Suruhanjaya Tenaga
Energy Commission

GUIDELINES ON

LPG STORAGE SYSTEM SAFETY FOR IN-SITU CYLINDERS FILLING

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Registration record

REGISTRATION NO.	REVISION DATE	REMARKS

Suruhanjaya Tenaga
Energy Commission

GAS SUPPLY ACT 1993

[*Act 501*]

GUIDELINES ON LPG STORAGE SYSTEM SAFETY FOR IN-SITU CYLINDERS FILLING

GP/ST/No.64/2026

IN exercise of the powers conferred by section 37C of the Gas Supply Act 1993 [*Act 501*], the Commission issues the following guidelines:

Citation and commencement

1. These guidelines may be cited as the Guidelines on LPG Storage System Safety for In-Situ Cylinders Filling.

2. These Guidelines shall come into operation on the date of the registration of these Guidelines.

Purpose

3. The purpose of these Guidelines are to establish the principles, roles and responsibilities, and safety requirements for in-situ refilling of LPG cylinder that connected to common filling pipe at commercial and residential premises.

Dated: 15 May 2026

SITI SAFINAH BINTI SALLEH
Chief Executive Officer
Energy Commission

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1. OBJECTIVES

1.1 These Guidelines are issued by the Commission with the following objectives:

(a) to ensure that the storage of Liquefied Petroleum Gas (LPG) for in-situ cylinders filling at commercial or residential premises comply with the requirements stipulated in the Act and the subsidiary legislations made under it and any relevant standard;

(b) to be a reference for any person interested or involved in the construction of the LPG Storage System at commercial or residential premises in Peninsular Malaysia and Federal Territory of Labuan;

(c) to facilitate the competent person in matters related to LPG Storage System;

(d) to support the sustainability of the industry by enabling the use of an alternative fuel and providing new growth opportunities aligned with the growing trend of adopting small-scale LPG solutions in Peninsular Malaysia and Federal Territory of Labuan;

(e) to control and manage hazards arising from the installation of LPG storage system at commercial or residential premises; and

(f) to promote the standardization of equipment specifications and installation for the LPG storage system and associated facilities.

2. APPLICATION OF THE GUIDELINES

2.1 These Guidelines shall apply to:

(a) the licensee;
(b) the owner of the installation;
(c) the competent person;
(d) the gas contractor working on the installation;
(e) the assembler, manufacturer or importer of the gas fittings and equipment accessories;

who are involved in the installation, operation and maintenance of in-situ refilling of LPG storage system.

2.2 These Guidelines shall apply to any LPG storage system with the following conditions:

(a) cylinder is installed at the fixed location of the premises;
(b) cylinder capacity shall be 50kg cylinder designed for liquid filling; and
(c) cylinder are connected directly by hose to the LPG piping system fitted with a common filling pipe used in dwelling are filled on site from a road tanker.

2.3 These Guidelines are not intended in any way to circumvent the application of obligations or requirements under any other written law or standards. Parties relying on these Guidelines are advised to obtain independent advice on the applicable of the same to their equipment or installations.

3. DEFINITIONS AND INTERPRETATION

3.1 In these Guidelines, unless the context requires, the definition of terms are as follows:

Terms	Definition
Act	means the Gas Supply Act 1993 [Act 501];
API	means American Petroleum Institute;
ASTM	means American Standard Testing Material;
ATI	means an approval to install issued pursuant to Regulation 15 of the Gas Supply Regulations 1997;
ATO	means an approval to operate issued pursuant to Regulation 16 of the Gas Supply Regulations 1997;
Commission	means Suruhanjaya Tenaga;
competent person	has the same meaning assigned to it under the Act;
content gauge	means a device typically incorporating a liquid level gauge that indicates the amount of LPG contained in a cylinder expressed as volume percentage and used to verify available capacity during refilling activities;
filling pipe	means a pipe that branching off from the main pipe into individual cylinder that used for in-situ filling;
cylinder	means an LPG cylinder with capacity of 50kg which is used for in-situ filling that specifically designed and fitted for the purpose of filling by road tanker but

	excludes cylinders connected direct by hose for use in domestic dwelling;
DOSH	means the Department of Occupational Safety and Health;
filling hose	means a flexible connector used for connecting the individual isolation valve attached to a filling pipe and the in-situ cylinder;
gas contractor	has the same meaning assigned to it under the Regulations;
in-situ	means "locally", "on site", "on the premises", or "in place" where the refilling activities are carried out;
individual isolation valve	means a ball valve installed before the flexible connector on a filling pipe for isolation purposes;
licensee	has the same meaning assigned to it under the Act;
LPG	means liquefied petroleum gas;
LPG storage system	means a system that is used to store cylinders which specifically designed and fitted with filling pipes for the purpose of liquid filling by road tanker at a premises;
LPG supplier	means a company holding a valid Licence to manufacture scheduled controlled goods issued by the Ministry of Domestic Trade and Cost of Living (KPDN) under the Control of Supplies Act 1961 and Control of Supplies Regulations 1974;

main isolation valve	means a ball valve installed after the filler valve on a filling pipe for isolation purposes;
manifold	means a manifolded group of cylinders. It is a collection of cylinders, inclusive of standby, connected to a central piping that is connected to a regulator;
Malaysian Standards	means standards issued by the Department of Standards Malaysia or its successors or as assigns;
multi-service valve	means a valve that incorporates two or more service functions such as vapor withdrawal, liquid withdrawal, filling, or pressure relief applications, and that meets the combined requirements of the individual functions;
premises	means a building that is used for residential and commercial;
Permit To Work (PTW)	means Permit to Work which refers to the written permission to carry out specific works and which will specify how such works will be carried out as well as verify them;
refilling activities	means the transfer of liquid LPG from a road tanker to the cylinders involves connections and disconnections in the refilling system;
relevant ministry	means the ministry that in charge for Gas Supply License;
Regulations	means the Gas Supply Regulations 1997, [*P.U.(A)*287/1997];

responsible person	has the same meaning assigned to it under the Regulations;
road tanker	means a road tank vehicle which is used for the transportation of LPG that used to fill cylinders
transfer personnel	means a person who transfer and transport liquid LPG as specified under section 1.6, MS 830: 2021;

3.2 Subject to paragraph 3.1 and unless expressly indicated to the contrary or unless the context otherwise requires, the terms adopted and used in these Guidelines shall bear the same meaning as they are defined in the Act and its subsidiary legislations made under it.

4. REGULATORY REQUIREMENTS

4.1 Design Approvals and Licenses

(a) The owner of the LPG storage system shall obtain:

(i) prior to the installation works, an Approval to Install (ATI) from the Commission.

(ii) upon completion of the installation, an Approval to Operate (ATO) from the Commission; and

(b) Any person shall apply and obtain a licence in accordance with section 11 of the Act for the purpose of supplying gas through the LPG storage system.

(c) The owner of LPG storage system shall appoint:

(i) the LPG supplier and ensure that such LPG Supplier complies with these Guidelines; and

(ii) responsible person with sufficient knowledge to perform its obligation during operation of the LPG storage system.

4.2 Obligation of Gas Contractor, Competent Person and Responsible Person

(a) The gas contractor shall:

(i) be responsible for the design, installation, testing, commissioning and operation of the LPG storage system; and

(ii) appoint a competent person to carry out or supervise any work in relation to the design, installation, testing, commissioning and operation of the LPG storage system.

(b) The competent person shall:

(i) carries out or supervises any work in relation to the design, installation, testing, commissioning and operation of the LPG storage system;

(ii) for the purpose of standard operation of any equipment, complies with any requirements specified in any written law in Malaysia; and

(iii) in the absence of prescribed standard operation of any equipment referred in paragraph 4.2(b)(ii) above, complies with the manufacturer's recommendations relating to the standard operation of the equipment.

(c) A responsible person shall:

(i) be in charged of the LPG storage system in the premises;

(ii) conduct regular inspections on the LPG storage system; and

(iii) ensure that the LPG storage system is free from any gas leakage.

4.3 **Compliance with Other Written Law**

(a) The owner of the LPG storage system, licensee, gas contractor and competent person shall:

(i) ensure any installation and equipment used in the LPG storage system is certified by the relevant authority in accordance with any applicable written law, regulations and industry standards; and

(ii) comply with any regulatory requirements issued by the relevant authority having jurisdiction.

(b) The LPG supplier shall:

(i) hold a valid licence to manufacture scheduled controlled goods issued by KPDN under the Control of Supplies Act 1961 and Control of Supplies Regulations 1974 and are permitted to carry out in-situ refilling of 50kg LPG cylinders; and

(ii) appoint a transfer personnel that deems fit to carry out in-situ refilling of LPG cylinders with sufficient technical and safety knowledge for LPG refilling activities in line with the latest engineering practice or technologies.

(c) The transfer personnel appointed by LPG supplier shall:

(i) conduct in-situ refilling of LPG cylinders activities in accordance with tha established refilling procedures by the LPG supplier in a safe manner; and

(ii) display his competency identification in the form of identification card or any form of identification as deemed appropriate by LPG supplier throughout the in-situ refilling of LPG cylinder activities.

5. DESIGN AND TECHNICAL REQUIREMENTS

5.1 Pre-Requisite

Prior to the application of ATI and ATO, the competent person appointed by the owner of the LPG storage system or gas contractor shall:

(a) ensure the compliance of Guidelines for Hazard Identification, Risk Assessment and Risk Control (HIRARC) issued by the DOSH; and

(b) conduct layout analysis for the purpose of installation of LPG storage system.

5.2 LPG Cylinder Requirements

The LPG cylinder used for in-situ refilling shall comply with the relevant codes and be approved by the DOSH. The cylinder shall be fitted with the following minimum requirement:

(a) a filler valve;

(b) a liquid level gauge that indicates maximum filled reading 85%;

(c) an overfilled prevention device that stops the filling at 85% or a device that able to indicates the maximum filling level at 85% of the cylinder's water capacity;

(d) a pressure relief valve; and

(e) a service valve for liquid application, vapour application or both.

A multi service valves may be used to to provide multiple service functions specified in paragraph 5.2, where applicable.

5.3 LPG Filling Connection Requirements

5.3.1 The filling connections shall be:

(a) provided with a double non-return valve;

(b) adequately protected against vehicle damage and tampering by unauthorized persons; and

(c) easily accessible.

5.3.2 The location of the filling connection shall be:

(a) at the edge of the LPG storage fenced area; and

(b) at a safe position that allows readily connect and disconnect during normal operation and emergencies.

5.3.3 The safety distance for the filling connection shall be:

(a) not less than 1 m horizontally from any opening into a building that is lower than the filling connection;

(b) not less than 4.5 m to a fixed ignition source;

(c) not be less than 2 m to any underground entrance; and

(d) not less than 1.5 m from road tanker for the purpose od refilling activities.

5.4 LPG Filling Pipe Requirements

The filling pipe for the purpose of receiving LPG from a road tanker shall comply with the following requirements:

(a) Filling pipe material shall be:

(i) a carbon steel ASTM A 106 or API 5L Grade B or any other equivalent recognized standards;

(ii) a seamless type; and

(iii) material with a minimum grade of Schedule 80 in accordance with ASME B36.10M.

(b) The filling pipe shall be equipped with:

(i) a main isolation valve on filling pipe;

(ii) an individual isolation valve from each filling hoses from filling pipe to the cylinder;

(iii) a hydrostatic relief valves where liquid may be trapped between shut off valves on the filling pipe; and

(iv) a pressure gauge to indicate the LPG pressure in the filling pipe;

(c) The filling pipe shall be fitted with proper pipe fittings for any changes in the direction;

(d) The filling pipe shall be adequatly supported to stand the load of the pipes and any vibrations created while refilling activities is in progress.

(e) All types of connections such as flanged and threaded shall minimized to reduce potential leak sources and comply with MS930 or any equivalent recognized standard.

(f) The height of filling pipe from finished floor shall not be more than 2.0 m;

(g) The length of hoses connection from filling pipe to cylinder shall not be more than 1 m;

(h) All welding works shall be performed by a certified welder. Welding joints shall be minimized where practicable;

(i) All piping systems shall not be in contact with any electrical cables or material that may generate sparks; and

(j) A bonding connection provided at the filling pipe to equalize the potential between road tanker and common filling pipe, prior to commencing the refilling activities.

5.5 LPG Storage Location and Minimum Safety Distances

The owner of the LPG storage system or the gas contractor, as the case may be, shall:

(a) ensure that the location of LPG storage system intended for insitu refilling activities is assessed and certified by a competent person that such location complies with the requirements as an in-situ cylinder refilling location;

(b) ensure that the compliance of the location as an in-situ refilling location re-assessed by a competent person at the intervals not more than twenty-four (24) months, in accordance with the gas installation maintenance reporting requirements.

(c) ensure that the location of LPG storage system is not located within building boundary;

(d) ensure a maximum of two (2) number of manifolds permited with zero distance to a building;

(e) where the installation of manifold cylinders of more than 2.5 kilolitre (kl) in a manifolded group of cylinders, safety distance of 7.5 m shall be provided from a building;

(f) ensure that the location of LPG storage system for the purpose of in-situ filling comply with the minimum safety distances specified in 12.2.1(c) to (q) and 12.2.2 of MS830;

(g) for the purpose refiiling activities by road tanker, ensure to provide a clearance of at least 3.5 m for public accessway shall be provided;

(h) ensure that the LPG storage system are designed to provide sufficient and safe working space the transfer personnel to perform refilling operations; and

(i) ensure that the LPG storage system is fenced and locked to prevent unauthorised access and tempering.

5.6 **Metering**

5.6.1 The metering system of the LPG storage system shall be in accordance with section 19 of the Act and regulations 78,79,80 and 136 of the Regulations for any LPG storage system that is installed for the purpose of retail activity.

5.6.2 The gas meter shall:

(i) be located in a ventilated space;
(ii) be located in a readily accessible locations for inspection, reading, replacement and maintenance;
(iii) be located at least 0.9 m away from any ignition source;
(iv) not be located in areas exposed to physical damage, corrosion, vibration or obstruction;
(v) not be located in area subject to extreme temperatures or conditions exceeding the manufacturer’s specification; and
(vi) be covered and provided at least with Ingress Protection 54 for outdoor installation.

5.7 Safety Signs and Notices

5.7.1 A safety briefing shall be conducted by the licensee or responsible person or a competent person before any individual is allowed to enter the LPG storage system.

5.7.2 Safety signs shall be displayed at conspicuous locations to indicate:

(a) prohibited access to non-public areas by an unauthorized person;

(b) the presence of hazardous areas;

(c) flammable liquid and gas;

(d) prohibition of smoking, open fire, and the use of non-explosion protected electric or electronic equipment including personal electronic devices (e.g. cameras, mobile phones, computers, radios, etc.); and

(e) the contact number of the responsible person and other emergency contacts (e.g. police, fire department), for premises operating on a 24-hours basis, shall be displayed in location readily accessible to public.

5 OPERATION REQUIREMENTS FOR REFILLING ACTIVITIES

6.1 During the refilling activities, the transfer personnel shall—

(a) comply with the operational refilling procedures established by the LPG supplier;

(b) wear PPE and other additional safety gear that are required and suitable in performing LPG refilling activities;

(c) full-time supervised the refilling process until its completion;

(d) ensure the discharge pressure at common filling pipe does not exceed 150 psig; and

(e) ensure the refilling to maximum of four (4) cylinders through common filling pipe at a time but should be limited to a maximum of four (4) cylinders at a time to ensure readily access to the individual isolation valve and content gauge during the refilling process.

7 EMERGENCY RESPONSE

7.1 The owner of the LPG storage system and LPG supplier shall be responsible to:

(a) develop an emergency response plan; and
(b) ensure that the responsible person and transfer personnel receive comprehensive training of emergency response.

7.2 The emergency response plan should revised regularly and kept up to date, be retained on the road tanker and apply to the following emergency situations:

(a) LPG leakage during refilling without fire;
(b) LPG leakage during refilling with fire; and
(c) LPG leakage during normal inspection.

7.3 The owner of the LPG storage system shall ensure that the following information is displayed at the LPG storage area:

(a) valid licence granted in accordance with section 11_B of the Act;
(b) approved isometric piping drawing including the shut-off points of the LPG storage system;
(c) emergency contact numbers of relevant authorities;
(d) emergency contact number of LPG supplier; and
(e) emergency contact number of responsible person.

8 MAINTENANCE REQUIREMENTS

8.1 The licensee shall issue a PTW, authorizing the competent person to carry out maintenance works.

8.2 The competent person shall carry out the maintenance of LPG storage system in accordance with the requirements of the Act and Regulations.

8.3 In the absence of the applicable guidelines or standards for gas fitting, equipment or accessories, the maintenance activities shall be carried out in accordance with manufacturer instructions and recommendations.

8.4 A domestic gas installation shall be checked, tested and certified by a competent person every three (3) years but other gas installations shall be conducted every two (2) years.

8.5 In the absence of the applicable guidelines or standards for gas fitting, equipment or accessories, the maintenance activities shall be carried out in accordance with manufacturer instructions and recommendations.

8.6 Inspection and maintenance records must be verified by a competent person, and retained by the responsible person for reference and audit purposes.

9 PERSONAL PROTECTIVE EQUIPMENT (PPE) AND HAND TOOLS

9.1 The gas supplier shall provide PPE during the refilling activities and maintenance work.

9.2 The PPE shall include but not limited to the following:

(a) full-face shields;

(b) safety helmet;

(c) non-sparking tools;

(d) safety shoes;

(e) portable gas leak detector; and

(f) long sleeve safety jacket.

10 RELEVANT STANDARDS APPLICATION

The relevant standards for the in-situ filling activity are listed below:

STANDARDS	DETAILS DESCRIPTION
MS830 : 2021	Storage, Handling and Transportation of Liquefied Petroleum Gases (LPG) - Code of Practice (Fourth revision)
MS930 : 2017	Installation of Fuel Gas Piping Systems and Appliances - Code of Practice (Second Revision)
MS ISO 22991	Gas cylinders - Transportable refillable welded steel cylinders for liquefied petroleum gas (LPG) - Design and construction
DOT4BW-240	Welded Steel Cylinders made of definitely prescribed Steels with Electric-arc Welded Longitudinal Seam
NFPA 58 : 2020	Liquefied Petroleum Gas Code
EN 13175:2019 + A1:2020	LPG Equipment and Accessories - Specification and Testing for Liquefied Petroleum Gas (LPG) Pressure-Vessel Valves and Fittings
ASME B36.10M	Welded and Seamless Wrought Steel Pipe

APPENDIX A

Standard Safety Signage

(geometric shapes and sizes shall be as per latest version of MS830)

SIGN	MEANING
	Smoking is Prohibited
	Fire, naked light and smoking are prohibited
	Nearby material is a fire risk
	No handphone

APPENDIX B

LIST OF FIGURES

MINIMUM REQUIREMENT FOR GENERAL ARRANGEMENT OF LPG STORAGE SYSTEM

(for illustration only - not drawn to scale)

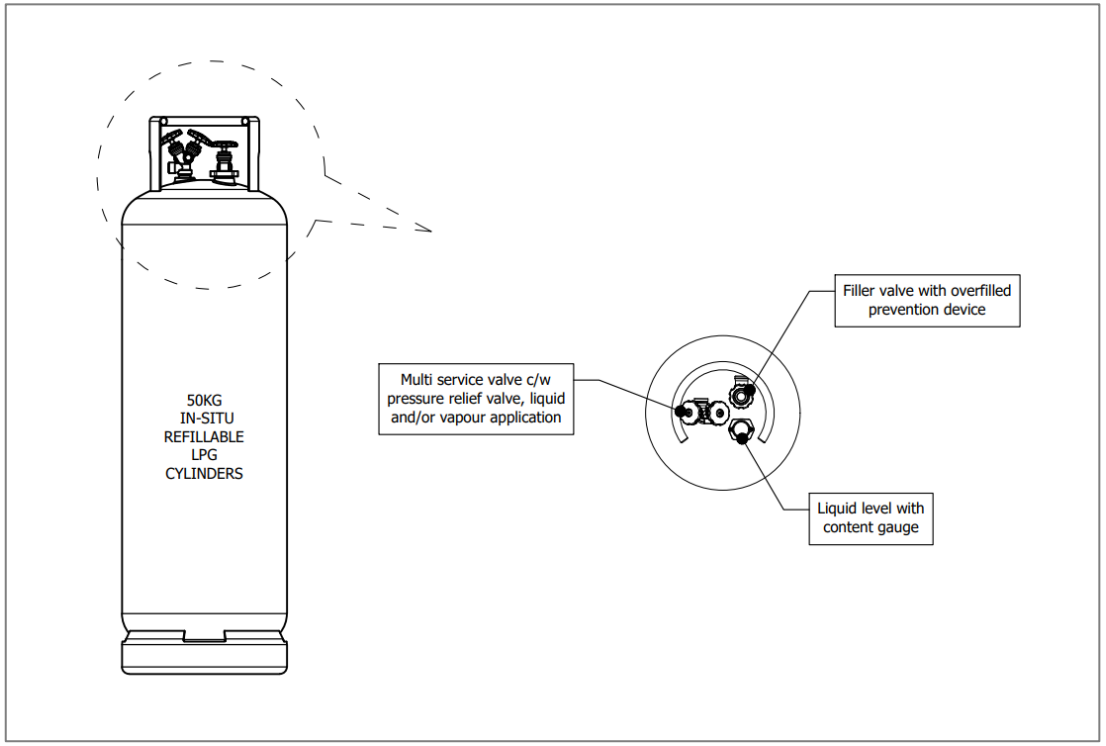

Figure 1: Diagram illustrates typical 50kg in-situ refillable LPG cylinder (front and top view)

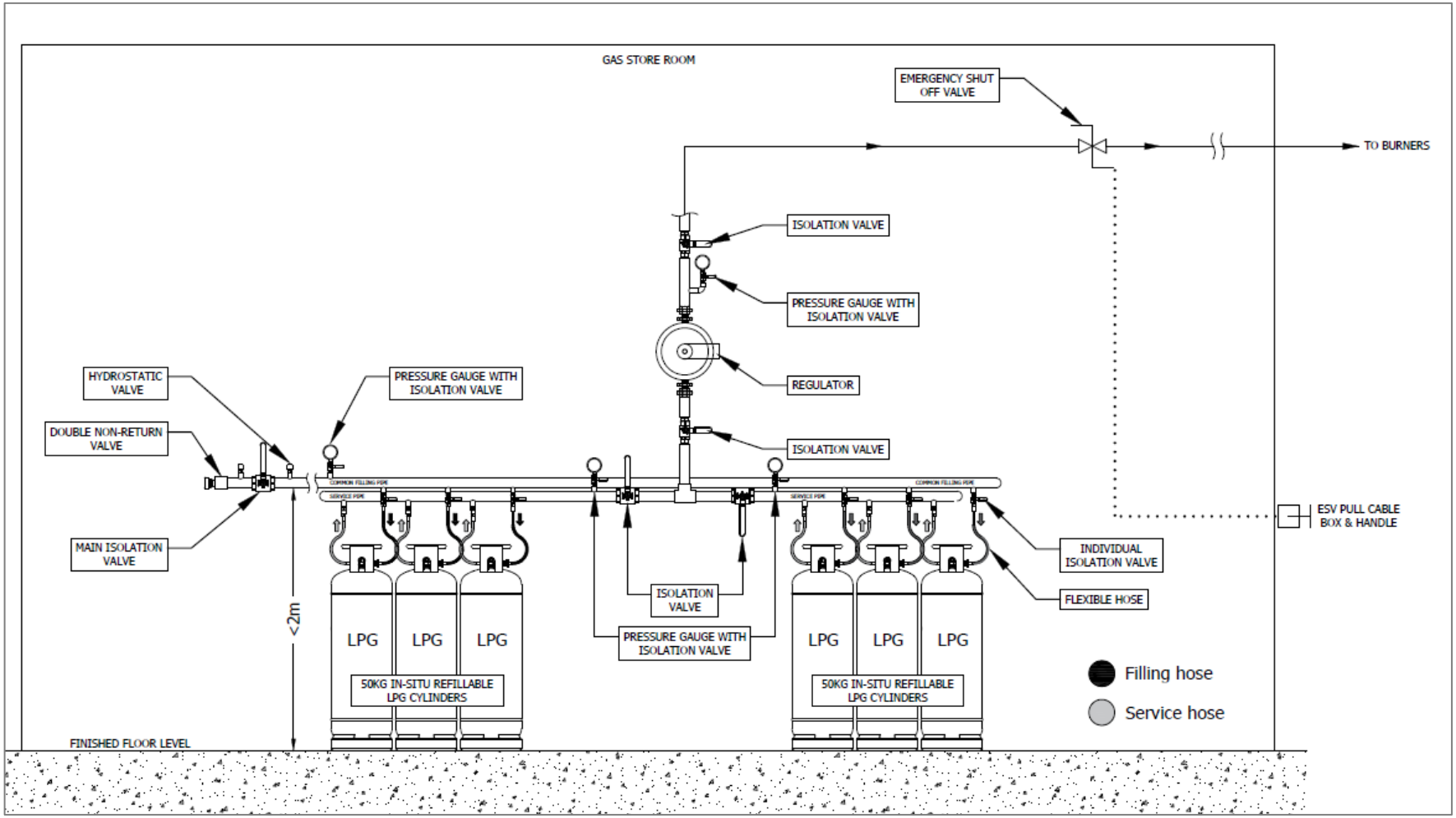

Figure 2: Diagram illustrates in-situ refillable LPG cylinders connected to common filling pipe (front view)

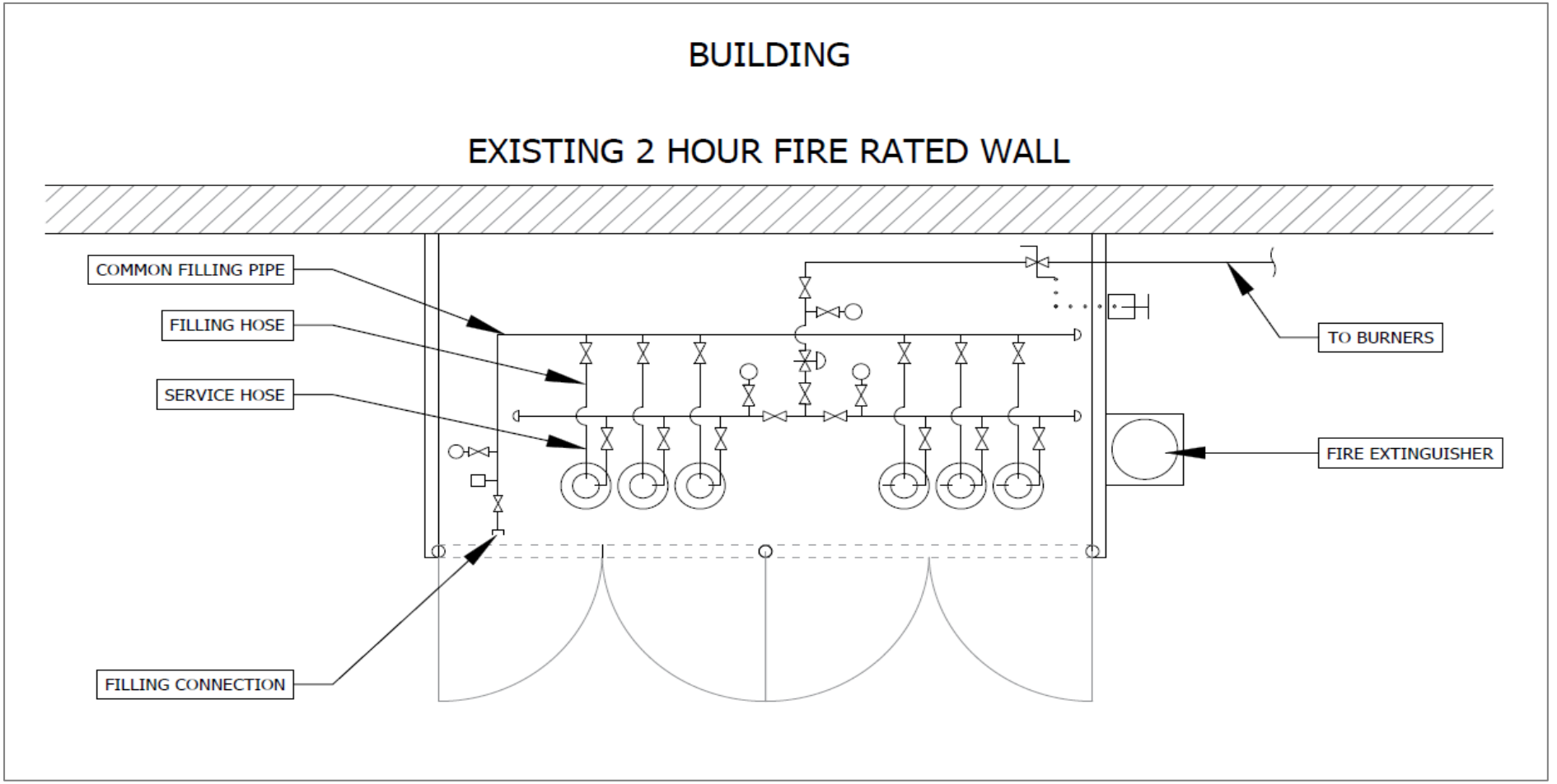

Figure 3: Digram illustrates in-situ refillable LPG cylinders connected to common filling pipe (top view)

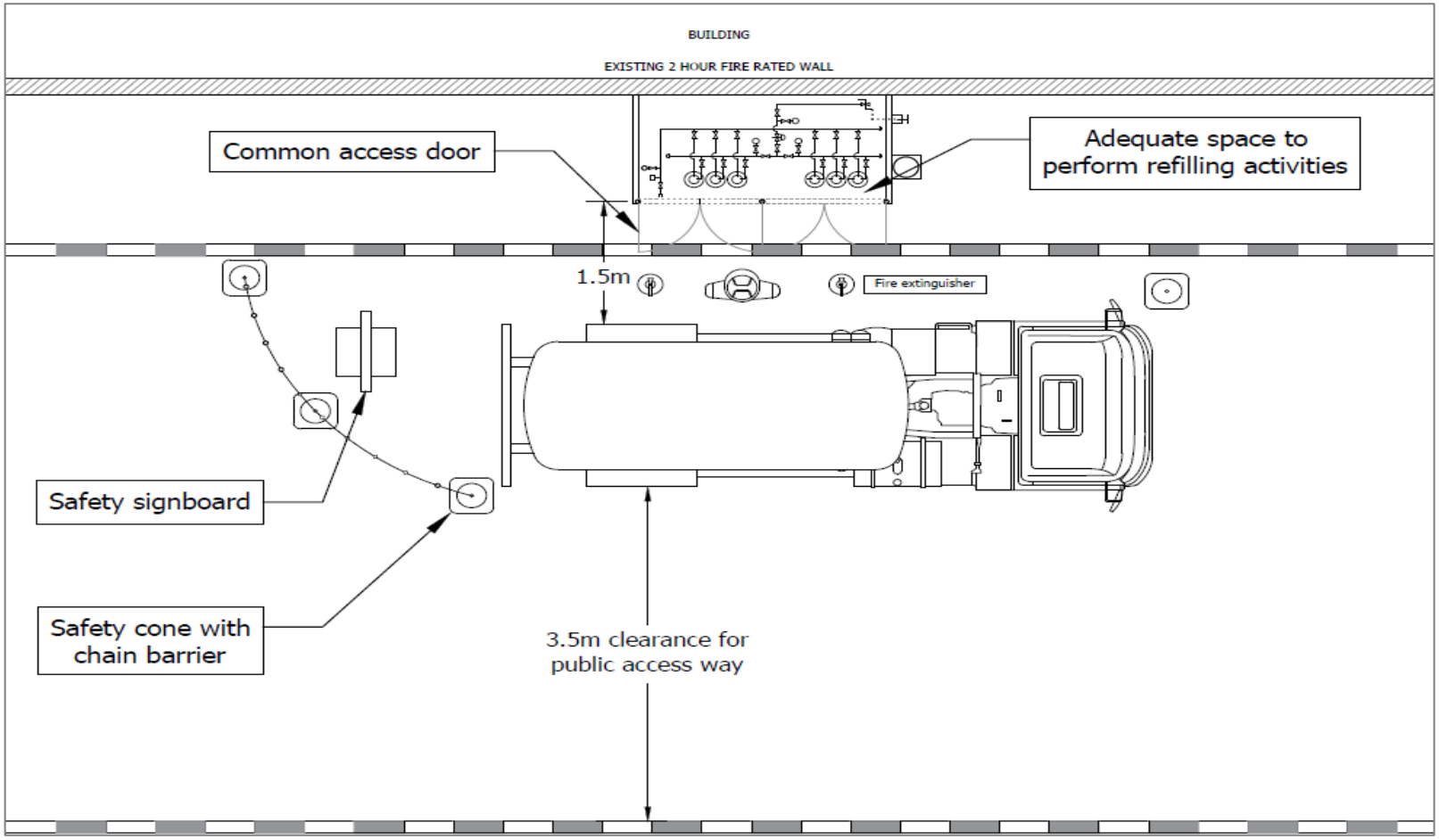

Figure 4: Diagram illustrates the positioning of road tanker while refilling activities

APPENDIX C

COMPLIANCE RE-ASSESSMENT CHECKLIST

COMPLIANCE RE-ASSESSMENT CHECKLIST
FOR IN-SITU FILLING OF 50KG CYLINDER LOCATION

DETAILS OF LOCATION			
Name			
Address			
Premise Category	Launderette / Restaurant / Shopping Complexe / Others:		
Type of Assessment	☐ New Assessment ☐ Re-assessment		
DETAILS OF LPG PIPING SYSTEM (for re-assessment)			
License Number			
ATO Number			
ATI Number			
IN-SITU FILLING OF 50KG LPG CYLINDER LOCATION			
LPG STORAGE:		**COMPLIANT**	**REMARKS**
Located at least zero distance to building or outdoor		Yes / No	
Sufficient and safe working space to perform refilling		Yes / No	
Sufficient ventilation provided		Yes / No	
Fenced and locked safely		Yes / No	
Emergency shut-off valve provided		Yes / No	
Fire Extinguisher provided		Yes / No	
Comply with all safety distance requirement under Section 12.2.1 of MS830		Yes / No	
Clearance of 3.5 m provided for public accessway during refilling		Yes / No	
FILLING PIPE:			
Located at the edge of LPG storage fenced area		Yes / No	
Positioned safely to easy connection and disconnection during refilling		Yes / No	
Filling connection are adequately protected againts vehicle damage and tempering		Yes / No	
Filling connection are easily accessible		Yes / No	
Filling connection provided with double non-return valve		Yes / No	
Filling connection not less than 1 m horizontally from opening into a building		Yes / No	
Filling connection not less than 4.5 m from fixed ignition source		Yes / No	
SAFETY SIGNAGE AND INFORMATIONS:			
Safety signage displayed comprising: (i) "Smoking is Prohibited" (ii) "Fire, Naked Light and Smoking are Prohibited" (iii) "Nearby Material is a Fire Risk" (iv) "No Hanphone"		Yes / No	
Licensed under Section 11, Gas Supply Act 1993 is displayed		Yes / No	
Isometric/Schematic LPG piping drawing (including shut-off points) is displayed		Yes / No	
Emergency contact numbers of relevant authorities are displayed		Yes / No	
Emergency contact number of LPG Supplier is displayed		Yes / No	
Emergency contact number of Responsible Person is displayed		Yes / No	

Remarks: _____

Endorsement by Appointed Competent Person:	**Endorsement by Licensee Representative:**
Signature :	**Signature :**
Name :	**Name :**
Designation :	**Designation :**
Date:	**Date :**
Competency Stamp :	**Company Stamp :**

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