03. SCOPE OF SUPPLY & SPECIFICATIONS

1 SCOPE OF SUPPLY & SPECIFICATIONS

1.1 SCOPE OF SUPPLY

CPSTL wish to obtain the quotations for the items listed below,

Important: All technical data of hoses under constructions of single-carcass to be attached along with bidding document.

Marine Hoses & Accessories

Item No.	Qty. Required	Unit	Description
			Hoses & Accessories for Floating Hose System
01	12	No.	16"Ø x 40' Kink Resistant, Mainline Floating Hose with ANSI 150# WN/FF Flanges at both ends
02	01	No.	16"Ø x 40' Half Tapered, One End Reinforced, Half Float, Kink Resistant First Off the Buoy Hose with ANSI 300# WN/FF Flange at the Reinforced End and ANSI 150# WN/FF Flange at the other End
03	03	No.	12"Ø x 40' Kink Resistant, Floating Tail Hose with ANSI 150# WN/FF Flanges at both ends
04	01	No.	16"Ø - 12"Ø x 40' Kink Resistant, Mainline Floating Hose with Integral Reducer and ANSI 150# WN/FF Flanges at both ends
05	03	No.	12"Ø x 30' Kink Resistant, Floating Tanker Rail Hose (Barbell) with ANSI 150# WN/FF Flanges at both ends
			Hoses & Accessories for Under buoy Hose System
06	*02*	*No.*	*16"Ø x 30' One End Reinforced, Kink Resistant, Submarine Hose with Location Collars and ANSI 300# WN/FF Flanges at both ends (for Buoy end)*
07	*02*	*No.*	*16"Ø x 25' Kink Resistant, Standard Submarine Hose with Location Collars and ANSI 300# WN/FF Flanges at both ends*
08	*02*	*No.*	*16"Ø x 30' One End Reinforced, Kink Resistant, Submarine Hose with Location Collars and ANSI 300# WN/FF Flanges at both ends (for PLEM end)*
09	*10*	*No.*	*Hinged Turnbuckle Type Body Floats*
10	*08*	*No.*	*Hinged Turnbuckle Type End Floats*
11	72	No.	7/8" Ø-9TUNC#210MM threaded stud bolt with 02 nuts
12	240	No.	7/8" Ø-9TUNC#120MM threaded stud bolt with 02 nuts
13	260	No.	1 1/4" Ø-8TUNC#190MM threaded stud bolt with 02 nuts
14	30	No.	1" Ø-8TUNC#280MM threaded stud bolt with 02 nuts
15	448	No.	1" Ø-8TUNC#140MM threaded stud bolt with 02 nuts
16	60	No.	7/8" Ø-9TUNC#250MM threaded stud bolt with 02 nuts
17	120	No.	7/8" Ø-9TUNC#160MM threaded stud bolt with 02 nuts

18	02	No.	Butterfly Valve 12" ANSI 150 Connection
19	02	No.	Studded Cam Locking for 12" Hose
20	02	No.	12" Light weight Blind Flange
21	02	No.	12" Spool Piece
22	06	No.	Obstruction Light for 16" Dia. Hose

Note:

1)*:* ***The floating hose system is undergone very severe weather condition during more than six (06) months in the year and therefore "the design of the first off hose (ITEM-2) should be very critical" and*** **- frequent failures of this hose is being experienced** ***and the hose shall be robust enough to withstand for the "weather parameter applicable" for hose design given in this document,*** **therefore the successful bidder shall discuss with CPSTL about the operational issues before starting the manufacturing process** ***(if any)*****.**

2). Simulated Model Testing for under buoy Hose System

Manufacturer shall conduct a detailed Simulated Model Testing (Static & Dynamic) for the Under-buoy hose system according to the relevant information given in the drawings, environmental & other technical data given under Clause 3.5, 3.6, drawings attached and design data of the buoy which can be provided to the contractor after awarding the tender in order to configure the hose string as **"Chinese Lantern"** method for two PLEMs. The report for detailed Simulated Model Testing (Static & Dynamic) shall be certified by the recognized third party surveyor.

3). Individual sizes of Item 06, 07 & 08 and quantity of Item 09 & 10 shall be decided by the supplier in accordance with results of static and dynamic simulation.

4). Manufacturer shall send a service engineer to the SPM site in Sri Lanka at the time installations of under buoy hose system to confirm the "hose string configuration is as per the design" and to provide manufacturer's acceptance for operation as per Clouse 2.10.

5). However, CAPC reserves the right to take the final decision regarding the requirement of Simulated Model Testing at the time of evaluation/awarding of the tender.

1.2 SPECIFICATIONS FOR MARINE HOSES AND ACCESSORIES

The bidder shall indicate whether the required specifications are met by them by marking (Yes) if it meets the requirements/comply and (No) if it is not, in front of each requirement/specification in the right-hand corner of each item. Variations and/or deviations from specification, if any, should be illustrated clearly in detail.

Please note that the following specifications are for the Standard single carcass hoses.

3.2.1 16"Ø x 40' Kink Resistant, Mainline Floating Hose with ANSI 150# WN/FF Flanges at both ends **(Item No. 01)**

Nominal Bore Diameter	:	16" (inch)
Length	:	40' (feet)
Rated Working Pressure (RWP)	:	15.5 barg (225psig)
Minimum Burst Pressure	:	77.5 barg (1125psig)
Allow. Operating Pressure	:	-0.85 barg to RWP
Design Temperature	:	-29^0C to 82^0C
Hose Construction	:	**Kink Resistant, Standard Single Carcass, reinforced with textile or fabric cord layers**
Floatation	:	Integral with 20% Reserve Buoyancy minimum when filled with Seawater
Flange Material	:	ASTM A 105
Flange Rating	:	ANSI/ASME B16.5 Class 150 at both ends
Flange Coating	:	Hot Dip Galvanized or Zinc Rich Primer system
Flange Face	:	Flat Face
Cover	:	Rubber (black colour) with orange colour spirally wound stripe, resistant to aging abrasion, weathering, tearing, sunlight, and oil & Seawater penetration
Cover Thickness	:	Manufacturer's standard
Minimum Bending Radius	:	6 times of nominal bore diameter of the hose
Conductivity	:	Electrical Continuous
Temporary Elongation	:	Max. 2.5%
Permanent Elongation	:	Max. 0.7%
Flow Velocity	:	up to 21m/sec
Aromatic Hydrocarbon Content	:	Max. 60%
Applicable Standards	:	OCIMF "GMPHOM" 2009, 5th Edition

3.2.2 16"Ø x 40' Half Tapered, One End Reinforced, Half Float, Kink Resistant First Off the Buoy Hose with ANSI 300# WN/FF Flange at the Reinforced End and ANSI 150# WN/FF Flange at the other end **(Item No. 02)**

Nominal Bore Diameter	:	16" (inch)
Length	:	40' (feet)
Rated Working Pressure (RWP)	:	15.5 barg (225psig)
Minimum Burst Pressure	:	77.5 barg (1125psig)
Allow. Operating Pressure	:	-0.85 barg to RWP
Design Temperature	:	-29^0C to 82^0
Hose Construction	:	**Kink Resistant, Standard Single Carcass, reinforced with textile or fabric cord layers**
Flange Material	:	ASTM A 105
Flange Rating	:	ANSI/ASME B16.5 Class 300 at the Buoy end & ANSI/ASME B16.5 Class 150 at the other end
Flange Coating	:	Hot Dip Galvanized or Zinc Rich Primer system
Flange Face	:	Flat Face

Cover	:	Rubber (black colour) with orange colour spirally wound stripe, resistant to aging abrasion, weathering, tearing, sunlight, oil & sea water penetration
Cover Thickness	:	Manufacturer's standard
Minimum Bending Radius	:	**3 times** of nominal bore diameter of the hose at the **non-floating part 6 times** of nominal bore diameter of the hose at the **floating part**
Conductivity	:	Electrical Continuous
Temporary Elongation	:	Max. 2.5%
Permanent Elongation	:	Max. 0.7%
Flow Velocity	:	up to 21m/sec
Aromatic Hydrocarbon Content	:	Max. 60%
Applicable Standards	:	OCIMF "GMPHOM" 2009, 5th Edition

3.2.3 12"Ø x 40' Kink Resistant, Floating Tail Hose with ANSI 150# WN/FF Flanges at both ends **(Item No. 03)**

Nominal Bore Diameter	:	16" (inch)
Length	:	40' (feet)
Rated Working Pressure (RWP)	:	15.5 barg (225psig)
Minimum Burst Pressure	:	77.5 barg (1125psig)
Allow. Operating Pressure	:	-0.85 barg to RWP
Design Temperature	:	-29^0C to 82^0C
Hose Construction	:	**Kink Resistant, Standard Single Carcass**, **reinforced with textile or fabric cord layers**
Floatation	:	Integral with 20% Reserve Buoyancy minimum when filled with Seawater
Flange Material	:	ASTM A 105
Flange Rating	:	ANSI/ASME B16.5 Class 150 at both ends
Flange Coating	:	Hot Dip Galvanized or Zinc Rich Primer system
Flange Face	:	Flat Face
Cover	:	Rubber (black colour) with orange colour spirally wound stripe, resistant to aging abrasion, weathering, tearing, sunlight, and oil & Seawater penetration
Cover Thickness	:	Manufacturer's standard
Minimum Bending Radius	:	6 times of nominal bore diameter of the hose
Conductivity	:	Electrical Continuous
Temporary Elongation	:	Max. 2.5%
Permanent Elongation	:	Max. 0.7%
Flow Velocity	:	up to 21m/sec
Aromatic Hydrocarbon Content	:	Max. 60%
Applicable Standards	:	OCIMF "GMPHOM" 2009, 5th Edition

3.2.4 16"Ø - 12"Ø x 40' Kink Resistant, Mainline Floating Hose with Integral Reducer and ANSI 150# WN/FF Flanges at both ends **(Item No. 04)**

Nominal Bore Diameter	:	11.85" (inch)
Length	:	40' (feet)
Rated Working Pressure (RWP)	:	15.5 barg (225psig)
Minimum Burst Pressure	:	77.5 barg (1125psig)
Allow. Operating Pressure	:	-0.85 barg to RWP
Design Temperature	:	-29^0C to 82^0C
Hose Construction	:	**Kink Resistant, Standard Single Carcass, reinforced with textile or fabric cord layers**
Floatation	:	Integral with 20% Reserve Buoyancy minimum when filled with Seawater
Flange Material	:	ASTM A 105
Flange Rating	:	ANSI/ASME B16.5 Class 150 at both ends
Flange Coating	:	Hot Dip Galvanized or Zinc Rich Primer system
Flange Face	:	Flat Face
Cover	:	Rubber (black colour) with orange colour spirally wound stripe, resistant to aging abrasion, weathering, tearing, sunlight, and oil & Seawater penetration
Cover Thickness	:	Manufacturer's standard
Minimum Bending Radius	:	6 times of nominal bore diameter of the hose
Conductivity	:	Electrical Continuous
Temporary Elongation	:	Max. 2.5%
Permanent Elongation	:	Max. 0.7%
Flow Velocity	:	up to 21m/sec
Aromatic Hydrocarbon Content	:	Max. 60%
Applicable Standards	:	OCIMF "GMPHOM" 2009, 5th Edition

3.2.5 12"Ø x 30' Kink Resistant, Floating Tanker Rail Hose (Barbell) with ANSI 150# WN/FF Flanges at both ends **(Item No. 05)**

Nominal Bore Diameter	:	12" (inch)
Length	:	30' (feet)
Rated Working Pressure (RWP)	:	15.5 barg (225psig)
Minimum Burst Pressure	:	77.5 barg (1125psig)
Allow. Operating Pressure	:	-0.85 barg to RWP
Design Temperature	:	-29^0C to 82^0C
Hose Construction	:	**Kink Resistant, Standard Single Carcass, reinforced with textile or fabric cord layers**
Floatation	:	Integral with 25% Reserve Buoyancy minimum when filled with Seawater
Flange Material	:	ASTM A 105
Flange Rating	:	ANSI/ASME B16.5 Class 150 at both ends
Flange Coating	:	Hot Dip Galvanized or Zinc Rich Primer system
Flange Face	:	Flat Face

Cover	:	Rubber (black colour) with orange colour spirally wound stripe, resistant to aging abrasion, weathering, tearing, sunlight, and oil & Seawater penetration
Cover Thickness	:	Manufacturer's standard
Minimum Bending Radius	:	4 times of nominal bore diameter of the hose
Conductivity	:	Electrical Discontinuous
Temporary Elongation	:	Max. 2.5%
Permanent Elongation	:	Max. 0.7%
Flow Velocity	:	up to 21m/sec
Aromatic Hydrocarbon Content	:	Max. 60%
Applicable Standards	:	OCIMF "GMPHOM" 2009, 5th Edition

3.2.6 16"Ø x 30' One End Reinforced, Kink Resistant, Submarine Hose with Location Collars and ANSI 300# WN/FF Flanges at both ends (for Buoy end) **(Item No. 06)**

Nominal Bore Diameter	:	16" (inch)
Length	:	30' (feet)
Rated Working Pressure (RWP)	:	15.5 barg (225psig)
Minimum Burst Pressure	:	77.5 barg (1125psig)
Allow. Operating Pressure	:	-0.85 barg to RWP
Design Temperature	:	-29^0C to 82^0C
Hose Construction	:	**Kink Resistant, Standard Single Carcass, reinforced with textile or fabric cord layers**
Flange Material	:	ASTM A 105
Flange Rating	:	ANSI/ASME B16.5 Class 300 at both ends
Flange Coating	:	Hot Dip Galvanized or Zinc Rich Primer system
Flange Face	:	Flat Face
Cover	:	Rubber (black colour), resistant to aging abrasion, weathering, tearing, sunlight, and oil & Seawater penetration
Cover Thickness	:	Manufacturer's standard
Minimum Bending Radius	:	4 times of nominal bore diameter of the hose
Conductivity	:	Electrical Continuous
Temporary Elongation	:	Max. 2.5%
Permanent Elongation	:	Max. 0.7%
Flow Velocity	:	up to 21m/sec
Aromatic Hydrocarbon Content	:	Max. 60%
Applicable Standards	:	OCIMF "GMPHOM" 2009, 5th Edition

3.2.7 16"Ø x 25' Kink Resistant, Standard Submarine Hose with Location Collars and ANSI 300# WN/FF Flanges at both ends **(Item No. 07)**

Nominal Bore Diameter	:	16" (inch)
Length	:	25' (feet)
Rated Working Pressure (RWP)	:	15.5 barg (225psig)
Minimum Burst Pressure	:	77.5 barg (1125psig)
Allow. Operating Pressure	:	-0.85 barg to RWP

Design Temperature	:	-29^{0}C to 82^{0}C
Hose Construction	:	**Kink Resistant, Standard Single Carcass, reinforced with textile or fabric cord layers**
Flange Material	:	ASTM A 105
Flange Rating	:	ANSI/ASME B16.5 Class 300 at both ends
Flange Coating	:	Hot Dip Galvanized or Zinc Rich Primer system
Flange Face	:	Flat Face
Cover	:	Rubber (black colour), resistant to aging abrasion, weathering, tearing, sunlight, and oil & Seawater penetration
Cover Thickness	:	Manufacturer's standard
Minimum Bending Radius	:	4 times of nominal bore diameter of the hose
Conductivity	:	Electrical Continuous
Temporary Elongation	:	Max. 2.5%
Permanent Elongation	:	Max. 0.7%
Flow Velocity	:	up to 21m/sec
Aromatic Hydrocarbon Content	:	Max. 60%
Applicable Standards	:	OCIMF "GMPHOM" 2009, 5th Edition

3.2.8. 16"Ø x 30' One End Reinforced, Kink Resistant, Submarine Hose with Location Collars and ANSI 300# WN/FF Flanges at both ends (for PLEM end) **(Item No. 08)**

Nominal Bore Diameter	:	16" (inch)
Length	:	30' (feet)
Rated Working Pressure (RWP)	:	15.5 barg (225psig)
Minimum Burst Pressure	:	77.5 barg (1125psig)
Allow. Operating Pressure	:	-0.85 barg to RWP
Design Temperature	:	-29^{0}C to 82^{0}C
Hose Construction	:	**Kink Resistant, Standard Single Carcass, reinforced with textile or fabric cord layers**
Flange Material	:	ASTM A 105
Flange Rating	:	ANSI/ASME B16.5 Class 300 at both ends
Flange Coating	:	Hot Dip Galvanized or Zinc Rich Primer system
Flange Face	:	Flat Face
Cover	:	Rubber (black colour), resistant to aging abrasion, weathering, tearing, sunlight, and oil & Seawater penetration
Cover Thickness	:	Manufacturer's standard
Minimum Bending Radius	:	4 times of nominal bore diameter of the hose
Conductivity	:	Electrical Discontinuous
Temporary Elongation	:	Max. 2.5%
Permanent Elongation	:	Max. 0.7%
Flow Velocity	:	up to 21m/sec
Aromatic Hydrocarbon Content	:	Max. 60%
Applicable Standards	:	OCIMF "GMPHOM" 2009, 5th Edition

3.2.9 Hinged Turnbuckle Type End Floats & Body Floats **(Item No. 09 & 10)**

Floats shall be **bead floats**, **hinged turnbuckle type**, capable of submergence to depth stated below (clause 3.5.1) without crushing or otherwise sustaining permanent damage, which would render the float unusable. All hardware used to secure the float halves together on the hoses shall be fabricated form stainless steel (Type 316) or equivalent corrosion resistant material.

Weight and buoyancy of the floats to be determined by the Manufacturer as per his design of under buoy hose system and shall consist of hard shell & closed cell Foam. Outer cover of floats will be Polyethylene or Polyurethane with the colour of white oil or fluorescent Orange.

3.2.10 Stud Bolt with 02 Nuts to Connect 12" and 16" Dia. Hoses having ANSI 300# & 150# FF Flanges **(Item No. 11, 12, 13, 14, 15, 16 & 17)**

Bolts	: ASTM A 193 Gr. B7
Nuts	: ASTM A 194 Gr. 2H

All stud bolts and nuts shall be properly coated with Xylar 1/ Xylan 1070/ 524 to protect them from for the intended use.

3.2.11 Butterfly Valve 12" ANSI 150 Connection **(Item No. 18)**

Working Pressure	: 15 bar Disk Open
Test Pressure	: 03 bar Seated
Test Pressure	: 28 bar on Body
Temperature	: Ambient
Valve Body Material	: Cast Steel ASTM A 216 WCB
Valve Disk Material	: All Bronze BS 1400 AB2 or Cast Stainless Steel Conformed to JIS G 5121 SCS – 13 (304 Type) or SCS – 14 (316 Type)
Shaft Material	: Stainless Steel W.St1.4122 or 304 SS
Locking Bolts, Box Wrench	: Stainless Steel 304 SS
Connecting Bolts & Nuts	: Alloy Steel, ASTM A 193 Gr. B7 & ASTM A 194 Gr. 2H Coated Carbon Resin
Packing	: wooden box
Testing/Manufacturing Standard	: BSEN593 : 2004

Important
Hydrostatic Test Certificate & Material Certificate according to EN 10204 – Type 3.1 shall be sent along with the items.

3.2.13 Studded Cam Locking for 12" Hose **(Item No. 19)**

Flange	: ANSI Class 150, ASTM A 105 or JIS G 4051 S 25 C
"O" Ring	: NBR
Cam	: Carbon Steel, JIS G 4051 S 45 C
Handle	: Rolled Steel, JIS G 3101 SS 41
Connecting Stud & Nuts	: Alloy Steel, ASTM A 193 Gr. B7 & ASTM A 194 Gr. 2H

3.2.14 12" Light weight Blind Flange **(Item No. 20)**

Flange to be conformed to ANSI 150 Class with suitable handle fixed to the outside of the body. Flange & handle materials should be rolled steel conformed to JIS G 3101 SS 41 or ASTM A 105.

3.2.15 12" Spool Piece **(Item No. 21)**

Material: Forged Steel, SATM A 105 or JIS G 4051 S 25 C

Important

1. Extended surfaces including flange faces shall be hot dipped galvanized in accordance with BS 729.
2. Please refer drawing for dimensions.
3. Spool pieces shall be fabricated of back-to-back flat face weld neck flanges with bore to match hose. Bolt holes shall straddle centreline.
4. Procedures for welding, welder qualifications and weld inspection shall be in accordance with API 1104 or ASME VIII/IX.
5. Spools shall be provided with two (02) lifting pad eyes located 1800 apart.

3.2.16 Obstruction Light (Anti Corrosive Aluminium Alloy Body) for 16" inner Dia. Floating Hose **(Item No 22)**

Height	:	Above 500 mm
Weight	:	Less Than 20 Kg
Body	:	Anti-Corrosive Aluminium Alloy suitable for marine service (ASTM B 928 or eq.)
Stand & Cover	:	Galvanized Rolled Steel, JIS G 3101 SS 41
Stand Fixing Bolts	:	Stainless Steel 316
Body Colour	:	Yellow
Bulb	:	Tungsten Filament
Light & Lens Colour	:	Clear White
Optical Range	:	More than 5 km (when atmospheric transmissivity factor = 0.85)
Flasher	:	Solid State with Sun switch
Flasher Frequency	:	Every 4 Sec. (0.5 Sec. On + 3.5 Sec. Off)
Bulb Life	:	06 Months (above 500 Hrs)
Power Source	:	Alkaline Dry Cell or Solar Chargeable
Battery Pack Life	:	At least 03 months

Obstruction light should be able to fix to the hose flanges (ANSI 150#) on upright position and should withstand environmental conditions mentioned in clause 4.3. Battery pack, bulb & operations unit should be protected from seawater.

1.3 SCOPE OF TESTING

A recognized Third Party should witness the following test to be carried out in accordance with OCIMF "Guide to Manufacturing & Purchasing Hoses for Offshore Moorings" (GMPHOM) 2009, 5th Ed.

(a) Material & Pre-Build Check
(b) Inline Inspection of Hose Carcass, Buoyancy Material & Outer Cover
(c) Adhesion Tests
(d) Weight Tolerance Test for submarine hoses
(e) Test Torsion
(f) Tensile Test

} Proto type test certificate are accepted

(g) Float Hydro Static Test & Impact Test
(h) Float Trial Test

In addition, the Third-Party Inspection will witness following Acceptance Tests along with Two (02) Mechanical Engineers appointed by CPSTL as per COC clause 2.5.

(i) Hydrostatic Pressure Test
(j) Vacuum Test
(k) Electrical Continuity Test
(l) Minimum Bending Radius Test
(m) Bending Stiffness Test
(n) Kerosene Test
(o) Final Product Inspection

Important:
Third Party Inspection Certificate shall be issued prior to the shipment

1.4 IMPORTANT

01. Country of Origin/Manufacturer shall be mentioned.

02. Warranty shall be mentioned.

03. Following information to be clearly indicated on each item by steel dye stamping or by water resistant paint.
- **a.** Heat number & Load
- **b.** CPSTL order & Tender Number
- **c.** Manufacturer's name & Country of Origin

04. All materials should be manufactured & testing should be as per OCIMF guidelines.

05. All marine hoses should be manufactured in accordance with OCIMF "Guide to Manufacturing and Purchasing Hoses for Offshore Moorings (GMPHOM) 2009, 5th Ed., and shall withstand severe weather conditions as stipulated under 4.3. Manufacturers are strongly advised to seek clarifications from CPSTL if essential information are found missing or inadequate to select & design hoses for this particular Tender.

06. The exposed internal & external surfaces of the end fittings and flanges (including flange faces) of all hoses should be hot dipped galvanized in accordance with EN ISO 1461 with minimum average coating thickness of 85µm and the surfaces should be prepared for galvanizing by blast cleaning (grit blasting) to SA2 ½ followed by pickling in Acid.

07. The serial number of each hose & floating reducer and the year of manufacture should be applied on the rim of each flange by depositing weld metal using electrodes having composition to ASME IIc code "Welding rods, electrodes & filler material", SFA-5.4 AWS classification E 308.

08. Unless otherwise specified, all materials should be manufactured & testing should be as per OCIMF guidelines.

1.5 SITE CONDITIONS & WEATHER DATA APPLICABLE AT THE TERMINAL

3.5.1 General

Location	: N = 203154.1 E = 93889.3
Chart Depth (MSL)	: 18 m
Location of the SPBM	: Approx. 3.25 km from Shore
Highest astronomical tide	: 1 m
Storm tide	: 1.2 m (Survival)

3.5.2 Operational Conditions (SPM with Tanker Moored)

Maximum Wave Height	: 6.9 m
Significant Wave Height	: 3.7 m
Spectrum Peak Period	: 10.0 Sec
Associated Wave Period	: 9.8 Sec
Wind Velocity	: 20 m/s
Current Speed (surface)	: 0.76 m/s

3.5.3 Survival Conditions (SPM without Tanker Moored)

Maximum Wave Height	: 13.6 m
Peak Wave Period	: 12.9 Sec
Significant Wave Height	: 7.3 m
Spectrum Peak Period	: 11.3 Sec
Associated Wave Period	: 12.6 Sec
Wind Velocity	: 45.0 m/s
Current Speed (surface)	: 1.25 m/s

1.6 INTENDED APPLICATION & GENERAL INFORMATION

All the hoses and accessories given in the Scope of Supply clause 3.1 are intended to be installed at Muthurajawela SPBM terminal operated by CPSTL. This terminal is only used for offloading finished products.

3.6.1 Characteristics of Products being offloaded

Product	: Kerosene, Diesel, Gasoline & Fuel Oil
Temperature	: Minimum 15 ^{0}C to Maximum 50 ^{0}C
Maximum Flow rate	: 1800 m^3/h
Tanker Discharge Pressure	: 10 kg/cm^2 (150 psig)
Flow	: From Tanker to Shore Tank

No	Product	Specific Gravity @ 15 ^{0}C	Viscosity @ 37.8 ^{0}C (cst)
01	Diesel	0.86	6 - 7
02	Kerosene	0.82	1.82
03	Petrol	0.725 – 0.785	7
04	Fuel Oil	Max. 0.97	180

3.6.2 Specifications of Vessels being moored at SPM Terminal

Maximum Dead weight	: 60,000 DWT
Overall Length	: 228 m
Moulded Breadth	: 34.9 m

Moulded Depth	:	18.2 m
Draft (Full Load)	:	12.7 m
Draft (Light Load)	:	4.6 m

Refer Marlow Ropes drawing No: MR.01.002.6560 – "CALM Buoy Mooring Hawser Assembly"

3.6.3 Specifications of the SPM Terminal

Type of SPBM	:	Dual Path Catenary Anchor Leg Mooring (CALM)
Under buoy Hose System	:	Chinese Lantern
No of PLEMs	:	02
Throughput	:	1800 m^3/hour
Overall Diameter of the Buoy	:	8.5 m (approx.)
Overall Height	:	4 m (approx.)
Dia. of Central Chamber	:	3.4 m
Total Weight of the Buoy	:	130 MT with product
Free Floating in Sea Water	:	2.2 m Draft (approx.) to the bottom of the Under-buoy Piping
Components of Watertight Hull	:	07 No. of Separate Watertight Compartments 01 No. of Cylindrical Central Chamber 06 No. of Surrounding Compartments
No of Anchor Chain Legs	:	06 spaced at 60^0 intervals
Chain Size	:	3" & $3^1/_2$" Dia.
Approx. Length of each chain	:	300 m
Radius from Buoy	:	285 m
Weight of the Anchors	:	12 & 16 MT (approx.)

Refer SBM Atlantia drawing No: DSM11004 - "8.5 METER CALM BUOY Mooring Buoy Elevation General Arrangement", drawing No: DPM21004 & DPM21005 - "Rotating Part Pipe Elevation" for two pipe arms , drawing No: DPM21004 – " Fixed Part Piping Elevation", drawing No: DMM41001 - "Anchor Leg Configuration"

3.6.4 Existing Floating Hose System

The existing Floating Hose System consists of two floating strings.

Floating Hose String No. 1 (Inboard): Gas Oil / Gasoline / Jet A 1

No	Description	Size	Quantity
01	Partially Reinforced First Off the Buoy Hose	16" ø x 40'	01
02	Mainline Full Floating Hose	16" ø x 40'	15
03	Floating Tail Hose	12" ø x 40'	02
04	Tanker Rail Hose	12" ø x 30'	01

Floating Hose String No. 2 (Outboard): Gas Oil / Gasoline / Jet A 1

No	Description	Size	Quantity
01	Partially Reinforced First Off the Buoy Hose	16" ø x 40'	01
02	Mainline Full Floating Hose	16" ø x 40'	16
03	Floating Tail Hose	12" ø x 40'	02
04	Tanker Rail Hose	12" ø x 25'	01

Refer SBM Atlantia drawing No: DPM46001 – "Floating Hose Configuration"

3.6.5 Existing Under buoy Hose System

The existing Under buoy Hose System consists of two submerged strings consisting of three hoses for each string.

Under buoy Hose String No. 1 (Inboard):
For Gas Oil / Gasoline / Jet A 1

No	Description	Size	Quantity
01	One End Reinforced Submarine Hose (Buoy side)	16" ø x 30'	01
02	Mainline Submarine Hose	16" ø x 25'	01
03	One End Reinforced Submarine Hose (PLEM Side)	16" ø x 30'	01
04	End Floats	-	01
05	Body Floats	-	04

Under buoy Hose String No. 2 (Outboard):
For Gas Oil / Gasoline / Jet A 1

No	Description	Size	Quantity
01	One End Reinforced Submarine Hose (Buoy side)	16" ø x 30'	01
02	Mainline Submarine Hose	16" ø x 25'	01
03	One End Reinforced Submarine Hose (PLEM Side)	16" ø x 30'	01
04	End Floats	-	02
05	Body Floats	-	05

Each under buoy hose string is connected to a separate PLEM as shown in the drawing No: DPM46002 and are configured to the "Chinese Lantern" method.

Refer SBM Atlantia drawing No: DPM21001 – "Fixed Part Piping Elevation", drawing No: DPM46002 – "Submarine Hose Configuration", drawing No: DCM97011 – "Field Layout" for PLEM location, drawing No: DSM26001 & DSM26004 – "Structural Piping & General Arrangement" for the New PLEM and drawing No: DSM07022 & DSM07024 for the Old PLEM.

1.7 CRITERIA FOR TECHNICAL EVALUATION

SUMMARY OF THE MARKING SCHEME

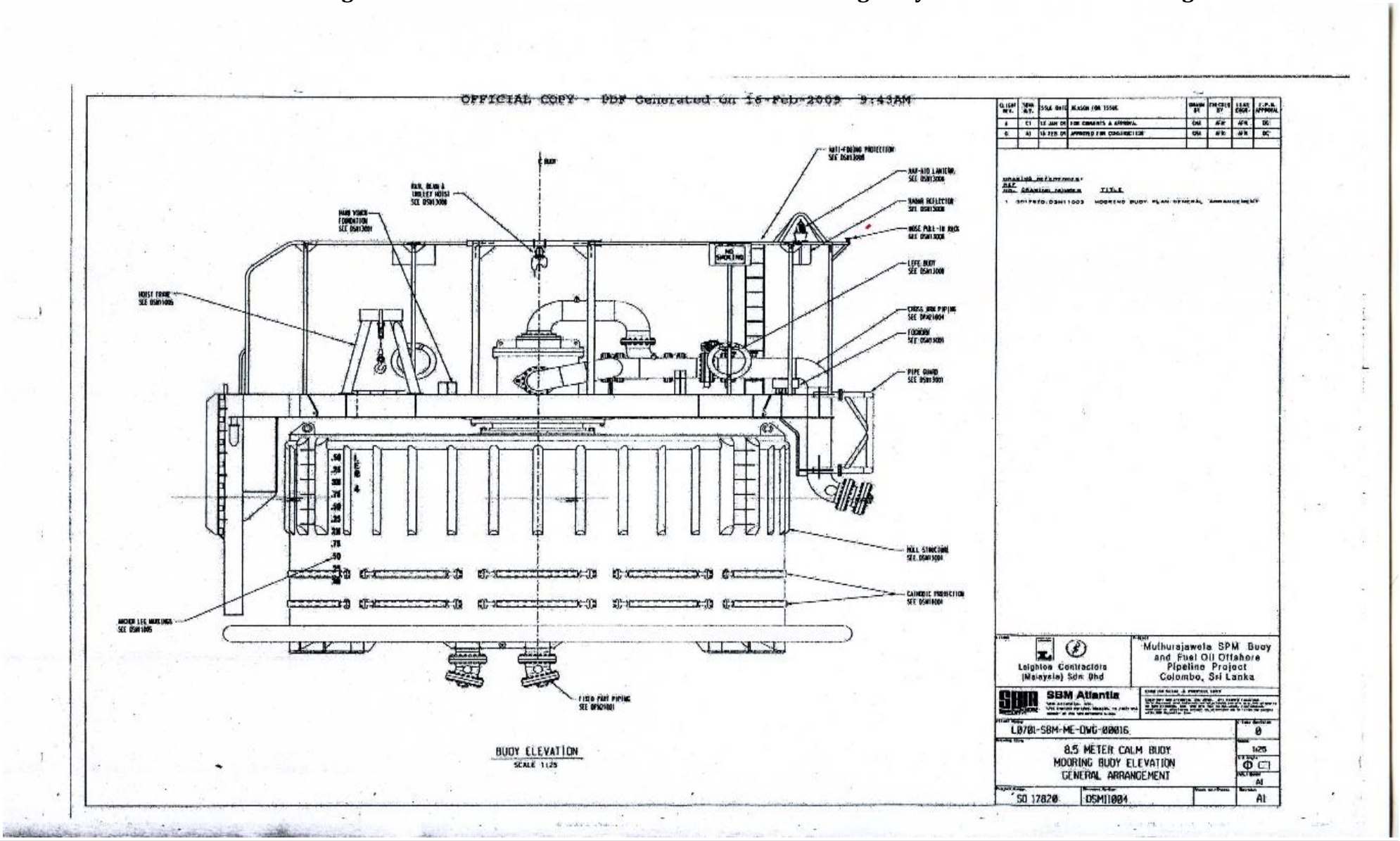
ITEM	WEIGHTAGE	MINIMUM CRITERIA
01. Specifications **1.1** Specification of the items (1 to 17) to be adequately acceptable to the CPSTL. It is mandatory requirement	60%	60%
1.2 Specification of the other accessories (Items 18 to 22) adequately acceptable to the CPSTL	20% (each item 4%)	16%
02. Manufacturer Experience **2.1** 10 years of experience of supplying hoses same magnitude	10%	14%
2.2 Successful Supply of subsea hoses for the SPMs installed in similar or worst weather conditions in open sea area	6%	
2.3 Successful supply of subsea hoses for SPMs in Sri Lanka	4%	
Total marks required for Technical evaluation	**100%**	**90%**

Note:
The information for the above will be derived from the information given by the bidders against the requested documents in the bidding document. Bids not accompanied with the documents requested will not be taken to the technical evaluation and will not be call as clarification in any circumstances.

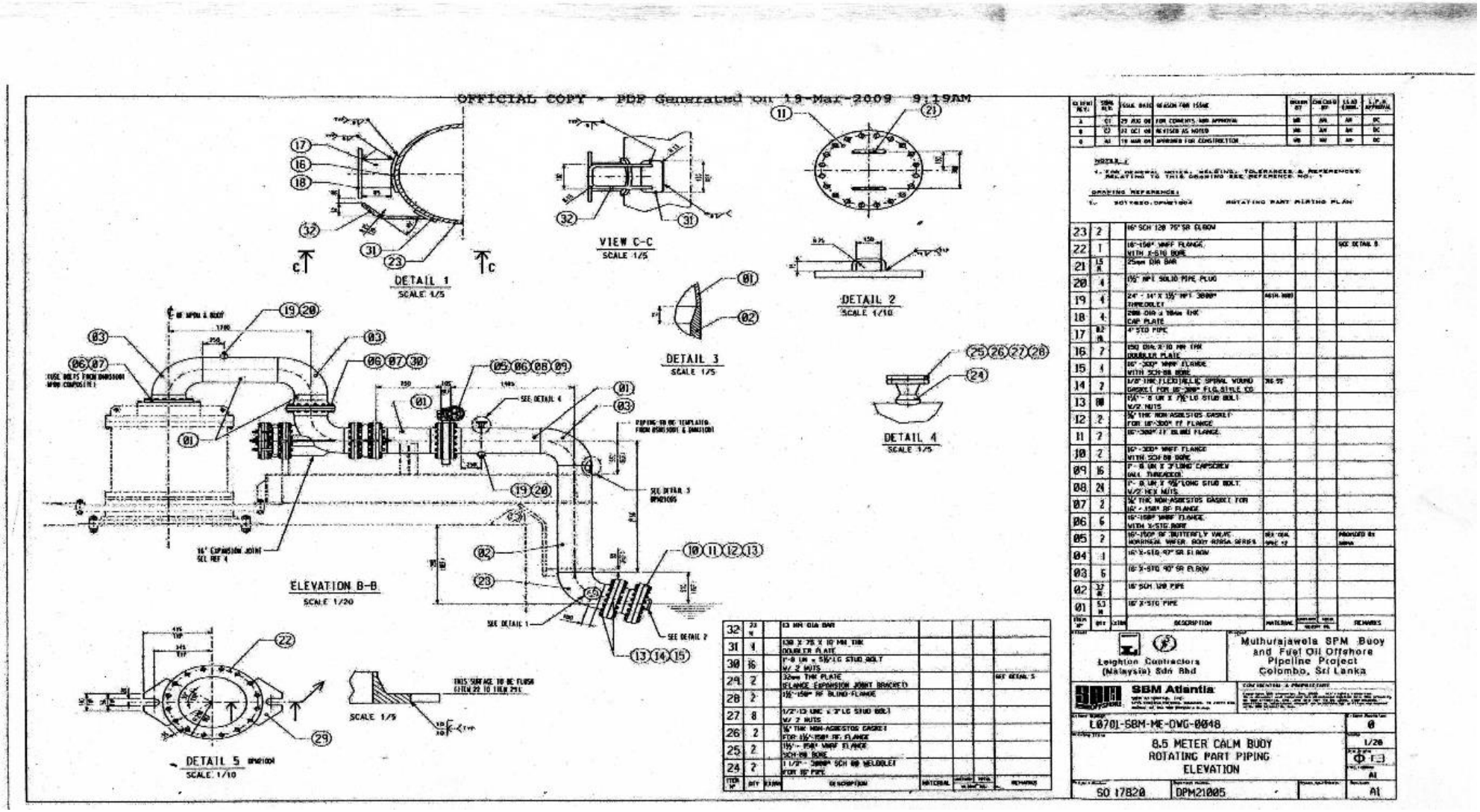
Bids fails to achieve an overall minimum of 90 points, together with the minimum required points given against each criterion, will be rejected.

Signature of the Bidder: …… Date:…… **(Common Company Seal)**

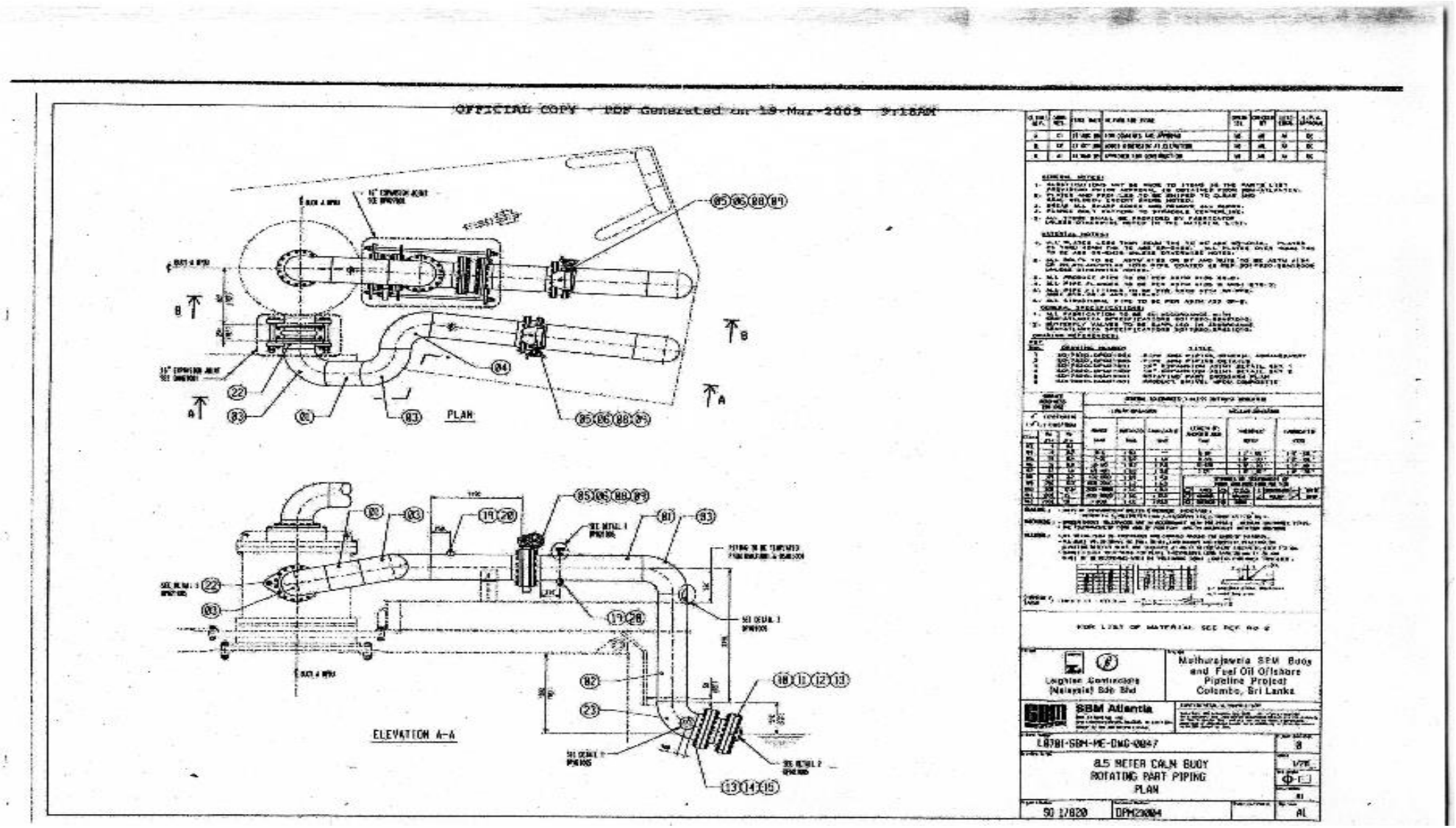
SBM Atlantia drawing No: DSM11004 - "8.5 METER CALM BUOY Mooring Buoy Elevation General Arrangement"



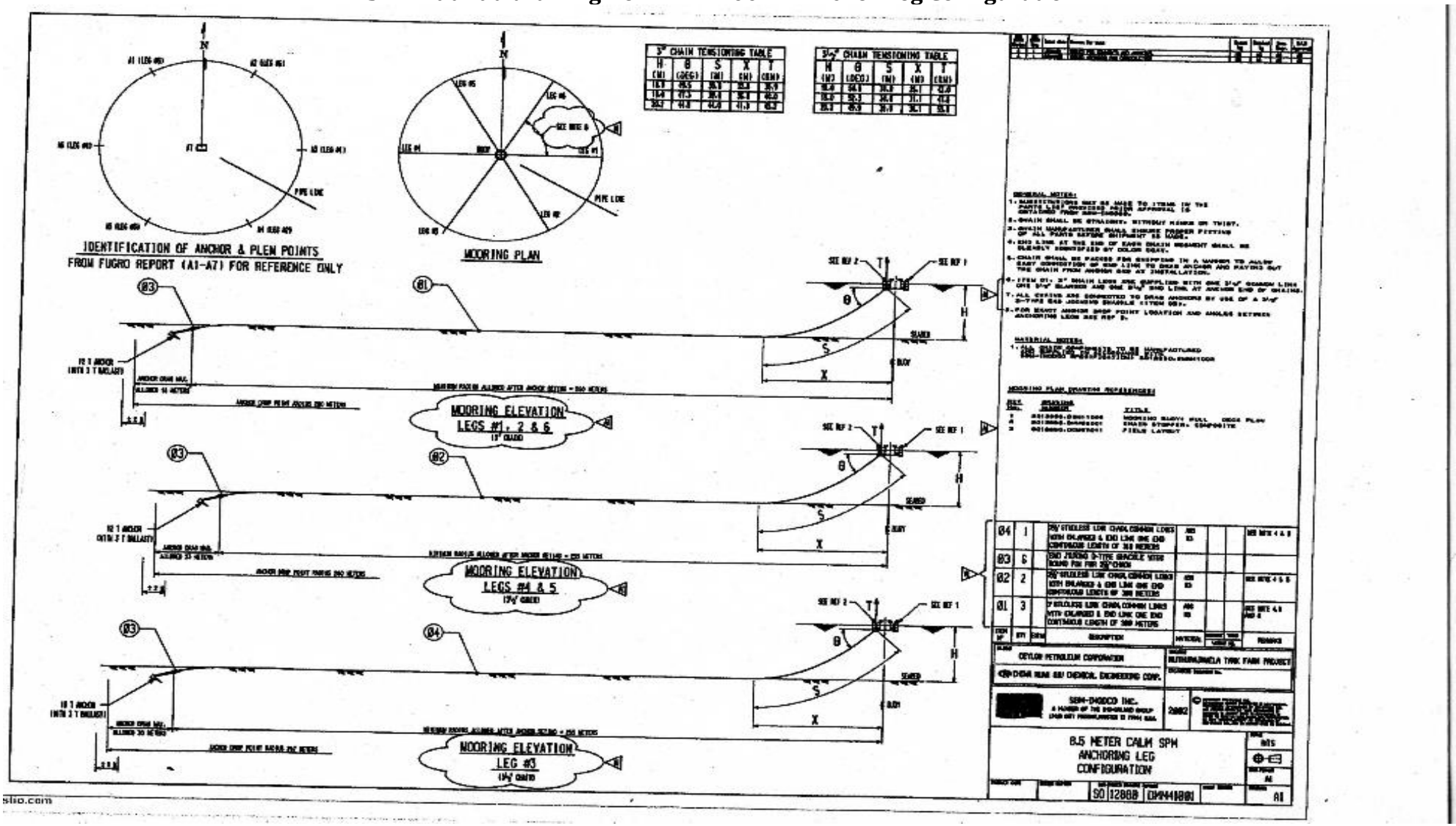
SBM Atlantia drawing No: DPM21005 - "Rotating Part Pipe Elevation"



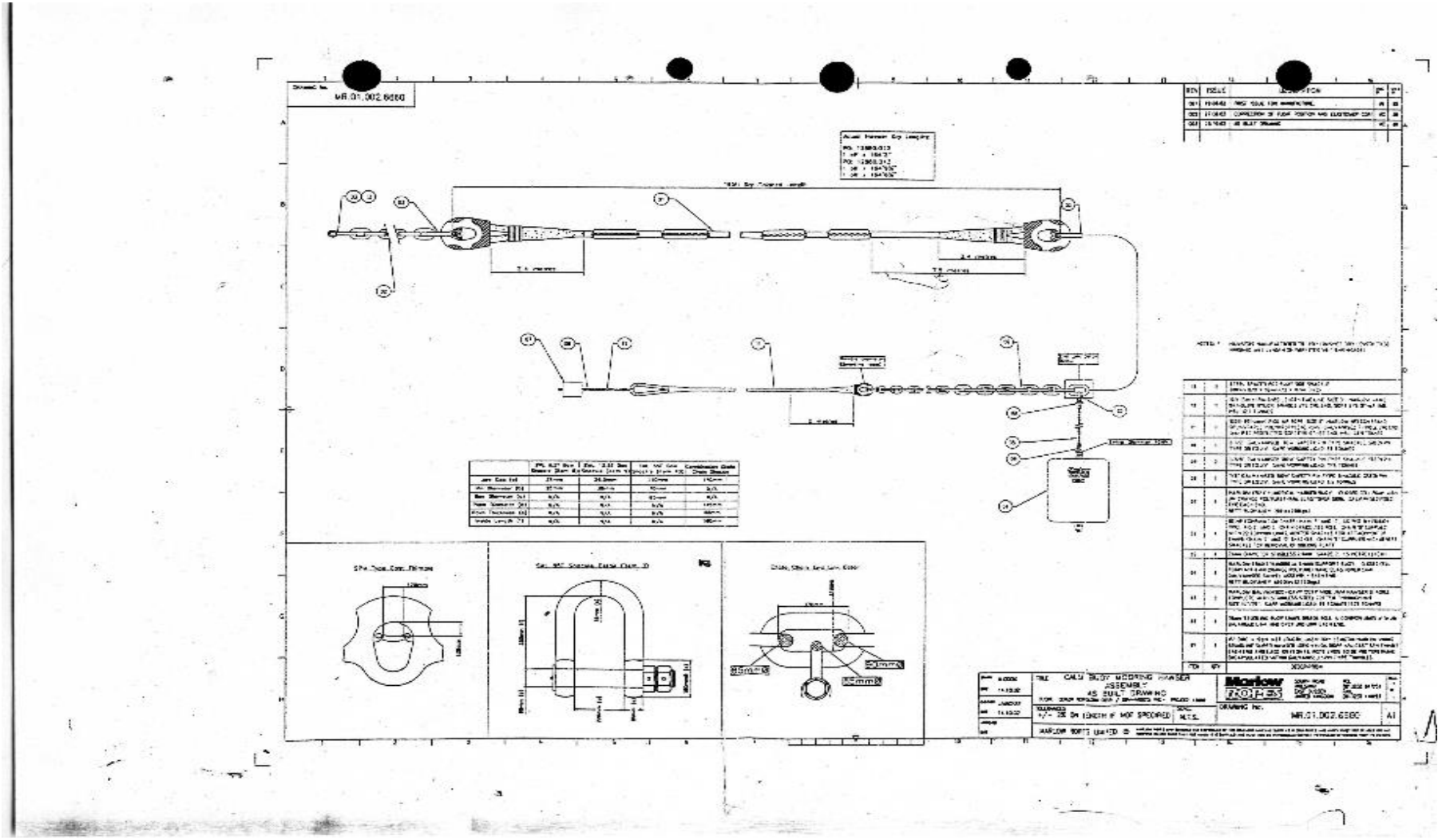
SBM Atlantia drawing No: DPM21004 – "Fixed Part Piping Elevation"



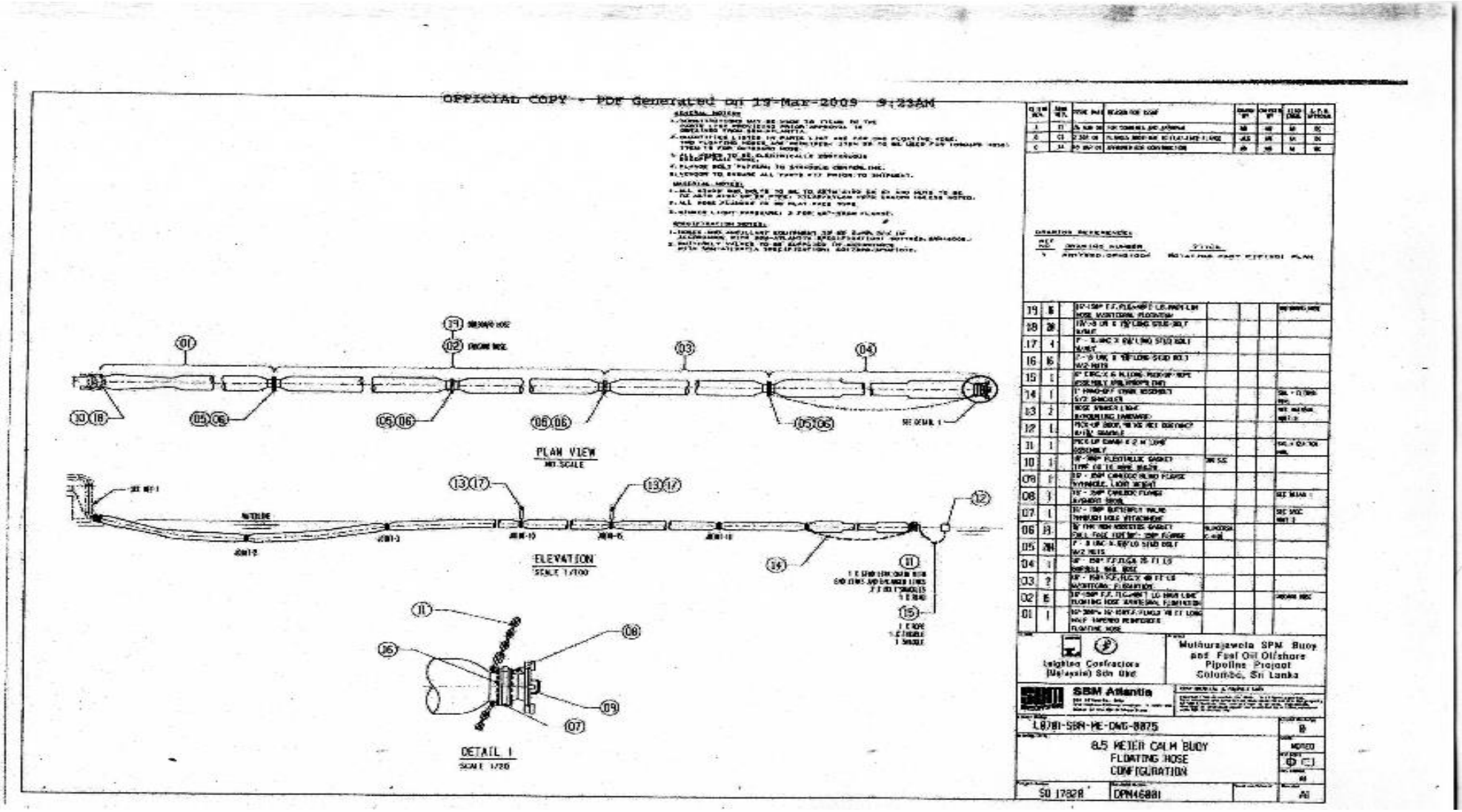
SBM Atlantia drawing No: DMM41001 - "Anchor Leg Configuration"



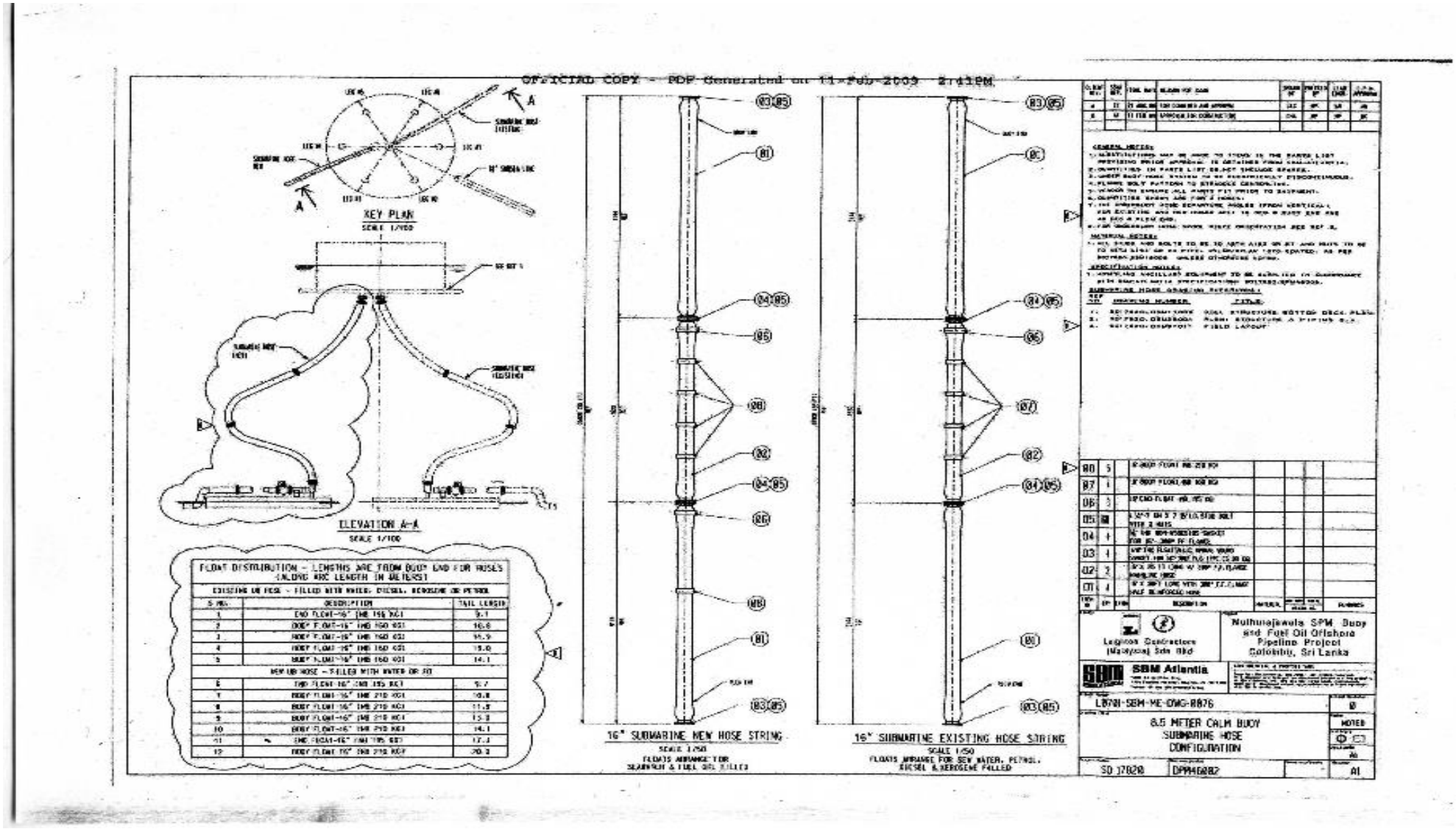
Marlow Ropes drawing No: MR.01.002.6560 – " CALM Buoy Mooring Hawser Assembly"



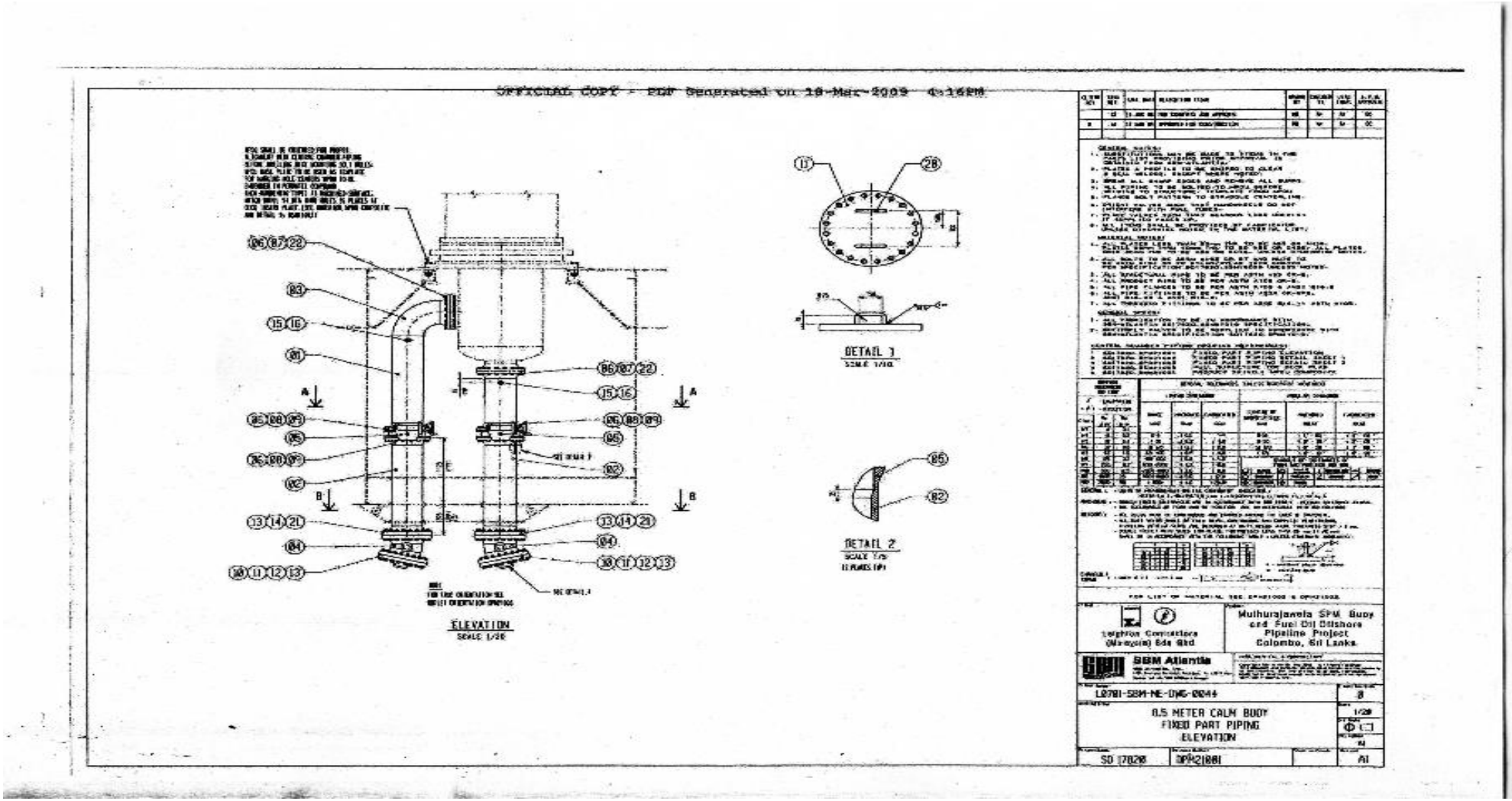
SBM Atlantia drawing No: DPM46001 – "Floating Hose Configuration"



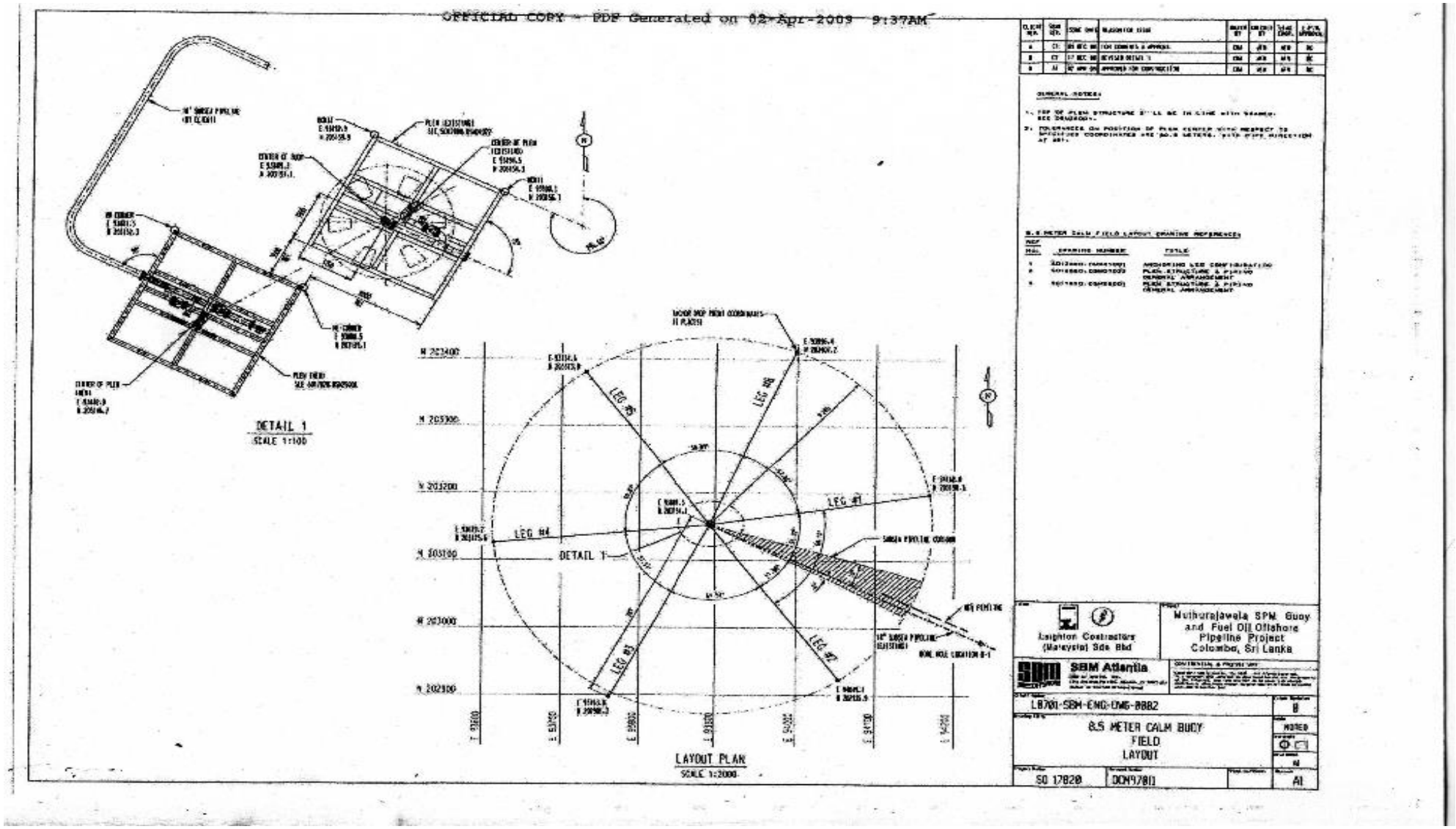
SBM Atlantia drawing No: DPM46002 – "Submarine Hose Configuration"



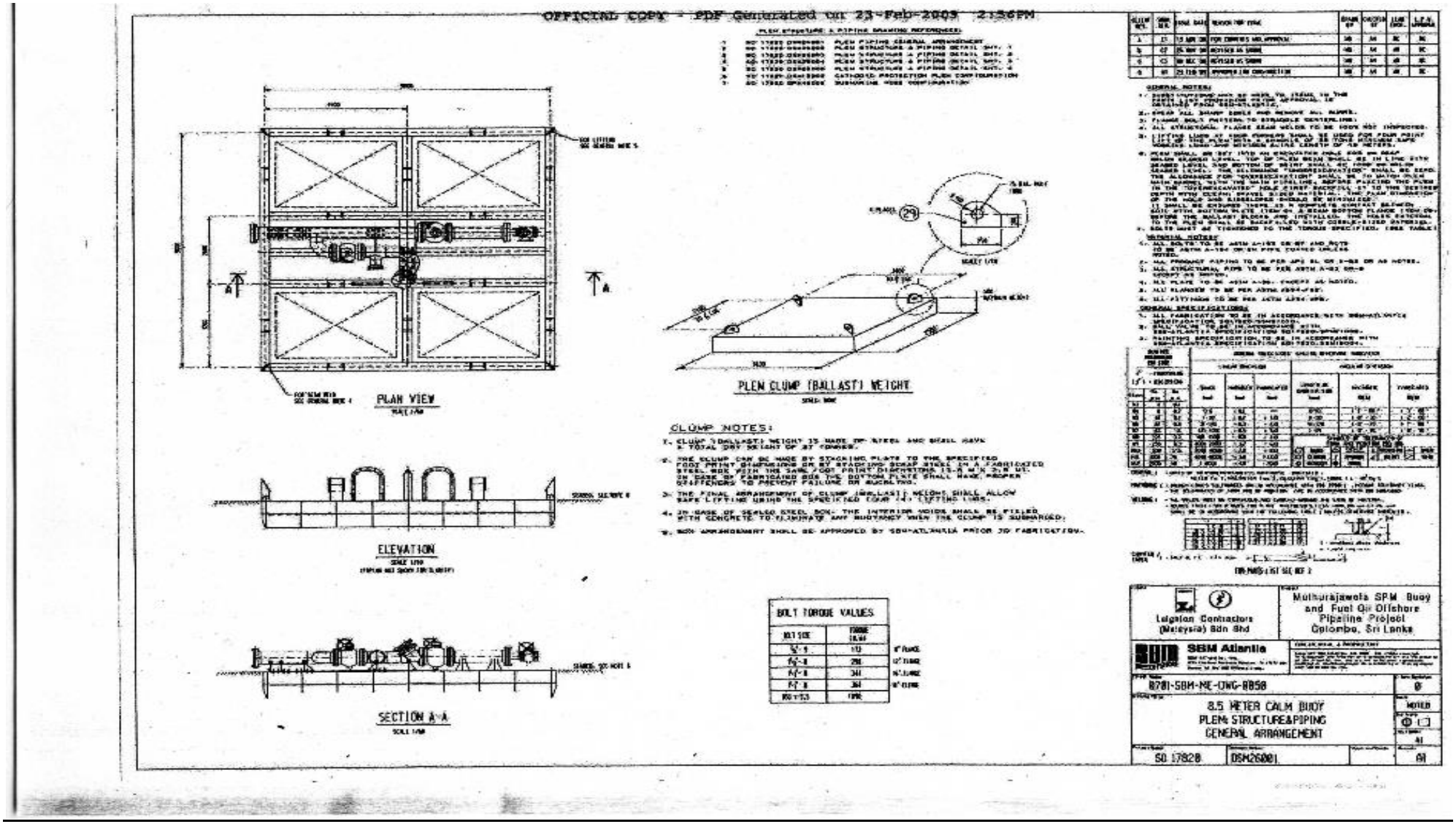
SBM Atlantia drawing No: DPM21001 – "Fixed Part Piping Elevation"



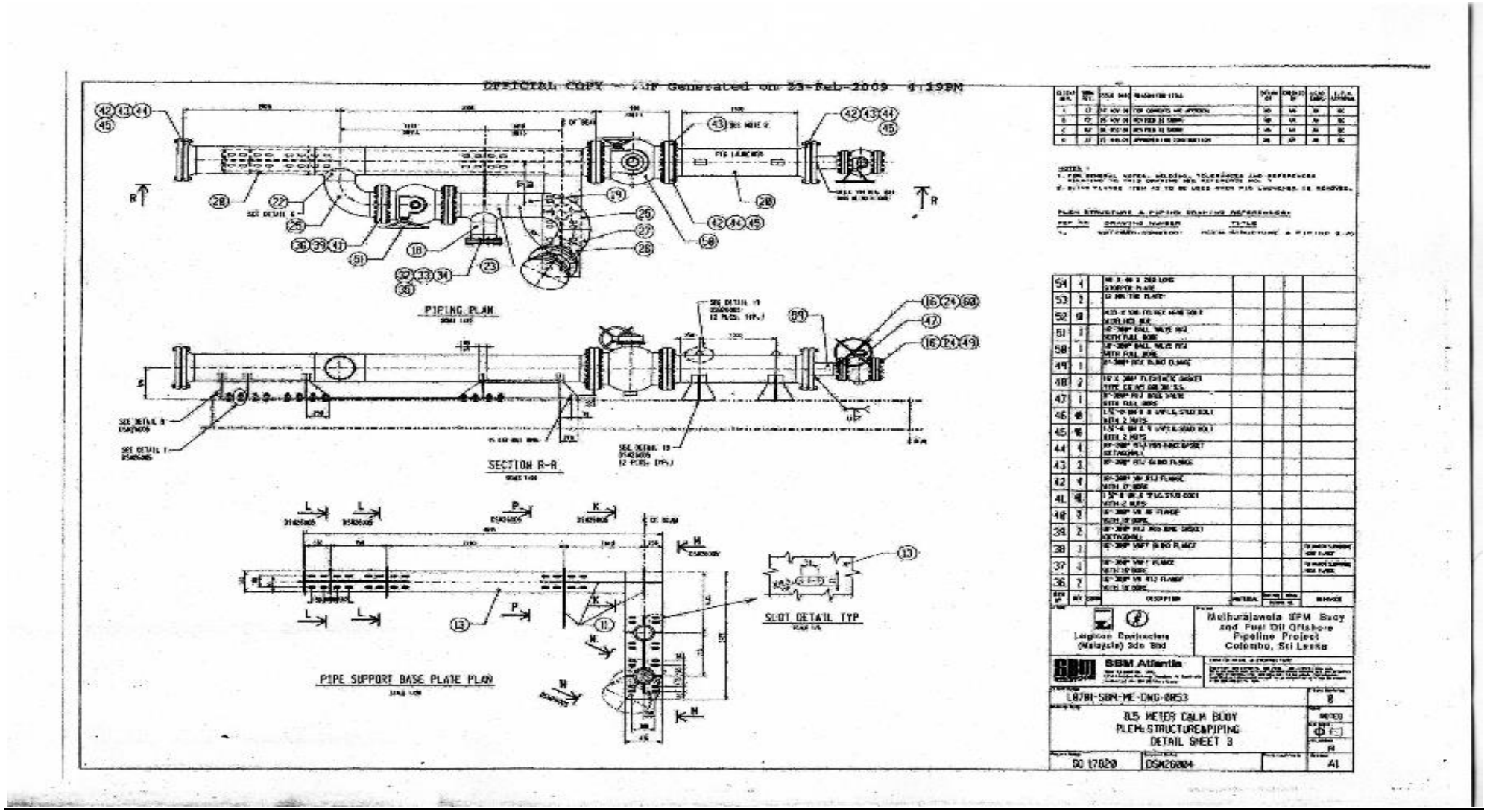
SBM Atlantia drawing No: DCM97011 – "Field Layout" for PLEM location



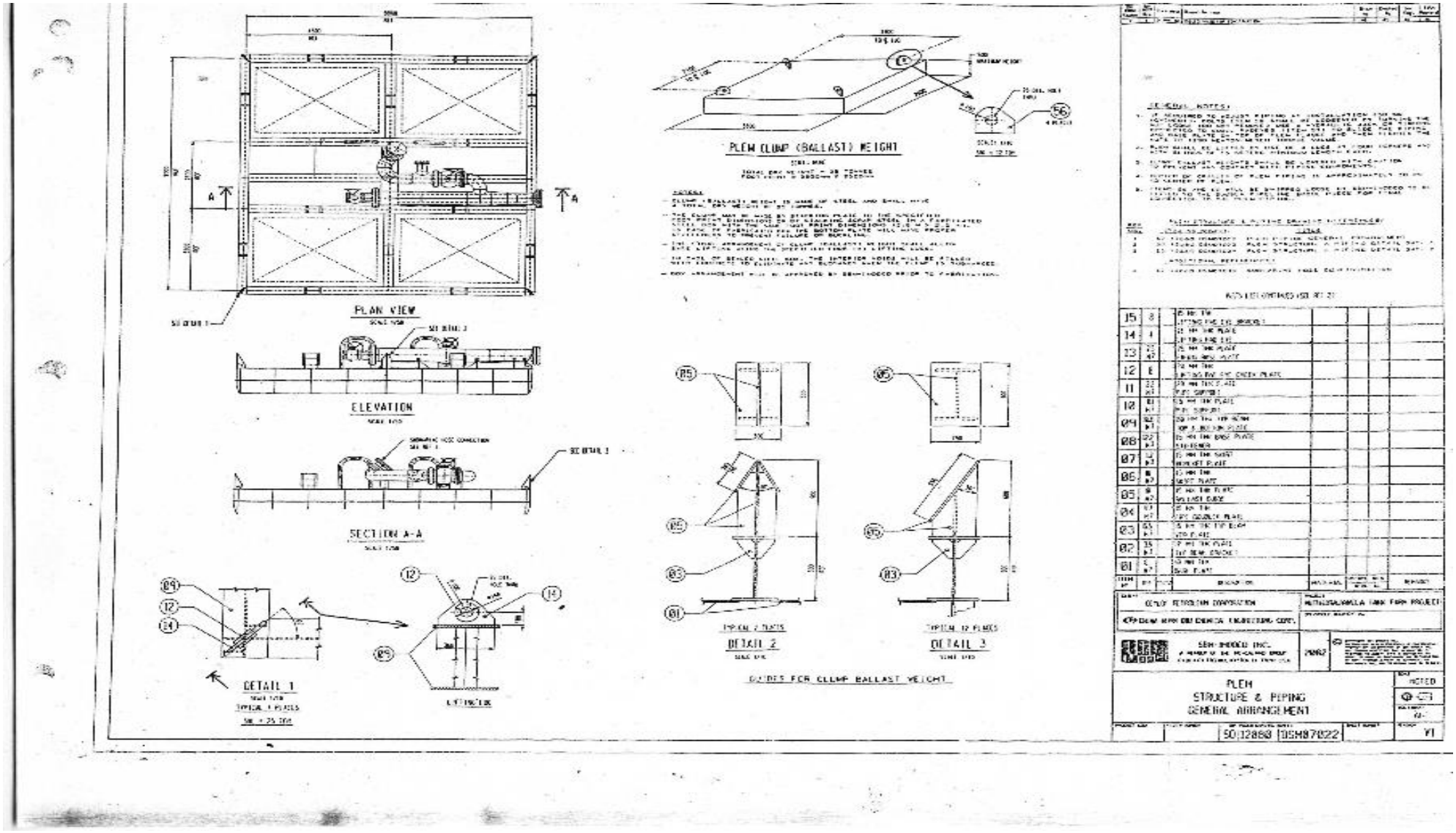
SBM Atlantia drawing No: DSM26001– "Structural Piping & General Arrangement" for the <u>New PLEM</u>



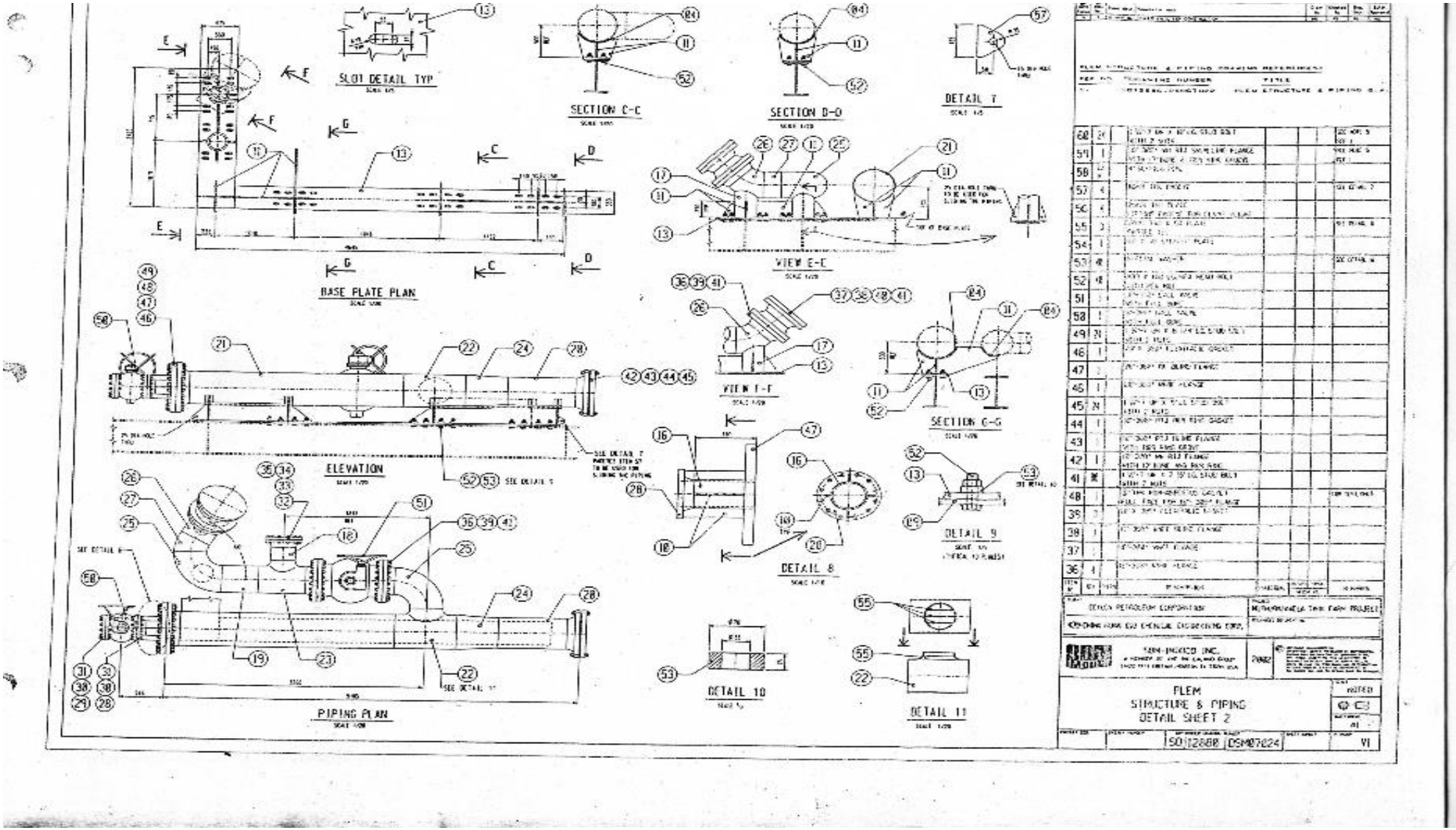
SBM Atlantia drawing No: DSM26004 – "Structural Piping & General Arrangement" for the <u>New PLEM</u>



SBM Atlantia drawing No: DSM07022 for the <u>Old PLEM</u>

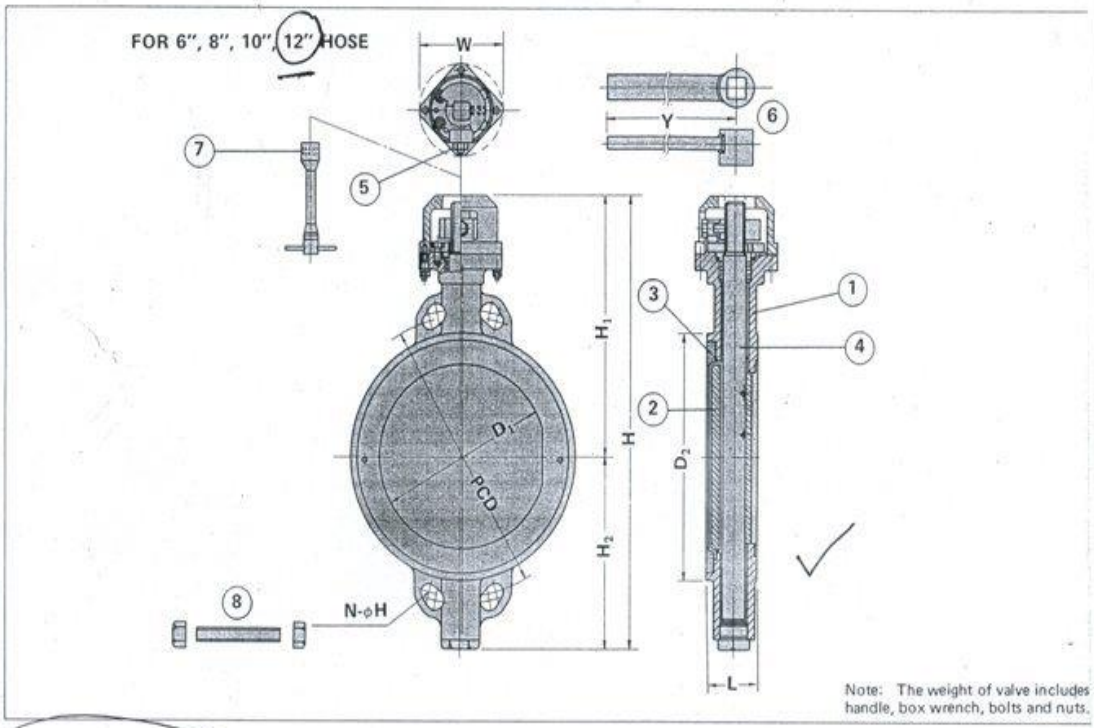


SBM Atlantia drawing No: DSM07024 for the <u>Old PLEM</u>



ITEM NO: - 18 (1/2)

4-1. Butterfly Valve (Lever Operated Type)



Note: The weight of valve includes handle, box wrench, bolts and nuts.

(Metric Units)

for Hose Size	Dimensions (mm)											Approx. Weight (kgs)	Connecting Bolt		
	D_1	D_2	P.C.D.	L	H	H_1	H_2	W	N	d	Y		Size	Length (mm)	Number
6"	142.0	216	241.3	57	425	250	175	126	4	22.4	400	27	3/4" – 10T UNC	160	8
8"	190.5	270	298.5	66	500	290	210	128	4	22.4	400	34	3/4" – 10T UNC	180	8
10"	236.5	324	362.0	71	608	350	258	140	4	25.4	600	55	7/8" – 9T UNC	195	12
12"	279.5	381	431.8	84	697	400	297	140	4	25.4	600	74	7/8" – 9T UNC	210	12
16"	See Drawing											137	1" – 8T UNC	240	16

(Imperial Units)

for Hose Size	Dimensions (ins)											Approx. Weight (lbs)	Connecting Bolt		
	D_1	D_2	P.C.D.	L	H	H_1	H_2	W	N	d	Y		Size	Length (ins)	Number
6"	5.59	8.50	9.50	2.24	16.73	9.84	6.89	4.96	4	0.88	15.75	60	3/4" – 10T UNC	6.30	8
8"	7.50	10.62	11.75	2.60	19.69	11.42	8.27	5.04	4	0.88	15.75	75	3/4" – 10T UNC	7.09	8
10"	9.31	12.75	14.25	2.80	23.94	13.78	10.16	5.51	4	1.00	23.62	121	7/8" – 9T UNC	7.68	12
12"	11.00	15.00	17.00	3.31	27.44	15.75	11.69	5.51	4	1.00	23.62	163	7/8" – 9T UNC	8.27	12
16"	See Drawing											302	1" – 8T UNC	9.45	6

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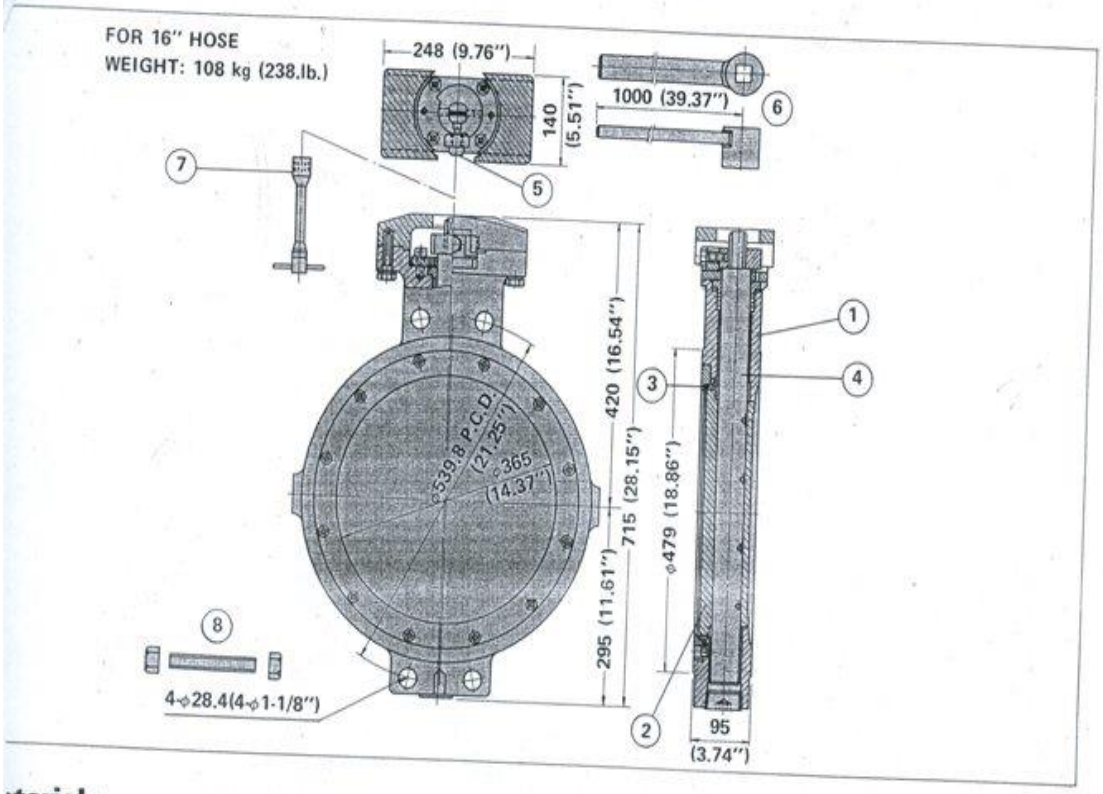
ITEM NO: - 18 (2/2)



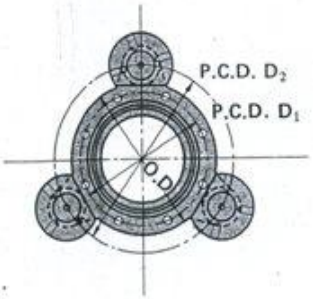
aterial :

No.	Name	Material Specification
1	Body	Cast Steel ASTM A 216 WCB
2	Wafer	Cast Stainless Steel JIS G 5121 SCS-13 (304 Type) or SCS-14 (316 Type)
3	Seat	Filled Teflon
4	Shaft	Stainless Steel 304 SS
5	Locking Bolt	Stainless Steel 304 SS
6	Handle	Rolled Steel JIS G 3101 SS41
7	Box Wrench	Rolled Steel JIS G3101 SS41
8	Connecting Bolt and Nuts	Alloy Steel ASTM A 193 Gr.B7 and ASTM A 194 Gr.2H Coated with Fluoro Carbon Resin.

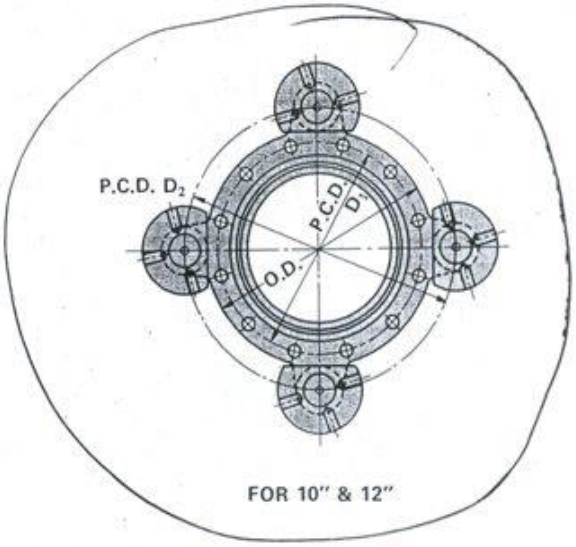
ITEM NO: - 19

1/2

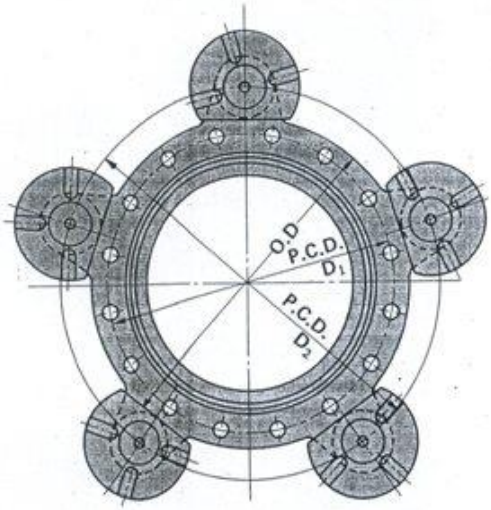
4-2-2. Studded Camlock Flange



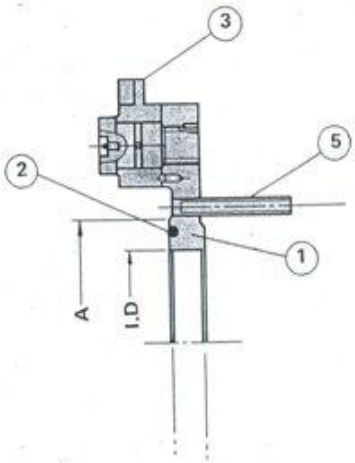
FOR 6" & 8"

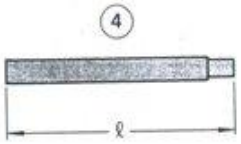


FOR 10" & 12"



FOR 16"





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Guard ring to be available and constructed with solid carbon steel

ITEM NO: - 19

2/2

aterial :

No.	Name	Material Specification
1	Flange	ANSI Class 150, ASTM A105
2	"O" Ring	NBR
3	Cam	Carbon Steel, JIS G 4051 S 45C
4	Handle	Rolled Steel, JIS G 3101 SS 41
5	Connecting Stud and Nuts	Alloy Steel, ASTM A 193 Gr. B7 and ASTM A 194 Gr. 2H Coated with Fluoro Carbon Resin.
6	Guard Ring	solid carbon steel

...etric Units)

for Hose Size	Dimensions (mm)						Weight (kgs)	Connecting Stud		
	O.D.	I.D.	A	D_1	D_2	ℓ		Size	Length (mm)	Number
6"	279.4	154.1	215.9	241.3	372	330	36	3/4"–10T UNC	75	8
8"	342.9	204.7	269.7	298.5	435	330	40	3/4"–10T UNC	78	8
10"	406.4	254.4	323.9	362.0	507.4	330	64	7/8"– 9T UNC	85	12
12"	482.6	304.8	381.0	431.8	583.5	330	82	7/8"– 9T UNC	90	12
16"	596.9	381.0	469.9	539.8	712.0	345	113	1"– 8T UNC	100	16

mperial Units)

for Hose Size	Dimensions (ins)						Weight (lbs)	Connecting Stud		
	O.D.	I.D.	A	D_1	D_2	ℓ		Size	Length (ins)	Number
6"	11.0	6.07	8.50	9.50	14.64	13.00	79	3/4"–10T UNC	2.95	8
8"	13.5	8.06	10.62	11.75	17.13	13.00	88	3/4"–10T UNC	3.07	8
10"	16.0	10.00	12.75	14.25	19.98	13.00	141	7/8"– 9T UNC	3.35	12
12"	19.0	12.00	15.00	17.00	22.97	13.00	181	7/8"– 9T UNC	3.54	12
16"	23.5	15.00	18.50	21.25	28.03	13.60	249	1"– 8T UNC	3.94	16

Note: The weight of camlock flange includes bolts and nuts.

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COMPLIANCE / DEVIATIONS SHEET - TECHNICAL

The bidder should indicate whether the required specifications are met by them by marking (Yes) if it meets the requirements/comply and (No) if it is not, in front of each requirement/specification in the right hand corner of each item. Variations and/or deviations from specification, if any, should be illustrated clearly in detail.

01. Marine Hoses & Accessories

Item No.	Description	Complied	Deviation if any
	Hoses & Accessories for Floating Hose System		
01	16"Ø x 40' Kink Resistant, Mainline Floating Hose with ANSI 150# WN/FF Flanges at both ends		
02	16"Ø x 40' Half Tapered, One End Reinforced, Half Float, Kink Resistant First Off the Buoy Hose with ANSI 300# WN/FF Flange at the Reinforced End and ANSI 150# WN/FF Flange at the other End		
03	12"Ø x 40' Kink Resistant, Floating Tail Hose with ANSI 150# WN/FF Flanges at both ends		
04	16"Ø - 12"Ø x 40' Kink Resistant, Mainline Floating Hose with Integral Reducer and ANSI 150# WN/FF Flanges at both ends		
05	12"Ø x 30' Kink Resistant, Floating Tanker Rail Hose (Barbell) with ANSI 150# WN/FF Flanges at both ends		
	Hoses & Accessories for Under buoy Hose System		
06	*16"Ø x 30' One End Reinforced, Kink Resistant, Submarine Hose with Location Collars and ANSI 300# WN/FF Flanges at both ends (for Buoy end)*		
07	*16"Ø x 25' Kink Resistant, Standard Submarine Hose with Location Collars and ANSI 300# WN/FF Flanges at both ends*		
08	*16"Ø x 30' One End Reinforced, Kink Resistant, Submarine Hose with Location Collars and ANSI 300# WN/FF Flanges at both ends (for PLEM end)*		
09	*Hinged Turnbuckle Type Body Floats*		
10	*Hinged Turnbuckle Type End Floats*		
11	7/8" Ø-9TUNC#210MM threaded stud bolt with 02 nuts		

12	7/8” Ø-9TUNC#120MM threaded stud bolt with 02 nuts		
13	1 1/4” Ø-8TUNC#190MM threaded stud bolt with 02 nuts		
14	1” Ø-8TUNC#280MM threaded stud bolt with 02 nuts		
15	1” Ø-8TUNC#140MM threaded stud bolt with 02 nuts		
16	7/8” Ø-9TUNC#250MM threaded stud bolt with 02 nuts		
17	7/8” Ø-9TUNC#160MM threaded stud bolt with 02 nuts		
18	Butterfly Valve 12” ANSI 150 Connection		
19	Studded Cam Locking for 12” Hose		
20	12” Light weight Blind Flange		
21	12” Spool Piece		
22	Obstruction Light for 16” Dia. Hose		

Signature of the Bidder: …… Date:…… **(Common Seal)**