WATER SUPPLIES DEPARTMENT

STANDARD SPECIFICATION EM-00-04

SITE SAFETY, HEALTH AND ENVIRONMENTAL MANAGEMENT OF MECHANICAL AND ELECTRICAL WORKS

Important Application Notes (not to include in the tender documents)

1. This Standard Specification is applicable to M&E contracts and service orders that do not require a Safety/Environmental Management Plan nor join the Pay for Safety Scheme.

2. This Standard Specification does not cover the implementation of trip ticket system for disposal of C&D materials and the taking of enhanced site cleanliness and tidiness measures that involve specific payment items under the Contract. The relevant contractual requirements should be specified in the PS and other appropriate parts of the contract.

3. Parts 6 and 15 of the Standard Specification are the adopted versions of the model documents to suit M&E contracts and service orders.

I N D E X

Page No.

General

1. General Duties of Contractor 1

2. Segregation of Works Areas by Barriers 1

3. Provision of Temporary Power Supply 1

4. Work in the Vicinity of Electrical Equipment 2

5. Provision of Temporary Lifting Equipment 2

Site Safety and Health

6. Safety and Health Management 3

(1) General 3

(2) Legislation, Regulations and/or Codes of Practice 3

(3) Safety Organization 6

(4) Safety Officer 6

(5) Safety Supervisor 8

(6) Safety Representatives 9

(7) Safety Training 9

(8) Risk Assessment 15

(9) Site Safety Committee 15

(10) Sub-contractors 16

(11) Reporting 17

(12) Further Safety Measures 18

(13) Electrical Safety of Temporary Power Supply 26

7. Wearing of Personal Protective Gear and Clothing by Workers 29

8. Welfare of Workers 29

(1) Provision of Drinking Water and Hand-washing Facilities 29

(2) Workplace Sheltered Rest Area 29

(3) Measures for Working in Hot Weather 30

9. Care of Public Utilities 30

10. Competent Persons and Arrangements for Special Works 30

11. Work in Chlorine Store and Plant Rooms 31

12. Fire Hazard (Naked Lights) 31

13. Control of Dogs on Construction Sites 32

14. Control of Rodents on Construction Sites 33

Site Environment

15. Environmental Management 34

(1) Nuisance Abatement Measures 34

(2) Waste Management 35

16. Care of Existing Streams, Water Courses and the Sea 35

17. Use of Materials Containing Volatile Organic Compounds (VOC) 35

(1) The Air Pollution Control (Volatile Organic Compounds) Regulation 35

(2) Measures to Reduce VOC Emission and Monitor the Use of Products containing VOC 36

Appendices

I Construction Accident Statistics Monthly Summary 37

II Colour Coding of Lifting Gear 41

III Proforma for Monthly Recording Delivery and Consumption of Ultra Low Sulphur Diesel on Site 43

IV Waste Flow Table 44

V Review on the Use of Products Containing Volatile Organic Compounds (VOC) 45

VI	Records on the Use of Products Containing Volatile Organic Compounds (VOC)	46
VII	Safety Precautions when Working in Sewers, Drains and Other Confined Space	47

EM-00-04
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GENERAL

1. GENERAL DUTIES OF CONTRACTOR

(1) The Contractor shall ensure the safety and health of workers and personnel at work sites. The Contractor shall comply with the Factories and Industrial Undertakings Ordinance, the Occupational Safety and Health Ordinance and their subsidiary Regulations and Codes of Practice.

(2) It is also the Contractor's responsibility to minimise the environmental nuisances of air, noise and wastewater pollution generated from the works on Site. Moreover, the Contractor shall minimise the construction and demolition (C&D) materials to be disposed of during the course of work.

2. SEGREGATION OF WORKS AREAS BY BARRIERS

When the Works are carried out in an existing installation, the Contractor shall enclose all Works areas including storage areas by approved type rigid barriers for the safety of other persons who may be present in close vicinity. The rigid barriers shall bear a notice stating the name of the Contractor, the Contract number, the start/completion date of work and the contact telephone number at regular intervals for easy identification by the Engineer's Representatives. When barriers are not required for the work, the above notice shall be securely affixed to the equipment under work. Barricade tapes shall only be used for fencing off temporary Works areas lasting not longer than 1 working day.

3. PROVISION OF TEMPORARY POWER SUPPLY

The Contractor shall arrange for the temporary electricity supply for executing the Works on Site. If the Site is located within an existing waterworks installation where permanent power supply is available as specified in the Particular Specification, the Contractor may obtain temporary power supply from a dedicated source usually via a spare switch on the low voltage switchboard for free subject to the following conditions:

- Prior approval is obtained from the Engineer;
- Power supply required is single phase 220V a.c. with rating not more than 20 Amp, or three phase 380V with rating not more than 30 Amp as appropriate for the Works.

The Contractor shall bear the costs and responsibilities for any loss and damage due to the use and misuse of the temporary power supply. The Contractor shall observe the safety measures as delineated in Paragraph 6.(13) below in the provision of temporary power supply.

4. WORK IN THE VICINITY OF ELECTRICAL EQUIPMENT

(1) Any permanent fencing or other safeguards required to be erected around electrical equipment shall be completed as far as practical before connection is made to the electricity supply. Where this is not practicable, the prior approval of the Engineer shall be obtained for the use of temporary fencing or other safeguards.

(2) If work in the vicinity of live electrical equipment has to be carried out, the Contractor shall observe the electricity safety requirements of Departmental Instruction No. 1506 issued by the Water Supplies Department and shall obtain a "Permit to Work" from the Authorized Person appointed by the Water Supplies Department. In addition, evident/proof showing the nominated Competent Persons are familiar with first aid or cardiopulmonary resuscitation shall be provided.

(3) In pursuance of the electricity safety requirements, the Competent Person responsible for installation and testing of electrical work shall possess a Certificate of Registration of Electrical Work under the Electricity Ordinance of the appropriate grade as follows or a higher competency:

(i) H.V. Work – Grade H2;
(ii) L.V. Work above 400A – Grade C2;
(iii) L.V. Work up to 400A – Grade A2.

5. PROVISION OF TEMPORARY LIFTING EQUIPMENT

The Contractor shall use proper lifting appliances and lifting gear for carrying out lifting operations on Site. For lifting operations at an existing waterworks installation where permanent lifting appliance is installed, the Contractor may be allowed to use such appliance for free provided that:

- Prior approval is obtained from the Engineer;
- the appliance, when under the Contractor's temporary custody, is tested, examined, inspected, certified and operated by competent personnel employed by the Contractor for compliance with the statutory requirements; and
- the appliance is used and under the proper control of competent personnel employed by the Contractor for compliance with the statutory requirements.

The Contractor shall bear all costs and responsibilities for any loss and damage due to the use and misuse of the lifting appliance.

SITE SAFETY AND HEALTH

6. SAFETY AND HEALTH MANAGEMENT

(1) General

(a) The Contractor shall ensure as a priority in all activities connected with the Works, the safety and health of all persons on or adjacent to the Site.

(b) The Contractor shall provide and employ on the Site only such personnel who have received adequate training including safety and health training relevant to their tasks and adopt safe working practices at all times and shall ensure that his subcontractors comply with this requirement.

(c) The Contractor shall not allow any person to work on the Site who has repeatedly breached safety requirements. A notice of such sanction shall be displayed at a prominent place on the Site.

(2) Legislation, Regulations and/or Codes of Practice

(a) The Contractor shall keep one set each of the following legislation, regulations and/or codes of practice at his nearest office including, but not limited to:-

(i) Legislation

- the Factories and Industrial Undertakings Ordinance
- the Factories and Industrial Undertakings Regulations
- the Construction Sites (Safety) Regulations
- the Factories and Industrial Undertakings (Safety Officers and Safety Supervisors) Regulations
- the Factories and Industrial Undertakings (Lifting Appliances and Lifting Gear) Regulations
- the Factories and Industrial Undertakings (Woodworking Machinery) Regulations
- the Factories and Industrial Undertakings (Abrasive Wheels) Regulations
- the Factories and Industrial Undertakings (Confined Spaces) Regulation

- the Factories and Industrial Undertakings (Dangerous Substances) Regulations

- the Factories and Industrial Undertakings (Protection of Eyes) Regulations

- the Factories and Industrial Undertakings (Cartridge-Operated Fixing Tools) Regulations

- the Factories and Industrial Undertakings (Electricity) Regulations

- the Factories and Industrial Undertakings (Suspended Working Platforms) Regulation

- the Factories and Industrial Undertakings (Safety Management) Regulation

- the Factories and Industrial Undertakings (Noise at Work) Regulation

- the Dangerous Goods Ordinance (Section 6)

- the Electricity Ordinance (Part VII)

- the Electricity (Wiring) Regulations

- the Occupational Safety and Health Ordinance

- the Occupational Safety and Health Regulation

- the Boiler and Pressure Vessel Ordinance

(ii) <u>Codes of Practice and Guides Published by Labour Department (where applicable)</u>

- Code of Practice for Bamboo Scaffolding Safety

- Code of Practice for Metal Scaffolding Safety

- Code of Practice for Safe Use of Mobile Cranes

- Code of Practice on Safety and Health at Work for Industrial Diving

- Code of Practice on Safety Management

- Code of Practice on Safety and Health at Work for Gas Welding and Flame Cutting

- Code of Practice on Safety and Health for Manual Electric Arc Welding

- Code of Practice on Safety and Health at Work with Asbestos

- Code of Practice for Safe Use and Operation of Suspended Working Platforms

- Code of Practice for Safety and Health at Work (Land-based Construction Over Water – Prevention of Fall)

- Code of Practice for Safety and Health at Work in Confined Spaces

- Code of Practice on Control of Air Impurities (Chemical Substances) in the Workplace

- Code of Practice on Working near Electricity Supply Lines

- Guidance Notes on Safe Use of Power-operated Elevating Working Platforms

- Guidance Notes on Personal Protective Equipment (PPE) for Use and Handling of Chemicals

- A Guide to the Factories and Industrial Undertakings Ordinance (Section 6A & 6B) – Know Your General Duties

- A Guide to the Construction Sites (Safety) Regulations

- A Guide to Construction Safety Management

(iii) <u>Codes of Practice and Guides Published by Other Departments</u>

- Code of Practice for the Electricity (Wiring) Regulations published by the Electrical and Mechanical Services Department

- Guidance Notes for the Electrical Products (Safety) Regulation published by the Electrical and Mechanical Services Department

- Guidelines on Safety of Vehicles and Mobile Plant on Construction Site published by Construction Industry Council

- Guidelines on Work-Above-Ground Safety published by Construction Industry Council

- Guidelines on Site Safety Measures for Working in Hot Weather published by Construction Industry Council

- Other safety and health related legislations, codes of practices and guides relevant to the execution of the Works.

(b) The Contractor shall display advisory and warning signs, labels and/or posters for the promotion and enhancement of safety and health and notices concerning the availability of the legislation and documents stated above at prominent locations around the Site including site offices, workshops and rest areas.

(c) All legislations and documents referred to in this Clause shall be kept in both Chinese and English insofar as available.

(3) Safety Organization

The Contractor shall provide to the Engineer's Representative at monthly intervals an updated safety organization chart containing a complete list of all sub-contractors, whether directly employed by the Contractor or not, on the Site and the Works and the name of the Safety Supervisor for each such sub-contractor, insofar as the employment of a Safety Supervisor is expressly set out in the Contract or in the absence of such requirement then by any enactment or statutory requirement. The list shall also include the names of the Safety Officer and Safety Supervisors, and the names of Safety Representatives and the respective labour groups or teams they belong. Telephone numbers of these safety staff shall also be shown on the chart.

(4) Safety Officer

(a) "Safety Officer" means a person registered as a safety officer in accordance with the Factories and Industrial Undertakings (Safety Officers and Safety Supervisors) Regulations (FIU(SO&SS)R) and employed by the Contractor to carry out the duties of a Safety

Officer as specified in the Contract and duties specified in the FIU(SO&SS)R.

(b) The Contractor shall employ at least one Safety Officer who shall be approved by the Engineer. The Safety Officer shall be present full time on Site unless the total number of workers employed on the Works or in connection with the Contract whether in the employ of the Contractor or his sub-contractor is less than 50. In such a case, the Safety Officer may be engaged part time for the Contract but with sufficient presence on the Site to perform the duties of a Safety Officer. The time thus spent on Site shall be not less than **12** hours per week excluding attendance of the Site Safety Committee meetings and progress meetings. If the Contract is a term contract, the Contractor shall employ one Safety Officer to be present full time on Site.

(c) The Contractor shall not commence any construction work on the Site without the appointment of the Safety Officer unless expressly permitted by the Engineer in writing.

(d) The duties of the Safety Officer shall be solely directed towards safety and health matters. In addition to the duties stipulated in the Factories and Industrial Undertakings (Safety Officers and Safety Supervisors) Regulations, the Safety Officer shall:

- carry out safety inspections and prepare inspection reports,
- supervise and monitor implementation of the Contractor's site safety obligations set out in the Contract,
- ensure that sub-contractors and all persons working on the Site are made aware of and comply with the Contractor's site safety obligations set out in the Contract.

(e) The Safety Officer shall maintain a safety diary which shall record all matters related to safety and health, including Safety Supervisors' reports, details of safety inspections and audits, accidents, dangerous occurrences, safety related incidents, etc. The Safety Officer shall check to ensure that all unsafe situations are promptly rectified and the dates of their completion duly recorded in the safety diary. The safety diary shall be made available for inspection by the Engineer upon request and copy thereof shall be submitted to the Engineer upon request.

(f) The Contractor shall empower the Safety Officer to order any person working on the Site to suspend any unsafe operation or to take urgent action to make safe the Site or the Works or to disallow any practice which may infringe the Contractor's site safety obligations set out in the Contract or any statutory safety requirement.

(g) The Safety Officer shall carry out comprehensive safety inspections on all activities on the Site at weekly intervals. The safety inspection shall identify any unsafe operation or potential hazards using a check-list agreed by the Engineer's Representative. The Safety Officer shall give prior notice to the Engineer's Representative of the date and time of the weekly inspection and shall allow the Engineer's Representative to attend the inspection. If the Contract is a term contract, the Safety Officer shall also prepare a written safety inspection report every week on the works for each Works Order with an estimated value in excess of $ 100,000. These reports shall be provided in the form of a comprehensive checklist agreed by the Engineer's Representative and shall be submitted to the Engineer at the beginning of the following week. Provided that nothing in this sub-clause shall prevent the Safety Officer from submitting reports or prevent the Engineer from requesting additional reports on any job with any estimated value or requesting reports in any format as directed by the Engineer.

(h) If the Safety Officer is unable to perform his duties for any reason, the Safety Officer shall be replaced as soon as practicable but in any case within 14 days. The Safety Officer shall not be replaced without consent by the Engineer.

(i) The Safety Officer shall be clearly identified on the Site by wearing an armband or a safety helmet appropriately marked in Chinese and English.

(j) When the nature of the Works of the relevant Contract is complex, or involves high risk operations, the proposed RSO should possess relevant engineering background and adequate experience meeting the requirements of the Contract.

(5) <u>Safety Supervisor</u>

(a) "Safety Supervisor" means a person employed by the Contractor or sub-contractors of all tiers on the Site to carry out the duties of a Safety Supervisor as stipulated in the Factories and Industrial Undertakings (Safety Officers and Safety Supervisors) Regulations. The Safety Supervisor shall carry out safety inspections on all active parts of the Site for which he is responsible at least at daily intervals using an appropriate comprehensive checklist agreed by the Engineer. All completed safety checklist shall be signed by the Safety Officer to ensure prompt follow-up actions have been taken on unsafe situations.

(b) The Contractor shall employ at least one Safety Supervisor to be present full time on Site. Where the number of workers employed on the Works or in connection with the Contract whether in the employ of the Contractor or by his sub-contractor exceeds 50, the number of Safety Supervisors to be provided shall be increased by one for every additional 50 workers.

(c) Notwithstanding the requirements stated in sub-clause no. (b) above, each sub-contractor of a works contract and of the first tier (directly employed by the Contractor) engaging 20 persons or more in the activities for which he is responsible shall provide at least one full-time Safety Supervisor to oversee the safety of his own activities. On the other hand, the Contractor of a term contract shall provide at least one full-time Safety Supervisor at one work location where the workers engaged there exceeds 20.

(d) Safety Supervisor shall have at least three years' experience on construction work and have completed an appropriate training course provided for safety supervisors.

(e) Safety Supervisors shall be clearly identified on the Site by wearing an armband or a safety helmet appropriately marked in Chinese and English.

(6) Safety Representatives

(a) In addition to the Safety Officer and Safety Supervisors, the Contractor shall appoint the foreman or ganger of each labour group or team working on the Site to act as Safety Representative. The Safety Representative shall be responsible for ensuring that the directives from the Contractor, the Safety Officer and Safety Supervisors on safety and health matters are duly carried out, safety practices are adopted and protective clothing and equipment are used by the work force at all times on the Site. Normally, each gang of workers shall have one Safety Representative. He shall be made aware of his responsibilities and the group of workers on the Site whose activities he is required to supervise. Every worker working on the Site shall be made aware of the roles of the Safety Representatives and from which Safety Representative he may seek advice or receive instructions on safety and health matters.

(b) Safety Representatives shall be clearly identified on the Site by wearing an armband or a safety helmet appropriately marked in Chinese and English.

(7) Safety Training

(a) The Contractor shall regularly review the training needs of all persons employed on the Works or in connection with the Contract and prepare a long-term training programme. Each month the Contractor shall submit a proposed training programme to be provided in the next month for the Engineer's approval. It shall contain the topics, dates, venues, the target participants of the proposed training and the names and qualification of the trainers.

(b) All persons carrying out construction work including general workers, skilled workers, foremen, gangers, drivers and plant operators, who are employed on the Works or in connection with the Contract whether in the employ of the Contractor or sub-contractors of all tiers must have completed the mandatory basic safety training course for the construction industry under the Factories and Industrial Undertakings (Amendment) Ordinance 1999 and hold the relevant valid certificate which shall be referred to hereafter as the Labour Department Recognized Green Card (LDRGC).

(c) (i) In addition to sub-clause (b) above, skilled workers of specific trades set out below in this sub-clause who are employed on the Works or in connection with the Contract whether in the employ of the Contractor or sub-contractors of all tiers shall attend the relevant Safety Training Course for Construction Workers of Specified Trades (also known as the Silver Card course) organized by the Construction Industry Council (CIC):

- painter and decorator
- carpenter
- plumber
- bar bender and fixer
- plasterer and tiler
- bamboo scaffolder and metal scaffolder
- construction materials rigger
- rigger and signaller
- any other recognized courses as notified by the Engineer

(ii) If the Contractor intends to employ or permit the employment of any skilled workers of trades specified in sub-clause (i) but do not possess the Silver Card that is relevant to the trade and work in which he/she is working on the Site for the execution of the Works, he shall arrange within 2 working days of such skilled workers commencing work on the Site to attend the course specific to the trade and work in which he/she is employed under the Contract. A skilled worker who passes the test at the end of the course

will be awarded with a Construction Industry Silver Card (Silver Card). For the purpose of this Contract, this course shall be referred to hereafter as the "trade specific advanced safety training" course.

(iii) The Contractor shall also ensure that all card holders will carry their LDRGC and Silver Card, or their Construction Workers Registration Cards with record of valid LDRGC and/or Silver Cards information as equivalent document of the LDRGC and/or Silver Cards as applicable, whilst working on the Site.

(d) (i) All persons employed on the Works or in connection with the Contract whether in the employ of the Contractor or sub-contractors of all tiers shall receive "site specific induction training".

(ii) Site specific induction training and its refresher shall take the form of an one-hour talk conducted by the Safety Officer in accordance with sub-clause (iii) below.

(iii) The talk shall be conducted as follows:

(1)	Safety Policy	10 mins
(2)	General particulars of the Site	10 mins
(3)	Special characteristics of the Works and inherent hazards on the Site, highlights of particular safety measures and use of personal protective equipment	15 mins
(4)	Emergency procedures and first-aid facilities	10 mins
(5)	Reporting of accidents and injury compensation procedures	5 mins
(6)	Questions and answers	10 mins
	total	60 mins

(iv) The Safety Officer shall prepare the talk based on Part II of the "Site Safety & Health Induction Training Manual" published by the Hong Kong Construction Association Ltd.

(v) An outline of the talk and every update of it shall be provided to the Engineer’s Representative for approval. All persons enumerated in sub-clause (i) above shall be provided with site specific induction training on the first day of their commencement of work on the Site. Thereafter,

he/she shall be given refresher talks at intervals of 6 months depending on the amount of changes to the site condition.

(vi) The Contractor shall ensure that "site specific induction training" talks are carried out by Safety Officers who are competent trainers and have received training on safety training techniques organized by the Hong Kong Construction Association Ltd. (HKCA), Construction Industry Council (CIC), Occupational Safety and Health Council (OSHC) or other approved training organizations.

(e) (i) The Contractor shall provide toolbox talks at a frequency of one talk per worker on Site every two weeks commencing from the date of commencement of the Works subject otherwise to any change in frequency as may be approved by the Engineer. The Contractor shall also ensure that the topic of every talk given to a worker is relevant to his/her trade and the work that he/she will perform under the Contract and a worker shall attend no more than one talk on the same topic in any two-month period.

(ii) The Contractor shall propose the topics of the toolbox talks at a frequency specified in sub-clause (i) having regard to the activities of the Site and the prevailing safety concern at that time. They shall be submitted with the proposed monthly training programme to the Engineer for his approval. The Engineer has the right to disapprove the training programme when the proposed topic is considered not relevant to the trade of the workers or the prevailing work activities. Moreover, the Engineer can request the Contractor to review the topics to cater for special safety concern. For workers undertaking scaffolding work including truss-out bamboo scaffolds, demolition work and works in confined spaces, they should be provided with suitable toolbox talks prior to the commencement of these works. Workers not having attended the concerned tool box talks shall not be allowed to undertake these works.

(iii) The content of the toolbox talks shall be based on training kits published by HKCA. Where such a proposed topic is not amongst one of those training kits published by HKCA, the Contractor shall develop training kits to a similar standard for approval by the Engineer’s Representative.

(iv) The Contractor shall ensure that "toolbox talks" are conducted by Safety Officers or Safety Supervisors or gangers who are competent trainers and have received

training on safety training techniques organized by HKCA, CIC, OSHC or other approved training organizations.

(f) The Contractor shall prepare attendance records on site specific induction training and toolbox talks which shall include the topics and dates of the talks, the names of the trainers, names and trades of the persons receiving the talks and their signatures.

(g) The Contractor shall ensure that all site management and supervisory staff, who are employed on the Works whether employed by the Contractor or sub-contractors of all tiers, shall attend, if they have not done so, and complete the basic training commensurate with their duties, as follows:-

(i) The term "site management staff" means persons engaged in the senior or managerial posts such as project managers, site agents, sub-agents, superintendents and site engineers. The basic training required to be attended by site management staff shall include:–

- Appropriate training course such as the Safety Training Course for Site Management Staff run by OSHC/CIC or other approved training organizations; or the corresponding revalidation course as appropriate. The course should cover amongst others: safety legislation and safety management techniques, risk assessment and safety inspection, accident investigation and accident prevention, Construction and Design Management (renamed as Design for Safety since 2016), work safe behavior and safety climate index.

(ii) The term "supervisory staff" means gangers and foremen. The basic training required to be attended by supervisory staff shall include:-

- Appropriate training course such as the Safety and Health Supervisor (Construction) Course run by OSHC or the Construction Safety Supervisor Course run by CIC or other approved training organizations; or the corresponding revalidation course as appropriate, such as the Enhancement Course for Safety Supervisors (Construction) run by OSHC or the Construction Safety Supervisor Enhancement Course run by CIC. The course should cover amongst others: safety legislation, safety management & training techniques, principle of accident prevention, safety at work and safety inspection techniques on construction sites.

(h) The Contractor shall keep on Site records of all safety training received by his staff including those on refresher training and make them available for inspection by the Engineer's Representative upon request.

(i) The following training requirements apply to the works in confined space in connection with or in the vicinity of underground pipework, drainage or sewage manholes or chambers, or structures alike.

(i) All workers having the qualification of a "competent person (CP)" as per s.2 and s.4(2) of Chapter 59AE – Factories and Industrial Undertakings (Confined Spaces) Regulation (Chapter 59AE), who are employed on the Works or in connection with the Contract whether in the employ of the Contractor or subcontractors at all tiers shall complete the 1-day "Confined Space Safety Training Course for Competent Persons Engaged in DSD's Works" run by the Construction Industry Council (CIC) and obtain a certificate. For the purpose of this Contract, the course is referred to hereinafter as the "Confined Space Training for Competent Persons" and the certificate as the "Certificate for Competent Persons". A CP who possesses the valid qualification of competent person pursuant to s.2 and s.4(2) of the Factories and Industrial Undertakings (Confined Spaces) Regulation and simultaneously holds a valid "Certificate for Competent Persons" is referred to hereinafter as "Designated Competent Person (DCP)".

(ii) All workers having the qualification of a "certified worker (CW)" as per s.2 and s.4(1) of Chapter 59AE — Factories and Industrial Undertakings (Confined Spaces) Regulation, who are employed on the Works or in connection with the Contract whether in the employ of the Contractor or subcontractors at all tiers shall complete the 1-day "Confined Space Safety Training Course for Certified Workers Engaged in DSD's Works" run by CIC and obtain a certificate. For the purpose of this Contract, the course is referred to hereinafter as the "Confined Space Training for Certified Workers" and the certificate as the "Certificate for Certified Workers".

(iii) For workers having both the qualifications of a CP and CW as stated in sub-clause (i) and (ii) above, they shall be taken as workers having the qualification of a CP only for the purpose of Paragraph 6.(7)(i) and the relevant provisions in Paragraph 6.(7)(i) shall apply.

(iv) The provisions in Paragraph 6.(7)(i) do not apply to Safety Officers (SOs) appointed by the Contractor, who are registered under the Factories and Industrial Undertakings (Safety Officers and Safety Supervisors) Regulations. However, if they are also qualified as "competent persons" as per Factories and Industrial Undertakings (Confined Spaces) Regulation and are to perform the duties of a CP in carrying out confined space works, they shall be taken as workers having the qualification of a CP for the purpose of Paragraph 6.(7)(i) and the relevant provisions in Paragraph 6.(7)(i) shall apply.

(8) Risk Assessment

The Contractor shall carry out, review and submit to the Engineer risk assessments for works scheduled to start at least for the next two months. The works shall be broken down into jobs/tasks for hazard identification and evaluation of the level of risk by competent persons. The documentation shall contain the hazards identified, the likelihood and consequence of the hazards occurring, the level of risk thus evaluated, the proposed risk mitigation/control measures and the anticipated residual risks, and identify the respective risk controller. The results of such risk assessments and documentation shall be endorsed by the Safety Officer and the Site Agent. In addition, they shall be incorporated into the Contractor’s site safety obligations set out in the Contract or relevant safety working procedures or method statements. In addition, the Contractor shall also maintain an updated register of all risk assessments carried out, and update the relevant safety checklist based on the safety measures recommended in each new risk assessment.

(9) Site Safety Committee

(a) The Contractor shall establish a Site Safety Committee which shall be responsible for ensuring the implementation of the Contractor’s site safety obligations set out in the Contract, reviewing and monitoring the effectiveness of the safety and health measures taken and seeking the co-operation and commitment of staff at all levels.

(b) The Site Safety Committee shall be chaired by the Site Agent with members comprising a representative at senior management level from the Contractor's headquarters or the project manager, the Safety Officer, all Safety Supervisors, selected Safety Representatives and other staff of the Contractor or sub-contractors as may be considered necessary. It shall meet at monthly or more frequent intervals discussing all matters relating to the implementation of the Contractor’s site safety obligations set out in the Contract. The first meeting shall be held no later

than 30 days after the commencement of construction work on Site. The Contractor may invite any other party such as the Labour Department, Marine Department, Fire Services Department, Police or representatives of utility undertakers to attend the meeting and provide advice as necessary.

(c) The Contractor shall give an advance notice of every Site Safety Committee meeting to the Engineer's Representative who will attend the meeting in person or nominate a representative to attend the meeting as an observer.

(d) The following items shall, amongst others, be discussed at the Site Safety Committee meeting :

- Review of the Contractor’s safety and health provisions and measures, safe working procedures and method statements and update of emergency and rescue procedures,
- Update of the safety organization chart and review of the adequacy of safety personnel,
- Review of the safety performance of sub-contractors,
- Any unsafe practices and conditions identified during safety inspections/audits and any follow up action,
- Advisory/warning letters issued by Marine Department and Labour Department and any Improvement/Suspension Notices received,
- Review of accident frequency rates and statistics of the Contractor and sub-contractors and identification of trends,
- Details of the Contractor's accident and dangerous occurrence experience,
- Safety and health training undertaken in the previous month and the proposed training programme for the following month,
- Site cleanliness and control of mosquito breeding,
- Follow-up actions on environmental issues,
- Details of safety promotional activities,
- Safety co-ordination between various sub-contractors working in close proximity to each other, and
- Monitoring of the follow-up action on defects and deficiencies identified.

(e) Minutes of the Site Safety Committee meeting shall be prepared by the Contractor and copied to the Engineer's Representative within 10 working days of the meeting. One copy of the minutes in Chinese, and English if necessary, shall be posted at a prominent place on the Site.

(10) Sub-contractors

(a) The Contractor shall provide each sub-contractor with sets of site rules and regulations, safe working procedures and safety obligations to ensure compliance.

(b) The Contractor shall, for contracts where more than two contractors are working in close proximity, establish a safety co-ordination system to liaise amongst the sub-contractors and to maintain a safe working environment.

(11) Reporting

(a) The Contractor shall complete any other forms as the Commissioner for Labour may require including, but not limited to, forms requesting supplementary information used by the Labour Department for the purpose of accident analysis. Copies of such forms should be made available for inspection by the Engineer upon request.

(b) Further to sub-clause (a) above, the Contractor shall notify the Engineer immediately of any accident/incident occurring on the Site or related to the Works involving dangerous occurrence or death or serious personal injury or with worker(s) admitted to the hospital. The initial notification may be made verbally. A written notification with details shall be made within 24 hours of the occurrence of the accident.

(c) The Contractor shall then investigate the incident/accident and complete any further report as may be required by the Engineer on the detailed cause of the accident or dangerous occurrences, measures to prevent recurrence and complete standard forms provided by the Engineer to enable the Water Supplies Department to prepare an up-to-date database on site accident statistics.

(d) The Contractor shall submit monthly report(s) for consideration at the following progress meeting. The report shall be prepared by the Safety Officer and duly endorsed by the Site Agent, to the Engineer containing the following information:

- all accidents involving dangerous occurrence, death, personal injury irrespective of severity or damages to properties in or adjacent to the Site,
- results of any Labour Department's inspections, advice, warning, Improvement/Suspension Notices and prosecutions,
- proposed training programme for the next month and training carried out in the previous month,

- a list of all competent persons and a summary record of all examination and test certificates required by any legislation or the Contract,
- Safety Officer's inspection reports, reports on follow up action taken on irregularities identified during safety inspections, and
- Construction Accident statistics monthly summary (Appendix I)

(e) Within 14 days from the request of the Engineer, the Contractor shall submit a written report to explain the high accident rates and to propose measures to improve the safety performance of the Site.

(f) Further to sub-clause (b) above regarding incident/accident with hospitalization of worker(s), the Contractor shall notify the Engineer's Representative immediately when the injured worker(s) has been discharged from the hospital, by provision of the relevant medical certificate or report with declaration detailed in paragraph 9.3.5 of Chapter 9 of the Construction Site Safety Manual.

(12) Further Safety Measures

(a) Safety, rescue and health matters shall be given a high degree of publicity on the Site. The Contractor's safety policy statement, emergency procedures and any rescue organization shall be made known to all persons on the Site. Such information shall include an emergency telephone list including the names and contact telephone numbers (such as mobile phone number and pager number) of at least two key members of the Contractor's emergency organization, and the telephone numbers of the appropriate divisional police, fire and ambulance stations, utility undertakers, Labour Department's Operation Division and Marine Department. Copies of the above information and safety posters, in Chinese and English languages, shall be displayed at prominent places on the Site. A notice board shall be erected near the entrance of the Site for the display of safety posters, up-to-date accident records and the names of the Safety Officer and the Site Agent.

(b) The Contractor shall ensure that all tools, plant, equipment and temporary facilities and all other items used in carrying out the Works how-so-ever provided are in a safe, sound and good condition, are capable of performing the functions for which they are intended, and where required by the law or by the relevant codes of practice, are licenced and/or have been issued with the necessary permits for use.

(c) Not used.

(d) Fences and/or nets of adequate strength shall be provided along all edges where workers may be liable to fall into water. If it is not possible to provide such fences and nets, persons working over or immediate adjacent to water shall wear a life jacket or a suitable buoyancy aid or a personal fall arrestor (as is appropriate) when so working. If there is a risk of the personnel becoming unconscious after falling into water, the life jacket shall be a self-inflatable type of the appropriate buoyance.

(e) If required by the Contract, the Contractor shall provide a suitably equipped and dedicated rescue launch, manned and available whenever work is being carried out on or over water. Adequate rescue equipment and personal protective equipment (PPE) shall be provided and maintained according to the manufacturer's specifications and recommendations.

(f) Alcoholic drinks and other substances which may impair judgment shall be prohibited from the Site. The Contractors shall remove any person under the influence of such substances from the Site immediately.

(g) Personal protective equipment provided by the Contractor for use in confined spaces and for protection against falling from height shall be full-body type safety harnesses with suitable lanyards. Safety belts shall not be permitted except for use as a means of positioning to restrict horizontal movement. The Contractor shall also provide secure anchorages for the attachment of safety harnesses/safety belts.

(h) Permit-to-work systems shall be implemented to control access to hazardous areas or the carrying out of any hazardous operations including, but not limited to, hot work, electrical work, work in confined space, operation and maintenance of material hoist, area or operation liable to release of flammable or toxic liquid or gas, etc.

(i) All lifting gear including slings, shackles and suchlike equipment shall be colour coded for identifying lifting gear which require re-inspection or disposal. Details of the colour coding system are given in Appendix II.

(j) Not used.

(k) All persons engaged in works with risks of receiving foot injuries including but not limited to pneumatic drilling work and manual handling work shall be provided with safety boots when they are

engaged in such works. The cost of provision of safety boots shall be deemed to have been allowed in the Contract Rates. Safety boots shall comply with BSEN ISO 20345 or equivalent standards.

(l) Further to the requirements under the Factories and Industrial Undertakings (Noise at Work) Regulation, the Contractor shall provide approved ear protectors to all persons working on the Site who are exposed to noise level of 90 dB(A) or above.

(m) The Contractor shall keep a register of all dangerous substances including those hazardous to health which are delivered to and stored for use on the Works. The register shall include information on :

- their physical and chemical properties,
- hazards,
- safe handling and storage,
- precautionary measures to be taken, and
- first aid measures

extracted from the manufacturers' material safety data sheets.

(n) The lifting of reinforcement bars shall be by use of wire slings. No cradles shall be used for the lifting of reinforcement bars unless they are properly designed and with their safe working load certified.

(o) Construction vehicles and plant used on Site shall be equipped with audible signals on reversing. Other form of warning signals and/or banksman shall be provided as necessary to guide such reversing movements if audible signals are causing nuisance to nearby residents particularly at night.

(p) The Contractor shall actively organize safety promotional activities to promote and enhance the standards of health and safety on the Site. In addition, the Contractor shall also participate in other territory-wide safety promotional campaigns as instructed by the Engineer.

(q) The Contractor shall provide protection to protruding steel reinforcements which may cause impalement injury. The protection can be by means of reinforcement caps; dowel bar sleeves; covering of the protruding steel reinforcement by wooden or metal troughs, steel planks and angles; or other means as agreed by the Engineer. Depending on the actual conditions of the site works, protection to the protruding steel reinforcements

locating at the areas non-accessible to the workers may not be required subject to the approval of the Engineer's Representative.

(r) The Contractor shall ensure all persons on site to fasten chin straps attached to their safety helmets when performing works to avoid accidental detachment of the safety helmets. Safety helmets shall comply with the "Guidance Notes on the Selection, Use and Maintenance of Safety Helmets" published by the Labour Department.

(s) The following requirements apply to the works in confined space in connection with or in the vicinity of underground pipework, drainage or sewage manholes or chambers, or structures alike.

(i) Safety precautions for working in drains, sewers and other enclosed spaces shall comply with (a) the statutory requirements laid down in Chapter 59AE — Factories and Industrial Undertakings (Confined Spaces) Regulation, (b) Code of Practice on Safety and Health at Work in Confined Space published by Labour Department, (c) the requirements contained in the publications "Safety Precautions in Sewers, Drains and Other Enclosed Spaces" in Appendix VII and (d) "Drainage Services Department Practice Note No. 1/2021 – Safety Supervision of Work in Confined Space" published by the Drainage Services Department (DSD) and its latest version. If an ambiguity or discrepancy in or divergence between the aforementioned documents and the Contract is found, the most stringent requirement contained in the aforementioned documents and the Contract shall prevail.

(ii) Man-entry to sewers or drains with a diameter not greater than 900mm or equivalent for undertaking any type of works shall be prohibited. For CCTV survey, man-entry to sewers or drains with a diameter not larger than 1300mm or equivalent shall also be prohibited. Where man-entry cannot be avoided under anomalous circumstances, the Contractor shall obtain prior approval from the Engineer. The Contractor's attention is drawn to that approval from the Engineer would not normally be given for man-entry to carry out opening of lateral connections inside a lined pipeline due to lack of robotic cutting machine/equipment or the like.

(iii) The Contractor shall establish a written notification system to enable the Engineer's Representative (ER) of confined space works to be carried out. The system shall include means to ensure that the ER is to be informed of, vide the Contractor, any such works to be carried out by him, his

subcontractors at all tiers or other persons on the Works or in connection with the Contract.

(iv) Then Contractor shall notify the ER two clear working days in advance of any proposed work in confined space in writing. The Contractor shall also notify the ER the proposed time of commencement for the confined space works. In case of emergency situations where the 2-day advance notification requirement cannot be met, the Contractor shall obtain verbal consent from the Engineer or the ER prior to the commencement of any confined space works. The verbal consent shall be recorded in writing by the Engineer or the ER before noon on the next working day following the granting of verbal consent.

(v) The Contractor shall implement a permit-to-work system for working in confined space. The permit-to-work certificate (refer to hereinafter as "Permit") shall only be signed and issued by the Contractor's representative on confined space works (viz. Project Manager or Site Agent) who is appointed by the Contractor and accepted by the Engineer, and shall not be issued by the subcontractors nor the DCP. The Permit shall be signed by the Contractor's representative on confined space works at the entrance of the confined space works and advance issue of the Permit shall not be accepted. The Permit shall legibly indicate the date and time of issue, allowable period of stay in the confined space and incorporate the latest record of gas monitoring at that space. Original copy of the valid Permit pertaining to each shift of confined space operation shall be displayed at the entrance of that confined space. The implementation of the permit-to-work system does not derogate the Contractor from his obligation under the legislation and other contractual requirements.

(vi) Any work involving entry into confined space shall not be carried out without the presence of the Contractor's Safety Officer or other staff who is a DCP, and having sufficient knowledge and experience in supervising the work in confined space appointed by the Contractor and accepted by the ER. He shall attend the Site and shall not leave the Site until all persons entering the confined space have left the confined space and return to the open atmosphere.

(vii) The Contractor shall submit a copy of the risk assessment with a safety checklist and detailed programme of the work at least two weeks before the commencement of confined space works for checking. When there is change in the

works or the risks involved, the Contractor shall submit a fresh risk assessment and programme to the ER at least two weeks in advance for checking.

(viii) The Contractor shall not allow work to proceed in a confined space unless all pre-entry requirements as mentioned in the Paragraph 6.(12)(s) and Appendix VII are fully checked and satisfied. Notwithstanding this, the Contractor shall ensure that any person entering a confined space shall bring along a gas detector each therein to continuously monitor the atmosphere throughout the stay in the confined space.

(ix) The Contractor shall ensure that each person entering a confined space shall wear an audio-visual personal alarm of dead-man type maintaining its operating in active mode throughout his/her stay in that space, and is able to give out signals that can alert the standby person stationed at the entrance of that space.

(x) The Contractor shall not allow work to proceed in a confined space located in industrial areas unless the persons working therein are wearing suitable breathing apparatus of approved type.

(xi) The Contractor shall ensure that each person entering a confined space shall wear safety harness with a lifeline connected to a man-lifting tripod or other lifting equipment approved by the Engineer for rescue purpose.

(xii) The Contractor shall set up CCTV cameras at manholes or end of pipeline for real-time monitoring of the conditions of the workers staying in the confined space where the direct line of sight between the standby person stationed at the entrance of a confined space and the person entering a confined space is impossible.

(xiii) The Contractor shall take video throughout the whole work duration, including entry to and exit from the confined space. The Contractor shall submit electronic copy of the videos to the ER within two working days for record purpose.

(xiv) The Contractor shall ensure that —

- any person entering a confined space shall wear a spark-proof/explosion-proof two-way telecommunication equipment to enable continuous and non-interrupted real-time communication with the standby person stationed at the entrance of a confined space; and

- any person entering a confined space shall be continuously monitored by the standby person or via the CCTV visual display panel real-time viewable by the standby person when the direct line of sight between the standby person stationed at the entrance of a confined space and the person entering a confined space is impossible.

(xv) The Contractor shall conduct regular rescue drills on confined space works to enhance and maintain the responsiveness of the confined space operating team and the rescue team during emergency. The rescue drills shall be conducted at an interval of not more than six months or a more frequent interval when considered necessary by the Engineer.

(xvi) The Contractor's representative on confined space works (viz. Project Manager or Site Agent) and the Safety Officer shall conduct at least 3 site checks in each shift of confined space works.

(t) The Contractor shall take the following safety precautionary measures for floor openings and free edges at building and structures –

(i) The Contractor shall fully cover all floor openings or erect railings around them. The Contractor shall post warning notices at the floor openings to alert site personnel of the floor openings.

(ii) Covers to all floor openings shall be constructed with solid material of sufficient strength and securely fixed in position to prevent fall of persons, materials and article. All covers to all floor openings shall be clearly and boldly marked to show their purpose.

(iii) The Contractor shall erect rigid and secure railings around the floor openings and at the free edges of a building or structure. They shall include but not be limited to the following —

- top railing at a height of 900 mm to 1150 mm;
- intermediate railing at a height of 450 mm to 600 mm;
- toe board of 200 mm high above the floor surface where no permanent upstand exists; and
- brightly coloured safety meshes mounted on the top railings and down to the toe boards.

(iv) On top of the provisions in sub-clause (iii) of Paragraph 6.(12)(t), for floor openings with considerable risks or safety concerns of falling persons or objects, the Contractor shall provide safety nets of suitable size and sufficient strength covering the floor openings. The safety nets shall be clear of any debris.

(v) Where the erection of railings or provision of covers to prevent fall from a floor opening or a free edge is considered impracticable, the Contractor shall provide suitable fall arrest system to workers with reference to the Guidance Notes on Classification and Use of Safety Belts and their Anchorage Systems published by the Labour Department.

(vi) The Contractor shall develop and implement an effective and safe system of work to ensure that the above safety measures are properly implemented and maintained.

(vii) For the avoidance of doubt, the Paragraph 6.(12)(t) is applied to all buildings or structures, irrespective of whether they are permanent or temporary in nature.

(u) The Contractor shall take the following control measures for conveying debris through floor openings –

(i) Debris generated in the works shall be regularly removed to prevent excessive stockpiling that could —

- affect the integrity of the building or structure;
- affect the access to and egress from the workplaces;
- result in a risk of fire; or
- cause health and safety hazards.

(ii) The Contractor shall only convey debris through floor openings with suitable chutes, full enclosures or shafts.

(iii) The Contractor shall define designated areas for conveying debris through floor openings with chute, full enclosure or shaft for acceptance by the Architect/Engineer. The designated areas shall have an enclosed structure to contain the falling debris where the hazard of workers or the public being struck by falling objects/rebounding debris is eliminated. The designated areas shall be clearly identified, and fenced off or barricaded to prevent unauthorized entry. Overhead conveyance of debris through designated areas shall be suspended during removal of debris therein. All site personnel involved shall be unequivocally informed of the

suspension of overhead conveyance of debris through the designated areas. Warning notice shall be posted at all entry points of the designated areas to warn site personnel of the potential hazards.

(iv) The Contractor shall ensure that all chutes, full enclosures or shafts installed at the floor openings —

- shall be of adequate strength and securely fixed and supported to allow safe and free falling of debris therein;
- shall be fully enclosed at every entry point to prevent a person from falling therein;
- shall be adequately secured having regard to the weight of the chute, full enclosure or shaft and the weight of possible accumulated load therein;
- shall prevent escape of materials and dust; and
- shall be able to minimise the noise while debris is passing through.

(v) The Contractor shall ensure that every entry point for the designated area mentioned in sub-clause (iii) of the Paragraph 6.(12)(u), and all chutes, full enclosures or shafts mentioned in sub-clause (iv) of the Paragraph 6.(12)(u) shall be adequately protected by barriers during the removal of debris by mobile plant, and suitably guarded by barriers with adequate strength at all times. Barriers shall be high enough to prevent mobile plant from riding over them, and strong enough to halt a fully loaded mobile plant.

(vi) Where the compliance of any provision in sub-clauses (ii), (iii), (iv) and (v) of the Paragraph 6.(12)(u) by the Contractor is considered impracticable, the Contractor shall submit an alternative proposal for conveying debris through floor openings, with due consideration and mitigation of hazards including, but not limited to falling from height and struck by falling objects, for acceptance by the Architect/Engineer before the commencement of conveying debris through floor openings.

(vii) For the avoidance of doubt, the Paragraph 6.(12)(u) is applied to all buildings or structures, irrespective of whether they are permanent or temporary in nature.

(13) Electrical Safety of Temporary Power Supply

(a) A Registered Electrical Worker (REW) of the appropriate grade under the Electricity Ordinance (EO) shall be employed by the

Contractor throughout the Contract to handle the entire temporary electrical systems and installations on the Site.

(b) Upon completion of the temporary electrical system (TES) and after each alteration/repair to the existing TES, the Contractor shall arrange his REW/Registered Electrical Contractor (REC) under the EO to complete an individual Work Completion Certificate (WR1) as required by the Code of Practice for the Electricity (Wiring) Regulations (COP) issued by the Electrical and Mechanical Services Department. If an REC is not employed, the Contractor shall then assume the responsibilities of an REC and sign on the WR1 together with the REW employed by the Contractor as per Code No. 19B(d) of the COP. Each of such Certificates shall include a circuit diagram clearly indicating which portion(s) of the TES is/are covered, and, where appropriate, other necessary supporting documents.

(c) Temporary electrical installations, such as lighting fittings, distribution boards, socket outlets, plugs and cable couplers in outdoor or damp environment shall be of splash-proof type to IP 54 or above.

(d) The sheath of all electric portable cables shall be of heavy-duty type or otherwise adequately protected against mechanical damage if laid on ground. They shall be hung overhead as far as possible. Ordinary PVC cables, if employed, shall be enclosed in metallic conduits or trunkings and properly maintained.

(e) The Contractor shall develop checklists for carrying out regular routine inspections and checking and monthly comprehensive checking of the TES. The checklists shall be developed by the Contractor and agreed by the Engineer’s Representative. Comprehensive checking shall include, but not be limited to, checking of temporary generators, functional test of earth leakage circuit breakers, integrity of cables and connections, measurement of earthing resistance and those items listed in Checklists Nos. 3 and 4 of the COP where appropriate. The checklist should be signed by the REW after each inspection and/or checking.

(f) Adequate precautionary measures shall be adopted to ensure safety during inspection, repair and maintenance of the temporary electrical installations including the use of permit-to-work system and/or lock-off system. The Contractor shall establish and review regularly the maintenance programme and logging system for the TES. The Contractor shall keep and maintain updated circuit diagrams, WR1(complete with supporting documents) and records of inspection and checking of the TES by REW/REC in a

dedicated file for inspection by the Engineer's site supervisory staff upon request.

(g) During joint safety inspections as requested by the Engineer's site supervisory staff, the Contractor shall open the cover plates of temporary electricity distribution boards for inspection of the conditions of the internal wiring and/or carry out testing immediately when requested. Updated schematic circuit diagram shall also be affixed inside the cover of the temporary distribution boards.

(h) All temporary electrical distribution boards shall be kept locked and accessible only by authorized persons appointed by the Contractor, e.g. REW and/or electrical foreman. Legible warning notices (Danger - Electricity) in both Chinese and English, names and telephone numbers of such authorized persons shall be posted on the temporary distribution boards.

(i) For work carried out in occupied buildings, unless prior approval has been obtained and proper and safe arrangement has been made, the Contractor shall not connect his fixed electric equipment directly to any existing permanent distribution boards. Such connection shall only be made through temporary distribution boards equipped with proper protective devices.

(j) All arc welding machines and electrode holders shall comply with BS 638 : Part 7, IEC 60974 – 1 (or BSEN60974 – 1) and BS EN 60974 – 11 or equivalent standards. The welding machines should be fitted with no-load voltage reducing device for protection against electric shock at the output side. Welding machines shall be enclosed and the metal casing shall be effectively connected to earth. Cable terminals of the welding machines shall be effectively insulated.

(k) All hand-held electrical tools and portable equipment (e.g. submersible pumps), whether they belong to the Contractor or sub-contractors of all tiers, Nominated Sub-contractor or Specialist Contractors under domestic sub-contract, shall be examined by the REW before they are used on Site. The examination shall include visual inspection for the general conditions of the tools and equipment and also tests for checking the functional, protective conductor continuity, polarity and insulation aspects. After passing the examination, all hand-held tools and equipment shall be registered and recorded. Identification labels showing the registration number, type of the tool, name of the owner and date of examination stamped with the Contractor's company chop shall be affixed to these tools and equipment. Re-examination of the registered hand-held tools shall

be carried out at 3-month intervals or each time after repairs to damages.

(l) Voltage in excess of 110V shall only be used for heavy equipment such as hoists, tower cranes, etc. with an earth leakage circuit breaker installed and in proper function. Portable and hand-held tools and temporary site lighting shall be operated at a voltage of 110V or less supplied from a step-down transformer with its output winding centre-tapped to earth and comply with BS EN 61558-1 and BS EN 61558-2-23 or equivalent. All cables shall be terminated within the transformer enclosure of Class I and IP55 and the outgoing circuit shall be provided with short circuit protection. In confined and damp environment, the voltage of temporary lighting and hand-held tools shall not exceed 25V.

7. WEARING OF PERSONAL PROTECTIVE GEAR AND CLOTHING BY WORKERS

All workers of the Contractor shall wear safety helmets and safety shoes at work. Additional safety gear and protective clothing shall also be worn/donned as required based on the pre-work risk assessment carried out by the Contractor.

8. WELFARE OF WORKERS

(1) Provision of Welfare Facilities for Workers

The Contractor shall provide sufficient amount of free drinking water and rubbish bins to the workers at work. The rubbish bins shall be provided in pairs, one for aluminium cans and plastic bottles and the other for general refuses. Temporary hand-wash and toilet facilities shall also be arranged on Site for compliance with the statutory requirements unless such provisions are provided by others as stated in the Particular Specification.

(2) Workplace Sheltered Rest Area

(a) The Contractor shall provide workplace sheltered rest areas for use by workers irrespective whether they are employed by the Contractor or his sub-contractors. The sheltered rest areas shall be able to provide sun shade and wind screen for the workers.

(b) Workplace sheltered rest areas shall be located at convenient locations close to working places of workers for them to take rest break or meal break. The rest areas should be provided with seats and tables, hand-wash facilities, rubbish bins, drinking facilities and with proper ventilation. The Contractor shall be responsible for maintaining cleanliness and hygiene of the rest areas.

(c) The Contractor shall provide adequate number of workplace sheltered rest areas taking into account the number of workers and their locations on the Site. The Contractor shall submit the proposal for these rest areas including their sizes, locations, layout, facilities to be provided for approval of the Engineer's Representative. The approved workplace sheltered rest area proposal shall be reviewed and updated by the Contractor as required by the Engineer's Representative.

(3) Measures for Working in Hot Weather

The Contractor shall set up a hot weather safety and health system for workers in accordance with the latest version of the "Guidelines on Site Safety Measures for Working in Hot Weather" issued by the Construction Industry Council.

9. CARE OF PUBLIC UTILITIES

(1) The Contractor shall exercise the greatest care to avoid damage to or interference with any utility services and shall be responsible for any such damage caused directly or arising indirectly from anything done or omitted to be done.

(2) Where diversions to utility services are necessitated by the Works any work which may affect the existing services shall not be commenced until the diversions have been made. Diversion shall not be commenced until approval of the Contractor's method statement is given by the Engineer.

(3) Where damage to utility services may be caused by the operation of powered construction plant, the Contractor shall excavate by hand.

10. COMPETENT PERSONS AND ARRANGEMENTS FOR SPECIAL WORKS

(1) The Contractor shall nominate Competent Persons for working on electrical, pressurized and chlorine installations for approval by the Engineer prior to the beginning of such works. The nominated Competent Persons shall possess qualifications and working experience relevant to the intended works. No works on an electrical, pressurized or chlorine installations shall be commenced unless the part involved is made dead or isolated and a work permit is acquired from the Authorized Person or Operator-in-charge of the Water Supplies Department as appropriate. Throughout the work, the Competent Person shall be present on the spot for ensuring the required safety precautions are taken and maintained by the workers. The Contractor shall put up a notice at the entrance of the installation to show the names and contact numbers of the approved Competent Persons and to warn other persons against unauthorized entry.

(2) Working on a live electrical, pressurized or chlorine installation will not be allowed unless it is absolutely necessary and appropriate extra safety precautions are taken by the Contractor as approved by the Engineer.

(3) The Contractor shall within 7 days from the notice of possession of Site submit a nomination of suitable staff to act as the Competent Persons for the Works under the Contract. The nomination shall be accompanied with relevant supporting details of the academic qualification and working experience of the candidate(s) for assessment by the Engineer.

(4) The Contractor shall not undertake any inspection/maintenance/alteration work of any kind on existing pumpsets involving shutdown of the pumpset without prior isolation of both the electrical supply and water flow unless otherwise agreed by the Engineer's Representative. The pumpset includes the pump, the pump motor, the intermediate shafting and the pump delivery check valve.

11. WORK IN CHLORINE STORE AND PLANT ROOMS

(1) Work of any kind on equipment involving the risk of chlorine release shall be carried out by at least two persons from the Contractor and only after a Permit-to-Work has been obtained from the Operator-in-charge of the chlorine installation.

(2) When the work is associated with a live chlorine supply system, every person involved shall be equipped with compressed air breathing apparatus, protective clothing and gloves.

(3) When the work is on the equipment in the chlorination plant or store room neither associated with nor in close proximity to a live chlorine supply system, only one person of the work team is required to be equipped with a compressed air breathing apparatus and act as the emergency coordinator.

(4) All members of the work team shall be familiarized with the established procedure of the Water Supplies Department for handling chlorine leak as stipulated in Departmental Instruction No. 2404.

(5) The Competent Person shall have sufficient technical knowledge or experience to avoid danger in the course of the work. He shall ensure the chlorine equipment or pipeline is isolated properly before the work begins and verify the work is completed satisfactorily and/or the plant affected is reinstated safely before resuming the chlorine system.

12. FIRE HAZARD (NAKED LIGHTS)

(1) No naked light shall be used by the Contractor on or above the Site other than in the open air without the permission in writing by the Engineer. If in the Engineer's opinion the use of naked lights may cause a fire hazard the Contractor shall take such additional precautions and provide such additional fire fighting equipment (including breathing apparatus) as the Engineer considers necessary.

(2) The term 'naked light' shall be deemed to include electric arcs and oxy-acetylene or other flames used in welding or cutting metals.

13. CONTROL OF DOGS ON CONSTRUCTION SITES

(1) No dogs shall be kept by the Contractor or his employees, his agents or sub-contractors or their employees, on the Site unless the dog is acceptable for licensing by the Agriculture, Fisheries and Conservation Department (AFCD), and is licenced under the Rabies Ordinance (Cap 421), implanted with a microchip, vaccinated against rabies. In addition, the keeper of the dog under licence shall either be:

(a) An employee of the Contractor who shall be of a rank not lower than deputy site agent or equivalent as agreed by the Engineer; or

(b) A security firm in its own name or an employee of the firm who shall not be of a rank lower than assistant manager level, where the security firm is engaged by the Contractor solely for the purpose of site security.

(2) All licenced dogs kept on the Site must be neutered. The Contractor shall keep or cause the aforesaid subcontractor to keep on the Site a copy of the licence, together with a copy of the certificate issued by a registered veterinary surgeon confirming that the dogs kept on the Site have been neutered, for inspection by the Engineer upon request. All licenced dogs on the Site shall be identified by some suitable markings on their collars as agreed by the Engineer, and shall be removed by the Contractor/ his subcontractor from the Site upon completion of the Works under the Contract.

(3) The Contractor shall alert AFCD and facilitate access where appropriate, to the Site from removal of any unlicenced dogs from the Site.

(4) The Contractor shall observe and undertake, or cause his employees, his agents or sub-contractors or their employees to observe and undertake the licensing and control measures as set out in the current edition of the Code of Practice for the Keeping of dogs on Construction Sites in Hong Kong issued by AFCD for any dogs kept on Site. The Engineer or his Representative shall have the power to order the removal of any person who fails to comply with the requirements from the Site.

14. CONTROL OF RODENTS ON CONSTRUCTION SITES

(1) The Contractor shall comply with the Code of Practice for Rodent Management and other relevant guidelines promulgated by the Food and Environmental Hygiene Department for anti-rodent work.

(2) The Contractor shall engage a competent pest control agent to carry out rodent disinfestation operations upon taking over the Site and throughout the Contract, which shall include, but not limited to –

(a) identify any rodent infested areas and any potential rodent infested areas on the Site;

(b) set out and install sufficient rodent control measures, such as rodent baiting points, rodent traps, rodent glues and filling of rodent holes, as appropriate, to disinfest any rodent found and to prevent rodent infestation on the Site;

(c) inspect the rodent control measures regularly, replenish and adjust them as necessary;

(d) place appropriate warning signs in the vicinity of the rodent baits, traps and glues; and

(e) collect and dispose of live and dead rodent and all wastes arising from the disinfestation operation to appropriate waste collection points.

(3) The Contractor shall clean up the Site to eliminate the three survival conditions of rodent on the Site, viz. removal of food sources, elimination of hiding places of rodents, and blockage of rodent dispersal routes, and continue to maintain the Site in a clean and hygienic condition.

(4) The Contractor shall provide statistics on anti-rodent work to the Engineer on a monthly basis. The statistics shall include the following items and other items as requested by the Engineer –

(a) Number of inspection conducted in connection with rodent infestation / control;
(b) Number of bait points set;
(c) Number of trap placed;
(d) Number of live rodent trapped;
(e) Number of dead rodent collected;
(f) Number of rodent hole filled;
(g) Number of joint site visit conducted with the Food and Environmental Hygiene Department;
(h) Number of joint visit conducted with Engineer; and

(i) Number of complaint received.

(5) The Contractor shall review the statistics enumerated in sub-clause (4) above as well as the sufficiency and effectiveness of rodent control measures adopted with the Engineer during the progress meetings or other appropriate meetings between the Contractor and the Engineer on a monthly basis.

SITE ENVIRONMENT

15. ENVIRONMENTAL MANAGEMENT

(1) Nuisance Abatement Measures

The Contractor shall provide the following nuisance abatement measures for the Works:

For Air Pollution Control

- Provide covering and containment of dusty materials;

- Where the public is affected by the dust or exhaust fumes from a plant, provide screens or enclosures for the dusty and smoky operations;

- Provide vacuum cleaners for dusty operations; and

- Use Ultra-low-sulphur diesel (ULSD) (defined as diesel fuel containing not more than 0.005% by weight of sulphur) in all diesel-operated plants and equipment on the Site. The Contractor shall demonstrate his compliance by maintaining a summary record of all the delivery notes of ULSD delivered to the Site, including those ordered by his sub-contractors, together with the details of replenishment of such fuel by the individual plant and equipment on the Site. The record shall be supported by the original receipts of delivery notes from the oil companies. A proforma of the summary record is attached at Appendix III.

For Noise Pollution Control

- Provide acoustic screens or enclosures for noisy operations; and

- Wrap up the tips of the percussion breaker for hard rock and concrete breaking works by excavators.

For Wastewater Pollution Control

- Provide measures such as sand bags to prevent ingress of surface run-off into the Site;

- Avoid slope erosion and exposure of soil on the Site where appropriate; and

- Arrange a licenced contractor to collect the sewage generated from the Site where connection to a public sewerage system is not available.

(2) Waste Management

(a) Measures to reduce/minimise generation of C&D materials:

- Sort and deliver hard rocks and broken concrete to designated recycling facility or location as specified in the Particular Specification or a location as notified by the Engineer;

- Sort and dispose of paper and cardboard packaging to recycling contractors;

- Properly handle and dispose of chemical waste by a specialist contractor;

- Conduct thorough sorting of demolition waste for recovering broken concrete, reinforcement bars, mechanical and electrical fittings, hardware etc., and deliver to proper recycling outlets.

(b) The Contractor shall complete the record for the quantities of C&D materials generated using the table in Appendix IV and submit to the Engineer's Representative by no later than the 15th day of the subsequent month following the quarter ending on the last day of February, May, August and November.

(c) The Contractor shall implement a documented system to ensure proper disposal of C&D materials.

16. CARE OF EXISTING STREAMS, WATER COURSES AND THE SEA

The Contractor shall not allow excavated materials, silt or debris from being deposited in existing drainage system, streams, water courses and the sea.

17. USE OF MATERIALS CONTAINING VOLATILE ORGANIC COMPOUNDS (VOC)

(1) The Air Pollution Control (Volatile Organic Compounds) Regulation

The Air Pollution Control (Volatile Organic Compounds) Regulation imposes maximum limits on the VOC content of architectural paints, adhesives and sealants, printing inks and some categories of consumer products. The Contractor shall note the details of the statutory control of VOC limits and the Guide to the Air Pollution Control (Volatile Organic Compounds) Regulation posted on the web site of Environmental Protection Department.

(2) Measures to Reduce VOC Emission and Monitor the Use of Products Containing VOC

(a) The Contractor shall not use any material of which the VOC content exceeds the VOC limits stipulated in the Air Pollution Control (Volatile Organic Compounds) Regulation.

(b) Prior to using materials containing VOC, the contractor shall review whether there are alternatives consuming less VOC or no VOC. The Contractor shall record the review in the form at Appendix V.

(c) Should it be unavoidable to use products containing VOC, the Contractor shall record the products in the form at Appendix VI.

The forms referred to above shall be submitted together with the material submissions to the Engineer for approval.

- End of this Specification -

C9-AV(a)-P01 (Ver. Mar. 2019)

Construction Accident Statistics Monthly Summary

[for the month ending * ☐☐ / ☐☐☐☐ (mm/yyyy)]
(To be submitted on or before the 15th day of each month)

Please tick your DEPARTMENT *

1. ☐ ArchSD 2. ☐ CEDD 3. ☐ DSD
4. ☐ EMSD 5. ☐ HyD 6. ☐ WSD

Office _____ Division _____

Contract No. : * _____

Works Order No. : _____

Part A: Summary

	This Month
1. Number of fatal accidents	
2. Number of dangerous occurrences	
3. Number of non-fatal accidents (with incapacity for more than 3 days)	
4. No. of man-day lost (i) due to accident(s) occurred in this month (ii) due to accident(s) of previous months	(To be input in Part C)
5. No. of Form 2B submitted to LD (with incapacity of 3 days or less)	
6. Number of LD inspection conducted	
7. Number of Improvement Notice(s) issued by LD	
8. Number of Suspension Notice(s) issued by LD	
9. Number of "Part 1" issued by LD	
10. Sum certified (in HK$) (including retention money)	

Note Key points to note when calculation man-days lost:
(a) Public holidays within the sick leave period should be counted; and
(b) The day of the reportable accident should be excluded in calculating man-days lost.

Part B: Number of man-days and man-hours worked by Trades (based on the return of GF 527 to the Census and Statistics Department)

C9-AV(a)-P02 (Ver. Mar. 2019)

		Man-days	Man-hours
1. Bar Bender & Fixer [or Steelbender]	1		
2. Concretor	2		
3. Drainlayer	3		
4. Plumber	4		
5. Leveller	5		
6. Bamboo Scaffolder	6		
7. Carpenter & Joiner	7		
8. Carpenter (Formwork)	8		
9. Joiner	9		
10. Plant & Equipment Operator (Load Shifting) [or Plant Operator (exc. driver, bulldozer driver, etc.)]	10		
11. Truck Driver	11		
12. Rock-Breaking Driller [or Pneumatic Driller]	12		
13. Blacksmith	13		
14. General Welder	14		
15. Metal Worker	15		
16. Glazier	16		
17. Excavator (male)	17		
18. Excavator (female)	18		
19. Labourer (male)	19		
20. Labourer (female)	20		
21. Concretor's Labourer (male)	21		
22. Concretor's Labourer (female)	22		
23. Heavy Load Labourer [or Heavy Load Coolie]	23		
24. Diver's Linesman	24		
25. Painter & Decorator	25		
26. Plasterer	26		
27. Terrazzo & Granolithic Worker	27		
28. Plasterer's Labourer (male)	28		
29. Plasterer's Labourer (female)	29		
30. Bricklayer	30		
31. Bricklayer's Labourer (male)	31		
32. Bricklayer's Labourer (female)	32		
33. Marble Worker	33		
34. Mason (incl. rubble mason, splitting mason and ashlar mason)	34		
35. Structural Steel Welder	35		
36. Structural Steel Erector	36		
37. Rigger/Metal Formwork Erector	37		
38. Asphalter (Road Construction)	38		
39. Construction Plant Mechanic [or Fitter]	39		
40. Diver	40		
41. Electrical Fitter (incl. Electrician)	41		
42. Mechanical Fitter	42		
43. Refrigeration/AC/Ventilation Mechanic	43		
44. Fire Service Mechanic	44		
45. Lift and Escalator Mechanic	45		
46. Building Services Maintenance Mechanic	46		
47. Cable Jointer (Power)	47		
48. Others not included in the above	48		
Total of this month :			

Part C: Injury Information

Ref No. *	Name of Injured Person *	Date of Injury *	No. of Man-day Lost in Reporting Month	End Date of Sick Leave	Percentage of Permanent Incapacity (PI) Finalized by LD (%)	Compensation Settled
						☐ Yes ☐ No
						☐ Yes ☐ No
						☐ Yes ☐ No
						☐ Yes ☐ No
						☐ Yes ☐ No
						☐ Yes ☐ No
						☐ Yes ☐ No
						☐ Yes ☐ No
						☐ Yes ☐ No
						☐ Yes ☐ No
						☐ Yes ☐ No
						☐ Yes ☐ No
						☐ Yes ☐ No
						☐ Yes ☐ No
						☐ Yes ☐ No
						☐ Yes ☐ No

Add Items

Part D: Monthly Return for Construction Worker with/without Specified Trade Safety Training Certificate (Silver Card)

	Worker with Silver Card		Worker without Silver Card		
Specified Trade	No. of Worker	Total No. of Man-days worked	No. of Worker	Total No. of Man-days worked	No. of Worker who have been arranged to attend Silver Card Course
Painter and Decorator					
Carpenter					
Demolition Worker (Building)					
Plumber					
Bar Bender and Fixer					
Plasterer and Tiler					
Bamboo Scaffolder and Metal Scaffolder					
Curtain Wall Installer					
Lift Mechanic (Installation and Maintenance)					
Tower Crane Worker (Erecting, Dismantling, Telescoping & Climbing)					
Construction Materials Rigger					
Tunnel Worker					
Others					
Total					

Colour Coding of Lifting Gear

1. General

1.1 This procedure applies to all slings, shackles and such-like equipment that are required by regulation to be certified.

1.2 This procedure will be distributed and shall apply to all contractors who are working on the Site.

1.3 This procedure will be distributed to Suppliers. It shall become a condition of purchase that all Suppliers use only certified lifting equipment on the Site. Such equipment will not feature on the Site Lifting Gear Register (the Register) if it is only present on a temporary basis during loading/unloading of plant, equipment or materials.

2. Arrival on the Site

2.1 Upon arrival on the Site, all contractors shall ensure that their lifting equipment is properly certified and identifiable (i.e. any stamping is legible). If it is not certified or the stamping is not legible then the equipment shall be quarantined and not used until such time as it is tested and certificates can be provided.

2.2 Sub-contractors shall report to the Contractor's Safety Officer (SO) who shall ensure that the certification and stamping are satisfactory, before entering the equipment in the Register and painting the equipment with the appropriate colour (see paragraph 3.1 below). The Register shall include the due date for re-examination of the equipment.

3. Routine Monitoring

3.1 A colour coding system will be in use for months as noted below: –

Jan - Feb – Mar	Blue
Apr - May – Jun	Yellow
Jul - Aug – Sept	Green
Oct - Nov – Dec	Orange
To be removed from the Site	Red
Equipment under quarantine in Contractor's Central Yard	White

3.2 The Contractor and the sub-contractors' foremen are to familiarize themselves with the colour for that month and ensure that personnel in their charge use only equipment painted in the appropriate colour.

3.3 On the last working day of each month (except as noted in paragraph 3.5) the SO will issue copies of the updated register to site foremen. The foreman will then check all equipment on their batch for compatibility with the register. The foremen shall particularly ensure that stamping is still legible and the colouring is appropriate. Any

equipment in doubt shall be removed from the working area and delivered to the Contractor's central yard whereupon sub-contractors will be required to have it quarantined, re-certified or scrapped accordingly. The equipment under quarantine shall be painted white by the SO. The SO or Safety Supervisors will supervise this operation and be responsible for it.

3.4 During day-to-day operations, it is the responsibility of all concerned to ensure that proper lifting equipment is used. Any irregularity shall be immediately reported to the SO who shall take action as necessary.

3.5 On the following days, or as soon thereafter as practical but in any event within 14 days, all lifting equipment shall be inspected by the SO who shall also check the validity of the certificates as stipulated in the Factories & Industrial Undertakings (Lifting Appliances and Lifting Gear) Regulations.

The days are	31st	March
	30th	June
	30th	September
	31st	December

3.6 Upon satisfactory inspection and certification, the SO shall paint the said equipment with the new colour as noted in paragraph 3.1 and enter in the Register accordingly.

3.7 The SO shall be responsible for ensuring that all equipments are painted with the appropriate colour and an updated register of such equipment kept. If routine monitoring (paragraph nos. 3.3 & 3.4) reveals faults with colour coding then sub-contractors shall inform the SO who will take the appropriate action. If equipment is obviously faulty then it shall be painted red and the sub-contractor be advised to remove it from the Site immediately.

3.8 The colour coding does not evade the Contractor's duty under the Factories & Industrial Undertakings (Lifting Appliances and Lifting Gear) Regulations in examining them every six months by Registered Professional Engineers.

4. Completion/Removal from the Site

4.1 From time to time, or upon completion of his work, a sub-contractor may require to remove equipment from the Site. Such removal shall be notified to the SO for updating the Register.

4.2 Once removed from the Site, if the equipment is then brought back, then it shall be treated as per paragraph 2 above.

Proforma for Monthly Recording Delivery and Consumption of Ultra Low Sulphur Diesel on Site

Contract No.: _____

Contract Title: _____

Name of Person completing the Proforma: _____

Name of Person responsible for audit checking: _____

	Intake			**Consumption**			
Date	**Name of Contractor/ Sub-contractor**	**Details of Ordering Fuel**	**Quantity of Fuel Delivered** (in litre)	**Details of Plant belong to the Contractor/ Sub-contractor**	**Date of Arrival**	**Date of Departure**	**Quantity of Fuel Consumed** (in litre)
		- name of oil company - delivery note no. and reference		- plant name and serial no.			
		Total Delivered				Total Consumed	

[N.B. The total for the month is for checking the relative order of quantity of fuel delivered and consumed on the Site and need not necessarily be balanced.]

Name of Department: **WSD** Contract No.: _____

(The following Waste Flow Table should be used for contracts either not included under the Pay for Safety and Environment Scheme or exempted from the full requirement for environmental management)

Waste Flow Table

Quarter ending	Actual Quantities of Inert C&D Materials Generated Quarterly						Actual Quantities of C&D Wastes Generated Quarterly				
	Total Quantity Generated	Broken Concrete (see Note 3)	Reused in the Contract	Reused in other Projects	Disposed as Public Fill	Imported Fill	Metals	Paper/ cardboard packaging	Plastics (see Note 2)	Chemical Waste	Others, e.g. general refuse
	(in 1000m^3)	(in 1000m^3)	(in 1000m^3)	(in 1000m^3)	(in 1000m^3)	(in 1000m^3)	(in 1000 kg)	(in 1000 kg)	(in 1000 kg)	(in 1000 kg)	(in 1000m^3)
Feb											
May											
Aug											
Nov											
Total											

Notes: (1) The waste flow table shall also include C&D materials that are specified in the Contract to be imported for use at the Site.
(2) Plastics refer to plastic bottles/containers, plastic sheets/foam from packaging material.
(3) Broken concrete for recycling into aggregates.

Review on the Use of Products Containing Volatile Organic Compounds (VOC)

Type: Paints/Inks/others ___ Contractor: _____

Date of Review	Product name	Product Application	Alternative Products Considered	Alternative Designs/Processes Considered	Recommendation	Reviewed by

Sheet No. _____

Records on the Use of Products Containing Volatile Organic Compounds (VOC)

Type: Paints/Inks/others ___ Contractor: _____

Date of Procurement	Product name	Product Quantity (kg)	VOC Content (%)	Estimated VOC Quantity (kg)	Product Application	Alternative Product/Process Required	Recorded by
			Total :				

Sheet No. _____

SAFETY PRECAUTIONS WHEN WORKING IN SEWERS, DRAINS AND OTHER CONFINED SPACE

1. **Responsibility**

1.1 The **person-in-charge** (e.g. foreman or gang leader) of the confined space works appointed by the Contractor and accepted by the Engineer's Representative (ER) shall ensure that —

(a) detailed working procedures and safety precautions are drawn up for the work being carried out;

(b) all workers are provided with adequate training and information on the personal hygiene and health precautions, the use of personal protective equipment etc;

(c) all workers are instructed in the working procedures and safety precautions to be followed;

(d) equipment is provided in sufficient quantities and readily available in serviceable condition at the scene for immediate use so that the working procedures and safety precautions can be followed;

(e) the working procedures and safety precautions are correctly carried out;

(f) the requirements of the Factories and Industrial Undertakings (Confined Spaces) Regulation and other requirements stated in the Contract are strictly complied with;

(g) a DCP is appointed to carry out risk assessment of the working environment and the works to be carried out in the confined space and make recommendations on measures to be taken in relation to safety and health of workers when work is to be undertaken, and he shall not be the certified worker in the same confined space operation;

(h) no workers enter or work in the confined space other than certified workers (For the purpose of this Contract, a certified worker refer to a person who possesses the valid qualification of certified worker pursuant to s.2 and s.4(1) of the Factories and Industrial Undertakings (Confined Spaces) Regulation and simultaneously holds a valid "Certificate for Certified Worker" (person refer to hereinafter as "DCW"));

(i) he shall not act as the Contractor's representative on confined space works or DCP in the same shift of confined space works concurrently;

(j) he shall attend the Site at the commencement of the confined space works and shall not leave the Site until all personnel entering the confined space have left that space and return to the open atmosphere; and

(k) he shall not enter the confined space to carry out any work thereat throughout the period of discharging the duties as "person-in-charge" in the confined space works. He shall arrange the responsible DCP to closely monitor the health and safety of all personnel staying in the confined space.

(l) Should entry of "person-in-charge" into confined space be required due to works management purpose, prior agreement shall be sought from Employer vide the Engineer and suitable arrangement should be made by the Contractor to the satisfaction of Employer in such manner that the responsibilities of "person-in-charge" stated in the above sub-clauses (a) to (j) will not be sacrificed due to his/her absence outside the confined space. During the entry of "person-in-charge " into confined space, the DCP shall be kept stationing outside the confined space. The time of entry/leave in each confined space by the "person-in-charge" shall be timely registered in a logsheet for subsequent auditing. For the avoidance of doubt, the entry of "person-in-charge" into the confined space is limited to ad-hoc (not full time) supervision, inspection, checking, verification of the progress/condition of work in confined space and handing-over of the works thereat. Simultaneous entry/staying of the responsible DCP and the "person-in-charge" within the confined space shall not be NOT allowed unless the Safety Officer is present at the entrance of confined space to oversee and monitor the health and safety of all personnel staying in that confined space. The "person-in-charge" entering the confined space shall hold a valid DCW certificate, comply with all necessary confined space safety requirements as stated in the contract and risk assessment for that shift of confined space works concerned, and shall not perform the works of certified workers during his/her period of stay in that confined space.

1.2 The **DCP** shall –

(a) attend the Site and shall not leave this Site until all persons entering the confined space have left that space and return to the open atmosphere;

(b) have sufficient knowledge and experience in supervising the work in confined space appointed by the Contractor and accepted by the ER;

(c) carry out risk assessment of the working environment and the works to be carried out in the confined space and make recommendations on measures to be taken in relation to safety and health of workers when work is to be undertaken in compliance with the Factories and Industrial Undertakings (Confined Spaces) Regulation;

(d) not enter the confined space throughout the period of discharging the duties as "DCP" in that operation. Should his/her entry into confined space be required, he/she should designate a competent standby person, who holds a valid DCW certificate, to station outside the confined space throughout the duration of his/her absence outside the confined space to perform the duties of the standby person according to the duties stated in paragraph 1.4 of this Appendix. DCP shall seek prior agreement of both the Contractor's representative and the ER before his/her entry. For the avoidance of doubt, DCP's entry is limited to ad-hoc (not full time) inspection, checking, verification or assessment of the condition in confined space and he/she shall hold a valid DCW certificate, comply with all necessary confined space safety requirements as stated in the contract, and all necessary safety precautions in relation to the hazards identified in the risk assessment pertaining to DCP's entry into confined space have been taken. He/She shall not perform the works of DCWs during his/her period of stay in that confined space. For the avoidance of doubt, a separate risk assessment (not compiled by the DCP intending to enter confined space) and Permit-to-work shall be prepared prior to DCP's entry; and

(e) not act as the person-in-charge or Contractor's representative on confined space works in the same shift of confined space works concurrently.

1.3 The **Contractor's representative on confined space works** (viz. Site Agent or Project Manager) shall —

(a) be directly and wholly employed by the Contractor;

(b) be authorized by the Contractor to endorse the risk assessment and issue / void the Permit for the work to be proceeded in the confined space;

(c) be responsible for determining the continuation / suspension / resuming of confined space operation at the onset of / during / after adverse weather conditions and / or the lowering of adverse weather warning signals;

(d) attend the Site and shall ensure all persons entering the confined space have left that space and return to the open atmosphere;

(e) not enter the confined space throughout the period of discharging the duties as "Contractor's representative on confined space works" in the same shift of confined space works; and

(f) not act as the person-in-charge or DCP in the same shift of confined space works concurrently.

1.4 **Standby person** is responsible for ensuring the safety of all personnel staying in the confined space. He shall —

(a) keep in touch with the personnel staying in the confined space via suitable two-way communication device at reasonable intervals, normally not more than every 2 minutes (Direct calling/shouting is NOT encouraged and the Contractor is required to explore and formulate alternative more effective two-way communication device before the commencement of confined space operation);

(b) ensure the lifelines are holding firmly on a man-lifting tripod, or other lifting equipment approved by the Engineer, pay out and reel in the lifelines as required, so that at all times the lifeline can be used in an emergency;

(c) in the event of a warning being received that working environment is likely to become dangerous, or if they suspect danger themselves, instruct all personnel staying in the confined space to return to the open atmosphere immediately;

(d) hold a valid DCW certificate and be responsible for the lookout for signs of danger including —

(i) sudden increases in flow,

(ii) heavy rain falling in the area or upstream, and

(iii) signs of hot or peculiar smelling discharges;

(e) ensure all confined space including manholes etc. required for ventilation are kept open;

(f) prohibit smoking and ensure that no naked lights, fires and internal combustion engine (diesel generator set) are located near to the confined space openings;

(g) check that all personnel have returned to the open atmosphere on completion of the operation and that all manhole covers are property reinstated;

(h) not act as the person-in-charge of the Contractor's representative; and

(i) not enter the confined space thereat throughout the period of discharging the duties as "standby-person" in the same shift of confined space operation.

1.5 **All persons entering or staying in manholes, sewers, drains and other confined space** should —

(a) hold a valid DCW certificate;

(b) wear adequate protective clothing and safety harness with lifeline;

(c) keep in touch with the standby persons and obey any instructions given by them;

(d) carry a gas detector with them and perform continuous gas monitoring throughout the period of stay;

(e) wear a dead-man type personal alarm, maintaining in active operating mode throughout his/her stay in that space;

(f) place safety chains etc. in manholes where facilities are provided for them, in particular, downstream of the area being worked;

(g) avoid stirring up silt and check frequently for gas when this is unavoidable;

(h) be on the lookout for signs of danger including:

(i) sudden increases in flow,

(ii) signs of hot or peculiar smelling discharges,

(iii) signs of gas shown by the gas detector equipment, and

(iv) tiredness, faintness, headaches;

(i) return to the open atmosphere immediately when the working environment become dangerous or weather condition become worsen;

(j) observe procedures implemented by the person-in-charge of the confined space operation;

(k) observe instructions and advice and have already attended relevant safety training courses for confined space operation; and

(l) make full and proper use of, and forthwith report to the person-in-charge of the confined space operation any fault or defect in, any safety equipment or emergency facilities provided.

2. **Safety Equipment**

(a) Every gang working in manholes, sewers, storm water drains and other confined space must check that they have the following safety equipment readily available in a serviceable condition at the scene in addition to normal working tools —

- sufficient number of gas detection apparatus (At least 1 no. of gas detection apparatus shall be carried into the confined space to continuously monitor the atmosphere therein.)

- 1 No. of dead-man type audio-visual personal alarm for each person, maintaining in active operating mode throughout his/her stay in that space, for each person entering the confined space to alert those staying outside.

  (WARNING: The dead-man type personal alarm emits "rescue signal" rather than "warning signal for danger detected". Its major use is for locating the victim in a rescue. The dead-man type alarm shall never be relied upon, whether knowingly or unknowingly, as an alarm of danger detected because serious harm could have already been done to the person wearing it before it is activated.)

- 1 No. of safety harness for each person.

- 1 No. of lifeline for each person, each 15m long.

- 1 No. of man-lifting tripod, or other lifting equipment approved by the Engineer.

- 1 No. of first aid kit.

- 1 No. of crowbar.

- Sufficient sets of spark-proof / explosion-proof lamp or torch.

- soap, antiseptic and an adequate supply of clean water.

- 3 Nos. of safety chains, each 3 m long.

- Other than those to be used by personnel entering the confined space, minimum 1 set of standby approved type of breathing apparatus (BA) shall be ready available at the scene for immediate use at each job location / work front in case of emergency. The nos. of BA required in

each shift of operation should be sufficient to cater for the extent, time to be spent and the nos. of personnel to enter into the confined space.

- Effective wireless and hands-free two-way communication device for establishing clear and uninterupted communications between the workers in the confined space and the supervisors/standby-persons at ground level or entrance of confined space of a type approved by the Engineer. When equipped by the workers in the confined space, such communication device shall not involve modification to the approved type of BA or if modification is required, the modified BA shall have been approved by Labour Department according to the prevailing legislation. The communication device shall be spark-proof/ explosion-proof.

- 1 set of resuscitation equipment.

- 1 No. of mechanical blower.

- 1 No. of stretcher.

- 1 set of fire fighting equipment.

(b) Each workman shall be provided with protective headgear, helmet, goggles, hearing protection, a pair of industrial gloves, rubber boots and other protective clothing as required by the working environment and the nature of the works to be carried out.

(c) The weather condition should be checked and under continuous monitoring by those personnel staying outside the confined space.

(d) CCTV camera shall be set up at manholes or end of pipeline for real-time monitoring of the condition of workers staying in the confined space where direct line of sight between the standby person at the entrance of that space and the person entering that space is impossible.

(e) The Contractor shall note that some of the survey works may involve man-entry into deep manholes with intermediate platforms where the access and line of sight may be hindered. In such case, the Contractor shall devise and implement specific safety measures in order to enable the survey works to be carried out in compliance with the safety requirements for confined space operations as stated in the contract. For example, the Contractor is required to setup one additional tripod at the intermediate platform for rescue. Where the intermediate platform does not provide sufficient space for setting up of tripod, the Contractor may design and construct temporary works / platform to ensure the safe execution of the survey works. For the avoidance

of doubt, if the Contractor fails to provide such specific safety measures resulting in abandonment of survey but the Engineer considers it reasonably practical to do so, the Engineer's acceptance will not be given for the application for abandonment of survey.

3. **General Precautions**

(a) Prohibit smoking, naked lights, fires or internal combustion engine (diesel generator set) located near to any entrance to manholes, drains, sewers or nullahs and only spark-proof / explosion-proof lamp or torch are to be used anywhere below ground level or inside confined space.

(b) Unhealed cuts or scratches, however, must be covered by impermeable plaster.

(c) Any abrasion, scratch or cut, no matter how slight, must be cleaned immediately and dressed with antiseptic gauze and impermeable plaster.

(d) Before eating and after changing clothing, all workers should wash their hands and forearms with soap and water containing disinfectant.

(e) Use caution and common sense at all times.

4. **Precautions Before Commencing Work**

(a) Check that all safety equipment is readily available and in serviceable condition.

(b) Check the position and likelihood of exceptional discharges or any influx of dangerous substances, either vapour/gases or liquid, from factories and other places affecting the area in which the gang is working.

(c) Check that the sewers, drains, manholes, confined space, etc., in which the gang is working, is structurally stable.

(d) Locate the nearest fire station and hospital for summoning assistance in case of an emergency. If man-entry confined space work is carried out at remote / rural areas, the nearest well known scenic spot or public road should be ascertained so that the rescue team can reach the correct spot to conduct the rescue expeditiously.

(e) Ventilate the area to be worked by opening the manhole covers and if necessary by providing forced ventilation. At least one manhole upstream and one manhole downstream of the length of sewer or drain being worked /

inspected should be opened in addition to those on the length being worked / inspected.

(f) All open manholes shall be marked with Danger Notice Boards and guarded at all sides so that vehicles and persons are kept well clear.

(g) Proper temporary traffic arrangement (TTA) and lighting, signing and guarding shall be provided.

(h) Alternative confined space exit point(s) is practicably available and imminently serviceable for evacuation / escape purpose. The location(s) and route(s) to reach these exit point(s) shall be made known to all personnel concerned before the commencement of each shift of man-entry confined space operation. These exit point(s) shall be opened and illuminated throughout each operation.

5. **Before Entering Manholes, Sewers, Drains or Confined Space**

(a) Risk assessment is carried out and prepared by the DCP at the scene of entry which is specific to the prevailing weather, actual working environment and the type, scope and duration of confined space works to be carried out.

(b) Permit-to-work is signed and issued by the Contractor's representative on confined space works (not by DCP or subcontractor) at the scene of entry.

(c) Advance preparation, signing or issue of risk assessment and/or permit-to-work are strictly prohibited.

(d) Standby persons are stationed at the scene of entry and shall attend full time at those points where personnel are entering or leaving a manhole, sewer, drains and other confined space.

(e) After the sewer, drain, manhole and other confined space has been ventilated for a sufficient period, a gas detection apparatus shall be lowered into that space to test whether or not it is safe for personnel to enter/stay.

(f) If working inside conduits is required, a gas detection apparatus shall be placed inside the concerned part of the conduits to test and monitor continuously whether or not it is safe for personnel to enter/stay.

(g) Even though the gas tests indicate safe conditions, if there is a peculiar smell or if there are any suspicious circumstances no one shall enter the sewer, drain, manhole or confined space.

(h) Clean down the manhole shaft and step irons or access ladder.

(i) Check any other works activities being implemented in the vicinity that may affect the safety of the workmen staying inside the sewer, drain, manhole or confined space.

(j) Set up a man-lifting tripod, or other lifting equipment approved by the Engineer, for holding lifelines. The tripod need not sit directly over the manhole or entrance / exit point during the works but must be placed in the vicinity such that it will be ready available for rescue purpose in case of emergency.

6. **In Case of Emergency**

(a) In the event of physical injury, first aid should be given and the injured person must be brought out of the manhole, sewer, drain or confined space as quickly as possible, care being taken not to aggravate the injury. Depending upon the seriousness of the injury, the person-in-charge must decide whether medical or other assistance is required.

(b) In the event of a person collapse in the sewer, drain, manhole or confined space, any personnel with him/her must warn the standby person(s) stationed outside the confined space and unless they are able to drag the casualty clear at once, leave the sewer, drain, manhole or confined space as quickly as possible.

(c) NO FURTFER RESCUE ATTEMPT SHOULD BE MADE WITHOUT BREATHING APPARATUS and help must be summoned AS QUICKLY AS POSSIBLE by dialing 999 and asking for life rescue.