**MEMO**

From Secretary for Development
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Date 28 December 2021

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Construction Site Safety Manual

**Control on Works in Confined Space
 in Connection with/in the Vicinity of Underground Pipework,
 Drainage/Sewage Manholes/Chambers or Structures Alike**

This memo is to promulgate new particular specification (PS) clauses to enhance the control on works in confined space in connection with or in the vicinity of underground pipework, drainage or sewage manholes or chambers, or structures alike (hereinafter referred to as “the Confined Space Works”), with a view to further improving the control and safety of working therein. The new PS clauses are attached at **Annex A** of this memo.

Effect on Public Works Contracts

2. The new PS clauses shall be incorporated in all public works contracts (including capital works contracts and maintenance contracts) of which the tenders are to be invited **on or after 28 January 2022**. For public works contracts to be tendered before 28 January 2022, the project officers are strongly encouraged to incorporate the new PS clauses as far as reasonably practicable. For existing public works contracts, the contract administrators are encouraged to explore the feasibility on implementing the measures described in the PS clauses at Annex A with the Contractor. Taking into account the circumstances of individual public works contracts, the measures relevant to the existing public works contracts should be adopted as far as reasonably practicable.

Supervision on Confined Space Works

3. On the supervision of Confined Space Works by the Resident Site Staff (RSS), irrespective of contracts supervised by in-house resources or managed by the consultants, the Engineer’s Representative (ER) shall appoint a member/members of staff having the qualification of Competent Person (CP)

[who possessed the valid qualification of competent person pursuant to s.2 and s.4(2) of the Factories and Industrial Undertakings (Confined Spaces) Regulation] or Designated Competent Person (DCP)¹ to check the setting up of the Confined Space Works before allowing works to commence. The checking shall be carried out together with the person-in-charge of the Contractor and includes the following –

- (i) Whether the Contractor, subcontractors and workers have fulfilled the statutory duties under the Factories and Industrial Undertakings (Confined Spaces) Regulation; and
- (ii) Whether the Contractor has implemented and maintained effective enhanced control measures on Confined Space Works as stated in the new PS clauses.

Safety Training for Personnel Involved in Confined Space Works

4. The new PS clauses provide the safety training required for various site personnel involved in Confined Space Works. In addition, the RSS supervising the Confined Space Works shall be a CP or DCP. Works Departments, consultants and contractors are appealed to arrange the prescribed safety training to these site personnel as soon as reasonably practicable.

5. In this connection, Table 2 of Appendix 4.8 of the Management Handbook for Direct Employment of Resident Site Staff by Consultants for Public Works Projects (“hereinafter referred to as “RSS Management Handbook”) enumerating the list of specified safety training courses for RSS has been updated and attached at **Annex B** of this memo.

6. Upon promulgation of the new PS clauses and the above enhanced measures, it is anticipated that there would be a surge in demand for the courses “Confined Space Safety Training Course for Certified Workers Engaged in DSD’s Works” and “Confined Space Safety Training Course for Competent Persons Engaged in DSD’s Works” currently run by the Construction Industry Council (CIC). We have informed the CIC to allocate resources to cater for the surge in demand. Nevertheless, the RSS and site personnel who would be involved in the Confined Space Works are encouraged to complete the aforementioned mentioned courses as soon as reasonably practicable.

¹ DCP is a competent person who possesses (a) the valid qualification of competent person pursuant to s.2 and s.4(2) of the Factories and Industrial Undertakings (Confined Spaces) Regulation; and (b) completed the 1-day “Confined Space Safety Training Course for Competent Persons Engaged in DSD’s Works” run by the Construction Industry Council and obtain a certificate.

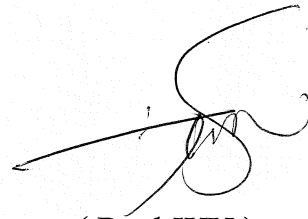
Incorporation into Manuals/Handbook

7. The above updates would be incorporated in the Construction Site Safety Manual and the RSS Management Handbook in their next updating exercise.

8. Please bring this memo to the attention of the project officers who are responsible for preparation of tenders for public works contracts and the project officers, consultants and resident site staff supervising public works contracts.

Enquiries

9. Any enquiries on the above should be addressed to Mr LEE Man-yiu, Assistant Secretary (Works Policies 5) 5 at 3509 8305.

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(Paul WU)
for Secretary for Development

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**Particular Specification on
Control on Works in Confined Space in Connection with/in the Vicinity of
Underground Pipework, Drainage/Sewage Manholes/Chambers or Structures
Alike**

The following PS Clauses applies 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.

A. Safety Training

- (1) (a) 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)”.
- (b) 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”**.
- (c) For workers having both the qualifications of a CP and CW as stated in

sub-clause (a) and (b) above, they shall be taken as workers having the qualification of a CP only for the purpose of this PS Clause and the relevant provisions in this PS Clause shall apply.

- (d) The provisions in this PS Clause 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 this PS Clause and the relevant provisions in this PS Clause shall apply.

B. Further Requirements

- (1) (a) 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” (at in **PS Appendix [X]**) 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.
- (b) 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 1 300mm 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.
- (c) 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.

- (d) The 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.
- (e) 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.
- (f) 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.
- (g) 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.

- (h) The Contractor shall not allow work to proceed in a confined space unless all pre-entry requirements as mentioned in this clause and **PS Appendix [X]** 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.
- (i) 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.
- (j) 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.
- (k) 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.
- (l) 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.
- (m) 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.
- (n) The Contractor shall ensure that –
 - i) 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

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

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.

(The following sub-clause shall be included in the tender document if it is considered that the “person-in-charge” will have genuine need to enter into confined space)

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 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 PS 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 or 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 uninterrupted 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 sub-contractor) 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 FURTHER 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.

Appendix 4.8 –**List of Specified Safety Training Courses for RSS****Table 1 - Basic Safety Training**

Rank	Course Title	Course Content	Duration	Organizers*
<u>Professional Staff</u> PRE, CRE, SRE, RE, ARE, CRA, SRA, RA, ARA <u>Technical Inspectorate</u> RCTO, RSIOW, RIOW, RAIOW, RSCOW, RCOW, RACOW	(1) Safety training course for site management staff	<ul style="list-style-type: none"> - Safety legislation and safety management techniques - Risk assessment and safety inspection 	27 hours	OSHC CIC
	OR	<ul style="list-style-type: none"> - Accident investigation and accident prevention - Safe design, construction and design management - Work safe behaviour and safety climate index 		
	appropriate refresher course by OSHC/CIC as refresher training at 5-year intervals^			
	(2) #Construction industry safety card course (Green Card)	<ul style="list-style-type: none"> - General duties of employers and employees - Potential hazards of construction works - Accident prevention 	8 hours	CIC
	OR			
	Construction industry safety card revalidation course	Ditto (only for holders of Green Cards which validity period of 3 years expires)	3.5 hours	OSHC CIC

Rank	Course Title	Course Content	Duration	Organizers*
<u>Supervisory Staff</u> RWSI, RWSII	(1) Safety & health supervisor (construction) course/ Construction safety supervisor course (N.B.: This course is recognized to be exempted from the Green Card Course. However, course participant has to attend the revalidation course after expiry of his/her Green Card)	<ul style="list-style-type: none"> - Basic safety management - Basic accident prevention - Basic occupational health - Construction safety 	43 hours	OSHC/ CIC
	OR Enhancement course for safety supervisors (construction)/ Construction safety supervisor enhancement course by OSHC/CIC as refresher training at 5-year intervals^^	<ul style="list-style-type: none"> - Recently amended/added occupational safety and health legislations - Contractual safety requirements for public work projects - Introduction to safe working cycle - 5S for good housekeeping in workplaces - Risk assessment, safety inspection and accident investigation - Role of safety supervisors in safety audit and safety review 	12 hours	LD

Rank	Course Title	Course Content	Duration	Organizers*
	(2) Marine construction works supervisor safety course [For those whose works involve marine construction only]	<ul style="list-style-type: none"> - Overview of legislative provisions on marine construction - General shipboard safety & safe working environment - Safe working practices in marine construction - Safe material and equipment handling - Safe use of machinery, equipment and appliances - Emergency preparedness 	2 days	MSTI CIC

Rank	Course Title	Course Content	Duration	Organizers*
<u>Others</u>				
(a)Engineering survey staff: SRLS, RLS, ARLS, RPSO(E), RSSO(E), RSO(E)	(1)#Construction industry safety card course (Green Card) Or Construction industry safety card revalidation course	- General duties of employers and employees - Potential hazards of construction works - Accident prevention	8 hours	OSHC CIC
(b) Quantity survey staff: RSQS, RQS, ARQS, RPSO(Q), RSSO(Q), RSO(Q)	(2) Blue Card shipboard safety training course [For those who work on board for a barge or ship only]	Ditto (only for holders of Green Cards which validity period of 3 years expires)	3.5 hours	OSHC CIC
(c)Landscape architectural staff: SRLA, RLA, ARLA, RSFO, RFOI, RFOII		- Overview of legislative provisions - General shipboard safety - Safe cargo handling operation - Safe use of cargo handling equipment	1 day	MSTI CIC
(d)Technical officer staff: RPTO, RSTO, RTO				
(e)Resident Artisan, Resident Chainman, Resident Laboratory Assistant				

Abbreviations:

CIC	Construction Industry Council
MSTI	Maritime Services Training Institute
OSHC	Occupational Safety and Health Council

Notes:

- * The list of organisers may not be exhaustive and there can be additional accepted organisers.

- ^ The refresher course is only applicable to those who have completed the safety training course for site management staff.

- ^^ The enhancement course is only applicable to those who have completed the safety & health supervisor (construction) course / construction safety supervisor course.

- # Not required if the staff are members of professional institutions who have satisfied the Commissioner for Labour (C for L) in respect of Section 6BA(4) of the Factories and Industrial Undertaking Ordinances; or have completed the “Multi-media Self-learning Package for Construction Industry Safety Card Course” and obtained a “Green Card” from CIC, any other course considered equivalent by C for L such as safety course for graduate engineers, construction safety officer course, construction safety supervisor course, assistant safety officer course organised by CIC.

Remark:

This table may be further modified by the Consultant for consideration by the managing department to suit the specific project needs if appropriate.

Table 2 - Safety Training for Works Involving Special Risks

Types of works involving special risks	Course Title	Content	Duration	Organizers*
Work in confined spaces	(1) Competent persons working with confined spaces N.B. RSS shall receive refresher training at 3-year intervals	- Regulations relating to confined spaces - Potential hazards - Risk assessment and control measures - Use of personal protective equipment and rescue equipment	2 days	Organizers in LD's approved list
	(2) Confined Space Safety Training Course for Competent Persons Engaged in DSD's Works	- Review of regulations and case study - Particular hazards of DSD's works - Risk assessment and permit-to-work - Handling of emergency situations	1 day	CIC
	N.B. RSS shall receive refresher training at 3-year intervals			
	(23) Certified workers working in confined spaces N.B. RSS shall receive refresher training at 3-year intervals	- Regulations relating to confined spaces - Potential hazards - Use of personal protective equipment and rescue equipment	1 day	Organizers in LD's approved list

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	<p>(4) Confined Space Safety Training Course for Certified Workers Engaged in DSD's Works</p> <p>N.B. RSS shall receive refresher training at 3-year intervals</p>	<p>- Review of regulations and case study</p> <p>- Particular hazards of DSD's works</p> <p>- Use of personal protective equipment and self-survival equipment</p>	1 day	CIC
Work on or near roads/highways	Safety at road works	<p>- Legislative requirements</p> <p>- Traffic signs for use at road works</p> <p>- Arrangement of signs at road works</p> <p>- Planning for road works</p> <p>- Procedures during road works</p>	3.5 hours	OSHC
Work with asbestos	Safe handling of asbestos	<p>- Regulations relating to control of asbestos</p> <p>- Potential hazards</p> <p>- Preventive measures</p>	24 hours	OSHC

Types of works involving special risks	Course Title	Content	Duration	Organizers*
Noise assessment	Certificate of competence in workplace noise assessment	<ul style="list-style-type: none"> - Legal requirement - Basic acoustics and effects of noise on human beings - Procedures for measuring noise - Hearing protection 	24 hours	OSHC
Manual handling	Certificate of competence in manual handling	<ul style="list-style-type: none"> - Legal requirement - Preliminary assessment - Related anatomy and physiology - Risk assessment - Prevention and protection measures 	12 hours	OSHC
Use and handling of chemicals	Safe handling of chemicals	<ul style="list-style-type: none"> - Hazards of chemicals - Labelling of chemicals - Use of personal protective equipment 	3.5 hours	OSHC
Work in dusty environment	Pneumoconiosis and its preventive measures	<ul style="list-style-type: none"> - Pneumoconiosis and its prevention - Health effects of pneumoconiosis - Respiratory protection equipment - Pneumoconiosis (Compensation) Ordinance 	1 day	Pneumoconiosis Compensation Fund Board

Abbreviations:

CIC Construction Industry Council

OSHC Occupational Safety and Health Council

LD Labour Department

Notes:

1. The above safety training courses are applicable to RSS responsible for supervising works involving special risks.
2. The above-listed safety training courses are not exhaustive. The Consultant shall determine if it is necessary for its RSS to attend other safety training courses appropriate to the specific project needs and seek approval from the managing department.
- * The list of organizers may not be exhaustive and there can be additional accepted organizers.

Remark:

This table may be further modified by the Consultant for consideration by the managing department to suit the specific project needs if appropriate.

Table 3 - Record of Safety Training for RSS

For period from _____ to _____

Consultancy Agreement No. & Title _____

Contract No. & Title _____

Name of staff	Rank / Post	Date of Employment	Safety training/refreshers course attended	Date of attendance	Safety training/refreshers course yet to be attended	Proposed date of attendance	Remarks

Record prepared by _____ (Name & post in block letters)
 _____ (Signature & date)
 _____ (Contact telephone no. & email)