the risks and control measures related to the security of the activities carried out at site.

HSE Monitoring

Workplace inspections, reviews and audits help checking the effective implementation of control measures defined for the identified risks related to the activities carried out at site.

Attachment 8: Example HSE Coordination Plan

Example:

Plot Plan:

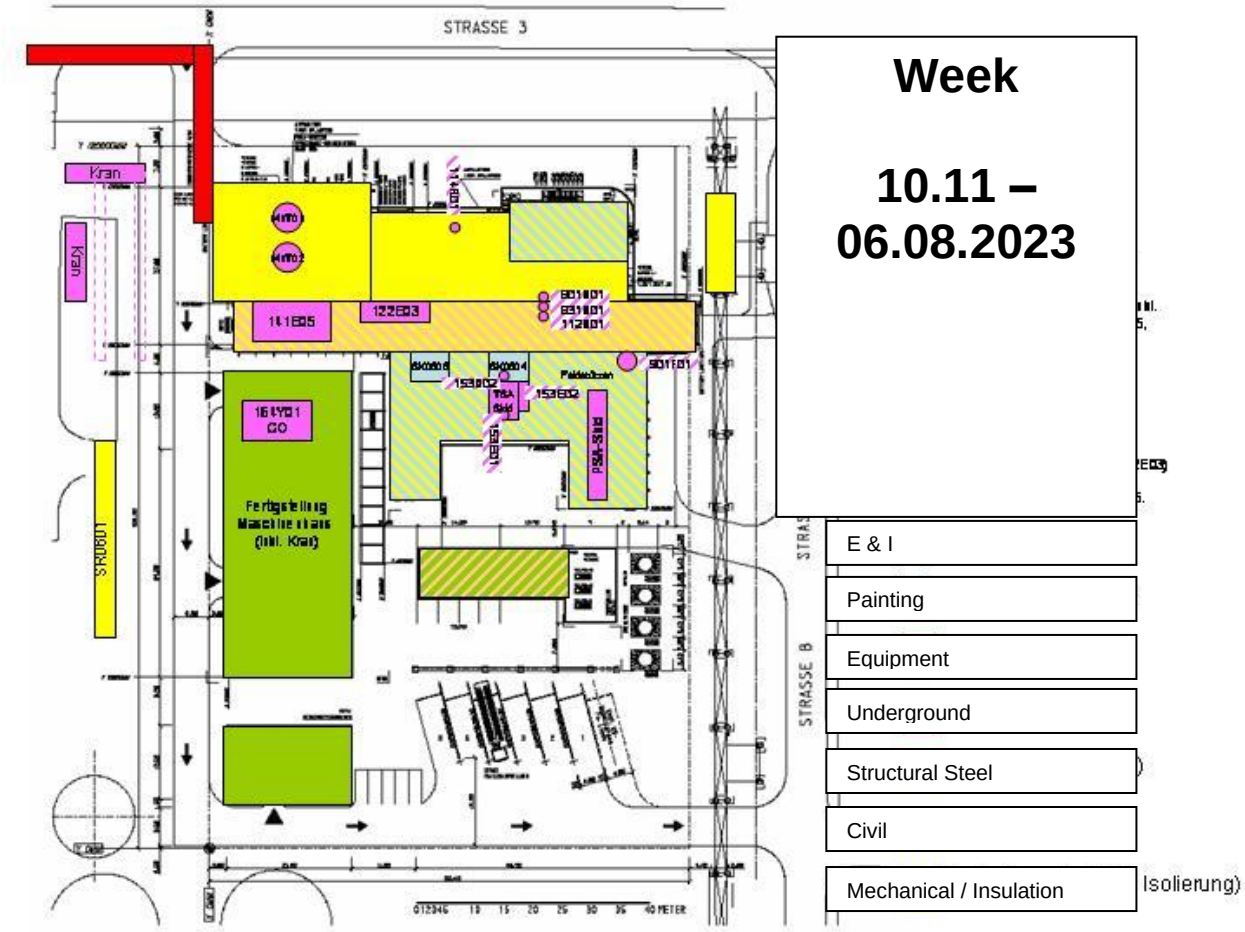

Table:

Week	Interface (short description)	Hazards	Action to be taken	Responsibility
17	Contr.1 with Contr.2	Radiation	Work only in lunch and evening time	Contr.1
			Barricading	
			Signboards	
			Permit System	
			Coordination Meetings	
	Contr.3 with Contr.4	Scaffolding	Scaffolding only after backfilling and compaction	Contr.3
			Coordination Meetings	
18	…			