

- 7.4.1 Sector, Organization, Department or Contractor Head is responsible in ensuring that provisions are made the safe systems of work to prevent and minimize risks in each workplace
- 7.4.2 Safety Practitioner/Coordinator is responsible to monitor the implementation of this procedures and document its effectiveness
- 7.4.3 The Responsible Person will support this procedure and ensure that any Contractor Organization working for, or on behalf of, the Sector, Organization, Department or Contractor will comply with the requirements of these procedures
- 7.4.4 Line Managers / Supervisors are responsible for training their workers in risks
- 7.4.5 The LP & FS Public Safety department will support the NEOM risk assessments by carrying out compliance checks and supporting and guiding the various safety teams.

## **8 Other Sections related to subject**

### **8.1 Employer's Duties**

- 8.1.1 Reference to “Employers Duties” in this Section 8 relate to Sector, Organization, Department or Contractor
  - (a) Every employer shall be responsible for performing a risk assessment in accordance with NEOM-Element 2 Risk and Opportunity Management to determine the risks associated to job tasks and determine the requirements of their occupational health and medical surveillance program.
  - (b) Employers shall maintain medical records and medical confidentiality in accordance with NEOM Element 3 Control of Documented Information & Legal Compliance.
  - (c) Employers shall arrange for medical surveillance of employees that have been or it is reasonably practicable to believe they have been exposed to a hazardous material if:
    - I. The material is listed in Appendix B and the degree of risk to the health of the employee is significant; or
    - II. The employer reasonably believes that:
    - III. An identifiable adverse effect may be related to exposure.
    - IV. The health effect may happen under the work conditions of the employee.
    - V. A valid biological or technical technique or test is available to detect the signs of the health effect, or a valid biological monitoring procedure is available to detect the material or its metabolite; and
    - VI. Where other legislation/regulations require such surveillance to be conducted.
- 8.1.2 If the medical surveillance relates to an occupation listed in Appendix A:1 the employer shall:
  - (a) Arrange for the medical surveillance to be done by a Ministry of Health (MOH) licensed physician under the supervision of a MOH licensed Occupational Medicine Specialist; and
  - (b) Ask the physician to give the employee and the employer a medical surveillance report which includes a description of the effects of the material or exposure on the employees' health and the need, if any, for remedial action or treatment, and an explanation of the report.
- 8.1.3 Employers with occupational health screening and medical surveillance programs shall use an employee general health history questionnaire to collect, at a minimum, the following information (see Appendix C - for sample questionnaire):
  - (a) Occupational history - physical, chemical, biological, radiological, and ergonomic stressors from previous employers.

- (b) Personal risk factors - personal and family history, allergies, and lifestyle.
  - (c) Previous medical conditions.
  - (d) Medical history - including surgical history or pregnancy in females; and
  - (e) Immunization history - if applicable.
- 8.1.4 Employers shall communicate the results of the occupational health screening and/or medical surveillance to the employee. This includes:
- (a) Informing employees of all findings and provide them with a copy of medical exam report.
  - (b) Providing any follow up treatment for employment related health problems, if needed.
  - (c) Counselling and education about relevant occupational hazards; and
  - (d) Provide follow up health education to ensure employee understands the health risks of his/her occupation and/or lifestyle habits.
- 8.1.5 The employer, or employer provided insurance (if included), shall pay all associated costs for the occupational health screening and medical surveillance.
- 8.1.6 Employees shall not be held responsible for any costs associated with these programs, including time required to undertake the programme/screening or surveillance tests or any other associated travel costs which shall be provided by the employer.

## **8.2 Occupational Health Screening**

- 8.2.1 Occupational health screening shall be undertaken with regards to the potential exposures expected related to the employee's occupation and before an employee is exposed to a hazardous work environment.

## **8.3 Medical Surveillance**

- 8.3.1 Medical surveillance shall be undertaken after a risk assessment and/or occupational hygiene assessments have been undertaken to assess exposure and after control measures have been implemented to control exposure to an acceptable level.
- 8.3.2 Employers shall ensure that OSH training complies with the requirements of:
- (a) NEOM Element 5 – Training, Awareness and Competency.
  - (b) NEOM-NLF-NMS-006.001 – SMS Organization, Practitioner Registration and Appointment of Contractor
- 8.3.3 Training programs shall be tailor-made to meet the needs of employees performing any of the Occupations found in Appendix A;1 or exposed to chemicals/materials listed in Appendix A: 2 of this NMS. Training shall focus on ways to reduce exposures to occupational hazards that could affect the employees' health.
- 8.3.4 Employers shall ensure all relevant employees and contractors covered by the requirements of the NMS are informed of the requirements of occupational health screening and medical surveillance.
- 8.3.5 Employers shall inform all employees of the requirement of this NMS and their right to medical record protection and medical confidentiality. (Refer: NEOM Element 3 Control of Documented Information & Legal Compliance)
- 8.3.6 Employers shall ensure that person(s) responsible for development and implementation of occupational health screening and medical surveillance programs are competent to do so. (Refer: NEOM Element 5 Training Awareness and Competence)

#### **8.4 General Requirements for Medical Surveillance:**

- 8.4.1 Medical surveillance programs shall be based on the results of the risk assessment and/or the results of an occupational hygiene survey which warrants such surveillance based upon exposure assessment results.
- 8.4.2 In the absence of industrial hygiene and exposure data, a qualified occupational physician licensed by MOH shall decide on the placement of employees into the medical surveillance program based on knowledge of the workplace processes, job requirements, exposures and occupational history of the employee.
- 8.4.3 As per the Saudi Labour Law, Chapter 8, The employer is responsible to conduct Full Medical Surveillance Examination for his workforce who are exposed to Occupational Diseases included within the Saudi Social Insurance Law with minimum frequency of once a year.
- 8.4.4 Data collected from Medical Surveillance shall be evaluated as a minimum every 6 months to determine if the occupational exposure in the workplace is causing or contributing to employee's injuries or illnesses. When data suggests that there is a link, control measures shall be implemented to reduce the risk to as low as reasonably practicable as well as additional medical surveillance if warranted.

#### **8.5 Types of Occupational Health Screening and Medical Surveillance**

##### **8.5.1 Occupational Health Screening/Baseline Examinations:**

- (a) Performed before placement in a specific job to medically assess if the employee is fit and capable of undertaking the work. They may be combined with occupational medical surveillance to record baseline health values for future comparison.
- (b) Prior to employee commences work. However, if the individual has already started work, these examinations shall be completed within 30 days of assignment. (Refer Appendix D for an example Employment Medical Examination Form.)

##### **8.5.2 Periodic Medical Surveillance Examinations**

- (a) Medical surveillance examinations shall be conducted periodically dependent on the results of the risk assessments.
- (b) Examinations may include an interval history, a physical examination, and/or clinical and laboratory screening tests based on exposures or workplace requirements and demands.

##### **8.5.3 Termination of Employment Examinations:**

- (a) Termination examinations are designed to assess pertinent aspects of an employee's health when the employee leaves employment.
- (b) Documentation of examination results may be beneficial in assessing the relationship of any future medical problems to an exposure in the workplace.

##### **8.5.4 Termination of Exposure Examinations:**

- (a) These examinations are performed when exposure to a specific hazard has ceased.
- (b) Exposure may cease when an employee is reassigned, a process is changed, or the employee leaves employment.

**8.5.5 Specific Occupations/Occupational Groups:**

8.5.6 Occupations listed in Appendix A:1, have specific job demands and requirements which are important for the tasks or activities of the job to be completed safely. These Occupations shall undergo Occupational Health Screening with appropriate tests and follow up Medical Surveillance if exposure warrants it.

**8.6 Medical Records and Medical Confidentiality:**

8.6.1 Medical records shall be maintained in a secure location with controlled access to the records.

- (a) If employers do not have medical personal or a medical program manager, medical records may be maintained at a MOH licensed medical facility; or
- (b) The employer may assign an OSH staff member or other employee the duties of maintaining medical records and ensuring records are secure. (Refer: NEOM Element 3 Control of Documented Information & Legal Compliance)

8.6.2 At no time may medical records be provided to Human Resources, Management, or any other Representative of the Entity to evaluate:

- (a) The performance of an employee.
- (b) If an employee shall be retained or contract renewed unless medically Justifiable; or
- (c) If an employee shall be promoted.

8.6.3 Medical records shall not be provided to any person or party outside the employer or employer approved medical provider without the written consent of the employee.

8.6.4 Medical record data may be used to evaluate the health of employees in general, guide employer sponsored wellness programs, or determine funding of employee sponsored wellness programs. When used for these purposes, the employer shall:

- (a) Remove any data that could be used to identify an employee; and
- (b) Ensure data of a single employee is not provided as standalone data.

8.6.5 Insurance claim forms shall be maintained with the same confidentiality as medical records.

8.6.6 Employee can request a copy of their medical records and a copy shall be provided within five (5) working days.

8.6.7 Employees may not be charged for receiving a copy of their medical records.

8.6.8 Employees and medical professionals that have access to employee medical records shall not discuss the contents of the records, or the health of employees to anyone not associated with providing medical care to the employees.

**8.7 Record Keeping**

8.7.1 The employer shall maintain an accurate record of each employee undergoing medical surveillance or screening. The employer shall assure that this medical record is maintained for the duration of employment and for a period of 30 years thereafter. (Refer: NEOM Element 3 Control of Documented Information & Legal Compliance)

8.7.2 All records must be retained if they are part of an external investigation or legal proceedings.

8.7.3 Medical records shall include, but not limited to:

- (a) Doctor's written opinion as to the employee's suitability for employment in specific job role.
- (b) Any medical complaint by the employee related to exposure to the toxic material or hazardous material.

- (c) A copy of any employee exposure monitoring reports which were conducted at an employee's work site.
- (d) A copy of the employee's employment history; and
- (e) Medical surveillance and/or screening records and exposure monitoring records shall be available for review by employees and the relevant SR.

## 9 Appendices

### 9.1 Appendix A: Specified Occupations Requiring Medical Screening

- 9.1.1 Professional Drivers (taxi, bus, truck drivers etc.)
- 9.1.2 Health Care Workers (Physicians, Nurses, Nursing Assistants, Dentist, Therapists – Physiotherapists, occupational therapists, respiratory therapists, Technicians – ECG, respiratory, radiographer, laboratory, radiology, sterilization)
- 9.1.3 Professional Divers
- 9.1.4 Emergency Responders (fire fighters, police, civil defense, ambulance personnel, hazmat emergency responders etc.)

**NOTE:** Professional Drivers includes but is not limited to:

- Taxi,
- truck,
- heavy equipment
- cranes, bulldozers,
- forklift drivers etc.

*Table 4: Specified Occupations Requiring Medical Screening*

<b>Sub Type:</b>	<b>Group 1: Taxi Driver (1 to 7 passengers)</b>
Workplaces:	Taxi company, Private, Commercial
Health History:	General Health History Questionnaire - Appendix 3
Physical Examination:	Employment Medical Examination Form - Appendix 4
Investigation:	Visual acuity and Colour vision
Restriction:	Vision Test: Typically, 6/9 in better eye
	Colour Vision: Ability to recognize signals
	Seizure free for 7 years with medication
	Malignant tumours of the brain = 1 year off driving
	Cardiac Artery Bypass Graft (CABG) = Cease driving for 4 weeks
	Absence of hypoglycaemic episodes
	Acute psychotic disorder, Mania, Schizophrenia; Must cease driving immediately - stable for 3 months can drive
	Alcohol misuse: 6 months with controlled drinking
	Alcohol dependence: 1 y without dependence
	Drug abuse: At least one year without abuse
	Sleep apnoea: If causing excessive sleep (in working hours)
Periodic Medical:	At the time of taking license 18 years to 70 years
	Once every 3 years - no upper limit
References:	Department of Transport (UK). DVLA. Medical Standards for fitness to drive.

<b>Sub Type:</b>	<b>Group 2: Bus, Taxi (8 or more passengers) - Category: D</b>
Workplaces:	Commercial drivers
Health History:	General Health History Questionnaire - Appendix 3
Physical Examination:	Employment Medical Examination Form - Appendix 4
Investigation:	Visual acuity and Colour vision
Restriction:	Complete Stage 3 of Bruce Protocol Vision Test: Typically, 6/9 in better eye Colour Vision: Ability to recognize signals Monocular Vision: not allowed to drive Seizure free for 10 years without medication Malignant tumours of the brain 2 years off driving
Periodic Medical:	CABG cease driving for 3 months Absence of hypoglycaemic episodes Acute psychotic disorder, Mania, Schizophrenia. Must cease driving immediately require stable for 3 years to drive Alcohol misuse: 1 year with controlled drinking Alcohol dependence: 3 years without dependence Drug abuse: At least one year without abuse Sleep apnoea: If causing excessive sleep (in working hours)
Periodic Medical:	At the time of taking license 21 years to 45 years 45 years and older: Medical every 5 years till age 65 years 65 years and older: Medical annually without upper limit
<b>Sub Type:</b>	<b>Group 2: Commercial Vehicle 3.5 to 7.5 ton - Category: C</b>
Workplaces:	Commercial drivers
Health History:	General Health History Questionnaire - Appendix 3
Physical Examination:	Employment Medical Examination Form - Appendix 4
Investigation:	Visual acuity Colour vision
Restriction:	Complete Stage 3 of Bruce Protocol Vision Test: Typically, 6/9 in better eye Colour Vision: Ability to recognize signals Monocular Vision: not allowed to drive Seizure free for 10 years without medication Malignant tumours of the brain 2 years off driving CABG cease driving for 3 months Absence of hypoglycaemic episodes Acute psychotic disorder, Mania, Schizophrenia. Must cease driving immediately - Require stable for 3 years to drive Alcohol misuse: 1 year with controlled drinking Alcohol dependence: 3 years without dependence Drug abuse: At least one year without abuse Sleep apnoea: If causing excessive sleep (in working hours)
Periodic Medical:	At the time of taking license 21 years to 45 years 45 years and older: Medical every 5 years till age 65 years 65 years and older: Medical annually without upper limit

<b>Sub Type:</b>	<b>Heavy Equipment - e.g., Crane, Bulldozer</b>
Workplaces:	Construction, demolition, renovation
Health History:	General Health History Questionnaire - Appendix 3
Physical Examination:	Employment Medical Examination Form - Appendix 4
Investigation:	Visual acuity, Stereoscopic vision Colour vision
Restriction:	Complete Stage 3 of Bruce Protocol Vision Test: Typically, 6/9 in better eye Colour Vision: Ability to recognize signals Monocular Vision: not allowed to drive Stereopsis: not allowed for crane or forklift operator Seizure free for 10 years without medication Malignant tumours of the brain 2 years off driving CABG cease driving for 3 months Absence of hypoglycaemic episodes Acute psychotic disorder, Mania, Schizophrenia. Must cease driving immediately - Require stable for 3 years to drive Alcohol misuse: 1 year with controlled drinking Alcohol dependence: 3 years without dependence Drug abuse: At least one year without abuse Sleep apnoea: If causing excessive sleep (in working hours)
Periodic Medical:	At the time of taking license 21 years to 45 years
	45 years and older: Medical every 5 years till age 65 years
	65 years and older: Medical annually without upper limit
References:	Department of Transport (UK). DVLA. Medical Standards for fitness to drive.
	Palmer K, Cox, R and Brown, I. Fitness for Work the Medical Aspect 4 <sup>th</sup> Ed. Oxford University Press. Oxford Medical Publications. 2007.

## 9.2 Appendix A; 2: Health Care Workers

- 9.2.1 Health Care workers include Physicians, Nurses, Nursing Assistants, Dentist, Therapists – Physiotherapists, Occupational Therapists, Respiratory Therapists, Technicians – ECG, Respiratory, Radiographer, Laboratory, Radiology, Sterilization/CSSD

*Table 5: Health Care Workers*

<b>Sub Type:</b>	<b>Physician</b>
Workplaces:	Hospitals, Clinics, Occupational Health Facilities in different industries, private practice, etc.
Health History:	General Health History Questionnaire - Appendix 3
Physical Examination:	Employment Medical Examination Form - Appendix 4
	Review Health History Questionnaire information and assess any positive findings in more detail.
Investigations:	Hepatitis Profile (A, B & C) and HIV
	Measles Antibodies and Varicella Antibodies
	Chest x-ray
Results of Investigations:	To be provided to Candidate / Employee
Restriction:	Hep Be antigen positive
	Active Pulmonary Tuberculosis
Periodic Medical:	Once every 3 years till age 59
	Once every year at age 60 and above
References:	CDC 'Yellow Book', USA, Atlanta, GA.
<b>Sub Type:</b>	<b>Nurse, Nursing Assistant</b>
Workplaces:	Hospitals, Clinics, Health Facilities in different industries, etc.
Health History:	General Health History Questionnaire - Appendix 3
Physical Examination:	Employment Medical Examination Form - Appendix 4
	Review Health History Questionnaire information and assess any positive findings in more detail.
Investigations:	Hepatitis Profile (A, B & C) and HIV
	Measles Antibodies and Varicella Antibodies
	Chest x-ray
Results of Investigations:	To be provided to Candidate / Employee
Restriction:	Hep B e antigen positive (Nursing Assistants are exempted)
	Active Pulmonary Tuberculosis
	Unable to perform moderate to heavy physical demands
	BMI of 40 or above with co morbidity
Periodic Medical:	Once every 3 years till age 59
	Once every year at age 60 and above
References:	CDC 'Yellow Book', USA, Atlanta, GA.

<b>Sub Type:</b>	<b>Dentist</b>
Workplaces:	Hospitals, Clinics, Private Practice, etc.
Health History:	General Health History Questionnaire - Appendix 3
Physical Examination:	Employment Medical Examination Form - Appendix 4 Review Health History Questionnaire information and assess any positive findings in more detail.
Investigations:	Hepatitis Profile (A, B & C) and HIV  Measles Antibodies and Varicella Antibodies  Chest x-ray
Results of Investigations:	To be provided to Candidate / Employee
Restriction:	Hep B e antigen positive  Active Pulmonary Tuberculosis
Periodic Medical:	Once every 3 years till age 59  Once every year at age 60 and above
References:	CDC 'Yellow Book', USA, Atlanta, GA.
<b>Sub Type:</b>	<b>Physiotherapist / Occupational / Respiratory Therapist</b>
Workplaces:	Hospitals, Clinics, Rehabilitation Centres, etc.
Health History:	General Health History Questionnaire - Appendix 3
Physical Examination:	Employment Medical Examination Form - Appendix 4 Review Health History Questionnaire information and assess any positive findings in more detail.
Investigations:	Hepatitis Profile (A, B & C) and HIV Measles Antibodies and Varicella Antibodies Chest x-ray
Results of Investigations:	To be provided to Candidate / Employee
Restriction:	Active Pulmonary Tuberculosis Unable to perform moderate to heavy physical demands BMI of 40 or above with co morbidity
Periodic Medical:	Once every 3 years till age 59  Once every year at age 60 and above
References:	CDC 'Yellow Book', USA, Atlanta, GA.
<b>Sub Type:</b>	<b>Technicians: ECG, Respiratory, Radiographer</b>
Workplaces:	Hospitals, Clinics, etc.
Health History:	General Health History Questionnaire - Appendix 3
Physical Examination:	Employment Medical Examination Form - Appendix 4 Review Health History Questionnaire information and assess any positive findings in more detail.
Investigations:	Hepatitis Profile (A, B & C) and HIV Measles Antibodies and Varicella Antibodies Chest x-ray
Results of Investigations:	To be provided to Candidate / Employee
Restriction:	Active Pulmonary Tuberculosis Unable to perform moderate to heavy physical demands BMI of 40 or above with co morbidity
Periodic Medical:	Once every 3 years till age 59  Once every year at age 60 and above
References:	CDC 'Yellow Book', USA, Atlanta, GA.

<b>Sub Type:</b>	<b>Laboratory Technician, Radiology Technician</b>
Workplaces:	Hospitals, Clinics, Independent Labs etc.
Health History:	General Health History Questionnaire - Appendix 3
Physical Examination:	Employment Medical Examination Form - Appendix 4 Review Health History Questionnaire information and assess any positive findings in more detail.
Investigations:	Hepatitis Profile (A, B & C) and HIV Measles Antibodies and Varicella Antibodies Chest x-ray
Results of Investigations:	To be provided to Candidate / Employee
Restriction:	Active Pulmonary Tuberculosis Unable to perform moderate to heavy physical demands
Periodic Medical:	Once every 3 years till age 59 Once every year at age 60 and above
References:	CDC 'Yellow Book', USA, Atlanta, GA.
<b>Sub Type:</b>	<b>Sterilization Technician</b>
Workplaces:	Hospitals, Clinics etc.
Health History:	General Health History Questionnaire - Appendix 3
Physical Examination:	Employment Medical Examination Form - Appendix 4 Review Health History Questionnaire information and assess any positive findings in more detail.
Investigations:	Hepatitis Profile (A, B & C) and HIV Measles Antibodies and Varicella Antibodies Chest x-ray
Results of Investigations:	To be provided to Candidate / Employee
Restriction:	Hep B e antigen positive Active Pulmonary Tuberculosis Unable to perform moderate to heavy physical demands BMI of 40 or above with co morbidity
Periodic Medical:	Once every 3 years till age 59 Once every year at age 60 and above
References:	CDC 'Yellow Book', USA, Atlanta, GA.

### 9.3 Appendix A; 3: Divers and Emergency Responders

9.3.1 Emergency Responders Includes: Fire-fighters, police, civil defence, ambulance personnel, hazmat emergency responders etc.

*Table 6: Divers and Emergency Responders*

<b>Sub Type:</b>	<b>Deep Sea Diver (Professional Divers)</b>
Workplaces:	Navy, Explorer, Merchants, Police
Health History:	General Health History Questionnaire - Appendix 3 Employment Medical Examination Form - Appendix 4
Physical Examination:	Electrocardiogram and Spirometry and Audiometry and Step Test Bruce Protocol (optional: if required to assess cardiac fitness)
Restriction:	Ischemic heart disease, angina, CABG and Valvular heart disease T.B, Asthma, Fibrotic or Cystic Lung disease Epilepsy, severe head injury, Severe motion sickness Active ENT infection, Stapedectomy, Meniere's Acute psychotic disorder, Mania, Schizophrenia Inflammatory bowel disease, hernia gall bladder or pancreatic pathology Sickle cell anaemia, thalassemia major, BMI greater than 27
Investigation:	CBC and Hb and Urine micro
Periodic Medical:	Initial medical and then annual assessment
References:	Health and Safety Executive (UK). The Medical Examination and Assessment of Divers (MA1).

<b>Sub Type:</b>	<b>Fire Fighter (Emergency Responders)</b>
Workplaces:	Civil Defence; Industry, offshore
Health History:	General Health History Questionnaire - Appendix 3
Physical Examination:	Employment Medical Examination Form - Appendix 4 Assess physical ability to perform the tasks associated with job
Investigation:	Spirometry and Electrocardiogram and Audiometry Bruce Protocol and Lab tests as per NFPA standard Respirators use medical evaluation if required
Results of investigations	To be provided to employee
Restriction:	Inability to wear Self Contained Breathing Apparatus (SCBA) Epilepsy or history of sudden loss of consciousness * Refer to NFPA standards regarding restrictions
Periodic Medical:	Initial Medical and then annual assessment Additional if exposure exceeds permissible exposure limits more than 29 days a year. Termination of employment
References:	NFPA. Standard on Comprehensive Occupational Medical Requirements for Fire Departments Standard 1582, USA. US Department of Labour. OSHA 3162-12R 2009. Screening and Surveillance Guide.

## 9.4 Appendix B: Hazardous Materials or Exposures Requiring Medical Surveillance

### 9.4.1 Acrylonitrile

#### Standard Requirements

<b>Pre-Placement Exam</b>	<b>YES<sup>1</sup></b>
<b>Periodic exam</b>	Yes – annual <sup>1</sup>
<b>Emergency/exposure examination and tests</b>	Yes
<b>Termination exam</b>	Yes – if no exam within 6 months of termination
<b>Examination includes special emphasis on these body systems</b>	Respiratory, gastrointestinal-nal <sup>1</sup> , thyroid, skin, neurological (peripheral and central)
<b>Work and medical history</b>	Required for all exams <sup>2</sup>
<b>Chest x-ray</b>	Yes
<b>Pulmonary function test (PFT)</b>	No
<b>Other required tests</b>	Faecal occult blood <sup>1</sup>
<b>Evaluation of ability to wear a respirator</b>	Yes
<b>Additional tests if deemed necessary</b>	Yes
<b>Written medical opinion</b>	Yes – physician to employer; employer to employee
<b>Employee counselling re: exam results, conditions of increased risk</b>	Yes – by physician
<b>Medical removal plan</b>	No

## 9.4.2 Arsenic (Inorganic)

### Standard Requirements

<b>Pre-Placement Exam</b>	<b>YES<sup>1</sup></b>
<b>Periodic exam</b>	Yes <sup>1</sup>
<b>Emergency/exposure examination and tests</b>	Yes
<b>Termination exam</b>	Yes – if no exam within 6 months of termination
<b>Examination includes special emphasis on these body systems</b>	Skin, nasal, peripheral nervous system
<b>Work and medical history</b>	Required for all exams <sup>2</sup> with focus on respiratory symptoms, includes smoking history
<b>Chest x-ray</b>	Yes
<b>Pulmonary function test (PFT)</b>	No
<b>Other required tests</b>	Urinary Total Arsenic
<b>Evaluation of ability to wear a respirator</b>	Yes
<b>Additional tests if deemed necessary</b>	Yes
<b>Written medical opinion</b>	Yes – physician to employer; employer to employee
<b>Employee counselling re: exam results, conditions of increased risk</b>	Yes – by physician
<b>Medical removal plan</b>	No

## 9.4.3 Asbestos (incl. Synthetic Mineral Fibres and Man-Made Mineral Fibres)

### Standard Requirements

Pre-Placement Exam	YES <sup>1,3</sup>
<b>Periodic exam</b>	Yes – annual or more frequently if determined by physician
<b>Emergency/exposure examination and tests</b>	No
<b>Termination exam</b>	No
<b>Examination includes special emphasis on these body systems</b>	Pulmonary and gastrointestinal
<b>Work and medical history</b>	Required for all exams <sup>2</sup> ; special emphasis on pulmonary, cardiovascular, gastrointestinal; standardised form required;
<b>Chest x-ray</b>	Yes <sup>1</sup> only for diagnosis certified radiologist or physician with expertise in pneumoconiosis required;
<b>Pulmonary function test (PFT)</b>	FVC, FEV1
<b>Other required tests</b>	No
<b>Evaluation of ability to wear a respirator</b>	Yes
<b>Additional tests if deemed necessary</b>	Yes
<b>Written medical opinion</b>	Yes – physician to employer; employer to employee
<b>Employee counselling re: exam results, conditions of increased risk</b>	Yes – by physician; includes informing employee of Increased risk of lung cancer from combined effects of smoking and asbestos exposure

## 9.4.4 Benzene

### Standard Requirements

<b>Pre-Placement Exam</b>	<b>YES<sup>1,3,4</sup></b>
<b>Periodic exam</b>	Yes – annual <sup>1,4</sup>
<b>Emergency/exposure examination and tests</b>	Yes <sup>1,4</sup> – includes urinary phenol test
<b>Termination exam</b>	No
<b>Examination includes special emphasis on these body systems</b>	Hemopoietic; add cardiopulmonary if respiratory protection used at least 30 days/ year, (initially, then every 3 years)
<b>Work and medical history</b>	Required for initial and periodic exams (pre-placement exam requires special history) <sup>2</sup>
<b>Chest x-ray</b>	No
<b>Pulmonary function test (PFT)</b>	Initially and every 3 years if respiratory protection used 30 days/year; specific tester requirements
<b>Other required tests</b>	CBC, differential, other specific blood tests; repeated as required;
<b>Evaluation of ability to wear a respirator</b>	Yes – if respirators are used
<b>Additional tests if deemed necessary</b>	Yes
<b>Written medical opinion</b>	Yes – physician to employer; employer to employee
<b>Employee counselling re: exam results, conditions of increased risk</b>	Yes – by physician

## 9.4.5 Blood-Borne Pathogens (Hepatitis, B)

### Standard Requirements

<b>Pre-placement exam</b>	No – must offer Hepatitis B (HBV) vaccine unless already immune or vaccine contraindicated
<b>Periodic exam</b>	No
<b>Emergency/exposure examination and tests</b>	Specific post-exposure monitoring for employee and source; HBV vaccine;
<b>Termination exam</b>	No
<b>Examination includes special emphasis on these body systems</b>	No
<b>Work and medical history</b>	No
<b>Chest x-ray</b>	No
<b>Pulmonary function test (PFT)</b>	No
<b>Other required tests</b>	Yes – post-exposure incident;
<b>Evaluation of ability to wear a respirator</b>	No
<b>Additional tests if deemed necessary</b>	Yes – for post-exposure incident; follow post-exposure protocols
<b>Written medical opinion</b>	Yes – licensed healthcare professional to employer; employer to employee
<b>Employee counselling re: exam results, conditions of increased risk</b>	Yes – by licensed healthcare professional; counselling re: HBV vaccine and post-exposure follow-up;

## 9.4.6 Butadiene

### Standard Requirements

<b>Pre-placement exam</b>	Yes <sup>1, 3, 4</sup>
<b>Periodic exam</b>	Yes1, 4
<b>Emergency/exposure examination and tests</b>	Yes <sup>1, 4</sup> – within 48 hours of exposure
<b>Termination exam</b>	Yes <sup>4</sup> – if 12 months have elapsed since last exam
<b>Examination includes special emphasis on these body systems</b>	Liver, spleen, lymph nodes, and skin
<b>Work and medical history</b>	Required annually and for all examinations <sup>2</sup> ; standardized form or equivalent; includes comprehensive occupational and health history;
<b>Chest x-ray</b>	No
<b>Pulmonary function test (PFT)</b>	No
<b>Other required tests</b>	Annually, CBC with differential and platelet count; also, within 48 hrs. after exposure in an emergency and repeated monthly for 3 more months
<b>Evaluation of ability to wear a respirator</b>	Yes – if respirators are used
<b>Additional tests if deemed necessary</b>	Yes
<b>Written medical opinion</b>	Yes – physician or other licensed healthcare professional to employer and employee
<b>Employee counselling re: exam results, conditions of increased risk</b>	Yes – by physician or other licensed healthcare professional

#### 9.4.7 Cadmium - Creosote

Standard Requirements	
<b>Pre-placement exam</b>	Yes
<b>Periodic exam</b>	Yes – annual
<b>Emergency/exposure examination and tests</b>	Yes <sup>1</sup> – special medical surveillance begins within 24 hours
<b>Termination exam</b>	No
<b>Examination includes special emphasis on these body systems</b>	Exam includes emphasis on the neurological system and Skin noting any abnormal lesions and Evidence of skin sensitisation
<b>Work and medical history</b>	Required for all examinations; includes family and occupational history, and environmental factors
<b>Chest x-ray</b>	No
<b>Pulmonary function test (PFT)</b>	No
<b>Other required tests</b>	No
<b>Evaluation of ability to wear a respirator</b>	Yes - if respirators are used
<b>Additional tests if deemed necessary</b>	Yes
<b>Written medical opinion</b>	Yes – physician to employer

## 9.4.8 Chromium (VI), Hexavalent

### Standard Requirements

<b>Pre-placement exam</b>	Yes <sup>1</sup>
<b>Periodic exam</b>	Yes <sup>1</sup>
<b>Emergency/exposure examination and tests</b>	Yes <sup>1</sup>
<b>Termination exam</b>	Yes <sup>3</sup> – unless last exam was less than 6 months prior to date of termination
<b>Examination includes special emphasis on these body systems</b>	Skin especially hands and forearms and respiratory tract
<b>Work and medical history</b>	Required for all exams <sup>2</sup> ; includes past, present and anticipated future exposure; any history of respiratory system dysfunction, asthma, dermatitis, skin ulceration or nasal septum perforation; smoking status and history
<b>Chest x-ray</b>	No
<b>Pulmonary function test (PFT)</b>	No
<b>Other required tests</b>	No
<b>Evaluation of ability to wear a respirator</b>	Yes
<b>Additional tests if deemed necessary</b>	Yes
<b>Written medical opinion</b>	Yes – physician to employer; employer to employee
<b>Employee counselling re: exam results, conditions of increased risk</b>	Yes – by physician

## 9.4.9 Coke Oven Emissions

### Standard Requirements

<b>Pre-placement exam</b>	Yes <sup>1</sup>
<b>Periodic exam</b>	Yes <sup>1</sup>
<b>Emergency/exposure examination and tests</b>	No
<b>Termination exam</b>	Yes – if no exam within 6 months of termination
<b>Examination includes special emphasis on these body systems</b>	Skin
<b>Work and medical history</b>	Required for all exams <sup>2</sup> , includes smoking history and presence and degree of respiratory symptoms
<b>Chest x-ray</b>	Yes
<b>Pulmonary function test (PFT)</b>	FVC, FEV1
<b>Other required tests</b>	Weight, urine cytology, urinalysis for sugar, albumin, hematuria
<b>Evaluation of ability to wear a respirator</b>	Yes
<b>Additional tests if deemed necessary</b>	Yes
<b>Written medical opinion</b>	Yes – physician to employer; employer to employee
<b>Employee counselling re: exam results, conditions of increased risk</b>	Yes – by physician; also, employer must inform employee of possible health consequences if employee refuses any required medical exam

#### 9.4.10 Cotton Dust

<b>Standard Requirements</b>	
<b>Pre-placement exam</b>	Physical exam not specified. other tests required
<b>Periodic exam</b>	Physical exam not specified; other tests required <sup>1,4</sup>
<b>Emergency/exposure examination and tests</b>	No
<b>Termination exam</b>	No
<b>Examination includes special emphasis on these body systems</b>	Pulmonary
<b>Work and medical history</b>	Medical history; standardized questionnaire required;
<b>Chest x-ray</b>	No
<b>Pulmonary function test (PFT)</b>	FVC, FEV1, FEV1/FVC Employees with specific abnormalities are referred to specialists <sup>1,4,5</sup>
<b>Other required tests</b>	No
<b>Evaluation of ability to wear a respirator</b>	Yes
<b>Additional tests if deemed necessary</b>	No
<b>Written medical opinion</b>	Yes – physician to employer; employer to employee
<b>Employee counselling re: exam results, conditions of increased risk</b>	Yes – by physician re: results of exam and any medical conditions requiring further examination or treatment

## 9.4.11 Crystalline Silica

<b>Standard Requirements</b>	
<b>Pre-placement exam</b>	Physical exam other tests required
<b>Periodic exam</b>	Physical exam annual; other tests required
<b>Emergency/exposure examination and tests</b>	No
<b>Termination exam</b>	No
<b>Examination includes special emphasis on these body systems</b>	
<b>Work and medical history</b>	Medical history; standardized questionnaire required;
<b>Chest x-ray</b>	No
<b>Pulmonary function test (PFT)</b>	FVC, FEV1, FEV1/FVC Employees with specific abnormalities are referred to specialists
<b>Other required tests</b>	Yes, x ray only for diagnosis certified radiologist or physician with expertise in pneumoconioses required;
<b>Evaluation of ability to wear a respirator</b>	Yes
<b>Additional tests if deemed necessary</b>	No
<b>Written medical opinion</b>	Yes – physician to employer; employer to employee
<b>Employee counselling re: exam results, conditions of increased risk</b>	Yes – by physician re: results of exam and any medical conditions requiring further examination or treatment

#### 9.4.12 dibromo-3-chloropropane

##### Standard Requirements

<b>Pre-placement exam</b>	Yes
<b>Periodic exam</b>	Yes <sup>1</sup>
<b>Emergency/exposure examination and tests</b>	Yes – male reproductive; repeat in 3 months
<b>Termination exam</b>	No
<b>Examination includes special emphasis on these body systems</b>	Reproductive, genitourinary.
<b>Work and medical history</b>	Required for all exams <sup>2</sup> ; Includes reproductive history;
<b>Chest x-ray</b>	No
<b>Pulmonary function test (PFT)</b>	No
<b>Other required tests</b>	No
<b>Evaluation of ability to wear a respirator</b>	Yes
<b>Additional tests if deemed necessary</b>	Yes
<b>Written medical opinion</b>	Yes – physician to employer; employer to employee
<b>Employee counselling re: exam results, conditions of increased risk</b>	Yes – by physician

#### 9.4.13 Ethylene Oxide

<b>Standard Requirements</b>	
<b>Pre-placement exam</b>	Yes <sup>1</sup>
<b>Periodic exam</b>	Yes – annual <sup>1</sup>
<b>Emergency/exposure examination and tests</b>	Yes <sup>1</sup>
<b>Termination exam</b>	Yes <sup>1</sup>
<b>Examination includes special emphasis on these body systems</b>	Pulmonary, skin, neurologic, hematologic, reproductive, eyes
<b>Work and medical history</b>	Required for all exams; includes reproductive history and special emphasis on some body systems;
<b>Chest x-ray</b>	No
<b>Pulmonary function test (PFT)</b>	No
<b>Other required tests</b>	CBC, white cell count with differential, hematocrit, hemoglobin, red cell count;
<b>Evaluation of ability to wear a respirator</b>	Yes
<b>Additional tests if deemed necessary</b>	Yes
<b>Written medical opinion</b>	Yes – physician to employer; employer to employee
<b>Employee counselling re: exam results, conditions of increased risk</b>	Yes – by physician

#### 9.4.14 Formaldehyde

<b>Standard Requirements</b>	
<b>Pre-placement exam</b>	Yes <sup>1,4</sup>
<b>Periodic exam</b>	Yes <sup>1, 4</sup>
<b>Emergency/exposure examination and tests</b>	Yes <sup>4</sup>
<b>Termination exam</b>	No
<b>Examination includes special emphasis on these body systems</b>	Evidence of irritation or sensitization of skin, respiratory system, eyes; shortness of breath
<b>Work and medical history</b>	Required for all exams <sup>2</sup> ; questionnaire required.
<b>Chest x-ray</b>	No
<b>Pulmonary function test (PFT)</b>	FVC, FEV1, FEF should be evaluated if respiratory protection is used
<b>Other required tests</b>	No
<b>Evaluation of ability to wear a respirator</b>	Yes
<b>Additional tests if deemed necessary</b>	Yes
<b>Written medical opinion</b>	Yes – physician to employer; employer to employee
<b>Employee counselling re: exam results, conditions of increased risk</b>	Yes– by physician; includes information on whether medical conditions were caused by past exposures or emergency exposures

#### 9.4.15 Hazardous Waste Operations and Emergency Response

<b>Standard Requirements</b>	
<b>Pre-placement exam</b>	Yes <sup>1</sup>
<b>Periodic exam</b>	Yes – annually or at physician's discretion <sup>1</sup>
<b>Emergency/exposure examination and tests</b>	Yes <sup>1</sup>
<b>Termination exam</b>	Yes – if no exam within 6 months of termination/reassignment
<b>Examination includes special emphasis on these body systems</b>	Determined by physician.
<b>Work and medical history</b>	Yes – with emphasis on symptoms related to handling hazardous materials and health hazards, fitness for duty and ability to wear PPE <sup>2</sup>
<b>Chest x-ray</b>	No – unless determined by physician
<b>Pulmonary function test (PFT)</b>	No – unless determined by physician
<b>Other required tests</b>	No – unless determined by physician
<b>Evaluation of ability to wear a respirator</b>	Yes
<b>Additional tests if deemed necessary</b>	Yes
<b>Written medical opinion</b>	Yes – physician to employer; employer to employee
<b>Employee counselling re: exam results, conditions of increased risk</b>	Yes – by physician

## 9.4.16 Isocyanates

<b>Standard Requirements</b>	
<b>Pre-placement exam</b>	Physical exam other tests required
<b>Periodic exam</b>	Physical exam annual; other tests required
<b>Emergency/exposure examination and tests</b>	No
<b>Termination exam</b>	No
<b>Examination includes special emphasis on these body systems</b>	Pulmonary, skin
<b>Work and medical history</b>	Medical history; standardized questionnaire required;
<b>Chest x-ray</b>	No
<b>Pulmonary function test (PFT)</b>	FVC, FEV1, FEV1/FVC
<b>Other required tests</b>	No
<b>Evaluation of ability to wear a respirator</b>	Yes
<b>Additional tests if deemed necessary</b>	No
<b>Written medical opinion</b>	Yes – physician to employer; employer to employee
<b>Employee counselling re: exam results, conditions of increased risk</b>	Yes – by physician re: results of exam and any medical conditions requiring further examination or treatment

#### 9.4.17 Lead

Standard Requirements	
<b>Pre-placement exam</b>	Yes
<b>Periodic exam</b>	Yes <sup>1, 4</sup>
<b>Emergency/exposure examination and tests</b>	Yes <sup>1, 4</sup>
<b>Termination exam</b>	No
<b>Examination includes special emphasis on these body systems</b>	Teeth, gums, hematologic, gastrointestinal, renal, cardiovascular (BP), neurologic; pulmonary status if respiratory protection used
<b>Work and medical history</b>	Required for all exams <sup>2</sup> ; includes reproductive history, past lead exposure, both work/non-work, and history of specific body systems; see standard
<b>Chest x-ray</b>	No
<b>Pulmonary function test (PFT)</b>	No – unless deemed necessary by physician
<b>Other required tests</b>	Hemoglobin, hematocrit, ZPP, BUN, serum creatinine, Urinalysis with micro, blood-lead levels, peripheral smear morphology, red cell indices <sup>1, 5</sup> ;
<b>Evaluation of ability to wear a respirator</b>	Yes
<b>Additional tests if deemed necessary</b>	Yes

## 9.4.18 Mercury

### Standard Requirements

<b>Pre-placement exam</b>	Yes
<b>Periodic exam</b>	Yes <sup>1, 4</sup>
<b>Emergency/exposure examination and tests</b>	Yes <sup>1, 4</sup>
<b>Termination exam</b>	No
<b>Examination includes special emphasis on these body systems</b>	Eyes, skin, respiratory gastrointestinal, renal, cardiovascular (BP), neurologic CNS and PNS; pulmonary status if respiratory protection used
<b>Work and medical history</b>	Required for all exams <sup>2</sup> ; includes reproductive history, past mercury exposure, both work/non-work, and history of specific body systems;
<b>Chest x-ray</b>	No
<b>Pulmonary function test (PFT)</b>	No
<b>Other required tests</b>	Urinary and blood inorganic mercury others determined by physician
<b>Evaluation of ability to wear a respirator</b>	Yes
<b>Additional tests if deemed necessary</b>	Yes

#### 9.4.19 Methylene Chloride

<b>Pre-placement exam</b>	Yes <sup>1, 4</sup>
<b>Periodic exam</b>	Yes <sup>1, 4</sup>
<b>Emergency/exposure examination and tests</b>	Yes <sup>4</sup>
<b>Termination exam</b>	Yes – if no exam within 6 months of termination
<b>Examination includes special emphasis on these body systems</b>	Lungs, cardiovascular (Including BP and pulse), liver, nervous, skin; extent of exam determined by examiner based on employee's health status, work, and medical history
<b>Work and medical history</b>	Required for all exams; example of work and medical history form provided
<b>Chest x-ray</b>	No
<b>Pulmonary function test (PFT)</b>	No – unless deemed necessary by physician or other licensed healthcare professional
<b>Other required tests</b>	Laboratory surveillance may include tests as determined by examiner including "before and after shift tests"; Carboxyhemoglobin
<b>Evaluation of ability to wear a respirator</b>	Yes
<b>Additional tests if deemed necessary</b>	Yes
<b>Written medical opinion</b>	Yes – by physician or other licensed healthcare professional to employer and Employee of increased risk of harm from combined effects of smoking and Methylene Chloride
<b>Employee counselling re: exam results, conditions of increased risk</b>	Yes – by physician or other licensed healthcare professional

#### 9.4.20 Methylene di-aniline (MDA)

##### Standard Requirements

<b>Pre-placement exam</b>	Yes <sup>1, 3, 4</sup>
<b>Periodic exam</b>	Yes – annual <sup>1, 4</sup>
<b>Emergency/exposure examination and tests</b>	Yes <sup>1, 4</sup>
<b>Termination exam</b>	No
<b>Examination includes special emphasis on these body systems</b>	Skin, hepatic
<b>Work and medical history</b>	Required for all examinations <sup>2</sup> ; includes past work with MDA and other specific items;
<b>Chest x-ray</b>	No
<b>Pulmonary function test (PFT)</b>	No
<b>Other required tests</b>	Liver function tests, urinalysis
<b>Evaluation of ability to wear a respirator</b>	Yes
<b>Additional tests if deemed necessary</b>	Yes
<b>Written medical opinion</b>	Yes – physician to employer; employer to employee
<b>Employee counselling re: exam results, conditions of increased risk</b>	Yes – by physician

#### 9.4.21 Noise

<b>Standard Requirements</b>	
<b>Pre-placement exam</b>	Baseline audiograms are required within 6 months of exposure at or above 85dB.
<b>Periodic exam</b>	Annual audiometric testing required
<b>Emergency/exposure examination and tests</b>	No
<b>Termination exam</b>	No requirements
<b>Examination includes special emphasis on these body systems</b>	Auditory
<b>Work and medical history</b>	Yes
<b>Chest x-ray</b>	No
<b>Pulmonary function test (PFT)</b>	No
<b>Other required tests</b>	Initial and annual audiometric testing <sup>1, 4, 5;</sup>
<b>Evaluation of ability to wear a respirator</b>	No
<b>Additional tests if deemed necessary</b>	Yes, bone conduction audiometry
<b>Written medical opinion</b>	No
<b>Employee counselling re: exam results, conditions of increased risk</b>	Yes – if standard threshold shift or suspected ear pathology

## 9.4.22 Organophosphate Pesticides

<b>Standard Requirements</b>	
<b>Pre-placement exam</b>	Physical exam other tests required baseline red blood cell and plasma Cholinesterase activity levels <sup>5</sup>
<b>Periodic exam</b>	Physical exam annual;
<b>Emergency/exposure examination and tests</b>	No
<b>Termination exam</b>	No
<b>Examination includes special emphasis on these body systems</b>	No
<b>Work and medical history</b>	Medical history; standardized questionnaire required;
<b>Chest x-ray</b>	No
<b>Pulmonary function test (PFT)</b>	No
<b>Other required tests</b>	Yes – if deemed necessary – estimated red cell and plasma cholinesterase activity at end of workday after exposure
<b>Evaluation of ability to wear a respirator</b>	Yes
<b>Additional tests if deemed necessary</b>	No
<b>Written medical opinion</b>	Yes – physician to employer; employer to employee
<b>Employee counselling re: exam results, conditions of increased risk</b>	Yes – by physician re: results of exam and any medical conditions requiring further examination or treatment

#### 9.4.23 Respiratory Protection

##### Standard Requirements

<b>Pre -placement exam</b>	Evaluation questionnaire or exam ; follow-up exam when required <sup>5</sup>
<b>Periodic exam</b>	Yes – in specific situations <sup>5</sup>
<b>Emergency/exposure examination and tests</b>	No
<b>Termination exam</b>	No
<b>Examination includes special emphasis on these body systems</b>	Yes <sup>5</sup>
<b>Work and medical history</b>	Yes <sup>2</sup>
<b>Chest x-ray</b>	As determined by physician or other licensed healthcare professional
<b>Pulmonary function test (PFT)</b>	As determined by physician or other licensed healthcare professional
<b>Other required tests</b>	As determined by physician or other licensed healthcare professional
<b>Evaluation of ability to wear a respirator</b>	Yes
<b>Additional tests if deemed necessary</b>	Yes
<b>Written medical opinion</b>	Yes – physician or other licensed healthcare professional to employer and employee
<b>Employee counselling re: exam results,</b>	Yes – by physician or other licensed healthcare

## 9.4.24 Vinyl Chloride

### Standard Requirements

<b>Pre-placement exam</b>	Yes <sup>1</sup>
<b>Periodic exam</b>	Yes <sup>1</sup>
<b>Emergency/exposure examination and tests</b>	Yes
<b>Termination exam</b>	No
<b>Examination includes special emphasis on these body systems</b>	Special attention to detecting enlargement of the liver, spleen or kidneys, or dysfunction of these organs and abnormalities in skin, connective tissue and pulmonary system;
<b>Work and medical history</b>	Required for initial and periodic exams <sup>2</sup> ; includes alcohol intake, history of hepatitis, exposure to hepa- toxic agents, blood transfusions, hospitalizations, and work history
<b>Chest x-ray</b>	No
<b>Pulmonary function test (PFT)</b>	No
<b>Other required tests</b>	Blood test for total bilirubin, alkaline phosphatase, SGOT, SGPT and gamma glutamyl transpeptidase
<b>Evaluation of ability to wear a respirator</b>	Yes
<b>Additional tests if deemed necessary</b>	Yes
<b>Written medical opinion</b>	Yes – physician to employer; employer to employee
<b>Employee counselling re: exam results, conditions of increased risk</b>	No

### Footnotes

<sup>1</sup> Pre-placement and periodic examinations are dependent upon specific factors such as airborne concentrations of the material and/or years of exposure, biological indices, age of employee, amount of time exposed per year.

<sup>2</sup> Standard requires medical and work history focused on special body systems, symptoms, personal habits, and/or specific family, environmental or occupational history.

<sup>3</sup> No examination required if previous examination done within specified time frame (e.g., 6 months or 12 months) and provisions of standard met.

<sup>4</sup> Additional physician review: Provisions for referring employees with abnormalities to a specialist as deemed necessary by examiner.

<sup>5</sup> May require specific protocol.

## 9.5 Appendix C: Sample General Health History Questionnaire

### 9.5.1 Medical Exam Frequency: Pre-Placement, Annual, Termination

General Health History Questionnaire – Page 1 of 2		
First Name	Last Name	Nationality
_____	_____	_____
Date of Birth (d/m/y) ____ / ____ / ____	<input type="checkbox"/> Female <input type="checkbox"/> Male	Height ____ cm
		Weight: ____ Kg

### Occupational History

	From	To	Occupation	WORK EXPOSURE (Check box if yes)	
1				<input type="checkbox"/> Ionizing Radiation	<input type="checkbox"/> Dust
2				<input type="checkbox"/> Chemicals	<input type="checkbox"/> Noise
3				<input type="checkbox"/> Heavy Metals	<input type="checkbox"/> Industrial Accident / Compensation

Personal History - Do you suffer from, or have you had? – (Check box if yes)

<input type="checkbox"/> Rheumatic Fever	<input type="checkbox"/> Rectal Bleeding	<input type="checkbox"/> Thyroid Disease	<input type="checkbox"/> Muscular weakness / paralysis
<input type="checkbox"/> High Blood Pressure	<input type="checkbox"/> Hernia	<input type="checkbox"/> Anxiety / Depression	<input type="checkbox"/> Lost work time due to back pain
<input type="checkbox"/> Varicose Veins	<input type="checkbox"/> Venereal Disease	<input type="checkbox"/> Insomnia	<input type="checkbox"/> Unexplained Chronic fatigue
<input type="checkbox"/> Chest Pain	<input type="checkbox"/> Kidney Disease	<input type="checkbox"/> Back Trouble	<input type="checkbox"/> Irritable or inflammatory bowel disease
<input type="checkbox"/> Breathlessness	<input type="checkbox"/> Renal Colic	<input type="checkbox"/> Bone Complaint	<input type="checkbox"/> Lost work time due to migraines
<input type="checkbox"/> Palpitations	<input type="checkbox"/> Incontinence	<input type="checkbox"/> Joint Complaint	<input type="checkbox"/> Diagnosis of depression
<input type="checkbox"/> Pneumonia	<input type="checkbox"/> Frequent Urination	<input type="checkbox"/> Skin Disease	<input type="checkbox"/> Diagnosis of Bipolar Disorder
<input type="checkbox"/> Tuberculosis	<input type="checkbox"/> Painful Urination	<input type="checkbox"/> Multiple Sclerosis	<input type="checkbox"/> Diagnosis of Obsessive-Compulsive disorder
<input type="checkbox"/> Bronchitis	<input type="checkbox"/> Blood in Urine	<input type="checkbox"/> Jaundice	<input type="checkbox"/> Diagnosis of anxiety or Panic Attacks
<input type="checkbox"/> Asthma	<input type="checkbox"/> Epilepsy	<input type="checkbox"/> Diabetes	<input type="checkbox"/> Have you been admitted to a mental health/Psychiatric Hospital?
<input type="checkbox"/> Chronic Cough	<input type="checkbox"/> Stroke	<input type="checkbox"/> Poliomyelitis	<input type="checkbox"/> Have you ever suffered any mental and/or psychiatric illness/disorder?
<input type="checkbox"/> Sputum with Blood	<input type="checkbox"/> Migraine	<input type="checkbox"/> Anaemia	<input type="checkbox"/> Have you ever taken and/or been prescribed any psychiatric meds?

<input type="checkbox"/> Peptic Ulcer	<input type="checkbox"/> Loss of Consciousness	<input type="checkbox"/> Cancer	<input type="checkbox"/> Have you ever suffered any serious head traumas/injuries?
	<input type="checkbox"/> Numbness	<input type="checkbox"/>	<input type="checkbox"/> Have you even seen a Psychiatric and/or Psychologist/Counsellor?
<input type="checkbox"/> Haemorrhoids	/		
	Tingling	Arthritis	
<input type="checkbox"/> Eye Trouble	<input type="checkbox"/> Ear Trouble	<input type="checkbox"/> Fibromyalgia	<input type="checkbox"/> Drug Reaction:
<input type="checkbox"/> Difficulty Colour Vision	<input type="checkbox"/> Nose Trouble		<input type="checkbox"/> Allergy

#### FEMALES

Are you pregnant? <input type="checkbox"/> Yes <input type="checkbox"/> No	Number of Pregnancies <input type="text"/>	Number of Live Births <input type="text"/>
--	--	--

#### Family History

FAMILY	AGE	State of Health / Cause of Death	FAMILY	AGE	State of Health / Cause of Death
Father			Wife / Husband		
Mother			Son(s)		
Brother(s)			Daughter(s)		
Sisters(s)			Number of Children	<input type="text"/>	

#### Is there a family history of – (Check box if yes)

<input type="checkbox"/> Heart Disease	<input type="checkbox"/> Anaemia	<input type="checkbox"/> Kidney Disease	<input type="checkbox"/> Diabetes
<input type="checkbox"/> High Blood Pressure	<input type="checkbox"/> Asthma	<input type="checkbox"/> Stroke	<input type="checkbox"/> Cancer
<input type="checkbox"/> Allergy	<input type="checkbox"/> Tuberculosis	<input type="checkbox"/> Epilepsy	<input type="checkbox"/> Mental disorder

**General Health History Questionnaire – Page 2 of 2**

<b>LIFESTYLE</b>	
<b>Daily</b> consumption of tobacco: _____ per day	Average <b>weekly</b> consumption of alcohol: _____ units per week
<b>Exercise type:</b> _____ Minutes per day _____	Recreational <input type="checkbox"/> Yes <input type="checkbox"/> No Drugs:

Medical History

<b>Information on Medications taken on a regular or occasional basis over the past two years.</b>			
<input type="checkbox"/> I have <u>not</u> taken any medications over the past 2 years <b>or</b> <b>List as requested below ...</b>			
Medication and Dosage	Date Started	Reason for Medication	Are you currently taking this medication?
			<input type="checkbox"/> Yes <input type="checkbox"/> No
			<input type="checkbox"/> Yes <input type="checkbox"/> No
			<input type="checkbox"/> Yes <input type="checkbox"/> No

Surgical History

<b>List all Chronic Health Problems, Hospitalizations and Surgeries that you have experienced:</b>				
<input type="checkbox"/> I have <u>not</u> had any chronic health problems, hospitalizations, nor surgeries <b>or</b> Complete information below ...				
Date	Problem / Hospitalization/Surgery	Surgery Performed?		<b>Current status related to each health issue &amp; Date of any surgery performed</b>
		Yes	No	

## Immunisation History

<b>Tuberculosis (TB)</b>	Have you ever had active pulmonary TB? <input type="checkbox"/> No <input type="checkbox"/> Yes; if 'yes' give date _____
	Was it treated and for how long? <input type="checkbox"/> No <input type="checkbox"/> Yes Treated for _____ months
	Have you had a BCG vaccine? <input type="checkbox"/> No <input type="checkbox"/> Yes. if 'yes' give year: _____
	Have you had a TB skin test (Mantoux)? <input type="checkbox"/> No <input type="checkbox"/> Yes, if 'yes' give date _____ & Result _____ mm
<b>Hepatitis</b>	Have you ever been diagnosed with Hepatitis (A, B, C)? <input type="checkbox"/> No <input type="checkbox"/> Yes, if 'yes' give date:

	What type of Hepatitis did you have? _____ What was your treatment? _____
	Have you had any Hepatitis vaccines? <input type="checkbox"/> No <input type="checkbox"/> Yes
	Which vaccine did you have? _____ _____ _____; _____ and
	Dates of each dose: _____ _____
<b>Measles, Mumps, Rubella</b>	Have you had the vaccine for Measles/Mumps/Rubella? <input type="checkbox"/> No <input type="checkbox"/> Yes, if 'yes' give date
<b>Tetanus / Diphtheria</b>	Have you had a booster for Tetanus / Diphtheria? <input type="checkbox"/> Never <input type="checkbox"/> Yes, in the year
<b>Chicken Pox / Varicella</b>	Have you had the Varicella vaccine? <input type="checkbox"/> No <input type="checkbox"/> Yes - Date of each dose _____ &
Please check to make sure you <u>have completed all questions</u> on the two pages of this form. <b>Your medical information cannot be evaluated unless all questions are completed or marked "unknown".</b>	
I affirm that the information and responses I have provided are accurate and true to the best of my knowledge.	
Signature: _____	Date (dd/mm/yy): _____

## 9.6 Appendix D; Sample Employment Medical Examination Form

EMPLOYMENT MEDICAL EXAMINATION FORM								
<i>Page 1 of 2</i>								
<p>This report is to be completed by a licensed Medical Physician who performs complete physical exams as a part of his/her practice. Please assess and describe all abnormal findings, including past surgeries, serious and chronic conditions and indicate all current treatments.</p>								
Family Name _____	First Name _____	Gender: <input type="checkbox"/> Male <input type="checkbox"/> Female	Age ____	Height (cm) ____	Weight (kg) ____	BMI ____		
EXAMINATION	FINDINGS	COMMENTS ON ABNORMAL FINDINGS						
<b>General</b>								
HAIR								
SKIN								
NAILS								
<b>EYES</b>								
LIGHT REFLEXES								
ACCOMODATION								
NYSTAGMUS								
FUNDI								
COLOR VISION	ISHIHARA TEST	EYE TEST RT / 6      LT / 6						
	OTHER							
<b>EARs</b>								
MEATUS								
EAR DRUMS								
ABILITY TO HEAR / CONVERSATIONAL HEARING TONES	Weber							
	Rinne							
<b>CARDIO – VASCULAR</b>								
PULSE	/ Min	INDICATE NATURE & DEGREE						
RHYTHM								
BLOOD PRESSURE	Systolic						/Diastolic	mmhg
HEART SOUNDS								
HEART MURMURS								
VARICOSE VEINS								
<b>RESPIRATORY</b>								
NASAL PASSAGE		PERCUSSION						
THYROID								
TRACHEA								
LYMPH NODES								
CHEST SHAPE / MOVEMENT								
BREATH SOUNDS								
ADDED SOUNDS								
<b>ALIMENTARY</b>								
TEETH								

TONGUE						
LIVER						
SPLEEN						
LYMPHADENOPATHY						
HERNIAL ORIEICES						
ANUS RECTUM / P.R.						
<b>URINARY</b>						
KIDNEYS						
GENITALIA						
<b>MUSCULO - SKELETAL</b>						
HANDS						
LIMBS						
BACK						
JOINTS						
INJURIES						
<b>CENTRAL NERVOUS</b>						
CRANIAL NERVES	I	II	III	IV	V	VI
	VII	VIII	IX	X	XI	XII
REFLEXES	SI	TR	SUP	KN	AN	PL
	RT.					
LT.						
POWER						
TONE						
CO -ORDINATION						
SENSATION						
EMOTIONAL STABILITY						
<b>EMPLOYMENT MEDICAL EXAMINATION Page 2 of 2</b>						
Please complete the requested information, based on your findings during the health history and physical exam on this individual ability to:						
ACTIVITY	Y	N	EXPLANATION/FINDINGS			
Ability to stand and walk continuously for 8 - 12 hours per day.						
Ability to bend, stoop & squat repeatedly						
Ability to push, pull and lift patients						
Ability to lift 12 kg						
Ability to carry 12 kg occasionally & for short periods						
Ability to climb step ladders						
Ability to operate motorized equipment and/or vehicles						

Ability to work 12 hours and to rotate shifts (shift work)			
Ability to sit for extended periods of time			
<b>Previous surgery</b>  <input type="checkbox"/> Yes <input type="checkbox"/> No	<b>Type Surgery</b>		
			<b>Date (dd/mm/yy)</b>
<b>Describe chronic conditions, with current status for each:</b>			
1			
2			
3			
5			
<b>I Have examined the employee and in my medical opinion consider that he / she is (check one):</b>			
<input type="checkbox"/> Physically fit for employment and demands of the job. <input type="checkbox"/> Temporarily unfit, but likely to become fit after recovery from the medical problem identified in the examination result.			
From a medical aspect, I estimate he / She may be fit for work in _____ weeks.			
MD Name & Stamp:	Signature		
	Date (d/m/y)		
<b>Note: This form is valid for a period of six months from the date of signature</b>			

## 9.7 Appendix E: Sample Certificate of Medical Fitness

### CERTIFICATE OF MEDICAL FITNESS

Name:

ID Number:

Date of Expiry of this Certificate:

I certify that the above mentioned has undergone a medical examination in compliance with the above regulation and I have found him/her fit for UNRESTRICTED WORK in NEOM:

**I confirm that:**

- His/her hearing and eyesight are satisfactory for the duties to be performed,
- His/her colour vision is satisfactory,
- He/she is fit / for lookout duties.

Name of Approved Medical Practitioner:	
Signature of the Approved Medical Practitioner:	
Date of Examination:	
Official Stamp	

## 9.8 Audit Criteria Occupational Health screening and medical surveillance

Contractor/ Area: \_\_\_\_\_

Department: \_\_\_\_\_

Completed by: \_\_\_\_\_ Date completed: \_\_\_\_\_

Audit Criteria		Requirements	Verification	Area of Concern
ISO 45001:2018 Clause	NMS Ref.			Yes/ No
5.3	7.1.3	Pre-Tender Health and Safety Plan has been developed and issued		
5.3, 8.1.4.2	7.1.4	Selection of Contractors undertaken in accordance with NEOM's policies and procedures		
7.2	7.2.4, 8.3.3	Persons appointed to manage /oversee work operations have the skills, knowledge, experience		
8.1.2 (e)	7.2.6, 7.3.3	Personal protective equipment required for use are fit for purpose		
6.1.2.3 6.1.2.2	7.2.5	Hazards Identification Plan (HIP)  Assessment of the various risks shall be undertaken,		
9.1.2, 9.1.1, 8.2, 8.1.4, 8.1.2, 6.1.2.2	7.3.4(b)	Employees have a right to decline to take part in occupational health screening or surveillance programs but shall be informed of the consequences by the employer or a qualified physician and evidence of the decision shall be recorded in writing along with the employees, employers and physicians' signatures		
	8.1.3	Employers with occupational health screening and medical surveillance programs shall use an employee general health history questionnaire to collect, at a minimum		
	8.3.1	Medical surveillance shall be undertaken after a risk assessment and/or occupational hygiene assessments have been undertaken to assess exposure and after control measures have been implemented to control exposure to an acceptable level		
	8.4.1	Medical surveillance programs shall be based on the results of the risk assessment and/or the results of an occupational hygiene survey which warrants such surveillance based upon exposure assessment results		
7.5	8.6.1, 8.7	Medical records shall be maintained in a secure location with controlled access to the records		

---

DOCUMENT CODE : NEOM-NLF-NMS-006.024	REVISION CODE: 02.00	PAGE 53 OF 53
--------------------------------------	----------------------	---------------



نیوم NEOM

**NEOM OCCUPATIONAL HEALTH and SAFETY  
NEOM MINIMUM STANDARD**

For

**PREVENTION and CONTROL of LEGIONNAIRES DISEASE**

NEOM-NLF-NMS-006.025- Rev 02.00 - February 2022

©NEOM [2021]. All rights reserved.

## Document History

Revision code	Description of changes	Purpose of issue	Date
Rev 00.00	First Issue	Issued for Implementation	27/07-2020
Rev 02.00	Sector Review	Issued for Implementation	01-02-2022

## Document Approval

	Prepared by	Reviewed by	Approved by
Name	Robert Murphy	Talal Al Anazi	Adel Al Wuhaib
Job Title	Loss Prevention Specialist - Public Safety	Director, Loss Prevention/Fire Safety (LP/FS) Public Safety	Executive Director Public Safety



## Contents

<b>1</b>	<b>PURPOSE .....</b>	<b>4</b>
<b>2</b>	<b>SCOPE .....</b>	<b>4</b>
<b>3</b>	<b>EXPECTATIONS.....</b>	<b>4</b>
<b>4</b>	<b>LIST OF DEFINITIONS .....</b>	<b>5</b>
<b>5</b>	<b>LIST OF ABBREVIATIONS .....</b>	<b>5</b>
<b>6</b>	<b>RELATED NEOM DOCUMENTS .....</b>	<b>5</b>
<b>7</b>	<b>ROLES AND RESPONSIBILITIES .....</b>	<b>6</b>
7.1	Duty Holders (Facility/Building Owners and/or Management Entities) .....	6
7.2	Contractor .....	6
7.3	Employee .....	6
<b>8</b>	<b>OTHER SECTIONS RELATED TO SUBJECT .....</b>	<b>7</b>
8.1	Prevention of Legionnaires' disease Bacteria Growth .....	7
8.2	Maintenance Program: .....	7
8.3	Sampling for Legionnaires' disease Bacteria.....	8
8.4	Personal Protective Equipment .....	8
8.5	Training and Competency.....	8
8.6	Record Keeping .....	9
<b>9</b>	<b>APPENDICES .....</b>	<b>10</b>
9.1	Appendix A: Forms and Checklists.....	10
9.2	Appendix B: Audit Criteria.....	11
9.3	Appendix C: Guidance Documents.....	12

## List of Tables

Table 1 : Table of Definitions.....	5
Table 2 : Table of Abbreviations .....	5
Table 3 : Related NEOM Documents.....	5

## **1 Purpose**

This NEOM Co. SMS Minimum Standards (hereafter referred to as NMS) relates to the management of all occupational health, and safety (OHS) risks associated with Legionnaires Disease.

It provides guidance to support compliance with industry best practice and international regulatory occupational health and safety requirements to ensure that the associated risks are assessed, and control measures are implemented in accordance with the hierarchy of risk controls.

It has been developed to align with the requirements of the ISO 45001 Health and Safety Management Manual (Refer NEOM-NLF-PRC-006- Section 2 ISO 14001 Cross Reference Audit Table)

## **2 Scope**

This NMS applies to all Sectors and Organisations within NEOM and includes Contractors.

It encompasses all places of business and commercial facilities that use, store, or disseminate water; and where there is the potential for legionella bacterium to grow/accumulate.

These include, but are not limited to:

- (a) Cooling towers (structures that contain water and a fan as part of centralized air-cooling systems for buildings or industrial processes);
- (b) Emergency Water Systems (Sprinklers, Safety Showers, Eye wash Stations);
- (c) Hot Water Tanks and Heaters;
- (d) Large, complex plumbing systems
- (e) Swimming Pools, Spa's;
- (f) Showerheads and Sink Faucets;
- (g) Decorative Fountains and Water Features; and
- (h) Other similar equipment that use and/or stores large amounts of water.

## **3 Expectations**

### **3.1.1 General Expectations**

To ensure the health and safety of all personnel, protection of assets (services, plant/equipment) and the environment

NEOM expect each Sector, Organization, Department or Contractor to ensure that risks associated with Legionnaires Disease are controlled in accordance with the hierarchy of risk controls: elimination, substitution, engineering controls, administrative controls, and personal protective equipment.

Consideration shall be given to technological advances that may introduce new means of controlling or eliminating the risks associated with the work environment.

That the expectation for safety and health compliance is meeting and where possible exceeding all applicable OSHA Laws, Regulations, and Industry Best Practice.

Increasing awareness about Legionella hazards and help employers plan and implement water management programs for controlling potential Legionella sources

*If requirements of this document conflict with those set by another regulatory authority, the more stringent requirements are required to be followed.*

DOCUMENT CODE : NEOM-NLF-NMS-006.025	Revision CODE: 02.00	Page 4 of 12
--------------------------------------	----------------------	--------------

## 4 List of Definitions

Table 1 : Table of Definitions

Terms	Definitions
Client	NEOM Sector / Department
Employer	The person or organisation that employs personnel to complete the work
Contractor	The organisation contracted to carry out the works
Legionnaires' disease	Legionnaires' disease is a severe form of pneumonia — lung inflammation usually caused by infection. It's caused by a bacterium known as legionella. Most people catch Legionnaires' disease by inhaling the bacteria from water or soil.
Bacterial biofilms	Clusters of bacteria that are attached to a surface and/or to each other and embedded in a self-produced matrix
Safety Management System (SMS)	Occupational Health and Safety Management System established by NEOM in compliance to ISO 45001 Standard

## 5 List of Abbreviations

Table 2 : Table of Abbreviations

Abbreviations	Descriptions
SMS	Safety Management System.
NMS	NEOM Minimum Standard
SOP	Standard Operating Procedure
ANSI	American National Standards Institute
NFPA	National Fire Prevention Association
ASHRAE	American Society of Heating, Refrigerating and Air-Conditioning
OSHA	Occupational Safety and Health Administration.
ASHRAE	American Society of Heating, Refrigerating and Air-Conditioning
IBC	International Building Codes
OHS	Occupational Health and Safety

## 6 Related NEOM Documents

Table 3 : Related NEOM Documents

Document Code	Document Name
NEOM ELEMENT 2	Opportunity & Risk Management
NEOM-ELEMENT 5	Training, Awareness and Competency.
NEOM-NLF -SM	Safety Management Manual - Roles and Responsibilities
NEOM-NLF-PRC-006	Section 2 - ISO 14001 Cross Reference Audit Table
NEOM-NLF-PRC-006;	Occupation Health, Safety, and Fire Safety requirements for contractors
NEOM-NLF-NMS 006.01	Organisation and Practitioner Registration and Appointment of Contractor
NEOM-NLF-NMS-006.021	Personal Protection Equipment (PPE)
29 CFR 1910.134	OSHA's Respiratory Protection standard

Document Code	Document Name
BS 7592:2008	Sampling for Legionella Bacteria in Water Systems. Code of Practice - Nov 2008).
ASHRAE Guideline 12-2000,	American Society of Heating, Refrigerating and Air-Conditioning

## 7 Roles and Responsibilities.

### 7.1 Duty Holder (Facility/Building Owners and/or Management Entities or Appointed Contractor)

- 7.1.1 All NEOM, Sectors, Organisations and Contractor shall appoint a Competent Person from within their area of control as a 'Duty Holder' with responsibility for:
- (a) The Implementation of an effective water management program;
  - (b) Ensuring legal requirements associated with the control of Legionnaires Disease are met and any necessary communications and notifications are carried out;
  - (c) Duty holders shall perform an annual health risk assessment on facilities and equipment that use or store water that could become contaminated with the Legionella Bacteria. (Refer: NEOM Element 2 Risk and Opportunity Management).
  - (d) Where the Risk Assessment identifies the potential for Legionella contamination Duty Holder shall implement a water treatment and maintenance program.
  - (e) Examples of acceptable treatment and maintenance programs can be found in the American Society of Heating, Refrigerating and Air-Conditioning (ASHRAE) Guideline 12-2000, minimizing the Risk of Legionellosis Associated with Building Water Systems.
  - (f) If a suspected or confirmed case of Legionnaires' disease or Pontiac Fever is identified, the duty holder shall have samples taken of any potential exposure source analyzed by a certified laboratory.
  - (g) When Legionella Bacteria is found in a workplace, or an employee is confirmed to have Legionnaires' disease or Pontiac Fever, the Duty Holder shall report the case immediately to NEOM MEDICAL and NEOM-LP&FS department.

### 7.2 Contractor

- 7.2.1 Shall undertake their roles and responsibilities in accordance with the general requirements of NEOM-NLF- SM –Safety Management Manual – Roles and Responsibilities:
- 7.2.2 Where the Contractor is appointed as the Duty holder or has formally been handed sole responsibility for an area or facilities for his own use, he shall undertake all the Duty holder's role in accordance with Section 7.1 above.
- 7.2.3 In addition, he shall ensure all documentation associated with his duties is maintained and are readily available.

### 7.3 Employee

- 7.3.1 Shall undertake their roles and responsibilities in accordance with the general requirements of NEOM-NLF-SM –Safety Management Manual – Roles and Responsibilities:
- 7.3.2 Report any plant and equipment issues that could contribute to the growth of Legionella Bacteria.
- 7.3.3 Report all suspected cases of Legionnaires' disease or Pontiac Fever to their employer.
- 7.3.4 Use any Personal Protective Equipment provided

### 7.1 Specific Responsibilities

DOCUMENT CODE : NEOM-NLF-NMS-006.025	Revision CODE: 02.00	Page 6 of 12
--------------------------------------	----------------------	--------------

- 7.1.1 Sector, Organization, Department or Contractor Head is responsible in ensuring that provisions are made the safe systems of work to prevent and minimize risks in each workplace
- 7.1.2 Safety Practitioner/Coordinator is responsible to monitor the implementation of this procedures and document its effectiveness
- 7.1.3 The Responsible Person will support this procedure and ensure that any Contractor Organization working for, or on behalf of, the Sector, Organization, Department or Contractor will comply with the requirements of these procedures
- 7.1.4 Line Managers / Supervisors are responsible for training their workers in risks
- 7.1.5 The LP & FS Public Safety department will support the NEOM risk assessments by carrying out compliance checks and supporting and guiding the various safety teams.

## **8 Other Sections related to subject**

### **8.1 Prevention of Legionnaires' disease Bacteria Growth**

- 8.1.1 Prevention and control measures shall include the followings:
  - (a) Keep water temperature either above or below the 20–50 °C (68–122 °F) range in which the Legionella bacterium thrives
  - (b) Prevent stagnation, for example, by removing from a pipe network any sections that are redundant or have closed outlet (dead ends). Where stagnation is unavoidable, as when offices are closed for certain period, systems must be drained and thoroughly disinfected prior to resuming normal operation.
  - (c) Prevent the build-up of biofilm by replacing construction materials that encourage its development, or by reducing the quantity of nutrients for bacterial growth that enter the system.
  - (d) Periodically disinfect the system, by high heat or a chemical biocide, and use chlorination where appropriate. Treatment of water with copper-silver ionization or ultraviolet light may also be effective.
  - (e) System design (or renovation) can reduce the production of aerosols and reduce human exposure to them, by directing them well away from building air.

### **8.2 Maintenance Program:**

- 8.2.1 Duty holders and Contractor shall develop maintenance programs to prevent the growth of Legionella Bacteria for equipment and facilities that use and store water.
- 8.2.2 Examples of locations/processes that require a maintenance program include, but are not limited to:
  - (a) Potable Water Systems:
    - I. Incoming water main.
    - II. Water softener.
    - III. Holding tanks / cisterns;
    - IV. Water heater tanks (at the inflows and outflows).
  - (b) Potable Water Outlets:
    - I. Faucets or taps;
    - II. Showers.
  - (c) Cooling Tower, Evaporative Condenser:
    - I. Makeup water.
    - II. Basin.
    - III. Sump;

DOCUMENT CODE : NEOM-NLF-NMS-006.025	Revision CODE: 02.00	Page 7 of 12
--------------------------------------	----------------------	--------------

IV. Heat sources and chillers.

(d) Humidifiers/Nebulizers:

- I. Bubblers for oxygen; and
- II. Water used for respiratory therapy equipment.

(e) Other Sources:

- I. Decorative fountains, waterfalls, and water features.
- II. Irrigation equipment.
- III. Fire sprinkler system (after use).
- IV. Emergency eyewash and showers.
- V. Swimming pools; and
- VI. Whirlpools and spas.

8.2.3 Disinfection and Control:

- (a) Contractor / duty holders shall regularly clean and disinfect equipment and facilities that produce water droplets, aerosols, mists, and steam;
- (b) Establish programs to regularly flush systems that are not in daily use (e.g., emergency eyewash, water storage tanks, etc.) to prevent the stagnation of water;
- (c) Follow ASHRAE Guideline 12-2000, "Minimizing the Risk of Legionellosis Associated with Building Water Systems";
- (d) Develop a monitoring and inspection program to evaluate the effectiveness of water management programs.

### **8.3 Sampling for Legionnaires' disease Bacteria**

- 8.3.1 Sampling for Legionella Bacteria shall be performed by a competent person in compliance with BS 7592:2008 Sampling for Legionella Bacteria in Water Systems. Code of Practice - Nov 2008.
- (a) Samples shall be sent to an approved certified laboratory
  - (b) New techniques for the rapid detection of *Legionella* in water samples have been developed, including the use of polymerase chain reaction and rapid immunological assays. These technologies can typically provide much faster results.

### **8.4 Personal Protective Equipment**

- 8.4.1 Contractor shall provide appropriate PPE and ensure its use when workers perform any maintenance, cleaning, disinfection activities on water systems that may be contaminated with Legionella.(Refer: NEOM-NLF-NMS-006.021 Personal Protection Equipment) (PPE)
- 8.4.2 Contractor shall implement a respiratory protection program that complies with OSHA's Respiratory Protection standard (29 CFR 1910.134). Including the standard's requirements for obtaining medical clearance for wearing a respirator and for conducting fit testing prior to use.

### **8.5 Training and Competency**

- 8.5.1 Contractor shall ensure that training complies with the requirements of:
- (a) NEOM Element 5 – Training, Awareness and Competency; and
  - (b) NEOM-NLF-NMS 006.001 – SMS Organisation, Practitioner Registration and Appointment of Contractor;
- 8.5.2 Employees required to perform maintenance on equipment that uses or stores water, or employees that perform work at or near such equipment shall receive annual training from duty holders on the following content:
- (a) Explanation of Legionnaires' disease and its history.

DOCUMENT CODE : NEOM-NLF-NMS-006.025	Revision CODE: 02.00	Page 8 of 12
--------------------------------------	----------------------	--------------

- (b) Signs and symptoms of Legionnaires' disease.
- (c) Sources of exposure and transmission of Legionnaires' disease.
- (d) Risk factors associated with Legionnaires' disease.
- (e) Precautions while working with potential sources; and
- (f) Strategies to prevent the growth of Legionnaires' disease Bacteria.

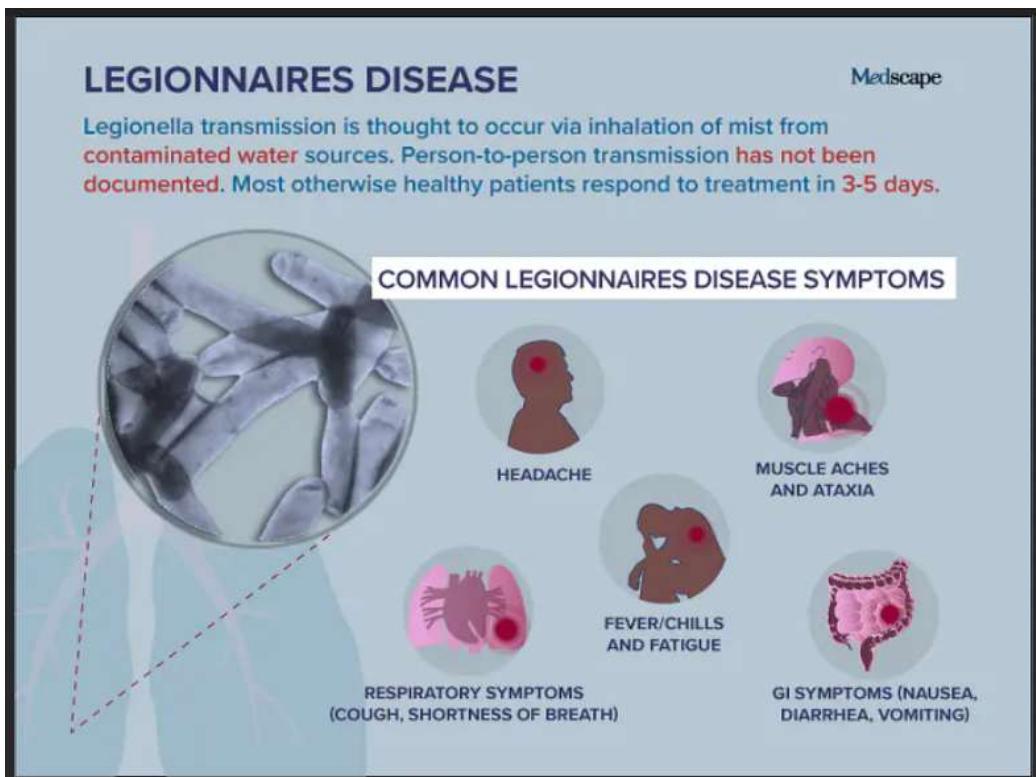
## **8.6 Record Keeping**

8.6.1 At a minimum, the following information shall be documented for Legionnaires' disease Bacteria prevention programs:

- (a) Procedure(s) on how to prevent Legionnaires' disease Bacteria.
- (b) Maintenance and disinfection schedule.
- (c) Employee training records;
- (d) Records related to confirmed cases of Legionnaires' disease or positive sampling results

## 9 Appendices

### 9.1 Appendix A: Forms, Signs and Checklists



**What is Legionnaires' Disease?**

Legionnaires' disease is a type of pneumonia that is caused by legionella bacteria, which grows best in warm water.

**Causes:** By breathing in mist from contaminated water sources, such as hot tubs that are not cleaned, hot water heaters, plumbing systems, cooling towers, and other stagnant pools of water

**Those at risk:** People 50 years or older, current or former smokers, those with a weak immune system, or those with lung disease

**Treatment:** Course of antibiotics as administered by your doctor

**SYMPTOMS**

- Cough
- Fever
- Chills
- Aches
- Shortness of Breath

## 9.2 Appendix B: Audit Criteria PREVENTION and CONTROL of LEGIONNAIRES DISEASE

Contractor/ Area: \_\_\_\_\_

Department: \_\_\_\_\_

Completed by: \_\_\_\_\_ Date completed: \_\_\_\_\_

Audit Criteria		Requirements	Verification	Area of Concern
ISO 45001:2018 Clause	NMS Ref.			Yes/ No
5.3	7.1.1	All NEOM, Sectors, Organizations and Contractor shall appoint a Competent Person from within their area of control as a 'Duty Holder'		
5.3	7.2.2	Where the Contractor is appointed as the Duty holder or has formally been handed sole responsibility for an area or facilities for his own use, he shall undertake all the Duty holder's role		
6.1.1, 6.1.2, 8.1.2	8.2.1	Duty holders and Contractor shall develop maintenance programs to prevent the growth of Legionella Bacteria for equipment and facilities that use and store water		
8.1.2(e)	8.4.1	Contractor shall provide appropriate PPE and ensure its use when workers perform any maintenance, cleaning, disinfection activities on water systems that may be contaminated with Legionella		
7.2, 7.3	8.5.2	Employees required to perform maintenance on equipment that uses or stores water, or employees that perform work at or near such equipment shall receive annual training from duty holders		

### **9.3 Appendix C: Guidance Documents**

- (a) There currently are no specific OSHA standards for Legionellosis; however, Section 5 (a) (1) of the Occupational Safety and Health (OSH) Act of 1970, 29 USC 654 (a) (1), (referred to as the "General Duty Clause") requires Contractor to furnish to each worker "employment and a place of employment which are free from recognized hazards that are causing or are likely to cause death or serious physical harm" to its workers.
- (b) Although there are no OSHA standards specific to Legionella or other non-blood borne, biological hazards, several existing requirements may apply to occupational exposure to Legionella.
- (c) VHA Directive 1061. 2021. Centers for Medicare & Medicaid Services. Requirement to reduce Legionella risk in healthcare facility water systems to prevent cases and outbreaks of Legionnaires' disease. 2017. Centers for Disease Control and Prevention.
- (d) Legionellosis: Risk management for building water systems. ANSI/ASHRAE standard 188–2018. Atlanta, GA: ASHRAE; 2018. Centers for Disease Control and Prevention.
- (e) Guidance can also be found in the free issue of;
  - INDG 458 a publication from the HSE in the UK – Legionnaires Disease – a brief guide for duty holders and
  - HSG 274 – L8 – 2013 – The control of legionella bacteria in water systems.
- (f) Further information can be found in;
  - the Approved Code of Practice (ACOP) on the legislation and regulations found in The HSW Act and in Control of Substances Hazardous to Health (COSHH).
  - Section 5(a) (1) of the Occupational Safety and Health (OSH) Act of 1970,
  - Personal Protective Equipment (PPE) (29 CFR 1910.132) and
  - Respiratory Protection (29 CFR 1910.134) standards.
  - Health and Safety at Work Act (1974) and the Control of Substances Hazardous to Health Regulation (1994).



نیوم NEOM

**NEOM OCCUPATIONAL HEALTH and SAFETY  
NEOM MINIMUM STANDARD  
for  
CONTRACTOR FIRE SAFETY PLAN**

NEOM-NLF-NMS-006.026 Rev 02.00 – February 2022

©NEOM [2021]. All rights reserved.

## Document History

Revision code	Description of changes	Purpose of issue	Date
Rev 00.00	First Issue	Issued for Implementation	27/07-2020
Rev 02.00	Sector Review	Issued for Implementation	01-02-2022

## Document Approval

	Prepared by	Reviewed by	Approved by
Name	Robert Murphy	Talal Al Anazi	Adel Al Wuhaib
Job Title	Loss Prevention Specialist LP/FS -Public Safety	Director, Loss Prevention/Fire Safety (LP/FS) Public Safety	Executive Director Public Safety



## CONTENTS

<b>1</b>	<b>PURPOSE .....</b>	<b>4</b>
<b>2</b>	<b>SCOPE .....</b>	<b>4</b>
<b>3</b>	<b>EXPECTATIONS .....</b>	<b>4</b>
<b>4</b>	<b>LIST OF DEFINITIONS .....</b>	<b>5</b>
<b>5</b>	<b>LIST OF ABBREVIATIONS .....</b>	<b>5</b>
<b>6</b>	<b>RELATED NEOM DOCUMENTS .....</b>	<b>6</b>
<b>7</b>	<b>ROLES AND RESPONSIBILITIES .....</b>	<b>6</b>
7.1	Client .....	6
7.2	Contractor .....	7
7.3	Employee.....	7
7.4	Specific Responsibilities.....	8
<b>8</b>	<b>OTHER SECTIONS RELATED TO SUBJECT .....</b>	<b>8</b>
8.1	General .....	8
<b>9</b>	<b>APPENDICES.....</b>	<b>10</b>
9.1	Appendix A: Form NEOM-NLF-NMS-006.026A – Contractor Fire Safety Plan .....	10
9.2	Appendix B: Audit Criteria .....	16

## List of Tables

Table 1 : Table of Definitions.....	5
Table 2 : Table of Abbreviations .....	5
Table 3 : Related NEOM Documents .....	6

## **1 PURPOSE**

This NEOM Co. SMS Minimum Standards (hereafter referred to as NMS) relates to the management of all occupational health, and safety risks associated with the Contractor's Fire Safety Plan

It provides guidance to support compliance with industry best practice and international regulatory safety requirements to ensure that the associated risks are assessed, and control measures are implemented in accordance with the hierarchy of risk controls.

It has been developed to align with the requirements of the ISO 45001 Health and Safety Management Manual (Refer NEOM-NLF-PRC-006- Section 2 ISO 14001 Cross reference table)

## **2 SCOPE**

This NMS applies to all personnel within NEOM and any Contractors working for NEOM and or associated projects and activities. It is designed to incorporate requirements set by the NEOM-SMS.

## **3 EXPECTATIONS**

To ensure the health and safety of all personnel, protection of assets (services, plant/equipment) and the environment

NEOM expect each Sector, Organization, Department or Contractor ensure that risks associated with work are controlled in accordance with the hierarchy of risk controls: elimination, substitution, engineering controls, administrative controls, and personal protective equipment.

Consideration shall be given to technological advances that may introduce new means of controlling or eliminating the risks associated with activities and equipment involving fire safety.

That the expectation for safety compliance is meeting and exceeding all applicable OSHA Laws, Regulations, and Industry Best Practice.

Applicable requirements and standards include:

- (a) OSHA Standards and Regulatory requirements;
- (b) ANSI requirements;
- (c) NFPA Standards and requirements;
- (d) NEOM Minimum Standards
- (e) Saudi Building Codes
- (f) International Building Codes

*If requirements of this document conflict with requirements set by another regulatory authority, Contractor are required to follow the more stringent requirement.*

## 4 LIST OF DEFINITIONS

*Table 1 : Table of Definitions*

Terms	Definitions
NEOM Co	NEOM Company
Client	NEOM Sector /Department responsible for management and oversight of the Contractor
Employer	The person or organisation employing personnel to complete the work
Contractor	The organisation contracted to carry out the works
Sector, Organization, Department or Contractor	The Sector, Organization, Department or Contractor is the NEOM entity or developer designated by NEOM to accept custody for planning, designing, constructing, or managing and operating a particular asset or a group of assets
Sector, Organization, Department or Contractor Head	The head of the Sector, Organization, Department or Contractor is responsible and accountable for the implementation and supervision of this procedure within the Sector, Organization, Department or Contractor
Responsible Person	The Sector, Organization, Department or Contractor Head may delegate a "Responsible Person" utilizing their approved delegation of authority process. The "Responsible Person" is the senior NEOM employee who has responsibility for the day-to-day management of the work activities, or the contracted party engaged in such activities
Safety Practitioner/ Coordinator	The "Safety Practitioner/Coordinator" is an employee working for the Sector, Organization, Department or Contractor Safety Department.
Safety Management System (SMS)	Occupational Health and Safety Management System established by NEOM in compliance to ISO 45001 Standard

## 5 LIST OF ABBREVIATIONS

*Table 2 : Table of Abbreviations*

Abbreviations	Descriptions
SMS	Safety Management System
NMS	NEOM Minimum Standard
SOP	Standard Operating Procedure
ANSI	American National Standards Institute
NFPA	National Fire Prevention Association
CPP	Construction Phase Plan
OSHA	Occupational Safety and Health Administration.
PPE	Personal Protective Equipment
ISO	International Standards Organisation
IBC	International Building Codes
OHS	Occupational Health and Safety

## 6 RELATED NEOM DOCUMENTS

Table 3 : Related NEOM Documents

Document Code	Document Name
NEOM Element 2	Risk and Opportunity Management
NEOM-Element 5	Training, Awareness and Competency.
NEOM-Element 6	Contractor Management
NEOM Element 9	Emergency Planning and Response Management ( <i>other fire documents are found here</i> )
NEOM-SMS	Neom Safety Management System
NEOM-NLF-SM	Safety Manual - Roles and Responsibilities
NEOM-NLF-PRC-006- Section 2	ISO 14001 Cross Reference Table
NEOM-NLF-PRC-006;	Occupation Health, Safety and Fire Safety requirements for Contractors
NEOM-NLF-NMS-006.012	Barricading of Hazards
NEOM-NLF-NMS-006.020	Hazardous Material
NEOM-NLF-NMS-006.021	Personal Protective Equipment (PPE)
NEOM-NLF-NMS-006.027	Compressed Gases and Air
NEOM-NLF-NMS-006.039	Hot Works

## 7 ROLES AND RESPONSIBILITIES

### 7.1 CLIENT

- 7.1.1 General Health and Safety roles and responsibilities are defined in; and shall be carried out in accordance with the requirements of NEOM-NLF-SM—Safety Management Manual - Roles and Responsibilities.
- 7.1.2 The Client is responsible for ensuring that NEOM Safety Commitment Statement and safety management system are properly applied within their areas of control/responsibility. Effective implementation will ensure compliance with relevant legislative requirements and will help promote the use of industry best safe working practices.
- 7.1.3 That a suitable, Pre-Tender Health and Safety Plan (Including Fire Safety Plan – Appendix A) has been developed and issued to Contractors to ensure they have all the information necessary to make informed decisions when developing the Construction Phase Health and Safety Plan (NEOM-NLF-NMS-006.002 Safety Construction Management Plan) (CPP) which will form part of the Contractor review and selection process
- 7.1.4 That the selection of Contractors shall be undertaken in accordance with NEOM's policies and procedures (NEOM-Element 6-Contractor Management). To ensure that only Competent organisations capable of meeting the requisite safety standards associated with project are contracted.
- 7.1.5 Conduct regular Contractor safety assurance reviews to provide the confidence level required that the safety management system is delivering as planned, and consistently achieves the acceptable level of safety. Including:
- (a) Safety performance monitoring and measuring;
  - (b) Managing change;
  - (c) Continuous improvement.

## **7.2 CONTRACTOR**

- 7.2.1 Contractor shall undertake their roles and responsibilities in accordance with the general requirements of NEOM–NLF-SM–Safety Management Manual-Roles and Responsibilities
- 7.2.2 Maintaining control of access to dangerous or high-risk areas or equipment using suitable barricades that are in serviceable condition (Refer: NEOM-NLF-NMS-006.012 – Barricading of Hazards)
- 7.2.3 That all work activities are assessed, planned, organized, and that suitably competent Supervision is available to implement the safety requirements and oversee the work (Refer: NEOM- Element 5 – Training, Awareness and Competency)
- 7.2.4 Ensure persons appointed to manage /oversee work operations have the skills, knowledge, experience and, where relevant, the organisational capability to plan and manage work safely and without risk to those who may be affected by the activities (Refer: NEOM Element 5 Training, Awareness, and Competence).
- 7.2.5 Ensure employees carrying out the work are trained to recognize the associated hazards and understand the processes and procedures to control or minimize the risks.(Refer: NEOM Element 2 Risk and Opportunity Management)
- 7.2.6 That all equipment including personal protective equipment required for use is fit for purpose, and (as required) has been inspected by a competent person and inspection records are maintained and readily available.(Refer: NEOM-NLF-NMS-006.021 Personal Protective Equipment) (PPE)
- 7.2.7 Contractor shall undertake their specific roles and responsibilities in accordance with the following:
  - (a) Prior to start of work all Contractors shall submit a completed Fire Safety Plan (Refer: Appendix A) for approval by Client
  - (b) Contractor shall ensure all personnel are aware of the content of the Fire Safety Plan.

## **7.3 Employee**

- 7.3.1 Shall undertake their roles and responsibilities in accordance with the general requirements of NEOM-NLF-SM – Safety Management Manual - Roles and Responsibilities.
- 7.3.2 Report any activity or defect relating to the work which they believe is reasonably foreseeable to endanger their safety or that of another person's.
- 7.3.3 Shall use appropriate equipment or safety devices provided for the work by the Contractor in accordance with any training or instruction received in the use of the work equipment. (Refer NEOM-NFL-NMS-006.021 Personal Protective Equipment)
- 7.3.4 Shall undertake their specific roles and responsibilities in accordance with the following:
  - (a) Employees shall ensure adherence to the requirements of the Fire Safety Plan

## **7.4 SPECIFIC RESPONSIBILITIES**

- 7.4.1 The Sector, Organization, Department or Contractor Head is responsible in ensuring that provisions are made the safe systems of work to prevent and minimize fire risk and hazards in each workplace
- 7.4.2 Safety Practitioner/Coordinator is responsible to monitor the implementation of this procedures and the contractor Fire Safety Plan for its effectiveness
- 7.4.3 Responsible Person will support this procedure and ensure that any Contractor Organization working for, or on behalf of, the Sector, Organization, Department or Contractor will comply with the requirements of these procedures
- 7.4.4 Line Managers / Supervisors are responsible for training their workers on fire risks and preventative measures
- 7.4.5 LP & FS Public Safety Department will support the contractor's Fire Safety Planning by carrying out compliance checks and supporting and guiding the various safety teams.

## **8 OTHER SECTIONS RELATED TO SUBJECT**

### **8.1 GENERAL**

- 8.1.1 Contractor shall ensure the Fire Safety Plan (Attached as Appendix A) is completed in a timely manner and in-line with contract requirements.
- 8.1.2 Information required within the Form includes, but is not limited to
  - (a) Definition of the fire safety requirements for the site
  - (b) Identification of any special (high hazard) areas
  - (c) Identification of fire detection safety systems in use
  - (d) Identification of alarms and alarm systems
  - (e) Methods of raising the alarm
  - (f) Identification of Muster and Escape routes
  - (g) Locations of all fire-fighting systems and equipment
  - (h) Provision of emergency lighting system
  - (i) Details of training and fire safety instructions to personnel.
- 8.1.3 Contractor shall supply details of any plans or procedures for liaising with or requesting support from local fire services or fire services belonging to other contractors (mutual aid plans)
- 8.1.4 Contractor shall supply details in regard of personnel smoking on site or in and around buildings and facilities
- 8.1.5 Contractor shall supply details of any hazardous materials to be stored and or used on site including
  - (a) Fuels
  - (b) Oils
  - (c) Chemicals
  - (d) LPG
  - (e) Gases under pressure
  - (f) Any other materials of hazardous nature. (Refer: NEOM-NLF-NMS-006.020 Hazardous Material)

8.1.6 Details will be submitted regarding waste / waste collection / waste storage and final removal and disposal.

8.1.7 Contractor shall supply information and details regarding

(a) any arrangements for gas powered equipment shall be included on the form (Refer: NEOM-NLF-NMS-006.027 Compressed Gases and Air)

(b) Stationary plant with petrol and or diesel tanks or supplies

(c) Methods and equipment for re-fueling both stationary and mobile plant and equipment

8.1.8 Contractor shall provide information in the form regarding;

(a) security arrangements,

(b) temporary buildings

(c) Hot works and controls (Refer: NEOM-NLF-NMS-006.039 Hot Works)

(d) Any special arrangements or precautions that he has identified to minimise the risk of fire or explosions

## 9 APPENDICES

### 9.1 APPENDIX A: FORM NEOM-NLF-NMS-006.026A – CONTRACTOR FIRE SAFETY PLAN

#### CONTENTS LIST

1.	Personnel with specific responsibilities .....	11
2.	Principal fire risks on this site.....	11
3.	General fire precautions .....	11
3.1	Fire detection systems .....	11
3.2	Fire alarm systems.....	12
3.3	Emergency services call-out procedure.....	12
3.4	Escape routes and assembly areas.....	12
3.5	Fire hydrants and water supplies.....	12
3.6	Fixed fire extinguisher systems.....	12
3.7	Portable fire extinguishers.....	12
3.8	Emergency lighting systems.....	13
3.9	Training and fire safety instructions to personnel.....	13
4.	Liaison with Fire Brigade .....	13
5.	Smoking on site .....	13
6.	Materials storage on site .....	13
6.1	General materials:.....	13
6.2	Fuels, oils, chemicals, and LPG: .....	14
6.3	Waste collection, storage, and removal .....	14
7.	Plant and equipment .....	14
7.1	Electrical tools and equipment .....	14
7.2	Gas-powered equipment.....	14
7.3	Stationary plant driven by petrol or diesel engines .....	14
7.4	Re-fuelling of plant (stationary and mobile) .....	14
8.	Security arrangements to minimise risk of arson.....	14
9.	Temporary buildings.....	15
10.	Hot work permits.....	15
11.	Special arrangements .....	15

#### *Guidance to users of this template:*

1. The section headings and sub-headings are set up with automatic numbering and will update themselves if any are added or deleted. Use Word styles 'CPPHeading1' and 'CPPHeading2'.
2. Do NOT edit the contents list manually. After editing any headings within the document, select the whole contents list and press 'F9'.
3. Guidance on required entries in the Plan is given in **blue italic** text. This is generally presented in separate rows in the table, so that it can easily be deleted if a 'clean' version of the Plan is needed. However, it is recommended that the guidance should normally be left in place since it may assist those subsequently updating the Plan.

NEOM *رَوْحٌ*

# Fire Safety Plan

(NEOM-NLF-NMS-006.026A)

Document no.....

Project name:		NEOM project no.:
Contract scope:		Contract no.:

## 1. PERSONNEL WITH SPECIFIC RESPONSIBILITIES

*Identify the site-based personnel with specific responsibilities for fire safety arrangements. Adjust the role titles and the number of roles to suit the needs of this particular site.*

Role title	Name	Training required	Other roles on site
Site Fire Safety Co-ordinator		Fire safety course	
Deputy Co-ordinator		Fire safety course	
Fire Marshal		Fire Marshal	
Deputy Fire Marshal		Fire Marshal	
Person authorised to issue Hot-Work Permits		Fire Marshal or insert	

## 2. PRINCIPAL FIRE RISKS ON THIS SITE

*Identify any specific fire risks that apply to this site — especially any that are not present on typical construction sites.*

## 3. GENERAL FIRE PRECAUTIONS

*Define the fire safety arrangements that apply to the site in general. Any areas with special requirements can be covered in a later section.*

### 3.1 Fire Detection Systems

*Identify any fire detection systems (automated or manual) that are in use.*

### **3.2 Fire alarm systems**

*Identify the arrangements for raising the alarm if a fire or similar incident occurs.*

--

### **3.3 Emergency services call-out procedure**

*Define the method(s) to be used for calling the emergency services if an incident arises.*

--

### **3.4 Escape routes and assembly areas**

*Describe the escape routes being provided, any assembly areas to be used and the signs being erected to define them.*

--

### **3.5 Fire hydrants and water supplies**

*Identify the nearest available fire hydrants and any temporary arrangements for making water available for fire-fighting purposes. (These should be clearly shown on the site layout plan.)*

--

### **3.6 Fixed fire extinguisher systems**

*Give details of any fixed fire extinguisher systems (such as sprinklers or CO<sub>2</sub> systems) that are active in working areas. At appropriate stages, this may include components of the permanent works that have been commissioned early. Define the responsibilities for maintaining and testing these systems.*

--

### **3.7 Portable fire extinguishers**

*Define the numbers, types, and locations of portable fire extinguisher equipment on the site. Adjust or add to the list of locations, as necessary.*

Location	Numbers of extinguishers				Fire blanket	Other equipment
	Water	Foam	Powder	CO <sub>2</sub>		
Office						
Canteen						
Stores						
Fuel store						

Arrangements for the maintenance and testing of portable extinguishers:

### 3.8 Emergency lighting systems

*Give details of any emergency lighting systems that are available, together with details of the responsibilities for maintenance and testing.*

### 3.9 Training and fire safety instructions to personnel

*Give details of types of fire-related training being provided to site-based personnel and visitors.*

**Induction training:**

**An emergency fire drill will be carried out monthly on all NEOM construction sites**

**Training on actions to be taken in the event of an incident:**

**Training on precautions to minimise the risks of fire:**

## 4. LIAISON WITH FIRE BRIGADE

*Actions being taken on (and responsibilities for) liaison with the fire brigade regarding specific fire risks on the site, on-site fire-fighting facilities, suitable access routes to and within the site, the maintenance of those access routes.*

## 5. SMOKING ON SITE

*Define the areas (if any) in which smoking is permitted and the arrangements made to enforce this.*

Smoking will only be permitted within the following designated areas:

## 6. MATERIALS STORAGE ON SITE

*Describe the arrangements for the on-site storage of potentially flammable materials and waste, with particular reference to any fire precautions being implemented. If any materials are to be covered with sheeting, ensure that the correct types of fire-inhibiting sheeting are used.*

### 6.1 General materials:

## **6.2 Fuels, oils, chemicals, and LPG:**

--

## **6.3 Waste collection, storage, and removal**

--

# **7. PLANT AND EQUIPMENT**

## **7.1 Electrical tools and equipment**

*Describe the arrangements for ensuring that fixed electrical equipment on the site is correctly installed by authorised personnel and that all electrical tools and equipment are used in a way that minimises the risk of fire or injury.*

--

## **7.2 Gas-powered equipment**

*Describe the arrangements for ensuring that gas-powered equipment is correctly installed by authorised personnel and that all such equipment is used so as to minimise the risk of fire or injury.*

--

## **7.3 Stationary plant driven by petrol or diesel engines**

*Describe the arrangements for ensuring that such plant is set up and used in a way that minimises the risk of fire or injury — with adequate ventilation and ensuring flammable materials cannot come into contact with hot components.*

--

## **7.4 Re-fuelling of plant (stationary and mobile)**

*Describe the arrangements to be used for plant re-fuelling — to minimise risks of fires (or environmental damage) being caused by spillage or vapours.*

--

# **8. SECURITY ARRANGEMENTS TO MINIMISE RISK OF ARSON**

*Describe any arrangements being made to secure the site perimeter — where needed to minimise the risks of arson (and other types of damage) by unauthorised persons entering the site.*

--

## **9. TEMPORARY BUILDINGS**

*This section covers all types of temporary buildings on site, including offices, canteens, stores and living accommodation. Particular requirements apply to the location, clearances from other structures, materials used for their construction, the types of heating or cooking appliance that may be used. Describe the precautions applicable to the particular site.*

--

## **10. HOT WORK PERMITS**

*If hot-work permits are to be used on the site, indicate the types of work to which they apply and any special requirements for their use — in addition to the procedure defined in P912 or A442.*

--

## **11. SPECIAL ARRANGEMENTS**

*Give details of any special precautions that are needed to minimise the risks of fire or explosion being caused by high-risk site activities which are not covered by other sections in this Plan.*

--

## **9.2 APPENDIX B: AUDIT CRITERIA**



نیوم NEOM

**NEOM OCCUPATIONAL HEALTH and SAFETY  
NEOM MINIMUM STANDARD  
for  
COMPRESSED GASES AND AIR**

NEOM-NLF-NMS-006027. Rev 02.00 – February 2022

©NEOM [2021]. All rights reserved.

## Document History

Revision code	Description of changes	Purpose of issue	Date
Rev 00.00	First Issue	Issued for Implementation	27/07-2020
Rev 02,00	Sector Review	Issued for Implementation	01-02-2022

## Document Approval

	Prepared by	Reviewed by	Approved by
Name	Robert Murphy	Talal Al Anazi	Adel Al Wuhaib
Job Title	Loss Prevention Specialist LP/FS -Public Safety	Director, Loss Prevention/Fire Safety (LP/FS) Public Safety	Executive Director Public Safety



## Contents

<b>1</b>	<b>PURPOSE.....</b>	<b>4</b>
<b>2</b>	<b>SCOPE.....</b>	<b>4</b>
<b>3</b>	<b>EXPECTATIONS .....</b>	<b>4</b>
<b>4</b>	<b>LIST OF DEFINITIONS.....</b>	<b>4</b>
<b>5</b>	<b>LIST OF ABBREVIATIONS.....</b>	<b>6</b>
<b>6</b>	<b>RELATED NEOM DOCUMENTS .....</b>	<b>7</b>
<b>7</b>	<b>ROLES AND RESPONSIBILITIES.....</b>	<b>8</b>
7.1	Client .....	8
7.2	Contractor.....	8
7.3	Employee .....	9
7.4	Specific Responsibilities.....	10
<b>8</b>	<b>OTHER SECTIONS RELATED TO SUBJECT.....</b>	<b>10</b>
8.1	Employer Duties .....	10
8.2	Training and Competency .....	10
8.3	Planning and Assessment.....	11
8.4	Safety Requirements.....	12
8.5	Compressors and Compression Units .....	13
8.6	Air Receivers (Tanks and Pressure Vessels).....	13
8.7	Pressure Relieving Safety Devices .....	14
8.8	Compressed Gas Cylinders - Portable Cylinders.....	16
8.9	Construction and Marking of Cylinders .....	16
8.10	Compressed Gas Cylinder Handling .....	17
8.11	Transportation of Compressed Gas Cylinders .....	18
8.12	Storage of Compressed Gas Cylinders.....	18
8.13	Gases with Specific Hazard Classes .....	19
8.14	Corrosive Gases.....	19
8.15	Cryogenic Liquids and Gases .....	19
8.16	Flammable Gases .....	20
8.17	Fuel, High Pressure and Oxidizing Gases .....	20
8.18	Toxic and Highly Toxic Gases:.....	21
8.19	Gas Cylinder Disposal.....	21
8.20	Inspection and Maintenance .....	21
8.21	Emergency Response .....	22
<b>9</b>	<b>APPENDICES .....</b>	<b>23</b>
9.1	Appendix A: Colour Codes for Gas Cylinders .....	23
9.2	Appendix B: Audit Criteria .....	25
9.3	Appendix C: Guidance Information .....	27

## List of Tables

Table 1 : Table of Definitions.....	4
Table 2 : Table of Abbreviations .....	6
Table 3 : Related NEOM Documents.....	7

## **1 Purpose**

This NEOM Co. SMS Minimum Standards (hereafter referred to as NMS) relates to the management of all occupational health, and safety (OHS) risks associated with compressed gases and air.

It provides guidance to support compliance with industry best practice and international regulatory safety requirements to ensure that the associated risks are assessed, and control measures are implemented in accordance with the hierarchy of risk controls.

It has been developed to align with the requirements of the ISO 45001 Health and Safety Management Manual (Refer NEOM-NLF-PRC-006- Section 2 ISO 14001 Cross reference table)

## **2 Scope**

This NMS applies to all personnel within NEOM and any Contractors working for NEOM and or associated projects and activities. It is designed to incorporate requirements set by the NEOM-SMS.

It incorporates requirements on how to use, store and transport compressed gases.

## **3 Expectations**

To ensure the health and safety of all personnel, protection of assets (services, plant/equipment) and the environment

NEOM expect each Sector, Organization, Department or Contractor to ensure that risks associated with the work are controlled in accordance with the hierarchy of risk controls: elimination, substitution, engineering controls, administrative controls, and personal protective equipment.

Consideration shall be given to technological advances that may introduce new means of controlling or eliminating the risks associated with work activities.

That the expectation for safety compliance is meeting and exceeding all applicable OSHA Laws, Regulations, and Industry Best Practice.

Applicable requirements and standards include:

- (a) OSHA Standards and Regulatory requirements;
- (b) ANSI requirements;
- (c) NFPA Standards and requirements;
- (d) NEOM Minimum Standards
- (e) Saudi Building Codes
- (f) International Building Codes

*If requirements of this document conflict with requirements set by another regulatory authority, Contractor are required to follow the more stringent requirement.*

## **4 List of Definitions**

*Table 1 : Table of Definitions*

ms	Definitions
NEOM Co	NEOM Company
Client	NEOM Sector /Department responsible for management and oversight of the Contractor
Employer	The person or organisation that employs personnel to complete the work
Contractor	The organisation contracted to carry out the works
Absolute Pressure	Based on a zero-pressure reference point, the perfect vacuum. Measured from this point, standard atmospheric pressure at sea level is 14.7 pounds per square inch (psi) or 101.325 kilo Pascal's (kPa). This is usually expressed as psia where the 'a' indicates an absolute measurement or kPa.
Air Receiver	An unfired pressure vessel used to store compressed air for various end uses which are constructed and maintained in accordance with the applicable local / national regulations, internationally recognized standards and industrial best practices including ASME Boiler and Pressure Vessel Code Section VIII.
Asphyxiant Gas:	Any non-toxic gas which displaces atmospheric oxygen below limits required to support life. These gases are usually colourless, odourless and tasteless and include nitrogen, argon and helium.
Competent Person	Combination of training, skills, experience, and knowledge that a person has and their ability to apply them to perform the work safely
Compressed Gas Cylinder	A compressed gas cylinder is any metal cylinder of the type approved by the concerned govt. authority for storage and transportation of gases under pressure, including liquefied gases. Approved metal cylinders shall be used for packaging compressed gases.
Corrosive Gas:	A gas that in contact with living tissue causes destruction of the tissue by chemical action.
Cryogenic Liquid:	A liquid with a normal boiling point below -150°C (-238°F).
Cryogenic Liquid Cylinder	Pressurized container designed and fabricated to hold cryogenic fluids. There are three common types of liquid cylinders: gas dispensing; liquid dispensing; or gas and liquid dispensing.
Cylinder Valve	A mechanical device attached to a compressed gas cylinder that permits flow into or out of the cylinder when the device is in the open position and prevents flow when in the closed position.
Dewar	An open-mouthed, non-pressurized, vacuum-jacketed container used to hold cryogenic fluids.
Frangible Disk	A thin piece of metal in a pressure system to relieve excessively high pressure.
Fusible Plugs	Fittings with an alloy that melts at a predetermined temperature.
Flammable Gas	A substance that meets the definition of a compressed gas which: 1. Is flammable in a mixture of 13% or less (by volume) with air. 2. Has a flammable range with air wider than 12%, at atmospheric temperature and pressure, regardless of the lower limit.
Gauge Pressure:	The pressure above or below atmospheric pressure. Therefore, absolute pressure minus local atmospheric pressure equals gauge pressure and is usually abbreviated as psig or kPa.

Handling:	Moving, connecting, or disconnecting a compressed or liquefied gas container under normal conditions of use.
High-pressure Cylinders	As defined by international standards are those marked with a service pressure of 900 psi or greater." The term "high pressure" can therefore be any level prescribed for the equipment or system in use. For incident prevention purposes, any pressure system shall be regarded as hazardous.
Highly Toxic Gas:	A compressed gas that has a median lethal concentration (LC50) in air of ≤ 200 ppm. A NFPA Health Hazard rating of 4 is given to gases having an LC50 in air ≤ 1000 ppm. An example of a highly toxic gas is fluorine with aLC50 of 185 ppm.
High Pressure Gas:	A gas in a container that has a pressure of 3448 kPa (500 psig) or higher at 21.1°C (70°F).
Inert Gas:	A gas which is chemically inactive.
Liquefied Gas:	A fluid within a pressurized container, other than in solution, which exists both as a liquid and gas at 20°C (68°F). Examples include propane, butane, ammonia, carbon dioxide, and sulphur dioxide.
Low Pressure Tank:	A tank designed to operate at pressure above 0.35 kg/cm <sup>2</sup> but not to exceed 1.055 kg/cm <sup>2</sup> .
Manifold:	A gas/air distribution system which transfers product through multiple outlets/inlets to or from compressed gas/air containers.
Non-flammable Gas:	A gas which, within the packaging, exerts an absolute pressure of 280 kPa (40 psi) or greater at 20°C (68°F) but is not a flammable gas as defined previously.
Oxidizing Gas:	A gas that can support and accelerate combustion of other materials.
Pressure Vessel:	A tank designed to operate at pressure above 1.055 kg/sq. cm.
Pressure Regulator:	A mechanical device used to safely control the discharge pressure of a compressed gas from a container.
Pressure Relief Device:	A pressure and/or temperature activated device used to prevent the pressure from rising above a predetermined maximum and thereby prevent rupture of a pressurized container.
Pyrophoric Gas:	A gas that will spontaneously ignite in air at or below 54.4°C (130°F). Examples include silane and phosphine.
Safety Management System (SMS)	Occupational Health and Safety Management System established by NEOM in compliance to ISO 45001 Standard

## 5 List of Abbreviations

Table 2 : Table of Abbreviations

Abbreviations	Descriptions
SMS	Safety Management System
NMS	NEOM Minimum Standard

Abbreviations	Descriptions
SOP	Standard Operating Procedure
ANSI	American National Standards Institute
NFPA	National Fire Prevention Association
CPP	Construction Phase Plan
OSHA	Occupational Safety and Health Administration.
PPE	Personal Protective Equipment
SCF:	One standard cubic foot (SCF) of gas at 21°C (70°F) and 101.325 kPa (14.696 psia). (xxx)
ASME	American Society of Mechanical Engineers
SDS	Safety Data Sheet
MSDS	Material Safety Data Sheet
CGA	Compressed Gas Association
IBC	International Building Codes
OHS	Occupational Health and Safety

## 6 Related NEOM Documents

Table 3 : Related NEOM Documents

Document Code	Document Name
NEOM Element 2	Opportunity & Risk Management
NEOM-Element 5	Training, Awareness and Competency.
NEOM-Element 6	Contractor Management
NEOM Element 9	Emergency Planning and Response Management
NEOM-NLF-SM	Safety Manual - Roles and Responsibilities
NEOM-NLF-PRC-006- Section 2	ISO 14001 Cross Reference Table
NEOM-NLF-PRC-006;	Occupation Health, Safety and Fire Safety requirements for Contractors
NEOM-NLF-NMS-006.001	SMS Organisation, Practitioner Registration and Appointment of Contractor
NEOM-NLF-NMS-006.002	Safety Construction Management Plan
NEOM-NLF-NMS-006.012 –	Barricading of Hazards
NEOM-NLF-NMS-006.013	Safety Signage and Signals
NEOM-NLF-NMS-006.021	Personal Protective Equipment (PPE)
NEOM-NLF-NMS-006.028	Lock Out/Tag Out
NEOM-NLF-NMS-006.029	First Aid and Medical Treatment
ASME	Boiler and Pressure Vessel Code Section VIII.
ANSI B57.1-1965	American National Standard Compressed Gas Cylinder Valve Outlet and Inlet Connections,

## **7 Roles and Responsibilities**

### **7.1 Client**

- 7.1.1 General Health and Safety roles and responsibilities are defined in; and shall be carried out in accordance with the requirements of NEOM-NLF-SM–Safety Management Manual - Roles and Responsibilities.
- 7.1.2 The Client is responsible for ensuring that NEOM Safety Commitment Statement and safety management system are properly applied within their areas of control/responsibility. Effective implementation will ensure compliance with relevant legislative requirements and will help promote the use of industry best safe working practices.
- 7.1.3 That a suitable, Pre-Tender Health and Safety Plan has been developed and issued to Contractors to ensure they have all the information necessary to make informed decisions when developing the Construction Phase Health and Safety Plan (NEOM-NLF-NMS-006.002 Safety Construction Management Plan) (CPP) which will form part of the Contractor review and selection process
- 7.1.4 That the selection of Contractors shall be undertaken in accordance with NEOM's policies and procedures (NEOM-Element 6-Contractor Management). To ensure that only Competent organisations capable of meeting the requisite safety standards associated with project are contracted.
- 7.1.5 Conduct regular Contractor safety assurance reviews to provide the confidence level required that the safety management system is delivering as planned, and consistently achieves the acceptable level of safety. Including:
  - (a) Safety performance monitoring and measuring;
  - (b) Managing change;
  - (c) Continuous improvement.

### **7.2 Contractor**

- 7.2.1 Contractor shall undertake their roles and responsibilities in accordance with the general requirements of NEOM-NLF-SM–Safety Management Manual-Roles and Responsibilities
- 7.2.2 Maintaining control of access to dangerous or high-risk areas or equipment using suitable barricades that are in serviceable condition (Refer: NEOM-NLF-NMS-006.012 – Barricading of Hazards)
- 7.2.3 That all work activities are assessed, planned, organized, and that suitably competent Supervision is available to implement the safety requirements and oversee the work (Refer: NEOM- Element 5 – Training, Awareness and Competency)
- 7.2.4 Ensure persons appointed to manage /oversee work operations have the skills, knowledge, experience and, where relevant, the organisational capability to plan and manage work safely and without risk to those who may be affected by the activities (Refer: NEOM Element 5 Training, Awareness, and Competence).

- 7.2.5 Ensure employees carrying out the work are trained to recognize the associated hazards and understand the processes and procedures to control or minimize the risks. (Refer: NEOM Element 2 Risk and Opportunity Management)
- 7.2.6 That all equipment including personal protective equipment required for use is fit for purpose, and (as required) has been inspected by a competent person and inspection records are maintained and readily available. (Refer: NEOM-NLF-NMS-006.021 Personal Protective Equipment) (PPE)
- 7.2.7 Contractor shall undertake their specific roles and responsibilities in accordance with the following:
- (a) Shall be responsible for performing a risk assessment in accordance with NEOM-Element 2 Risk and Opportunity Management to determine the risks associated to identify areas compressed gas control measures and safe work practices are required to reduce employee's exposures to compressed gases and hazards materials/chemicals.
  - (b) Shall implement the Occupational Health and Safety hierarchy of controls, when developing control measures to remove or reduce employee exposure to hazards associated with exposure to compressed gases.
  - (c) Shall ensure that protective equipment or other control measures shall be used to keep the exposure of employees to compressed gases and hazardous materials/chemicals within limits prescribed by manufacturers specifications and applicable legal requirements.
  - (d) Shall develop and implement an inspection, testing and preventative maintenance plan to ensure compressed gas systems are safe and working efficiently and according to manufacture specifications and applicable legal requirements.
  - (e) Shall ensure compressed gases systems are tested and inspected regularly (at a minimum annually) to ensure the system work in accordance with manufactures specifications.
  - (f) Shall monitor the use of compressed gases systems to ensure employees are using compressed gases appropriately.

### **7.3 Employee**

- 7.3.1 Shall undertake their roles and responsibilities in accordance with the general requirements of NEOM-NLF-SM – Safety Management Manual - Roles and Responsibilities.
- 7.3.2 Report any activity or defect relating to the work which they believe is reasonably foreseeable to endanger their safety or that of another person's.
- 7.3.3 Shall use appropriate equipment or safety devices provided for the work by the Contractor in accordance with any training or instruction received in the use of the work equipment. (Refer NEOM-NFL-NMS-006.021 Personal Protective Equipment)
- 7.3.4 Shall undertake their specific roles and responsibilities in accordance with the following:
- (a) Employees shall use appropriate equipment or safety devices provided by the employer in accordance with any training or instruction received in the use of the work equipment or device concerned.
  - (b) Employees shall not perform any task requiring training until they have received the required training and it is documented.
  - (c) Employees shall not operate any piece of equipment that they are not familiar with, competent to operate and/or appropriately trained on its use.

## **7.4 Specific Responsibilities**

- 7.4.1 Sector, Organization, Department or Contractor Head is responsible in ensuring that provisions are made the safe systems of work to prevent and minimize risks in each workplace
- 7.4.2 Safety Practitioner/Coordinator is responsible to monitor the implementation of this procedures and document its effectiveness
- 7.4.3 The Responsible Person will support this procedure and ensure that any Contractor Organization working for, or on behalf of, the Sector, Organization, Department or Contractor will comply with the requirements of these procedures
- 7.4.4 Line Managers / Supervisors are responsible for training their workers in risks
- 7.4.5 The LP & FS Public Safety department will support the NEOM risk assessments by carrying out compliance checks and supporting and guiding the various safety teams.

## **8 Other Sections related to subject**

### **8.1 Employer Duties**

- 8.1.1 Employer duties/responsibilities in this NMS can apply to Client, Sector, Division, Contractor, Appointed Duty Holder depending on who has responsibility for a site, facility, contractual arrangements, control of work and equipment, or legal duty of care.

### **8.2 Training and Competency**

- 8.2.1 Employers shall ensure that training complies with the requirements of:
  - (a) NEOM-Element 5 Training, Awareness and Competency.
  - (b) NEOM-NLF-NMS-006.001 – SMS Organisation, Practitioner Registration and Appointment of Contractor.
- 8.2.2 Employers shall ensure all relevant employees and contractors that perform tasks that work with or near compressed gasses receive training that includes at a minimum:
  - (a) Physical hazards associated with compressed gases.
  - (b) Design specification, capabilities and limitations of compressed gas storage systems and their uses at the work site.
  - (c) Methods and procedures that will prevent exposure to compressed gases or hazards associated with compressed gases.
  - (d) The importance of control measures.
  - (e) Safe work practices.
  - (f) Required use, maintenance, and storage of PPE. (Refer: NEOM-NLF-NMS-006.021 Personal Protective Equipment)
  - (g) Emergency response procedures.
  - (h) Safe handling and storage.
  - (i) Health hazards associated with compressed gases used at the work site.
  - (j) Signs and symptoms of exposure to compressed gases used at the work site; and
  - (k) Operator maintenance requirements for compressed gas systems.

8.2.3 Employers shall ensure managers and supervisors of operators of compressed gas systems shall be trained on:

- (a) Maintenance requirements of compressed gas system to ensure they are working appropriately and within specifications.
- (b) How to recognize unsafe work practices when working with compressed gas; and
- (c) How to identify when the compressed gas systems are not working appropriately.
- (d) Refresher training shall be provided at appropriate intervals

8.2.4 Employers shall maintain a record of the required training that contains the following:

- (a) Name and ID number.
- (b) Subject(s) of training.
- (c) Date(s) of training; and
- (d) Person providing the training.

### **8.3 Planning and Assessment**

8.3.1 Employers shall ensure the following:

- (a) An assessment of the various risks is undertaken, and systems of work are established which are safe to all parties involved or affected including the public.
- (b) That appropriate control measures are implemented in order to manage activities safely and without risk to health.
- (c) That the management of compressed gases requirements are included in the Pre-Tender Safety and Health Plan in accordance with NEOM-NLF-NMS-006.002- Safety Construction Management Plan.

8.3.2 That associated safe systems of work, and site rules are included in the Health and Safety Construction Management Plan NEOM-NLF-NMS-006.002 (CPP) in accordance with NEOM Element 6 Contractor Management”.

8.3.3 When performing risk assessments in accordance with NEOM-Element 2 Risk and Opportunity Management, the following shall be considered:

- (a) The condition of the equipment being used (compressors, hoses, couplings etc.) And if they are rated by an appropriate international standard for their intended use.
- (b) The type, frequency, and duration of the compressed air work.
- (c) The environment in which the compressed air work is to be undertaken (e.g., Dirty/dusty conditions, uneven work surfaces, cramped conditions).
- (d) The pressure at which the compressor is operating.
- (e) The level of experience of the personnel involved in the work; and
- (f) Check OSHA standard §1910.101(a)1, 49 CFR 173.34, Qualification, Maintenance and Use of Cylinders and the latest Compressed Gas Associations (CGA) pamphlets?
- (g) Other identified hazards associated with the work.

## **8.4 Safety Requirements**

- 8.4.1 When using compressed gas systems (to include pneumatic tools), the following requirements shall be met:
- (a) Pipes, hoses, and fittings shall display the rating of the maximum pressure of the compressor. Compressed air pipelines shall be identified and tested to maximum working pressure.
  - (b) Under no circumstances shall the pressure of the compressed air exceed the maximum working pressure of any of the components in use.
  - (c) Couplings shall have safety clips fitted to them to prevent inadvertent uncoupling when under pressure ensure whip checks are in place – makeshift tie-wire shall not be used.
  - (d) Ensure all components comply with the appropriate international standard for their intended use and are regularly maintained in a fit for purpose condition.
  - (e) The setting of safety valves or reducing valves shall only be adjusted by a competent person.
  - (f) Air supply shutoff valves shall be located, as near as reasonably practicable, at the point-of-operation.
  - (g) Air hoses shall be kept free of grease and oil to reduce the possibility of deterioration.
  - (h) Hoses shall not be located across floors or aisles where they are liable to cause personnel to trip and fall. When reasonably practicable, air supply hoses shall be suspended overhead, or otherwise located to afford efficient access and protection against damage.
  - (i) Hose ends shall be secured to prevent whipping if an accidental cut or break occurs.
  - (j) Pneumatic impact tools, such as riveting guns, shall never be pointed at a person.
  - (k) Before pneumatic tools are disconnected (unless it has quick disconnected plugs), the air supply shall be turned off at the control valve and the tool bled.
  - (l) Compressed air shall not be used under any circumstances to clean dirt and dust from clothing or off a person's skin.
  - (m) Air used for cleaning shall be regulated to 15 psi unless equipped with diffuser nozzles to provide lesser pressure.
  - (n) Static electricity may be generated using pneumatic tools. This type of equipment shall be grounded or bonded if it is used where fuel, flammable vapours or explosive atmospheres are present.
  - (o) When used for cleaning, the compressed air equipment (air nozzle) shall reduce the outlet (working) air pressure to less than 30 pounds square inch (psi) at the discharge tip. In-line chip protection shall be used when airlines are connected directly to a compressed air system. This does not mean that the supply air or line pressure be reduced to 30 psi if the static (dead head) pressure exiting the nozzle when restricted does not exceed the mandatory maximum 30psi.
  - (p) Reduction of air pressure for cleaning can be done with nozzles and tips designed for this purpose. Employees shall not remove, damage, cover (e.g., tape), replace or in any way alter the equipment provided for this purpose. Nozzles that have been altered or "home-made" and shall not be used.
  - (q) Goggles, face shields or other eye and hearing protection shall be worn by personnel using compressed air for cleaning equipment, in compliance with NEOM-NLF-NMS-006.021 – Personal Protective Equipment; and
  - (r) All defects shall be immediately reported to the employer and the use of the defected equipment shall be ceased.

- 8.4.2 The handling, storage, utilization, and inspection of all compressed gases in cylinders, portable tanks, rail tank-cars, or motor vehicle cargo tanks shall be in accordance with current international requirements.

## 8.5 Compressors and Compression Units

- 8.5.1 When a gas compressor plant or a gas processing plant discharges gas into a line to which other sources of gas supply are connected there shall be a valve installed in the plant's discharge line, or lines, for the purpose of automatically preventing the return flow of gas. The valve shall, where reasonably practicable, be located outside of the plant but within a reasonable distance of the plant.
- 8.5.2 Where a gas compressor pressure-relieving safety device discharges into the atmosphere, the discharge outlet shall be located outside of the compressor building and if it discharges adjacent to the building, it shall have the discharge outlet located above the compressor building eaves.
- 8.5.3 Where hazardous quantities of liquid may be present in the incoming gas to compressors, an inlet scrubber shall be provided, and a device installed thereon to give either audible warning or shut down the compressors in case the liquid in the scrubber exceeds a predetermined level.
- 8.5.4 Gas compressor discharge lines shall have a pressure-relieving safety device. There shall be no valve located between the pressure relieving safety device and the cylinder or cylinders it is to protect.
- 8.5.5 The pressure-relieving safety device shall be set to open at a pressure not to exceed the maximum allowable working pressure of the cylinder.
- 8.5.6 The relieving capacity of the pressure relieving safety device shall be such as to prevent a rise of pressure in the cylinders of more than 10 percent above their maximum allowable working pressure. The pressure-relieving valve shall be bench tested, calibrated, and certified.
- 8.5.7 Gas lines which enter plants, and which are connected to compressor intakes, shall be provided with shut-off valves in a safe location.
- 8.5.8 While maintenance work of a nature requiring the opening of lines or equipment containing gas is being performed on a compressor or its suction or discharge piping, employees shall be protected from being endangered by escaping gas by closing and locking of the valves in the intake and discharge lines. If the closing and locking of the lines is inappropriate, the lines shall be blinded, or other equally effective means taken to prevent the escape of gas. Lock out/Tag out shall be done in accordance with NEOM-NLF-NMS-006.028 – Lock Out/Tag Out.
- 8.5.9 Air and gas compressor engines of over 30 horsepower shall be provided with means other than manual for starting, providing that manual starting may be used in emergencies.

## 8.6 Air Receivers (Tanks and Pressure Vessels)

- 8.6.1 The normal operating conditions of the tank or vessel shall not exceed the design pressure or temperature.
- 8.6.2 Internal bracing will include vent holes to prevent the forming of gas pockets or liquid pools when liquid level rises or falls.
- 8.6.3 The smallest diameter dimension on any manhole will not be less than 400 mm circular or 280 x 400 mm oval or 255 x 410 mm oval.
- 8.6.4 Air receivers shall be designed, fabricated, tested stamped and installed in accordance with the applicable local / national regulations, internationally recognized standards and industrial best practices including the ASME Boiler and Pressure Vessel Code, Section VII.
- 8.6.5 Air receivers shall be installed to ensure accessibility for maintenance and draining.

- 8.6.6 To provide for removal of accumulated water and oil, a drainpipe and valve shall be installed at the lowest point of every air receiver. The drain valve shall be opened at a minimum daily to drain the air receiver of accumulated water and oil.
- 8.6.7 Drain valve, safety valve, examination holes and manholes shall be accessible.
- 8.6.8 Every air receiver shall be equipped with a pressure gauge which is readily visible and with spring loaded safety valves which prevents the receiver from exceeding the maximum allowable working pressure by more than 10 percent.
- 8.6.9 Valves, indicated devices, and controlling devices shall be constructed, located, and installed so that they cannot be readily rendered inoperable.
- 8.6.10 Tank and vessel support shall be installed on firm foundations. Tank supports shall be of concrete, masonry, or steel.
- 8.6.11 Tanks without supports shall rest on the ground or on foundations made of concrete, masonry, piling or steel.
- 8.6.12 Atmospheric tanks shall be vented to prevent the development of vacuum pressure appropriate to distort the tank or exceed the design pressure because of filling or emptying, and atmospheric temperature changes.
- 8.6.13 Normal vents shall be sized in accordance with good engineering practice or shall be at least as large as the filling or withdrawal connection, whichever is larger but in no case less than 30 mm inside diameter.
- 8.6.14 Any physical work other than that permitted (e.g., drilling, welding, etc.) to tank or vessel after stamping shall be performed by a manufacturer approved by qualified engineer or third-party inspection agency to maintain the integrity of the stamp on the tank. Tanks shall be periodically re-inspected at a frequency determined by the risk assessment and applicable legal and international standards.
- 8.6.15 Tank/Vessel Record - A permanent and progressive record for each tank and vessel shall be maintained at the plant where the tank and vessel are located. The record shall be available for inspection by concerned authorities and shall include the following:
  - (a) Serial or identification number of the tank or vessel.
  - (b) Established safe working pressure of the tank or vessel for the working temperature.
  - (c) Relief valve setting.
  - (d) Maximum working temperature; and
  - (e) Manufacturer's data reports, when obtainable, and all data pertaining to tests, inspections and calculations used in establishing the safe working pressure.

## **8.7 Pressure Relieving Safety Devices**

- 8.7.1 Only qualified personnel shall be allowed to repair or adjust pressure regulating equipment.
- 8.7.2 Valves, gauges, and other regulating devices shall be installed on compressor equipment in such a way that cannot be made inoperative, normally locked open.
- 8.7.3 Air tank safety valves shall be set no less than 15 psi or 10 percent (whichever is greater) above the operating pressure of the compressor but never higher than the maximum allowable working pressure of the air receiver.
- 8.7.4 Air lines between the compressor and receiver shall not be equipped with stop valves. Where stop valves are necessary and authorized, standard safety valves shall be installed between the stop valves and the compressor.

- 8.7.5 The Safety valves shall be set to blow at pressures slightly above those necessary to pop the receiver safety valves.
- 8.7.6 Blow-off valves shall be located on the equipment and shielded so sudden blow-offs will not cause personnel injuries or equipment damage.
- 8.7.7 Cast iron seat or disk safety valves shall be approved in compliance to applicable standards and stamped for intended service application.
- 8.7.8 If the design of a safety or a relief valve is such that liquid can collect on the discharge side of the disk, the valve shall be equipped with a drain at the lowest point where liquid can collect.
- 8.7.9 Safety valves exposed to freezing temperatures shall be located so water cannot collect in the valves. Frozen valves shall be thawed and drained before operating the compressor.
- 8.7.10 Safety relief valves installed on pressure vessels shall be constructed, installed, and maintained in accordance with relevant international standards.
- 8.7.11 No pressure vessel shall be operated more than the allowable working pressure of the vessel as established by codes or the maximum allowable working pressure as established for the vessel at its last inspection, whichever is the least. Pressure-relieving devices shall be set to prevent the pressure from rising more than 10% above the maximum allowable working pressure.
- 8.7.12 A permanent and progressive record of pressure-relieving safety devices in service, showing the serial or identification number, the location, the pressure setting, the free orifices area in sq. cm, the date of installation in service, and the date of testing shall be maintained at the location where the pressure relieving safety device is located or at the supervising office.
- 8.7.13 A vessel having a stop valve that shuts off the vessel from its pressure relieving device, shall be protected by an additional safety device, if the vessel may become entirely filled with liquid and if it is reasonably practicable that pressure may be generated by continued input of heat through exchanger tubes or similar devices, or by exposure to sun or adjacent hot equipment. This additional safety device shall be connected to the vessel at all times. The additional safety device may be set higher so that the pressure cannot rise higher than 20% above the safe working pressure.
- 8.7.14 The aggregate capacity of the pressure-relieving safety devices applied to any vessel or system of vessels for the release of vapour shall be appropriate to carry off the maximum quantity of vapour that can be generated in, or supplied to, the attached equipment within the variations of normal operation, without permitting a rise in pressure within the vessel of more than 16 percent above the safe working pressure.
- 8.7.15 Each pressure-relieving safety device installed on operating equipment shall be maintained to ensure the appropriate functioning of the device at the intended pressure. Such maintenance shall include inspection, testing, and the repair of the pressure-relieving safety devices at frequencies as required by the service conditions.
- 8.7.16 Each pressure-relieving safety device in service shall have serial or identification number stamped upon it and in addition a metal plate or metal tag shall be attached to each such device and shall show the pressure setting and the date the device was installed in service.
- 8.7.17 Outlets from pressure-relieving safety devices shall be appropriately secured and shall lead to a safe place of discharge. Pressure-relieving safety device stacks which are open to the atmosphere shall be provided with a drain.
- 8.7.18 All safety valves shall be tested on a regular basis to ensure they are in good operating condition. This can be performed by a competent external Organisation and records shall be maintained at the facility and accessible to inspectors and maintenance staff.

8.7.19 The size of outlets or stacks shall be such that any pressure drop shall not reduce the relieving capacity of the relieving devices below that required to protect the vessel. No stop valve shall be placed on a discharge line from a pressure relieving safety device except when such discharge line discharges to a common header, in which case such stop valve shall be locked or sealed open and shall be closed, while the vessel is in operation, only by a person definitely assigned to such duties by the employer, and such person shall not leave the location until the stop valve is opened and relocked or resealed.

## **8.8 Compressed Gas Cylinders - Portable Cylinders**

- 8.8.1 The handling, storage, utilization, and inspection of all compressed cylinders shall be in accordance with current international requirements.
- 8.8.2 Compressed gas cylinders require special construction, handling, storage, transportation, and disposal techniques. This Section describes requirements for safe handling of Compressed Gas Cylinders within the workplace.
- 8.8.3 Gases drawn from cylinders are usually characterized as:
  - (a) Permanent gases having boiling points of -150oF or lower and cannot be liquefied at room temperature no matter how high the pressure. Such gases include oxygen, nitrogen, and helium.
  - (b) Liquid gas which liquefies at temperatures of -130oF or higher at one atmosphere but can be liquefied and maintained as liquids at higher pressures. Such gases include propane, chlorine, and butane. Carbon dioxide is in this category, but becomes a solid rather than a liquid; and
  - (c) Dissolved gases in common use such as acetylene dissolved in acetone which holds 35 times its own volume of acetylene.
- 8.8.4 Compressed gas cylinder users shall maintain and refer to the specific Safety Data Sheets (SDS) for the substances contained in the cylinder for more details. Specific standards for some compressed gases such as acetylene, hydrogen, oxygen, etc. shall be considered.

## **8.9 Construction and Marking of Cylinders**

- 8.9.1 All portable cylinders used for the storage and shipment of compressed gases shall be constructed and maintained in accordance with the requirements of the Compressed Gas Association (CGA) and applicable local / national regulations and internationally recognized standards appropriate to the use or intended use of the cylinder.
- 8.9.2 Compressed gas cylinders shall be legibly marked, for the purpose of identifying the gas content, with either the chemical or the trade name of the gas. Such marking shall be by means of stencilling, stamping, or labelling, and shall not be readily removable. Whenever reasonably practicable, the marking shall be located on the shoulder of the cylinder.
- 8.9.3 Labels shall be securely attached to cylinders so that they cannot be inadvertently or accidentally detached during use, transport, and storage.
- 8.9.4 Numbers and markings stamped into cylinders shall not be tampered with.
- 8.9.5 Compressed gas cylinders shall be equipped with connections complying with the applicable local / national regulations, internationally recognized standards including American National Standard Compressed Gas Cylinder Valve Outlet and Inlet Connections, ANSI B57.1-1965.
- 8.9.6 Cylinders with a water weight capacity of over 30 pounds (13.6 kg) shall be equipped with a means of connecting a valve protection cap or with a collar or recess to protect valve.

## **8.10 Compressed Gas Cylinder Handling**

- 8.10.1 Cylinders shall always be considered full and shall be handled carefully.
- 8.10.2 Cylinders which are designed to accept valve protection devices shall be equipped with such devices when the cylinders are in transport, storage, not in use between shifts, or otherwise not connected for use.
- 8.10.3 Unless cylinder valve is protected by a recess in the head, the metal cap shall be kept in place to protect the valve when the cylinder is not connected for use.
- 8.10.4 Threads on a regulator shall be identical to those on the cylinder valve outlet. Connections that do not fit shall not be forced on.
- 8.10.5 All parts of a compressed gas cylinder shall be checked before use. All cylinders shall be in good condition with an operable valve or regulator. Cylinders without valves and regulators shall be capped.
- 8.10.6 Flashback devices shall be fitted at both the regulator and torch end of oxygen/fuel gas systems. Safety devices in valves or on cylinders shall not be tampered with.
- 8.10.7 Cylinder valves shall be opened slowly. Cylinders without hand wheel valves shall be opened with a spindle key, special wrench, or other tool provided or approved by the gas supplier.
- 8.10.8 Valves of empty cylinders shall be closed.
- 8.10.9 Cylinders shall not be dropped or struck or permitted to strike each other violently.
- 8.10.10 Cylinder valves not provided with fixed hand wheels shall have keys or handles on valve spindles or stems while cylinders are in service. In multiple cylinder installations only one key or handle is required for each manifold.
- 8.10.11 Cylinder valves shall not be tampered with, nor shall any attempt be made to repair them.
- 8.10.12 The supplier shall be contacted immediately if damage occurs.
- 8.10.13 Complete removal of the stem from a diaphragm-type cylinder valve shall be avoided.
- 8.10.14 Cylinders shall never be used as rollers or supports.
- 8.10.15 Cylinders shall never be used without a pressure-reducing regulator attached to the cylinder valve except where cylinders are attached to a manifold – in which case the regulator shall be attached to the manifold header.
- 8.10.16 Before making connection to a cylinder valve outlet, the valve shall be slightly opened for an instant to clear the opening of particles of dust or dirt. The valve and opening shall always be pointed away from the body and not toward anyone else.
- 8.10.17 Regulators and pressure gauges shall be used only with gases for which they are designed and intended.
- 8.10.18 Employers shall not attempt to repair or alter cylinders, valves, or attachments. This shall be done only by the manufacturer / approved service agent.
- 8.10.19 Oil or grease shall never be used as a lubricant on valves or attachments of oxygen cylinders. Oxygen cylinders and fittings shall be kept away from oil and grease such cylinders or apparatus shall not be handled with oily hands, gloves, or clothing.
- 8.10.20 Oxygen shall not substitute for compressed air in pneumatic tools, in oil pre-heating burners, to start internal combustion engines, or to remove dust from clothing. It shall be used only for the purpose for which it is intended.
- 8.10.21 Cylinders shall never be brought into confined spaces or unventilated rooms.
- 8.10.22 DO NOT use or compress Acetylene in a free state at pressure higher than 15 pounds per square inch.

8.10.23 Never completely empty a cylinder; there shall always be a minimum residual gas pressure of 30psi.

8.10.24 Before a regulator is removed, the cylinder valve shall be closed, and the gas released from the regulator.

8.10.25 Unless the cylinder valve has first been closed tightly, no attempt shall be made to stop a leak between the cylinder and the regulator.

8.10.26 If a leak occurs in a fuel gas cylinder it shall be taken out of use immediately and handled as follows:

(a) The valve shall be closed, and the cylinder taken outdoors well away from any ignition source. The cylinder shall be tagged (Do Not Use, No Smoking, No Ignition Source) and the supplier notified; and

(b) A regulator attached to the valve may be used temporarily to stop a leak through the valve seat.

8.10.27 When flammable gas lines or other parts of equipment are being purged of air or gas, open lights or other sources of ignition shall not be permitted near uncapped openings.

## **8.11 Transportation of Compressed Gas Cylinders**

8.11.1 Unless cylinders are secured on a specifically designed rack / equipment, regulators shall be removed, and valve-protection devices put in place prior to movement.

8.11.2 Compressed gas cylinders in portable service shall be conveyed by appropriate trucks to which they are securely fastened; and all gas cylinders in service shall be securely held in substantial racks or secured to other rigid structures so that they will not fall or be knocked over.

**Note:** Exception: When it is not reasonably practicable to transport cylinders neither by truck, nor to bring in racks to point of operation, as in some construction work, cylinders may be carried in, and appropriately secured in an appropriate manner. For short distances, cylinders may be moved by tilting and rolling them on their bottom edges.

8.11.3 Gas cylinders transported by crane, hoist, forklift, or derrick shall be handled in appropriate cradles, nets or skip boxes, and shall never be lifted by magnet or by slings, unless the slings are designed and constructed to prevent accidental release of the cylinders.

8.11.4 Valve protection devices shall not be used for lifting cylinders. Exception: Valve protection devices may be used for manual lifting if they were designed for that purpose.

8.11.5 Bars shall not be used under valves or valve protection caps to pry cylinders loose when frozen to the ground or otherwise fixed; the use of warm (not boiling) water is recommended.

8.11.6 Ensure cylinder valves shall be closed before moving cylinders.

## **8.12 Storage of Compressed Gas Cylinders**

8.12.1 Cylinders shall always be secured to prevent them falling over. Chains or a clamp-plus-strap is an acceptable method of keeping cylinders upright. The chain or strap shall be placed above the midpoint of the cylinder to keep it from falling over.

8.12.2 Cylinders of compressed gas shall be stored in areas where they are protected from external heat sources such as flame impingement, intense radiant heat, electric arc, or high temperature steam lines.

8.12.3 Inside of buildings, cylinders shall be stored in a well-protected, well-ventilated, dry location, at least six meters from highly combustible materials such as oil or flammable packaging materials. Assigned storage spaces shall be located where cylinders will not be damaged by passing or falling objects, or subject to tampering by unauthorized persons.

- 8.12.4 Storage rooms for cylinders containing flammable gases shall be well ventilated to prevent the accumulation of explosive concentrations of gas; no source of ignition shall be permitted; smoking shall be prohibited.
- 8.12.5 Storage areas shall contain the appropriate safety signage, in accordance with NEOM-NLF-NMS-006.013 – Safety Signs and Signals.
- 8.12.6 Employers shall ensure that only authorized persons have access to compressed gases storage areas.
- 8.12.7 Cylinders shall not be stored in temperatures above 51 degrees Celsius or near sources of heat such as radiators/furnaces, or near highly flammable substance like gasoline, oil, or volatile liquids.
- 8.12.8 Do not store incompatible gases together. Oxygen cylinders in storage shall be separated from fuel gas cylinders or combustible materials (especially oil or grease) a minimum distance of 6 meters or by a non-combustible barrier at least 2 meters high, or a minimum of 46 centimetres above the tallest cylinder and having a fire-resistance rating of at least one hour.
- 8.12.9 Compressed gas cylinders shall be stored or transported in a manner to prevent them from creating a hazard by tipping, falling, or rolling.
- 8.12.10 Liquefied fuel-gas cylinders shall be stored or transported in a position so that the safety relief device is always in direct contact with the vapour space in the cylinder.
- 8.12.11 Acetylene and liquefied fuel gas cylinders shall be stored with the valve end up.
- 8.12.12 Cylinders stored in the open shall be protected from contact with the ground and against weather affects.
- 8.12.13 Cylinders shall not be placed where they might form part of an electric circuit.

### **8.13 Gases with Specific Hazard Classes**

- 8.13.1 The following information regarding specific classes of gases is offered as additional requirements to be used in conjunction with the general usage requirements listed in preceding sections.

### **8.14 Corrosive Gases**

- 8.14.1 (a) Corrosive gases, examples include chlorine, hydrogen chloride, fluorine, hydrogen fluoride, hydrogen sulphide, carbon monoxide and carbon dioxide:
  - (a) When using corrosive gases, equipment and lines shall be checked daily for damage and leaks.
  - (b) A diaphragm gauge shall be used with corrosive gases that would destroy a steel or bronze gauge. Check with gas supplier for recommended equipment; and
  - (c) After removing regulators, employers shall inspect them for damage and flush them with dry air or nitrogen.

### **8.15 Cryogenic Liquids and Gases**

- 8.15.1 Cryogenic liquids and their boil-off vapours rapidly freeze human tissue and cause embrittlement of many common materials which may crack or fracture under stress. All cryogenic liquids produce large volumes of gas when they vaporize (at ratios of 600:1 to 1440:1, gas: liquid) and may create oxygen-deficient conditions. Examples of common cryogenic liquids include liquid oxygen, hydrogen, helium, and liquid neon. The following information applies to the use and handling of cryogenics:
  - (a) Employees shall use appropriate personal protective equipment (PPE) including insulated gloves and eye protection (goggles and a face shield) during any transfer of cryogenic liquid.

- (b) Emergency procedures shall be developed for accidental exposures to include skin contact with a cryogenic liquid.
- (c) Only equipment, valves and containers designed for the intended product and service pressure and temperature shall be used.
- (d) Employers shall inspect containers for loss of insulating vacuum. Repairs shall be made by the manufacturer, or a manufacturer approved Organisation.
- (e) Transfer operations involving open cryogenic containers such as dewars shall be conducted slowly to minimize boiling and splashing of the cryogenic fluid.
- (f) Ice or other foreign matter shall not be allowed to accumulate beneath the vaporizer or the tank.
- (g) All cryogenic systems including piping shall be equipped with pressure relief devices to prevent excessive pressure build-up.
- (h) Pressure reliefs shall be directed to a safe location.
- (i) Employees shall not tamper with pressure relief valves or the settings for the valves; and
- (j) Hot air, steam or hot water shall be used to thaw frozen equipment. Do not use water to thaw liquid helium equipment.

## **8.16 Flammable Gases**

- 8.16.1 The following information applies to the use and handling of flammable gases. Some common examples of flammable gases include acetylene, hydrogen, methane, propane, and iso-butane:
- (a) Flammable gases, except for protected fuel gases, shall not be used near ignition sources. Ignition sources include open flames and sparks, sources of heat, oxidizing agents and ungrounded or non-intrinsically safe electrical or electronic equipment.
  - (b) Portable fire extinguishers shall be available for fire emergencies. The fire extinguisher shall be compatible with the apparatus and the materials in use.
  - (c) Flames shall not be used for detecting leaks. A compatible leak detection solution shall be used for leak detection.
  - (d) Spark proof tools shall be used when working with or on a flammable compressed gas cylinder or system.
  - (e) Access doors to areas which use, or store flammable gases shall be posted "No Smoking" and "No Open Flames".
  - (f) Manifold systems shall be designed and constructed by competent personnel who are thoroughly familiar with the requirements for piping of flammable gases. Manifolds shall comply with the applicable standards.
  - (g) Standard specifications shall be identified before starting design and construction; and
  - (h) Consultation with the gas supplier shall be completed before installation of manifolds.

## **8.17 Fuel, High Pressure and Oxidizing Gases**

- 8.17.1 The following information applies to the use and handling of fuel, high pressure, and oxidizing gases:
- (a) Use of fuel gases shall comply with applicable national & international standards including NFPA and industrial best practices.
  - (b) Employers shall have a qualified engineer or other competent person design and oversee the installation of Oxygen-Fuel Gas Systems for Welding, Cutting and Allied Processes.

- (c) High pressure gases can be rated up to 3000 pounds per square inch (psi). Typical uses include MIG (Metal Inert Gas) welding gas mixtures, cryogenics, non-toxic gas distribution, medical gas distribution, and emergency oxygen services.
- (d) In addition to any gas specific hazards, high pressure gases shall carry the following hazard label: "CAUTION: HIGH PRESSURE GAS"; and
- (e) Do not use oil in any apparatus where oxygen will be used. Gauges and regulators for oxygen shall bear the warning "OXYGEN - USE NO OIL".

## **8.18 Toxic and Highly Toxic Gases:**

8.18.1 The following information applies to the use of toxic and highly toxic gases.

- (a) Unless otherwise indicated, all gases shall be stored in a continuously mechanically ventilated gas cabinet, fume hood or other enclosure.
- (b) Small quantities (e.g., Lecture cylinders) or dilute concentrations of these gases may be stored outside of a ventilated enclosure.
- (c) Audible alarms shall be utilized in ventilated hoods that are dedicated to toxic gas usage or storage; and
- (d) Standard Operating Procedures (SOP's) for processes or procedures which use toxic or highly toxic gases shall be developed by the employer that include emergency response actions.

## **8.19 Gas Cylinder Disposal**

- 8.19.1 When feasible, employers shall purchase compressed gas only from manufacturers that will agree to take back the empty cylinder.
- 8.19.2 A cylinder is considered empty when the container pressure is 35psi or less.
- 8.19.3 Refillable cylinders shall be returned to the authorized supplier or directly to the vendor.
- 8.19.4 If a refillable cylinder is encountered that does not have a manufacturer label, contact approved Registered Service Providers, for advice on disposal and / or identifying the manufacturer through stamp marks on the cylinder.
- 8.19.5 Maintain manufacturer labels and label the cylinder as "Empty".
- 8.19.6 Appropriate identification of the contents of all cylinders is required and is the responsibility of the employer and/or cylinder owner.

## **8.20 Inspection and Maintenance**

- 8.20.1 Compression Units as per Ministry of Municipal and Rural Affairs shall be inspected by a competent person that licensed by the ministry of labour at a minimum annually.
- 8.20.2 Gas Cylinders:
  - (a) Gas cylinders shall be hydrostatically tested at a minimum every five years which shall be conducted by a qualified testing facility. The test date shall be stamped onto the cylinder each time the cylinder is tested.
  - (b) Cylinders in use are allowed to exceed the five-year limit, but shall be tested prior to refilling or before the sixth (6th) year, whichever is sooner; and
  - (c) Inspection of Low-Pressure Cylinders (0.35 kg/cm<sup>2</sup> to 1.055 kg/cm<sup>2</sup>) is exempted from the Hydrostatic Test.

- 8.20.3 Air Receiver shall be tested by a competent person or a skilled third-party agency at a frequency defined by the applicable legal requirements, manufacturer recommendations and/or employer's inspection & maintenance scheme. Inspection shall include, but not be limited to:
- (a) Visual Examination each six month by Employer's competent person.
  - (b) Thorough Internal and External Visual Inspection plus a Gas Leak test at full working pressure OR Internal overpressure test plus a Gas Leak Test at full working pressure; and
  - (c) Thorough internal and external visual examination and gas leak test to maximum working pressure. If the competent person deems it necessary, an overpressure test to 1.1 times the maximum working pressure shall be conducted.
- 8.20.4 Pipework shall be tested by a competent person or a skilled third-party agency at a frequency defined by the applicable legal requirements, manufacturer recommendations and/or employer's inspection & maintenance scheme. Inspection shall include, but not limited to:
- (a) Visual examination.
  - (b) Gas leak test at maximum working pressure of the system; and
  - (c) Internal pressure test to 1.5 time's maximum working pressure of the system plus gas leak test at maximum working pressure of the system.
- 8.20.5 Electronics shall be visually examined, function tested (to include protective devices), and continuity and resistance testing of any cables by the employer competent person or a skilled third-party agency.

## **8.21 Emergency Response**

- 8.21.1 Emergency Response procedures compliant to NEOM Element 9 – Emergency Planning and Response Management shall be developed for all compressed gas systems. Requirements for emergencies involving compressed gas cylinders include leaks, fire, explosions etc. as identified through the Risk Assessment.
- 8.21.2 First aid procedures in accordance with NEOM-NLF-NMS-006.029 First Aid and Medical Treatment shall be developed.
- 8.21.3 Emergency and first aid procedures shall include:
- (a) The provision of first aid facilities, kits, and officers to appropriately deal with compressed air injuries, such as air and foreign particle injection.
  - (b) Provisions to immediately shut down air compressors isolate gas cylinders etc. In the event of an emergency.
  - (c) Contact details for external emergency services and the relevant on-site personnel.
  - (d) Evacuation routes and emergency assembly points; and
  - (e) For toxic gases leaks, the cylinder shall be removed to an isolated, well-ventilated area, but only if this is reasonably practicable while maintaining personal safety. A general evacuation of the building may be necessary and have the cylinder approached only by trained emergency response personnel wearing protective apparel and self-contained breathing apparatus (SCBA).

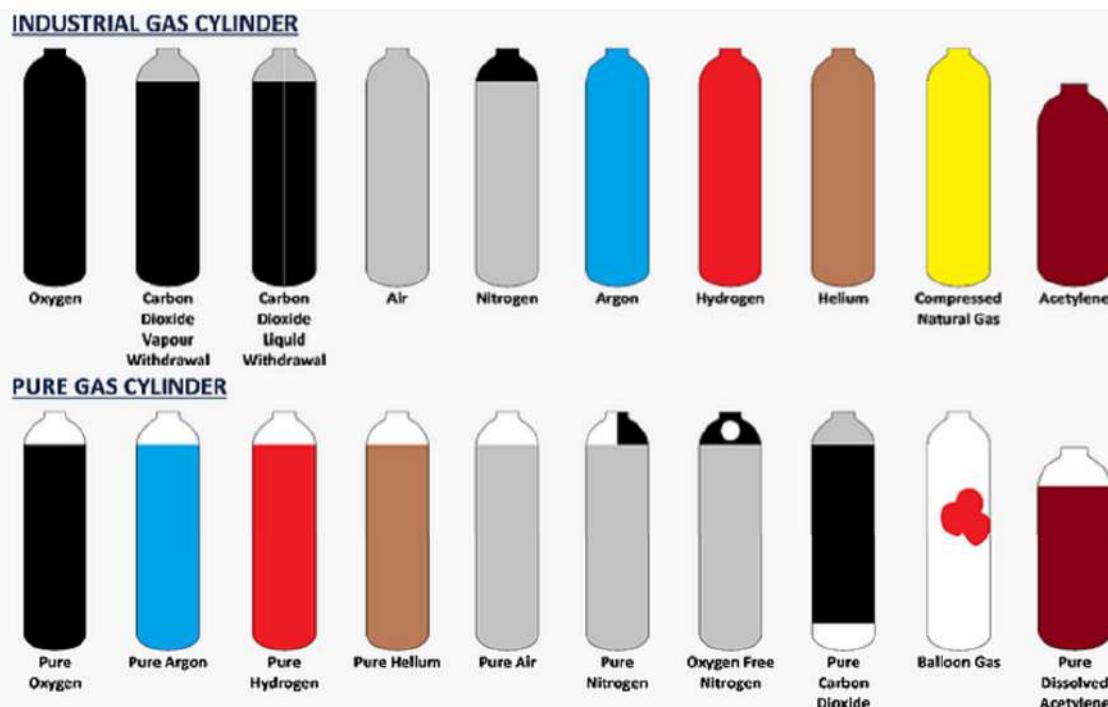
## 9 Appendices

### 9.1 Appendix A: Colour Codes for Gas Cylinders

#### Color Coding Explanation

Color-coding is used as a gas identifier worldwide for medical gas fittings and connections. The following color-coding chart is for your assistance.

Gas	U.S. Color Code	ISO Color Code
<b>Carbon Dioxide</b>	Grey	Grey
<b>He-O<sub>2</sub></b>	Brown & Green	Brown & White
<b>Instrument Air</b>	Red (USA Only)	
<b>Medical Air</b>	Yellow	Black & White
<b>Nitrogen</b>	Black	Black
<b>Nitrous Oxide</b>	Blue	Blue
<b>O<sub>2</sub>-He</b>	Green & Brown	White & Brown
<b>Oxygen</b>	Green	White
<b>Vacuum (Suction)</b>	White	Yellow
<b>WAGD (Evac)</b>	Purple	Purple



#### MIXTURE GAS CYLINDER

Ar + CO<sub>2</sub>Ar + O<sub>2</sub>Ar + H<sub>2</sub>

Ar + He

Ar + N<sub>2</sub>Ar + O<sub>2</sub> + CO<sub>2</sub>O<sub>2</sub> + HeN<sub>2</sub> + O<sub>2</sub>Four Mixture  
(Laser Gas)Five Mixture  
(Laser Gas)

#### MEDICAL GAS CYLINDER



Medical Oxygen



Nitrox



Carbon Dioxide



Medical Air

O<sub>2</sub> + CO<sub>2</sub>

Nitrous Oxide



Nitrous Oxide Liquid Withdrawal

**WARNING!**

Read all cylinder labels and stenciled marks.  
Do not rely on colour of cylinder alone.

DISCLAIMER: While WKS has made every effort to ensure that this User Guide is accurate, WKS disclaims liability for any inaccuracies or omissions that may have occurred. Information in this User Guide is subject to change without notice and does not represent a commitment on the part of WKS. WKS assumes no responsibility for any inaccuracies that may be contained in this User Guide. WKS makes no commitment to update or keep current the information in this User Guide, and reserves the right to change the contents of this User Guide at any time without notice.



**WARNING**  
Compressed  
gas



## 9.2 Appendix B: Audit Criteria COMPRESSED GASES AND AIR NEOM-NLF--NMS-006-027

Contractor/ Area: \_\_\_\_\_

Department: \_\_\_\_\_

Completed by: \_\_\_\_\_ Date completed: \_\_\_\_\_

Audit Criteria		Requirements	Verification	Area of Concern
ISO 45001:2018 Clause	NMS Ref.			Yes/ No
5.3	7.1.3, 8.3.1(c)	Pre-Tender Health and Safety Plan has been developed and issued		
5.3, 8.1.4.2	7.1.4	Selection of Contractors undertaken in accordance with NEOM's policies and procedures		
7.2	7.2.4, 8.2	Persons appointed to manage /oversee work operations have the skills, knowledge, experience		
8.1.2 (e)	7.2.6, 7.3.3	Personal protective equipment required for use are fit for purpose		
6.1.2.3	7.2.5, 8.3.3	Hazards Identification Plan (HIP) for lone employee		
6.1.2.2		Assessment of the various risks shall be undertaken, where lone working has been identified, the risk assessment shall be developed		
8.1.1, 8.1.2	7.2.7 (a)	Contractor shall consider safe methods of working		
9.1.2	8.4.2	The handling, storage, utilization, and inspection of all compressed gases in cylinders, portable tanks, rail tank-cars, or motor vehicle cargo tanks shall be in accordance with current international requirements		
8.1	8.6.1	The normal operating conditions of the tank or vessel shall not exceed the design pressure or temperature		
8.1, 9.1.1	8.6	Tanks shall be periodically re-inspected at a frequency determined by the risk assessment and applicable legal and international standards		
9.1.2	8.7	Each pressure-relieving safety device installed on operating equipment shall be maintained to ensure the appropriate functioning of the device at the intended pressure		
8.1, 9.1.1	8.7	Maintenance shall include inspection, testing, and the repair of the pressure-relieving safety devices at frequencies as required by the service conditions		
6.1.3	8.9	All portable cylinders shall be constructed and maintained in accordance with the requirements of the Compressed Gas Association (CGA) and applicable local /		

Audit Criteria		Requirements	Verification	Area of Concern
ISO 45001:2018 Clause	NMS Ref.			Yes/ No
		national regulations and internationally recognized standards		
6.1, 6.2, 8.1.2	8.11	Unless cylinders are secured on a specifically designed rack / equipment, regulators shall be removed, and valve-protection devices put in place prior to movement shall be conveyed by appropriate trucks to which they are securely fastened		
6.1.2.2	8.14	Equipment and lines shall be checked daily for damage and leaks of Corrosive gases, examples include chlorine, hydrogen chloride, fluorine, hydrogen fluoride, hydrogen sulphide, carbon monoxide and carbon dioxide		
8.2	8.18	Standard Operating Procedures (SOP's) for processes or procedures which use toxic or highly toxic gases shall be developed that include emergency response actions		
9.1.2	8.20.1	Compression Units as per Ministry of Municipal and Rural Affairs shall be inspected by a competent person that licensed by the ministry of labour at a minimum annually		

### 9.3 Appendix C: Guidance Information

Hazards associated with compressed gases include oxygen displacement, fires, explosions, and toxic gas exposures, as well as the physical hazards associated with high pressure systems. Special storage, use, and handling precautions are necessary in order to control these hazards. Throughout OSHA references can be found to compressed gases and air and general regulations can be found in the following;

General Industry (29 CFR 1910)		Related Information
1910 Subpart H - Hazardous Materials	1910.101, Compressed gases (general requirements).	<a href="#">Related Information</a>
	1910.102, Acetylene.	<a href="#">Related Information</a>
	1910.103, Hydrogen.	<a href="#">Related Information</a>
	1910.104, Oxygen.	<a href="#">Related Information</a>
	1910.105, Nitrous oxide.	<a href="#">Related Information</a>
1910 Subpart M - Compressed Gas and Compressed Air Equipment	1910.169, Air receivers.	<a href="#">Related Information</a>
1910 Subpart Q - Welding, Cutting and Brazing	1910.253, Oxygen-fuel gas welding and cutting.	<a href="#">Related Information</a>
	1910.254, Arc welding and cutting.	<a href="#">Related Information</a>
1910 Subpart T - Commercial Diving Operations	1910.430, Equipment.	<a href="#">Related Information</a>

Maritime (29 CFR 1915, 1917, 1918)		Related Information
1915 Subpart D	1915.55, Gas welding and cutting.	<a href="#">Related Information</a>
1915 Subpart G - Gear and Equipment for Rigging and Materials Handling	1917.152, Welding, cutting and heating (hot work) (See also §1917.2, definition of Hazardous cargo, materials, substance, or atmosphere).	<a href="#">Related Information</a>
	1917.154, Compressed air.	<a href="#">Related Information</a>
	1917.155, Air receivers.	<a href="#">Related Information</a>

Construction (29 CFR 1926)		Related Information
1926 Subpart D	1926.65, Hazardous waste operations and emergency response.	<a href="#">Related Information</a>
1926 Subpart J - Welding and Cutting	1926.350, Gas welding and cutting.	<a href="#">Related Information</a>

29 CFR 1926.350(a)(9) Securing of Compressed Gas Cylinders. STD 03-08-002, (March 11, 1981).

Drains on Air Receivers; 29 CFR 1910.169(a)(2)(i) and (6)(2). STD 01-10-002, (October 30, 1978).

Reduction of Air Pressure below 30 psi for Cleaning Purposes. STD 01-13-001, (October 30, 1978)

In the UK Under domestic law (the Health and Safety at Work Act 1974) employers are responsible for ensuring the safety of their employees and others. This responsibility is reinforced by regulations.

The Work in Compressed Air Regulations 1996 provide a framework for the management of health and safety risks by those undertaking tunnelling and other construction work in compressed air.

Guidance can be found on the HSE website in L 96 A guide to working in Compressed Air Regulations 1996 and

Publication HSG 39 Compressed air safety aims to promote the safe use of compressed air and describes the many ways in which compressed air can be dangerous as well as how to minimise the risk of such dangers occurring. It is aimed at designers, manufacturers, installers, users, and others concerned with or responsible for health and safety at work.



نیوم NEOM

**NEOM OCCUPATIONAL HEALTH and SAFETY  
NEOM MINIMUM STANDARD  
for  
LOCK-OUT TAG-OUT (ISOLATION)**

NEOM-NLF-NMS-006.028 - Rev 02.00 – February 2022

©NEOM [2021]. All rights reserved.

## Document History

Revision code	Description of changes	Purpose of issue	Date
Rev 00.00	First Issue	Issued for Implementation	27/07-2020
Rev 02.00	SMS Update	Issued for Implementation	01-02-2022

## Document Approval

	Prepared by	Reviewed by	Approved by
Name	Robert Murphy	Talal Al Anazi	Adel Al Wuhaib
Job Title	Loss Prevention Specialist - Public Safety	Director, Loss Prevention/Fire Safety (LP/FS) Public Safety	Executive Director Public Safety



## Contents

<b>1</b>	<b>PURPOSE .....</b>	<b>4</b>
<b>2</b>	<b>SCOPE .....</b>	<b>4</b>
<b>3</b>	<b>EXPECTATIONS.....</b>	<b>4</b>
<b>4</b>	<b>LIST OF DEFINITIONS .....</b>	<b>5</b>
<b>5</b>	<b>LIST OF ABBREVIATIONS .....</b>	<b>5</b>
<b>6</b>	<b>RELATED NEOM DOCUMENTS.....</b>	<b>6</b>
<b>7</b>	<b>ROLES AND RESPONSIBILITIES .....</b>	<b>6</b>
7.1	Client .....	6
7.2	Contractor .....	7
7.3	Employee .....	7
7.4	Specific Responsibilities .....	8
7.5	Employer .....	8
<b>8</b>	<b>OTHER SECTIONS RELATED TO SUBJECT.....</b>	<b>9</b>
8.1	Minimum Standards Application .....	9
8.2	Planning and Assessment.....	9
8.3	Lock-out/Tag-out Requirements .....	9
8.4	Training and Competency .....	11
<b>9</b>	<b>RECORD KEEPING .....</b>	<b>12</b>
<b>10</b>	<b>APPENDICES .....</b>	<b>13</b>
10.1	Appendix A: Forms, Signs and Checklists .....	13
10.2	Appendix B: Audit Criteria.....	14
10.3	Appendix C: Guidance Documents.....	15

## List of Tables

Table 1 : Table of Definitions .....	5
Table 2 : Table of Abbreviations .....	5
Table 3 : Related NEOM Documents.....	6

## **1 Purpose**

This NEOM Co. SMS Minimum Standard (hereafter referred to as NMS) relates to the management of all occupational health, and safety (OHS) risks associated with Lock-Out/ Tag-Out. (LOTO).

It provides guidance to support compliance with industry best practice and international regulatory safety requirements to ensure that the associated risks are assessed, and control measures are implemented in accordance with the hierarchy of risk controls.

It has been developed to align with the requirements of the ISO 45001 Health and Safety Management Standard (Refer NEOM-NLF-SM-01.00- Section 14 ISO 45001 Cross Reference Audit Table)

## **2 Scope**

This NMS applies to all Sectors, Organisations within NEOM; and any Contractors working for NEOM. It applies to all servicing and maintenance of machines and equipment in which the unexpected energization or start-up could result in an accident or incident.

NOTE: Exemptions to this NMS are shown in section 8.1.2 below.

## **3 Expectations**

To ensure the health and safety of all personnel, protection of assets (services, plant/equipment) and the environment

NEOM expect each Sector, Organization, Department or Contractor to ensure that risks are controlled in accordance with the hierarchy of risk controls: elimination, substitution, engineering controls, administrative controls, and personal protective equipment.

Consideration shall be given to technological advances that may introduce new means of controlling or eliminating the risks associated with work activities

That the expectation for safety compliance is meeting and exceeding all applicable OSHA Laws, Regulations, and Industry Best Practice:

Where required, and as a minimum, the following shall also be met;

- (a) OSHA Standards and Regulatory requirements;
- (b) ANSI requirements;
- (c) NFPA Standards and requirements;
- (d) NEOM Minimum Standards
- (e) Saudi Building Codes
- (f) International Building Codes

*If requirements of this document conflict with requirements set by another regulatory authority, Contractor are required to follow the more stringent requirement.*

## 4 List of Definitions

Table 1 : Table of Definitions

Terms	Definitions
NEOM Co	NEOM Company
SMS-NMS	Safety Management System – NEOM Minimum Standard
Client	NEOM Sector / Department responsible for management and oversight of the Contractors
Employer	The person or organisation that employs personnel to complete the work.
Contractor	The organisation contracted and responsible for carrying out the works
Lock-out / Tag-out (Isolation)	<p>The introduction of a device to isolate energy sources &amp; placement of tag on isolated device to show why and by whom, that equipment has been placed out of service.</p> <p>It is a process by which it can be ensured that equipment is shut down, inoperable, and (where relevant) de-energized.</p>
Safety Management System (SMS)	Occupational Health and Safety Management System established by NEOM in compliance to ISO 45001 Standard

## 5 List of Abbreviations

Table 2 : Table of Abbreviations

Abbreviations	Descriptions
SMS	Safety Management System
NMS	NEOM Minimum Standard
SOP	Standard Operating Procedure
ANSI	American National Standards Institute
NFPA	National Fire Prevention Association
LOTO	Lock-out Tag-out
OSHA	Occupational Safety and Health Administration.
CPP	Construction Phase Plan
PPE	Personal Protective Equipment
PRC	Procedure
LOTO	Lock-Out Tag-Out
IBC	International Building Codes

Abbreviations	Descriptions
OHS	Occupational Health and Safety

## 6 Related NEOM Documents

Table 3 : Related NEOM Documents

Document	Title
NEOM-NLF-SM-01.00	Section 14- ISO 45001 Cross Reference Audit Table
NEOM-NLF-SM	NEOM Safety Management Manual - Roles and Responsibilities
NEOM Element 2	Opportunity and Risk Management
NEOM- Element 3	Control of Documented Information and Legal Compliance
NEOM Element 5	Training, Awareness and Competence
NEOM-Element 6	Contractor Management
NEOM-NLF PRC 006	Occupational Health, Safety, and Fire Safety Requirements for Contractors
NEOM-NLF-NMS 006.001	SMS Organisation, Practitioner Registration and Appointment of Contractor
NEOM-NLF NMS 006.002	Occupational, Health and Safety Construction Management Plan (CPP)
NEOM-NLF-NMS 006.04	Permit to Work
NEOM-NLF-NMS-006.008	Overhead and Underground Services
NEOM-NLF- NMS 006.013	Safety Signage and Signal
NEOM-NLF-NMS-006.016	Electrical Safety
NEOM-NLF-NMS-006.021	Personal Protective Equipment (PPE)
NEOM-NLF-NMS-006.027	Compressed Gasses and Air
NEOM-NLF-NMS-006.038	Confined Spaces
OSHA 29 CFR 1910.147	Various Sections

## 7 Roles and Responsibilities

### 7.1 Client

- 7.1.1 General Health and Safety roles and responsibilities are defined in; and shall be carried out in accordance with, the requirements of NEOM-NLF-SM – Safety Management Manual - Roles and Responsibilities.
- 7.1.2 The Client is responsible for ensuring that NEOM Safety Commitment Statement and safety management system are properly applied within their areas of control/responsibility. Effective implementation will ensure compliance with relevant legislative requirements and will help promote the use of industry best safe working practices. Client shall ensure;
  - (a) That a suitable, Pre-Tender Health and Safety Plan (NEOM Element 6- Contractor Management Element 6) has been developed and issued to Contractors to ensure they have all the information

necessary to make informed decisions when developing the Construction Phase Health and Safety Plan which will form part of the Contractor review and selection process.

- (b) That for the Construction Sector the management of lock out / tag out general requirements are included in the Pre-Tender Health and Safety Plan
  - (c) That associated safe systems of work, and site rules are included in the Occupational, Safety and Health Construction Management Plan (NEOM-NLF-NMS 006.002 - CPP) in the case of the Construction Sector in accordance with NEOM-SMS Element 6 Contractor Management
  - (d) That the selection of Contractors shall be undertaken in accordance with NEOM's policies and procedures (NEOM Element 6- Contractor Management) to ensure that only Competent organisations capable of meeting the requisite safety standards associated with project are contracted.
- 7.1.3 Client shall conduct regular Contractor safety assurance reviews to provide the confidence level required that the safety management system is delivering as planned, and consistently achieves the acceptable level of safety. Including:
- (a) Safety performance monitoring and measuring;
  - (b) Managing change;
  - (c) Continuous improvement.

## 7.2 Contractor

- 7.2.1 Contractor shall undertake their roles and responsibilities in accordance with the general requirements of NEOM-NLF-SM-Safety Management Manual - Roles and Responsibilities
- 7.2.2 Contractor is responsible for all sub-contractors employed under their work contractors and shall ensure;
- (a) That all work activities are assessed, planned, organized, and that suitably competent Supervision is available to implement the safety requirements and oversee the work
  - (b) That persons appointed to manage /oversee work operations have the skills, knowledge, experience and, where relevant, the organisational capability to plan and manage work safely and without risk to those who may be affected by the activities. (Refer: NEOM- Element 5 – Training, Awareness and Competence)
  - (c) That employees carrying out the work are trained to recognize the associated hazards and understand the processes and procedures to control or minimize the risks.
  - (d) That all equipment including personal protective equipment required for use with work is fit for purpose, and (as required) has been inspected by a competent person and inspection records are maintained and readily available. (Refer: NEOM-NLF-NMS-006.021- Personal Protective Equipment) (PPE)
  - (e) All activities where unexpected energization or start up or machinery and/or equipment is identified as a hazard shall appropriately properly planned, organized, and supervised;
  - (f) Appropriate safe systems of work shall be developed; and
  - (g) An energy control program, as outlined in this NMS, shall be developed.

## 7.3 Employee

- 7.3.1 Employee shall undertake their roles and responsibilities in accordance with the general requirements of NEOM-NLF-SM –Safety Management Manual - Roles and Responsibilities
- 7.3.2 Report any activity or issue relating to the work which they believe is reasonably foreseeable to endanger their safety or that of another person's.
  
- 7.3.3 Shall use appropriate equipment or safety devices provided for work by the Employer in accordance with any training or instruction received in the use of the work equipment. (Refer NEOM-NFL-NMS-006.021 Personal Protective Equipment (PPE))
- 7.3.4 Employee shall undertake specific roles and responsibilities in accordance with the following:
  - (a) Never attempt to access dangerous parts of machinery unless authorised to do so by the employer and only once the machine has been made safe through isolation and implementation of the LOTO process
  - (b) Report any machine defects immediately and mark the machine out of use.
  - (c) Follow the safe systems of work as instructed by the Contractor.
  - (d) Follow the site rules, signage, and emergency arrangements

#### **7.4 Specific Responsibilities**

- 7.4.1 Sector, Organization, Department or Contractor Head is responsible in ensuring that provisions are made the safe systems of work to prevent and minimize risks in each workplace
- 7.4.2 Safety Practitioner/Coordinator is responsible to monitor the implementation of this procedures and document its effectiveness
- 7.4.3 The Responsible Person will support this procedure and ensure that any Contractor Organization working for, or on behalf of, the Sector, Organization, Department or Contractor will comply with the requirements of these procedures
- 7.4.4 Line Managers / Supervisors are responsible for training their workers in risks
- 7.4.5 The LP & FS Public Safety department will support the NEOM risk assessments by carrying out compliance checks and supporting and guiding the various safety teams.

#### **7.5 Employer**

The responsibility for Safety relating to Lock Out/ Tag Out may change depending on who is in charge of the site or location or equipment. To this end specific responsibilities relating to the LOTO in this NMS will generally be covered under the title 'Employer' – for the purpose of this NMS defined as an organisation that employs people and who has responsibility for the Site, Work Activity or for managing the LOTO System at any given time (Client, Operator, Contractor, Sector, Organisation, Division, or department).

## **8 Other Sections related to subject**

### **8.1 Minimum Standards Application**

- 8.1.1 This NMS applies to the servicing and maintenance of machines and equipment in which the unexpected energization or start-up of the machines or equipment, or release of stored energy could result in an accident or incident. This NMS establishes minimum requirements for the control of such hazardous energy.
- 8.1.2 This NMS does **not** apply to the following:
- (a) Normal production operations are not covered by this NMS. Servicing and/or maintenance which takes place during normal production operations is covered by this NMS only if:
    - I. An employee is required to remove or bypass a guard or other safety device; or
    - II. An employee is required to place any part of his body into an area on a machine or piece of equipment where work is performed upon the material being processed (point of operation).
  - (b) Work on cord and plug connected electric equipment for which exposure to the hazards of unexpected energization or start-up of the equipment is controlled by the unplugging of the equipment from the energy source and by the plug being under the exclusive control of the employee performing the servicing or maintenance;
  - (c) Hot tap operations on systems involving transmission and distribution for substances such as gas, steam, water, or petroleum products when they are performed on pressurized pipelines, provided that the Client and Contractor can demonstrate that:
    - I. Continuity of service is essential;
    - II. Shutdown of the system is impractical; and
    - III. Documented procedures are followed, and special equipment is used which will provide proven effective protection for employees.

### **8.2 Planning and Assessment**

- 8.2.1 Employer shall evaluate each site or work operation to determine if hazards are present and the workplace shall be assessed using risk management practices as required by NEOM Element 2 Risk and Opportunity Management.
- 8.2.2 Where hazards are present, the Employer shall develop an energy control program in line with the requirements of this NMS and shall ensure;
- (a) The establishment of systems of work which are safe to other employees, contractors, and the public;
  - (b) That associated safe systems of work, and site rules are included in the Occupational, Safety and Health Construction Management Plan NEOM-NLF-NMS-006.002 CPP) and in accordance with NEOM Element 6 Contractor Management

### **8.3 Lock-out/Tag-out Requirements**

- 8.3.1 Employer shall establish a program consisting of energy control measures, procedures, training, and periodic inspections to ensure that before an employee performs any inspection, repair maintenance or cleaning on plant / machinery / equipment where unexpected energizing, start-up or release of stored energy could occur. The plant / machinery / equipment shall be isolated for the energy source and rendered inoperative.
- 8.3.2 If an energy isolating device is capable of being locked out, the energy control measures shall utilize lockout (Refer: OSHA 29 CFR 1910.147).

- 8.3.3 If an energy isolating device is not capable of being locked out, the energy control measures shall utilize a tag-out system.
- 8.3.4 When a tag-out system / device is used on an energy isolating device which is capable of being locked out, the tag-out device shall be attached at the same location that the lock-out device would have been attached, and the Employer shall demonstrate that the tag-out program will provide a level of safety equivalent to that obtained by using a lockout program.
- 8.3.5 Whenever replacement or major repair, renovation or modification of a machine or equipment is performed, and whenever new machines or equipment are installed, energy isolating devices for such machine or equipment shall be designed to accept a lockout device.
- 8.3.6 Procedures shall clearly and specifically outline the scope, purpose, authorization, rules, and techniques to be utilized for the control of hazardous energy, and the means to enforce compliance; including, but not limited to, the following:
- (a) A specific statement of the intended use of the procedure;
  - (b) Specific procedural steps for shutting down, isolating, blocking, and securing machines or equipment to control hazardous energy;
  - (c) Specific procedural steps for the placement, removal and transfer of lock-out devices or tag-out devices and the responsibility for them;
  - (d) Specific requirements for testing a machine or equipment to determine and verify the effectiveness of lock-out devices, tag-out devices, and other energy control measures;
  - (e) Procedures to be followed where multiple lock out / tag out devices are to be utilized due to multiple tasks being undertaken;
  - (f) Specific requirements for removing lock-out or tag-out devices and restoring machines and equipment to normal operation.
- 8.3.7 Appropriate locks, tags, chains, or other hardware shall be provided by the Employer for isolating, securing, or blocking of machines or equipment from energy sources.
- 8.3.8 Lock-out devices and tag-out devices shall be singularly identified; shall be the only devices(s) used for controlling energy; shall not be used for other purposes; and shall meet the following requirements:
- (a) lock-out and tag-out devices shall be capable of withstanding the environment to which they are exposed for the maximum period that exposure is expected;
  - (b) Tags shall be legible, printed in Arabic and English, and any other language(s) necessary for the understanding and comprehension by all employees;
  - (c) Tags shall be constructed and printed so that exposure to weather conditions or wet and damp locations will not cause the tag to deteriorate or the message on the tag to become illegible;
  - (d) Tags shall not deteriorate when used in corrosive environments such as areas where acid and alkali chemicals are handled and stored;
  - (e) Tags shall be securely attached to energy isolating devices so that they cannot be inadvertently or accidentally detached during use;
- 8.3.9 Lock-out, tag-out devices shall be robust enough to sustain any adverse, forceful penetration.
- 8.3.10 The Employer shall conduct a periodic inspection of the energy control measures / procedures on an annual basis to ensure that the procedure and the requirements of this NMS are being followed. The periodic inspection shall be performed by a competent employee other than the ones(s) utilizing the energy control procedure(s) being inspected.

## **8.4 Training and Competency**

- 8.4.1 Employer shall ensure that OSH training complies with the requirements of:
- (a) NEOM Element 5 – Training, Awareness and Competency;
  - (b) NEOM-NLF-NMS 006.001 – OSH-MS Organisation, OSH Practitioner Registration and Appointment of Contractor
- 8.4.2 Employer shall provide training to ensure that the purpose and function of the energy control program are understood by employees and that the knowledge and skills required for the safe application, usage, and removal of the energy controls are acquired by employees. The training shall include the following:
- (a) Recognition of applicable hazardous energy sources;
  - (b) Types and magnitude of the energy available in the workplace;
  - (c) Types of isolation devices and their use; and
  - (d) Procedures, methods and means required for energy isolation and control in the workplace.
- 8.4.3 Each employee who shall work on machines or equipment which are subject to lockout/tag-out requirements shall be instructed in the purpose and use of the energy control procedure;
- 8.4.4 All other employees whose work operations are or may be in an area where energy control measures may be utilized, shall be instructed about the procedure, and about the prohibition relating to attempts to restart or reenergize machines or equipment which are locked out or tagged out.
- 8.4.5 When tag-out systems are used, employees shall also be trained in the following limitations of tags:
- (a) Tags are essentially warning devices affixed to energy isolating devices, and do not provide the physical restraint on those devices that is provided by a lock;
  - (b) When a tag is attached to an energy isolating means, it is not to be removed without authorization of the employee responsible for it, and it is never to be bypassed, ignored, or otherwise defeated;
  - (c) Tags may evoke a false sense of security, and their meaning needs to be understood as part of the overall energy control program.
- 8.4.6 Refresher training shall be provided for employees whenever there is a change in their job assignments, a change in machines, equipment or processes that present a new hazard, or when there is a change in the energy control measures;
- 8.4.7 Additional refresher training shall also be conducted whenever a periodic inspection reveals, or whenever the Employer has reason to believe that there are deviations from or inadequacies in the employee's knowledge or use of the energy control measures;
- 8.4.8 The refresher training shall re-establish employee proficiency and introduce new or revised control measures and procedures, as necessary.
- 8.4.9 The Employer shall maintain a record of employee training. The record shall contain:
- (a) Employee name and ID number;
  - (b) Classification of employee (authorized, affected, other);
  - (c) Dates of training; and
  - (d) Name of person providing the training.
- 8.4.10 The training shall be conducted in the common, understandable language of the employees & Employer must make sure that all necessary units of the training being delivered & understood by all involved in training program.

## **9 Record Keeping**

9.1.1 The Employer shall maintain a record that the periodic inspections have been performed. The record shall contain:

- (a) Training records;
- (b) List of authorized persons;
- (c) The machine or equipment on which the energy control procedure was being utilized;
- (d) The date of the inspection;
- (e) The employees included in the inspection;
- (f) The person performing the inspection;
- (g) Manufacturer's catalogue with all necessary information (Refer: NEOM-Element 3 Control of Documented Information & Legal Compliance)

## 10 Appendices

### 10.1 Appendix A: Forms, Signs and Checklists



## 10.2 Appendix B: Audit Criteria LOCK-OUT TAG-OUT (ISOLATION)

Contractor/ Area: \_\_\_\_\_

Department: \_\_\_\_\_

Completed by: \_\_\_\_\_ Date completed: \_\_\_\_\_

Audit Criteria		Requirements	Verification	Area of Concern
ISO 45001:2018 Clause	NMS Ref.			Yes/ No
5.3	7.1.2 (a)	Pre-Tender Health and Safety Plan has been developed and issued		
5.3, 8.1.4.2	7.1.2(d)	Selection of Contractors undertaken in accordance with NEOM's policies and procedures		
7.2	7.2.2 (b), 8.4	Persons appointed to manage /oversee work operations have the skills, knowledge, experience		
8.1.2 (e)	7.2.2(d), 7.3.3	Personal protective equipment required for use are fit for purpose		
6.1.2.3, 6.1.2.2	7.2.2(c), 8.2.1, 8.2.2	Hazards Identification Plan (HIP)  Assessment of the various risks shall be undertaken		
8.1.1, 8.1.2	7.2.2(f)	Contractor shall consider safe methods of working		
6.1.4, 8.1.2	8.3.2	Energy isolating device is capable of being locked out, the energy control measures shall utilize lockout		
	8.3.7	Appropriate locks, tags, chains, or other hardware shall be provided by the Employer for isolating, securing, or blocking of machines or equipment from energy sources		
9.1	8.3.10	The Employer shall conduct a periodic inspection of the energy control measures / procedures on an annual basis		

## 10.3 Appendix C: Guidance Documents

The Occupational Safety and Health Administration (OSHA) - holds an organisation responsible for ensuring that a clearly-defined lockout/tagout procedure is in place and followed to ensure the safety of those carrying out repairs and servicing.

The OSHA standard for The Control of Hazardous Energy (Lockout/Tagout) (29 CFR 1910.147) for general industry outlines measures for controlling different types of hazardous energy. The LOTO standard establishes the employer's responsibility to protect workers from hazardous energy. Employers are also required to train each worker to ensure that they know, understand, and are able to follow the applicable provisions of the hazardous energy control procedures:

Their guidance states that you must:

- Develop, implement and enforce an energy control program
- Use lockout devices where appropriate to fully secure an energy source. Only where a lockout device isn't suitable can tagout be used, and the level of protection must be equivalent to that of a lockout.
- Ensure that new/overhauled equipment is fully capable of being locked out during maintenance periods
- Develop, implement and enforce a tagout program which can be used when lockout isn't possible
- Develop, implement and enforce energy control procedures
- Any lockout devices used must be suitable for use on the device you're locking out. For example, a valve lockout could not be used on a MCB and be expected to be fully secure.
- Lockout/tagout devices must identify the individual users. This can be done by tagging, or by attaching individually tagged padlocks.
- A policy must be enforced that means only the person who locked out an energy source can remove it. No one else should do so
- Inspect energy control procedures regularly, or at least annually
- Relevant training must be provided to any employees carrying out lockout/tagout
- Comply with OSHA standard to ensure that outside contractors, those carrying out group lockouts and shift and personnel changes are fully aware of the correct LOTO procedures

The control of hazardous energy is also addressed in a number of other OSHA standards, including Marine Terminals (1917 Subpart C), Safety and Health Regulations for Longshoring (1918 Subpart G), Safety and Health Regulations for Construction; Electrical (1926 Subpart K), Concrete and Masonry Construction (1926 Subpart Q), Electric Power Transmission and Distribution (1926 Subpart V), and General Industry; Electrical (1910 Subpart S), Special Industries (1910 Subpart R), and Electric Power Generation, Transmission and Distribution (1910.269).

In the UK there are no specific regulations that nominate LOTO's however isolations are regulated in a number of different regulations such as the Electricity at Work Regs 1989. All have a common theme of isolation of potential hazards. There are a number of free publications available from the HSE web site including, but not limited to;

HSG 85 – Electricity at Work --- HSR 25 Guidance on the Electricity at Work Regulations 1989 ---  
INDG 163 Controlling risks in the workplace --- Best Practice Guide on safe isolations



نیوم NEOM

**NEOM OCCUPATIONAL HEALTH and SAFETY**

**NEOM MINIMUM STANDARD**

for

**FIRST AID MEDICAL EMERGENCY TREATMENT**

NEOM-NLF-NMS-006.029 Rev 02.00 – February 2022

©NEOM [2021]. All rights reserved.

## Document History

Revision code	Description of changes	Purpose of issue	Date
Rev 00.00	First Issue	Issued for Implementation	27/07-2020
Rev 02,00	Sector Review	Issued for Implementation	01-02-2022

## Document Approval

	Prepared by	Reviewed by	Approved by
Name	Robert Murphy	Talal Al Anazi	Adel Al Wuhaib
Job Title	Loss Prevention Specialist LP/FS -Public Safety	Director, Loss Prevention/Fire Safety (LP/FS) Public Safety	Executive Director Public Safety

## OUR NEOM VALUES



### CATALYST

Make a difference.  
Create a legacy.



### CARE

Leave the environment  
in a better place.



### CURIOUS

Challenge the norm.  
Stay restless.



### PASSIONATE

Be accountable.  
Finish what you start.



### RESPECT

Be authentic.  
Be true. Be fair.



### DIVERSITY

Embrace cultural  
differences.  
Seek to understand.

## Contents

<b>1</b>	<b>PURPOSE.....</b>	<b>4</b>
<b>2</b>	<b>SCOPE.....</b>	<b>4</b>
<b>3</b>	<b>EXPECTATIONS .....</b>	<b>4</b>
<b>4</b>	<b>LIST OF DEFINITIONS.....</b>	<b>5</b>
<b>5</b>	<b>LIST OF ABBREVIATIONS.....</b>	<b>5</b>
<b>6</b>	<b>RELATED NEOM DOCUMENTS .....</b>	<b>6</b>
<b>7</b>	<b>ROLES AND RESPONSIBILITIES.....</b>	<b>8</b>
7.1	Client .....	8
7.2	Contractor.....	8
7.3	Employee .....	9
7.4	Specific Responsibilities.....	9
<b>8</b>	<b>OTHER SECTIONS RELATED TO SUBJECT.....</b>	<b>10</b>
8.1	Medical Professional .....	10
8.2	First Aid and Medical Care Facilities .....	11
8.3	First Aid Material Resources .....	11
8.4	Communications.....	12
8.5	Lone Worker(s) and Remote Location Worker(s):.....	12
8.6	First Aiders and Medical Staff: .....	12
8.7	First Aid/Medical Emergency Treatment Requirements.....	12
8.8	First Aid Treatment of Patients.....	13
8.9	First Aid Kits .....	13
8.10	Automated External Defibrillators (AED).....	14
8.11	Infection Control .....	15
8.12	Hazardous Materials .....	16
8.13	Workers Camps / Villages .....	16
8.14	First Aid and Medical Emergency Treatment Centres.....	16
8.15	Health Insurance Coverage.....	17
8.16	Record Keeping.....	17
<b>9</b>	<b>APPENDICES .....</b>	<b>19</b>
9.1	Appendix A:1: Minimum First Aid Requirements/Content Checklist.....	19
9.2	Appendix A:2: Recommended CPR / AED Equipment list.....	21
9.3	Appendix B: Audit Criteria .....	22

## List of Tables

Table 1 : Table of Definitions .....	5
Table 2 : Table of Abbreviations .....	5
Table 3 : Related NEOM Documents .....	6

## **1 Purpose**

This NEOM Co. SMS Minimum Standards (hereafter referred to as NMS) relates to the provision of first aid and medical emergency treatment to employees/workers/other persons.

It provides guidance to support compliance with industry best practice and international regulatory occupational health and safety (OHS) requirements to ensure that the associated risks are assessed, and control measures are implemented in accordance with the hierarchy of risk controls.

It has been developed to align with the requirements of the ISO 45001 Health and Safety Management Manual (Refer NEOM-NLF-PRC-006- Section 2 ISO 14001 Cross reference table)

## **2 Scope**

This NMS applies to all personnel within NEOM and any Contractors working for NEOM and or associated projects and activities. It is designed to incorporate requirements set by the NEOM-SMS.

## **3 Expectations**

To ensure the health and safety of all personnel, protection of assets (services, plant/equipment) and the environment

NEOM expect each Sector, Organization, Department or Contractor to ensure that risks associated with work activities are controlled in accordance with the hierarchy of risk controls: elimination, substitution, engineering controls, administrative controls, and personal protective equipment.

Consideration shall be given to technological advances that may introduce new means of controlling or eliminating the risks associated with work.

That the expectation for safety compliance is meeting and exceeding all applicable OSHA Laws, Regulations, and Industry Best Practice.

Applicable requirements and standards include:

- (a) OSHA Standards and Regulatory requirements;
- (b) ANSI requirements;
- (c) NFPA Standards and requirements;
- (d) NEOM Minimum Standards
- (e) Saudi Building Codes
- (f) International Building Codes

*If requirements of this document conflict with requirements set by another regulatory authority, Contractor are required to follow the more stringent requirement.*

## 4 List of Definitions

Table 1 : Table of Definitions

Terms	Definitions
NEOM Co	NEOM Company
Client	NEOM Sector /Department responsible for management and oversight of the Contractor
Employer	The person or organisation that employs personnel to complete the work
Contractor	The organisation contracted to carry out the works
First Aid	An immediate assistance given to a person suffering from a sudden illness or injury in the workplace, with care provided to preserve life, prevent the condition from worsening, and/or promote recovery.
First Aider	A person that has been trained in first aid to perform first aid in case of an emergency.
Medical Device	A product used in healthcare for the diagnosis, prevention, monitoring or treatment of illness or handicap excluding drugs. As a rule, it does not achieve its principal intended action in or on the human body by pharmacological, immunological, or metabolic means
Medical (emergency) treatment	A medical (emergency) service provided by a suitably qualified and licensed healthcare professional, aimed at treating, curing or healing a medical condition or health problem.
Sector, Organization, Department or Contractor	The Sector, Organization, Department or Contractor is the NEOM entity or developer designated by NEOM to accept custody for planning, designing, constructing, or managing and operating a particular asset or a group of assets
Safety Management System (SMS)	Occupational Health and Safety Management System established by NEOM in compliance to ISO 45001 Standard

## 5 List of Abbreviations

Table 2 : Table of Abbreviations

Abbreviations	Descriptions
SMS	Safety Management System
NMS	NEOM Minimum Standard
SOP	Standard Operating Procedure
ANSI	American National Standards Institute
NFPA	National Fire Prevention Association
CPP	Construction Phase Plan
OSHA	Occupational Safety and Health Administration.
PPE	Personal Protective Equipment
MOH	Ministry of Health (KSA)
AED	Automated External Defibrillator
AHLS	Advanced HazMat Life Support
BHLS	Basic HazMat Life Support

Abbreviations	Descriptions
CPR	Cardiopulmonary resuscitation
EMT	Emergency Medical Technicians
EMT-P	Emergency Medical Technicians - Paramedics
GP	General Practitioner
MOH	Ministry Of Health
ID	Identification number. This number may include the following: <ul style="list-style-type: none"><li>• ID number</li><li>• Visa number</li><li>• Work permit number</li></ul>
ILS	Immediate Life Support
OFQUAL	Office of Qualifications and Examinations Regulation (United Kingdom)
PDIC	Poison and Drug Information Centre (at MOH)
SPI	Skin Penetrating Injury
SCA	Sudden Cardiac Arrest
IBC	International Building Codes
OHS	Occupational Health and Safety

## 6 Related NEOM Documents

Table 3 : Related NEOM Documents

Document Code	Document Name
NEOM Element 2	Risk and Opportunity Management
NEOM Element 3	Control of Documented Information & Legal Compliance
NEOM-Element 5	Training, Awareness and Competency.
NEOM-Element 6	Contractor Management
NEOM Element 8	Incident Investigation & Management
NEOM-SMS	Neom Safety Management System
NEOM-NLF-SM	Safety Manual - Roles and Responsibilities
NEOM-NLF-PRC-006- Section 2	ISO 14001 Cross Reference Table
NEOM-NLF-PRC-006;	Occupation Health, Safety, and Fire Safety requirements for Contractors
NEOM-NLF-NMS-006.001	SMS Organisation, Practitioner Registration and Appointment of Contractor
NEOM-NLF-NMS-006.002	Safety Construction Management Plan
NEOM-NLF-NMS-006.012 –	Barricading of Hazards
NEOM-NLF-NMS-006.013	Safety Signage and Signals
NEOM-NLF-NMS-006.020	Hazardous Materials (COSHH))
NEOM-NLF-NMS-006.021	Personal Protective Equipment (PPE)
NEOM-NLF-NMS-006.036	Lone Working and / or Working in Remote Locations



## **7 Roles and Responsibilities**

### **7.1 Client**

- 7.1.1 General Health and Safety roles and responsibilities are defined in; and shall be carried out in accordance with the requirements of NEOM-NLF-SM–Safety Management Manual - Roles and Responsibilities.
- 7.1.2 The Client is responsible for ensuring that NEOM Safety Commitment Statement and safety management system are properly applied within their areas of control/responsibility. Effective implementation will ensure compliance with relevant legislative requirements and will help promote the use of industry best safe working practices.
- 7.1.3 That a suitable, Pre-Tender Health and Safety Plan has been developed and issued to Contractors to ensure they have all the information necessary to make informed decisions when developing the Construction Phase Health and Safety Plan (NEOM-NLF-NMS-006.002 Safety Construction Management Plan) (CPP) which will form part of the Contractor review and selection process
- 7.1.4 That the selection of Contractors shall be undertaken in accordance with NEOM's policies and procedures (NEOM-Element 6 Contractor Management). To ensure that only Competent organisations capable of meeting the requisite safety standards associated with project are contracted.
- 7.1.5 Conduct regular Contractor safety assurance reviews to provide the confidence level required that the safety management system is delivering as planned, and consistently achieves the acceptable level of safety. Including:
  - (a) Safety performance monitoring and measuring;
  - (b) Managing change;
  - (c) Continuous improvement.

### **7.2 Contractor**

- 7.2.1 Contractor shall undertake their roles and responsibilities in accordance with the general requirements of NEOM–NLF-SM–Safety Management Manual-Roles and Responsibilities
- 7.2.2 Maintaining control of access to dangerous or high-risk areas or equipment using suitable barricades that are in serviceable condition (Refer: NEOM-NLF-NMS-006.012 – Barricading of Hazards)
- 7.2.3 That all work activities are assessed, planned, organized, and that suitably competent Supervision is available to implement the safety requirements and oversee the work (Refer: NEOM- Element 5 – Training, Awareness and Competency)
- 7.2.4 Ensure persons appointed to manage /oversee work operations have the skills, knowledge, experience and, where relevant, the organisational capability to plan and manage work safely and without risk to those who may be affected by the activities (Refer: NEOM Element 5 Training, Awareness, and Competence).
- 7.2.5 Ensure employees carrying out the work are trained to recognize the associated hazards and understand the processes and procedures to control or minimize the risks.(Refer: NEOM Element 2 Risk and Opportunity)
- 7.2.6 That all equipment including personal protective equipment required for use is fit for purpose, and (as required) has been inspected by a competent person and inspection records are maintained and readily available.(Refer: NEOM-NLF-NMS-006.021 Personal Protective Equipment) (PPE)

### **7.3 Employee**

- 7.3.1 Shall undertake their roles and responsibilities in accordance with the general requirements of NEOM-NLF-SM – Safety Management Manual - Roles and Responsibilities.
- 7.3.2 Report any activity or defect relating to the work which they believe is reasonably foreseeable to endanger their safety or that of another person's.
- 7.3.3 Shall use appropriate equipment or safety devices provided for the work by the Contractor in accordance with any training or instruction received in the use of the work equipment. (Refer NEOM-NFL-NMS-006.021 Personal Protective Equipment)
- 7.3.4 Shall undertake their specific roles and responsibilities in accordance with the following:
- 7.3.5 Employees shall report to appropriate supervisors / first aider when items from first aid kits are used.
- 7.3.6 Employees shall report all injuries and illnesses to a designated first aider or onsite medical personnel. All data should be reported in NEOM Element 10 Safety statistics NEOM-NLF-PRC-010.02 and submitted to LPFS on a weekly basis
- 7.3.7 Self-Employed Persons:
  - (a) A self-employed person shall provide, or ensure provision of such first-aid equipment, as is appropriate and sufficient in the circumstances to enable him/her to render first-aid to him/herself while at work.

### **7.4 Specific Responsibilities**

- 7.4.1 Sector, Organization, Department or Contractor Head is responsible in ensuring that provisions are made the safe systems of work to prevent and minimize risks in each workplace
- 7.4.2 Safety Practitioner/Coordinator is responsible to monitor the implementation of this procedures and document its effectiveness
- 7.4.3 The Responsible Person will support this procedure and ensure that any Contractor Organization working for, or on behalf of, the Sector, Organization, Department or Contractor will comply with the requirements of these procedures
- 7.4.4 Line Managers / Supervisors are responsible for training their workers in risks
- 7.4.5 The LP & FS Public Safety department will support the NEOM risk assessments by carrying out compliance checks and supporting and guiding the various safety teams.

## **8 Other Sections related to subject**

### **8.1 Medical Professional**

- 8.1.1 Any medical professional providing services beyond first aid in the occupational setting, or at employers supplied accommodation (worker camps), shall have a valid license to practice medicine as required by KSA Ministry of Health (MOH). Medical and advanced first aid facilities shall maintain valid licenses as required by MOH.
- 8.1.2 Employer (Sector, Organization, Department or Contractor) shall undertake their specific roles and responsibilities in accordance with the following:
- (a) Ensure that all employees, contractors, and subcontractors have appropriate medical health insurance that will provide coverage for medical care provided in NEOM.
  - (b) If health insurance coverage is not present for whatever reason:
    - I. Employers shall pay all costs associated with medical emergency treatment and transportation to medical facilities for employees as long as the employee follows established policies and procedures for receiving medical treatment.
    - II. Shall pay all costs in the case of emergencies regardless of other policies and procedures.
- 8.1.3 Ensure those persons who require emergency first aid services receive prompt and appropriate first aid services by an appropriately certified and trained first aider, whilst appropriate arrangements for emergency support are being pursued.
- 8.1.4 Ensure in the event of a medical emergency or work-related injury/illness, based on medical recommendation by the NEOM medical provider shall transfer the employee to the nearest medical facility that can provide appropriate care for the employee. Employers shall not transfer employees to medical facilities outside of NEOM unless that is where the closest medical facility that can provide appropriate care is located.
- 8.1.5 Ensure documented health risk assessments are undertaken, on a regular basis, to determine the level of first aid and medical care required at the worksite. The risk assessment shall conform with requirements of NEOM Element 2 Risk and Opportunity Management. and shall consider:
- (a) The nature of the work and workplace hazards and risks.
  - (b) The size of the organisation.
  - (c) The nature of the workforce.
  - (d) Work patterns.
  - (e) The number and distribution of the workforce.
  - (f) The entities history of incidents.
  - (g) Provision for medical emergency treatments up to a 24-hour day and during weekends where required.
  - (h) The need of travelling, remote or lone employees.
  - (i) The remoteness of the worksite from emergency medical services.
  - (j) Transport arrangements for emergency evacuation when required.
  - (k) Employees working on shared or multi-occupied sites.
  - (l) Annual leave and other absences of first aiders and appointed persons; and
  - (m) First aid provisions for non-employees.

- (n) Ensure reported first aid and medical emergency treatment cases are investigated as per the requirements of NEOM Element 8 Incident Investigation & Management

## **8.2 First Aid and Medical Care Facilities**

- 8.2.1 Ensure that first aid and medical care facilities at each place of work are appropriate for the risks and hazards associated with the worksite and that they meet the minimum requirements set forth in Section 8.2 (First Aid/Medical Emergency Treatment Requirements) of this document and comply with requirements set in Chapter 8 of KSA Labour law.
- 8.2.2 Worksites with medical facilities including first aid treatment and/or licensed medical professionals shall meet all the requirements set by the Ministry of Health (MOH) for registration and licensing.
- 8.2.3 Ensure that first aid trained personnel are always available at the worksite.
- 8.2.4 Ensure that Nurses, Occupational Health Nurses, Medical Practitioners, and any other medical professionals rendering related services are registered in their professional capacity with MOH.
- 8.2.5 Ensure that only licensed/professional medical staff shall operate medical emergency treatment centres and provide medical emergency services to employees working on-site in a manner that provides the best patient care reasonably practicable.
- 8.2.6 Designated first aid or medical treatment centre shall be of appropriate size to meet the needs of the worksite as per the risk assessment and MOH requirements. Saudi "Labor Law")
- 8.2.7 Availability of First Aiders and Medical staff and their level of training, skills, knowledge, and experience shall be based on the assessed risk factors of the industry and entity.

## **8.3 First Aid Material Resources**

- 8.3.1 Employers shall ensure that the workplace first aid resources are documented in Policies and Operating Procedures and compliant with Chapter 8 of KSA Labour law.
- 8.3.2 First aid resources shall be based on the assessed risks and be appropriate to manage injuries and/or illnesses that are reasonably foreseeable to occur in a particular workplace environment. See Appendix 1. Minimum First Aid Requirements/Content Checklist
- 8.3.3 Safe disposal of waste resulting from first aid treatment shall be in accordance with the relevant waste regulations and requirements.

## **8.4 Communications**

- 8.4.1 All first aid facilities shall be appropriately identified and marked with the recognized first aid sign, as per NEOM-NLF-NMS-006 013 Safety Signage and Signals.
- 8.4.2 The location where first aid treatment may take place shall be so as far as reasonably practicable, free from hazards.
- 8.4.3 Workplaces shall have a detailed medical emergency plan that includes contact information for medical care facilities, ambulance services, and maps to the closest medical facility that can provide emergency medical care.
- 8.4.4 Ensure that employees understand how and where to receive first aid or medical emergency treatment.
- 8.4.5 Notices indicating contact details for first aiders, on-site medical providers, the emergency contact number/radio frequency, and where the first aid box is, shall be posted throughout the worksite.
- 8.4.6 Special consideration shall be given to the provision of first aid information to employees in a manner considering language and literacy levels.
- 8.4.7 Contact and address information shall be posted at the entrance to worksites for employers approved physician (along with the hours of operation) and emergency medical facility (e.g., hospital) that shall provide care beyond first aid for employees.

## **8.5 Lone Worker(s) and Remote Location Worker(s):**

- 8.5.1 Employers with lone workers and/or remote location workers shall provide or ensure provision of training and such first-aid equipment, as is appropriate and sufficient in the circumstances to enable the employees to render first-aid to himself/herself/themselves while at work. Employees shall also have appropriate means of communication and contact information for local emergency services. (Refer: NEOM-NLF-NMS-006.036 Lone Working and / or Working in Remote Locations)

## **8.6 First Aiders and Medical Staff:**

- 8.6.1 First Aiders / Medical Staff are required to:
  - (a) Limit their first aid treatment to that within the scope of their license and training level.
  - (b) Ensure that their training is certified and current.
  - (c) Keep documentation of cases treated in accordance with requirements of this NMS and their employers.
  - (d) Be knowledgeable about the nature and type of hazards that they are reasonably practicable to encounter and the types of injuries and specific health conditions that are reasonably practicable to require first aid treatment; and
  - (e) Ensure that emergency support services are pursued to ensure timely intervention by specialist services such as ambulance services or physician support for a chronic condition.

## **8.7 First Aid/Medical Emergency Treatment Requirements**

- 8.7.1 The number of first aiders and medical staff to the number of employees / workers/other persons shall be in line with the identified risks and hazards of the workplace environment, the needs of the organization and the employees/persons, and the requirements of other relevant regulatory bodies, but shall conform to the following minimum requirements:
  - (a) At least one first aider per worksite per shift with less than 50 employees; and
  - (b) At least one first aider per 50 employees per worksite per shift with more than 50 employees.

**Note:** for requirements related to on duty nurses and medical emergency treatment by physicians, refer to Chapter 8 of KSA Labour law.

- 8.7.2 First aiders and medical staff working hours should not exceed 12 hours in any 24-hour period and must not exceed the maximum prescribed working hours for adult employees of eight hours per day or forty-eight hours per week.

## 8.8 First Aid Treatment of Patients

### 8.8.1 For emergency services:

- (a) Initial first aid treatment shall be available anywhere on the worksite within an acceptable minimum response time.
- (b) If a worksite has onsite ambulance services, the response time shall be within acceptable limits to anywhere on the site.
- (c) If ambulance response time (for internal or external ambulance services) is greater than 15 minutes for a worksite that have high hazard activities, the worksite shall have appropriate medical staff (emergency medical technician (EMT)/paramedic or ambulance nurse) onsite with current Immediate Life Support (ILS) and Basic Trauma Life Support (BTLS) training to ensure a response time of 10 minutes or less.
- (d) Providers of emergency services and the appropriate surface transport sector authority shall work together to ensure that access to emergency services is available on the surface transport network within the time limits as specified by MOH access requirements for healthcare services.
- (e) Up-to-date telephone numbers of first aiders and nearest emergency organizations (e.g., medical clinics, hospitals) shall be clearly displayed on notice boards and communication points, including the contact information for the Saudi Food and Drug Authority (SFAD) Poison and Drug Information Centre (PDIC), which is to be called only in case of poison exposures.

**Note:** Current contacts of PDIC: - Web Site: <https://dpic.sfda.gov.sa>

### 8.8.2 General Emergency Treatment of Injured Persons:

- (a) For slight injuries, injured persons shall be evaluated and treated according to their injuries.
- (b) For non-life-threatening injuries that require a higher level of medical treatment, the injured person can be transported by a company vehicle to the nearest medical emergency treatment centre or hospital.
- (c) For serious injuries and injuries that are life threatening, ambulance services shall be called upon to transport the patient to the nearest hospital for treatment.
- (d) Employees complaining of chest pain shall always be treated as a life-threatening condition and ambulance services must be called immediately. As far as reasonably practicable, an employee complaining of chest pain shall not be transported to a medical treatment centre or hospital in a personal or company vehicle, unless the vehicle has been registered with MOH as an ambulance and meets the MOH Standard for Ambulance Services and is staffed with a minimum of one EMT and a driver.

## 8.9 First Aid Kits

- 8.9.1 Employers shall perform a health risk assessment to determine the number and contents of the first aid kits. (Refer: NEOM Element 2 Risk and Opportunity Management)
- 8.9.2 First aid kits shall be placed in all worksite vehicles.
- 8.9.3 First aid kits shall be placed in all office buildings (minimum one on each floor) and throughout the worksite as needed and be secured in a suitably secured container / cupboard / facility that can be accessed easily and quickly in case of emergency.
- 8.9.4 Contents of the first aid kits shall be based on the health risk assessment, but at a minimum shall have the contents listed in Appendix 1. Minimum First Aid Requirements/Content Checklist
- 8.9.5 Employers shall ensure that first aid kits / medical supplies are inspected by a competent person at least once per month to ensure the required contents are available, including replenishing necessary items and replacing expired items.
- 8.9.6 A first aid registry shall be provided with the first aid kit to be completed by the first aider and be provided to the responsible person after administering any form of first aid.

## **8.10 Automated External Defibrillators (AED)**

- 8.10.1 Employers should consider establishing an AED program and installing AEDs to manage sudden cardiac arrest in their workplace, based on risk assessment and /or as mandated by relevant authorities.
- 8.10.2 An AED program should:
  - (a) Include a management system and written summary of the AED program, establishing clearly defined lines of responsibility for those who oversee and monitor the program or participate in it.
  - (b) Assign a MOH-licensed physician for managing all medical aspects of the AED program and oversee the program's administration and coordination activities.
  - (c) Be integrated in the more general plan describing emergency responses at the occupational setting.
  - (d) Include recognized and standardized training of all designated first aid responders and employed healthcare professionals. Topics should include CPR and use of the specific AED expected to be available and used at the occupational site.

**Note:** *In case of sudden cardiac arrest AEDs should be used by the first available suitably trained first aider.*

- (e) Ensure selection and placement of AEDs and ancillary supplies that meet local and federal legislation criteria for medical devices, and ensure they are regularly maintained as per the manufacturer's requirements; and

**Note:** *See Appendix 2 for a recommended CPR/AED equipment list.* Be incorporated into or have its own quality assurance program.

- 8.10.3 Placement of AEDs should be considered for all workplaces where people may congregate, such as corporate offices, worksites, and employee camps/villages, in the following areas:
  - (a) Areas where many people work closely together, such as assembly lines and office buildings.
  - (b) AEDs should be conveniently installed and easily accessible to ensure response time within 3-5 minutes.
  - (c) Close to a confined space.
  - (d) Areas where electric-powered devices are used.
  - (e) Outdoor worksites where lightning may occur.
  - (f) Health units where workers may seek treatment for heart attack symptoms.

- (g) Company fitness units and cafeterias; and
- (h) Remote sites, such as offshore drilling rigs, construction projects, marine vessels, power transmission lines, and energy pipelines.

## **8.11 Infection Control**

- 8.11.1 First aid personnel and employees that may be at risk of exposure to infectious diseases or biological hazards shall receive training on the various types of blood borne pathogens and methods to protect themselves from exposure. Refresher training and audits must be conducted at least twice per year with documented evidence of audits and awareness programs
- 8.11.2 Appropriate personal protective equipment (PPE) shall be provided to protect first aid personnel and ill or injured persons from risks of exposure to infections.
- 8.11.3 Personal protective equipment (PPE) shall include at a minimum:
  - (a) Protective gloves such as disposable PVC, latex gloves, or heavy-duty gloves where there is a risk of exposure to sharp objects or when cleaning blood or body substance spills.
  - (b) Protective clothing such as disposable non-porous overalls or plastic aprons.
  - (c) Eye protection such as goggles and safety glasses.
  - (d) Safety footwear to protect feet from sharp objects; and
  - (e) Resuscitation mask to reduce the risk of exposure to blood and body substances.
- 8.11.4 Control measures shall be in place for first aid personnel for the management of skin penetrating injuries (SPI) and other exposures to blood or body substances.
- 8.11.5 Management of a skin penetrating injury (SPI) includes the following:
  - (a) Encourage the wound to bleed by gently squeezing.
  - (b) Wash the area with cold running water and soap if available; and
  - (c) Apply an antiseptic if available then cover the wound with an appropriate dressing.
  - (d) This is a reportable work-related injury – the medical provider should complete at a minimum their own internal reporting and submit NEOM incident report.
- 8.11.6 Management of exposure to blood or body substances includes the following:
  - (a) Wash away the blood or body substance with soap and water. If water is not available, then use a 60-90% alcohol-based hand rinse or foam.
  - (b) If the eyes are contaminated, rinse eyes while open with tap water or saline solution; and
  - (c) If blood gets into the mouth, spit it out and then repeatedly rinse with water.
- 8.11.7 If exposed to blood or body substances the person shall be referred for medical assessment immediately. The doctor can then assess the degree of exposure and arrange blood tests and immunization where appropriate. Access to professional counselling shall also be provided, if necessary.
- 8.11.8 Records of blood or body substance exposure shall be documented and kept at the workplace. Records of exposure and treatment shall be kept confidential.
- 8.11.9 Employees who are suspected or diagnosed by a MOH-licensed physician to suffer from an acute onset of a notifiable communicable disease with a potential to spread the disease to co-workers or the community (e.g., influenza), must be provided with appropriate personal protective equipment (e.g., face mask) and immediately be transferred to a MOH-licensed healthcare facility. (Refer: NEOM-NLF-NMS-006.021 Personal Protective Equipment)

## **8.12 Hazardous Materials**

8.12.1 First aid personnel and employees that may be at risk of exposure to hazardous materials shall receive training on the various types of hazardous materials and methods to protect themselves from exposure. (Refer: NEOM-NLF-NMS-006.020 Hazardous Materials (COSHH))

8.12.2 Appropriate personal protective equipment (PPE) shall be provided to protect first aid personnel and ill or injured persons from risks of exposure to hazardous materials. (Refer: NEOM-NLF-NMS-006.021 Personal Protective Equipment)

**Note:** Employers should consider providing basic and/or advanced HazMat life support training (BHLS/AHLS, [www.ahls.org](http://www.ahls.org)) for healthcare professionals likely to attend to patients exposed to toxic substances.

## **8.13 Workers Camps / Villages**

8.13.1 Employers that have workers camps/villages, or contract out to a third party to provide a worker's camp/village, shall ensure that: the medical service from any provider will need to exceed the NEOM minimum standard and aspire to the NEOM Vision of health care for all. These clauses will be in any new contract for Construction camp clinics and should,

- (a) First aid and/or medical emergency treatment facility is available onsite; and
- (b) Ambulance services are provided, under consideration of response time from nearby hospitals or third-party services.

8.13.2 In addition to the requirements set above for first aid and medical emergency treatment, employers shall ensure a community health program exists that provides the following services:

- (a) Education of employees/workers on communicable diseases including blood borne pathogens, HIV, Hepatitis B & C, sexually transmitted diseases (STD's), chicken pox, and tuberculosis (TB).
- (b) Annual drug and alcohol awareness campaigns.
- (c) Annual poison prevention campaign.
- (d) Annual smoking cessation campaigns.
- (e) Vaccination & immunisation programme aligned with relevant MOH policy and standards.
- (f) Education on healthy eating and basic nutrition.
- (g) Education on basic oral health and personal hygiene; and
- (h) For workers exposed to heat in summer, a programme of awareness and education regarding precautions to be taken and the requirements of a heat stress management programme.

8.13.3 Ensure that workers camps/villages have a crisis management plan that addresses potential outbreak of a contagious disease and meets requirements of relevant authorities, and that facilities are designated to isolate employees that have contagious diseases (e.g., chicken pox, flu, etc.)

8.13.4 Ensure workers camps/villages have a medical emergency response plan that is tested, at a minimum, annually.

## **8.14 First Aid and Medical Emergency Treatment Centres**

8.14.1 Worksites with first aid and medical emergency treatment centres shall meet all the requirements set by MOH for registration and licensing as a clinic. The MOH definition of a clinic includes the following:

- (a) A clinic is a health care facility that is staffed by a health care general practitioner (one or more) or specialist (one or more). A clinic is mainly used for health consultations, first aid services and

simple treatment. It does not provide emergency services. Emergency cases shall be referred to a hospital; and

- (b) Clinic Subtypes:
- (c) General Clinic.
- (d) General Dental Clinic.
- (e) School Clinic.
- (f) Specialized Clinic.
- (g) Specialized Dental Clinic; and
- (h) First Aid Post (A health facility that administers emergency treatment to an injured or sick person before necessary professional medical care is secured).

8.14.2 The structural and equipment requirements of First Aid and Medical Treatment Centres shall follow MOH Guidelines for Health Facility Design, Approvals, and Construction Prequalification.

## **8.15 Health Insurance Coverage**

8.15.1 As per GOSI and KSA Labour Law, healthcare services for work-related injuries and diseases as determined in Chapter 8, Regarding Work injuries, are covered by health insurance, and must be included in the schedule of benefits of all health insurance policies (basic and enhanced).

## **8.16 Record Keeping**

8.16.1 At a minimum, records shall be maintained of the following:

- (a) Training of First Aiders and Medical staff (Section 2.3)
- (b) Contact details of First Aiders and Medical staff; and
- (c) First Aid statistics and emergency cases treated.

8.16.2 As a minimum, the following information shall be documented for all first aid and medical emergency treatment cases:

- (a) Injured person's name.
- (b) ID number.
- (c) Employee ID number.
- (d) Profession of injured person.
- (e) Date, time and place of injury.
- (f) Description of injury.
- (g) Description of how the injury occurred.
- (h) Treatment provided, including treatment provided by outside medical services.
- (i) Any follow-up treatment required; and
- (j) Name and signature of the first aider or provider of medical emergency treatment.

8.16.3 Information must be documented in accordance with the NEOM Element 3 Control of Documented Information & Legal Compliance, and the MOH Policy on Medical Record Health Information, Retention and Disposal.



## 9 Appendices

### 9.1 Appendix A: Minimum First Aid Requirements/Content Checklist

Item No.	Product Description	Item Quantity (by size of kit)			
		Small	Medium	Large	Travel
<b>Required</b>					
1	Pocket First Aid Guide	1	1	1	1
2	Contents list	1	1	1	1
3	Disposable gloves, latex free, powder-free, different sizes (small/medium/large), pairs	2/2/2	3/3/3	4/4/4/	1/1/1
4	Laerdal pocket mask or resuscitation face shield	1	1	2	1
5	Adhesive plasters, water resistant, low allergy, assorted sizes	40	60	100	10
6	Medium sterile dressing (12 x 12 cm)	4	6	8	1
7	Large sterile dressing (18 x 18 cm)	1	2	2	1
8	Eye pad sterile dressing	2	3	4	1
9	Finger sterile dressing	2	3	4	0
10	Burns sterile dressing (preferably water gel)	1	2	2	1
11	Triangular bandage	2	3	4	1
12	Conforming bandage	1	2	2	1
13	Alcohol free moist cleansing wipes	20	30	40	4
14	Safety pins, assorted sizes	6	12	24	2
15	Adhesive tape, preferably hypo-allergenic	1	1	1	1
16	Sterile eye wash	0	0	0	1
17	First Aid scissors – Tough cut type with skin protective leading edge	1	1	1	1
18	Roller bandages, 50 mm/100 mm wide	2/2	4/4	8/8	2/2
19	Skin disinfectant (spray)	1	1	1	1
20	Medical Waste disposal bag	1	2	4	1
<b>Optional / Based on first aid needs assessment</b>					
21	Splints for limps fracture, small & large	1/1	2/2	3/3	1/1
22	Paper stitches (e.g., Steri-Strip™), packets	1	2	4	1
23	Pair of forceps or splinter tweezers	1	1	1	1
24	Hand sanitizer (min. 61. % Ethyl alcohol)	1	1	1	1
25	Emergency blanket (foil blanket)	1	2	3	1
26	Torch, preferably kinetic	1	1	1	1
27	Epinephrine auto-injector	1	1	1	1
28	Analgesic tablets	2	4	8	2
29	Rapid Nasal packing	1	2	3	1
30	Cold packs (mind. 10 x 12.5 cm)	1	2	3	1

Size of Kit	Small	Medium	Large	Travel
Lower risk, e.g., offices, shops, libraries	Less than 25 employees	25-100 employees	More than 100 employees	Per vehicle
Higher risk, e.g., food processing, assembly work, engineering, construction, manufacturing etc.	Less than 5 employees	5-25 employees	More than 25 employees	Per vehicle

Ref.: BS-8599 (UK, 2011), ANSI Z308.1 (USA, 2009), DIN 13157-C/DIN 13169 (Germany, 2009).

## 9.2 Appendix A: Recommended CPR / AED Equipment list

CPR / AED Equipment		
Item No.	Product Description	Item Quantity
1	CPR mouth pieces	2
2	Adult AED with adult pads	1
3	Child AED with child pads (optional)	1
4	AED accessories (towel, razor, etc.)	1
5	Spare batteries for AED	1
6	1-way valve adult mask	1
7	1-way valve Paediatric mask (optional)	1
8	Face shield	1



### 9.3 Appendix B: Audit Criteria

Contractor/ Area: \_\_\_\_\_

Department: \_\_\_\_\_

Completed by: \_\_\_\_\_ Date completed: \_\_\_\_\_

Audit Criteria		Requirements	Verification	Area of Concern
ISO 45001:2018 Clause	NMS Ref.			Yes/ No
5.3	7.1.3	Pre-Tender Health and Safety Plan has been developed and issued		
5.3, 8.1.4.2	7.1.4	Selection of Contractors undertaken in accordance with NEOM's policies and procedures		
7.2	7.2.3, 7.2.4	Persons appointed to manage /oversee work operations have the skills, knowledge, experience		
8.1.2 (e)	7.2.6, 7.3.3	Personal protective equipment required for use are fit for purpose		
6.1.2.3 6.1.2.2	7.2.5, 8.1.5, 8.2.1	Hazards Identification Plan (HIP) Documented health risk assessments shall be undertaken, on a regular basis, to determine the level of first aid and medical care required at the worksite		
		A self-employed person shall provide, or ensure provision of such first-aid equipment, as is appropriate and sufficient in the circumstances to enable him/her to render first-aid to him/herself while at work		
6.1.3	8.1.1	Medical professional providing services shall have a valid license to practice medicine as required by KSA Ministry of Health (MOH)		
		Medical and advanced first aid facilities shall maintain valid licenses as required by MOH		
6.1.4	8.3.2	First aid resources shall be based on the assessed risks and be appropriate to manage injuries and/or illnesses that are reasonably foreseeable to occur in a particular workplace environment		
8.1.2 (d)	8.4.1	First aid facilities shall be appropriately identified and marked with the recognized first aid sign		
8.1.2, 8.2	8.7.1	The number of first aiders and medical staff to the number of employees / workers/other persons shall be in line with the identified risks and hazards of the workplace environment		
8.1.2, 8.2	8.7.1 (b), 8.7.2	At least one first aider per 50 employees per worksite per shift with more than 50 employees, working hours should not exceed 12 hours in any 24-hour period		
8.1.2, 8.2	8.8.1 (a)	Initial first aid treatment shall be available anywhere on the worksite within an acceptable minimum response time		

Audit Criteria		Requirements	Verification	Area of Concern
ISO 45001:2018 Clause	NMS Ref.			Yes/ No
8.1.2, 8.2	8.8.1 (e)	Up-to-date telephone numbers of first aiders and nearest emergency organizations shall be clearly displayed on notice boards and communication points, including the contact information for the Saudi Food and Drug Authority (SFAD) Poison and Drug Information Centre (PDIC), which is to be called only in case of poison exposures		
7.2, 8.2	8.11.1	First aid personnel and employees that may be at risk of exposure to infectious diseases or biological hazards shall receive training on the various types of blood borne pathogens and methods to protect themselves from exposure		
8.2	8.13.1	Workers camps/villages, or contract out to a third party to provide a worker's camp/village, first aid and/or medical emergency treatment facility is available onsite		



نیوم NEOM

**NEOM OCCUPATIONAL HEALTH and SAFETY  
NEOM MINIMUM STANDARD  
for  
MACHINE GUARDING**

NEOM-NLF-NMS-006.030 - Rev 02.00 – February 2022

©NEOM [2021]. All rights reserved.

## Document History

Revision code	Description of changes	Purpose of issue	Date
Rev 00.00	First Issue	Issued for Implementation	27/07-2020
Rev 02.00	Sector Review	Issued for Implementation	01-02-2022

## Document Approval

	Prepared by	Reviewed by	Approved by
Name	Robert Murphy	Talal Al Anazi	Adel Al Wuhaib
Job Title	Loss Prevention Specialist LP/FS -Public Safety	Director, Loss Prevention/Fire Safety (LP/FS) Public Safety	Executive Director Public Safety



## Contents

<b>1</b>	<b>PURPOSE.....</b>	<b>4</b>
<b>2</b>	<b>SCOPE.....</b>	<b>4</b>
<b>3</b>	<b>EXPECTATIONS .....</b>	<b>4</b>
<b>4</b>	<b>LIST OF DEFINITIONS.....</b>	<b>5</b>
<b>5</b>	<b>LIST OF ABBREVIATIONS.....</b>	<b>5</b>
<b>6</b>	<b>RELATED NEOM DOCUMENTS .....</b>	<b>5</b>
<b>7</b>	<b>ROLES AND RESPONSIBILITIES.....</b>	<b>6</b>
7.1	Responsibility .....	6
7.2	Client .....	6
7.3	Contractor.....	7
7.4	Employee .....	7
7.5	Employer .....	8
7.6	Specific Responsibilities.....	8
<b>8</b>	<b>OTHER SECTIONS RELATED TO SUBJECT.....</b>	<b>9</b>
8.1	Planning and Assessment.....	9
8.2	General Machinery Guarding .....	9
8.3	Types of Guards.....	11
8.4	Basic Rules for Guard Design .....	12
8.5	Control Measures Required .....	12
8.6	Servicing Considerations.....	12
8.7	Guard Placement and Reach.....	13
8.8	Guard Placement and Mesh Size.....	13
8.9	Reaching Down and Over .....	14
8.10	Training and Competency .....	15
<b>9</b>	<b>APPENDICES .....</b>	<b>16</b>
9.1	Appendix A: Forms, Signs and Checklists .....	16
9.2	Appendix B: Audit Criteria .....	17
9.3	Appendix C: Guidance Documents .....	18

## List of Tables

Table 1 : Table of Definitions .....	5
Table 2 : Table of Abbreviations .....	5
Table 3 : Related NEOM Documents .....	5
Table 4 : Minimum Clearance Distances.....	10
Table 5 : Guard Distance.....	10
Table 6 : Barrier Distances.....	11

## **1 Purpose**

This NEOM Co. SMS Minimum Standard (hereafter referred to as NMS) relates to the management of all occupational health and safety (OHS) risks associated with Machine Guarding.

It provides guidance to support compliance with industry best practice and international regulatory safety requirements to ensure that the associated risks are assessed, and control measures are implemented in accordance with the hierarchy of risk controls.

It has been developed to align with the requirements of the ISO 45001 Health and Safety Management Standard (Refer NEOM-NLF-SM-01.00- Section 14 ISO 45001 Cross Reference Audit Table)

## **2 Scope**

This NMS applies to all Sectors, Organisations within NEOM; and any Contractors working for NEOM. It applies to all activities involving Machine Guarding.

## **3 Expectations**

To ensure the health and safety of all personnel, protection of assets (services, plant/equipment etc.) and the environment.

NEOM expect each Sector, Organization, Department or Contractor to ensure that risks are controlled in accordance with the hierarchy of risk control: elimination, substitution, engineering controls, administrative controls, and personal protective equipment.

Consideration shall be given to technological advances that may introduce new means of controlling or eliminating the risks associated with work activities

That the expectation for safety compliance is meeting and exceeding all applicable OSHA Laws, Regulations, and Industry Best Practice, inclusive of:

- (a) OSHA Standards and Regulatory requirements;
- (b) ANSI requirements;
- (c) NFPA Standards and requirements;
- (d) NEOM Minimum Standards
- (e) Saudi Building Codes
- (f) International Building Codes

*If requirements of this document conflict with requirements set by another regulatory authority, Contractor are required to follow the more stringent requirement.*

## 4 List of Definitions

Table 1 : Table of Definitions

Terms	Definitions
NEOM Co	NEOM Company
Machine Guards	Protective devices that cover moving pieces of machinery that may pose a danger to workers.
Client	NEOM Sector /Department responsible for Management and Oversight of the Contractors
Contractor	The organisation contracted to carry out the works
Employer	For the purpose of this NMS defined as an organisation that employs people and who has responsibility for the Machinery/Equipment, the Work Site, or Work Activity
Safety Management System (SMS)	Occupational Health and Safety Management System established by NEOM in compliance to ISO 45001 Standard

## 5 List of Abbreviations

Table 2 : Table of Abbreviations

Abbreviations	Descriptions
SMS	Safety Management System
NMS	NEOM Minimum Standard
SOP	Standard Operating Procedure
ANSI	American National Standards Institute
NFPA	National Fire Prevention Association
ASHRAE	American Society of Heating, Refrigerating and Air-Conditioning
OSHA	Occupational Safety and Health Administration.
CPP	Construction Phase Plan
OHS	Occupational Health and Safety
PPE	Personal Protective Equipment

## 6 Related NEOM Documents

Table 3 : Related NEOM Documents

Document	Title
NEOM-NLF-SM-01.00	Section 14 ISO 45001 Cross Reference Audit Table
NEOM-NLF-SM	NEOM Safety Management Manual - Roles and Responsibilities
NEOM Element 2	Risk and Opportunity Management

Document	Title
NEOM Element 3	Control of Documented Information and Legal Compliance
NEOM Element 6	Contractor Management
NEOM Element 5	Training, Awareness and Competency
NEOM-NEN-PRC-006.01	Safety in Design
NEOM-NLF-NMS 006.01	SMS Organisation, Practitioner Registration and Appointment of Contractor
NEOM-NLF PRC 006	Occupational Health, Safety and Fire Safety Requirements for Contractors
NEOM-NLF-NMS-006.002	Construction Management Plan
NEOM-NLF- NMS 006.013	Safety Signage and Signal
NEOM-NFL-NMS-006.021	Personal Protective Equipment (PPE)
NEOM-NLF – NMS 06.024	Lock-out / Tag-out (Isolations)

## 7 Roles and Responsibilities

### 7.1 Responsibility

The responsibility for Safety relating to Machine Guarding is likely to change throughout the products life cycle depending on who is responsible for Design, Purchasing, Operations, Maintenance, and Decommissioning.

To this end specific responsibilities relating to the equipment will generally be covered under the title 'Employer' – for the purpose of this NMS this is defined as an organisation that employs people and who has responsibility for the Machinery/Equipment, the Site, or Work Activity at any given time (Client, Designer, Operator, Contractor).

### 7.2 Client

- 7.2.1 General Health and Safety roles and responsibilities are defined in; and shall be carried out in accordance with the requirements of NEOM-NLF -SM – Roles and Responsibilities.
- 7.2.2 The Client is responsible for ensuring that NEOM health and safety policy and safety management system are properly applied within their areas of control/responsibility. Effective implementation will ensure compliance with relevant legislative requirements and will help promote the use of industry best safe working practices.
- 7.2.3 That a suitable, Pre-Tender Health and Safety Plan has been developed and issued to Contractors to ensure they have all the information necessary to make informed decisions when developing the Construction Phase Health and Safety Plan (NEOM-NLF-NMS-006.002 Safety Construction Management Plan) which will form part of the Contractor review and selection process.
- 7.2.4 That the selection of Contractors shall be undertaken in accordance with NEOM's policies and procedures (NEOM-Element 6 Contractor Management). To ensure that only competent organisations capable of meeting the requisite safety standards associated with project are contracted.
  
- 7.2.5 Conduct regular Contractor safety assurance reviews to provide the confidence level required that the safety management system is delivering as planned, and consistently achieves the acceptable level of safety. Including:
  - (a) Safety performance monitoring and measuring;
  - (b) Managing change;
  - (c) Continuous improvement.

### **7.3 Contractor**

- 7.3.1 Contractor shall undertake their roles and responsibilities in accordance with the general requirements of NEOM–NLF-SM–Safety Management Manual-Roles and Responsibilities
- 7.3.2 Maintaining control of access to dangerous or high-risk areas or equipment using suitable barricades that are in serviceable condition (Refer: NEOM-NLF-NMS-006.012 – Barricading of Hazards)
- 7.3.3 That all work activities are assessed, planned, organized, and that suitably competent Supervision is available to implement the safety requirements and oversee the work (Refer: NEOM- Element 5 – Training, Awareness and Competency)
- 7.3.4 Ensure persons appointed to manage /oversee work operations have the skills, knowledge, experience and, where relevant, the organisational capability to plan and manage work safely and without risk to those who may be affected by the activities (Refer: NEOM Element 5 Training, Awareness, and Competence).
- 7.3.5 Ensure employees carrying out the work are trained to recognize the associated hazards and understand the processes and procedures to control or minimize the risks.(Refer: NEOM Element 2 Risk and Opportunity Management)
- 7.3.6 That all equipment including personal protective equipment required for use is fit for purpose, and (as required) has been inspected by a competent person and inspection records are maintained and readily available. (Refer: NEOM-NLF-NMS-006.021 Personal Protective Equipment) (PPE)

### **7.4 Employee**

- 7.4.1 Shall undertake their roles and responsibilities in accordance with the general requirements of NEOM-NLF -SM – Safety Management Manual - Roles and Responsibilities.
- 7.4.2 Employees shall follow all instruction and training they receive
- 7.4.3 Report any activity or issue relating to the work which they believe is reasonably foreseeable to endanger their safety or that of another person's.
- 7.4.4 Shall use appropriate equipment or safety devices provided for work by the Employer in accordance with any training or instruction received in the use of the work equipment. (Refer NEOM-NFL-NMS-006.021 Personal Protective Equipment (PPE))
- 7.4.5 Employee shall undertake specific roles and responsibilities in accordance with the following:
  - (a) Never attempt to access dangerous parts of machinery unless authorised to do so by the employer and only once the machine has been made safe;
  - (b) Report any machine defects immediately and mark the machine out of use.

## **7.5 Employer**

- 7.5.1 Employer shall undertake specific roles and responsibilities in accordance with the following:
  - (a) When purchasing of new machinery, guarding should be assessed, and the level of safety should be considered during the purchase process.
  - (b) No new machinery should be allowed on site without QA/QC inspection for guarding needs.
  - (c) For purchase or use of a second-hand machinery the same should apply regarding the inspection and assessment
  - (d) Employer shall identify, through a documented risk assessment, all areas of machinery that could pose a hazard to human health through access to or contact with any dangerous part of machinery or rotating stock bar; or
  - (e) Shall prevent access to any dangerous part of machinery or to any rotating stock-bar or stop the movement of any dangerous part of machinery or rotating stock-bar before any part of a person enters a danger zone.

## **7.6 Specific Responsibilities**

- 7.6.1 Sector, Organization, Department or Contractor Head is responsible in ensuring that provisions are made the safe systems of work to prevent and minimize risks in each workplace
- 7.6.2 Safety Practitioner/Coordinator is responsible to monitor the implementation of this procedures and document its effectiveness
- 7.6.3 The Responsible Person will support this procedure and ensure that any Contractor Organization working for, or on behalf of, the Sector, Organization, Department or Contractor will comply with the requirements of these procedures
- 7.6.4 Line Managers / Supervisors are responsible for training their workers in risks
- 7.6.5 The LP & FS Public Safety department will support the NEOM risk assessments by carrying out compliance checks and supporting and guiding the various safety teams.

## **8 Other Sections related to subject**

### **8.1 Planning and Assessment**

- 8.1.1 Employer shall evaluate each site or operation and carry out the following:
- 8.1.2 Determine if hazards are present and the workplace shall be assessed using risk management practices as required by NEOM Element 2 Risk & Opportunity Management.
- 8.1.3 Shall ensure that the risk assessment is reviewed on a regular basis in line with the requirements of NEOM Element 2 Risk & Opportunity Management.
- 8.1.4 Risk assessments shall include not only the operators of machinery, but also others who could be affected by its operation.
- 8.1.5 One or more methods of machine guarding shall be provided to protect the machine operator and other employees in the area from hazards such as those created by point(s) of operation(s), in-running nip points, rotating parts, flying chips and sparks.

### **8.2 General Machinery Guarding**

- 8.2.1 The point of operation of a machine is the area where work is performed on material being processed. Any point of operation whose operation exposes an employee to injury shall be guarded.
- 8.2.2 Guards shall be affixed to the machine where reasonably practicable and secured elsewhere if attachment to the machine is not reasonably practicable.
- 8.2.3 All safety guards are to be painted the same colour. Use high visibility yellow (provided it is different to the general machinery colour) so that it can be clearly seen when a guard has been removed or when it is not in its appropriate place. It is also good practice to paint the surfaces behind the guard a different colour (e.g., blue or red), so that when the guard has been removed, the exposed colour is clearly visible. It is then easy to identify that the guard has been removed and employees are alerted to possible danger.
- 8.2.4 Guards shall consist of physical barriers, two hand trip devices, point of operation devices, electronic safety devices, or other device that meets the requirements of this NMS.
- 8.2.5 Guards and guarding devices shall be installed, inspected, and maintained in working order as per the manufacturer's instructions.
- 8.2.6 Employer shall ensure that no employee operates a machine for which a guard or guarding device has been fabricated or installed unless that guard or device is in place, secured and functioning appropriately.
- 8.2.7 Hand tools for placing and removing materials into the point of operation shall be designed to permit handling of materials without placing a hand into the point of operation. However, such tools shall not be substituted for a guard as required by this NMS.
- 8.2.8 Revolving barrels, containers, and drums shall be guarded by an enclosure. Entrances to such enclosures shall be interlocked to the operating mechanism so that the barrel, drum or container cannot rotate unless all openings to the enclosure are in place.
- 8.2.9 Machines designed for a fixed location shall be securely anchored to prevent walking or moving of the equipment during operation.
- 8.2.10 Large machinery or plant may require extensive guarding, and these guards may need to be removed for maintenance access. While some sections may remain fixed, it is a requirement that the guard be divided into easily removable sections. Sections shall be designed to be removed and handled easily by one person. Appropriate placement of handles on movable sections shall facilitate ease of removal, lifting and handling and thus reduce the risk of manual handling injuries
- 8.2.11 Except for those circuits required for safety systems, all machinery shall be fitted with a means of isolation from all energy sources. Such isolators shall be clearly identified and be capable of being locked if reconnection could place people at risk. (Refer to NEOM-NLF-NMS-006.028 – Lock-out Tag-out) (Isolations)
- 8.2.12 An appropriate isolation method is a lock-out/tag-out system, in which one or more padlocks are fitted to the isolation switch, with keys being held by the operators or maintenance personnel. Their name and reason for the lock-out are written on the tags attached to the padlock. When the task is completed, the locks and tags are removed, and power can be restored. (Refer to NEOM-NLF-NMS 006.024 – Lock-out / Tag-out) (Isolations).
- 8.2.13 Emergency stop devices shall be tested on a regular basis and the results and frequency recorded.

- 8.2.14 Emergency stop devices shall be located where an operator can easily reach them. Poorly located devices may encourage dangerous practices, such as reaching across moving parts, a failure to shut down machinery or plant when a problem occurs, or situations where the machine or plant can be started by one employee while another is in a dangerous location.
- 8.2.15 As part of the risk assessment process, Contractor / Employer shall consider the need for breaking devices where high speed machines are in use. (Refer to NEOM-Element 2 - Risk and Opportunity Management).
- 8.2.16 The number of emergency stop devices required needs to be considered. If the machine or plant is large, several devices may be necessary. When there are multiple devices, safe operating practices shall be adopted so that machinery or plant is not restarted when it is undergoing maintenance or other temporary operations. A lock-out/tag-out system, is therefore an essential part of isolating an energy source to prevent accidental plant start-up. (Refer to NEOM-NLF– NMS 006.024 – Lock-out / Tag-out) (Isolations).
- 8.2.17 To safeguard operators and other staff, cleaning, repair, maintenance and emergency procedures shall be in place and understood by employees. A regular inspection regime shall be in place to identify any problems with plant and machinery and safeguards. Any additional hazards associated with these activities shall be identified and assessed as part of the risk management process. Special precautions need to be taken where employees undertaking these tasks are obscured, or where there are multiple operating switches. Apply isolation procedures whenever maintenance or repair requires people to enter the danger area around machinery. (Refer: NEOM-NLF–NMS 006.024 – Lock-out / Tag-out) (Isolations).
- 8.2.18 Guards shall only be able to be opened or removed with the aid of a tool and when the machine is not in operation.
- 8.2.19 Guards that move out of the way for each operation (automatic guards) need special consideration. Watch for potential risks in the interactions between guard and machine, between guard and person and between guard and workpiece.

### **8.3 Types of Guards**

- 8.3.1 **Fixed guards.** These are stationary guards and prevent contact between moving machinery parts and any part of the body. They offer protection only when appropriately fixed in position. Fixed guards may be adjusted or moved and shall be easy to remove and replace, but only be able to be opened, removed or adjusted with the aid of a tool and when the machine is not in operation.
- 8.3.2 **Interlocking guards.** They prevent machinery and plant from being operated, unless the guard is in place. Interlocking guards such as enclosure guards are known as movable guards and have the moving part interconnected with the control system. Interconnections are usually electrical, mechanical, hydraulic or pneumatic.
- 8.3.3 **Automatic guards.** They are self-adjusting and automatically move into position as the machine or cycle starts. They are also known as push-away guards. These are only appropriate on slow machines.
- 8.3.4 **Distance guards** these prevent access to dangerous areas through a barrier or fence. Any access points through the guard (e.g., gates and doors) shall be secured with a lock or interlocking system.
- 8.3.5 **Trip guards.** These are presence-sensing and stop the machine when a person gets into a position where they are liable to be injured. Photoelectric curtains, laser scanners and pressure mats are examples of this type of guard.

## **8.4 Basic Rules for Guard Design**

- 8.4.1 The primary function of a guard is to provide a physical barrier between an employee and the dangerous parts of machinery or plant. When selecting control measures, careful attention to design and layout at the outset can avoid later problems. Basic rules for guard design include:
- (a) Ensure the materials used are of appropriate strength and good quality.
  - (b) Having any sort of guard may not be enough. Poorly designed or inappropriate guarding has contributed to injuries from machinery or plant. Ideally a guard would be custom designed for the machine and the work process.
  - (c) Interlock devices may need to be used in conjunction with other types of guarding to ensure safety; and
  - (d) Avoid second best when designing a guard. If a guard is used from another machine, it shall be checked carefully to ensure that it is not defective, that it fits the target machine, is of appropriate strength and quality for the new application and that it achieves the aim of controlling the risk presented by the target machine.
- 8.4.2 In determining the most appropriate control measure for the hazard, risk and machine, other issues or risks shall also be taken into consideration. Guarding can play a useful role in both dust and noise reduction. In many cases, issues of wear, heat and ventilation affect operating efficiency and may also have consequences for employee health and safety.

## **8.5 Control Measures Required**

- 8.5.1 The provision of fixed guards enclosing every dangerous part or rotating part, where and to the extent that it is practicable to do so, but where or to the extent that it is not, then.
- (a) The provision of other guards or protection devices where and to the extent that it is reasonably practicable to do so, but where or to the extent that it is not, then; and
  - (b) The provision of jigs, holders, push-sticks or similar protection appliances used in conjunction with the machinery where and to the extent that it is reasonably practicable to do so.

## **8.6 Servicing Considerations**

- 8.6.1 Guards shall be designed for easy removal and replacement. These types of guard make tasks such as regular cleaning, maintenance and machine adjustment or belt changes easier, particularly if this work needs to be done frequently. Safe procedures for removal of guards for repair, or to clear jams or breakdowns shall be developed by Contractor / Employer. In all cases, guards shall be designed so they can only open or be removed with the aid of a tool and when the machine is not in operation.
- 8.6.2 Servicing issues include:
- (a) Documented safe work procedures, including reference to manufacturer's recommendations.
  - (b) Proximity to hot or sharp parts.
  - (c) Cool down or warm up periods.
  - (d) Lock-out provisions or permission for guard removal.
  - (e) Appropriate room to perform tasks without risk of injury or strain.

- (f) Any additional hazards arising from maintenance procedures (e.g., testing while machine is unguarded (dry run), working at heights, use of solvents); and
- (g) Maintenance of servicing records.

## 8.7 Guard Placement and Reach

- 8.7.1 The design and positioning of guards shall provide at least the following clearance indicated in Table 4:

*Table 4 – Minimum Clearance Distance*

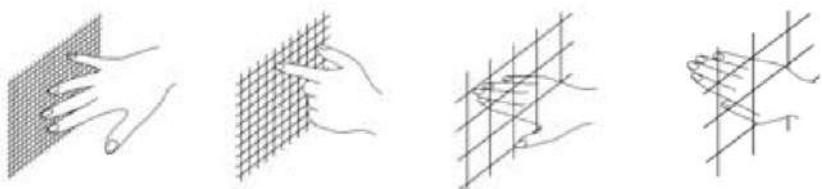
Reach	Minimum Distance Assumed to the Danger Point
Arm reach	Greater than or equal to 850 mm from under arm to fingertip
Elbow reach	Greater than or equal to 550 mm from the inside elbow to fingertip
Wrist reach	Greater than or equal to 230 mm from wrist to tip of middle finger
Finger reach	Greater than or equal to 130 mm
Vertical reach	2500 mm maximum when standing on toes

## 8.8 Guard Placement and Mesh Size.

- 8.8.1 The size of mesh or other openings in the guard and the distance of the guard from the danger point can be selected based on the Table 5.

*Table 5 – Guard Distance*

Mesh Size	Distance to the Danger Point
Mesh size openings up to and including 9 mm	Distance of guard from danger point virtually the same
Mesh size over 9mm but less than 40 mm	Guard at least 200 mm from danger point
All types of guards	Distance between bottom opening and floor not to exceed 250 mm



No admittance      Reach restricted to root of finger      Reach restricted to root of thumb      Reach restricted to hand thickness

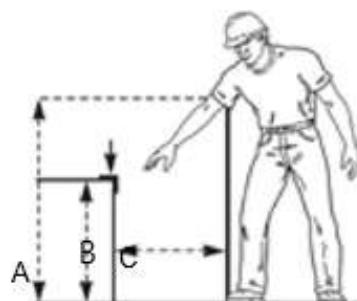
*Figure 1.0: Example Distances*

## 8.9 Reaching Down and Over

8.9.1 In table six (6) and Figure 2:

- (a) A = distance of danger points from the floor or working surface.
- (b) B = height of the barrier; and
- (c) C = horizontal distance to be maintained between edge of barrier and danger point.

Figure 2; Barriers



Note: Barriers must not be able to be stepped over.

Table 6 – Barrier Distances

A – distance of danger points from floor (mm)	B – height of the barrier (mm)							
	2400	2200	2000	1800	1600	1400	1200	1000
	C – horizontal distance to be maintained between barrier and danger point (mm)							
2400	-	100	100	100	100	100	100	100
2200	-	250	350	400	500	500	600	600
2000	-	-	350	500	600	700	900	1100
1800	-	-	-	600	900	900	1000	1100
1600	-	-	-	500	900	900	1000	1300
1400	-	-	-	100	800	900	1000	1300
1200	-	-	-	-	500	900	1000	1400
1000	-	-	-	-	300	900	1000	1400
800	-	-	-	-	-	600	900	1300
600	-	-	-	-	-	-	500	1200
400	-	-	-	-	-	-	300	1200
200	-	-	-	-	-	-	200	1100

## **8.10 Training and Competency**

- 8.10.1 Contractor / Employer shall ensure that training complies with the requirements of:
- (a) NEOM Element 5 – Training, Awareness and Competency.
  - (b) NEOM-NLF-NMS- 006.001 – SMS Organisation, Practitioner Registration and Appointment of Contractor.
- 8.10.2 Contractor / Employer shall ensure that all persons who use work equipment have received appropriate training for purposes of health and safety, including training in the methods, which may be adopted when using the work equipment, any risks, which such use may entail, and precautions to be taken.
- 8.10.3 Contractor / Employers shall ensure that any of his employees who supervises or manages the use of work equipment has received appropriate training for purposes of health and safety, including training in the methods which may be adopted when using the work equipment, any risks which such use may entail and precautions to be taken. The training shall include the following items as a minimum:
- (a) A description and identification of the hazards associated with specific machines.
  - (b) The safeguards themselves, how they provide protection, and the hazards for which they are intended.
  - (c) How to use the safeguards and why.
  - (d) How and under what circumstances safeguards can be removed, and by whom (in most cases, repair, or maintenance personnel only); and
  - (e) What to do if a safeguard is damaged, missing, or unable to provide appropriate protection.

## 9 Appendices

### 9.1 Appendix A: Forms, Signs and Checklists



## 9.2 Appendix B: Audit Criteria Machine Guarding NEOM-NLF-NMS 006.030

Contractor/ Area: \_\_\_\_\_

Department: \_\_\_\_\_

Completed by: \_\_\_\_\_ Date completed: \_\_\_\_\_

Audit Criteria		Requirements	Verification	Area of Concern
ISO 45001:2018 Clause	NMS Ref.			Yes/ No
5.3	7.2.3	Pre-Tender Health and Safety Plan has been developed and issued		
5.3, 8.1.4.2	7.2.4	Selection of Contractors undertaken in accordance with NEOM's policies and procedures		
7.2	7.3.4,	Persons appointed to manage /oversee work operations have the skills, knowledge, experience		
8.1.2 (e)	7.3.6, 7.4.4	Personal protective equipment required for use are fit for purpose		
6.1.2.3, 6.1.2.2	7.2.4,  8.1.1, 8.1.2	Documented risk assessment of all areas of machinery that could pose a hazard to human health through access to or contact with any dangerous part of machinery or rotating stock bar		
8.1.1, 8.1.2	8.2.2, 8.2.5	Guards shall be affixed to the machine and guarding devices shall be installed, inspected, and maintained in working order as per the manufacturer's instructions		
6.1.2.3, 6.1.2.2, 8.1.1, 8.1.2	8.2.11	All machinery shall be fitted with a means of isolation from all energy sources. Such isolators shall be clearly identified and be capable of being locked if reconnection could place people at risk		
	8.2.14	Risk assessment process, Contractor / Employer shall consider the need for breaking devices where high speed machines are in use		
	8.2.11	Isolation method is a lock-out/tag-out system, in which one or more padlocks shall be fitted to the isolation switch, with keys being held by the operators or maintenance personnel		

### **9.3 Appendix C: Guidance Documents**

**OSHA 1910.212 General requirements for machine guards** - Guards shall be affixed to the machine where possible and secured elsewhere if for any reason attachment to the machine is not possible. Moving machine parts create workplace hazards and potential machinery-related injuries, making machine guards vitally important. You need to identify all the potential hazards in your workplace that require machine safeguarding and ensure they adhere to OSHA regulations and this NMS.

**OSHA's requirements for machine Guarding are found in more than one place dependant on the industry.**

**1910 Subpart O** – Machinery and Machine Guarding looks at general requirements for all machines: - Woodworking Machinery – Abrasive Wheels – Mills and calanders in rubber and plastic industries – Power presses – Forging Machines and Power Transmission apparatus

**1910 Subpart R** – Special Industries - Textiles – Bakery equipment and Telecommunications

**1917 Subpart G** Are related to marine terminals

**1918 Subpart I** - Maintenance and repair work in the vicinity of longshoring operations. Paragraph (e) contains general requirements for machine guarding

**29 CFR 1918.2**, see the definition of "danger zone"

**1926 Subpart I** – covers moving parts in the construction industry; such as - General requirements - Hand tools - Power-operated hand tools - Abrasive wheels and tools - Woodworking tools - Jacks-lever and ratchet, screw, and hydraulic - Air receivers - Mechanical power-transmission apparatus.

**1928 Subpart D** - Safety for Agricultural Equipment

**Machinery safety in the UK is driven by two sets of Regulations:**

**Supply of Machinery (Safety) Regulations 2008**, as amended by the **Supply of Machinery (Safety) (Amendment) Regulations 2011** – these regulations require all machines placed on the market in the EU to carry a CE mark as described by the **European Machinery Directive 2006/42/EC**

**Provision and Use of Work Equipment Regulations 1998 (PUWER 98)** – these regulations place duties on people and companies who own, operate or have control over work equipment

In the UK the safety of new and existing machinery is covered mainly by **The Provision and Use of Work Equipment Regulations 1998 (PUWER 98)**. These Regulations require that risks from machinery are controlled by engineering means where it is practicable to do so (regulation 11); that is to say, risks must be controlled by providing suitable guards, protection devices, warning devices and system control devices such as emergency stop buttons. In all circumstances these safeguards must be properly maintained (regulation 5) and appropriate information, training, instruction and supervision must be provided.

The free issue **Guide to the New Machinery Directive 2006/42/EC** sixth edition gives excellent guidance for employers



نیوم NEOM

**NEOM OCCUPATIONAL HEALTH and SAFETY  
NEOM MINIMUM STANDARD  
for  
STEEL ERECTION**

NEOM-NLF-NMS-006.031 - Rev 02.00 – February 2022

©NEOM [2021]. All rights reserved.

## Document History

Revision code	Description of changes	Purpose of issue	Date
Rev 00.00	First Issue	Issued for Implementation	27/07-2020
Rev 02.00	Sector Review	Issued for Implementation	01-02-2022

## Document Approval

	Prepared by	Reviewed by	Approved by
Name	Robert Murphy	Talal Al Anazi	Adel Al Wuhaib
Job Title	Loss Prevention Specialist LP/FS -Public Safety	Director, Loss Prevention/Fire Safety (LP/FS) Public Safety	Executive Director Public Safety



## Contents

<b>1</b>	<b>PURPOSE.....</b>	<b>4</b>
<b>2</b>	<b>SCOPE.....</b>	<b>4</b>
<b>3</b>	<b>EXPECTATIONS .....</b>	<b>4</b>
<b>4</b>	<b>LIST OF DEFINITIONS.....</b>	<b>5</b>
<b>5</b>	<b>LIST OF ABBREVIATIONS.....</b>	<b>5</b>
<b>6</b>	<b>RELATED NEOM DOCUMENTS .....</b>	<b>6</b>
<b>7</b>	<b>ROLES AND RESPONSIBILITIES.....</b>	<b>7</b>
7.1	Client .....	7
7.2	Contractor.....	7
7.3	Employee .....	8
<b>8</b>	<b>OTHER SECTIONS RELATED TO SUBJECT.....</b>	<b>9</b>
8.1	Planning and Assessment.....	9
8.2	Design and Planning .....	10
8.3	Documented Safe Systems of Work .....	10
8.4	General Hazards .....	11
8.5	Ground Conditions .....	11
8.6	Preparation and Bases.....	11
8.7	Cranes.....	12
8.8	Lifting Steel Members .....	12
8.9	Material Storage.....	12
8.10	Stacking.....	13
8.11	Stability of Structures .....	13
8.12	Connecting beams and columns:.....	14
8.13	Metal Decking.....	14
8.14	Scaffolds.....	14
8.15	Temporary Access .....	14
8.16	Permanent Access .....	15
8.17	Inspection and Maintenance .....	15
8.18	Training and Competency .....	15
<b>9</b>	<b>RECORDS AND RETENTION.....</b>	<b>16</b>
<b>10</b>	<b>APPENDICES .....</b>	<b>17</b>
10.1	Appendix A: Forms, Signs and Checklists .....	17
10.2	Appendix B: Audit Criteria .....	18
10.3	Appendix C: Guidance Information .....	20

## List of Tables

Table 1 : Table of Definitions .....	5
Table 2 : Table of Abbreviations .....	5
Table 3 : Related NEOM Documents .....	6
Table 4 : Records and Retention.....	19

## **1 Purpose**

This NEOM Co. SMS Minimum Standards (hereafter referred to as NMS) relates to the management of all occupational health, and safety (OHS) risks associated with Steel Erection.

It provides guidance to support compliance with industry best practice and international regulatory safety requirements to ensure that the associated risks are assessed, and control measures are implemented in accordance with the hierarchy of risk controls.

It has been developed to align with the requirements of the ISO 45001 Health and Safety Management Standard (Refer NEOM-NLF-SM-01.00- Section 14 ISO 45001 Cross Reference Audit Table

## **2 Scope**

This NMS applies to all personnel within NEOM and any Contractors working for NEOM and or associated projects and activities. It applies to all aspects and stages of Steel Erection (Design, Planning, Erection, Altering, Repairing, Dismantling, and Decommissioning).

## **3 Expectations**

To ensure the health and safety of all personnel, protection of assets (services, plant/equipment) and the environment

NEOM expect each Sector, Organization, Department or Contractor to ensure that risks are controlled in accordance with the hierarchy of risk controls: elimination, substitution, engineering controls, administrative controls, and personal protective equipment.

Consideration shall be given to technological advances that may introduce new means of controlling or eliminating the risks associated with work activities

That the expectation for safety compliance is meeting and exceeding all applicable OSHA Laws, Regulations, and Industry Best Practice, where required, and as a minimum, the following shall also be met;

- (a) OSHA Standards and Regulatory requirements;
- (b) ANSI requirements;
- (c) NFPA Standards and requirements;
- (d) NEOM Minimum Standards
- (e) Saudi Building Codes
- (f) International Building Codes

*If requirements of this document conflict with requirements set by another regulatory authority, Contractor are required to follow the more stringent requirement.*

## 4 List of Definitions

Table 1 : Table of Definitions

Terms	Definitions
NEOM Co	NEOM Company
OSHA Standards	An Occupational Safety Health Administration (OSHA) standard is a regulatory requirement to serve as criteria for measuring whether employers are in compliance with the OSH Act laws. OSHA Standard are published in title 29 of the Code of Federal Regulations (CFR).
Client	NEOM Sector /Department responsible for management and oversight of the Contractor
Employer	The person or organisation that employs personnel to complete the work
Contractor	Organisation contracted and responsible for carrying out the works
Steel Erection	A general term referring to work tasks associated with the erection and dismantling of a structural steel frame or structure which may include hoisting, connecting, welding, bolting, and rigging structural steel, steel joists and metal buildings; installing metal deck, siding systems, miscellaneous metals, ornamental iron and similar materials; and moving from point-to-point to perform these activities.
Safety Management System (SMS)	Occupational Health and Safety Management System established by NEOM in compliance to ISO 45001 Standard

## 5 List of Abbreviations

Table 2 : Table of Abbreviations

Abbreviations	Descriptions
SMS	Safety Management System
NMS	NEOM Minimum Standard
SOP	Standard Operating Procedure
ANSI	American National Standards Institute
NFPA	National Fire Prevention Association
OSHA	Occupational Safety and Health Administration.
PPE	Personal Protective Equipment
MEWP	Mobile Elevated Work Platform
IBC	International Building Codes
OHS	Occupational Health and Safety

## 6 Related NEOM Documents

Table 3 : Related NEOM Documents

Document	Title
NEOM Element 2	Risk and Opportunity Management
NEOM- Element 3	Control of Documented Information and Legal Compliance
NEOM-ELEMENT 5	Training, Awareness and Competency
NEOM-Element 6	Contractor Management
NEOM Element 9	Emergency Response
NEOM-NLF-SM	NEOM Safety Management Manual - Roles and Responsibilities
NEOM-NLF-SM-01.00	Section 14 - ISO 45001 Cross Reference Audit Table
NEOM-NEN-PRC-006.01.	Safety in Design
NEOM-NLF PRC 006	Occupational Health, Safety, and Fire Safety Requirements for Contractor
NEOM-NLF-NMS-006.012	Barricading of Hazards
NEOM-NLF -NMS 006. 07	Working at Height
NEOM-NLF-NMS 006.04	Permit to Work Systems
NEOM-NLF-NMS 006.02	Construction Phase Health & Safety Plan (CPP)
NEOM-NLF-NMS-006.021	Personal Protective Equipment.
NEOM NLF NMS-006.006	Safe Use of Lifting Equipment and Lifting Accessories.
NEOM-NLF-NMS-006.03	Scaffolding
NEOM-NLF- NMS 006.013	Safety Signage and Signal
NEOM-NLF-NMS 006.041	Working on or Adjacent to a Road
NEOM-NLF-NMS 006. 014	Ladders.
NEOM-NLF NMS 006.001	SMS Organisation, Practitioner Registration and Appointment of Contractor.
Civil Defense	Construction Health and Safety Manual
OSHA Reg. 213/91	Section 17

## **7 Roles and Responsibilities**

### **7.1 Client**

- 7.1.1 General Health and Safety roles and responsibilities are defined in; and shall be carried out in accordance with the requirements of NEOM-NLF -SM – Roles and Responsibilities.
- 7.1.2 The Client is responsible for ensuring that NEOM Safety Commitment Statement and safety management system are properly applied within their areas of control/responsibility. Effective implementation will ensure compliance with relevant legislative requirements and will help promote the use of industry best safe working practices.
- 7.1.3 That a suitable, Pre-Tender Health and Safety Plan (NLF-NMS 006.02 CPP Construction Phase Health & Safety Plan) has been developed and issued to Contractor to ensure they have all the information necessary to make informed decisions when developing the Construction Phase Health and Safety Plan which will form part of the Contractor review and selection process
- 7.1.4 That the selection of Contractor shall be undertaken in accordance with NEOM's policies and procedures (NEOM Element 6 - Contractor Management). To ensure that only competent organisations capable of meeting the requisite safety standards associated with project are contracted.
- 7.1.5 Conduct regular Contractor safety assurance reviews to provide the confidence level required that the safety management system is delivering as planned, and consistently achieves the acceptable level of safety. Including:
  - (a) Safety performance monitoring and measuring;
  - (b) Managing change;
  - (c) Continuous improvement.
- 7.1.6 The Client shall undertake their roles and responsibilities in accordance with the following:
  - (a) Ensure the Contractor has all available descriptions of the site, including design drawings, site surveys, plans of services and information on the nature and location of hazardous materials, the nature of building materials and the building or structure's relationship to surrounding properties;
  - (b) Provide coordination for all other entities on the project who may be affected by the work being carried out by the steel erection works;
  - (c) Ensure all relevant authorities and utility service providers are notified, and all necessary approvals are obtained before work commences;
  - (d) Notify the owners of adjoining properties of the proposed work especially where the use of cranes or out-of-hours working is undertaken; and
  - (e) Ensure information regarding the location of all utility services is known to the Contractor.

### **7.2 Contractor**

- 7.2.1 Contractor shall undertake their roles and responsibilities in accordance with the general requirements of NEOM–NLF-SM – Safety Manual - Roles and Responsibilities
- 7.2.2 Contractor is responsible for all sub-Contractor employed under their work contracts
- 7.2.3 That all work activities are assessed, planned, organized, and that suitably competent Supervision is available to implement the safety requirements and oversee the work (Refer: NEOM Element 5 Training, Awareness and Competence)

- 7.2.4 Ensure employees carrying out the work are trained to recognize the associated hazards and understand the processes and procedures to control or minimize the risks. (Refer: NEOM Element 2 Risk and Opportunity Management)
- 7.2.5 Ensure persons appointed to manage /oversee work operations have the skills, knowledge, experience and, where relevant, the organisational capability to plan and manage work safely and without risk to those who may be affected by the activities
- 7.2.6 That all equipment including personal protective equipment required for use with work at height (during steel erection) is fit for purpose, and (as required) has been inspected by a competent person and inspection records are maintained and readily available. (Refer – NEOM-NLF-NMS-006.021 Personal Protective Equipment) (PPE)
- 7.2.7 That for management of steel erection general requirements are included in the Pre-Tender Safety and Health Plan in accordance with NEOM-NLF-PRC – 006 – Occupation safety health and Fire Safety Requirements for Contractors
- 7.2.8 That associated safe systems of work, and site rules are included in the Occupational Safety and Health Construction Management Plan NEOM-NLF-NMS 006.02 (CPP) and NEOM-NLF-PRC – 006 Occupation safety health and Fire Safety Requirements for Contractors
- 7.2.9 Contractor shall undertake their specific roles and responsibilities in accordance with the following:
  - (a) All steel erection work is appropriately planned, organized, and supervised;
  - (b) Those involved in steel erection are trained and competent;
  - (c) The place where steel erection work is carried out is safe;
  - (d) Steel erection equipment shall be appropriately inspected;
  - (e) Inform the Client and any other relevant parties of the selected method for steel erection and the equipment to be used;
  - (f) Obtain all necessary work permits and authorizations and provide all necessary notifications concerning the work;
  - (g) Nominate a person to implement the operations and to always supervise the work. This person shall be competent in the type of steel erection needed for the project and experienced in the implementation of safe work procedures.
  - (h) Erect all appropriate fencing and protection barriers for the protection of the public and employees at the workplace; (Refer – NEOM-NLF-NMS-006.012 Barricading of Hazards)
  - (i) Arrange for the recycling of building waste wherever reasonably practicable and the disposal of all other refuse and debris.

### **7.3 Employee**

- 7.3.1 Shall undertake their roles and responsibilities in accordance with the general requirements of NEOM-NLF-SM – Roles and Responsibilities.
- 7.3.2 Employees shall undertake their specific roles and responsibilities in accordance with the following:
  - (a) Shall refrain from any work activities unless they have had the requisite work at training, that all relevant permits/permissions have been obtained and that the required safety measures are understood and have been implemented.
  - (b) Report any activity or defect relating to the work which they believe is reasonably foreseeable to endanger their safety or that of another person's.

- (c) Shall use appropriate equipment or safety devices provided by the Contractor in accordance with any training or instruction received in the use of the work equipment. Consistent with NEOM-NLF-NMS-006-021 – Personal Protective Equipment
- (d) Follow the site rules, signage, and emergency arrangements

## **7.4 Specific Responsibilities**

- 7.4.1 Sector, Organization, Department or Contractor Head is responsible in ensuring that provisions are made the safe systems of work to prevent and minimize risks in each workplace
- 7.4.2 Safety Practitioner/Coordinator is responsible to monitor the implementation of this procedures and document its effectiveness
- 7.4.3 Line Managers / Supervisors are responsible for training their workers in risks
- 7.4.4 The Responsible Person will support this procedure and ensure that any Contractor Organization working for, or on behalf of, the Sector, Organization, Department or Contractor will comply with the requirements of these procedures
- 7.4.5 The LP & FS Public Safety department will support the NEOM risk assessments by carrying out compliance checks and supporting and guiding the various safety teams.

## **8 Other Sections related to subject**

### **8.1 Planning and Assessment**

- 8.1.1 Contractor shall ensure the following:
  - (a) Risk Assessment and Method Statements shall be prepared in consultation with the person in control of the work and communicated to those responsible for carrying out the work (Refer to: NEOM Element 2 Risk and Opportunity Management and NEOM-NLF-NMS 006. 007 Work at Height)
  - (b) An assessment of the various risks is undertaken and systems of work that are safe to both employees and the public shall be established;
  - (c) That effective procedures and control measures are developed and implemented for management of the hazards; (refer to NEOM-NLF– NMS 006.004 – Permit to Work Systems).
  - (d) That associated safe systems of work, and site rules are included in the Occupational Safety and Health Construction Management Plan (NLF-NMS 006.002 CPP) in accordance with NEOM-Element 6 Contractor Management
  - (e) Ensure all foreseeable emergency situations are identified, and appropriate emergency procedures developed, and mitigation measures are fully implemented, and practiced, (Refer to Section 17 of OSHA Reg. 213/91 and NEOM-Element 9 Emergency Response).
  - (f) That steel erection general requirements are included in the Pre-Tender Environment, Health and Safety Plan in accordance with NEOM-NLF PRC 006 Occupational Safety, Health and Fire Safety Requirements for Contractor
  - (g) That associated safe systems of work, and site rules are included in the Safety and Health Construction Management Plan (NLF-NMS 006.02-CPP) in accordance with NEOM-NLF PRC 006 Occupational Safety, Health and Fire Safety Requirements for Contractor.

## **8.2 Design and Planning**

- 8.2.1 Contractor shall ensure the planning for steel erection is commenced at the initial design stage with designers considering the need for and the practicality of safe methods of working during erection in accordance with the general requirements of NEOM-NEN-PRC-006.001 Safety in Design and NEOM-NLF NMS 006.007 – Working at Heights. There are two distinct phases of design— structural design and the design for handling, transportation and erection of the individual members and the structure.
- 8.2.2 Contractor shall consider the following during each design stage:
- (a) Technological advances that may be incorporated in the design or planning to introduce new means of controlling or eliminating the risks associated with work activities
  - (a) Stability at all stages of erection of the assembled structure, individually assembled portions and single components;
  - (b) The effect of the erection sequence on stability and where this is critical, the sequence shall be stipulated;
  - (c) Realistic assessment of loadings at all stages of construction;
  - (d) Provision of safe access / egress and working places;
  - (e) Ease of connecting components including the provision of landing cleats, which allow a beam to be safely located whilst suspended from a crane, and remove the need to align it manually by using an appropriate tool;
  - (f) Safe handling, lifting, storing, stacking and transportation of components, depending on their size, shape and/or weight;
  - (g) For sub-assemblies, it is critical that overall weight and lifting points are identified on drawings;
  - (h) Designers and planners shall also consider demolition and disassembly requirements.
- 8.2.3 Design specifications shall incorporate requirements and essential information for the scheme to be planned and erected safely.

## **8.3 Documented Safe Systems of Work**

- 8.3.1 In accordance with NEOM-NLF-SM Safety Management Manual - Roles and Responsibilities Contractor shall ensure documented safe systems of work are developed and implemented and include:
- (a) A detailed erection scheme;
  - (b) Phasing of the work, particularly with that of another affected Contractor;
  - (c) Special requirements relating to the safe erection of the structure shall be highlighted at the pre-contract stage;
  - (d) Special site conditions such as proximity of other buildings or access restrictions;
  - (e) Ground conditions particularly with regards to conditions that may need to be considered when positioning a crane;
  - (f) Ensuring that prior to the erection of structures, all underground services in the area are located and rendered safe;
  - (g) Cranes and lifting gear which shall be selected and used in accordance with the requirements of NEOM NLF NMS -006.006 — Safe Use of Lifting Equipment and Lifting Accessories.
  - (h) Personal Protective Equipment (PPE) shall be selected by considering standards and requirements that apply to construction generally, and to steel erection in accordance with – NEOM-NLF-NMS-006.021 Personal Protective Equipment.

- (i) Documented safe system of work will include Permit to Work. This will utilise a permit system that meets or exceeds the requirements of NEOM-NLF-NMS-006.004 Permit to work Systems.

### 8.3.2 Documented safe systems of work shall:

- (a) Be distributed to all those concerned with the supervision of the steel erection;
- (b) Communicated in a comprehensible manner to all employees involved in steel erection;
- (c) Ensure steel erection is monitored to ensure that the planned sequence of operations is not deviated from in any way;
- (d) Be reviewed and updated as necessary so that it remains current.

## 8.4 General Hazards

### 8.4.1 Contractor shall ensure control measures are developed and implemented for the following general hazards and limitations which may be found on sites where steel erection works are to be undertaken:

- (a) Overhead electric power lines in the area where steel erection planned;
- (b) Buried services, including underground electric cables, gas, or other pipelines;
- (c) Restricted access to, and on, the site due to road alignment which may limit the size and weight of structural members and plant, including cranes;
- (d) Restricted space for erection, maneuvering, storage and, if required, for on-site pre-assembly of fabrication, and low ground bearing capacity;
- (e) Proximity and condition of other buildings or roads, which may affect the planned method of erection and craneage;
- (f) Proximity of the public to the site;
- (g) Activities of another Contractor;
- (h) Barriers and notices shall prohibit entry to non-erection personnel; and
- (i) Toxic gases, chemicals, fluids, or dust emitting from processes on or near the site.

## 8.5 Ground Conditions

### 8.5.1 Contractor shall ensure the following with regards to ground conditions:

- (a) The provision of hard standing ground, appropriate for mobile access equipment and cranes prior to the commencement of erection;
- (b) Good vehicular access to the hard standing to be provided and vehicle turning circles shall also be considered.
- (c) Routing identified and marked out to provide safe access and egress

## 8.6 Preparation and Bases

### 8.6.1 Contractor shall ensure the following with regards to preparation and bases:

- (a) A sound foundation is provided for each steel column which shall be capable of accepting both a vertical load and the additional horizontal thrust which is developed as soon as temporary props have been removed.
- (b) The area around where the steel erection is to take place shall be clear of all materials and levelled as far as reasonably practicable;

- (c) Steel components are placed as close as reasonably practicable to the work area without interfering with access or the work sequence;
- (d) Employees involved shall be briefed on the steel erection sequence, in particular understanding where temporary supports will be required to ensure stability of the structure during erection.

## **8.7 Cranes**

- 8.7.1 In accordance with the requirements of NEOM NLF-NMS -006.006 - Safe Use of Lifting Equipment and Lifting Accessories Contractor shall also co-ordinate the use of cranes which include:
- (a) Ensuring the appropriate number and type of cranes;
  - (b) Confirming that the designated siting positions for cranes can be achieved, with appropriate hard standings provided;
  - (c) Checking for the presence of hazards or development which may have altered the site since the original plans were made;
  - (d) That all fabricated units shall have a distinctive mark identical to the erection drawings, to ensure that structures are correctly assembled;
  - (e) Appointing a competent person to supervise the complete lifting operation, particularly when tandem lifts are used; and
  - (f) Appropriate ladders shall be available to ensure safe access on and off vehicles for persons unloading materials.

## **8.8 Lifting Steel Members**

- 8.8.1 Contractor shall ensure the following with regards to lifting steel members:
- (a) Planned routes for pre-planned lifts;
  - (b) Procedures implemented for multiple lifts;
  - (c) When lifting steel members, they shall be slung using flat slings in a conventional manner as detailed in a specifically prepared lifting plan.
  - (d) Every lift shall be under the supervision of a trained and certified signaler / slinger;
  - (e) Prior to lifting each steel member into position, the load shall be raised slightly off the ground and checked for balance and stability;
  - (f) Structural steel members shall not be released from lifting equipment until they have been secured and braced in accordance with the designer's specification;
  - (g) Exclusion areas are to be established to prevent unauthorized access to the working area and to prevent working under loads; and
  - (h) Lifting accessories shall be inspected for signs of damage or wear by the signaler / slinger at the start of each shift. Damaged or worn lifting accessories shall immediately be removed from service.

## **8.9 Material Storage**

- 8.9.1 Contractor shall ensure areas are allocated for stacking and storing components which shall be clearly marked on site plans. These areas shall be:
- (a) Clear of obstructions, as level as reasonably practicable, and of appropriate size;

- (b) On ground which is capable of withstanding loads imposed by the stored materials and plant used in the area and investigation shall include a check for the presence of underground services to prevent damage from imposed loads;
- (c) Sited away from hazards such as overhead power lines;
- (d) Arranged so that clear access and lines of sight are provided and maintained between stacks of components;
- (e) Provided with artificial lighting and weather protection, where appropriate, to aid handling; and
- (f) If on site manufacture, fabrication, modification, or repair work is to be undertaken, additional areas may be needed with facilities similar to those of storage areas.

## **8.10 Stacking**

- 8.10.1 Materials shall be stacked to ensure there is little risk of collapse or sliding.
- 8.10.2 Timbers, battens, and wedges shall be provided for resting material stacks on and preventing uncontrolled material movements;
- 8.10.3 Safe access for slinging purposes shall be provided;
- 8.10.4 Employees shall be briefed on the safe system of work when moving materials from storage areas;
- 8.10.5 Care shall be taken when breaking steel banding used to secure materials on pallets.
- 8.10.6 Appropriate space shall be provided around material stacks to allow for the safe movement of employees involved with moving materials;
- 8.10.7 Steel members shall be placed on wooden blocks to ensure safe slinging;
- 8.10.8 Materials on pallets shall be stacked no more than 3 pallets high or as per the supplier's recommendations.

## **8.11 Stability of Structures**

- 8.11.1 Contractor shall ensure the requirements for stability at all stages of steel erection are clearly understood by all persons dealing with the steel erection work.
- 8.11.2 Contractor shall ensure additional control measures are implemented to verify stability in the following circumstances:
  - (a) Temporary cessation of work;
    - I. When fastenings may be incomplete in case of lining up and adjustment of level, high wind or when high winds are expected;
    - II. When the stage of completion of permanent work on which the stability depends is inappropriate, or when the permanent work has not developed appropriate strength;
    - III. When the structure or parts of it may be subject to construction loads due to impact, stacking of parts, and lifting or freeing of components which may have become inadvertently wedged in position;
  - (b) Temporary supports
 

Temporary supports shall be:

    - I. Of appropriate design and construction as identified on drawings or in the method statement;
    - II. Left in place until the structural steel is fixed in place in accordance with the designer's specification. The minimum number of bolts for columns and other structural members shall be determined by the designer; and

- III. Used in the way intended. Improvised supports must not be employed.
- (c) Anchor points:
- I. Must be able to resist any force reasonably foreseeable to be imposed upon them;
  - II. Anchor points or bolts that are damaged during the fixing operation shall not be used.
  - III. Anchor points and bolts shall not be repaired;
  - IV. Movement of an anchor shall be reported immediately, and prompt remedial action taken;
  - V. Steel cables for anchorage purposes shall not enter the ground unless appropriately protected;
  - VI. Fastening of guy lines to anchorages in the ground shall be carried out using chains or steel bars;
  - VII. Screw type anchors shall be used in accordance with the manufacturer's instructions.

## **8.12 Connecting beams and columns:**

- 8.12.1 Where structural steel beams and columns are joined or connected this shall be in accordance with the designer's specification;
- 8.12.2 Where column or beam splices are used all bolts must be fitted and tightened to the designers recommended torque before the joint can be relied upon structurally.

## **8.13 Metal Decking**

- 8.13.1 Contractor shall ensure that metal decking is progressed in accordance with working at height requirements as set out in NEOM-NLF NMS 006.007 – Working at Height and take all reasonably practicable control measures to ensure employees are protected from the hazard of falling.
- 8.13.2 Contractor shall ensure that before metal decking is used as a working platform or before working at height control measures are removed it must be secured in accordance with the manufacturer's requirements.

## **8.14 Scaffolds**

- 8.14.1 Contractor shall ensure scaffolding is erected in accordance with NEOM-NLF–NMS-006.003– Scaffolding which may include:
  - (a) Towers - used for making low level connections;
  - (b) Independent scaffolds - for the construction of ladder access towers to provide roof access; or
  - (c) Purpose-built platforms - these are appropriately designed and fabricated platforms which are used where many similar connections require fixing. They can be fixed to components and can be removed for re-use at the next location.

## **8.15 Temporary Access**

- (a) Contractor shall consider various means of temporary access that may be used in the erection of structures, and Contractor shall consider the type of equipment to be used in the preparation of the documented safe systems of work, in accordance with NEOM NLF NMS 006.007 – Working at Heights. These may include:

- (b) Platforms or staging's may be used as working platforms, but they require a firm base and shall always be securely fixed;
- (c) Under no circumstances shall 'beam walking' as a means of access be allowed;
- (d) Ladders used to access heights or column shall be footed or fixed securely in accordance with NEOM-NLF -NMS 006. 014 – Ladders.
- (e) Consideration shall be given on larger steel frame erection projects to the provision of Mobile Elevating Work Platforms (MEWPs); and
- (f) Where it is not reasonably practicable to use MEWPs, or other equipment specifically designed for lifting persons, then man-riding skips or cradles suspended from cranes may be used.

## **8.16 Permanent Access**

8.16.1 Contractor shall ensure the following with regards to permanent access:

- (a) All permanent walkways, ladders and steps shall be erected as early as reasonably practicable to enable the structure itself to be used for access;
- (b) Edge protection shall be appropriate and temporary guardrails shall be fitted if the permanent rails are not available; and
- (c) Once an access route has been established, gratings and boards shall be removed only under a permit-to-work system.

## **8.17 Inspection and Maintenance**

8.17.1 Contractor shall ensure appropriate control measures are implemented for the inspection and maintenance of a steel erected structure to ensure it remains in a safe condition.

8.17.2 Contractor shall ensure after erection and prior to handover, the steel erection to be inspected by a competent person to ensure that the structure has been erected in compliance with the design drawings. If design drawings have been prepared by an engineer, the engineer shall provide the certification.

8.17.3 Contractor shall ensure copies of the certification are kept on site.

8.17.4 Contractor shall, as a minimum, ensure that the inspections include:

- (a) The structure / supporting structure is appropriate;
- (b) Working platforms are secured and protected;
- (c) Access and egress are appropriate;
- (d) That the structure will enable the work to be performed appropriately and safely.

8.17.5 Contractor shall determine the frequency of inspections which may vary depending on weather and site conditions, the type and size of the structure and the risks associated with collapse.

8.17.6 Contractor shall ensure inspection records are kept on site and include the location, comments, date and time of inspections, relevant design or specification references and the details of the person who conducted the inspection.

## **8.18 Training and Competency**

8.18.1 Contractor shall ensure that Safety training complies with the requirements of:

- (a) NEOM Element 5 – Training, Awareness and Competency.
- (b) NEOM-NLF NMS 006.001 – SMS Organisation, Practitioner Registration and Appointment of Contractor

- (c) In accordance with NEOM-SMS-SM – Roles and Responsibilities Contractor shall ensure employees required to implement the requirements of this NMS are trained in steel erection and understand the risks associated with using the relevant plant and the control measures put in place by the Contractor.
- 8.18.2 Contractor shall ensure all employees involved in the steel erection of the structures are trained to recognize and respond to hazards associated with this type of work.
- 8.18.3 Training shall be tailored to the specific requirements of the jobsite and include any unique issues or requirements.
- 8.18.4 Contractor shall ensure an overall training programme is planned for both riggers and supervisors, and shall include, but not limited to the following:
- (a) All aspects of rigging and erection methods, multi-lifting procedures, lifting equipment, use of tools and plant, erection of scaffolds and staging's, together with safe working practices, fall prevention, guardrail systems and statutory obligations;
  - (b) Induction training for supervisory staff, riggers, and erectors prior to commencement of the work;
  - (c) Project planning for structures;
  - (d) Establishment and running of the site organization;
  - (e) Procedures for dealing with emergencies and incidents; and
  - (f) Issue and explanation of the company safety policy, procedures and site rules, the location of emergency telephones, first aid and medical services, and the use of protective clothing and equipment.
- 8.18.5 Contractor shall maintain a record of the required training that contains the following information:
- (a) Name and ID number;
  - (b) Subject(s) of training;
  - (c) Date(s) of training; and
  - (d) Person(s) providing the training.

## 9 Records and Retention

*Table 4 Records and Retention*

Documents	Retention
All Design Documentation	Included in the handover documentation
Documented Safe Systems of Work	Retained until completion of the works
Erection Plans	Included in the handover documentation
QA / QC documentation	Included in the handover documentation
All inspection documents	Retained until completion of the works
Training Records	Retained until employee leaves the company
Lifting Plans	Retained until completion of the works
Permit to Work documentation	Retained for a minimum of one (1) year following the expiry date of the permit.

## 10 Appendices

### 10.1 Appendix A: Forms, Signs and Checklists



## 10.2 Appendix B: Audit Criteria Steel Erection NEOM -NLF-NMS-006 .031

Contractor/ Area: \_\_\_\_\_

Department: \_\_\_\_\_

Completed by: \_\_\_\_\_ Date completed: \_\_\_\_\_

Audit Criteria		Requirements	Verification	Area of Concern
ISO 45001:2018 Clause	NMS Ref.			Yes/ No
5.3	7.1.3	Pre-Tender Health and Safety Plan has been developed and issued		
5.3, 8.1.4.2	7.1.4	Selection of Contractors undertaken in accordance with NEOM's policies and procedures		
7.2	7.2.5, 8.18	Persons appointed to manage /oversee work operations have the skills, knowledge, experience		
8.1.2 (e)	7.2.6	Personal protective equipment required for use are fit for purpose		
6.1.2.3	7.2.4,	Hazards Identification Plan (HIP) for lone employee		
6.1.2.2	8.1.1	Assessment of the various risks shall be undertaken, where lone working has been identified, the risk assessment shall be developed		
8.1.1, 8.1.2	8.2.2	Contractor shall consider safe methods of working Design and Planning for steel erection		
8.1.1, 8.1.2	8.4 8.5, 8.6, 8.7, 8.8 8.9, 8.10, 8.11, 8.12, 8.13, 8.14, 8.15, 8.16	Contractor shall ensure control measures are developed and implemented for: a) General hazards and limitations b) Ground Conditions c) Preparation and Bases d) Cranes e) Lifting Steel Members f) Material Storage g) Stacking h) Stability of Structures i) Connecting beams and columns j) Metal Decking k) Scaffolds l) Temporary Access m) Permanent Access		
9.1.1, 9.1.2	8.17	After erection and prior to handover, the steel erection shall be inspected by a competent person to ensure that the structure has been erected in compliance with the design drawings		



### **10.3 Appendix C: Guidance Information**

Steel erection is one of the top 10 most hazardous occupations according to BLS fatality data year after year. Steel erection work includes high rise structures, metal buildings and even signs. Steel erection is often the skeletal core of bridges, office buildings, commercial, retail, and industrial structures

In OSHA Steel Erection is regulated through 29 CFR 1926 Subpart R ; 1910.12 ; 1911 and 1911.15

The standard is intended to protect employees from steel erection hazards when involved in the construction, alteration, or repair of:

- Single-story buildings
- Multi-story buildings
- Bridges
- Other structures where steel erection occurs

The requirements apply to all employers engaged in steel erection unless otherwise specified. It does not cover electrical transmission towers, communication and broadcast towers, or tanks.

In the UK Steel Erection is covered under the Construction (Design and Management) Regulations and guidance is available in the free publication HSG 246 – 2016 Safety in the storage and handling of steel and other metal stock

This revised guidance is aimed at directors, owners, managers, and supervisors and pays particular attention to the most common hazards, including (un)loading of delivery vehicles, storage systems, workplace transport, mechanical lifting and injuries from sharp edges.

New sections compare the use of single- versus double-hoist cranes and give additional information on the safe use of pendant and remote controllers, suitable lifting accessories, working at height and providing better access arrangements with stock products.

HSG 150 3<sup>rd</sup> Edition - Health and Safety in Construction is also useful freely available safety guidance and covers all aspects of Construction safety including Steel Erection . It provides help and assistance on how to work safely on most tasks you will encounter. It will also help to identify the main causes of accidents and ill health and explains how to eliminate hazards and control risks. The guidance is simple but comprehensive. The solutions are straightforward and easy to adopt.



نیوم NEOM

**NEOM OCCUPATIONAL HEALTH and SAFETY  
NEOM MINIMUM STANDARD  
for  
SITE TRAFFIC MANAGEMENT AND LOGISTICS**

NEOM-NLF-NMS-006.032 Rev 02.00 – February 2022

©NEOM [2021]. All rights reserved.

## Document History

Revision code	Description of changes	Purpose of issue	Date
Rev 00.00	First Issue	Issued for Implementation	27/07-2020
Rev 02,00	Sector Review	Issued for Implementation	01-02-2022

## Document Approval

	Prepared by	Reviewed by	Approved by
Name	Robert Murphy	Talal Al Anazi	Adel Al Wuhaib
Job Title	Loss Prevention Specialist LP/FS -Public Safety	Director, Loss Prevention/Fire Safety (LP/FS) Public Safety	Executive Director Public Safety

## OUR NEOM VALUES



### CATALYST

Make a difference.  
Create a legacy.



### CARE

Leave the environment  
in a better place.



### CURIOS

Challenge the norm.  
Stay restless.



### PASSIONATE

Be accountable.  
Finish what you start.



### RESPECT

Be authentic.  
Be true. Be fair.



### DIVERSITY

Embrace cultural  
differences.  
Seek to understand.

## Contents

<b>1</b>	<b>PURPOSE .....</b>	<b>4</b>
<b>2</b>	<b>SCOPE .....</b>	<b>4</b>
<b>3</b>	<b>EXPECTATIONS.....</b>	<b>4</b>
<b>4</b>	<b>LIST OF DEFINITIONS .....</b>	<b>5</b>
<b>5</b>	<b>LIST OF ABBREVIATIONS .....</b>	<b>5</b>
<b>6</b>	<b>RELATED NEOM DOCUMENTS.....</b>	<b>6</b>
<b>7</b>	<b>ROLES AND RESPONSIBILITIES .....</b>	<b>6</b>
7.1	Client .....	6
7.2	Contractor .....	7
7.3	Employee .....	7
7.4	Specific Responsibilities .....	7
<b>8</b>	<b>OTHER SECTIONS RELATED TO SUBJECT .....</b>	<b>8</b>
8.1	Employers Responsibilities.....	8
8.2	Planning and Assessment.....	8
8.3	Site Traffic Management.....	9
8.4	Traffic Routes .....	9
8.5	Pedestrian Routes .....	10
8.6	Traffic Marshals.....	10
8.7	Vehicle Reversing .....	11
8.8	Traffic Management Plans .....	11
8.9	Logistics.....	12
8.10	Storage Areas.....	12
8.11	Material Deliveries and Collection .....	12
8.12	Journey Management Plan .....	13
8.13	Inspection of Site Traffic Management and Logistics Arrangements.....	14
<b>9</b>	<b>APPENDICES .....</b>	<b>15</b>
9.1	Appendix A: Forms, Signs and Checklists .....	15
9.2	Appendix B: Audit Criteria.....	16
9.3	Appendix C: Guidance Information.....	18

## List of Tables

Table 1 : Table of Definitions .....	5
Table 2 : Table of Abbreviations .....	5
Table 3 : Related NEOM Documents .....	6

## **1 Purpose**

This NEOM Co. SMS Minimum Standards (hereafter referred to as NMS) relates to the management of all occupational health and safety (OHS) risks associated with Site Traffic Management and Logistics.

It provides guidance to support compliance with industry best practice and international regulatory safety requirements to ensure that the associated risks are assessed, and control measures are implemented in accordance with the hierarchy of risk controls.

It has been developed to align with the requirements of the ISO 45001 Health and Safety Management Manual (Refer NEOM-NLF-PRC-006- Section 2 ISO 14001 Cross reference table)

## **2 Scope**

This NMS applies to all personnel within NEOM and any Contractors working for NEOM and or associated projects and activities. It is designed to incorporate requirements set by the NEOM-SMS.

It establishes the requirements and logistics associated with Site Traffic Management.

Site traffic refers to all forms of vehicle traffic movements, including powered lift trucks or plant, on site and includes the movements of visitors' vehicles.

*N.B Road Safety is covered in: NEOM-NLF-NMS-006.042*

## **3 Expectations**

To ensure the health and safety of all personnel, protection of assets and the environment

NEOM expect each Sector, Organization, Department or Contractor to ensure that risks associated with the work are controlled in accordance with the hierarchy of risk controls: elimination, substitution, engineering controls, administrative controls, and personal protective equipment.

Consideration shall be given to technological advances that may introduce new means of controlling or eliminating the risks associated with work activities involving traffic management and logistics on and around sites.

That the expectation for safety compliance is meeting and exceeding all applicable OSHA Laws, Regulations, and Industry Best Practice.

Applicable requirements and standards include:

- (a) OSHA Standards and Regulatory requirements.
- (b) ANSI requirements.
- (c) NEOM Minimum Standards
- (d) NEOM Technical Schedules Section 17.1
- (e) NEOM Design Manual for Roads and Bridges and NEOM-NPR-PRO-5501 Temporary Traffic Controls
- (f) International Building Codes

*If requirements of this document conflict with requirements set by another regulatory authority, Contractor are required to follow the more stringent requirement.*

## 4 List of Definitions

Table 1 : Table of Definitions

Terms	Definitions
NEOM Co	NEOM Company
Client	NEOM Sector /Department responsible for management and oversight of the Contractor
Employer	The person or organisation that employs personnel to complete the work - Can be Sector, Organization, Department or Contractor
Contractor	The organisation contracted to carry out the works
Vehicle	In this document refers to any powered truck, car, van or item of site plant that may be operated by a driver or operator.
Site	In this document refers to a project or facility in which the traffic is being managed, including internal traffic movements such as powered forklift trucks.
Site traffic	In this document refers to all forms of vehicle traffic movements, including powered lift trucks or plant, on site and includes the movements of visitors' vehicles
Sector, Organization, Department or Contractor	The Sector, Organization, Department or Contractor is the NEOM entity or developer designated by NEOM to accept custody for planning, designing, constructing, or managing and operating a particular asset or a group of assets
Safety Management System (SMS)	Occupational Health and Safety Management System established by NEOM in compliance to ISO 45001 Standard

## 5 List of Abbreviations

Table 2 : Table of Abbreviations

Abbreviations	Descriptions
SMS	Safety Management System
NMS	NEOM Minimum Standard
SOP	Standard Operating Procedure
ANSI	American National Standards Institute
NFPA	National Fire Prevention Association
CPP	Construction Phase Plan
OSHA	Occupational Safety and Health Administration.
PPE	Personal Protective Equipment
IBC	International Building Codes
OHS	Occupational Health and Safety

## 6 Related NEOM Documents

Table 3 : Related NEOM Documents

Document Code	Document Name
NEOM Element 2	Risk and Opportunity Management
NEOM-Element 5	Training, Awareness and Competency.
NEOM-Element 6	Contractor Management
NEOM Element 9	Emergency Planning and Response Management
NEOM-SMS	Neom Safety Management System
NEOM-NLF-SM	Safety Manual - Roles and Responsibilities
NEOM-NLF-PRC-006- Section 2	ISO 14001 Cross Reference Table
NEOM-NLF-PRC-006;	Occupation Health, Safety and Fire Safety requirements for Contractors
NEOM-NLF-NMS-006.002	Safety Construction Management Plan
NEOM-NLF-NMS-006.012 –	Barricading of Hazards
NEOM-NLF-NMS-006.013	Safety Signage and Signals
NEOM-NLF-NMS-006.021	Personal Protective Equipment (PPE)
NEOM-NLF-NMS-006.040	General Workplace Amenities
NEOM-NLF-NMS-006.042	Road Safety

## 7 Roles and Responsibilities

### 7.1 Client

- 7.1.1 General Health and Safety roles and responsibilities are defined in; and shall be carried out in accordance with the requirements of NEOM-NLF-SM–Safety Management Manual - Roles and Responsibilities.
- 7.1.2 The Client is responsible for ensuring that NEOM Safety Commitment Statement and safety management system are properly applied within their areas of control/responsibility. Effective implementation will ensure compliance with relevant legislative requirements and will help promote the use of industry best safe working practices.
- 7.1.3 That a suitable, Pre-Tender Health and Safety Plan has been developed and issued to Contractors to ensure they have all the information necessary to make informed decisions when developing the Construction Phase Health and Safety Plan (NEOM-NLF-NMS-006.002 Safety Construction Management Plan) (CPP) which will form part of the Contractor review and selection process
- 7.1.4 That the selection of Contractors shall be undertaken in accordance with NEOM's policies and procedures (NEOM-Element 6-Contractor Management). To ensure that only Competent organisations capable of meeting the requisite safety standards associated with project are contracted.

- 7.1.5 Conduct regular Contractor safety assurance reviews to provide the confidence level required that the safety management system is delivering as planned, and consistently achieves the acceptable level of safety. Including:
- (a) Safety performance monitoring and measuring;
  - (b) Managing change;
  - (c) Continuous improvement.

## 7.2 Contractor

- 7.2.1 Contractor shall undertake their roles and responsibilities in accordance with the general requirements of NEOM–NLF-SM–Safety Management Manual-Roles and Responsibilities
- 7.2.2 Maintaining control of access to dangerous or high-risk areas or equipment using suitable barricades that are in serviceable condition (Refer: NEOM-NLF-NMS-006.012 – Barricading of Hazards)
- 7.2.3 That all work activities are assessed, planned, organized, and that suitably competent Supervision is available to implement the safety requirements and oversee the work (Refer: NEOM- Element 5 – Training, Awareness and Competency)
- 7.2.4 Ensure persons appointed to manage /oversee work operations have the skills, knowledge, experience and, where relevant, the organisational capability to plan and manage work safely and without risk to those who may be affected by the activities (Refer: NEOM Element 5 Training, Awareness, and Competence).
- 7.2.5 Ensure employees carrying out the work are trained to recognize the associated hazards and understand the processes and procedures to control or minimize the risks.(Refer: NEOM Element 2 Risk and Opportunity Management)
- 7.2.6 That all equipment including personal protective equipment required for use is fit for purpose, and (as required) has been inspected by a competent person and inspection records are maintained and readily available.(Refer: NEOM-NLF-NMS-006.021 Personal Protective Equipment) (PPE)

## 7.3 Employee

- 7.3.1 Shall undertake their roles and responsibilities in accordance with the general requirements of NEOM-NLF-SM – Safety Management Manual - Roles and Responsibilities.
- 7.3.2 Report any activity or defect relating to the work which they believe is reasonably foreseeable to endanger their safety or that of another person's.
- 7.3.3 Shall use appropriate equipment or safety devices provided for the work by the Contractor in accordance with any training or instruction received in the use of the work equipment. (Refer NEOM-NFL-NMS-006.021 Personal Protective Equipment)
- 7.3.4 Shall undertake their specific roles and responsibilities in accordance with the following:
  - (a) Employees shall follow all instruction and training they receive on site traffic management and logistics;

## 7.4 Specific Responsibilities

- 7.4.1 Sector, Organization, Department or Contractor Head is responsible in ensuring that provisions are made the safe systems of work to prevent and minimize risks in each workplace
- 7.4.2 Safety Practitioner/Coordinator is responsible to monitor the implementation of this procedures and document its effectiveness
- 7.4.3 Line Managers / Supervisors are responsible for training their workers in risks

- 7.4.4 The Responsible Person will support this procedure and ensure that any Contractor Organization working for, or on behalf of, the Sector, Organization, Department or Contractor will comply with the requirements of these procedures
- 7.4.5 The LP & FS Public Safety department will support the NEOM risk assessments by carrying out compliance checks and supporting and guiding the various safety teams.

## **8 Other Sections related to subject**

### **8.1 Employers Responsibilities**

- 8.1.1 Employer's responsibilities in this Section 8 relate to: Sector, Organization, Department or Contractor
- 8.1.2 Employers shall undertake their specific roles and responsibilities in accordance with the following:
  - (a) Site traffic management shall be appropriately planned, organized, and supervised;
  - (b) Pedestrian and vehicles routes shall be segregated so far as is reasonably practicable;
  - (c) Pedestrian and vehicle routes shall be clearly marked with signs and barriers;
  - (d) Separate site entrances and exits shall be provided for both vehicles and pedestrians;
  - (e) Appropriate speed limits shall be enforced for the facility, considering pedestrian movements and the risks from the operations being undertaken.
  - (f) Visitor vehicles movements shall be managed in an appropriate manner for the facility. At a minimum traffic shall be stopped at the site entrance and drivers briefed by a competent person on the site traffic management arrangements.
  - (g) All arrangements for site traffic management and logistics shall be regularly reviewed and updated where deemed necessary; and
  - (h) All persons involved in site traffic management and logistics shall be trained and competent.
  - (i) Training records shall be maintained for all personnel involved in site transport and logistics movements.

### **8.2 Planning and Assessment**

- 8.2.1 Employers shall evaluate each site or operation to determine if site traffic management or logistic hazards are present and risks shall be assessed using risk management practices as required by NEOM Element 2 Risk and Opportunity Management.
- 8.2.2 Employers shall ensure the following:
  - (a) An assessment of the various risks is undertaken and systems of work which are safe to both employees and the public shall be established;
  - (b) Where required by risk or high number of traffic movements, a traffic management plan is prepared where applicable and regularly updated;
  - (c) That effective procedures and control measures are implemented in order to manage the risks associated with site traffic management and logistics;
  - (d) That the site traffic management and logistics requirements are included in the Pre-Tender Safety and Health Plan in accordance with the NEOM Element 6 Contractor Management

- (e) That associated safe systems of work, and site rules are included in the Safety and Health Construction Management Plan (NEOM-NLF-NMS-006.002 (CPP) in the case of the Construction Sector in accordance with NEOM -Element 6 Contractor Management
- (f) That the traffic management plan is implemented in accordance with all other NEOM Minimum Standards relevant to the operation and movement of vehicles as part of the employer's operational activities.

### **8.3 Site Traffic Management**

8.3.1 Employers shall ensure the following when planning for site traffic movements:

- (a) All vehicle routes are to be planned to minimize the need for vehicles to reverse by introducing one-way-systems wherever reasonably practicable;
- 8.3.2 Road construction and surface quality for traffic routes shall be appropriate for the vehicle types that will use them;
  - (a) Consideration shall be given to vehicle access route widths and the turning radius of bends to ensure clear access for emergency vehicles;
  - (b) Appropriate lighting for roads and pedestrian walkways shall be provided;
  - (c) All vehicles including contractor and visitor vehicles shall be subject to the site rules for vehicles;
  - (d) Arrangements shall be made by the employer to brief contractor's and visitor's drivers and operators on the safety requirements of the site traffic routes and the required PPE requirements should they leave their vehicle;
  - (e) Parking areas shall be incorporated away from operational requirements;
  - (f) The design of traffic routes shall be in a manner that avoids blind-spots and tight bends;
  - (g) Traffic routes shall be segregated from pedestrian routes wherever reasonably practicable; and
  - (h) Engineering control measures shall be given priority over administrative controls when planning traffic management systems.

### **8.4 Traffic Routes**

8.4.1 Employers shall ensure that vehicle traffic routes are appropriate and wide enough for the type of vehicle using them. Where two-way traffic is unavoidable the width of the traffic route shall be wide enough to allow vehicles to pass safely without risk of collision or striking with the other vehicle.

8.4.2 Access for emergency vehicles shall always be maintained. Where routes are blocked or obstructed temporarily due to site activities, alternative arrangements shall be in place for emergency vehicle access.

8.4.3 Employers shall ensure the following:

- (a) Signage shall be provided to clearly indicate the traffic route, direction of travel and any specific instructions that the driver or operator may need to know; (Refer: NEOM-NLF-NMS-006.013 Safety Signage and Signals)
- (b) Speed limits shall be determined, and appropriate signage shall be displayed at frequent intervals displaying the maximum speed limit. The risk assessment process shall be followed to assess each site-specific requirements;
- (c) Where there is a public interface at the site entrance and/or exit warning signs and traffic control measures shall be provided. In most cases this will involve the use of traffic marshals to direct and oversee traffic arrangements and public safety;
- (d) Signage shall be checked regularly and maintained so that it can be easily read;

- (e) Multi-language signs shall be provided in appropriate languages of the drivers or operators;
- (f) Traffic control measures shall be provided at junctions, pedestrian crossing points or other potentially dangerous areas;
- (g) Arrangements shall be made to check the safe use of traffic routes including:
  - I. Vehicle speed;
  - II. Direction of travel;
  - III. Safe driving practices;
  - IV. Compliance with passing/overtaking rules; and
  - V. Adherence to warning signs and traffic signals.
- (h) Where speed bumps are used they shall be clearly signposted, physically marked and designed so as not to create additional hazards for the type of vehicles using the traffic route; and
- (i) Traffic routes shall be maintained, and the surface shall be kept in good condition. Potholes and other wear shall be identified through inspection and remedial action shall be taken.

## **8.5 Pedestrian Routes**

- 8.5.1 As far as is reasonably practicable, ensure that designated walkways and routes are provided for pedestrians. Pedestrian walkways shall be clearly marked with signage and were reasonably practicable, protected with baulk timbers or other appropriate barriers.
- 8.5.2 Ensure that pedestrian routes are maintained in good order and kept free from obstruction. Daily checks of each walkway shall be made at the beginning of each shift.
- 8.5.3 Employers shall ensure the following:
  - (a) Details of the arrangements for pedestrian access and safety shall be included and covered thoroughly in the site environment health and safety induction;
  - (b) Access to high-risk vehicle maneuvering areas is restricted with appropriate barriers and signs in accordance with NEOM-NLF-NMS-006.012 Barricading of Hazards;
  - (c) Appropriate crossing points are provided and clearly signposted where pedestrians have to cross vehicle traffic routes;
  - (d) Control measures are implemented to prevent pedestrian taking shortcuts. This may include increased levels of barrier protection or security staff at high-risk areas; and
  - (e) Pedestrian routes shall be illuminated where out-of-hours or night-time working is required. This arrangement also covers access by night-time security staff.

## **8.6 Traffic Marshals**

- 8.6.1 Employers shall ensure that appropriately trained traffic marshals are provided on site to oversee traffic control arrangements. Traffic marshals shall be easily identifiable with a high-visibility vest or jacket.
- 8.6.2 That appropriate shelters are provided for traffic marshals to shade them from the sun, this will include air conditioning for main entrance and exit posts.
- 8.6.3 Traffic marshals shall comply with the requirements of NEOM-NLF-NMS -006.013 Safety Signs and Signals. Traffic marshals shall ensure that they are in full view of the driver at all times whilst undertaking reversing operations and shall prevent any pedestrian movement behind reversing vehicles.

## **8.7 Vehicle Reversing**

- 8.7.1 Employers shall ensure so far as reasonably practicable that control measures are implemented to prevent the need for vehicle reversing movements
- 8.7.2 Where it is not reasonably practicable to prevent the need for vehicle reversing movements employers shall ensure the following:
- (a) A full and detailed risk assessment shall be undertaken;
  - (b) The need for reversing shall be minimized where reasonably practicable;
  - (c) Audible alarms and flashing amber lights are to be fitted to vehicles which operate automatically when the reverse gear is selected;
  - (d) Designated reversing areas are to be provided indicated with appropriate signs;
  - (e) Pedestrian access to reversing areas is to be restricted with appropriate barriers and warning signs; (Refer: NEOM-NLF-NMS-006.012 Barricading of Hazards and NEOM-NLF-NMS-006.013 Safety Signage and Signals)
  - (f) Vehicle drivers or operators are to be briefed on the reversing arrangements; and
  - (g) Appropriate supervision is to be provided to monitor the effective implementation of the control measures for reversing vehicles.
- 8.7.3 Traffic marshals shall be considered as a last resort and shall only be used in circumstances where other control measures, identified through risk assessment, are not possible.
- 8.7.4 Where traffic marshals are used, Employers shall ensure they are fully trained and competent to undertake the role of a traffic marshal. Training shall be in accordance with the requirements of this document.

## **8.8 Traffic Management Plans**

- 8.8.1 Employers shall ensure that a site specific 'Traffic Management Plan' is prepared on each site where vehicle(s) are operating. The 'Traffic Management Plan' shall include, as a minimum, details on the following:
- (a) General site description and details of the type of traffic on site;
  - (b) Site specific risk assessment for vehicles on site;
  - (c) Site layout drawing clearly showing traffic routes, pedestrian crossing points, signage location and pedestrian routes;
  - (d) Estimated volumes of each vehicle traffic type and means of monitoring traffic flow rates;
  - (e) Details of the traffic control measures at junctions and pedestrian crossing points including arrangements for the segregation of pedestrians and vehicles;
  - (f) Location of designated site parking areas;
  - (g) Details of the person overseeing traffic management arrangements;
  - (h) Details of vehicle driver / operator site rules;
  - (i) Description of the arrangements for visiting drivers; and
  - (j) List of traffic marshals operating on site along with records of their training.
- 8.8.2 Employer shall ensure that the 'Traffic Management Plan' is reviewed on a regular basis and updated to ensure it is appropriate for the current arrangements implemented at site.

- 8.8.3 Employer shall develop and keep up-to-date detailed emergency procedures to deal with vehicle incidents and vehicle fires that may arise on site. (Refer: NEOM Element 9 Emergency Planning and Response Management)
- 8.8.4 The following emergency situations, as a minimum, shall be viewed as foreseeable and detailed in the emergency procedures for the site:
- (a) Vehicle collisions;
  - (b) Vehicle overturning;
  - (c) Vehicle breakdown in high volume traffic area;
  - (d) pedestrians struck by vehicle; and
  - (e) Vehicle fire.

## **8.9 Logistics**

- 8.9.1 Employers shall ensure that prior to the commencement of the main works the site is set up to meet the following requirements:
- (a) Establishment of the site perimeter fencing;
  - (b) Provision of welfare facilities to meet the requirements of the anticipated workforce numbers when work commences;
  - (c) Establishment of site offices; and
  - (d) Provision of traffic routes, pedestrian routes, delivery areas and storage areas.

## **8.10 Storage Areas**

- 8.10.1 Employers shall ensure that appropriate storage areas are provided for materials that can be easily accessed and do not present a danger to employees.
- 8.10.2 Employers shall ensure the following:
- (a) A concrete hard-standing area is provided for the storage of palletized materials;
  - (b) Palletized materials are stacked no more than 3 pallets high or in accordance with manufacturers recommendations (whichever is less);
  - (c) Appropriate space is allowed around storage areas for employees to move around safely without the risk of being trapped between stacked materials and walls or barriers;
  - (d) Storage areas are defined using barriers and signs; Refer: NEOM-NLF-NMS-006.012 Barricading of Hazards and NEOM-NLF-NMS-006.013 Safety Signage and Signals)
  - (e) Arrangements are made to ensure the safe loading and unloading of materials to and from storage areas; and
  - (f) Storage areas are always maintained in good order.

## **8.11 Material Deliveries and Collection**

- 8.11.1 Employers shall ensure that arrangements are in place to ensure the controlled or organised delivery and collection of materials.
- 8.11.2 Delivery / collection drivers shall be subject to Safety briefing / induction with regards to traffic management. This shall include, as a minimum:
- (a) site layout and designated route,
  - (b) speed restrictions,

- (c) site traffic requirements, loading / unloading requirements,
  - (d) any specific risks, and
  - (e) any additional relevant information.
- 8.11.3 Delivery / collection drivers will be made aware of the minimum PPE requirements should they leave their vehicle for any reason.
- 8.11.4 Establish appropriate dedicated vehicle parking areas for delivery / collection vehicles. Parked vehicles shall be turned off with hand brakes on.
- 8.11.5 Employers shall ensure the following:
- (a) Arrangements are in place to ensure all delivery / collection drivers report to security upon arrival to site;
  - (b) Material delivery / collections is made at designated storage / collection areas;
  - (c) Materials can be unloaded / loaded safely by mechanical means where appropriate in safety and without risk to others on site;
  - (d) Those involved in material handling are trained in the site delivery procedures;
  - (e) Vehicle loads are checked prior to entry to site to ensure that they are safe;
  - (f) Vehicle loads are checked and approved by both the employer and the driver following loading on site prior to release of the vehicle for exit from site;
  - (g) Implement safe loading and dispatch procedures as required according to assessed risk; and
  - (h) Coupling / uncoupling shall be undertaken in an appropriate dedicated area. Employer shall assume responsibility for the safe coupling / uncoupling when undertaken on site. Vehicle operators shall be competent in coupling / uncoupling procedures.

## **8.12 Journey Management Plan**

- 8.12.1 Journey Management is controlled and authorised by NEOM Security
- 8.12.2 A Journey Management Plan shall be developed and implemented for employers involved in off-site vehicle movements related to operational activities including collection, delivery, client meetings etc. This does not apply to commuting journeys to and from the workplace at the beginning and end of the shift.
- 8.12.3 The Journey Management Plan shall include the following principles:
- (a) A journey by road shall be necessary and business related;
  - (b) Journey plan shall consider the factors like selection of route, timings, location etc.;
  - (c) A log of the journey including the vehicle used, the driver and any passengers, the time out, destination, expected arrival and return times shall be recorded. An appropriate log shall be maintained on site;
  - (d) Driver shall inform the employer upon arrival at destination;
  - (e) Driver shall inform the employer upon return and sign log as completion of journey;
  - (f) Should the driver be more than one hour late in submitting relevant reports (at destination or on return) then the employer shall take necessary steps to contact driver and ensure his safety;
  - (g) All drivers shall be made aware of the requirements of NEOM-NLF-NMS-006.042 Road Safety
  - (h) Driver shall inform the employer of any unexpected delays (traffic jams); and
  - (i) The employer shall have in place appropriate response procedures for breakdowns, incidents etc.

## **8.13 Inspection of Site Traffic Management and Logistics Arrangements**

- 8.13.1 Employers shall ensure that routine Safety inspections carried out on site cover the site traffic management and site logistics arrangements.
- 8.13.2 Record inspections and identify areas of non-compliance against this NMS. Where non-compliances are identified a corrective action plan shall be developed to deal with their timely close-out

## 9 Appendices

### 9.1 Appendix A: Forms, Signs and Checklists



## 9.2 Appendix B: Audit Criteria

Audit Criteria		Requirements	Verification	Area of Concern
ISO 45001:2018 Clause	NMS Ref.			Yes/ No
5.3	7.1.3	Pre-Tender Health and Safety Plan has been developed and issued		
5.3, 8.1.4.2	7.1.4	Selection of Contractors undertaken in accordance with NEOM's policies and procedures		
7.2	7.2.4	Persons appointed to manage /oversee work operations have the skills, knowledge, experience		
8.1.2 (e)	7.2.6	Personal protective equipment required for use are fit for purpose		
8.1.2 (c, d)	7.2.2	Control of access to dangerous or high-risk areas or equipment using suitable Barricades and Signage		
6.1.2.3	7.2.5	Hazards Identification Plan (HIP)		
6.1.2.2	8.2.1,	Evaluate each site or operation to determine if site traffic management or logistic hazards are present and risks shall be assessed using risk management practices		
8.1.1, 8.1.2	8.3.2, 8.4.1	Road construction and surface quality for traffic routes shall be appropriate for the vehicle types		
8.1.1, 8.1.2	8.4.3(g)	Arrangements shall be made to check the safe use of traffic routes including: a) Vehicle speed; b) Direction of travel; c) Safe driving practices; d) Compliance with passing/overtaking rules; and e) Adherence to warning signs and traffic signals.		
8.1.1, 8.1.2	8.5.1	Pedestrian walkways shall be clearly marked with signage and where reasonably practicable, protected with baulk timbers or other appropriate barriers		
6.1.2.2	8.5.3(b)	Access to high-risk vehicle maneuvering areas is restricted with appropriate barriers and signs		
7.2	8.6.1	Trained traffic marshals with a high-visibility vest or jacket shall be provided on site to oversee traffic control arrangements		
8.1.1, 8.1.2	8.7.1, 8.7.2	Control measures to prevent the need for vehicle reversing, where it is not practicable to prevent the need for vehicle reversing, a full and detailed risk assessment shall be undertaken		
	8.8.1	Specific 'Traffic Management Plan' is prepared on each site where vehicle(s) are operating		
8.2	8.8.3	Develop and keep up-to-date detailed emergency procedures to deal with vehicle incidents and vehicle fires that may arise on site		

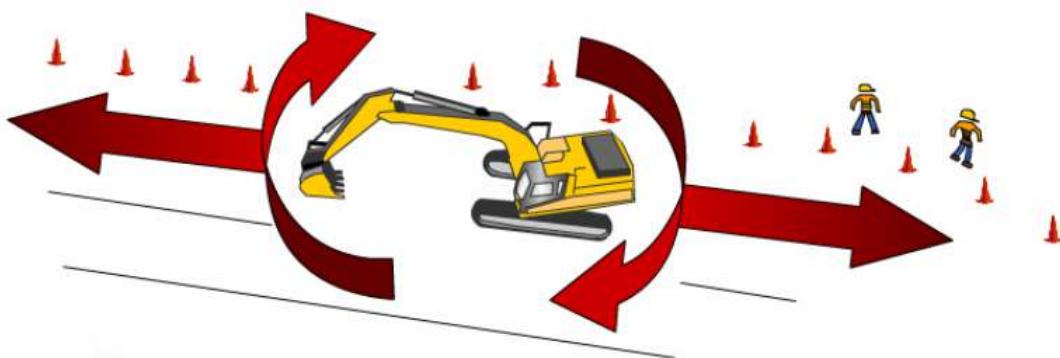
Audit Criteria		Requirements	Verification	Area of Concern
ISO 45001:2018 Clause	NMS Ref.			Yes/ No
8.1.1, 8.1.2	8.9, 8.10, 8.11	Prior to the commencement of the main works, arrangements shall be made for the logistics, storage areas, material deliveries and Collection		
8.1.2	8.13	Inspections shall be carried out on site cover the site traffic management and site logistics arrangements		

### 9.3 Appendix C: Guidance Information

OSHA requires “adequate access roads into and through the site for the safe delivery and movement of derricks, cranes, trucks, other necessary equipment, and the material to be erected and means and methods for pedestrian and vehicular control. Exception: this requirement does not apply to roads outside of the construction site.”

The OSHA standards that regulate work in traffic are found in 29 CFR 1926 Subpart G; these are the Federal OSHA requirements

Warning System for Mobile Equipment Rotating and moving equipment has caused injury and death. By placing cones or other warning signs, posts, etc. around the equipment, workers are then warned of this hazard. The competent person on the job can also conduct a daily briefing with all workers as to the location and expected work path and location of any piece of equipment.



In the UK under HSE a free publication A Guide to Workplace Transport Safety is available on the HSE web site in HSG 136

This guide will be useful for managers, supervisors, employees and their safety representatives, as well as contractors, vehicle operators and other organisations concerned with workplace transport safety.

The new guide is much shorter and more streamlined than the previous edition and includes advice on your general legal duties and information on health and safety management. There is also more specific advice on controlling risks associated with workplace transport, which has been restructured into three main areas:

- safe site (design and activity);
- safe vehicle;
- safe driver

The UK HSE document HSG 136 Workplace Transport Safety gives valuable advice related to this NMS and is freely available from the UK HSE web-site.



نیوم NEOM

**NEOM OCCUPATIONAL HEALTH and SAFETY  
NEOM MINIMUM STANDARD  
for  
ABRASIVE BLASTING**

NEOM-NLF-NMS-006.033 Rev 02.00 – February 2022

©NEOM [2021]. All rights reserved.

## Document History

Revision code	Description of changes	Purpose of issue	Date
Rev 00.00	First Issue	Issued for Implementation	27/07-2020
Rev 02,00	Sector Review	Issued for Implementation	01-02-2022

## Document Approval

	Prepared by	Reviewed by	Approved by
Name	Robert Murphy	Talal Al Anazi	Adel Al Wuhaib
Job Title	Loss Prevention Specialist LP/FS -Public Safety	Director, Loss Prevention/Fire Safety (LP/FS) Public Safety	Executive Director Public Safety

## OUR NEOM VALUES



### CATALYST

Make a difference.  
Create a legacy.



### CARE

Leave the environment  
in a better place.



### CURIOS

Challenge the norm.  
Stay restless.



### PASSIONATE

Be accountable.  
Finish what you start.



### RESPECT

Be authentic.  
Be true. Be fair.



### DIVERSITY

Embrace cultural  
differences.  
Seek to understand.

## Contents

<b>1</b>	<b>PURPOSE .....</b>	<b>4</b>
<b>2</b>	<b>SCOPE .....</b>	<b>4</b>
<b>3</b>	<b>EXPECTATIONS.....</b>	<b>4</b>
<b>4</b>	<b>LIST OF DEFINITIONS .....</b>	<b>5</b>
<b>5</b>	<b>LIST OF ABBREVIATIONS .....</b>	<b>5</b>
<b>6</b>	<b>RELATED NEOM DOCUMENTS.....</b>	<b>6</b>
<b>7</b>	<b>ROLES AND RESPONSIBILITIES .....</b>	<b>7</b>
7.1	Client .....	7
7.2	Contractor .....	7
7.3	Employee .....	8
7.4	Specific Responsibilities .....	9
<b>8</b>	<b>OTHER SECTIONS RELATED TO SUBJECT .....</b>	<b>9</b>
8.1	Employer Responsibilities .....	9
8.2	Training and Competency .....	9
8.3	General Requirements .....	10
8.4	Blast Media .....	11
8.5	Abrasive Blasting Operations outside a Booth or Cabinet .....	11
8.6	Abrasive Blasting Operations in a Workroom .....	13
8.7	Abrasive Blasting in Confined Space .....	13
8.8	Atmospheric Monitoring / Air Sampling .....	13
8.9	Maintenance and Cleaning .....	14
8.10	Occupational Health.....	15
8.11	Emergency Response .....	15
8.12	Record Keeping .....	15
<b>9</b>	<b>APPENDICES .....</b>	<b>16</b>
9.1	Appendix A: Forms, Signs and Checklists .....	16
9.2	Appendix B: Audit Criteria.....	17
9.3	Appendix C: Guidance Information.....	19

## List of Tables

Table 1 : Table of Definitions .....	5
Table 2 : Table of Abbreviations .....	5
Table 3 : Related NEOM Documents.....	6

## **1 Purpose**

This NEOM Co. SMS Minimum Standards (hereafter referred to as NMS) relates to the management of all occupational health and safety (OHS) risks associated with Abrasive Blasting and for Protective Coating Work refer to NEOM-NLF-NMS-006.037 Spray Finishing.

It provides guidance to support compliance with industry best practice and international regulatory safety requirements to ensure that the associated risks are assessed, and control measures are implemented in accordance with the hierarchy of risk controls.

It has been developed to align with the requirements of the ISO 45001 Health and Safety Management Manual (Refer NEOM-NLF-PRC-006- Section 2 ISO 14001 Cross reference table)

## **2 Scope**

This NMS applies to all personnel within NEOM and any Contractors working for NEOM and or associated projects and activities. It is designed to incorporate requirements set by the NEOM-SMS.

It sets the minimum requirements for Abrasive Blasting Operations.

## **3 Expectations**

To ensure the occupational health and safety (OHS) of all personnel, protection of assets (services, plant/equipment) and the environment

NEOM expect each Sector, Organization, Department or Contractor to ensure that risks associated with the work are controlled in accordance with the hierarchy of risk controls: elimination, substitution, engineering controls, administrative controls, and personal protective equipment.

Consideration shall be given to technological advances that may introduce new means of controlling or eliminating the risks associated with work.

That the expectation for safety compliance is meeting and exceeding all applicable OSHA Laws, Regulations, and Industry Best Practice.

Applicable requirements and standards include:

- (a) OSHA Standards and Regulatory requirements;
- (b) ANSI requirements;
- (c) NFPA Standards and requirements;
- (d) NEOM Minimum Standards
- (e) Saudi Building Codes
- (f) International Building Codes

*If requirements of this document conflict with requirements set by another regulatory authority, Contractor are required to follow the more stringent requirement.*

## 4 List of Definitions

Table 1 : Table of Definitions

Terms	Definitions
NEOM Co	NEOM Company
Employer	The person or organisation that employs personnel to complete the work
Client	NEOM Sector /Department responsible for management and oversight of the Contractor
Sector, Organization, Department or Contractor	The Sector, Organization, Department or Contractor is the NEOM entity or developer designated by NEOM to accept custody for planning, designing, constructing, or managing and operating a particular asset or a group of assets
Contractor	The organisation contracted to carry out the works
Abrasive Material	A solid substance used in an abrasive-blasting operation
Abrasive blasting:	The forcible application of an abrasive to a surface by pneumatic pressure, hydraulic pressure, or centrifugal force.
Abrasive-blasting respirator:	A respirator constructed so that it covers the wearer's head, neck, and shoulders to protect the wearer from rebounding abrasive.
Blast cleaning room:	A complete enclosure in which blasting operations are performed and where the operator works inside of the room to operate the blasting nozzle and direct the flow of the abrasive material.
Blasting cabinet:	An enclosure where the operator stands outside and operates the blasting nozzle through an opening or openings in the enclosure.
Clean air:	Air of such purity that it will not cause harm or discomfort to an individual if it is inhaled for extended periods of time.
Dust collector:	A device or combination of devices for separating dust from the air handled by an exhaust ventilation system.
Inspirable dust:	Any dust which can be inhaled.
Particulate-filter respirator:	An air purifying respirator commonly referred to as a dust or a fume respirator, which removes most of the dust or fume from the air passing through the device.
Respirable dust:	Is only that dust which is small enough to be inhaled into the lungs. Airborne dust in sizes capable of passing through the upper respiratory system to reach the lower lung passages. This sort of dust can result in permanent scarring of the lung tissue. Abrasive blasting results in high concentrations of respirable dust.
Safety Management System (SMS)	Occupational Health and Safety Management System established by NEOM in compliance to ISO 45001 Standard

## 5 List of Abbreviations

Table 2 : Table of Abbreviations

Abbreviations	Descriptions
SMS	Safety Management System
NMS	NEOM Minimum Standard

Abbreviations	Descriptions
SOP	Standard Operating Procedure
ANSI	American National Standards Institute
NFPA	National Fire Prevention Association
CPP	Construction Phase Plan
OSHA	Occupational Safety and Health Administration.
PPE	Personal Protective Equipment
RPE	Respiratory Protective Equipment
SDS	Safety Data Sheet
MSDS	Material Safety Data Sheet
IBC	International Building Codes
OHS	Occupational Health and Safety

## 6 Related NEOM Documents

Table 3 : Related NEOM Documents

Document Code	Document Name
NEOM Element 2	Opportunity & Risk Management
NEOM-Element 3	Control of Documented Information & Legal Compliance
NEOM-Element 5	Training, Awareness and Competency.
NEOM-Element 6	Contractor Management
NEOM Element 9	Emergency Planning and Response Management
NEOM-SMS	Neom Safety Management System
NEOM-NLF-SM	Safety Manual - Roles and Responsibilities
NEOM-NLF-PRC-006- Section 2	ISO 14001 Cross Reference Table
NEOM-NLF-PRC-006;	Occupation safety health and Fire Safety requirements for Contractors
NEOM-NLF-NMS-006.001	Organisation and Practitioner Registration and Appointment of Contractor
NEOM-NLF-NMS-006.002	Safety Construction Management Plan
NEOM-NLF-NMS-006.004	Permit to Work Systems
NEOM-NLF-NMS-006.012	Barricading of Hazards
NEOM-NLF-NMS-006.013	Safety Signage and Signals
NEOM-NLF-NMS-006.018	Local Exhaust Ventilation.
NEOM-NLF-NMS-006.021	Personal Protective Equipment (PPE)
NEOM NLF- NMS-006.022	Occupational Noise
NEOM-NLF-NMS-006.024	Occupational Health Screening and Medical Surveillance
NEOM NLF-NMS-006.027	Compressed Gases and Air
NEOM-NLF-NMS-006.029	First Aid and Medical Treatment
NEOM-NLF-NMS-006.037	Spray Finishing.
NEOM-NLF-NMS-006.038	Confined Spaces.

Document Code	Document Name
NEOM-NLF-NMS-006.040	General Workplace Amenities
NEOM-NLF-NMS-006.047	Respiratory Protective Equipment

## 7 Roles and Responsibilities

### 7.1 Client

- 7.1.1 General Health and Safety roles and responsibilities are defined in; and shall be carried out in accordance with the requirements of NEOM-NLF-SM—Safety Management Manual - Roles and Responsibilities.
- 7.1.2 The Client is responsible for ensuring that NEOM Safety Commitment Statement and safety management system are properly applied within their areas of control/responsibility. Effective implementation will ensure compliance with relevant legislative requirements and will help promote the use of industry best safe working practices.
- 7.1.3 That a suitable, Pre-Tender Health and Safety Plan has been developed and issued to Contractors to ensure they have all the information necessary to make informed decisions when developing the Construction Phase Health and Safety Plan (NEOM-NLF-NMS-006.002 Safety Construction Management Plan) (CPP) which will form part of the Contractor review and selection process
- 7.1.4 That the selection of Contractors shall be undertaken in accordance with NEOM's policies and procedures (NEOM-Element 6-Contractor Management). To ensure that only Competent organisations capable of meeting the requisite safety standards associated with project are contracted.
- 7.1.5 Conduct regular Contractor safety assurance reviews to provide the confidence level required that the safety management system is delivering as planned, and consistently achieves the acceptable level of safety. Including:
  - (a) Safety performance monitoring and measuring;
  - (b) Managing change;
  - (c) Continuous improvement.

### 7.2 Contractor

- 7.2.1 Contractor shall undertake their roles and responsibilities in accordance with the general requirements of NEOM-NLF-SM–Safety Management Manual-Roles and Responsibilities
- 7.2.2 Maintaining control of access to dangerous or high-risk areas or equipment using suitable barricades that are in serviceable condition (Refer: NEOM-NLF-NMS-006.012 – Barricading of Hazards)
- 7.2.3 That all work activities are assessed, planned, organized, and that suitably competent Supervision is available to implement the safety requirements and oversee the work (Refer: NEOM- Element 5 – Training, Awareness and Competency)
- 7.2.4 Ensure persons appointed to manage /oversee work operations have the skills, knowledge, experience and, where relevant, the organisational capability to plan and manage work safely and without risk to those who may be affected by the activities (Refer: NEOM Element 5 Training, Awareness, and Competence).
- 7.2.5 Ensure employees carrying out the work are trained to recognize the associated hazards and understand the processes and procedures to control or minimize the risks.(Refer: NEOM Element 2 Risk and Opportunity Management)
- 7.2.6 That all equipment including personal protective equipment required for use is fit for purpose, and (as required) has been inspected by a competent person and inspection records are maintained and readily available.(Refer: NEOM-NLF-NMS-006.021 Personal Protective Equipment) (PPE)
  
- 7.2.7 Contractor shall undertake their specific roles and responsibilities in accordance with the following:
  - (a) Shall be responsible for performing a risk assessment in accordance with NEOM-Element 2 – Risk and Opportunity Management to determine the risks associated with abrasive blasting and to identify areas where control measures and safe work practices are required to reduce employee's exposures to hazards.
  - (b) When purchasing abrasive blasting equipment ensure that safety features have been designed into the equipment.
  - (c) Consider engineering control measures are evaluated and implemented to remove or reduce employee exposure to hazards associated with abrasive blasting operations.
  - (d) Shall ensure air monitoring is conducted during blasting operations
  - (e) Shall develop and enforce safe work practices.
  - (f) Ensure that protective equipment or other control measures are used to keep the exposure of employees to hazards associated with abrasive blasting within limits prescribed by NEOM-NLF-NMS-006.021 Personal Protective Equipment.
  - (g) Ensure that when ventilation systems, blast booths, and/or blasting cabinets are used to control employee exposures they comply with the requirements of NEOM-NLF-NMS-006.018 Local Exhaust Ventilation.
  - (h) Develop an inspection, testing and preventative maintenance plan to ensure abrasive blasting systems are safe and working efficiently and according to manufacturer specifications.
  - (i) Ensure maintenance is performed on abrasive blasting systems as per the preventative maintenance plan.
  - (j) Ensure abrasive blasting systems are tested and inspected regularly (at a minimum annually) to ensure the system works in accordance with manufacturers specifications.
  - (k) Shall monitor abrasive blasting operations to ensure employees are using equipment, safety devices and personal protective equipment appropriately.

### **7.3 Employee**

DOCUMENT CODE : NEOM-NLF-NMS-006.033	REVISION CODE: 02.00	PAGE 8 OF 19
--------------------------------------	----------------------	--------------

- 7.3.1 Shall undertake their roles and responsibilities in accordance with the general requirements of NEOM-NLF-SM – Safety Management Manual - Roles and Responsibilities.
- 7.3.2 Report any activity or defect relating to the work which they believe is reasonably foreseeable to endanger their safety or that of another person's.
- 7.3.3 Shall use appropriate equipment or safety devices provided for the work by the Contractor in accordance with any training or instruction received in the use of the work equipment. (Refer NEOM-NFL-NMS-006.021 Personal Protective Equipment)
- 7.3.4 Shall undertake their specific roles and responsibilities in accordance with the following:
  - (a) Comply with safe work practices and standard operating procedures.
  - (b) Use appropriate equipment or safety devices provided by the employer in accordance with any training or instruction received in the use of the work equipment or device concerned.
  - (c) Shall not perform any task requiring training until they have received the required training and it is documented.
  - (d) Shall not operate any piece of equipment that they are not familiar with and appropriately trained on its use.

## 7.4 Specific Responsibilities

- 7.4.1 Sector, Organization, Department or Contractor Head is responsible in ensuring that provisions are made the safe systems of work to prevent and minimize risks in each workplace
- 7.4.2 Safety Practitioner/Coordinator is responsible to monitor the implementation of this procedures and document its effectiveness
- 7.4.3 Line Managers / Supervisors are responsible for training their workers in risks
- 7.4.4 The Responsible Person will support this procedure and ensure that any Contractor Organization working for, or on behalf of, the Sector, Organization, Department or Contractor will comply with the requirements of these procedures
- 7.4.5 The LP & FS Public Safety department will support the NEOM risk assessments by carrying out compliance checks and supporting and guiding the various safety teams.

## 8 Other Sections related to subject

### 8.1 Employer Responsibilities

- 8.1.1 Responsibilities of the Employer in this Section 8 can relate to Sector, Organization, Department or Contractor dependent on the person or organization that employs the people carrying out the work.

### 8.2 Training and Competency

- 8.2.1 Employers shall ensure that Safety training complies with the requirements of:
  - (a) NEOM-Element 5 – Training, Awareness and Competency.
  - (b) NEOM-NLF-NMS-006.1 – SMS Organisation, Practitioner Registration and Appointment of Contractor.

8.2.2 Employers shall ensure all relevant employees and contractors that perform abrasive blasting operations are, as a minimum, trained on:

- (a) Physical hazards associated with abrasive blasting operations;
- (b) Design specification, capabilities and limitations of abrasive blasting systems and their uses at the work site;
- (c) Methods and procedures that will prevent exposure to hazards associated with abrasive blasting operations;
- (d) The importance of control measures;
- (e) Safe work practices;
- (f) Required use, maintenance, and storage of PPE;
- (g) Emergency response procedures;
- (h) Storage and handling procedures;
- (i) Health hazards associated with abrasive blasting and any waste material created by the blasting operation;
- (j) Hazards associated with the blast media used in abrasive blasting;
- (k) Signs and symptoms of exposure to the abrasive material used in abrasive blasting operations at the work site and the waste material created from the blasting operations;
- (l) Operator maintenance requirements for abrasive blasting systems;
- (m) Methods of communication between the blast operator and the abrasive blast operation's assistant;
- (n) Information on the various types of abrasives used for surface preparation at the worksite; and
- (o) Requirements to protect the environment from impacts/hazards arising from blasting activities.

8.2.3 Employers shall ensure managers and supervisors of abrasive blasting operations shall be trained on:

- (a) Requirements listed in Section 8.2.2 above;
- (b) Maintenance inspection requirements of abrasive blasting systems to ensure they are working appropriately and within specifications;
- (c) How to recognize unsafe work practices when performing abrasive blasting operations; and
- (d) How to identify when abrasive blasting systems are not working appropriately.

8.2.4 After an employee receives training on abrasive blasting operations, a competent person shall evaluate the employee performing abrasive blasting to ensure they have understood the training and are following safe work practices.

8.2.5 Training shall be conducted prior to an employee performing any abrasive blasting operations and annually thereafter. Retraining shall also be conducted if an employee is not following safe work practices.

### **8.3 General Requirements**

8.3.1 When performing risk assessments in accordance with NEOM Element 2 Risk and Opportunity Management, the following, as a minimum, shall be considered:

- (a) The blast media used in the abrasive blasting operation and their impact on the health of employee(s) and any impact they may have on the environment;

- (b) The material that is being removed along with the material being blasted and its impact on the health of employee(s) and any impact they may have on the environment;
  - (c) The condition of the abrasive blasting equipment being used (nozzles, compressors, hoses, couplings etc.) and if they are rated by an appropriate International Standard for their intended use;
  - (d) The type, frequency, and duration of abrasive blasting operations;
  - (e) Ergonomic risks associated with shot blasting;
  - (f) The environment in which the abrasive blasting operations is to be undertaken;
  - (g) The level of experience of the personnel involved in the work; and
  - (h) Any other identified hazards associated with the work.
- 8.3.2 When using compressed gas systems, to include pressurized air, as part of the abrasive blasting system, the requirements of NEOM NLF-NMS-006.027 Compressed Gases and Air shall be followed.

- 8.3.3 All abrasive blasting operations shall be performed in blasting booths or a blasting cabinet that meets the requirements of NEOM-NLF-NMS-006 018 – Local Exhaust Ventilation except:
- (a) Where, by reason of its shape, size or weight, an article cannot readily be moved or cannot fit into a booth or cabinet and shall be blasted where it is located, e.g., boilers, structural steel fabrications, ships, boats, aircraft
- 8.3.4 For abrasive blasting operations that cannot be performed inside a booth or cabinet, a risk assessment shall be performed for the operation and alternative control measures implemented to limit employee exposure to as low as reasonably practicable level. (Refer: Section 8.5 below)
- 8.3.5 Employees shall use respiratory protection at all times while performing abrasive blasting activities. (Refer: NEOM-NLF-NMS-006.047 Respiratory Protective Equipment (RPE))
- 8.3.6 Temporary enclosures shall be used when the object or structure is unable to be transported. Any object measuring greater than 2.5m X 2.5m X 3.0m can be considered large in consideration with applicable local / national regulations or the international standard. Temporary enclosures are to be used for fixed structures, e.g., bridges or water tanks.

#### **8.4 Blast Media**

- 8.4.1 Use of hazardous blast media shall be eliminated wherever reasonably practicable; where alternatives are not available necessary control measures shall be implemented.
- 8.4.2 The blast media utilized shall be appropriate for the blasting operation.
- 8.4.3 Safety Data Sheet (SDS) for blast media utilized shall be made available and maintained at the blast location and in the site office.
- 8.4.4 Blast media shall be disposed of in an appropriate manner, as per the requirement of NEOM Waste Management.

#### **8.5 Abrasive Blasting Operations outside a Booth or Cabinet**

- 8.5.1 Where it is not reasonably practicable to do the abrasive blasting in a booth or cabinet and it is carried out in a building or structure other than a confined space, the building or structure shall be of open construction, or a mechanical exhaust system shall be used to prevent the build-up of dusts or hazardous materials. (Refer: NEOM-NLF-NMS-006.018 Local Exhaust Ventilation)
- 8.5.2 Appropriate steps shall be taken to protect the abrasive blaster, other employees or persons in the vicinity, and the environment, from hazards associated with abrasive blasting operations.
- 8.5.3 An abrasive blasting exclusion zone, with restrictions on entry, shall be designated around the area where the abrasive blasting is being carried out.
- (a) An exclusion zone in itself will not provide appropriate protection and shall be used in conjunction with other control measures.
- 8.5.4 All abrasive blasting operations shall be conducted in an isolated location, "exclusion zone."
- (a) An abrasive blasting process is not effectively isolated from other operations if dust or contaminants from the abrasive blasting operation can be inhaled by any persons engaged in work near the area.
- (b) Neither is the exclusion zone effectively isolated from plant, machinery, or equipment if there is danger of contamination from the abrasive blasting operation.
- 8.5.5 In general, the exclusion zone shall be at least 10 meters horizontal and 4 meters vertical clearance above and below the place where the abrasive blasting is occurring; however, in determining the size of the exclusion zone, the following factors, as a minimum, shall be considered:
- (a) The nature of the substance being blasted;
- (b) The blast media being used;
- (c) The work environment, including wind speed, ambient temperature, and humidity;
- (d) Fire and dust explosion hazards;
- (e) The location and physical conditions of the site; and
- (f) Whether other people are reasonably foreseeable to be in the vicinity. Relocation of employees not involved in abrasive blasting activities to other parts of the workplace may be necessary.
- 8.5.6 Greater vertical clearance may be required when abrasive blasting at heights as dusts can travel with air currents and settle on surfaces below.
- 8.5.7 Once an abrasive blasting exclusion zone has been established, a number of procedures shall be implemented to control risks. These shall, as a minimum, include:
- (a) Physical barriers and warning signs to prevent unprotected persons from entering the exclusion zone; (Refer: NEOM-NLF-NMS-006.012 Barricading of Hazards and NEOM-NLF-NMS-006.0113 Safety Signage and Signals)
- (b) Restricted entry of unprotected persons into the exclusion zone for a time period that ensures airborne concentrations of hazardous substances have reduced to below the relevant exposure standards;
- (c) Removal of hazardous substances that are not immediately needed for abrasive blasting, to reduce unnecessary exposure and fire or explosion risks;
- (d) Removal of stored wastes and solvents from within the exclusion zone to control fire or explosion risks;
- (e) Removal of electrical and ignition sources, including smoking, from within the exclusion zone to control fire and dust explosion risks; and
- (f) Restriction of abrasive blasting within 20 meters of the boundary to adjacent premises or a greater separation where sensitive appropriately is located.

- 8.5.8 Consideration shall be given to ensure noise and dust created from abrasive blasting is controlled in walkways, public areas, and air conditioning intake vents. (Refer: NEOM-NLF-NMS-006.022 Occupational Noise)
- 8.5.9 Persons other than the abrasive blaster and their assistant shall not enter the exclusion zone during a blasting operation unless equivalent personal protective equipment is worn. A sign stating "ABRASIVE BLASTING AREA - AUTHORISED PERSONNEL ONLY" shall be prominently displayed at the exclusion zone.

## **8.6 Abrasive Blasting Operations in a Workroom**

- 8.6.1 If the room to be used for abrasive blasting is within a building, there shall be a local exhaust ventilation system installed to remove dusts and waste materials. Exhausted air shall be filtered before it is ventilated to the outside atmosphere. (Refer: NEOM-NLF-NMS-006.018 Local Exhaust Ventilation)
- 8.6.2 If the blasting area is part of a larger room (for example, a hangar), employers shall enclose the blasting area and install a local exhaust ventilation system that filters the exhaust prior to ventilating to the outside atmosphere.
- 8.6.3 Before blasting, all potential sources of ignition shall be removed.
  - (a) Unprotected electrical equipment shall be removed or isolated.
  - (b) If there has to be any electrical equipment in the blast room, a risk assessment and hazardous area classification shall be carried out to decide the level of protection required.
  - (c) Ventilation shall be provided to ensure that a dust inhalation hazards to employees and dust explosion hazards do not exist.
- 8.6.4 Applicable control measures listed in other relevant sections of this document shall be followed.

## **8.7 Abrasive Blasting in Confined Space**

- 8.7.1 Abrasive blasting operations that are conducted in confined spaces shall be performed in accordance with the requirements of NEOM-NLF-NMS-006.038 – Confined Spaces.
- 8.7.2 Abrasive blasting operations that are conducted in confined spaces a Permit to Work System that meets the requirements of NEOM-NLF-NMS-006.004 Permit to Work Systems. shall be enforced
- 8.7.3 Working in a confined space shall not be permitted if an explosive atmosphere can exist due to dust created by the blasting operation.
- 8.7.4 Ignition sources that could cause a dust explosion shall be identified as a part of risk assessment and shall be eliminated prior to the commencement of abrasive blasting.
- 8.7.5 Ventilation within the confined space shall be maintained until abrasive blasting operation is completed and there is no further risk to the health of employees. (Refer: NEOM-NLF-NMS-006018 Local Exhaust Ventilation)

## **8.8 Atmospheric Monitoring / Air Sampling**

- 8.8.1 When performing abrasive blasting operations, the work atmosphere shall be monitored through air sampling to assess the employee exposures to dusts and hazardous materials:
  - (a) If air sampling results exceed the permissible exposure limits set by NEOM and or International Standards, then control measures shall be implemented to reduce / prevent employee exposures.

- 8.8.2 If monitoring results indicate that control measures are required to reduce / prevent employee exposures, air sampling shall be used to assess the effectiveness of the control measures.
- 8.8.3 Air sampling shall be at a frequency decided by the risk assessment and the blast media, or material being blasted that could affect an employee's exposure.
- 8.8.4 Air sampling records shall be maintained that include:
- (a) Who performed the sampling;
  - (b) Procedures used for air sampling;
  - (c) Location of air sampling;
  - (d) Date and time of sampling;
  - (e) Serial number of equipment used for sampling;
  - (f) Calibration data for sampling equipment;
  - (g) Analytical methods used for sampling;
  - (h) Laboratory used to analyse of samples;
  - (i) Laboratory certifications;
  - (j) Chain of custody for the samples;
  - (k) Sampling results; and
  - (l) Report of findings and corrective actions.
- 8.8.5 Laboratory analysis shall be conducted by laboratories approved by NEOM.

## **8.9 Maintenance and Cleaning**

- 8.9.1 Abrasive blasting equipment shall be cleaned daily or at the end of each shift.
- 8.9.2 Waste material shall be stored and disposed
- 8.9.3 Employers shall develop a maintenance program that ensures equipment is working appropriately and provides early detection of any defect in control measures that could result in a reduced level of protection.
- 8.9.4 Abrasive blasting equipment shall be inspected prior to use on each shift. Examination of the equipment shall include:
- (a) Visual inspection of equipment looking for worn equipment, damaged equipment, integrity of joints / connections / hoses and any leaks;
  - (b) Personal protective equipment shall be inspected to ensure it is clean and is not damaged; and
  - (c) If a local exhaust ventilation system is used, it shall be inspected to ensure it is working appropriately and filters are in good condition.
- 8.9.5 Service records shall be maintained that include:
- (a) Equipment and control measures which require servicing;
  - (b) Nature of the servicing needed;
  - (c) Frequency of the servicing;
  - (d) Who is responsible for the servicing;
  - (e) Documentation of defects and how they were corrected; and

(f) Performance testing and evaluation.

## **8.10 Occupational Health**

- 8.10.1 Employees shall not be allowed to eat, drink, or smoke in the vicinity of abrasive blasting operations. No open containers of food or drink shall be stored within or close to abrasive blasting operations where contaminants could enter the open container.
- 8.10.2 Appropriate changing rooms and showers shall be provided at the worksite for employees working in abrasive blasting operations as a major part of their daily work. (Refer: NEOM-NLF-NMS-006.040 General Workplace Amenities)
- 8.10.3 Employers shall have a first aid and medical treatment program in compliance with NEOM NLF-NMS-006.029- First Aid and Medical Treatment.
- 8.10.4 Employers shall have a medical surveillance program in compliance with NEOM NLF-NMS-006.024– Occupational Health Screening and Medical Surveillance

## **8.11 Emergency Response**

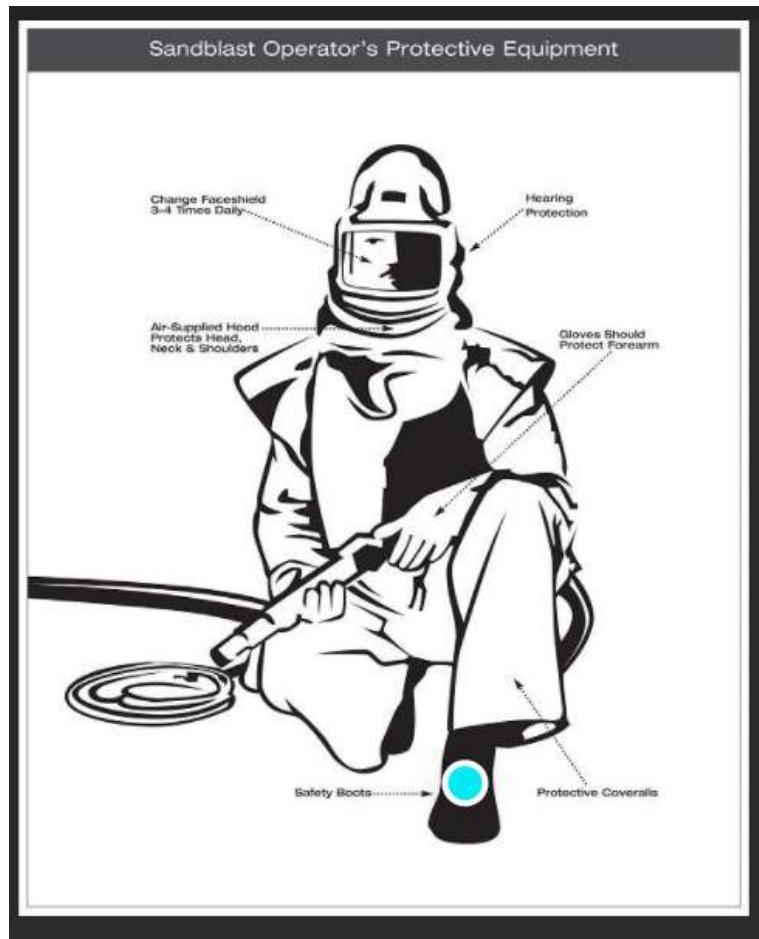
- 8.11.1 Emergency Response procedures compliant to NEOM-Element 9 – Emergency Planning and Response Management shall be developed for all abrasive blasting operations Requirements for emergencies involving abrasive blasting operations include medical emergencies, hazardous material exposures, fire, explosions etc. as identified through the Risk Assessment.(Refer: NEOM Element 2 Risk and Opportunity Management)
- 8.11.2 First aid procedures in accordance with NEOM-NLF-NMS-006.029 First Aid and Medical Treatment.

## **8.12 Record Keeping**

- 8.12.1 Employee medical surveillance and medical records shall be maintained in accordance with NEOM NLF-NMS-006.024– Occupational Health Screening and Medical Surveillance
- 8.12.2 All maintenance, inspection and testing records shall be maintained in accordance with NEOM-Element 3 Control of Documented Information & Legal Compliance
- 8.12.3 Employee training records shall be maintained in accordance with NEOM-Element 3 Control of Documented Information & Legal Compliance

## 9 Appendices

### 9.1 Appendix A: Forms, Signs and Checklists



## 9.2 Appendix B: Audit Criteria

Audit Criteria		Requirements	Verification	Area of Concern
ISO 45001:2018 Clause	NMS Ref.			Yes/ No
5.3	7.1.3	Pre-Tender Health and Safety Plan has been developed and issued		
5.3, 8.1.4.2	7.1.4	Selection of Contractors undertaken in accordance with NEOM's policies and procedures		
7.2	7.2.4, 8.2	Persons appointed to manage /oversee work operations have the skills, knowledge, experience	Training Records	
8.1.2 (e)	7.2.6 7.2.7(e), 7.3.3	Personal protective equipment required for use are fit for purpose		
8.1.2 (c, d)	7.2.2	Control of access to dangerous or high-risk areas or equipment using suitable Barricades and Signage		
6.1.2.3	7.2.5,	Hazards Identification Plan (HIP)		
6.1.2.2	7.2.7(a), 8.3.1	Assessment of the various risks shall be undertaken		
6.1.2, 6.1.3, 6.1.4	7.2.7 (f)	Ensure that when ventilation systems, blast booths, and/or blasting cabinets are used to control employee exposures they comply with the requirements		
	8.3.6	Temporary enclosures are to be used for fixed structures, e.g., bridges or water tanks		
	8.4.1, 8.4.3	Use of hazardous blast media shall be eliminated wherever reasonably practicable, Safety Data Sheet (SDS) for blast media utilized shall be made available and maintained at the blast location		
6.1.4	8.5.4,	All abrasive blasting operations shall be conducted in an isolated location, "exclusion zone.", the exclusion zone shall be at least 10 meters horizontal and 4 meters vertical clearance above and below the place		
8.1	8.5.7(a)	Physical barriers and warning signs to prevent unprotected persons from entering the exclusion zone		
6.1.2, 6.1.3, 6.1.4	8.6.1	For abrasive blasting within a building there shall be a local exhaust ventilation system installed to remove dusts and waste materials		
	8.8	Work atmosphere shall be monitored through air sampling to assess the employee exposures to dusts and hazardous materials	Air Sampling Results	
	8.9	Equipment maintenance program that ensures equipment is working appropriately and provides early detection of any defect in control	Equipment Maintenance Logs	

Audit Criteria		Requirements	Verification	Area of Concern
ISO 45001:2018 Clause	NMS Ref.			Yes/ No
		measures that could result in a reduced level of protection shall be in place		
8.2	8.10	Occupational Health Emergency Response procedures shall be in place		

### **9.3 Appendix C: Guidance Information**

Under the OSHA regulations Abrasive Blasting is covered in a number of places but mostly in the areas of PPE requirements i.e. According to rules set out by OSHA in standard 1910.134, abrasive blasting respirators must cover the head, neck, and shoulders, and be approved by the National Institute for Occupational Safety and Health (NIOSH) to protect from dust generated during blasting. Employers must use only respirators approved by the National Institute for Occupational Safety and Health (NIOSH) under 42 CFR part 84 to protect employees from dust produced during abrasive-blasting operations. Abrasive-blasting respirators shall be worn by all abrasive-blasting operators:

Available information from OSHA can be found in Abrasive Blasting: Protecting Workers from the Hazards of Abrasive Blasting Materials Fact Sheet (OSHA FS 3697 - 2014) (English: PDF)

This document gives information related to health hazards such as;

Abrasive blasting operations can create high levels of dust and noise. Abrasive material and the surface being blasted may contain toxic materials (e.g., lead paint, silica) that are hazardous to workers.

- Silica sand (crystalline) can cause silicosis, lung cancer, and breathing problems in exposed workers.
- Coal slag and garnet sand may cause lung damage similar to silica sand (based on preliminary animal testing).
- Copper slag, nickel slag, and glass (crushed or beads) also have the potential to cause lung damage.
- Steel grit and shot have less potential to cause lung damage.
- Slags can contain trace amounts of toxic metals such as arsenic, beryllium, and cadmium

#### **Engineering Controls**

##### **1. Substitution**

- Use a less toxic abrasive blasting material.
- Use abrasives that can be delivered with water (slurry) to reduce dust.

##### **2. Isolation and Containment**

- Use barriers and curtain walls to isolate the blasting operation from other workers.
- Use blast rooms or blast cabinets for smaller operations.
- Use restricted areas for non-enclosed blasting operations.
- Keep coworkers away from the blaster.

##### **3. Ventilation**

- Use exhaust ventilation systems in containment structures to capture dust



نیوم NEOM

**NEOM OCCUPATIONAL HEALTH and SAFETY  
NEOM MINIMUM STANDARD  
for  
TEMPORARY STRUCTURES**

NEOM-NLF-NMS-006.034 Rev 02.00 – February 2022

©NEOM [2021]. All rights reserved.

## Document History

Revision code	Description of changes	Purpose of issue	Date
Rev 00.00	First Issue	Issued for Implementation	27/07-2020
Rev 02.00	SMS Update	Issued for Implementation	01-02-2022

## Document Approval

	Prepared by	Reviewed by	Approved by
Name	Robert Murphy	Talal Al Anazi	Adel Al Wuhaib
Job Title	Loss Prevention Specialist LP/FS -Public Safety	Director, Loss Prevention/Fire Safety (LP/FS) Public Safety	Executive Director Public Safety



## Contents

<b>1</b>	<b>PURPOSE .....</b>	<b>4</b>
<b>2</b>	<b>SCOPE .....</b>	<b>4</b>
<b>3</b>	<b>EXPECTATIONS.....</b>	<b>4</b>
<b>4</b>	<b>LIST OF DEFINITIONS .....</b>	<b>5</b>
<b>5</b>	<b>LIST OF ABBREVIATIONS .....</b>	<b>5</b>
<b>6</b>	<b>RELATED NEOM DOCUMENTS.....</b>	<b>5</b>
<b>7</b>	<b>ROLES AND RESPONSIBILITIES .....</b>	<b>6</b>
7.1	Client .....	6
7.2	Contractor .....	7
7.3	Employee .....	7
<b>8</b>	<b>OTHER SECTIONS RELATED TO SUBJECT .....</b>	<b>8</b>
8.1	Planning and Assessment.....	8
8.2	Portable Buildings .....	8
8.3	Electrical Installations .....	9
8.4	Cranes to Lift Portable Buildings .....	9
8.5	Stacking of Portable Buildings.....	9
8.6	Tents - Permit and Plan Processing .....	9
8.7	Fire Fighting Provisions and Structural Fire Precautions.....	10
8.8	Heating and Cooking Requirements .....	11
8.9	General Requirements .....	11
8.10	Inspection Requirements .....	11
8.11	Training and Competency .....	12
<b>9</b>	<b>APPENDICES .....</b>	<b>13</b>
9.1	Appendix A: Tents – Tips for safe set-up.....	13
9.2	Appendix B: Audit Criteria.....	15
9.3	Appendix C: Guidance Documents.....	16

## List of Tables

Table 1 : Table of Definitions .....	5
Table 2 : Table of Abbreviations .....	5
Table 3 : Related NEOM Documents.....	5

## **1 Purpose**

This NEOM Co. SMS Minimum Standard (hereafter referred to as NMS) relates to the management of all occupational health and safety (OHS) risks associated with Temporary Structures.

It provides guidance to support compliance with industry best practice and international regulatory safety requirements to ensure that the associated risks are assessed, and control measures are implemented in accordance with the hierarchy of risk controls.

It has been developed to align with the requirements of the ISO 45001 Health and Safety Management Standard (Refer NEOM-NLF-SM-01.00- Section 14 ISO 45001 Cross Reference Audit Table)

## **2 Scope**

This NMS applies to all sectors, organisation within NEOM and any Contractors working for NEOM. It applies to all activities involving Temporary Structures (Design, Planning, Erection, Altering, Repairing, and Dismantling).

## **3 Expectations**

To ensure the health and safety of the public, all personnel, protection of assets (services, plant/equipment) and the environment.

NEOM expect each Sector, Organization, Department or Contractor to ensure that risks associated with temporary structures are controlled in accordance with the hierarchy of risk control: elimination, substitution, engineering controls, administrative controls, and personal protective equipment.

Consideration shall be given to technological advances that may introduce new means of controlling or eliminating the risks associated with work activities

That the expectation for safety compliance is meeting and exceeding all applicable OSHA Laws, Regulations, and Industry Best Practice, inclusive of:

- (a) OSHA Standards and Regulatory requirements;
- (b) ANSI requirements;
- (c) NFPA Standards and requirements;
- (d) NEOM Minimum Standards
- (e) Saudi Building Codes
- (f) International Building Codes

*If requirements of this document conflict with requirements set by another regulatory authority, Contractor are required to follow the more stringent requirement.*

## 4 List of Definitions

Table 1 : Table of Definitions

Terms	Definitions
NEOM Co	NEOM Company
NEOM SMS	NEOM Safety Management System
Client	NEOM Sector /Department responsible for Management and Oversight of the Contractors
Contractor	The Organisation Contracted to carry out the works
Temporary structure	Any structure that is erected on a temporary basis and includes portacabins, containers, and tents
Employer	The person or organisation that employs personnel to complete the work
Safety Management System (SMS)	Occupational Health and Safety Management System established by NEOM in compliance to ISO 45001 Standard

## 5 List of Abbreviations

Table 2 : Table of Abbreviations

Abbreviations	Descriptions
SMS	Safety Management System
NMS	NEOM Minimum Standard
SOP	Standard Operating Procedure
ANSI	American National Standards Institute
NFPA	National Fire Prevention Association
PPE	Personal Protective Equipment
OSHA	Occupational Safety and Health Administration.
CPP	Construction Phase Plan
IBC	International Building Codes
OHS	Occupational Health and Safety
PPE	Personal Protective Equipment

## 6 Related NEOM Documents

Table 3 : Related NEOM Documents

Document	Title
NEOM-NLF-SM-01.00	ISO 45001 Cross Reference Table
NEOM Element 2	Risk and Opportunity Management
NEOM Element 5	Training, Awareness and Competence)

Document	Title
NEOM- Element 6	Contractor Management
NEOM-Element 9	Emergency Planning & Response Management
NEOM-NLF-SM	NEOM Safety Management Manual - Roles and Responsibilities
NEOM-NLF PRC 006	Occupational Health, Safety and Fire Safety Requirements for Contractors
NEOM-NLF-NMS 006.001	SMS Organisation, Practitioner Registration and Appointment of Contractor.
NEOM-NLF-NMS-006.002	Construction Management Plan
NEOM-NLF-NMS 006.006	Safe Use of Lifting Equipment and Lifting Accessories
NEOM NLF- NMS 006.007	Working at Heights
NEOM-NLF-NMS-006.012	Barricading of Hazards
NEOM-NLF-NMS-006013	Safety Signs and Signals
NEOM-NLF-NMS-006 .016	Electrical Safety
NEOM-NFL-NMS-006.021	Personal Protective Equipment (PPE)
NEOM NLF- NMS-006. 032	Traffic Management and Logistics
NEOM-NLF-NMS-006.026	Contractor Fire Plan

## 7 Roles and Responsibilities

### 7.1 Client

- 7.1.1 General Health and Safety roles and responsibilities are defined in; and shall be carried out in accordance with the requirements of NEOM-NLF-SM – Safety Management Manual - Roles and Responsibilities.
- 7.1.2 The Client is responsible for ensuring that NEOM Safety Commitment Statement and safety management system are properly applied within their areas of control/responsibility. Effective implementation will ensure compliance with relevant legislative requirements and will help promote the use of industry best safe working practices.
- 7.1.3 That a suitable, Pre-Tender Health and Safety Plan (NEOM-NLF-NMS 006.002 CPP Construction Phase Health & Safety Plan) has been developed and issued to Contractor to ensure they have all the information necessary to make informed decisions when developing the Construction Phase Health and Safety Plan which will form part of the Contractor review and selection process
- 7.1.4 That the selection of Contractor shall be undertaken in accordance with NEOM's policies and procedures (NEOM-Element 6 - Contractor Management). To ensure that only competent organisations capable of meeting the requisite safety standards associated with project are contracted.
- 7.1.5 Conduct regular Contractor safety assurance reviews to provide the confidence level required that the safety management system is delivering as planned, and consistently achieves the acceptable level of safety. Including:
  - (a) Safety performance monitoring and measuring;
  - (b) Managing change;
  - (c) Continuous improvement.

## **7.2 Contractor**

- 7.2.1 Contractor shall undertake their roles and responsibilities in accordance with the general requirements of NEOM–NLF-SM – Safety Management Manual - Roles and Responsibilities
- 7.2.2 Contractor is responsible for
- (a) All sub-Contractors employed under their work contracts
  - (b) That all work activities are assessed, planned, organized, and that suitably competent Supervision is available to implement the safety requirements and oversee the work
  - (c) That persons appointed to manage /oversee work operations have the skills, knowledge, experience and, where relevant, the organisational capability to plan and manage work safely and without risk to those who may be affected by the activities (Refer: NEOM Element 5 – Training, Awareness and Competence)
  - (d) That employees carrying out the work are trained to recognize the associated hazards and understand the processes and procedures to control or minimize the risks.
  - (e) That all equipment including personal protective equipment required for use with work at height) is fit for purpose, and (as required) has been inspected by a competent person and inspection records are maintained and readily available.(Refer: NEOM-NLF-NMS-006.021 Personal Protective Equipment)
  - (f) That for management of Temporary Structures general requirements are included in the Pre-Tender Safety and Health Plan in accordance with NEOM-NLF -PRC – 006 – Occupation safety health and Fire Safety requirements for contractors
  - (g) That associated safe systems of work, and site rules are included in the Occupational Safety and Health Construction Management Plan (NLF -NMS 006.02-CPP) and NEOM-NLF-PRC–006– Occupation safety health and Fire Safety requirements for contractors
- 7.2.3 Contractor shall undertake their specific roles and responsibilities in accordance with the following:
- (a) Maintaining control of access to dangerous or high-risk areas or equipment using suitable barricades that are in serviceable condition (Refer: NEOM-NLF-NMS-006.012 – Barricading of Hazards)
  - (b) Specific emergency arrangements shall be developed to deal with the emergency evacuation of temporary structures;
  - (c) All persons involved in designing, specifying, and erecting temporary structures are trained and competent.
  - (d) Where temporary structures are to be used for public gatherings or functions a detailed public safety risk assessment shall be undertaken;
  - (e) Temporary structures shall be fit for purpose and meet all the requirements of the NEOM Fire Safety and Public Safety department;

## **7.3 Employee**

- 7.3.1 Shall undertake their roles and responsibilities in accordance with the general requirements of NEOM–NLF-SM –Safety Management Manual - Roles and Responsibilities.
- 7.3.2 Employees shall follow all instruction and training they receive on erecting and working in temporary structures.
- 7.3.3 Report any activity or defect relating to the work which they believe is reasonably foreseeable to endanger their safety or that of another person's.

- 7.3.4 Shall use appropriate equipment or safety devices provided for work by the Contractor in accordance with any training or instruction received in the use of the work equipment. (Refer NEOM-NFL-NMS-006.021 Personal Protective Equipment) (PPE)

#### **7.4 Specific Responsibilities**

- 7.4.1 Sector, Organization, Department or Contractor Head is responsible in ensuring that provisions are made the safe systems of work to prevent and minimize risks in each workplace
- 7.4.2 Safety Practitioner/Coordinator is responsible to monitor the implementation of this procedures and document its effectiveness as well as the rest of the team undertaking this role
- 7.4.3 The Responsible Person will support this procedure and ensure that any Contractor Organization working for, or on behalf of, the Sector, Organization, Department or Contractor will comply with the requirements of these procedures
- 7.4.4 Line Managers / Supervisors are responsible for training their workers in risks
- 7.4.5 The LP & FS Public Safety department will support the NEOM risk assessments by carrying out compliance checks and supporting and guiding the various safety teams.

### **8 Other Sections related to subject**

#### **8.1 Planning and Assessment**

- 8.1.1 Contractor shall evaluate the need for temporary structures and the risks associated with their use using risk management practices as required by NEOM–Element 2 – Risk Management.
- 8.1.2 Contractor shall ensure the following:
- (a) Temporary structure shall be used only where the use of a permanent structure is not reasonably practicable. Typical uses of temporary structures would include the following:
- I. Temporary site offices;
  - II. Tent for a private party or wedding;
  - III. Tent for a celebration or festival open to the public;
  - IV. Temporary sales office; and
  - V. Exhibition or conference offices.
- (b) An assessment of the various risks is undertaken in consultation with the person in control of the work.
- (c) Safe systems of work which are safe to both employees and the public shall be established and communicated to those responsible for carrying out the work

#### **8.2 Portable Buildings**

- 8.2.1 Contractor shall ensure that portable buildings are fit for purpose and comply with all the appropriate fire and electrical safety regulations that are required in NEOM. (Refer: NEOM-NLF-NMS-006.016 Electrical Safety)
- 8.2.2 Contractor shall ensure the following:
- (a) The positioning of portable buildings on site shall allow for safe access and egress for persons using the portable building;
- (b) A level concrete base shall be provided for each portable building and the gap between the bottom of the building and the ground shall be filled to prevent the accumulation of combustible waste materials under the building;

- (c) Where multiple (2 or more) portable buildings are used an emergency plan shall be developed including a fully integrated fire alarm system; (Refer: NEOM Element 9 – Emergency Planning & Response Management)
- (d) Fire detection equipment and firefighting equipment shall be provided in each portable building in accordance with NEOM Fire Safety requirements and NEOM-Element 9 – Emergency Planning & Response Management.
- (e) Spacing between portable buildings shall be in accordance with the NEOM Public Safety requirements;
- (f) Where multiple portable buildings are used access between buildings shall be maintained with footpaths and walkways. Segregation shall be provided between pedestrians and vehicles in accordance with NEOM NLF- NMS-006. 032 - – Traffic Management and Logistics; and
- (g) Appropriate steps along with a handrail shall be provided at the entrance point and emergency exit of every portable building.

### **8.3 Electrical Installations**

- 8.3.1 Contractor shall ensure that electrical installations to every portable building are made by a competent electrician in accordance with NEOM-NLF-NMS-006 .016 - Electrical Safety.
- 8.3.2 Contractor shall test the electrical distribution board and associated cables, wall sockets and other fixed electrical installations in portable buildings every six (6) months. (Refer: NEOM-NLF-NMS-006 .016 - Electrical Safety).

### **8.4 Cranes to Lift Portable Buildings**

- 8.4.1 Contractor shall ensure that the requirements of NEOM-NLF – NMS 006.06 – Safe Use of Lifting Equipment and Lifting Accessories are complied with when lifting portable buildings.
- 8.4.2 Contractor shall ensure that the manufacturer's recommendations are followed for lifting proprietary portable buildings.
- 8.4.3 Contractor shall ensure the lifting points for portable buildings have been certified following an inspection and test by an approved third-party engineer. (Refer: NEOM-NLF-NMS-006.006 Safe Use of Lifting Equipment and Lifting Accessories) Ensure certification is maintained with the temporary building

### **8.5 Stacking of Portable Buildings**

- 8.5.1 Contractor shall ensure that where portable buildings are stacked a competent engineer shall check all loading to ensure the safety of the building.
- 8.5.2 Contractor shall provide appropriate metal stairs to access the first-floor level of portable buildings. The stairs shall be provided with a fixed handrail and landing platforms shall be fitted with toe boards in accordance with NEOM NLF- NMS 006.007– Working at Heights.
- 8.5.3 At all locations where portable buildings are stacked the upper levels shall have a means of exit in addition to the entrance normally used.
- 8.5.4 Where portable buildings are stacked the roof of the lower building and the floor of the upper building shall be fire rated in accordance with the NEOM Fire Safety requirements.

### **8.6 Tents - Permit and Plan Processing**

- 8.6.1 Contractor shall ensure the following:
  - (a) That a plan covering the following points is submitted to the concerned Permitting Authority at least 10 working days before the scheduled erection of any tent or canopy that will be used for any commercial event
  - (b) An appropriate scale or dimensioned site diagram showing the location of the tent to other structures;

- (c) A statement highlighting the intended use of structure together with dates for which the permit is required;
  - (d) Designated allocation for parking of vehicles shall be detailed on the plan, this shall include access routes for emergency vehicles;
  - (e) Fire safety aspects shall be considered for the material used to build the temporary structure. The material shall be flame retardant to a recognized international standard such as NFPA;
  - (f) Fire detection, prevention and fighting systems approved by NEOM Fire Safety and Public Safety;
  - (g) Locations of any additional emergency equipment such as hose-lines or emergency power supplies intended shall be detailed on the plan;
  - (h) Type of floor surface proposed inside tent or canopy;
  - (i) Detail the proposed use of any heating/cooling cooking equipment or open flame devices is intended; and
  - (j) Emergency rescue plan detailing arrangements and procedures to deal with emergency situations that could arise.
- 8.6.2 Construction documents with the following marked-up and clearly shown on the floor plan shall be submitted:
- (a) Proposed seating arrangements and dimensions of tables including the maximum capacity of the tent;
  - (b) Type of all other interior obstacles such as cabinets, display stands, etc.;
  - (c) All common accesses and emergency exit pathways;
  - (d) Location and type of emergency lighting, including proposed power source;
  - (e) Locations and type of exit signs and “NO SMOKING” signs; (Refer: NEOM-NLF-NMS-006013 Safety Signs and Signals)
  - (f) Fire protection equipment or/and portable fire extinguishers; (Refer: NEOM-NLF-NMS-006.026 Contractors Fire Plan)
  - (g) Location and width of fire access roadways.
- 8.6.3 Tents, canopies, or membrane structures shall not be located within 6 meters of plot lines, buildings, other tents, parked vehicles, or internal combustion engines. To determine required distances, support ropes and guy wires shall be considered as part of the tent or canopy;
- 8.6.4 A minimum of 2 exits shall be provided and each exit shall be of minimum 2 meters wide irrespective of occupant load. The exit capacity is based on a maximum of 120 persons per meter width of exit;
- 8.6.5 The maximum travel distance from any point within the tent to the nearest exit at the external edge of the tent shall not exceed 30 meters;
- 8.6.6 Any row of stall inside a tent shall not exceed 15 meters in length;
- 8.6.7 Separation distance of at least 3 meters between rows of stalls shall be maintained;
- 8.6.8 All designated exits points shall be provided with illuminated “exit” signs incorporated with battery operated standby power supply; and
- 8.6.9 All escape routes / passageways shall be free of obstruction. Exit points shall lead directly to open exterior areas.

## **8.7 Fire Fighting Provisions and Structural Fire Precautions**

- 8.7.1 All parts of a tent are to be located within 100 meters of a fire hydrant. No tent shall be located within 3 meters of any fire hydrant, breeching inlet of firefighting rising main or fire exit staircases of neighboring buildings;

- 8.7.2 No activity shall be carried out on the fire engine access way / fire engine hard standing (parking space) or pedestrian walkways;
- 8.7.3 ABC dry chemical powder fire extinguisher of 2.5 kg capacity shall be provided such that no person needs to travel more than 15 meters to reach them;
- 8.7.4 Two 2.5kg capacity carbon dioxide fire extinguishers shall be provided in the vicinity of each generator / air conditioning set. Generators are to be sited at least 5 meters away from buildings and tents / stalls;
- 8.7.5 AC units with return-air shall be fitted with smoke detectors;
- 8.7.6 Roofing or false ceiling of covered booths shall be of non-combustible;
- 8.7.7 All sides of the timber flooring decking / stage / platform shall be appropriately sealed with no storage of goods / materials / electrical services beneath them;
- 8.7.8 The sidewalls, drops, top, floor coverings, Fabric materials / curtains and decorative materials shall be of flame-resistant material or treated with a flame retardant material; and
- 8.7.9 Fire vehicle and ambulance shall be kept standby at the site throughout the event in accordance with the NEOM Fire Safety and Public Safety instructions.

## **8.8 Heating and Cooking Requirements**

- 8.8.1 Any activity involving the use of LPG shall be subject to a specific permit and permission from the Civil Defence. A risk assessment shall be prepared for the hazards of using LPG and control measures shall meet the NEOM requirements;
- 8.8.2 “Open-flame” cooking shall not be performed except where solid fuel burners are used to warm food that has already been prepared and cooked;
- 8.8.3 Combustible materials shall be kept to a minimum and away from heat sources; and
- 8.8.4 Outdoor cooking that produces sparks or grease laden vapours shall not be performed within 6 meters of a tent, canopy, or membrane structure.

## **8.9 General Requirements**

- 8.9.1 The event organizer shall provide a team of appropriately trained personnel to control occupancy load within the tent to the agreed maximum and to deal with any emergency situations that may arise;
- 8.9.2 Electrical fixtures /wiring are to be firmly secured away from public's path;
- 8.9.3 That temporary structures are dismantled and removed within 3 days upon expiry of the approved period;
- 8.9.4 There shall be a minimum clearance of at least 1 meter between the fabric envelope and all contents located inside the tent or membrane structure;
- 8.9.5 Spot or effect lighting shall only be electrically powered and all combustible materials within 2 meters shall be cleared;
- 8.9.6 Smoking shall not be permitted in tents, canopies, or membrane structures. Appropriate “NO SMOKING” signs shall be conspicuously posted throughout the structure; and
- 8.9.7 The floor surface inside tents, canopies, or membrane structures and the ground outside and within a 10-meter perimeter shall be kept clear of combustible waste. Such waste shall be stored in approved containers until removed from the premises.

## **8.10 Inspection Requirements**

- 8.10.1 Contractor shall notify the concerned Permitting Authority (NEOM Fire Safety and NEOM Public Safety) after the tent or canopy has been erected (prior to the event).

8.10.2 The team inspecting shall verify compliance with applicable regulations. The inspections shall be scheduled after the erection of the structure is complete but at least 2 days prior to the date of the event wherein all relevant approvals from the building and planning department will be verified.

## **8.11 Training and Competency**

8.11.1 Contractor shall ensure that Safety training complies with the requirements of:

- (a) NEOM-Element 5 – Training, Awareness and Competency.
- (b) NEOM-NLF- NMS 006.001 – Organisation, Safety Practitioner Registration and Appointment of Principle Contractor.

8.11.2 In accordance with NEOM-SMS-SM – Safety Management Manual - Roles, and Responsibilities Section employers shall ensure employees required to implement the requirements of this NMS are trained in the planning and erection of temporary structures and understand the risks associated with such activities and the control measures implemented by the employer.

8.11.3 Training for employees shall be competency-based and include:

- (a) Information on the safe systems of work identified in the risk assessment;
- (b) Appropriate control measures to be followed by those involved in planning the erection of temporary structures;
- (c) Appropriate control measures to be followed by those involved in erecting temporary structures; and
- (d) Reporting procedure in the event of incidents during the erection and use of temporary structures.

8.11.4 Employers shall conduct additional retraining whenever a periodic inspection reveals, or there is a reason to believe, that there are deviations from or inadequacies in the employee's knowledge of temporary structure requirements.

8.11.5 Employers shall conduct additional re-training whenever a temporary structure procedure fails.

8.11.6 Employers shall maintain a record of the required training that contains, as a minimum, the following information:

- (a) Name and ID number;
- (b) Subject(s) of training;
- (c) Date(s) of training; and
- (d) Company/person(s) providing the training.

## 9 Appendices

### 9.1 Appendix A: Tents – Tips for safe set-up

All tents should be erected on firm ground to ensure stability and prevent shifting/movement. Care should be taken to ensure all structures are securely fastened to the ground and are properly electrically grounded (as applicable). Contractor must have a valid PTW along with method statement and risk assessment.

Before the use of any tent pegs/stakes, vendor has to use CAT (Cable avoidance tool) to locate any underground services so that to avoid damaged systems or harm to individuals. Make sure tent pegs/stakes have a safety cap on the end to prevent injury to persons walking outside of tents. Tent pegs and stakes should be located outside of means of egress from buildings and pedestrian walkways.

- Take consideration of the effects of rain, lightning and wind when setting up, dismantling and working in tents.
- Entrance and exit routes must be kept clear of obstructions.
- Tents should not block access to fire hydrants or to all other firefighting equipment's. It should also provide unobstructed ways of travel at all times to permit prompt escape from any point of danger in case of fire.
- If Generators are used contractor must have a valid PTW along with method statement and risk assessment. It must be placed in such way that exhaust fumes do not enter tents. Generators must be a minimum of 20 feet from the tent and shall be fenced in.
- If Portable generators are used, Vendors should have the manufacture's written specification for each portable generator and made available to the fire warden.
- Such generators shall be capable of running continuously, without refueling for the entire length of the event. Refueling a hot portable generator or the storage of fuel on site is not permitted.
- If the tent is air conditioner, contractor must have a valid PTW along with method statement and risk assessment. Air handling unit shall be located outside 1.5-meter tube shall be used to supply the tent with cold air.
- Each air condition shall be provided with separate circuit shall be provided with separate circuit breaker.
- For all electrical installations' contractor must have a valid PTW along with method statement and risk assessment. Cables shall be in protected pipes/sleeve and a circuit breaker shall also be provided.
- Electric cords should be located to minimize their exposure to rain and water on the ground.
- Electrical loads shall be equally distributed over automatic breakers.
- Electric cords should not be used if they are not in good repair, damaged or frayed. Cords repaired with electric tape or missing ground prongs on their plugs MUST NOT be used.
- The electrical system and equipment must be isolated from the public by guarding. All electrical fuses and switches must be enclosed in approved enclosures. Cables on the ground and in areas traveled by the public must be secured. Make sure electrical systems are properly grounded.



- If any internal lighting used inside tent, a safe distance (approximately) shall be maintained between the internal lighting and the tent's fabrics.

- For bigger tents interior decoration and decoration fabrics shall be treated with fire retardant materials.
- For bigger tents materials and fabrics used to manufacture tent shall be anti-flame.
- Suitable and sufficient number of fire extinguishers according to layout shall be provided.
- One or more trained personnel knows how to operate fire extinguishers should be available on site.
- No inflammable materials, waste or grass shall be kept in the area which surrounding the tents.
- Storage is strictly prohibited inside the tents.
- Heaters, smoking, ovens and cooking devices are not allowed inside the tents. Kitchen should be 20 meters away from tent.
- Distance of 4 meters minimum shall be between the tents themselves and the booths.
- While erecting adjacent tents enough space shall be provided for tent occupation emergency evacuation.



## 9.2 Appendix B: Audit Criteria

Audit Criteria		Requirements	Verification	Area of Concern
ISO 45001:2018 Clause	NMS Ref.			Yes/ No
5.3	7.1.3	Pre-Tender Health and Safety Plan has been developed and issued		
5.3, 8.1.4.2	7.1.4	Selection of Contractors undertaken in accordance with NEOM's policies and procedures		
7.2	7.2.2(C), 8.11	Persons appointed to manage /oversee work operations have the skills, knowledge, experience		
8.1.2 (e)	7.2.2	Personal protective equipment required for use are fit for purpose		
8.1.2 (c, d)	7.2.3 (a)	Control of access to dangerous or high-risk areas or equipment using suitable Barricades and Signage		
6.1.2.2	8.1.2(b)	Assessment of the various risks shall be undertaken, where Temporary Structure has been identified, the risk assessment shall be developed		
7.5	8.1.2	Safe systems of work for Temporary structure, safe to both employees and the public shall be established		
8.1, 9.1	8.2.1, 8.3	Portable buildings shall be fit for purpose and comply with all the appropriate fire and electrical safety regulations		
	8.4	The lifting points for portable buildings shall be certified following an inspection and test by an approved third-party engineer		
6.1.3	8.6	Plan Submission to the concerned Permitting Authority at least 10 working days before the scheduled erection of any tent or canopy that will be used for any commercial event		
	8.7	Fire Fighting Provisions and Structural Fire Precautions in accordance with the NEOM Fire Safety and Public Safety instructions		
	8.8	A risk assessment shall be prepared for the hazards of using LPG and control measures shall meet the NEOM requirements		

### **9.3 Appendix C: Guidance Documents**

OSHA standards are published in Title 29 of the Code of Federal Regulations (CFR) and are divided into separate standards for General Industry, Construction, and Maritime.

29 CFR 1910.142 looks at requirements for temporary labour camps and has details regarding layout, construction, living spaces and other aspects of temporary buildings and structures.

Regarding temporary buildings. 29 CFR 1926.151 looks at regulatory requirements including;

- No temporary building shall be erected where it will adversely affect any means of exit.
- Temporary buildings, when located within another building or structure, shall be of either noncombustible construction or of combustible construction having a fire resistance of not less than 1 hour.

In the International Fire Code 2018 (IFC 2018) – Chapter 31 is dedicated to requirements regarding Tents, Temporary Special Event Structures and other Membrane structures.

Chapter 31 provides requirements that are intended to protect temporary as well as permanent tents and air-supported and other membrane structures and temporary stage special event structures from fire and similar hazards.

The provisions regulate structure location and access, anchorage, egress, heat-producing equipment, hazardous materials and operations, combustible vegetation, ignition sources, and waste accumulation. This is accomplished through requiring regular inspections and certifying continued compliance with fire safety regulations. This chapter also addresses outdoor assembly events, which are not limited to those events with tents or other membrane structures, but are regulated due to the number of people, density of those people and hazards associated with large outdoor events related to egress, fire hazards from cooking and other related concerns.

In the UK Temporary Building in most cases are covered by schedule 2 of the Building Regulations and the Fire Safety Regulations

BS EN 13200 spectator facilities & BS 9999:2008 Code of practice for fire safety in design, management and use of buildings are both useful sources of information



نیوم NEOM

**NEOM OCCUPATIONAL HEALTH and SAFETY  
NEOM MINIMUM STANDARD  
for  
CONCRETE PLACING EQUIPMENT**

NEOM-NLF-NMS-006.035 Rev 02.00 – February 2022

©NEOM [2021]. All rights reserved.

## Document History

Revision code	Description of changes	Purpose of issue	Date
Rev 00.00	First Issue	Issued for Implementation	27/07-2020
Rev 01,00	Sector Review	Issued for Implementation	01-02-2022

## Document Approval

	Prepared by	Reviewed by	Approved by
Name	Robert Murphy	Talal Al Anazi	Adel Al Wuhaib
Job Title	Loss Prevention Specialist LP/FS -Public Safety	Director, Loss Prevention/Fire Safety (LP/FS) Public Safety	Executive Director Public Safety

## OUR NEOM VALUES



### CATALYST

Make a difference.  
Create a legacy.



### CARE

Leave the environment  
in a better place.



### CURIOS

Challenge the norm.  
Stay restless.



### PASSIONATE

Be accountable.  
Finish what you start.



### RESPECT

Be authentic.  
Be true. Be fair.



### DIVERSITY

Embrace cultural  
differences.  
Seek to understand.

## Contents

<b>1</b>	<b>PURPOSE.....</b>	<b>4</b>
<b>2</b>	<b>SCOPE.....</b>	<b>4</b>
<b>3</b>	<b>EXPECTATIONS .....</b>	<b>4</b>
<b>4</b>	<b>LIST OF DEFINITIONS.....</b>	<b>5</b>
<b>5</b>	<b>LIST OF ABBREVIATIONS.....</b>	<b>5</b>
<b>6</b>	<b>RELATED NEOM DOCUMENTS .....</b>	<b>6</b>
<b>7</b>	<b>ROLES AND RESPONSIBILITIES.....</b>	<b>7</b>
7.1	Client .....	7
7.2	Contractor.....	7
7.3	Employee .....	8
7.4	Specific Responsibilities.....	8
<b>8</b>	<b>OTHER SECTIONS RELATED TO SUBJECT.....</b>	<b>8</b>
8.1	General Requirements .....	8
8.2	Planning and Preparation.....	9
8.3	Documented Safe Systems of Work .....	10
8.4	Setting Up on Site .....	10
8.5	Setting Up Near Power Lines or Electrical Equipment.....	10
8.6	Setting Up in a Public Place .....	11
8.7	Operational Safety Zone .....	11
8.8	Traffic Control.....	11
8.9	Fumes .....	12
8.10	Occupational Noise .....	12
8.11	Occupational Health.....	12
8.12	Residue Collection .....	12
8.13	Equipment .....	12
8.14	Deck Area Concreting .....	14
8.15	Preparation for Road Travel .....	14
8.16	Inspection and Maintenance .....	14
8.17	Reporting Defects .....	15
8.18	Logbooks and Inspection Check Sheets.....	15
8.19	Pipe Identification.....	15
8.20	Couplings .....	16
8.21	Training and Competency .....	16
8.22	Record Keeping .....	16
<b>9</b>	<b>APPENDICES.....</b>	<b>17</b>
9.1	Appendix A: Forms, Signs and Checklists .....	17
9.2	Appendix B: Audit Criteria .....	18
9.3	Appendix C: Guidance Information .....	19

## List of Tables

Table 1 : Table of Definitions.....	5
Table 2 : Table of Abbreviations.....	5
Table 3 : Related NEOM Documents .....	6

## **1 Purpose**

This NEOM Co. SMS Minimum Standards (hereafter referred to as NMS) relates to the management of all occupational health, and safety (OHS) risks associated with the use of Concrete Placing Equipment.

It provides guidance to support compliance with industry best practice and international regulatory safety requirements to ensure that the associated risks are assessed, and control measures are implemented in accordance with the hierarchy of risk controls.

It has been developed to align with the requirements of the ISO 45001 Health and Safety Management Standard (Refer NEOM-NLF-PRC–006- Section 2 ISO 14001 Cross Reference Table)

## **2 Scope**

This NMS applies to all personnel within NEOM and any Contractors working for NEOM and or associated projects and activities. It is designed to incorporate requirements set by the NEOM-SMS.

It applies to the safe operation of all types of concrete pumps and associated placing equipment used in pumping or spraying concrete

## **3 Expectations**

To ensure the health and safety of all personnel, protection of assets (services, plant/equipment) and the environment

NEOM expect each Sector, Organization, Department or Contractor to ensure that risks associated with concrete placing equipment are controlled in accordance with the hierarchy of risk controls: elimination, substitution, engineering controls, administrative controls, and personal protective equipment.

Consideration shall be given to technological advances that may introduce new means of controlling or eliminating the risks associated with work activities.

That the expectation for safety compliance is meeting and exceeding all applicable OSHA Laws, Regulations, and Industry Best Practice.

Applicable requirements and standards include:

- (a) OSHA Standards and Regulatory requirements;
- (b) ANSI requirements;
- (c) NFPA Standards and requirements;
- (d) NEOM Minimum Standards
- (e) Saudi Building Codes
- (f) International Building Codes

*If requirements of this document conflict with requirements set by another regulatory authority, Contractor are required to follow the more stringent requirement.*

## 4 List of Definitions

Table 1 : Table of Definitions

Terms	Definitions
NEOM Co	NEOM Company
Client	NEOM /Sector or Department responsible for management or oversight of Contractor
Employer	The person or organisation that employs personnel to perform the work
Contractor	The organisation contracted to carry out the works
Concrete Delivery Pipe	A steel pipe used to deliver concrete. The length of a standard pipe is 3 metres. They have a flange at both ends to allow them to be coupled together using coupling sets.
Concrete Pump	A piece of construction equipment designed to pump concrete from one position on a construction site to another. Concrete pumps can be categorised as static pumps or mobile pumps.
Boom	The hydraulically controlled arm of a concrete pump used to distribute and place the concrete
Boom pump	A truck mounted concrete pump with a hydraulic boom that is used to place the concrete
Concrete Truck	Carries the ready concrete mixture to the construction sites. It is also called a truck mixer or transit mixer (TM) or concrete mixer
Safety Management System (SMS)	Occupational Health and Safety Management System established by NEOM in compliance to ISO 45001 Standard

## 5 List of Abbreviations

Table 2 : Table of Abbreviations

Abbreviations	Descriptions
SMS	Safety Management System
NMS	NEOM Minimum Standard
SOP	Standard Operating Procedure
ANSI	American National Standards Institute
NFPA	National Fire Prevention Association
PPE	Personal Protective Equipment
OSHA	Occupational Safety and Health Administration.
CPP	Construction Phase Plan
IBC	International Building Codes
OHS	Occupational Health and Safety

## 6 Related NEOM Documents

Table 3 : Related NEOM Documents

Document Code	Document Name
NEOM Element 2	Risk and Opportunity Management
NEOM-Element 3	Control of Documented Information & Legal Compliance
NEOM-Element 5	Training, Awareness and Competency.
NEOM-Element 6	Contractor Management
NEOM-SMS	Neom Safety Management System
NEOM-NLF-SM	Safety Management Manual - Roles and Responsibilities
NEOM-NLF-PRC-006;	Occupation health, safety, and Fire Safety requirements for Contractors
NEOM-NLF-PRC-006- Section 2	ISO 14001 Cross Reference Table
NEOM-NLF-NMS 006.001	Organisation, Safety Practitioner Registration and Appointment of Contractor.
NEOM-NLF-NMS-006.002	Safety Construction Management Plan (CPP)
NEOM NLF- NMS 006.008	Overhead and Underground Services
NEOM-NLF-NMS-006.010	Falsework (Formwork).
NEOM-NLF-NMS-006.012	Barricading of Hazards
NEOM-NLF-NMS-006 .016	Electrical Safety
NEOM-NLF-NMS-006.021	Personal Protective Equipment (PPE)
NEOM-NLF-NMS-006.022	Occupational Noise
NEOM NLF-NMS-006.023	Vibration
NEOM-NLF-NMS-006.024	Occupational Health Screening and Medical Surveillance
NEOM-NLF-NMS-006.028	Lock-out /Tag-out (Isolation)
NEOM-NLG-NMS-006.032	Site Traffic Management and Logistics
NEOM-NLF-NMS-006.040	General Workplace Amenities.
NEOM-NLF-NMS-006.042	Road Safety

## **7 Roles and Responsibilities**

### **7.1 Client**

- 7.1.1 General Health and Safety roles and responsibilities are defined in; and shall be carried out in accordance with the requirements of NEOM-NLF-SM–Safety Management Manual - Roles and Responsibilities.
- 7.1.2 The Client is responsible for ensuring that NEOM Safety Commitment Statement and safety management system are properly applied within their areas of control/responsibility. Effective implementation will ensure compliance with relevant legislative requirements and will help promote the use of industry best safe working practices.
- 7.1.3 That a suitable, Pre-Tender Health and Safety Plan has been developed and issued to Contractors to ensure they have all the information necessary to make informed decisions when developing the Construction Phase Health and Safety Plan (NEOM-NLF-NMS-006.002 Safety Construction Management Plan) which will form part of the Contractor review and selection process
- 7.1.4 That the selection of Contractors shall be undertaken in accordance with NEOM's policies and procedures (NEOM Element-6 Contractor Management). To ensure that only Competent organisations capable of meeting the requisite safety standards associated with project are contracted.
- 7.1.5 Conduct regular Contractor safety assurance reviews to provide the confidence level required that the safety management system is delivering as planned, and consistently achieves the acceptable level of safety. Including:
  - (a) Safety performance monitoring and measuring;
  - (b) Managing change;
  - (c) Continuous improvement.

### **7.2 Contractor**

- 7.2.1 Contractor shall undertake their roles and responsibilities in accordance with the general requirements of NEOM–NLF-SM – Safety Management Manual - Roles and Responsibilities
- 7.2.2 Shall ensure that all work activities are assessed, planned, organized, and that suitably competent Supervision is available to implement the safety requirements and oversee the work
- 7.2.3 Ensure persons appointed to manage /oversee work operations have the skills, knowledge, experience and, where relevant, the organisational capability to plan and manage work safely and without risk to those who may be affected by the activities(Refer: NEOM Element 5 – Training, Awareness, and Competence)
- 7.2.4 Ensure employees carrying out the work are trained to recognize the associated hazards and understand the processes and procedures to control or minimize the risks.(Refer: NEOM Element 2 Risk and Opportunities Management)
- 7.2.5 That all equipment including personal protective equipment required for use is fit for purpose, and (as required) has been inspected by a competent person and inspection records are maintained and readily available. (Refer: NEOM-NLF-NMS-006.021 Personal Protective Equipment (PPE))
- 7.2.6 Maintaining control of access to dangerous or high-risk areas or equipment using suitable barricades and Signage that are in serviceable condition (Refer: NEOM-NLF-NMS-006.012 Barricading of Hazards)
- 7.2.7 Contractor shall undertake their specific roles and responsibilities in accordance with the following:
  - (a) Ensure correct selection of Concrete Pump type (Mobile, Line, Screed),

- (b) Ensure Pump and Equipment is appropriately maintained and inspected; including
- (c) Where a Contractor is to use a Concrete Pump from another Organisation ensure that the equipment is inspected by competent person and declared safe and appropriate for use.

### **7.3 Employee**

- 7.3.1 Shall undertake their roles and responsibilities in accordance with the general requirements of NEOM-NLF-SM – Safety Management System - Roles and Responsibilities.
- 7.3.2 Report any activity or defect relating to the work which they believe is reasonably foreseeable to endanger their safety or that of another person's.
- 7.3.3 Shall use appropriate equipment or safety devices provided for the work by the Contractor in accordance with any training or instruction received in the use of the work equipment. (Refer NEOM-NFL-NMS-006.021 Personal Protective Equipment (PPE))
- 7.3.4 Employees shall undertake their specific roles and responsibilities in accordance with the following:
  - (a) Follow information provided by the Contractor regarding concrete placing equipment use.
  - (b) Observe the concrete placing equipment safe work practices and other control measures implemented by the Contractor, including the observation of warning signs; and
  - (c) Follow procedures for inspection and maintenance of concrete pumping equipment.

### **7.4 Specific Responsibilities**

- 7.4.1 Sector, Organization, Department or Contractor Head is responsible in ensuring that provisions are made the safe systems of work to prevent and minimize risks in each workplace
- 7.4.2 Safety Practitioner/Coordinator is responsible to monitor the implementation of this procedures and document its effectiveness, as well as other supervisors from the team
- 7.4.3 The Responsible Person will support this procedure and ensure that any Contractor Organization working for, or on behalf of, the Sector, Organization, Department or Contractor will comply with the requirements of these procedures
- 7.4.4 Line Managers / Supervisors are responsible for training their workers in risks
- 7.4.5 The LP & FS Public Safety department will support the NEOM risk assessments by carrying out compliance checks and supporting and guiding the various safety teams.

## **8 Other Sections related to subject**

### **8.1 General Requirements**

- 8.1.1 Planning and Assessment
  - (a) An assessment of the various risks shall be undertaken, and systems of work established, which are safe to all parties involved or affected including the public.
  - (b) Effective control measures shall be implemented to manage activities safely and without risk to health.
  - (c) For the management of concrete placing equipment general requirements are to be included in the Pre-Tender Safety and Health Plan in accordance with NEOM-SMS -Element 6 Contractor Management
  - (d) Associated safe systems of work, and site rules are to be included in the Occupational Safety and Health Construction Management Plan (NEOM-NLF-NMS-006.002-CPP) and in accordance with NEOM Element 6 Contractor Management

- 8.1.2 Prior to the undertaking of concrete pumping operations, a risk assessment is to be conducted to ensure the selection of appropriate control measures. Refer to NEOM Element2 Opportunity & Risk Management.
- 8.1.3 Ensure the risk assessment considers, as a minimum, the following general hazards and manual handling risks associated with the use of concrete placing which may include:
- (a) Space restrictions when running the Concrete Delivery Pipe and making connections in difficult to reach areas.
  - (b) Positioning of the Concrete Pump and placement boom with regards to the Structural integrity of the means of fixing.
  - (c) Recoil from the flexible Concrete Delivery Pipe used by employees when concrete is being pumped.
  - (d) The effects of high winds on the Hydraulic Boom especially when located in open and exposed areas.
  - (e) The high pressure pumping of concrete and the potential for Hydraulic Boom, Concrete Delivery Pipe degradation through internal friction and abrasion.
  - (f) Manual handling risks associated with Delivery Pipes, Clamps, and other associated equipment;
  - (g) Health hazards of working with wet concrete.

## **8.2 Planning and Preparation**

- 8.2.1 When planning for Concrete Pumping on site the Contractor shall consider such factors as:
- (a) The most appropriate method of pumping concrete to the pour area.
  - (b) Location of the Concrete Pump in the most favorable position to pump concrete.
  - (c) Level area of ground with a firm base that can support the Pump unit.
  - (d) Clear access to the Pump Unit for Concrete Trucks.
  - (e) The capacity and type of Pump to be used to complete the job satisfactorily.
  - (f) Safe and unobstructed access for the public if the Pump Unit is set up in the street.
  - (g) Provision of pedestrian ramps if the Pump line must cross the footpath.
  - (h) Approval of the formwork structure and suitability in accordance with NEOM-NLF-NMS-006.010 Falsework (Formwork).
  - (i) Time schedule assessment to complete the work prior to commencing a major pour which allows for:
    - I. Weather.
    - II. Accessibility.
    - III. Volume of concrete.
    - IV. Concrete supply factors.
    - V. Slab limitations; and
    - VI. Restricted work times.
  - (j) Provision of safe access for employees to the pour area including elimination of trip and slip hazards wherever reasonably practicable; and
  - (k) Existence of overhead power cables if using a truck mounted concrete placing boom.

8.2.2 Ensure Mobile Concrete Pumps (Boom Pumps) are equipped with all necessary safety equipment, including:

- (a) Stocked first aid kit (shall include eye wash and barrier creams). Size depending on size of truck
- (b) Charged and current fire extinguisher; and
- (c) Appropriate number of reflective traffic cones (minimum 450mm high).

8.2.3 Provide additional safety equipment if the pump is set-up on or near a roadway and may include:

- (a) Pedestrian warning and diversion signs.
- (b) Vehicle traffic warning signs; and
- (c) Traffic management equipment.

### **8.3 Documented Safe Systems of Work**

8.3.1 Ensure documented safe systems of work are developed and implemented and include reference to any instruction manuals supplied with the Pump Unit and Boom, giving comprehensive instructions for operation.

### **8.4 Setting Up on Site**

8.4.1 When setting-up on site ensure:

- (a) The area around the concrete pump shall be level, solid and free from obstructions.
- (b) The Pump is not being positioned over or adjacent to:
  - I. Previously disturbed ground that has been backfilled.
  - II. Excavations, trenches, or holes in the ground.
  - III. Cellars, basements, or pits; or
  - IV. Inadequately compacted or soft ground.

8.4.2 If outriggers are used, baseplates shall be provided to ensure outriggers do not subside.

8.4.3 Regular checks are conducted on the outriggers to ensure stability as per manufacturers recommendations or site conditions ;

8.4.4 The outriggers pads are clear of excavations, soft or filled ground, or other obstacles liable to cause instability.

8.4.5 Ensure precautions are taken when a concrete pump is used in the vicinity of an excavation where there is the potential for collapse or subsidence.

8.4.6 Ensure unauthorized persons are kept away from the immediate work area pump with the use of appropriate barriers or guardrails.

8.4.7 Ensure Concrete Trucks have safe means of access to and from the receiving hopper of the pump. If necessary ensure a traffic controller shall be appointed to safely direct the movement of the trucks.

### **8.5 Setting Up Near Power Lines or Electrical Equipment**

8.5.1 When setting up near overhead power lines ensure the electricity authority is consulted to determine minimum safe distance requirements, meeting the requirements of NEOM-NLF-NMS-006 .016 – Electrical Safety and NEOM NLF- NMS 006.008 Overhead and Underground Services.

8.5.2 Ensure placement of Pump and positioning of Boom takes account of safe distancing requirements from power lines and also potential for changes in wind conditions.

8.5.3 All overhead power lines or electrical conductors shall be considered LIVE unless they are positively identified to be isolated from all sources of the power supply. A certificate issued by the electricity authority shall confirm that all power lines and electrical conductors have been de-energized and isolated before any work commences.

## 8.6 Setting Up in a Public Place

8.6.1 When setting-up a concrete pump in a street, roadway or other public place ensure:

- (a) Protective screens are erected or fitted around the concrete pump area to prevent concrete being splashed on the public. (Refer: NEOM-NLF-NMS-006.012 Barricading of Hazards)
- (b) A close-fitting mesh shall be fitted to the concrete pump hopper to prevent concrete splash.
- (c) A sign stating "concrete pump being used" or "concrete pump in operation" is posted in a language that is easily understood by those passing by; and
- (d) Provision of an access ramp for the public when a concrete line crosses over the footpath. The ramp shall:
  - I. Be stable and of solid construction and capable of performing the purpose it was designed for.
  - II. Not create a trip hazard at the leading edge of the ramp.
  - III. Have a height to length ratio of no more than 1:12 from the highest point to the end of the ramp.
  - IV. Be easily negotiable by wheelchair.
  - V. Be provided with a non-slip surface even when wet.
  - VI. Extend across the width of the footpath.
  - VII. Be fitted with handrails and toe boards at an appropriate height for both adults and small children and follow the contour of the ramp.
  - VIII. Have appropriate lighting to ensure the area is appropriately always illuminated;
  - IX. Have pump pipes that are removable for inspection and cleaning.

## 8.7 Operational Safety Zone

8.7.1 Contractor shall ensure access to areas around the concrete pump and delivery pipeline are restricted; the use of one or more of the following control measures shall be considered:

- (a) Covered walkways.
- (b) Mesh fence panels.
- (c) Fixed barricades.
- (d) Cones and tape or flags; or
- (e) Appropriate signage.

8.7.2 Contractor shall ensure where the concrete pumping or pipeline set-up is for a project with a longer time duration the control methods shall be of a more permanent nature.

## 8.8 Traffic Control

8.8.1 Ensure the following:

- (a) That pedestrians on or off the site are not at risk from trucks delivering concrete to the pump by ensuring access routes are clearly defined and utilized and that pedestrian segregation is maintained (Refer: NEOM-NLF-NMS-006.032 Site Traffic Management and Logistics)
- (b) Appoint a person whose duties are to control the traffic; ensure the appointed person is clearly identifiable by wearing appropriate personal protective equipment including a high visibility jacket

- (c) Ensure a traffic management plan is in place -where possible one-way systems adopted

## **8.9 Fumes**

### **8.9.1 Ensure the following:**

- (a) Where a concrete pump and delivery trucks are working/operating in an enclosed or confined area where there is a likelihood of build-up of gases from internal combustion engines, precautions are to be taken to direct the gases to the open air.
- (a) If deemed necessary mechanical means ( Air replacement or extraction systems) may be required to ensure appropriate level of ventilation and safe atmosphere is maintained

## **8.10 Occupational Noise**

### **8.10.1 Noise Control**

- (a) The noise and vibration levels from machinery or equipment during pumping operations shall not be a risk to hearing or health in accordance with the requirements contained in NEOM-NLF-NMS-006.022 – Occupational Noise and NEOM NLF-NMS-006.023 – Vibration.
- (b) Appropriate hearing protection equipment is to be provided to all employees in the vicinity of the concrete pump and other associated equipment if the noise is in excess of the noise exposure limits; (Refer: NEOM-NLF-NMS-006.021Personal Protective Equipment)
- (c) Hearing protection zones are to be set up and clearly indicated with safety signs to ensure that all employees working in areas where the noise levels are in excess of the limits set in NEOM NLF-NMS-006.022 Occupational Noise, shall wear hearing protection.

## **8.11 Occupational Health**

- 8.11.1 Ensure that all staff that work with wet concrete are fully aware of the hazards of dermatitis.
- 8.11.2 Ensure an occupational health program is in place to undertake regular occupational screening and monitoring for employees working with wet concrete. (Refer: NEOM-NLF-NMS-006.024 Occupational Health Screening and Medical Surveillance)

## **8.12 Residue Collection**

- 8.12.1 Where a permanent or semi-permanent concrete pumping set-up has been established on site or where a concrete pump is set-up in a roadway or public place ensure a method to collect concrete residue is put in place.
- 8.12.2 All necessary precautions shall be taken to prevent wash-down residue from the clean-up of concrete pumping operations finding its way into surface or storm-water drains, this also includes concrete delivery trucks.

## **8.13 Equipment**

### **8.13.1 Water and Air Lines**

- (a) Where compressed air and water lines are supplied on site for use with the concrete pump, they shall be positioned to avoid damage to the lines and shall as far as reasonably practicable be kept well clear of any public place.

### **8.13.2 Pump Gauges**

- (a) The gauges fitted to the concrete pump are accurate and of a size and style that are easy to read; and

- (b) The instruments are to be checked on a regular basis and the results recorded in the concrete pump's logbook.

#### 8.13.3 Concrete Pipelines

- (a) When laying a delivery pipeline avoid the use of unnecessary bends.
- (b) Horizontal delivery pipelines are to be appropriately supported.
- (c) Each section of pipe in a vertical delivery pipeline is supported to avoid extra load on the pipe clamp.
- (d) The right angle (90 degree) bend where the delivery pipeline changes from a horizontal to a vertical plane shall be equipped with a leg sitting firmly on the ground; and
- (e) Ensure vertical delivery pipelines are mechanically secured to the building.

#### 8.13.4 Pipe Clamps

- (a) Ensure when using quick release pipe clamps that each clamp is locked using the locking pin to prevent accidental release.

#### 8.13.5 Anchor Brackets

- (a) Ensure that enough anchor brackets and tie-downs are used to appropriately secure the system.
- (b) On a vertical (riser) pipeline, brackets shall be mechanically fixed to the wall or to the edge of each floor slab at no more than 3 metres intervals.

#### 8.13.6 Delivery Pipeline (Hose)

- (a) The rubber delivery pipeline is checked for damage prior to being fitted.
- (b) If used on a concrete placing boom or concrete skip where it may pass vertically over either employees or the public, it shall be fitted with an appropriate stop cap at the outlet end.
- (c) Control measures are taken to prevent damage to the pipeline during use;
- (d) The delivery pipeline on a boom pump is secured in position by a safety chain, sling, or other retaining device in accordance with the manufacturer's specifications.

#### 8.13.7 Pipe Movement

- (a) Contractor shall ensure that appropriate mechanical fixings are provided along the pipeline to control the surging action created as concrete is pumped through the pipeline, special attention shall be given to bends and elbows.

#### 8.13.8 Receiving Hopper

- (a) The receiving hopper is positioned securely so that it can receive concrete flow readily from the discharge chute of a concrete delivery truck.
- (b) A hinged grill is provided to prevent access to dangerous moving parts such as feed or agitator mechanisms and the valve gear. The grill shall be constructed of parallel bars, spaced so that it is not reasonably practicable for a person's hand to become trapped;
- (c) The spacing of the grill parallel bars shall not exceed 70mm and the distance from the grill to moving parts shall be at least 150mm.

#### 8.13.9 Line Cleaning

- (a) Line cleaning is carried out by experienced and trained pumping personnel.
- (b) There is always a connection to atmosphere (air relief valve) as well as the air entry point to the pipeline. This connection is to allow the system to be depressurised before removing any pipeline;
- (c) Where a cleaning ball is used and blown through the concrete pipeline an appropriate ball catcher shall be used at the end of the line and the area shall be cleared of all unnecessary personnel.

### **8.13.10 Pump Cleaning**

- (a) Before a person places any part of their body into a pump opening that the engine is shut down and the controls actuated to exhaust any hydraulic accumulators which can allow the Units to move or rotate with the engine stopped.
- (b) When cleaning that another person is in the immediate vicinity to provide assistance if required;
- (c) Ensure isolation in accordance with NEOM-NLF-NMS-006.028 – Lock-out /Tag-out (Isolation).

## **8.14 Deck Area Concreting**

### **8.14.1 Ensure a maintenance and inspection program is developed which shall include provisions for:**

- (a) Perimeter guardrails or safety screens shall be securely in place. Where guardrails are used the top rail shall be fixed a minimum of 950mm above the finished concrete slab level.
- (b) Enable appropriate access for those carrying equipment to the pour area. These walkways can consist of scaffold planks placed at least two planks wide which can be moved back as the pour progresses.
- (c) A confined area such as slip-form or jump-form can present a fume or fire hazard during a pour and electric powered vibrating machines shall be used rather than petrol driven machines. Fire extinguishers shall be on hand in the immediate work area where petrol machines are in use;
- (d) Workplaces and access to workplaces where a concrete pour is being carried out shall be appropriately lit, in accordance with NEOM-NLF-NMS-006.040 – General Workplace Amenities.

## **8.15 Preparation for Road Travel**

### **8.15.1 Ensure the manufacturer's requirements are followed and include:**

- (a) Lock hydraulic operated booms and outriggers in the stowed or travelling position.
- (b) Stow all loose components, such as pipes, couplings, and tools; and
- (c) Disengage all drives to hydraulic pumps for operating the concrete pump, boom and outriggers and put the controls in the OFF position.

## **8.16 Inspection and Maintenance**

### **8.16.1 Ensure a maintenance and inspection program is developed which shall include provisions for:**

- (a) Pre-operational checks and tests.
- (b) Routine inspection and maintenance at specified time intervals.
- (c) Recording in the logbook and maintenance records all:
  - I. Inspections and maintenance.
  - II. Defects found and repairs undertaken; and
  - III. Structural alterations.

### **8.16.2 Ensure appropriate control measures are implemented for the inspection and maintenance of concrete pumps and booms to ensure they remain in a safe condition.**

### **8.16.3 Manufacturer's requirements shall be followed with regards to daily checks. Any repairs or replacements shall be in accordance with the manufacturer's recommendations.**

### **8.16.4 Only trained and competent personnel shall carry out inspections, repairs, or replacement.**

### **8.16.5 All pipeline, including reducers, bends, hose, and couplings shall be inspected monthly and a record of the inspection shall be maintained.**

- 8.16.6 Periodic ultrasonic testing for metal parts and areas reasonably foreseeable to be subjected to wear shall be carried out based on concrete flow volumes through each section of pipeline, reducer, or bend.
- 8.16.7 Records of the pipeline inspection shall be kept in the logbook or on site in the case of fixed pipeline installation.
- 8.16.8 Concrete placing booms and pumps and all other associated equipment, except pipelines, shall be thoroughly examined once a year by a competent person and the results entered in the logbook. This is in addition to the daily visual checks and inspections by the operator prior to the equipment being used.
- 8.16.9 In the case of concrete placing booms there shall be a thorough check of all areas of potential wear or fatigue at least every 6 years by the owner of the equipment by a competent person or 3<sup>rd</sup> party inspection . This inspection shall include but not be limited to:
- (a) The complete stripping and inspection of the slew ring or king post assembly.
  - (b) The replacement of the slew ring bolts.
  - (c) Magnetic particle, dye penetration or radiographic checking of all critical areas for cracking.
  - (d) Ultrasonic thickness testing of any wear areas or corroded sections; and
  - (e) Detailed inspection of all arm joints including bearings, bushes, pins, links.

#### 8.16.10 Welding

- (a) Only person(s) authorized by the boom manufacturer shall perform welding work on the placing boom, the outrigger system or other stressed structural components that are related to the placing boom's stability or structural integrity.

### 8.17 Reporting Defects

- 8.17.1 The concrete pump operator shall report defects without delay. If a defect is considered to be a hazard to safety, pumping operations shall be stopped until the defect is repaired. The repairs shall be recorded in the logbook.

### 8.18 Logbooks and Inspection Check Sheets

- 8.18.1 The following records shall be maintained:

- (a) A logbook is maintained that sets out the complete details of all inspections, tests, repairs, and modifications carried out on equipment.
- (b) Evidence is available to prove that plant has been competently inspected and is in a safe working condition before the plant is allowed on site;
- (c) No machine shall operate without having an up-to-date log book available for inspection at the workplace.

### 8.19 Pipe Identification

- 8.19.1 Ensure pipes, bends and reducers are identified with a permanently fixed metal tag with numbers not less than 10mm in height.
- 8.19.2 Ensure all pipes ends and hose tails are regularly inspected by a competent person.

## **8.20 Couplings**

8.20.1 All couplings are to be regularly inspected by a competent person for signs of wear and fatigue and couplings showing deformation or damage that affect the efficiency of the coupling action shall be replaced.

## **8.21 Training and Competency**

8.21.1 Ensure that training complies with the requirements of:

- (a) NEOM-SMS-Element 5 – Training, Awareness and Competency.
- (b) NEOM-NLF-NMS 006.001 – Organisation, Safety Practitioner Registration and Appointment of Contractor.

8.21.2 In accordance with NEOM-SM– Safety Management Manual - Roles and Responsibilities ensure employees required to implement the requirements of this NMS are trained in the use of concrete placing equipment and understand the risks associated with using the plant and the control measures put in place by the Contractor.

8.21.3 Ensure all employees involved in the concrete placing equipment and activities trained to recognise and respond to hazards associated with this type of work.

8.21.4 Ensure that all personnel are trained to recognize the hazards of working with wet concrete and the propensity of dermatitis.

8.21.5 Ensure an overall training programme is planned for both employees and supervisors, and shall include, but not limited to the:

- (a) Work method to be used in the setting-up and safe operation of concrete placing booms and pumps.
- (b) Method for inspection and maintenance and a knowledge of the manufacturer's operation and service manuals.
- (c) Correct use, care, and storage of personal protective equipment; and
- (d) Correct use, care and storage of tools and equipment to be used, including electrical safety practices.

8.21.6 Records of the required training shall contain the following information:

- (a) Name and ID number.
- (b) Subject(s) of training.
- (c) Dates(s) of training; and
- (d) Person(s) providing the training.

## **8.22 Record Keeping**

8.22.1 Records shall be maintained including:

- (a) Logbooks and inspection check sheets.
- (b) Third party annual inspection certificate(s)
- (c) Personnel training records and qualifications

## 9 Appendices

### 9.1 Appendix A: Forms, Signs and Checklists



## 9.2 Appendix B: Audit Criteria

Audit Criteria		Requirements	Verification	Area of Concern
ISO 45001:2018 Clause	NMS Ref.			Yes/ No
5.3	7.1.3, 8.1.1(c)	Pre-Tender Health and Safety Plan has been developed and issued		
5.3, 8.1.4.2	7.1.4	Selection of Contractors undertaken in accordance with NEOM's policies and procedures		
7.2	7.2.4	Persons appointed to manage /oversee work operations have the skills, knowledge, experience		
	8.21	Training and Competency complies with the requirements and records are maintained		
8.1.2 (e)	7.2.1(d), 7.3.3	Personal protective equipment required for use are fit for purpose		
8.1.2 (c, d)	7.2.1(e)	Control of access to dangerous or high-risk areas or equipment using suitable Barricades and Signage		
6.1.2.2	8.1.2, 8.1.3	Prior to the undertaking of concrete pumping operations, a risk assessment is to be conducted to ensure the selection of appropriate control measures		
6.1.1, 6.1.2	8.3  8.4 8.5  8.6 8.7 8.8 8.9 8.10 8.11 8.12 8.13 8.14 8.15	Ensure documented safe systems of work are developed and implemented and include reference to any instruction manuals supplied with the Pump Unit and Boom, giving comprehensive instructions for operation; Setting Up on Site Setting Up Near Power Lines or Electrical Equipment Setting Up in a Public Place Operational Safety Zone Traffic Control Fumes Occupational Noise Occupational Health Residue Collection Equipment Deck Area Concreting Preparation for Road Travel		
	8.16, 8.17, 8.18	Inspection and Maintenance program is developed, implemented and logbook is maintained of all inspections, tests, repairs, and modifications carried out on equipment	Logbooks and Inspection Check Sheets	

### **9.3 Appendix C: Guidance Information**

The pumping of concrete is an efficient method of moving and placing concrete. This basic process is used in the manufacture of pre-cast and tilt-up panels, reinforced concrete construction, slab construction, concrete paving, and concrete spraying.

Numerous OSHA standards address worker safety from concrete boom pump trucks on construction projects. Section 29 CFR 1926.700(a)

This subpart sets forth requirements to protect all construction employees from the hazards associated with concrete and masonry construction operations performed in workplaces covered under 29 CFR Part 1926. In addition to the requirements in Subpart Q, other relevant provisions in Parts 1910 and 1926 apply to concrete and masonry construction operations (emphasis added).

Section 1926.702(e)(1) (Concrete pumping systems) requires that "Concrete pumping systems using discharge pipes shall be provided with pipe supports designed for 100 percent overload." Many other OSHA standards impose additional requirements for safely using concrete boom pump trucks to place concrete in construction, including the following sections:

1926.20(b)(4) [1926 Subpart C, General Safety and Health Provisions] - "The Contractor shall permit only those employees qualified by training or experience to operate equipment and machinery." This applies to operating the truck, outriggers, and concrete pumping system components.

1926.21(b)(2) [1926 Subpart C, General Safety and Health Provisions] - "The Contractor shall instruct each employee in the recognition and avoidance of unsafe conditions and the regulations applicable to his work environment to control or eliminate any hazards or other exposure to illness or injury."

Under the UK HSE Cementing is under the COSHH regulations however a good information document freely available is OCE 24 which covers the hazards associated with cementing.

Another free publication from the UK HSE web site is HSG 150 Health and safety in construction which covers the hazards associated with pumping concrete and cement



نیوم NEOM

**NEOM OCCUPATIONAL HEALTH and SAFETY  
NEOM MINIMUM STANDARD  
for  
LONE WORKING and/or  
WORKING in REMOTE LOCATIONS**

NEOM-NLF-NMS-006.036 Rev 02.00 – February 2022

©NEOM [2021]. All rights reserved.

## Document History

Revision code	Description of changes	Purpose of issue	Date
Rev 00.00	First Issue	Issued for Implementation	27/07-2020
Rev 02,00	SMS Update	Issued for Implementation	01-02-2022

## Document Approval

	Prepared by	Reviewed by	Approved by
Name	Robert Murphy	Talal Al Anazi	Adel Al Wuhaib
Job Title	Loss Prevention Specialist LP/FS -Public Safety	Director, Loss Prevention/Fire Safety (LP/FS) Public Safety	Executive Director Public Safety



## Contents

<b>1</b>	<b>PURPOSE .....</b>	<b>4</b>
<b>2</b>	<b>SCOPE .....</b>	<b>4</b>
<b>3</b>	<b>EXPECTATIONS.....</b>	<b>4</b>
<b>4</b>	<b>LIST OF DEFINITIONS .....</b>	<b>5</b>
<b>5</b>	<b>LIST OF ABBREVIATIONS .....</b>	<b>5</b>
<b>6</b>	<b>RELATED NEOM DOCUMENTS.....</b>	<b>6</b>
<b>7</b>	<b>ROLES AND RESPONSIBILITIES .....</b>	<b>7</b>
7.1	Client .....	7
7.2	Contractor .....	7
7.3	Employee .....	8
7.4	Employers .....	8
7.5	Specific Responsibilities .....	9
<b>8</b>	<b>OTHER SECTIONS RELATED TO SUBJECT.....</b>	<b>9</b>
8.1	Lone Working Defined .....	9
8.2	Planning and Assessment.....	9
8.3	Assessing the Risk .....	10
8.4	Supervision.....	11
8.5	Medical Fitness .....	11
8.6	Tools and Equipment .....	12
8.7	Type or Nature of Work .....	12
8.8	Personal Alarm Systems.....	12
<b>9</b>	<b>APPENDICES .....</b>	<b>13</b>
9.1	Appendix A: Forms, Signs and Checklists .....	13
9.2	Appendix B: Audit Criteria.....	14
9.3	Appendix C: Guidance Information.....	15

## List of Tables

Table 1 : Table of Definitions .....	5
Table 2 : Table of Abbreviations .....	5
Table 3 : Related NEOM Documents.....	6

## **1 Purpose**

This NEOM Co. SMS Minimum Standards (hereafter referred to as NMS) relates to the management of all occupational health, safety risks associated with lone working or working in remote locations.

It provides guidance to support compliance with industry best practice and international regulatory safety requirements to ensure that the associated risks are assessed, and control measures are implemented in accordance with the hierarchy of risk controls.

It has been developed to align with the requirements of the ISO 45001 Health and Safety Management Manual (Refer NEOM-NLF-PRC-006- Section 2 ISO 14001 Cross reference table)

## **2 Scope**

This NMS applies to all personnel within NEOM and any Contractors working for NEOM and or associated projects and activities. It is designed to incorporate requirements set by the NEOM-SMS.

## **3 Expectations**

To ensure the occupational health and safety (OHS) of all personnel, protection of assets (services, plant/equipment) and the environment. That special consideration to personnel who have to work alone.

NEOM expect each Sector, Organization, Department or Contractor to ensure that risks associated with the work are controlled in accordance with the hierarchy of risk controls: elimination, substitution, engineering controls, administrative controls, and personal protective equipment.

Consideration shall be given to technological advances that may introduce new means of controlling or eliminating the risks associated with work activities.

That the expectation for safety compliance is meeting and exceeding all applicable OSHA Laws, Regulations, and Industry Best Practice.

Applicable requirements and standards include:

- (a) OSHA Standards and Regulatory requirements.
- (b) ANSI requirements.
- (c) NFPA Standards and requirements.
- (d) NEOM Minimum Standards
- (e) Saudi Building Codes
- (f) International Building Codes

*If requirements of this document conflict with requirements set by another regulatory authority, Contractor are required to follow the more stringent requirement.*

## 4 List of Definitions

Table 1 : Table of Definitions

Terms	Definitions
NEOM Co	NEOM Company
Client	NEOM Sector /Department responsible for management and oversight of the Contractor
Employer	Person accountable for the implementation and function of this procedure within the Sector, Organization, Department or Contractor
Contractor	The organization contracted to carry out the works
Lone Worker	Lone workers are those who work by themselves without close or direct supervision. Anybody who works alone, including contractors, self-employed people, and employee, is classed as a lone worker
Safety Management System (SMS)	Occupational Health and Safety Management System established by NEOM in compliance to ISO 45001 Standard

## 5 List of Abbreviations

Table 2 : Table of Abbreviations

Abbreviations	Descriptions
SMS	Safety Management System
NMS	NEOM Minimum Standard
SOP	Standard Operating Procedure
ANSI	American National Standards Institute
NFPA	National Fire Prevention Association
CPP	Construction Phase Plan
OSHA	Occupational Safety and Health Administration.
PPE	Personal Protective Equipment
CCTV	Closed Circuit Television
IBC	International Building Codes
OHS	Occupational Health and Safety

## 6 Related NEOM Documents

Table 3 : Related NEOM Documents

Document Code	Document Name
NEOM Element 2	Risk and Opportunity Management
NEOM-Element 5	Training, Awareness and Competency.
NEOM-Element 6	Contractor Management
NEOM Element 9	Emergency Planning and Response Management
NEOM-SMS	Neom Safety Management System
NEOM-NLF-SM	Safety Manual - Roles and Responsibilities
NEOM-NLF-PRC-006- Section 2	ISO 14001 Cross Reference Table
NEOM-NLF-PRC-006;	Occupational health, safety and Fire Safety requirements for Contractors
NEOM-NLF-NMS-006.002	Safety Construction Management Plan
NEOM-NLF-NMS-006.012 –	Barricading of Hazards
NEOM-NLF-NMS-006.016	Electrical Safety,
NEOM-NLF-NMS-006.017	Plant and Equipment.
NEOM-NLF-NMS-006.019	Portable Power Tools
NEOM-NLF-NMS-006-020	Hazardous Materials (COSHH)
NEOM-NLF-NMS-006.021	Personal Protective Equipment (PPE)
NEOM-NLF-NMS-006.024	Occupational Health Screening and Medical Surveillance
NEOM-NLF-NMS-006.029	First Aid and Medical Treatment
NEOM-NLF-NMS-006.040	General Workplace Amenities
NEOM-NLF-NMS-004.002	Heat Stress.
NEOM-NLF-NMS-004.003	Cold Stress
NEOM-NLF- NMS-006.042	Road Safety

## **7 Roles and Responsibilities**

### **7.1 Client**

- 7.1.1 General Health and Safety roles and responsibilities are defined in; and shall be carried out in accordance with the requirements of NEOM-NLF-SM–Safety Management Manual - Roles and Responsibilities.
- 7.1.2 The Client is responsible for ensuring that NEOM Safety Commitment Statement and safety management system are properly applied within their areas of control/responsibility. Effective implementation will ensure compliance with relevant legislative requirements and will help promote the use of industry best safe working practices.
- 7.1.3 That a suitable, Pre-Tender Health and Safety Plan has been developed and issued to Contractors to ensure they have all the information necessary to make informed decisions when developing the Construction Phase Health and Safety Plan (NEOM-NLF-NMS-006.002 Safety Construction Management Plan) (CPP) which will form part of the Contractor review and selection process
- 7.1.4 That the selection of Contractors shall be undertaken in accordance with NEOM's policies and procedures (NEOM-Element 6 Contractor Management). To ensure that only Competent organizations capable of meeting the requisite safety standards associated with project are contracted.
- 7.1.5 Conduct regular Contractor safety assurance reviews to provide the confidence level required that the safety management system is delivering as planned, and consistently achieves the acceptable level of safety. Including:
  - (a) Safety performance monitoring and measuring.
  - (b) Managing change.
  - (c) Continuous improvement.

### **7.2 Contractor**

- 7.2.1 Contractor shall undertake their roles and responsibilities in accordance with the general requirements of NEOM-NLF-SM–Safety Management Manual-Roles and Responsibilities
- 7.2.2 Maintaining control of access to dangerous or high-risk areas or equipment using suitable barricades that are in serviceable condition (Refer: NEOM-NLF-NMS-006.012 – Barricading of Hazards)
- 7.2.3 That all work activities are assessed, planned, organized, and that suitably competent Supervision is available to implement the safety requirements and oversee the work (Refer: NEOM- Element 5 – Training, Awareness and Competency)
- 7.2.4 Ensure persons appointed to manage /oversee work operations have the skills, knowledge, experience and, where relevant, the organizational capability to plan and manage work safely and without risk to those who may be affected by the activities (Refer: NEOM Element 5 Training, Awareness, and Competence).
- 7.2.5 Ensure employees carrying out the work are trained to recognize the associated hazards and understand the processes and procedures to control or minimize the risks.(Refer: NEOM Element 2 Risk and Opportunity)
- 7.2.6 That all equipment including personal protective equipment required for use is fit for purpose, and (as required) has been inspected by a competent person and inspection records are maintained and readily available.(Refer: NEOM-NLF-NMS-006.021 Personal Protective Equipment (PPE))

### **7.3 Employee**

- 7.3.1 Shall undertake their roles and responsibilities in accordance with the general requirements of NEOM-NLF-SM – Safety Management Manual - Roles and Responsibilities.
- 7.3.2 Report any activity or defect relating to the work which they believe is reasonably foreseeable to endanger their safety or that of another person's.
- 7.3.3 Shall use appropriate equipment or safety devices provided for the work by the Contractor in accordance with any training or instruction received in the use of the work equipment. (Refer NEOM-NLF-NMS-006.021 Personal Protective Equipment)
- 7.3.4 Shall undertake their specific roles and responsibilities in accordance with the following:
  - (a) Employees shall ensure they follow all the rules and regulation set by the employer with regards to lone working.
  - (b) Employees shall ensure that they immediately report any hazard or information that may affect, adversely or otherwise, the works being undertaken.

### **7.4 Employers**

- 7.4.1 Employers (Person/entity accountable for the implementation and function of this procedure within the Sector, Organization, Department or Contractor) shall undertake their specific roles and responsibilities relating to Lone Working in accordance with the following:
  - (a) Where lone working and / or working in remote locations has been identified, the employer shall develop a procedure containing specific instructions on lone working.
  - (b) A check in process shall be established. The check in process shall include the following items:
    - I. A daily work plan so it is known where the lone employee will be and when.
    - II. Identify one main person to be the contact at the office, plus a backup.
    - III. Define under what circumstances the lone employee will check in and how often.
    - IV. Stick to the visual check or call-in schedule. You may wish to have a written log of contact.
    - V. Have the contact person call or visit the lone employee periodically to make sure he or she is okay.
    - VI. Pick out a code word to be used to identify or confirm that help is needed.
    - VII. Develop an emergency action plan to be followed if the lone employee does not check in when they are supposed to.
    - IX. Each procedure shall be individual to each lone worker and shall be updated on a regular basis.
  - (c) Ensure that all persons who are at an increased risk due to working alone are identified and appropriate control measures are implemented to reduce the risk.
  - (d) Provide appropriate welfare facilities, in compliance with the requirements of, but not limited to:
    - I. NEOM Element 9 Emergency Planning and Response Management.
    - II. NEOM NLF-NMS-006.029 First Aid and Medical Treatment.
    - III. NEOM NLF-NMS-006.040 General Workplace Amenities
    - IV. NEOM-NLF-NMS-004.002 Heat Stress.
    - V. NEOM-NLF-NMS-004.003 Cold Stress
    - VI. NEOM-NLF- NMS-006.042 Road Safety
- 7.4.2 Ensure that Lone Workers are fully aware and compliant with any specific legislation that applies to lone working, examples could include occupational diving or certain chemical works

## **7.5 Specific Responsibilities**

- 7.5.1 Sector, Organization, Department or Contractor Head is responsible in ensuring that provisions are made the safe systems of work to prevent and minimize risks in each workplace
- 7.5.2 Safety Practitioner/Coordinator is responsible to monitor the implementation of this procedures and document its effectiveness
- 7.5.3 The Responsible Person will support this procedure and ensure that any Contractor Organization working for, or on behalf of, the Sector, Organization, Department or Contractor will comply with the requirements of these procedures
- 7.5.4 Line Managers / Supervisors are responsible for training their workers in risks
- 7.5.5 The LP & FS Public Safety department will support the NEOM risk assessments by carrying out compliance checks and supporting and guiding the various safety teams.

## **8 Other Sections related to subject**

### **8.1 Lone Working Defined**

- 8.1.1 Lone working is defined as those who work by themselves without close supervision or direct supervision. There are many situations where people can find themselves “working alone”, some examples are set out below:
  - (a) People in fixed establishments where:
    - I. Only one person works on the premises, e.g., in small workshops, petrol stations, kiosks, shops and home employees or personnel working “remotely”.
    - II. People working separately from others, e.g., in factories, warehouses, some research and training establishments and leisure centers.
    - III. People working outside normal hours, e.g., cleaners, security, special production, maintenance, or repair staff.
  - (b) Mobile employees working away from their fixed base:
    - I. On construction, plant installations, maintenance and cleaning work, electrical repairs, lift repairs, painting and decorating, vehicle recovery etc.
    - II. Agricultural employees; service employees, e.g., postal/Courier staff, home help/domestic staff, pest control employees, drivers, engineers, architects, estate agents, sales representatives and similar professionals visiting domestic and commercial premises.

### **8.2 Planning and Assessment**

- 8.2.1 Employers shall evaluate each site or operation to determine if hazards are present and the workplace shall be assessed using risk management practices as required by NEOM Element 2 Risk and Opportunity Management.
- 8.2.2 Where lone working has been identified, the employer shall ensure, as part of their risk management program, a full risk assessment is undertaken. The risk assessment shall be developed in line with the requirements of NEOM Element 2 Risk and Opportunity Management. The following, as a minimum, shall be ensured:
  - (a) An assessment of the various risks is undertaken, and systems of work are established which are safe to all parties involved or affected including the public.
  - (b) That effective procedures and control measures are in place, which are implemented to manage activities safely and without risk to health.

- (c) That associated safe systems of work are included in the NEOM-NLF-NMS-006.002 Safety and Health Construction Management Plan (CPP) and in accordance with NEOM Element 6 Contractor Management

### **8.3 Assessing the Risk**

- 8.3.1 Lone employees shall not be at more risk than other employees. This may require extra risk control measures.
- 8.3.2 Precautions shall take account of normal work and foreseeable emergencies, e.g., fire, equipment failure, illness, and incidents.
- 8.3.3 Employers shall identify situations where people work alone and consider, as a minimum, the issues identified below.

(a) Length of Time the Person will be Working Alone

- I. What is a reasonable length of time for the person to be alone?
- II. Is it reasonable for the person to be alone at all?
- III. How long will the person be alone to finish the job?
- IV. Is it legal for the person to be alone while doing certain activities? (For example: working alone in a confined space or during lock-out / tag-out operations).
- V. What time of the day will the person be alone?

(b) When employees are working in remote locations consider whether:

- I. The emergency services can approach close enough (if necessary).
- II. There is a clear understanding about how long the work should take.
- III. There is appropriate access to first aid, or provision for mobile employees to carry a first aid kit; and
- IV. Transport arrangements to and from the workplace are appropriate.

(c) Location of the Work

- I. Is the work in a remote or isolated location? (Remember that a remote location does not have to be far away. Storage rooms that are rarely used can be considered remote or isolated).
- II. Is transportation necessary to get there? What kind of transportation is needed?
- III. Is the vehicle equipped with emergency supplies such as food and drinking water, as well as a first aid kit?
- IV. Will the person need to carry some or all the emergency supplies with them when they leave the vehicle?
- V. Does the person need training to be able to use the first aid equipment?
- VI. What are the consequences if the vehicle breaks down?

(d) Condition of the Workplace

- I. Ensure a safe means of entry and exit to the workplace.
- II. Ensure that there are appropriate workplace amenities (e.g., lighting, drinking water, food storage, preparation and eating facilities, washing facilities), in compliance with the requirements of NEOM NLF-NMS-006.040 - General Workplace Amenities

(e) Communication

- I. Employers shall consider whether communication is appropriate, and in particular:
  - I. Has the lone employee been equipped with a system for maintaining contact, such as two-way means of communication or a personal alarm?
  - II. Is there a closed-circuit television (CCTV) system available, and will it be monitored?
  - III. What forms of communication are available?

- IV. Is it necessary to "see" the person, or is voice communication appropriate?
- V. Will emergency communication systems work appropriately in all situations?
- VI. If the communication systems are in a vehicle, are alternative arrangements required to cover the person when they are away from the vehicle?

(f) Personal Assault

- I. Employees who are thought to be carrying cash, or who can be seen in possession of valuables, such as laptop computers, pharmaceuticals, hand tools, mobile phones, etc. may be at risk from robbery or attack.
- II. Persons with criminal intent may also pose a risk if they find out an employee's address.

(g) Emergency Procedures

- I. In case of emergency, consideration shall be given to:
  - 1. Whether appropriate preparation has been made to cope with the emergency, e.g., Fire, illness, or incident, and have appropriate procedures have been established?
  - 2. What provisions are in place to make the workplace secure if it must be left unattended. Solitary employees shall be capable of responding correctly to emergency situations; and
  - 3. Emergency procedures and control measures follow the requirements of NEOM-Element 9– Emergency Planning and Response Management.

## **8.4 Supervision**

- 8.4.1 Although solitary employees cannot be subject to constant supervision, it is still the employer's duty to provide appropriate control of the work. Supervision complements information, instruction and training and helps to ensure that employees understand the risks associated with their work and that the necessary safety precautions are carried out. It can also provide guidance in situations of uncertainty.
- 8.4.2 The extent of supervision required depends on the risks involved and the proficiency and experience of the employee to identify and handle safety issues.
- 8.4.3 Employees new to the job, undergoing training, doing a job which presents special risks, or dealing with new situations may need to be accompanied at first.
- 8.4.4 The extent of supervision required is a management decision. It shall not be left to individuals to decide whether they require assistance.
- 8.4.5 Safety supervision can generally be carried out when visits are made to check the progress and quality of the work and may take the form of periodic site visits coupled with discussions in which safety issues are assessed.
- 8.4.6 In situations where there is a lack of supervision, extra care shall be taken to ensure that the lone employee is competent to both carry out the task and to deal with foreseeable problems.

## **8.5 Medical Fitness**

- 8.5.1 Issues that shall be discussed, as a minimum, in relation to medical fitness include:
  - (a) Do the circumstances of working alone place additional requirements on employees in terms of their physical or mental stamina?
  - (b) Is there a medical condition that makes them inappropriate for working alone?
  - (c) Would a pre-employment questionnaire or medical examination be helpful under the circumstances?

## **8.6 Tools and Equipment**

- 8.6.1 Where machinery or power tools are being used, consideration of the electrical safety, guarding and fire precautions required are paramount. Refer: NEOM-NLF-NMS-006.016 Electrical Safety, NEOM-NLF-NMS-006.019 Portable Power Tools and NEOM-NLF-NMS-006.017-Plant and Equipment.
- 8.6.2 The use of flammable, explosive or toxic chemicals shall be fully assessed. The presence of automatic fire protection (flood) systems e.g., carbon dioxide gas may pose special risks, Refer: NEOM-NLF-NMS-006-020 Hazardous Materials (COSHH)
- 8.6.3 Access equipment that is appropriate for handling by one person alone may be required, and all lifting operations shall be performed in an appropriate and safe manner. Consideration shall be given to supplying appropriate personal protective equipment, bearing in mind the limited possibilities for supervision. (Refer: NEOM-NLF-NMS-006021 Personal Protective Equipment)

## **8.7 Type or Nature of Work**

- 8.7.1 Employers shall ensure the risk assessment considers, as a minimum, the following.
  - (a) Is there appropriate personal protective equipment available? Is it in good working order?
  - (b) What machinery, tools or equipment will be used?
  - (c) Are there any high-risk activity involved examples of which are work activities;?
    - I. At heights.
    - II. In confined spaces (such as tanks, grain bins or elevators, culverts, etc.).
    - III. With electricity.
    - IV. With hazardous substances or materials.
    - V. With hazardous equipment such as chainsaws or firearms.
    - VI. With materials at great pressure; and/or
    - VII. With the public, where there is a potential for violence.
  - (d) Is fatigue a reasonably foreseeable to be a factor?
  - (e) Are there extremes of temperature?
  - (f) Is there risk of an animal attack, insect bite (poisonous, or allergic reaction), etc.?
  - (g) If the person is working inside a locked building, how will emergency services be able to get in? (e.g., a night cleaner in a secure office building)
  - (h) Does the work involve working with money or other valuables?
  - (i) Does the work involve seizing property or goods (such as repossession, recovering stolen property, etc.)?

## **8.8 Personal Alarm Systems**

- 8.8.1 There are several portable alarm systems available, of varying degrees of sophistication. Some can be bought off the shelf, while others can be made up to a company's own specification. There are also alarm systems that are set up to monitor remote plant and equipment. These systems shall be able to detect failure or malfunction that may put a lone employee at risk, and are often integrated with a complete security package including CCTV, fire detection etc.
- 8.8.2 The system most appropriate shall depend on the circumstances it is to be used for, but there is one common basic feature to all systems. It shall ensure that vulnerable individuals can raise an instant alarm, or be located precisely, so that immediate assistance can be sent.

## 9 Appendices

### 9.1 Appendix A: Forms, Signs and Checklists



Safety Alarms can be as simple as a mobile phone and having a direct contact who knows you're working alone

## 9.2 Appendix B: Audit Criteria

Audit Criteria		Requirements	Verification	Area of Concern
ISO 45001:2018 Clause	NMS Ref.			Yes/ No
5.3	7.1.3	Pre-Tender Health and Safety Plan has been developed and issued		
5.3, 8.1.4.2	7.1.4	Selection of Contractors undertaken in accordance with NEOM's policies and procedures		
7.2	7.2.4	Persons appointed to manage /oversee work operations have the skills, knowledge, experience		
8.1.2 (e)	7.2.6	Personal protective equipment required for use are fit for purpose		
8.1.2 (c, d)	7.2.2	Control of access to dangerous or high-risk areas or equipment using suitable Barricades and Signage		
6.1.2.3	7.2.5, 8.7	Hazards Identification Plan (HIP) for lone employee		
6.1.2.2	8.2, 8.3	Assessment of the various risks shall be undertaken, where lone working has been identified, the risk assessment shall be developed		
6.1.2.2 6.1.2.3	8.3	Lone employees shall not be at more risk than other employees, employers shall identify situations where people work alone and consider		
	8.5	Medical Fitness of lone employee to assure physical or mental stamina		
8.1.2 (e)	8.4, 8.6.3	Supplying appropriate personal protective equipment, bearing in mind the limited possibilities for supervision		
	8.8	Personal Alarm Systems integrated with integrated with a complete security package including CCTV		

### **9.3 Appendix C: Guidance Information**

Under OSHA's guidelines 29 CFR 1915 Subpart F and specifically 1915.84 Working Alone and 1926.103 --- 1926.800 and 1910.134 all cover various aspects of Lone Workers.

However, companies who employ lone workers must account for each employee: Alongside this, employers should also implement their own policies to help ensure the safety of their lone workers. Being able to monitor your employee's whereabouts is extremely important in keeping them safe, as accidents can occur at any time.

Aside from providing adequate safety training and a safe work environment, employers must also comply with OSHA's standards to minimize the risk of worker injuries and fatalities. Employers have a responsibility to report any work-related death or accident, as well as any fatalities leading to work-related hospitalizations, within 8 hours.

Under UK Management of Health and Safety at Work Regulations, as an employer, you must manage any health and safety risks before people can work alone. This applies to anyone contracted to work for you, including self-employed people. Lone workers are those who work by themselves without close or direct supervision, there will always be greater risks for lone workers without direct supervision or anyone to help them if things go wrong.

An excellent guidance document is freely available on the UK HSE web site - INDG 73 Protecting Lone Workers



نیوم NEOM

**NEOM OCCUPATIONAL HEALTH and SAFETY  
NEOM MINIMUM STANDARD  
for  
SPRAY FINISHING**

NEOM-NLF-NMS-006.037 Rev 02.00 – February 2022

©NEOM [2021]. All rights reserved.

## Document History

Revision code	Description of changes	Purpose of issue	Date
Rev 00.00	First Issue	Issued for Implementation	27/07-2020
Rev 02,00	Sector Review	Issued for Implementation	01-02-2022

## Document Approval

	Prepared by	Reviewed by	Approved by
Name	Robert Murphy	Talal Al Anazi	Adel Al Wuhaib
Job Title	Loss Prevention Specialist LP/FS -Public Safety	Director, Loss Prevention/Fire Safety (LP/FS) Public Safety	Executive Director Public Safety



## Contents

<b>1</b>	<b>PURPOSE .....</b>	<b>4</b>
<b>2</b>	<b>SCOPE .....</b>	<b>4</b>
<b>3</b>	<b>EXPECTATIONS.....</b>	<b>4</b>
<b>4</b>	<b>LIST OF DEFINITIONS .....</b>	<b>5</b>
<b>5</b>	<b>LIST OF ABBREVIATIONS .....</b>	<b>6</b>
<b>6</b>	<b>RELATED NEOM DOCUMENTS.....</b>	<b>6</b>
<b>7</b>	<b>ROLES AND RESPONSIBILITIES .....</b>	<b>7</b>
7.1	Client .....	7
7.2	Contractor .....	8
7.3	Employee .....	8
7.4	Specific Responsibilities .....	9
<b>8</b>	<b>OTHER SECTIONS RELATED TO SUBJECT.....</b>	<b>10</b>
8.1	Responsibilities of Employer .....	10
8.2	Training and Competency .....	10
8.3	Safety Requirements.....	11
8.4	Paint Booths / Spray Finishing Booths .....	11
8.5	Spray Finishing Operations outside a Booth .....	12
8.6	Spray Finishing Operations in a Workroom .....	13
8.7	Spray Finishing in Confined Space.....	13
8.8	Mixing and Pouring .....	14
8.9	Atmospheric Monitoring / Air Sampling .....	14
8.10	Storage and Labelling of Spray Finishing Materials.....	15
8.11	Maintenance and Cleaning .....	15
8.12	Occupational Health.....	15
8.13	Emergency Response .....	16
<b>9</b>	<b>APPENDICES .....</b>	<b>17</b>
9.1	Appendix A: Forms, Signs and Checklists .....	17
9.2	Appendix B: Audit Criteria.....	18
9.3	Appendix C: Guidance Information.....	20

## List of Tables

Table 1 : Table of Definitions .....	5
Table 2 : Hazardous Zones.....	6
Table 3 : Abbreviations .....	6
Table 4 : Related NEOM Documents .....	6

## **1 Purpose**

This NEOM Co. SMS Minimum Standards (hereafter referred to as NMS) relates to the management of all occupational health, safety (OHS) risks associated with Spray Finishing.

It provides guidance to support compliance with industry best practice and international regulatory safety requirements to ensure that the associated risks are assessed, and control measures are implemented in accordance with the hierarchy of risk controls.

It has been developed to align with the requirements of the ISO 45001 Health and Safety Management Manual (Refer NEOM-NLF-PRC-006- Section 2 ISO 14001 Cross reference table)

## **2 Scope**

This NMS applies to all personnel within NEOM and any Contractors working for NEOM and or associated projects and activities. It is designed to incorporate requirements set by the NEOM-SMS.

It sets the requirements for spray finishing operations which includes spray painting.

## **3 Expectations**

To ensure the health and safety of all personnel, protection of assets (services, plant/equipment) and the environment

NEOM expect each Sector, Organization, Department or Contractor to ensure that risks associated with the work are controlled in accordance with the hierarchy of risk controls: elimination, substitution, engineering controls, administrative controls, and personal protective equipment.

Consideration shall be given to technological advances that may introduce new means of controlling or eliminating the risks associated with this work.

That the expectation for safety compliance is meeting and exceeding all applicable OSHA Laws, Regulations, and Industry Best Practice.

Applicable requirements and standards include:

- (a) OSHA Standards and Regulatory requirements;
- (b) ANSI requirements;
- (c) NFPA Standards and requirements;
- (d) NEOM Minimum Standards
- (e) Saudi Building Codes
- (f) International Building Codes

*If requirements of this document conflict with requirements set by another regulatory authority, Contractor are required to follow the more stringent requirement.*

## 4 List of Definitions

Table 1 : Table of Definitions

Terms	Definitions
NEOM Co	NEOM Company
Client	NEOM Sector /Department responsible for management and oversight of the Contractor
Contractor	The organisation contracted to carry out the works
Employer	The person or organization that employs personnel to complete the work
Absolute Pressure:	Based on a zero-pressure reference point, the perfect vacuum. Measured from this point, standard atmospheric pressure at sea level is 14.7 pounds per square inch (psi) or 101.325 kilo Pascal's (kPa).
Airless spraying:	A method by which pressure is applied directly to the paint, which is forced out of a nozzle.
Atmospheric monitoring	The sampling of workplace atmospheres to obtain an estimate of inhalation exposure to hazardous substances. Monitoring indicates whether the recommended exposure standards are being exceeded or approached.
Electrostatic spray-guns:	Spray guns which have electrically charged nozzles which transfer the electric charge to droplets of paint
Hazardous Area:	An area where flammable or explosive gas or vapour-air mixtures are, or may be expected to be, present in quantities which require special precautions to be taken against the risk of ignition
Lower explosive limit (LEL)	The lower level a combustible gas being the smallest amount of the gas that supports a self-propagating flame when mixed with air (or oxygen) and ignited.
Spray finishing / painting	Refers to the process by which a liquid coating substance, such as paint, is converted into a mist or aerosol in order to apply a coating onto an object or surface.
Sector, Organization, Department or Contractor	The Sector, Organization, Department or Contractor is the NEOM entity or developer designated by NEOM to accept custody for planning, designing, constructing, or managing and operating a particular asset or a group of assets
Safety Management System (SMS)	Occupational Health and Safety Management System established by NEOM in compliance to ISO 45001 Standard

**NOTE 1:** There are three classes of hazardous area or zone: zone 0, zone 1 and zone 2.

A zone is an area around a process or activity where a flammable atmosphere may be present. The definitions of the three hazardous zones are given in Table 2 below.

It is advisable to exclude electrical equipment from the spray area. Any electrical equipment that has to be inside the spray area shall be designed and constructed for use in a zone 1 or zone 2 according to the hazardous area classification. All other sources of ignition shall be removed from the hazardous area.

Table 2: Hazardous Zones

Zone	Definition
Zone 0	An area in which an explosive gas mixture is continuously present or present for long periods.
Zone 1	An area in which an explosive gas mixture is reasonably foreseeable to occur in normal operation.
Zone 2	An area in which an explosive gas mixture is not reasonably foreseeable to occur in normal operation, and, if it does occur, is reasonably foreseeable to do so only infrequently and will exist for a short period only.

**NOTE 2:** In the Spray-Painting Process air is driven across the mouth of a small outlet under such pressure as to draw the paint out of its container and produce an air-paint mist from the jet of the spray-gun.

Another method is the paint may be fed under pressure to the gun.  
Spray painting may be carried out by hand or automatically.

## 5 List of Abbreviations

Table 3 : Table of Abbreviations

Abbreviations	Descriptions
SMS	Safety Management System
NMS	NEOM Minimum Standard
SOP	Standard Operating Procedure
ANSI	American National Standards Institute
NFPA	National Fire Prevention Association
CPP	Construction Phase Plan
OSHA	Occupational Safety and Health Administration.
PPE	Personal Protective Equipment
LEL	Lower Explosive Level
IBC	International Building Codes
OHS	Occupational Health and Safety
COSHH	Control of Substances Hazardous to Health

## 6 Related NEOM Documents

Table 4 : Related NEOM Documents

Document Code	Document Name
NEOM Element 2	Risk and Opportunity Management
NEOM-Element 3	Control of Documented Information & Legal Compliance
NEOM-Element 5	Training, Awareness and Competency.
NEOM-Element 6	Contractor Management
NEOM Element 9	Emergency Planning and Response Management
NEOM-SMS	Neom Safety Management System
NEOM-NLF-SM	Safety Manual - Roles and Responsibilities
NEOM-NLF-PRC-006- Section 2	ISO 14001 Cross Reference Table
NEOM-NLF-PRC-006;	Occupation safety health and Fire Safety requirements for Contractors
NEOM-NLF-NMS-006.001	SMS Organisation, Practitioner Registration and Appointment of Contractor
NEOM-NLF-NMS-006.002	Safety Construction Management Plan
NEOM NLF-NMS-006.04	Permit to Work Systems.
NEOM-NLF-NMS-006.012 –	Barricading of Hazards
NEOM-NLF-NMS-006.013	Safety Signage and Signals

Document Code	Document Name
NEOM-NLF-NMS-006.018	Local Exhaust Ventilation
NEOM NLF-NMS-006.-020	Hazardous Materials (COSHH)
NEOM-NLF-NMS-006.021	Personal Protective Equipment (PPE)
NEOM-NLF-NMS-006.024	Occupational Health Screening and Medical Surveillance
NEOM-NLF-NMS-006.027	Compressed Gases and Air
NEOM-NLF-NMS-006.028	Lock-Out Tag-Out
NEOM-NLF-NMS-006.029	First Aid and Medical Treatment
NEOM-NLF-NMS-006.038	Confined Spaces
NEOM-NLF-NMS-006.040	General Workplace Amenities
NEOM-NLF-NMS-006.047	Respiratory Protection

## 7 Roles and Responsibilities

### 7.1 Client

- 7.1.1 General Health and Safety roles and responsibilities are defined in; and shall be carried out in accordance with the requirements of NEOM-NLF-SM–Safety Management Manual - Roles and Responsibilities.
- 7.1.2 The Client is responsible for ensuring that NEOM Safety Commitment Statement and safety management system are properly applied within their areas of control/responsibility. Effective implementation will ensure compliance with relevant legislative requirements and will help promote the use of industry best safe working practices.
- 7.1.3 That a suitable, Pre-Tender Health and Safety Plan has been developed and issued to Contractors to ensure they have all the information necessary to make informed decisions when developing the Construction Phase Health and Safety Plan (NEOM-NLF-NMS-006.002 Safety Construction Management Plan) (CPP) which will form part of the Contractor review and selection process
- 7.1.4 That the selection of Contractors shall be undertaken in accordance with NEOM's policies and procedures (NEOM-Element 6-Contractor Management). To ensure that only Competent organisations capable of meeting the requisite safety standards associated with project are contracted.
- 7.1.5 Conduct regular Contractor safety assurance reviews to provide the confidence level required that the safety management system is delivering as planned, and consistently achieves the acceptable level of safety. Including:
  - (a) Safety performance monitoring and measuring;
  - (b) Managing change;
  - (c) Continuous improvement.

## **7.2 Contractor**

- 7.2.1 Contractor shall undertake their roles and responsibilities in accordance with the general requirements of NEOM-NLF-SM—Safety Management Manual-Roles and Responsibilities
- 7.2.2 Maintaining control of access to dangerous or high-risk areas or equipment using suitable barricades that are in serviceable condition (Refer: NEOM-NLF-NMS-006.012 – Barricading of Hazards)
- 7.2.3 That all work activities are assessed, planned, organized, and that suitably competent Supervision is available to implement the safety requirements and oversee the work (Refer: NEOM- Element 5 – Training, Awareness and Competency)
- 7.2.4 Ensure persons appointed to manage /oversee work operations have the skills, knowledge, experience and, where relevant, the organisational capability to plan and manage work safely and without risk to those who may be affected by the activities (Refer: NEOM Element 5 Training, Awareness, and Competence).
- 7.2.5 Ensure employees carrying out the work are trained to recognize the associated hazards and understand the processes and procedures to control or minimize the risks.(Refer: NEOM Element 2 Risk and Opportunity Management)
- 7.2.6 That all equipment including personal protective equipment required for use is fit for purpose, and (as required) has been inspected by a competent person and inspection records are maintained and readily available.(Refer: NEOM-NLF-NMS-006.021 Personal Protective Equipment) (PPE)
- 7.2.7 Contractor shall undertake their specific roles and responsibilities in accordance with the following:
  - (a) A risk assessment shall be carried out in accordance with NEOM-Element 2 Risk and Opportunity Management to identify areas where control measures and safe work practices are required to reduce employee's exposures to hazards associated with spray finishing operations and hazards materials/chemicals.
  - (b) That risks are controlled in accordance with the hierarchy of risk controls, and that suitable control measures are implemented
  - (c) Protective equipment or other control measures shall be used to keep the exposure of employees to hazards associated with spray finishing and hazardous materials/chemicals within acceptable levels. (Refer: NEOM-NLF-NMS-006.021 Personal Protective Equipment)
  - (d) Develop an inspection, testing and preventative maintenance plan to ensure spray finishing systems are safe, working efficiently according to manufacturer's specifications and applicable legal requirements.
  - (e) Ensure maintenance is performed on spray finishing systems as per the preventative maintenance plan.
  - (f) Ensure spray finishing systems are tested and inspected regularly (at a minimum annually) to ensure the system work in accordance with manufacturer's specifications and other applicable requirements.
  - (g) Monitor spray finishing operations to ensure employees are using equipment, safety devices and personal protective equipment appropriately.
  - (h) Ensure personnel involved in spray finishing are regularly and as a minimum, annually medically screened. (Refer NEOM-NLF-NMS-006.024 Occupational Health Screening and Medical Surveillance)

## **7.3 Employee**

DOCUMENT CODE : NEOM-NLF-NMS-006.037	REVISION CODE: 02.00	PAGE 8 OF 20
--------------------------------------	----------------------	--------------

- 7.3.1 Shall undertake their roles and responsibilities in accordance with the general requirements of NEOM-NLF-SM – Safety Management Manual - Roles and Responsibilities.
- 7.3.2 Report any activity or defect relating to the work which they believe is reasonably foreseeable to endanger their safety or that of another person's.
- 7.3.3 Shall use appropriate equipment or safety devices provided for the work by the Contractor in accordance with any training or instruction received in the use of the work equipment. (Refer NEOM-NFL-NMS-006.021 Personal Protective Equipment)
- 7.3.4 Shall undertake their specific roles and responsibilities in accordance with the following:
  - (a) Comply with safe work practices and standard operating procedures.
  - (b) Use appropriate equipment or safety devices provided by the employer in accordance with any training or instruction received in the use of the work equipment or device concerned. (Refer: NEOM-NLF-NMS-006.021 Personal Protective Equipment)
  - (c) Shall not perform any task until they have received the required training and it is documented. (Refer: NEOM Element 5 Training, Awareness and Competence)
  - (d) Shall not operate any piece of equipment that they are not familiar with, competent to operate and/or appropriately trained on its use.

#### **7.4 Specific Responsibilities**

- 7.4.1 Sector, Organization, Department or Contractor Head is responsible in ensuring that provisions are made the safe systems of work to prevent and minimize risks in each workplace
- 7.4.2 Safety Practitioner/Coordinator is responsible to monitor the implementation of this procedures and document its effectiveness
- 7.4.3 The Responsible Person will support this procedure and ensure that any Contractor Organization working for, or on behalf of, the Sector, Organization, Department or Contractor will comply with the requirements of these procedures
- 7.4.4 Line Managers / Supervisors are responsible for training their workers in risks
- 7.4.5 The LP & FS Public Safety department will support the NEOM risk assessments by carrying out compliance checks and supporting and guiding the various safety teams.

## **8 Other Sections related to subject**

### **8.1 Responsibilities of Employer**

8.1.1 Responsibilities of the Employer referred to in this document relate to Sector, Organization, Department and / or Contractor depending on who has direct control over the work activities

### **8.2 Training and Competency**

8.2.1 Employers shall ensure that training complies with the requirements of:

8.2.2 NEOM Element 5– Training, Awareness and Competency.

8.2.3 NEOM-NLF-NMS-006.001 – SMS Organisation, Practitioner Registration and Appointment of Contractor.

8.2.4 Employers shall ensure all relevant employees and contractors that perform tasks that spray finishing operations are trained, but not limited to:

- (a) Physical hazards associated with spray finishing operations.
- (b) Design specification, capabilities and limitations of spray finishing systems and their uses at the work site.
- (c) Methods and procedures that will prevent exposure to hazards associated with spray finishing operations.
- (d) Safe storage and handling procedures.
- (e) Safe work practices.
- (f) Required use, maintenance, and storage of PPE.
- (g) Emergency response procedures.
- (h) Health hazards associated with chemical used in spray finishing at the work site.
- (i) Signs and symptoms of exposure to spray finishes used at the work site; and
- (j) Operator maintenance requirements spray finishing systems.

8.2.5 Ensure managers and supervisors of spray finishing operations shall be trained on:

- (a) Requirements listed in Section 8.1.4.
- (b) Maintenance requirements of spray finishing system to ensure they are working appropriately and within specifications.
- (c) How to recognize unsafe work practices when performing spray finishing operations; and
- (d) How to identify when spray finishing systems are not working appropriately.

8.2.6 After an employee receives training on spray finishing operations, a competent person shall evaluate the employee performing spray finishing operations to ensure they have understood the training and are following safe work practices.

8.2.7 All training shall be conducted prior to an employee performing any spray finishing operations and annually thereafter. Retraining shall also be conducted if an employee is not following safe work practices.

### **8.3 Safety Requirements**

- 8.3.1 When performing risk assessments in accordance with NEOM Element 2 Risk and Opportunity Management, as a minimum, the following shall be considered:
- (a) The chemicals used in the spray finishing operation and their impact on the health of employee(s) and any impact they may have on the environment.
  - (b) The condition of the spray finishing equipment being used (compressors, hoses, couplings etc.) And if they are rated by an appropriate international standard for their intended use.
  - (c) The type, frequency, and duration of spray finishing operations.
  - (d) The environment in which the spray finishing operations is to be undertaken.
  - (e) The level of experience of the personnel involved in the work; and
  - (f) Other identified hazards associated with the work.
- 8.3.2 When using compressed gas systems, including pressurized air, as part of the spray finishing system, the requirements of NEOM-NLF-NMS-006.027 Compressed Gases and Air shall be complied with.
- 8.3.3 All spray finishing operations shall be performed in spray booths that meet the requirements of this NMS except when:
- (a) Where, by reason of its shape, size or weight, an article cannot readily be moved or cannot fit into a booth and must be sprayed where it has been assembled, e.g., Boilers, structural steel fabrications, ships, boats, aircraft.
  - (b) For infrequent spraying of heavy or bulky equipment;
  - (c) For minor operations such as spotting or touching up.
- 8.3.4 For spray finishing operations that cannot be performed inside a booth, a risk assessment shall be performed for the operation and alternative control measures are implemented to limit employee exposure to the lowest level feasible.

### **8.4 Paint Booths / Spray Finishing Booths**

- 8.4.1 Booths shall provide a continuous, uniform and evenly distributed supply of air flow throughout the spray-painting area to the exhaust outlets. There shall be no pockets of still air in the booth. (Refer: NEOM-NLF-NMS-006.018 Local Exhaust Ventilation)
- 8.4.2 The source of air supply shall be located in an appropriate area to ensure a clean and uncontaminated primary source.
- 8.4.3 Employees (e.g., spray painters) shall not be positioned between the spray gun and the ventilation exhaust duct.
- 8.4.4 Booths shall maintain an internal negative pressure during operation to prevent leakage of contaminants into surrounding work areas. Booths shall be equipped with a negative pressure gauge.
- 8.4.5 Booths shall be equipped with a gauge or alarm to indicate if airflow drops below the minimum set air flow rate to capture contaminants.
- 8.4.6 Booth ventilation system shall remain on for five (5) minutes after completing spraying operations to purge the chamber.
- 8.4.7 Booths shall provide a level of air velocity at any point within the booth that complies with the following requirements:
- (a) Minimum air velocity for downdraft booths and cross-draft booths where drafts from outside the booth is equal to or less than 0.2 meters per second: 0.5 meters per second.

- (b) Minimum air velocity for downdraft booths and cross-draft booths where drafts from outside the booth is more than 0.2 meters per second: 0.8 meters per second; and
- (c) Minimum air velocity for electrostatic spray painting and spray finishing without operator: 0.4 meters per second.

## 8.5 Spray Finishing Operations outside a Booth

- 8.5.1 Where it is not reasonably practicable to do the spray finishing in a booth and it is carried out in a building or structure other than a confined space, the building or structure shall be of open construction, or a mechanical exhaust system shall be used to prevent the build-up of flammable or toxic fumes. (Refer: NEOM-NLF-NMS-006.018 Local Exhaust Ventilation)
- 8.5.2 Appropriate control measures shall be implemented to protect the spray finisher, other employees or persons in the vicinity, and the environment, from hazards associated with spray finishing operations. A spray finishing exclusion zone, with restrictions on entry, shall be designated around the area where the spray finishing is being carried out. An exclusion zone in itself will not provide appropriate protection and shall be used in conjunction with other appropriate control measures.
- 8.5.3 All spray finishing operations shall be conducted in an isolated location, “exclusion zone.” A spray finishing process is not effectively isolated from other operations if paint from the spray finishing operation can be inhaled by any persons engaged in work near the area. Neither is it effectively isolated from plant, machinery, or equipment if there is danger of the plant being ignited by a source of ignition associated with the plant, machinery, or equipment.
- 8.5.4 The exclusion zone shall be at least 6 metres horizontal and 2 metres vertical clearance above and below the place where the spray finish is being applied; however, in determining the size of the exclusion zone, the following factors shall be considered:
  - (a) The nature of the substance being sprayed.
  - (b) The work environment, including wind speed, ambient temperature and humidity.
  - (c) Fire and explosion hazards.
  - (d) The location and physical conditions of the site; and
  - (e) Whether other people are reasonably foreseeable to be in the vicinity. Relocation of employees not involved in spray finishing activities to other parts of the workplace may be necessary.
- 8.5.5 Greater vertical clearance may be required when spray finishing in stairwells and other areas which allow vertical movement of vapours.
- 8.5.6 Once a spray finishing exclusion zone has been established, a number of procedures shall be implemented to control risks. These include:
  - (a) Physical barriers and warning signs to prevent unprotected persons from entering the exclusion zone.
  - (b) Shrouding of the area where spraying is to occur.
  - (c) Restricted entry of unprotected persons into the exclusion zone for a time period that ensures airborne concentrations of hazardous substances have reduced to below the relevant exposure standards.
  - (d) Removal of hazardous substances that are not immediately needed for spray finishing work, to reduce unnecessary exposure and fire or explosion risks.
  - (e) Removal of stored wastes such as solvent-soaked rags and waste paint from within the exclusion zone to control fire or explosion risks.

- (f) Removal of electrical and ignition sources, including smoking, from within the exclusion zone to control fire and explosion risks.
  - (g) Restriction of spraying when wind speed is greater than 15 kilometres per hour; and
  - (h) Restriction of spraying within 50 meters of the boundary to adjacent premises or a greater separation where car parks and other sensitive property is located.
- 8.5.7 Consideration shall be given to ensure spray drift in walkways, public areas and air conditioning intake vents is controlled. Persons other than the spray painter shall not enter the exclusion zone during a spray-painting operation unless equivalent personal protective equipment is worn. A sign stating “SPRAY PAINTING AREA - AUTHORISED PERSONNEL ONLY” shall be prominently displayed at the exclusion zone. (Refer: NEOM-NLF-NMS-006.013 Safety Signage and Signals)
- 8.5.8 Where spray finishing using two-pack paints containing isocyanates is carried out in the open air, all persons within 15 meters of the spraying operation shall wear respiratory protection. (Refer: NEOM-NLF-NMS-006.047 Respiratory Protection)

## **8.6 Spray Finishing Operations in a Workroom**

- 8.6.1 When it is not reasonably practicable to use a booth to contain the spraying operation, for example when spraying large items of steelwork or equipment. In this case, spraying may be carried out in a workroom provided appropriate control measures are implemented.
- 8.6.2 If the room to be used for spraying is within a building, there shall be half-hour fire separation between the spray room and the rest of the building. If the spray area is part of a larger room (for example, a hangar), employers shall divide the room with fire-resistant curtains to define the spraying area and provide fire protection. (Refer: NEOM Element 9 Emergency Planning and Response Management)
- 8.6.3 Before spraying, all potential sources of ignition shall be removed. Unprotected electrical equipment shall be removed or isolated. If there has to be any electrical equipment in the spray room, a risk assessment and hazardous area classification shall be carried out to decide the level of protection required. (Refer: NEOM-NLF-NMS-006.028 Lock-Out Tag-Out)
- 8.6.4 Employers shall conduct continuous atmospheric monitoring / air sampling to ensure compliance to permissible LEL.
- 8.6.5 Ventilation shall be provided to maintain the concentration below 25% at any point of time (occasional peaks) and shall be maintained below 10% of the LEL on a continuous monitoring basis.
- 8.6.6 Monitoring using an explosimeter is required.
- 8.6.7 The use of a spray system, that reduces the quantity of solvent used and the overspray produced, is recommended.
- 8.6.8 Care shall be taken to ensure that the ventilation system is effective at low level and anywhere vapours could accumulate. (Refer: NEOM-NLF-NMS-006.018 Local Exhaust Ventilation)
- 8.6.9 Applicable controls listed in other relevant sections of this document shall be followed.

## **8.7 Spray Finishing in Confined Space**

- 8.7.1 Spray finishing operations that are conducted in confined spaces shall be performed in accordance with the requirements of NEOM-NLF-NMS-006.038 Confined Spaces and NEOM NLF-NMS-006.04 Permit to Work Systems.

- 8.7.2 Employers shall consider if it is reasonably practicable that a flammable liquid is be ignited at a temperature lower than the stated flash point when the paint is atomized. Ignition sources identified as a part of risk assessment shall be eliminated prior to the commencement of spraying.
- 8.7.3 Sources of ignition inside the confined space shall be prohibited and any lighting used shall be protected to a standard appropriate for flammable and explosive atmospheres.
- 8.7.4 Any unprotected equipment used, such as fan motors, compressors, switches, and alarms shall be sited in safe areas outside the confined space where they cannot be exposed to flammable concentrations of vapour. (Refer NEOM-NLF-NMS-006.004 Permit to Work Systems)
- 8.7.5 Employers shall ensure ventilation within the confined space until the coating is dry and there is no further risk of a flammable atmosphere. (Refer: NEOM-NLF-NMS-006.018 Local Exhaust Ventilation).

## **8.8 Mixing and Pouring**

- 8.8.1 During any mixing and pouring of spray finishing materials, the employer shall ensure:
  - (a) Appropriate ventilation is maintained.
  - (b) All containers are appropriate, grounded, bonded, and labelled.
  - (c) Safety Data Sheets are available.
  - (d) Appropriate protective equipment is worn (refer to the relevant SDS).
  - (e) Mixing and pouring shall be conducted by mechanical means were reasonably practicable.
  - (f) Appropriate spill kits and equipment are available, and spills are cleaned up immediately.
- 8.8.2 If spray painting substances are splashed on clothing or the body, the contaminated clothing shall be immediately removed, and the skin thoroughly cleaned with soap and water.
- 8.8.3 Solvents and thinners used to clean work areas shall not be used to clean employee's skin.
- 8.8.4 Unused or surplus liquid shall be returned to the container designated for that liquid.

## **8.9 Atmospheric Monitoring / Air Sampling**

- 8.9.1 When hazardous materials are used for spray finishing, the work atmosphere shall be monitored though air sampling to assess the employee exposures.
  - (a) If air sampling results exceed the permissible exposure limits, then controls shall be implemented to reduce / prevent employee exposures.
- 8.9.2 If monitoring results indicate that control measures are required to reduce / prevent employee exposures, air sampling shall be used to assess the effectiveness of the control measures.
- 8.9.3 Air sampling records shall be maintained that include:
  - (a) Who performed the sampling?
  - (b) Procedures used for air sampling.
  - (c) Location of air sampling.
  - (d) Date and time of sampling.
  - (e) Serial number of equipment used for sampling.
  - (f) Calibration data for sampling equipment.
  - (g) Analytical methods used for sampling.
  - (h) Laboratory used to analysis of samples.

- (i) Laboratory certifications.
- (j) Chain of custody for the samples.
- (k) Sampling results; and
- (l) Report of findings and corrective actions.

## **8.10 Storage and Labelling of Spray Finishing Materials**

- 8.10.1 Materials shall be labelled, handled, stored, and segregated as per the manufacturer's requirements and NEOM NLF-NMS-006.-020 Hazardous Materials (COSHH)
- 8.10.2 Labels shall be securely attached to containers so that they cannot be inadvertently or accidentally detached during use, transport, and storage.

## **8.11 Maintenance and Cleaning**

- 8.11.1 When spray finishing equipment is in use, it shall be cleaned daily or at the end of each shift.
- 8.11.2 A maintenance program shall be developed that ensures equipment is working appropriately and provides early detection of any defect in control measures that could result in a reduced level of protection.
- 8.11.3 Spray finishing equipment shall be inspected prior to use on each shift. Examination of the equipment shall include:
  - (a) Visual inspection of equipment looking for worn equipment, damaged equipment, integrity of joints / connections / hoses and any leaks.
  - (b) Personal protective equipment shall be inspected to ensure it is clean and is not damaged.
  - (c) If a local exhaust ventilation system is used, it shall be inspected to ensure it is working appropriately and filters are in good condition.
- 8.11.4 Service records shall be maintained that include:
  - (a) Equipment and control measures which require servicing.
  - (b) Nature of the servicing needed.
  - (c) Frequency of the servicing.
  - (d) Name of the person responsible for the servicing;?
  - (e) Documentation of defects and how they were corrected; and
  - (f) Performance testing and evaluation.

## **8.12 Occupational Health**

- 8.12.1 Employees shall not be allowed to eat, drink, or smoke in the vicinity of spray finishing operations. No open containers of food or drink shall be stored within or close to spray finishing operations where contaminants could enter the open container.
- 8.12.2 Changing rooms and showers shall be provided at the worksite for employees working in spray finishing operations, as per the requirements of NEOM-NLF-NMS-006.040 General Workplace Amenities.

- 8.12.3 Employers shall have a first Aid facilities program in compliance with NEOM-NLF-NMS-006-029 First Aid and Medical Treatment.
- 8.12.4 Employers shall have a medical surveillance program in compliance with NEOM-NLF-NMS-006.024– Occupational Health Screening and Medical Surveillance

### **8.13 Emergency Response**

- 8.13.1 Emergency Response procedures meeting the requirements of NEOM Element 9 Emergency Planning & Response Management shall be developed for all spray finishing operations. Requirements for emergencies involving spray finishing operations, as a minimum, include;
  - (a) Medical emergencies,
  - (b) Chemical spills, leaks,
  - (c) Fire, explosions etc.
- 8.13.2 First aid procedures in accordance with NEOM-NLF-NMS--006.029 First Aid and Medical Treatment shall be developed.

## 9 Appendices

### 9.1 Appendix A: Forms, Signs and Checklists



## 9.2 Appendix B: Audit Criteria

Audit Criteria		Requirements	Verification	Area of Concern
ISO 45001:2018 Clause	NMS Ref.			Yes/ No
5.3	7.1.2	NEOM health and safety policy and safety management system are properly applied within their areas of control/responsibility		
6.1	7.1.3	Pre-Tender Health and Safety Plan has been developed and issued to Contractor		
5.3, 8.1.4.2	7.1.4	Selection of Contractors undertaken in accordance with NEOM's policies and procedures		
6.1.2.2		Assessment of the various risks shall be undertaken		
9.0	7.1.5	Conduct regular safety and welfare assurance reviews to provide the confidence level		
7.2	7.2.4 (b, c)	Persons appointed to manage /oversee work operations have the skills, knowledge, experience		
	8.2.4	Employees and contractors that perform tasks that spray finishing operations are trained		
8.1.2 (e)	7.2.4 (d)	Personal protective equipment required for use are fit for purpose		
8.1.2 (c, d)	7.2.2 (e)	Control of access to dangerous or high-risk areas or equipment using suitable Barricades and Signage		
6.1.2.3, 8.1.2	7.2.5,	A thorough and comprehensive hazard identification and risk assessment of Road Safety Operations		
	7.2.7	Hazards Identification Plan (HIP)		
6.1.4	8.3	Spray finishing operations shall meet the requirements of the NMS;		
	8.4	a) Paint Booths / Spray Finishing Booths		
	8.5	b) Spray Finishing Operations outside a Booth		
	8.6	c) Spray Finishing Operations in a Workroom		
	8.7	d) Spray Finishing in Confined Space		
	8.8	e) Mixing and Pouring		
8.1.2	8.9	When hazardous materials are used for spray finishing, the work atmosphere shall be monitored through air sampling to assess the employee exposures		
		Air sampling records shall be maintained		
	8.10	Materials shall be labelled, handled, stored, and segregated as per the manufacturer's requirements and NMS-006.-020 Hazardous Materials (COSHH)		

Audit Criteria		Requirements	Verification	Area of Concern
ISO 45001:2018 Clause	NMS Ref.			Yes/ No
	8.11	Maintenance & Cleaning program for spray finishing equipment shall be in place		
8.2	8.13	Emergency Planning & Response Management shall be developed for all spray finishing operations		

### **9.3 Appendix C: Guidance Information**

Spray painting has many advantages over brush painting. If you are painting your car, spray painting will result in a smooth surface without the brush strokes left by a paintbrush. For large jobs, such as ships, buildings, or houses, it is as much about saving time as it is about how the finished product looks. However, spray painting presents special health and safety hazards. Vaporized paint and fumes can cause organ damage. Some paints are highly flammable. Paint can irritate your skin and cause damage to your eyes.

Paint fumes and vaporized paint can cause serious health problems. Some types of paint, such as lacquer and oil-based paints, can cause damage to the brain, liver, kidneys, and other organs. Oil-based paint exposure can cause oil-based paint poisoning, with symptoms as mild as itchiness or as severe as coma and death. Prolonged exposure to the skin or eyes can cause serious problems. In addition to the physical health issues, some types of paint are extremely volatile and cause fires or explosions.

To minimize these risks, the Occupational Safety and Health Administration has created workplace regulations governing spray painting.

OSHA regulates workplace safety. They have instituted regulations that allow workers to engage more safely in what can be a dangerous process. In OSHA 29 CFR 1917.153 - Spray painting (See also 1917.2, definition of Hazardous cargo, materials, substance, or atmosphere). The employer is responsible for ensuring that all workers know about personal protective equipment (PPE) and how to use it, wear it or put it on properly. The employees must know when they should use PPE and the limitations of the equipment. The employer must provide any special PPE. This includes eye and face protection that meets certain standards. To prevent the inhalation of toxic fumes and paint dust, the employer must provide workers with appropriate respirators. The employer is responsible for regular safety checks of all breathing equipment and must offer workers free periodic medical evaluations. Protective breathing gear must fit tightly against the skin. Facial hair and eyeglasses may not interfere with this. Electrical equipment is not permitted in areas with flammable vapors, except wiring with no open splices, breaks or fittings. Wiring and electrical equipment not exposed to explosive fumes must be rated explosion-proof. Electric motors that power the exhaust system must be outside the spray area.

In the UK Sparay Painting is governed by risk assessment and control mainly under the COSHH regulations. One of the best pieces of advice from UK HSE is to follow the model;

**Assess** - You cannot properly control construction health risks without first having clear plans:

**Plan** - your overall strategy - Identify - the health hazards linked to your work

**Assess** - the significance of these hazards

**Involve** - workers in managing health risks --- Remember - 'Manage risk not lifestyles'

**Control** - Clear plans are no good if you do not act on them:

**Prevent** - risks before work starts

**Control** - any remaining risk

**Train** – workers ---- Remember - 'Ill-health can be prevented'

**Supervise** - workers

**Maintain** - controls

**Monitor** - controls to ensure they are effective

**Act** - to put any problems right ---- Remember - 'Control the risks not the symptoms'



نیوم NEOM

**NEOM OCCUPATIONAL HEALTH and SAFETY  
NEOM MINIMUM STANDARD  
for  
CONFINED SPACE**

NEOM-NLF-NMS-006.038 Rev 02.00 – February 2022

©NEOM [2021]. All rights reserved.

## Document History

Revision code	Description of changes	Purpose of issue	Date
Rev 00.00	First Issue	Issued for Implementation	27/07-2020
Rev 02,00	SMS Update	Issued for Implementation	01-02-2022

## Document Approval

	Prepared by	Reviewed by	Approved by
Name	Robert Murphy	Talal Al Anazi	Adel Wuhaib
Job Title	Loss Prevention Specialist LP/FS -Public Safety	Director, Loss Prevention/Fire Safety (LP/FS) Public Safety	Executive Director Public Safety



## Contents

<b>1</b>	<b>PURPOSE .....</b>	<b>4</b>
<b>2</b>	<b>SCOPE .....</b>	<b>4</b>
<b>3</b>	<b>EXPECTATIONS.....</b>	<b>4</b>
<b>4</b>	<b>LIST OF DEFINITIONS .....</b>	<b>5</b>
<b>5</b>	<b>LIST OF ABBREVIATIONS .....</b>	<b>5</b>
<b>6</b>	<b>RELATED NEOM DOCUMENTS.....</b>	<b>6</b>
<b>7</b>	<b>ROLES AND RESPONSIBILITIES .....</b>	<b>6</b>
7.1	Client .....	6
7.2	Contractor.....	7
7.3	Employee.....	8
<b>8</b>	<b>OTHER SECTIONS RELATED TO SUBJECT.....</b>	<b>8</b>
8.1	Definition of a Confined Space .....	8
8.2	Training and Competency .....	9
8.3	Planning and Assessment.....	10
8.4	Identification of Confined Spaces .....	10
8.5	Avoid entering Confined Spaces .....	11
8.6	The Confined Space program shall include, as a minimum, the following items:.....	11
8.7	Risk Assessment.....	11
8.8	Confined Space Entry Permit / Permit to Work .....	12
8.9	Safe Working Procedure .....	13
8.10	Emergency Procedures .....	13
<b>9</b>	<b>APPENDICES .....</b>	<b>15</b>
9.1	Appendix A: Signs .....	15
9.2	Appendix B: Audit Criteria .....	16
9.3	Appendix C: Guidance Information.....	17

## List of Tables

Table 1 : Table of Definitions .....	5
Table 2 : Table of Abbreviations .....	5
Table 3 : Related NEOM Documents .....	6

## **1 Purpose**

This NEOM Co. SMS Minimum Standards (hereafter referred to as NMS) relates to the management of all occupational health, safety (OHS) risks associated with Confined Spaces.

It provides guidance to support compliance with industry best practice and international regulatory safety requirements to ensure that the associated risks are assessed, and control measures are implemented in accordance with the hierarchy of risk controls.

It has been developed to align with the requirements of the ISO 45001 Health and Safety Management Manual (Refer NEOM-NLF-PRC-006- Section 2 ISO 14001 Cross reference audit table)

## **2 Scope**

This NMS applies to all personnel within NEOM and any Contractors working for NEOM and or associated projects and activities. It is designed to incorporate requirements set by the NEOM-SMS.

## **3 Expectations**

To ensure the health and safety of all personnel, protection of assets (services, plant/equipment) and the environment

NEOM expect each Sector, Organization, Department or Contractor to ensure that risks associated with the work are controlled in accordance with the hierarchy of risk controls: elimination, substitution, engineering controls, administrative controls, and personal protective equipment.

Consideration shall be given to technological advances that may introduce new means of controlling or eliminating the risks associated with work activities.

That the expectation for safety compliance is meeting and exceeding all applicable OSHA Laws, Regulations, and Industry Best Practice.

Applicable requirements and standards include:

- (a) OSHA Standards and Regulatory requirements;
- (b) ANSI requirements;
- (c) NFPA Standards and requirements;
- (d) NEOM Minimum Standards
- (e) Saudi Building Codes
- (f) International Building Codes

*If requirements of this document conflict with requirements set by another regulatory authority, Contractor are required to follow the more stringent requirement.*

## 4 List of Definitions

Table 1 : Table of Definitions

Terms	Definitions
NEOM Co	NEOM Company
Client	NEOM / Department
Employer	The person or organisation that employs personnel to complete the work
Contractor	The organisation contracted to carry out the works
Safety Stand-by Person	In all situations a stand-by person/attendant must be posted outside the confined space when work is performed and must remain on duty throughout the duration of the entry, unless relieved by another person of equivalent experience and training. Capable of being in communication with and if practicable, able to observe persons working inside the confined space. Capable of initiating emergency procedures (including Rescue) The standby person may operate and monitor equipment for the safety of personnel in the confined space and monitor conditions outside the space. Golden rule: Stand-by person NEVER enters the confined Space
Safety Management System (SMS)	Occupational Health and Safety Management System established by NEOM in compliance to ISO 45001 Standard

## 5 List of Abbreviations

Table 2 : Table of Abbreviations

Abbreviations	Descriptions
SMS	Safety Management System
NMS	NEOM Minimum Standard
SOP	Standard Operating Procedure
ANSI	American National Standards Institute
NFPA	National Fire Prevention Association
PRCSP	Permit Required Confined Space Programme
OSHA	Occupational Safety and Health Administration.
CPP	Construction Phase Plan
LFL	Lower Flammable Limit
LEL	Lower Explosive Limit
PEL	Permissible Exposure Limit
TLV	Threshold Limit Value
TWA	Time-Weighted Average
PPE	Personal Protective Equipment

Abbreviations	Descriptions
IBC	International Building Codes
OHS	Occupational Health and Safety

## 6 Related NEOM Documents

Table 3 : Related NEOM Documents

Document Code	Document Name
NEOM Element 2	Risk and Opportunity Management
NEOM-Element 3	Control of Documented Information & Legal Compliance
NEOM-Element 5	Training, Awareness and Competency.
NEOM-Element 6	Contractor Management
NEOM Element 9	Emergency Planning and Response Management
NEOM-SMS	NEOM Safety Management System
NEOM-NLF-SM	Safety Manual - Roles and Responsibilities
NEOM-NLF-PRC-006- Section 2	ISO 14001 Cross Reference Table
NEOM-NLF-PRC-006;	Occupation Health Safety and Fire Safety requirements for Contractors
NEOM-NLF-NMS-006.001	SMS Organisation, Practitioner Registration and Appointment of Contractor
NEOM-NLF-NMS-006.002	Safety Construction Management Plan (CPP)
NEOM-NLF-NMS-006.004	Permit to Work Systems
NEOM-NLF-NMS-006.012	Barricading of Hazards
NEOM-NLF-NMS-006.013	Safety Signs and Signals.
NEOM-NLF-NMS-006.021	Personal Protective Equipment

## 7 Roles and Responsibilities

### 7.1 Client

- 7.1.1 General Health and Safety roles and responsibilities are defined in; and shall be carried out in accordance with the requirements of NEOM-NLF -SM – Safety Management Manual - Roles and Responsibilities.
- 7.1.2 The Client is responsible for ensuring that NEOM Safety Commitment Statement and safety management system are properly applied within their areas of control/responsibility. Effective implementation will ensure compliance with relevant legislative requirements and will help promote the use of industry best safe working practices.
- 7.1.3 That a suitable, Pre-Tender Health and Safety Plan has been developed and issued to Contractors to ensure they have all the information necessary to make informed decisions when developing the Construction Phase Health and Safety Plan (NEOM-NLF-NMS-006.002 Safety Construction Management Plan) which will form part of the Contractor review and selection process
- 7.1.4 That the selection of Contractors shall be undertaken in accordance with NEOM's policies and procedures (NEOM-Element 6 - Contractor Management). To ensure that only Competent organisations capable of meeting the requisite safety standards associated with project are contracted.
  
- 7.1.5 Conduct regular Contractor safety assurance reviews to provide the confidence level required that the safety management system is delivering as planned, and consistently achieves the acceptable level of safety. Including:
  - (a) Safety performance monitoring and measuring;
  - (b) Managing change;
  - (c) Continuous improvement.

## **7.2 Contractor**

- 7.2.1 Contractor shall undertake their roles and responsibilities in accordance with the general requirements of NEOM-NLF-SM – Safety Management Manual - Roles and Responsibilities
  - (a) That all work activities are assessed, planned, organized, and that suitably competent Supervision is available to implement the safety requirements and oversee the work
  - (b) Ensure persons appointed to manage /oversee work operations have the skills, knowledge, experience and, where relevant, the organisational capability to plan and manage work safely and without risk to those who may be affected by the activities (Refer: NEOM Element 5 Training, Awareness, and Competency)
  - (c) Ensure employees carrying out the work are trained to recognize the associated hazards and understand the processes and procedures to control or minimize the risks.
  - (d) That all equipment including personal protective equipment required for use is fit for purpose, and (as required) has been inspected by a competent person and inspection records are maintained and readily available. (Refer: NEOM-NLF-NMS-006.021 Personal Protective Equipment)(PPE)
  - (e) Maintain control of access to dangerous or high-risk areas or equipment using suitable barricades and Signage that are in serviceable condition (Refer: NEOM-NLF-NMS-006.012 – Barricading of Hazards)
- 7.2.2 Contractor shall undertake their specific roles and responsibilities in accordance with the following:
  - (a) Ensure that all activities that require persons to work within a Confined Space, are identified and recorded;
  - (b) Shall only allow entry to Confined Space when it is not reasonably practicable to achieve the purpose without such entry to the Confined Space;

- (c) Shall ensure any confined space entry is completed under a Permit to Work (Refer: NEOM-NLF-NMS-006.004 Permit to Work Systems)
- (d) Ensure that all persons required to enter a Confined Space are competent and fully aware of the Emergency Procedures/Escape Plan (Refer: NEOM-Element 5 Training, Awareness and Competence and NEOM Element 9 Emergency Planning and Response Management)

### **7.3 Employee**

- 7.3.1 Shall undertake their roles and responsibilities in accordance with the general requirements of NEOM-NLF -SM – Safety Management Manual - Roles and Responsibilities.
- 7.3.2 Report any activity or defect relating to the work which they believe is reasonably foreseeable to endanger their safety or that of another person's.
- 7.3.3 Shall use appropriate equipment or safety devices provided for the work by the Employer in accordance with any training or instruction received in the use of the work equipment. (Refer NEOM-NFL-NMS-006.021 Personal Protective Equipment)
- 7.3.4 Employees shall undertake their specific roles and responsibilities in accordance with the following:
  - (a) Never enter a Confined Space unless authorised to do so after having undertaken the requisite training and once all the relevant control measures have been identified and implemented;
  - (b) Ensure a Permit to Work has been raised and is in place prior to any Confined Space entry.

### **7.4 Specific Responsibilities**

- 7.4.1 Sector, Organization, Department or Contractor Head is responsible in ensuring that provisions are made the safe systems of work to prevent and minimize risks in each workplace
- 7.4.2 Safety Practitioner/Coordinator is responsible to monitor the implementation of this procedures and document its effectiveness
- 7.4.3 The Responsible Person will support this procedure and ensure that any Contractor Organization working for, or on behalf of, the Sector, Organization, Department or Contractor will comply with the requirements of these procedures
- 7.4.4 Line Managers / Supervisors are responsible for training their workers in risks
- 7.4.5 The LP & FS Public Safety department will support the NEOM risk assessments by carrying out compliance checks and supporting and guiding the various safety teams.

## **8 Other Sections related to subject**

### **8.1 Definition of a Confined Space**

- 8.1.1 A Confined Space is a place which is substantially enclosed (though not always entirely), and where serious injury can occur from hazardous substances or conditions within the space.
- 8.1.2 Confined Spaces are not intended or designed for occupancy and may have the following hazards:
  - (a) Restricted means for entry and exit;
  - (b) An atmosphere which contains potentially harmful levels of contaminant; or not have a safe oxygen level;

- (c) Potential for engulfment when the material contained in a Confined Space can create enough force on the body to cause injury or death by constriction, crushing, or strangulation.
- (d) Respiratory hazards associated with engulfment includes suffocation from breathing in a fine substance that fills the lungs or from drowning in a liquid.

8.1.3 Confined Spaces include but are not limited to:

- (a) Storage tanks, tank cars, process vessels, boilers, pressure vessels, silos, and other tank-like compartments;
- (b) Open-topped spaces such as pits or degreasers;
- (c) Pipes, sewers, shafts, ducts, and similar structures;
- (d) Any shipboard spaces entered through a small hatchway or access point, cargo tanks, cellular double bottom tanks, duct keels, ballast and oil tanks, and void spaces

*It is not possible to provide a comprehensive list of Confined Spaces. Some places may become Confined Spaces when work is carried out, or during their construction, fabrication, or subsequent modification.*

## 8.2 Training and Competency

### 8.2.1 General Training

- (a) Where it has been identified that there are Confined Spaces within a Site, Facility or Undertaking The controlling body with responsibility for the Site shall ensure that all persons who may be affected are trained on the 'Hazards of Confined Spaces' and the need to prevent unauthorised entry.
- (a) The controlling body (Client, Contractor, Appointed Duty Holder) shall ensure that Specific Confined Space Training is provided for employees required to enter a confined space
- (b) Training shall comply with the requirements of:
  - I. NEOM-SMS -Element 5 Training, Awareness and Competency.
  - II. NEOM-NLF-NMS-006.001 – SMS Organisation, Practitioner Registration and Appointment of Contractor.
- (c) The training shall be developed and implemented to ensure that all employees who enter a Confined Space (CS) have the requisite, knowledge, and skills necessary for the safe performance of all associated duties. (Refer: NEOM-NLF-NMS-006.004 – Permit to Work System).

### 8.2.2 The training program shall cover, as a minimum the following areas:

- (a) Hazard identification;
- (b) Equipment selection and testing;
- (c) Permits to work; (Refer: NEOM-NLF-NMS-006.004 Permit to Work Systems)
- (d) Safe working procedures – general and specific to the entry; including ventilation and isolation of energy sources
- (e) Hygiene;
- (f) Gas detection and monitoring; - Use of oxygen escape sets (if required through risk assessment);
- (g) Type, selection, and use of PPE; (Refer: NEOM-NLF-NMS-006.021 Personal Protective Equipment)
- (h) Incident and Emergency Procedures/Escape Plan. (Refer: NEOM Element 9 Emergency Planning and Response Management)

- (i) Top man /hole watch roles and responsibilities

**8.2.3 Ensure that training is provided to each affected employee:**

- (a) Before the employee is first assigned duties involving Confined Space entry;
- (b) Before there is a change in assigned duties;
- (c) Whenever there is a change in Confined Space operations that presents a hazard about which an employee has not previously been trained; and
- (d) Whenever there is reason to believe either that there are deviations from the Confined Space entry procedures or that there are inadequacies in the employee's knowledge or use of these procedures.

**8.2.4 Ensure that records of the required training contain the following information:**

- (a) Name and ID number of the employee;
- (b) Subject(s) of training;
- (c) Training provider;
- (d) Dates(s) of training; and
- (e) Person(s) providing the training.

**8.3 Planning and Assessment**

**8.3.1 Before any Confined Space work is carried out ensure the following:**

- (a) An assessment of the various risks is undertaken, and systems of work are established which are safe to all parties involved or affected including the public;
- (b) In most cases the assessment will include consideration of:
  - I. The task;
  - II. The working environment;
  - III. Working materials and tools;
  - IV. The suitability of those carrying out the task;
  - V. Arrangements for emergency rescue.
- (c) Where possible avoid entry to Confined Spaces, e.g., by doing the work from outside;
- (d) That effective procedures and controls are in place, which are implemented to manage activities safely and without risk to health;
- (e) That the management of Confined Spaces requirements are included in the Pre-Tender Safety and Health Plan in accordance with NEOM-NLF-NMS 006.002 – Safety Construction Management Plan
- (f) That associated safe systems of work, and site rules are included in the Occupational, Safety and Health Construction Management Plan (NEOM-NLF-NMS 006.002- Safety Construction Management Plan (CPP)) and in accordance with NEOM-SMS -Element 6 Contractor Management

**8.4 Identification of Confined Spaces**

- 8.4.1 Ensure that all activities that require persons to work within a Confined Space are identified and recorded.
- 8.4.2 All Confined Spaces shall be clearly identified with a sign reading – CONFINED SPACE – PERMIT REQUIRED – DO NOT ENTER. All safety signs shall be in line with the requirements of NEOM-NLF-NMS-006.013– Safety Signs and Signals.
- 8.4.3 The language of the sign shall be in both Arabic and English, and any other language appropriate for the understanding and comprehension of the exposed workforce.
- 8.4.4 All involved personnel shall be informed of the general hazards associated with Confined Spaces and the safe working procedures for entry.

## **8.5 Avoid entering Confined Spaces**

- 8.5.1 Check if work can be done another way to avoid the entry or the need to work in Confined Spaces.
- 8.5.2 Modify the Confined Space itself so that entry is not necessary
- 8.5.3 Inspection sampling and cleaning operations can often be done from outside using appropriate tools and equipment - Remote cameras can often be used for internal inspection of vessels

## **8.6 The Confined Space**

- 8.6.1 The confined space program shall include, as a minimum, the following items:
- 8.6.2 Contractor shall ensure a Confined Space programme is developed and regularly updated. The programme shall ,as a minimum, include
  - (a) Instruction to ensure that where personnel are required to enter a Confined Space for work purposes a Permit to Work and a Permit to Enter is in place with appropriate controls identified.
  - (b) A List of all identified Confined Spaces is maintained;
  - (c) Activities that are undertaken, under normal operation, within the Confined Space;
  - (d) List of competent Confined Space entry personnel;
  - (e) List of competent emergency rescue personnel, in relation to Confined Spaces;
  - (f) List of all associated equipment, including calibration requirements;
  - (g) Record of all entry into a Confined Space, including persons undertaking the entry and/or supervising the tasks; and
  - (h) Specific risk assessment and safe working procedures for each Confined Space identified.

## **8.7 Risk Assessment**

- 8.7.1 Ensure there is an appropriate risk assessment for each entry into a Confined Space.
- 8.7.2 The risk assessment shall be specific to the activity being undertaken and to the time and date of entry.
- 8.7.3 The risk assessment shall follow the requirements of NEOM-Element 2 – Risk and Opportunities Management.
- 8.7.4 The risk assessment shall also consider assessment of any previous content or residue present within the Confined Space.
- 8.7.5 The risk assessment shall also include any emergency situations that may occur because of the work being undertaken. (Refer: NEOM Element 9 Emergency Planning and Response Management)
- 8.7.6 The risk assessment shall identify all foreseeable hazards related to the persons entering and/or working within the Confined Space. The risk assessment shall also consider any additional risks introduced to others due to the work being undertaken within the Confined Space.
- 8.7.7 Risk assessment will include how the confined space is protected barriers etc.
- 8.7.8 Completed risk assessments shall be held within the confined space program as reference and record for each individual entry to a Confined Space.

## **8.8 Confined Space Entry Permit / Permit to Work**

- 8.8.1 Prior to entry to a Confined Space, ensure that a Confined Space Entry Permit has been completed. (Refer: NEOM-NLF-NMS-006.004 Permit to Work Systems)
- 8.8.2 Entry into the Confined Space shall be prohibited until all conditions of the Entry Permit have been satisfied and verified.
- 8.8.3 The Entry Permit System shall follow the requirements of NEOM-NLF-NMS 006.004– Permit to Work Systems.
- 8.8.4 Each Permit to Entry / Work shall be specific to the activity being undertaken and to the time and date of entry.
  
- 8.8.5 Prior to the commencement of Confined Space work, the following precautions are taken, to prevent any fire, explosion, injury, or other danger developing during the performance of Confined Space work:
  - (a) Ensure the appropriate ventilation of the Confined Space work area, including, atmospheric oxygen concentration levels between 19.5% and 23.5%;
  - (b) Ensure constant supervision and stand-by man; Ensure the provision of a safe entry to and exit from the Confined Space area;
  - (c) Isolate the area where the Confined Space work is to be performed and appropriately locate the equipment, including emergency firefighting equipment;
  - (d) Carryout continuous monitoring for the presence of any flammable gas or flammable vapour in the Confined Space and work area; - Ensure the concentration of any flammable gas or flammable vapour, as determined by the testing required is less than 5% of its Lower Explosive Limit (LEL);
  - (e) If specified by the Confined Space permit, a firewatcher shall be stationed in the area near the work, to ensure that no condition arises that will lead to a hazardous situation.

- (f) The Confined Space work area shall be secured overnight and at the expiry of a Confined Space work permit, to prevent unauthorized entry;
- (g) At the completion of the task, work area shall be left clean and tidy, and all equipment returned to storage for cleaning, inspection, calibration etc. as required
- (h) At the completion of the work the “Confined Space work permit” shall be signed off.

## **8.9 Safe Working Procedure**

- 8.9.1 Develop safe working procedures for each identified confined space
- 8.9.2 The safe working procedure shall be specific to the activity being undertaken and to the time and date of entry.
- 8.9.3 Ensure that the persons undertaking the task within the confined space fully understand and comprehend the safe working procedure.
- 8.9.4 The safe working procedure shall as a minimum contain information on:
  - (a) Provision of supervision (safety stand-by person);
  - (b) Competence for employees working in Confined Space;
  - (c) Communications methods and procedures;
  - (d) Emergency response procedure and rescue plan(s);
  - (e) Testing and monitoring of the environment (atmosphere) of the Confined Space;
  - (f) Ventilation and removal of residues;
  - (g) Isolation from gases and other hazardous materials;
  - (h) Isolations from liquids and other flowing materials;
  - (i) Isolation from mechanical and electrical equipment;
  - (j) Selection and use of appropriate equipment;
  - (k) Selection and use of Personal Protective Equipment (PPE) and Respiratory Protective Equipment (RPE); (Refer: NEOM-NLF-NMS-006.021 Personal Protective Equipment)
  - (l) Use of portable gas cylinders and internal combustion engines;
  - (m) Access and egress;
  - (n) Fire prevention and control;
  - (o) Lighting inside the Confined Space; and
  - (p) Limiting duration of exposure (working in the Confined Space).

## **8.10 Emergency Procedures**

- 8.10.1 No person shall enter or work within a confined space unless appropriate a specific emergency response plan has been prepared for the rescue of persons in the event of an emergency. (Refer: NEOM-Element 9 Emergency Planning and Response Management.)
- 8.10.2 The emergency arrangements shall be specific to the activity being undertaken and to the time and date of entry.
- 8.10.3 The emergency arrangements shall not be considered appropriate unless:
  - (a) They reduce, so far as is reasonably practicable, the risks to the health and safety of any person required to put the arrangements for rescue into operation; and

- (b) They require, where the need for resuscitation of any person is a reasonably foreseeable consequence, the provision and maintenance of such equipment as is necessary to enable resuscitation procedures to be carried out.
- (c) That where specialised equipment (stretchers, breathing apparatus, rescue harness, lifelines, etc.) is required, that it is readily available and rescue personnel are trained in its use.

## 9 Appendices

### 9.1 Appendix A: Signs



## 9.2 Appendix B: Audit Criteria

Audit Criteria		Requirements	Verification	Area of Concern
ISO 45001:2018 Clause	NMS Ref.			Yes/ No
5.3	7.1	NEOM health and safety policy and safety management system are properly applied within their areas of control/responsibility		
6.1	7.1.3, 8.3.1 (e)	Pre-Tender Health and Safety Plan has been developed and issued to Contractor		
5.3, 8.1.4.2	7.1.4	Selection of Contractors undertaken in accordance with NEOM's policies and procedures		
6.1.2.2	8.7	Risk assessment shall identify all foreseeable hazards related to the persons entering and/or working within the Confined Space		
9.0		Conduct regular safety and welfare assurance reviews to provide the confidence level		
7.2	7.2.2 (d)	Persons appointed to manage /oversee work operations have the skills, knowledge, experience		
8.1.2 (e)	7.3.6	Personal protective equipment required for use are fit for purpose		
8.1.2 (c, d)	7.2.1 (e), 8.4	Control of access to dangerous or high-risk areas (confined space) or equipment using suitable Barricades and Signage		
10.2	7.2.1(b) 8.2.2 (h)	Incident investigations and nonconformities reviews		
7.2	8.2	Controlling body for Identified Confined Spaces shall ensure that all persons who may be affected are trained on the 'Hazards of Confined Spaces' and the need to prevent unauthorized entry		
8.1	8.3, 8.6	Management of Confined Spaces requirements/ program developed, updated and in place		
	8.8	Entry Permit System shall follow the requirements	NMS-006.004 Permit to Work Systems	
8.2	8.9, 8.10	Emergency & Safe Working Procedures shall be in place		

### **9.3 Appendix C: Guidance Information**

The Occupational Safety and Health Administration (OSHA) has not published regulations dealing specifically with Confined Spaces found in the construction industry.

The OSHA confined-space standard, 29 CFR 1910.146, is written for general industry and states that it is not applicable to construction. However, the construction standard relating to safety training and education (29 CFR 1926.21) places an affirmative duty on the employer to train employees who enter confined or enclosed spaces during construction work on the hazards involved, precautions to take, and protective and emergency equipment needed. Therefore, the general industry standard on Confined Spaces still may be of use to roofing contractors as a means of assessing and dealing with hazards and selecting proper personal protective equipment (PPE) and emergency equipment.

It is impossible to detect a hazardous atmosphere without instruments designed for that purpose. It should never be assumed that a Confined Space is safe or that an employee will be fine if he or she doesn't linger in a Confined Space or perform dangerous work there.

A person can be overcome in a hazardous atmosphere in a matter of moments. Even quick and simple work in an area not recognized as a Confined Space can result in injuries or death by asphyxiation or as a result of an explosion.

In order to enter any Confined Space without the use of special types of PPE, such as a self-contained breathing apparatus (SCBA), atmospheric conditions must have these characteristics:

- Oxygen: 19.5 percent to 23.5 percent
- Flammability: below 10 percent of the lower flammable limit (LFL) for gases, vapors, mists or combustible dust
- Toxic gases: below the permissible exposure limit (PEL)/threshold limit value (TLV) or time-weighted average (TWA) of a substance

When testing for atmospheric hazards, a contractor should

1<sup>st</sup> test for oxygen. Combustible gas meters are oxygen-dependent and will not work properly in an oxygen-deficient atmosphere.

2<sup>nd</sup>, a contractor should test for combustible gases and vapours because the threat of fire or explosion is usually more immediate and life threatening.

3<sup>rd</sup>, a contractor must test for toxic gases and vapours.

All the operations that will be taking place within the space and any hazardous substances that may result, such as fumes from welding or vapours from solvents or other chemicals, must be considered. The proximity to traffic and automotive vehicles on site should also be noted because this may generate carbon monoxide.

A useful and informative free publication is available from the UK HSE web site: INDG 258 - Confined Spaces - A brief guide to working safely.



نیوم NEOM

**NEOM OCCUPATIONAL HEALTH and SAFETY  
NEOM MINIMUM STANDARD  
for  
HOT WORK OPERATIONS  
(E.G. WELDING AND CUTTING)**

NEOM-NLF-NMS-006.039 Rev 02.00 – February 2022

©NEOM [2021]. All rights reserved.

## Document History

Revision code	Description of changes	Purpose of issue	Date
Rev 00.00	First Issue	Issued for Implementation	27/07-2020
Rev 02.00	Sector Review	Issued for Implementation	01-02-2022

## Document Approval

	Prepared by	Reviewed by	Approved by
Name	Robert Murphy	Talal Al Anazi	Adel Wuhaib
Job Title	Loss Prevention Specialist LP/FS -Public Safety	Director, Loss Prevention/Fire Safety (LP/FS) Public Safety	Executive Director Public Safety



## Contents

<b>1</b>	<b>PURPOSE.....</b>	<b>4</b>
<b>2</b>	<b>SCOPE.....</b>	<b>4</b>
<b>3</b>	<b>EXPECTATIONS .....</b>	<b>4</b>
<b>4</b>	<b>LIST OF DEFINITIONS.....</b>	<b>5</b>
<b>5</b>	<b>LIST OF ABBREVIATIONS.....</b>	<b>5</b>
<b>6</b>	<b>RELATED NEOM DOCUMENTS .....</b>	<b>6</b>
<b>7</b>	<b>ROLES AND RESPONSIBILITIES.....</b>	<b>6</b>
7.1	Client .....	6
7.2	Contractor.....	7
7.3	Employee .....	7
7.4	Specific Responsibilities.....	8
<b>8</b>	<b>OTHER SECTIONS RELATED TO SUBJECT.....</b>	<b>8</b>
8.1	Planning and Assessment.....	8
8.2	General Requirements for Hot Work.....	9
8.3	Designated Hot Work Area(s) .....	9
8.4	Fumes and Gases .....	10
8.5	Electricity and Radiation.....	10
8.6	Preventing Fire .....	10
8.7	Hazardous Areas.....	11
8.8	Electric Arc Welding .....	11
8.9	Gas Welding.....	12
8.10	Storage of Gas Cylinders .....	12
8.11	Cylinder Handling .....	13
8.12	Cylinder Attachments .....	13
8.13	Inspection .....	14
8.14	Training and Competency .....	14
8.15	Records .....	15
<b>9</b>	<b>APPENDICES .....</b>	<b>16</b>
9.1	Appendix A: Forms, Signs and Checklists .....	16
9.2	Appendix B: Audit Criteria .....	17
9.3	Appendix C: Guidance Information .....	19

## List of Tables

Table 1 : Table of Definitions .....	5
Table 2 : Table of Abbreviations.....	5
Table 3 : Related NEOM Documents .....	6

## **1 Purpose**

This NEOM Co. SMS Minimum Standards (hereafter referred to as NMS) relates to the management of all occupational health, safety (OHS) risks associated with Hot Work Operations.

It provides guidance to support compliance with industry best practice and international regulatory safety requirements to ensure that the associated risks are assessed, and control measures are implemented in accordance with the hierarchy of risk controls.

It has been developed to align with the requirements of the ISO 45001 Health and Safety Management Manual (Refer NEOM-NLF-PRC-006- Section 2 ISO 14001 Cross reference table)

## **2 Scope**

This NMS applies to all Sectors, Organisations within NEOM and any Contractors working for NEOM. It is designed to incorporate requirements set by the NEOM-SMS.

It specifies the requirements and standards so that the risks associated with Hot Work Operations are assessed and that all relevant control measures are implemented

## **3 Expectations**

To ensure the health and safety of all personnel, protection of assets (services, plant/equipment) and the environment

NEOM expect each Sector, Organization, Department or Contractor to ensure that risks are controlled in accordance with the hierarchy of risk controls: elimination, substitution, engineering controls, administrative controls, and personal protective equipment.

Consideration shall be given to technological advances that may introduce new means of controlling or eliminating the risks associated with Work Operations

That the expectation for safety compliance is meeting and exceeding all applicable OSHA Laws, Regulations, and Industry Best Practice.

Applicable requirements and standards include:

- (a) OSHA Standards and Regulatory requirements;
- (b) ANSI requirements;
- (c) NFPA Standards and requirements;
- (d) NEOM Minimum Standards
- (e) Saudi Building Codes
- (f) International Building Codes

*If requirements of this document conflict with requirements set by another regulatory authority, Contractor are required to follow the more stringent requirement.*

## 4 List of Definitions

Table 1 : Table of Definitions

Terms	Definitions
NEOM Co	NEOM Company
Client	NEOM Sector / Department
Employer	The person or organisation that employs personnel to complete the work
Contractor	The organisation contracted to carry out the works
Hot Work	A general term referring to grinding, welding, thermal or oxygen cutting or heating, and other related heat-producing or spark-producing operations. This also includes the opening or working on and or opening intrinsically safe equipment and fittings.
Welding	The fusion of two pieces of metal, rendered plastic or liquid by heat or by pressure, or by both. There are many different welding processes, but the two most used in industry are gas welding and electric arc welding.
Hazardous Area	An area in which flammable liquids, vapours or gases, combustible liquids, dusts or fibres, or other flammable or explosive substances may be present.
Safety Management System (SMS)	Occupational Health and Safety Management System established by NEOM in compliance to ISO 45001 Standard

## 5 List of Abbreviations

Table 2 : Table of Abbreviations

Abbreviations	Descriptions
SMS	Safety Management System
NMS	NEOM Minimum Standard
SOP	Standard Operating Procedure
ANSI	American National Standards Institute
NFPA	National Fire Prevention Association
OSHA	Occupational Safety and Health Administration.
CPP	Construction Phase Plan
LEV	Local Exhaust Ventilation (Point of work extraction)
RCD	Residual Current Device
LEL	Lower Explosion Limit
COSHH	Control of Substances Hazardous to Health
PPE	Personal Protective Equipment
IBC	International Building Codes
OHS	Occupational Health and Safety

## 6 Related NEOM Documents

Table 3 : Related NEOM Documents

Document Code	Document Name
NEOM Element 2	Risk and Opportunity Management
NEOM Element 3	Control of Documented Information & Legal Compliance
NEOM-Element 5	Training, Awareness and Competency.
NEOM-Element 6	Contractor Management
NEOM-NLF-SM	Safety management Manual - Roles and Responsibilities
NEOM-NLF-PRC-006- Section 2	ISO 14001 Cross Reference Table
NEOM-NLF-PRC-006;	Occupation Health Safety and Fire Safety requirements for Contractors
NEOM-NLF-NMS 006.01	SMS Organisation, Practitioner Registration and Appointment of Contractor
NEOM-NLF-NMS-006.002	Safety Construction Management Plan (CPP)
NEOM-NLF-NMS 006.004	Permit to Work Systems.
NEOM-NLF-NMS-006.012	Barricading of Hazards
NEOM-NLF-NMS-006 018	Local Exhaust Ventilation
NEOM-NLF-NMS 006.-020	COSHH – Hazardous Substances
NEOM-NLF-NMS-006.021	Personal Protective Equipment (PPE)
NEOM NLF- NMS-006.024–	Occupational Health Screening and Medical Surveillance
NEOM-NLF-NMS-006.027	Compressed Gases and Air

## 7 Roles and Responsibilities

### 7.1 Client

- 7.1.1 General Health and Safety roles and responsibilities are defined in; and shall be carried out in accordance with the requirements of NEOM-NLF-SM – Safety Management Manual - Roles and Responsibilities:
- 7.1.2 The Client is responsible for ensuring that NEOM Safety Commitment Statement and safety management system are properly applied within their areas of control/responsibility. Effective implementation will ensure compliance with relevant legislative requirements and will help promote the use of industry best safe working practices.
- 7.1.3 That a suitable, Pre-Tender Health and Safety Plan has been developed and issued to Contractors to ensure they have all the information necessary to make informed decisions when developing the Construction Phase Health and Safety Plan (NEOM-NLF-NMS-006.002 Safety Construction Management Plan (CPP) which will form part of the Contractor review and selection process
- 7.1.4 That the selection of Contractors shall be undertaken in accordance with NEOM's policies and procedures (NEOM-Element 6 Contractor Management). To ensure that only Competent organisations capable of meeting the requisite safety standards associated with project are contracted.

- 7.1.5 Conduct regular Contractor safety assurance reviews to provide the confidence level required that the safety management system is delivering as planned, and consistently achieves the acceptable level of safety. Including:
- (a) Safety performance monitoring and measuring;
  - (b) Managing change;
  - (c) Continuous improvement.

## 7.2 Contractor

- 7.2.1 Contractor shall undertake their roles and responsibilities in accordance with the general requirements of NEOM–NLF-SM – Safety Management Manual - Roles and Responsibilities:
- 7.2.2 That all work activities are assessed, planned, organized, and that suitably competent Supervision is available to implement the safety requirements and oversee the work
- 7.2.3 Ensure persons appointed to manage /oversee work operations have the skills, knowledge, experience and, where relevant, the organisational capability to plan and manage work safely and without risk to those who may be affected by the activities
- 7.2.4 Ensure employees carrying out the work are trained to recognize the associated hazards and understand the processes and procedures to control or minimize the risks.
- 7.2.5 That all equipment including personal protective equipment required is fit for purpose, and (as required) has been inspected by a competent person and inspection records are maintained and readily available.
- 7.2.6 Contractor shall undertake their specific roles and responsibilities related to Hot Work in accordance with the following:
  - (a) Maintaining control of access to hot work areas and equipment using suitable barriers that are regularly maintained (Refer: NEOM-NLF-NMS-006.012 – Barricading of Hazards)
  - (b) Ensuring Hot Work plant and equipment (e.g., welding and cutting equipment) shall be suitable for the task and maintained in good working condition; and is inspected daily by a competent person
  - (c) All work involving the use of hot work plant and equipment is planned, organised, and adequately supervised;
  - (d) Implement a suitable medical surveillance program in accordance with NEOM-NLF-NMS-006.024– Occupational Health Screening and Medical Surveillance
  - (e) Conduct occupational air and health monitoring and take the appropriate actions to reduce exposures to employees involved with hot works.
- 7.2.7 Ensure specialised protective clothing for welders is readily available if required including: a shield or helmet with a filtered lens; fire resistant gloves; a leather apron; boots; leather spats; a felt skullcap or beret and preferably fire-retardant overalls (Refer NEOM-NFL-NMS-006.021 Personal Protective Equipment).

## 7.3 Employee

- 7.3.1 Shall undertake their roles and responsibilities in accordance with the general requirements of NEOM–NLF-SM – Safety Management Manual - Roles and Responsibilities.
- 7.3.2 Report any activity or defect relating to the work which they believe is reasonably foreseeable to endanger their safety or that of another person's.
- 7.3.3 Shall use appropriate equipment or safety devices provided for the work by the Contractor in accordance with any training or instruction received in the use of the work equipment.

- 7.3.4 Employees shall use safety devices provided to use with the welding and cutting equipment by Contractor in accordance with training or instruction received in the use of the work equipment or other device.

#### **7.4 Specific Responsibilities**

- 7.4.1 Sector, Organization, Department or Contractor Head is responsible in ensuring that provisions are made the safe systems of work to prevent and minimize risks in each workplace
- 7.4.2 Safety Practitioner/Coordinator is responsible to monitor the implementation of this procedures and document its effectiveness
- 7.4.3 The Responsible Person will support this procedure and ensure that any Contractor Organization working for, or on behalf of, the Sector, Organization, Department or Contractor will comply with the requirements of these procedures
- 7.4.4 Line Managers / Supervisors are responsible for training their workers in risks
- 7.4.5 The LP & FS Public Safety department will support the NEOM risk assessments by carrying out compliance checks and supporting and guiding the various safety teams.

### **8 Other Sections related to subject**

#### **8.1 Planning and Assessment**

- 8.1.1 Risk Assessment and Method Statements shall be prepared in consultation with the person in control of the work and communicated to those responsible for carrying out the work (Refer to: NEOM Element 2 Risk and Opportunity and NEOM- NLF-NMS 006. 007 Work at Height)
- 8.1.2 An assessment of the various risks associated with hot work shall be undertaken and systems of work that are safe to both employees and others who may be affected by the work shall be established;
- 8.1.3 That effective procedures and control measures are developed and implemented for management of the hazards; (Refer: NEOM-NLF-NMS 006.004 Permit to Work Systems and NEOM-NLF-NMS 006.031 – Steel Erection).
- 8.1.4 Ensure all foreseeable emergency situations are identified, and appropriate emergency procedures developed, and mitigation measures are fully implemented, and practiced, (Refer: Section 17 of OSHA Reg. 213/91)
- 8.1.5 That hot work general requirements are included in the Pre-Tender Environment, Health and Safety Plan in accordance with NEOM-NLF PRC 006 Occupational Safety, Health and Fire Safety Requirements for Contractor
- 8.1.6 That associated safe systems of work, and site rules are included in the Safety and Health Construction Management Plan (NEOM-NLF-NMS 006.002-CPP) and in accordance with NEOM-NLF PRC 006 Occupational Safety, Health and Fire Safety Requirements for Contractor
- 8.1.7 No hot work is allowed to be undertaken, outside of a designated area, unless a specific Permit to Work is in place.
- 8.1.8 In particular, such precautions shall apply to hot work during manufacturing, construction, maintenance, repairs, demolition and where plant or equipment contains flammable, combustible ,or explosive material.
- 8.1.9 That the management of hot work requirements are included in the Pre-Tender Occupational Safety and Health Plan in accordance with NEOM-NLF-NMS 006.002 – Construction Management Plan (CPP)

- 8.1.10 That associated safe systems of work, and site rules are included in the Occupational Safety and Health Construction Management Plan and in accordance with NEOM-Element 6 Contractor Management.
- 8.1.11 When assessing the various risks Contractor shall consider if there are specific hot work-related hazards such as:
- (a) Fire and explosion;
  - (b) Burns;
  - (c) Fumes, gases, and ventilation;
  - (d) Electricity; and
  - (e) Radiation.
  - (f) Safety Data sheets available at work location

## **8.2 General Requirements for Hot Work**

- 8.2.1 Contractor shall ensure the following:
- (a) Material safety data sheets for electrodes, fluxes and coatings are made available to employees required to perform welding activities;
  - (b) The protection of welders and other persons in the vicinity of the work from burns caused by sparks, hot metal, etc.;
  - (c) The erection of screens for the protection of persons in the vicinity of the welding work from harmful radiation rays produced by the welding process;
  - (d) The use of welding booths, where reasonably practicable;
  - (e) The provision and use of point of work extraction systems were reasonably practicable
  - (f) Gas systems (e.g., cylinders, regulators, hoses, etc.) are in good working order;
  - (g) All welding-associated waste is placed in a hot waste skip located as close as reasonably practicable to where the welding activities are carried out. Such hot waste includes slag, shot crucibles and metal off-cuts;
- 8.2.2 In areas where welding work is performed, competent First Aiders and first aid equipment shall be provided. This shall include, but not be limited to the ability to respond to;
- (a) Persons overcome by welding fumes or gases;
  - (b) Burns; and
  - (c) "Welding flash" eye injuries.

## **8.3 Designated Hot Work Area(s)**

- 8.3.1 A designated hot work area is a permanent location designed for hot work. These areas do not normally require a permit to perform hot work.
- 8.3.2 Where it is reasonably practicable to do so, Contractor shall ensure that all hot works are undertaken within a designated hot works area.
- 8.3.3 Access / Egress to the designated area shall be restricted for non-authorised person(s) and clearly marked
- 8.3.4 A designated hot work area shall be:
- (a) Of non-combustible, fire-resistive construction, essentially free of combustibles and flammables;
  - (b) Appropriately segregated from adjacent areas;

- (c) Equipped with automatic fire protection or fire extinguishers;
- (d) Inspected and approved by management; and
- (e) Have appropriate ventilation.
- (f) Include ramp access for disabled employees (Risk assessment will identify this requirement )

#### **8.4 Fumes and Gases**

- 8.4.1 Appropriate control measures shall be utilised to reduce as far as reasonably practicable, the exposure level of personnel to harmful fumes and gases. These control measures include but are not limited to:
  - (a) Removal of rust inhibitors, paints, degreasers, and other coatings prior to welding;
  - (b) Segregation of degreasing operations from welding tasks; and
  - (c) Positioning of welders away from welding fumes.
- 8.4.2 Employees required to perform welding work shall be monitored for any adverse side effects on their health, related to exposure to welding fumes and gases, as per the requirements of NEOM NLF- NMS-006.024– Occupational Health Screening and Medical Surveillance
- 8.4.3 Appropriate ventilation is provided in all locations where welding work is carried out which may consist of:
  - (a) General ventilation;
  - (b) Dilution ventilation (e.g. Diluting the concentration of contaminants in the atmosphere with fresh air); or
  - (c) Local exhaust ventilation (LEV).
- 8.4.4 The determination of the type of ventilation to be used takes into consideration that, in most instances, general or dilution ventilation by themselves are not sufficient. In addition, the design of local exhaust ventilation shall ensure that the ventilation inlet point is as close as reasonably practicable to the actual welding work. (Refer: NEOM-NLF-NMS-006 018 Local Exhaust Ventilation).

#### **8.5 Electricity and Radiation**

- 8.5.1 Contractor shall ensure electrical and radiation hazards are eliminated or significantly reduced through adherence to the following:
  - (a) All cord-connected electrical welding machines shall be tested in accordance with the manufacturer's specifications;
  - (b) Electrical welding machines shall only be connected to circuits protected by residual current devices (RCDs) and shall be appropriately earthed;
  - (c) Personnel performing welding activities shall ensure that electric cables are not damaged by sparks, hot metal, etc.

#### **8.6 Preventing Fire**

- 8.6.1 Contractor shall ensure the following fire precautions are taken:
  - (a) Move the workpiece to a safe location for carrying out the hot work process;
  - (b) Remove any combustible materials (such as flammable liquids, wood, paper, textiles, packaging or plastics) from within 10 meters of the work;
  - (c) Ventilate spaces where vapours could accumulate, such as vehicle pits or trenches;

- (d) Protect any combustible materials that cannot be moved, from close contact with flame, heat, sparks, or hot slag. Use appropriate guards or covers such as metal sheeting, mineral fibreboards, or fire-retardant blankets;
- (e) Check that there are no combustible materials hidden behind walls or partitions which could be ignited, particularly if prolonged welding or cutting is planned;
- (f) Use guards or covers to prevent hot particles passing through openings in floors and walls (doorways, windows, etc.);
- (g) Maintain a continuous fire watch during the period of the work, and for at least an hour afterwards; and
- (h) Keep fire extinguishers nearby. (Refer: NEOM Element 9 Emergency Planning and Response Management)

## **8.7 Hazardous Areas**

- 8.7.1 Ensure that prior to the commencement of hot work in hazardous areas, the following precautions are taken, to prevent any fire, explosion, injury, or other danger developing during the performance of the hot work:
- (a) A “Hot-Work Permit” shall be obtained before any work is carried out in a hazardous area where flammable or explosive gases and dusts may be present; (Refer: NEOM -NLF NMS-006.004 – Permit to Work Systems).
  - (b) Identify and control any fire hazard (including the presence of flammable or combustible liquids, gases, vapours, dusts, fibres, or substances) within 10 m from the hot work.
  - (c) Ensure there is appropriate ventilation of the hot-work area;
  - (d) Appropriately locate the equipment, including emergency firefighting equipment;
  - (e) Isolate the area where the hot work is to be performed;
  - (f) Ensure the provision of a safe entry to and exit from the hot-work area;
  - (g) Carryout regular testing for the presence of any flammable gas or flammable vapour in the atmosphere within the area and in any pipe, drum, tank, vessel, and piece of equipment adjacent to or involved in the hot work;
  - (h) Ensure the concentration of any flammable gas or flammable vapour, as determined by the testing required is less than 5% of its Lower Explosion Limit (LEL);
  - (i) If specified by the permit, a firewatcher shall be stationed in the hot work area, to oversee the safe conduct of the hot work and ensure that no condition arises that will lead to a hazardous situation;
  - (j) The site or work area shall be secured overnight and at the expiry of a hot-work permit period;
  - (k) Upon completion of work all equipment shall be removed to storage and the work site shall be left in a safe condition suitable for normal operations or occupancy to be resumed
  - (l) At the completion of a job the “Hot-work permit” shall be signed off.

## **8.8 Electric Arc Welding**

- 8.8.1 Ensure Arc cutting and welding equipment is installed and used in accordance with the manufacturer's specifications.
- 8.8.2 The current used for electric arc welding is either direct or alternating but, whichever system is used, the voltage should be as low as is consistent with efficient welding;
- 8.8.3 Welding leads and welding return cables shall meet the following requirements:
- (a) Insulation is appropriate for resisting hard usage;

- (b) Are examined, as a minimum daily, for defects;
  - (c) For the part of the cable which is connected to the electrode holder it is as flexible as reasonably practicable so as not to hamper the movement of the welder; and
  - (d) Have the welding return section and the welding lead return are both of suitable length
- 8.8.4 Joints between cable sections are made with appropriately constructed insulated cable couplings appropriately shrouded, so that live metal is not exposed if the parts of the connector are separated;
- 8.8.5 The welding return is firmly connected to the metal on which welding is taking place, by means of a well-constructed clamp;
- 8.8.6 An electrode holder is fully insulated, so that the live portions cannot be touched accidentally;
- 8.8.7 When arc welding is suspended for a substantial period, such as during lunch periods or overnight, the power source to the equipment is de-energised, the electrodes are removed from the holders and the holders are placed so that accidental contact or arcing cannot occur.

## **8.9 Gas Welding**

### **8.9.1 Requirements:**

- (a) Under no circumstances any fittings on oxy-acetylene equipment be allowed to be contaminated with grease or oil; (Refer: NEOM-NLF-NMS-006027 Compressed Gases and Air)
- (b) Regulators are daily checked, at least daily; as they can fail in two ways - by the controlled forward flow of gas which is known as "regulator creep" or by the reverse flow of another gas in the gas lines;
- (c) Employees never use equipment fitted with a regulator in which a creep condition is known to exist;
- (d) The use of the correct colour and type of hoses and fittings recommended by the manufacturer's specifications;
- (e) Copper shall never be used on acetylene lines as the chemical reactions between materials may cause spontaneous ignition;
- (f) Flashback arresters shall be fitted to all oxy-acetylene equipment;
- (g) Oxy-acetylene equipment is not left near hot equipment or metals which could burn the leads;
- (h) There shall be no smoking when welding or near welding activities.

## **8.10 Storage of Gas Cylinders**

### **8.10.1 When storing ensure the following:**

- (a) All cylinders shall be stored vertically, whether full or empty, and shall be secured against falling;
- (b) Full cylinders shall be kept separate from empty ones;
- (c) All cylinders shall be shielded from direct sunlight, or other heat, to avoid the build-up of excess internal pressure which might lead to gas leakage or, in extreme cases, bursting of the cylinder;
- (d) Oxygen cylinders shall be stored, as a minimum, 6 meters away from those containing acetylene or LPG, since any mixture of oxygen with one of the fuel gases, could be highly explosive;
- (e) Refer: NEOM-NLF-NMS 006.-020 COSHH – Hazardous Substances and NEOM-NLF-NMS-006.027 – Compressed Gases and Air.

## **8.11 Cylinder Handling**

8.11.1 Gas cylinders shall be treated with care and not subjected to shocks, drops, or falls. Always ensure the following:

- (a) Employees hands and clothing shall be free from grit, grease and oil when cylinders are handled to prevent them from slipping and to prevent grit from getting into the valve, or grease on to the nozzle or valve;
- (b) Nozzles shall not be used for handling purposes as they are not designed to take such weight or stress;
- (c) Cylinders in use shall be normally kept and moved in purpose-built trolleys (If it is necessary to move cylinders which are not in a trolley, regulators and hoses shall be detached and a check made that valves are appropriately shut);
- (d) Under no circumstance's cylinders are to be rolled along the ground;
- (e) If cylinders are to be lifted by crane, they shall be secured in a special carrier and on no account shall they to be lifted with chain or wire rope slings;
- (f) When transported in a vehicle around a site, cylinders shall be secured to prevent injury in the event of any sudden vehicle movement, and when being unloaded from a vehicle they shall not be dropped to the ground;
- (g) Acetylene cylinders shall always be transported and used in the vertical position. If they have been subjected to the horizontal position (accidentally following a fall) they shall be stood upright for 15 minutes to settle out before use; (Refer: NEOM-NLF-NMS-006.-020 COSHH – Hazardous Substances and NEOM-NLF-NMS-006.027 - Compressed Gases and Air).

## **8.12 Cylinder Attachments**

8.12.1 Cylinder attachments use, care and safety checks:

- (a) Regulators are always fitted to the cylinders to reduce the gas pressure from that in the cylinder to the working pressure of the blowpipe;
- (b) Only regulators designed for the gas being used and rated for the current full cylinder pressure are fitted to the cylinders;
- (c) The cylinder valve is "cracked open" before the regulator is fitted to the cylinder to blow all the dust and other foreign matter clear;
- (d) The adjusting screw of the regulator is always released before the cylinder valve is opened, and the cylinder valve is opened gradually;
- (e) Periodic checks are made to ensure that no gas is leaking from the regulator when the pressure regulating screw is set at zero. Checks for gas leakage from any part of the equipment shall only be made with water containing detergent. Bubbles in the detergent indicate the presence of a leak;
- (f) Hoses are:
  - I. Kept for one type of gas only, and colour coded for identification - red for acetylene or other fuel gases (except LPG), orange for LPG and blue for oxygen;
  - II. Inspected daily before use to see that they are free from cuts, scratches, cracks, burnt or worn patches; and
  - III. Effectively always clipped or crimped to the equipment and protected from sharp edges, falling metal, passing traffic and sparks from the welding operation.

- (g) Gas mixtures arising in use are prevented, e.g. if the blowpipe nozzle becomes blocked, non-return valves (flashback arrestors) shall be fitted to each blowpipe inlet connection;
- (h) In situations of high risk, flashback arrestors are fitted, and examples of such situations include:
  - I. In a confined space where access is difficult, or the means of escape may be endangered by fire/explosion;
  - II. Operations under hot work permit adjacent to live operating plant;
  - III. Near compressed air workings;
  - IV. When employees are under training; and
  - V. Where there is a device in the gas line with significant internal volume, e.g. A welding flux container.
- (i) Blowpipes are dismantled and cleaned at regular intervals; (Refer: NEOM-NLF-NMS-006.027 Compressed Gases and Air).

## **8.13 Inspection**

### **8.13.1 Inspection requirements include the following:**

- (a) Visual checks are carried by users on welding and cutting equipment before use;
- (b) Formal inspections shall be carried out by competent persons at regular intervals and in accordance with the manufacturers' specification and at a minimum:
  - I. Daily inspection and leak test all joints at working pressure;
  - II. Weekly inspection (if in constant use) or before every use;
  - III. 6 monthly functional tests by a competent person; and
  - IV. 5 yearly (or as recommended by the manufacturer) refurbishment or replacement.
- (c) Elastomers and seals will wear and deteriorate in service and deteriorate out of service. Items stored for one year or over without use shall be inspected as per the annual maintenance inspection.
- (d) Any welding and cutting equipment that is malfunctioning is immediately removed from service.

## **8.14 Training and Competency**

Ensure that training complies with the requirements of:

- (a) NEOM-Element 5 – Training, Awareness and Competency.
- (b) NEOM-NLF-NMS-006.001–Organisation, Safety Practitioner Registration and Appointment of Contractor.

### **8.14.1 Training for employees shall be competency-based and include:**

- (a) Systems of work needed for the safe hot work operations;
- (b) Types and selection of correct welding and cutting equipment;
- (c) Type, selection, and use of PPE; and
- (d) Care, maintenance, and inspection of welding and cutting equipment.

8.14.2 Contractor shall conduct additional retraining whenever a periodic inspection reveals, or there is reason to believe, that there are deviations from or inadequacies in the employee's knowledge of the correct hot work operations.

8.14.3 Contractor shall maintain a record of the required training that contains the following information:

- (a) Name and ID number;
- (b) Subject(s) of training;
- (c) Date(s) of training; and
- (d) Person(s) providing the training.
- (e) Assessment Record for the trainee

## **8.15 Records**

8.15.1 Ensure the following records are maintained;

- (a) Register of Daily / Weekly inspection
- (b) Functional tests of equipment
- (c) 5 yearly (or as recommended by the manufacturer) refurbishment or replacement documentation.  
(Refer NEOM Element 3 Control of Documented Information & Legal Compliance)

## 9 Appendices

### 9.1 Appendix A: Forms, Signs and Checklists



## 9.2 Appendix B: Audit Criteria

Audit Criteria		Requirements	Verification	Area of Concern
ISO 45001:2018 Clause	NMS Ref.			Yes/ No
5.3	7.1.2	NEOM health and safety policy and safety management system are properly applied within their areas of control/responsibility		
6.1	7.1.3, 8.1.5, 8.1.9	Pre-Tender Health and Safety Plan has been developed and issued to Contractor		
5.3, 8.1.4.2	7.1.4	Selection of Contractors undertaken in accordance with NEOM's policies and procedures		
9.0	7.1.5	Conduct regular safety and welfare assurance reviews to provide the confidence level		
7.2	7.2.4 (b, c), 8.1.4	Persons appointed to manage /oversee work operations have the skills, knowledge, experience		
8.1.2 (e)	7.2.6	Personal protective equipment required for use are fit for purpose		
8.1.2 (c, d)	7.2.6 (a)	Control of access to hot work areas and equipment using suitable barriers that are regularly maintained	NMS-006.012 – Barricading of Hazards	
10.2		Incident investigations and nonconformities reviews		
	7.2.6(d)	Implement a suitable medical surveillance program	NMS-006.024– Occupational Health Screening and Medical Surveillance	
5.4	8.1.1	Risk Assessment and Method Statements shall be prepared in consultation with the person in control of the work and communicated to those responsible for carrying out the work		
6.1.2.2	8.1.2, 8.1.3	Assessment of the various risks shall be undertaken		
	8.2.1	Material safety data sheets for electrodes, fluxes and coatings are made available		
6.1.2	8.3	A designated hot work area designed for hot work		
	8.4	Control measures to reduce as far as reasonably practicable, the exposure level of personnel to harmful fumes and gases		
6.1.2	8.5	Electrical and radiation hazards are eliminated or significantly reduced		
	8.6	Fire prevention precautions (controls & measures)		
	8.7	Hazardous areas where flammable or explosive gases and dusts may be present are identified and "Hot-Work Permit" shall be obtained before any work is carried out		

Audit Criteria		Requirements	Verification	Area of Concern
ISO 45001:2018 Clause	NMS Ref.			Yes/ No
	8.8	Arc cutting and welding equipment is installed and used in accordance with the manufacturer's specifications		
8.1	8.9, 8.10	Gas Welding requirements are implemented, and Storage of Gas Cylinders is as per standards		
8.1	8.11, 8.12	Gas cylinders and Cylinder attachments use, care, and safety checks		
9.1	8.13	Formal inspections shall be carried out by competent persons at regular intervals and in accordance with the manufacturers' specification and at a minimum		

### 9.3 Appendix C: Guidance Information

OSHA 29 CFR 1910.252 required fire prevention actions for welding/hot works. Where practicable all combustibles shall be relocated at least 35 feet from the work site.

29 CFR 1917 Subpart G (Marine Terminals) define "Hot work" to mean riveting, welding, flame cutting or other fire or spark-producing operation this section has much in the way of requirements regarding where hot work is conducted e.g., in confined spaces etc. and 29 CFR 1915 Subpart B looks specifically at confined spaces and other dangerous atmospheres in shipyards.

Information available from the UK HSE web site includes DIS 6 – Hot work in docks which is a very informative document. HSG 65 / HSG 51 and HSG 48 all free publications which gives good advice on permitting and works involving hot work.



The OSHA Hazard Communication Standard defines a compressed gas as:

- A gas or mixture of gases having, in a container, an absolute pressure exceeding 40 psi at 70 deg. F (21.1 deg. C); or
- A gas or mixture of gases having, in a container, an absolute pressure exceeding 104 psi at 130 deg. F (54.4 deg. C) regardless of the pressure at 70 deg. F (21.1 deg. C); or
- A liquid having a vapor pressure exceeding 40 psi at 100 deg. F (37.8 deg. C) as determined by ASTM D-323-72.

Compressed gases can be toxic, flammable, oxidizing, corrosive or inert. In the event of a leak, inert gases can quickly displace air in a large area creating an oxygen-deficient atmosphere, while toxic gases can create poison atmospheres, and flammable or reactive gases can result in fire and exploding cylinders. In addition, there are hazards from the pressure of the gas and the physical weight of the cylinder. A gas cylinder falling over can break containers and crush feet. The cylinder can itself become a missile if the cylinder valve is broken off.





نیوم NEOM

**NEOM OCCUPATIONAL HEALTH and SAFETY  
NEOM MINIMUM STANDARD  
for  
GENENRAL OFFICE WORKPLACE AMENITIES**

NEOM-NLF-NMS-006.040 Rev 02.00 – February 2022

©NEOM [2021]. All rights reserved.

## Document History

Revision code	Description of changes	Purpose of issue	Date
Rev 00.00	First Issue	Issued for Implementation	27/07-2020
Rev 02,00	Sector Review	Issued for Implementation	01-02-2022

## Document Approval

	Prepared by	Reviewed by	Approved by
Name	Robert Murphy	Talal Al Anazi	Adel Al Wuhaib
Job Title	Loss Prevention Specialist LP/FS -Public Safety	Director, Loss Prevention/Fire Safety (LP/FS) Public Safety	Executive Director Public Safety



## Contents

<b>1</b>	<b>PURPOSE.....</b>	<b>4</b>
<b>2</b>	<b>SCOPE.....</b>	<b>4</b>
<b>3</b>	<b>EXPECTATIONS .....</b>	<b>4</b>
<b>4</b>	<b>LIST OF DEFINITIONS.....</b>	<b>5</b>
<b>5</b>	<b>LIST OF ABBREVIATIONS.....</b>	<b>5</b>
<b>6</b>	<b>RELATED NEOM DOCUMENTS .....</b>	<b>6</b>
<b>7</b>	<b>ROLES AND RESPONSIBILITIES.....</b>	<b>6</b>
7.1	Client.....	7
7.2	Contractor .....	7
7.3	Employee .....	8
<b>8</b>	<b>OTHER SECTIONS RELATED TO SUBJECT .....</b>	<b>9</b>
8.1	Housekeeping .....	9
9.2	Aisles and Passageways .....	9
9.3	Floor Loading and Shelf Loading Protection .....	9
9.4	Windows, Skylights, Ventilators and Transparent or Translucent Doors.....	9
9.5	Heating, Ventilation, and Air Conditioning (HVAC).....	10
9.6	Lighting.....	11
9.7	Room Dimensions and Space .....	11
9.8	Drinking Water (Potable Water) .....	11
9.9	Sanitary Conveniences (Bathrooms) .....	11
9.10	Washing Facilities.....	12
9.11	Training and Competency .....	12
<b>10</b>	<b>APPENDICES .....</b>	<b>14</b>
10.1	Appendix A: Forms and Checklists .....	14
10.2	Appendix B: Audit Criteria.....	15
10.3	Appendix C: Guidance Information.....	17

## List of Tables

Table 1 : Table of Definitions .....	5
Table 2 : Table of Abbreviations .....	5
Table 3 : Related NEOM Documents .....	6
Table 4 Air Changes Per Hour for HVAC Systems.....	9
Table 5: Illumination Intensities.....	10

## **1 Purpose**

This NEOM Co. SMS Minimum Standards (hereafter referred to as NMS) relates to the management of all occupational health, safety(OHS) risks and welfare arrangements associated with General Workplace Amenities.

It provides guidance to support compliance with industry best practice and international regulatory safety requirements to ensure that the associated risks are assessed, and control measures including welfare arrangements are implemented in accordance with the hierarchy of risk controls.

It has been developed to align with the requirements of the ISO 45001 Health and Safety Management Manual (Refer NEOM-NLF-PRC-006- Section 2 ISO 14001 Cross reference table)

## **2 Scope**

This NMS applies to all personnel within NEOM and any Contractor working for NEOM and or associated projects and activities. It is designed to incorporate requirements set by the NEOM-SMS. This NMS covers the provision of workplace amenities and facilities for the working environment in all workplaces

## **3 Expectations**

To ensure the health and safety of all personnel, protection of assets (services, plant/equipment) and the environment

NEOM expect each Sector, Organization, Department or Contractor to ensure that risks associated with Workplace Amenities are controlled in accordance with the hierarchy of risk controls: elimination, substitution, engineering controls, administrative controls, and personal protective equipment.

Consideration shall be given to technological advances that may introduce new means of controlling or eliminating the risks associated with work activities

That the expectation for safety compliance is meeting and exceeding all applicable OSHA Laws, Regulations, and Industry Best Practice.

Applicable requirements and standards include:

- (a) OSHA Standards and Regulatory requirements;
- (b) ANSI requirements;
- (c) NFPA Standards and requirements;
- (d) NEOM Minimum Standards
- (e) Saudi Building Codes
- (f) International Building Codes

*If requirements of this document conflict with requirements set by another regulatory authority, Contractor are required to follow the more stringent requirement.*

## 4 List of Definitions

Table 1 : Table of Definitions

Terms	Definitions
NEOM Co	NEOM Company
Client	NEOM Sector /Department responsible for management and oversight of the Contractor
Employer	The person or organisation that employs personnel to complete the work
Contractor	The organisation contracted to carry out the works
General Workplace Amenities	Often also referred to as "Welfare Facilities" include but not limited to; Toilets, hand basins with soap and towels, hand-dryer; drinking water; A place to store clothing, changing rooms, restrooms/canteens
Safety Management System (SMS)	Occupational Health and Safety Management System established by NEOM in compliance to ISO 45001 Standard

## 5 List of Abbreviations

Table 2 : Table of Abbreviations

Abbreviations	Descriptions
SMS	Safety Management System
NMS	NEOM Minimum Standard
SOP	Standard Operating Procedure
ANSI	American National Standards Institute
NFPA	National Fire Prevention Association
CPP	Construction Phase Plan
OSHA	Occupational Health and Safety Administration.
PPE	Personal Protective Equipment
SASO	Saudi Standards, Metrology and Quality Organization
IBC	International Building Codes
OHS	Occupational Health and Safety

## 6 Related NEOM Documents

Table 3 : Related NEOM Documents

Document Code	Document Name
NEOM Element 2	Risk & Opportunity Management
NEOM Element 4	Personal Safety
NEOM-Element 5	Training, Awareness and Competency.
NEOM-Element 6	Contractor Management
NEOM-SMS	Neom Safety Management System
NEOM-NLF-SM	Safety Management Manual - Roles and Responsibilities
NEOM-NLF-PRC-006;	Occupation Health Safety and Fire Safety requirements for Contractor
NEOM-NLF-PRC-006- Section 2	ISO 14001 Cross Reference Table
NEOM-NLF-NMS 006.01	SMS Organisation, Practitioner Registration and Appointment of Contractor
NEOM-NLF-NMS-006.002 Safety	Construction Management Plan (CPP)
NEOM-NLF-NMS-006.007	Working at Height
NEOM-NLF-NMS-006.012	Barricading of Hazards
NEOM-NLF-NMS-006.013	Safety Signage and Signals
NEOM-NLF-NMS-006.021	Personal Protective Equipment (PPE)

## **7 Roles and Responsibilities**

### **7.1 Client**

- 7.1.1 General Health and Safety roles and responsibilities are defined in; and shall be carried out in accordance with the requirements of NEOM-NLF-SM–Safety Management Manual - Roles and Responsibilities.
- 7.1.2 The Client is responsible for ensuring that NEOM Safety Commitment Statement and safety management system are properly applied within their areas of control/responsibility. Effective implementation will ensure compliance with relevant legislative requirements and will help promote the use of industry best safe working practices.
- 7.1.3 Must provide, so far as is reasonably practicable, adequate facilities for the welfare of employees at any workplace under the company's management and control.
- 7.1.4 The same duty is owed to independent contractors and their employees who are working at the workplace, but only for matters over which the Client has, or should have, control.
- 7.1.5 That a suitable, Pre-Tender Health and Safety Plan has been developed and issued to Contractor to ensure they have all the information necessary (including welfare requirements) to make informed decisions when developing the Construction Phase Health and Safety Plan (NEOM-NLF-NMS-006.002 Safety Construction Management Plan) (CPP) which will form part of the Contractor review and selection process
- 7.1.6 That the selection of Contractor shall be undertaken in accordance with NEOM's policies and procedures (NEOM-Element 6-Contractor Management). To ensure that only Competent organisations capable of meeting the requisite safety standards associated with project are contracted.
- 7.1.7 Conduct regular safety and welfare assurance reviews to provide the confidence level required that the safety management system is delivering as planned, and consistently achieves the acceptable level of safety. Including:
  - (a) Safety performance and welfare arrangements monitoring and measuring;
  - (b) Managing change;
  - (c) Continuous improvement.

### **7.2 Contractor**

- 7.2.1 Contractor shall undertake their roles and responsibilities in accordance with the general requirements of NEOM–NLF-SM–Safety Management Manual-Roles and Responsibilities
- 7.2.2 Must provide, so far as is reasonably practicable, adequate facilities for the welfare of employees at any workplace under the company's management and control.
- 7.2.3 The same duty is owed to independent sub-contractors
- 7.2.4 and their employees who are working at the workplace, but only for matters over which the Contractor has, or should have, control.
- 7.2.5 That all work activities are assessed, planned, organized, and that suitably competent Supervision is available to implement the safety requirements and oversee the work (Refer: NEOM- Element 5 – Training, Awareness and Competency)
- 7.2.6 Ensure persons appointed to manage /oversee work operations have the skills, knowledge, experience and, where relevant, the organisational capability to plan and manage work safely and without risk to those who may be affected by the activities (Refer: NEOM Element 5 Training, Awareness, and Competence).

- 7.2.7 Ensure employees carrying out the work are trained to recognize the associated hazards and understand the processes and procedures to control or minimize the risks.(Refer: NEOM Element 2 Risk and Opportunity)
- 7.2.8 That all equipment including personal protective equipment required for use is fit for purpose, and (as required) has been inspected by a competent person and inspection records are maintained and readily available (Refer: NEOM-NLF-NMS-006.021 Personal Protective Equipment (PPE))
- 7.2.9 Maintaining control of access to dangerous or high-risk areas or equipment using suitable barricades that are in serviceable condition (Refer: NEOM-NLF-NMS-006.012 – Barricading of Hazards)
- 7.2.10 Contractor shall ensure the general welfare of all employees is met. This includes ensuring, as required, employees have access to:
- (a) Prayer room / mosque;
  - (b) Appropriate facilities for eating;
  - (c) Clean and sanitary bathrooms; and
  - (d) Changing rooms (where required).

7.2.11 To ensure requirements are in place and adequately maintained the Contractor shall develop a system for routine inspections of the facilities and worksites.

### **7.3 Employee**

- 7.3.1 Shall undertake their roles and responsibilities in accordance with the general requirements of NEOM-NLF-SM – Safety Management Manual - Roles and Responsibilities.
- 7.3.2 Report any activity or defect relating to the work or facilities which they believe is reasonably foreseeable to endanger their safety or that of another person's.
- 7.3.3 Shall use equipment, safety devices and welfare facilities provided for the work by the Contractor in accordance with any training or instruction received. (Refer NEOM-NFL-NMS-006.021 Personal Protective Equipment)
- 7.3.4 Employees shall follow procedures set by the Contractor to keep the facilities and worksite free from safety and health hazards.

### **7.4 Specific Responsibilities**

- 7.4.1 Sector, Organization, Department or Contractor Head is responsible in ensuring that provisions are made the safe systems of work to prevent and minimize risks in each workplace
- 7.4.2 Safety Practitioner/Coordinator is responsible to monitor the implementation of this procedures and document its effectiveness
- 7.4.3 The Responsible Person will support this procedure and ensure that any Contractor Organization working for, or on behalf of, the Sector, Organization, Department or Contractor will comply with the requirements of these procedures
- 7.4.4 Line Managers / Supervisors are responsible for training their workers in risks
- 7.4.5 The LP & FS Public Safety department will support the NEOM risk assessments by carrying out compliance checks and supporting and guiding the various safety teams.

## **8 Other Sections related to subject**

### **8.1 Housekeeping**

- 8.1.1 All places of employment including, passageways, storerooms, and service rooms shall be kept clean and orderly and in a sanitary condition.
- 8.1.2 The floor of every workroom shall be maintained in a clean and so far as reasonably practicable, dry condition. Where wet processes are used, drainage shall be maintained and false floors, platforms, mats, or other dry standing places shall be provided.
- 8.1.3 Workspaces shall be free from biological and chemical hazards. Where biological and chemical hazards exist as a necessary part of operational processes Contractor shall ensure a risk assessment has been performed and appropriate control measures have been implemented. (Refer: NEOM Element 2 Risk and Opportunities)
- 8.1.4 Bathrooms shall be cleaned and serviced regularly, depending on use, to maintain a clean and sanitary environment.
- 8.1.5 Workspaces shall be free from excessive storage of paper, materials, and trash that could cause health issues, create fire hazards, or promote infestations of rodents and pests.
- 8.1.6 If rodent and pest infestation is suspected, Contractor shall hire a licensed exterminator to evaluate the worksite and take appropriate actions.

### **8.2 Aisles and Passageways**

- 8.2.1 Where mechanical handling equipment is used, appropriate safe clearances shall be allowed for aisles, at loading docks, through doorways, and wherever turns or passages shall be made.
- 8.2.2 Aisles and passageways shall be kept clear and in good repairs, with no obstruction across or in aisles that could create a hazard.
- 8.2.3 Aisles and passageways shall be wide enough to allow emergency egress. The minimum width shall not be less than 90cm.
- 8.2.4 Covers and/or guardrails shall be provided to protect employees from the hazards of holes in floors, open pits, tanks, vats, ditches, etc.
- 8.2.5 Every wall opening that has a drop that could cause an injury shall be guarded by a rail, roller, fence, half door, or equivalent barrier.
- 8.2.6 Where aisles and passageways are at a height where employees could walk or work below them, toe boards shall be provided to prevent tools and equipment from falling. Toe boards shall be a minimum of 15 cm in height.

### **8.3 Floor Loading and Shelf Loading Protection**

- 8.3.1 In every building or other structure, or part thereof, used for mercantile, business, industrial, or storage purposes shall have the approved loading identified in a visible location.

### **8.4 Windows, Skylights, Ventilators and Transparent or Translucent Doors**

- 8.4.1 Every window or other transparent or translucent surface in a wall or partition and every transparent or translucent surface in a door or gate shall, where necessary for reasons of health or safety, be made of safety material or be protected against breakage.
- 8.4.2 For transparent or translucent doors and windows that are larger than two meters in height and one meter in width, they shall be appropriately marked or incorporate features to make it apparent that it is not a passageway.

- 8.4.3 No window, skylight or ventilator shall be capable of being opened, closed, or adjusted in a manner which exposes any person performing such operation to a risk to health or safety.
- 8.4.4 No window, skylight or ventilator shall be in a position when open which is to expose any person in the workplace to a risk to health or safety.
- 8.4.5 If a skylight is located on a walking/working surface, or on a roof where someone could walk (e.g., flat roof or low slope roof), the skylight shall be guarded by a standard skylight screen or a fixed standard railing on all exposed sides.
- 8.4.6 All windows and skylights in a workplace shall be of a design or be so constructed that they may be cleaned safely. (Refer: NEOM-NLF-NMS-006.007 Working at Height)

## **8.5 Heating, Ventilation, and Air Conditioning (HVAC)**

- 8.5.1 HVAC systems shall be designed for the specific use intended and all outdoor air and recirculated air is filtered to remove contaminants.
- 8.5.2 Contractor or building owners shall ensure HVAC systems are serviced regularly, to include replacing filters according to manufacturer's specifications.
- 8.5.3 During work hours, the temperature in all workplaces inside buildings shall be reasonable. If temperatures exceed 35 degrees Celsius, Contractor shall implement a heat stress program as required by NEOM-Element 4 - Personal Safety
- 8.5.4 Fresh air intakes for HVAC systems shall be in a place that shall not pull in environmental contaminates such as vehicle exhaust, noxious fumes, unpleasant smells, or chemical contaminants.
- 8.5.5 An evaluation shall be completed at the worksite to determine the amount of outdoor air that shall be mixed with recirculation of filtered air for HVAC systems.
- 8.5.6 As a minimum, HVAC systems shall be designed to allow for 15 cubic feet of per minute (CFM) of outdoor air to be mixed with the recirculation of filtered air. For areas where contaminants, such as people smoking, degrade the quality of recirculated air, a minimum of 20 cubic feet per minute (CFM) of outdoor air shall be mixed with the recirculation of filtered air.
- 8.5.7 An evaluation shall be completed at the worksite to determine the amount of air changes per hour that is required for HVAC systems. At a minimum, the following air changes per hour shall be set for HVAC systems:

*Table 4 Air Changes Per Hour for HVAC Systems*

Type of Room	Number of Air Changes Per Hour
Office / general work area	4-6 air changes per hour;
Meeting rooms	7-10 air changes per hour
Commercial kitchens	20-60 air changes per hour
Public bathrooms	6 air changes per hour
laboratories	6 - 12 air changes per hour
gas and/or chemical /industrial process	10 air changes per hour
Garages	6-10 air changes per hour.

## **8.6 Lighting**

- 8.6.1 Workplaces shall be lighted to a minimum of the illumination intensities shown in Table 5.

*Table 5: Illumination Intensities*

Room Type	Illumination Intensities
Offices, General Work Areas, First Aid Stations, and Medical Treatment Centres	30 Foot Candles (382.5 Lux);
Bathrooms, Dining Halls, Mechanical and Electrical Equipment Rooms, Carpenter Shops, General Construction Plant and Shops (E.G., Batch Plants, Screening Plants, and Active Storerooms)	10 Foot-Candles (127.5 Lux);
Access Ways, Storage Areas, Warehouses, Refueling, Maintenance Areas, and Loading Platforms	5 Foot-Candles (62.85 Lux);
General Construction Sites, Concrete Placement, Excavation, Tunnels, Shafts, and Underground Work Areas	5 Foot-Candles. (62.85 Lux);

**Note:** One Foot-Candle ≈ 12.57 lux.

## **8.7 Room Dimensions and Space**

- 8.7.1 A risk assessment shall be undertaken to determine the amount of space needed for a work area to ensure safe access and egress and appropriate room to perform tasks safely.
- 8.7.2 Workplaces shall have a minimum of 10m<sup>3</sup> per person and a minimum ceiling height of 2.5 meters.
- 8.7.3 Work areas that include a desk and chair shall have a clearance of 90cm from behind the desk to any obstruction. If there is a walkway behind the person working, or other work being completed, than the space behind the desk shall be a minimum of 1 meter to the nearest obstruction.
- 8.7.4 Appropriate space is required to enable storage facilities such as filing cabinets, cupboards, and bookcases to be used without excessive bending or twisting. Appropriate storage facilities shall be provided so that heavy and frequently used items can be stored between the employee's standing knee and shoulder height. A minimum clearance of 1.2 m is recommended.

## **8.8 Drinking Water (Potable Water)**

- 8.8.1 An adequate supply of drinking water shall be provided for all persons at work in the workplace in compliance with the Saudi Standards, Metrology and Quality Organization (SASO) Water quality standards.
- 8.8.2 Every supply of drinking water shall be readily accessible at appropriate places and conspicuously marked with an appropriate sign where necessary. (Refer: NEOM-NLF-NMS-006.013 Safety Signage and Signals)
- 8.8.3 Where a supply of drinking water is required, there shall also be provided an appropriate number of appropriate cups or other drinking vessels unless the supply of drinking water is in a jet form which the person can drink easily.
- 8.8.4 Drinking water dispenser shall be cleaned daily.
- 8.8.5 Common / shared drinking cups, water bottles, or other such devices are not allowed.

## **8.9 Sanitary Conveniences (Bathrooms)**

- 8.9.1 Appropriate sanitary conveniences shall be provided at readily accessible places and designed to meet the requirements of this NMS.

8.9.2 Sanitary conveniences shall:

- (a) Be well ventilated and lit;
- (b) Kept in a clean and orderly condition;
- (c) Be well maintained and operational;
- (d) Have floors made of a non-slip surface;
- (e) Have at least one facility for the physically handicapped; and
- (f) Have separate rooms for men and women and a door of which is capable of being secured from the inside.

8.9.3 Portable sanitary facilities shall be provided for temporary workplaces and construction workplaces. Facilities shall include toilet facilities and hand washing facilities and the facilities shall be cleaned on a regular basis to maintain a sanitary condition.

8.9.4 Public toilet and washing facilities shall only be used as a last resort and if they are convenient to the worksite.

## **8.10 Washing Facilities**

8.10.1 Appropriate washing facilities, including showers if required by the nature of the work or for health reasons, shall be provided at readily accessible places, no sharing of towels or sponges etc will be allowed.

8.10.2 Washing facilities shall:

- (a) Be provided in the immediate vicinity of every sanitary convenience, whether provided elsewhere as well;
- (b) Include a supply of clean hot and cold water (which shall be running as far as reasonably practicable);
- (c) Include soap and towels or other appropriate means of drying;
- (d) Be ventilated and well lit;
- (e) Have floors made of a non-slip surface;
- (f) Be kept in a clean and orderly condition; and
- (g) Be well maintained and operational.

8.10.3 Shower facilities shall:

- (a) Have separate facilities and changing rooms for men and women;
- (b) Include a supply of clean hot and cold water;
- (c) Include soap or other appropriate means of cleaning;
- (d) Include clean towels or other appropriate means of drying;
- (e) Be ventilated and well lit;
- (f) Be kept in a clean and orderly condition; and
- (g) Be well maintained and operational.

## **8.11 Training and Competency**

8.11.1 Contractor shall ensure that training complies with the requirements of:

- (a) NEOM Element 5 – Training, Awareness and Competency.

- (b) NEOM-NLF-NMS 006.001 – Organisation, Safety Practitioner Registration and Appointment of Contractor

8.11.2 Contractor shall, as a minimum, train their employees on:

- (a) Common hazards in the workplace;
- (b) Requirements set by the Contractor to prevent occupational injuries and illnesses; and
- (c) Housekeeping and general amenity requirements. (e.g., trash disposal, cleaning workspaces, preventing chemical exposures, etc.).

## 9 Appendices

### 9.1 Appendix A: Forms, Signs and Checklists



## 9.2 Appendix B: Audit Criteria

Audit Criteria		Requirements	Verification	Area of Concern
ISO 45001:2018 Clause	NMS Ref.			Yes/ No
5.3	7.1.2	NEOM health and safety policy and safety management system are properly applied within their areas of control/responsibility		
6.1	7.1.5	Pre-Tender Health and Safety Plan has been developed and issued to Contractor		
5.3, 8.1.4.2	7.1.6	Selection of Contractors undertaken in accordance with NEOM's policies and procedures		
6.1.2.2		Assessment of the various risks shall be undertaken		
6.1.2.3		Hazards Identification Plan (HIP)		
9.0	7.1.7	Conduct regular safety and welfare assurance reviews to provide the confidence level		
7.2	7.2.4 (b, c)	Persons appointed to manage /oversee work operations have the skills, knowledge, experience		
8.1.2 (e)	7.2.4 (d)	Personal protective equipment required for use are fit for purpose		
8.1.2 (c, d)	7.2.2 (e)	Control of access to dangerous or high-risk areas or equipment using suitable Barricades and Signage		
10.2		Incident investigations and nonconformities reviews		
6.1.2	8.0	Places of employment including, passageways, storerooms, and service rooms shall be kept clean and orderly and in a sanitary condition		
6.1.2	8.5	HVAC systems shall be designed for the specific use intended and all outdoor air and recirculated air is filtered to remove contaminants		
6.1.2	8.6	Workplaces shall be lighted to a minimum of the illumination intensities shown		
6.1.2	8.7	Determine the amount of space needed for a work area to ensure safe access and egress and appropriate room to perform tasks safely		
6.1.2	8.8	Adequate supply of drinking water shall be readily accessible at appropriate places and conspicuously marked with an appropriate sign where necessary		
6.1.2	8.9, 8.10	Appropriate sanitary conveniences, washing facilities including showers shall be provided at readily accessible places		
7.2	8.11	Training and Awareness of employees on: (d) Common hazards in the workplace; (e) Requirements set by the Contractor to prevent occupational injuries and illnesses; and		

Audit Criteria		Requirements	Verification	Area of Concern
ISO 45001:2018 Clause	NMS Ref.			Yes/ No
		(f) Housekeeping and general amenity requirements. (e.g., trash disposal, cleaning workspaces, preventing chemical exposures, etc.).		

### **9.3 Appendix C: Guidance Information**

'Welfare facilities' are those that are necessary for the well-being of your employees, such as washing, toilet, rest and changing facilities, and somewhere clean to eat and drink during breaks

Under OSHA Every worker of a construction site is entitled to welfare facilities provided by his employer. Welfare is a basic necessity for workers and required by the law. The employer should consider at the planning and preparation phases the availability of welfare facilities, their location on site and how they will be maintained.

OSHA requires employers to provide all workers with sanitary and immediately available toilet facilities (restrooms). The sanitation standards (29 CFR 1910.141, 29 CFR 1926.51 and 29 CFR 1928.110) are intended to ensure that workers do not suffer adverse health effects that can result if toilets are not sanitary and/or are not available when needed.

Employers, under OSHA regulations, must:

Allow workers to leave their work locations to use a restroom when needed. Provide an adequate number of restrooms for the size of the workforce to prevent long lines. Avoid imposing unreasonable restrictions on restroom use. Ensure restrictions, such as locking doors or requiring workers to sign out a key, do not cause extended delays

In the UK the workplace (Health, Safety and Welfare) Regulations 1992 cover a wide range of basic health, safety and welfare issues and apply to most workplaces (except those involving construction work on construction sites, those in or on a ship, or those below ground at a mine).

On the UK HSE Web site, they provide in INDG 293 Welfare at work - Guidance for employers on welfare provisions

Workplace health, safety, and welfare. Workplace (Health, Safety and Welfare) Regulations 1992. Approved Code of Practice and guidance L 24 gives all of the requirements the employer should provide for the workers and publication CIS 59 gives details regarding Provision of welfare facilities during construction work



نیوم NEOM

**NEOM OCCUPATIONAL HEALTH and SAFETY  
NEOM MINIMUM STANDARD  
for  
WORKING ON OR ADJACENT TO A ROAD**

NEOM-NLF-NMS-006.041 Rev 02.00 – February 2022

©NEOM [2021]. All rights reserved.

## Document History

Revision code	Description of changes	Purpose of issue	Date
Rev 00.00	First Issue	Issued for Implementation	27/07-2020
Rev 02	Sector Review	Issued for Implementation	01-02-2022

## Document Approval

	Prepared by	Reviewed by	Approved by
Name	Robert Murphy	Talal Al Anazi	Adel Wuhaib
Job Title	Loss Prevention Specialist LP/FS -Public Safety	Director, Loss Prevention/Fire Safety (LP/FS) Public Safety	Executive Director Public Safety



## Contents

<b>1</b>	<b>PURPOSE .....</b>	<b>5</b>
<b>2</b>	<b>SCOPE .....</b>	<b>5</b>
<b>3</b>	<b>EXPECTATIONS.....</b>	<b>5</b>
<b>4</b>	<b>LIST OF DEFINITIONS .....</b>	<b>6</b>
<b>5</b>	<b>LIST OF ABBREVIATIONS .....</b>	<b>6</b>
<b>6</b>	<b>RELATED NEOM DOCUMENTS.....</b>	<b>7</b>
<b>7</b>	<b>ROLES AND RESPONSIBILITIES .....</b>	<b>7</b>
7.1	Client .....	8
7.2	Contractor .....	8
7.3	Employee .....	9
<b>8</b>	<b>OTHER SECTIONS RELATED TO SUBJECT .....</b>	<b>9</b>
8.1	Road Works Defined .....	9
8.2	Planning and Assessment.....	10
8.3	Traffic Control Plans (TCP) .....	10
8.4	Major Roadwork Sites.....	11
8.5	Roadwork Hazards and Controls.....	12
8.6	Incidents Involving Members of the Public.....	12
8.7	Vehicle and Plant Incidents .....	13
8.8	Burns and Fire Risks .....	13
8.9	Health Risks.....	13
8.10	Protective Clothing and Equipment .....	14
8.11	Fuels .....	15
8.12	Fire Extinguishers .....	15
8.13	Traffic Diversions.....	15
8.14	Safety Zones.....	16
8.15	Working Space .....	16
8.16	Buffer Zones.....	16
8.17	Traffic Barriers.....	16
8.18	Cones.....	17
8.19	Advance Signage .....	17
8.20	Lamps .....	18
8.21	Pedestrians.....	18
8.22	Night Work.....	18
8.23	Training and Competency .....	19
<b>9</b>	<b>APPENDICES .....</b>	<b>20</b>

9.1	Appendix A: Forms and Checklists .....	20
9.2	Appendix B: Audit Criteria.....	21
9.3	Appendix C: Guidance Information.....	23

## List of Tables

Table 1 : Table of Definitions.....	6
Table 2 : Table of Abbreviations.....	6
Table 3 : Related NEOM Documents .....	7
Table 4: Positioning of Signs and Cones.....	17

## **1 Purpose**

This NEOM Co. SMS Minimum Standards (hereafter referred to as NMS) relates to the management of all occupational health, safety (OHS) risks associated with Working on or Adjacent to Roads.

It provides guidance to support compliance with industry best practice and international regulatory safety requirements to ensure that the associated risks are assessed, and control measures are implemented in accordance with the hierarchy of risk controls.

It has been developed to align with the requirements of the ISO 45001 Health and Safety Management Manual (Refer NEOM-NLF-PRC-006- Section 2 ISO 14001 Cross Reference Table)

## **2 Scope**

This NMS applies to all personnel within NEOM and any Contractors working for NEOM and or associated projects and activities. It is designed to incorporate requirements set by the NEOM-SMS.

It establishes the standards and requirements to manage the risks associated with road works, as applied to both new highway construction works and the reconstruction or resurfacing of existing highways,

## **3 Expectations**

To ensure the occupational health and safety of all personnel, protection of assets (services, plant/equipment) and the environment

NEOM expect each Sector, Organization, Department or Contractor to ensure that risks associated with work are controlled in accordance with the hierarchy of risk controls: elimination, substitution, engineering controls, administrative controls, and personal protective equipment.

Consideration shall be given to technological advances that may introduce new means of controlling or eliminating the risks associated with work activities.

That the expectation for safety compliance is meeting and exceeding all applicable OSHA Laws, Regulations, and Industry Best Practice.

Applicable requirements and standards include:

- (a) OSHA Standards and Regulatory requirements;
- (b) ANSI requirements;
- (c) NFPA Standards and requirements;
- (d) NEOM Minimum Standards
- (e) Saudi Building Codes
- (f) International Building Codes

*If requirements of this document conflict with requirements set by another regulatory authority, Contractor are required to follow the more stringent requirement.*

## 4 List of Definitions

Table 1 : Table of Definitions

Terms	Definitions
NEOM Co	NEOM Company
Traffic Control Plan	TCP
Client	NEOM / Department
Employer	The person or organisation which employs personnel to complete the work
Contractor	The organisation contracted to carry out the works
Road Works	The general term used in this NMS for activities of working on or adjacent to a road
Competent Person	A person with the skills, knowledge, experience and, where relevant, the organisational capability to plan and manage work safely and without risk to those who may be affected by the activities
Safe System of Work	is a formal procedure based on a systematic examination of work in order to identify the hazards . It defines safe methods of working which eliminate those hazards or minimize the risks associated with them.
Safety Management System (SMS)	Occupational Health and Safety Management System established by NEOM in compliance to ISO 45001 Standard

## 5 List of Abbreviations

Table 2 : Table of Abbreviations

Abbreviations	Descriptions
SMS	Safety Management System.
NMS	NEOM Minimum Standard
SOP	Standard Operating Procedure
ANSI	American National Standards Institute
NFPA	National Fire Prevention Association
ASHRAE	American Society of Heating, Refrigerating and Air-Conditioning
OSHA	Occupational Safety and Health Administration.
CPP	Construction Phase Plan
COC	Certificate of Completion
NOC	No Objection Certificate
TCP	Traffic Control Plan
SSoW	A Safe System of Work
IBC	International Building Codes
OHS	Occupational Health and Safety

Abbreviations	Descriptions
---------------	--------------

## 6 Related NEOM Documents

Table 3 : Related NEOM Documents

Document Code	Document Name
NEOM Element 2	Risk and Opportunity Management
NEOM-Element 3	Control of Documented Information & Legal Compliance
NEOM-Element 5	Training, Awareness and Competency.
NEOM-Element 6	Contractor Management
NEOM Element 9	Emergency Planning and Response Management
NEOM-SMS	NEMO Safety Management System
NEOM-NLF-SM	Safety Manual - Roles and Responsibilities
NEOM-NLF-PRC-006- Section 2	ISO 14001 Cross Reference Table
NEOM-NLF-PRC-006;	Occupation Health, Safety and Fire Safety requirements for Contractors
NEOM-NLF-NMS-006.001	SMS Organisation, Practitioner Registration and Appointment of Contractor
NEOM-NLF-NMS-006.002	Safety Construction Management Plan
NEOM-NLF-NMS-006.003	Scaffolding
NEOM-NLF-NMS-006.007	Working at Heights
NEOM-NLF-NMS-006.012 –	Barricading of Hazards
NEOM-NLF-NMS-006.013	Safety Signage and Signals
NEOM-NLF-NMS-006.021	Personal Protective Equipment (PPE)
NEOM NLF- NMS-006.022	Occupational Noise
NEOM NLF- NMS-006 .023	Vibration
NEOM-NLF-NMS-006.024	Occupational Health Screening and Medical Surveillance
NEOM-NLF-NMS-006.029	First Aid and Medical Treatment
NEOM-NLF-NMS-006.040	General Workplace Amenities

## **7 Roles and Responsibilities**

### **7.1 Client**

- 7.1.1 General Occupational Health and Safety roles and responsibilities are defined in; and shall be carried out in accordance with the requirements of NEOM-NLF-SM – Safety Management Manual - Roles and Responsibilities.
- 7.1.2 The Client is responsible for ensuring that NEOM Safety Commitment Statement and safety management system are properly applied within their areas of control/responsibility. Effective implementation will ensure compliance with relevant legislative requirements and will help promote the use of industry best safe working practices.
- 7.1.3 That a suitable, Pre-Tender Health and Safety Plan has been developed and issued to Contractors to ensure they have all the information necessary to make informed decisions when developing the Construction Phase Health and Safety Plan (NEOM-NLF-NMS-006.002 Safety Construction Management Plan) which will form part of the Contractor review and selection process
- 7.1.4 That the selection of Contractors shall be undertaken in accordance with NEOM's policies and procedures (NEOM-Element 6 - Contractor Management). To ensure that only Competent organisations capable of meeting the requisite safety standards associated with project are contracted.
- 7.1.5 Conduct regular Contractor safety assurance reviews to provide the confidence level required that the safety management system is delivering as planned, and consistently achieves the acceptable level of safety. Including:
  - (a) Safety performance monitoring and measuring;
  - (b) Managing change;
  - (c) Continuous improvement.

### **7.2 Contractor**

- 7.2.1 Contractor shall undertake their roles and responsibilities in accordance with the general requirements of NEOM-NLF-SM – Safety Management Manual -Roles and Responsibilities
  - (a) That all work activities are assessed, planned, organized, and that suitably competent Supervision is available to implement the safety requirements and oversee the work
  - (b) Ensure persons appointed to manage /oversee work operations have the skills, knowledge, experience and, where relevant, the organisational capability to plan and manage work safely and without risk to those who may be affected by the activities (Refer: NEOM Element 5 Training, Awareness, and Competence)
  - (c) Ensure employees carrying out the work are trained to recognize the associated hazards and understand the processes and procedures to control or minimize the risks.(Refer: NEOM Element 2 Risk and Opportunities Management)
  - (d) That all equipment including personal protective equipment required for use is fit for purpose, and (as required) has been inspected by a competent person and inspection records are maintained and readily available. (Refer: NEOM-NLF-NMS-006.021 Personal Protective Equipment)
  - (e) Maintain control of access to dangerous or high-risk areas or equipment using suitable Barricades and Signage that are in serviceable condition (Refer: NEOM-NLF-NMS-006.012 – Barricading of Hazards)
- 7.2.2 Contractors shall undertake their specific roles and responsibilities in accordance with the following:
  - (a) Ensure the appropriate planning of work on or around road works in accordance with this NMS;

- (b) Development and communication of a Traffic Control Plan for all works carried out on or adjacent to roads (Refer: Section 8.3 below)

### **7.3 Employee**

- 7.3.1 Shall undertake their roles and responsibilities in accordance with the general requirements of NEOM-NLF -SM – Roles and Responsibilities.
- (a) Report any activity or defect relating to the work which they believe is reasonably foreseeable to endanger their safety or that of another person's.
  - (b) Shall use appropriate equipment or safety devices provided for the work by the Contractor in accordance with any training or instruction received in the use of the work equipment. (Refer NEOM-NFL-NMS-006.021 Personal Protective Equipment)
- 7.3.1 Employees shall undertake their specific roles and responsibilities in accordance with the following:
- (a) Follow the safe work practices and operating procedures related to the Traffic Control Plan

### **7.4 Specific Responsibilities**

- 7.4.1 Sector, Organization, Department or Contractor Head is responsible in ensuring that provisions are made the safe systems of work to prevent and minimize risks in each workplace
- 7.4.2 Safety Practitioner/Coordinator is responsible to monitor the implementation of this procedures and document its effectiveness
- 7.4.3 The Responsible Person will support this procedure and ensure that any Contractor Organization working for, or on behalf of, the Sector, Organization, Department or Contractor will comply with the requirements of these procedures
- 7.4.4 Line Managers / Supervisors are responsible for training their workers in risks
- 7.4.5 The LP & FS Public Safety department will support the NEOM risk assessments by carrying out compliance checks and supporting and guiding the various safety teams.

## **8 Other Sections related to subject**

### **8.1 Road Works Defined**

- 8.1.1 The term "Road works" is the general term used in this NMS for activities of working on or adjacent to a road. Road works includes:
- (a) Any construction work which involves the opening, excavating, or breaking up of the road, work carried out adjacent to the road, or the road is obstructed by plant/equipment or by materials during the course of the work.
  - (b) The use of heavy plant and equipment to transport or maneuver site materials
  - (c) The use of road surfacing materials:
    - I. Soil
    - II. Stone Aggregates: ...
    - III. Bituminous Materials: ...
    - IV. Cement, Cement Mortar and Cement Concrete:
- 8.1.2 The planning and set-up of traffic manage controls

## **8.2 Planning and Assessment**

8.2.1 Contractor shall ensure the following:

- (a) An assessment of the various risks shall be undertaken, in consultation with the personnel in control of the work and communicated to those responsible for carrying out the work (Refer: NEOM Element 2 Risk and Opportunity Management)
- (b) Safe Systems of Work shall be established which are safe to all parties involved or affected including the public;
- (c) That effective Procedures, Method Statements and Control Measures are in place, and are implemented to manage activities safely and without risk to health;
- (d) That the management of road works general requirements are included in the Pre-Tender Safety and Health Plan in accordance with NEOM-NLF-NMS-006.002 – Safety Construction Management Plan (CPP)
- (e) That associated safe systems of work and site rules are included in the Occupational Safety and Health Construction Management Plan (NLF NMS-006.02-CPP) in accordance with NEOM-ELEMENT 6 Contractor Management

8.2.2 Contractor shall ensure that planning and design is developed in accordance with the relevant Department / Authority requirements, design manuals and instructions and the relevant No Objection Certificate (NOC) and Certificate of Completion (COC) are to be obtained.

8.2.3 When planning roadwork, Contractor shall consider if there are specific roadwork related risks such as:

- (a) Pedestrian access and private properties requiring vehicular access where these shall always be maintained;
- (b) If any underground services are present;
- (c) Where work is planned which involves breaking up or opening any road or any sewer drain or tunnel under it; this shall be specified on the notice of intent and approval shall be given by all relevant authorities before commencing works;
- (d) Any part of the road to be obstructed by plant or materials shall be appropriately signed and guarded, paying regard to the needs of the disabled; (Refer: NEOM-NLF-NMS-006.012 - Barricading of Hazards and NEOM-NLF-NMS-006.013 Safety Signage and Signals)
- (e) Works shall be Supervised by a suitably qualified person. An appointed Competent Operative shall be on site at all times;(Refer: NEOM-Element 5 Training, Awareness and Competence)
- (f) It is important that the workforce is given appropriate induction training before beginning road works; and
- (g) Visitors shall be given appropriate instruction on relevant hazards before entering the works area and be accompanied by a trained person.

## **8.3 Traffic Control Plans (TCP)**

8.3.1 Contractor shall ensure a Traffic Control Plan (TCP) is developed for all work performed within the public right-of-way which includes:

- (a) The sequence of the Construction operations;
- (b) The Construction to be performed;
- (c) Schedule of activities;
- (d) Traffic routes that will be utilized during each phase of construction.

8.3.2 Consideration shall be given to technological advances that may introduce new means of controlling or eliminating the risks associated with work activities. Examples include:

*Road traffic simulation software to provide detailed analysis: Assessing roadway capacity and throughput and evaluating traffic congestion level and provide highway planning and schematics.*

8.3.3 A Site traffic control assessment shall be carried out by a Competent Person taking into consideration:

- (a) Traffic conditions, such as major or minor road; high or low speed road; residential, commercial, or rural location; peak-hour traffic flows;
- (b) Road type and conditions (e.g., Divided, number of lanes, near or at an Intersection);
- (c) Road layout (uphill, downhill, work near a curve or a crest);
- (d) Reasonably foreseeable weather conditions and visibility;
- (e) Time of the day (e.g., lighting conditions, different traffic flows);
- (f) Extent of the disruption caused by the work (e.g., Number of lanes to be closed, how many are left open, if the work involves closing the footpath, whether parking is affected); and
- (g) Work zone activities along the running traffic shall be assessed according to method statements.

8.3.4 The TCP site layout and sequence of work shall:

- (a) Allow road traffic to be safely guided through, around or past the work area;
- (b) Keep traffic delays and disruptions to a minimum; and
- (c) Provide safe pedestrian access around or past the work site.

## **8.4 Major Roadwork Sites**

8.4.1 On major roadwork sites, such as on highways, designers shall consider safety during construction and ensure that a safe method of construction is identified, covering the workforce, others involved in the project and members of the public.

8.4.1 Consideration shall be given to utilizing new technological advances that may introduce new means of controlling or eliminating the risks associated with work activities. Examples: Traffic engineering and transportation planning tool for simulating and managing road traffic system

8.4.2 Designers shall avoid difficult space limitations wherever reasonably practicable. Appropriate space is required for lateral and longitudinal safety zones, for the working area, for buffer zones and for efficient traffic management systems.

8.4.3 Contractor shall provide suitable barriers for buffer and safety zones according to the running traffic speed (plastic or concrete barriers). In certain circumstances, where there is a high risk to employees from highway traffic the use of concrete barriers may be required. (Refer: NEOM-NLF-NMS-006.012 Barricading of Hazards)

8.4.4 Contractor shall ensure that appropriate space is provided for:

- (a) Access for site transport;
  - I. where reasonably practicable, well signed lead-in and lead-out coned off lanes shall be provided for site transport. (Refer: NEOM-NLF-NMS-006.012 Barricading of Hazards and NEOM-NLF-NMS-006.013 Safety Signage and Signals)
- (b) Access for emergency services;
  - I. Where reasonably practicable, a clear traffic lane shall be provided between the limits of the "working space" and the live traffic, for use by the emergency services;

- II. Where a clear lane cannot be provided, the site access lane will need to be used by emergency services and, in the event of an incident blocking the running lanes, traffic police may require the site access lane to be used by general traffic
  - III. Where a site access lane cannot be provided, it will be necessary for an access through the works area to be made available for use in an emergency. Refer: NEOM Element 9 Emergency Planning and Response Management)
- (c) Access across traffic lanes;
- I. Where works personnel need to get from one side of a traffic lane to the other a risk assessment shall be carried out to identify the safest means of crossing; (Refer: NEOM Element 2 Risk and Opportunities)
  - II. Where traffic volume is low and vehicle speeds are less than 80 km/h works personnel may cross via designated crossing points;
  - III. Busy and high-speed traffic lanes safe pedestrian access shall be introduced, such as the provision of temporary bridges, or an approved route for authorized vehicles to follow. Refer: NEOM-NLF-NMS-006.003 Scaffolding)

## **8.5 Roadwork Hazards and Controls**

8.5.1 Contractor shall ensure safe systems of work are established that include:

- (a) Vehicles and plant shall be equipped with high intensity reversing lamps and audible reversing alarm to alert workers to potential danger
- (b) Where reversing manoeuvres are a regular occurrence a banksman located towards the rear of the vehicle but within sight of the driver shall be utilised;
- (c) To enable works to proceed smoothly on heavily used roads, consideration shall be given to:
  - I. Working during light traffic flows only;
  - II. Working at night; and working at weekends.
- (d) When works are being carried out on a road open to traffic, two-way working of traffic flows shall be maintained whenever reasonably practicable; Minimum widths recommended are 2.75 meters for one-way working and 5.5 meters for two-way working;
- (e) Approved speed limits for the work area shall be appropriately posted (km/h);
- (f) Vehicles and plant shall be secure and immobilised when not in use.

## **8.6 Incidents Involving Members of the Public**

8.6.1 Contractors shall ensure safe systems of work are established that include

- (a) Control measure implemented to maintain both site safety and security both during and outside working hours to reduce the risk of accidents to the public;
- 8.6.2 Control measures for public drivers shall include the implementation of advance warning signs, for road works together with an appropriate traffic control system.
- 8.6.3 Control measures for pedestrians shall include clear identification/signage showing designated safe crossings

## **8.7 Vehicle and Plant Incidents**

- 8.7.1 Contractor shall ensure that safe systems of work are developed to minimise the risks associated with vehicles and plant that include:
- (a) The risks when vehicles or plant are moving or working alongside pedestrians including members of the public on any road works site. Hazards under this heading fall into two general categories:
  - (b) The traffic incident type where a pedestrian is run over by plant or a vehicle; and
  - (c) The machinery/operative type of incident where injury is caused by the operation of the plant, vehicle, or machinery such as in the case of being struck by the bucket of an excavator.
- 8.7.2 To control these risks Contractor shall provide a clear segregation area where reasonably practicable or provide a banksman where this is not the case. The preferred option shall be to provide dummy flagger instead of an employee.

## **8.8 Burns and Fire Risks**

- 8.8.1 Contractor shall ensure safe systems of work are established that shall include:
- (a) Control measures for bituminous materials that are supplied and used in hot form. This includes hot rolled asphalt which is supplied at a temperature in the region of 135°C and liquid bitumen for surface dressing at 150°C, for which burns can easily occur;
  - (b) Control measures for machinery and hand tools used to lay hot bituminous materials or to heat existing road surfaces;
  - (c) Control measures to prevent the overheating of bitumen or tar boilers and the control measures implemented to control the fire risks associated with fuels such as diesel and LPG; and
  - (d) Control measures for skin contact with LPG which can give cold burns, and cement, when wet, in the form of concrete or mortar which can cause serious burns. (Refer: NEOM-NLF-NMS-006.029 First Aid and Medical Treatment)

## **8.9 Health Risks**

- 8.9.1 Contractor shall ensure safe systems of work are established that include:
- (a) Control measures to protect personnel - operatives who use pitch, tar, or mineral oils, especially over a long period of time can develop a skin cancer in the form of cancerous warts. The danger arises where any of these materials are in frequent contact with the skin;
  - (b) Control measures that will be taken to screen for such conditions which may occur on the face, neck, hands, arms, or scrotum that can often be cured by early treatment; (Refer: NEOM-NLF-NMS-006.024 Occupational Health Screening and Medical Surveillance)
  - (c) Control measures where further hazards from prolonged and constant contact with these same materials and the contraction of dermatitis.

### **8.9.2 Eye Hazards**

Contractor shall ensure safe systems of work are established that include:

- (a) The specific eye hazards associated with the use of hot bitumen and epoxy resins; and
- (b) Control measures which are in accordance with NEOM-NLF-NMS-006.021 Personal Protective Equipment.

### **8.9.3 Falls**

- (a) Control measures required to manage specific work at height risks associated with road works;

- (b) Control measures required to manage the specific risk of falling from moving vehicles or plant; (Refer: NEOM-NLF-NMS-006.007 – Working at Heights).

#### 8.9.4 Noise & Vibration

- (a) Control measures where excessively noisy plant or other equipment is used whereby permanent damage to hearing can occur;
- (b) Control measures for the reduction of noise at source and the provision and use of hearing protection. However, Contractor shall consider that, if hearing protection is worn when working close to fast moving traffic, the risk of a traffic incident is increased; (Refer: NEOM NLF- NMS-006.022 – Occupational Noise and NEOM NLF- NMS-006 .023 Vibration ).

#### 8.9.5 Hazards from Overhead and Underground Services

Contractor shall ensure safe systems of work are established that include:

- (a) Control measures required where the presence of underground electricity cables and other services exist, particularly on existing roads;
- (b) The location and identification of all underground and overhead mains and cables which shall be established before works on site commence;
- (c) Control measures covering attention to electricity cables, both underground and overhead and to gas mains, water mains and telecoms;
- (d) Control measures required to verify the location of any given service main before commencing excavation works in the locality; (Refer: NEOM-NLF-NMS-006.008 – Overhead and Underground Services).

#### 8.9.6 Hazards from Dusts, Fumes and Smoke

Contractor shall ensure safe systems of work are established that include:

- (a) Control measures required for various dusts on roadwork sites including dust containing pitch, which is carcinogenic, cement dust which can cause lung scarring, burns and dermatitis and Silica dust which can cause silicosis; and
- (b) The assessment and monitoring of any dust, fume or smoke conditions as fumes and smoke from hot bituminous materials can cause discomfort, nausea and may lead to cancer.

#### 8.9.7 Personal Hygiene

Contractor shall ensure safe systems of work are established that include:

- (a) Transportable washing and toilet facilities which are provided on all sites to enable operatives to wash off bituminous materials, cement, or oils from the skin, especially before eating or using toilet facilities;
- (b) The provision of appropriate welfare facilities;
- (c) The arrangements for clean overalls for all employees involved with using solvents, bituminous materials, and epoxy resin; (Refer: NEOM-NLF-NMS-006.040 General Workplace Amenities).

### 8.10 Protective Clothing and Equipment

8.10.1 Contractor shall ensure all operatives handling bituminous materials or concrete, and all others working on roadwork sites shall always wear the following in accordance with NEOM-NLF-NMS-006.021 – Personal Protective Equipment:

- (a) Safety helmets: - Conspicuously coloured to make the wearer more visible to vehicle and plant operators. All site personnel shall always wear a safety helmet.
- (b) Safety boots: - with steel toecaps and with stout heat resisting soles.

- (c) High visibility clothing: - Essential to ensure that operatives are easily visible to all vehicle and plant drivers and to passing traffic.
  - (d) General covering/clothing: - Cover exposed parts of the body to prevent contamination of the skin with bituminous materials or concrete or cement;
- 8.10.2 If clothing becomes impregnated with any bituminous material or concrete or cement, it ceases to protect and may even cause the effects which it is intended to prevent as oils, bituminous materials and cement work their way through clothing on to the skin; and
- 8.10.3 All overalls, gloves shall be regularly cleaned to remove any contamination. In bad cases of saturation with bituminous material or cement, the only remedy is disposal and replacement.
- (a) Gloves: - Able to protect the wearer against heat, oil, tars, bitumen, and concrete.
  - (b) Eye protection: - For such operations as cutting out, grinding, spraying bitumen or tar. Eye protection shall include provision of eye wash facility to wash eyes in case of dust, chemical or foreign body enters the eyes.
  - (c) Hearing protection: - Noise from various sources can often be reduced by the provision of baffles or screens. - Noise from internal combustion engines can be reduced by the provision of silencers or replacement of defective ones.
  - (d) Dust masks and breathing apparatus: - Where working in confined sites such as a narrow road between tall buildings or in tunnels or underpasses; and if breathing apparatus is required, appropriate selection and training is required.

## **8.11 Fuels**

- 8.11.1 Contractor shall ensure safe systems of work are established that include:
- (a) Correctly storing fuels and limiting storage amounts wherever reasonably practicable;
  - (b) Implementation of a strict no smoking policy for all persons involved with roadwork;
  - (c) Taking measures to ensure leaks of any fuel are stopped quickly and effectively; and
  - (d) Keeping spill kits at convenient locations to deal with fuel spills. (Refer: NEOM Element 9 Emergency Planning and Response Management)

## **8.12 Fire Extinguishers**

- 8.12.1 Contractor shall ensure safe systems of work are established that include:
- (a) Providing appropriate fire extinguishers conveniently located throughout the area where roadwork is being carried out;
  - (b) Provision for all fuel storage areas with firefighting points;
  - (c) Maintaining fire extinguishers in all vehicles and plant used where road works are being carried out; (Refer: NEOM Element 9 - Emergency Planning & Response Management).

## **8.13 Traffic Diversions**

- 8.13.1 Contractor shall ensure that traffic diversions comply with any special requirements of the NEOM Traffic Department, as a minimum, the following shall apply:
- (a) It is essential and mandatory for the protection of operatives and the public that appropriate signs are displayed giving road users advance warning of road works;
  - (b) The sizes and positioning of signs and cones are dependent on the type of the road and the relevant speed limits;
  - (c) Sandbags shall be used to prevent cones moving during high winds.

- (d) Warning signs shall be set so that their lower edge is at least 300mm clear of the ground;
- (e) Signs shall be clearly visible to approaching drivers, both day and night, and in all weather conditions; (Refer: NEOM-NLF-NMS-006.013 Safety Signage and Signals)
- (f) Where lighting is inadequate reflective signs shall be used at night.

## **8.14 Safety Zones**

8.14.1 Contractor shall ensure safe systems of work are established that include:

- (a) A safety zone, marked by cones and lamps shall be provided to segregate operatives from traffic
- (b) On any roadwork site, access and laydown shall be provided around the works for the storage of spoil, tools, plant, and equipment to allow the safe movement and operation of plant;
- (c) Plant and personnel must not be allowed to enter the safety zone, other than for maintenance work (resetting cones, signs etc.)
- (d) A safety zone which comprises:
  - I. A lead-in taper of cones, which will vary with the speed limit and width of the works;
  - II. A sideways clearance between the working space and moving traffic, which shall be at least 0.6 meters on roads with speeds up to 80 km/h and at least 1.2 meters on roads with speeds of 80 km/h and over;
  - III. An exit taper which is always at 45 degrees to the curb side or road edge; and
  - IV. A traffic barrier, facing oncoming traffic, positioned within the coned-off area to show the width of the works site.
  - V. For roads with a speed limit of 80 km/h or more, an additional traffic barrier at the end of the lead-in taper.

## **8.15 Working Space**

8.15.1 Contractor shall ensure appropriate working space to ensure that the movement and operation of plant (e.g., swinging of jibs and excavator arms) is clear of passing traffic and does not impact safety zone, or adjacent pedestrian access way.

## **8.16 Buffer Zones**

8.16.1 Contractor shall ensure safe systems of work are established that include:

- (a) On heavily used high-speed roads such as highways and other principal roads, control measures which are developed to provide buffer zones, to segregate opposing traffic flows;
- (b) The width of such buffer zones which shall preferably be a full lane width of 3.65 meters but shall be at least 1 meter. A full lane width has the added advantage of providing a separate unused lane for access and emergency vehicles if breakdown or incident occurs; and
- (c) Barriers that are used to delineate buffer zones. The ideal types in this case are traffic cones, cats eye bollards or simple red and white coloured plastic pendant markers, all of which are relatively harmless if hit by a vehicle.

## **8.17 Traffic Barriers**

8.17.1 Contractor shall ensure safe systems of work are established that include:

- (a) Traffic barriers that are constructed shall be continuous concrete traffic protection devices (barriers) used to indicate the road works and to segregate the traffic from the works; (Refer: NEOM-NLF-NMS-006.012 – Barricading of Hazards)

- (b) their design shall not cause a further hazard if hit by a moving vehicle, and they shall be of a conspicuous colour and kept clean.

## 8.18 Cones

8.18.1 Contractor shall ensure safe systems of work are established that include:

- (a) A line of traffic cones shall be positioned at a taper and shall guide traffic past the works, at a distance ahead of the works as indicated in Table 1 under the row ‘Minimum Number of Cones’;
- (b) The maximum spacing distance of cones in longitudinal lengths of coning shall be no more than 9 meters, but no less than 2 cones shall be used in any length between tapers; and
- (c) Generally, lead-in tapers used with traffic control measures, and all exit tapers, shall be approximately 45° to the curb line with cones spaced 1.2 m apart.

## 8.19 Advance Signage

8.19.1 Contractor shall ensure safe systems of work are established that include;

- (a) ‘Road Works Ahead’ signs which shall be placed in advance of the road works and shall be the first signs to be seen by the driver;
- (b) Signs shall be placed in accordance with the specifications laid out in Table 4 Positioning of Signs and Cones shown below;
- (c) ‘Road Narrows Ahead’ signs which shall be placed midway between the ‘Road Works Ahead’ signs and the beginning of the taper of traffic cones;
- (d) ‘Keep Right’ or ‘Keep Left’ signs which shall be placed at the beginning and end of the lead in taper of cones; and
- (e) On roads with speed limits of 80km/h or more, all “Ahead” signs which shall have the distance to the works in meters printed on them.

*Table 4: Positioning of Signs and Cones*

Type of road	Minimum siting distance (D) of first sign in advance of works (metres) (Note 1)	Minimum clear visibility to first sign (metres)	Minimum size of signs (mm)	Minimum height of cones (mm) (Note 2)	Details of lead-in cone tapers									
					Width of hazard (metres)									
								1	2	3	4	5	6	7
Single carriageway road, restricted to 40km/h or less	20 to 45	60	600	450	Length of taper (T) in metres	13	26	39	52	65	78	91		
					Min. No. of cones	4	4	6	7	9	10	12		
					Min. No. of lamps at night	3	3	5	6	8	9	11		
Single carriageway road, restricted of speeds 41km/h to 60km/h inclusive	45 to 110	60	750	450	Length of taper (T) in metres	20	40	60	80	100	120	140		
					Min. No. of cones	4	6	8	10	13	15	17		
					Min. No. of lamps at night	3	5	7	9	12	14	16		
		60	750	450	Length of taper (T) in metres	25	50	75	100	125	150	175		

All-purpose dual carriageway road, restricted to 40km/h or less	110 to 275				Min. No. of cones	4	7	10	13	15	18	21
					Min. No. of lamps at night	3	6	9	12	14	17	20
Single carriageway road, with speed limit 80km/h or more	275 to 450	75	750	450	Length of taper (T) in metres	25	50	75	100	125	150	175
					Min. No. of cones	4	7	10	13	15	18	21
					Min. No. of lamps at night	3	6	9	12	14	17	20
All-purpose dual carriageway road, with speed limit 80km/h or more	725 to 1600	105	1200	750	Length of taper (T) in metres	32	64	96	128	160	192	224
					Min. No. of cones	5	9	12	16	19	23	26
					Min. No. of lamps at night	4	8	11	15	18	22	25

*Note 1: Minimum and normal maximum distance of the first sign (D) is given to allow a range wherein the sign can be placed in a convenient position, bearing in mind available space and visibility for drivers.*

*Note 2: It may be appropriate to use the next larger size of cone in lead-in tapers (e.g., 750mm cones) in tapers where 450mm cones are indicated and 1-meter-high cones where 750mm cones are shown.*

## 8.20 Lamps

8.20.1 Contractor shall ensure safe systems of work are established that include;

- (a) Provision of road danger lamps for use at night, in poor daytime visibility and in bad weather;
- (b) Road danger lamps shall not be higher than 1.2 meters above the road (flashing lamps 120 to 150 flashes per minute);
- (c) Lamps can be used on any road with or without street lighting; and
- (d) Lamps are only to be used if all the following are satisfied:
  - I. The road speed limit shall be under 60 km/h;
  - II. The road danger lamp shall be within 50 meters of a streetlamp;
  - III. The street shall be illuminated; and
  - IV. The lamps are steady.

## 8.21 Pedestrians

8.21.1 Contractor shall ensure safe systems of work are established that include:

- (a) Works on footways which shall leave at least 1.5 meters unobstructed width for temporary pedestrian ways. Where this is not reasonably practicable, an alternative safe route for pedestrians shall be provided;
- (b) Rigid barriers which shall be used to mark any temporary footway and to protect pedestrians from traffic, excavations, plant, and materials. Road danger lamps shall be placed at the ends of the barriers at night. Handrails shall be between 1.0 meter and 1.2 meters above ground level; and
- (c) Temporary footway if in the carriageway signing will be necessary for both pedestrians and drivers. The requirement for Kerb ramps or raised footways shall be risk assessed.

## 8.22 Night Work

8.22.1 Contractor shall ensure safe systems of work are established for night work that include:

- (a) All vehicles and plant which shall be equipped with two high intensity rear fog lamps that are automatically switched on when the vehicle is placed in reverse;
- (b) Floodlights shall be positioned so as not to affect the vision of oncoming traffic;

- (c) For lane closures where necessary flashing arrow signs are used to signify lane closures;
- (d) The work site to be fully lit by floodlighting. Where it is not practical to floodlight the whole work site consider floodlighting the Traffic Controllers and the Stop/Slow signs;
- (e) The works supervisor who shall check floodlighting to ensure it does not adversely affect road users or adjacent dwellings or businesses;
- (f) Raised reflective pavement markers and Retro-reflective cones shall be used to provide the continuity to guide motorists through the work site effectively;
- (g) Control measures needed to achieve standard spacing's, particularly on winding rural roads;
- (h) Externally lit signs are preferred to unlit retro-reflective signs;
- (i) Messages on signs shall be brief and clear;
- (j) Use standard signs in standard sizes for ease of storage and installation; and
- (k) Keep accurate records of the locations and types of signs displayed.

## **8.23 Training and Competency**

8.23.1 Contractor shall ensure that Safety training complies with the requirements of:

- (a) NEOM-Element 5 – Training, Awareness and Competency.
- (b) NEOM-NLF-NMS-006.001 – Organisation and Practitioner Registration and Appointment of Contractor

8.23.2 Contractor shall ensure employees required to implement the requirements of this NMS are trained in the use of relevant plant and equipment and understand the risks associated with working on or adjacent to roads and the control measures put in place by the employer.

8.23.3 Contractor shall ensure that those involved in the planning and organisation of road works have received respective competence training which can be demonstrated in the safe systems of work and precautions to be adopted.

8.23.4 In addition, those operating any site plant or equipment shall have received training to a recognised standard in its safe operation and can understand the method statement and risk assessment to that activity.

8.23.5 Induction training to the workforce shall identify the precautions to be taken by individuals, including use of personal protective equipment and segregated traffic routes for pedestrians and vehicles.

8.23.6 Contractor shall maintain a record of the required training that contains the following information:

- (a) Name and ID number;
- (b) Subject(s) of training;
- (c) Dates(s) of training;
- (d) Training provider; and
- (e) Person(s) providing the training.

## 9 Appendices

### 9.1 Appendix A: Forms, Signs and Checklists



## 9.2 Appendix B: Audit Criteria

Audit Criteria		Requirements	Verification	Area of Concern
ISO 45001:2018 Clause	NMS Ref.			Yes/ No
5.3	7.1.3	Pre-Tender Health and Safety Plan has been developed and issued		
5.3, 8.1.4.2	7.1.4	Selection of Contractors undertaken in accordance with NEOM's policies and procedures		
7.2	7.2.1 (b)	Persons appointed to manage /oversee work operations have the skills, knowledge, experience		
8.1.2 (e)	7.2.1 (d)	Personal protective equipment required for use are fit for purpose		
8.1.2 (c, d)	7.2.2 (e)	Control of access to dangerous or high-risk areas or equipment using suitable Barricades and Signage		
8.1	7.2.2 (a)	The appropriate planning of work on or around road works		
7.4	7.2.2 (b)	Development and communication of a Traffic Control Plan		
6.2.2, 7.3	7.3.1	Workers follow the safe work practices and operating procedures related to the Traffic Control Plan		
6.1.2.2	8.2.1 (b)	Assessment of the various risks shall be undertaken		
6.1.2.3		Hazards Identification Plan (HIP)		
5.2	8.2.1 (c)	Effective Procedures, Method Statements and Control Measures are in place, and are implemented to manage activities safely and without risk to health		
6.1.3	8.2.2	Relevant No Objection Certificate (NOC) and Certificate of Completion (COC) are to be obtained relevant Department / Authority		
7.2	8.2.3 (e)	Works shall be Supervised by a suitably qualified person		
6.2.2	8.3	Traffic Control Plan (TCP) is developed for all work performed within the public right-of-way.		
	8.3	The TCP site layout and sequence of work		
6.2.2	8.4.4	Appropriate space provided; (f) Access for site transport; (g) Access for emergency services; (h) Access across traffic lanes;		
6.1.2, 8.1.1.2	8.5	Roadwork Hazards and Controls; (a) Vehicles & Plants (b) Traffic flows (c) Speed limits (d) Road Width		
6.2.1, 10.2, 8.1.1.2, 8.2	8.6 8.7	Safe systems of work are established and implemented to minimize the risks associated; (a) Incidents Involving Members of the Public;		

Audit Criteria		Requirements	Verification	Area of Concern
ISO 45001:2018 Clause	NMS Ref.			Yes/ No
	8.8 8.9	(b) Vehicle and Plant Incidents (c) Burns and Fire Risks (d) Health Risks		
8.1.2(e)	8.10	Contractor shall ensure all operatives safe handling by using Protective Clothing and Equipment		
6.2.1, 10.2, 8.1.1.2, 8.2	8.11 8.12 8.13 8.14 8.15 8.16 8.17 8.18 8.19 8.20 8.21 8.22	Safe systems of work are established and implemented; (a) Fuels (b) Fire Extinguishers (c) Traffic Diversions (d) Safety Zones (e) Work Space (f) Buffer Zones (g) Traffic Barriers (h) Cones (i) Advance Signage (j) Lamps (k) Pedestrians (l) Night Work		
7.2	8.23	Training and Competency shall comply with the requirements and contractor maintain the record of the provided training		

### 9.3 Appendix C: Guidance Information

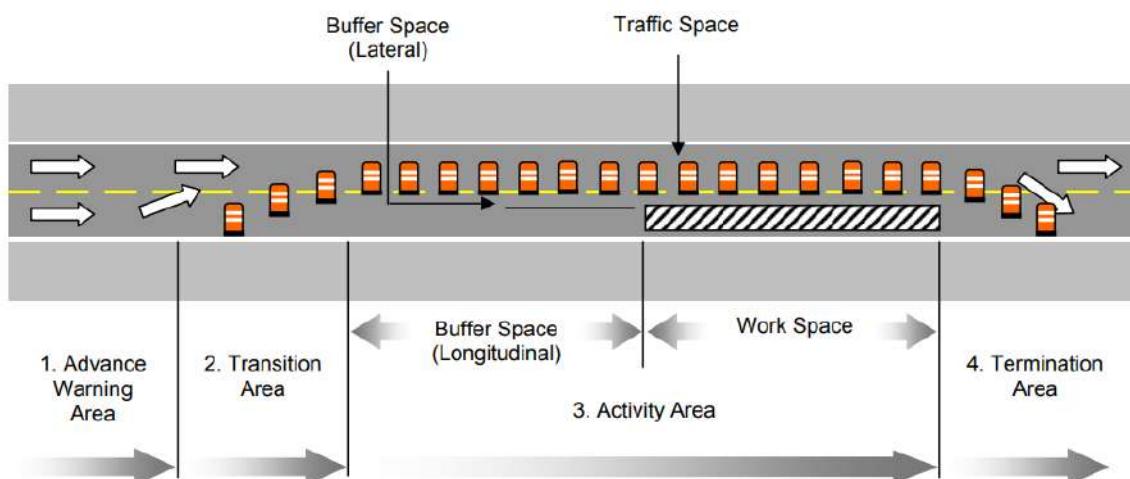
OSHA has developed this webpage to provide workers and employers useful, up-to-date information on Highway Work Zones and Signs, Signals, and Barricades.

[www.osha.gov/highway-workzones](http://www.osha.gov/highway-workzones)

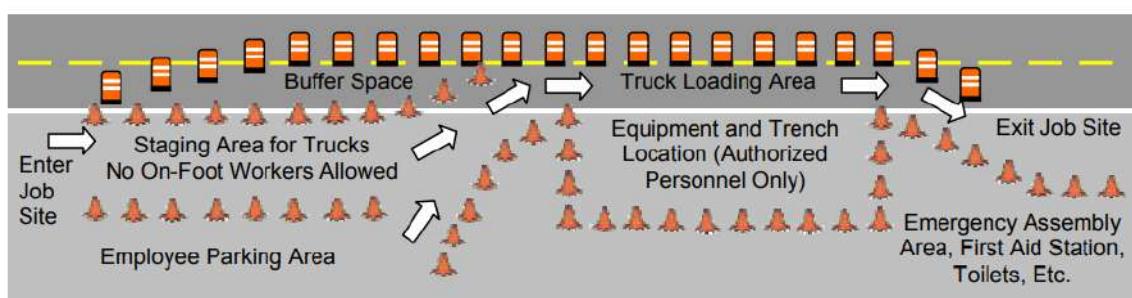
The OSHA standards that regulate work in traffic are found in 29 CFR 1926 Subpart G;

An employer must assign a competent person to each job-site. This person has the responsibility to conduct frequent and regular inspections of the job-site, materials and equipment; this includes traffic control devices.

Example: Temporary Traffic Control "Work Zone" – External Traffic Temporary Traffic Control "Work Zone" components (diagram below); follow the requirements of The Manual of Uniform Traffic Control Devices for Streets and Highways (MUTCD).



Example: INTERNAL TRAFFIC CONTROL PLAN (ITCP)





نیوم NEOM

**NEOM OCCUPATIONAL HEALTH and SAFETY  
NEOM MINIMUM STANDARD  
for  
ROAD SAFETY**

NEOM-NLF-NMS-006.042 Rev 02.00 – February 2022

©NEOM [2021]. All rights reserved.

## Document History

Revision code	Description of changes	Purpose of issue	Date
Rev 00.00	First Issue	Issued for Implementation	27/07-2020
Rev 02,00	Sector Review	Issued for Implementation	01-02-2022

## Document Approval

	Prepared by	Reviewed by	Approved by
Name	Robert Murphy	Talal Al Anazi	Adel Al Wuhaib
Job Title	Loss Prevention Specialist LP/FS -Public Safety	Director, Loss Prevention/Fire Safety (LP/FS) Public Safety	Executive Director Public Safety

## OUR NEOM VALUES



### CATALYST

Make a difference.  
Create a legacy.



### CARE

Leave the environment  
in a better place.



### CURIOS

Challenge the norm.  
Stay restless.



### PASSIONATE

Be accountable.  
Finish what you start.



### RESPECT

Be authentic.  
Be true. Be bold.



### DIVERSITY

Embrace cultural  
differences.  
Seek to understand.

## Contents

<b>1</b>	<b>PURPOSE.....</b>	<b>5</b>
<b>2</b>	<b>SCOPE.....</b>	<b>5</b>
<b>3</b>	<b>EXPECTATIONS .....</b>	<b>5</b>
<b>4</b>	<b>LIST OF DEFINITIONS.....</b>	<b>6</b>
<b>5</b>	<b>LIST OF ABBREVIATIONS.....</b>	<b>6</b>
<b>6</b>	<b>RELATED NEOM DOCUMENTS .....</b>	<b>7</b>
<b>7</b>	<b>ROLES AND RESPONSIBILITIES.....</b>	<b>7</b>
7.1	Client .....	7
7.2	Contractor.....	8
7.3	Employee .....	9
7.4	Specific Responsibilities.....	9
<b>8</b>	<b>OTHER SECTIONS RELATED TO SUBJECT.....</b>	<b>9</b>
8.1	Employer Responsibilities .....	9
8.2	Road Safety Standard .....	9
8.3	Hazard Identification and Risk Assessment of Road Safety .....	10
8.4	Recording of Transportation Risk Assessments .....	11
8.5	Passenger and Freight Operations .....	11
8.6	Passengers .....	11
8.7	Drivers' Hours.....	11
8.8	Seat Belts .....	12
8.9	Vehicles Standards .....	12
8.10	Driver Selection Training and Performance .....	13
8.11	Speed Limits.....	14
8.12	Cellular Phone and other devices .....	14
8.13	Smoking and Eating/Drinking whilst driving .....	14
8.14	Parking .....	15
8.15	Daytime Running Lights and headlights (DRL) .....	15
8.16	Drivers Responsibilities at end of journey .....	15
8.17	Reversing .....	15
8.18	Desert Driving.....	15
8.19	NEOM Familiarisation .....	16
8.20	Journey Management and Route Planning .....	16
8.21	Routine and Repetitive Journeys .....	17
8.22	Non-Routine Journey Management and Planning .....	17
8.23	Road Traffic Incident (RTI) Reporting and Investigation .....	18
8.24	Contractor Management.....	19
8.25	Training And Competency.....	19
<b>9</b>	<b>APPENDICES.....</b>	<b>21</b>
9.1	Appendix A: Reversing Signs.....	21

9.2	Appendix B: Audit Criteria .....	22
9.3	Appendix C: Guidance Information .....	24

## List of Tables

Table 1 : Table of Definitions .....	6
Table 2 : Table of Abbreviations .....	6
Table 3 : Related NEOM Documents .....	7
Table 4 Maximum Driving Hours.....	10

## **1 Purpose**

This NEOM Co. SMS Minimum Standards (hereafter referred to as NMS) relates to the management of all occupational health, safety (OHS) risks associated with Road Safety.

It provides guidance to support compliance with industry best practice and international regulatory safety requirements to ensure that the associated risks are assessed, and control measures are implemented in accordance with the hierarchy of risk controls.

It has been developed to align with the requirements of the ISO 45001 Health and Safety Management Manual (Refer NEOM-NLF-PRC-006- Section 2 ISO 14001 Cross reference table)

## **2 Scope**

It is designed for the protection of Neom Personnel, Contractors, and the public travelling on thoroughfares (carriageways, public highways, main roads, access roads) used, owned, or operated by NEOM. This also covers journeys to and from NEOM Sites/Facilities.

N.B Travel on site roads (passenger vehicles and plant/equipment and logistics) is covered in NEOM-NLF-NMS-006.032 Site Traffic Management and Logistics Land Transport

This NMS applies to all personnel within NEOM and any Contractors working for NEOM and or associated projects and activities. It is designed to incorporate requirements set by the NEOM-SMS.

## **3 Expectations**

To ensure the occupational health and safety (OHS) of all personnel, protection of assets (services, plant/equipment) and the environment

NEOM expect each Sector, Organization, Department or Contractor to ensure that risks are controlled in accordance with the hierarchy of risk controls: elimination, substitution, engineering controls, administrative controls, and personal protective equipment.

Consideration shall be given to technological advances that may introduce new means of controlling or eliminating the risks associated with work activities involving Road Safety

That the expectation for safety compliance is meeting and exceeding all applicable OSHA Laws, Regulations, and Industry Best Practice.

Applicable requirements and standards include:

- (a) OSHA Standards and Regulatory requirements;
- (b) ANSI requirements;
- (c) NFPA Standards and requirements;
- (d) NEOM Minimum Standards
- (e) Saudi Building Codes
- (f) International Building Codes

*If requirements of this document conflict with requirements set by another regulatory authority, Contractor are required to follow the more stringent requirement.*

## 4 List of Definitions

Table 1 : Table of Definitions

Terms	Definitions
NEOM Co	NEOM Company
Client	NEOM Sector /Department responsible for management and oversight of the Contractor
Employer	The person or organization that employs personnel to complete the work.
Contractor	The organization contracted to carry out the works
Sector, Organization, Department or Contractor	The Sector, Organization, Department or Contractor is the NEOM entity or developer designated by NEOM to accept custody for planning, designing, constructing, or managing and operating a particular asset or a group of assets
Sector, Organization, Department or Contractor Head	The head of the Sector, Organization, Department or Contractor is responsible and accountable for the implementation and supervision of this procedure within the Sector, Organization, Department or Contractor
Responsible Person	The Sector, Organization, Department or Contractor Head may delegate a "Responsible Person" utilizing their approved delegation of authority process. The "Responsible Person" is the senior NEOM employee who has responsibility for the day-to-day management of the work activities, or the contracted party engaged in such activities
Safety Practitioner/ Coordinator	The "Safety Practitioner/Coordinator" is an employee working for the Sector, Organization, Department or Contractor Safety Department.
Vehicle Danger Zone	Any position in which the driver of the vehicle cannot see you or you him.
Safety Management System (SMS)	Occupational Health and Safety Management System established by NEOM in compliance to ISO 45001 Standard

## 5 List of Abbreviations

Table 2 : Table of Abbreviations

Abbreviations	Descriptions
SMS	Safety Management System
NMS	NEOM Minimum Standard
SOP	Standard Operating Procedure
ANSI	American National Standards Institute
NFPA	National Fire Prevention Association
CPP	Construction Phase Plan
OSHA	Occupational health and safety Administration.
PPE	Personal Protective Equipment
ISO	International Standards Organization
DRL	Daytime Running Lights
RTI	Road Traffic Incident

Abbreviations	Descriptions
IBC	International Building Codes
OHS	Occupational Health and Safety

## 6 Related NEOM Documents

Table 3 : Related NEOM Documents

Document Code	Document Name
NEOM Element 2	Risk and Opportunity Management
NEOM-Element 3	Control of Documented Information & Legal Compliance
NEOM-Element 5	Training, Awareness and Competency.
NEOM-Element 6	Contractor Management
NEOM Element 8	Incident Investigation and Management
NEOM Element 9	Emergency Planning and Response Management
NEOM-SMS	NEOM Safety Management System
NEOM-NLF-SM	Safety Manual - Roles and Responsibilities
NEOM-NLF-PRC-006- Section 2	ISO 14001 Cross Reference Table
NEOM-NLF-PRC-006;	Occupation safety health and Fire Safety requirements for Contractors
NEOM-NLF-NMS-006.001	SMS Organization, Practitioner Registration and Appointment of Contractor
NEOM-NLF-NMS-006.002	Safety Construction Management Plan
NEOM-NLF-NMS-006.012 –	Barricading of Hazards
NEOM-NLF-NMS-006.013	Safety Signage and Signals
NEOM-NLF-NMS-006.021	Personal Protective Equipment (PPE)
NEOM-NLF-NMS-006.032	Site Traffic Management and Logistics

## 7 Roles and Responsibilities

### 7.1 Client

- 7.1.1 General Health and Safety roles and responsibilities are defined in; and shall be carried out in accordance with the requirements of NEOM-NLF-SM–Safety Management Manual - Roles and Responsibilities.
- 7.1.2 The Client is responsible for ensuring that NEOM Safety Commitment Statement and safety management system are properly applied within their areas of control/responsibility. Effective implementation will ensure compliance with relevant legislative requirements and will help promote the use of industry best safe working practices.
- 7.1.3 That a suitable, Pre-Tender Health and Safety Plan has been developed and issued to Contractors to ensure they have all the information necessary to make informed decisions when developing the Construction Phase Health and Safety Plan (NEOM-NLF-NMS-006.002 Safety Construction Management Plan)(CPP) which will form part of the Contractor review and selection process
- 7.1.4 That the selection of Contractors shall be undertaken in accordance with NEOM's policies and procedures (NEOM-Element 6-Contractor Management). To ensure that only Competent organizations capable of meeting the requisite safety standards associated with project are contracted.
  
- 7.1.5 Conduct regular Contractor safety assurance reviews to provide the confidence level required that the safety management system is delivering as planned, and consistently achieves the acceptable level of safety. Including:
  - (a) Safety performance monitoring and measuring;
  - (b) Managing change;
  - (c) Continuous improvement.

## **7.2 Contractor**

- 7.2.1 Contractor shall undertake their roles and responsibilities in accordance with the general requirements of NEOM–NLF-SM–Safety Management Manual-Roles and Responsibilities
- 7.2.2 Maintaining control of access to dangerous or high-risk areas or equipment using suitable barricades that are in serviceable condition (Refer: NEOM-NLF-NMS-006.012 – Barricading of Hazards)
- 7.2.3 That all work activities are assessed, planned, organized, and that suitably competent Supervision is available to implement the safety requirements and oversee the work (Refer: NEOM- Element 5 – Training, Awareness and Competency)
- 7.2.4 Ensure persons appointed to manage /oversee work operations have the skills, knowledge, experience and, where relevant, the organizational capability to plan and manage work safely and without risk to those who may be affected by the activities (Refer: NEOM Element 5 Training, Awareness, and Competence).
- 7.2.5 Ensure employees carrying out the work are trained to recognize the associated hazards and understand the processes and procedures to control or minimize the risks.(Refer: NEOM Element 2 Risk and Opportunity)
- 7.2.6 That all equipment including personal protective equipment required for use is fit for purpose, and (as required) has been inspected by a competent person and inspection records are maintained and readily available.(Refer: NEOM-NLF-NMS-006.021 Personal Protective Equipment (PPE))
- 7.2.7 Contractor shall undertake their specific roles and responsibilities in accordance with the following:
  - (a) Ensuring that all personnel driving both on site and access roads and or to and from site on NEOM roads are aware of and comply with the Road Safety standards.

### **7.3 Employee**

- 7.3.1 Shall undertake their roles and responsibilities in accordance with the general requirements of NEOM-NLF-SM – Safety Management Manual - Roles and Responsibilities.
- 7.3.2 Report any activity or defect relating to the work which they believe is reasonably foreseeable to endanger their safety or that of another person's.

### **7.4 Specific Responsibilities**

- 7.4.1 Sector, Organization, Department or Contractor Head is responsible in ensuring that provisions are made the safe systems of work to prevent and minimize risks in each workplace
- 7.4.2 Safety Practitioner/Coordinator is responsible to monitor the implementation of this procedures and document its effectiveness
- 7.4.3 Line Managers / Supervisors are responsible for training their workers in risks
- 7.4.4 The Responsible Person will support this procedure and ensure that any Contractor Organization working for, or on behalf of, the Sector, Organization, Department or Contractor will comply with the requirements of these procedures
- 7.4.5 The LP & FS Public Safety department will support the NEOM risk assessments by carrying out compliance checks and supporting and guiding the various safety teams.

## **8 Other Sections related to subject**

### **8.1 Employer Responsibilities**

- 8.1.1 Responsibilities of Employers in this Section 8 can relate to Sector, Organization, Department or Contractor. (Refer: Definitions – Employer)

### **8.2 Road Safety Standard**

- 8.2.1 Employers that own and operate vehicles shall develop a road safety standard aligned with industry best practice that meets or exceeds the requirements of this NMS to achieve safe and incident free travel.
- 8.2.2 They should consider personal, group, and organizational behavioral change methodologies to ensure personnel are made aware of and understand the benefits of following the Road Safety rules.
- 8.2.3 Senior Management shall demonstrate their leadership and commitment to Road Safety by:
  - (a) Setting a good example by their own attitude and driving performance.
  - (b) Allocating the necessary resources to support Road Safety, including training and assessment of drivers.
  - (c) Clearly communicate the importance of Road Safety.
  - (d) Encourage safety promotions and employee involvement for measures to improve Road Safety performance.
  - (e) Set plans, targets, and measure Road Safety performance.
  - (f) Ensure that all transport operations meet the same level of safe performance standard as NEOM.

- 8.2.4 The management structure and responsibilities for managing Road Safety shall be clearly documented
- 8.2.5 Processes shall be developed to ensure that employees and others who may be impacted by Road Safety are aware of their responsibilities to support the Road Safety program and initiatives.
- 8.2.6 Appropriate documentation shall be maintained for critical aspects of Road Safety, such as driver training and vehicle inspection and maintenance records.(Refer NEOM Element 5 Training, Awareness and Competence and NEOM Element 3 Control of Documented Information & Legal Compliance)
- 8.2.7 A thorough and comprehensive hazard identification and risk assessment of Road Safety Operations shall be carried out at regular intervals (dependent on the risk).(Refer: NEOM Element 2 Risk and Opportunity Management)
- 8.2.8 A journey management system shall be implemented and operated to ensure each new, non-regular, or unusual journey is necessary, properly organized and supported.
  
- 8.2.9 For company business all aspects of land transportation operations, vehicle selection and use, must be planned in line with the policy and strategic objectives of NEOM.
- 8.2.10 The plan should consider new legislation, types of transport, the environment, latest techniques for managing road safety and training requirements.
- 8.2.11 Road Safety procedures shall include controls for carrying out driver monitoring, driver training and testing, and for ensuring that no person can drive a vehicle unless he/she is competent and licensed to do so.
- 8.2.12 Any changes in personnel, vehicles, processes, or procedures connected to or part of land transport have the potential for adverse effect on HSE performance. Impact of changes should be reviewed prior to implementation. (Refer: NEOM Element 2 Risk and Opportunity Management)
- 8.2.13 Emergency Procedures should be developed and maintained to identify and be able to respond to foreseeable emergencies involving vehicles.(Refer: NEOM Element 9 Emergency Planning and Response Management)
- 8.2.14 Employers shall ensure Road Safety / land transport procedures and processes include an Audit Plan.
- 8.2.15 The Audit Plan shall identify the responsibility for auditing specific activities/areas.
- 8.2.16 The degree of risk and the results of previous audits, inspections and incidents data should determine the audit frequency and depth.
- 8.2.17 Those carrying out the audit shall have specific competence to deal with land transport issues.

### **8.3 Hazard Identification and Risk Assessment of Road Safety**

- 8.3.1 Employers shall ensure The Road Safety / Land Transport processes or procedures include the requirement for a formal, thorough, and comprehensive hazard identification and risk assessment to be undertaken at regular intervals. (Refer: NEOM Element 2 Risk and Opportunity Management)
- 8.3.2 The objective of the hazard identification and risk assessment is to review all land transport operations to identify all significant risks and hazards and suggest remedial actions. The exercise should also be used to identify any opportunities that would reduce risks or remove hazards.
- 8.3.3 The hazard identification and risk assessment must be applied over the entire life cycle of the transport operation, including at the design stage and during decommissioning. It must cover:
  - (a) Sourcing of vehicles.
  - (b) Routine and non-routine operations.
  - (c) Incidents and potential emergency situations.

(d) Disposal of vehicles

#### **8.4 Recording of Transportation Risk Assessments**

- 8.4.1 All routes travelled should be assessed for hazards and inherent risks that could adversely affect the success of a journey.
- 8.4.2 The assessment could range from a review of local intersections and roads with a history of vehicle accidents or to a systematic evaluation of a route travelled.
- 8.4.3 Persons well versed in the type of vehicles to be operated and the routes, should perform these assessments prior to the commencement of operations in each area.
- 8.4.4 The risks and controls measure subsequently identified should then be included in the pre-journey risk review process.
- 8.4.5 Alternative lower risk routes should be selected whenever possible.

#### **8.5 Passenger and Freight Operations**

- 8.5.1 The driver of a vehicle is solely responsible for loading of the vehicle.
- 8.5.2 Where possible, cargo and baggage shall be carried in the designated cargo area of the vehicle and segregated and restrained from interfering with the driver and passengers.
- 8.5.3 If personal belongings are to be carried within the passenger compartment they must be placed and secured to prevent disturbance to passengers and drivers.
- 8.5.4 Where airbags are fitted, passengers should refrain from carrying items such as laptops as these may cause injury in the event of an airbag being activated.
- 8.5.5 Any heavy article carried inside the cab of a pick-up truck or cargo vehicle, such as a jack, fire extinguisher, etc., shall be firmly secured in such a way that it shall be prevented from injuring personnel in the event of a crash.
- 8.5.6 All loads transported in a pick-up truck, utility truck, or other cargo vehicle shall be fastened securely and shall not exceed the manufacturer's specifications and legal limits for the vehicle or the road conditions.

#### **8.6 Passengers**

- 8.6.1 Passengers of a vehicle can influence a driver's performance. Passengers shall:
  - (a) Always wear seatbelts while in a moving vehicle, check seatbelt accessibility and condition.
  - (b) Ensure cargo is stored securely to prevent loose objects becoming dangerous projectiles.
  - (c) Not distract or divert driver's attention from the road.
  - (d) Warn the driver of any hazard or unsafe condition.
  - (e) Take responsibility for informing drivers when they are driving in an unsafe manner, e.g., reckless driving, excessive speed.
  - (f) Assist the driver when maneuvering / reversing/parking in hazardous or confined areas.
  - (g) Report unsafe driving practices, defective equipment and unsafe vehicle or road conditions. Positive as well as negative driving experiences should be reported.
- 8.6.2 Any person not involved in NEOM business, or social activities shall not be carried. In cases where third-party road users (i.e., non-NEOM or Contractor persons) are stranded due to vehicle breakdown or environmental conditions creating a hazardous situation, assistance should be rendered with prior approval given by the driver's supervisor /manager

#### **8.7 Drivers' Hours**

- 8.7.1 Employers shall be aware of the impact that fatigue can have on driving and job performance. Fatigue training specific to land transportation safety shall be conducted for all supervisors, managers, and drivers to enable them to identify fatigue indicators.
- 8.7.2 The table below provides driving hours, as per International Best Practices. Non-adherence to these guidelines can have a negative impact on the safety of the vehicle and occupants and is considered a serious offence.

*Table 4 Maximum Driving Hours*

Requirement	Standard
Maximum driving time between breaks	Light vehicle 2 hours Heavy vehicles 4 hours
Minimum break time	15 minutes
Maximum driving hours within a rolling 24-hour period	10 hours total excluding commuting time 11 hours including commuting time
Maximum duty hours within a rolling 24-hour period	16 hours
Maximum duty hours in a rolling 7-day period	72 hours
Maximum duty hours in a rolling 14-day period	120 hours
Off-duty period in a rolling 7-day period	Minimum of a continuous 24-hour break

## 8.8 Seat Belts

- 8.8.1 Approved seating capacity in a vehicle shall be equal to the number of available operational seats correctly fitted with working three-point seat belts, in accordance with the manufacturer's design and guidelines. It is recommended that belts incorporate pre-tensioners.
- 8.8.2 NEOM does not authorize a vehicle to transport personnel unless driver and passengers are wearing seatbelts.
- 8.8.3 Each driver and passenger shall take responsibility for wearing their seat belt in the correct manner.
- 8.8.4 It is the responsibility of the driver to ensure that each passenger is wearing a seatbelt in the correct manner during the journey.
- 8.8.5 Drivers shall refuse to transport passengers who will not fasten their seat belts in the correct manner.
- 8.8.6 Buses shall be fitted with a 3-point inertia reel type seatbelt for the driver, and all front seat passengers.
- 8.8.7 All other passenger seats should be fitted with either a 3-point inertia reel seatbelt or an inertia 2-point lap seatbelt. As a minimum.
- 8.8.8 Passenger seatbelts must be approved by the vehicle or bus body manufacturer for the type of vehicle or seat configuration being used.
- 8.8.9 Seat belts shall be checked by the driver daily to assess their suitability and to identify any which are not functioning correctly.
- 8.8.10 If a driver discovers any seat belts which are not functioning correctly, the driver shall ensure the seat is not occupied by any passenger and that the deficiency is reported and a corrective action is completed.

## 8.9 Vehicles Standards

### 8.9.1 Selection

- (a) It is important that vehicles are selected on the basis of being fit for purpose, including consideration of loads to be carried, type of terrain, and road/operating conditions that the vehicle will be operating in.

### 8.9.2 Fit for Purpose

- (a) Vehicles shall be suitable for operation in local climatic conditions.
- (b) Right hand drive vehicles should not be used by NEOM or Contractors unless no alternative exists (on specialist plant for example).
- (c) All vehicles shall:
  - I. Have no modifications without endorsement from vehicle manufacturer, or custodian of specification.
  - II. Have a complete documentation regarding ownership, origin, and technical specifications to be kept by vehicle owner or by vehicle operator. (Refer: NEOM Element 3 Control of Documented Information & Legal Compliance)
  - III. Have a valid pass when travelling within NEOM areas of operation.
  - IV. Comply with requirements of Saudi Arabia Traffic Rules.
- (d) These standards also apply to all contractor owned or hired vehicles employed on NEOM business.

### 8.9.3 Vehicle Operational Service Life

- (a) Company owned passenger vehicles and specialized transport operational service life shall follow the Vehicle Disposal Policy requirements as per SASO Saudi Standards.
- (b) Contractors are responsible to maintain roadworthiness of their vehicles and to follow Maximum recommended vehicle age in years in Vehicle Specifications

### 8.9.4 Vehicle Maintenance and Inspection

- (a) Routine maintenance shall be carried out on all vehicles with regularity and within scope in accordance with manufacturers' recommendations.
- (b) Procedures, instructions, and schedules shall be developed for vehicle technical maintenance and records kept.
- (c) Vehicle maintenance shall be performed as per Manufacturers Procedure for Inspection and maintenance of NEOM and Contractor Vehicles.
- (d) Saudi Arabia mandatory vehicle technical inspection shall be carried out as per Traffic Regulations requirements.

## 8.10 Driver Selection Training and Performance

### 8.10.1 Professional Drivers

- (a) A Professional Driver is any NEOM, contractor or subcontractor employee engaged primarily in a driving capacity in support of the NEOM operations.

### 8.10.2 Occasional Drivers

- (a) An Occasional Driver is any person who is not employed as a Professional Driver but who may, on occasions, be required to drive on NEOM business as part of their job.

### 8.10.3 Driver training

- (a) Prior to Professional Drivers and Occasional Drivers commencing driving, they shall receive Defensive Driver Training by an NEOM Approved Training Supplier.

- (b) Defensive Driver Training focuses on road hazard and risk management and the modification of driver behaviors to ensure timely identification of hazards and good driving management of those hazards. The training consists of:
  - I. Review of NEOM policies and requirements related to driving
  - II. Defensive driving techniques
  - III. Journey Management techniques
  - IV. Alertness and fatigue management
  - V. Effects of medication and substance abuse
  - VI. Vehicle restraint systems and safety equipment
  - VII. Pre-trip checks and proper seating position
  - VIII. Local driving hazards (including personal security), regulations and culture
  - IX. Commentary driving
  - X. Assessment of driving skills and behavior
  - XI. Hazardous goods Training
- (c) Defensive Driver Training will raise participants' driving skills, visual skills, knowledge of vehicle limitations and awareness of their responsibility to other road users. The training, through classroom sessions and practical sessions on the road, will provide drivers with an awareness of hazards associated with driving on all types of road conditions in the Saudi Arabia and will equip them with the skills necessary to take the appropriate action. (Refer: NEOM Element 5 Training Awareness, and Competence)

## **8.11 Speed Limits**

- 8.11.1 NEOM and RoK laws and regulations dictate safe speed for vehicles. In cases where speed limits specified by RoK laws and NEOM differ, the lower speed limits shall be followed by drivers.
- 8.11.2 Driving speeds shall be lowered to account for driving conditions, e.g., during adverse weather, driving through the hours of darkness, etc.
- 8.11.3 Drivers to be instructed of permitted access ways on NEOM facilities, roads, speed limits and hazardous road sections.
- 8.11.4 Drivers shall not operate a vehicle on any unknown roads or any other access ways on NEOM facilities without NEOM permission
- 8.11.5 NEOM and Contractors management shall carry out a thorough risk (hazard) assessment related to operation on Desert roads, opening new access ways and changing existing ones and, if necessary, ensure implementation of appropriate control measures to reduce risks (hazards).

## **8.12 Cellular Phone and other devices**

- 8.12.1 All in-coming and out-going transmissions by cellular telephone and two-way radios, in either hand-held or hands-free mode, by driver of vehicle while vehicle is in motion (include texting) is prohibited.
- 8.12.2 Use of wired and wireless headphones is prohibited.
- 8.12.3 Calls cannot be made or received while stationary in traffic or stopped at traffic lights.
- 8.12.4 If it is deemed necessary to make or receive a call, driver must locate to a safe area bringing vehicle to a complete stop without creating a hazard to other road users and make or receive calls.
- 8.12.5 Drivers shall not use any device whilst driving that distracts his / her driving concentration from the road. This includes gaming. Watching any screen activated entertainment, texting, making or receiving calls etc.

## **8.13 Smoking and Eating/Drinking whilst driving**

8.13.1 Drivers are not allowed to smoke in vehicles and eat/drink whilst driving.

## **8.14 Parking**

8.14.1 Driver is responsible for parking of vehicle and must ensure that:

- I. Vehicle is parked so that it is not causing any obstruction to any other road users or pedestrians.
- II. Vehicle is properly parked such that first move of vehicle will be forward when it is next in use.
- III. Excessive engine idle is avoided and vehicles are not left unattended with engines running.
- IV. When parked, all light vehicles have their wheels turned towards nearside of road, with park brake engaged.
- V. All heavy vehicles and trailers are equipped with at least two-wheel chock blocks, are to be in place behind wheels whenever vehicle is parked. This practice encourages driver to walk around vehicle before commencing operation.

## **8.15 Daytime Running Lights and headlights (DRL)**

- 8.15.1 DRLs automatically switch on with vehicle's engine and are designed to operate during daytime hours. If driving in dull or overcast conditions, ensure that dipped headlights always illuminated.
- 8.15.2 NEOM and Contractor vehicles, including buses and heavy vehicles, shall drive with their dipped headlights always illuminated.
- 8.15.3 If not fitted with DRL as per original equipment manufacturer, headlights must be turned on. No modification to be made without endorsement from manufacturer.
- 8.15.4 During times of darkness drivers shall be aware of other road users and ensure to dip headlights when approaching vehicles travelling in the opposite direction (Dip don't Dazzle)

## **8.16 Drivers Responsibilities at end of journey**

8.16.1 When finished any journey drivers, prior to leaving the vehicle, shall:

- (a) Stop the vehicle off road, preferably at designated parking place.
- (b) Ensure Park brake is engaged;
- (c) Switch off the engine and when ready lock the vehicle
- (d) Inform management if road conditions have presented a hazard for driving.

## **8.17 Reversing**

8.17.1 All heavy vehicles (greater than 3.5 tonne) shall be fitted with reversing alarms

8.17.2 A banksman, when required, will be involved for driver assistance to ensure safe reversing.

8.17.3 Banksman shall:

- I. wear a high visibility vest.
- II. ensure that area is free of pedestrians, other vehicles, and equipment.
- III. remain in view all time and remain out of "Danger Zone" areas
- IV. provide clear and understandable hand signals. (Refer Appendix C)

## **8.18 Desert Driving**

- 8.18.1 Desert driving requires special skills. No vehicle is allowed to be taken into the desert unless the driver has received specific training and the vehicle is suitable.
- 8.18.2 Vehicles must not be taken into desert regions without appropriate safety precautions including:
- The vehicle must be suitable for desert driving (e.g., all-wheel drive, appropriate tyres for soft sand that are inflated to a suitable pressure, have appropriate type of seat belts and head restraints,
  - The vehicle must be carrying sufficient water for all persons on-board.
  - The vehicle must be carrying a desert survival box containing all equipment necessary for desert survival including a means of communication
  - The driver must have special training for desert conditions.



## **8.19 NEOM Familiarisation**

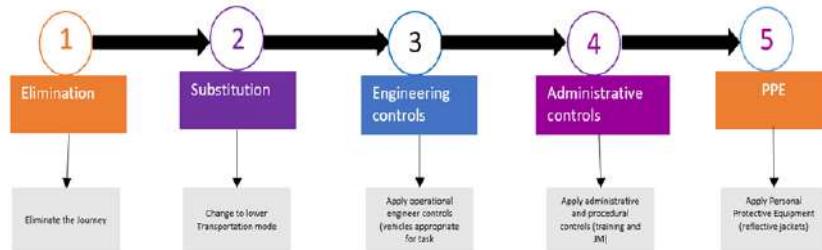
- 8.19.1 NEOM & Contractors shall ensure provision of familiarization of different routes, areas, facilities that are required to be known by drivers, on the NEOM areas and employers shall ensure suitable accompaniment for drivers new to NEOM. Length of time of this familiarization will be determined according to the experience of the driver, number of routes to drive and complexity of task.

## **8.20 Journey Management and Route Planning**

- 8.20.1 Journey Management is controlled and authorized by NEOM Security  
Follow the instructions in NEOM Safety management guide: Journey Management Program
- 8.20.2 To ensure road safety risks are As Low as Reasonably Practicable (ALARP), NEOM and Contractors shall operate a Journey Management process with following objectives:
- Ensure health and safety of all employees who are required to travel in vehicles on NEOM business.
  - Challenge need for unnecessary journeys and undertake minimum number of journeys.
  - Maximize efficiency of each journey.
  - Avoid (preferably) or minimize effect of all identified hazards likely to be encountered.
  - Be able to recover in a timely manner from any incident.
  - Monitor journey performance.
  - Ensure that drivers are fully aware of journey plans and any hazards.
- 8.20.3 Journey Management applies to all transport activities, including personnel and cargo transportation for all locations associated with NEOM, except for:
- Journeys within City's. towns.
  - Journeys within NEOM Operations areas.

8.20.4 In support of objectives of journey management process, Managers, Line Managers and Supervisors shall:

- (a) Periodically question and review number of journeys with intent to eliminate journeys and lower risk associated with driving.
- (b) Reduce risk to ALARP by applying following Hierarchy of Controls:



## 8.21 Routine and Repetitive Journeys

- 8.21.1 Hazard exposure considered for this type of trip is usually predictable and consistent. Control measures will normally be addressed through driver training programs and self-administrative pre-drive checks.
- 8.21.2 There is generally no need to follow a more rigorous journey management process for this type of trip. However, drivers and journey management are still required to consider variable factors such as time of day, climate and visibility before each journey commences. Recognition of escalating factors may lead trips to be considered as non-routine.
- 8.21.3 All vehicles transporting materials or equipment in and out of NEOM are required to carry completed load bills containing details of vehicle, driver, routes, technical condition etc.
- 8.21.4 Even for this type of trip vehicles shall be fitted with breakdown and response equipment (spare wheel, jack, wheel brace, warning triangle etc..)

## 8.22 Non-Routine Journey Management and Planning

8.22.1 Non-Routine journeys require specific security and emergency response considerations as well as planning and safety control measures beyond those implemented for Routine and Repetitive Journeys.

8.22.2 Non-Routine journeys require a specific written Journey Plan by a Journey manager

8.22.3 Use of the NEOM Journey Request Web Portal (when applicable) [Home - NEOM E-security Services](#)

The JMP shall include the following sections and standards as minimum requirements:

A time-out/time-in log system for identifying when vehicles, vessels, or aircraft are overdue. The logging system shall include:

- Name(s)
- Nature of travel
- Destination(s) in order of travel, if applicable
- Transport type and vehicle/charter number
- Planned route(s)
- Departure time
- Expected arrival time at destination
- Expected return time to origin, if applicable
- Contact telephone number(s) or radio frequency (if applicable)
- Additional information
- Confirmation of off-road mandatory equipment, if applicable
- Identification of the Journey Management Coordinator (JMC)
- Signature(s) out/in (or equivalent to meet the intent)

8.22.4 Each Journey requires formal approval, based on current and anticipated exposures and established controls.

8.22.5 Journey Management is controlled and authorized by NEOM Security

## **8.23 Road Traffic Incident (RTI) Reporting and Investigation**

8.23.1 NEOM and Contractors drivers/passengers involved in RTI are required to stop and report on RTI to Traffic Police immediately:

8.23.2 Information collection shall not interfere with Emergency Response activities being taken to mitigate incident, nor shall investigation members endanger themselves to hazards resulted from the incident. (Refer: NEOM Element 9 Emergency Planning and Response Management)

8.23.3 Commence collection of information shall include but is not limited to:

- (a) Photographs / video.
- (b) Sketch

- 8.23.4 An incident investigation shall be conducted for any RTI in accordance with NEOM Incident Investigation Procedure.(Refer: NEOM Element 8 Incident Investigation and Management)
- 8.23.5 Objective of RTI investigation is to identify root causes, lessons learnt and use recommendations to reduce possibility of any similar road traffic incidents occurring or improve response activities.
- 8.23.6 Following should not be reported as RTIs:
- (a) Injuries that occur when entering or exiting a parked vehicle.
  - (b) Any event involving loading or unloading from a parked vehicle.
  - (c) Damage to or total loss of a vehicle solely due to environmental conditions or vandalism theft.
  - (d) Another third-party vehicle crashes into properly parked vehicle.
  - (e) Superficial damage, such as a stone or rock chip damaging a windscreen, paintwork, wheel, etc.

**NOTE:** The above are reportable however NOT as Road Traffic Incidents but should be reported to Security.

## **8.24 Contractor Management**

- 8.24.1 All the responsibilities and processes mentioned in this NMS that are governing the operating NEOM employees shall be applicable to the Contractors.

## **8.25 Training And Competency**

- 8.25.1 Employers shall ensure that Safety training complies with the requirements of :
- 8.25.2 NEOM Element 5 – Training, Awareness and Competency.
- 8.25.3 NEOM-NLF-NMS 006.001 – SMS Organization, Practitioner Registration and Appointment of Contractor.
- 8.25.4 Employers shall ensure employees required to implement the requirements of this NMS are trained in the management of site traffic and logistics and understand the risks associated with such activities and the control measures are implemented by the employer.
- 8.25.5 Training for employees shall be competency-based and as a minimum, include
- (a) Information on the safe systems of work identified in the risk assessment ;
  - (b) Appropriate control measures to be followed by vehicle drivers or operators ;
  - (c) Appropriate training on the vehicle they are operating ;
  - (d) Appropriate control measures to be followed by pedestrians; and
  - (e) Reporting procedure in the event of incidents involving site traffic .
- 8.25.6 Employer shall conduct additional retraining whenever a periodic inspection reveals, or there is a reason to believe, that there are deviations from or inadequacies in the employee's knowledge of site traffic management and logistics.
- 8.25.7 Employers shall conduct additional retraining whenever a site traffic management or logistics procedure fails.
- 8.25.8 Employers shall maintain a record of the required training that contains the following information:
- (a) Name and ID number.
  - (b) Subject(s) of training;
  - (c) Date(s) of training; and
  - (d) Organization / person(s) providing the training.



## 9 Appendices

### 9.1 Appendix A: Reversing Signs



## 9.2 Appendix B: Audit Criteria

Audit Criteria		Requirements	Verification	Area of Concern
ISO 45001:2018 Clause	NMS Ref.			Yes/ No
5.3	7.1.2	NEOM health and safety policy and safety management system are properly applied within their areas of control/responsibility		
6.1	7.1.3	Pre-Tender Health and Safety Plan has been developed and issued to Contractor		
5.3, 8.1.4.2	7.1.4	Selection of Contractors undertaken in accordance with NEOM's policies and procedures		
6.1.2.2		Assessment of the various risks shall be undertaken		
9.0	7.1.5	Conduct regular safety and welfare assurance reviews to provide the confidence level		
7.2	7.2.4 (b, c)	Persons appointed to manage /oversee work operations have the skills, knowledge, experience		
8.1.2 (e)	7.2.4 (d)	Personal protective equipment required for use are fit for purpose		
8.1.2 (c, d)	7.2.2 (e)	Control of access to dangerous or high-risk areas or equipment using suitable Barricades and Signage		
10.2		Incident investigations and nonconformities reviews		
6.1.2.3, 8.1.2	8.2.7	A thorough and comprehensive hazard identification and risk assessment of Road Safety Operations		
		Hazards Identification Plan (HIP)		
8.2	8.2.3	Emergency Procedures to respond to foreseeable emergencies involving vehicles		
	8.5 8.6 8.7 8.8 8.9 8.10 8.11 8.12 8.13 8.14 8.15 8.16 8.17 8.18	General requirements of NEOM-NLF-SM-Safety Management Manual-Roles and Responsibilities shall be implemented; (a) Passenger and Freight Operations (b) Passengers (c) Drivers' Hours (d) Seat Belts (e) Vehicles Standards (f) Driver Selection Training and Performance (g) Speed Limits (h) Cellular Phone and other devices (i) Smoking and Eating/Drinking whilst driving (j) Parking (k) Daytime Running Lights and headlights (DRL) (l) Drivers Responsibilities at end of journey		

Audit Criteria		Requirements	Verification	Area of Concern
ISO 45001:2018 Clause	NMS Ref.			Yes/ No
		(m) Reversing (n) Desert Driving		
10.2	8.23	Road Traffic Incident (RTI) Reporting and Investigation		
7.2	8.25	Employees required to implement the requirements of this NMS are trained in the management of site traffic and logistics and understand the risks associated with such activities and the control measures are implemented		

### **9.3 Appendix C: Guidance Information**

Nearly a quarter of all deaths involving vehicles at work occur during reversing. Many other reversing accidents do not result in injury but cause costly damage to vehicles, equipment, and premises.

Most of these accidents can be avoided by taking simple precautions, such as those below.

#### **Guidance**

Remove the need for reversing altogether, by setting up one-way systems, for example drive-through loading and unloading positions. Where reversing is unavoidable, routes should be organized to minimize the need for reversing.

Ensure visiting drivers are familiar with the layout of the workplace, and with any site rules. Do drivers have to report to reception on arrival?

In locations where reversing cannot be avoided:

- 'Reversing areas' should be planned out and clearly marked.
- People who do not need to be in reversing areas should be kept well clear.

Consider employing a trained signaller (a banksman), both to keep the reversing area free of pedestrians and to guide drivers. Be aware: The use of signallers is not allowed in some industries due to the size of vehicles involved, and the difficulty that drivers have in seeing them.

A signaller:

- I. Will need to use a clear, agreed system of signalling.
- II. Will need to be visible to drivers at all times.
- III. Will need to stand in a safe position, from which to guide the reversing vehicle without being in its way.
- IV. Should wear very visible clothing, such as reflective vests, and ensure that any signals are clearly seen.
- V. If drivers lose sight of the signallers they should know to stop immediately.
- VI. Consider whether portable radios or similar communication systems would be helpful





نیوم NEOM

**NEOM OCCUPATIONAL HEALTH and SAFETY  
NEOM MINIMUM STANDARD  
for  
UNDER WATER ACTIVITIES**

NEOM-NLF-NMS-006.043 Rev 02.00 – February 2022

©NEOM [2021]. All rights reserved.

## Document History

Revision code	Description of changes	Purpose of issue	Date
Rev 00.00	First Issue	Issued for Implementation	27/07-2020
Rev 02,00	SMS Update	Issued for Implementation	01-02-2022

## Document Approval

	Prepared by	Reviewed by	Approved by
Name	Robert Murphy	Talal Al Anazi	Adel Al Wuhaib
Job Title	Loss Prevention Specialist LP/FS -Public Safety	Director, Loss Prevention/Fire Safety (LP/FS) Public Safety	Executive Director Public Safety



## Contents

<b>1</b>	<b>PURPOSE .....</b>	<b>4</b>
<b>2</b>	<b>SCOPE .....</b>	<b>4</b>
<b>3</b>	<b>EXPECTATIONS.....</b>	<b>4</b>
<b>4</b>	<b>LIST OF DEFINITIONS .....</b>	<b>5</b>
<b>5</b>	<b>LIST OF ABBREVIATIONS .....</b>	<b>5</b>
<b>6</b>	<b>RELATED NEOM DOCUMENTS AND REFERENCES .....</b>	<b>6</b>
<b>7</b>	<b>ROLES AND RESPONSIBILITIES .....</b>	<b>7</b>
7.1	Client .....	7
7.2	Contractor .....	7
7.3	Employers .....	8
7.4	Employee .....	8
7.5	Specific Responsibilities .....	9
<b>8</b>	<b>OTHER SECTIONS RELATED TO SUBJECT .....</b>	<b>10</b>
8.1	Employers Definition.....	10
8.2	Training and Competency .....	10
8.3	Divers Require:.....	11
8.4	Planning and Assessment.....	11
8.5	Recreational Diving Operations and SCUBA Diving Training Centres .....	11
8.6	Commercial Diving Operations .....	13
8.7	Decompression Chamber.....	15
8.8	Commercial Divers .....	15
8.9	Cylinders and Compressed Air .....	16
8.10	Warning Notices and Signals.....	16
8.11	Safety of Navigation .....	17
8.12	Record Keeping .....	18
<b>9</b>	<b>APPENDICES .....</b>	<b>19</b>
9.1	Appendix A: Forms, Signs and Checklists .....	19
9.2	Appendix B: Audit Criteria.....	20
9.3	Appendix C: Guidance Information.....	21

## List of Tables

Table 1 : Table of Definitions .....	5
Table 2 : Table of Abbreviations .....	5
Table 3 : Related NEOM Documents .....	6

## **1 Purpose**

This NEOM Co. SMS Minimum Standards (hereafter referred to as NMS) relates to the management of all occupational health, safety risks associated with Underwater Activities.

It provides guidance to support compliance with industry best practice and international regulatory safety requirements to ensure that the associated risks are assessed, and control measures are implemented in accordance with the hierarchy of risk controls.

It has been developed to align with the requirements of the ISO 45001 Health and Safety Management Manual (Refer NEOM-NLF-PRC-006- Section 2 ISO 14001 Cross reference table)

## **2 Scope**

This NMS applies to all personnel within NEOM and any Contractors working for NEOM and or associated projects and activities. It is designed to incorporate requirements set by the NEOM-SMS.

It includes for all diving and related support operations conducted in connection with all types of work, including general industry, construction, recreational diving, commercial diving, ship repairing, shipbuilding, ship-breaking, and long shoring.

## **3 Expectations**

To ensure the health and safety of all personnel, protection of assets (services, plant/equipment) and the environment

NEOM expect each Sector, Organization, Department or Contractor to ensure that risks associated with under water activities are controlled in accordance with the hierarchy of risk controls: elimination, substitution, engineering controls, administrative controls, and personal protective equipment.

Consideration shall be given to technological advances that may introduce new means of controlling or eliminating the risks associated with any activities conducted in or in support of underwater activities

That the expectation for safety compliance is meeting and exceeding all applicable OSHA Laws, Regulations, and Industry Best Practice.

Applicable requirements and standards include:

- (a) OSHA Standards and Regulatory requirements;
- (b) ANSI requirements;
- (c) NFPA Standards and requirements;
- (d) NEOM Minimum Standards
- (e) Saudi Building Codes
- (f) International Building Codes

*If requirements of this document conflict with requirements set by another regulatory authority, Contractor are required to follow the more stringent requirement.*

## 4 List of Definitions

Table 1 : Table of Definitions

Terms	Definitions
NEOM Co	NEOM Company
Client	NEOM Sector /Department responsible for management and oversight of the Contractor
Employer	The person or organization that employs personnel to complete the work
Contractor	The organization contracted to carry out the works
Sector, Organization, Department or Contractor	The Sector, Organization, Department or Contractor is the NEOM entity or developer designated by NEOM to accept custody for planning, designing, constructing, or managing and operating a particular asset or a group of assets
Safety Management System (SMS)	Occupational Health and Safety Management System established by NEOM in compliance to ISO 45001 Standard

## 5 List of Abbreviations

Table 2 : Table of Abbreviations

Abbreviations	Descriptions
SMS	Safety Management System
NMS	NEOM Minimum Standard
SOP	Standard Operating Procedure
ANSI	American National Standards Institute
NFPA	National Fire Prevention Association
CPP	Construction Phase Plan
OSHA	Occupational Safety and Health Administration.
PPE	Personal Protective Equipment
PADI	Professional Association of Dive Instructors
BSAC	British Sub Aqua Club
SAA	Sub Aqua Association
SSI	SCUBA Schools International
SCUBA	Self-Contained Breathing Apparatus
FSW (fsw)	Feet of Salt Water
ESD	Emergency Shut Down
OHS	Occupational Health and Safety
EAN	Enriched Air Nitrox
IMCA	International Marine Contractors Association
ADAS	Advanced Diver Assistance Systems
CGA	Compressed Gas Association

Abbreviations	Descriptions
ISO	International Standards Organisation
IBC	International Building Codes

## 6 Related NEOM Documents and References

Table 3 : Related NEOM Documents

Document Code	Document Name
NEOM Element 2	Risk and Opportunity Management
NEOM-Element 3	Control of Documented Information & Legal Compliance
NEOM-Element 5	Training, Awareness and Competency.
NEOM-Element 6	Contractor Management
NEOM Element 8	Incident Notification, Investigation and Reporting;
NEOM Element 9	Emergency Planning and Response Management
NEOM-SMS	NEOM Safety Management System
NEOM-NLF-SM	Safety Manual - Roles and Responsibilities
NEOM-NLF-PRC-006- Section 2	ISO 14001 Cross Reference Table
NEOM-NLF-PRC-006;	Occupation health safety and Fire Safety requirements for Contractors
NEOM-NLF-NMS-006.001	OHS-MS Organization, Practitioner Registration and Appointment of Contractor
NEOM-NLF-NMS-006.002	OHS Construction Management Plan
NEOM-NLF-NMS-006.006	Safe use of Lifting Equipment and Lifting Accessories
NEOM-NLF-NMS-006.004	Permit to Work Systems
NEOM-NLF-NMS-006.012 –	Barricading of Hazards
NEOM-NLF-NMS-006.020	Hazardous Materials
NEOM-NLF-NMS-006.021	Personal Protective Equipment (PPE)
NEOM-NLF-NMS-006.024	Occupational Health Screening and Medical Surveillance
NEOM-NLF-NMS-006.029	First Aid and Medical Treatment
ISO 24803:2007,	Recreational Diving Services – Requirements for recreational scuba diving service providers
ISO 24802-1:2007,	Recreational Diving Services – Safety related minimum requirement for the training of scuba instructors – Part 1: Level 1;
ISO 24802-2:2007,	Recreational Diving Services – Safety related minimum requirements for the training of scuba instructors – Part 2: Level 2;
ISO 11107:2009,	Recreational Diving Services – Requirements for training programs on enriched air nitrox (EAN) diving;
ISO 24801-3:2007,	Recreational Diving Services – Safety related minimum requirements for the training of recreational scuba divers – Part 3: Level 3 – Dive Leader.
ISO 11107:2009,	Recreational Diving Services – Requirements for training programs on enriched air nitrox (EAN) diving

## **7 Roles and Responsibilities**

### **7.1 Client**

- 7.1.1 General Health and Safety roles and responsibilities are defined in; and shall be carried out in accordance with the requirements of NEOM-NLF-SM–Safety Management Manual - Roles and Responsibilities.
- 7.1.2 The Client is responsible for ensuring that NEOM Safety Commitment Statement and safety management system are properly applied within their areas of control/responsibility. Effective implementation will ensure compliance with relevant legislative requirements and will help promote the use of industry best safe working practices.
- 7.1.3 That a suitable, Pre-Tender Health and Safety Plan has been developed and issued to Contractors to ensure they have all the information necessary to make informed decisions when developing the Construction Phase Health and Safety Plan (NEOM-NLF-NMS-006.002 Safety Construction Management Plan) (CPP) which will form part of the Contractor review and selection process
- 7.1.4 That the selection of Contractors shall be undertaken in accordance with NEOM's policies and procedures (NEOM-Element 6-Contractor Management). To ensure that only Competent organizations in Underwater Activities (Diving) capable of meeting the requisite safety standards associated with project are contracted.
- 7.1.5 Conduct regular Contractor safety assurance reviews to provide the confidence level required that the safety management system is delivering as planned, and consistently achieves the acceptable level of safety. Including:
  - (a) Safety performance monitoring and measuring;
  - (b) Managing change;
  - (c) Continuous improvement.

### **7.2 Contractor**

- 7.2.1 Contractor shall undertake their roles and responsibilities in accordance with the general requirements of NEOM–NLF-SM–Safety Management Manual-Roles and Responsibilities
- 7.2.2 Maintaining control of access to dangerous or high-risk areas or equipment using suitable barricades that are in serviceable condition (Refer: NEOM-NLF-NMS-006.012 – Barricading of Hazards)
- 7.2.3 That all work activities are assessed, planned, organized, and that suitably competent Supervision is available to implement the safety requirements and oversee the work (Refer: NEOM- Element 5 – Training, Awareness and Competency)
- 7.2.4 Ensure persons appointed to manage /oversee work operations have the skills, knowledge, experience and, where relevant, the organizational capability to plan and manage work safely and without risk to those who may be affected by the activities (Refer: NEOM Element 5 Training, Awareness, and Competence).
- 7.2.5 Ensure employees carrying out the work are trained to recognize the associated hazards and understand the processes and procedures to control or minimize the risks.(Refer: NEOM Element 2 Risk and Opportunity Management)
- 7.2.6 That all equipment including personal protective equipment required for use is fit for purpose, and (as required) has been inspected by a competent person and inspection records are maintained and readily available.(Refer: NEOM-NLF-NMS-006.021 Personal Protective Equipment) (PPE)

### **7.3 Employers**

7.3.1 The Employer responsibilities relate to Sector, Organization, Department or Contractor. Employer specific responsibilities related to this procedure include:

- (a) Employer shall be responsible for performing a risk assessment in accordance with NEOM Element 2 Risk and Opportunity Management to determine the risks associated with dive activities and develop an Occupational Diving Program that implements the appropriate control measures.
- (b) Ensure that there are appropriate divers who are competent in both diving and the actual work to be undertaken and possess valid diving certifications as required by this NMS.
- (c) Ensure that diving operations shall not take place without a competent appointed diving supervisor. (Refer: NEOM Element 5 Training, Awareness and Competence)
- (d) Provide appropriate plant and equipment and ensure that it is correctly certified and maintained.
- (e) Ensure all divers have a medical evaluation to assess their fitness to perform work prior to starting work and annually thereafter. A physician familiar with the hazards of diving operations shall perform medical evaluations. (Refer: NEOM-NLF-NMS-006.024 Occupational Health Screening and Medical Surveillance)
- (f) Maintain insurance coverage for all divers that shall cover treatment of injuries and illnesses associated with underwater activities, to include medical evacuations and treatment of decompression illnesses.
- (g) Implement the employer's Occupational Diving Program which shall include reviewing risk assessments and consulting their staff to ensure all relevant hazards are identified and appropriate control measures are implemented.
- (h) Ensure divers are assessed prior to any operations for obvious changes in their medical fitness if such changes have occurred; they shall not allow the diver to perform work until assessed and found fit by a medical professional.
- (i) Ensure there are appropriate arrangements for firefighting on-board vessel(s). (Refer: NEOM Element 9 Emergency Planning and Response Management)
- (j) Ensure there are appropriate arrangements for recovery of injured divers, first aid and medical treatment, including contract or service agreement with medical facilities with the appropriate specialist hyperbaric medical equipment and practitioners. Refer: (NEOM Element 9 Emergency Planning and Response Management and NEOM-NLF-NMS-006.029 First Aid and Medical Treatment)
- (k) Ensure that diving project logbooks (including required stamp) / records are appropriately maintained.
- (l) Ensure everyone in the diving operation is aware of the diving project plan, and that the plan is kept up to date.
- (m) Ensure there is appropriate communication with the divers in the water.
- (n) Check the site on the day of the dive, and when conditions change, confirm that the risk assessment is still current.

### **7.4 Employee**

- 7.4.1 Shall undertake their roles and responsibilities in accordance with the general requirements of NEOM-NLF-SM – Safety Management Manual - Roles and Responsibilities.
- 7.4.2 Report any activity or defect relating to the work which they believe is reasonably foreseeable to endanger their safety or that of another person's.
- 7.4.3 Shall use appropriate equipment or safety devices provided for the work by the Contractor in accordance with any training or instruction received in the use of the work equipment. (Refer NEOM-NFL-NMS-006.021 Personal Protective Equipment)
- 7.4.4 Shall undertake their specific roles and responsibilities in accordance with the following:
  - (a) Report any activity or defect relating to underwater activities which they believe is reasonably foreseeable to endanger their safety or that of another person.
  - (b) Use appropriate equipment or safety devices provided for underwater activities by the employer in accordance with any training or instruction received in the use of the work equipment or device concerned.
  - (c) Hold an approved qualification and experience for the diving operations.
  - (d) Have a valid certificate of medical fitness to dive.
  - (e) Maintain a daily logbook / record of their dives, which shall be kept for a minimum of five (5) years.
  - (f) Follow the requirements of their employers Occupational Diving Program and maintain their diving certifications.

## **7.5 Specific Responsibilities**

- 7.5.1 Sector, Organization, Department or Contractor Head is responsible in ensuring that provisions are made the safe systems of work to prevent and minimize risks in each workplace
- 7.5.2 Safety Practitioner/Coordinator is responsible to monitor the implementation of this procedures and document its effectiveness
- 7.5.3 The Responsible Person will support this procedure and ensure that any Contractor Organization working for, or on behalf of, the Sector, Organization, Department or Contractor will comply with the requirements of these procedures
- 7.5.4 Line Managers / Supervisors are responsible for training their workers in risks
- 7.5.5 The LP & FS Public Safety department will support the NEOM risk assessments by carrying out compliance checks and supporting and guiding the various safety teams.

## **8 Other Sections related to subject**

### **8.1 Employers Definition**

8.1.1 The Employer responsibilities in this Section 8 relate to Sector, Organization, Department or Contractor

### **8.2 Training and Competency**

8.2.1 Employers shall ensure that training complies with the requirements of:

- (a) NEOM Element 5 – Training, Awareness and Competency;
- (b) NEOM-NLF-NMS-006.001 – Organization, Safety Practitioner Registration and Appointment of Contractor.

8.2.2 They shall ensure all relevant employees and other persons have:

- (a) Appropriate training to ensure they acquire the understanding, knowledge, and skills necessary for the safe performance of all duties;
- (b) Valid commercial diving certification if they perform underwater work that includes, but is not limited to welding, pipeline construction and/or repair, rig construction and/or repair, bridge construction and/or repair, or other similar activities;
- (c) A valid commercial diving certification if they collect criminal evidence or scientific samples, locate bodies, and/or photograph or film underwater;
- (d) A valid diving qualification/certification from one of the following, or equivalent, diving organizations if they are providing recreational diving services or instruction:
  - I. Professional Association of Diving Instructors (PADI);
  - II. British Sub-Aqua Club (BSAC);
  - III. Sub-Aqua Association (SSA); or
  - IV. SCUBA Schools International (SSI).
- (e) Diving qualifications/certifications and training equivalent to the depth of the dives performed and operations performed while diving;
- (f) Training on risks associated with activities they will perform;
- (g) Training on control measures implemented to address identified risks;
- (h) Annual refresher training on the employer's Occupational Diving Program;
- (i) Training on what work can and cannot be performed while diving; and
- (j) Specific emergency procedures to follow if an incident occurs.
- (k) Employers are to ensure managers and supervisors of Diving Operations shall have a valid Commercial Diving Certification and training equivalent to the work being performed if they manage or supervise commercial diving operations;
- (l) The following minimum qualification/certification, or equivalent, if providing recreational diving services:
  - I. PADI – Dive Master;
  - II. BSAC – Advanced Diver;
  - III. SSA – Dive Supervisor;
  - IV. SSI – Dive Control Specialist; or
  - V. Equivalent from a recognized diving organization

- (m) Diving qualifications/certifications equivalent to the depth of the dives performed and operations performed while diving;
- (n) Current first aid training in accordance with SCUBA diving certification requirements and NEOM-NLF-NMS-006.029– First Aid and Medical Treatment;
- (o) Training on risks associated with tasks their staff will perform;
- (p) Training on control measures implemented to address identified risks;
- (q) Annual refresher training on the employer's occupational diving program;
- (r) Training on what work can and cannot be performed while diving; and
- (s) Specific emergency procedures to follow if an incident occurs.

### **8.3 Divers Require:**

- 8.3.1 A valid Commercial Diving Certification and training equivalent to the work being performed if they manage or supervise commercial diving operations;
- 8.3.2 A valid diving qualification/certification when providing recreational diving services from one of the following, or equivalent, recognized diving certification organizations:
  - (a) PADI;
  - (b) BSAC;
  - (c) SSA; or
  - (d) SSI.

### **8.4 Planning and Assessment**

- 8.4.1 Employers shall ensure the following:
  - (a) An assessment of the various risks is undertaken, and systems of work are established which are safe to all parties involved or affected including the public;
  - (b) That appropriate control measures are implemented in order to manage activities safely and without risk to health;
  - (c) That for the Construction Sector the management of underwater activities requirements are included in the Pre-Tender Safety and Health Plan in accordance with NEOM-NLF-NMS-006/002 Safety Construction Management Plan;
  - (d) That associated safe systems of work, and site rules are included in the Occupational Safety and Health Construction Management Plan (CPP) and in accordance with NEOM Element 6 Contractor Management.

### **8.5 Recreational Diving Operations and SCUBA Diving Training Centres**

- 8.5.1 Employers shall perform a risk assessment in accordance with NEOM-Element 2 – Risk and Opportunity Management, to determine the risks, control measures and training requirements for employees performing diving and instruction operations.
- 8.5.2 Recreational Diving Operations and SCUBA Diving Training Centers shall maintain current permit(s) and license(s) as required.
- 8.5.3 Recreational Diving Operations and SCUBA Diving Training Centers shall meet the following international standard requirements:
  - (a) Recreational scuba diving businesses shall meet the requirements of ISO 24803:2007, Recreational Diving Services – Requirements for recreational scuba diving service providers;

- (b) Assistant scuba diving Instructors shall meet the requirements of ISO 24802-1:2007, Recreational Diving Services – Safety related minimum requirement for the training of scuba instructors – Part 1: Level 1;
  - (c) Scuba diving instructors shall meet the requirements of ISO 24802-2:2007, Recreational Diving Services – Safety related minimum requirements for the training of scuba instructors – Part 2: Level 2;
  - (d) Scuba divers using enriched air shall meet the requirements of ISO 11107:2009, Recreational Diving Services – Requirements for training programs on enriched air nitrox (EAN) diving; and
  - (e) Managers and supervisors of scuba diving operations shall meet the requirements of ISO 24801-3:2007, Recreational Diving Services – Safety related minimum requirements for the training of recreational scuba divers – Part 3: Level 3 – Dive Leader.
- 8.5.4 Recreational diving operations shall have an Occupational Diving Program that shall at a minimum consist of the following:
- (a) Training for new employees, and refresher training as required;
  - (b) Process to ensure employees have been appropriately trained and maintain valid Diving qualifications/certifications;
  - (c) Communication system to inform/remind employees of the hazards of diving operations and control measures that shall be implemented to reduce identified risks;
  - (d) Pre-work assessment and job briefings that shall review work procedures to ensure all risks have been identified and appropriately controlled;
  - (e) Emergency procedures and contact information for emergency services, medical clinics, hospitals, Coast Guard, and a physician that is competent and capable of treating diving and decompression related injuries and illnesses;
  - (f) Reporting and investigation of incidents occurring during diving operations as required by NEOM Element 8– Incident Notification, Investigation and Reporting;
  - (g) Medical monitoring / surveillance program to ensure no medical condition exists that makes employees unsuitable for performing recreational diving and instruction work; (NEOM-NLF-NMS-006.024 Occupational Health Screening and Medical Surveillance)
  - (h) Process for logging dives and maintaining safe diving operations as specified by a professional diving organization (e.g., PADI or BSAC); and
  - (i) Process for maintaining, testing, and servicing all diving equipment.
- 8.5.5 Diving shall be planned so that employees do not dive alone, and medical assistance is available when required while performing diving activities.
- 8.5.6 Select one professional diving organization that their occupational diving operations shall adhere to and follow the requirements set by that organization. All divers shall maintain qualifications/certifications from that organization.
- 8.5.7 New employees with qualifications/certifications from another organization shall have six months to obtain the qualifications/certifications from the employer selected professional organization, but they shall have equivalent qualifications for the work and depth of dives they will be performing for the employer.
- 8.5.8 Any diving operations deeper than 35 meters, the employer shall ensure:
- (a) Employees and managers/supervisors performing the dive operations have the equivalent commercial and/or technical dive certification/qualification for performing the dives;
  - (b) That all divers have the appropriate equipment to safely perform diving operations. They shall also ensure all breathing gases have been tested to ensure they meet required specifications as set by the professional diving organization's standards they are following; and

- (c) A decompression chamber or bell, with qualified medical staff, is available within one hour of the dive operations.
- 8.5.9 The maximum depth for recreational diving is 40 meters. Any diving operations deeper than 40 meters shall follow the requirements for commercial diving operations.
- 8.5.10 All diving equipment shall be maintained to manufacturer's requirements.
- 8.5.11 The minimum qualification/certification for the senior diver on a dive boat that is providing recreational dive services shall be:
- (a) PADI – Dive Master;
  - (b) BSAC – Advanced Diver;
  - (c) SSA – Dive Supervisor;
  - (d) SSI – Dive Control Specialist; or
  - (e) equivalent from a recognized diving organization.

## **8.6 Commercial Diving Operations**

- 8.6.1 Employers shall:
- (a) Perform a risk assessment in accordance with NEOM-Element 2 – Risk and Opportunity Management, to determine the risks and training requirements for employees performing diving operations;
  - (b) Have membership in and follow the practices of the International Marine Contractors Association (IMCA) or any equivalent membership of an internationally recognized organization (HSE-UK, Association of Diving Contractors, etc.);
  - (c) Shall maintain current permit(s) and license(s) as required;
  - (d) Require all diving operations to be carried out under appropriate work procedures along with performing a task specific risk assessment; and
  - (e) Identify a Competent Person for Diving Operations in writing.
- 8.6.2 Competent Person for Diving Operations shall:
- (a) Ensure competency of divers and diving contractors;
  - (b) Coordinate with diving team operations and prepare plans for diving operations;
  - (c) Ensure diving operations are in accordance with this NMS and team diving plans; and
  - (d) Ensure that divers update and maintain their personal dive logbooks at the end of each day.
- 8.6.3 Facility/Site Manager or Ships Master shall:
- (a) Ensure that all interfaces are identified, the risks analysed, and actions taken to mitigate risks. Such interfaces resulting from concurrent activities include:
    - I. Over side lifting, scaffolding or any other work that may cause objects to drop in the diving zone;
    - II. Over side disposal of effluent and/or waste (e.g., Drilling mud/cuttings);
    - III. Ship movements in the vicinity of diving location;
    - IV. Testing of firefighting facilities (e.g., start-up of fire pumps); and
    - V. Special operations that may cause accidental loss of containment in the vicinity of the diving operations. (e.g., pressure testing of subsea pipe work, testing of subsea Emergency Shutdown Valves (ESDs).

- 8.6.4 Ensure that, where reasonably practicable, concurrent operations are avoided. However, if avoiding these is not an option, then Permit to Work (PTW) control measures requirements shall be strictly applied; (Refer: NEOM-NLF-NMS-006.004 Permit to Work Systems)
- 8.6.5 Inform the Competent Person for Diving Operations of the location and exact operational details of all interface items in writing and in appropriate time to account for them in the risk assessments;
- 8.6.6 Provide the Competent Person for Diving Operations in writing with details of any substances that are reasonably foreseeable to be encountered by the diving team that would be hazardous to their health; (Refer: NEOM-NLF-NMS-006.020 Hazardous Materials)
- 8.6.7 Ensure appropriate lifting equipment is available, in compliance with NEOM-NLF-NMS-006.006 Safe use of Lifting Equipment and Lifting Accessories;
- 8.6.8 Ensure that the competent Person of Diving Operations is kept informed of any changes that may affect the diving operation.
- 8.6.9 Commercial diving operations shall meet the following international standard requirements:
- (a) Scuba divers using enriched air shall meet the requirements of ISO 11107:2009, Recreational Diving Services – Requirements for training programs on enriched air nitrox (EAN) diving; and
  - (b) Managers and supervisors of scuba diving operations shall at a minimum meet the requirements of ISO 24801-3:2007, Recreational Diving Services – Safety related minimum requirements for the training of recreational scuba divers – Part 3: Level 3 – Dive Leader.
- 8.6.10 Employers that have commercial diving operations shall develop an Occupational Diving Program that shall at a minimum consist of the following:
- (a) Training for new employees, and refresher training as required;
  - (b) Process to ensure employees have valid diving qualifications/certifications;
  - (c) Communication system to inform/remind employees of the hazards of diving operations and the required control measures they shall implement to reduce identified risks;
  - (d) Pre-work assessment and job briefings that shall review work procedures to ensure all risks have been identified and appropriately controlled;
  - (e) Procedures for emergency response or medical treatment if an incident occurs to include identifying a physician that is familiar with and capable of treating decompression illnesses;
  - (f) Reporting and investigation of incidents occurring during diving operations as required by NEOM-Element 8– Incident Notification, Investigation and Reporting.
  - (g) Medical monitoring / surveillance program to ensure no medical condition exists that makes employees unsuitable for performing commercial diving operations;
  - (h) Process for logging dives and maintaining safe diving operations as specified by a professional diving association; and
  - (i) Process for maintaining, testing, and servicing all diving equipment.
- 8.6.11 Work shall be planned so that employees do not work alone, and medical assistance is available when required while performing diving activities.
- 8.6.12 Any diving operations deeper than 35 meters, the employer shall ensure:
- (a) Employees and managers/supervisors performing the dive operations have the equivalent commercial and/or technical dive certification/qualification for performing the dives;
  - (b) That all divers have the appropriate equipment to safely perform diving operations. They shall also ensure all breathing gases have been tested to ensure they meet required specifications as set by the professional diving organization's standards they are following; and
  - (c) A decompression chamber or bell, with qualified medical staff, is available within one hour of the dive operations, except where a decompression chamber is required on site as specified below.

- 8.6.13 Qualified medical staff and a decompression chamber capable of recompressing the diver at the surface to a minimum of 165 feet of salt water (fsw) shall be available within five minutes of the dive location (on-site) for:
- (a) Surface-supplied air diving to depth deeper than 100 fsw and shallower than 220 fsw; or
  - (b) Mixed gas diving deeper than 150 fsw and shallower than 300 fsw; or
  - (c) Diving outside the no-decompression limits shallower than 300 fsw.
- 8.6.14 Qualified medical staff and a decompression chamber capable of recompressing the diver at the surface to the maximum depth of the dive shall be available within five minutes of the dive location (on-site) for dives deeper than 300 fsw.

## **8.7 Decompression Chamber**

8.7.1 The decompression chamber shall be:

- (a) Dual lock;
- (b) Multi-place and
- (c) Equipped with:
  - I. A pressure gauge for each pressurized compartment designed for human occupancy;
  - II. A built-in-breathing-system with a minimum of one mask per occupant;
  - III. A two-way voice communication system between the occupants and a dive team member at the dive location;
  - IV. A viewport; and
  - V. Illumination capability to light the interior.

## **8.8 Commercial Divers**

- 8.8.1 Divers shall hold a diving qualification appropriate for the work they intend to do. They shall have the original certificate in their possession at the site of the diving project – copies are not acceptable; and maintain one of the following qualifications, or an equivalent qualification:
- (a) Scuba Diving to 30 meters - ADAS Part 1 (AS2815.1);
  - (b) Surface Supply to 30 meters - ADAS Part 2 (AS2815.2);
  - (c) Surface Supply to 50 meters - ADAS Part 3 (AS2815.3); and
  - (d) Bellmen and lockout divers - ADAS Part 4 (AS2815.4).
- 8.8.2 Before the commencement of a diving project, the employer shall develop a diving project plan that is updated as necessary during the diving operations if conditions change, or new hazards are identified. At a minimum, the diving project plan shall:
- (a) Include written appointment of a competent person to supervise the operation that is appropriately qualified to perform the functions of diving supervisor;
  - (b) List the risks identified during the risk assessment and control measures that will be taken to remove or control the risks to an as low as reasonably practicable level;
  - (c) Cover the general principles of the diving techniques to be used as well as the needs of the particular operation;
  - (d) Identify emergency procedures and contact information for emergency services, medical clinics, hospitals, Coast Guard, and experienced / competent physicians;
  - (e) Include procedures for checking and testing air quality of compressed air used in diving operations; and

- (f) Include communication procedures during diving operations to include how divers shall communicate with other divers and personal overseeing operations at the surface.

## 8.9 Cylinders and Compressed Air

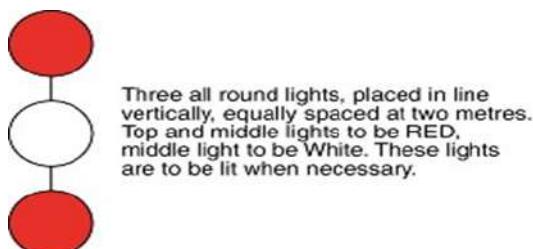
- 8.9.1 All cylinders and valves shall be inspected for serviceability prior to use. All cylinders shall have the inside of the cylinder visually inspected at a minimum annually and pressure tested at a minimum every five years and the date of pressure testing stamped on the cylinder.
- 8.9.2 Compressed air shall meet the requirements of the Compressed Gas Association (CGA), Table 1, Level E Standards for Scuba Diving Air.

## 8.10 Warning Notices and Signals

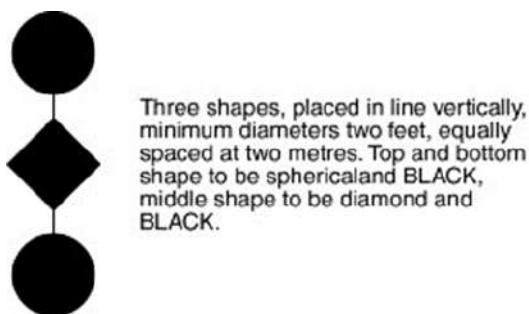
- 8.10.1 Diving signals shall be displayed in the most conspicuous position relative to the diving operation and visible to all vessels at all times. The area of the diving operation shall be clearly defined with the international "A" "Diver Below" (see Figure 1) and where applicable mast head lights (see Figure 2) or mast head symbols (see Figure 3) shall be used.
- 8.10.2 In no wind situations a rigid replica of the International Flag "A," with a minimum dimension one square meter shall be displayed adjacent to the diving site.



**Figure 1:** International Flag "A" (Diver Below)

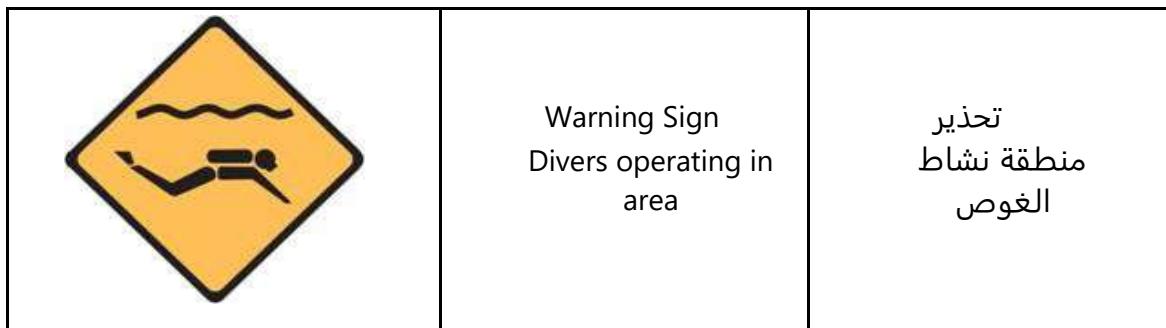


**Figure 2:** International Mast Headlights



**Figure 3:** International Mast Head Symbols

- 8.10.3 During conditions when a wind exists and a non-ridged International Flag "A" is displayed, the dimensions shall not be less than 750 millimetres in length and not less than 600 millimetres in width when displayed on a vessel and 300 millimetres in length and 300 millimetres in width when displayed from a buoy.
- 8.10.4 When using International Mast Headlights and International Mast Head Symbols, they shall be clearly visible for a distance not less than 200 meters.
- 8.10.5 When diving is taking place during the hours of darkness, a yellow or orange flashing light with a visibility of not less than 200 meters and visible to all vessels shall be used.
- 8.10.6 When diving operations occur from locations other than a vessel (e.g., beach, bridge, platform, etc.) the following safety signage (see figure 4) shall be posted at all times and visible to all vessels within 100 meters. During diving activities, the International Flag "A" shall also be displayed.



**Figure 4: Warning Sign**

## 8.11 Safety of Navigation

- 8.11.1 Personal Flotation Devices of the appropriate size shall be made available to all personnel on the vessel (boat).
- 8.11.2 Vessels shall not exceed a speed of 6 knots when:
- Within 100 meters of any diving operations;
  - Within 100 meters of a vessel or buoy on which a "diver below" signal corresponding to the international code flag "A" (figure 1) is displayed;
  - Within 60 meters of a designated swimming area;
  - Within 60 meters of a person in the water;
  - Within 60 meters of any fixed or floating structure, either on or in the water; except where that structure is an Aid to Navigation and the width of the Navigable Channel prevents such distance off to be maintained; (vi) within 200 meters of the water's edge; and (vii) passing through an arch of a bridge.
- 8.11.3 Operators of vessels shall have training on the appropriate operation of the vessel and associated rules and regulations on the safe operations of a vessel.
- 8.11.4 Operators of vessels shall have the appropriate training certificates and licenses as required by the Department of Transportation.
- 8.11.5 Employers with vessels shall comply with the requirements of the Transport (Waterways Management) Code of Practice 2011.
- 8.11.6 Vessels engaged in commercial underwater operations shall exhibit:
- International Mast Headlights (Figure 2) or International Mast Head Symbols (Figure 3);

- (b) Two all-round red lights or two ball in a vertical line to indicate the side on which the diving operations are occurring; and
  - (c) Two all-round green lights or two diamonds in a vertical line to indicate the side on which another vessel may pass.
- 8.11.7 Whenever the size of a vessel engaged in commercial diving operations means it not reasonably practicable to exhibit all lights and shapes prescribed in Section 3.6(f), the following shall be exhibited:
- (a) Three all-round lights in a vertical line where they can best be seen. The highest and lowest of these lights shall be red and the middle light shall be white; and
  - (b) A rigid replica of the International Code Flag "A" not less than 1 meter in height and width shall be displayed and visible to all vessels at all times.

## **8.12 Record Keeping**

- 8.12.1 All medical evaluation records and training records shall be maintained in accordance with NEOM-Element 3 Control of Documented Information & Legal Compliance
- 8.12.2 All diving logs, end of job reports, and associated paper work shall be maintained for a minimum of five (5) years.
- 8.12.3 A log of equipment maintenance, servicing, and testing shall be maintained for a minimum of five (5) years.

## 9 Appendices

### 9.1 Appendix A: Forms, Signs and Checklists

#### Common hand signals.

Signals may vary somewhat, so review them when planning a dive with a new buddy.



1. Stop, hold it, stay there



2. Something is wrong



OK? OK.



4. OK? OK. (glove on)



5. Distress, help



6. OK? OK. (on surface at distance)



7. OK? OK. (one hand occupied)



8. Danger



9. Go up, going up



10. Go down, going down



11. Low on air



12. Out of air



13. Buddy breathe or share air

## 9.2 Appendix B: Audit Criteria

Audit Criteria		Requirements	Verification	Area of Concern
ISO 45001:2018 Clause	NMS Ref.			Yes/ No
5.3	7.1.2	NEOM health and safety policy and safety management system are properly applied within their areas of control/responsibility		
6.1	7.1.3	Pre-Tender Health and Safety Plan has been developed and issued to Contractor		
5.3, 8.1.4.2	7.1.4	Selection of Contractors undertaken in accordance with NEOM's policies and procedures		
6.1.2.2		Assessment of the various risks shall be undertaken		
9.0	7.1.5	Conduct regular safety and welfare assurance reviews to provide the confidence level		
7.2	7.2.4 (b, c)	Persons appointed to manage /oversee work operations have the skills, knowledge, experience		
8.1.2 (e)	7.2.6	Personal protective equipment required for use are fit for purpose		
8.1.2 (c, d)	7.2.2 (e)	Control of access to dangerous or high-risk areas or equipment using suitable Barricades and Signage		
10.2		Incident investigations and nonconformities reviews		
7.2, 6.1.3	7.3.1 (c)	Diving operations shall not take place without a competent appointed diving supervisor		
	7.3.1(b)	Divers who are competent in both diving and the actual work to be undertaken and possess valid diving certifications		
	7.3.1(e)	Divers have a medical evaluation to assess their fitness to perform work		
7.2, 6.1.3	8.5.2	Recreational Diving Operations and SCUBA Diving Training Centers shall maintain current permit(s) and license(s)		
8.1, 8.2	8.5.4 8.6	Recreational/ Commercial Diving Operations <ul style="list-style-type: none"> <li>• diving operations shall have an Occupational Diving Program;</li> <li>• Training</li> <li>• Communication</li> <li>• Pre-work assessment</li> <li>• Emergency procedures</li> <li>• Reporting and investigation of incidents</li> <li>• Medical monitoring / surveillance program</li> </ul>		
	8.10	Warning Notices and Signals		
	8.11	Safety of Navigation		
7.5	8.12	All medical evaluation records and training records, diving logs, end of job reports, log of equipment maintenance, servicing, and testing shall be maintained		

### **9.3 Appendix C: Guidance Information**

The "diving industry" can be considered as a number of sectors where people need to go underwater to work. With the exception of the recreational sector, diving is primarily a method of getting to a work site that happens to be underwater.

Under OSHA 29 CFR 1910 Subpart T are applied to commercial diving this is standard across all industries including General Industry – Maritime Industries and Construction Industries. For recreational diving the diving organisations set the rules however the instructors and the diving company must meet the OSHA requirements

In the UK the main set of regulations that apply to diving are the Diving at Work Regulations 1997 (DWR). DWR cover all divers when one or more divers are at work, whether employed or self-employed.

here are five Approved Codes of Practice (ACOPs) which give advice on how to comply with the law. These Codes are for different sectors of the commercial diving industry and cover:

- Commercial diving projects offshore
- Commercial diving projects inland/inshore
- Media diving projects
- Scientific and archaeological diving projects, and
- Recreational diving projects

In the UK for Recreational diving:

If divers are paying for training from a diving instructor or there is a dive guide employed then the Diving at Work Regulations 1997 will apply.

There should be a 'Diving Project Plan'. The instructor or guide should brief the divers on its content.

This plan should cover team size and the duties that some of the team will carry out. There should be a minimum of three people nominated in the plan:

the 'supervisor' (usually the instructor/guide)

- a 'person on the surface' who can summon help if required
- a diver nominated as the 'safety or rescue diver' qualified to render assistance to the supervisor if necessary. A novice diver will not usually be able to carry out this role
- The pre-dive brief should cover the planned duration and the criteria for ending the dive and returning to the surface (usually time and/or cylinder pressure). The brief should also cover dive abort procedures, if the expected water conditions are not acceptable, and lost diver procedures.
- The plan should detail the arrangements for the provision of first aid and oxygen administration.
- The 'staff divers' should all have an in date HSE 'certificate of medical fitness to dive'.
- Equipment servicing records should be available.
- If using a dry suit, adequate confined water training should be completed before open water use.



نیوم NEOM

**NEOM OCCUPATIONAL HEALTH and SAFETY  
NEOM MINIMUM STANDARD  
for  
EMPLOYER SUPPLIED ACCOMMODATION**

NEOM-NLF-NMS-006.044 Rev 02.00 – February 2022

©NEOM [2021]. All rights reserved.

## Document History

Revision code	Description of changes	Purpose of issue	Date
Rev 00.00	First Issue	Issued for Implementation	27/07-2020
Rev 02,00	SMS Update	Issued for Implementation	01-02-2022

## Document Approval

	Prepared by	Reviewed by	Approved by
Name	Robert Murphy	Talal Al Anazi	Adel Al Wuhaib
Job Title	Loss Prevention Specialist LP/FS -Public Safety	Director, Loss Prevention/Fire Safety (LP/FS) Public Safety	Executive Director Public Safety

## OUR NEOM VALUES



### CATALYST

Make a difference.  
Create a legacy.



### CARE

Leave the environment  
in a better place.



### CURIOUS

Challenge the norm.  
Stay restless.



### PASSIONATE

Be accountable.  
Finish what you start.



### RESPECT

Be authentic.  
Be true. Be bold.



### DIVERSITY

Embrace cultural  
differences.  
Seek to understand.

## Contents

<b>1</b>	<b>PURPOSE .....</b>	<b>4</b>
<b>2</b>	<b>SCOPE .....</b>	<b>4</b>
<b>3</b>	<b>EXPECTATIONS.....</b>	<b>4</b>
<b>4</b>	<b>LIST OF DEFINITIONS .....</b>	<b>5</b>
<b>5</b>	<b>LIST OF ABBREVIATIONS .....</b>	<b>5</b>
<b>6</b>	<b>RELATED NEOM DOCUMENTS.....</b>	<b>5</b>
<b>7</b>	<b>ROLES AND RESPONSIBILITIES .....</b>	<b>6</b>
7.1	NEOM (Sector, Organization, Department or Contractor).....	6
7.2	Client .....	6
7.3	Contractor .....	6
<b>8</b>	<b>OTHER SECTIONS RELATED TO SUBJECT .....</b>	<b>7</b>
8.1	Application of Requirements .....	7
8.2	NEOM Safety Management System.....	7
8.3	Key Requirements .....	8
8.4	NEOM-NEN-SCH-005 Technical Codes and Standards Summary .....	8
8.5	NEOM-NEN-PRC-025 Construction Planning Management Procedure (Summary).....	9
8.6	NEOM-NEV-TGD-502 Sustainability Guidelines for Temporary Assets (Summary) .....	9
8.7	Scope of Sustainability Guidelines for Temporary Assets.....	10
<b>9</b>	<b>APPENDICES .....</b>	<b>11</b>
9.1	Appendix A: Temporary Asset Typologies .....	11
9.2	Appendix B: Audit Criteria.....	12
9.3	Appendix C: Guidance Information.....	13

## List of Tables

Table 1 : Table of Definitions .....	5
Table 2 : Table of Abbreviations .....	5
Table 3 : Related NEOM Documents .....	5
Table 4: NEOM Temporary Asset Typologies.....	12

## **1 Purpose**

This NEOM Co. SMS Minimum Standards (hereafter referred to as NMS) relates to the management of all occupational health, safety (OHS) risks associated with Employer Supplied Accommodation (permanent or temporary) are adequately addressed.

It provides guidance to support compliance industry best practice and international regulatory safety requirements to ensure that the associated risks are assessed, and control measures are implemented in accordance with the hierarchy of risk controls.

It has been developed to align with the requirements of the ISO 45001 Health and Safety Management Manual (Refer: NEOM-NLF-PRC-006- Section 2 ISO 14001 Cross reference table)

## **2 Scope**

The requirements of this NMS shall be considered as the main criteria for the design, construction, management, and operation of employer supplied accommodation (Temporary or Permanent) pursuant to the NEOM-SMS and best international practices.

This NMS applies to all personnel within NEOM and any Contractors working for NEOM and or associated projects and activities.

The Guidelines (NEOM-NEV-TGD-502 Sustainability Guidelines for Temporary Assets) apply to both permanent and temporary employer supplied accommodation, facilities, and assets. These Guidelines do not cover other permanent assets and associated construction facilities.(Refer: Section 8.5 and Appendix A)

This NMS applies to NEOM Sector, Organization, Department or Contractor

## **3 Expectations**

To ensure the health and safety of all personnel, protection of assets (facilities and services, plant/equipment) and the environment

NEOM expect each Sector, Organization, Department or Contractor to ensure that risks associated with work are controlled in accordance with the hierarchy of risk controls: elimination, substitution, engineering controls, administrative controls, and personal protective equipment.

Consideration shall be given to technological advances that may introduce new means of controlling or eliminating the risks associated with work activities

That the expectation for safety compliance is meeting and exceeding all applicable OSHA Laws, Regulations, and Industry Best Practice.

Applicable requirements and standards include:

- (a) OSHA Standards and Regulatory requirements.
- (b) ANSI requirements.
- (c) NFPA Standards and requirements.
- (d) NEOM Minimum Standards
- (e) Saudi Building Codes
- (f) International Building Codes

*If requirements of this document conflict with requirements set by another regulatory authority, Contractor are required to follow the more stringent requirement.*

## 4 List of Definitions

Table 1 : Table of Definitions

Terms	Definitions
NEOM Co	NEOM Company
Client	NEOM Sector /Department responsible for management and oversight of the Contractor
Contractor	The organization contracted to carry out the works
Safety Management System (SMS)	Occupational Health and Safety Management System established by NEOM in compliance to ISO 45001 Standard

## 5 List of Abbreviations

Table 2 : Table of Abbreviations

Abbreviations	Descriptions
SMS	Safety Management System
NMS	NEOM Minimum Standard
SOP	Standard Operating Procedure
ANSI	American National Standards Institute
NFPA	National Fire Prevention Association
CPP	Construction Phase Plan
OSHA	Occupational Safety and Health Administration.
PPE	Personal Protective Equipment
SEC	Saudi Electric Company
IBC	International Building Codes
OHS	Occupational Health and Safety

## 6 Related NEOM Documents

Table 3 : Related NEOM Documents

Document Code	Document Name
NEOM-NEN-PRC-025 02.00	Construction Planning Management
NEOM-NEV-TGD-502	Sustainability Guidelines for Temporary Assets
NEOM-NEN-SCH-005	Technical Codes and Standards
NEOM-SMS	Neom Safety Management System
NEOM-NLF-SM	Safety Manual - Roles and Responsibilities
NEOM-NLF-PRC-006- Section 2	ISO 14001 Cross Reference Table
NEOM Element 2	Risk and Opportunity Management
NEOM-Element 5	Training, Awareness and Competency.
NEOM-Element 6	Contractor Management

Document Code	Document Name
NEOM-NLF-NMS-006.001	Organization and Practitioner Registration and Appointment of Contractor
NEOM-NLF-NMS-006.002	Safety Construction Management Plan
NEOM-NLF-NMS-006.012 –	Barricading of Hazards
NEOM-NLF-NMS-006.021	Personal Protective Equipment (PPE)

## 7 Roles and Responsibilities

### 7.1 NEOM (Sector, Organization, Department or Contractor)

- 7.1.1 This Is the NEOM entity or developer designated by NEOM to accept custody for planning, designing, constructing, or managing and operating a particular asset or a group of assets

### 7.2 Client

- 7.2.1 General Health and Safety roles and responsibilities are defined in; and shall be carried out in accordance with the requirements of NEOM-NLF-SM–Safety Management Manual - Roles and Responsibilities.
- 7.2.2 The Client is responsible for ensuring that NEOM Safety Commitment Statement and safety management system are properly applied within their areas of control/responsibility. Effective implementation will ensure compliance with relevant legislative requirements and will help promote the use of industry best safe working practices.
- 7.2.3 That a suitable, Pre-Tender Health and Safety Plan has been developed and issued to Contractors to ensure they have all the information necessary to make informed decisions when developing the Construction Phase Health and Safety Plan (NEOM-NLF-NMS-006.002 Safety Construction Management Plan) (CPP) which will form part of the Contractor review and selection process
- 7.2.4 That the selection of Contractors shall be undertaken in accordance with NEOM's policies and procedures (NEOM-Element 6-Contractor Management). To ensure that only Competent organizations capable of meeting the requisite safety standards associated with project are contracted.
- 7.2.5 Conduct regular Contractor safety assurance reviews to provide the confidence level required that the safety management system is delivering as planned, and consistently achieves the acceptable level of safety. Including:
- (a) Safety performance monitoring and measuring.
  - (b) Managing change.
  - (c) Continuous improvement.

### 7.3 Contractor

- 7.3.1 Contractor shall undertake their roles and responsibilities in accordance with the general requirements of NEOM-NLF-SM–Safety Management Manual-Roles and Responsibilities
- 7.3.2 Maintaining control of access to dangerous or high-risk areas or equipment using suitable barricades that are in serviceable condition (Refer: NEOM-NLF-NMS-006.012 – Barricading of Hazards)
- 7.3.3 That all work activities are assessed, planned, organized, and that suitably competent Supervision is available to implement the safety requirements and oversee the work (Refer: NEOM- Element 5 – Training, Awareness and Competency)
  
- 7.3.4 Ensure persons appointed to manage /oversee work operations have the skills, knowledge, experience and, where relevant, the organizational capability to plan and manage work safely and without risk to those who may be affected by the activities (Refer: NEOM Element 5 Training, Awareness, and Competence).
- 7.3.5 Ensure employees carrying out the work are trained to recognize the associated hazards and understand the processes and procedures to control or minimize the risks.(Refer: NEOM Element 2 Risk and Opportunity)
- 7.3.6 That all equipment including personal protective equipment required for use is fit for purpose, and (as required) has been inspected by a competent person and inspection records are maintained and readily available.(Refer: NEOM-NLF-NMS-006.021 Personal Protective Equipment) (PPE)

#### **7.4 Specific Responsibilities**

- 7.4.1 Sector, Organization, Department or Contractor Head is responsible in ensuring that provisions are made the safe systems of work to prevent and minimize risks in each workplace
- 7.4.2 Safety Practitioner/Coordinator is responsible to monitor the implementation of this procedures and document its effectiveness
- 7.4.3 The Responsible Person will support this procedure and ensure that any Contractor Organization working for, or on behalf of, the Sector, Organization, Department or Contractor will comply with the requirements of these procedures
- 7.4.4 Line Managers / Supervisors are responsible for training their workers in risks
- 7.4.5 The LP & FS Public Safety department will support the NEOM risk assessments by carrying out compliance checks and supporting and guiding the various safety teams.

### **8 Other Sections related to subject**

#### **8.1 Application of Requirements**

- 8.1.1 The requirements in this Section 8.0, relate to the NEOM Sector, Organization, Department, Contractor, Entity or Developer designated by NEOM to accept custody for planning, designing, constructing, or managing and operating a particular accommodation asset or a group of accommodation assets

#### **8.2 NEOM Safety Management System**

- 8.2.1 Element 6 (Contractor Management) of the NEOM SMS will apply in its entirety to any Contractor supplying or developing employer provided accommodation either temporary or permanent. Element 6 of the safety management system outlines all the requirements applicable to contractors prior to, during and on completion of providing any services for NEOM.

### **8.3 Key Requirements**

- 8.3.1 This Section 8.0 Identifies key documents related to Design, Licensing, Construction and Sustainability associated with NEOM Accommodation.
- (a) NEOM-NEN-SCH-005 Technical Schedules Summary
  - (b) NEOM-NEN-PRC-025 Construction Planning Management Procedure Summary
  - (c) NEOM-NEV-TGD-502 Sustainability Guidelines for Temporary Assets Summary
- 8.3.2 Other documents not mentioned within this section are documents currently under development from other Sectors, Divisions and or departments. (e.g., Occupational Health and Hygiene, Health Wellbeing & Biotech etc.) The requirements of these documents should be considered as and when the documents are issued into the management systems.

### **8.4 NEOM-NEN-SCH-005 Technical Codes and Standards Summary**

#### **8.4.1 Introduction**

- (a) NEOM is determined to implement the best engineering practices and references possible to achieve its vision. Technical Schedules provides a list of codes and standards, related technical documents, and regulations arranged in different disciplines, functions, and facilities to ensure the highest quality to achieve the functional and performance requirements for all NEOM projects and developments.

#### **8.4.2 Approach**

- (a) NEOM has benchmarked international and local codes and standards to determine the best and most appropriate codes and standards for the design and construction of its assets. The criteria used for selection of the best applicable codes and standards are as follows:
  - I. Shall satisfy the base economy requirements as a minimum and allow modification and enhancement to provide higher quality in a consistent and compatible manner
  - II. Shall properly address the objectives and relevant design criteria (strength, safety, sustainability, ...etc.)
  - III. Shall be active, reviewed and updated regularly and reflecting latest advancement in knowledge and materials.
  - IV. Shall be integrated with the quality infrastructure of laboratories, accreditation, and quality marks organizations

- 8.4.3 The selected codes and standards are presented with respect to eighteen variations of disciplines, functions, facility type and profession to cover the most encountered cases in a convenient way, as shown below:

- (a) General
- (b) Building codes & standards
- (c) Architectural applications
- (d) Sustainability
- (e) Structural applications
- (f) Geotechnical
- (g) Mechanical engineering applications
- (h) Fire protection

- (i) Telecoms & data
- (j) Extra-low voltage systems
- (k) Security
- (l) Electrical applications
- (m) Renewable energy
- (n) Quality management
- (o) Sports facilities
- (p) Waterfront facilities (coastal & marine)
- (q) Transportation facilities
- (r) Healthcare facilities
- (s) Water works
- (t) Environmental protection and waste management

## **8.5 NEOM-NEN-PRC-025 Construction Planning Management Procedure (Summary)**

- 8.5.1 The purpose of this procedure is to outline the requirements for construction schedule management and control in the development and delivery of NEOM Assets.
- 8.5.2 For every NEOM project, the engaged Consultant/Contractor shall submit the project particular list of codes and standards prior to the commencement of the concept design phase to NEOM for approval.

## **8.6 NEOM-NEV-TGD-502 Sustainability Guidelines for Temporary Assets (Summary)**

- 8.6.1 The purpose of these Guidelines is to set the minimum sustainability standards for compliance of both permanent and temporary assets in the provision of permanent or temporary employer supplied accommodation and strives to set a best practice benchmark. These Guidelines provide a consistent approach to establishing assets at NEOM so that proponents understand the sustainability expectations for all assets from inception through to asset decommissioning and departure from NEOM
- 8.6.2 Applying the Guidelines
  - (a) These Guidelines must be considered by any entity undertaking an activity at NEOM that involves the installation of either permanent or temporary employer supplied accommodation, facilities , or assets. This guideline includes but is not limited to asset suppliers, delivery partners, consultants, contractors and sub-contractors, service providers, and operators (hereby referred to as 'proponents').
  - (b) Sustainability requirements identified in these Guidelines are mandatory. Proponents must incorporate the relevant sustainability requirements as appropriate into their permanent or temporary facility or asset delivery and provide evidence that demonstrates compliance
- 8.6.3 Other Key NEOM Documents that govern the employer supplied accommodation are.
  - (a) NEOM Interim Sustainability Requirements Procedure (NEOM-NEV-PRC-501)
  - (b) NEOM Procedure for Regenerative Development (NEOM-NEV-PRC-016)
  - (c) NEOM Employer Requirements for Regenerative Developments (NEOM-NEV-EMR-401)
  - (d) NEOM Site Acceptance and Handover Procedure (NEOM-NEV-PRC-701)
  - (e) NEOM Environmental and Social Protection Procedures for Construction (Compilation) (NEOM-NEVPRC-712)
  - (f) NEOM GHG Inventory System: GHG Inventory Scoping Report
  - (g) NEOM Environmental Accord

- (h) NEOM LP&FS (Public Safety) SMS
- (i) NEOM Plan of Work (NEOM-NEN-PRC-029) The NEOM Style Guide is also in development and should be consulted once available to ensure any proposed accommodation asset also meet the requirements set out in the document.

## **8.7 Scope of Sustainability Guidelines for Temporary Assets**

- 8.7.1 These Guidelines apply to both permanent and temporary employer supplied accommodation, facilities, and assets. (Refer: Appendix A)
- 8.7.2 These Guidelines do not cover other permanent assets and associated construction facilities.
  - (a) Temporary assets are defined as: a structure or facility proposed for temporary use or need.
  - (b) These Guidelines must be considered for use by all proponents that undertake permanent or temporary activities in NEOM that require the provision of employer supplied accommodation, assets, or facilities.
  - (c) Should the decision be made to extend the life of a temporary accommodation asset to greater than seven years and/or to make the asset a permanent asset, the ongoing operation and decommissioning of the asset must be assessed against NEOM-NEV-PRC-501 and other relevant procedures and guidelines as a permanent asset.

## 9 Appendices

### 9.1 Appendix A: Temporary Asset Typologies

9.1.1 These Guidelines are required to be applied across the temporary asset typologies shown in Table 4. The list is not exhaustive. Any other temporary assets proposed for application across NEOM are also required to meet the compliance criteria within these Guidelines (refer to Appendices).

Table 4: NEOM Temporary Asset Typologies

<b>Temporary Asset Typology</b>	<b>Buildings</b>	<b>Tourism Infrastructure</b>	<b>Function and Event Infrastructure</b>	<b>Utilities and Services Infrastructure</b>	<b>Transport and Social Infrastructure</b>
<b>Example Asset</b>	<b>Occupied building (conditioned / temperature controlled):</b> <ul style="list-style-type: none"> <li>• Accommodation</li> <li>• Office</li> <li>• Education facility</li> <li>• Healthcare facility (hospital, clinic)</li> <li>• Hospitality asset (restaurant, café, food truck)</li> <li>• Place of worship</li> <li>• Agricultural asset (greenhouse, agriculture)</li> <li>• Retail asset</li> <li>• Conditioned storage facility</li> <li>• Security post</li> </ul> <b>Unoccupied building:</b> <ul style="list-style-type: none"> <li>• Ablutions, toilets, and other amenities</li> <li>• Storage facility or warehouse</li> </ul>	<ul style="list-style-type: none"> <li>• Accommodation facilities (conditioned / temperature / control and/or unconditioned)</li> <li>• Amenities or supporting facilities</li> <li>• Tourism support facilities</li> </ul>	<ul style="list-style-type: none"> <li>• Event tent</li> <li>• Marquee or pavilion</li> <li>• Shelter</li> <li>• Exhibition equipment</li> <li>• Arts, entertainment and culture facilities</li> <li>• Film industry</li> <li>• Sporting event equipment (e.g., stadiums/arena, seating, and management areas)</li> </ul>	<ul style="list-style-type: none"> <li>• Water/sewerage treatment infrastructure</li> <li>• Utility reticulation infrastructure</li> <li>• Water storage tank</li> <li>• Renewable energy plant / solar farm</li> <li>• Waste facility (storage and/or processing)</li> <li>• Generator plant room</li> <li>• Firefighting control room</li> </ul>	<ul style="list-style-type: none"> <li>• Road, bridge or car park</li> <li>• Pedestrian pathway</li> <li>• Cycleway</li> <li>• Public transport facilities (e.g., bus stop or transport shelter)</li> <li>• Marine infrastructure (e.g., jetty, pontoon)</li> <li>• Community infrastructure (e.g., gazebo)</li> </ul>

## 9.2 Appendix B: Audit Criteria

Audit Criteria		Requirements	Verification	Area of Concern
ISO 45001:2018 Clause	NMS Ref.			Yes/ No
5.3	7.1	NEOM health and safety policy and safety management system are properly applied within their areas of control/responsibility		
6.1	7.2.3	Pre-Tender Health and Safety Plan has been developed and issued to Contractor		
5.3, 8.1.4.2	7.3	Selection of Contractors undertaken in accordance with NEOM's policies and procedures		
6.1.2.2		Assessment of the various risks shall be undertaken		
9.0	7.3.3	Conduct regular safety and welfare assurance reviews to provide the confidence level		
7.2	7.3.4	Persons appointed to manage /oversee work operations have the skills, knowledge, experience		
8.1.2 (e)	7.3.6	Personal protective equipment required for use are fit for purpose		
8.1.2 (c, d)	7.3.2	Control of access to dangerous or high-risk areas or equipment using suitable Barricades and Signage		
10.2		Incident investigations and nonconformities reviews		
	8.4.2, 8.4.3	Benchmarked international and local codes and standards to determine the best and most appropriate codes and standards for the design and construction of assets		
	8.5	Consultant/Contractor shall submit the project particular list of codes and standards prior to the commencement of the concept design phase		
	8.6	Sustainability requirements identified in NEOM-NEV-TGD-502 Sustainability Guidelines are mandatory for Temporary Assets		

### **9.3 Appendix C: Guidance Information**

Employers must comply with all applicable OSHA standards. They must also comply with the General Duty Clause of the OSH Act, which requires employers to keep their workplace free of serious recognized hazards this also applies to employer supplied accommodation.

Employers who provide accommodation to employees in remote areas have duties to ensure the premises are safe and do not pose a risk to those using them.

What is employer provided accommodation?

Residential premises are considered to be employer provided accommodation when:

- I. the residence is owned by or under control of the employer;
- II. the residence is situated outside the metropolitan area or a gazetted townsite
- III. the occupancy of the premises is necessary for the purposes of employment because no other accommodation is reasonably available in the area.

The duty of care does not apply where there is a written agreement that is a lease (otherwise known as a tenancy agreement) or lease like arrangement.

Employers need to make sure that as far as practicable, the accommodation is maintained in a safe and healthy condition so that employees are not exposed to hazards at the premises. If the obligation applies to premises then it also applies to land and outbuildings that are intended to be used in connection with that premises (for example separate laundry facilities or outside showers gardens and grounds).



نیوم NEOM

**NEOM OCCUPATIONAL HEALTH and SAFETY  
NEOM MINIMUM STANDARD  
for  
POWERED MOBILE PLANT**

NEOM-NLF-NMS-006.015 Rev 02.00 – February 2022

©NEOM [2021]. All rights reserved.

## Document History

Revision code	Description of changes	Purpose of issue	Date
Rev 00.00	First Issue	Issued for Implementation	27/07-2020
Rev 02,00	SMS Update	Issued for Implementation	01-02-2022

## Document Approval

	Prepared by	Reviewed by	Approved by
Name	Robert Murphy	Talal A. Alanazi	Adel Wuhaib
Job Title	Loss Prevention Specialist LP/FS -Public Safety	Director, Loss Prevention/Fire Safety (LP/FS) Public Safety	Executive Director Public Safety





## Contents

<b>1</b>	<b>PURPOSE .....</b>	<b>4</b>
<b>2</b>	<b>SCOPE .....</b>	<b>4</b>
<b>3</b>	<b>EXPECTATIONS.....</b>	<b>5</b>
<b>4</b>	<b>LIST OF DEFINITIONS .....</b>	<b>5</b>
<b>5</b>	<b>LIST OF ABBREVIATIONS .....</b>	<b>6</b>
<b>6</b>	<b>RELATED NEOM DOCUMENTS.....</b>	<b>6</b>
<b>7</b>	<b>ROLES AND RESPONSIBILITIES .....</b>	<b>7</b>
7.1	Client .....	7
7.2	Contractor .....	7
7.3	Employee.....	8
<b>8</b>	<b>OTHER SECTIONS RELATED TO SUBJECT .....</b>	<b>8</b>
8.1	Training and Competency .....	8
8.2	Operator Selection .....	10
8.1	Equipment Selection and Visual Aids .....	10
8.2	Planning and Assessment.....	11
8.3	Risk Assessment Communication .....	12
8.4	Pedestrians in Working Area .....	12
8.5	Powered Mobile Plant Operators Daily Inspection .....	14
8.6	Powered Mobile Plant Site Inspection .....	14
8.7	Maintenance and Inspection.....	15
8.8	Record Keeping .....	15
<b>9</b>	<b>APPENDICES .....</b>	<b>17</b>
9.1	Appendix A: Checklist- Powered Mobile Plant Tipper – Rigid or Articulated .....	17
9.2	Checklist 180° Excavator/Backhoe .....	19
9.3	Checklist Forward and Side Tipping Dumper .....	21
9.4	Checklist Tracked 360° Excavator.....	23
9.5	Checklist Wheeled 360° Excavator.....	26
9.6	Checklist Mixer Truck .....	28
9.7	Checklist Telehandler .....	30
9.8	Checklist Concrete Pump .....	32



9.9	Checklist Crawler Crane .....	34
9.10	Checklist Lorry Loader Crane.....	37
9.11	Checklist Mobile Elevated Working Platform.....	39
9.12	Appendix B: Audit Criteria .....	41
9.13	Appendix D: Guidance Information.....	Error! Bookmark not defined.

## List of Tables

Table 1 : Table of Definitions .....	5
Table 2 : Table of Abbreviations .....	6
Table 3 : Related NEOM Documents.....	6
Table 4 : Minimum Health Screening Checks Prior to Authorisation to Operate a Powered Powered Mobile Plant..9	

## 1 Purpose

This NEOM Co. SMS Minimum Standards (hereafter referred to as NMS) relates to the management of all occupational health, and safety (OHS) risks associated with the use of Powered Mobile Plant.

It provides guidance to support compliance with industry best practice and international regulatory safety requirements to ensure that the associated risks are assessed, and control measures are implemented in accordance with the hierarchy of risk controls.

It has been developed to align with the requirements of the ISO 45001 Safety Management Manual (Refer NEOM-NLF-PRC-006- Section 2 ISO 14001 Cross Reference Table)

## 2 Scope

This NMS applies to all personnel within NEOM and any Contractors working for NEOM and or associated projects and activities. It is designed to incorporate requirements set by the NEOM-SMS.

It sets out the requirements for the use of Powered Mobile Plant including, but not limited to:

- Powered Mobile Plant Tipper – Rigid or Articulated
- Checklist 180° Excavator/Backhoe
- Forward and Side Tipping Dumper
- Tracked 360° Excavator 21
- Wheeled 360° Excavator
- Mixer Truck
- Telehandler
- Concrete Pump
- Crawler Crane

### 3 Expectations

To ensure the health and safety of all personnel, protection of assets (Powered Mobile Plant) and the environment

NEOM expect each Sector, Organization, Department or Contractor to ensure that risks associated with the work are controlled in accordance with the hierarchy of risk controls: elimination, substitution, engineering controls, administrative controls, and personal protective equipment.

Consideration shall be given to technological advances that may introduce new means of controlling or eliminating the risks associated with work activities.

That the expectation for safety compliance is meeting and exceeding all applicable OSHA Laws, Regulations, and Industry Best Practice.

Applicable requirements and standards include:

- (a) OSHA Standards and Regulatory requirements;
- (b) ANSI requirements;
- (c) NFPA Standards and requirements;
- (d) NEOM Minimum Standards
- (e) Saudi Building Codes
- (f) International Building Codes

*If requirements of this document conflict with those set by another regulatory authority, Contractors are required to follow the more stringent requirement.*

### 4 List of Definitions

Table 1 : Table of Definitions

Terms	Definitions
NEOM Co	NEOM Company
Client	NEOM Sector /Department responsible for management and oversight of the Contractor
Employer	The person or organisation that employs personnel to complete the work
Contractor	The organisation contracted to carry out the works
Powered Mobile Plant	Any machinery, appliance or other similar device that is able to move independently and is used for the purpose of performing construction work on a construction site.
Safety Management System	Occupational Health and Safety Management System established by NEOM in compliance to ISO 45001 Standard



## 5 List of Abbreviations

Table 2 : Table of Abbreviations

Abbreviations	Descriptions
SMS	Safety Management System
NMS	NEOM Minimum Standard
SOP	Standard Operating Procedure
ANSI	American National Standards Institute
NFPA	National Fire Prevention Association
CPP	Construction Phase Plan
OSHA	Occupational Safety and Health Administration.
PPE	Personal Protective Equipment
ACOP	Approved Code of Practice
IBC	International Building Codes
OHS	Occupational Health and Safety

## 6 Related NEOM Documents

Table 3 : Related NEOM Documents

Document Code	Document Name
NEOM Element 2	Risk and Opportunity Management
NEOM Element 3	Control of Documented Information & Legal Compliance
NEOM-Element 5	Training, Awareness and Competency.
NEOM-Element 6	Contractor Management
NEOM-NLF-SM	Safety Manual - Roles and Responsibilities
NEOM-NLF-PRC-006- Section 2	ISO 14001 Cross Reference Table
NEOM-NLF-PRC-006;	Occupation Health, Safety, and Fire Safety requirements for Contractors
NEOM- NLF-NMS-006.001	Organisation, Safety Practitioner Registration and Appointment of Contractor.
NEOM-NLF-NMS-006.002	Occupational Health and Safety Construction Management Plan (CPP)
NEOM-NLF-NMS 006.004	Permit to Work Systems
NEOM-NLF-NMS-006.012	Barricading of Hazards
NEOM-NLF- NMS 006 013	Safety Signs and Signals.
NEOM-NLF-NMS-006.017	Plant and Equipment
NEOM-NLF-NMS-006.021	Personal Protective Equipment (PPE)
NEOM-NLF-NMS 006.024	Occupational Health Screening and Medical Surveillance
NEOM-NLF-NMS- 006.032	Traffic Management and Logistics.

## 7 Roles and Responsibilities

### 7.1 Client

- 7.1.1 General Health and Safety roles and responsibilities are defined in; and shall be carried out in accordance with the requirements of NEOM-NLF-SM–Safety Management Manual - Roles and Responsibilities.
- 7.1.2 The Client is responsible for ensuring that NEOM safety commitment statement and safety management system are properly applied within their areas of control/responsibility. Effective implementation will ensure compliance with relevant legislative requirements and will help promote the use of industry best safe working practices.
- 7.1.3 That a suitable, Pre-Tender Health and Safety Plan has been developed and issued to Contractors to ensure they have all the information necessary to make informed decisions when developing the Construction Phase Health and Safety Plan (NEOM-NLF-NMS-006.002 Safety Construction Management Plan) which will form part of the Contractor review and selection process
- 7.1.4 That the selection of Contractors shall be undertaken in accordance with NEOM's policies and procedures (NEOM-Element 6 - Contractor Management). To ensure that only Competent organisations capable of meeting the requisite safety standards associated with project are contracted.
- 7.1.5 Conduct regular Contractor safety assurance reviews to provide the confidence level required that the safety management system is delivering as planned, and consistently achieves the acceptable level of safety. Including:
  - (a) Safety performance monitoring and measuring;
  - (b) Managing change;
  - (c) Continuous improvement.

### 7.2 Contractor

- 7.2.1 Contractor shall undertake their roles and responsibilities in accordance with the general requirements of NEOM–NLF-SM – Safety Management Manual -Roles and Responsibilities
  - (a) Ensure persons appointed to manage /oversee work operations have the skills, knowledge, experience and, where relevant, the organisational capability to plan and manage work safely and without risk to those who may be affected by the activities (Refer: NEOM Element 5 Training, Awareness, and Competency).
  - (b) That all work activities are assessed, planned, organized, and that suitably competent Supervision is available to implement the safety requirements and oversee the work
  - (c) Ensure employees carrying out the work are trained to recognize the associated hazards and understand the processes and procedures to control or minimize the risks. (Refer: NEOM Element 2 Risk and Opportunity Management)
  - (d) That all equipment including personal protective equipment required for use is fit for purpose, and (as required) has been inspected by a competent person and inspection records are



maintained and readily available. (Refer: NEOM-NLF-NMS-006.021 Personal Protective Equipment) (PPE)

- (e) Maintain control of access to dangerous or high-risk areas or equipment using suitable barricades and Signage that are in serviceable condition (Refer: NEOM-NLF-NMS-006.012 – Barricading of Hazards)
- 7.2.2 Contractor shall undertake their specific roles and responsibilities in accordance with the following:
- (a) That all persons who are required to use Powered Mobile Plant are trained, competent and licensed to do so.
  - (b) Ensure that a system is implemented to prevent untrained employees from using Powered Mobile Plants.
  - (c) So far as is reasonably practicable, separate the movements of pedestrians and Powered Mobile Plant
  - (d) That all traffic routes are safe and in accordance with the requirements of NEOM-NLF-NMS-006.032 – Traffic Management and Logistics.

### 7.3 Employee

- 7.3.1 Shall undertake their roles and responsibilities in accordance with the general requirements of NEOM-NLF-SM – Safety Management Manual - Roles and Responsibilities.
- 7.3.2 Report any activity or defect relating to the work which they believe is reasonably foreseeable to endanger their safety or that of another person's.
- 7.3.3 Shall use appropriate equipment or safety devices provided for the work by the Contractor in accordance with any training or instruction received in the use of the work equipment. (Refer NEOM-NLF-NMS-006.021 Personal Protective Equipment)
- 7.3.4 Employee shall undertake their specific roles and responsibilities in accordance with the following:
  - (a) Shall only use Powered Mobile Plant that they have been trained in the use of and are authorized to use by the Contractor.
  - (b) Use Powered Mobile Plant for the tasks they have received training in and shall not undertake any task that the equipment is not appropriate for.
  - (c) Ensure that any defect on the Powered Mobile Plant is reported immediately and the plant is taken out of service until such times as a competent engineer has inspected the Powered Mobile Plant and declared it fit for use.
  - (d) Shall ensure that they immediately report any hazard or information that may affect, adversely or otherwise, the works being undertaken.
  - (e) Employees shall not undertake any type of repair unless competent and authorised by the Contractor.

## 8 Other Sections related to subject

### 8.1 Training and Competency



- 8.1.1 Contractor shall ensure that training complies with the requirements of:
- (a) NEOM-Element 5 – Training, Awareness and Competency;
  - (b) NEOM- NLF-NMS–006.001 –SMS Organisation, Practitioner Registration and Appointment of Contractor.
- 8.1.2 Specific training programs are to be developed for each different type of Powered Mobile Plant.
- 8.1.3 Operators of Powered Mobile Plant shall hold the appropriate plant operator's license
- 8.1.4 Training shall include a combination of formal instruction (e.g., lecture, discussion, interactive computer learning, video, written material), practical training (demonstrations performed by the trainer, and practical exercises performed by the trainee), and evaluation of the operator's performance in the workplace.
- 8.1.5 Operator training and evaluation shall be conducted by competent persons, certified by an independent third party, who have the knowledge, training, and experience to train Powered Mobile Plant Operators and evaluate their competence, meeting the requirements of NEOM-Element 5 Training, Awareness, and Competence.
- 8.1.6 Training on Powered Mobile Plant shall include three stages:
- (a) **Basic** – the basic skills and knowledge required to operate the Powered Mobile Plant
  - (b) **Specific** – operating principles and controls of the truck, use of the Powered Mobile Plant in work specific conditions and the type of work to be undertaken
  - (c) **Familiarization** – application of skills learned under normal conditions, with close supervision by a competent person / trainer.
- 8.1.7 Refresher training in relevant topics shall be provided to the operator when:
- (a) The Operator has been observed to operate the vehicle in an unsafe manner
  - (b) The Operator has been involved in an incident or near-miss incident
  - (c) The Operator has received an evaluation that reveals that the operator is not operating the plant safely
  - (d) The operator is assigned to operate a different type of type of plant
  - (e) A condition in the workplace changes in a manner that could affect safe operation of the truck
  - (f) As required by risk assessment and/or legal requirements.
- 8.1.8 An evaluation of each Operator's performance shall be conducted at least once every year.
- 8.1.9 A record the training and evaluation required shall be maintained. The record shall include;
- (a) The name and ID number of the operator;
  - (b) The date of the training;
  - (c) The date and results of the evaluation; and
  - (d) The identity of the person(s) performing the training or evaluation.



- 8.1.10 Training records required by this section are to be maintained for the duration of employment plus 1 year.

## 8.2 Operator Selection

- 8.2.1 Ensure that all persons selected to operate Powered Mobile Plant are medically fit to do so and have shown a reliable and mature attitude to work.
- 8.2.2 Ensure appropriate medical screening prior to authorizing any person to use Powered Mobile Plant. The minimum checks are highlighted in Table 4. Refer to NEOM-NLF-NMS 006.024 – Occupational Health Screening and Medical Surveillance for further information on medical screening.

*Table 4 Minimum Health Screening Checks Prior to Authorisation to Operate a Powered Mobile Plant*

Issue	Reasoning
Health questionnaire	To identify any pre-existing condition which may affect the ability to operate a Powered Mobile Plant safely; to identify any medication which is taken which may affect the ability to operate a Powered Mobile Plant safely.
Eyesight testing	Eyesight shall comply with the Group1 standard, which is the ability to read a vehicle license plate at a distance of 20.5 meters. Complete field of vision and good depth perception are also required.
Blood pressure	Raised blood pressure increases the risk of heart disease and stroke.
Mobility	Operators shall have appropriate flexibility and mobility to enable them to look behind them and to maintain good control over the vehicle.
Height/weight	Being very overweight may restrict mobility and may also make it difficult to operate the equipment comfortably.
Hearing	Appropriate hearing may be required to ensure that the operator is able to hear warning shouts or alarms. Good conversational hearing will usually be considered appropriate, but audiometry may be conducted where there are specific concerns.

## 8.1 Equipment Selection and Visual Aids

- 8.1.1 When selecting work equipment for use, employers should have regard to both the working conditions and the way the work equipment is to be used, to ensure that suitable work equipment is chosen.
- 8.1.2 For mobile plant, significant risks may arise from limited driver visibility. Vehicles should be carefully selected to minimise risks in the expected conditions of use and to provide the best direct vision for the driver to minimise any reliance on vision aids.
- 8.1.3 Where the driver's direct field of vision is inadequate to ensure safety, suitable devices for improving visibility from the drivers position of mobile plant, shall be provided so far as is reasonably practicable.
- 8.1.4 Selection of, appropriate visibility devices or sensing aids will depend upon the level of residual risk not controlled by other means, the extent and nature of the field of vision problem and the speed and use of the vehicle, site conditions
- 8.1.5 Where additional devices or aids have been fitted then additional information and training or instruction may be required to ensure that the aids have been set correctly and the potential benefits are optimised.

## **8.2 Planning and Assessment**

- 8.2.1 Risk Assessment shall be carried by a Competent Person to evaluate each Site or Operation to determine any hazards present in relation to the use of Powered Mobile Plant (Refer: NEOM-Element 2 – Risk and Opportunity Management)
- 8.2.2 That effective procedures and control measures are developed and implemented for management of the hazards; (Refer: NEOM-NLF-NMS 006.004 – Permit to Work Systems)
- 8.2.3 The Risk Assessment shall be carried out in consultation with the person in control of the work and communicated to Operators responsible for carrying out the work
- 8.2.4 Risk assessment should be prepared before operating Powered Mobile Plant to identify any hazards, who is at risk, how they could be harmed, and the control measures needed to prevent accidents. When using Powered Mobile Plant in any environment, the following common risks may need to be assessed:
  - (a) Contact with a person: The most common accidents are workers or members of the public being run over by Powered Mobile Plant or crushed between it and another object.
  - (b) Overturning: When operated on a slope that is outside safe operating parameters, Powered Mobile Plant can overturn, or operator may be ejected.
  - (c) Failure of plant: If Powered Mobile Plant breaks down due to the failure of or damage to a hydraulic system (such as a burst pipe or detached connector), the failure may result in unexpected or unintended movement.
  - (d) Unsecured attachments (buckets): A serious but common event on excavators is failure to correctly position the safety locating pins on excavator buckets. If this goes unnoticed, it can result in the bucket suddenly dropping from a great height
  - (e) Contact with overhead obstructions: When operating Powered Mobile Plant below overhead objects, there is a risk of contact. Overhead electrical cables are commonly struck
  - (f) The mobile equipment itself



- I. Mobility
- II. Electrical, hydraulic, and mechanical power sources,
- III. Moving parts
- IV. Load carrying capacity
- V. Operator protection
- VI. Operator Visibility

### 8.3 Risk Assessment Communication

- 8.3.1 Work activities that have HSE risks must be identified, the risks must be assessed, and means to eliminate or control the risks must be communicated to all affected persons
  - 8.3.2 Ensure method statements or job safety analysis are developed and discussed at Tool-Box Safety Talks for all activities involving mobile plant.
  - 8.3.3 Establish, maintain, and implement a process to control or prevent unauthorized personnel entering areas where machines are working.
- 8.3.4 ***Ensure that all personnel are aware that when approaching Powered Mobile Plant, the Plant Operator may have restricted visibility or may not be looking in the right place at the right time. It is, therefore, essential for anyone approaching mobile plant to make eye contact with the Plant Operator and wait for the Operator to stop and give permission to approach or pass.***

### 8.4 Pedestrians in Working Area

- 8.4.1 Design a scheme for the safe management and movement of pedestrians on site

- (a) All employees
- (b) All contractors
- (c) All hauliers
- (d) All delivery drivers
- (e) All official visitors (including enforcement officers/regulators)
- (f) All members of the public:
  - I. Customers/visitors to site
  - II. Persons using public rights of way that cross through operational areas of sites
  - III. Persons accidentally or deliberately trespassing
- (g) YOU! ....



- 8.4.2 Thoroughly review your existing arrangements and check where improvements can be made
  - 8.4.3 Organise the site such that vehicles and pedestrians can move around safely, effectively and are not 'free-to-roam'
  - 8.4.4 So far as is reasonably practicable ensure, that pedestrians are separated from vehicle routes through the provision of physical barriers. Physical barriers shall be of appropriate construction and strength to withstand collision from Powered Mobile Plant and continue to provide a safe route, (Refer: NEOM-NLF-NMS 006.012 – Barricading of Hazards).
  - 8.4.5 Where it is not reasonably practicable to segregate through physical barriers, ensure that pedestrian routes are clearly marked and employees who are required to use these walkways are fully aware of the hazards.
  - 8.4.6 Mark-out and sign crossing points for both drivers and pedestrians
  - 8.4.7 Ensure that all aisles/passageways or roads where Powered Mobile Plants are used are kept in good repair, with appropriate safety signage and clearly marked. Safety signage shall follow NEOM-NLF- NMS 006 013 – Safety Signs and Signals.
  - 8.4.8 Tackle unsafe and distracting behaviour such as uncontrolled use of mobile phones or stopping for a chat at whatever point persons happen to meet
  - 8.4.9 Instruct, inform, and alert both drivers and pedestrians about routes, rules, and layout.
  - 8.4.10 Consider site inductions, tailored brief-inductions, toolbox-talks, maps, leaflets, signage, etc.
- 
- 8.4.11 Effective communications – radios, hand signals
  - 8.4.12 Ensure there is suitable PPE, including hi-visibility clothing provided for use on site.
  - 8.4.13 Ensure that all Powered Mobile Plants are fitted with audible and visual warning devices to ensure that pedestrians are aware of their presence.
  - 8.4.14 Ensure that all areas where Powered Mobile Plant are working are appropriate and safe for the tasks being undertaken.
  - 8.4.15 Ensure that the concentration of vehicle emissions is monitored and controlled within the work environment to ensure they are within safe limits
  - 8.4.16 Unauthorized personnel shall not be permitted to ride on Powered Mobile Plant
  - 8.4.17 When Powered Mobile Plant is left unattended it shall be neutralized, power shall be shut off, keys removed, and brakes set. Wheels shall be blocked if the plant is parked on an incline
  - 8.4.18 Ensure there is appropriate headroom under overhead installations, lights, pipes, sprinkler system, etc.
  - 8.4.19 Powered Mobile Plants shall be fitted with:
    - (a) Audible and visual reverse alarms; and
    - (b) Appropriate mirrors (rear view and wing);
    - (c) Appropriate headlights if required to work in reduced visibility conditions;

- 8.4.20 The operator shall be required to look in the direction of, and keep a clear view of the path of travel;
- 8.4.21 All traffic regulations shall be observed, including authorized workplace speed limits. A safe distance shall be maintained from the vehicles ahead.
- 8.4.22 Under all travel conditions Powered Mobile Plant shall be operated at a speed that will permit it to be brought to a stop in a safe manner;
- 8.4.23 Powered Mobile Plant shall not be used for lifting people to and from a height
- 8.4.24 Only stable or safely arranged loads shall be handled. Caution shall be exercised when handling off-centre loads which cannot be centered; and
- 8.4.25 Only loads within the rated capacity of the plant shall be handled.

## 8.5 Powered Mobile Plant Operators Daily Inspection

- 8.5.1 All plant operators need to carry out daily pre-use inspections on their Powered Mobile Plant before work begins.
- 8.5.2 An appropriate pre-start check sheet shall be completed and daily recorded inspections
- 8.5.3 Inspection sheet to be available in the cab and ideally visually displayed.
- 8.5.4 Pre-use inspections are to identify obvious defects in the equipment, such as broken mirrors, CCTV, controls, lights, signals or warning systems that are not working correctly, as well as low fluid levels and fluid leaks that may affect safe operation.
- 8.5.5 Refer: Appendix A Checklists for:
  - (a) Powered Mobile Plant Tipper – Rigid or Articulated
  - (b) Checklist 180° Excavator/Backhoe
  - (c) Forward and Side Tipping Dumper
  - (d) Tracked 360° Excavator 21
  - (e) Wheeled 360° Excavator
  - (f) Mixer Truck
  - (g) Telehandler
  - (h) Concrete Pump
  - (i) Crawler Crane
- 8.5.6 If a checklist is not available a full list of pre-use inspection checks should be contained in the Plant Operator's Handbook for the Powered Mobile Plant in question.

## 8.6 Powered Mobile Plant Site Inspection

- 8.6.1 Ensure that prior to being used, Powered Mobile Plant arriving at the site is inspected by a competent person.
- 8.6.2 Contractors shall ensure the incoming inspection is documented on the appropriate equipment inspection form.
- 8.6.3 Ensure that each piece of plant undergoes a formal, monthly documented inspection by a competent person.
- 8.6.4 Ensure process and or procedures include for the equipment operator to perform a daily inspection.
- 8.6.5 If deficiencies are found during inspections that effect safe operation the equipment will be shut down and tagged defective until corrective action is completed.
- 8.6.6 Deficiencies corrected must be documented on the inspection form that noted the deficiency along with signature of inspection.
- 8.6.7 Powered Mobile Plant used in the workplace shall be in good condition, well maintained and appropriate for the type of service required.

## **8.7 Maintenance and Inspection**

- 8.7.1 Establish, maintain, and implement a programme and schedule of preventative maintenance activities for all mobile equipment based on the manufacturer's recommendations.
- 8.7.2 Ensure that during any maintenance or repair operations on mobile equipment any equipment, or parts, which are suspended or held aloft shall be secured to prevent falling or shifting prior to employees working under or between them.
- 8.7.3 Contractors shall ensure bulldozer and scraper blades, end-loader buckets, dump bodies, and similar equipment, shall be either fully lowered or blocked when being repaired or when not in use.
- 8.7.4 Ensure during any maintenance or repair work personnel always set all controls in a neutral position, with the motors stopped and brakes set, unless work being performed requires otherwise.
  
- 8.7.5 Ensure that a safety tire rack, cage, or equivalent protection shall be provided and used when inflating, mounting, or dismounting tires installed on split rims, or rims equipped with locking rings or similar device
- 8.7.6 Inspections of mobile equipment shall be performed by competent and qualified inspectors.
- 8.7.7 Inspection records be accessible and retained at the location for life of the piece of mobile equipment in effect detailing a life cycle record.
- 8.7.8 As a minimum inspection shall occur at least annually and more frequently if operating conditions warrant as determined by the location.

## **8.8 Record Keeping**

- 8.8.1 Appropriate records shall be maintained, including but not limited to:
  - (a) Valid and up to date test and inspection certificates for Powered Mobile Plant undertaken by approved third party;
  - (b) Inspection records shall be maintained on site for a minimum period of one year;



- (c) Maintenance records shall be maintained on site for the lifespan of the vehicle;
- (d) Training records for operators shall be kept on site for the duration of their employment; and a copy of operator's vehicle operator license shall be kept on site for the duration of their employment. (Refer: NEOM-Element 3 Control of Documented Information & Legal Compliance)

## 9 Appendices

### 9.1 Appendix A: Checklist- Powered Mobile Plant Tipper – Rigid or Articulated

#### General

All plant to be inspected prior to first use and the appropriate pre-start check sheet completed and daily recorded inspections thereafter. Inspection sheet to be available in the cab and ideally visually displayed. The employment of a dedicated Plant Manager or similar designation with the technical competence to ensure preventative, condition and break down maintenance and inspection is carried out at suitable frequencies as specified within the Plant and Equipment's Operation Manual.



#### Minimum requirement

##### Vehicle

- Operator licence displayed in the cab windscreen.
- Mirrors and colour camera – to satisfy current QCS regulations, i.e., all round visibility and one metre high at one metre distance visibility criteria
- Flashing beacons, reflective markers, and motorway/highway maintenance
- sticker and chevrons where required
- All tippers to have automatic dust sheeting for load
- Tipper body up alarm in cab
- Reversing alarm to be fitted, working and audible at 10 metres
- Seatbelts must be fitted and must comply with road vehicles (construction and use) regulations requirements
- Tipping mechanism to be in good condition and tipping linkage must have no excessive play
- Discharge – all equipment to be intact and secure
- Fire extinguisher in cab
- Clean and safe access to cab and all areas where the operator is required to work
- Articulated tippers not to be supplied unless prior approval granted, and additional control procedure and risk assessment applied
- Pre-use (daily) inspection signed off
- Full induction attended prior to starting work
- Evidence of having signed on to the appropriate risk assessment/lift plan for the task
- Full site-defined PPE
- Demonstrable training and experience in operation of tipper
- Compliance with pre-use, daily/weekly defect reporting system
- Competency assessment prior to being put to work – be familiar with machine
- Do not to be tip whilst on the move or during high winds
- Loads must not be tipped downhill
- Ensure tipping is carried out on even and firm ground
- Seatbelts must be worn
- Briefing of and compliance with all site speed limits
- Existing contracts utilising Articulated Trucks should retrofit inclinometers to prevent roll-overs



## Mandatory

- Automated operation for tailgate
- Driver/operator to have induction and subject to ongoing medical screening/surveillance
- Seatbelt operation interlocked with ignition switch/warning indicator
- Complete people exclusion area around plant and operation
- Vulnerable road user safety precautions (e.g., additional mirror, sidebars, audible signals and signage)
- Following the instructions of the banksman / flagman before, during and after off-loading
- Machine under five years since date of manufacture
- Operator to have passed drug and alcohol test, attended the site induction and be subject to ongoing medical screening / surveillance
- Post incident and random drug and alcohol testing for operators will be conducted throughout the duration of the project
- New contracts will operate using Rigid Body Trucks only. Articulated Trucks will be prohibited on the Programme.

## Operator

- Pre-use (daily) inspection signed off
- Full induction attended prior to starting work
- Evidence of having signed on to the appropriate risk assessment for the task
- Demonstrable training and experience in operation of Tipper Truck
- Full site-defined PPE required
- Compliance with pre-use daily and weekly defect reporting system
- A maximum of eight working hours per day except for the month of Ramadan when the maximum shall be six working hours per day
- A maximum of two hours overtime allowed per day
- No more than five consecutive hours shall be worked without a rest period
- At least one rest day per week

## Hazards/risks

Significant hazards/risks identified when operating the machine and for those adjacent to machine:

- Access into cab/refueling and maintenance
- Plant and personnel interface
- High risk of overturning at speed and on inclines – refer to manufacturer's recommendations
- Effect of weather on visibility and working/traffic surfaces
- Danger of crushing in articulation area under un-propped body
- Overloading of tipper body – risk of material falling onto haul road/public highway
- Overturning whilst tipping; articulated **tippers are particularly vulnerable**
- Uneven distribution of load on tipper body
- Wet materials/clay are prone to stick and cause instability during tipping
- De-mounting the cab in vicinity of heavy plant, particularly dozers
- Overhead obstructions – cables, bridges, power lines, telephone lines



- Limitations to all round visibility
- Public interface – working alongside pedestrian's vehicles/plant crossings
- Effect of weather visibility and working/traffic surfaces
- Hazardous substances e.g., fuels, oils and greases
- Human error due to fatigue

## 9.2 Checklist 180° Excavator/Backhoe

### General

All plant to be inspected prior to first use and the appropriate pre-start check sheet completed and daily recorded inspections thereafter. Inspection sheet to be available in the cab and ideally visually displayed. The employment of a dedicated Plant Manager or similar designation with the technical competence to ensure preventative, condition and break down maintenance and inspection is carried out at suitable frequencies as specified within the Plant and Equipment's Operation Manual.

### Minimum requirement – Plant

- Pre-use Inspection signed off
- 12-month thorough examination
- On public highway – taxed, registered and insured
- Roll overprotective structure (ROPS)
- Falling object's protective structure (FOPS) to cab by risk assessment dependent upon work being undertaken
- Seat belts must be fitted
- Mirrors/colour CCTV to satisfy 1m high at 1m distance visibility criteria
- Flashing amber beacon
- Brake efficiency testing to be carried out and recorded e.g. daily user park and service brake and dynamic brake efficiency test at maximum six monthly intervals
- Reversing alarm to be fitted working and audible at 10 metres
- Tooth guards must be always used when on public highway
- Evidence of regular inspection plus next service due date
- All safety labels (decals) in place
- If wheeled duties use axle locks, for other duties stabilisers must be deployed
- Isolation controls by a secondary device, such as seat rotation
- unless demonstrated that it will not be used for lifting:
  - Six-month thorough examination on lifting accessories
  - Certified lifting point required for all lifting duties
  - SWL to be clearly marked on certified lifting points
  - Audible or visual overload warning system fitted and operational
  - A machine specific lifting duty sheet, lift plan and risk assessment
- Check valves must be fitted to excavators' boom and dipper circuits
- If Quick hitch fitted:
  - Must be fully automatic double locking for machines over 5 tons (unless fixed
  - as a direct attachment - no quick hitch)
  - Have an in-cab audible alarm to warn of detachment
  - Copy of manufacturers operating instructions
  - Pre-use Inspection signed off



- If used under overhead cables or obstructions:
  - Height restrictors with indication on machine
  - Avoidance of danger from overhead electric power lines must be followed
- If used adjacent to live lanes control measures must be put in place that in the event of operator error the machine will be prevented from striking passing traffic e.g., slew restrictors, banks man with remote cut out etc.
- Fire extinguisher in cab

### Operator

- Pre-use (daily) inspection signed off to be available in the cab
- Authorisation required prior to driving on public highway
- Do not break ground unless briefed on, have received and fully understood a permit to break ground
- Seat belt must be worn
- Engine must be turned off and keys removed from the cab before leaving the cab if left unattended
- Full induction attended prior to starting work
- Evidence of having signed on to the appropriate risk assessment for the task
- Full site-defined PPE required if outside cab, non-loose-fitting PPE required in all cases to avoid catching on controls
- Compliance with pre-use, daily and weekly defect reporting system
- Competency assessment prior to being put to work – be familiar with machine
- If quick hitch fitted:
  - Be briefed on safe use of quick hitches
  - Operator shall be trained in how to use specific quick hitch attachments
  - Daily inspection signed off
- If used for lifting:
  - Lift plan and/or permit to lift must be briefed and understood
  - Operator shall be trained in how to use excavator as a crane and specific lifting attachments
- A maximum of eight working hours per day except for the month of Ramadan when the maximum shall be six working hours per day
- A maximum of two hours overtime allowed per day
- No more than five consecutive hours shall be worked without a rest period
- At least one rest day per week

### Mandatory

- Tracker unit, isolation method independent of factory fitted locks, locking caps/ covers to fuel and all other tanks
- Complete people exclusion area around plant and operation
- When using a lifting eye, a swivel hook should be considered to ensure load can be maneuvered without risk of swinging back or overloading
- A list of weights of potential items to be lifted should be maintained
- System to prevent operation in reverse at speed by January 2016
- Operator to have induction and subject to ongoing medical screening/surveillance
- Seat belt operation interlocked with ignition switch/warning indicator

- Use of slew restrictors where appropriate
- Machine under five years since date of manufacture
- Operator to have passed drug and alcohol test, attended the site induction and be subject to ongoing medical screening / surveillance
- Post incident and random drug and alcohol testing for operators will be conducted throughout the duration of the project

### **Hazards/risks**

Significant hazards/risks identified when operating the machine and for those adjacent to machine:

- Access into cab/refueling and maintenance
- Danger of crushing in slew zone
- Overturning if on uneven ground or lifting duties exceeded
- Use of accessories and how they are attached/inspected such as breaking hammer
- Effect of weather visibility and working/traffic surfaces
- Clothes can get snagged on controls prior to release of servo isolator/safety handle
- Plant and personnel interface
- Overhead obstructions – cables/bridges
- Public interface – working alongside pedestrians/vehicles
- Underground services
- Limitations to all round visibility
- Transportation including loading/unloading
- Hazardous substances such as fuels, oils and greases
- Human error due to fatigue

### **9.3 Checklist Forward and Side Tipping Dumper**

#### **General**

All plant to be inspected prior to first use and the appropriate pre-start check sheet completed and daily recorded inspections thereafter. The employment of a dedicated Plant Manager or similar designation with the technical competence to ensure preventative, condition and break down maintenance and inspection is carried out at suitable frequencies as specified within the Plant and Equipment's Operation Manual.



#### **Minimum requirement**

##### **Plant**

- Selection of dumpers one ton and below or seven ton or above must have a specific risk assessment prior to work to determine suitability for task. This must take account of the inclines and speeds at which they are to be used.
- For use on public highway must be registered
- Pre-use inspection signed off
- Evidence of regular inspection plus next service due date
- Roll overprotective structure (ROPS)



- Seat belts must be fitted and interlocked with ignition switch/warning indicator and green beacon
- Flashing amber beacon
- Forward collision avoidance system (Proximity sensor or forward-facing camera or similar approved) to ensure one metre high at one metre distance visibility criteria on dumpers of seven ton and above
- risk assessment
- Reversing alarm to be fitted, working and audible
- Locking caps/covers
- Isolation switch with key
- All safety decals in place
- Brake efficiency testing to be carried out and recorded e.g. daily user park, service brake and dynamic brake efficiency test at maximum six monthly intervals
- Operating maintenance instructions
- Tow hitch (where permissible) must have correct pin with chain attached to dumper
- Tipping mechanism to be in good condition
- Fire extinguisher available

### **Operator**

- Pre-use (daily) Inspection signed off
- Authorisation required prior to driving on public highway
- Full induction attended prior to starting work
- Evidence of having signed on to the appropriate risk assessment for the task
- Full site-defined PPE
- Compliance with pre-use, daily and weekly defect reporting system
- Competency assessment prior to being put to work – be familiar with machine
- Seat belt must be worn
- If towing required:
  - Be trained in towing and operational risk assessed
  - Register of persons authorised to tow must be maintained
  - Special care must be taken to weigh towed especially for breaking activities
- Operator must consider stability issues when towing and the operator must refer to operator's manual prior to towing
- Do not tip whilst on the move or during high winds
- Engine must be turned off and keys removed before leaving vehicle unattended
- A maximum of eight working hours per day except for the month of Ramadan when the maximum shall be six working hours per day
- A maximum of two hours overtime allowed per day
- No more than five consecutive hours shall be worked without a rest period
- At least one rest day per week

### **Mandatory**

- Load measurement device
- Directional white noise reversing warning
- Complete people exclusion area around plant and operation

- A rule of thumb, 25 percent of dumper capacity should be placed in a skip/discharge area prior to towing
- Where turntable dumpers are narrow mouth, or high lift equipment, extra training must be given to the operator so that the dumper is used correctly
- A three-way or side-tipping dumper must be three-way complete left or right or forward only. Diagonal tipping should be avoided as non-compliance can result in loss of stability
- Machine under five years since date of manufacture
- Operator to have passed drug and alcohol test, attended the site induction and be subject to ongoing medical screening / surveillance
- Post incident and random drug and alcohol testing for operators will be conducted throughout the duration of the project

### **Hazards/risks**

Significant hazards/risks identified when operating the machine and for those adjacent to machine:

- Access into cab/refueling and maintenance
- Danger of crushing
- High risk of overturning at speed and on inclines. Refer to manufacturer's recommendations.
- Consider risk of towed items, such as roller
- Transportation including loading/unloading
- Falls/overturning into excavations
- Plant and personnel interface
- Public interface – working alongside pedestrians/vehicles
- All round visibility /loads restricting driver vision
- Effect of weather on visibility and working/traffic surfaces
- The buckets on side tipping dumpers can protrude significantly when turned to the side, creating a hazard to pedestrians
- Hazardous substances, such as fuels, oils, and greases
- Wet materials/clay are prone to stick and cause instability during tipping
- Human error due to fatigue

## **9.4 Checklist Tracked 360° Excavator**

### **General**

All plant to be inspected prior to first use and the appropriate pre-start check sheet completed and daily recorded inspections thereafter. Inspection sheet to be available in the cab and ideally visually displayed. The employment of a dedicated Plant Manager or similar designation with the technical competence to ensure preventative, condition and break down maintenance and inspection is carried out at suitable frequencies as specified within the Plant and Equipment's Operation Manual.



### **Minimum requirement**

#### **Plant**

- Pre-use inspection signed off



- 12 Month thorough examination
- Roll over protection structure (ROPS) to cab and Falling object's protective structure (FOPS) where required by risk assessment where the working environment requires.
- Seat belts must be fitted and worn
- Mirrors/colour CCTV to satisfy 1m high at 1m distance visibility criteria
- White noise movement alarm fitted, working and audible at 10 metres
- Flashing amber beacon
- Evidence of regular inspection plus next service due date
- Work at height protection to provide Safe work environment when on the machine for refueling and maintenance etc.
- Operator instructions must be available on the machine
- All safety labels (decals) in place
- Check valves must be fitted to excavators' boom and dipper circuits
- Unless demonstrated that it will not be used for lifting:
  - Six-month thorough examination on lifting accessories
  - Audible or visual overload warning system fitted and operational
  - Certified lifting point required for all lifting duties
  - SWL to be clearly marked on all lifting points
  - A machine specific lifting duty sheet, lift plan and risk assessment
  - If lift and carry duties to be undertaken specific risk assessment to be completed considering manufacturer's instructions.
- If used adjacent live lanes control measures must be put in place that in the event of operator error the machine will be prevented from striking passing traffic e.g., slew restrictors, banks man remote cut out or track lock
- If quick hitch fitted:
  - Must be fully automatic double locking for machines over 5 tons (unless direct attachment-no quick hitch)
  - Have an in-cab warning alarm
  - Copy of manufacturers operating instructions
  - Pre-use inspection signed off
- If used under overhead cables or obstructions:
  - Height restrictors with indication on machine
- Fire extinguisher in cab

## Operator

- Pre-use (daily) inspection signed off and to be available in the cab
- Operator to ensure buckets are always carried safely
- All hoses to be inspected regularly
- Evidence of having signed on to the appropriate risk assessment for the task
- Compliance with pre-use, daily and weekly defect reporting system
- Do not break ground unless briefed on, have received, and fully understood a permit to break ground
- Seat belt must be worn
- Engine must be turned off if approached by others and keys removed from the cab before leaving the cab if left unattended



- Full induction attended prior to starting work
- Competency assessment prior to being put to work – be familiar with machine
- Full site-defined PPE required if outside cab, non-loose-fitting PPE required in all cases to avoid catching on controls
- If quick hitch fitted:
  - Be briefed on 'safe use of quick hitches '
  - Operator shall be trained in how to use specific quick hitch attachments
  - Daily inspection signed off
- If used for lifting:
  - Trained in how to use the excavator as a crane
  - Lift plan and/or permit to lift must be briefed and understood
  - Operator shall be trained in how to use specific lifting attachments
- A maximum of eight working hours per day except for the month of Ramadan when the maximum shall be six working hours per day
- A maximum of two hours overtime allowed per day
- No more than five consecutive hours shall be worked without a rest period
- At least one rest day per week

## Mandatory

- Tracker unit, isolation method independent of factory fitted locks
- Locking caps/covers to fuel and all other tanks
- Complete people exclusion area around plant and operation
- Zero tail swing ballast/counterweight
- Quarry specification light to indicate when seat belt worn. Some machines have also been wired such that the safety lever will not engage until seatbelt is connected
- Handrails on body where access required
- Track direction indicator note
- When used for lifting a list of weights of potential items to be lifted should be maintained
- Operator subject to ongoing medical screening/surveillance
- Seat belt operation interlocked with ignition switch/warning indicator
- Machine under five years since date of manufacture
- Use of slew restrictors where appropriate
- Operator to have passed drug and alcohol test, attended the site induction and be subject to ongoing medical screening / surveillance
- Post incident and random drug and alcohol testing for operators will be conducted throughout the duration of the project

## Hazards/risks

Significant hazards/risks identified when operating the machine and for those adjacent to machine:

- Access into cab/refueling and maintenance
- Danger of crushing in slew zone
- Overturning if lifting duties exceeded
- Use of accessories and how they are attached/inspected – such as breaking hammer
- Effect of weather visibility and working/traffic surfaces

- Controls can be caught inadvertently if near to safety lever
- Clothes can get snagged on controls prior to release of servo isolator/safety handle
- Plant and personnel interface
- Overhead obstructions – cables/bridges
- Public interface – working alongside pedestrians/vehicles
- Underground services
- Limitations to all round visibility
- Transportation including loading/unloading
- Hazardous substances such as fuels, oils and greases
- Human error due to fatigue

## **9.5 Checklist Wheeled 360° Excavator**

### **General**

All plant to be inspected prior to first use and the appropriate pre-start check sheet completed and daily recorded inspections thereafter. Inspection sheet to be available in the cab and ideally visually displayed. The employment of a dedicated Plant Manager or similar designation with the technical competence to ensure preventative, condition and break down maintenance and inspection is carried out at suitable frequencies as specified within the Plant and Equipment's Operation Manual.



### **Minimum requirement**

#### **Plant**

- Pre-use inspection signed off
- 12-month thorough examination
- If used on public highway must be registered and insured
- Seat belts must be fitted and worn
- Roll over protection structure (ROPS) to cab and Falling object's protective structure (FOPS) where required by risk assessment where the working environment requires.
- Mirrors/colour CCTV to satisfy one metre high at one metre distance visibility criteria
- Brake efficiency testing to be carried out and recorded e.g., daily user park, service brake and dynamic brake efficiency test at maximum six monthly intervals
- Flashing amber beacon
- Evidence of regular inspection plus next service due date
- Work at height protection; to provide Safe work environment when on the machine for refueling and maintenance etc.
- Operator instructions must be available on the machine
- All safety labels (decals) in place
- White noise movement alarm fitted, working and audible at 10 metres
- System to prevent operation at speeds in reverse
- Check valves must be fitted to excavators' boom and dipper circuits
- Unless demonstrated that it will not be used for lifting:
  - Six-month thorough examination on lifting accessories
  - All lifting points to be certified.
  - SWL to be clearly marked on all certified lifting points



- A machine specific lifting duty sheet, lift plan and risk assessment
- If lift and carry duties to be undertaken specific risk assessment to be completed considering manufacturer's instructions.
- Audible or visual overload warning system fitted and operational
- If quick hitch fitted:
  - Must be fully automatic double locking for machines over 5 tons (unless direct attachment-no quick hitch)
  - Have an in-cab warning alarm
  - Copy of manufacturers operating instructions
  - Pre-use inspection signed off
- If used under overhead cables or obstructions:
  - Height restrictors with indication on machine
  - Best Safety Practice and Prevent Cable Damages guidelines must be followed
- If used adjacent live lanes control measures must be put in place that in the event of operator error the machine will be prevented from striking passing traffic e.g. slew restrictors, banks man remote cut out.
- Fire extinguisher in cab

## Operator

- Pre-use (daily) Inspection signed off and to be available in the cab
- Authorisation required prior to driving on public highway
- Evidence of having signed on to the appropriate risk assessment for the task
- Do not break ground unless briefed on, have received, and fully understood a permit to break ground
- Seatbelt must be worn
- Engine must be turned off and keys removed from the cab before leaving the cab unattended
- Full induction attended prior to starting work
- Operator to ensure buckets are carried and secured safely when being transported
- Full site-defined PPE required if outside cab; non-loose-fitting PPE required in all cases to avoid catching on controls
- Compliance with pre-use, daily and weekly defect reporting system
- Competency assessment prior to being put to work - be familiar with machine
- If wheeled duties use axle locks, for other duties stabilisers must be deployed
- If quick hitch fitted:
  - Be briefed on safe use of quick hitches
  - Operator shall be trained in how to use specific quick hitch attachments
  - Daily inspection signed off
- If used for lifting:
  - Lift plan and/or permit to lift must be briefed and understood
  - Operator shall be trained in how to use the excavator as a crane
  - Operator shall be trained in how to use specific lifting attachments
- A maximum of eight working hours per day except for the month of Ramadan when the maximum shall be six working hours per day
- A maximum of two hours overtime allowed per day
- No more than five consecutive hours shall be worked without a rest period



- At least one rest day per week

### Mandatory

- Tracker unit, isolation method independent of factory fitted locks, locking caps/covers to fuel and all other tanks
- Complete people exclusion area around plant and operation
- When using lifting eye, a swivel hook should be considered to ensure load can be manoeuvred without risk of swinging back or overloading
- Travel direction indicator
- Handrails on body where access required
- When used for lifting a list of weights of potential items to be lifted should be maintained
- Operator to have passed induction and subject to ongoing medical screening/surveillance
- Machine under five years since date of manufacture
- Seat belt operation interlocked with ignition switch/warning indicator
- Use of slew restrictors where appropriate
- Operator to have passed drug and alcohol test, attended the site induction and be subject to ongoing medical screening / surveillance
- Post incident and random drug and alcohol testing for operators will be conducted throughout the duration of the project

### Hazards/risks

Significant hazards/risks identified when operating the machine and for those adjacent to machine:

- Access into cab/refueling and maintenance
- Danger of crushing in slew zone
- Overturning if lifting duties exceeded
- Use of accessories and how they are attached/inspected such as breaking hammer
- Effect of weather visibility and working/traffic surfaces
- Clothes can get snagged on controls prior to release of servo isolator/safety handle
- Operating in reversing mode
- Plant and personnel interface
- Overhead obstructions – cables/bridges
- Public interface – working alongside pedestrians/vehicles
- Underground services
- Limitations to all round visibility
- Transportation including loading/unloading
- Hazardous substances such as fuels, oils, and greases
- Human error due to fatigue

### 9.6 Checklist Mixer Truck





## General

All plant to be inspected prior to first use and the appropriate pre-start check sheet completed and daily recorded inspections thereafter. Inspection sheet to be available in the cab and ideally visually displayed. The employment of a dedicated Plant Manager or similar designation with the technical competence to ensure preventative, condition and break down maintenance and inspection is carried out at suitable frequencies as specified within the Plant and Equipment's Operation Manual.

## Minimum requirement

### Vehicle requirements

- Mirrors/CCTV to satisfy one metre high at one metre distance visibility criteria
- Reversing alarm to be fitted, working and audible at 10 metres
- If used on public highway, registered and fully compliant with road vehicles (construction and use regulations)
- Evidence of regular vehicle inspection
- All current certificates/service documents provided
- All safety labels (decals) in place
- Full handrail protection to platform and tank
- Copy of manufacturer's operating instructions must be available
- Fire extinguisher in cab

### Driver/operator

- Pre-use (daily) inspection signed off
- Full induction attended prior to starting work
- Evidence of having signed on to the appropriate risk assessment for the task
- Demonstrable training and experience in operation of mixer truck
- Full site-defined PPE required, hand and skin dermatitis protection/monitoring
- Compliance with pre-use daily and weekly defect reporting system
- A maximum of eight working hours per day except for the month of Ramadan when the maximum shall be six working hours per day
- A maximum of two hours overtime allowed per day
- No more than five consecutive hours shall be worked without a rest period
- At least one rest day per week

### Mandatory

- Reversing alarm to be directional and white noise
- Isolation method independent of factory fitted locks
- Locking caps/covers to fuel and all other tanks
- Statement on hours to next service
- Safe access to all areas where the operator is required to work including full handrail protection etc.
- Operator to be competency assessed in dealing with spills and environmental protection
- Driver/operator to have induction and subject to ongoing medical screening/surveillance
- Seat belt operation interlocked with ignition switch/warning indicator
- Machine under five years since date of manufacture
- Operator to have passed drug and alcohol test, attended the site induction and be subject to ongoing medical screening / surveillance



- Post incident and random drug and alcohol testing for operators will be conducted throughout the duration of the project

### Hazards/risks

Significant hazards/risks identified when operating the machine and for those adjacent to machine:

- Access into cab/refueling and maintenance
- Danger of moving parts – rotating drum
- Danger of spills when filling or discharging or driving up steep inclines
- Tripping over hoses on ground or slipping on spills
- Number of climbing operations in to and out of the cab and when inspecting drum contents
- Imposed loadings on underground services
- Plant and personnel interface
- Hazard from concrete washout discharging
- Noise and visibility
- Proximity to concrete skips being lifted
- WAH – access on to top of tank/body
- Public interface – working alongside pedestrian's vehicles/plant crossings
- Effect of weather visibility and working/traffic surfaces
- Limitations to all round visibility
- Hazardous substances for example fuels, oils and greases
- Human error due to fatigue

## 9.7 Checklist Telehandler

### General

All plant to be inspected prior to first use and the appropriate pre-start check sheet completed and daily recorded inspections thereafter. Inspection sheet to be available in the cab and ideally visually displayed. The employment of a dedicated Plant Manager or similar designation with the technical competence to ensure preventative, condition and break down maintenance and inspection is carried out at suitable frequencies as specified within the Plant and Equipment's Operation Manual.



### Minimum requirement

#### Plant

- Evidence of regular inspection plus next service due date
- Falling object protective structure (FOPS) to cab
- Fitted and operational audible or visual overload warning system (RCI)
- Seatbelts must be fitted
- Flashing amber beacon
- Reversing alarm to be fitted working and audible at 10 metres
- Mirrors/CCTV to satisfy one metre high at one metre distance visibility criteria
- All safety labels (decals) in place
- If used on public highway – registered and insured



- Current 12 monthly thorough examination certificate (six monthly required if machine being used in conjunction with man-riding basket)
- Current six-monthly certification for all on-board lifting tackle and/or fork attachments
- Lifting duty chart to be displayed on boom or in cab
- If lifting from forks (under slinging) attachments must be fixed with heel pins (not T screws) and have specific lift plan
- Forks to be folded/secured if travelling on public highway
- Protective mesh to be in place on jib side of cab if window is of opening type
- No materials including lifting tackle to be stored beneath the boom
- Boom ram lock facility must be provided with the machine
- Only fully integrated man-riding baskets are permitted when supported by a task specific risk assessment.
- Brake efficiency testing to be carried out and recorded e.g., daily user park and service brake and dynamic brake efficiency test at maximum six monthly intervals
- Fire extinguisher in cab

#### **Operator**

- Pre-use (daily) Inspection signed off
- Must have current relevant drivers' licence if driving on public highway
- Authorisation required prior to driving on public highway
- Check for ground conditions prior to lifting and must consider stabilisers where appropriate
- Competent to check rated capacity indicator (RCI)
- Machine levelling devices must be used in all cases if fitted
- Operator must ensure the boom is always carried at a safe level in accordance with the manufacturer's recommendations
- Full induction attended prior to starting work
- Evidence of having signed on to the appropriate risk assessment/lift plan for the task
- Full site-defined PPE
- Compliance with pre-use, daily and weekly defect reporting system
- Competency assessment prior to being put to work – be familiar with machine and telehandler attachments
- Seatbelt must be worn
- A maximum of eight working hours per day except for the month of Ramadan when the maximum shall be six working hours per day
- A maximum of two hours overtime allowed per day
- No more than five consecutive hours shall be worked without a rest period
- At least one rest day per week

#### **Mandatory**

- Tracker unit – immobilizing method independent of factory fitted locks, locking caps/covers to fuel and all other tanks
- Complete people exclusion area around plant and operation
- Inclinometer gauge and/or decal advising of gradient limits for safe operation
- Boom angle indicator
- Tyre pressure indicators
- Wheel nut indicators



- Maintain a list of weights of potential items to be lifted
- Roll overprotective structure (ROPS) particularly with all-terrain models
- Operator to have passed drug and alcohol test on induction and subject to ongoing medical screening/surveillance
- Machine under five years since date of manufacture
- Seat belt operation interlocked with ignition switch/warning indicator
- Operator to have passed drug and alcohol test, attended the site induction and be subject to ongoing medical screening / surveillance
- Post incident and random drug and alcohol testing for operators will be conducted throughout the duration of the project

### Hazards/risks

Significant hazards/risks identified when operating the machine and for those adjacent to machine:

- Access into cab/refueling and maintenance
- Overturning if lifting duties are exceeded or use on uneven ground
- Effect of weather visibility and working/traffic surfaces
- Clothes can get snagged on controls prior to release of servo isolator/safety handle
- Plant and personnel interface
- Overhead obstructions – cables/bridges
- Public interface – working alongside pedestrians/vehicles
- Limitations to all round visibility
- Transportation including loading/unloading
- Hazardous substances such as fuels, oils and greases
- Human error due to fatigue

## 9.8 Checklist Concrete Pump

### General

All plant to be inspected prior to first use and the appropriate pre-start check sheet completed and daily recorded inspections thereafter. Inspection sheet to be available in the cab and ideally visually displayed. The employment of a dedicated Plant Manager or similar designation with the technical competence to ensure preventative, condition and break down maintenance and inspection is carried out at suitable frequencies as specified within the Plant and Equipment's Operation Manual.



### Minimum requirements

#### Plant

If truck mounted:

- Operator licence displayed in the cab windscreens
- Current 12 monthly thorough examination certificate
- Operation and maintenance manual
- Completed operator daily/weekly checklist (to include pipework)
- Mirrors and camera – to satisfy current QCS Specifications e.g. all round visibility
- Remote controls for the operator



- Safe access for maintenance activities
- Flashing amber beacon
- Reversing alarm to be fitted, working and audible
- Door lock keys supplied
- Locking caps and covers
- Fire extinguisher in cab
- Ball catcher fitted to discharge end
- If used adjacent live lanes control measures must be put in place that in the event of operator error the machine will be prevented from striking passing traffic e.g., slew restrictors, banks man remote cut out or similar

#### **Driver/operator**

- Pre-use (daily) Inspection signed off
- Full induction attended prior to starting work
- Evidence that the operator is medically fit to operate the pump
- Evidence of having signed on to the appropriate risk assessment
- Evidence of familiarisation training for the type of pump to be operated
- Full site-defined PPE required, hand and skin dermatitis protection/monitoring
- Compliance with pre-use, daily/weekly defect reporting system
- A maximum of eight working hours per day except for the month of Ramadan when the maximum shall be six working hours per day
- A maximum of two hours overtime allowed per day
- No more than five consecutive hours shall be worked without a rest period
- At least one rest day per week

#### **Mandatory**

- Nylacast outrigger pads
- Illuminated pump control panel
- Hands free voice activated radio communication between the pump operator and the operative at the end of the line
- Driver/operator to have passed drug and alcohol test on induction and subject to ongoing medical screening/surveillance
- Seatbelt operation interlocked with ignition switch/warning indicator
- Spill kit
- Handrails fitted around pipe storage areas at rear of vehicle
- Machine under five years since date of manufacture
- Operator to have passed drug and alcohol test, attended the site induction and be subject to ongoing medical screening / surveillance
- Post incident and random drug and alcohol testing for operators will be conducted throughout the duration of the project

#### **Hazards/risks**

Significant hazards/risks identified when operating the machine and for those adjacent to machine:

- Access into cab/refuelling and maintenance
- Plant and personnel interface – trapping/crushing of site operatives

- Overturning – ground capable of withstanding-imposed outrigger loadings
- Effect of weather on visibility and working/traffic surfaces
- Failure of pressurised lines and use of compressed air to clean pipes
- Vibration and manual handling when using compressed air system
- Potential excessive noise
- Blockages in pipework
- Whip from flexible hoses
- Boom clash with overhead obstructions, power lines, adjacent cranes
- Hazard from concrete washout discharging
- Public interface – working alongside pedestrian's vehicles/plant crossings
- Effect of weather visibility and working/traffic surfaces
- Hazardous substances such as cement, additives, fuels, oils and greases
- Uncontrolled discharge of waste concrete
- Human error due to fatigue

## 9.9 Checklist Crawler Crane

### General

All plant to be inspected prior to first use and the appropriate pre-start check sheet completed and daily recorded inspections thereafter. Inspection sheet to be available in the cab and ideally visually displayed. Hydraulic cranes only permitted not mechanical. The employment of a dedicated Plant Manager or similar designation with the technical competence to ensure preventative, condition and break down maintenance and inspection is carried out at suitable frequencies as specified within the Plant and Equipment's Operation Manual.



### Minimum requirement

#### Plant

- CE certificate
- Current 12 monthly thorough examination certificate
- Have either a four yearly overload test certificate or a defined written scope of examination scheme supported by a declaration of compliance
- Current six-monthly thorough examination certificate for all lifting tackle carried
- Current six-monthly certificate for the crane
- Lifting accessories marked with SWL
- Fitted and operational audible or visual overload warning system
- Operator instructions must be available on the machine
- Flashing amber beacon
- Mirrors/colour CCTV to satisfy one metre high at one metre distance visibility criteria
- Where cranes have extendable tracks and where there is a limitation on gradient for carrying out extension/retraction the crane must be fitted with a spirit level in the operator's sight line showing acceptable limits.



- Reversing alarm to be directional and white noise, working and audible at 10 metres
- Slew alarms
- Door lock keys supplied
- Aircraft warning lights fitted (if working within the vicinity of aerodromes)
- Slew, jib height and radius restrictors if working in the vicinity of overhead power lines, railways, adjacent live traffic, etc.
- Hook block over hoist cut-out facility
- Boom hoist cut-out facility
- Handrails fitted to running boards and crane upper structure
- Load bearing hydraulic cylinders fitted with check valves
- Fire extinguisher in cab
- Crane fitted with anemometer or other device to monitor in service wind speeds
- If used adjacent live lanes control measures must be put in place that in the event of operator error the machine/load will be prevented from striking passing traffic. E.g., slew restrictors, banks man remote cut out or track lock.

### **Operator**

- Pre-use (daily) inspection signed off
- Lifting plan and permit to lift in place as appropriate
- Full induction attended prior to starting work and passed a drug and alcohol test
- Valid medical certificate
- Evidence of familiarisation training for type of crane to be operated
- Evidence of having signed on to the appropriate risk assessment for the task
- Full site-defined PPE required if outside the cab, non-loose fitting
- Engine must be turned off if approached by others and keys removed from the cab before leaving the cab unattended for any reason
- A maximum of eight working hours per day except for the month of Ramadan when the maximum shall be six working hours per day
- A maximum of two hours overtime allowed per day
- No more than five consecutive hours shall be worked without a rest
- At least one rest day per week

### **Man riding requirements**

- Carrier hoisting and lowering ropes minimum diameter of 8 millimetre
- Hook fitted with safety catch
- Ability to restrict the working speed of all crane functions to 0.5 metre
- Control levers return to neutral automatically
- SWL of crane configuration in use is at least twice the rated capacity of the carrier
- Power lowering capacity fitted to the crane. If not, free fall capability must be locked out

### **Mandatory**

- Jib head tracker if working on sites with blind lifting issues



- Counterweight mounted colour CCTV
- Block stand to be provided when reeving rope into hook block whilst block is lying down
- Anemometer
- Window guards
- Audible/visual slew alarm – use of slew restrictors where appropriate
- All round vision system to avoid potential crushing incident
- Operator to have minimum of three years relevant operating experience
- Perimeter edge protection, handrails etc. to body of crane where access required
- Means for operator to monitor hoist rope tension such as camera or mirror
- Red, amber, and green high-level illumination to indicate crane is operating within safe limits
- Crane Supervisor to have handheld anemometer to measure wind speeds
- Operator to have induction and subject to ongoing medical screening/surveillance
- Seatbelt operation interlocked with ignition switch/warning indicator
- Machine under five years since date of manufacture
- Operator to have passed drug and alcohol test, attended the site induction and be subject to ongoing medical screening / surveillance
- Post incident and random drug and alcohol testing for operators will be conducted throughout the duration of the project

## Hazards/risks

Significant hazards/risks identified when operating the machine and for those adjacent to machine:

- Access into cab/refuelling and maintenance
- Danger of crushing in slew zone
- Load path – slewing over site personnel
- Overturning if lifting duties exceeded
- Ground conditions capable of withstanding-imposed track loadings
- Imposed loadings on underground services
- Dropped loads
- Effect of weather visibility and working/traffic surfaces
- Operating in reversing mode
- Plant and personnel interface
- Overhead obstructions – cables/bridges/power lines/telephone lines
- Jib clash with adjacent cranes/tall plant
- Public interface – working alongside pedestrians/vehicles
- Limitations to all round visibility
- Use of jib walkways – falls from height
- Hazardous substances such as fuels, oils, and greases

- Potential excessive noise
- Human error due to fatigue

## 9.10 Checklist Lorry Loader Crane

### General

All plant to be inspected prior to first use and the appropriate pre-start check sheet completed and daily recorded inspections thereafter. Inspection sheet to be available in the cab and ideally visually displayed. The employment of a dedicated Plant Manager or similar designation with the technical competence to ensure preventative, condition and break down maintenance and inspection is carried out at suitable frequencies as specified within the Plant and Equipment's Operation Manual.



### Minimum requirements

#### Vehicle requirements

- Compliance with road vehicles (construction and use) regulations (spray suppression, under run guards, lighting, markers etc.)
- Amber hazard beacons and highway/motorway maintenance decal
- Operator's instructions must be available on the machine
- Safe access to all areas where operator or slinger/signaller required to work
- Reversing alarm to be fitted, white noise and audible at 10 metres
- Fitted with all round vision aids to satisfy 1metre high at 1metre distance
- Edge protection or fall arrest arrangements where access to vehicle body required
- Audible and visual warning to be fitted in the cab to remind driver / operator including the hydraulic arm fitted, if not safety stowed prior to travelling
- Fire extinguisher in cab

#### Crane requirements

- Current six-monthly certification for all on-board lifting tackle and accessories
- Accessories to be marked with safe working loads
- Crane duties chart displayed on boom or at operator's station
- Functioning audible warning devices – safe load indicator/rated capacity
- indicator/device with hydraulic lock-out/warning light/alarm
- If used adjacent live lanes control measures must be put in place that in the event of operator error the machine/load will be prevented from striking passing traffic. e.g., slew restrictors, banks man remote cut out

#### Driver/operator

- Pre-use (daily) inspection signed off
- Full induction attended prior to starting work
- Competency assessment prior to being put to work – be familiar with machine
- Evidence of having signed on to the appropriate risk assessment for the task



- Full site-defined PPE required if outside the cab – non loose fitting
- A maximum of eight working hours per day with the exception of the month of Ramadan when the maximum shall be six working hours per day
- A maximum of two hours overtime allowed per day
- No more than five consecutive hours shall be worked without a rest period
- At least one rest day per week

### Mandatory

- Outrigger lock-out preventing crane operation with legs in stowed position
- Stabiliser legs not stowed warning device
- Fleet Operator Recognition Scheme (FORS) compliant
- Sensor de-rate system if crane is used short-rigged
- Traffic cones or other means of maintaining safe zones and avoiding pedestrian traffic near lifting
- Driver/operator to have induction and subject to ongoing medical screening/surveillance
- Seatbelt operation interlocked with ignition switch/warning indicator
- Use of slew restrictors where appropriate
- Machine under five years since date of manufacture
- Operator to have passed drug and alcohol test, attended the site induction and be subject to ongoing medical screening / surveillance
- Post incident and random drug and alcohol testing for operators will be conducted throughout the duration of the project

### Hazards/risks

Significant hazards/risks identified when operating the machine and for those adjacent to machine:

- Access into cab/refuelling and maintenance
- Load path – slewing over site personnel
- Overturning if lifting duties exceeded
- Ground conditions capable of withstanding-imposed track loadings
- Imposed loadings on underground services
- Dropped loads/instability of load
- Plant and personnel interface
- Overhead obstructions – cables/bridges/power lines/telephone lines
- Jib clash with adjacent cranes/tall plant
- Public interface – working alongside pedestrians/vehicles
- Effect of weather visibility and working/traffic surfaces
- Limitations to all round visibility
- Hazardous substances such as fuels, oils and greases
- Human error due to fatigue



## 9.11 Checklist Mobile Elevated Working Platform

### General

All plant to be inspected prior to first use and the appropriate pre-start check sheet completed and daily recorded inspections thereafter. The employment of a dedicated Plant Manager or similar designation with the technical competence to ensure preventative, condition and break down maintenance and inspection is carried out at suitable frequencies as specified within the Plant and Equipment's Operation Manual.



### Minimum requirement

#### Plant - all MEWP's

- Pre-use inspection signed off
- Six monthly thorough examination certificates
- Operation manual supplied
- Power failure safe lowering system
- When MEWPs are used in situations involving a risk of crushing against overhead structures or equipment, specific control measures must be implemented, and the use of anti-trapping devices must be used
- Movement alarm to be fitted, working and audible
- SWL displayed in platform
- Outrigger/wheel loading details
- Controls must be shrouded and be fitted with anti-crush protection measures
- Completed operator daily/weekly checklist
- Door lock keys in cabs of lorry mounted booms
- Direction of travel must be clearly indicated
- If used adjacent to live lanes, control measures must be put in place that in the event of operator error the machine will be prevented from striking passing traffic, e.g., slew restrictors or banks man remote cut out
- Fire extinguisher available

#### Boom type MEWP's only

- Flashing amber beacon
- Harness anchorage points in boom platform

### Operator

- Daily inspection signed off Trained in use of harness as appropriate
- Full induction attended prior to starting work and passed a drug and alcohol test
- Evidence of having signed on to the appropriate risk assessment for the task
- Full site-defined PPE required if outside the cab – non loose fitting
- Compliance with pre-use, daily and weekly defect reporting system
- Competency assessment by site supervisor prior to being put to work



- Evidence of familiarisation training for the MEWP to be operated, including emergency recovery from the ground
- Use of harness – harness to be worn in boom type MEWP or in the scissor lift if travelling, and to be appropriate for specific use
- Be briefed on the site plant and vehicle management procedures and check for overhead obstructions and hazards
- A maximum of eight working hours per day except for the month of Ramadan when the maximum shall be six working hours per day
- A maximum of two hours overtime allowed per day
- No more than five consecutive hours shall be worked without a rest period
- At least one rest day per week)

### Mandatory

- MEWPs to have 110V supply available in basket pre-wired
- Wheel nut indicators fitted
- Tilt alarm fitted
- Fire suppression in engine compartment if working in a zone of fire risk or if emergency basket to basket evacuation procedures not practical
- Fish eye mirrors for all round vision when travelling
- Audible alarm for lowering and for entrapment of operator
- Toolbox equipment storage in basket
- Operator to have passed Drug and Alcohol test on induction and subject to ongoing medical screening/surveillance
- Machine under five years since date of manufacture
- Operator to have passed drug and alcohol test, attended the site induction and be subject to ongoing medical screening / surveillance
- Post incident and random drug and alcohol testing for operators will be conducted throughout the duration of the project

### Scissor type MEWP's only

- Flashing beacon on scissor lift
- Harness anchorage point in scissor lift (mandatory if it is to be used whilst travelling)

### Boom type MEWP's only

- Audible parking position of the boom in air should not be permitted

### Hazards/risks

Significant hazards/risks identified when operating the machine and for those adjacent to machine:

- Ground conditions/underground services – imposed wheel/outrigger loadings
- Falls from height
- Access into cab/refuelling and maintenance
- Danger of crushing in slew zone



- Operator recovery from an incapacitated machine
- Overturning if lifting duties exceeded
- Ground conditions capable of withstanding-imposed track loadings
- Uneven ground conditions and driving up ramps during travelling can create a risk of crush/impact injury
- Handling materials on MEWP platforms can overload machinery or be at risk of falling
- Effect of weather visibility and working/traffic surfaces
- Potential for clashes with other plant working in the vicinity
- Stability when travelling machine with platform raised
- Clearances between buildings/other platforms
- High wind speed
- Operating in reversing mode
- Plant and personnel interface
- Overhead obstructions – cables/bridges/power lines/telephone lines
- Public interface – working alongside pedestrians/vehicles
- Limitations to all round visibility
- Hazardous substances such as fuels, oils, and greases
- Interface with crane/load during lifting operations (e.g., if MEWP used for completing joints)
- Human error due to fatigue

## 9.12 Appendix B: Audit Criteria POWERED MOBILE PLANT Audit Criteria/ Checklist

Contractor/ Area: \_\_\_\_\_

Department: \_\_\_\_\_

Completed by: \_\_\_\_\_ Date completed: \_\_\_\_\_

Audit Criteria		Requirements	Verification	Area of Concern
ISO 45001:2018 Clause	NMS Ref.			Yes/ No
5.3	7.1.3	Pre-Tender Health and Safety Plan has been developed and issued		
5.3, 8.1.	7.1.4	Selection of Contractors undertaken in accordance with NEOM's policies and procedures		
7.2	7.2.1(a), 8.1,	Persons appointed to manage /oversee work operations have the skills, knowledge, experience		
8.1.2 (e)	7.2.1(d), 7.3.3 8.4.12	Personal protective equipment required for use are fit for purpose		
		Ensure there is suitable PPE, including hi-visibility clothing provided for use on site		
6.1.2.3 6.1.2.2	7.2.1(c), 8.2.1	Hazards Identification Plan (HIP)		
		Assessment of the various risks shall be undertaken by a Competent Person to evaluate each Site or Operation to determine any hazards present in relation to the use of Powered Mobile Plant		
8.1.2, 8.1.4	8.1.2	Vehicles should be carefully selected to minimize risks in the expected conditions of use and to provide the best direct vision for the driver to minimize any reliance on vision aids		
	8.3.3	Establish, maintain, and implement a process to control or prevent unauthorized personnel entering areas where machines are working		
	8.4.7	Ensure that all aisles/passageways or roads where Powered Mobile Plants are used are kept in good repair, with appropriate safety signage and clearly marked		
8.1.2, 8.1.4	8.4.13	Ensure that all Powered Mobile Plants are fitted with audible and visual warning devices to ensure that pedestrians are aware of their presence		
	8.4.17	When Powered Mobile Plant is left unattended it shall be neutralized, power shall be shut off, keys removed, and brakes set. Wheels shall be blocked if the plant is parked on an incline		
9.1.1, 9.1.2	8.5.1, 8.5.2, 8.5.3	All plant operators need to carry out daily pre-use inspections on their Powered Mobile Plant before work begins, pre-start check sheet shall be completed and daily recorded inspections sheet shall be available in the cab and ideally visually displayed.		



Audit Criteria		Requirements	Verification	Area of Concern
ISO 45001:2018 Clause	NMS Ref.			Yes/ No
	8.7.1	Establish, maintain, and implement a program and schedule of preventative maintenance activities for all mobile equipment based on the manufacturer's recommendations		



نیوم NEOM

**NEOM OCCUPATIONAL HEALTH and SAFETY  
NEOM MINIMUM STANDARD  
for  
OCCUPATIONAL FOOD HANDLING AND FOOD  
PREPARATION AREAS**

NEOM-NLF-NMS-006.046 Rev 02.00 – February 2022

©NEOM [2021]. All rights reserved.

## Document History

Revision code	Description of changes	Purpose of issue	Date
Rev 00.00	First Issue	Issued for Implementation	27/07-2020
Rev 02,00	SMS Update	Issued for Implementation	01-02-2022

## Document Approval

	Prepared by	Reviewed by	Approved by
Name	Robert Murphy	Talal Al Anazi	Adel Al Wuhaib
Job Title	Loss Prevention Specialist LP/FS -Public Safety	Director, Loss Prevention/Fire Safety (LP/FS) Public Safety	Executive Director Public Safety

## OUR NEOM VALUES



### CATALYST

Make a difference.  
Create a legacy.



### CARE

Leave the environment  
in a better place.



### CURIOS

Challenge the norm.  
Stay restless.



### PASSIONATE

Be accountable.  
Finish what you start.



### RESPECT

Be authentic.  
Be true. Be fair.



### DIVERSITY

Embrace cultural  
differences.  
Seek to understand.

## Contents

<b>1</b>	<b>PURPOSE .....</b>	<b>4</b>
<b>2</b>	<b>SCOPE .....</b>	<b>4</b>
<b>3</b>	<b>EXPECTATIONS.....</b>	<b>4</b>
<b>4</b>	<b>LIST OF DEFINITIONS .....</b>	<b>5</b>
<b>5</b>	<b>LIST OF ABBREVIATIONS .....</b>	<b>5</b>
<b>6</b>	<b>RELATED NEOM DOCUMENTS.....</b>	<b>6</b>
<b>7</b>	<b>ROLES AND RESPONSIBILITIES .....</b>	<b>6</b>
7.1	Client .....	6
7.2	Contractor .....	7
7.3	Employee .....	8
7.4	Specific Responsibilities .....	9
<b>8</b>	<b>OTHER SECTIONS RELATED TO SUBJECT.....</b>	<b>10</b>
8.1	Training and Competency .....	10
8.2	Food Preparation and Food Storage Facilities .....	11
8.3	Working Environment and Ergonomics .....	11
8.4	Work Related Contact Dermatitis, Hazardous Substances and Chemicals .....	13
8.5	Manual Handling.....	13
8.6	Waste Management: .....	14
8.7	Vermin and Pest Control.....	14
8.8	Food Transportation .....	14
8.9	Food Handling: .....	14
8.10	Emergency Planning.....	16
<b>9</b>	<b>APPENDICES .....</b>	<b>17</b>
9.1	Appendix A: Forms, Signs and Checklists .....	17
9.2	Appendix B: Audit Criteria.....	18
9.3	Appendix C: Guidance Information.....	20

## List of Tables

Table 1 : Table of Definitions .....	5
Table 2 : Table of Abbreviations .....	5
Table 3 : Related NEOM Documents.....	6

## **1 Purpose**

This NEOM Co. SMS Minimum Standards (hereafter referred to as NMS) relates to the management of all occupational health, safety(OHS) risks associated with Food Handling and Food Preparation.

It provides guidance to support compliance with industry best practice and international regulatory safety requirements to ensure that the associated risks are assessed, and control measures are implemented in accordance with the hierarchy of risk controls.

It has been developed to align with the requirements of the ISO 45001 Health and Safety Management Manual (Refer NEOM-NLF-PRC-006- Section 2 ISO 14001 Cross reference table)

## **2 Scope**

This NMS applies to all personnel within NEOM and any Contractors working for NEOM and or associated projects and activities. It is designed to incorporate requirements set by the NEOM-SMS.

It establishes the requirements and standards for occupational food handling and food preparation

## **3 Expectations**

To ensure the health and safety of all personnel, protection of assets and the environment

NEOM expect each Sector, Organization, Department or Contractor to ensure that risks associated with Food Handling and Food Preparation are controlled in accordance with the hierarchy of risk controls: elimination, substitution, engineering controls, administrative controls, and personal protective equipment.

Consideration shall be given to technological advances that may introduce new means of controlling or eliminating the risks associated with work activities.

That the expectation for safety compliance is meeting and exceeding all applicable OSHA Laws, Regulations, and Industry Best Practice.

Applicable requirements and standards include:

- (a) OSHA Standards and Regulatory requirements.
- (b) ANSI requirements.
- (c) NFPA Standards and requirements.
- (d) NEOM Minimum Standards
- (e) Saudi Building Codes
- (f) International Building Codes
- (g) Ministry of Municipal and Rural Affairs

*If requirements of this document conflict with requirements set by another regulatory authority, Contractor are required to follow the more stringent requirement.*

## 4 List of Definitions

Table 1 : Table of Definitions

Terms	Definitions
NEOM Co	NEOM Company
Client	NEOM Sector /Department responsible for management and oversight of the Contractor
Employer	The person or organization that employs personnel to complete the work
Contractor	The organization contracted to carry out the works
Food Chain	Includes all stages of food production (including feeds/fertilizers and other inputs into production), processing, preparation, manufacturing, packing, transporting, storing, distributing, displaying, servicing and selling
Establishment	Any building(s) or areas(s), fixed or mobile, in which food is handled at any stage of the food chain
Licensee:	In this NMS is a person with valid license for operating any activity related to food and its handling
Food Business Operator	The natural or legal person(s) responsible for ensuring that the requirements of food law are met within the food business under their control
Food	Any substance, whether processed, semi-processed or raw, which is intended for human consumption, inter-alia drink, chewing gum and any substance which has been used in the manufacture, preparation or treatment of “food”
Safety Management System (SMS)	Occupational Health and Safety Management System established by NEOM in compliance to ISO 45001 Standard

## 5 List of Abbreviations

Table 2 : Table of Abbreviations

Abbreviations	Descriptions
SMS	Safety Management System
NMS	NEOM Minimum Standard
SOP	Standard Operating Procedure
ANSI	American National Standards Institute
NFPA	National Fire Prevention Association
CPP	Construction Phase Plan
OSHA	Occupational Safety and Health Administration.
PPE	Personal Protective Equipment
MOMRA	Ministry of Municipal and Rural Affairs
SFDA	Saudi Food and Drug Authority
MSDS	Material Safety Data Sheet
HACCP	Hazard Analysis and Critical Control Point

Abbreviations	Descriptions
IBC	International Building Codes
OHS	Occupational Health and Safety

## 6 Related NEOM Documents

Table 3 : Related NEOM Documents

Document Code	Document Name
NEOM Element 2	Risk and Opportunity Management
NEOM-Element 3	Control of Documented Information & Legal Compliance
NEOM-Element 5	Training, Awareness and Competency.
NEOM-Element 6	Contractor Management
NEOM-Element 8	Incident Investigation and Management (ENABLON)
NEOM-NLF-SM	Safety Management Manual - Roles and Responsibilities
NEOM-NLF-PRC-006;	Occupation health safety and Fire Safety requirements for Contractors
NEOM-NLF-PRC-006- Section 2	ISO 14001 Cross Reference Table
NEOM-NLF-NMS 006.01	Organization and Practitioner Registration and Appointment of Contractor
NEOM-NLF-NMS-006.002	Safety Construction Management Plan (CPP)
NEOM-NLF-NMS-006.012	Barricading of Hazards
NEOM-NLF-NMS-006.016	Electrical Safety.
NEOM-NLF-NMS 006.018	Local Exhaust Ventilation.
NEOM-NLF-NMS-006.020	Hazardous Materials
NEOM-NLF-NMS-006.021	Personal Protective Equipment (PPE)
NEOM-NLF-NMS-006.030	Machine Guarding.
NEOM-NLF-NMS 006.040	General Workplace Amenities
NEOM-NLF-NMS-004.001	Manual Handling

## 7 Roles and Responsibilities

### 7.1 Client

- 7.1.1 General Health and Safety roles and responsibilities are defined in; and shall be carried out in accordance with the requirements of NEOM-NLF-SM–Safety Management Manual - Roles and Responsibilities.
- 7.1.2 The Client is responsible for ensuring that NEOM Safety Commitment Statement and safety management system are properly applied within their areas of control/responsibility. Effective implementation will ensure compliance with relevant legislative requirements and will help promote the use of industry best safe working practices.
- 7.1.3 That a suitable, Pre-Tender Health and Safety Plan has been developed and issued to Contractors to ensure they have all the information necessary to make informed decisions when developing the Construction Phase Health and Safety Plan (NEOM-NLF-NMS-006.002 Safety Construction Management Plan)(CPP) which will form part of the Contractor review and selection process.
- 7.1.4 That the selection of Contractors shall be undertaken in accordance with NEOM's policies and procedures (NEOM-Element 6-Contractor Management). To ensure that only Competent organizations capable of meeting the requisite safety standards associated with project are contracted.
- 7.1.5 Conduct regular Contractor safety assurance reviews to provide the confidence level required that the safety management system is delivering as planned, and consistently achieves the acceptable level of safety. Including:
  - (a) Safety performance monitoring and measuring.
  - (b) Managing change.
  - (c) Continuous improvement.

## **7.2 Contractor**

- 7.2.1 Contractor shall undertake their roles and responsibilities in accordance with the general requirements of NEOM-NLF-SM–Safety Management Manual-Roles and Responsibilities
- 7.2.2 That all work activities are assessed, planned, organized, and that suitably competent Supervision is available to implement the safety requirements and oversee the work (Refer: NEOM- Element 5 – Training, Awareness and Competency)
- 7.2.3 Ensure persons appointed to manage /oversee work operations have the skills, knowledge, experience and, where relevant, the organizational capability to plan and manage work safely and without risk to those who may be affected by the activities (Refer: NEOM Element 5 Training, Awareness, and Competence).
- 7.2.4 Ensure employees carrying out the work are trained to recognize the associated hazards and understand the processes and procedures to control or minimize the risks.(Refer: NEOM Element 2 Risk and Opportunity Management)
- 7.2.5 That all equipment including personal protective equipment required for use is fit for purpose, and (as required) has been inspected by a competent person and inspection records are maintained and readily available. (Refer: NEOM-NLF-NMS-006.021 Personal Protective Equipment (PPE))
- 7.2.6 Maintaining control of access to dangerous or high-risk areas or equipment using suitable barricades that are in serviceable condition (Refer: NEOM-NLF-NMS-006.012 – Barricading of Hazards)
- 7.2.7 Contractor shall undertake their specific roles and responsibilities in accordance with the following:
  - (a) Shall be responsible for performing a risk assessment in accordance with NEOM-Element 2 Risk & Opportunity Management to determine the risks associated with dining facilities, food storage and food preparation. Controls shall be implemented for any identified hazards.
  - (b) Shall ensure all relevant employees have the required certificate of medical fitness and are licensed with the Saudi Food and Drug Authority (SFDA) and the Ministry of Municipal and Rural Affairs (MOMRA)
  - (c) Shall ensure all dining facilities, food storage, and food preparation facilities are registered with the MOMRA.
  - (d) Shall ensure procedures and policies for managing dining facilities and food preparation operations and food preparation operations are in accordance with Ministry of Municipal and Rural Affairs requirements.
  - (e) Shall ensure all supply / food chain Organizations have implemented appropriate Occupational Safety, and Health systems / control measures.
  - (f) Shall ensure through contractual arrangements and monitoring activities, which business / supply / food chain organization is appropriately licensed and is inspected to ensure appropriate food handling and storage processes are in place and followed. For facilities located within NEOM, the Client shall ensure they are licensed in accordance with the requirements of MOMRA
  - (g) Notify the SFDA when a food related injury or illness has occurred, in accordance with the requirements set by the SFDA and NEOM-Element 8– Incident Investigation and Management (ENABLON)

### **7.3 Employee**

- 7.3.1 Shall undertake their roles and responsibilities in accordance with the general requirements of NEOM-NLF-SM – Safety Management Manual - Roles and Responsibilities.
- 7.3.2 Report any activity or defect relating to the work which they believe is reasonably foreseeable to endanger their safety or that of another person's.
- 7.3.3 Shall use appropriate equipment or safety devices provided for the work by the Contractor in accordance with any training or instruction received in the use of the work equipment. (Refer NEOM-NLF-NMS-006.021 Personal Protective Equipment)
- 7.3.4 Employees shall undertake their specific roles and responsibilities in accordance with the following:
  - (a) Shall report any activity or defect relating to food handling or storage which they believe is reasonably foreseeable endanger their safety or that of another person.
  - (b) Shall use appropriate equipment and/or safety devices provided for food handling and storage activities by the employer in accordance with any training or instruction received in the use of the work equipment or device concerned. (Refer: NEOM-NLF-NMS-006.021 Personal Protective Equipment)
  - (c) Shall hold a valid license from the MOMRA.
  - (d) Shall hold a valid certificate of medical fitness to handle and prepare food.
  - (e) Shall follow all food storage and food handling procedures set by the Contractor.

#### **7.4 Specific Responsibilities**

- 7.4.1 Sector, Organization, Department or Contractor Head is responsible in ensuring that provisions are made the safe systems of work to prevent and minimize risks in each workplace
- 7.4.2 Safety Practitioner/Coordinator is responsible to monitor the implementation of this procedures and document its effectiveness
- 7.4.3 The Responsible Person will support this procedure and ensure that any Contractor Organization working for, or on behalf of, the Sector, Organization, Department or Contractor will comply with the requirements of these procedures
- 7.4.4 Line Managers / Supervisors are responsible for training their workers in risks
- 7.4.5 The LP & FS Public Safety department will support the NEOM risk assessments by carrying out compliance checks and supporting and guiding the various safety teams.

## **8 Other Sections related to subject**

### **8.1 Training and Competency**

8.1.1 Contractor shall ensure that training complies with the requirements of:

- (a) NEOM-Element 5– Training, Awareness and Competency.
- (b) NEOM-NLF-NMS-006.001 – SMS Organization, Practitioner Registration and Appointment of Contractor

8.1.2 Contractor shall ensure that all relevant employees and other contractors receive appropriate training and are competent to perform their duties, including:

- (a) How to recognize and report hazards.
- (b) How to raise an alarm during an emergency or contact medical services in the event of a severe burn, cut, or medical emergency.
- (c) How to identify the correct personal protective equipment required for a job or task (e.g., gloves, safety shoes, eye protection, etc.) and the appropriate procedures to care for the equipment; (Refer: NEOM-NLF-NMS-006.021 Personal Protective Equipment)
- (d) Procedures for food preparation to prevent cross contamination of food and meat items.
- (e) Procedures on how to appropriately store and prepare food to prevent food borne illnesses.
- (f) Dining hall procedures and best practices when presenting food to a consumer to prevent food borne illnesses.
- (g) Safety procedures to follow in food preparation areas to prevent incidents, illnesses, and injuries; and
- (h) Process for identifying and disposing of food that exceeded its shelf-life.

8.1.3 Contractor shall ensure food storage and preparation activities meet the general training requirements of this NMS and any additional requirements as identified in their risk analyses including:

- (a) Procedures and policies for managing dining facilities and food preparation operations in accordance with Ministry of Municipal and Rural Affairs and Saudi Food and Drug Authority.
- (b) Procedures for handling food incidents and notifying Saudi Food and Drug Authority (SFDA) when an incident has occurred.

8.1.4 Training shall include but is not limited to:

- (a) Demonstrate how to recognize and report hazards.
- (b) Ensure competence before commencing work or any new activity.
- (c) How to identify, care for and use any personal protective equipment, such as gloves, safety footwear and eye protection.
- (d) Policies and procedures that apply in the workplace; and
- (e) Introduce key personnel including First Aiders, Fire Marshals and Safety Manager/Officers.

8.1.5 Contractor shall consider to literacy, educational standards, cultural and/or language barriers. All training shall be documented, and records maintained.

## **8.2 Food Preparation and Food Storage Facilities**

### **8.2.1 Location**

- (a) The food preparation area shall be in an appropriate location, kept clean and maintained in a good condition.
- (b) The establishment shall not be located where, after considering such control measures, it is clear that there shall remain a risk to food safety or suitability. In particular, establishments shall be located as far away as reasonably practicable from:
  - I. Environmentally polluted areas and industrial activities.
  - II. Areas prone to infestations of pests; and
  - III. Areas where wastes, either solid or liquid, cannot be removed effectively.

### **8.2.2 Flooring, Walls, Ceiling and Lighting**

- (a) Floor surfaces shall be made of impervious, waterproof, non-absorbent, non-slip, washable and non-toxic materials, allowing appropriate cleaning and surface drainage.
- (b) Where appropriate, floors shall slope appropriately for liquids to drain to trapped outlets. They shall be constructed in such a way that prevents slips, trips, and falls
- (c) Wall surfaces and partitions shall be made of impervious, waterproof, non-absorbent, sealed, washable, non-toxic and of light color materials. When appropriate, walls shall have a smooth, easy to clean and disinfect surface, and be of an appropriate height.
- (d) Ceilings (or, where there are no ceilings, the interior surface of the roof) and overhead fixtures shall be easy to clean, of light color, constructed and finished to prevent the accumulation of dirt and to reduce condensation, growth of undesirable molds and the shedding of particles.
- (e) Appropriate natural or artificial lighting, with appropriate covers, shall be provided to enable operating in a safe manner. The lighting intensity shall be appropriate to the nature of the operation.
- (f) Lighting fixtures and electrical wires shall be protected to reduce the potential for electrical short circuits and prevention of cross contamination. All fixtures and fittings shall comply with the requirements of NEOM-NLF-NMS -006.016– Electrical Safety.

### **8.2.3 Exhaust System and Ventilation**

- (a) Appropriate means of natural or mechanical ventilation shall be provided while avoiding any mechanical airflow from a contaminated area to a clean area that is in accordance with NEOM-NLF-NMS 006.018 Local Exhaust Ventilation.
- (b) Appropriate ventilation shall be provided with a screen or protecting enclosure of no corrodible material with an easy access to filters and other parts that require cleaning.
- (c) The ventilation shall be appropriate to minimize air-borne contamination of food and to control ambient temperature, odors, and humidity.

## **8.3 Working Environment and Ergonomics**

### **8.3.1 Hot Liquids, Surfaces, Equipment and Steam Generating Machinery**

- (a) Soft tissue burns are common injuries in the food industry. Employees are at risk from burns and scalds when cooking food or removing food from ovens, deep fat fryers, grills, or hot water baths. Using steam generating equipment such as espresso and milk foaming devices are also responsible for these types of injuries.

### **8.3.2 Employers shall ensure:**

- (a) Equipment containing hot oils or liquefiable fats shall remain covered with an appropriate close-fitting lid when not in use, to prevent spillages and accidental exposure.

- (b) Employees shall avoid carrying hot liquids and materials where reasonably practicable, Employers shall arrange the working area to ensure such activities are kept to the minimum.
- (c) Employees shall be trained in safe work procedures when using hot liquids (e.g. drying food before dipping in oil to reduce spitting or allowing oil to cool before draining it into a container); use of dry, instead of damp cloth to handle hot pans to prevent steam burns; how to correctly open doors and lids of steam heated equipment away from the body; and to always ensure that pan/pot handles are turned inwards away from the stove's edge to prevent accidental impact with the employee;
- (d) Consider substituting vegetable oil for animal fat – it remains in liquid form when cool.
- (e) Where reasonably practicable, use alternative cooking methods to deep frying (e.g., microwave, grilling or baking).
- (f) Consider installing wheeled containers to receive used grease from deep fat fryers. These can be safely rolled from the kitchen to the fat waste storage area; and
- (g) All portable kitchen equipment shall be maintained and serviced to ensure equipment is free from defects and carry handles are secure.

#### 8.3.3 Working in Hot and Humid Environments

- (a) Working in environments that develop high levels of heat and humidity, such as bakeries and kitchens, can lead to heat stress, especially if there are low levels of air movement, poor ventilation, or ineffective air conditioning.
- (b) When exposed to hot and humid environments, the human body needs to adapt and will attempt to disperse heat more effectively, as the humidity increases the body's system is unable to reduce the core temperature, this can lead to heat-related illnesses such as headaches, weakness, nausea, vomiting and in some cases collapse.
- (c) Organizations that are exposed to these conditions shall install an efficient HVAC system to remove steam/heated air from the work areas in the kitchen this shall include the installation of an exhaust hood to remove heat from stoves.
- (d) Appropriate quantity of potable water shall be available, and employees shall be advised to drink regularly throughout the working day to replenish fluids. Supervisors shall be trained to spot the signs and symptoms of heat stress and monitor the employees.
- (e) Employees shall be provided with appropriate rest breaks away from the hot environment in a cool area, and ensure they have access to cool drinking water

#### 8.3.4 Slips, Trips and Falls

- (a) Employers shall ensure appropriate control measures are implemented in compliance with NEOM-NLF-NMS 006.040 – General Workplace Amenities.
- (b) Working areas and surfaces shall be kept grease free and standing water and foodstuffs shall be removed immediately.
- (c) Drying of floors shall be completed following wet mopping and appropriate warning signage shall be utilized.
- (d) A spill procedure shall be introduced. Appropriate drainage shall be installed to prevent pooling of water and build up grease.
- (e) Flooring fitted within the hazardous area shall be appropriate for the nature of the activity and shall be slip resistant.
- (f) Employees shall be provided with appropriate safety footwear that has a non-slip sole.
- (g) Appropriate natural or artificial lighting, including appropriate covers, shall be provided that enables employees to identify any hazards, the color of the lighting shall not be misleading, and fixtures and fittings shall be protected to ensure further hazards are created.

### 8.3.5 Portable Appliances, Knives and Hand Tools

- (a) Machinery with moving parts shall be fitted with an appropriate guard to prevent sharp edges and moving parts coming into contact with the operator. Employers shall ensure operators are competent to use the equipment and always ensure the guards are in place when operating the equipment, in compliance with NEOM-NLF-NMS-006.030 – Machine Guarding.
- (b) The employer shall ensure:
  - I. All pressure vessels, such as coffee machines, shall be fitted with a low-level cut-off device and be securely fixed to the working surface.
  - II. Where under-counter compactors are used, they shall be fitted with a safety switch that prevents operation until a bin or trolley is in place.
  - III. Establish an appropriate maintenance program for all portable equipment, to include regular inspection and replacement of damaged items immediately; and
  - IV. Appropriate and conveniently located toilets shall be provided, that are in accordance with NEOM-NLF-NMS 006.040 – General Workplace Amenities. .
  - V. Where necessary, appropriate changing facilities shall be provided.

## 8.4 Work Related Contact Dermatitis, Hazardous Substances and Chemicals

- 8.4.1 The use of chemicals, or hazardous substances, within the food industry is a day-to-day activity and is one of the main causes of ill health. Exposure to these substances often leads to contact dermatitis, sometimes referred to as eczema, it results in redness, swelling and blistering of the skin.
- 8.4.2 Some common chemicals used include cleaning products, oven and toilet cleaner and dishwashing detergents. Contact with foods including juices, fish proteins meat and flour can also lead to this condition.
- 8.4.3 Employers shall ensure compliance with NEOM-NLF-NMS-006.020 – Hazardous Materials, including:
  - (a) Availability of Safety Data information and employees are provided with appropriate training of Safety Data Sheets (SDS) for all substances suspected of being harmful to health. The SDS information shall be filed and stored in an appropriate location in the workplace that is available for all employees.
  - (b) All chemical containers shall be labelled to identify the chemical and the safety information about the chemical (e.g., flammable, toxic if swallowed and avoid contact with skin).They shall be stored in approved containers only, never in old bottles or food containers.
  - (c) The contact details of an appropriately qualified and certificated First Aid responder shall be posted in prominent locations throughout the work area.
- 8.4.4 Employers shall conduct an appropriate risk assessment and provide appropriate PPE; (Refer:NEOM-NLF-NMS-006.021 Personal Protective Equipment)(PPE)
- 8.4.5 Employees shall check their skin regularly and report any changes immediately to their supervisor.

## 8.5 Manual Handling

- 8.5.1 An assessment shall be made of all activities and a program of effective controls developed to ensure manual handling hazards have been identified and suitable controls have been established. (Refer: NEOM-NLF-NMS-004.001 Manual Handling)
- 8.5.2 All personnel shall be trained in the requirements and controls established for manual handling.

## **8.6 Waste Management:**

- 8.6.1 Appropriate standard operating procedures for storage and disposal of food waste, nonedible by-products and other refuse shall be developed and implemented,
- 8.6.2 Food waste, non-edible by-products and other refuse shall be separate and removed from rooms where food is present as quickly as reasonably practicable to avoid their accumulation and any risk of cross-contamination.
- 8.6.3 Food waste, non-edible by-products and other refuse shall be deposited in closable containers and disposed of appropriately. Containers shall be constructed of appropriate leak-proof, impervious material that is easy to clean or disposable.
- 8.6.4 Containers used to hold dangerous substances shall be labelled and, where appropriate, be lockable to prevent malicious or accidental contamination of food.
- 8.6.5 Design and management of refuse stores shall ensure that premises remain clean and free of animals and pests.
- 8.6.6 Refuse areas shall be, where necessary, refrigerated, and include appropriate wash out capability. Waste shall be eliminated in a hygienic and environmentally friendly way, where reasonably practicable recycling of waste foods through an effective food waste management program, as per the requirements of the Centre for Waste Management.

## **8.7 Vermin and Pest Control**

- 8.7.1 Appropriate procedures and control measures shall be in place to control pests and prevent domestic animals from having access to places where food is prepared, handled, or stored.
- 8.7.2 Regular inspections shall be made in all areas where there is a potential for vermin.

## **8.8 Food Transportation**

- 8.8.1 Transport of food shall be carried out in such a way to prevent any contamination of the food, to maintain its integrity and at the appropriate temperatures.
- 8.8.2 Food transport vehicles, including reusable containers, shall be kept clean and maintained in good repair and conditions to protect food from contamination.
- 8.8.3 The interior of food transport vehicles shall be appropriately insulated with a lined interior that provides a smooth, continuous, easily cleanable waterproof surface.
- 8.8.4 Food items shall be physically separated from non-food items during transport.
- 8.8.5 Ready-to-eat and raw foods transported in the same vehicle shall be appropriately separated to avoid cross contamination.
- 8.8.6 Food shall be stacked to leave enough space from walls and above the floors to avoid any pest infestation and allow appropriate ventilation and ease of cleaning.
- 8.8.7 Bulk food in liquid, granulate or powder form shall be transported in food transport vehicles reserved for such purpose. The containers shall be marked in a clearly visible and indelible fashion, in Arabic and English as necessary, to show that they are used for the transport of foods, or to be marked 'for food only'.

## **8.9 Food Handling:**

- 8.9.1 Food establishments shall ensure the medical fitness of its food handlers and shall acquire the health practice card in accordance with the Health Authority –
- 8.9.2 Food business operators shall be responsible for the following:
  - (a) Tracing the food handled within NEOM and identify its distribution locations.

- (b) Ensuring the accuracy of food labelling displayed in the markets to facilitate its tracing process; and
- (c) Recalling food in cases where proven that it is unfit for human consumption.
- 8.9.3 Food business operators shall ensure the food safety and quality for human consumption, as well as his/her legal and civil obligation for the performance of his/her agents, subordinates and employees as specified in the laws, bylaws, decisions, and circulars issued there under. The food business operator shall ensure:
- To provide the required documented records, which reflect compliance to the present law, and the related bylaws, regulations, and decisions.
  - Training the food handlers working in the establishment in the areas of health and food safety and is further committed to any training programs issued by the MOMRA; and
  - Informing the Municipality of any food, under its responsibility, that may pose a risk to consumer's health and the implemented control measures to protect consumer against health risks.
- 8.9.4 Food business operators shall be prohibited to do any of the following:
- Adulterating food or handle any harmful or deteriorated food.
  - Handling food containing pork, its products, or any alcoholic components without prior permission; and
  - Removing, altering, or intervening, in any way, in any detained food without the written permission from the SFDA.
- 8.9.5 Food business operators shall ensure that food handlers are trained and demonstrate knowledge and skills in food safety & good hygienic practices, as applicable to their assigned tasks, and have obtained the official food safety training programs certification.
- 8.9.6 Food business operators shall ensure, concerning the health status of food handlers, the following:
- Food handlers are medically fit to work and maintain records of absences for infected employees or carriers of any disease that may pose a risk to food safety.
  - Directing food handlers suffering from or being a carrier of a disease to report immediately any symptoms that may pose a risk to food safety. Resumption of duties shall not be allowed, unless they are medically examined and issued an appropriate medical certificate / clearance prior to returning to work, for 48 hours after symptoms have ceased; and
  - Food handlers are free from infectious gastrointestinal illnesses, Tuberculosis, infected skin lesions or cuts on exposed parts of the body, any discharge from eyes, ear, nose or mouth or acute streptococcal sore throat, including symptoms of jaundice, diarrhoea, vomiting and fever.
- 8.9.7 Food business operators shall:
- Ensure that primary products are protected against contamination, taking into consideration the processing that the primary product will subsequently undergo.
  - Avoid the use of areas where the environment poses a threat to the safety of food.
  - Control contaminants, pests and diseases of animals and plants in such a way as not to pose a risk to food safety; and
  - Adopt practices and control measures to ensure food is produced under appropriately hygienic conditions.
- 8.9.8 Food business operators shall develop, implement, and maintain a food safety management system based on the Hazard Analysis and Critical Control Point (HACCP) principles.

- 8.9.9 Personal protective equipment assessment of the workforce shall be conducted, and the correct equipment provided at no cost to the employee, as in accordance with NEOM-NLF-NMS 006.021 – Personal Protective Equipment.
- 8.9.10 Food handlers suffering from or being a carrier of a disease that is reasonably foreseeable to be transmitted through food shall not be permitted to handle food or enter any food handling area.
- 8.9.11 Personnel with cuts and wounds, who are permitted to continue working, shall cover them with appropriate waterproof dressings.
- 8.9.12 Food handlers shall maintain a high degree of personal cleanliness and shall appropriate, clean and protective clothing such as hair nets, gloves, masks, and beard covers.
- 8.9.13 Food handlers shall wash and, where necessary disinfect their hands, including the start of food handling activities, immediately after using the toilet and after handling raw food or any contaminated material.
- 8.9.14 Food handlers shall refrain from behaviors that may result in contamination of food such as wearing of jewellery, smoking, spitting, chewing, eating, sneezing, coughing over uncovered food or any other related behaviors.

## **8.10 Emergency Planning**

### **8.10.1 Interruption of Electrical Service**

- (a) Consider access to an electrical generator to be used in emergencies. Make certain that the generator has the capacity to operate critical equipment such as refrigerators and freezer units, pumps, safety lighting, hot water heaters etc. Make certain that individuals are trained to operate the equipment safely.
- (b) Consider securing access to a refrigerated truck that can be delivered to the site during an emergency
- (c) Consider a warehouse that has a backup generator to accommodate refrigerated food

### **8.10.2 Interruption of Water Service**

- (a) Organize as a contingency to hauler to supply alternative source of water during an emergency
- (b) Locate public water supply in your area and points where containers can be filled with drinking water.
- (c) Develop a contingency plan for toilets and washing facilities. If the water service is interrupted, where will you and your employees find toilet facilities available for use?

### **8.10.3 Fire Safety**

- (a) Competent person shall conduct an assessment to determine if there are any fire hazards.
- (b) Develop a plan for what to do in case of a fire. Practice fire drills regularly
- (c) Assure that fire extinguisher is charged, and fire suppression system inspections are up to date.
- (d) Maintain current contact information for people who can help you such as the fire department, police department, insurance company, water and fire damage restoration company, utility companies, lawyer, local health department, etc.

## 9 Appendices

### 9.1 Appendix A: Forms, Signs and Checklists



## 9.2 Appendix B: Audit Criteria

Audit Criteria		Requirements	Verification	Area of Concern
ISO 45001:2018 Clause	NMS Ref.			Yes/ No
5.3	7.1.2	NEOM health and safety policy and safety management system are properly applied within their areas of control/responsibility		
6.1	7.1.3	Pre-Tender Health and Safety Plan has been developed and issued to Contractor		
5.3, 8.1.4.2	7.1.4	Selection of Contractors undertaken in accordance with NEOM's policies and procedures		
6.1.2.2	7.2.2	Assessment of the various risks shall be undertaken. Accordance with NEOM-Element 2 Risk & Opportunity Management to determine the risks associated with dining facilities, food storage and food preparation.		
6.1.2.3	7.2.2	Hazards Identification Plan (HIP)		
9.0	7.1.5	Conduct regular safety and welfare assurance reviews to provide the confidence level		
7.2	7.2.1 (b), 8.1.1 8.1.2	Persons appointed to manage /oversee work operations have the skills, knowledge, experience		
8.1.2 (e)	7.2.4 (d), 7.3.4	Personal protective equipment required for use are fit for purpose		
8.1.2 (c, d)	7.2.2 (e)	Control of access to dangerous or high-risk areas or equipment using suitable Barricades and Signage		
10.2	7.3.2	Incident investigations and nonconformities reviews		
	8.1.3	Handling food incidents and notifying Saudi Food and Drug Authority (SFDA) when an incident has occurred		
6.1.1	7.2.2(b)	Relevant employees have the required certificate of medical fitness and are licensed with the Saudi Food and Drug Authority (SFDA) and the Ministry of Municipal and Rural Affairs (MOMRA)		
6.1.2.1	8.1.3	Food storage and preparation activities meet the general training requirements of this NMS		
6.1.2.1	8.2.1	The food preparation/ storage area shall be in an appropriate location, kept clean and maintained in a good condition		
	8.2.2	Flooring, Walls, Ceiling and Lighting shall comply with requirements		
6.1.2.1	8.2.3	Natural or mechanical ventilation shall be provided		
6.1.2.1	8.3	Working Environment and Ergonomics best practices/ standards shall be applied/ adopted for. a) Hot Liquids, Surfaces, Equipment and Steam Generating Machinery b) Working in Hot and Humid		

Audit Criteria		Requirements	Verification	Area of Concern
ISO 45001:2018 Clause	NMS Ref.			Yes/ No
		Environments c) Slips, Trips and Falls d) Portable Appliances, Knives and Hand Tools		
8.1.2, 8.1.4.1	8.4	Ensure compliance with NEOM-NLF-NMS-006.020 – Hazardous Materials. a) Work Related Contact Dermatitis b) Hazardous Substances and Chemicals		
8.1.4.1, 8.4.4.2, 8.4.4.3	8.6	Standard operating procedures for storage and disposal of food waste, nonedible by-products and other refuse shall be developed and implemented		
	8.7	Procedures and control measures shall be in place to control pests and prevent domestic animals from having access to places where food is prepared, handled, or stored		
	8.8	Transport of food shall be carried out in such a way to prevent any contamination of the food, to maintain its integrity and at the appropriate temperatures		
	8.9.1	Medical fitness of food handlers and shall acquire the health practice card in accordance with the Health Authority		
	8.9.8	Food handlers are medically fit to work and maintain records of absences for infected employees or carriers of any disease that may pose a risk to food safety	FMS	
	8.10	Emergency Planning & preparedness. a) Interruption of Electrical Service b) Interruption of Water Service c) Fire Safety	Fire Drills Record	

### **9.3 Appendix C: Guidance Information**

In the US food hygiene involved in preparation, handling and storage of food is regulated by the Food and Drug Administration (FDA)

A copy of the FDA Food Code (2017) is available on-line from U.S. Department of Health and Human Services - Public Health Service • Food and Drug Administration. The Food Code is a model for safeguarding public health and ensuring food is unadulterated and honestly presented when offered to the consumer. It represents FDA's best advice for a uniform system of provisions that address the safety and protection of food offered at retail and in food service.

Surveillance of foodborne illness is complicated by several factors. The first is underreporting. Although foodborne illnesses can be severe or even fatal, milder cases are often not detected through routine surveillance. Second, many pathogens transmitted through food are also spread through water or from person to person, thus obscuring the role of foodborne transmission. Finally, pathogens or agents that have not yet been identified and thus cannot be diagnosed cause some proportion of foodborne illness.

Epidemiological outbreak data repeatedly identify five major risk factors related to employee behaviors and preparation practices in retail and food service establishments as contributing to foodborne illness:

- I. Improper holding temperatures,
- II. Inadequate cooking, such as undercooking raw shell eggs,
- III. Contaminated equipment,
- IV. Food from unsafe sources, and
- V. Poor personal hygiene

The Food Code addresses controls for risk factors and further establishes 5 key public health interventions to protect consumer health. Specifically, these interventions are:

- I. demonstration of knowledge,
- II. employee health controls,
- III. controlling hands as a vehicle of contamination,
- IV. time and temperature parameters for controlling pathogens, and
- V. the consumer advisor

In the UK regulations exist under the Food Standards Act 1999 which established 'The Food Standards Agency', and provided it with functions and powers also transferred to it certain functions in relation to food safety and standards under other Acts. When leaving the EU the United Kingdom retained a number of EU Laws and Regulations.

The principal aim of retained EU law Regulation (EC) 178/2002, 'General Food Law' is to protect human health and consumer's interest in relation to food. It applies to all stages of production, processing and distribution of food and feed with some exceptions. Food businesses must comply with food and feed safety law. To place safe food on the market food businesses must ensure:

- I. traceability of food
- II. appropriate presentation of food
- III. suitable food information is provided
- IV. prompt withdrawal or recall of unsafe food placed on the market
- V. food and feed imported into, and exported from, Great Britain (GB) shall comply with food law.

The Food Standards Agency have produced guidance notes on food safety, traceability, product withdrawal and recall, based on General Food Law. Freely available on their web site is the guidance document on Food Traceability, Withdrawals, and Recalls within the UK Food Industry (2019) which offers guidance to all employers involved in the Food Chain.



نیوم NEOM

**NEOM OCCUPATIONAL HEALTH and SAFETY  
NEOM MINIMUM STANDARD  
for  
RESPIRATORY PROTECTION**

NEOM-NLF-NMS-006.047 Rev 02.00 – February 2022

©NEOM [2021]. All rights reserved.

## Document History

Revision code	Description of changes	Purpose of issue	Date
Rev 00.00	First Issue	Issued for Implementation	27/07-2020
Rev 02,00	SMS Update	Issued for Implementation	01-02-2022

## Document Approval

	Prepared by	Reviewed by	Approved by
Name	Robert Murphy	Talal Al Anazi	Adel Al Wuhaib
Job Title	Loss Prevention Specialist LP/FS -Public Safety	Director, Loss Prevention/Fire Safety (LP/FS) Public Safety	Executive Director Public Safety

## OUR NEOM VALUES



### CATALYST

Make a difference.  
Create a legacy.



### CARE

Leave the environment  
in a better place.



### CURIOS

Challenge the norm.  
Stay restless.



### PASSIONATE

Be accountable.  
Finish what you start.



### RESPECT

Be authentic.  
Be true. Be fair.



### DIVERSITY

Embrace cultural  
differences.  
Seek to understand.

## Contents

<b>1</b>	<b>PURPOSE .....</b>	<b>4</b>
<b>2</b>	<b>SCOPE .....</b>	<b>4</b>
<b>3</b>	<b>EXPECTATIONS.....</b>	<b>4</b>
<b>4</b>	<b>LIST OF DEFINITIONS .....</b>	<b>5</b>
<b>5</b>	<b>LIST OF ABBREVIATIONS .....</b>	<b>6</b>
<b>6</b>	<b>RELATED NEOM DOCUMENTS.....</b>	<b>7</b>
<b>7</b>	<b>ROLES AND RESPONSIBILITIES .....</b>	<b>7</b>
7.2	Contractor.....	8
7.3	Employee.....	8
7.4	Specific Responsibilities .....	8
<b>8</b>	<b>OTHER SECTIONS RELATED TO SUBJECT.....</b>	<b>9</b>
8.1	Employer's duties .....	9
8.2	Respiratory Protection .....	9
8.3	Hazard Assessment .....	9
8.4	RPE Issue and Use .....	9
8.5	Required Use of Respirators .....	10
8.6	Quality Of Respirable Air .....	10
8.7	Self-Contained Self Rescuer (SCSR).....	11
8.8	Long Duration Closed Circuit Breathing Apparatus (CCBA) .....	11
8.9	Training.....	11
8.10	Fit Testing.....	12
8.11	Qualitative and Quantitative Fit Test Methods.....	12
8.12	Inspection/Storage/Maintenance/Cleaning .....	12
8.13	The Voluntary Use of Filtering Facepiece Respirators .....	13
8.14	Recordkeeping for Employees .....	14
<b>9</b>	<b>APPENDICES .....</b>	<b>15</b>
9.1	Appendix A: Forms, Signs and Checklists.....	15
9.2	Appendix B: Audit Criteria .....	16

## List of Tables

Table 1 : Table of Definitions .....	5
Table 2 : Table of Abbreviations .....	6
Table 3 : Related NEOM Documents .....	7

## **1 Purpose**

This NEOM Co. SMS Minimum Standards (hereafter referred to as NMS) relates to the management of Respiratory Protection to ensure protection from all occupational health, and safety (OHS) risks associated with airborne contaminants.

It provides guidance to support compliance with industry best practice and international regulatory safety requirements to ensure that the associated risks are assessed, and control measures are implemented in accordance with the hierarchy of risk controls.

It has been developed to align with the requirements of the ISO 45001 Health and Safety Management Manual (Refer NEOM-NLF-PRC-006- Section 2 ISO 14001 Cross reference table)

## **2 Scope**

This NMS applies to all personnel within NEOM and any Contractors working for NEOM and or associated projects and activities. It is designed to incorporate requirements set by the NEOM-SMS.

This document describes the requirements for respiratory protection and the proper selection, use and care of respirators.

## **3 Expectations**

To ensure the health and safety of all personnel, protection of assets (services, plant/equipment) and the environment

NEOM expect each Sector, Organization, Department or Contractor to ensure that risks associated with airborne contaminants are controlled in accordance with the hierarchy of risk controls: elimination, substitution, engineering controls, administrative controls, and personal protective equipment.

Consideration shall be given to technological advances that may introduce new means of controlling or eliminating the risks associated with work activities.

That the expectation for safety compliance is meeting and exceeding all applicable OSHA Laws, Regulations, and Industry Best Practice.

Applicable requirements and standards include:

- (a) OSHA Standards and Regulatory requirements.
- (b) ANSI requirements.
- (c) NFPA Standards and requirements.
- (d) NEOM Minimum Standards
- (e) Saudi Building Codes
- (f) International Building Codes

*If requirements of this document conflict with requirements set by another regulatory authority, Contractor are required to follow the more stringent requirement.*

## 4 List of Definitions

Table 1 : Table of Definitions

Terms	Definitions
NEOM Co	NEOM Company
Client	NEOM Sector /Department responsible for management and oversight of the Contractor
Employer	The person or organization employing personnel to complete the work
Contractor	The organization contracted to carry out the works
Air Purifying Respirator	A respirator designed to remove contaminants from ambient air prior to its inhalation.
Approved Respirator	A respirator tested and listed as satisfactory by local regulatory agency or recognized scientific body. Any modification to an approved respirator that is not authorized by the approving agency or scientific body voids the approval.
Assigned Protection Factor	The expected level of workplace respiratory protection that would be provided by a properly functioning respirator or a class of respirators to properly fitted and trained users
Elastomeric Respirator	is a respirator with a flexible facepiece.
Filtering Facepiece Respirator	A negative pressure particulate respirator with a filter as an integral part of the facepiece or with the entire facepiece composed of the filtering medium. Refers to what is commonly called a “disposable dust mask.”
Fit Factor	The ratio of the concentration of airborne contaminant outside the respirator to the concentration inside the respirator determined under controlled conditions.
High Purity Air	Compressed or liquid air used for respiration. High purity air quality shall comply with Carbon monoxide level shall not exceed 10 ppm, the carbon dioxide content shall not exceed 1000 ppm, total hydrocarbons shall not exceed 5 milligrams per cubic meter, oxygen levels shall be between 19.5% and 23.5% and there shall be no pronounced odor.
Immediately Dangerous to Life or Health	Any hazardous atmosphere that poses an immediate threat to life or health or that poses an immediate threat of severe exposure to contaminants
Negative Pressure Respirator	A respirator in which the air pressure inside the facepiece is positive during exhalation in relation to the air pressure of the outside atmosphere and negative during inhalation in relation to the air pressure of the outside atmosphere.
Positive Pressure Respirator	A respirator in which the air pressure inside the respiratory inlet covering is positive in relation to the air pressure of the outside atmosphere during exhalation and inhalation.
Powered Air Purifying Respirator	A positive pressure air purifying device incorporating a half facepiece, full facepiece or head covering which provides the wearer with air filtered through a powered filtering unit, comprising a filter or filters, and an electrically operated blower unit. This respirator is referred to as a PAPR.
Respirator	A device designed to protect the wearer from inhalation of harmful atmospheres.
Sector, Organization, Department or Contractor	The Sector, Organization, Department or Contractor is the NEOM entity or developer designated by NEOM to accept custody for planning, designing, constructing, or managing and operating a particular asset or a group of assets

Surgical mask	A shield like device worn by healthcare professionals and others to reduce the spread of bacteria and viruses released in liquid droplets and aerosols from the wearer's mouth and nose. Surgical masks are made of soft materials, have no filtering medium or chemical adsorbent, and are discarded after each use.
Tight Fitting Facepiece	A respirator inlet covering that forms a complete seal with the face. Typically, this is half facepiece or full facepiece respirators
Voluntary Use of a Respirator	When a person uses a respirator even though a documented exposure assessment shows any exposure potentially requiring a respirator is below the occupational exposure limit.
Workplace Environmental Measurements	Measurements based on the concentration of the respiratory hazard as measured in the work area, or anticipated potential concentration, as determined by the industrial hygiene professional or qualified person.
Safety Management System (SMS)	Occupational Health and Safety Management System established by NEOM in compliance to ISO 45001 Standard

## 5 List of Abbreviations

Table 2 : Table of Abbreviations

Abbreviations	Descriptions
SMS	Safety Management System
NMS	NEOM Minimum Standard
SOP	Standard Operating Procedure
ANSI	American National Standards Institute
NFPA	National Fire Prevention Association
CPP	Construction Phase Plan
OSHA	Occupational Safety and Health Administration.
PPE	Personal Protective Equipment
RPE	Raspatory Protective Equipment
CCBA	Closed Circuit Breathing Apparatus
SCSR	Self-Contained Self Rescuer
APF	Assigned Protection Factor
WPF	Workplace Protection Factor
SWPF	Simulated Workplace Protection Factor
PAPRs	Powered Air Purifying Respirators
SARs	Supplied Air Respirators
MSDS	Material Safety Data Sheet
SDS	Safety Data Sheet
PEL	Personal Exposure Limit
COSHH	Control of Substances Hazardous to Health
IBC	International Building Codes
OHS	Occupational Health and Safety

Abbreviations	Descriptions
---------------	--------------

## 6 Related NEOM Documents

Table 3 : Related NEOM Documents

Document Code	Document Name
NEOM Element 2	Risk and Opportunity Management
NEOM-Element 3	Control of Documented Information & Legal Compliance
NEOM-Element 5	Training, Awareness and Competency.
NEOM-Element 6	Contractor Management
NEOM Element 9	Emergency Planning and Response Management
NEOM-SMS	Neom Safety Management System
NEOM-NLF-SM	Safety Manual - Roles and Responsibilities
NEOM-NLF-PRC-006- Section 2	ISO 14001 Cross Reference Table
NEOM-NLF-PRC-006;	Occupation health safety and Fire Safety requirements for Contractors
NEOM-NLF-NMS-006.001	SMS Organization, Practitioner Registration and Appointment of Contractor
NEOM-NLF-NMS-006.002	Safety Construction Management Plan
NEOM-NLF-NMS-006.012 –	Barricading of Hazards
NEOM-NLF-NMS-006.021	Personal Protective Equipment (PPE)

## 7 Roles and Responsibilities

- 7.1.1 Client General Health and Safety roles and responsibilities are defined in; and shall be carried out in accordance with the requirements of NEOM-NLF-SM–Safety Management Manual - Roles and Responsibilities.
- 7.1.2 The Client is responsible for ensuring that NEOM Safety Commitment Statement and safety management system are properly applied within their areas of control/responsibility. Effective implementation will ensure compliance with relevant legislative requirements and will help promote the use of industry best safe working practices.
- 7.1.3 That the selection of Contractors shall be undertaken in accordance with NEOM's policies and procedures (NEOM-Element 6-Contractor Management). To ensure that only Competent organizations capable of meeting the requisite safety standards associated with project are contracted.
- 7.1.4 Conduct regular Contractor safety assurance reviews to provide the confidence level required that the safety management system is delivering as planned, and consistently achieves the acceptable level of safety. Including:
  - (a) Safety performance monitoring and measuring.
  - (b) Managing change.
  - (c) Continuous improvement.

## **7.2 Contractor**

- 7.2.1 Contractor shall undertake their roles and responsibilities in accordance with the general requirements of NEOM-NLF-SM–Safety Management Manual-Roles and Responsibilities
- 7.2.2 Maintaining control of access to dangerous or high-risk areas or equipment using suitable barricades that are in serviceable condition (Refer: NEOM-NLF-NMS-006.012 – Barricading of Hazards)
- 7.2.3 That all work activities are assessed, planned, organized, and that suitably competent Supervision is available to implement the safety requirements and oversee the work (Refer: NEOM- Element 5 – Training, Awareness and Competency)
- 7.2.4 Ensure persons appointed to manage /oversee work operations have the skills, knowledge, experience and, where relevant, the organizational capability to plan and manage work safely and without risk to those who may be affected by the activities (Refer: NEOM Element 5 Training, Awareness, and Competence).
- 7.2.5 Ensure employees carrying out the work are trained to recognize the associated hazards and understand the processes and procedures to control or minimize the risks.(Refer: NEOM Element 2 Risk and Opportunity Management)
- 7.2.6 That all equipment including personal protective equipment required for use is fit for purpose, and (as required) has been inspected by a competent person and inspection records are maintained and readily available. (Refer: NEOM-NLF-NMS-006.021 Personal Protective Equipment)(PPE)

## **7.3 Employee**

- 7.3.1 Shall undertake their roles and responsibilities in accordance with the general requirements of NEOM-NLF-SM – Safety Management Manual - Roles and Responsibilities.
- 7.3.2 Report any activity or defect relating to the work which they believe is reasonably foreseeable to endanger their safety or that of another person's.
- 7.3.3 Shall use appropriate equipment or safety devices provided for the work by the Contractor in accordance with any training or instruction received in the use of the work equipment. (Refer NEOM-NFL-NMS-006.021 Personal Protective Equipment)

## **7.4 Specific Responsibilities**

- 7.4.1 Sector, Organization, Department or Contractor Head is responsible in ensuring that provisions are made the safe systems of work to prevent and minimize risks in each workplace
- 7.4.2 Safety Practitioner/Coordinator is responsible to monitor the implementation of this procedures and document its effectiveness
- 7.4.3 The Responsible Person will support this procedure and ensure that any Contractor Organization working for, or on behalf of, the Sector, Organization, Department or Contractor will comply with the requirements of these procedures
- 7.4.4 Line Managers / Supervisors are responsible for training their workers in risks
- 7.4.5 The LP & FS Public Safety department will support the NEOM risk assessments by carrying out compliance checks and supporting and guiding the various safety teams.

## **8 Other Sections related to subject**

### **8.1 Employer's duties**

- 8.1.1 Throughout Section 8 employer's duties shall relate to Sector, Organization, Department or Contractor

### **8.2 Respiratory Protection**

- 8.2.1 Correct respiratory protection certified by recognized certification bodies shall be selected to provide adequate protection against airborne hazards.
- 8.2.2 Employers are required to evaluate the respiratory hazards in their workplaces to determine the identity of contaminants, chemical states, and physical forms.
- 8.2.3 If an employer cannot identify or reasonably estimate employee exposures to respiratory hazards, the employer must consider the atmosphere "Immediately Dangerous to Life or Health" (IDLH).
- 8.2.4 IDLH atmospheres require a full-face piece, pressure demand self-contained breathing apparatus (SCBA) or supplied-air respirator (SAR) with self-contained auxiliary air supply.

### **8.3 Hazard Assessment**

- 8.3.1 Hazard assessments must be conducted to select the appropriate respirators for environmental conditions. (Refer: NEOM Element 2 Risk and Opportunity Management)
- 8.3.2 Employers shall begin the hazard assessment by obtaining information from the material safety data sheets (MSDSs) supplied by product manufacturers.
- 8.3.3 The MSDSs provide health hazard information, the nature of the chemicals in the product, the PEL and other valuable information.
- 8.3.4 To quantify the airborne concentration of a contaminant, air samples must be collected, and subsequent testing of samples will aid in selecting the type of respirator that is needed, if any.
- 8.3.5 Control of potentially harmful occupational exposures shall be accomplished by feasible work practices or engineering control measures.
- 8.3.6 Personnel shall be protected using appropriate respirators when these methods of control are not practical or when the use of respirators is determined to be supplemental protection.

### **8.4 RPE Issue and Use**

- 8.4.1 Respiratory Protective Equipment (RPE) consisting of SCBA, or SAR shall be available to all persons who are exposed to any situation in which there is a possibility of the atmosphere being or becoming deficient in oxygen or containing any harmful substance (e.g., particle, dust, mist, vapor or gas), Example include:
- Work in containers or vessels where a danger of oxygen depletion is a potential.
  - Work where an oxygen deficiency or harmful gases may be present.
  - Work in shafts, sewers, or enclosed septic tanks.
  - Work in refrigeration plants where the danger of escape of refrigerant gas exists.
  - Grit or abrasive blasting operations

- 8.4.2 Respirators are an effective method of protection against designated hazards when properly selected and worn.
- 8.4.3 Respirator use is encouraged, even when exposures are below the exposure limit, to provide an additional level of comfort and protection for personnel. (See Section 8.13 Voluntary Use of Filtering Facepiece Respirators)

## **8.5 Required Use of Respirators**

- 8.5.1 Respirators shall be required if a documented exposure assessment shows potential exposures above the occupational exposure limit, or as determined by a Industrial Hygiene Professional or Competent Person regardless of the occupational exposure limit.
- 8.5.2 Where the use of respirators is required, the Employer in conjunction with respiratory Competent Person shall develop, implement, and maintain a written respiratory protection program compliant with this document.
- 8.5.3 Respirators shall be provided as needed and personnel shall use the provided respiratory protection in strict accordance with the training received. Any respirator malfunctions shall be immediately reported to the immediate supervisor.
- 8.5.4 The effectiveness of the respiratory protection program shall be reviewed at least annually, and an improvement action plan developed to address any shortfalls
- 8.5.5 The selection of an approved respirator shall require consideration of the following factors.
  - (a) Nature of Hazard
  - (b) Type of hazard including oxygen deficiency and contaminant.
  - (c) Physical, chemical, and warning properties of the hazard.
  - (d) Physiological effects of the hazard on the body and whether the hazard is immediately dangerous to life or health.
  - (e) Actual or potential, average and peak, concentration of the hazard as compared to established occupational exposure limits such as time weighted averages, short term exposure levels and ceiling or peak.
  - (f) The physical characteristics, the functional capabilities, and the performance limitations of the various types of respirators.
  - (g) The duration of respirator use, such as for routine, non-routine, emergency, or rescue use.
  - (h) Assigned protection factor, which is a selection and use guide and shall only be used with the selection criteria outlined in this document and the advice of the Competent Person for respiratory protection administrator.

## **8.6 Quality Of Respirable Air**

- 8.6.1 Compressed and liquid air used for respiration shall be of high purity. Air quality shall meet the appropriate technical or regulatory specification.
- 8.6.2 Breathing air may be supplied to respirators from cylinders or air compressors. The contents of compressed air cylinders used to provide the air supply for an airline respirator shall be tested for oxygen concentration and carbon monoxide content.
- 8.6.3 The air supply in the cylinder shall be sufficient to permit completion of the work and escape. An emergency escape bottle shall be worn if air supplied respirators are used in an immediately dangerous to life or health atmosphere.

- 8.6.4 Vendor supplied compressed air cylinders shall be certified or have a certificate of analysis to demonstrate compliance with the requirements of this section.
- 8.6.5 A suitable inline air purifying sorbent bed and filters shall be incorporated into breathing air type compressor systems to assure breathing air quality.
- 8.6.6 Compressor air intakes shall avoid the entry of contaminated air into the system.
- 8.6.7 Oil lubricated compressors shall have a high temperature alarm or a carbon monoxide alarm or both. If a carbon monoxide alarm is used, follow the manufacturer recommended calibration procedures. If only a high temperature alarm is used, the air from the compressor shall be monitored at intervals sufficient to ensure carbon monoxide in the breathing air meets local regulations, or in the absence of local regulations, does not exceed 10 parts per million.
- 8.6.8 Each self-contained breathing apparatus shall be inspected monthly and shall be inspected in accordance with manufacturer's recommendations.
- 8.6.9 Breathing air cylinders shall be hydrostatically tested in accordance with manufacturer's recommendations.

## **8.7 Self-Contained Self Rescuer (SCSR)**

- 8.7.1 Personal required to wear Self-Contained Self Rescuer shall be trained in the effective use of the equipment in emergencies. (Code of Federal Regulations CFR mineral resources (57.15030)).

## **8.8 Long Duration Closed Circuit Breathing Apparatus (CCBA)**

- 8.8.1 CCBA's to be used for emergency response where emergency response team (ERT) need to enter toxic environments. This device is an option in normal operations and emergencies if continuous air supply is not available. CCBA's can give up to four hours of breathable air. Personal shall be trained in the effective use of the CCBA's in emergencies.

## **8.9 Training**

- (a) Supervisor, Person Issuing Respirators and Respirator Wearers shall be adequately trained by qualified personnel to ensure the proper use of specific respirators. Initial training for each respirator wearer shall occur prior to the first use of a respirator and shall include the following:
  - (b) An explanation of the need for respiratory protection.
  - (c) The nature, extent ,and effects of exposure to respiratory hazards.
  - (d) An explanation of the method used to select a particular type of respirator for a specific respiratory hazard.
  - (e) An explanation of the operation, capabilities and limitations of the respirator selected.
  - (f) Instruction for inspecting, fitting, checking the fit and wearing the respirator.
  - (g) An opportunity for each respirator wearer to handle the respirator, learn how to fit and wear it properly, check the respirator seals and wear it in a safe atmosphere.
  - (h) Instructions on regulations concerning respirator use.
  - (i) Why fit testing is required (if relevant).
  - (j) Use and misuse of RPE.
  - (k) An explanation of the efforts to reduce or eliminate the need for respirators including why engineering controls are not being applied or are not adequate.
  - (l) Instructions on maintenance and storage of the respirator.

- (m) Instructions on how to recognize and cope with emergency situations.
  - (n) Instructions as needed for special respirator use.
- 8.9.1 Refresher respirator training shall be conducted at least annually for all required respirator wearers. Specific content of the respirator training may vary depending on the frequency of respirator use and type of respirator worn

## **8.10 Fit Testing**

- 8.10.1 Some pre-existing medical conditions (for example, breathing disorders such as asthma; skin allergies; or even heart problems) may restrict or prevent some workers wearing any RPE, or certain types of RPE. Ensure that workers are fit to wear the selected and required RPE. If you unsure the employer should arrange for appropriate medical assessment.
- 8.10.2 Powered or constant-flow airline BA RPE with loose-fitting hoods or helmets do not require fit testing.
- 8.10.3 Tight-fitting powered or constant-flow airline BA RPE under positive pressure still requires fit testing as studies have shown that during heavy exertion, inward leakage is possible.
- 8.10.4 A fit test should be carried out as part of the initial selection of the RPE.
- 8.10.5 A fit test should be repeated whenever there is a change to the RPE type, size, model or material or whenever there is a change to the circumstances of the wearer that could alter the fit of the RPE, for example:
  - (a) Weight loss or gain.
  - (b) Substantial dental work.
  - (c) Any facial changes (scars, moles, effects of ageing etc.) around the face seal area.
  - (d) Facial piercings.
  - (e) Introduction or change in other head-worn personal protective equipment
- 8.10.6 Respirator fit tests shall be used to select specific respirator makes and models to be used by individual respirator wearers
- 8.10.7 Each respirator wearer shall be required to check the seal of the respirator by appropriate means prior to entering a potentially hazardous atmosphere.

## **8.11 Qualitative and Quantitative Fit Test Methods**

- 8.11.1 Qualitative fit testing (QLFT) is a pass/fail test based on the wearer's subjective assessment of any leakage through the face seal region by detecting the introduction of bitter- or sweet-tasting aerosol as a test agent. QLFT methods are suitable for disposable and reusable half masks; they are not suitable for full-face masks
- 8.11.2 Quantitative fit testing (QNFT) provides a numerical measure of how well a facepiece seals against a wearer's face; this is called a fit factor. These tests give an objective measure of face fit. QNFT methods are suitable for disposable and reusable half masks and full-face masks.

## **8.12 Inspection/Storage/Maintenance/Cleaning**

- 8.12.1 Respiratory protective equipment will be used, stored, maintained, and replaced in accordance with the manufacturer's requirements.
- 8.12.2 Respiratory Protective Equipment (RPE) shall be inspected by a Competent Person on a weekly basis. Records of such inspections must be maintained and made available to Saudi governmental inspecting agencies on request.

8.12.3 Air-Purifying Respirators (half mask, full face piece, hood, or helmet) inspection criteria to include but not be limited to the following:

- (a) Rubber Face Piece -- Check for:
  - I. Excessive dirt (clean all dirt from face piece)
  - II. Cracks, tears, or holes (obtain new respirator)
  - III. Full face respirators cracked, scratched, or loose-fitting lenses (obtain new respirator)
- (b) Head Straps -- Check for:
  - I. Breaks or tears (replace head straps)
  - II. Loss of elasticity (replace head straps)
  - III. Broken or malfunctioning buckles (obtain new straps & buckles or respirator)
- (c) Inhalation Valve and Exhalation Valve -- Check for:
  - I. Detergent residue, dust particles, or dirt on valve or valve seat (clean with water or a weak solution of Clorox and water -- one cup of bleach per gallon of water).
  - II. Cracks, tears, or lack of flexibility in the valve material (obtain new valve)
  - III. Cracks and flexibility of valve seats (obtain new respirator)
- (d) Filter Element -- Check for:
  - I. Proper filter for the hazard
  - II. Worn threads; both in filter and face piece (replace filter or face, as applicable)
  - III. Cracks or dents in filter housing A (replace filter)
  - IV. Cartridge gaskets in place (if applicable)
- (e) A record of inspection dates, findings, and remedial actions shall be kept for the life of each respirator

## 8.13 The Voluntary Use of Filtering Facepiece Respirators

8.13.1 Voluntary use of filtering facepiece respirators shall comply with the following:

- (a) A written respiratory protection program shall be developed to describe the process for approving and monitoring the voluntary use of filtering facepiece respirators. And shall include as minimum the following:
- (b) Initial and annual refresher training shall be provided for voluntary use of filtering facepiece respirators. .
- (c) Additional training information may be necessary based on the exposure risk or other factors.
- (d) Training content shall comply with this document and the following information shall be communicated to personnel who use filtering facepiece respirators voluntarily
  - I. Read all instructions provided by the manufacturer on use, maintenance, cleaning and care, and warnings regarding the respirator's limitations.
  - II. Choose respirators certified for use to protect against the contaminant of concern. A label or statement of certification should appear on the respirator or respirator packaging. It will state what the respirator is designed for and how much it will protect from hazards.
  - III. Do not wear the respirator into atmospheres containing contaminants for which your respirator is not designed to protect against. For example, a respirator designed to filter dust particles will not protect against gases, vapors, or very small solid particles of fumes or smoke.

- IV. Keep track of your respirator so that you do not mistakenly use someone else's respirator.
- V. Notify your immediate supervisor, the location respirator protection administrator or Environment, Health and Safety department regarding problems with the respirator or with any questions or concerns regarding exposure to airborne contaminants.

## **8.14 Recordkeeping for Employees**

- 8.14.1 Recordkeeping requirements for employees shall comply with the local regulations
- 8.14.2 Records shall be maintained for at least 40 years or for the duration of employment plus 30 years. (Refer: NEOM Element 3 Control of Documented Information & Legal Compliance)
- 8.14.3 Records shall be maintained by the respiratory protection administrator or their designee as part of the overall respiratory protection program. Recordkeeping shall include:
  - (a) Employee training session outlines and attendance records.
  - (b) Results of fit test.
  - (c) Medical evaluation of respirator wearers.

## 9 Appendices

### 9.1 Appendix A: Forms, Signs and Checklists

## TYPES OF RESPIRATORY PROTECTION



**Elastomeric Half Facepiece**  
Respirators are reusable and have replaceable cartridges or filters. They cover the nose and mouth and provide protection against gases, vapors, or particles when equipped with the appropriate cartridge or filter.



**Elastomeric Full Facepiece**  
Respirators are reusable and have replaceable canisters, cartridges, or filters. The facepiece covers the face and eyes, which offers eye protection.



**Filtering Facepiece Respirators**  
are disposable half facepiece respirators that filter out particles such as dusts, mists, and fumes. They do NOT provide protection against gases and vapors.



**Powered Air-Purifying Respirators (PAPRs)**  
have a battery-powered blower that pulls air through attached filters, canisters, or cartridges. They provide protection against gases, vapors, or particles, when equipped with the appropriate cartridge, canister, or filter. Loose-fitting PAPRs do not require fit testing and can be used with facial hair.



**Supplied-Air Respirators** are connected to a separate source that supplies clean compressed air through a hose. They can be lightweight and used while working for long hours in environments not immediately dangerous to life and health (IDLH).



**Self-Contained Breathing Apparatus (SCBAs)** are used for entry into or escape from environments considered to be IDLH. They contain their own breathing air supply and can be either open circuit or closed circuit.



**Combination Respirators** can be either a supplied-air SCBA respirator or supplied-air-air-purifying respirator. The SCBA type has a self-contained air supply if primary airline fails and can be used in IDLH environments. The air-purifying type offers protection using both a supplied-air hose & an air-purifying component and cannot be used for entry into IDLH environments.



**Use  
self-contained  
breathing  
apparatus**



**Respirators must  
be worn in this  
area**

## 9.2 Appendix B: Audit Criteria

Audit Criteria		Requirements	Verification	Area of Concern
ISO 45001:2018 Clause	NMS Ref.			Yes/ No
5.3	7.1	NEOM health and safety policy and safety management system are properly applied within their areas of control/responsibility		
6.1	7.2.3	Health and Safety Plan has been developed and issued to Contractor		
5.3, 8.1.4.2	7.1.3	Selection of Contractors undertaken in accordance with NEOM's policies and procedures		
6.1.2.2	7.2.5	Assessment of the various risks shall be undertaken		
9.0	7.1.4	Conduct regular safety and welfare assurance reviews to provide the confidence level		
7.2	7.1.3	Persons appointed to manage /oversee work operations have the skills, knowledge, experience		
8.1.2 (e)	7.3.3	Personal protective equipment required for use are fit for purpose		
8.1.2 (c, d)	7.2.2	Control of access to dangerous or high-risk areas or equipment using suitable Barricades and Signage		
10.2	7.3.2	Incident investigations and nonconformities reviews		
7.2	8.2	Correct respiratory protection certified by recognized certification bodies shall be selected to provide adequate protection against airborne hazards		
8.1.1, 8.1.2	8.3	Hazard assessments must be conducted to select the appropriate respirators for environmental conditions		
8.1.2 (e)	7.3.3, 8.4.1	Respiratory Protective Equipment (RPE) consisting of SCBA, or SAR shall be available		
8.2	8.5.4	The effectiveness of the respiratory protection program shall be reviewed at least annually, and an improvement action plan developed to address any shortfalls		
	8.6.9b	Breathing air cylinders shall be hydrostatically tested in accordance with manufacturer's recommendations		
7.2	8.9	Respirators and Respirator Wearers shall be adequately trained		
8.2	8.10, 8.11	Qualitative and Quantitative Fit Test Methods as appropriate shall be carried out if required		
	8.12	Respiratory protective equipment shall be used, stored, maintained, and replaced in accordance with the manufacturer's requirements		
	8.14	Recordkeeping requirements for employees shall comply with the local regulations (at least 40 years or for the duration of employment plus 30 years)		