Appendix C
Facility illustration(s)

- Site layout (adesign Investments) – Drawing 2018-02-EPG-Klerksoord – alternative considered but not selected
- Selected site layout (adesign Investments) – Drawing 2018-02-EPG-Klerksoord
- Design (SAIBA Engineering) - design code EN13445)
- LPG storage tank D4200 (Lapesa) – Model LP400A-42/ESP; Reference: FLP0470I-04
- Technical record (Lapesa) – Reference 14ETL0055 revision 3

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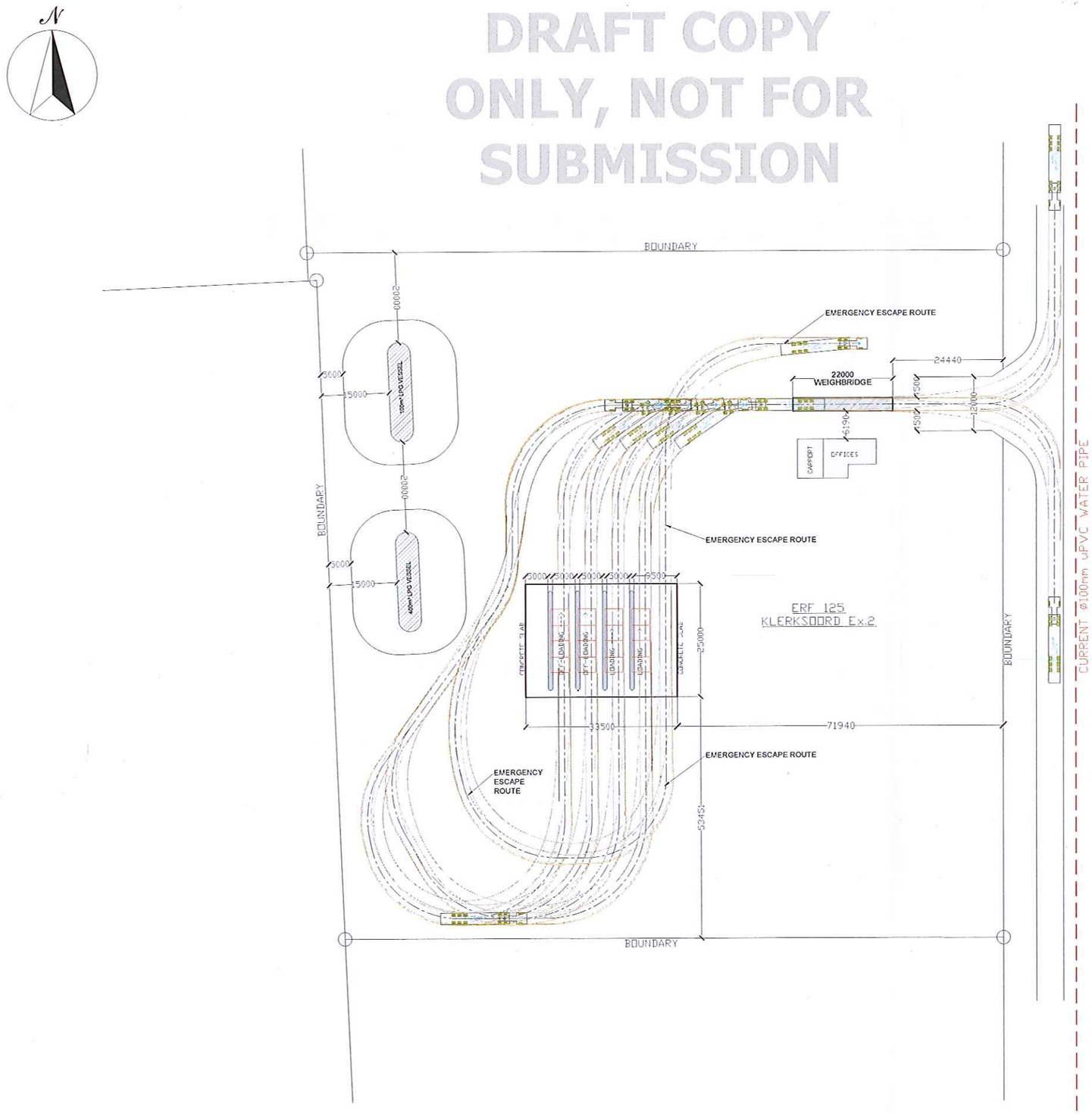
SUBMISSION



SITE LAYOUT
SCALE 1:500

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SUBMISSION

GAS NOTES

ALL SIZES AND SAFETY DISTANCES TO BE CHECKED ON SITE AND MUST BE COMPLIANCE WITH SANS 10087-3:2015 EDITION 5.

THIS INSTALLATION IS SUBJECT TO LOCAL AUTHORITY APPROVAL.

ALL MANDATORY FIRE EQUIPMENT TO BE PRESENT AND MAINTAINED.

A 3m RADIUS AROUND THE GAS INSTALLATION IS TO BE KEPT CLEAR OF ALL COMBUSTIBLE MATERIALS.

ALL SAFETY AND WARNING NOTICES TO BE DISPLAYED AS PER SANS 1186.

ENSURE THAT ACCESS TO THE GAS FACILITY IS BY AUTHORIZED PERSON ONLY.

ALL BUILDING WORK TO COMPLY WITH SANS 10400.

ALL ELECTRICAL WORK TO COMPLY WITH SANS 10108. NO ELECTRICAL INSTALLATION WITHIN 5m RADIUS OF THE GAS INSTALLATION.

NO GAS MAY BE SUPPLIED UNTIL PLAN HAS BEEN APPROVED AND REGISTERED BY THE LOCAL AUTHORITY.

GAS INSTALLATIONS AND PIPELINES TO BE INSTALLED BY REGISTERED INSTALLER, IN ACCORDANCE WITH THE REGULATIONS OF SANS 10087 PART 1.

INSTALLATION AND LAYOUT OF LPG PIPEWORK ONLY

THE FOLLOWING REQUIREMENTS SHALL BE CONSIDERED AND APPLIED IN ADDITION TO ANY SIMILAR SPECIFIC DETAILS THAT MIGHT BE INTRODUCED BY THE INSTALLER:

- PIPELINES ABOVE GROUND

1. USAGE ABOVE GROUND IS ALLOWED SUBJECT TO THE STEEL PIPE BEING PROTECTED AGAINST CORROSION.

> PIPES FOR CONVEYING LIQUID SHALL BE OF STEEL.
> PIPES FOR CONVEYING VAPOUR SHALL BE OF STEEL.
> COPPER PIPE MAY ALSO BE USED.

STEEL PIPING SHALL BE SEAMLESS AND AS FOLLOWS:

> WHERE SCREWED JOINTS ARE USED, THESE SHALL BE LIMITED TO PIPES OF NOMINAL BORE NOT EXCEEDING 32mm. SUCH PIPES SHALL COMPLY WITH THE REQUIREMENTS OF BS 1500 FOR SCHEDULE 80 PIPING OR OF API SPEC 5L (OR \ EQUIVALENT). PIPE FITTINGS SHALL BE OF WROUGHT STEEL AND OF A GRADE AT LEAST EQUAL TO THAT OF THE MATING PIPE.

> PIPES OF NOMINAL BORE LARGER THAN 32mm SHALL HAVE WELDED OR FLANGED JOINTS AND SHALL COMPLY WITH REQUIREMENTS OF BS 1500 FOR SCHEDULE 40 PIPING OR OF API SPEC 5L (OR EQUIVALENT) OR THE APPROPRIATE REQUIREMENTS OF ISO 3183.

- PIPELINES UNDERGROUND

HDPE PIPE MAY BE USED.

> ALL PIPEWORK SHALL BE INSTALLED TO A MINIMUM DEPTH OF AT LEAST 500mm.
> FOR PIPELINES THAT ARE BURIED, THE BACKFILL SHALL INCORPORATE AN APPROVED MEANS (FOR EXAMPLE, CHEVRON TAPE PLACED ABOUT HALFWAY BETWEEN THE PIPE AND THE SURFACE) TO IDENTIFY THE EXISTENCE OF THE PIPE.
> ALL BURIED PIPES SHALL BE CORROSION PROTECTED IN AN APPROVED MANNER.
> PIPES THAT ARE TO BE EMBEDDED IN CONCRETE BEFORE THE COMPLETION OF A FLOOR SHALL NOT HAVE ANY TYPE OF MECHANICAL JOINT, REQUIRE FLOOR PLANS AND MUST BE PLACED AT LEAST 50mm BELOW THE TOP OF THE CONCRETE.

INSTALLATIONS INVOLVING BURIED AND MOUNDED STORAGE VESSELS

- THE SAFETY DISTANCES APPLICABLE TO THE INSTALLATION OF MOUNDED STORAGE VESSELS SHALL BE IN ACCORDANCE WITH THE APPROPRIATE VALUES GIVEN IN TABLE 1 ON PAGE 19, WITHIN SANS 10087-3:2015 ED5.

- OTHER PARTS OF THE STORAGE VESSEL SHALL BE NOT CLOSER THAN 1m TO A BUILDING, BOUNDARY OR OTHER EQUIPMENT (REFER TO FIGURE 6 ON PAGE 23, WITHIN SANS 10087-3:2015 ED5.)

- MOUNDED STORAGE VESSELS SHALL BE LOCATED OUTSIDE OF ANY BUILDING.

- BUILDINGS SHALL NOT BE CONSTRUCTED OVER ANY MOUNDED STORAGE VESSELS.

- SIDES OF ADJACENT STORAGE VESSELS SHALL BE SEPARATED BY NOT LESS THAN 1m.

MOUNDED STORAGE VESSELS SHALL BE INSTALLED AS FOLLOWS:

- MOUNDING MATERIAL SHALL BE EARTH, SAND, OR OTHER NON-COMBUSTIBLE, NON-CORROSIVE MATERIALS AND SHALL PROVIDE A MINIMUM THICKNESS OF COVER FOR THE CONTAINER OF AT LEAST 0.3m.

- A PROTECTIVE COVER SHALL BE PROVIDED ON TOP OF MOUNDING MATERIALS SUBJECT TO EROSION.

- STORAGE VESSEL VALVES AND APPURTENANCES SHALL BE ACCESSIBLE FOR OPERATION OR REPAIR, WITHOUT DISTURBING MOUNDING MATERIAL, AS FOLLOWS:

  - WHERE STORAGE VESSELS ARE MOUNDED AND THE BOTTOM OF THE CONTAINER IS 750mm OR MORE ABOVE THE SURROUNDING GRADE, ACCESS TO BOTTOM CONNECTIONS SHALL BE PROVIDED BY OPENING OR PLANE, WITH A 1.2m MINIMUM DIAMETER AND 900mm CLEAR AREA.
  - BOTTOM CONNECTIONS THAT EXTEND BEYOND THE MOUND SHALL BE PART OF THE STORAGE VESSEL AND SHALL BE DESIGNED AND INSTALLED FOR FORCES THAT CAN ACT ON THE CONNECTIONS.
  - MOUNDED STORAGE VESSELS SHALL COMPLY WITH THE CORROSION-PROTECTION REQUIREMENTS OF 7.3.5 ON PAGE 28, WITHIN SANS 10087-3:2015 ED5.

STORAGE VESSELS AND PIPEWORK, INCLUDING COATING MATERIALS AND THEIR APPLICATION SHALL BE CORROSION PROTECTED. IF CATHODIC PROTECTION IS APPLIED, READINGS SHALL BE TAKEN AND SHALL BE RECORDED IN A PRESSURE STORAGE VESSEL LOGBOOK. THESE READINGS SHALL BE REVIEWED BY A COMPETENT PERSON AND SHALL BE DONE TO THE TEST REQUIREMENTS OF REGULATION 11 OF THE PRESSURE EQUIPMENT REGULATIONS OF THE OCCUPATIONAL HEALTH AND SAFETY ACT, 1993 (ACT No. 85 OF 1993).

CATHODIC CORROSION PROTECTION AND INSPECTION PERIODS SHALL BE IN ACCORDANCE WITH SANS 10329-1.

VESSELS SHALL BE PROTECTED FROM CORROSION, WHERE CATHODIC PROTECTION IS NOT USED, THEN A SUITABLE COMMERCIALLY AVAILABLE COATING SHALL BE APPLIED, FOR EXAMPLE FIBRE GLASS WRAPPING, BITUMEN COATING, OR MULTI COAT PAINT SYSTEMS.

GENERAL

- SAFETY DISTANCES SHALL BE MEASURED HORIZONTALLY FROM STORAGE VESSELS WHERE VAPOUR BARRIERS ARE USED. THE DISTANCE SHALL BE MEASURED IN A HORIZONTAL LINE AROUND SUCH BARRIERS. SAFETY DISTANCES SHALL BE MEASURED HORIZONTALLY AND RADIALLY FROM STORAGE VESSELS WHERE FIREWALLS ARE USED. THE FIREWALL SHALL BE AT LEAST THE HEIGHT OF THE STORAGE VESSEL.
- THE NUMBER OF STORAGE VESSELS IN ANY ONE GROUP SHALL NOT EXCEED SIX PLACED PARALLEL TO EACH OTHER. EACH STORAGE VESSEL IN ONE GROUP SHALL BE AT LEAST 7.5m FROM THE NEAREST STORAGE VESSEL IN ANOTHER GROUP.
- THE MINIMUM HORIZONTAL SEPARATION DISTANCE BETWEEN ABOVE-GROUND LPG STORAGE VESSELS AND ABOVE-GROUND STORAGE VESSELS THAT CONTAIN LIQUIDS OR GASES THAT HAVE FLASH POINTS BELOW 93.4°C, SHALL BE 6m.

- IF SO REQUIRED BY THE APPROVING AUTHORITY OR THE REQUIREMENTS OF SANS 10087-3, A RISK ASSESSMENT SHALL BE CARRIED OUT ON EACH INSTALLATION. THE RISK ASSESSMENT SHALL BE CARRIED OUT IN ACCORDANCE WITH THE APPROPRIATE REQUIREMENTS OF THE MAJOR HAZARD INSTALLATION REGULATIONS OF THE OCCUPATIONAL HEALTH AND SAFETY ACT, 1993 (ACT NO. 85 OF 1993).

- AN ENVIRONMENTAL IMPACT ASSESSMENT MUST BE DONE BY AN AUTHORIZED AND REGISTERED PERSON.

FIRE FIGHTING EQUIPMENT AND SIGNAGE REQUIREMENTS:

- 7 x 9kg DRY CHEMICAL POWDER FIRE EXTINGUISHER

- 7 x SET OF SYMBOLIC SAFETY SIGNS AND INSTALLER DETAILS

- 3 x FIRE HYDRANTS

- 6 x DELUGE SYSTEMS

END USER:

EPG FILLING STATION — EPG GAS DISTRIBUTORS

SYMBOLIC SAFETY SIGNS

PV1	PV2	PV3	PV27

LOCAL AUTHORITY APPROVAL STAMP:

adesign Investments
PROFESSIONAL CAD DESIGNING & DRAUGHTING
ALFONSO NIEMAND
MANAGING DIRECTOR
PO BOX 6756, WESTGATE, 1734
CELL 082 922 6536
adesign@yebo.co.za / alfonso@adesigninvestments.co.za
www.adesigninvestments.co.za

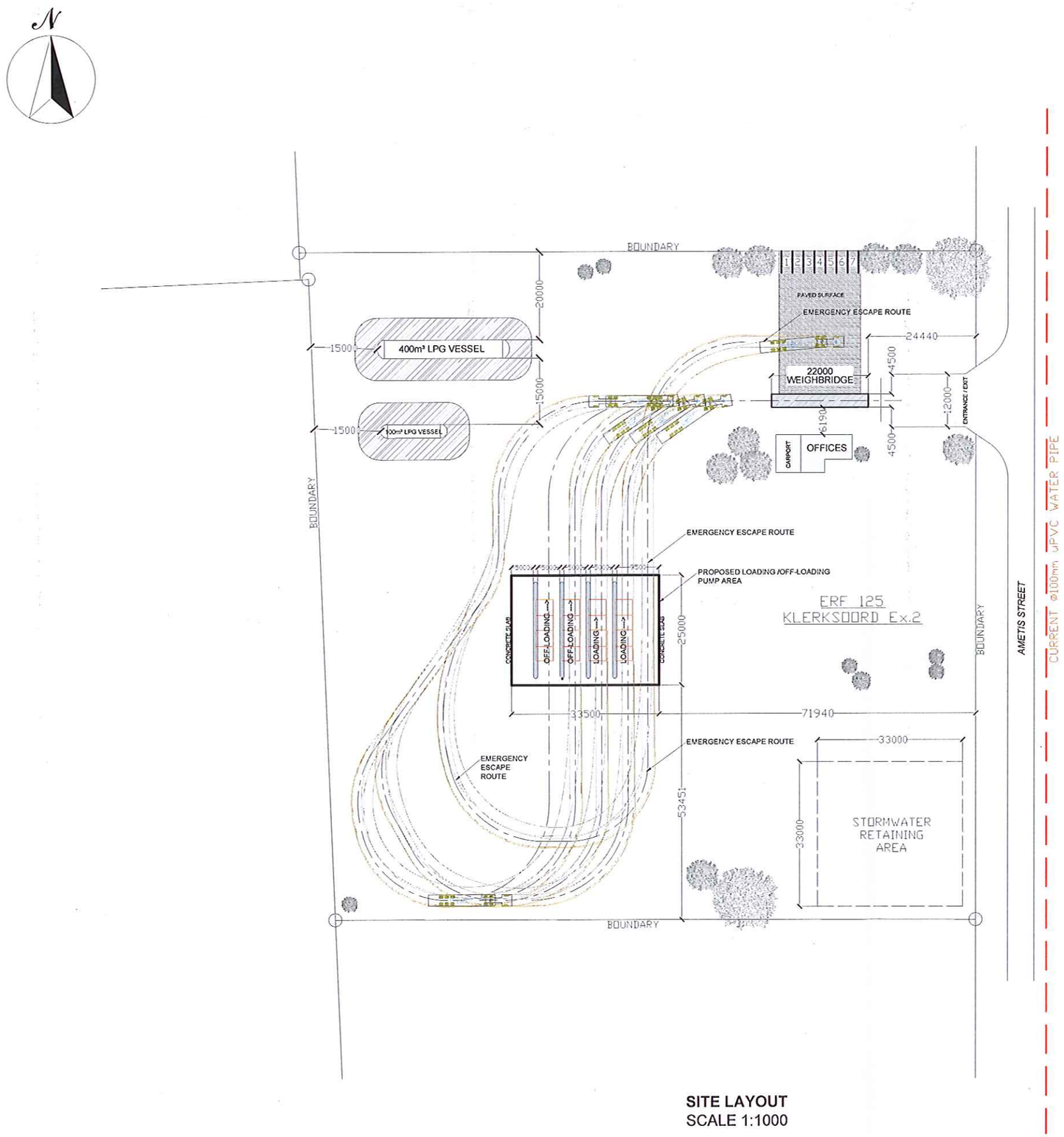
LPG CAPACITY ON SITE:

- 1 x 100m³ LPG BULK TANK = 100 000L / 42 481 kg
- 1 x 400m³ LPG BULK TANK = 400 000L / 169 924 kg

TOTAL LPG CAPACITY ON SITE = 500 000L / 212 405 kg

SITE ADDRESS:
25 AMETIS STREET, KLERKSOORD

BY COMPANY: ADESIGN	REGISTERED: SAID	CLIENT: EPG GAS	REV00
DRAWN BY: A NIEMAND	PROPOSED NEW 100m³ AND 400m³ MOUNDED LPG VESSEL INSTALLATIONS AT EPG GAS IN KLERKSOORD		
CHECKED BY: P LE ROUX	*SITE LAYOUT*		
SCALE: AS INDICATED ON THE DRAWING	ERF DETAILS:	ERF 125 ; KLERKSOORD Ex. 2	
DATE: 23/02/2018	SHEET SIZE A1	SHEET 1 OF 1	DRAWING NO: 2018-02-EPG-KLERKSOORD



SITE LAYOUT
SCALE 1:1000

EXISTING OFFICE FLOOR AREA:	±78.23m²
EXISTING CARPORT FLOOR AREA:	±45m²
PROPOSED LOADING / OFF-LOADING PUMP AREA:	±500m²

SCHEDULE:

PARKING:	2 PER 100m² FLOOR AREA
F.A.R:	0,02
COVERAGE:	10%
HEIGHT:	15m

END USER:

EPG FILLING STATION — since 1994 — EPG GAS DISTRIBUTORS

SYMBOLIC SAFETY SIGNS

PV1 | PV2 | PV3 | PV27

LOCAL AUTHORITY APPROVAL STAMP:

adesign Investments
PROFESSIONAL CAD DESIGNING & DRAUGHTING
ALFONSO NIEMAND
MANAGING DIRECTOR
PO BOX 6756, WESTGATE, 1734
CELL 082 922 6536
adesign@yebo.co.za / alfonso@adesigninvestments.co.za
www.adesigninvestments.co.za

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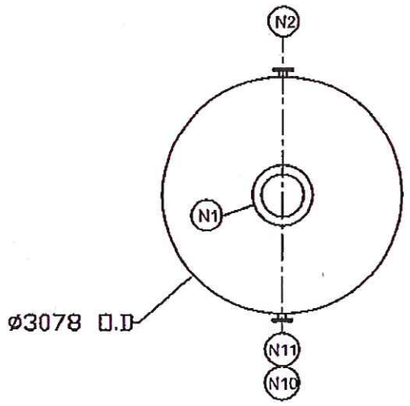
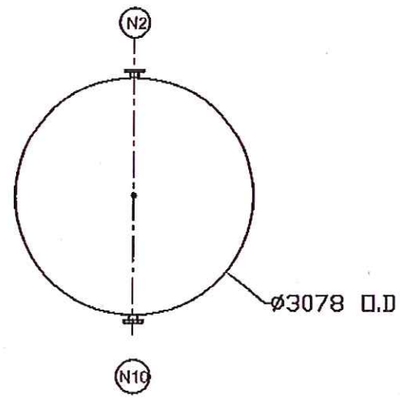
TOTAL LPG CAPACITY ON SITE = 500 000L / 212 405 kg

SITE ADDRESS:
25 AMETIS STREET, KLERKSOORD

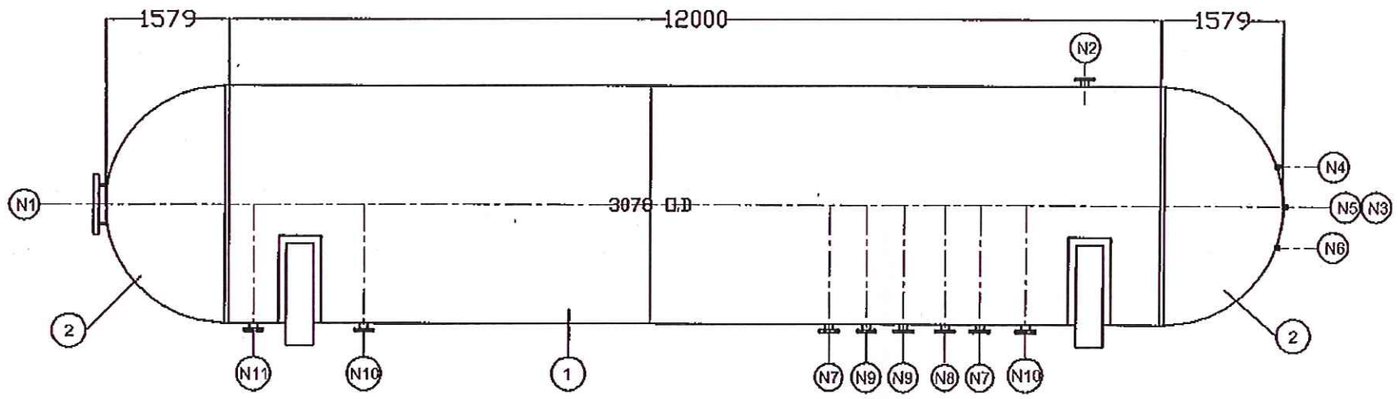
BY COMPANY: ADESIGN	REGISTERED: SAID	CLIENT: EPG GAS	REV01
DRAWN BY: A NIEMAND	PROPOSED NEW 100m³ AND 400m³ MOUNDED LPG VESSEL INSTALLATIONS AT EPG GAS IN KLERKSOORD		
CHECKED BY: P LE ROUX	SITE LAYOUT		
SCALE: AS INDICATED ON THE DRAWING	ERF DETAILS:	ERF 125 ; KLERKSOORD Ex. 2	
DATE: 23/03/2018	SHEET SIZE A3	SHEET 1 OF 1	DRAWING NO: 2018-02-EPG-KLERKSOORD



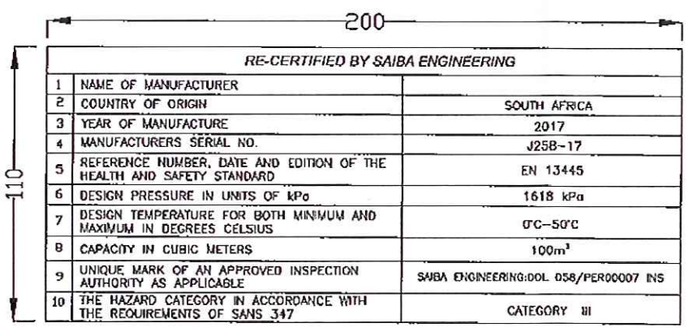
LEFT VIEW



RIGHT VIEW



SIDE VIEW



	RE-CERTIFIED BY SAIBA ENGINEERING	
1	NAME OF MANUFACTURER	
2	COUNTRY OF ORIGIN	SOUTH AFRICA
3	YEAR OF MANUFACTURE	2017
4	MANUFACTURERS SERIAL NO.	J258-17
5	REFERENCE NUMBER, DATE AND EDITION OF THE HEALTH AND SAFETY STANDARD	EN 13445
6	DESIGN PRESSURE IN UNITS OF kPa	1618 kPa
7	DESIGN TEMPERATURE FOR BOTH MINIMUM AND MAXIMUM IN DEGREES CELSIUS	0°C–50°C
8	CAPACITY IN CUBIC METERS	100m³
9	UNIQUE MARK OF AN APPROVED INSPECTION AUTHORITY AS APPLICABLE	SAIBA ENGINEERING:DOL 058/PER00007 INS
10	THE HAZARD CATEGORY IN ACCORDANCE WITH THE REQUIREMENTS OF SANS 347	CATEGORY III

NAMEPLATE

DESIGN DATA

DESIGN CODE : EN13445

DESIGN PRESSURE	kPag	1618
DESIGN TEMPERATURE (MAX)	°C	50
OPERATING PRESSURE	kPag	1618
WORKING TEMPERATURE	°C	50
HYDRO. TEST PRESSURE	kPag	2022.5
MIN. DESIGN METAL TEMPERATURE	°C	0
CORROSION ALLOWANCE	mm	0
CAPACITY	m³	100

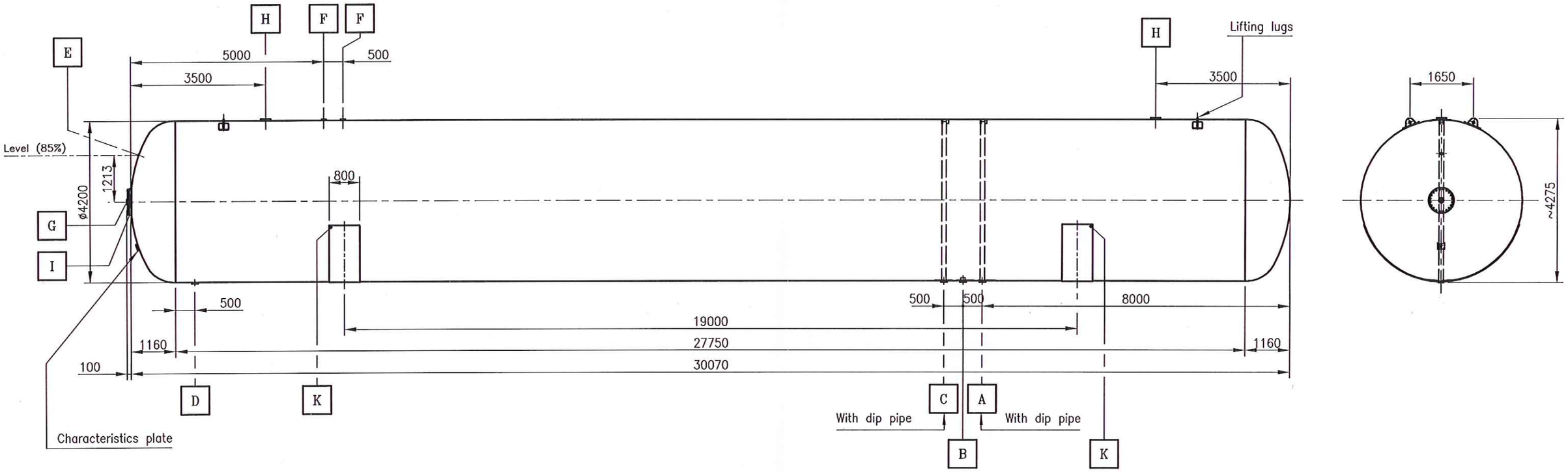
NOZZLE SCHEDULE

MK	QTY.	SIZE	CLASS	SCH.	TYPE	MATERIAL
N1	1	20"	300	40	RFSO	SA 106 Gr B
N2	1	4"	300	–	--	SA 105
N3	1	3/4"	–	6000 LBS	NPT	SA 105
N4	1	3/4"	–	6000 LBS	NPT	SA 105
N5	1	1"	–	6000 LBS	NPT	SA 105
N6	1	3/4"	–	6000 LBS		SA 105
N7	1	4"	–	–	NPT	SA 105
N8	1	3"	–	–	NPT	SA 105
N9	1	3"	–	–	NPT	SA 105
N10	1	2"	–	–	NPT	SA 105
N11	1	2"	–	–	NPT	SA 105

ITEM	QTY	DESCRIPTION	MATERIAL
1	1	SHELL 3078 O.D x 12000 LNG x 14MM THK	P355GH
2	1	DOME 3078 O.D x 8MM THICK	P355GH

DRAWING TITLE: 100m LPG HORIZONTAL VESSEL GENERAL ARRANGEMENT	SAIBA ENGINEERING cc		
DRAWN: N.CHETTY			
CHECKED: S.LALLA	SIGNATURE:		
DATE: 30/08/2017	DWG NO: J258-17-DRG	REV: 0	
CLIENT: MUIRHEAD INSPECTION SERVICES	SCALES: NTS		

lapesa	L.P.G. STORAGE TANK D4200 Mod.: LP400A-42/ESP	Designed: A.P.O. Approved: R.G.I.	Scale 1:150 Acc/DRW: LP2276-05	Record Ref.: **FLP0470I-04** Date: 20-05-14



DESIGN DATA		
Volume	400	m3
Dessign pressure	17	bar
Test pressure	25	bar
Temperature	−20, +50	°C
Weight (approx.)	52	Tn
CE marked		
Standards	97/23/CE	
	EN13445	
	SANS 347	

FINISH		
Inner	Clean	
Outer	Blast cleaning SA 2-1/2	
	Epoxy polyamide	
	Finish white polyurethane	
	Total thickness 120µ	

CONNECTIONS

Ref.	ND	INT. THR.	FUNCTION
A	2" ASA300#	2"NPT	Filling
B	2" ASA300#	2"NPT	Liquid phase
C	2" ASA300#	2"NPT	Gas phase
D	2" ASA300#	2"NPT	Drain
E	3/4"	NPT	High point (85%) and manometer
F	3/4" ASA 300#	–	Spare connections (x2)
G	Rochester Magnetel	–	Level gauge
H	4" ASA300#	–	Collector Safety (x2)
I	ND 500	–	Manhole
K	M12	–	Grounding connection

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lapesa	Technical Record		
	Reference: 14ETL0055 Rev.03	Date: 20.05.2014	Page: 1 de 1

Vessel:	**LP400A-42 m³ LPG storage tank, aboveground.**
Client:	**PRESSURE CONCEPTS TRADING**
Related documents:	• **Catalogue**

CHARACTERISTICS:			**OTHERS**
Pressure vessel:	**LP 400A-42/ESP**		• One manhole PAD type DN 500
Amount	**3**	units	• Cover DN 500 for manhole
Product:	GLP		• Lifting lugs for empty tank manipulation
Installation:	Aboveground		• Grounding rod
Position	Horizontal		
Nominal capacity:	400.000	Litres	
External diameter:	4.200	mm.	
Total length approximate:	30.090	mm.	***Optional***
Nominal thickness (shell):	15,5	mm.	• **2** internal reinforcements
Nominal thickness (ends):	17,5	mm.	• **2** legs support of elevation 100 mm.
Approximate weight	53,0	Tonnes	
SPECIFICATIONS			**MATERIALS**
Design pressure:	17,00	Bar g	Shell P 460 N s/EN 10028–3
Test pressure:	25,00	Bar g	Ends P 460 N s/EN 10028–3
Design temperature:	´-20° +50°	°C	Flanges PAD type ASA 300# RF
Code:	Directiva 97/23/EC (EN 13445) and SANS		
X-Ray main weldings (%):	100%		
Joint efficiency	1,00		
Corrosion allowance	0	mm.	
VESSEL FINISH			**INSPECTION**
Inner face:	Clean		Hydraulic test to 25 bar
Outer face:	SA 2 ½	Blast cleaning	Longitudinal welds X-Ray 100%
	60 µ.	Epoxy polyamide	Other inspections according to code
	60 µ.	White polyurethane	
Minimum thickness:	120 µ.		
Note: Paint products to be used will be the LAPESA standard ones			

CONNECTIONS			**VALVE EQUIPMENT** (*Optional equipment)	
Pressure relief	**2** flange PAD	ASA 4" 300#	**2**	REGO 8574 (4 válv.) 17 bar
Filling	**1** flange PAD	ASA 2" 300#	**1**	Check valve REGO A 3400 L4
			1	Ball valve PEKOS Z34 SSSGV 300# RF 2" + AT351S12 U
			1	Actuator PEKOS AT351S12 U
Liquid phase	**1** flange PAD	ASA 2" 300#	**1**	Excess flow REGO A 3500 P4
			1	Ball valve PEKOS Z34 SSSGV 300# RF 2" + AT351S12 U
			1	Actuator PEKOS AT351S12 U
Gas phase	**1** flange PAD	ASA 2" 300#	**1**	Excess flow REGO A 3500 P4
			1	Ball valve PEKOS Z34 SSSGV 300# RF 2" + AT351S12 U
			1	Actuator PEKOS AT351S12 U
Magnetic level	**1** special flange	MAGNETEL	**1**	Roch. 6342.08 D4200 Magnetel
Drain	**1** flange PAD	ASA 2" 300#	**1**	Excess flow REGO A 3500 P4
			1	Ball valve PEKOS Z34 SSSGV 300# RF 2" + AT351S12 U
			1	Actuator PEKOS AT351S12 U
Instrumentation	**1** flange PAD	ASA 3/4" 300#	**1**	Ball valve PEKOS Z34 SSSGV 300# RF 3/4"
Instrumentation	**1** flange PAD	ASA 3/4" 300#	**1**	Ball valve PEKOS Z34 SSSGV 300# RF 3/4"
High point and manometer	**1** coupling	3/4" NPT	**1**	High level REGO A 2805 C + manometer

* **Note:** All flanges are PAD type 300# RF

FINAL DOCUMENTS	**ENCLOSED DOCUMENTS**
• Certificate of compliance CE • General drawing of the vessel for approval • Pressure Relief valve Certificate	

Performed by: Approved by: