Oil & Gas Regulatory Authority

LAYOUT PLANS FOR INSTALLATION OF LPG AUTOGAS STATIONS

1.0 BACKGROUND & INTRODUCTION:

The Federal government in a meeting held on 21st September, 2005 considered the Ministry of Petroleum and Natural Resources summary and approved in principle the use of LPG in motor vehicles, subject to Oil and Gas Regulatory Authority (OGRA) providing a regulatory frame work ensuring comprehensive safety standards. In this regard, the OGRA has devised a regulatory framework to ensure effective regulation, efficient monitoring and public/consumer safety.

The Regulatory Framework for the use of LPG in the Auto sector has become a part of LPG (Production and Distribution) Rules 2001 as an Appendix V by an amendment through S.R.O. 256 (I)/ 2007 Islamabad, the 10th March, 2007.

The Regulatory Framework provides a general criteria for installation of LPG Autogas Stations. Now OGRA has prepared a Brochure containing guidelines / layout plans in accordance with the approved Regulatory Framework, showing details, including the minimum required inter distances for the equipment, storage tanks/built-up areas etc. under NFPA-58. In view of the foregoing, the layout plans were developed, taking into account the following categories:

- Stand alone LPG Autogas station
- LPG Autogas station co-located with CNG, Gasoline & Diesel.

2.0 DISCUSSION ON REGULATORY FRAMEWORK & DEVELOPED LAYOUTS:

2.1 Regulatory Framework

The Regulatory Framework contains the following criteria to setup LPG Autogas Stations:

- The LPG Auto refueling/dispensing station shall only be located on roads/highways having minimum 60 feet width.

- The LPG Auto refueling/dispensing station shall not be located in congested or residential areas nor should any of the adjacent buildings is used for accommodation or public gathering of any sort.

- The installation of LPG refueling station shall conform to the technical standards prescribed in LPG (production & distribution) Rules, 2001 & NFPA 58.

- For ensuring safety, the storage capacity at an LPG auto refueling/dispensing station shall be limited to 10 metric tons (max.).

- In addition to the requirements of NFPA-58, the minimum area for the installation of LPG auto refueling / dispensing station shall be in no case is less than 10,000 sq. Feet with a minimum 80 feet frontage and depth.

- Only brand new equipment shall be installed at the refueling / dispensing station i.e. use of second hand equipment shall not be allowed.

- Conversion kit and cylinder shall only be installed at licensee approved centers and installed vehicle shall have the respective licensee's seal of compliance to NFPA-58, otherwise it will be considered illegal.

2.2 Layout Criteria

As part of development of layouts for LPG Autogas stations following criteria has been developed based on NFPA-58 (Liquefied Petroleum Gas Code).

- The minimum distance between LPG vessels and property lines shall be atleast 50ft as per table 6.3.1.
- The minimum distance between LPG vessels and any combustible material/dry grass shall be atleast 50ft as per table 6.3.1.
- The minimum distance between LPG vessels and property lines shall be atleast 10ft as per section 6.24 (Alternate Provisions for Installation of ASME containers), which requires use of fail-safe product control measures and low emission transfer concepts.
- The minimum distance between LPG vessels and buildings with fire resistant walls shall be atleast 10ft as per section 6.24.
- The minimum distance between LPG vessels and any combustible material/dry grass shall be atleast 10ft as per section 6.4.5.2 and 6.4.5.4.
- The minimum distance of LPG vessels vent and any source of ignition/open flame shall be atleast 10ft and per table 6.3.9.
- The minimum distance between LPG vessels and any above ground petrol/diesel storage shall be atleast 20ft as per section 6.4.5.5.

- The minimum distance between LPG vessels and auto dispenser shall be atleast 10ft as per table 6.5.3 part (J).

- The minimum distance between LPG vessels and point of transfer/decanting area shall be atleast 10ft as per table section 7.2.3.3.

- The minimum distance between buildings with fire resistant walls and point of transfer/decanting area shall be atleast 10ft as per table 6.5.3 part (A) and part (F).

- The minimum distance between source of ignition/open flame and point of transfer/decanting area shall be atleast 25ft as per section 7.2.3.2(B).

- The minimum distance between source of ignition/open flame and auto dispenser shall be atleast 25ft as per section 7.2.3.2(B).

- The minimum distance between buildings with non fire resistant walls and point of transfer/decanting area shall be atleast 25ft as per table 6.5.3 part (B).

- The minimum distance between buildings with non fire resistant walls and auto dispenser shall be atleast 25ft as per table 6.5.3 part (B).

- The minimum distance between auto dispenser and property line shall be atleast 25ft as per table 6.5.3 part (D).

- The minimum distance between point of transfer/decanting area and property line shall be atleast 25ft as per table 6.5.3 part (D).

- Metal cutting/welding shall be done atleast 35ft away from point of transfer / decanting and auto dispenser as per section 7.2.3.2 (C).

- Public way shall be atleast 10ft away from point of transfer/decanting and auto dispenser as per table 6.5.3 part (F).

- The minimum distance between points of transfer/decanting and auto dispenser shall be 10ft as per table 6.5.3 part (F).

2.3 Developed Layouts

The layouts developed of various options prepared are as follows:

- Layout of LPG refueling station: Area required **20,240 sq ft**
  "Installation of ASME container as per NFPA 58, sec. 6.3 with 04 dispensers (option-I)."

- Layout of LPG refueling station: Area required **17,520 sq ft**
  "Installation of ASME container as per NFPA 58, sec. 6.3 with 02 dispensers (option-II)."

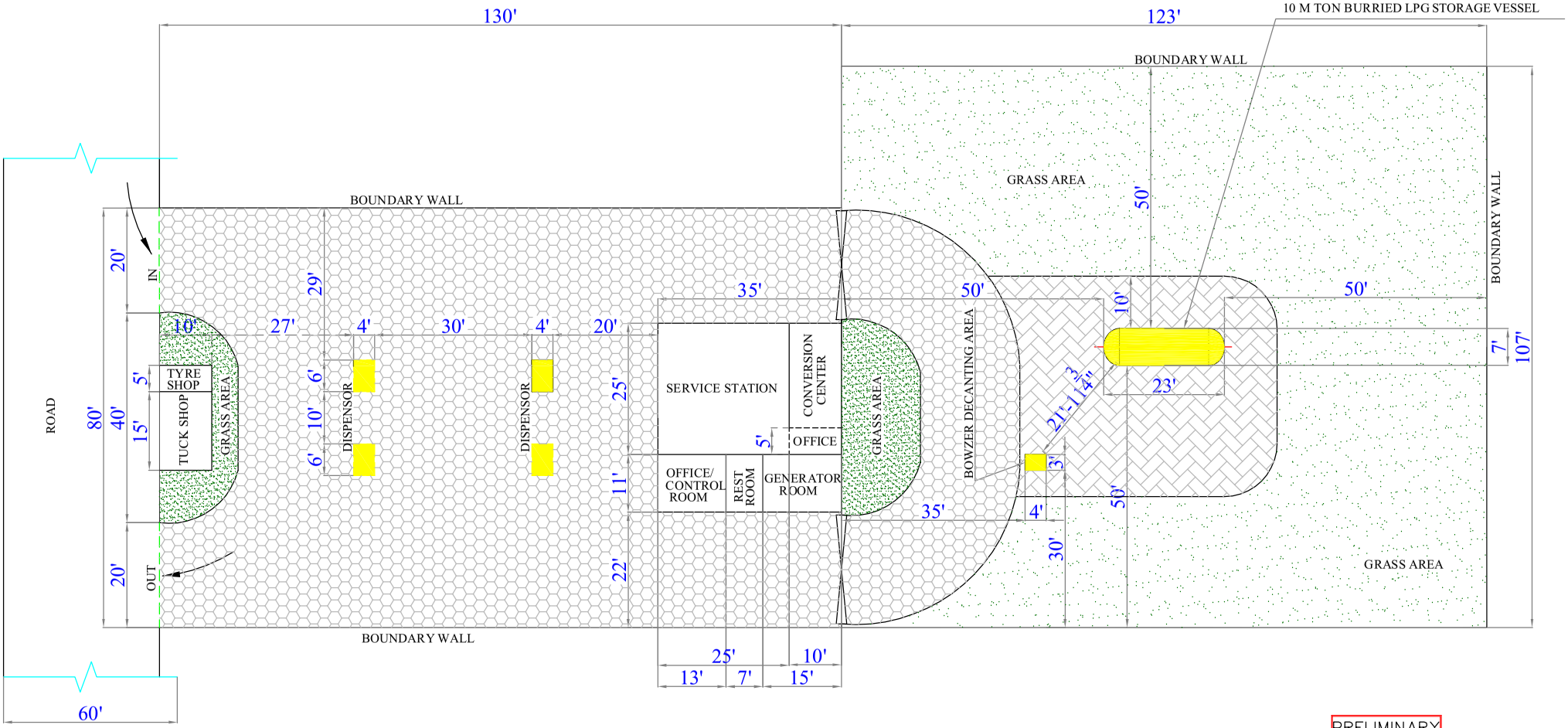
- Layout of LPG refueling station: Area required **10,000 sq ft**
  "Alternate provision for installation of ASME container as per NFPA 58, sec. 6.24 with 02 dispensers (option-III)."

- Layout of LPG refueling station: Area required **10,000 sq ft**
  "Alternate provision for installation of ASME container as per NFPA 58, sec. 6.24 with cng, petrol & diesel facilities (option-IV)."

- Minimum separation distances as per NFPA 58, table 6.3.1 & table 6.5.3.

- Minimum separation distances as per NFPA 58, sec. 6.24 & table 6.5.3.

- Typical hazardous area classification of LPG refueling station.



PRELIMINARY

REV	DATE	DESCRIPTION OF REVISION
A	03-07-2007	ISSUED FOR COMMENTS

OIL & GAS REGULATORY AUTHORITY

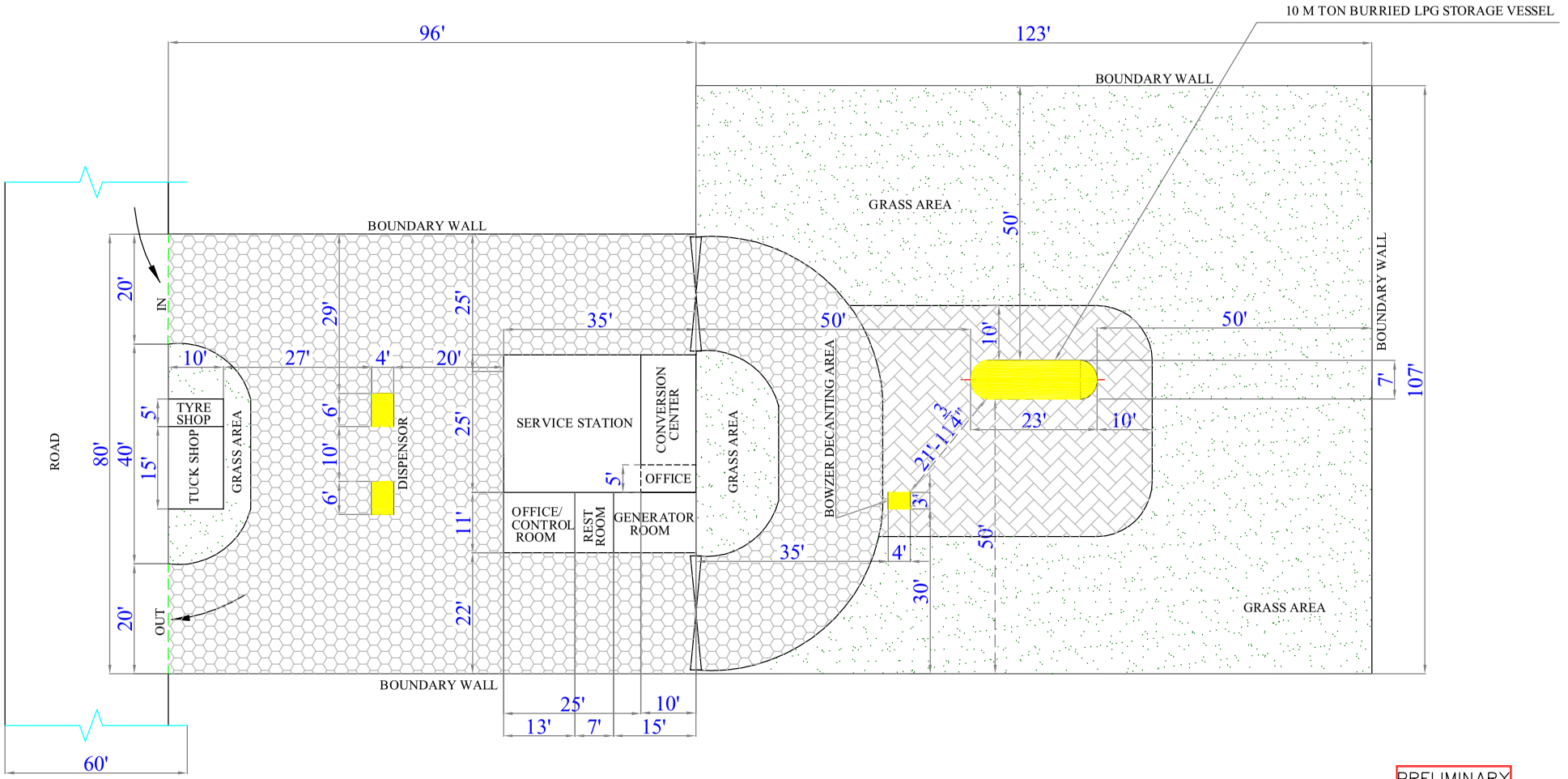
O G R A

Dwg. No.

4929-PC-2201-001

COMPUTER CODE:	4929-PC-2201-001-A
SHT.SIZE:	A1 (841,594)
SCALE:	

TITLE : LAYOUT OF LPG REFUELING STATION INSTALLATION OF ASME CONTAINER AS PER NFPA-58, SEC. 6.3 WITH 04 DISPENERS (OPTION-I)



PRELIMINARY

REV	DATE	DESCRIPTION OF REVISION
A	03-07-2007	ISSUED FOR COMMENTS

OIL & GAS REGULATORY AUTHORITY

O G R A

Dwg. No.

4929-PC-2201-002

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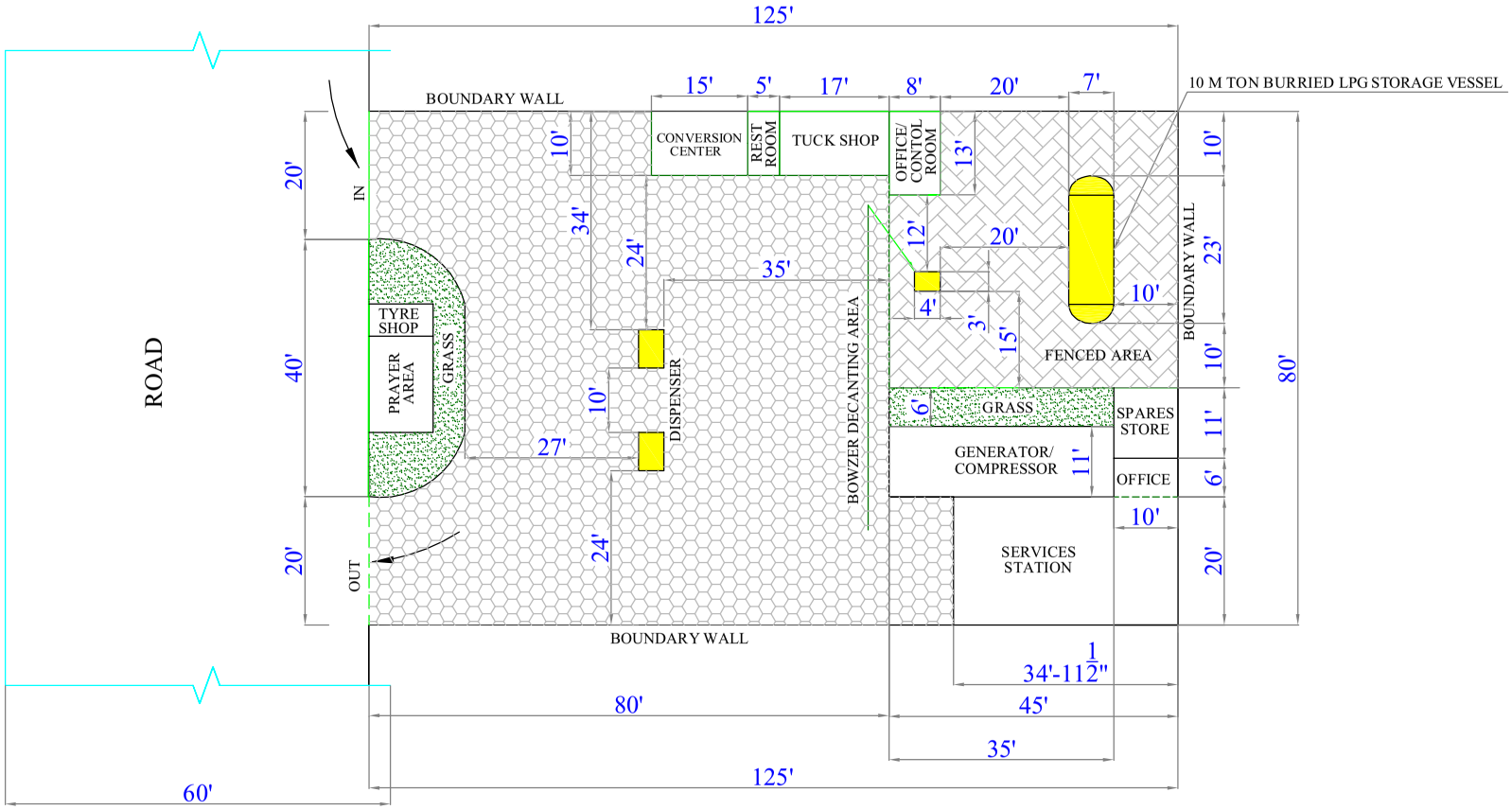

PRELIMINARY

REV	DATE	DESCRIPTION OF REVISION
A	03-07-2007	ISSUED FOR COMMENTS

Dwg. No.
4929-PC-2201-003

OIL & GAS REGULATORY AUTHORITY
O G R A

COMPUTER CODE:	4929-PC-2201-003-A
SHT.SIZE:	A1 (841,594)
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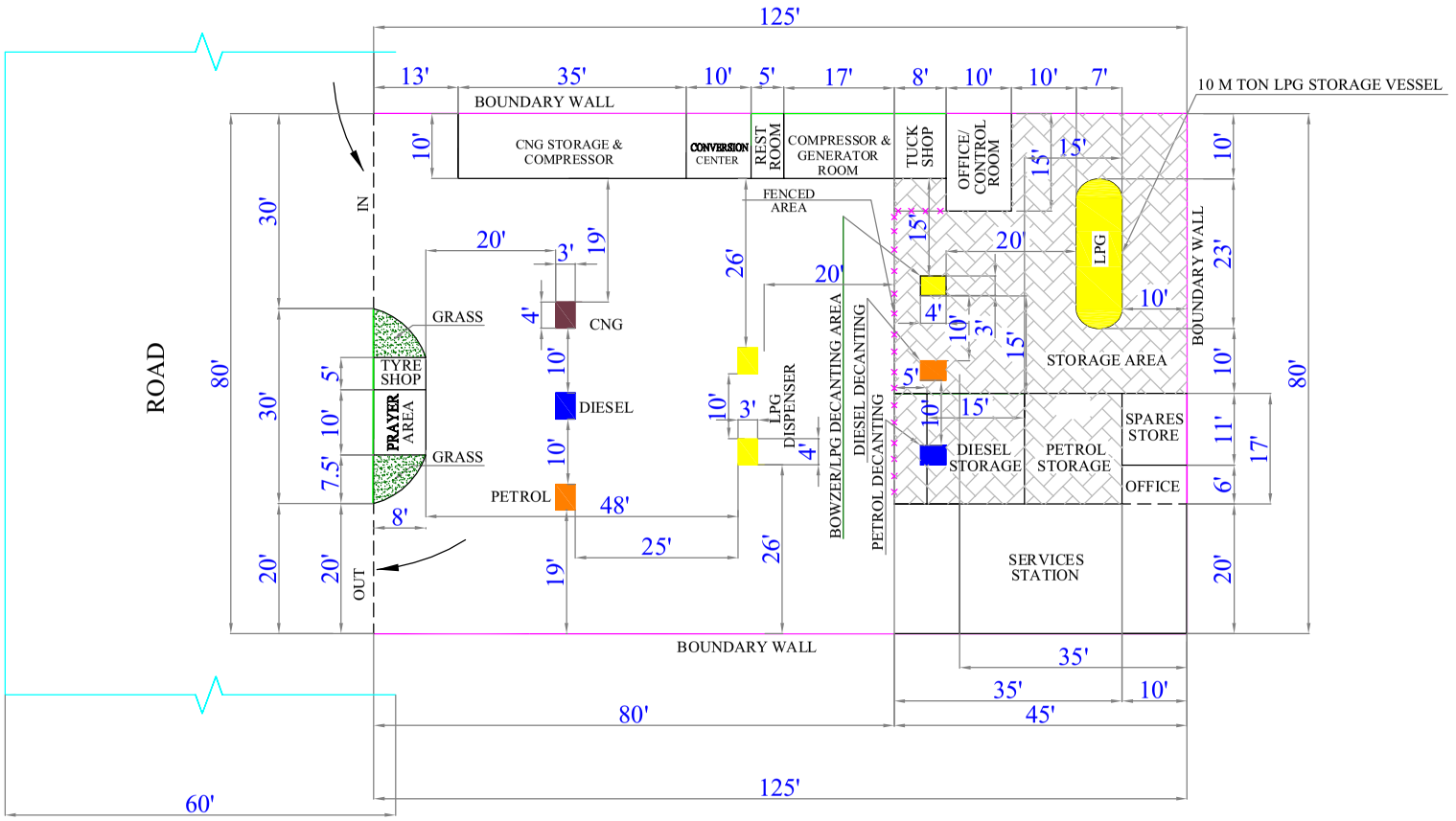


PRELIMINARY

NOTES:

1. ALL STORAGE TANKS ARE BURIED.

REV	DATE	DESCRIPTION OF REVISION
A	03-07-2007	ISSUED FOR COMMENTS

Dwg. No. 4929-PC-2201-004

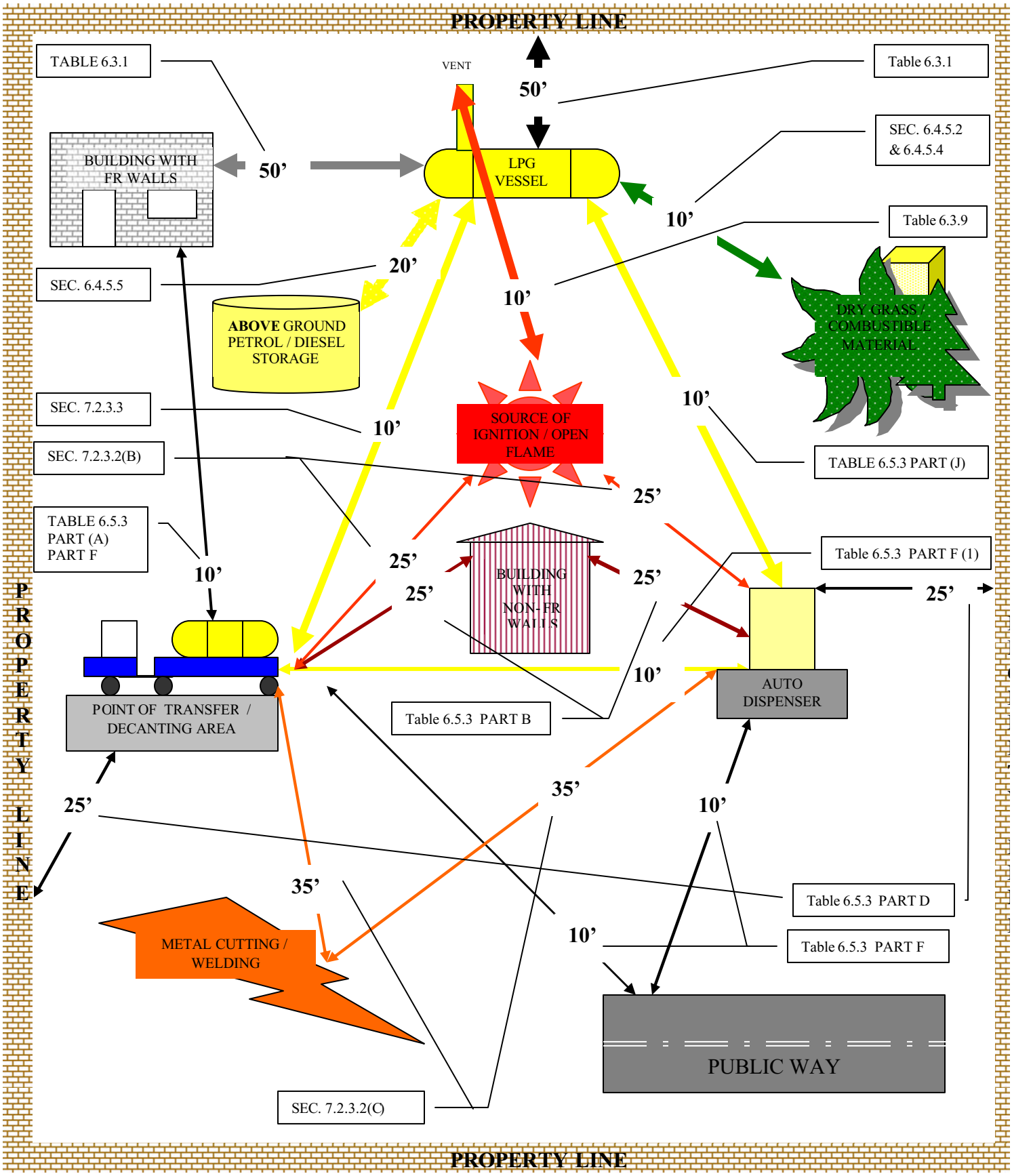
OIL & GAS REGULATORY AUTHORITY

O G R A

COMPUTER CODE:	4929-PC-2201-004-A
SHT.SIZE:	A1 (841,594)
SCALE:	

TITLE : LAYOUT OF LPG REFUELING STATION ALTERNATE PROVISION FOR INSTALLATION OF ASME CONTAINER AS PER NFPA-58, SEC. 6.24 WITH CNG, PETROL AND DIESEL FACILITIES (OPTION-IV)

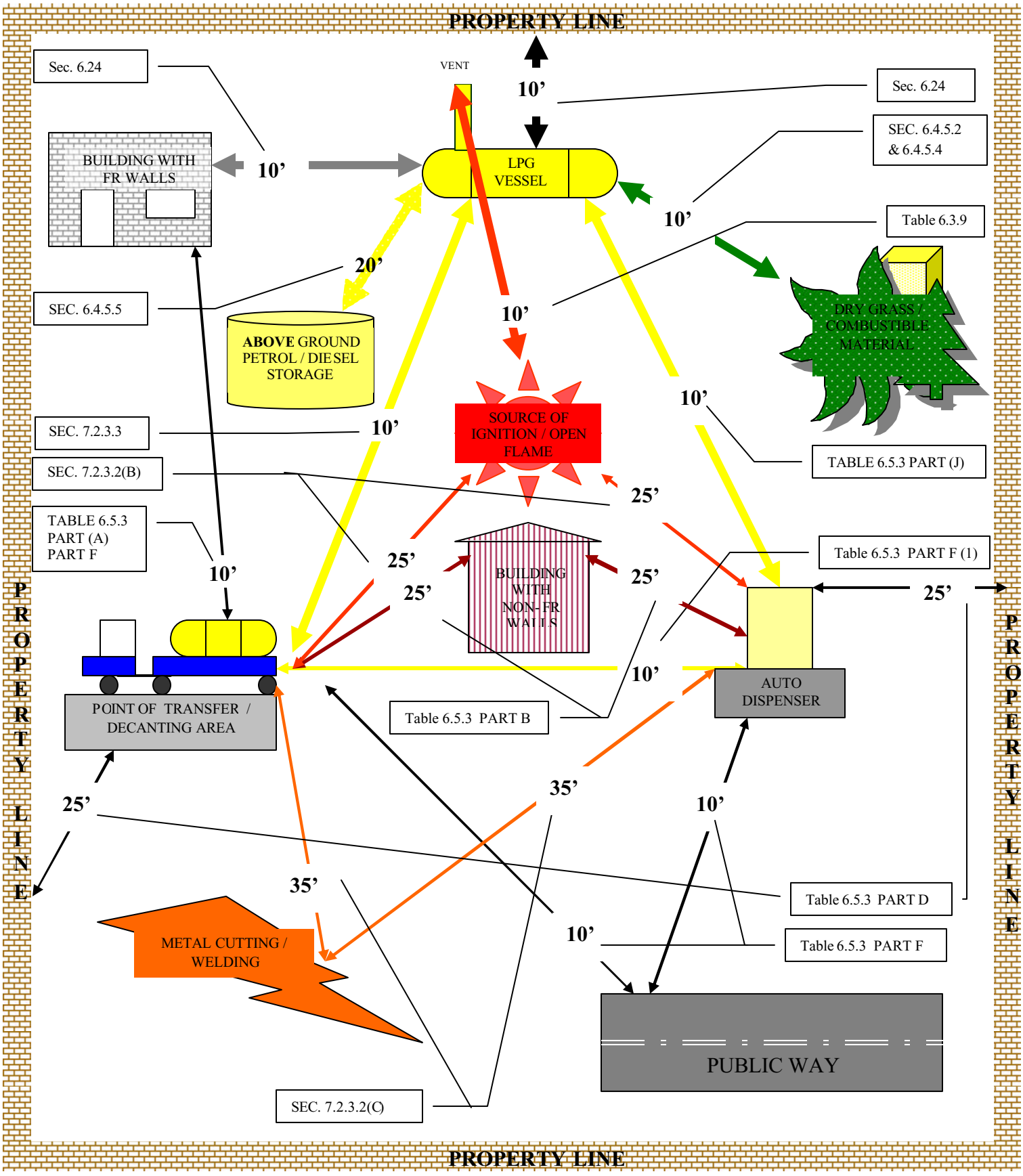
MINIMUM SEPERATION DISTANCES



AS PER NFPA 58, TABLE 6.3.1 & TABLE 6.5.3

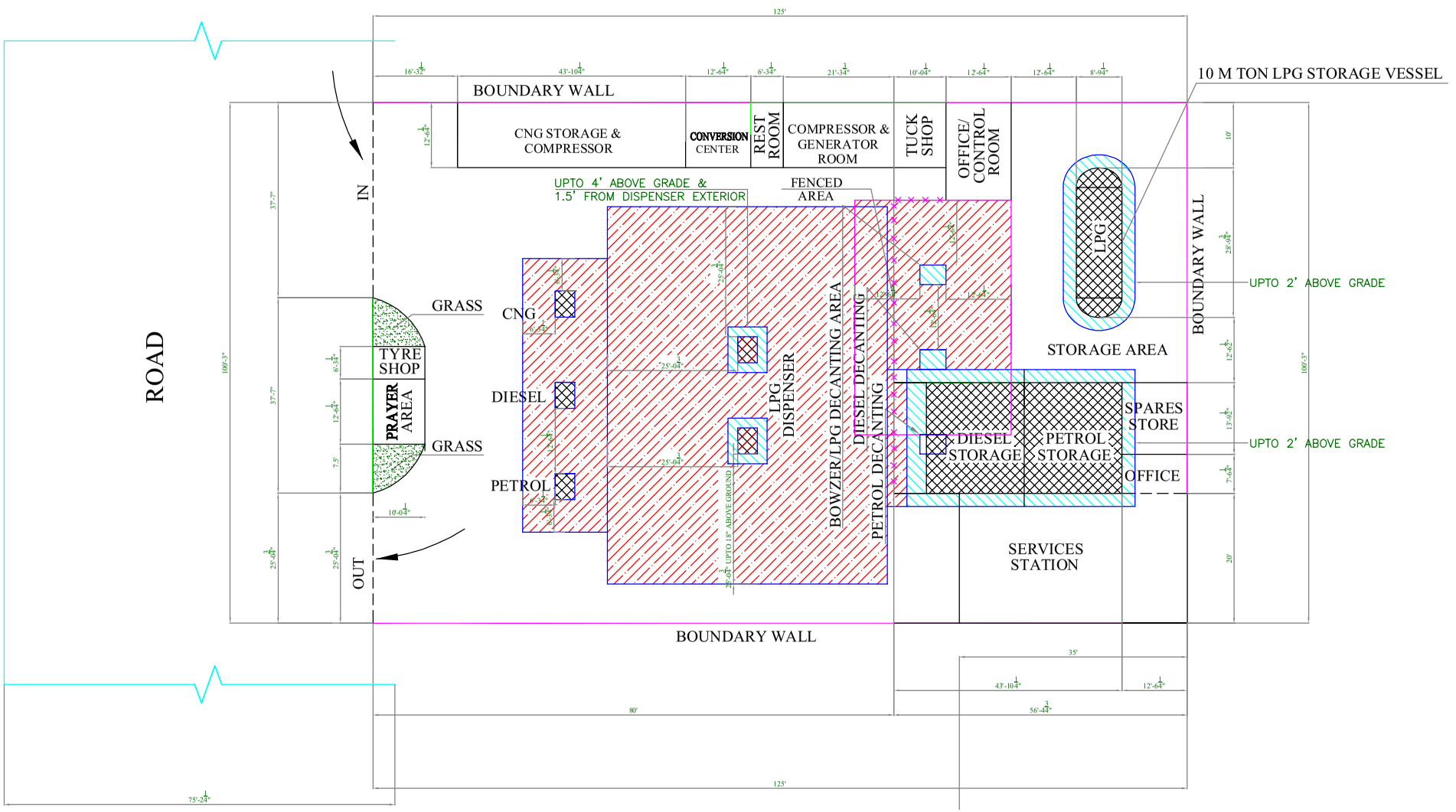
FILE: SAFE DISTANCE FOR AUTO REFUELING STATION AS PER 6.3.1\090707

MINIMUM SEPERATION DISTANCES



AS PER NFPA 58, SEC. 6.24 & TABLE 6.5.3
(ALTERNATE PROVISIONS FOR INSTALLATION OF ASME CONTAINER)

FILE: SAFE DISTANCE FOR AUTO REFUELING STATION AS PER 6.3.1\090707



LEGEND

ZONE 0

ZONE 1

ZONE 2

FOR DETAIL REFER NFPA 70 NEC ARTICLE 505.9

DESIGNATION	TECHNIQUE	ZONE*
d	FLAMEPROOF ENCLOSURE	1
e	INCREASED SAFETY	1
ia	INCREASED SAFETY	0
ib	INCREASED SAFETY	1
[ia]	INTRINSICALLY SAFE ASSOCIATED APPARATUS	UNCLASSIFIED
[ib]	INTRINSICALLY SAFE ASSOCIATED APPARATUS	UNCLASSIFIED
m	ENCAPSULATION	1
nA	NONSPARKING EQUIPMENT	2
nC	SPARKING EQUIPMENT IN WHICH THE CONTACTS ARE SUITABLY RESTRICTED OTHER THAN BY RESTRICTED BREATHING ENCLOSURE	2
nR	RESTRICTED BREATHING	2
O	OIL IMMERSION	1
p	PURGED AND PRESSURIZED	1 OR 2
q	POWDER FILLED	1

PRELIMINARY

NOTES:

1. ALL STORAGE TANKS ARE BURIED.
2. THE ENTIRE PIT OR OPEN SURFACE BENEATH LPG DISPENSER WITHIN 6m HORIZONTALLY (zone 0)
3. THE SELECTION OF ELECTRICAL / ELECTRONIC EQUIPMENT SHALL BE AS PER HAZARDOUS AREA CLASSIFIED IN THIS DRAWING.

*4. EQUIPMENT LISTED IN ZONE 1 SHALL BE PREMITTED IN ZONE 2 LOCATION

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COMPUTER CODE:	4929-ELD-6701-001-A
SHT.SIZE:	A1 (841,594)
SCALE:	

TITLE : TYPICAL HAZARDOUS AREA CLASSIFICATION OF LPG REFUELING STATION ALTERNATE PROVISION FOR INSTALLATION OF ASME CONTAINER AS PER NFPA-58, SEC. 6.24 WITH CNG, PETROL AND DIESEL FACILITIES

3.0 CONCLUSION:

As per NFPA 58 Section 6.3 the area requirements for LPG Autogas Station comes to 20,240 sq ft with 04 dispensers and 17,520 sq ft with 02 dispensers. However NFPA 58 Section 6.24 provides an alternate whereby the area requirements are reduced to 10,000 sq ft with elaborate safety requirements including the following. The complete requirements are given in NFPA 58, Section 6.24:

- Installation of internal valve with excess flow valve and positive shut-off valve.
- Automatic closure of all primary valves actuated by fire detection or hose pull-away.
- Remote shutdown stations are within 15 ft and another between 25 ft and 100 ft of the transfer point.