



Requirements and rationale for the acceptance of petrol filling stations located under residential, hotels or commercial property

The requirements cover the safe underground installation and protection of the property, public and persons above the filling station in particular from the road tanker stand, delivery procedure and dispensing of fuel.

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REQUIREMENTS AND RATIONALE FOR THE ACCEPTANCE OF PETROL FILLING STATIONS LOCATED UNDER RESIDENTIAL, HOTELS OR COMMERCIAL PROPERTY

Foreword

The requirements for the safe design, construction, modifications of filling stations is covered in The Blue Book published by the APEA/Energy Institute and this is widely accepted by the industry and also the petroleum enforcing authorities as providing satisfactory guidance for the safe keeping and dispensing of petroleum fuels to the public.

There has however been an increase in the interest to further develop filling stations mainly in urban areas regarding development above the filling station to include offices, hotels or residential accommodation. This guidance provides additional assistance to those designing and approving installations of this type which is not already covered in The Blue Book.

Scope

This document provides guidance on the additional requirements that should be considered when dealing with an application to develop above or very close to a petrol filling station. This includes fire separation between the station and the other accommodation, and means of escape in case of fire or explosion.

Underground Installations

All underground tanks in these developments shall be double wall with Class 1 leak detection.

Each tank chamber shall be provided with liquid sensors (class 3) within the tank chamber

Tanks shall be fitted with overflow prevention devices which are capable of being tested in situ without removal from the tank. In addition there shall be an external warning device which is triggered by the gauge console when it detects a high tank level. The external warning device should consist of high-decibel sounder and large flashing beacon to be positioned so that it is clearly audible and visible by the tanker driver and site staff and suitably labelled 'UNDERGROUND TANK OVERFILL WARNING ALARM' or similar so everyone is clear on what the alarm is signalling.

All underground pipe work shall comply with EN 14125 and be double wall with class 1 leak detection. Suction systems shall be used to serve the dispensers

Tank should be filled by offset fill pipes terminated above ground and tank contents ascertained using suitable contents gauges

Drainage

Drainage to the road tanker stand and the dispensing area shall be provided and designed to retain any spillage on site and any liquid run-off diverted to the separator

Should a major problem occur during delivery, it is now estimated that with one compartment at free flow the loss will be around 1000 litres per minute, it will take between 7 to 8 minutes to empty the largest compartment. The drainage must be designed to accept this flow rate keeping any spillage on the curtilage of the site and direct it to the oil water separator of sufficient capacity (minimum of 9000l)

Pipe Diameter	Fall	Flow Rate
100	1:60	8 litres per second
100	1:80	7 litres per second
150	1:60	25 litres per second
150	1:80	20 litres per second
225	1:80	55 litres per second

An Example

A well designed tanker site with 200mm channel grating surround and 2 discharges x 150mm pipes laid at 1:60 fall will take 3000 litres per minute providing a reasonable safety margin

Requirements for above ground hazards:

Ventilation

1. Site shall be well ventilated, ideally on at least two sides to provide natural cross ventilation.
2. A full hazardous area assessment of the road tanker stand, tank fill pipes, vent pipes shall be made taking account of any reduced ventilation and be agreed with the enforcing authority.
3. The road tanker should ideally be accommodated in an area 15m x 5m for discharging and be located to achieve good natural ventilation and structural

- protection from the building with the ability to drive off the forecourt without manoeuvring.
4. Full vapour recovery stage 1b and stage 2 shall be installed at the site.
 5. The tank vent pipes shall be located to accommodate the hazard zones associated with them. This is usually in the open air, however when sufficient cross ventilation is provided, locations under the roof of the petrol filling station may be considered.

Separation

6. There must be complete separation from all elements of the residential/hotel/commercial accommodation. Minimum of 4hr (usually reinforced concrete structural walls, ceilings, floors etc).
7. There must be adequate means of escape from these areas which shall exit clear of the filling station
8. The maximum possible overhang protection to openings to residential elements of the building in the area above the tanker discharge area to be provided.
9. The tank fill area and road tanker stand may be provided with a suitable wall 4m long and 2m high
10. Ideally a distance of 12m from tank fills to openings of buildings above and 9 meter from dispensers should be planned
11. If this cannot be achieved the design of deflecting architectural features or drenchers shall be used to protect openings.

Fire Protection

12. If the forecourt i.e. dispensing positions/tanker standing area is below residential property or other sleeping risk, the following applies:-
 - Appropriate sprinkler protection to be provided to the dispensing and tanker stand areas.
 - Operation of the sprinklers shall activate an alarm system with adequate sounders that sound both in the forecourt shop/buildings and in the residential property surrounding the petrol filling station.
 - There shall be an easily accessible facility for fire fighters to switch off the sprinklers to aid fire fighting if necessary.

Sprinklers are required to suppress fire/smoke and reduce the likelihood of explosion for the period when evacuation of the residential property would be taking place. This is balanced against the risk of water spreading petrol/fire, and to combat this, there must also be a suitable liquid containment system installed at the site.

Electrical

There is a very real risk of increased electric shock and explosion if the filling station structure is also part of the larger building structure as power is taken from the local electricity supply company it will likely be TNC-S. If there are offices, a hotel or a building with multiple occupancy flats all with their own power supplies there will be conflict with the filling station because of “Common” earthed metal work e.g. the steel structure, metal pipes, ducts and possible sprinkler systems, could even be electrical cables e.g fire system cables or data phone cables between the various premises.

Therefore it is important that Filling Stations should be provided with TT or a guaranteed TN-S earth.

Fire Alarms

13. Fire detection alarm systems shall be provided to the site and also cover the associated buildings

Operational Requirements

14. The site should be manned at all opening times and attended service or attendant self service only shall be permitted.
15. The site shall be closed during the road tanker delivery period

Training

Once a filling station is in operation, site operators are to ensure suitable and sufficient emergency procedures are in place. Such information is to be provided to all staff members and all competent persons are to receive full training to ensure they are able to deal with all accidents, incidents and emergencies.

Consultation

Environmental Health Officers should be consulted regarding vehicle exhaust fumes in poorly ventilated areas

The Fire Authority should be consulted over the fire safety engineering design of the structure and include the components for smoke and heat control systems

Additional Legislation to be considered

- The Electricity at Work Regulations 1989
- The Environmental Protection Act 1990
- The Provision of Personal Protective Equipment Regulations 1992
- The Health and Safety (Signs and Signals) Regulations 1996
- The Confined Space Regulations 1997
- The Management of Health and Safety at Work Regulations 1999
- The Control of Substances Hazardous to Health Regulations 2002
- The Regulatory Reform (Fire Safety) Order 2005
- Environmental Permitting (England and Wales) Regulations 2010
- The Construction (Design and Management) Regulations 2015