



Energising Quality
VCS Quality Services Pvt. Ltd.

NORTH EAST GAS GRID PHASE-III OF IGGL



DATA SHEET FOR RELIEF VALVE

Total Sheets

03

Document no.

C221052

00

PP

DS


2006

INDRADHANUSH GAS GRID LIMITED (IGGL)

NORTH EAST GAS GRID PHASE-III OF IGGL

DATA SHEET FOR RELIEF VALVE ☐

D1	19.05.2022	Issued for BID	AK	AK	MC
REV	DATE	DESCRIPTION	PREP	CHKD	APPR

RELIEF VALVE						Rev.		
GENERAL	1	Tag Number		Refer Attachment-1				
	2	Quantity		Refer Attachment-1				
	3	P&ID Number		Refer Attachment-1				
	4	Line No / Equipment No.		Refer Attachment-1				
	5	Inlet Line Size/Sch	Outlet Line Size/Sch	Refer Attachment-1	Refer Attachment-1			
	6	Inlet Line Material	Outlet Line Material	Refer Attachment-1	Refer Attachment-1			
	7	Hazardous Aea Classification		Zone 1, Gas Group IIA/B, T3				
	8							
PROCESS DATA	9	Service		Refer Attachment-1				
	10	Fluid	Phase	Natural Gas	Gas			
	11	Corrosive	Erosive	Due to CO2	-			
	12	Required Capacity(kg/hr)						
	13	Set Pressure(kg/cm ² g)	%Allow Overpressure	Refer Attachment-1	Note-12			
	14	Back Pressure (kg/cm ² g)	Constant	Refer Attachment-1				
	15		Variable					
	16		Total					
	17	Oper Temperature(Min/Max)(⁰ C)	Relief Temperature(⁰ C)	-	Refer Attachment-1			
	18	SG @ Relief	Visc @ Relief Cp	Refer Attachment-1	Refer Attachment-1			
	19	MW @ Relief	Density @ Relief	-	Refer Attachment-1			
	20	Sp HT Ratio (Cp/Cv)	Compressibility (Z)	Refer Attachment-1	Refer Attachment-1			
	21	Design Pressure(kg/cm ² g)	Design Temperature(⁰ C)	-	-			
	22	Latent Heat of Vap	Barometric Pressure	-	-			
	23	Relieving Pressure (kg/cm ² g)		Refer Attachment-1				
	24	Wall temperature (⁰ C)		Refer Attachment-1				
	25	Ambient Temperature(⁰ C)		16-50				
	26	Exposed Surface Area (m2)		Refer Attachment-1				
DESIGN BASIS	27	Nozzle		Full Nozzle				
	28	Type		Balanced Bellow				
	29	Bonnet Type		Closed				
	30	Design Code		API 520 I/II, API 521, API 526 & API 527				
	31	Sizing Basis		Refer Attachment-1				
	32	Relieves To		To Atmospheric Safe Location				
	33	Calculated Area	Selected Area	*	*			
	34	Orifice Designation		*				
	35	Calculated Capacity		*				
	36	Size/Rating/Type : Inlet / Outlet		*				
	37	Cap over adj. Bolt		Required				
	38	Screwed / Bolted		Bolted				
	39	Lifting Lever		-				
	40	Test Gag		Required				
	MATERIAL	42	Body	Bonnet	ASTM A216 GR. WCC	ASTM A216 GR. WCC		
43		Nozzle (Seat)	Nozzle Ring	SS316	*			
44		Spring	Disc	Inconel X 750	SS316			
45		Bellows	Guide	SS316				
46		Main Valve Seat / Seal		*				
47		Stud Bolt & Nut material		ASTM A193 Gr. B7 & ASTM A194 Gr. 2H				
48		Manufacturer	Model No.	*	*			
MISC	49							
Notes:								
1	Vendor to specify. *							
2	Refer P&ID for more information.							
3	Relief Valve shall be sized as per API 520 & 526. Vendor to provide sizing calculations and select material as per process conditions.							
4	Tagplate (SS 316) stamped with instrument tag number and service in 10mm characters shall be attached via SS wire (1 mm).							
5	Vendor shall submit detailed catalogue with model decodification sheet with datasheet.							
6	Vendor shall submit detailed GA drawing along with part names and MOC of the parts along with datasheets.							
7	Details mentioned are tentative, Vendor to submit sizing calculations for approval and confirm the size & orifice designation.							
8	Seat tightness shall meet the requirement specified in API 527.							
9	Hydrotest (1.5 times of design pressure), Leak test, MPI ,100% RT, Material Testing in accordance to EN 10204 Section 3.2 shall be performed.							
10	UV stamp is required for all safety valves.							
11	Valve spring shall be selected such that it can permit adjustment of ± 5 % as minimum.							
12	Allowable over pressure: For Fire case=21% of set pressure, for Blocked Discharge / Thermal relief=10% of set pressure.							
		CLIENT:	INDRADHANUSH GAS GRID LIMITED (IGGL)					
		PROJECT:	NORTH EAST GAS GRID PHASE-III OF IGGL	D1	19.05.2022	AK	AK	MC
			REV.	DATE	PRPD	CHKD	APPD	
Document No.: C221052-00-PP-DS-2006								

ATTACHMENT -1																					
S.NO.	TAG NO.	P&ID No.	INLET/OUTLET LINE SIZE & RATING	INLET/OUTLET SIZE & RATING	RELIEF VALVES TYPE	LOCATION / SERVICE	LINE NUMBER / EQUIPMENT NUMBER	EXPOSED SURFACE AREA (mt2)	SIZING CASE	FLOW RATE(kg/hr)	SPECIFIC GRAVITY	Gas/ Vapour Viscosity	SET PRESS. (kg/cm²g)	MAX. BACK PRESSURE (Kg/cm²g)	RELIEVING PREASURE (kg/cm²g)	Wall TEMPERATURE (°C)	RELIEVING TEMPERATURE (°C)	Cp/Cv	Z	MOL. WT	QTY.
1	Refer P&ID	Refer P&ID	2" X 600# / 4" X 150#	HOLD (*)	Balanced Bellows	Refer P&ID	Refer P&ID	HOLD (*)	Fire case	HOLD (*)	Refer process data	Refer process data	92	HOLD (*)	92	HOLD (*)	HOLD (*)	Refer process data	HOLD (*)	Refer process data	As per P&ID.

* Vendor to decide based on sizing calculation of PSV.



Energising Quality

NORTH EAST GAS GRID PHASE-III OF IGGL



DATA SHEET – VERTICAL QUICK OPENING END CLOSURE

Client Job Number

C221052

Total Sheets

02

DOCUMENT NO

C221052

00

PP

DS

2007

INDRADHANUSH GAS GRID LIMITED (IGGL)

NORTH EAST GAS GRID PHASE-III OF IGGL

DATA SHEET FOR VERTICAL QUICK OPENING END CLOSURE

D1	18-05-2022	ISSUED FOR BID	AY	AK	MC
REV	DATE	DESCRIPTION	PREP	CHK	APPR

NORTH EAST GAS GRID PHASE-III OF IGGL

SIZE	4" NB
RATING	ANSI 600#
DESIGN CODE	ASME Section VIII, Division 1
SPECIFICATION NO.	
DESIGN PRESSURE	92 kg/cm ² (g)
HYDROTEST PRESSURE	138 kg/cm ² (g)
DESIGN TEMPERATURE	-29°C TO 65°C
SERVICE	Natural Gas / RLNG
END CONNECTION	BUTT-WELD AS PER ANSI B 31.8 & B16.25
CONNECTING PIPE SPECIFICATION	Diameter – 4" NB Thickness – Sch. XS Material – ASTM A106 GR. B (Charpy)
CORROSION ALLOWANCE	1.5 mm
DESIGN FACTOR	0.5
MATERIALS SPECIFICATION (EQUIVALENT OR SUPERIOR):	
a. BODY/PRESSURE CONTAINING PARTS	ASTM A105 (Charpy)
b. INSERTS/GASKETS	VITON
c. OTHER COMPONENT	AS PER MANUFACTURE'S STANDARD BUT MATERIALS USED SHALL BE SUITABLE FOR SERVICE MENTIONED ABOVE. MANUFACTURE'S SHALL FURNISH MATERIAL SPECIFICATION OF EACH PARTS USED AT THE TIME OF BIDDING.
CHARPY V-NOTCH TEST	REQUIRED AT (-) 29°C, CV (Avg.) - 27J & CV (Min)- 22J (Min. 3 Samples).
HARDNESS TEST	REQUIRED AS PER MATERIAL SPECIFICATION
INSTALLATION	VERTICAL POSTION AT AN ELEVATION OF 3.0M ABOVE FINISHED GROUND LEVEL/WORKING LEVEL.
PAINTING	AS PER PAINTING SPECIFICATION



Energising Quality

NORTH EAST GAS GRID PHASE-III OF IGGL



MECHANICAL DATA SHEET - JIB CRANE

Total Sheets

4

Document No.

C221052

00

ME

DS

3001

INDRADHANUSH GAS GRID LIMITED (IGGL)

NORTH EAST GAS GRID PHASE-III OF IGGL

MECHANICAL DATA SHEET FOR - JIB CRANE

C1	20.05.2022	ISSUED FOR BID	RKP	RZ	MC
REV	DATE	DESCRIPTION	PREPARED	CHECKED	APPROVED



NORTH EAST GAS GRID PHASE-III OF IGGL

CLIENT:


INDRADHANUSH GAS GRID LIMITED

PMC:

VCS QUALITY SERVICES PVT. LTD.

MECHANICAL DATA SHEET- JIB CRANE

1	GENERAL	UNIT :	XXXX	TAG No. :	XXXX
2		EQUIPMENT NAME :	Jib Crane	QUANTITY :	As per SOR
3		SERVICE :	Handling of Pigs	P&ID REFERENCE :	
4		TYPE :	XXXX	OPERATION :	Intermittent
5	CODES & STANDARDS	Design Code	IS:3832 IS:807 IS:15419		
6		Load Tested	IS:807		
7		Pipe	API/IS:3589		
8		Other Structural Material	IS:2062 / API Gr. B		
9	OPERATING CONDITIONS AND DATA	Equipment Title	Pillar Mounted Jib Crane anti spark type		
10		Service	Handling of Pigs		
11		Under Boom Height (Lift)	4 m (Note-2)		
12		Length of Boom	3 m (Note-2)		
13		Rotation	360°		
14		Capacity	2T Min # (Note-1)		
15		Quantity Required	As per SOR		
16		Location	Outside - Near Trap Skid		
17		Equipment Tag No. of Launcher/Receiver	Refer Data Sheet of Launcher/Receiver		
18		Speed of Hoist at Full Load	* (Note-1)		
19		Area Classification	Hazardous - Zone 1 & 2, Group II-A & II-B, T3		
20		Mode of Hoisting Operation	Manual Operation		
21		Mode of Trolley Motion	Manual Operation		
22		Mode of Slew Motion	Manual Operation		
33	MANUFACTURER'S DATA	Boom			
34		Type of Construction	Vendor to confirm		
35		Size	Vendor to confirm		
36		Material	Vendor to confirm		
37		Weight of Boom	Vendor to confirm		
38		Maximum Deflection of Boom	Vendor to confirm		
39		Column			
40		Type of Construction	Vendor to confirm		
41		Size	Vendor to confirm		
42		Material	Vendor to confirm		
43		Weight of Column	Vendor to confirm		
44		Maximum Deflection of Column	Vendor to confirm		
45		Slew Bearing / Trunion Assembly			
46		Type	Vendor to confirm		
47		Quantity Required	Vendor to confirm		
48		Location	Vendor to confirm		
49		Lubrication Arrangement	Vendor to confirm		
50		Any Other Details	Vendor to confirm		
51		Hoist			
52		Speed at Full Load	Vendor to confirm		
53		Capacity	Vendor to confirm		
54		Height of Lift	Vendor to confirm		
55		Bearing	Vendor to confirm		
56		Hoist Drum			
57		Make	Vendor to confirm		
58		Type	Vendor to confirm		
59		Construction	Vendor to confirm		
60		Material	Vendor to confirm		
61		Length	Vendor to confirm		
62		Quantity of Flanges	Vendor to confirm		
63		Ratio of Drum size to Rope Size	Vendor to confirm		
64		Hoist Rope / Chain			
65		Make	Vendor to confirm		
66		Size and length	Suitable for 4 Mtr. Height		
67	Construction, Grade	Vendor to confirm			
68	Grade	Vendor to confirm			

 Energising Quality	MECHANICAL DATA SHEET- JIB CRANE	Document No.	Rev
		C221052-00-ME-DS-3001	C1
		02 OF 04	



NORTH EAST GAS GRID PHASE-III OF IGGL

CLIENT:

INDRADHANUSH GAS GRID LIMITED

PMC:

VCS QUALITY SERVICES PVT. LTD.

MECHANICAL DATA SHEET- JIB CRANE

1	Material	Vendor to confirm
2	Type	Anti spark Type (Required)
3	Minimum Braking Load	Vendor to confirm
4	Factor of Safety	Min. 1.5 times of Payload
5	Sheaves	
6	Make	Vendor to confirm
7	Construction	Vendor to confirm
8	Material	Vendor to confirm
9	Diameter	Vendor to confirm
10	Quantity	Vendor to confirm
11	Bearings	Vendor to confirm
12	Quantity / Type	Vendor to confirm
13	Gears	
14	Make	Vendor to confirm
15	Material	Vendor to confirm
16	Type	Vendor to confirm
17	Ratio	Vendor to confirm
18	Lubrication Arrangement	Vendor to confirm
19	Hook	
20	Make	Vendor to confirm
21	Type	Vendor to confirm
22	Material	Vendor to confirm
23	Capacity	Vendor to confirm
24	Bearings	
25	Safety Lock (Latch) Provided	Required
26	Brakes	Vendor to confirm
27	Hoist	Vendor to confirm
28	Trolley	Vendor to confirm
29	Swivel	Vendor to confirm
30	Material	Vendor to confirm
31	Torque	Vendor to confirm
32	Materials	
33	Ratchet wheel, chain guides and gears	Vendor to confirm
34	Hand chain	Vendor to confirm
35	Load chain	Vendor to confirm
36	Hand chain wheel	Vendor to confirm
37	Load chain wheel	Vendor to confirm
38	Buffers	Vendor to confirm
39	Load chain wheel guides	Vendor to confirm
40	Geared and ungeared wheels	Vendor to confirm
41	Pinions	Vendor to confirm
42	Other Details	Vendor to confirm
43	Boom locking device	Required
44	Swivel Stopper	Required
45	Buffers	Vendor to confirm
46	Provision to protect the bearing against dust and rain.	Required
47	Foundation Bolts	Required
48	Free Standing of Jib Crane type	Base plate mounted(gusset Type)/Insert Mounted/Sleeve Insert mounted
49	Design Construction of free standing Jib Crane	*As per Seismic Zones Requirements (Note-5)
50	Painting of jib crane	Refer Doc. No (For Marine & coastal Environment) SS-PI-008

MANUFACTURER'S DATA



Energising Quality

MECHANICAL DATA SHEET- JIB CRANE

Document No.

C221052-00-ME-DS-3001

Rev

C1

03 of 04



NORTH EAST GAS GRID PHASE-III OF IGGL

CLIENT:

INDRADHANUSH GAS GRID LIMITED

PMC:

VCS QUALITY SERVICES PVT. LTD.

MECHANICAL DATA SHEET- JIB CRANE

1	INSPECTION AND TESTING	Description	Required	Witnessed	Reviewed
2		Material identification	Yes	Yes	Yes
3		Material certificate	Yes	Yes	Yes
4		Non destructive testing	Yes	Yes	Yes
5		Operability test	Yes	Yes	Yes
6		Dimensions	Yes	Yes	Yes
7		Noise measurement	Yes	Yes	Yes
8		Load Test	Yes	Yes	Yes
9	NOTES	1) (*) Capacity to be Suitable for Pigs (including Intelligent Pig) for 12" Line Size with MOC: carbon steel & Stainless steel			
10		2) (#) Bidder shall confirm the Boom Height suitable for the Pig Launcher/ Receiver of 18"*12" and from 1500 mm ground elevation.			
11		3) Vendor to submit fully filled in data sheet of Jib Crane separately for each application/capacity with proposal.			
12		4) (*) Components that are rubbing against each other shall be selected of nonsparking material (aluminum bronze or phosphor bronze) in view of the hazardous working area.			
		Load Calculation Requirements			
13		5) (*) Vendor To be Submit Calculation of Differents Associated Axial load, Buckling Loads & Deflections of Jib & Colume with Seismic Considertion as per IS:3832 IS:807 IS:15419			
14		6) (*)Vendor To be Submit Max deflection at End span, Deflection due to self-weight of jib, & Deflection due to Hoisting weight & safe working Load			



Energising Quality

MECHANICAL DATA SHEET- JIB CRANE

Document No.

C221052-00-ME-DS-3001

Rev

C1

1. DATA SHEET FOR ROCKFALL PROTECTION NET

ROCKFALL PROTECTION NET PROPERTIES			
Sr.	Particulars		Specifications /Test Methods
1.	Mesh Type (cm)	4 X 6	
2.	Mesh Opening 'D' (mm)	100	IS 16014 : 2012
3.	Mesh Tolerance (%)	± 16 to -4	IS 16014 : 2012
4.	Unit Dimensions	L X W XH	
5.	Tolerance in sizes of units	L & W ± 5 %, H > 0.3 M ± 5 % or ± 10 % FOR H = < 0.3	IS 16014 : 2012
6.	Characteristics	Zn Coated	
7.	Mesh Wire Dia (mm)	3.0 (D.) (+/- 0.08)	IS 16014 : 2012
8.	Zn coated min (gsm)	270	IS 16014 : 2012
9.	Selvedge / Edge Wire Dia (mm)	3.9 (D.) (+/- 0.1)	IS 16014 : 2012
10.	Zn coated min (gsm)	280	IS 16014 : 2012
11.	Lacing Wire Dia (mm)	2.2(D.) (+/- 0.06)	IS 16014 : 2012
12.	Zn Coated min (gsm)	240	IS 16014 : 2012
13.	Tensile strength of wire	350 - 500 MPa at a minimum elongation of 10%.	IS 280 : 2006
14.	Tensile Strength of Mesh Panel	40.0 kN/m in the parallel to twist direction and 20.5 kN/m in the perpendicular to twist direction	IS 16014 : 2012
15.	Zinc Coating	coating weight shall be Heavily coated and soft type	IS 4826 : 1972.
16.	Adhesion of Zinc Coating	No flakes or crack shall be observed	IS 4826 : 1972.

LEGEND : VTA – vendor to advise

NOTE : 1. The rock fall protection net shall be used in consultation with engineer in-charge.

2. The rock fall protection properties given above are indicative vendor to advise similar or superior net as per manufacturer's standard.

3. Baseplates, posts, brakes, rope for anchoring of the rock fall protection net and any other required material are in vendor's scope.

1. DATA SHEET FOR ROCKSHIELD

PIPELINE DATA		
1.	Pipeline Size NPS (mm)	12" (323.8MM)
2.	Material	API 5L GR. X70, PSL2, HFW
3.	External Coating	3LPE
4.	Nominal Length of Pipe	12M
5.	Design Temperature (max./min), (°C)	(-) 29°C / 65°C
ROCKSHIELD CHARACTERISTICS		
Physical Characteristics		
1.	Material Structure	Diamond Mesh
2.	Polymer Type	HDPE
3.	U V Stability	Carbon Black
4.	Color	Black
Dimensional Characteristics		
5.	Minimum Thickness	4 mm (± 0.20 mm)
6.	Mesh Size	4 x 6 mm (± 1 mm)
7.	Mesh Count	1.2 (± 0.1)
8.	Roll Width	1.50 / 2 meter (VTA)
9.	Roll Length	25 meters (VTA)
10.	Overlapping Width	535 mm (VTA)
Technical Characteristics		
11.	Tensile Strength (ASTM D1682)	193 Kg/Cm ²
12.	Compressive Strength (ASTM D1621)	17.5 Kg/Cm ²

LEGEND: VTA – vendor to advise

NOTE: 1. Rock shield is applied in circumferential bands acceptance by cable ties, strapping or self-adhesive tape applied at 300-400mm intervals or as advice by EIC.

12.0 QAP/ITP FOR BOUGHTOUT ITEMS

**(Appendix-III to Particular Job
Specification of Work)**



VCS QUALITY SERVICES PVT. LTD.

INSPECTION AND TEST PLAN FOR FLANGES & SPECTACLE BLINDS VPC – ITP – PP – 2003

01	19/12/2021	SR	MC	HK	HK
Rev. No	Date	Prepared By	Checked By	Approved By	Authorized By

UNCONTROLLED COPY	:	If printed
CONTROLLED COPY	:	If in soft and signed

REVISION RECORD						
Rev.	Revision Date	Prepared by	Checked by	Approved by	Authorized by	Revision Description
00	22/04/2020					
		MB	MC	AD	SK	
01	19/12/2021					Revised as Marked
		SR	MC	HK	HK	

ABBREVIATIONS:			
CE	Carbon Equivalent	NDT	Non Destructive Testing
DCN	Dispatch Clearance Note	PO	Purchase Order
HT	Heat Treatment	PR	Purchase Requisition
IC	Inspection Certificate	RT	Radiography Testing
IR	Inspection Report	TC	Test Certificate
IRC	Inspection Release Certificate	TPI or TPIA	Third Party Inspection Agency
ITP	Inspection and Test Plan	UT	Ultrasonic Testing
MPT/MT	Magnetic Particle Testing	VDR	Vendor Data Requirement
MTC	Material Test Certificate		
LEGENDS:			
H - Hold (Do not proceed without approval)			
W - Witness (Give due notice, work may proceed after scheduled date)			
P - Perform			
R - Review			
RW - Random Witness [As specified or 10% (min.1 no. of each size and type of Bulk items)]			

1.0 SCOPE:

This Inspection and Test Plan covers the minimum testing requirements of Flanges, Spectacle Blinds & Drip Rings.

2.0 REFERENCE DOCUMENTS:

PO / PR / Standards referred there in / Job specifications / Approved documents.

3.0 INSPECTION AND TEST REQUIREMENTS:

SL.NO.	STAGE/ACTIVITY	CHARACTERISTICS	QUANTUM OF CHECK	RECORD	SCOPE OF INSPECTION		
					SUB VENDOR	VENDOR	TPIA
1.0	Procedure						
1.1	Heat Treatment, NDT and Other Procedures	Documented Procedures	100%	Procedure Documents	-	H	R
2.0	Material Inspection						
2.1.	Raw Material Inspection	Chemical, Mechanical, Properties	100%	Test Certificates	-	H	R
3.0	In Process Inspection						

SL.NO.	STAGE/ACTIVITY	CHARACTERISTICS	QUANTUM OF CHECK	RECORD	SCOPE OF INSPECTION		
					SUB VENDOR	VENDOR	TPIA
3.1	Heat Treatment	Stress Relieving, Normalising, Tempering, Solution Annealing, Stabilization Heat Treatment etc. as applicable	100%	HT Chart	-	H	R
3.2	Identification of Test Samples	Product Chemical, Mechanical, Impact and Other test as applicable	One/Heat/Lot	Test Report	-	H	H
3.4	Product Analysis (As applicable)	Chemical Composition	As per PR/Purchase Specification	Test Reports	-	H	R
3.5	Destructive Testing	Mechanical, Impact and Other test as applicable	One/Heat/Lot	Test Reports	-	H	H
3.6	MPI	Surface & Internal Imperfections	As per PR/Purchase Specification	NDT Reports	-	H	R
4.0	Final Inspection						
4.1	Final Inspection	1. Visual 2 Dimensions 3. Hardness 4. Marking etc	100%	Inspection Report	-	H	W

SL.NO.	STAGE/ACTIVITY	CHARACTERISTICS	QUANTUM OF CHECK	RECORD	SCOPE OF INSPECTION		
					SUB VENDOR	VENDOR	TPIA
4.2	PMI Check	Chemical	As per Spec.	Inspection Report	-	H	RW
4.3	Final Stamping	Stamping Of Accepted Flanges & Spectacle Blinds	Stamping of Valves which are witnessed by TPIA.	Inspection Report	-	H	H
5.0	Painting						
5.1	Rust Preventive Coating & Color Coding	Visual & Color Coding as applicable	100%	Inspection Report	-	H	-
6.0	Documentation & IC						
6.1	Documentation & Inspection Certificate(IC)	Review of Stage Inspection Reports / Test Reports & Issue of IC	100%	Vendor TC & IC	-	H	H
7.0	Final Documentation & Submission of Reports	Compilation of IR/IRC/DCN/MTC/DRGS./VDR	100%	Compliance Certificate (Note-1)	-	H	-

NOTES (As applicable):

1. If the certification is specified as EN 10204 Type 3.1 in Datasheet / Material Requisition, then '**W**' may be replaced with '**R**' with Material Traceability.
2. ITP shall be submitted including but not limited to the item/activity covered above. Any item/activity identified and required for the completeness shall also be covered in the ITP submitted by the manufacturers.



VCS QUALITY SERVICES PVT. LTD.

INSPECTION AND TEST PLAN FOR FORGED, SEAMLESS & WELDED FITTINGS (16" NB & BELOW) VPC – ITP – PP – 2005

01	19/12/2021	SR	MC	HK	HK
Rev. No	Date	Prepared By	Checked By	Approved By	Authorized By
UNCONTROLLED COPY		:	If printed		
CONTROLLED COPY		:	If in soft and signed		

REVISION RECORD						
Rev.	Revision Date	Prepared by	Checked by	Approved by	Authorized by	Revision Description
00	22/04/2020					
		MB	MC	AD	SK	
01	19/12/2021					Revised as Marked
		SR	MC	HK	HK	



**INSPECTION AND TEST PLAN
FOR
FORGED, SEAMLESS & WELDED FITTINGS (16"NB & BELOW)**

**DOC NO: VPC-ITP-PP-2005
Rev No : 01**

ABBREVIATIONS:			
CE	Carbon Equivalent	PMI	Positive Material Identification
DCN	Dispatch Clearance Note	PO	Purchase Order
DFT	Dry Film Thickness	PQR	Procedure Qualification Record
DPT	Dye Penetrant Testing	PR	Purchase Requisition
HT	Heat Treatment	RT	Radiography Testing
IC	Inspection Certificate	TC	Test Certificate
IR	Inspection Report	TPI or TPIA	Third Party Inspection Agency
IRC	Inspection Release Certificate	UT	Ultrasonic Testing
ITP	Inspection and Test Plan	VDR	Vendor Data Requirement
MPT/MT	Magnetic Particle Testing	WPQ	Welders Performance Qualification
MTC	Material Test Certificate	WPS	Welding Procedure Specification
NDT	Non Destructive Testing		
LEGENDS:			
H- Hold (Do not proceed without approval)			
W- Witness (Give due notice, work may proceed after scheduled date)			
P- Perform			
R- Review			
RW- Random Witness [As specified or 10% (min. 1 no. of each size and type of Bulk item)]			



**INSPECTION AND TEST PLAN
FOR
FORGED, SEAMLESS & WELDED FITTINGS (16"NB & BELOW)**

**DOC NO: VPC-ITP-PP-2005
Rev No : 01**

1.0 SCOPE:

This Inspection and Test Plan covers the minimum testing requirements of Forged, Seamless & Welded Fittings.

2.0 REFERENCE DOCUMENTS:

PO / PR / Standards referred there in / Job specifications / Approved documents.

3.0 INSPECTION AND TEST REQUIREMENTS:

SL.NO.	STAGE/ACTIVITY	CHARACTERISTICS	QUANTUM OF CHECK	RECORD	SCOPE OF INSPECTION		
					SUB VENDOR	VENDOR	TPIA
1.0	Procedure						
1.1	Heat Treatment / NDT	Documented Procedures	100%	Procedure Documents	-	H	R
1.2	WPS, PQR & WPQ	Welding Parameters & Qualification Record	100%	WPS, PQR & WPQ	-	H	W- New R- Existing
2.0	Material Inspection						
2.1	Raw Material Identification (Billets, Rounds, Pipes, Coil, Plates, etc.)	Chemical and Mechanical Properties, Size & Steel making practice etc	100%	Mill test certificate, Vendor's Inspection Report	-	H	R

**INSPECTION AND TEST PLAN
FOR
FORGED, SEAMLESS & WELDED FITTINGS (16"NB & BELOW)**

**DOC NO: VPC-ITP-PP-2005
Rev No : 01**

SL.NO.	STAGE/ACTIVITY	CHARACTERISTICS	QUANTUM OF CHECK	RECORD	SCOPE OF INSPECTION		
					SUB VENDOR	VENDOR	TPIA
3.0	In Process Inspection						
3.1	Welding	Welding Parameters as per WPS / PQR	100%	Inspection Reports	-	H	-
3.2	Heat Treatment	Stress Relieving, Normalising, Tempering, Solution Annealing, Stabilization Heat Treatment etc. as applicable	100%	HT chart	-	H	R
3.3	RT For Fittings As Applicable	Weld defects	PR / Purchase Specification	RT films & Reports	-	H	R (RT film review)
3.4	Identification of Test Samples	Product Chemical, Mechanical, Impact, Hardness and Other test as applicable	One/Heat/Lot	Test Reports	-	H	H

**INSPECTION AND TEST PLAN
FOR
FORGED, SEAMLESS & WELDED FITTINGS (16"NB & BELOW)**

**DOC NO: VPC-ITP-PP-2005
Rev No : 01**

SL.NO.	STAGE/ACTIVITY	CHARACTERISTICS	QUANTUM OF CHECK	RECORD	SCOPE OF INSPECTION		
					SUB VENDOR	VENDOR	TPIA
3.5	Product Analysis	Chemical Composition	PR/ Purchase Specification	Test Reports	-	H	R
3.6	Destructive Testing	Mechanical, Impact, Hardness and Other test as applicable	One/Heat/Lot	Test Reports	-	H	H
3.7	MPT/LPT	Surface & Internal Imperfections	PR/ Purchase Specification	NDT Reports	-	H	R
4.0	Final Inspection						
4.1	Visual and Dimensional Inspection (VDI)	Surface finish, Dimensions, Marking etc	100%	Inspection report	-	H	RW
4.2	PMI Check	Chemical Check	As Per Spec./Code	Inspection report	-	H	RW

**INSPECTION AND TEST PLAN
FOR
FORGED, SEAMLESS & WELDED FITTINGS (16"NB & BELOW)**

**DOC NO: VPC-ITP-PP-2005
Rev No : 01**

SL.NO.	STAGE/ACTIVITY	CHARACTERISTICS	QUANTUM OF CHECK	RECORD	SCOPE OF INSPECTION		
					SUB VENDOR	VENDOR	TPIA
4.3	Final Stamping	Stamping of accepted Items	100%	Inspection report	-	H	H
5.0	Painting						
5.1	Rust Preventive Coating & Colour Coding	Visual Inspection & Colour Coding	100%	Inspection report	-	H	-
6.0	Documentation & IC						
6.1	Documentation & Inspection Certificate(IC)	Review of Stage Inspection Reports / Test Reports & Issue of IC	100%	Vendor TC & IC	-	H	H
7.0	Final Documentation and Submission of Reports	Compilation of IR/IRC/DCN/MTC/DRGS./VDR	100%	Compliance Certificate (Note-1)	-	H	-



**INSPECTION AND TEST PLAN
FOR
FORGED, SEAMLESS & WELDED FITTINGS (16"NB & BELOW)**

**DOC NO: VPC-ITP-PP-2005
Rev No : 01**

NOTES (As applicable):

1. If the certification is specified as EN 10204 Type 3.1 in Datasheet / Material Requisition, then '**W**' may be replaced with '**R**' with Material Traceability.
2. ITP shall be submitted including but not limited to the item/activity covered above. Any item/activity identified and required for the completeness shall also be covered in the ITP submitted by the manufacturers.



VCS QUALITY SERVICES PVT. LTD.

INSPECTION AND TEST PLAN FOR BALL VALVE VPC – ITP – PP – 2007

03	19/12/2021	SR	MC	HK	HK
Rev. No	Date	Prepared By	Checked By	Approved By	Authorized By

UNCONTROLLED COPY	:	If printed
CONTROLLED COPY	:	If in soft and signed

REVISION RECORD						
Rev.	Revision Date	Prepared by	Checked by	Approved by	Authorized by	Revision Description
00	16/06/2017					
		GS	ADE	AD	SK	
01	20/01/2020					Formatting update, Doc Numbering change from VCS-SD- ITP-007 to VPC-ITP- PP-2007
		AG	MC	AD	SK	
02	19/05/2020					Revised as Marked
		AG	MC	AD	SK	
03	19/12/2021					Revised as Marked
		SR	MC	HK	HK	

ABBREVIATIONS:			
CE	Carbon Equivalent	NDT	Non-Destructive Testing
DCN	Dispatch Clearance Note	PO	Purchase Order
DFT	Dry Film Thickness	PQR	Procedure Qualification Record
DPT	Dye Penetrant Testing	PR	Purchase Requisition
HT	Heat Treatment	RT	Radiography Testing
ITP	Inspection and Test Plan	TC	Test Certificate
IC	Inspection Certificate	TPI or TPIA	Third Party Inspection Agency
IGC	Inter Granular Corrosion	UT	Ultrasonic Testing
IR	Inspection Report	VDR	Vendor Data Requirement
IRC	Inspection Release Certificate	WPQ	Welders Performance Qualification
MPT / MT	Magnetic Particle Testing	WPS	Welding Procedure Specification
MTC	Material Test Certificate		
LEGENDS:			
H - Hold (Do not proceed without approval)			
W – Witness (Give due notice, work may proceed after scheduled date)			
P - Perform			
R - Review			
RW - Random Witness [As specified or 10% (min.1 no. of each size and type of Bulk items)]			

1.0 SCOPE:

This Inspection and Test Plan covers the minimum testing requirements of Ball Valves.

2.0 REFERENCE DOCUMENTS:

PO / PR / Standards referred there in / Job specifications / Approved documents.

3.0 INSPECTION AND TEST REQUIREMENTS:

SL. NO.	COMPONENT & OPERATION	CHARACTERISTICS / METHOD OF CHECK	QUANTUM OF CHECK	REFERENCE DOCUMENT & ACCEPTANCE CRITERIA	FORMAT OF RECORD	SCOPE OF INSPECTION		
						SUB VENDOR	VENDOR	TPIA
1.0	PROCEDURES							
1.1	Hydrostatic Test, NDT and Other Procedures	Documented Procedures	100%		Procedure Documents	-	H	R
1.2	WPS,PQR & WPQ	Welding Parameters & Qualification Record	100%		WPS ,PQR & WPQ	-	H	W- New R- Existing
1.3	Pre-Qualification Tests	Fire safe, Cryogenic & Other Test as applicable	As per PR/Purchase Specification		Acceptance Report	-	H	H (If new)
2.0	RAW MATERIAL							
2.1	Forging / Casting:							
	1) Body	Visual & Dimension	100%	Material & Technical Specification	Inspection Report	H	H	-
	2) End Piece							
	3) Ball	Chemical: Chemical Analysis IGC (For SS component)	All Heats	Material & Technical Specification	Vendor Test Certificate	H	R	R
	4) Seat Ring							
	5) Pup Piece (as applicable)	Mechanical: Mechanical Test	All Heats	Material & Technical Specification	Vendor Test Certificate	H	R	W (Note-1)

**INSPECTION AND TEST PLAN
FOR
BALL VALVE**

**DOC NO: VPC-ITP-PP-2007
Rev No : 03**

SL. NO.	COMPONENT & OPERATION	CHARACTERISTICS / METHOD OF CHECK	QUANTUM OF CHECK	REFERENCE DOCUMENT & ACCEPTANCE CRITERIA	FORMAT OF RECORD	SCOPE OF INSPECTION		
						SUB VENDOR	VENDOR	TPIA
		Impact Test (@ - 29°C): for CS Impact Test (@ - 45°C): for LTCS	All Heats	Material & Technical Specification / ASME B 16.34	Test Report	H	R	W (Note-1)
		Non-Destructive Examination (NDT): Radiography (100% Critical Area)	100%	Material & Technical Specification / ASME B 16.34	RT Report	H	R (RT-Film review)	R (RT-Film review)
		Non-Destructive Examination (NDT): Magnetic Particle Examination (100% exterior & accessible interior)	100%	Material & Technical Specification / ASME B 16.34	MPI Report	H	R	R
		ENP (For Ball): Visual, Thickness & Hardness	100%	25 microns (min) & 50 HRC (min)	Vendor Test Certificate	H	R	R
3.0 INCOMING / BOF ITEMS								
3.1	Stem	Chemical: Chemical Analysis	All Heats	Material & Technical Specification	Vendor Test Certificate	H	R	R
		Mechanical: Mechanical Test	All Heats	Material & Technical Specification	Vendor Test Certificate	H	R	R
3.2	Fasteners	Chemical: Chemical Analysis	All Heats	Material & Technical Specification	Vendor Test Certificate	H	R	R
		Mechanical: Mechanical Test	All Heats	Material & Technical Specification	Vendor Test Certificate	H	R	R
		Impact Test (@ - 29°C): for CS Impact Test (@ - 45°C): for LTCS	All Heats	Material & Technical Specification / ASME B 16.34	Test Report	H	R	R
3.3	Gaskets, Gear units, Gland, Packings, etc.	Physical / Chemical Properties	100%	Material & Technical Specification	Test Certificates & Lab Report	H	R	R

**INSPECTION AND TEST PLAN
FOR
BALL VALVE**

**DOC NO: VPC-ITP-PP-2007
Rev No : 03**

SL. NO.	COMPONENT & OPERATION	CHARACTERISTICS / METHOD OF CHECK	QUANTUM OF CHECK	REFERENCE DOCUMENT & ACCEPTANCE CRITERIA	FORMAT OF RECORD	SCOPE OF INSPECTION		
						SUB VENDOR	VENDOR	TPIA
4.0	MACHINED COMPONENTS							
4.1	Body, Connector, Ball & Seat Ring	Surface examination & Dimension Inspection: Visual & Measurement	100%	Manufacturer’s Drawing	Inspection Reports	100%	R	R
5.0	IN-PROCESS							
5.1	Body & Connector joint welding	Non-Destructive Examination (NDT): Magnetic Particle Examination (MPI)	100%	ASME Sec VIII - Appendix V & VI	MPI Report	100%	R	R
5.2	Valve & Pup Piece Bevel Ends joint welding	Non-Destructive Examination (NDT): Radiography (100% on weld joint)	100%	ASME B16.34	RT Report	100%	R (RT-Film review)	R (RT-Film review)
6.0	FINAL INSPECTION							
6.1	Finished Valve Assembly: Pressure Test & Final Inspection	Shell Test: Hydrostatic	100%	Testing Procedure as per Code	Test Record	-	H	RW
6.2		Seat Test: Hydrostatic				-	H	RW
6.3		Seat Test: Pneumatic				-	H	RW
6.4		Functional Test - Actuated Valve @ Atm. Pressure & Max. Diff. Pressure: Operation- Open / Close				-	H	RW
6.5		Double Block & Bleed: Hydrostatic				-	H	RW
6.6		Final Inspection: Visual, Dimension, TC Verification, Special Requirements & Marking as per sale order	100%	Approved GA Drawing (if applicable)	Test Report	-	H	RW
6.7		Anti-Static Test	100%	API 6D & Technical Specification	Test Record	-	H	RW

SL. NO.	COMPONENT & OPERATION	CHARACTERISTICS / METHOD OF CHECK	QUANTUM OF CHECK	REFERENCE DOCUMENT & ACCEPTANCE CRITERIA	FORMAT OF RECORD	SCOPE OF INSPECTION		
						SUB VENDOR	VENDOR	TPIA
6.8		Fire Safe Test	100%	API-6FA / ISO-10497	Fire safe type test report	-	H	R
6.9	Final Stamping	Stamping Of Accepted Valves	Stamping of Valves which are witnessed by VCS/TPIA	As per Tender Specification	Inspection Report	-	H	H
7.0	PAINTING & PACKING	Surface examination & DFT Inspection: Visual & Measurement	100%	As per Tender Specification	Painting Record	-	H	R
8.0	DOCUMENTATION & INSPECTION CERTIFICATE(IC)	Review of Stage Inspection Reports / Test Reports & Issue of IC	100%	As per Tender Specification	Vendor TC & IC	-	H	H
9.0	FINAL DOCUMENTATION & SUBMISSION OF REPORTS	Compilation of IR/IRC/DCN/MTC/DRGS./VDR	100%	EN 10204 type 3.2/3.1 certification as specified in valve datasheet (Note-1)	Compliance Certificate	-	H	-

NOTES (As applicable):

1. If the certification is specified as EN 10204 Type 3.1 in Data sheet / Material Requisition, then 'W' may be replaced with 'R' with Material Traceability.
2. ITP shall be submitted including but not limited to the item/activity covered above. Any item/activity identified and required for the completeness shall also be covered in the ITP submitted by the manufacturers.



VCS QUALITY SERVICES PVT. LTD.

INSPECTION AND TEST PLAN FOR GATE/GLOBE/CHECK VALVES VPC – ITP – PP – 2008

01	19/12/2021	SR	MC	HK	HK
Rev. No	Date	Prepared By	Checked By	Approved By	Authorized By

UNCONTROLLED COPY	:	If printed
CONTROLLED COPY	:	If in soft and signed

REVISION RECORD						
Rev.	Revision Date	Prepared by	Checked by	Approved by	Authorized by	Revision Description
00	22/04/2020					Revised as Marked
		MB	MC	AD	SK	
01	19/12/2021					Revised as Marked
		SR	MC	HK	HK	

ABBREVIATIONS:			
CE	Carbon Equivalent	NDT	Non Destructive Testing
DCN	Dispatch Clearance Note	PO	Purchase Order
DFT	Dry Film Thickness	PQR	Procedure Qualification Record
DPT	Dye Penetrant Testing	PR	Purchase Requisition
HT	Heat Treatment	RT	Radiography Testing
IC	Inspection Certificate	TC	Test Certificate
IR	Inspection Report	TPI or TPIA	Third Party Inspection Agency
IRC	Inspection Release Certificate	UT	Ultrasonic Testing
ITP	Inspection and Test Plan	VDR	Vendor Data Requirement
MPT/MT	Magnetic Particle Testing	WPQ	Welders Performance Qualification
MTC	Material Test Certificate	WPS	Welding Procedure Specification
LEGENDS:			
H - Hold (Do not proceed without approval)			
W - Witness (Give due notice, work may proceed after scheduled date)			
P - Perform			
R - Review			
RW - Random Witness [As specified or 10% (min.1 no. of each size and type of Bulk items)]			

1.0 SCOPE:

This Inspection and Test Plan covers the minimum testing requirements of Valves.

2.0 REFERENCE DOCUMENTS:

PO / PR / Standards referred there in / Job specifications / Approved documents.

3.0 INSPECTION AND TEST REQUIREMENTS:

SL.NO.	STAGE/ACTIVITY	CHARACTERISTICS	QUANTUM OF CHECK	RECORD	SCOPE OF INSPECTION		
					SUB VENDOR	VENDOR	TPIA
1.0	Procedure						
1.1	Hydrostatic Test, NDT and Other Procedures	Documented Procedures	100%	Procedure Documents	-	H	R
1.2	WPS,PQR & WPQ	Welding Parameters & Qualification Record	100%	WPS ,PQR & WPQ	-	H	W- New R- Existing

SL.NO.	STAGE/ACTIVITY	CHARACTERISTICS	QUANTUM OF CHECK	RECORD	SCOPE OF INSPECTION		
					SUB VENDOR	VENDOR	TPIA
2.0	Material Inspection						
2.1	Castings & Forgings (Body, Bonnet, Disc, Stem, Body ring)	Chemical ,Mechanical , Heat Treatment, NDT & Other Properties as applicable	100%	Test Certificates	H	R	W (Note-1)
2.2	Castings & Forgings (Body, Bonnet, Disc, Stem, Body ring)	Visual & Dimension	100%	Inspection Report	H	H	-
2.3	Body and Bonnet Castings	Radiography Examination	As per PR / Purchase Specification	Films and report	H	R (RT-Film review)	R (RT-Film review) (Note-1)
2.4	Bars for Trim material	Chemical Analysis	Each Heat	Test Certificates& Lab Report	H	R	R
2.5	Gaskets, Gear units, Fasteners, Gland, Packings, etc.	Physical / Chemical Properties	100%	Test Certificates& Lab Report	H	R	R

SL.NO.	STAGE/ACTIVITY	CHARACTERISTICS	QUANTUM OF CHECK	RECORD	SCOPE OF INSPECTION		
					SUB VENDOR	VENDOR	TPIA
2.6	Actuators as applicable	Performance , Statutory Certificates as applicable	100%	Test Certificates& Lab Report	H	H	R
3.0	In Process Inspection						
3.1	Welding	Welding Parameters as per WPS / PQR	100%	Inspection Reports	-	H	R
3.2	Machining of components	Visual / Dimension	100%	Inspection Reports	-	H	-
4.0	Final Inspection						
4.1	Hydrostatic / Pneumatic Test	Hydrostatic Test – Shell Pneumatic Test – Seat & Back Seat	As per PR / Purchase Specification	Test Report	-	H	RW
4.2	Visual / Dimension	Surface & Dimension Check	100%	Test Report	-	H	RW
4.3	Final Stamping	Stamping Of Accepted Valves	Stamping of Valves which are witnessed by TPIA.	Inspection Report	-	H	H

SL.NO.	STAGE/ACTIVITY	CHARACTERISTICS	QUANTUM OF CHECK	RECORD	SCOPE OF INSPECTION		
					SUB VENDOR	VENDOR	TPIA
5.0	Painting						
5.1	Painting and Colour coding as applicable	Visual / DFT Check	100%	Inspection Report	-	H	R
6.0	Documentation & IC						
6.1	Documentation & Inspection Certificate(IC)	Review of Stage Inspection Reports / Test Reports & Issue of IC	100%	Vendor TC & IC	-	H	H
7.0	Final Documentation & Submission of Reports	Compilation of IR/IRC/DCN/MTC/DRGS./VDR	100%	Compliance Certificate (Note-1)	-	H	-

NOTES (As applicable):

1. If the certification is specified as EN 10204 Type 3.1 in Data sheet / Material Requisition, then 'W' may be replaced with 'R' with Material Traceability.
2. ITP shall be submitted including but not limited to the item/activity covered above. Any item/activity identified and required for the completeness shall also be covered in the ITP submitted by the manufacturers.



VCS QUALITY SERVICES PVT. LTD.

INSPECTION AND TEST PLAN FOR WELDED FITTINGS (18" NB & ABOVE) VPC – ITP – PP – 2011

01	19/12/2021	SR	MC	HK	HK
Rev. No	Date	Prepared By	Checked By	Approved By	Authorized By

UNCONTROLLED COPY	:	If printed
CONTROLLED COPY	:	If in soft and signed

REVISION RECORD						
Rev.	Revision Date	Prepared by	Checked by	Approved by	Authorized by	Revision Description
00	22/04/2020					
		MB	MD	AD	SK	
01	19/12/2021					Revised as Marked
		SR	MC	HK	HK	

ABBREVIATIONS:			
CE	Carbon Equivalent	MTC	Material Test Certificate
DCN	Dispatch Clearance Note	NDT	Non Destructive Testing
DFT	Dry Film Thickness	PO	Purchase Order
DPT	Dye Penetrant Testing	PQR	Procedure Qualification Record
HT	Heat Treatment	TC	Test Certificate
IC	Inspection Certificate	TPI or TPIA	Third Party Inspection Agency
IR	Inspection Report	UT	Ultrasonic Testing
IRC	Inspection Release Certificate	VDR	Vendor Data Requirement
ITP	Inspection and Test Plan	WPQ	Welders Performance Qualification
LPT	Liquid Penetrant Test	WPS	Welding Procedure Specification
MPT / MT	Magnetic Particle Testing		
LEGENDS:			
H - Hold (Do not proceed without approval)			
W - Witness (Give due notice, work may proceed after scheduled date)			
P - Perform			
R - Review			
RW - Random Witness (As specified or 10% [min.1 no. of each size and type of Bulk item])			

1. SCOPE

This Inspection and Test Plan covers the minimum testing requirements of CS FLANGES AND WELDED FITTINGS (18" NB & ABOVE).

2. REFERENCE DOCUMENTS

PO/PR/ Standards referred there in/ Job specifications /Approved documents.

3. INSPECTION AND TEST REQUIREMENTS

SL. NO.	STAGE/ ACTIVITY	CHARACTERISTICS	QUANTUM OF CHECK	RECORD	SCOPE OF INSPECTION		
					SUB VENDOR	VENDOR	TPIA
1.0	Procedure						
1.1	Heat Treatment, NDT and Other Procedures	Documented Procedures	100%	Procedure Documents	-	H	R
1.2	WPS, PQR & WPQ	Welding Parameters & Qualification Record	100%	WPS, PQR & WPQ	-	H	W- New R- Existing
2.0	Material Inspection						
2.1	Raw Material Inspection	Chemical & Mechanical Properties	100%	Test Certificates	-	H	R

SL. NO.	STAGE/ ACTIVITY	CHARACTERISTICS	QUANTUM OF CHECK	RECORD	SCOPE OF INSPECTION		
					SUB VENDOR	VENDOR	TPIA
3.0	In Process Inspection						
3.1	Welding	Welding Parameters as per WPS / PQR	100%	Inspection Reports	-	H	-
3.2	Heat Treatment	Stress Relieving, Normalising, Tempering, Solution Annealing, Stabilization Heat Treatment etc. as applicable	100%	HT chart	-	H	R
3.3	RT For Fittings As Applicable	Weld defects	PR / Purchase Specification	RT films & Reports	-	H	R (RT-Film review)
3.4	Identification of Test Samples	Product Chemical, Mechanical, Impact, Hardness and Other test as applicable	One/Heat/Lot	Test Reports	-	H	H
3.5	Product Analysis	Chemical Composition	PR/ Purchase Specification	Test Reports	-	H	R
3.6	Destructive Testing	Mechanical, Impact, Hardness and Other test as applicable	One/Heat/Lot	Test Reports	-	H	H

SL. NO.	STAGE/ ACTIVITY	CHARACTERISTICS	QUANTUM OF CHECK	RECORD	SCOPE OF INSPECTION		
					SUB VENDOR	VENDOR	TPIA
3.7	MPT/LPT	Surface & Internal Imperfections	PR/ Purchase Specification	NDT Reports	-	H	R
4.0	Final Inspection						
4.1	Visual and Dimensional Inspection (VDI)	Surface finish, Dimensions, Marking etc	100%	Inspection report	-	H	RW
4.2	PMI Check	Chemical Check	As Per Spec./Code	Inspection report	-	H	RW
4.3	Final Stamping	Stamping of accepted Items	100%	Inspection report	-	H	H
5.0	Painting						
5.1	Rust Preventive Coating & Colour Coding	Visual Inspection & Colour Coding	100%	Inspection report	-	H	-

SL. NO.	STAGE/ ACTIVITY	CHARACTERISTICS	QUANTUM OF CHECK	RECORD	SCOPE OF INSPECTION		
					SUB VENDOR	VENDOR	TPIA
6.0	Documentation & IC						
6.1	Documentation & Inspection Certificate(IC)	Review of Stage Inspection Reports / Test Reports & Issue of IC	100%	Vendor TC & IC	-	H	H
7.0	Final Documentation and Submission of Reports	Compilation of IR/IRC/DCN/MTC/DRGS./VDR	100%	Compliance Certificate (Note-1)	-	H	-

NOTES (As applicable):

1. If the certification is specified as EN 10204 Type 3.1 in Data sheet / Material Requisition, then '**W**' may be replaced with '**R**' with Material Traceability.
2. ITP shall be submitted including but not limited to the item/activity covered above. Any item/activity identified and required for the completeness shall also be covered in the ITP submitted by the manufacturers.



VCS QUALITY SERVICES PVT. LTD.

INSPECTION AND TEST PLAN FOR BOLTING MATERIAL VPC – ITP – PP – 2012

00	22/04/2020	MB	MD	AD	SK
Rev. No	Date	Prepared By	Checked By	Approved By	Authorized By

UNCONTROLLED COPY	:	If printed
CONTROLLED COPY	:	If in soft and signed

REVISION RECORD						
Rev.	Revision Date	Prepared by	Checked by	Approved by	Authorized by	Revision Description
00	22/04/2020					
		MB	MD	AD	SK	

ABBREVIATIONS

CE	Carbon Equivalent	NPSH	Net Positive Suction Head
DFT	Dry Film Thickness	PO	Purchase Order
DPT	Dye Penetrant Testing	PESO	Petroleum Explosive Safety Organization
DHT	De-hydrogen Heat Treatment	PQR	Procedure Qualification Record
ERTL	Electronics Regional Test Laboratory	PR	Purchase Requisition
FCRI	Fluid Control Research Institute	PMI	Positive Material Identification
HT	Heat Treatment	RT	Radiography Testing
HIC	Hydrogen Induced Cracking	SSCC	Sulphide Stress Corrosion Cracking
ITP	Inspection and Test Plan	TC	Test Certificate
IP	Ingress Protection	TPI or TPIA	Third Party Inspection Agency
IHT	Intermediate Heat Treatment	UT	Ultrasonic Testing
IC	Inspection Certificate	VDR	Vendor Data Requirement
IGC	Inter Granular Corrosion	WPS	Welding Procedure Specification
MRT	Mechanical Run Test	WPQ	Welders Performance Qualification
NDT	Non Destructive Testing	MPT / MT	Magnetic Particle Testing

1. SCOPE

This Inspection and Test Plan covers the minimum testing requirements of Bolting Material.

2. REFERENCE DOCUMENTS

PO/PR/ Standards referred there in/ Job specifications /Approved documents.

3. INSPECTION AND TEST REQUIREMENTS

SL. NO.	STAGE/ ACTIVITY	CHARACTERISTICS	QUANTUM OF CHECK	RECORD	SCOPE OF INSPECTION		
					SUB SUPPLIER	SUPPLIER	TPIA
1.0	Procedure						
1.1	Heat Treatment, NDT and Other Procedures	Documented Procedures	100%	Procedure Documents	-	H	R
2.0	Material Inspection						
2.1	Raw Material Inspection	Chemical, Steel making process, Macro Etch , etc.	100%	Test Certificates	H	H	R
3.0	In Process Inspection						
3.1	Thread Rolling, Hot forging of Nuts/ Bolt Heads, Machining	Process Parameters	100%	Inspection Reports	-	H	-

3.2	Heat Treatment	Normalising & Tempering, Quenching & Tempering Solution Annealing, Stabilization Heat Treatment, Strain Hardening, Nitriding etc. as applicable	100%	Inspection Reports	-	H	R
3.3	NDT (as applicable)	Defects detection	100%	Inspection Reports	-	H	R
3.4	Identification of Test Samples	Product Chemical, Proof Load Test, Stress Rupture, Tensile, Hardness, Impact, and Other test as applicable	Lot as per specification	Test Reports	-	H	W
3.5	Destructive Testing	Product Chemical, Proof Load Test , Stress Rupture, Mechanical, Impact and Other test as applicable	Lot as per specification	Test Reports	-	H	W
3.6	Galvanizing (If Applicable)	Integrity Of Galvanised Coating	100%	Inspection Report	-	H	R
4.0	Final Inspection						
4.1	Visual and Dimensional	Visual Marking & Dimensions	100% by supplier & Random by TPIA	Inspection report	-	H	RW(Note- 4)

4.2	Final Stamping	Stamping of Accepted Bolting Material	Stamping of bolting material which are witnessed by TPIA. Others to have suppliers Identification.	Inspection report	-	H	W
4.3	PMI Check	Chemical Check	As Per VCS Spec.	Inspection report	-	H	W
5.0	Painting						
5.1	Rust Preventive & Color Coding (as applicable)	Visual & Color Coding as applicable	100%	Inspection report	-	H	-
6.0	Documentation & IC						
6.1	Documentation & Inspection Certificate(IC)	Review of Stage Inspection Reports / Test Reports & Issue of IC	100%	Supplier TC & IC	-	H	H

Legend:

H - Hold (Do not proceed without approval),

P - Perform,

RW - Random Witness (As specified or 10% [min.1 no. of each size and type of Bulk item]),

R - Review,

W - Witness (Give due notice, work may proceed after scheduled date).PR-PURCHASE REQUISITION

NOTES (As applicable):

1. This document describes the generic test requirements. Any additional test or Inspection scope if specified in contract documents shall also be applicable. (Unless otherwise agreed upon).
2. Acceptance Norms for all the activities shall be as per PO/PR/STANDARDS referred there in /Job Specification /Approved Documents.
3. For orders placed on stockist, items shall be accepted based on manufacturer's TC with EN310204 type 3.2 certification from VCS / OWNER approved suppliers.
4. Final visual and dimension shall be checked as per below sampling plan

Lot Size (Nos.)	Sample Size (Minimum)
Upto 100	2% (Min. 2 Nos.)
101 to 500	1% (Min. 3 Nos.)
501 and above	0.5% (Min.5Nos.)



VCS QUALITY SERVICES PVT. LTD.

INSPECTION AND TEST PLAN FOR GASKETS

VPC – ITP – PP – 2013

00	22/04/2020	MB	MD	AD	SK
Rev. No	Date	Prepared By	Checked By	Approved By	Authorized By

UNCONTROLLED COPY	:	If printed
CONTROLLED COPY	:	If in soft and signed

REVISION RECORD						
Rev.	Revision Date	Prepared by	Checked by	Approved by	Authorized by	Revision Description
00	22/04/2020					
		MB	MD	AD	SK	

Abbreviations:

CE	Carbon Equivalent	NPSH	Net Positive Suction Head
DFT	Dry Film Thickness	PO	Purchase Order
DPT	Dye Penetrant Testing	PESO	Petroleum Explosive Safety Organization
DHT	De-hydrogen Heat Treatment	PQR	Procedure Qualification Record
ERTL	Electronics Regional Test Laboratory	PR	Purchase Requisition
FCRI	Fluid Control Research Institute	PMI	Positive Material Identification
HT	Heat Treatment	RT	Radiography Testing
HIC	Hydrogen Induced Cracking	SSCC	Sulphide Stress Corrosion Cracking
ITP	Inspection and Test Plan	TC	Test Certificate
IP	Ingress Protection	TPI or TPIA	Third Party Inspection Agency
IHT	Intermediate Heat Treatment	UT	Ultrasonic Testing
IC	Inspection Certificate	VDR	Vendor Data Requirement
IGC	Inter Granular Corrosion	WPS	Welding Procedure Specification
MRT	Mechanical Run Test	WPQ	Welders Performance Qualification
NDT	Non Destructive Testing	MPT / MT	Magnetic Particle Testing

1. SCOPE

This Inspection and Test Plan covers the minimum testing requirements of Gaskets.

2. REFERENCE DOCUMENTS

PO/PR/ Standards referred there in/ Job specifications/ Approved documents.

3. INSPECTION AND TEST REQUIREMENTS

SL. NO.	STAGE/ ACTIVITY	CHARACTERISTICS	QUANTUM OF CHECK	RECORD	SCOPE OF INSPECTION		
					SUB SUPPLIER	SUPPLIER	VCS/TPIA
1.0	Procedure						
1.1	HT & Test Procedure	Documented Procedures	100%	Procedure Documents	-	H	R
2.0	Material Inspection						
2.1	Raw Material Inspection	Chemical, Physical and other properties as per applicable material specification	100%	Test Certificates	H	H	-

3.0	In Process Inspection						
3.1	Punching & Finishing	Finish & Dimension	100%	Inspection Report	-	H	-
3.2	Heat Treatment for RTJ Gaskets (As applicable)	Time & Temperature	100%	HT Charts	-	H	R
4.0	Final Inspection						
4.1	Final Visual, Dimension & Testing	Compressibility, Recovery, Seal ability, Groove Hardness for Ring & Tongue Joint etc as applicable and Visual/ Dimension	100%	Inspection Report	-	H	R
4.2	Final Stamping	Stamping of Accepted Gaskets	100%	Inspection Report	-	H	-
4.3	PMI Check (as applicable)	Chemical Check	As per VCS Spec.	Inspection Report	-	H	R
5.0	Painting						
5.1	Rust Preventive & Color Coding as applicable	Visual & Color Coding as applicable	100%	Inspection Report	-	H	-

6.0	Documentation & IC						
6.1	Documentation & IC	Review of test reports, Inspection documents & Issue of IC	100%	Supplier Records/ IC	-	H	-

Legend: H – Hold (Do not proceed without approval), P – Perform, RW – Random Witness (As specified or 10% (min. 1 no. of each size and type of Bulk item), R – Review, W – Witness (Give due notice, work may proceed after scheduled date).

Notes (as applicable):

1. This document describes the generic test requirements. Any additional test or Inspection scope if specified in contract documents shall also be applicable. (Unless otherwise agreed upon).
2. Acceptance Norms for all the activities shall as per PO/PR/STANDARDS referred therein/ Job Specification/ Approved Documents.



VCS QUALITY SERVICES PVT. LTD.

INSPECTION AND TEST PLAN FOR SEAMLESS LINE PIPES UP TO 16"

VPC – ITP – PP – 2015

03	19/12/2021	SR	MC	HK	HK
Rev. No	Date	Prepared By	Checked By	Approved By	Authorized By

UNCONTROLLED COPY	:	If printed
CONTROLLED COPY	:	If in soft and signed

REVISION RECORD						
Rev.	Revision Date	Prepared by	Checked by	Approved by	Authorized by	Revision Description
0	14.05.2019					Issued as Standard
		BS	MV	AD	SK	
1	19.11.2019					Re-Issued as Standard
		SS	MC	AD	SK	
2	15.05.2020					Document formatting, Doc numbering updated from VPC-PL-ITP-025 to VPC-ITP-PP-2015 other detail update as marked
		SS	MC	AD	SK	
3	19.12.2021					Revised as Marked
		SR	MC	HK	HK	

ABBREVIATIONS:			
CE	Carbon Equivalent	MTC	Material Test Certificate
HT	Heat Treatment	NDT	Non-Destructive Testing
IC	Inspection Certificate	PO	Purchase Order
IGC	Inter Granular Corrosion	PMI	Positive Material Identification
ITP	Inspection and Test Plan	TC	Test Certificate
MPT/MT	Magnetic Particle Testing	TPI or TPIA	Third Party Inspection Agency
MPS	Manufacturing Process Specification	UT	Ultrasonic Testing
MR	Material Requisition	VDR	Vendor Data Requirement
LEGENDS:			
H - Hold (Do not proceed without approval)			
W - Witness (Give due notice, work may proceed after scheduled date)			
P - Perform			
R - Review			
RW - Random Witness (As specified or 10% [min.1 no. of each size and type of Bulk item])			

1.0 SCOPE:

This Inspection and Test Plan covers the minimum testing requirements of Seamless Pipes up to 16" (Including 16")

2.0 REFERENCE DOCUMENTS:

PO/PR/ Standards referred there in/ Job specifications /Approved documents.

3.0 INSPECTION AND TEST REQUIREMENTS:

SL. NO.	STAGE/ ACTIVITY	CHARACTERISTICS	QUANTUM OF CHECK	RECORD	SCOPE OF INSPECTION		
					SUB VENDOR	VENDOR	TPIA
1.0	Procedure						
1.1	MPS	Documented Procedures	100%	Procedure Documents	-	H	R
2.0	Raw Material Procurement						
2.1	Raw Material Inspection	Chemical & Mechanical Properties, Method of manufacturing, Heat Treatment Condition etc.	100%	Mill Test Certificates (EN 10204-3.2)	H	H (Note-3)	R (Note-3)

SL. NO.	STAGE/ ACTIVITY	CHARACTERISTICS	QUANTUM OF CHECK	RECORD	SCOPE OF INSPECTION		
					SUB VENDOR	VENDOR	TPIA
3.0	In Process Inspection						
3.1	First Day Production test	All testing requirement as per PR/ MPS	As per PR/ MPS	Test Report	-	H	H
3.2	Raw material Inspection	Marking & Correlations with Test Certificates	100%	Inspection Reports	-	H	-
3.3	Heat Treatment	Heat Treatment time and temperature	100%	HT Graph / Record	-	H	R
4.0	Final Inspection						
4.1	Hydrostatic Testing	Leak & pressure Drop, Calibration of Gauges/ Recorder	100%	Inspection Report	-	H	RW (Min.5%)

SL. NO.	STAGE/ ACTIVITY	CHARACTERISTICS	QUANTUM OF CHECK	RECORD	SCOPE OF INSPECTION		
					SUB VENDOR	VENDOR	TPIA
4.2	Calibration of UT system	Run with calibration pipe	1) Beginning of each shift 2) After Breakdown /Maintenance	Inspection Report	-	H	W
4.3	Pipe UT	Lamination & other defects	100%	Inspection Report	-	H	RW (Min.5%)
4.4	Pipe End UT MPT as applicable	Lamination & other defects	100%	Inspection Report	-	W	RW (Min.1%)
4.5	Final visual and dimension	1. Visual Examination 2. Dimensional Check Surface Condition, Straightness, End Finish, Bevel Angle, Root Face, Outer Dia., Thickness, Length, End Finish, Marking etc.	100%	Inspection Report	-	H	RW (Min.5%)
4.6	Lot Testing	1. Chemical Analysis 2. Tensile Tests 3. Macro & Hardness Tests 4. Impact Tests and other applicable test	As per MPS/API 5L/Spec.	Inspection Report	-	H	W

SL. NO.	STAGE/ ACTIVITY	CHARACTERISTICS	QUANTUM OF CHECK	RECORD	SCOPE OF INSPECTION		
					SUB VENDOR	VENDOR	TPIA
4.7	Non-conforming product/stage	Repair / Retest /Reject	100%	Inspection Report	-	H	W
4.8	Marking/Stenciling	Pipe No, Acceptance No., Heat. No., Size, Weight, Grade, Thickness, Colour Code etc as per MPS	100%	Inspection Report	-	H	RW (Min.5%)
5.0	PAINTING						
5.1	Rust Preventive Coating & Colour Coding	Visual & Colour Coding as applicable	100%	Inspection Report	-	H	-
6.0	Documentation & IC						

SL. NO.	STAGE/ ACTIVITY	CHARACTERISTICS	QUANTUM OF CHECK	RECORD	SCOPE OF INSPECTION		
					SUB VENDOR	VENDOR	TPIA
6.1	Documentation & Inspection Certificate(IC)	Review of Stage Inspection Reports / Test Reports & Issue of IC	100%	Manufacturer TC & IC (Note-4)	-	H	H
6.2	Final documents as per PR/MR	Verification & compilation of inspection & test records for submission to customer	100%	Final dossier (Note-4)	-	H	H

NOTES (As applicable):

1. ITP shall be submitted including but not limited to the item/activity covered above. Any item/activity identified and required for the completeness shall also be covered in the ITP submitted by the manufacturers.
2. Acceptance Norms for all the activities shall be as per PO/PR/STANDARDS referred there in /Job Specification /Approved Documents.
3. Raw Material shall be inspected at Mills (Sub vendors works) by TPIA appointed by Vendor.
4. Items shall be EN 10204 Type 3.2 Certified based on this ITP/MR/PR for the Pipe (Final product).



VCS QUALITY SERVICES PVT. LTD.

INSPECTION AND TEST PLAN FOR ASSORTED PIPES

VPC – ITP – PP – 2021

01	19/12/2021	SR	MC	HK	HK
Rev. No	Date	Prepared By	Checked By	Approved By	Authorized By

UNCONTROLLED COPY	:	If printed
CONTROLLED COPY	:	If in soft and signed

REVISION RECORD						
Rev.	Revision Date	Prepared by	Checked by	Approved by	Authorized by	Revision Description
00	22/04/2020					
		MB	MC	AD	SK	
01	19/12/2021					Revised as Marked
		SR	MC	HK	HK	

ABBREVIATIONS:			
CE	Carbon Equivalent	NDT	Non-Destructive Testing
HT	Heat Treatment	PO	Purchase Order
DCN	Dispatch Clearance Note	PMI	Positive Material Identification
IC	Inspection Certificate	PR	Purchase Requisition
IR	Inspection Report	TC	Test Certificate
IRC	Inspection Release Certificate	TPI or TPIA	Third Party Inspection Agency
ITP	Inspection and Test Plan	VDR	Vendor Data Requirement
MPT / MT	Magnetic Particle Testing		
LEGENDS:			
H- Hold (Do not proceed without approval)			
W- Witness (Give due notice, work may proceed after scheduled date).			
P- Perform			
R- Review			
RW - Random Witness (As specified or 10% (min.1 no. of each size and type of Bulk item))			

1. SCOPE

This Inspection and Test Plan covers the minimum testing requirements of small sizes and Assorted length Pipes.

2. REFERENCE DOCUMENTS:

PO/PR/ Standards referred there in/ Job specifications /Approved documents.

3. INSPECTION AND TEST REQUIREMENTS:

SL. NO.	STAGE/ACTIVITY	CHARACTERISTICS	QUANTUM OF CHECK	RECORD	SCOPE OF INSPECTION		
					SUB VENDOR	VENDOR	TPIA
1.0	Pipe Inspection						
1.1	Pipe Inspection	Chemical & Mechanical Properties	100%	Test Certificates and marking on pipe (EN 10204 Type 3.2)	-	H	R
2.0	Final Inspection (In case of non-availability of 3.2 Certificate)						
2.1	Hydrostatic Testing	Leak Check	100%	Test Report	-	H	R
2.2	1) Visual 2) Dimension 3) Marking w.r.t MTC	Surface Condition, Straightness, End Finish, Bevel Angle, Root Face, Outer Dia., Thickness, Length, End Finish, Marking etc	100%	Inspection Report	-	H	RW

SL. NO.	STAGE/ACTIVITY	CHARACTERISTICS	QUANTUM OF CHECK	RECORD	SCOPE OF INSPECTION		
					SUB VENDOR	VENDOR	TPIA
2.3	PMI Check	Chemical Check	As Per Spec.	Inspection Report	-	H	RW
2.4	Identification of Test Samples	Product Chemical, Mechanical, Impact and Other test as applicable	As Per Spec. / Code	Test Reports	-	H	H
2.5	Product Analysis	Chemical Composition	As Per Spec. / Code	Test Reports	-	H	R
2.6	Destructive Testing	Mechanical, Impact, and Other test as applicable	As Per Spec. / Code	Test Reports	-	H	H
2.7	PMI Check	Chemical Check	As Per Spec. / Code	Inspection Report	-	H	RW
2.8	Final Stamping	Stamping Of Accepted Pipes	Stamping of Pipes	Inspection Report	-	H	H

SL. NO.	STAGE/ACTIVITY	CHARACTERISTICS	QUANTUM OF CHECK	RECORD	SCOPE OF INSPECTION		
					SUB VENDOR	VENDOR	TPIA
3.0	Painting						
3.1	Rust Preventive Coating & Color Coding	Visual Inspection & Color Coding	100%	Inspection Report	-	H	-
4.0	Documentation & IC						
4.1	Documentation & Inspection Certificate (IC)	Review of Stage Inspection Reports / Test Reports & Issue of IC	100%	Vendor TC/IR/IRC/DCN/DRGS./VDR (Note-1)	-	H	-

NOTES (As applicable):

1. Items shall be accepted based on EN 10204 type 3.2/3.1 certification as specified in material requisition.
2. ITP shall be submitted including but not limited to the item/activity covered above. Any item/activity identified and required for the completeness shall also be covered in the ITP submitted by the manufacturers.



VCS PROJECTS CONSULTANTS PVT. LTD.

INSPECTION AND TEST PLAN FOR ELECTRIC WELDED LINE PIPES

VPC – ITP – PP – 2016

03	15/05/2020	SS	MC	AD	SK
Rev. No	Date	Prepared By	Checked By	Approved By	Authorized By

UNCONTROLLED COPY	:	If printed
CONTROLLED COPY	:	If in soft and signed

REVISION RECORD						
Rev.	Revision Date	Prepared by	Checked by	Approved by	Authorized by	Revision Description
0	11.10.2018					Issued as Standard
		BS	MC	AD	SK	
1	26.09.2019					Re-Issued as Standard
		SS	MC	AD	SK	
2	19.11.2019					Re-Issued as Standard
		SS	MC	AD	SK	
3	15.05.2020					Document formatting, Doc numbering updated from VPC-PL-ITP-026 to VPC-ITP-PP-2016 other detail update as marked
		SS	MC	AD	SK	

ABBREVIATIONS

CE	Carbon Equivalent	NDT	Non Destructive Testing
CIMFR	Central Institute of Mining & Fuel Research	NPSH	Net Positive Suction Head
DFT	Dry Film Thickness	PO	Purchase Order
DPT	Dye Penetrant Testing	PESO	Petroleum Explosive Safety Organization
DHT	De-hydrogen Heat Treatment	PQR	Procedure Qualification Record
ERTL	Electronics Regional Test Laboratory	MR	Material Requisition
FCRI	Fluid Control Research Institute	PMI	Positive Material Identification
HT	Heat Treatment	RT	Radiography Testing
HIC	Hydrogen Induced Cracking	SSCC	Sulphide Stress Corrosion Cracking
ITP	Inspection and Test Plan	TC	Test Certificate
IP	Ingress Protection	TPI or TPIA	Third Party Inspection Agency
IHT	Intermediate Heat Treatment	UT	Ultrasonic Testing
IC	Inspection Certificate	VDR	Vendor Data Requirement
IGC	Inter Granular Corrosion	WPS	Welding Procedure Specification
MPT/MT	Magnetic Particle Testing	WPQ	Welders Performance Qualification
MTC	Material Test Certificate		
MRT	Mechanical Run Test		

1.0 SCOPE:

This Inspection and Test Plan covers the minimum testing requirements of Electric Welded Pipes.

2.0 REFERENCE DOCUMENTS:

PO/PR/ Standards referred there in/ Job specifications /Approved documents.

3.0 INSPECTION AND TEST REQUIREMENTS:

SL. NO.	STAGE/ ACTIVITY	CHARACTERISTICS	QUANTUM OF CHECK	RECORD	SCOPE OF INSPECTION		
					SUB SUPPLIER	SUPPLIER	OWNER/PMC/TPIA
1.0	Procedure						
1.1	Hydrostatic Test, Heat Treatment, NDT and Other Procedures	Documented Procedures	100%	Procedure Documents	-	H	R
1.2	WPS, PQR & WPQ	Welding parameters & Qualification Record	100%	WPS, PQR & WPQ	-	H	W- New R- Existing (Qualified under Reputed TPIA)
2.0	Raw Material Procurement						

2.1	Inspection of Coils at Mills (Sub vendor works)	Chemical & Mechanical Properties, Method of manufacturing, Heat Treatment Condition etc.	100%	Mill Test Certificates (EN 10204-3.2)	H	H (Note-3)	R (Note-3)
3.0	In Process Inspection						
3.1	First Day Production test	All testing requirement as per PR/ MR	As per PR/ MR	Test Report	-	H	H
3.2	Raw material Inspection	Heat No, Coil /Plate, Visual & Dimension	100%	Inspection Reports	-	H	RW (Min.1%)
3.3	Coil /Skelp UT as applicable	1) 25mm (Min) from edges 2) 20 % Min Coverage in Bal. part of Coil/ Plate	100%	Inspection Reports	-	H	RW (Min.1%)
3.4	Pipe Forming & Welding	Offset & Welding Parameters	100%	Inspection Reports	-	H	-
3.5	Heat Treatment	Weld Seam Normalising, Stress Relieving, Normalising, Tempering, Solution Annealing, Stabilization Heat Treatment , Heat Treatment temperature etc. as applicable	100%	HT Graph / Record	-	H	R

4.0	Final Inspection						
4.1	Hydrostatic Testing	Leak & pressure Drop, Calibration of Gauges/ Recorder	100%	Inspection Report	-	H	RW (Min.5%)
4.2	Final weld UT & Pipe body UT (If applicable)	Calibration, Seam Tracking. & Examination of Defects	100%	Inspection Report	-	H	RW (Min.5%)
4.3	Manual UT of Pipe end	Welding defects, crack/ lamination of base metal	100%	Inspection Report	-	W	RW (Min.1%)
4.4	Inspection of Pipe ends MPT	1. Examination of Surface Defects after Beveling 2. Demagnetization	100%	Inspection Report	-	H	RW (Min.1%)
4.5	Final visual and dimension	1. Visual Examination 2. Dimensional Check Surface Condition, Straightness, End Finish, Bevel Angle, Root Face, Outer Dia., Thickness, Length, End Finish, Marking etc.	100%	Inspection Report	-	H	RW (Min.5%)
4.6	Weight Checking as applicable	Weight	100%	Inspection Report	-	H	-

4.7	Lot Testing	1. Chemical Analysis 2. Tensile Tests 3. Flattening 4. Reverse Bend Test 5. Macro & Hardness Tests 6. Impact Tests 7. Drop Weight Tear Test, etc. as applicable	100%	Inspection Report	-	H	W
4.8	Non-conforming product/stage	Repair / Retest /Reject	100%	Inspection Report	-	H	RW
4.9	Marking/Stenciling	Pipe No, Acceptance No., Heat. No., Size, Weight, Grade, Thickness, Colour Code etc	100%	Inspection Report	-	H	RW (Min.5%)
5.0	PAINTING						
5.1	Rust Preventive Coating & Colour Coding	Visual & Colour Coding as applicable	100%	Inspection Report	-	H	-
6.0	Documentation & IC						

6.1	Documentation & Inspection Certificate(IC)	Review of Stage Inspection Reports / Test Reports & Issue of IC	100%	Manufacturer TC & IC	-	H	H
6.2	Final documents as per PR/MR	Verification & compilation of inspection & test records for submission to customer	100%	Final dossier	-	H	H

Legend: H - Hold (Do not proceed without approval), P - Perform, RW - Random Witness (As specified or 10% [min.1 no. of each size and type of Bulk item]), R - Review, W - Witness (Give due notice, work may proceed after scheduled date).

NOTES (As applicable):

1. This document describes the generic test requirements. Any additional test or Inspection scope if specified in contract documents shall also be applicable. (Unless otherwise agreed upon). Supplier shall submit specific ITP for Approval
2. Acceptance Norms for all the activities shall be as per PO/PR/STANDARDS referred there in /Job Specification /Approved Documents.
3. Raw Material (Coils) shall be inspected at Mills (Sub vendors works) by TPIA appointed by Supplier.
4. Supplier shall issue EN 10204-3.2 certificate based on this ITP/ MR/ PR for the Pipes (Final Product)



VCS PROJECTS CONSULTANTS PVT. LTD.

INSPECTION AND TEST PLAN FOR 3 LAYER PE COATING OF LINEPIPES

VPC – ITP – PP – 2017

02	15/05/2020	MB	MC	AD	SK
Rev. No	Date	Prepared By	Checked By	Approved By	Authorized By

UNCONTROLLED COPY	:	If printed
CONTROLLED COPY	:	If in soft and signed

REVISION RECORD						
Rev.	Revision Date	Prepared by	Checked by	Approved by	Authorized by	Revision Description
0	11.10.2017					Issued as Standard
		GS	ADE	AD	SK	
1	27.05.2019					Re-Issued as Standard
		BS	MC	AD	SK	
2	15.05.2020					Document formatting, Doc numbering updated from VCS-PL-ITP-025 to VPC-ITP-PP-2017 other detail update as marked
		MB	MC	AD	SK	

ABBREVIATIONS

CE	Carbon Equivalent	NDT	Non Destructive Testing
DFT	Dry Film Thickness	NPSH	Net Positive Suction Head
DPT	Dye Penetrant Testing	PO	Purchase Order
DHT	De-hydrogen Heat Treatment	PESO	Petroleum Explosive Safety Organization
ERTL	Electronics Regional Test Laboratory	PQR	Procedure Qualification Record
FCRI	Fluid Control Research Institute	MR	Material Requisition
HT	Heat Treatment	PMI	Positive Material Identification
HIC	Hydrogen Induced Cracking	RT	Radiography Testing
ITP	Inspection and Test Plan	SSCC	Sulphide Stress Corrosion Cracking
IP	Ingress Protection	TC	Test Certificate
IHT	Intermediate Heat Treatment	TPI or TPIA	Third Party Inspection Agency
IC	Inspection Certificate	UT	Ultrasonic Testing
IGC	Inter Granular Corrosion	VDR	Vendor Data Requirement
MPT/MT	Magnetic Particle Testing	WPS	Welding Procedure Specification
MTC	Material Test Certificate	WPQ	Welders Performance Qualification
MRT	Mechanical Run Test		

1.0 SCOPE:

This Inspection and Test Plan covers the minimum testing requirements of 3-Layer PE Coating of Line pipes

2.0 REFERENCE DOCUMENTS:

PO/PR/ Standards referred there in/ Job specifications /Approved documents.

3.0 INSPECTION AND TEST REQUIREMENTS:

SL. NO.	STAGE/ ACTIVITY	CHARACTERISTICS	QUANTUM OF CHECK	RECORD	SCOPE OF INSPECTION		
					SUB SUPPLIER	SUPPLIER	TPIA
1.0	Procedure						
1.1	Coating application, testing and Other Procedures	Documented Procedures	100%	Procedure Documents	-	H	R
2.0	Material Inspection						
2.1	Epoxy powder, Adhesive & Polyethylene compound	All the properties as per Material specification	100%	Manufacturer Test Certificates	H	R	R
3.0	In Process Inspection						

3.1	Epoxy powder, Adhesive & Polyethylene compound check testing	Properties as per Material specification	100%	Test Reports	-	H	H
3.2	Coating Procedure qualification	All the testing as per Material specification	As per Material Specification	Inspection/Test Report	-	H	H
3.3	Incoming Pipes	Visual inspection, marking verification & correlation with mill TC/Tally sheet	100%	Supplier Data Sheet	-	H	-
3.4	Blast Cleaning	Pre Heating, Elapsed time, Degree of cleaning,, Surface Profile, Contamination of shots/grits, salt level, Degree of dust & roughness	100%	Inspection Reports	-	H	RW (Min.1%)
3.5	Lab test for Chromate, Phosphoric acid & de-ionized water (as applicable)	Properties as per purchase specification / Manufacturer TC	As per Material Specification	Inspection Reports	-	H	RW (Once in a Day)
3.6	Phosphoric acid wash followed by de-ionized water wash (as applicable)	Visual, PH Value, salt level etc.	100%	Inspection Reports	-	H	RW (Once in a Day)
3.7	Chromate Treatment (as applicable)	Uniform application as per Manufacturer's	100%	Inspection Reports	-	H	RW (Once in a Day)

		recommendation					
3.8	Coating application	Preheating temperature, Inter coat time, line speed, Adhesive / PE film temperature, Overlap of layers etc.	100%	Inspection Reports	-	H	RW (Min.1%)
3.9	Epoxy and adhesive Thickness on semi coated pipe	Visual, Thickness, overlap, Adhesion test (St Andrew's Cross Cut method) etc.	As per Material Specification	Inspection Reports	-	H	W
4.0	Final Inspection						
4.1	Holiday detection at 25KV	Pin hole, coating damage & Other through thickness defects.	100%	Inspection Report	-	H	RW (Min.1%)
4.2	Visual and Dimensional	Visual, coating thickness, Cut back dimension, Marking , colour coding etc.	100%	Inspection Report	-	H	RW (Min.1%)
4.3	Impact test	No coating damage @ specified Energy	As per Material Specification	Inspection Report	-	H	W

4.4	Peel Test	Bond strength, mode of failure, rate of peeling etc.	As per Material Specification	Inspection Report	-	H	RW (Min.1%)
4.5	Resistance to indentation test	Hardness against indentation	As per Material Specification.	Inspection Report	-	H	W
4.6	Cathodic Disbondment Test	Disbonded area / Equivalent circle radius (ECR)	As per Material Specification	Inspection Report	-	H	W
4.7	Dry Adhesion Test	Epoxy Coating resists Disbondment from the steel (rating 1 or 2)	As per Material Specification	Inspection Report	-	H	W
4.8	Hot water immersion test	Average less than or equal to 2 and maximum less than or equal to 3 as per ISO 21809-1	As per Material Specification	Inspection Report	-	H	W
4.9	Elongation at Break	Minimum 400%	As per Material Specification	Inspection Report	-	H	W
4.10	Visual (Air Entrapment)	Air entrapment between the layers	As per Material Specification	Inspection Report	-	H	W

4.11	Degree of Cure Test	Cure %, Glass Transition Temp(ΔH and ΔT_g)	As per Material Specification	Inspection Report	-	H	W
4.12	Calibration of measuring Instruments / Holiday tester	Verify Accuracy	As per Material Specification	Calibration Report	-	H	R
4.13	Handling, Load out & Transportation (Bare & coated pipes)	Pipes stacking & weather protection	As per Material Specification	Inspection Report	-	H	-
5.0	Documentation & IC						
5.1	Documentation & Inspection Certificate(IC)	Review of Stage Inspection Reports / Test Reports & Issue of IC	100%	Manufacturer TC & IC	-	H	H
5.1	Final Document submission	Compilation of Inspection / Test reports as per VDR / PR	100%	Final data folder /Completeness certificate	-	H	H

Legend: H - Hold (Do not proceed without approval), P - Perform, RW - Random Witness (As specified or 10% [min.1 no. of each size and type of Bulk item]), R - Review, W - Witness (Give due notice, work may proceed after scheduled date).

NOTES (As applicable):

1. This document describes the generic test requirements. Any additional test or Inspection scope if specified in contract documents shall also be applicable. (Unless otherwise agreed upon)
2. Acceptance Norms for all the activities shall be as per PO/MR/STANDARDS referred there in /Job Specification /Approved Documents.



VCS QUALITY SERVICES PVT. LTD.

INSPECTION AND TEST PLAN FOR FLOW TEE

VPC – ITP – PP – 2001

03	19/12/2021	SR	MC	HK	HK
Rev. No	Date	Prepared By	Checked By	Approved By	Authorized By

UNCONTROLLED COPY	:	If printed
CONTROLLED COPY	:	If in soft and signed

REVISION RECORD						
Rev.	Revision Date	Prepared by	Checked by	Approved by	Authorized by	Revision Description
00	24/05/2017					Issued as Standard ITP
		GS	ADE	AD	SK	
01	05/02/2018					Re-issued as Standard ITP
		CM	MC	AD	SK	
02	22/04/2020					Document formatting, numbering updated from VCS-PL-ITP-001 to VPC-ITP-PP-2001 other detail update as marked
		MB	MC	AD	SK	
03	19/12/2021					Revised as Marked
		SR	MC	HK	HK	

ABBREVIATIONS:			
CE	Carbon Equivalent	PQR	Procedure Qualification Record
DFT	Dry Film Thickness	PR	Purchase Requisition
DPT	Dye Penetrant Testing	RT	Radiography Testing
HT	Heat Treatment	TC	Test Certificate
IC	Inspection Certificate	TPI or TPIA	Third Party Inspection Agency
ITP	Inspection and Test Plan	UT	Ultrasonic Testing
MPT / MT	Magnetic Particle Testing	VDR	Vendor Data Requirement
NDT	Non-Destructive Testing	WPQ	Welders Performance Qualification
PO	Purchase Order	WPS	Welding Procedure Specification
LEGENDS:			
H - Hold (Do not proceed without approval)			
W -Witness (Give due notice, work may proceed after scheduled date)			
P - Perform			
R -Review			
RW - Random Witness (As specified or 10% (min.1 no. of each size and type of Bulk item))			

1. SCOPE

This Inspection and Test Plan covers the minimum testing requirements of Onshore Flow Tees.

2. REFERENCE DOCUMENTS:

PO/PR/ Standards referred there in/ Job specifications /Approved documents.

3. INSPECTION AND TEST REQUIREMENTS:

SL. NO.	STAGE/ACTIVITY	CHARACTERISTICS	QUANTUM OF CHECK	RECORD	SCOPE OF INSPECTION		
					SUB VENDOR	VENDOR	TPIA
1.0	PROCEDURE						
1.1	Heat Treatment, NDT and other Procedures	Document Procedures	100%	Procedure Documents	-	H	R
1.2	WPS, PQR & WPQ	Welding Parameters & Qualification Record	100%	WPS, PQR & WPQ	-	H	W- New R- Existing
1.3	Design Proof Test *(To be conducted under TPI appointed by vendor)	Hydrostatic proof test	100%	Proof test record	-	H*-New R-Already qualified	R
2.0	Material Inspection						
2.1	Pipes / Fittings / Forgings (Pressure	Chemical, tensile, impact, hardness,	100%	Test Certificates	H	H*	R

SL. NO.	STAGE/ACTIVITY	CHARACTERISTICS	QUANTUM OF CHECK	RECORD	SCOPE OF INSPECTION		
					SUB VENDOR	VENDOR	TPIA
	containing parts) *(vendor/sub vendor to arrange TPIA certification)	NDT, Heat treatment and other applicable Properties					
2.2	Forging	1) Chemical 2) Physical 3) Impact 4) Hardness	100%	Lab Test Report	H	H	W (Note-1)
3.0	In Process Inspection						
3.1	Raw Material Identification of pressure containing parts	Verification of marking & correlation with MTC	100%	MTC, Inspection Report	-	H	R
3.2	Raw Material Identification of non-pressure parts	Chemical & Mechanical Properties	100%	MTC, Inspection Report	-	H	-
3.3	Welding	Welding Parameters as per WPS / PQR	100%	Inspection reports	-	H	-
3.4	Heat Treatment of welding as applicable	Heat treatment temperature and time	100%	HT chart / Record	-	H	R

SL. NO.	STAGE/ACTIVITY	CHARACTERISTICS	QUANTUM OF CHECK	RECORD	SCOPE OF INSPECTION		
					SUB VENDOR	VENDOR	TPIA
3.5	RT of pressure containing butt Welds	Defects	100%	RT Film / Report	-	H	R
3.6	UT/DPT/MPT as applicable	Lamination/ Defects	100%	NDT Report	-	H	R
4.0	Final Inspection						
4.1	Visual and Dimensional Inspection (VDI)	Surface Condition / Dimensions, Marking, etc	100%	Inspection Report	-	H	RW
4.2	Final Stamping	Stamping of accepted flow tees	100%	Inspection Report	-	H	H
5.0	Painting						
5.1	Corrosion protection painting & Colour Coding as applicable	Visual Inspection & Colour Coding	100%	Inspection Report	-	H	R
6.0	Documentation & IC						

SL. NO.	STAGE/ACTIVITY	CHARACTERISTICS	QUANTUM OF CHECK	RECORD	SCOPE OF INSPECTION		
					SUB VENDOR	VENDOR	TPIA
6.1	Certificate (IC) Documentation & Inspection	Review of Stage Inspection Reports / Test Reports & Issue of IC	100%	Manufacturer TC & IC	-	H	H
7.0	Final Document submission	Compilation of Inspection reports, drawings, etc as per VDR / PR	100%	Compliance Certificate (Note-1)	-	H	-

NOTES (As applicable):

1. If the certification is specified as EN 10204 Type 3.1 in Data sheet / Material Requisition, then '**W**' may be replaced with '**R**' with Material Traceability.
2. ITP shall be submitted including but not limited to the item/activity covered above. Any item/activity identified and required for the completeness shall also be covered in the ITP submitted by the manufacturers.



VCS QUALITY SERVICES PVT. LTD.

INSPECTION AND TEST PLAN FOR SCRAPPER LAUNCHER/RECEIVER VPC – ITP – PP – 2002

02	19/12/2021	SR	MC	HK	HK
Rev. No	Date	Prepared By	Checked By	Approved By	Authorized By

UNCONTROLLED COPY	:	If printed
CONTROLLED COPY	:	If in soft and signed

REVISION RECORD						
Rev.	Revision Date	Prepared by	Checked by	Approved by	Authorized by	Revision Description
00	01/06/2017					Issued as Standard ITP
		SM	ADE	AD	SK	
01	02/05/2020					Document formatting, numbering updated from VCS-SD-ITP-002 to VPC-ITP-PP-2002
		MB	MC	AD	SK	
02	19/12/2021					Revised as Marked
		SR	MC	HK	HK	

ABBREVIATIONS:			
CE	Carbon Equivalent	PMI	Positive Material Identification
DFT	Dry Film Thickness	RT	Radiography Testing
DPT	Dye Penetrant Testing	TC	Test Certificate
ITP	Inspection and Test Plan	TPI or TPIA	Third Party Inspection Agency
MPT / MT	Magnetic Particle Testing	UT	Ultrasonic Testing
NDT	Non-Destructive Testing	VDR	Vendor Data Requirement
PO	Purchase Order	WPQ	Welders Performance Qualification
PQR	Procedure Qualification Record	WPS	Welding Procedure Specification
PR	Purchase Requisition		
LEGENDS:			
H -Hold (Do not proceed without approval)			
W -Witness (Give due notice, work may proceed after scheduled date).			
P -Perform			
R -Review			
RW -Random Witness (As specified or 10% (min.1 no. of each size and type of Bulk item))			

1. SCOPE:

This Inspection and Test Plan covers the minimum testing requirements of Scraper Launcher/Receiver (Onshore).

2. REFERENCE DOCUMENTS:

PO/PR/ Standards referred there in/ Job specifications /Approved documents.

3. INSPECTION AND TEST REQUIREMENTS:

S.NO.	STAGE/ACTIVITY	CHARACTERISTICS	QUANTUM OF CHECK	FORMAT OF REPORT	SCOPE OF INSPECTION		
					SUB VENDOR	VENDOR	TPIA
1.0	PROCEDURES						
1.1	Hydro-test, NDT and other procedures (as applicable)	Documented Procedures	100%	Procedure Documents	-	H	R
1.2	WPS/ PQR /WPQ	Documented Procedures	100%	Procedure Documents	-	H	R-Existing W-New
2.0	MATERIAL INSPECTION						

S.NO.	STAGE/ACTIVITY	CHARACTERISTICS	QUANTUM OF CHECK	FORMAT OF REPORT	SCOPE OF INSPECTION		
					SUB VENDOR	VENDOR	TPIA
2.1	Plates, Pipes, Tubes, forgings, Fittings, Fasteners, Gaskets, etc.	Chemical, Physical and other properties as per purchase specification	100%	Mill Test Certificates	H	H	R
2.2	Welding Consumables	Chemical and Physical Properties as applicable	100%	Batch Certificates	W	R	R
3.0	IN PROCESS INSPECTION						
3.1	Material identification for Pressure Parts (Plates, Pipes)	Review of Test Certificates, Markings, Visual and Dimensional inspection, identity co-relation & Transfer of identification marks	100%	Material Clearance Record (3.2 certificate or check test [mechanical, chemical, hardness & impact])	-	H	H
3.2	Material identification for Pressure Parts (Forgings, Fittings, Fasteners, Gaskets, etc.)	Review of Test Certificates, Markings, identity co-relation	100%	Material Clearance Record (3.2 certificate or check test [mechanical, chemical, hardness & impact])	-	H	R

S.NO.	STAGE/ACTIVITY	CHARACTERISTICS	QUANTUM OF CHECK	FORMAT OF REPORT	SCOPE OF INSPECTION		
					SUB VENDOR	VENDOR	TPIA
3.3	Non-Pressure Parts (Supports, Internals, etc.)	Review of Test Certificates	100%	Material Test Certificates	-	W	-
3.4	Inspection of Formed Components	NDT of weld seam, as applicable	100%	NDT Report / RT Films	-	W	R
		NDT On knuckle portion after forming - inside & outside	100%	NDT Report	-	W	R
		HT (as applicable)	100%	HT Graph & record	-	W	R
		Test coupon, if applicable	100%	Test Report	-	W	W
		Visual & Dimensional Inspection (Min. Thickness, profile, ovality etc.)	100%	Test Report	-	H	W
3.5	Weld Edge & Set up of pressure parts	Visual & dimensional, Weld edge, root gap, offset, alignment, cleanliness etc.	100%	Inspection Report	-	W	-
		NDT (as applicable)	100%	Inspection Report	-	W	-

S.NO.	STAGE/ACTIVITY	CHARACTERISTICS	QUANTUM OF CHECK	FORMAT OF REPORT	SCOPE OF INSPECTION		
					SUB VENDOR	VENDOR	TPIA
3.6	Intermediate Inspection of Welds	Visual, Inter-pass temperature, DPT as applicable	100%	Inspection report	-	W	-
		Heat Treatment as applicable	100%	HT Graph & record	-	W	R
3.7	Inspection of finished welds	Visual inspection for reinforcement, undercuts, surface defects, etc.	100%	Inspection report	-	W	-
		Non-Destructive Testing	100%	NDT Report / RT Films	-	W	R
3.8	Visual and dimension check before PWHT (as applicable)	Dimensions, Surface defects, Completeness of equipment.	100%	Inspection report	-	H	R
3.9	Pneumatic Test of RF Pads	Leak Test	100%	Inspection report	-	H	R
3.10	PMI as applicable	PMI	Each Component & weld	Inspection report	H	W	R

S.NO.	STAGE/ACTIVITY	CHARACTERISTICS	QUANTUM OF CHECK	FORMAT OF REPORT	SCOPE OF INSPECTION		
					SUB VENDOR	VENDOR	TPIA
4.0	FINAL INSPECTION						
4.1	Visual & Dimensional Inspection after PWHT	Dimensions, Surface defects, Completeness of equipment, Hardness etc.	100%	Inspection report	-	H	H
4.2	Hydrostatic Test	Leak Check	100%	Inspection report	-	H	H
5.0	Painting						
5.1	Final painting (As applicable)	Visual inspection (after surface preparation and final painting for workmanship, uniformity) DFT check	100%	Inspection report	-	H	R

S.NO.	STAGE/ACTIVITY	CHARACTERISTICS	QUANTUM OF CHECK	FORMAT OF REPORT	SCOPE OF INSPECTION		
					SUB VENDOR	VENDOR	TPIA
6.0	Documentation & IC						
6.1	Documentation & Inspection Certificate (IC)	Review of Stage Inspection Reports / Test Reports & Issue of IC	100%	Manufacturer TC & IC	-	H	H
6.2	Final Document submission	Compilation of Inspection reports, drawings, etc as per VDR / PR	100%	Final data folder/ Completeness certificate (Note-1)	-	H	H

NOTES (As applicable):

1. Items shall be EN 10204 Type 3.2 certified.
2. ITP shall be submitted including but not limited to the item/activity covered above. Any item/activity identified and required for the completeness shall also be covered in the ITP submitted by the manufacturers.



VCS QUALITY SERVICES PVT. LTD.

INSPECTION AND TEST PLAN FOR PIG SIGNALLERS

VPC – ITP – PP – 2014

02	19/12/2021	SR	MC	HK	HK
Rev. No	Date	Prepared By	Checked By	Approved By	Authorized By

UNCONTROLLED COPY	:	If printed
CONTROLLED COPY	:	If in soft and signed

REVISION RECORD						
Rev.	Revision Date	Prepared by	Checked by	Approved by	Authorized by	Revision Description
00	01/02/2018					Issued as Standard ITP
		BS	MC	AD	SK	
01	22/04/2020					Document formatting, numbering updated from VCS-PL-ITP-014 to VPC-ITP-PP-2014
		MB	MD	AD	SK	
02	19/12/2021					Revised as Marked
		SR	MC	HK	HK	

ABBREVIATIONS:			
CE	Carbon Equivalent	MTC	Material Test Certificate
DCN	Dispatch Clearance Note	NDT	Non Destructive Testing
DFT	Dry Film Thickness	PO	Purchase Order
DPT	Dye Penetrant Testing	PR	Purchase Requisition
IC	Inspection Certificate	TC	Test Certificate
IR	Inspection Report	TPI or TPIA	Third Party Inspection Agency
IRC	Inspection Release Certificate	UT	Ultrasonic Testing
ITP	Inspection and Test Plan	VDR	Vendor Data Requirement
MPT / MT	Magnetic Particle Testing		
LEGENDS:			
H – Hold (Do not proceed without approval)			
W – Witness (Give due notice, work may proceed after scheduled date)			
P – Perform			
R – Review			
RW – Random Witness (As specified or 10% (min. 1 no. of each size and type of Bulk item)			

1. SCOPE

This Inspection and Test Plan covers the minimum testing requirements of Pig Signallers.

2. REFERENCE DOCUMENTS

PO/PR/ Standards referred there in/ Job specifications/ Approved documents.

3. INSPECTION AND TEST REQUIREMENTS

SL. NO.	STAGE/ ACTIVITY	CHARACTERISTICS	QUANTUM OF CHECK	RECORD	SCOPE OF INSPECTION		
					SUB VENDOR	VENDOR	TPIA
1.0	Material Inspection						
1.1	Plates, Pipes, Forgings for Trigger, Mounting Nozzle, Gaskets, Visual Indicator, Limit Switch, Fasteners etc.	<ul style="list-style-type: none"> Chemical Properties Tensile/Impact/Hardness/ HIC & other applicable tests NDT (As Applicable) 	As per Purchase Specification	Material Test Certificates/ Lab Test Reports	H	H	R

SL. NO.	STAGE/ ACTIVITY	CHARACTERISTICS	QUANTUM OF CHECK	RECORD	SCOPE OF INSPECTION		
					SUB VENDOR	VENDOR	TPIA
2.0	In Process Inspection						
2.1	Identification of Plates & Pipes for pressure parts	Review of test certificates & Co-relation of marking	100%	Inspection Report	-	H	-
2.2	Machining of Components	Visual & Dimensional	100%	HT Charts	-	H	-
2.3	Inspection of Welds	<ul style="list-style-type: none"> Visual Applicable NDT 	100%	Inspection Reports/ RT Film	-	H	R
3.0	Final Inspection						
3.1	Functional Test	Satisfactory Performance	100%	Test Report	-	H	R

SL. NO.	STAGE/ ACTIVITY	CHARACTERISTICS	QUANTUM OF CHECK	RECORD	SCOPE OF INSPECTION		
					SUB VENDOR	VENDOR	TPIA
3.2	Hydrostatic Test	Leak Check	100%	Test Report	-	H	R
3.3	Visual & Dimensional Inspection	Dimensions & Completeness of Assembly	100%	Inspection Report	-	H	R
4.0	Painting						
4.1	Corrosion Resistant Painting & / or Antifouling Coating (As Applicable)	<ul style="list-style-type: none"> • Painting Scheme • Visual Check • Final DFT Check 	100%	Inspection Report	-	H	-

SL. NO.	STAGE/ ACTIVITY	CHARACTERISTICS	QUANTUM OF CHECK	RECORD	SCOPE OF INSPECTION		
					SUB VENDOR	VENDOR	TPIA
5.0	Documentation & IC						
5.1	Documentation & IC	Issue of IC & Final document completeness certificates	As per PR	IC & Document completeness certificate	-	H	H
6.0	Final Documentation & Submission of Reports	Compilation of IR/IRN/DCN/MTC/DRGS./VDR	100%	Compliance Certificate (Note-1)	-	H	-

NOTES (as applicable):

1. Items shall be EN 10204 Type 3.1 Certified.
2. ITP shall be submitted including but not limited to the item/activity covered above. Any item/activity identified and required for the completeness shall also be covered in the ITP submitted by the manufacturers.



VCS QUALITY SERVICES PVT. LTD.

INSPECTION AND TEST PLAN FOR LONG RADIUS BENDS FOR ONSHORE PIPELINES VPC – ITP – PP – 2004

02	19/12/2021	SR	MC	HK	HK
Rev. No	Date	Prepared By	Checked By	Approved By	Authorized By

UNCONTROLLED COPY	:	If printed
CONTROLLED COPY	:	If in soft and signed

REVISION RECORD						
Rev.	Revision Date	Prepared by	Checked by	Approved by	Authorized by	Revision Description
00	05/06/2017					Issued as Standard ITP
		GS	ADE	AD	SK	
01	22/04/2020					Document formatting, Doc numbering updated from VCS-PL-ITP-004 to VPC-ITP-PP-2004 other detail update as marked
		MB	MC	AD	SK	
02	19/12/2021					Revised as Marked
		SR	MC	HK	HK	

ABBREVIATIONS:			
CE	Carbon Equivalent	PR	Purchase Requisition
IC	Inspection Certificate	RT	Radiography Testing
ITP	Inspection and Test Plan	TC	Test Certificate
MPT/MT	Magnetic Particle Testing	TPI or TPIA	Third Party Inspection Agency
MTC	Material Test Certificate	UT	Ultrasonic Testing
NDT	Non Destructive Testing	VDR	Vendor Data Requirement
PO	Purchase Order		
LEGENDS:			
H - Hold (Do not proceed without approval)			
W - Witness (Give due notice, work may proceed after scheduled date)			
P - Perform			
R - Review			
RW - Random Witness [As specified or 10% (min.1 no. of each size and type of Bulk items)]			

1.0 SCOPE:

This Inspection and Test Plan covers the minimum testing requirements of Long radius Bends for onshore Pipelines.

2.0 REFERENCE DOCUMENTS:

PO / PR / Standards referred there in / Job specifications / Approved documents.

3.0 INSPECTION AND TEST REQUIREMENTS:

SL.NO.	STAGE/ACTIVITY	CHARACTERISTICS	QUANTUM OF CHECK	RECORD	SCOPE OF INSPECTION		
					SUB VENDOR	VENDOR	TPIA
1.0	Procedure						
1.1	Hydro Test, NDT, Bend Manufacturing, Heat treatment and Other Procedures	Documented Procedures	100%	Procedure Documents	-	H	R
2.0	Material Inspection						
2.1	Raw Material Inspection	Chemical, mechanical properties, method of manufacturing, Heat Treatment Condition, etc	100%	Mill Test Certificates (EN 10204 Type 3.2 certificate)	H	R	R

SL.NO.	STAGE/ACTIVITY	CHARACTERISTICS	QUANTUM OF CHECK	RECORD	SCOPE OF INSPECTION		
					SUB VENDOR	VENDOR	TPIA
3.0	In Process Inspection						
3.1	Material Identification (In case of EN 10204 Type 3.1 certificate)	Review of Test Certificates, Markings, Visual and Dimensional inspection, identity co-relation & Transfer of identification marks	One/Heat	Material Clearance Record (3.2 certificate or check test [mechanical, chemical, impact, hardness])	-	H	H
3.2	Bend Manufacturing Procedure Qualification	Bend forming parameters, Mechanical, Impact, Micro and Hardness	100%	Test Report	-	H	H
3.3	Induction Bending (Production bends)	Bending temp Bending rate Power input As per qualified procedure of test bend	100%	Inspection Report	-	H	M

SL.NO.	STAGE/ACTIVITY	CHARACTERISTICS	QUANTUM OF CHECK	RECORD	SCOPE OF INSPECTION		
					SUB VENDOR	VENDOR	TPIA
3.4	Heat Treatment (If Applicable)	Time / temp record	100%	HT Graph	-	H	R
4.0	Final Inspection						
4.1	NDT-RT, UT & MPT as applicable	Defects	100%	Films/Test Reports	-	H	R
4.2	Hydrostatic Test	Soundness / Leak check	100%	Test Report	-	H	W
4.3	Final visual and dimension	Visual and Dimension	100%	Inspection Report	-	H	W
4.4	Gauging Pig Passing (95% of ID)	Verification of ID / Profile	100%	Inspection Report	-	H	W
5.0	Documentation & IC						
5.1	Documentation & Inspection Certificate (IC)	Review of Stage Inspection Reports / Test Reports & Issue of IC	100%	Vendor TC & IC	-	H	H

SL.NO.	STAGE/ACTIVITY	CHARACTERISTICS	QUANTUM OF CHECK	RECORD	SCOPE OF INSPECTION		
					SUB VENDOR	VENDOR	TPIA
5.2	Final documents as applicable	Verification & compilation of inspection & test records for submission to customer	100%	Final dossier	-	H	H

NOTES (As applicable):

1. ITP shall be submitted including but not limited to the item/activity covered above. Any item/activity identified and required for the completeness shall also be covered in the ITP submitted by the manufacturers.



VCS QUALITY SERVICES PVT. LTD.

INSPECTION AND TEST PLAN FOR INSULATING JOINTS VPC – ITP – PP – 2006

02	19/12/2021	SR	MC	HK	HK
Rev. No	Date	Prepared By	Checked By	Approved By	Authorized By

UNCONTROLLED COPY	:	If printed
CONTROLLED COPY	:	If in soft and signed

REVISION RECORD						
Rev.	Revision Date	Prepared by	Checked by	Approved by	Authorized by	Revision Description
00	06/06/2017					Issued as Standard
		GS	ADE	AD	SK	
01	22/04/2020					Document formatting, numbering updated from VCS-SD-ITP-006 to VPC-ITP-PP-2006 .
		MB	MC	AD	SK	
02	19/12/2021					Revised as Marked
		SR	MC	HK	HK	

**INSPECTION AND TEST PLAN
FOR
INSULATING JOINTS**

DOC NO: VPC-ITP-PP-2006
Rev No : 02

ABBREVIATIONS:			
CE	Carbon Equivalent	PO	Purchase Order
DFT	Dry Film Thickness	PQR	Procedure Qualification Record
DPT	Dye Penetrant Testing	PR	Purchase Requisition
HT	Heat Treatment	RT	Radiography Testing
IC	Inspection Certificate	TC	Test Certificate
ITP	Inspection and Test Plan	TPI or TPIA	Third Party Inspection Agency
MPT/MT	Magnetic Particle Testing	UT	Ultrasonic Testing
MTC	Material Test Certificate	VDR	Vendor Data Requirement
NDT	Non Destructive Testing	WPQ	Welders Performance Qualification
PMI	Positive Material Identification	WPS	Welding Procedure Specification
LEGENDS:			
H - Hold (Do not proceed without approval)			
W - Witness (Give due notice, work may proceed after scheduled date)			
P - Perform			
R - Review			
RW - Random Witness [As specified or 10% (min.1 no. of each size and type of Bulk items)]			

1.0 SCOPE:

This Inspection and Test Plan covers the minimum testing requirements of Insulating Joints.

2.0 REFERENCE DOCUMENTS:

PO / PR / Standards referred there in / Job specifications / Approved documents.

3.0 INSPECTION AND TEST REQUIREMENTS:

SL.NO.	STAGE/ACTIVITY	CHARACTERISTICS	QUANTUM OF CHECK	RECORD	SCOPE OF INSPECTION		
					SUB VENDOR	VENDOR	TPIA
1.0	Procedure						
1.1	Hydrostatic Test, NDT and other procedures	Documented Procedures	100%	Procedure Documents	-	H	R
1.2	WPS/ PQR /WPQ	Documented procedures	100%	Procedure Documents	-	H	R-Existing W-New
2.0	Material Inspection						

**INSPECTION AND TEST PLAN
FOR
INSULATING JOINTS**

DOC NO: VPC-ITP-PP-2006
Rev No : 02

SL.NO.	STAGE/ACTIVITY	CHARACTERISTICS	QUANTUM OF CHECK	RECORD	SCOPE OF INSPECTION		
					SUB VENDOR	VENDOR	TPIA
2.1	1) Forging 2) Pup Piece	Chemical / Mechanical Properties, NDT, HT and other requirement as per purchase specification.	100%	MTC & Inspection Record	H	W	W
2.2	Gasket, Insulating Ring, Filling Material, etc.	As per material spec./code	100%	MTC & Inspection Record	H	H	R
3.0	In Process Inspection						
3.1	Welding	Welding Parameters, NDT (as applicable)	100%	NDT Records/RT films	-	W	R
4.0	Final Inspection						
4.1	Hydro Testing, Air Leak test, Vacuum test (As applicable)	Leak Check	100%	Test Report	-	H	H

**INSPECTION AND TEST PLAN
FOR
INSULATING JOINTS**

DOC NO: VPC-ITP-PP-2006
Rev No : 02

SL.NO.	STAGE/ACTIVITY	CHARACTERISTICS	QUANTUM OF CHECK	RECORD	SCOPE OF INSPECTION		
					SUB VENDOR	VENDOR	TPIA
4.2	Visual and Dimension Check	Visual and Dimension Check	100%	Inspection Report	-	H	RW
4.3	Dielectric Test	Insulating Resistance	100%	Inspection Report	-	W	W
5.0	Painting						
5.1	Final painting (as applicable)	Paint Scheme, Visual & Paint thickness check	100%	Inspection Report	-	H	R
6.0	Documentation & IC						
6.1	Stamping and review of inspection documents, issue of IC	Review of documents for compliance as per PR.	100%	IC	-	-	H


**INSPECTION AND TEST PLAN
FOR
INSULATING JOINTS**

DOC NO: VPC-ITP-PP-2006
Rev No : 02

SL.NO.	STAGE/ACTIVITY	CHARACTERISTICS	QUANTUM OF CHECK	RECORD	SCOPE OF INSPECTION		
					SUB VENDOR	VENDOR	TPIA
7.0	Review of final documentation	Compilation of documents as per VDR attached with PR records for submission to customer	100%	Dossier/Completion Certificate (EN 10204 Type 3.2)	-	H	H

NOTES (As applicable):

1. Items shall be EN 10204 Type 3.2 Certified.
2. ITP shall be submitted including but not limited to the item/activity covered above. Any item/activity identified and required for the completeness shall also be covered in the ITP submitted by the manufacturers.

		INSPECTION AND TEST PLAN FOR VALVES			VCS-PL-ITP-008	
<div>INSPECTION AND TEST PLAN FOR VALVES</div>						
0	21.09.2019	ISSUED FOR APPROVAL		SS	MC	AD
REV	DATE	DESCRIPTION		PREP	CHK	APPR

ABBREVIATIONS:

CEIL	Certification Engineers International Limited	MRT	Mechanical Run Test
CIMFR	Central Institute of Mining & Fuel Research	NDT	Non Destructive Testing
CE	Carbon Equivalent	NPSH	Net Positive Suction Head
DFT	Dry Film Thickness	PO	Purchase Order
DPT	Dye Penetrant Testing	PESO	Petroleum Explosive Safety Organization
DHT	De-hydrogen Heat Treatment	PQR	Procedure Qualification Record
ERTL	Electronics Regional Test Laboratory	PR	Purchase Requisition
FCRI	Fluid Control Research Institute	PMI	Positive Material Identification
HT	Heat Treatment	RT	Radiography Testing
HIC	Hydrogen Induced Cracking	SSCC	Sulphide Stress Corrosion Cracking
ITP	Inspection and Test Plan	TC	Test Certificate
IP	Ingress Protection	TPI or TPIA	Third Party Inspection Agency
IHT	Intermediate Heat Treatment	UT	Ultrasonic Testing
IC	Inspection Certificate	VDR	Vendor Data Requirement
IGC	Inter Granular Corrosion	WPS	Welding Procedure Specification
MPT/MT	Magnetic Particle Testing	WPQ	Welders Performance Qualification
MTC	Material Test Certificate		

1.0 SCOPE:

This Inspection and Test Plan covers the minimum testing requirements of Valves.

2.0 REFERENCE DOCUMENTS:

PO / PR / Standards referred there in / Job specifications / Approved documents.

3.0 INSPECTION AND TEST REQUIREMENTS:

SL- NO.	STAGE / ACTIVITY	CHARACTERISTICS	QUANTUM OF CHECK	RECORD	SCOPE OF INSPECTION		
					SUB SUPPLIER	SUPPLIER	VCS/TPIA
1.0	Procedure						
1.1	Hydrostatic Test, Heat Treatment, NDT, Helium Leak Test and Other Procedures	Documented Procedures	100%	Procedure Documents	-	H	R
1.2	WPS, PQR & WPQ	Welding Parameters & Qualification Record	100%	WPS, PQR & WPQ	-	H	W- New R- Existing
1.3	Pre-Qualification Tests	Fire safe, Cryogenic & Other Test as applicable	As per PR / Purchase Specification	Acceptance Report	-	H	H (If New)
2.0	Material Inspection						

SL- NO.	STAGE / ACTIVITY	CHARACTERISTICS	QUANTUM OF CHECK	RECORD	SCOPE OF INSPECTION		
					SUB SUPPLIER	SUPPLIER	VCS/TPIA
2.1	Castings & Forgings (Body, Bonnet, Disc, Stem, Body ring)	Chemical, Mechanical, Heat Treatment, NDT, IGC & Other Properties as applicable	100%	Test Certificates	H	R	R
2.2	Castings & Forgings (Body, Bonnet, Disc, Stem, Body ring)	Visual & Dimension	100%	Inspection Report	H	H	-
2.3	Body and Bonnet Castings	Radiography Examination	As per PR / Purchase Specification	Films and report	H	R	R
2.4	Bars for Trim material	Chemical Analysis	Each Heat	Test Certificates & Lab Report	H	R	-
2.5	Gaskets, Gear units, Fasteners, Gland, Packing etc.	Physical / Chemical Properties	100%	Test Certificates& Lab Report	H	R	-
2.6	Actuators as applicable	Performance, Statutory certificates as applicable	100%	Test Certificates, Inspection report	H	H	R

SL- NO.	STAGE / ACTIVITY	CHARACTERISTICS	QUANTUM OF CHECK	RECORD	SCOPE OF INSPECTION		
					SUB SUPPLIER	SUPPLIER	VCS/TPIA
3.0	In Process Inspection						
3.1	Welding	Welding Parameters as per WPS / PQR	100%	Inspection Reports	-	H	-
3.2	Machining of components	Visual / Dimension	100%	Inspection Reports	-	H	-
4.0	Final Inspection						
4.1	Hydrostatic / Pneumatic Test and Helium Leak test as applicable	Leak Check	As per PR / Purchase Specification	Test Report	-	H	RW (Note-1)
4.2	Visual / Dimension	Surface & Dimension Check	100%	Test Report	-	H	RW (Note-1)
4.3	Functional Test for Actuator Operated Valves	Satisfactory Performance	100%	Test Report	-	H	RW
4.4	PMI Check	Chemical	As per VCS Spec.	Inspection Report	-	H	RW

SL- NO.	STAGE / ACTIVITY	CHARACTERISTICS	QUANTUM OF CHECK	RECORD	SCOPE OF INSPECTION		
					SUB SUPPLIER	SUPPLIER	VCS/TPIA
4.5	Strip Check as applicable	Verify Components & Differential hardness if applicable	As per PR / Purchase Specification	Inspection Report	-	H	RW (Note-1)
4.6	Final Stamping	Stamping of Accepted Valves	Stamping of Valves which are witnessed by VCS/TPIA.	Inspection Report	-	H	RW (Note-1)
5.0	Painting						
5.1	Painting and Color coding as applicable	Visual / DFT Check	100%	Inspection Report	-	H	-
6.0	Documentation & IC						
6.1	Documentation & Inspection Certificate (IC)	Review of Stage Inspection Reports / Test Reports & Issue of IC	100%	Supplier TC & IC	-	H	H

Legend: H - Hold (Do not proceed without approval), P - Perform, RW - Random Witness [As specified or 10% (min.1 no. of each size and type of Bulk items)], R - Review, W - Witness (Give due notice, work may proceed after scheduled date).

NOTES (As applicable):

1. Non NACE & Non Hydrogen service Carbon Steel Valves up to size 12"-300ANSI Class and Carbon Steel Forged Valves up to size 1.5"-800ANSI Class will be accepted on review of Supplier Test Certificate. Supplier Test Certificate along with back up reports to be review by VCS/TPIA
2. This document describes the generic test requirements. Any additional test or Inspection scope if specified in contract documents shall also be applicable (unless otherwise agreed upon).
3. Acceptance Norms for all the activities shall be as per PO/PR/STANDARDS referred there in /Job Specification /Approved Documents.



PROJECT NUMBER: C221052



INSPECTION AND TEST PLAN (ITP) INSTRUMENTS

**TOTAL
SHEET
S**

2

DOCUMENT NO

C221052

CD

IN

ITP

5006

INDRADHANUSH GAS GRID LIMITED

NORTH EAST GAS GRID PHASE-III OF IGGL

**INSPECTION AND TEST PLAN (ITP)
INSTRUMENTS**

D1	20-05-2022	ISSUED FOR BID	AB	AS	KNC
REV	DATE	DESCRIPTION	PREPD	CHKD	APPRD



NORTH EAST GAS GRID PHASE-III OF IGGL

INSTRUCTIONS FOR FILLING UP:

1. QAP shall be submitted for each equipment separately with breakup of assembly / sub-assembly & part/component or for group of equipment having same specification.
2. Use numerical codes as indicated for extent of inspection & tests and submission of test certificates & documents. Additional codes & description for extent of inspection & test may be added as applicable for the plant and equipment's.
3. Separate identification number with quantity for equipment shall be indicated wherever equipment having same specifications belonging to different facilities are grouped together.
4. Weight in kilogram must be indicated under column 5 for each item. Estimated weights may be indicated wherever actual weights are not available.

ABBREVIATION USED:

CONTR : CONTRACTOR

MFR : MANUFACTURER

TPI : THRID PARTY INSPECTION AGENCY

* : Vendor / Bidder to provide

P / W / R : P : Performer , R : Review ; W : Witness

EN 10204, Type 3.2 certificates shall be provided for bought out items. Those shall be inspected by TPI appointed by Vendor.

CODES FOR EXTENT OF INSPECTION, TESTS, TEST CERTIFICATES & DOCUMENTS :

CODE DESCRIPTION	CODE DESCRIPTION	CODE DESCRIPTION	CODE DESCRIPTION
1. Visual 2. Dimensional 3. fitment & alignment 4. Physical Test (Sample) 5. Chemical test(Sample) 6. Ultrasonic test 7. Magnetic particle test(MPT) 8. Radiography test 9. Dye Penetrant test 10. Measurement of IR value a) Before HV test b) After HV test 11. High voltage test/Dielectric Test	12. Routine test as per relevant IS other standard 13. Type test as per relevant IS/ other standard 14. Impulse Test 15. Partial Discharge Test 16. Heat run risk test/temper 17. Enclosure protection test 18. Calibration 19. Noise & Vibration 20. Test certificate of bought out components 21. Tank pressure test 22. Paint shed vibration	23. Short time rating 24. Operational & functional test 25. Over speed test 26. Flame proof Test 27. Clearance and creep age distance 28. Acceptance test 29 Honing Test 30 Hydro test/ Shell leak test 31 Pneumatic Seat leak test 32 Impact test	D1. Approved GA Drawing. D2. Approved single line/ schematic diagram D3. Test certificates D4. Approved Bill of materials D5. Un-priced P.O. copy D6. Calibration certificates of all measuring instrument And gauges.

Equipment Details							Inspection & Test								
S No.	Item	Identification Number	Qty	Weight Kg	Exp Date of Inspection	MFR Name & Address	In-Process Stage			Final Inspection			Test certificate & Document to be submitted to CLIENT	Acceptance Criteria standards/ IS/BS/ASME/ Norms and documents	Remark / Sampling Plan
							MFR	CONTR & TPI	CLIENT	MFR	CONTR & TPI	CLIENT			
1.	PSV	Refer P&ID	*	*	*	IGGL Approved	1,2,3,4 5,8,30, 32 – P	30 - W 32 – R	-	1,2,3,5,8, 20,18,24, 31 – P	1,2,3,5,8, 18, 20-R. 24,30, 31,32 -W	1,2,3,5,8,2 0,18,24,30, 31,32 -R	1,2,3,5,8, 18,20, 24, 30, 31,32 D1, D3, D4,D6	D3,D6, Tech. spec	100%



INSPECTION AND TEST PLAN (ITP) INSTRUMENTS

Document No.

C221052-CD-IN-ITP-5006

Rev

D1

13.0 PIPELINE SCHEMATIC ROUTE DIAGRAM

**(Appendix-IV to Particular Job Specification
of Work)**

PIPELINE SCHEMATIC DIAGRAM FOR NORTH EAST GAS GRID PHASE-III OF IGGL
SILIGURI-GANGTOK PIPELINE SECTION (SGPL)
12", 7.14/8.38mm THK. 600# X 195.3 KM (APPROX), API 5L x 70 PSL-2
SECTION-11
(FOR PART-D1 & D2)

REFERENCE DRAWINGS / DOCUMENTS

S.NO.	TITLE	NO.
1	PIPELINE ROUTE MAP	C221052-SGPL-PP-RM-2001
2	P&ID - SILIGURI	C221052-SGPL-PC-PID-1001
3	P&ID - SV	C221052-SGPL-PC-PID-1002-06 C221052-SGPL-PC-PID-1008-10
4	P&ID - RT	C221052-SGPL-PC-PID-1011
5	P&ID - IP	C221052-SGPL-PC-PID-1007

NOTES:-

- THIS PIPELINE SCHEMATIC HAS BEEN DEVELOPED BASED ON SURVEY DATA & DFR DOCUMENT PROVIDED BY IGGL.
- LOCATION OF INTERMEDIATE PIGGING SATION (IPS), SECTIONALIZE VALVE (SV) ARE SHOWN TENTATIVE HERE . EXACT LOCATION OF SV & IPS SHALL BE FINALIZED AT SITE BASED ON AVAILABILITY OF LAND, READILY ACCESSIBILITY, TERRAIN FEATURE ETC.
- BOUNDARY TO BOUNDARY LENGTH HAS BEEN SHOWN IN SCHEMATIC.
- FACILITIES SHOWN INSIDE STATIONS (DT,SV,IP,RT) ARE TENTATIVE, P&ID SHALL BE REFER FOR FURTHER DETAIL
- FOR FURTHER DETAIL OF ALL TYPES OF CROSSING ALIGNMENT SHEET & SURVEY REPORT SHALL BE REFERRED.

LEGEND:-

- ACTUATED BALL VALVE
SV STATION
MANUAL VALVE
PIG LAUNCHER/RECEIVER
PROPOSED UNDER GROUND (UG) P/L
PROPOSED ABOVE GROUND (AG) P/L
- AG : ABOVE GROUND
UG : UNDER GROUND
P/L : PIPELINE
TOP : TAP-OFF POINT
SGPL : SILIGURI-GANGTOK PIPELINE

PIPELINE DETAILS

S.No.	ROUTE DESCRIPTION	PIPE SIZE & RATING	MATERIAL	THK. (mm)	LENGTH
1.	DT TO IPS (LAVA)	12"x600#	API 5Lx70 PSL-2	7.14 / 8.38	128.000 KM
2.	IPS (LAVA) TO RT (GANGTOK)	12"x600#	API 5Lx70 PSL-2	7.14 / 8.38	67.313 KM

TOTAL PIPELINE LENGTH - 195+313 KM (APPROX)

SCOPE BATTERY LIMIT SHOWN IN BLUE COLOUR FOR PART-D1 (SPREAD-2B) & PART-D2 (SPREAD-2C) INCLUDING PIPELINE SV & OTHERS STATIONS ETC.

D5	09.11.22	ISSUED FOR BID	ARV.	MC	HK
D4	07.07.22	ISSUED FOR BID	RA	MC	HK
D3	16.05.22	ISSUED FOR CLIENT APPROVAL	JK	MC	HK
D2	02.05.22	RE-ISSUED FOR CLIENT REVIEW	JK	MC	HK
D1	05.04.22	RE-ISSUED FOR CLIENT REVIEW	RA	MC	HK
C1	31.03.22	ISSUED FOR CLIENT REVIEW	RA	MC	HK
B1	24.03.22	ISSUED FOR INTERNAL REVIEW	RA	MC	HK
REV.	DATE	DESCRIPTION	PREP.	CHKD.	APPD.

CLIENT: INDRADHANUSH GAS GRID LIMITED

PMC: VCS QUALITY SERVICES PVT. LTD.

PROJECT: NORTH EAST GAS GRID PHASE-III OF IGGL

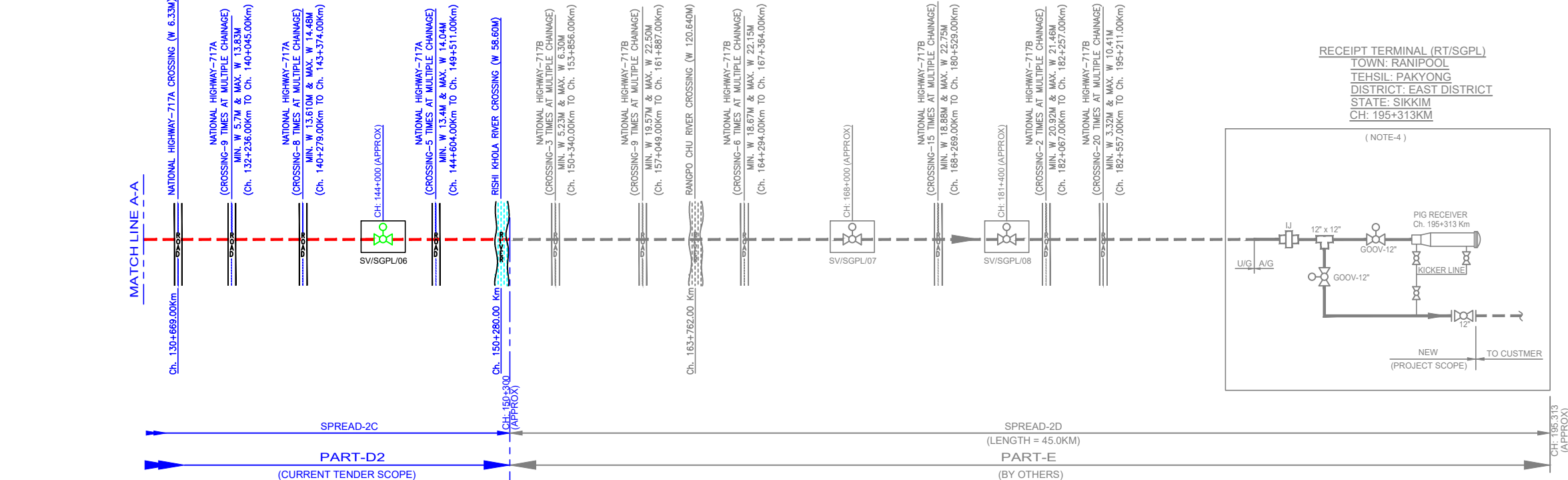
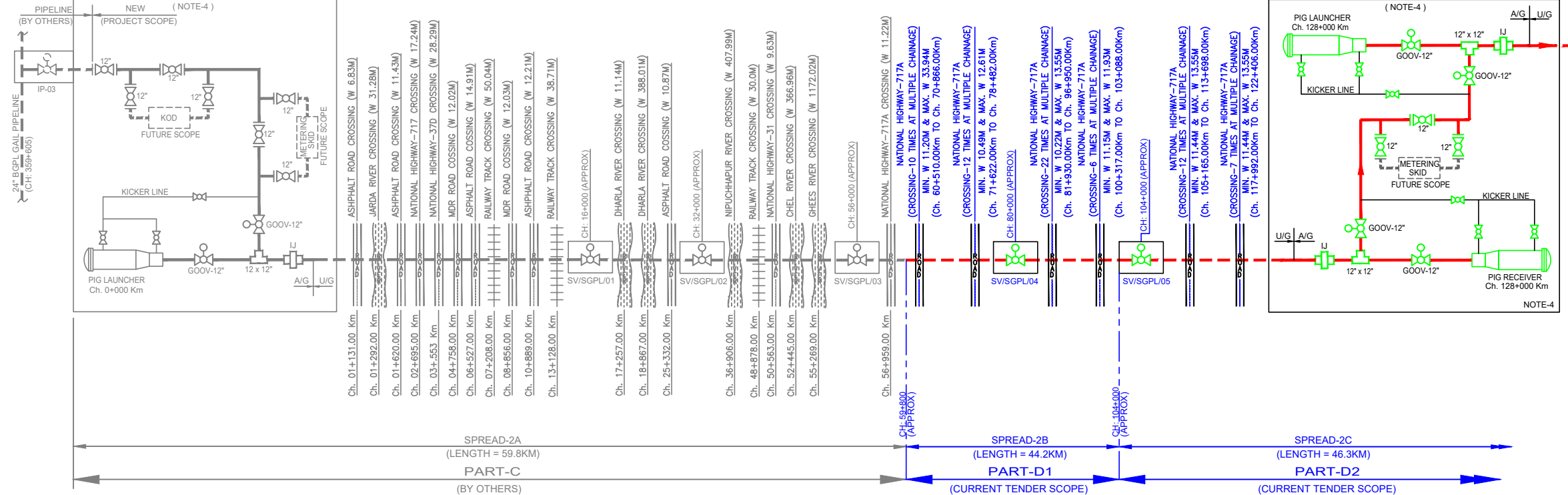
TITLE: PIPELINE SCHEMATIC DIAGRAM (SILIGURI-GANGTOK PIPELINE SECTION)

SCALE:	N.T.S.	TOTAL NO. OF SHTS:	1 OF 1
SIZE	JOB NO.	DRAWING NUMBER	REV.
A1	C221052	C221052-SGPL-PP-SCM-2001	D5

CROSSING DETAIL (FOR ALL PARTS)

Sr.No.	CROSSING	PIPELINE ROUTE	WIDTH (M)	CONSTRUCTION METHOD
1.	RAILWAY	Ch. 13+128.00 Km	50.04	HDD
2.	RAILWAY	Ch. 13+128.00 Km	38.71	HDD
3.	RAILWAY	Ch. 48+878.00 Km	30.0	HDD
4.	RIVERS	6 NOS. OF RIVERS AT MULTIPLE CHAINAGE	-	HDD
5.	NH-717	Ch. 02+695.00 Km	17.24	HDD
6.	NH-37D	Ch. 03+553.00 Km	28.29	HDD

Sr.No.	CROSSING	PIPELINE ROUTE	WIDTH (M)	CONSTRUCTION METHOD
7.	NH-31	Ch. 50+563.00 Km	9.63	HDD
8.	NH-717A	73 NOS. OF NH-717A AT MULTIPLE CHAINAGE	-	HDD
9.	NH-717B	54 NOS. OF NH-717B AT MULTIPLE CHAINAGE	-	HDD



DISPATCH TERMINAL (DT / SGPL)
CITY: MAYNAGURI
TEHSIL: MAYNAGURI
DISTRICT: JALPAIGURI
STATE: WEST BENGAL
CH: 0+000

INTERMEDIATE PIGGING STATION (IP/SGPL/01)
TOWN: LAVA
TEHSIL: KALIMPONG-1
DISTRICT: KALIMPONG
STATE: WEST BENGAL
CH: 128+000

RECEIPT TERMINAL (RT/SGPL)
TOWN: RANIPOL
TEHSIL: PAKYONG
DISTRICT: EAST DISTRICT
STATE: SIKKIM
CH: 195+313KM

14.0 VIDEOGRAPHY SURVEY

**(Appendix-V to Particular Job Specification
of Work)**



**LAYING & CONSTRUCTION OF STEEL GAS PIPELINE AND TERMINALS
ALONG WITH ASSOCIATED FACILITIES FOR
SECTION-10 & 11 UNDER
NORTH EAST GAS GRID PHASE III OF IGGL**



APPENDIX V – VIDEOGRAPHY SURVEY

1.0 INTRODUCTION

The purpose of video survey is to capture before starting construction activities the ground realities along the pipeline route and to co-relate the same with digitised maps of Survey of India. Moreover, during construction activities the Contractor shall video report at least once a week all site activities.

2.0 PROJECT DESCRIPTION

Approximate Length and Size of Pipeline: As per Scope of work defined elsewhere.

3.0 SCOPE OF WORK

Contractor or the approved agency (by Owner / Engineer) shall carry out the videography along the route of the pipeline.

The work will be subdivided in two phases:

Phase1: Videography of the entire route prior to any construction activities

A) The contractor shall capture the video for the following areas but not limited to:

1. Pipeline route
2. Location of various Stations and Tap Off points.
3. Major features such as water bodies, plantation, flora & fauna, forest,
4. All Crossings like road, railways, river, canal, khadi etc.
5. The photographs of the major crossing like river, railways highways both upstream and downstream of the pipeline. The photographs and video should cover the type of soil and terrain condition, obstacles, rocks etc.

B) The identified locations on digitised map of Survey of India shall be interfaced with Videography through software whereby one can access both simultaneously and match the two. The identified locations like Crossings: National Highways, State Highways, Rivers, Major Canals, Hills, Major Khadi

Areas: Rocky, Marshy, Forest, Plantation.

The digitised map shall be procured from Survey of India by the Contractor. Digital theodolite shall be used for all surveys. However, IGGL will provide all



**LAYING & CONSTRUCTION OF STEEL GAS PIPELINE AND TERMINALS
ALONG WITH ASSOCIATED FACILITIES FOR
SECTION-10 & 11 UNDER
NORTH EAST GAS GRID PHASE III OF IGGL**



possible help in collection of required map, and Authorisation letter required, if any to contractor.

- C) There is no need to carry out videography of the route if there is no change in topographical features. Such areas should highlight at end and starting point in videography.

Phase 2: Videography during Construction activities

During construction, the Contractor shall video survey all distinct / main activities under progress alongside the entire pipeline routing.

The purpose of this survey is to get a complete videography of the construction site at different stages of the construction.

This includes all main activities as per phased working procedure. Each phase of the construction shall be at least surveyed at 5 different locations distributed equally along the pipeline routing.

Each Natural Gas station will be also surveyed on the same way. Contractor shall submit his planning and his methodology to Owner / Engineer approval right after the LOA.

- 3.1 The proper log of the location, landmark, crossings, town, districts and important comments will be embedded.
- 3.2 The search will be text based and it will retrieve the relevant video segment along with textual / visual data for reference.
- 3.3 A special programme will be written which will help create interface through which the video of important landmarks can be searched / viewed.
- 3.4 Narration in back side of video will be provided along the route.
- 3.5 The Contractor shall hand over

CDs and USB Drive : 6 Nos. for Phase-1

CDs and USB Drive : 6 Nos. for Phase 2

4.0 ASSISTANCE

The Contractor to indicate in detail the information and assistance as required from client to execute the survey.

5.0 TIME OF WORK

One month for phase 1

Construction period for phase 2



**LAYING & CONSTRUCTION OF STEEL GAS PIPELINE AND TERMINALS
ALONG WITH ASSOCIATED FACILITIES FOR
SECTION-10 & 11 UNDER
NORTH EAST GAS GRID PHASE III OF IGGL**



6.0 PRICE SCHEDULE

Contractor to quote for each phase its lump sum fee on per Km of route survey basis. The fees shall include all expenses and cost of facilities used to carry out the scope covered in clauses above. Contractor to quote separate item as stated in Schedule of Rates (SOR). Price will be indicated under Schedule of Rate (SOR).

15.0 THIRD PARTY INSPECTION AGENCY

**(Appendix-VI to Particular Job Specification
of Work)**

 ENERGISING QUALITY	CLIENT:	IGGL	 IGGL
	CONSULTANT:	VCS Quality Services Private Limited	
LIST OF RECOMMENDED THIRD PARTY INSPECTION AGENCY (TPIA)			
SL. NO	NAME OF TPI		
1	Det Norske Veritas (DNV)		
2	Germanischer Lloyd		
3	Bureau Veritas (BV)		
4	Moody International		
5	SGS		
6	Certification Engineer International Ltd(CEIL)		
7	Technische Ulierwachungs Verein (TUV)		
8	Velosi		
9	American Bureau Services(ABS)		
10	AB-Vincotee		
11	Lloyd Register of Industrial Services		
12	Meenar Global		
13	Dr. Amin Controller Pvt Ltd.		
14	M/s Edlipse Engineering Global Private Limited		
15	M/s IRCLASS Systems and Solutions Private Limited		
Apart from inspection by TPIA, inspection may also be performed by VCS / IGGL's personnel. Latest TPIA list of Client available at the time of execution shall be followed.			

16.0 AIR SURVEILLANCE

**(Appendix-VII to Particular Job
Specification of Work)**



**LAYING & CONSTRUCTION OF STEEL GAS PIPELINE AND TERMINALS
ALONG WITH ASSOCIATED FACILITIES FOR
SECTION-10 & 11 UNDER
NORTH EAST GAS GRID PHASE III OF IGGL**



APPENDIX VII - AIR SURVEILLANCE

SCOPE OF WORK

The scope of work shall include but not limited to following:

- ✈ Coordination with designated Engineer-in-charge of M/s IGGL regarding schedule and duration of each sortie.
- ✈ Coordination with DGCA, ATC and other statutory authorities.
- ✈ Arrangement for boarding and lodging for Pilot and crew to be borne by the bidder. However, Guest house accommodation shall be provided by IGGL at remote locations, subject to availability and on chargeable basis.
- ✈ Landing and takeoff within pipeline route shall be as per instructions of IGGL Engineers.
- ✈ Arrangements and despatch of aviation fuel to IGGL site in advance for refueling. Cost of aviation fuel and transportation and cost of all spare parts to be borne by the bidder.
- ✈ Maintenance of helicopter to excellent state of air worthiness. All spare parts & consumables to be procured & maintained by contractor at suitable locations.
- ✈ Payment of landing and takeoff charges, if payable, at places other than IGGL's sites to be borne by the bidder.
- ✈ Insurance of helicopter and IGGL personnel nominated for patrolling to be borne by the bidder.
- ✈ No extra payment shall be made on shifting the helicopter from one base to another.

Payment terms:

Along with bill for pipe laying as per actual hours of use duly certified by the Engineer-in-charge



**LAYING & CONSTRUCTION OF STEEL GAS PIPELINE AND TERMINALS
ALONG WITH ASSOCIATED FACILITIES FOR
SECTION-10 & 11 UNDER
NORTH EAST GAS GRID PHASE III OF IGGL**



Insurance :

- ✚ The contractor shall maintain throughout at its own expense full liability insurance / self insurance of the helicopter. The contractor shall also maintain throughout the period of contract at its expenses, insurance / self insurance against war risk and hijacking.
- ✚ Passengers liability insurance liability is to be indemnified in respect of all sums which shall become legally liable to pay for or for admitted liability of Rs. 10 lakhs on any passenger for bodily injury arising out of contract of carriage of any passenger by an occurrence whilst the passenger is in the care, custody or contract of the contractor. The passenger admitted liability offered is against full legal discharge. In the event of non-acceptance, the policy is to indemnify for their legal liability only.
- ✚ Personnel baggage liability insurance in respect of damage to or loss of any property caused whilst being carried by a helicopter or in the course of any of the operations of loading or unloading to the extent of Indian Rupees equivalent to US \$ 1250. Each and every claim but not applicable to claim arising from an accident to the carrying aircraft or any war or related peril reinstated by AVN-52c.
- ✚ Worker's compensation and all other laws in effect with reference to employing, safeguarding, insurance and protecting all labour employed or used by the Contractor and shall insure and continue to insure against third party bodily injury or loss of life on each occurrence as per the statutory provision.
- ✚ Third party legal liability insurance is to indemnify IGGL in respect of all sum which the Contractor shall become legally liable to pay for bodily injury and property damage caused by an occurrence arising out of the Ownership, maintenance or use of aircraft.
- ✚ Combined single limit (Bodily injury / property damage / baggage as mentioned above is restricted to Indian Rupees 35 crores for any one occurrence.

HELICOPTER SPECIFICATIONS AND EQUIPMENT

- ✚ The contractor shall ensure that the helicopter is equipped to Visual Flying Rules standards and that the said equipment is in good and safe condition and safety secured or fitted to the helicopter and is maintained to regulatory airworthiness standards.



**LAYING & CONSTRUCTION OF STEEL GAS PIPELINE AND TERMINALS
ALONG WITH ASSOCIATED FACILITIES FOR
SECTION-10 & 11 UNDER
NORTH EAST GAS GRID PHASE III OF IGGL**



The Contractor may make additions or deletions to the equipment or make modifications to the helicopter as deemed fit and proper from time to time for its operational use with information to IGGL.

CONTRACTORS PERSONNEL

The Contractor's personnel shall be employee / representative of the Contractor for all purposes and intents.

OPERATIONAL DAY

The helicopter and its crew shall be available and fully operational for use by IGGL after giving Contractor written notice of atleast 24 hours before the flight commences.

CHARGES

Hourly flying charges shall be claimed by the contractor. All other charges like landing and parking charges, navigation, any other charges pertaining to Airport Authority of India / DGCA shall be exclusively borne by contractor. However, free parking shall be provided to the contractor wherever available at IGGL'S locations. There will be no increase or decrease in hourly flying charges which shall remain firm during the currency of the contract.

INDEMNIFY

The Contractor shall indemnify and hold harmless the Owner from and against all claims, costs, demands, actions, including legal fees and costs, however, arising out of the use of the helicopter (including damage or loss of helicopter and air carrier's third party liability) during the period of contract.

TAXES AND DUTIES

All taxes, liabilities and duties applicable on operation of the helicopter as per the laws of the country would be paid by the contractor.

If contractor fails to provide Helicopter as requisitioned, IGGL may at its option hire an equivalent helicopter at market rates for such helicopter from any other operator at the risk and cost of contractor. Any additional expenditure incurred by the IGGL over and above the prorate fixed monthly charges as per SOR and hourly flying charges for duration of such flight shall be recoverable from the contractor.



**LAYING & CONSTRUCTION OF STEEL GAS PIPELINE AND TERMINALS
ALONG WITH ASSOCIATED FACILITIES FOR
SECTION-10 & 11 UNDER
NORTH EAST GAS GRID PHASE III OF IGGL**



SECURITY

The contractor shall be responsible for the security of the helicopter parking / operating area at base, its passengers, baggage (both registered and hand baggage) cargo, mail etc., and shall abide by the following:-

At airports where schedule civil flights operate, the passengers and crew of the helicopter should undergo body frisking and baggage check as that of the passengers of Indian Airlines and other airlines.

- ↗ At helipads of IGGL security arrangement to be ensured by the contractor.
- ↗ The registered baggage of passenger, if any, should be identified by the passenger and it must also be checked by IGGL. Likewise, physical check of the cargo / unaccompanied baggage before loading shall also be the responsibility of IGGL. In case IGGL is unable to do a physical check, a cooling off period 36 (thirty six) hours should be observed.
- ↗ Under no circumstances, IGGL, except for the authorized security personnel, shall carry arms, ammunition, explosives or any inflammable material in the helicopter. IGGL shall not originate any helicopter service from any of the helipad without complying with the above.

17.0 LIST OF CROSSINGS

**(Appendix-VIII to Particular Job
Specification of Work)**

**Please Refer Volume IV of IV for Crossing
List**

18.0 LIST OF APPROVED PARTY FOR BOUGHT OUT ITEMS

**(Appendix-IX to Particular Job Specification
of Work)**



LIST OF RECOMMENDED VENDORS FOR BOUGHT OUT ITEMS & TPIA

**TOTAL
SHEETS**

58

DOCUMENT NO

VCS-00-00-VL-0001

LIST OF RECOMMENDED VENDORS FOR BOUGHT OUT ITEMS

04	03-06-2022	Issued for Vendor's	Mahesh Chand	Anjum Afroz	Hashim Khan
REV	DATE	DESCRIPTION	PREP	CHK	APPR

**TABLE OF CONTENT**

A.	MECHANICAL & PIPELINE	8
1.0	CARBON STEEL PIPES.....	8
1.1	PIPE CARBON STEEL TO INDIAN STANDARDS	8
1.2	PIPE & TUBULARS TO A.P.I. STANDARDS	9
1.3	PIPE/TUBE CS (SEAMLESS) TO ASTM STANDARDS.....	10
1.4	PIPE CARBON STEEL (WELDED) TO ASTM STANDARDS.....	10
2.0	VALVES	11
2.1	GLOBE VALVES	11
2.2	CHECK VALVES	11
2.3	PLUG VALVES	12
2.4	BALL VALVES	12
3.0	TEE	13
3.1	FLOW TEE.....	13
3.2	SPLIT TEE.....	13
4.0	FLANGES	14
5.0	FITTINGS	14
6.0	PIG LAUNCHERS/ RECEIVERS/ PIG SIGNALERS.....	15
7.0	LONG RADIUS BENDS.....	16
8.0	CLEAN AGENT SYSTEM.....	16
9.0	INSULATING JOINTS	17
10.0	GASKETS.....	17
11.0	FASTENERS	17
12.0	WELDING ELECTRODES FOR PIPELINE/PIPING WORK	18
13.0	STRAINERS	18
14.0	COLD APPLIED TAPES.....	18
15.0	HEAT SHRINKABLE SLEEVE/ FIBREGLAS REINFORCED SLEEVE ...	18
16.0	STUD BOLTS WITH NUTS.....	18
17.0	WARNING MAT.....	18



18.0	HDPE PIPES/DUCT.....	19
19.0	DRY GAS FILTER & FILTER SEPERATOR.....	19
20.0	FILTER ELEMENT.....	20
21.0	NDT AGENCY.....	20
22.0	Cold Applied Tapes.....	20
23.0	PUR Coating.....	20
24.0	Casing End Closure.....	20
25.0	Casing Insulators.....	20
26.0	FIRE FIGHTING EQUIPMENT.....	21
26.1	FIRE EXTINGUISHERS.....	21
26.2	FIRE HYDRANTS, MONITORS, DELUGE VALVE, NOZZLES ...	21
26.3	RRL Hose.....	21
26.4	HOSES.....	21
B.	CIVIL AND STRUCTURAL	23
C.	ELECTRICAL.....	28
1.0	AIR CONDITIONER.....	28
2.0	BATTERIES (LEAD ACID).....	28
3.0	BATTERIES (NICKEL CADMIUM).....	28
4.0	BATTERY CHARGER/DC-DC CONVERTER.....	28
5.0	CABLE – FIRE ALARM & COMMUNICATION CABLES.....	29
6.0	CABLE – HT(XLPE).....	29
7.0	CABLE – LT / MV POWER AND CONTROL.....	29
8.0	CABLE – GLAND.....	30
9.0	CABLE – LUGS & TERMINAL BLOCKS.....	30
10.0	CABLE – TRAY.....	31
11.0	CABLE TERMINATION AND JOINTING KIT.....	31
12.0	CEILING/EXHAUST/PEDESTAL FANS & CIRCULATORS.....	31
13.0	CONTRACTORS – AC POWER.....	31
14.0	CONTROL TRANSFORMER.....	31
15.0	GAS GENERATOR/DIESEL GENERATOR SET.....	32
16.0	EARTHING MATERIALS.....	32
17.0	FLAME PROOF LDB’S/ JB’S/CONTROL STATION/ SWITCHES.....	33



ENERGISING QUALITY

LIST OF RECOMMENDED VENDORS FOR BOUGHT OUT ITEMS

DOC NO: VCS-00-00-VL-0001
Rev No : 04

18.0	HIGH MAST	33
19.0	HIGH VOLTAGE PCC/ MCC PANELS	33
20.0	INDICATING LAMPS.....	33
21.0	INDICATING METERS.....	34
22.0	LIGHTING FIXTURES	34
23.0	LIGHTING FIXTURES – FLAMEPROOF.....	34
24.0	MINIATURE CIRCUIT BREAKERS (MCBS) AND LIGHTING DB	34
25.0	MOULDED CASE CIRCUIT BREAKER (MCCBS).....	35
26.0	PROTECTION RELAYS – THERMAL.....	35
27.0	LOW/MEDIUM VOLTAGE POWER CONTROL CENTER (PCC)/ MCC/ PDB/ MLDB/ LDB.....	35
28.0	PUSH BUTTONS.....	36
29.0	SWITCHES-CONTROL.....	36
30.0	SWITCHES – 5/15A PIANO/ PLATE, SWITCH SOCKET	36
31.0	SWITCH SOCKET OUTLETS (INDUSTRIAL)	36
32.0	SOLAR POWER SYSTEM MODULES.....	37
33.0	SOLAR STREET LIGHTING.....	37
34.0	TERMINALS BLOCKS.....	37
35.0	TRANSFORMERS.....	37
36.0	UPS SYSTEM AND INVERTER.....	38
37.0	GI-OCTAGONAL POLE	38
38.0	ELECTRICAL MOTORS	38
39.0	LIST OF RECOMMENDED MANUFACTURERS FOR HEATER.....	38
40.0	CATHODIC PROTECTION AGENCIES/CONTRACTOR/ VENDERS	39
41.0	BACKUP AGENCY FOR INTERFERENCE SURVEY & MITIGATION....	39
42.0	PERMANENT REFERENCE CELL.....	39
43.0	CP CABLES.....	39
44.0	CP SACRIFICIAL ANODES.....	40
45.0	CP PORTABLE REFERENCE CELL.....	40
46.0	CP PERMANENT REFERENCE CELL	40
47.0	CPTR (AC OPERATED).....	41



48.0	PIN BRAZING.....	41
49.0	THERMITWELD	41
50.0	CP SURGE DIVERTER/SPARK GAP ARRESTOR (EX-D).....	41
51.0	DIGITAL MULTIMETER.....	41
52.0	CTSU.....	41
53.0	CP SOLID STATE POLARISATION CELL.	41
54.0	PETROLEUM COKE BREEZE:	41
55.0	PIN BRAZING.....	42
56.0	CP ANODE (MMO TYPE):.....	42
57.0	CP ANODE BACKFILL MATERIAL.....	42
58.0	HEAT SHRINK CAP FOR CP ANODE	42
59.0	ER- PROBE (EXTERNAL CORROSION).....	42
60.0	ER- PROBE & CORROSION COUPON.....	42
61.0	HEAT SHRINK CAP FOR ANODE TO CABLE JOINT	43
62.0	MMO WIRE ANODES (WITH FACTORY PRE-PACKED COKE BREEZE)	43
63.0	MMO WIRE ANODES (WITHOUT FACTORY PRE-PACKED COKE BREEZE)	43
64.0	MMO TUBULAR/ STRIP/ RIBBON ANODES.....	43
D.	INSTRUMENTATION	44
1.0	PRESSURE GAUGES.....	44
2.0	TEMPERATURE GAUGES.....	44
3.0	TEMPERATURE ELEMENTS INCLUDING SKIN TYPE.....	45
4.0	POSITIVE DISPLACEMENT FLOW METERS.....	45
5.0	TURBINE FLOW METER.....	45
6.0	ELECTRONIC VOLUME CORRECTOR.....	46
7.0	ORIFICES (METER RUN, FLOW CONDITIONER, ORIFICE PLATE AND ASSEMBLY)	46
8.0	ULTRASONIC FLOW METERS	46
9.0	MASS FLOW METERS	46
10.0	FIELD INSTRUMENTS (P, DP, F, L, T).....	46
11.0	LEVEL GAUGES/ LEVEL INSTRUMENTS.....	47



ENERGISING QUALITY

LIST OF RECOMMENDED VENDORS FOR BOUGHT OUT ITEMS

DOC NO: VCS-00-00-VL-0001
Rev No : 04

12.0	PRESSURE REGULATOR AND SLAM SHUT VALVE.....	47
13.0	PRESSURE SAFETY VALVES.....	47
14.0	CONTROL PANEL & ACCESSORIES	48
15.0	JUNCTION BOXES AND CABLES GLANDS	48
16.0	CONTROL AND SIGNAL CABLES	49
17.0	GAS DETECTION SYSTEM	49
18.0	MOV ACTUATOR:	50
19.0	PNEUMATIC ACTUATOR (SOLENOID OPERATED ON-OFF TYPE) ...	50
20.0	SOLENOID VALVES	50
21.0	ELECTRO – HYDRAULIC ACTUATOR.....	50
22.0	GAS OVER OIL ACTUATOR.....	51
23.0	OFC.....	51
24.0	FLOW CONTROL VALVES	51
25.0	FLOW COMPUTERS.....	52
26.0	INDICATORS & CONTROLLERS	52
27.0	BARRIERS	52
28.0	GAS CHROMATOGRAPH	52
29.0	I/P CONVERTERS	52
30.0	SS FITTINGS, INSTRUMENT VALVES & MANIFOLDS.....	53
30.1	FOR CNG WORK:.....	53
30.2	EXCEPT CNG WORK:	53
31.0	SS TUBES.....	53
31.1	FOR CNG WORK:.....	53
31.2	EXCEPT CNG WORK:	53
E.	SHOP & FIELD PAINTING	54
1.0	INDIAN VENDORS	54
2.0	FOREIGN VENDORS FOR OVERSEAS PRODUCTS	54
F.	FOR PE & LMC WORK (GI/CU)	56
1.0	MDPE FITTINGS & MDPE VALVES	56
2.0	GI PIPE.....	56
3.0	CASTING GI FITTINGS	56



**LIST OF RECOMMENDED VENDORS FOR
BOUGHT OUT ITEMS**

DOC NO: VCS-00-00-VL-0001
Rev No : 04

ENERGISING QUALITY

4.0	FORGED GI FITTING (FOR HIGH RISE SEGMENT)	56
5.0	COPPER TUBES & FITTINGS	56
6.0	BRASS FITTINGS	57
7.0	BRASS VALVES	57
8.0	BRASS FITTINGS	57
9.0	STEEL RE-INFORCED RUBBER HOSE (TYPE-4).....	57
10.0	CORRUGATED FLEXIBLE METAL HOSES (ANACONDA).....	57

**A. MECHANICAL & PIPELINE****1.0 CARBON STEEL PIPES****1.1 PIPE CARBON STEEL TO INDIAN STANDARDS**

- a. A.S.T. Pipes Pvt. Ltd. (AST Group)
- b. Advance Steel Tube Ltd.
- c. Apl Apollo Tubes Ltd. (Er. Bihar Tubes Ltd.
- d. Asian Mills Pvt. Ltd.
- e. Asrani Tubes Limited
- f. Dadu Pipes (P) Ltd.
- g. Essar Steel Limited(Er Hazira Pipes Mill)
- h. Gaurang Products Pvt Ltd. (Ast Group)
- i. Goodluck Steel Tubes Ltd.
- j. Hi-Tech Pipes Limited
- k. Indus Tube Limited
- l. Jindal Industries Ltd
- m. Jindal Pipes Ltd.
- n. Jindal Saw Ltd (Kosi Works)
- o. Jotindra Steel & Tube Ltd
- p. Lalit Pipes And Pipes Ltd.
- q. Maharashtra Seamless Ltd.
- r. Man Industries (India) Ltd. – Pithampur
- s. Man Industries (India) Ltd. Anjar
- t. Mukat Tanks & Vessels Ltd.
- u. Nezone Tubes Limited
- v. North Eastern Tubes Limited
- w. Pratibha Industries Limited
- x. Pratibha Pipes & Structural Ltd.
- y. Psl Ltd (Chennai)
- z. Psl Ltd (V1, V2 & NC)
- aa. Rama Steel Tubes Ltd.
- bb. Ratnamani Metals And Tubes Ltd.
- cc. Ravindra Tubes Limited
- dd. Samshi Pipe Industries Limited
- ee. Surya Roshni Ltd.



- ff. Swastik Pipes Ltd.
- gg. Utkarsh Tubes & Pipes Ltd. (Formly Bmw)
- hh. Welspun Corp. Limited (Dahej)
- ii. Zenith Birla (India) Limited

1.2 PIPE & TUBULARS TO A.P.I. STANDARDS

- a. Arcelormittal Tubular Products Roman Sa, Romania
- b. Bhel (Trichy), India
- c. Dalmine Spa (Enquiry To Tenaris), Uae
- d. Eewkorea Co. Ltd (Germany), Korea
- e. Eew Korea Co. Ltd. (Korea), Korea
- f. Eisenbau Kramer Gmbh, Germany
- g. Hyundai Rb Co. Ltd. South Korea
- h. Ilva Lamiere E Tubi Srl (Enq To Ilva Spa, Italy
- i. Inox Tech. Spa, Italy
- j. ISMT Ltd. Ahmednagr, India
- k. TATA Steel, India
- l. PSL
- m. Jindal Pipes Ltd., India
- n. Jindal Saw Ltd. (Kosi Works), India
- o. Jindal Saw Ltd. (Nashik Works), India
- p. Lalit Pipes And Pipes Ltd. India
- q. Maharashtra Seamless Ltd., India
- r. Man Industries (I) Ltd. (Pithampur), India
- s. Mukat Tanks & Vessels Ltd., India
- t. Pratibha Industries Limited, India
- u. Ratnamani Metals And Tubes Ltd., India
- v. Siderca S.A.I.C (Enquiry Totenaris), Uae
- w. Sumitomo Metal Ind. Ltd., India
- x. Surya Roshni Ltd., India
- y. Swastik Pipes Ltd, India
- z. Tata Steel Uk Limited (Formerly C702)
- aa. Tubos De Acero De Mexico Sa (Enq. Tenaris), Uae
- bb. Tubos Reunidos Sa Spain
- cc. Umran Steel Pipe Inc (Turkey), Turkey



- dd. Valcovny Trub Chomutov, Czech Republic
- ee. Vallourec And Mannesmann Tubes, France
- ff. Welspun Corp Limited (Dahej), India

1.3 PIPE/TUBE CS (SEAMLESS) TO ASTM STANDARDS

- a. Arcelormittal Tubular Products Roman Sa, Romania
- b. Bhel (Trichy), India
- c. Changshu Seamless Steel Tube Co. Ltd., China
- d. Dalmine Spa (Enquiry To Tenaris, Uae
- e. Heavy Metals & Tubes Limited (Mehsana), India
- f. Ismt Ltd. Ahmednagr, India
- g. Ismt Ltd. Baramati India
- h. Jfe Steel Corporation, Uae
- i. Jindal Sdaw Ltd (Nashik Works) India
- j. Klt Automotive And Tubular Products Ltd., India
- k. Mahalaxmi Seamless Limited, India
- l. Maharashtra Seamless Ltd, India
- m. Products Tubulares S.A.U, Spain
- n. Ratnadeep Metal Tubes Ltd., India
- o. Staineest Tubes Pvt Ltd., India
- p. Sumitomo Metal Ind. Ltd., India
- q. Tubos Reunidos Sa Spain
- r. Valcovny Trub Chomutov, Czech Republic
- s. Vallourec Andmannesmann Tubes France
- t. Yangzhou Chengde Steel Pipe Co. Ltd Dubai (UAE)

1.4 PIPE CARBON STEEL (WELDED) TO ASTM STANDARDS

- a. Eew Korea Co. Ltd. (Germany), Korea
- b. Eew Korea Co. Ltd. (Korea), Korea
- c. Eisenbau Kramer Gmbh, Germany
- d. Hyundai Rb Co. Ltd., South Korea
- e. Inox Tech. Spa, Italy
- f. Jindal Saw Ltd (Kosi Works), India
- g. Lalit Pipes and Pipes Ltd., India
- h. Man Industries (I) Ltd.(Pithampur), India
- i. Man Industries (India) Ltd. Anjar, India



- j. Mukat Tanks & Vessels Ltd., India
- k. Ratnamani Metals And Tubes Ltd., India
- l. Sumitomo Metal India Ltd., India
- m. Tata Steel Uk Limited

2.0 VALVES

2.1 GLOBE VALVES

- a. BDK (New Delhi)
- b. Datre Corpn (Calcutta)
- c. KSB Pumps (New Delhi)
- d. L&T (New Delhi)
- e. Neco Schuber & Salzer Ltd. (New Delhi)
- f. Niton Valve (Mumbai)
- g. Ornate Valves (Mumbai)
- h. Panchavati Valves (Mumbai)
- i. AV Valves Ltd.
- j. BHEL (Trichy), India
- k. Econo Valves Pvt Ltd, India
- l. Fouress Engg (I) Ltd (Aurangabad)
- m. Guru Industrial Valves Pvt Ltd
- n. Leader Valves Ltd, India
- o. NSSL Ltd. (Neco Schubert & SalzerLtd)
- p. Oswal Industries Ltd, India
- q. Petrochemical Engineering Enterprises, India
- r. Sakhi Engineers Pvt Ltd
- s. Shalimar Valves Pvt Ltd
- t. Steel Strong Valves India Pvt Ltd, India
- u. Petro Valves Pvt. Limited, Ahmedabad
- v. Hawa Engineers Limited, Ahmedabad

2.2 CHECK VALVES

- a. Advance Valves Pvt. Ltd., Noida
- b. Aksons & Mechanical Enterprises, Mumbai
- c. Larsen & Toubro Limited (Audco India Limited, Chennai)
- d. AV valves Ltd., Agra
- e. BDK engineering India Ltd., Hubli



- f. BHEL, OFE&OE Group, New Delhi
- g. Datre Coroportion Limited, Calcutta
- h. Leader Valves Ltd., Jalandhar
- i. Neco schubert & Salzer Ltd., New Delhi
- j. Niton Valves Industries (P) Ltd., Mumbai
- k. Precision Engg. Co., Mumbai
- l. Econo Valves Pvt Ltd, India
- m. Fouress Engg (I) Ltd (Aurangabad)
- n. KSB Pumps Ltd (Coimbatore), India
- o. NSSL Ltd. (Neco Schubert & Salzer Ltd)
- p. Oswal Industries Ltd, India
- q. Panchvati Valves & Flanges Pvt Ltd, India
- r. Petrochemical Engineering Enterprises, India
- s. Sakhi Engineers Pvt Ltd
- t. Shalimar Valves Pvt Ltd
- u. Steel Strong Valves India Pvt Ltd, India

2.3 PLUG VALVES

- a. Breda Energia Sesto Industria Spa, Italy
- b. Fisher Sanmar Ltd., Chennai
- c. Larsen & Toubro Ltd., New Delhi
- d. Nordstrom Valves, USA
- e. Serck Audco Valves, UK
- f. Sumitomo Corporation India Pvt. Ltd., New Delhi
- g. Z Corporation, Korea
- h. Hawa Valves (India) Pvt. Ltd., Mumbai
- i. Steel Strong Valves India Pvt. Ltd., Navi Mumbai
- j. Econo Valves
- k. Flow-Serve PTE (Mfr. SERCK), India

2.4 BALL VALVES

- a. Hawa Valves (India) Pvt. Ltd, Navi Mumbai
- b. Larsen & Toubro, Delhi
- c. Microfinish Valves Pvt. Ltd., Noida
- d. Oswal Industries Ltd., Gandhi nagar
- e. Virgo Engineers Ltd., Delhi



- f. Boteli Valve Group Co. Ltd., China
- g. Cameron (Malaysia) SDN BHD, Malaysia
- h. Dafram S.P.A., Italy
- i. Fangyuan Valve Group Co. Ltd., China
- j. Franz Schuck GmbH, Germany
- k. O.M.S. Saleri (Italy)
- l. Pibi Viesse S.P.A (Italy)
- m. Nuovo Pignone (Italy)
- n. Perar S.P.A (Italy)
- o. Pietro Fiorentini (Italy)
- p. Cooper Cameron Valv Italy SRL-FRM, Italy
- q. Petrol Valves SRL
- r. Tormene Gas Technology S.P.A (VALVITALIA)
- s. Petro Valves Pvt. Limited, Ahmedabad

3.0 TEE

3.1 FLOW TEE

- a. Coprosider SPA, Italy
- b. GEA Energy System India Limited, Chennai
- c. Multitex Filtration
- d. Pipeline Engineering, UK
- e. Scomark Engg. Limited (U.K.)
- f. Skeltonhall Limited, England(U.K.)
- g. Technospecial SPA, Italy
- h. Tectubi SPA, Italy
- i. RMA Germany
- j. Pipefit Engineers Pvt. Ltd.
- k. Vee Kay Vikram & Co.

3.2 SPLIT TEE

- a. IPSCO, Canda
- b. TD Willamsons, USA
- c. Plant-Tech Power Technical Services Pvt Ltd
- d. Teemans, UK
- e. Vee Kay Vikram & CO.

**4.0 FLANGES**

- a. Aditya Forge Ltd., Vadodara
- b. Amforge Industries Ltd., Mumbai
- c. CD Engineering Co., Ghaziabad
- d. Echjay Forgings Pvt. Ltd. (Bombay), Mumbai
- e. Echjay Industries Ltd., Rajkot
- f. Forge & Forge Pvt. Ltd., Rajkot
- g. Golden Iron & Steel Works, New Delhi
- h. JK Forgings, New Delhi
- i. Metal Forgings Pvt. Ltd., Mumbai
- j. Perfect Marketings Pvt. Ltd., New Delhi
- k. Sky Forge, Faridabad
- l. S&G, Faridabad
- m. Chaudhry Hammer Works Ltd, India
- n. JAV Forgings (P) Ltd, India
- o. Kunj Forgings Pvt Ltd, India
- p. MS Fittings
- q. R.N. Gupta & Co. Ltd, India
- r. R.P. Engineering Pvt Ltd, India
- s. Sanghvi Forgings & Engineering Ltd
- t. Shri Ganesh Forgings Ltd., India
- u. Uma Shankar Khandelwal & Co., India
- v. Sawan Engineers, Baroda
- w. Stewarts & Lloyds of India Ltd., Kolkata
- x. Engineering Services Enterprises
- y. Pipefit Engineers Pvt. Ltd.
- z. Jindal Forging
- aa. Vivial Forges

5.0 FITTINGS

- a. Commercial Supplying Agency, Mumbai
- b. Dee Development Engineers Ltd.
- c. Eby Industries, Mumbai
- d. Flash Forge Pvt. Ltd., Vishakhapatnam
- e. Gujarat Infra Pipes Pvt. Ltd., Vadodara



- f. M.S. Fittings Mfg. Co. Pvt. Ltd., Kolkata
- g. Stewarts & Lloyds of India Ltd., Kolkata
- h. Teekay Tubes Pvt. Ltd., Mumbai
- i. Pipe Fit, Baroda
- j. Sky Forge, Faridabad
- k. S&G, Faridabad
- l. Sawan Engineers, Baroda
- m. Eby Fasteners, India
- n. Leader Valves Ltd, India
- o. R.N. Gupta & Co. Ltd, India
- p. Exten Engg Pvt Ltd
- q. Sivananda Pipe & Fittings Ltd
- r. Jindal Forging
- s. Vivial Forges
- t. PK Tubes Rajasthan
- u. CSA Fitting
- v. Gujarat Infrapipes pvt ltd, Vadodara
- w. KS Pipes Fitting Pvt Ltd, Palwal
- x. Tube Bend, Kolkata

6.0 PIG LAUNCHERS/ RECEIVERS/ PIG SIGNALERS

- a. Bassi Luigi Fittings B.V., Holland
- b. BRAUN STAHL PIPE TEC, GERMANY
- c. FORAIN, ITALY
- d. Fluidel SRL, ITALY
- e. RMA Maschinen- und, GERMANY
- f. Siiritec Nigi, Itlay
- g. SCHUCK ARMATUREN, GERMANY
- h. T.D. Williamson Inc., USA
- i. Tectubi SPA, Italy
- j. Taylor Forge Engineering System INC, USA
- k. Tormene Americana S.A. (Argentina)
- l. Tormene Gas Technology S.p.A., Italy
- m. PIPELINE ENGINEERING, UNITED KINGDOM



- n. Krohne, Oil & Gas BV, Drive Houston,
- o. Multitex Filtration Engrs. Ltd, New Delhi
- p. BGR ENERGY SYSTEMS LIMITED New Delhi
- q. Glapwell Contracting Services Ltd. UK
- r. FULGOSI GIOVANNI S.n.c di Corrado & C, ITALY
- s. VEEKAY VIKRAM & CO, GUJRAT
- t. GBM S.R.L, ITALY
- u. Cardew Ltd., Alexeander
- v. Forain S.R.L.
- w. GD Engineering, India
- x. Pipeline Engineering, UK
- y. Siirtec Nigi SPA
- z. Control Plus
- aa. Oswal Infrastructure

7.0 LONG RADIUS BENDS

- a. Jindal Saw Ltd. (Kosi Works), India
- b. PSL Limited (Gandhidham – Mfrg), India
- c. BHEL, Trichy, Tamilnadu
- d. Welspun, Gujarat
- e. Sawan
- f. Gujarat Infra
- g. P K Tubes
- h. DEE Development
- i. Pipefit Engineers Pvt. Ltd.

8.0 CLEAN AGENT SYSTEM

- a. ADN Fire Safety Pvt Ltd (Vashi East, Thane)
- b. Chetan Corporation (Ahmedabad)
- c. Chetan Engineers (Ahmedabad)
- d. Mx Systems International Pvt. Ltd. (Mumbai)
- e. New Fire Engineers (P) Ltd (Sil Vassa)
- f. Nitin Fire Protection Industries Ltd (New Bombay)
- g. Nohmi Bosai (India) Private Limited
- h. Tyco Fire & Security India Pvt. Ltd (Bangalore)
- i. Vimal Fire Controls Pvt Ltd (Vadodara)

**9.0 INSULATING JOINTS**

- a. IGP Engineers
- b. V K Vikram
- c. Advance Electronics
- d. Nupros INC

10.0 GASKETS

- a. IGP Engineers (P) Ltd., Madras
- b. Madras Industrial Products, Madras
- c. Dikson & Company, Bombay
- d. Banco Products (P) Ltd., Vadodara
- e. Goodrich Gaskets Pvt Ltd
- f. Starflex Sealing India Pvt Ltd, India
- g. Teekay Meta Flex Pvt Ltd
- h. UNIKLINGER Ltd
- i. HEM Engg. Corp.
- j. Unique Industrial Packing Pvt. Ltd.

11.0 FASTENERS

- a. Nireka Engg. Co. (P) Ltd., Calcutta
- b. Precision Taps & Dies, Bombay
- c. AEP Company, Vithal Udyoug Nagar
- d. Fix Fit Fasteners, Calcutta
- e. Precision Engg. Industries, Baroda
- f. Echjay Forgings Pvt. Ltd., Bombay
- g. Capital Industries, Bombay
- h. Boltmaster India Pvt Ltd, India
- i. Deepak Fasteners Limited, India
- j. Fasteners & Allied Products Pvt Ltd, India
- k. Hardwin Fasteners Pvt Ltd, India
- l. J.J. Industries, India
- m. Multi Fasteners Pvt Ltd, India
- n. Nexo Industries, India
- o. Pacific Forging & Fasteners Pvt Ltd, India
- p. Pioneer Nuts & Bolts Pvt Ltd, India
- q. Precision Auto Engineers, India



- r. President Engineering Works, India
- s. Sandeep Engineering Works, India
- t. Syndicate Engineering Industries, India

12.0 WELDING ELECTRODES FOR PIPELINE/PIPING WORK

- a. For Mainline – Lincoln/ Bohler make
- b. For Terminal – For root pass –Lincoln/ Bohler make
For other passes – Lincoln, D&H or equivalent makeLincon

13.0 STRAINERS

- a. Bombay Chemical Equipments
- b. Gujarat Auto filed
- c. Multitex Filtration Engineering Limited
- d. Grand Prix Engineering Limited

14.0 COLD APPLIED TAPES

- a. Denso GmbH
- b. Raychem

15.0 HEAT SHRINKABLE SLEEVE/ FIBREGLAS REINFORCED SLEEVE

- a. Covalence - Seal For Life India Pvt. Ltd. (Formerly Covalence Raychem- Berry Plastics Corporation)
- b. Canussa-CPS

16.0 STUD BOLTS WITH NUTS

- a. Multi Thread Fasteners, Baroda
- b. Darukhanwala
- c. Precision Engineers, Baroda
- d. Unbrako
- e. TVC

17.0 WARNING MAT

- a. Sparco Multiplast Pvt. Ltd., Ahmedabad
- b. Singhal Industries , Ahemdabad
- c. Puja Packing, Mumbai
- d. Bina Enterprises, Mumbai
- e. Shree Vijay Wire & Cable Industries



18.0 HDPE PIPES/DUCT

- a. Climax Synthetics (P) Ltd., Vadodra
- b. Indian Poly Pipes, Calcutta
- c. Jain Irrigation Systems Ltd., Jalgaon
- d. Kirti Industries (India) Ltd., Indore
- e. Ori Plast Limited, Calcutta
- f. Phoel Industries Limited, Delhi
- g. Sangir Plastics (P) Ltd., Mumbai
- h. Veekay Plast, Jaipur
- i. Kisan Irrigation
- j. Dutron Polymers Ltd.
- k. Manikya Plastichem (P) Ltd
- l. Himalyan Pipe Industries

19.0 DRY GAS FILTER & FILTER SEPERATOR

- a. Grand Prix Fab (Pvt.) Ltd. (New Delhi)
- b. Perry Equipment, USA
- c. Faudi Filter, Germany
- d. Forain S.r.l., Italy
- e. ABB, Faridabad
- f. Burgess Manning, USA
- g. Multitex Filtration Engineers India
- h. Triveni Plenty Engg. Ltd. (New Delhi)
- i. Siirtec International Contractor S.P.A (Italy)
- j. Flashpoint, Pune india
- k. Filtration Engineers (I) Pvt Ltd, India
- l. Gujarat Otofilt, India
- m. Tormene Gas Technology
- n. Ultrafilter (India) Pvt Ltd, India
- o. Ravi Techno Systems Pvt Ltd, India
- p. Siirtec Nigi S.P.A
- q. Filtan Filter Anlagenbau GmbH
- r. Fairley Arlon BV
- s. PECO Facet
- t. EPE Epenstenner GMBH



- u. Filtrex srl
- v. Petromar Engineered Soln
- w. Plenty Filter
- x. Eurofiltex
- y. PTI Technologies Inc

20.0 FILTER ELEMENT

- a. Peco – Facet
- b. Velcon
- c. Pall – Filterite
- d. Burgess Manning

21.0 NDT AGENCY

- a. NDT Services, Ahmedabad
- b. GEECY Industrial Services Pvt. Ltd., Mumbai
- c. Corrosion Control Services, Mumbai
- d. Perfect Metal Testing & Inspection Agency, Calcutta
- e. Inter Ocean Shipping Co., New Delhi
- f. RTD, Mumbai
- g. Sievert, Mumbai
- h. X-Tech, Vizag
- i. Industrial X Ray and Allied Radiographers (I) Pvt. Ltd.

22.0 Cold Applied Tapes

- a. Denso GmbH
- b. Polyken (Berry Plastics Corporation)

23.0 PUR Coating

- a. Powercrete (Berry Plastics Corporation)

24.0 Casing End Closure

- a. Raci, Italy
- b. Raychem RPG Limited

25.0 Casing Insulators

- a. Raci, Italy
- b. Raychem RPG Limited
- c. VeekayVikram



26.0 FIRE FIGHTING EQUIPMENT**26.1 FIRE EXTINGUISHERS**

- a. Avon Services (Production & Agencies) Pvt. Ltd., Bombay
- b. Kooverji Devshi & Co., Bombay
- c. Reliable (Fire Protection) India Ltd., Bombay
- d. Zenith Fire Services, Bombay
- e. Safex Fire Services, Bombay
- f. Brij Basi Hi
- g. tech Udyog
- h. Bharat Engg Works, India
- i. Gunnebo India Ltd
- j. Nitin Fire Protection Industries Ltd, India
- k. Supremex Equipments, India
- l. Vimal Fire Controls Pvt Ltd., India

26.2 FIRE HYDRANTS, MONITORS, DELUGE VALVE, NOZZLES

- a. Zenith
- b. Minimax
- c. Newage
- d. HD Fire
- e. Vijay Fire
- f. Asco Strumech Pvt Ltd, India
- g. Brij Basi Hi
- h. tech Udyog
- i. Gunnebo India Ltd
- j. Nitin Fire Protection Pvt Ltd
- k. Shah Bhogilal Jethamal & Brothers
- l. Venus Pumps & Engineering Works

26.3 RRL Hose

- a. Jayshree
- b. Newage

26.4 HOSES

- a. Ashit Sales Corporation, Bombay
- b. Royal India Corporation, Bombay



- c. Gayatri Industrial Corporation
- d. Simplex Rubber Products Ltd., Ahmedabad
- e. Zaverchand Marketing Pvt. Ltd., Baroda
- f. Presidency Rubber Mill, Calcutta
- g. The Cosmopolite, Calcutta
- h. Simplex Rubber Products, Thane

NOTE:

- 1) For procuring bought out items from vendors other than those listed above, the same may be acceptable subject to the following: -
 - a) The vendor/ supplier of bought out item(s) is a manufacturer/ supplier of said item(s) for intended services and the sizes being offered is in their regular manufacturing supply range.
 - b) The vendor / supplier should not be in the Holiday list of CLIENT / VCS / other PSU.
 - c) Should have supplied at least one single random length (i.e. 5.5 meters to 6.5 meters) for item assorted pipes / tubes and for other items, which are to be supplied in quantity on number-basis (other than assorted pipes / tubes) minimum 01 (One) number of same or higher in terms of size and rating as required for intended services. The bidder should enclose documentary evidences i.e. PO copies, Inspection Certificate etc. for the above, along with their bids.
- 2) For any other item(s) for which the vendor list is not provided, bidders can supply those item(s) from vendors/ suppliers who have earlier supplied same item(s) for the intended services in earlier projects and the item(s) offered is in their regular manufacturing/ supply range. The bidder is not required to enclose documentary evidences (PO copies, Inspection Certificate etc.) along with their offer, however in case of successful bidder, these documents shall require to be submitted by them within 30 days from date of Placement of Order for approval to CLIENT / VCS.
- 3) The details of vendors indicated in this list are based on the information available with VCS, Contractor shall verify capabilities of each vendor for producing the required quantity with. PMC does not guarantee any responsibility on the performance of the vendor. It is the contractor's responsibility to verify the correct status of vendor and quality control of each parties and also to expedite the material in time.

**B. CIVIL AND STRUCTURAL**

Sr. No.	Items/ Name of Products	Make/ Brands/ Manufactures
1.	Reinforcement Steel	TATA, SAIL, RINL, JSW.
2.	Cement	Ambuja, ACC, JK, Grasim, Ultratech, Birla, L&T, Cement Corporation of India
3.	Structural Steel	TATA, SAIL, RINL, IISCO, ESSAR
4.	Structural Steel Tubes ISI Marked	TATA, JINDAL, SURYA
5.	Mineral wool for thermal insulation of ceilings (Under deck insulation)	Rock wool (india) Ltd. Minwool Rock Fibres Ltd., Lloyd Insulation.
6.	Synthetic Enamel Paint (1st quality only)	ICI Paint (Dulux), Asian Paint (Apolite), Berger Paints (Luxol). Goodlass Nerolac Paints (Nerolac), Jenson & Nicholson Paints Ltd (Borolac)
7.	G.I SHEET	ESSAR, JSW, SAIL
8.	Sheeting Screw	Corroshield, Buildex,
9.	Chemical for Antitermite treatment	DE- NOCIL Bombay, Pest Control of India, Trishul
10.	Factory made Panelled Door shutter	Century; Godrej ; M/s Hindustan Housing factory Ltd., New Delhi ; M/s Delhi Construction Eqp, Sadar Bazar, Delhi ; M/s Joinery manufacturing Co., Calcutta;
11.	PVC Panel Door (Solid Core)	Rajshri Plastiwood Limited, Sintex, Hindopan, Marino
12.	Pressed steel door frames/ cupboard and window frames (manufacturers)	M/s SAIL, M/s TATA
13.	Pressed steel door frames/ cupboard and window frames (fabricators)	M/s Loyal safe works Mayapuri, N/Delhi M/s Multiwyn Industrial Corpn Calcutta M/s Metal Window Corpn N/Delhi M/s Chhabra Steel Udyog, 260 Sadar Bazar, Meerut Cantt. M/s Delite safe works, Rani Jhansi Road, N/Delhi
14.	Steel Windows, Ventilators (as per IS- 1038 of 1983) & frames pressed steel door/window	M/S Multiwyn Industrial Corpn, Calcutta ; M/S Metal Window Corp, N/ Delhi ; M/S Chhabra Steel Udyog 260, Sadar Bazar, Meerut Cantt ; Agent steel MFG Pvt Ltd, Ahmedabad ; Godrej ;
15.	AI Section for AI Door/ Window/ Partitions	Hindalco, Ajit India, Jindal
16.	AluminumI Door/ Window/ Glazing Fabricated and	M/s Alumilite Pvt Ltd, M/s Ajit India Pvt Ltd, M/s Ramniklal S Raste Agra, Argent Industries, M/s Aluminium Tech Industries, I-2249 DSIDC Narela,



ENERGISING QUALITY

LIST OF RECOMMENDED VENDORS FOR BOUGHT OUT ITEMS

DOC NO: VCS-00-00-VL-0001
Rev No : 04

	Anodized	Delhi, M/s VR Associates, GH-14/242 Paschim Vihar, Delhi
17.	Aluminium door and windows Fittings	M/s Elite Enterprises C/6 Shalimar Hardware 133, Jarg Mahal, Dhobitalao Mumbai 400002. M/s Mohan Metal Industries 178/2-A, Bhole Nath Nagar, Shahadara, Delhi 110032. Mepro, Argent New Delhi, Classic, New Delhi. Jindal, Argent New Delhi, Golden Industries Pvt. Ltd. ECIE
18.	Aluminium Grill	Alu Grill, Arihant Aluminium Corporation, Decogrille
19.	Door Closer	Everite, Golden, Gandhi,
20.	Floor Spring	Prabhat, Everite
21.	Plywood for general purpose (IS-303)	National Plywood Inds Pvt Ltd, S Fancy lane, 8th floor, Calcutta-700001, Merino Plywood, Archid Ply, Ply, Swastik, Universal, Century, Greenply, National.
22.	Pre laminated Particle board	Kitply, Bhutan board, Ecoboard, Novapan, Archid ply, Merinova, Merino
23.	Laminated Sheets	Formica, Merino Lam, Greenlam, National, Century
24.	Modular Partitions	Godrej, Blowplast
25.	False Ceiling (Mineral Fibre Board)	Armstrong, Daiken, Luxalon, Llyods, Gypboard, Trac, Aerolite
26.	Aluminium False Ceiling	Lloyds, Armstrong, Luxlon, Trac
27.	Flooring Tiles (Mosaic / Terrazzo / PCC) (1st quality only)	Kajaria Ceramics, NITCO, Royal Tiles, Gem Tiles, Hindustan Tiles, M/S National Tiles & Industries, Ultra Tiles
28.	Glazed Ceramic Tiles, Non-Skid (Floor/Wall), (1st quality only)	Kajaria, Somany, NITCO. Murudeshwar Ceramic Ltd (Navin Diamond tile), Johnson (Marbonite),
29.	Vitrified/ Designer Vitrified Tiles (1st quality only)	Asian, Marbonite (Johnson), Kerrogres (Kajaria), NITCO, Orient
30.	PVC Tiles/Flooring (IS 3461) (1st quality only)	Marblex Tiles, Krishna Tiles, Polyfin, Armstrong, Wonder floor.
31.	False Flooring	Godrej or equivalent
32.	Glass Mosaic Tiles (1st quality only)	Paladio, Coral, Accura, Bisazza, Italia, Mridul.
33.	Designer Paver Tiles/ Interlocking tiles ISI marked/ Grass-jointed Tiles. (1st quality only)	Pavit, Ultra, Hindustan, Eurocon, Vyara, National Tiles, Gem, Unistone, Konkrete, Unitile
34.	Wall care Putty for Base preparation (1st quality only)	Birla Wall care putty, Berger, Jenson & Nicholson, JK White



ENERGISING QUALITY

LIST OF RECOMMENDED VENDORS FOR BOUGHT OUT ITEMS

DOC NO: VCS-00-00-VL-0001
Rev No : 04

35.	White Cement (1st quality only)	Birla, JK
36.	Cement based Paints (1st quality only)	Super Snowcem, Duracem, Super Acrocem.
37.	Dry Distemper / Oil bound Distemper (1st quality only)	Goodlass Nerolac Paint, Shalimar Paint, Jenson & Nicholson, Asian Paint, Berger. ICI Dulux
38.	Acrylic Washable Distemper (1st quality only)	Asian, Berger, ICI Dulux, Jenson & Nicholson, Nerolac, Shalimar, Garware & Goodlass
39.	Plastic Emulsion Paint (1st quality only)	Asian, Berger, ICI, Nerolac, Jenson & Nicholson, Shalimar, Garware & Goodlass
40.	Exterior Acrylic Emulsion (1st quality only)	ICI (Weathercoat), Excel (Nerolac), Apex (Asian), Berger, Jenson & Nicholson, Shalimar, Garware & Goodlass
41.	Polymer based Paint	STP, CICO
42.	Textured Paint / Wall Tile (1st quality only)	Unitile, Heritage, Spectrum, Iokos, Acropaints, Asian
43.	Flexible board for Expansion joint	STP or equivalent
44.	Grout	Shrinkomp, Fosroc, Fairmate
45.	Integral water proofing compound	STP, Pidilite, Fosroc, CICO, Sika.
46.	Concrete Admixture	Pidilite, Fosroc, CICO, Sika.
47.	Water proofing for cementations surface IS-2645	Acrocrete & Acrocote, CICO, Fosroc, STP
48.	Bituminous Product	M/s Faridabad Spinning & Woolen Mills Pvt Ltd, 837, SP Mukherjee Marg Delhi, M/s STP Ltd (Formerly Shalimar Tar Products) M/s Bitufelt Pvt Ltd 123/377 Fazalm Ganj Kanpur 208012, Texas, Texas India Ltd, Multiplas
49.	Hardeners	Ironite, Ferrok, Hardonate
50.	Construction Chemicals	Choksey, CICO, Forsroc, Sika
51.	Stainless Steel Cladding	Jindal
52.	Punch Tape Concertina Coil	Global Technocrat, S.G. Engineers Delhi
53.	Stainless Steel Railing	Jindal
54.	FRP/ HDPE Garbage Bins	Sintex, Swift, Nutech, Sheetal
55.	Sanitary ware	Neycer Kermag (standard), Hindustan Sanitary Ware (1st quality), Parryware (superfine), Cera (1st quality), Classica (1st / standard)



ENERGISING QUALITY

LIST OF RECOMMENDED VENDORS FOR BOUGHT OUT ITEMS

DOC NO: VCS-00-00-VL-0001
Rev No : 04

56.	WC seat cover ISI Marked	Parryware, Neycer Kermag (standard), Hindustan Sanitary Ware (Ist quality), Cera (Ist quality), Classica (Ist / standard)
57.	PVC Flushing Cistern IS: 774-1984 (ISI Certified)	Parryware, Hindustan Sanitary Wares, Cera.
58.	Faucets & Taps, Stop Valves & Pillar Taps, Surgical basin mixer, Shower rose etc.	Gem, Parko, Parryware, HSW, Jaquar
59.	Kitchen Stainless Steel Sink	Diamond, Nirali, Neel Kanth, Jayna
60.	Looking Mirror	Saint Gobain, Modi Float, Triveni Float Glass, Crown, Atul.
61.	Readymade Bathroom Cabinets	Commander Gratings (I) Pvt Ltd, Gratolite Cabinet, A- 4 Sector VIII Noida-202701, Alpina, Cera.
62.	Float Valve	Leader, Bombay Metal & Alloy Co, Bombay superflow.
63.	SGSW Pipes (IS-651) ISI Marked	Perfect Agra, Devraj Ind Gaziabad, Buran, RK, Prince,
64.	CI (Centrifugally Cast) Pipes for sewage disposal ISI marked	NICCO, SRIF, A-1 Singhal Casting Co Agra, Jindal Saw, Kesoram, NECO
65.	PVC rain water/sewage pipes (IS-4985)	Reliance, Finolex, Supreme, Kisan, Prince, Hindustan Plastic & machine corporation, Polypack industries (P) Ltd.
66.	HDPE Water storage tanks (Rotational Moulded)	Sintex, Swift, Nutech, Sheetal
67.	Cast Iron Pipes and Fittings	Hindustan Engineering Products Company Calcutta, S.L.C., Standard approved manufacturers of any other brand of fittings having ISI marking, RIF, BIS
68.	RCC Pipes	Indian Hume Pipe Company, Delhi / Allahabad / Chandigarh / Lucknow; Hindustan Pressure Pipes, Kolhapur; Dhere Concrete Products, Pune or any other approved manufacturer conforming B.I.S. Standard
69.	Brass Fittings	Leader Engineering Works, Jalandhar; L & K Mathura; Luster Sanitary, Jalandhar; Annapurna Metal Works, Calcutta; Neta Metal Works, Jalandhar
70.	C.P. Fittings	Ego Metal Works, Ballabhgarh; Jaquar Industries, Delhi; Soma Plumbing Fixtures Limited, Calcutta; Gem Sanitary Appliances Pvt. Ltd., Delhi; Essco Sanitations, Delhi.
71.	Stone Ware (Salt-Glazed) Pipes	Hind Ceramics Limited, Orissa; Ceramic Industries Limited, Sambalpur; Shrikamakshi Agencies, Madras; Binary Udyog Pvt. Limited, Howrah; Tirumati Moulds Limited, Nagpur.
72.	Asbestos Cement Pipes and Fittings	Ganga Asbestos Limited, U.P.; Hyderabad Asbestos Cement Products Limited; J.K. Super Pipe Industries, Nanded; Konark Cement and Asbestos Limited, Orissa; Maharashtra Asbestos Limited, Bombay.



List of Recommended Vender/Suppliers of Major Bought-Out Items: Unless otherwise specifically mentioned in the Schedule of Items, Contractor has to use materials as listed below, of only these brand names/Company's names, which are mentioned in the RECOMMENDED list for structural items thereon.

Sl. No.	Items/Name of Products	Makes/Brands/Manufactures
1	Structural Steel	SAIL / TATA / RINL / IISCO / ESSAR / ISPAT
2	Structural Steel Tubes ISI Marked	TATA / JINDAL / SURYA / SWASTIK
3	Synthetic Enamel Paint 1st Quality only	ICI Paint (Deluxe), Asian Paint (Apolite), Shalimar Paint (Superlac), Goodlass, Nerolac Paint (Nerolac), Berger Paints

Any materials not fully specified in these specifications and which may be offered for use in the works shall be subject to approval of Engineer, without which it shall not be used anywhere in the construction works.

**C. ELECTRICAL****LIST OF SUPPLIERS OF MAJOR BOUGHT-OUT ITEMS****1.0 AIR CONDITIONER**

- a. O General.
- b. Daikin.
- c. Hitachi.
- d. LG.
- e. Samsung.
- f. Blue star.
- g. Haier.
- h. Voltas.
- i. Videocon.

2.0 BATTERIES (LEAD ACID)

- a. Amco Batteries Ltd.
- b. Exide Industries Ltd.
- c. HBL Power System Ltd.
- d. Amara Raja Batteries Ltd.
- e. Luminous Power Technologies Pvt Ltd.
- f. Su-Kam Power Systems Ltd.
- g. Base Corporation Ltd.
- h. Okaya Power Ltd.
- i. Southern Batteries Pvt Ltd.
- j. True Power International Ltd.
- k. Evolute Solutions Pvt Ltd.
- l. Greenvision Technologies Pvt Ltd.
- m. Artheon Electronics Ltd.

3.0 BATTERIES (NICKEL CADMIUM)

- a. Amco Batteries Ltd.
- b. HBL Power Systems Ltd.
- c. SAFT.

4.0 BATTERY CHARGER/DC-DC CONVERTER

- a. Amara Raja Power System(P)Ltd.



- b. BCH.
- c. Chhabi Electricals Pvt. Ltd..
- d. Caldyne Automatics Limited.
- e. Dubas.
- f. HBL Nife Power Systems Ltd..
- g. Universal Industries Products.
- h. Universal Instrument Mfg. Co Pvt Ltd.
- i. Hitachi HI-REL Power Electronics P. Ltd
- j. Mass-Tech Controls Pvt Ltd
- k. Dubas Engineering Pvt Ltd
- l. Chloride Power Systems & Solutions Ltd

5.0 CABLE – FIRE ALARM & COMMUNICATION CABLES

- a. Cords Cable Industries Ltd.
- b. CMI.
- c. Delton cables Ltd.
- d. ELKAY Telelinks.
- e. KEI Industries Ltd.
- f. Reliance Engineers Ltd.

6.0 CABLE – HT(XLPE)

- a. Universal Cable Ltd.
- b. KEI Industries Ltd.
- c. Industrial Cables.
- d. NICCO Corporation Ltd.
- e. Uniflex.
- f. Polycab.
- g. Torrent cables Ltd.

7.0 CABLE – LT / MV POWER AND CONTROL

- a. Cords Cable Industries Ltd.
- b. Universal Cable Ltd.
- c. KEI Industries Ltd.
- d. Havells.
- e. Delton.
- f. Elkay Telelinks.



- g. Evershine Electricals.
- h. Ecko.
- i. Ravin.
- j. Rallison.
- k. Suyog.
- l. Netco.
- m. Uniflex.
- n. Paramount.
- o. Gloster.
- p. Associated cables Pvt Ltd.
- q. CMI.
- r. Gemscab.
- s. Industrial cables.
- t. NICCO.
- u. Polycab.
- v. Torrent.

8.0 CABLE – GLAND

- a. Baliga.
- b. Comet.
- c. Flexpro.
- d. Flameproof.
- e. FCG.
- f. Electro Werke.
- g. Dowels.
- h. CCI.
- i. Sudhir Switchigear
- j. Keyson Techno Equipments,

9.0 CABLE – LUGS & TERMINAL BLOCKS

- a. Dowels.
- b. Jainson.
- c. Sharma Electrical
- d. Punitam
- e. Yamuna Powers
- f. Rapid Manufacturer



- g. Varun Controls.

10.0 CABLE – TRAY

- a. Ercon Composites.
- b. Yamuna Power & Infrastructure Ltd.
- c. MEM
- d. Bharti
- e. Profab.
- f. Ratan.
- g. Slotco.

11.0 CABLE TERMINATION AND JOINTING KIT

- a. CCI.
- b. Raychem.
- c. M-Seal.

12.0 CEILING/EXHAUST/PEDESTAL FANS & CIRCULATORS

- a. Bajaj Electricals Ltd.
- b. Crompton Greaves Ltd.
- c. Khaitan Electricals Ltd.
- d. Havell's.

13.0 CONTRACTORS – AC POWER

- a. Andrew Yule.
- b. ABB.
- c. BHEL.
- d. C&S.
- e. Havell's.
- f. L&T.
- g. Schneider.
- h. Siemens Ltd.
- i. Telemecanique.

14.0 CONTROL TRANSFORMER

- a. AE.
- b. Indushree.
- c. Intra Vidyut.
- d. Kalpa Electricals.



- e. Transpower Industries Ltd.
- f. Siemens.

15.0 GAS GENERATOR/DIESEL GENERATOR SET

- a. Sterling and Wilson.
- b. Jackson Limited.
- c. Sudhir Gensets.
- d. Power Engineering (India) Pvt Ltd.
- e. Prasha Technologies Limited.
- f. Kumar Generator house.
- g. Ashok Leyland Ltd.
- h. Powerica Limited.
- i. Supernova Engineers Limited.
- j. Bhaskar Power Products (P) Ltd.
- k. Caterpillar India (P) Ltd.
- l. Cummins India Ltd.
- m. Escorts Ltd.
- n. Greaves Cotton Ltd.
- o. Kirloskar Ltd.
- p. Mahindra & Mahindra Ltd.
- q. Honda.
- r. Perkins.
- s. Eicher.
- t. Tata Motors.
- u. Ashok Leyland.

16.0 EARTHING MATERIALS

- a. Rukmani Electrical & Components Pvt Ltd.
- b. Indiana Grating Pvt Ltd.
- c. Jef Techno Solutions Pvt Ltd.
- d. Flame proof LDB's/ JB,s/Control Station/ switches
- e. FCG
- f. Sudhir
- g. Prompt Engineering Works
- h. Flame Proof equipments pvt. Ltd.
- i. Baliga Lighting Equipments Pvt. Ltd.



- j. Flexpro Electricals Pvt. Ltd.

17.0 FLAME PROOF LDB'S/ JB'S/CONTROL STATION/ SWITCHES

- a. FCG.
- b. Sudhir switchgears.
- c. Prompt Engineering Works
- d. Flame Proof equipments pvt. Ltd.
- e. Baliga Lighting Equipments Pvt. Ltd.
- f. Flexpro Electricals Pvt. Ltd.
- g. Exprotecta, Beroda.
- h. FFLP Control Gears.
- i. Sterling.

18.0 HIGH MAST

- a. Bajaj Electricals Limited.
- b. Crompton Greaves Limited.
- c. Philips India Limited.
- d. Surya Roshani.

19.0 HIGH VOLTAGE PCC/ MCC PANELS

- a. BHEL.
- b. Control and Switchgear.
- c. Siemens.
- d. Tricolite Electrical Industries.
- e. Schneider.
- f. CGL.
- g. L&T.
- h. ABB.

20.0 INDICATING LAMPS

- a. Alstom Ltd.
- b. BCH.
- c. L&T Ltd.
- d. Siemens Ltd.
- e. Vaishno Electricals.
- f. Technik
- g. ABB

**21.0 INDICATING METERS**

- a. ABB.
- b. AMCO.
- c. AE.
- d. Alstom Ltd. (EE).
- e. Conzerv/Schneider
- f. Elecon Measurement Pvt. Ltd.
- g. HPL Electric & Power Pvt. Ltd.
- h. MECO Instruments Ltd.
- i. Minilec.
- j. Rishabh Instruments Pvt. Ltd.
- k. Trinity energy system.
- l. Kaycee.
- m. Salzer.

22.0 LIGHTING FIXTURES

- a. GE Lighting Pvt. Ltd.
- b. Bajaj Electricals Ltd.
- c. Crompton Greaves Ltd.
- d. Philips India Ltd.

23.0 LIGHTING FIXTURES – FLAMEPROOF

- a. Bajaj Electricals Ltd.
- b. Baliga Lighting Equipment Pvt. Ltd.
- c. Crompton Greaves Ltd.
- d. CEAG Flameproof Controlgear Pvt. Ltd.
- e. Flexpro Electricals Pvt. Ltd.
- f. Philips India Ltd.
- g. Sudhir Switchgears Pvt. Ltd.
- h. FCG.

24.0 MINIATURE CIRCUIT BREAKERS (MCBS) AND LIGHTING DB

- a. ABB.
- b. Hagger.
- c. Havell's India Ltd.
- d. Indo Asian Fusegear Ltd.



- e. Legrand.
- f. MDS Switchgear Ltd.
- g. Schneider.
- h. Siemens Ltd..
- i. HPL.
- j. L & T

25.0 MOULDED CASE CIRCUIT BREAKER (MCCBS)

- k. ABB.
- l. Andrew Yule.
- m. Larsen & Toubro.
- n. Schneider.
- o. Siemens.
- p. Control and Switchgear.
- q. Indo Asian,
- r. Hager.
- s. Merlin Gerin.
- t. Havell's India Ltd

26.0 PROTECTION RELAYS – THERMAL

- a. BCH.
- b. L&T Ltd.
- c. Siemens Ltd.
- d. Tele-mechanique & Controls (India) Ltd.

**27.0 LOW/MEDIUM VOLTAGE POWER CONTROL CENTER (PCC)/ MCC/
PDB/ MLDB/ LDB**

- a. ABB.
- b. BCH.
- c. BHEL.
- d. C & S.
- e. Elecmech Switchgear & Instrumentation.
- f. KMG ATOZ.
- g. L&T.
- h. Pyrotech Electronics Pvt. Ltd.
- i. Risha control Engineers Pvt. Ltd.
- j. UDKAM PROCESS EQUIPMENT INDIA PVT. LTD



- k. Tricolite Electrical Industries.
- l. Unilec Engineers Ltd.
- m. Vidyut Control India Pvt. Ltd.
- n. Control and Schematic.
- o. Zenith Engineering.
- p. Schneider Electric,
- q. AEG,
- r. HAVELL'S,
- s. MDS.

28.0 PUSH BUTTONS

- a. BCH.
- b. Alstom Ltd.
- c. L&T.
- d. Siemens Ltd.
- e. Tele-Menchanique & Controls (India) Ltd.
- f. Vaishno Electricals.

29.0 SWITCHES-CONTROL

- a. BCH.
- b. Easum Reyrolle Relays & Devices Ltd.
- c. Alstom.
- d. Kaycee Industries Ltd..
- e. L&T.
- f. Siemens Ltd.

30.0 SWITCHES – 5/15A PIANO/ PLATE, SWITCH SOCKET

- a. Anchor Electronics & Electricals Pvt. Ltd.
- b. Kingal Electricals Pvt. Ltd.
- c. North-West Switchgear Ltd.

31.0 SWITCH SOCKET OUTLETS (INDUSTRIAL)

- a. Alstom Ltd.
- b. Best & Crompton Engineering Ltd.
- c. BCH.
- d. Crompton Greaves Ltd.
- e. Essen Engineering Company Pvt. Ltd.



32.0 SOLAR POWER SYSTEM MODULES

- a. Tata Power Solar Systems Ltd
- b. REIL,
- c. CEIL,.
- d. HBL Power.
- e. Vikram Solar.
- f. Waaree Solar.
- g. Solar Semiconductor.
- h. Sonali.

33.0 SOLAR STREET LIGHTING

- a. Tata BP Solar (I) Ltd.
- b. REIL, Jaipur.
- c. CEIL, Sahibabad.
- d. HBL.

34.0 TERMINALS BLOCKS

- a. Connectwell.
- b. Controls & Switchgear Co. Ltd.
- c. Elmex Controls Pvt. Ltd.
- d. Essen Engineering Co. Pvt. Ltd.

35.0 TRANSFORMERS

- a. ABB.
- b. Andrew Yule.
- c. Areva.
- d. BHEL.
- e. Bharat Bijlee
- f. Crompton Greaves.
- g. EMCO Ltd..
- h. Intra Vidyut.
- i. Indushree.
- j. Indcoil
- k. Kirloskar.
- l. Skippers Electricals.
- m. Transformers & Rectifiers (I) Ltd.



- n. Voltamp.

36.0 UPS SYSTEM AND INVERTER

- a. DB Power.
- b. Keltron.
- c. Hi-Rel/HITACHI.
- d. Dubas.
- e. Toshiba Corporation.
- f. Fuzi Electric Co Ltd.
- g. Emerson.
- h. Synergy System.
- i. Eaton.

37.0 GI-OCTAGONAL POLE

- a. Bajaj.
- b. Transrail.
- c. Wipro.
- d. K.L. Industries.

38.0 ELECTRICAL MOTORS

- a. Siemens.
- b. Crompton Greaves.
- c. Kirloskar.
- d. BHEL.
- e. Bharat Bijlee.
- f. Hindustan motors.
- g. Alstom.
- h. Texmo.
- i. GE India.
- j. National Motors.
- k. ABB.

39.0 LIST OF RECOMMENDED MANUFACTURERS FOR HEATER

- a. Escorts Limited, Faridabad, Haryana.
- b. Spherehot / Kanti Lal Chuni Lal & Sons Appliances Pvt Ltd.Surat.
- c. Kerone, Bhayander(E), Thane – 401105.
- d. Excel Heaters, Andheri (West), Mumbai - 400 053, India.



- e. Nirmal Industrial Controls Pvt. Ltd., Mulund(W), Mumbai - 400 080.

40.0 CATHODIC PROTECTION AGENCIES/CONTRACTOR/ VENDERS

- a. Raychem-RPG Private Limited.
- b. CALTECH Engineering Service.
- c. Universal Corrosion Prevention India.
- d. Cathodic Technology Limited.
- e. Cathodic Control Company Pvt. Ltd.
- f. CORRTECH International Pvt Ltd.
- g. MITCORR Cathodic Protection Pvt Ltd.
- h. Underground Pipeline & NDTs Pvt. Ltd.
- i. JG Corrosion Solution.
- j. Mercury Cathodic Protection Service.
- k. UNDTs Corrosion Service.

41.0 BACKUP AGENCY FOR INTERFERENCE SURVEY & MITIGATION

- a. PLE Germany
- b. Vendor Velde
- c. Nippon Japan
- d. SSS India CIPL / interference survey.
- e. Balslev Denmark, .
- f. SSS Germany

42.0 PERMANENT REFERENCE CELL

- a. PERMACELL/ HARCO (USA)
- b. CORRTECH (ZULU), INDIA
- c. TINKER RASOR, USA
- d. SILVION, UK

43.0 CP CABLES

- a. Brooks Cables.
- b. Nicco Corporation Ltd.
- c. CCI Ltd.
- d. Delton Cables Ltd.
- e. KEI Industries.



- f. Torrent Cables.
- g. Universal cables.
- h. Victor Cables.
- i. Associated Flexible & Wires Pvt Ltd.
- j. Asain Cables (RPG Cables).
- k. Fort Gloster (Gloster Cables Ltd).
- l. Finolex Cable.
- m. Rediant Cables.
- n. NETCO Cables Pvt Ltd.
- o. Havells Ltd.

44.0 CP SACRIFICIAL ANODES

- a. Scientific Metals Engineers Pvt. Ltd., Karaikudi
- b. PSL Holding Pvt. Ltd., Mumbai.
- c. Cathodic Controls, Bangalore.
- d. BHEL, Bhopal.
- e. Nippon Corrosion, Japan.
- f. AFIC, KSA.
- g. Platt Bros. and Company, USA
- h. Wilson Walton International.
- i. Impalloy International.
- j. Corrpro International.
- k. HOCKWAY, UK
- l. NAKABOHTEC, Japan .
- m. Cortech International
- n. Titanor Component

45.0 CP PORTABLE REFERENCE CELL

- a. MC Miller (USA) .
- b. Borin, USA
- c. Krick
- d. corrtch.

46.0 CP PERMANENT REFERENCE CELL

- a. Borin Manufacturer USA
- b. MC Miller USA



- c. Corrttech
- d. Krick

47.0 CPTR (AC OPERATED)

- a. Canara Electric
- b. (Raychem RPG Ltd)
- c. CATHODIC CONTROL COMPANY PVT LTD.
- d. Raychem RPG Ltd
- e. Kriston Systems

48.0 PIN BRAZING

- a. SAFETRACK, SWEDEN
- b. BAC, UK

49.0 THERMITWELD

- a. ERICO, USA
- b. THERMOWELD, USA
- c. ERICO, EUROPE

50.0 CP SURGE DIVERTER/SPARK GAP ARRESTOR (EX-D)

- a. Dhen, OBO
- b. Corrpro system
- c. Sohne

51.0 DIGITAL MULTIMETER

- a. MOTWANE,
- b. Rishabh,
- c. Fluke .

52.0 CTSU

- a. Kriston systems .

53.0 CP SOLID STATE POLARISATION CELL.

- a. Dairyland
- b. Corrpro systems
- c. Mc Miller
- d. Krik Engineering

54.0 PETROLEUM COKE BREEZE:

- a. Goa Carbon , Goa



- b. India carbon, Durgapur (WB)

55.0 PIN BRAZING

- a. BAC
- b. Safetrack

56.0 CP ANODE (MMO TYPE):

- a. Corrttech
- b. Scientific Metal Engineers Karaikudi
- c. Titanor Component Ltd., Goa, India.
- d. Denora Permelic S.P.A (Italy). .
- e. Oronzio De Nora S.A. Ingano Switzerland
- f. CER Anode Technologies International USA
- g. ACTEL, UK
- h. ELTECH System Corporation, Texas
- i. MAGNETO-CHEMIE, Netherlands
- j. MATCOR (USA)

57.0 CP ANODE BACKFILL MATERIAL

- a. Goa Carbon (Goa).
- b. India Carbon (Calcutta),
- c. Petro carbon & Chemical Company (Haldia).

58.0 HEAT SHRINK CAP FOR CP ANODE

- a. RAYCHEM
- b. MATCOR (USA) To Cable Joint

59.0 ER- PROBE (EXTERNAL CORROSION)

- a. Rose Corrosion Services UK
- b. Metal Samples, USA. .
- c. Monitoring) Roharbak Cosasco USA
- d. Caproco UK

60.0 ER- PROBE & CORROSION COUPON

- a. Rose Corrosion Services UK
- b. Metal Samples
- c. USA Assembly. .
- d. Roharbak Cosasco, USA



- e. Caproco, UK

61.0 HEAT SHRINK CAP FOR ANODE TO CABLE JOINT

- a. Raychem, USA
- b. Matcor (USA)

62.0 MMO WIRE ANODES (WITH FACTORY PRE-PACKED COKE BREEZE)

- a. Matcor (USA)
- b. Covalence (USA)
- c. Berry Plastics (USA) – (Seal for Life Industries)

63.0 MMO WIRE ANODES (WITHOUT FACTORY PRE-PACKED COKE BREEZE)

- a. GROUPPO DENORA, GOA, INDIA
- b. CERANODE TECHNOLOGIES, USA
- c. TELPRO, USA

64.0 MMO TUBULAR/ STRIP/ RIBBON ANODES

- a. GROUPPO DENORA, GOA, INDIA
- b. ORANZIO DE NORA, ITALY
- c. MAGNETOCHEMIE, HOLLAND
- d. ACTEL LTD., U.K.
- e. ELTECH SYSTEMS CORPORATION, USA
- f. CERANODE TECHNOLOGIES, USA
- g. MATCOR (USA)

Note: -

For any other brought out item(s) for which the vendor list is not provided in the tender , bidders can supply those item(s) from vendors/ suppliers who have earlier supplied similar item(s) for the intended services in earlier Oil and Gas projects and the item(s) offered is in their regular manufacturing/ supply range.

- 1) The vendor/supplier should not be in the Holiday list of OWNER/ CONSULTANT/other PSU
- 2) The bidder is not required to enclose documentary evidences (PO copies, Inspection & Completion with satisfactory working certificates etc.) along with their offer, however in case of successful bidder, these documents shall required to be submitted by them within 30 days from date of Placement of Order for approval to OWNER / CONSULTANT.

D. INSTRUMENTATION

LIST OF RECOMMENDED VENDER/SUPPLIERS OF MAJOR BOUGHT-OUT ITEMS

1.0 PRESSURE GAUGES

- a. AN Instruments Pvt Ltd
- b. Badotherm Process Instruments B.V.
- c. Baumer Bourdon Haenni S.A.S
- d. British Rototherm Co Ltd
- e. Budenberg Gauge Co Ltd
- f. Dresser Inc
- g. Forbes Marshall (Hyd) Pvt Ltd
- h. General Instrument Consortium
- i. H. Guru Instruments (South India) Pvt Ltd
- j. Manometer (India) Pvt Ltd
- k. Nagano Keiki Seisakusho Ltd
- l. Hirlekar Precision, India
- m. Waaree Instruments Ltd
- n. Walchandnagar Industries Ltd (Tiwac Divn)
- o. Wika Alexander Wiegand & Co GmbH
- p. Wika Instruments India Pvt Ltd
- q. Ashcroft India Pvt Ltd.

2.0 TEMPERATURE GAUGES

- a. AN Instruments Pvt Ltd.
- b. Badotherm Process Instruments B.V.
- c. Bourdon Haenni S.A.
- d. Dresser Inc.
- e. General Instruments Consortium
- f. H. Guru Instruments (South India) Pvt Ltd
- g. Nagano Keiki Seisakusho Ltd
- h. Solartron ISA
- i. Walchandnagar Industries Ltd (Tiwac Divn)
- j. Wika Alexander Wiegand & Co GmbH
- k. Wika Instruments India Pvt Ltd



- l. Pyro Electric, Goa
- m. Ashcroft India Pvt Ltd.

3.0 TEMPERATURE ELEMENTS INCLUDING SKIN TYPE

- a. ABB Automation Ltd
- b. Altop Industries Ltd
- c. Bourdon Haenni S.A.
- d. Detriv Instrumentation & Electronics Ltd
- e. General Instruments Consortium
- f. Japan Thermowell Co Ltd
- g. Tecnomatic S.P.A
- h. Tempsen Instrument India Ltd
- i. Thermo Electric Co. Inc.
- j. Thermo-Couple Products Co
- k. Thermo-Electra B.V.
- l. Wika Alexander Wiegand & Co GmbH
- m. Altop Industries Ltd., Baroda
- n. Nagman Sensors (Pvt.) Ltd.
- o. Pyro Electric, Goa

4.0 POSITIVE DISPLACEMENT FLOW METERS

- a. RMG (Germany)
- b. Elster Instromet
- c. Romet
- d. Dresser
- e. Itron
- f. FMG
- g. Common
- h. Metreg
- i. Raychem RPG
- j. Vemmtec

5.0 TURBINE FLOW METER

- a. Daniel
- b. Elster Instromet
- c. Itron



- d. RMG
- e. Rockwin

6.0 ELECTRONIC VOLUME CORRECTOR

- a. Elgas
- b. Itron
- c. Plum
- d. Pietro Fiorentini

7.0 ORIFICES (METER RUN, FLOW CONDITIONER, ORIFICE PLATE AND ASSEMBLY)

- a. Emerson
- b. FMC, USA
- c. Pietro Fiorentini S.P.A (Italy)
- d. Canalta Controls, Canada

8.0 ULTRASONIC FLOW METERS

- a. Daniel (USA)
- b. RMG (Germany)
- c. Instromet International (Belgium)
- d. Sick Maihak, Germany
- e. FMC, Germany

9.0 MASS FLOW METERS

- a. Daniel Measurement & Control Asia Pacific
- b. Endress + Hauser Instruments International
- c. FMC Measurements Solutions
- d. Heinrichs Messtechnik GMBH
- e. Rheonik MessGerate GMBH

10.0 FIELD INSTRUMENTS (P, DP, F, L, T)

- a. ABB Ltd



- b. Honeywell
- c. Fuji Electric Instruments Co Ltd
- d. Yokogawa
- e. Invensys India Pvt.Ltd

11.0 LEVEL GAUGES/ LEVEL INSTRUMENTS

- a. Bliss Anand
- b. Chemtrols
- c. V-Automat
- d. Levcon
- e. Nivo Controls
- f. Sbeletro Mechanicals
- g. TRAC

12.0 PRESSURE REGULATOR AND SLAM SHUT VALVE

- a. Pietro Fiorentini S.P.A. (Italy)
- b. Emerson
- c. RMG-Regel Messtechnik (Germany)
- d. Mokveld Valves BV (Netherlands)
- e. Schlumberger (USA)
- f. Gortter Controls B V (Netherlands)
- g. Instromet International NV
- h. Nirmal Industrial Controls Pvt Ltd. (up to 6" size only)
- i. ESME Valves Ltd
- j. Kaye & Macdonald Inc.
- k. Nuovo Pignone S.P.A (Italy) (GE Oil Co.)
- l. Richards Industries (Formerly Treloar)
- m. Samson AG Mess-und Regeltechnik
- n. Tormene Gas Technology
- o. Dresser Inc, USA (upto 8" size, 300# class only)

13.0 PRESSURE SAFETY VALVES

- a. Keystone Valves (India) Pvt. Ltd.



- b. Larson & Toubro Ltd.
- c. Lesser GmbH & Co KG
- d. Mekaster Engg Ltd..
- e. Tyco Sanmar Ltd. (New Delhi)
- f. Anderson Greenwood Crosby
- g. BHEL (Trichy)
- h. Curtiss Wright Flow Control Corporation
- i. Dresser Inc.
- j. Fukui Seisakusho Co. Ltd
- k. Nakakita Seisakusho Co Ltd
- l. Nuovo Pignone S.P.A (Italy) (GE Oil co)
- m. Parcol S.P.A
- n. Safety Systems UK Ltd
- o. Tai Milano S.P.A
- p. Weir Valves & Controls France
- q. Bliss Anand Pvt Ltd.

14.0 CONTROL PANEL & ACCESSORIES

- a. Keltron Controls Ltd., Kerala
- b. Elechmec Corporation Ltd., Mumbai
- c. Industrial Controls & Appliances Pvt. Ltd.,
- d. Alstom System Ltd., Noida
- e. Emerson Process Management (I) Pvt. Ltd.
- f. ABB Instruments Ltd., New Delhi
- g. Larsen & Toubro Ltd.
- h. Control & Automation, New Delhi
- i. GE Fanuc Systems Pvt. Ltd., New Delhi
- j. Rockwell Automation (I) Ltd., Ghaziabad
- k. Honeywell Automation Ltd.
- l. Rittal
- m. Pyrotech Elcronics Pvt Ltd.
- n. Positronics Pvt Ltd.
- o. Electronics Corporation of India Ltd.

15.0 JUNCTION BOXES AND CABLES GLANDS

- a. Ex-Protecta



- b. Flameproof Control Gears
- c. Baliga
- d. Flexpro Electricals

16.0 CONTROL AND SIGNAL CABLES

- a. Associated Cables
- b. Brook
- c. Associated Flexibles & Wires (Pvt) Ltd
- d. Universal Cables Ltd, India
- e. Delton Cables Ltd, India
- f. KEI Industries Ltd INDIA
- g. CMI Limited
- h. Cords Cable Industries Ltd, India
- i. Elkay Telelinks (P) Ltd., India
- j. Udey Pyrocables Pvt Ltd, India
- k. Goyolene Fibres (I) Pvt Ltd, India
- l. Netco Cable Industries Pvt Ltd, India
- m. Nicco Corporation Ltd, India
- n. Paramount Communications Ltd, India
- o. Polycab Wires Pvt Ltd, India
- p. Radiant Cables Pvt Ltd, India
- q. Reliance Engineers Ltd., India
- r. Suyog Electricals Ltd, India
- s. Thermo Cables Ltd

17.0 GAS DETECTION SYSTEM

- a. Crowcon Detection Instruments Ltd
- b. Detection Instruments (I) Pvt Ltd
- c. Detector Electronics Corporation
- d. Drager Safety AG & Co. KGAA
- e. General Monitors Ireland Ltd
- f. Mine Safety Appliances Company
- g. MSA – Mines Safety Appliances(India) Ltd
- h. Industrial Scientific Oldham France S.A.
- i. Riken Keiki Co Ltd



- j. Simrad Optronics Icare
- k. Honeywell Analytics
- l. Net Safety Monitoring Inc.
- m. Simtronics SAS

18.0 MOV ACTUATOR:

- a. Rotork- UK, USA & INDIA
- b. Limitorque
- c. Auma- India
- d. Biffi- Italy

19.0 PNEUMATIC ACTUATOR (SOLENOID OPERATED ON-OFF TYPE)

- a. Metso Automation
- b. Tyco
- c. Samson Controls
- d. L&T
- e. Emerson
- f. Fisher
- g. Masoneilan Process Control
- h. Instrumentation Limited (IL)-Palghat
- i. Micro Finish
- j. Rotex

20.0 SOLENOID VALVES

- a. Avcon
- b. Festo

21.0 ELECTRO – HYDRAULIC ACTUATOR

- a. Avcon Rotork controls (Deutschland Gmbh)
- b. Biffi Italia Srl
- c. Ledeen (Italy)
- d. Virgo Valves and Controls ltd.-India
- e. Limittorque
- f. Reineke
- g. Voith
- h. Bettis



- i. Rotork- UK, USA & INDIA
- j. Rotex
- k. Schuck Group

22.0 GAS OVER OIL ACTUATOR

- l. Biffi Italia Srl,
- m. Ledeen(Italy)
- n. Virgo Valves & Control Ltd.-India,
- o. Voith,
- p. Bettis,
- q. Rotork-UK, USA, India,
- r. Rotex,
- s. Schuck Group,
- t. Valve Italia.

23.0 OFC

Manufacture/ Procurement, Testing and supply of suitable OFC Joint closures including all necessary accessories of any of the following make:

- a. Raychem
- b. 3M
- c. Siemens
- d. Any other make from the approved vendor list of client with supporting paper.

24.0 FLOW CONTROL VALVES

- e. Fouress Engg. (New Delhi)
- f. Fisher Xomox (New Delhi)
- g. MIL Control Ltd. (Noida)
- h. KOSO India Pvt Ltd
- i. Samson Control (Thane)
- j. Dresser Valves India Pvt Ltd.
- k. Fisher Controls
- l. Valvitalia Italy
- m. CCI Valve technology
- n. Flowserve Pvt Ltd.
- o. Metso Singapore Pvt Ltd.



- p. Instrumentation Ltd Palghat
- q. Dresser Inc. USA

25.0 FLOW COMPUTERS

- r. Emerson
- s. Instromet International (Belgium)
- t. FMC Measurement Solutions (UK)
- u. RMG (Germany)
- v. OMNI Flow Computers Inc.
- w. Thermo Fisher, USA

26.0 INDICATORS & CONTROLLERS

- x. Yokogawa
- y. Eurotherm Chessel
- z. Honeywell
- aa. Emerson

27.0 BARRIERS

- bb. MTL
- cc. STHAL
- dd. P&F
- ee. Phoenix

28.0 GAS CHROMATOGRAPH

- ff. ABB
- gg. Emerson
- hh. Instromet International, NV
- ii. RMG Regal+Messtechnik GmbH
- jj. Yokogawa

29.0 I/P CONVERTERS

- kk. ABB
- ll. Emerson
- mm. IMI Watson Smith Ltd.
- nn. Moore Controls Ltd
- oo. Shreyas Instruments Pvt Ltd, India
- pp. Thermo Brandt Instruments

**30.0 SS FITTINGS, INSTRUMENT VALVES & MANIFOLDS****30.1 FOR CNG WORK:**

- qq. DK-LOK
- rr. Swagelok Co.
- ss. Parker

30.2 EXCEPT CNG WORK:

- a. Swagelok Co.
- b. Parker
- c. Aura INC.
- d. HOKE
- e. Excelsior Engineering works
- f. Swastik Engineering works India
- g. Comfit and valves pvt ltd
- h. Arya craft and engineering Pvt ltd
- i. DK lok

31.0 SS TUBES**31.1 FOR CNG WORK:**

- a. Swagelok Co.
- b. Parker
- c. Sandvik

31.2 EXCEPT CNG WORK:

- a. Swagelok Co.
- b. Parker
- c. Sandvik
- d. Heavy metal and tube limited
- e. Nuclear fuel complex India
- f. Scorodite
- g. Ratnamani Metals and Tubes
- h. Jindal Saw

**E. SHOP & FIELD PAINTING****LIST OF RECOMMENDED VENDER/SUPPLIERS OF MAJOR BOUGHT-OUT ITEMS****1.0 INDIAN VENDORS**

- a. Asian Paints (I) Ltd.
- b. Berger Paints Ltd.
- c. Goodlass Nerlolac Paints Ltd.
- d. Jenson And Nicholson Paint Ltd & chokuGu Jenson & Nicholson Ltd.
- e. Shalimar Paints Ltd.
- f. Sigma Coating, Mumabai
- g. CDC Carboline Ltd.
- h. Premier Products Ltd.
- i. Coromandel Paints & Chemicals Ltd.
- j. Anupam Enterprises
- k. Grand Polycoats
- l. Bombay Paints Ltd.
- m. Vanaprabha Esters & Glycer, Mumbai
- n. Sunil Paints and Varnishes Pvt. Ltd.
- o. Courtaulds Coating & Sealants India (Pvt.) Ltd.
- p. Mark-chem Incorporated, Mumbai (for phosphating chemicals only)
- q. VCM Polyurethane Paint (for polyurethane Paint only)

2.0 FOREIGN VENDORS FOR OVERSEAS PRODUCTS

- a. Sigma Coating, Singapore
- b. Ameron, USA
- c. Kansai Paint, Japan
- d. Hempel Paint, USA
- e. Valspar Corporation, USA
- f. Courtaulds Coating, UK.

**Notes:**

1. Bidder can select equipment of two different makes, selected from this VENDOR LIST and mention the same in the checklist for technical evaluation attached with the tender. The offered bid must include filled datasheet indicating make, model, size, rating of offered instrument/ equipment duly supported by sizing calculation of offered equipment (wherever applicable).
2. Vendors who have already supplied above equipment in other terminals of client, shall also be considered qualified for this tender provided the supplied equipment are commissioned and running successfully and they have not been put on holiday.
3. Equipment / Instruments of any make which is offered by one bidder and acceptable to client shall be accepted for other bidder also. After placement of order, on request of the successful bidder list of other qualified makes for a particular item (for which successful bidder wants to change the vendor) shall be provided.
4. Bidder shall take prior approval of the make / model no of the offered item and it shall be from the list given above. However additional vendors will be considered in exceptional cases, provided they have supplied for similar application to reputed gas transmission/distribution companies, in quantities at least half the numbers being supplied for this tender, and working satisfactorily for minimum 6 months. Documentary evidence substantiating above shall be submitted for taking approval.

**F. FOR PE & LMC WORK (GI/CU)****1.0 MDPE FITTINGS & MDPE VALVES**

- a. Aliaxis,
- b. George Fischer,
- c. Al-Aziz,
- d. Kimplas,
- e. Banides,
- f. Agru,
- g. Friatech,
- h. Plasson

2.0 GI PIPE

- a. Swastik Pipe Ltd.
- b. Jindal Industries Ltd.
- c. Vishal Pipes Ltd.
- d. Indus Tubes Ltd
- e. Advance steel Tubes Ltd.
- f. Good Luck Tubes Ltd.
- g. Surya Roshni Limited
- h. APL Apollo Tubes Limited
- i. Jindal Pipes Limited
- j. RK Steel Manufacturing Company Private Limited
- k. PSL Tubes Limited

3.0 CASTING GI FITTINGS

- a. Sarin Industries Ltd.
- b. Jupiter Metal Industries Ltd.
- c. Jainsons Industries Ltd.
- d. Jinan Meide Casting Co. Ltd.
- e. Green Malleable Pvt. Ltd.

4.0 FORGED GI FITTING (FOR HIGH RISE SEGMENT)

- a. Jainsons Industries
- b. B.M. Meters Pvt. Ltd.

5.0 COPPER TUBES & FITTINGS



- a. Jay Banas Mehta Tubes Limited- Trade Mark "MEXFLOW"
- b. Rajco metal (Tubes & Fittings)
- c. Paras Industries
- d. MERCURE METAL & ALLOYS PVT LTD

6.0 BRASS FITTINGS

- a. Chandan Enterprises
- b. Paras Industries Ltd.

7.0 BRASS VALVES

- a. Universal srl, Italy
- b. Tiemme Raccorderie Sede, Italy
- c. Enolgas Bonimu s.a.s., Italy
- d. Fratelli Fortis s.r.l, Italy
- e. Giacomo Climbrio, Italy
- f. Parker Hannifin S.P.A., USA
- g. Singapore Valve & Amp; Fittings Pte Limited, Singapore /Bengaluru
- h. Rubinetterie Utensilerie Bonomi (RUB), Italy
- i. Zhejiang Valogin Technology Co. Ltd., China,
- j. Ningbo Zhiqing Industrial Co. Ltd., China,
- k. Zhejiang Dunan Valve Co. Ltd.,
- l. Ningbo Huaping, China.

8.0 BRASS FITTINGS

- a. Chandan Enterprises
- b. Paras Industries Ltd.
- c. Chokhawala Distributors – Brass Adaptor.

9.0 STEEL RE-INFORCED RUBBER HOSE (TYPE-4)

- a. Super Seal Flexible Hose Ltd.
- b. Suraksha Products Pvt. Ltd.
- c. Vansh Industries
- d. T & L Gases

10.0 CORRUGATED FLEXIBLE METAL HOSES (ANACONDA)

- a. KPC Flex Tubes
- b. Vestas Hose Division
- c. Alpha Flexi Tubes



- d. Chandan Enterprises

Note:

1. Vendor may procure material from any of approved vendors listed.
2. For equipment/components other than the above, vendor shall submit past track record for the proposed sub-vendors and obtain written approval from Owner / Consultant before placing order.
3. In case of exigencies like long delivery periods from approved vendors, the contractor shall list down the proposed suppliers/vendors for such items and submit the same for owner review/approval along with necessary documents/PTR.
4. Non-acceptance of a particular proposed vendor due to any reasons whatsoever shall not be a cause of schedule and cost implication. If equipment is sourced from outside India, vendor shall obtain prior approval for make of equipment before placement of order.

Above mentioned vendor list is tentative and further addition/deletion may be done as per discretion of Owner/VCS.

19.0 MINIMUM NO OF CONSTRUCTION EQUIPMENT TO BE DEPLOYED DURING RE-MOBILISATION

**(Appendix-X to Particular Job Specification
of Work)**

List of Minimum Equipment to be deployed by Bidder during re-mobilisation

Sl. No.	Equipment Description	(For Part-D1)	(For Part-D2)	Release of Balance 5% Mobilisation Advance (Per Spread Wise)
		Spread 2 B	Spread 2 C	
1.	Dozer with Ripper–D6 or Equivalent	1	1	1
2.	Excavator / Back Hoe-Ex 200 & Above or Equivalent	2	2	1
3.	Excavator / Back Hoe-Ex-100 & above or Equivalent	2	2	2
4.	Excavator with tyre mounted/ JCB	As Required		
5.	Dumper	As Required		
6.	Hydra (10 T or Equivalent)	6	6	3
7.	Pipe Layer/Side Boom–40T & Above Capacity	-	-	2
8.	DG Welding Machines	12	12	6
9.	Pipe bending Machine	1		
10.	Horizontal Auger Boring Machine with rock breaking tool	As Required		
11.	Pipe Clamp (Pneumatic/Hydraulic)– Internal (12")	2	2	1
12.	HDD Rig with All Equipments & Accessories	As Required		
13.	X-Ray M/C – Internal Crawler	1	1	
14.	X-Ray M/C – External	1	1	
15.	Gamma Source	1		
16.	Water Lifting Pump (400 m³/hr.& above)	1	1	
17.	Filling Pumps (400 to 1000 m³/hr)	1		
18.	Pressurization Pump – Motorized	1		
19.	Induction/ Resistance Heating Equipment or LPG Multi torch	2	2	
20.	Air Compressor – (300 CFM)	2	2	
21.	Air Compressor – (450/600/800 CFM)	1		
22.	D.G.Sets : 62.5KVA to 200KVA (inclusive of generators)	1	1	
23.	Blast Cleaning Machine	2	2	
24.	Mobile Workshop	1	1	
25.	Dozing Pump	1		
26.	Mud Mat of min. size 4 mx2 m each (for working in Monsoon)*	As required		

**20.0 MINIMUM NO OF SKILLED
MANPOWER TO BE DEPLOYED DURING
RE-MOBILISATION**

**(Appendix-XI to Particular Job Specification
of Work)**

**MINIMUM NUMBER OF SKILLED MANPOWER TO BE DEPLOYED DURING RE-MOBILISATION
PER SPREAD WISE**

Sl. No.	DESCRIPTION	REQUIREMENT
1.	Construction Manager (Note-7)	1
2.	Spread In-charge (Note-7)	1
3.	ROU Opening Coordinator	2
4.	Logistic Manager	1
5.	Billing Coordinator (Note-7)	1
6.	Lowering & Back-end Coordinator	2
7.	Planning engineer / Coordinator (Note-7)	1
8.	QA/QC engineer (Front/Back- end Activities/HDD Activities) (Note-7)	2
9.	Safety officer (Note-7)	2
10.	Qualified Surveyor	2
11.	Welding/NDT engineer (Note-7)	2/2
12.	Discipline Engineers (Civil/Mech/Elec./Instr.)	2/3/1/1
13.	Foreman/Supervisor (Front/Back-end Activities)	5/5
14.	Civil surveyor/liaison team	2/2
15.	Document controller/Account Officer (for linepipe)	1/1
16.	Storekeeper / storein-charge	2/2
17.	Welder (Manual)	20
18.	Fitter	4
19.	Grinder	12
20.	Machine operator	As Required
21.	Blast cleaning crew	4
22.	Electrician/Machine mechanic	As Required
23.	Rigger	10
24.	Drivers	As Required
25.	Pipe bending crew	1
26.	Thrust/Hor. Auger Boring crew	1
27.	X-ray/Gamma Ray crew	2/1
28.	Hydro-testing crew (Mainline/HDD/Terminal)	2
29.	Field joint coating crew (Mainline/HDD/Terminal)	3
30.	Holiday testing crew	3
31.	HDD crew	As required (Refer Note1)
32.	OFC jointing crew	1
33.	Civil survey crew (with equipment)	2
34.	Station civil works (carpenter/bar-bender/mason/fitter etc.)	As Required
35.	Unskilled workers	20
36.	Station mechanical, pre-fabrication/erection crew	2
37.	Electrical Works crew	1
38.	Instrumentation works crew	1

21.0 SCHEDULE OF DOCUMENT SUBMISSION

**(Appendix-XII to Particular Job
Specification of Work)**



SCHEDULE OF SUBMISSION OF DOCUMENTS

APPENDIX-XIII TO PJS



**Project Name: LAYING & CONSTRUCTION OF STEEL GAS PIPELINE AND TERMINALS ALONG WITH ASSOCIATED FACILITIES FOR SECTION-10 & 11 NORTH EAST GAS GRID
PHASE-III OF IGGL**

Client: M/s IGGL.

Date of FOA

Contractor:

SL. NO.	DOCUMENT TITLE	SUBMISSION OF DOCUMENT			
---------	----------------	------------------------	--	--	--

LIST OF PROCEDURES

Mainline Works

1	Electrode Qualification Test	Within 30 days from FOA			
2	Welding Procedure Qualification/ Specification (WPS)	Within 30 days from FOA			
3	Welder Performance Qualification	Within 30 days from FOA			
4	Route Survey	Within 30 days from FOA			
5	Clearing and Grading of ROW	Within 30 days from FOA			
6	Stringing of Line Pipes	Within 30 days from FOA			
7	Production Welding	Within 30 days from FOA			
8	Repair of Arc Strike	Within 30 days from FOA			
9	Weld Joint Numbering	Within 30 days from FOA			
10	NDT (X-Ray and Gamma Ray)	Within 30 days from FOA			
11	NDT Ultrasonic	Within 30 days from FOA			
12	Liquid Penetrant Test	Within 45 days from FOA			
13	Magnetic Particle Test	Within 45 days from FOA			
14	Welding Repair	Within 30 days from FOA			
15	Field Joint Coating & Repair	Within 30 days from FOA			
16	Trench Excavation	Within 45 days from FOA			
17	Rock Blasting	Within 30 days from FOA			
18	Lowering and Backfilling of Pipe Section	Within 45 days from FOA			
19	Tie-in Welding	Within 45 days from FOA			
20	Cold Field Bending	Within 45 days from FOA			



SCHEDULE OF SUBMISSION OF DOCUMENTS

APPENDIX-XIII TO PJS



**Project Name: LAYING & CONSTRUCTION OF STEEL GAS PIPELINE AND TERMINALS ALONG WITH ASSOCIATED FACILITIES FOR SECTION-10 & 11 NORTH EAST GAS GRID
PHASE-III OF IGGL**

Client: M/s IGGL.

Date of FOA

Contractor:

SL. NO.	DOCUMENT TITLE	SUBMISSION OF DOCUMENT			
21	Transportation, Handling and Storage of Line Pipes, Materials and Equipment	Within 30 days from FOA			
22	Incoming Material Inspection	Within 45 days from FOA			
23	Health, Safety And Environment	Within 30 days from FOA			
24	Quality Assurance Plan	Within 30 days from FOA			
25	Open Cut Crossings	Within 60 days from FOA			
26	Cased Crossing -Boring	Within 60 days from FOA			
27	HDD	Within 60 days from FOA			
28	Pre- Hydrotesting	Within 60 days from FOA			
29	Mainline Hydrostatic Testing	Within 60 days from FOA			
30	Post Hydrotesting	Within 90 days from FOA			
31	Pre-commissioning (Dewatering, Swabing and Drying of Pipeline	Within 90 days from FOA			
32	Magnetic Cleaning	Within 90 days from FOA			
33	EGP	Within 90 days from FOA			
34	Nitrogen Purging	Within 90 days from FOA			
35	SV Installation	Within 90 days from FOA			
36	Restoration	Within 90 days from FOA			
37	Permanent Markers	Within 90 days from FOA			
38	Commissioning	Within 90 days from FOA			
39	Videography before construction and after construction	Within 90 days from FOA			
40	Pipe Book	Within 60 days from FOA			
41	Final Acceptance dossier	Within 90 days from FOA			



SCHEDULE OF SUBMISSION OF DOCUMENTS

APPENDIX-XIII TO PJS



**Project Name: LAYING & CONSTRUCTION OF STEEL GAS PIPELINE AND TERMINALS ALONG WITH ASSOCIATED FACILITIES FOR SECTION-10 & 11 NORTH EAST GAS GRID
PHASE-III OF IGGL**

Client: M/s IGGL.

Date of FOA

Contractor:

SL. NO.	DOCUMENT TITLE	SUBMISSION OF DOCUMENT			
Station Works (Mechanical)					
1	Piping, Fabrication and erection of above ground piping	Within 90 days from FOA			
2	Welding Procedure Specification (Piping)	Within 90 days from FOA			
3	Hydrotesting / Leak Test	Within 90 days from FOA			
4	Painting of structural / piping	Within 90 days from FOA			
5	Equipment erection and Alignment	Within 90 days from FOA			
6	NDT and Radiography	Within 90 days from FOA			
Instrumentation/ Telecom Works					
1	HDPE Duct laying & Testing	Within 30 days from FOA			
2	Field Instrument installation & Commissioning	Within 90 days from FOA			
3	OFC Laying, Drum testing, OFC Jointing & Testing	Within 30 days from FOA			
4	Control Panel Installation, Cable Tray installation, Cable laying & Commissioning	Within 90 days from FOA			
Electrical, TCP & CMS Works					
1	Earthing & lighting	Within 60 days from FOA			
2	Equipment & Accessories Erection	Within 60 days from FOA			
3	Conduiting & Wiring Works	Within 60 days from FOA			
4	Cable Tray Installation	Within 60 days from FOA			
5	Cable Laying, Glanding & Termination	Within 60 days from FOA			
6	Installation Procedure of various TCP items at site	Within 60 days from FOA			
7	Soil Resistivity survey procedure	Within 60 days from FOA			
8	TCP Pre-commissioning & commissioning procedure	Within 60 days from FOA			
9	Installation Procedure of various CMS items at site	Within 60 days from FOA			



SCHEDULE OF SUBMISSION OF DOCUMENTS

APPENDIX-XIII TO PJS



Project Name: LAYING & CONSTRUCTION OF STEEL GAS PIPELINE AND TERMINALS ALONG WITH ASSOCIATED FACILITIES FOR SECTION-10 & 11 NORTH EAST GAS GRID
PHASE-III OF IGGL

Client: M/s IGGL.

Date of FOA

Contractor:

SL. NO.	DOCUMENT TITLE	SUBMISSION OF DOCUMENT			
Civil/ Structural/ Architectural Works					
1	Earth Work Excavation & Backfilling	Within 60 days from FOA			
2	Brick Masonary	Within 60 days from FOA			
3	Structural Steel Works	Within 60 days from FOA			
4	RCC Works	Within 60 days from FOA			
5	Pavement roads & drain works	Within 60 days from FOA			
6	Concrete weight coating	Within 60 days from FOA			
7	Installation of Steel/ Aluminium Doors, Windows and Ventilators	Within 75 days from FOA			
8	Plastering and Pointing	Within 75 days from FOA			
9	Sanitary Fittings	Within 75 days from FOA			
10	Plumbing & Drainage	Within 75 days from FOA			
11	Floor Finishing	Within 75 days from FOA			
12	Reinforcement	Within 60 days from FOA			
13	Bitumen Painting	Within 75 days from FOA			
14	PCC Works	Within 60 days from FOA			
15	ACC Masonary	Within 60 days from FOA			
16	Roof treatment	Within 75 days from FOA			



Date of FOA:

Client: M/s IGGL.

Contractor:

SL. NO.	ITEM	PURCHASE ORDER COPY	SUBMISSION OF DOCUMENTS	FIRST LOT RECEIVED AT SITE	BALANCE MATERIAL RECEIVED AT SITE	MINIMUM MATERIAL IN STOCK AT ANY TIME AFTER RECEIPT OF FIRST LOT	REMARKS
QAP							
1	Warning mesh	Within 30 days from FOA	Within 37 days from FOA	Within 60 days from FOA	Within 150 days from FOA	For a pipeline length of minimum 5 Kms	
2	HDPE Duct	Within 30 days from FOA	Within 37 days from FOA	Within 60 days from FOA	Within 150 days from FOA	For a pipeline length of minimum 5 Kms	
3	Insulator	Within 45 days from FOA	Within 60 days from FOA	Within 90 days from FOA	Within 180 days from FOA	For a pipeline length of minimum 5 Kms	
4	TCP material	Within 45 days from FOA	Within 60 days from FOA	Within 120 days from FOA	Within 180 days from FOA	For a pipeline length of minimum 5 Kms	
5	Stud, nuts and gaskets	Within 45 days from FOA	Within 60 days from FOA	Within 120 days from FOA	Within 150 days from FOA		
DESIGN APPROVALS							
1	TCP design approval	Within 45 days from FOA	Within 60 days from FOA				
2	HDD profile approval	Within 45 days from FOA	Within 90 days from FOA				
3	LR Bends Quantity approval	Within 30 days from FOA	Within 60 days from FOA	Within 120 days from FOA	Within 150 days from FOA		
CONSUMABLES							
1	Coating Sleeves	Within 30 days from FOA	Within 37 days from FOA	Within 45 days from FOA	Within 180 days from FOA		
2	Electrodes	Within 30 days from FOA	Within 37 days from FOA	Within 45 days from FOA			

Note: In case of delay in above mentioned schedule, Recovery shall be applied at the rate of INR 10,000 per Procedure/ Drawing/ QAP (as applicable) limiting to maximum INR 15,00,000.00 (15.0 Lacs). In case the Contractor achieves the contractual completion period for commissioning of the pipeline, the already deducted amount on account of delay in submission of documents shall be refunded.

22.0 STANDARD OPERATING PROCEDURE

**(Appendix-XIII to Particular Job
Specification of Work)**



STANDARD OPERATING PROCEDURE

LAYING NEW PIPELINE IN COMMON ROW PARALLEL TO EXISTING PIPELINES

1. Purpose:

Ensuring Safety and preventing damage to existing pipeline(s) during laying of new pipeline in Common ROW.

2. Scope:

This SOP attempts to define roles and responsibilities of the concerned construction in-charge from CLIENT, Contractor, PMC and concerned Process Owner of the ROW.

This SOP shall be applicable where the pipeline is being laid in common ROW, parallel to an existing pipeline —of all sizes; in operation including de-commissioned pipeline.

2.1 Exclusion:

This SOP shall not be applicable for abandoned pipeline sections in the existing ROW.

3. Different Kind of Activities:

1. ROW grading
2. Identification of existing pipeline (s)
3. Marking of existing pipeline (s)
4. Digging of Trench
5. Line Pipe Stringing
6. Welding and joint coating
7. Line Pipe Lowering
8. Back filling
9. Restoration of ROW

4. Roles and Responsibilities:

Roles and responsibilities of various stakeholders are as given below:

4.1 Construction in-charge: Construction in-charge from CLIENT shall be responsible to ensure compliance to the activities in the attached checklist by all concerned at all the time during execution of the Job in ROW.

4.2 PMC: Project Management Consultant being the EIC of the contract shall ensure compliance of the activities as defined in the checklist, by the contractor at all the time during execution of the Job in ROW.



4.3 Contractor: Contractor engaged for executing of pipeline laying activities, shall, at all the time, strictly comply and ensure the activities described in the attached checklist.

The Contractor shall be held responsible for any untoward incident due to not following the instructions contained in this SOP/Checklist.

4.4 Concerned Process Owner: Concerned Process Owner shall be responsible to ensure accurate marking of the existing pipelines and compliance to other activities as described in the checklist. Concerned Process Owner is also responsible to ensure that work is being carried out as per the permission given to Construction department.

5. Resource Requirement:

- a) GPS Device
- b) XYX report of Pigging of Existing Line, for Coordinates of existing Line which also shows if any leak clamps / repairs fixed on line, for precautions to be taken during excavation near to such locations.
- c) Repair history of Pipe Line after In Line inspection-Chainage wise (& GPS) details.
- d) Alignment sheets of Existing Pipe Line – Updated with Crossings permitted after laying of Line. All new crossings to be physically marked prior to start of job for additional precaution, to avoid damage to 3rd party.
- e) Coating Repair kit, in case of any coating damage to Existing coating during Excavation.
- f) Leak Clamp with Non-sparking tools; in case of line puncture during excavation /Leak observed during Excavation.
- g) Gas Leak Detector
- h) Fire extinguishers.
- i) Route maps of Existing Pipe Line.
- j) List of markers with chainage details of existing Line. (Latest report signed by P/L HOD of Existing line and Project in charge of new Line). For verification after completion of job.
- k) Pipeline Locator
 - l) Measurement Tape
- m) Tools for Digging
- n) Wooden Rods /Ranging Rods with red flags
- o) Nylon Rope / Warning Tape
- p) Lime Powder

6. Safety PPEs:

- a. Cotton dress
- b. Safety Shoes
- c. Cotton hand gloves
- d. Hard Helmet
- e. Specific PPEs used during Welding, NDT etc.

7. Do's and Don't's

As per enclosed checklist

8. Definitions:

Abandoned Pipeline: A pipeline which has been duly decommissioned after following proper procedure and scrapped & and not to be taken in operation in future.

De-commissioned Pipeline: A pipeline which has been taken out of service to carryout maintenance work etc.

Operational Area: Area of existing pipeline in ROW.

Concerned Process Owner: Process Owner in-charge or his authorized representative not below the rank of Manager.

9. Procedure:

Laying of new pipeline in common ROW parallel to exiting pipelines requires utmost care to be undertaken by all concerned.

Various activities as detailed below are to be ensured for compliance by following officials (as listed out):-

- i). CLIENT -Construction site I/C not below manager
- ii). CLIENT -Process Owner or his representative not below Manager
- iii). Project Management Consultant
- iv). Construction Contractor Site In-charge

Following steps are to be taken:

1. Identification of existing pipelines/Utilities running along the ROW completed with the help of pipe locator.
2. Marking of left and right side of ROW verified with reference to direction of flow and completed with boundary pillars.
3. Location of the existing lines marked with continuous lime powder wherever feasible and installation of wooden stick/ranging rod firmly grounded with at least 1.0 mtr clear height from ground level; with red flags at interval of 50 mtr completed.
4. Physical verification by manual digging check pit at a distance of 500 mtrs completed for confirmation of indicated location by pipe locator. All bends are to be physically identified.
5. Marking of working area boundary at a distance of atleast 1.5 mtrs from last existing pipeline/utility towards the proposed working side for new pipeline completed.
6. Clear distance of **3.0 mtr** between existing line and new line to be maintained.



7. Barricading by installation of wooden rods / ranging rods on working area boundary, at a distance of 2-3 mtrs & tied with nylon rope/ warning tape completed.
8. Briefing given to operators / supervisors for not crossing the barricading area and non-movement of heavy equipment over operational area.
9. ROW cleared for entry of equipments and pipeline laying activities.
10. Ensuring that the permissions / Work Permit have been taken from Process Owner / Other utility owners.
11. All risk regarding marking and barricading existing pipelines as enumerated at **annexure-I**, are assessed and mitigation measures ensured.
12. Ensure that Safety Work Permit has been obtained and there is a safety officer to oversee the requirements of safety measures / Fire Fighting equipment during execution of job.
13. A full time supervisor of executing agency with contact number identified who shall be primarily responsible under overall control by Construction Department for above during/ throughout the work execution.
14. Ensuring that all the requirements of Work permit have been **complied-on daily basis** before start of work.

Note:

- a) Joint Survey of the site by the team.
- b) Compliance to the requirements stipulated in Work Permit System.
- c) Refer the Checklist at **Annexure -1**.
- d) Make the complete checklist as part of Work Permit.



Annexure-1

CHECKLIST FOR LAYING NEW PIPELINE IN COMMON ROW PARALLEL TO EXISTING PIPELINES

1. To be filled prior to entry of any equipment in ROW.
2. Validity period not more than one Week.

PROJECT NAME:	Date:
SECTION:	Valid till:
CHAINAGE: From	To:

S.NO.	CHECK POINTS	Responsibility		
		Compliance	Ensure Compliance	
			Primary	Secondary
1.	Identification of existing Pipelines / Utilities running along the ROW completed with the help of pipe locator.	Contractor	PMC	CLIENT Construction / Process Owner
2.	Marking of left and right side of ROW verified with reference to direction of flow and completed with boundary pillars.	Contractor	PMC	CLIENT Construction / Process Owner
3.	Location of the existing lines marked with continuous lime powder wherever feasible and installation of wooden stick / ranging rod firmly grounded with atleast 1.0 mtr clear height from ground level; with red flags at interval of 50 mtr completed.	Contractor	PMC	CLIENT Construction / Process Owner
4.	Physical verification by manual digging check pit at a distance of 500 mtrs completed for confirmation of indicated location by pipe locator. All bends are to be physically identified.	Contractor	PMC	CLIENT Construction / Process Owner
5.	Marking of working area boundary at a distance of at least 1.5 mtrs from last existing pipeline / utility towards the proposed working side for new pipeline completed.	Contractor	PMC	CLIENT Construction / Process Owner
6.	Clear distance of 3.0 mtr between existing line and new line to be maintained.	Contractor	PMC	CLIENT Construction / Process Owner

7.	Barricading by installation of Wooden rods / ranging rods on working area boundary, at a distance of 2-3 mtrs & tied with nylon rope / warning tape completed.	Contractor	PMC	CLIENT Construction / Process Owner
8.	Briefing given to operators / supervisors for not crossing the barricading area and non-movement of heavy equipment over operational area.	Contractor	PMC	CLIENT Construction / Process Owner
9.	ROW cleared for entry of equipments and pipeline laying activities.	Contractor	PMC	CLIENT Construction / Process Owner
10.	Ensuring that the permissions / Work Permit have been taken from Process Owner / Other utility owners.	Contractor	PMC	CLIENT Construction / Process Owner
11.	All risk regarding marking and barricading existing pipelines as enumerated at annexure-1, are assessed and mitigation measures ensured.	Contractor	PMC	CLIENT Construction / Process Owner
12.	Ensure that Safety Work Permit has been obtained and there is a safety officer to oversee the requirements of safety measures / Fire Fighting equipment during execution of job.	Contractor	PMC	CLIENT Construction / Process Owner
13.	A full time supervisor of executing agency with contact number identified who shall be responsible for above checklist during/ throughout the work execution.	Contractor	PMC	CLIENT Construction / Process Owner
14.	Ensuring that all the requirements of Work permit have been complied- on daily basis before start of work.	Contractor	PMC	CLIENT Construction / Process Owner

Note: A typical line diagram for ready reference is attached.

Annexure- 2: Perceived risks related to Marking and Barricading of existing pipelines / Utilities in ROW

Construction Contractor	PMC	CLIENT -Construction site 1/C not below manager	CLIENT –Process Owner or his representative not
Sign:	Sign:	Sign:	Sign:
Name:	Name:	Name:	Name:
Date:	Date:	Date:	Date:

Ref.: SOP No.....Rev.0

Annexure-2

PERCEIVED RISK RELATED TO LAYING NEW PIPELINE IN COMMON ROW PARALLEL TO EXISTING PIPELINES

1. Possibility of damage to the existing pipelines/utilities due to –
 - a. Lack of awareness about exact location of existing pipelines/utilities.
 - b. Lack of awareness of impact of accidental damage to the existing pipelines / utilities.
 - c. Wrong marking of existing pipelines / utilities.
2. Turning points / bends may not be accurately located and marked.
3. Delay in construction in absence of clarity of ROW and unforeseen surprises if work area is not clearly marked.
4. Identification of responsible person to ensure adherence to SOP.

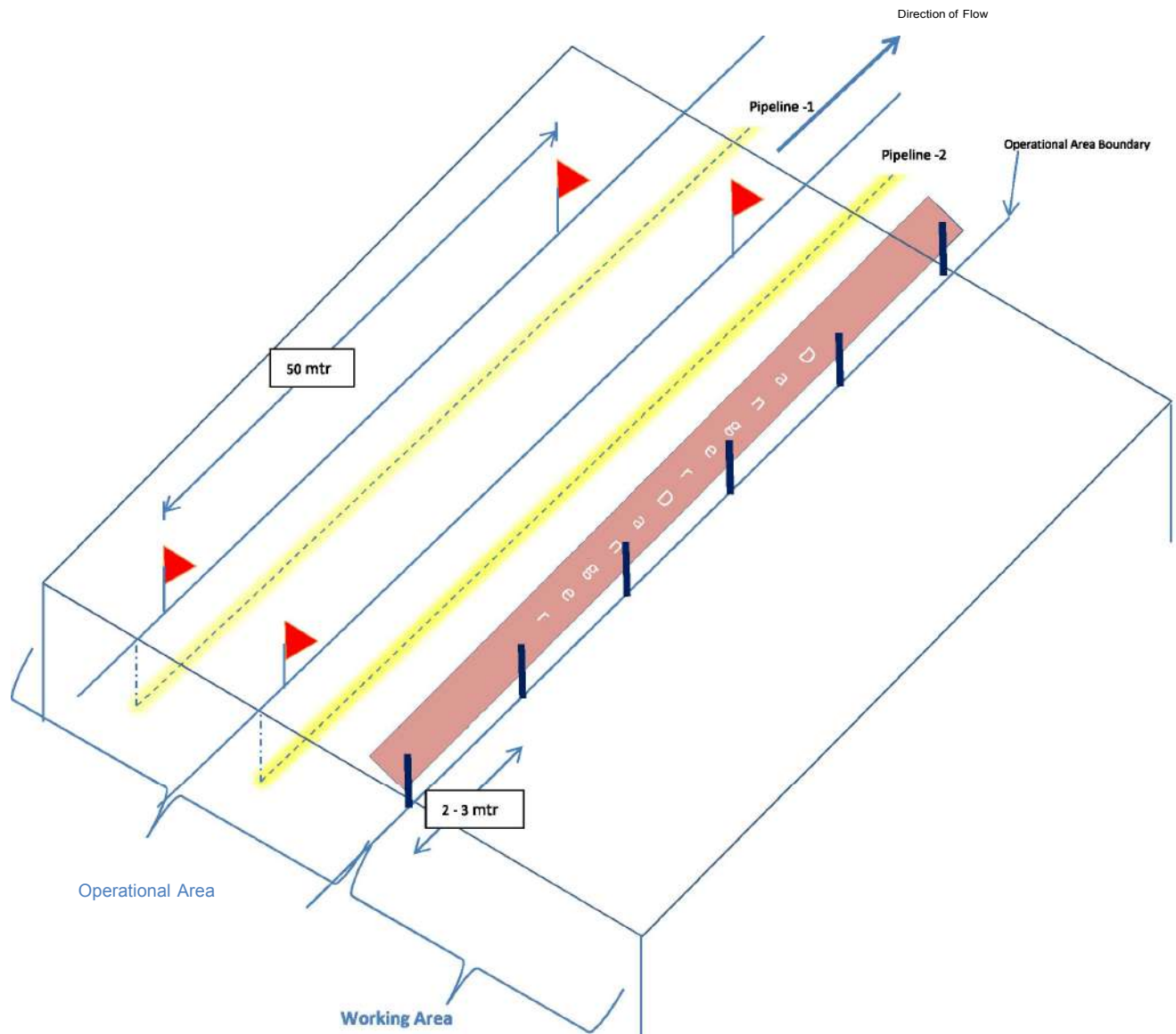


Figure 1A Typical Line Diagram for marking Operational Area

23.0 INSPECTION CATEGORIZATION PLAN

**(Appendix-XIV to Particular Job
Specification of Work)**

INSPECTION CATEGORISATION PLAN

Sl. No.	Item Description	Unit	Inspection Category TPIA	Inspection Category Contractor	Inspection Category PMC
1.0	Pipeline Works				
1.1	Electrode	Lot	N/A	C	C
1.2	Joint Coating Material	Lot	N/A	C	C
1.3	Casing Pipe	Mtrs.	N/A	C	C
1.4	Casing Insulator	Nos.	N/A	C	C
1.5	Casing End Seal	Nos.	N/A	C	C
2.0	Instrumentation Works				
2.1	Instruments (PG, TG, PT, TT, LEL Detectors, RTD etc)	Nos.	B	B/C	B/C
2.2	Instrument cables	Nos.	B	B/C	B/C
2.3	Control panel	Nos.	B	B/C	B/C
2.4	Cable Trays	Nos.	N/A	C	C
2.5	Junction Boxes , Cable Glands	Nos.	N/A	C	C
2.6	Tube Fittings , Tube manifolds	LS	N/A	C	C
2.7	Instrumentation Valves	Nos.	N/A	C	C
3.0	Telecom Works				
3.1	Jointing Closures	Nos.	N/A	B/C	C
3.2	Electronic Markers & Locators	Nos.	N/A	B/C	C
3.3	HDPE Duct and Accessories	Mtrs.	B	B/C	B/C
3.4	OFC	Drum	B	B/C	B/C
4.0	TCP				
4.1	CP Cables (1Cx6Sqmm, 1Cx10 Sqmm, 1Cx25Sqmm & 1Cx35 Sqmm)	Mtrs.	B	C	C
4.2	Test Stations (Big & Small Type)	Nos.	B	C	C
4.3	Sacrificial Mg & Zn Anodes	Nos.	B	C	C
4.4	Spark Gap Arrestor (100 kA)	Nos.	N/A	C	C
4.5	Polarisation Cell (Solid State)	Nos.	N/A	C	C

4.6	External ER Probe	Nos.	N/A	C	C
4.7	CTSU (Computerised Test Station Unit) & CTSU Reader	Nos.	B	C	C
4.8	Permanent Reference Cell	Nos.	B	C	C
4.9	Zinc Ribbon Anode	Mtr/Nos.	B	C	C
5.0	CMS				
5.1	ER Probe, Access Fitting Assembly For ER Probes	Nos.	B	C	C
5.2	Transmitter & Receiver	Nos.	B	C	C
5.3	Corrosion coupons, coupon holder, access fitting assembly for corrosion coupons	Nos.	B	C	C
5.4	Retriever Kit, Service Valve Kit	Nos.	B	C	C
6.0	Electrical				
6.1	PDB-1/2, I-E LDB, PP LDB, OLDB	Nos.	N/A	B	B
6.2	FLP Feeder Pillar (Structure mounted) for outdoor lighting	Nos.	N/A	C	C
6.3	Inverter with tubular battery	Nos.	N/A	C	C
6.4	Earthing material (Earth pit with GI Electrode/Cu plate Electrode, GI/Copper Strips, GI wire, GI Lightning rod, Advance Maintenance free earthing system)	Nos.	B	C	C
6.5	Power & Control Cables (HT & LT)	Mtrs.	B	B	C
6.6	Lighting fixtures (FLP & Non-FLP type)	Nos.	N/A	C	C
6.7	Street Light Pole (6Mtr height)	Nos.	B	C	C
6.8	High Mast & FLP Feeder pillar panel for High Mast	Set	B	C	C
6.9	Distribution Transformers (11/0.433kV)	Nos.	N/A	B	B
6.10	MCCB Enclosure – WP Outdoor type	Nos.	N/A	B	B
6.11	ACSR weasel conductor	Mtrs.	N/A	C	C
6.12	Ceiling/Wall mounted Fans, Exhaust Fans, Air conditioners,	Nos.	N/A	C	C

6.13	Welding socket	Nos.	N/A	C	C
6.14	Cable Tray	Mtrs.	N/A	C	C
6.15	First Aid box	Nos.	N/A	C	C
6.16	Carbon-di-oxide(CO2) type fire extinguisher	Nos.	N/A	C	C
6.17	Insulating Mat	Mtrs.	N/A	C	C
6.18	Telephone/LAN socket, LAN Switches	Nos.	N/A	C	C
6.19	Telephone/LAN/UTP cable	Nos.	N/A	C	C
6.20	AVR	Nos.	N/A	B	B

LEGEND:

- 1. A - Stage-wise Inspection + Final Inspection + Document Review as per approved ITP / MTC / QAP.**
- 2. B - Final Inspection + Document Review as per approved ITP / MTC / QAP.**
- 3. C - Document Review as per approved ITP / MTC / QAP.**

Notes:

- 1. TPIA – Third party inspection agency**
- 2. QAP shall be prepared by vendor / laying contractor and shall be submitted for approval.**
- 3. All materials to be procured from MECON approved vendor.**

VOLUME-I ANNEXURE I
(Temporary Cathodic Protection Works)



Energising Quality

PROJECT NUMBER: C221052



CATHODIC PROTECTION DESIGN BASIS

TOTAL SHEETS

13

DOCUMENT NO.

C221052

00

CP

DB

4002

Indradhanush Gas Grid Limited

NORTH EAST GAS GRID PHASE-III OF IGGL

C1	14.11.2022	ISSUED FOR Review	VV	RD	AA
REV	DATE	DESCRIPTION	PREP	CHKD	APPR

ABBREVIATION

IGGL	Indradhanush Gas Grid Limited (IGGL)
PNGRB	Petroleum and Natural Gas Regulatory Board
OISD	Oil Industry Safety Directorate
CEA	Central Electricity Authority
SEA	State Electricity Authority
BS	British Standards
ICCP	Impressed Current Cathodic Protection
PCP	Temporary Cathodic Protection
MEDB	Main Electrical Distribution Board
TCP	Temporary Cathodic Protection
HDD	Horizontal directional drilling
MLV	Main Line valve
CPPSM	Cathodic Protection Power Supply Module
3LPE	3-Layer Polyethylene
NACE	National Association of Corrosion Engineers
ASTM	American Society for Testing and Materials
CIPL	Close Interval Potential Logging
CPTRU	Cathodic Protection Transformer Unit
DCVG	Direct Current Voltage Gradient
IJ	Insulation Joint

 Energising Quality	CATHODIC PROTECTION DESIGN BASIS	Document No.	Rev
		C221052-00-CP-DB-4002	C1
		Page 2 of 13	

TABLE OF CONTENTS

1.0	DEFINITION.....	4
2.0	INTRODUCTION	4
3.0	PROJECT BRIEF	5
4.0	PIPELINE SIZE, LENGTH AND DESIGN CONDITIONS	6
5.0	SCOPE.....	7
6.0	STANDARDS	7
7.0	AREA CLASSIFICATION AND EQUIPMENT SELECTION.....	8
8.0	CATHODIC PROTECTION SYSTEM DESIGN	9
9.0	PROTECTION OF PIPELINE AT HT LINE CROSSING.....	10
10.0	CP AT CASED CROSSINGS	10
11.0	CATHODIC PROTECTION DESIGN CRITERIA.....	10
12.0	CABLING SYSTEM.....	11
13.0	STATUTORY APPROVAL	11
13.0	DRAWINGS AND DESIGN DOCUMENTS	12

 Energising Quality	CATHODIC PROTECTION DESIGN BASIS	Document No.	Rev
		C221052-00-CP-DB-4002	C1
		Page 3 of 13	

1.0 DEFINITION

Where used in this document, the following terms shall have the meanings indicated below, unless clearly indicated by the context to this order:

PROJECT	PMC Services for North East Gas Grid Phase-III OF IGGL.
OWNER	Indradhanush Gas Grid Limited
CONSULTANT	VCS Quality Services Private Limited (VCSQSPL) the party to act for and on behalf of the OWNER for the Engineering Services
VENDOR / MANUFACTURER	Party, which manufactures and supplies equipment and services to the OWNER or to CONTRACTOR .

2.0 INTRODUCTION

The Hydrocarbon vision 2030 for North East India (vision document), released by MoP&NG proposes detailed plan for Natural gas infrastructure development in North-East. The states covered in the vision document include Arunachal Pradesh, Assam, Manipur, Meghalaya, Mizoram, Nagaland, Sikkim and Tripura.

M/s Indradhanush Gas Grid Limited (IGGL), a Joint Venture of IOCL, ONGC, GAIL, OIL and NRL, is in the process of implementing the North East Gas Grid (NEGG) with a vision to connect all the eight (08) northeastern state capitals and major consumption centers in the region. The NEGG will be connected to National gas grid at Guwahati through Barauni-Guwahati pipeline (already under execution by M/s GAIL).

M/s IGGL intends to lay pipeline along with terminal works for section-10 & 11 which consist of 12" NB x 199.007 Km (approx.) in section-10 and 12" NB x 186 Km (approx.) in section-11 mainline. Main line taken from Siliguri DT to Gangtok RT in Section-11. Similarly in section-10 12" Main line taken from T point Jorhat to Dimapur DT to Sekmai gas Bottling plant RT Via IP station at Tadubi (Manipur).

The brief scope of work includes supply of materials (other than free issue), pipeline laying work including but not limited to Construction Management, HSE & Quality Management, Survey, ROU management, clearing of ROU, grading, stringing, bending, welding (Manual), trenching, joint coating, lowering, crossings, crossings by HDD (wherever specified), Tie-ins, NDT and destructive testing, backfilling, laying of pipeline along-with OFC & HDPE ducts, TCP works, site restoration, hydro-testing, dewatering, swabbing, drying, nitrogen purging (as applicable), pre-commissioning, commissioning and Gas-in of pipeline including construction / installation of related

 Energising Quality	CATHODIC PROTECTION DESIGN BASIS	Document No.	Rev
		C221052-00-CP-DB-4002	C1
		Page 4 of 13	

facilities like scraper launching / receiving facilities and all piping works at dispatch / receiving terminals, I.P. Stations and piping works at Sectionalizing valve stations, Tap-off station & Injection points, etc. including associated Mechanical, Cathodic protection, Corrosion monitoring works, Electrical works, Telecom works, Firefighting works, Instrumentation, Civil works (including boundary wall and building works), Architectural and Structural works at all stations, and Pipeline Information Management system. The scope of work has been divided into the following parts:

PROJECT TITLE: -SILIGURI-GANGTOK PIPELINE SECTION (SECTION-11)		
REF. SCHEMATIC DRAWING NO: -C221052-SGPL-PP-SCM-2001		
PART NO	SPREAD NO.	SCOPE OF WORK
PART-D1 (Length 44.2 km)	SPREAD-2B (Length 44.2 km)	Pipeline laying from Ch. 59+800 Km to Ch. 104+000 Km including associated works (Mechanical, Piping & Including Terminal works as per scope matrix) & One (01) SV stations.
PART-D2 (Length 46.3 km)	SPREAD-2C (Length 46.3 km)	Pipeline laying from Ch. 104+000 km to Ch. 150+300 Km. Intermediate Pigging Station (IP station) Lava, West Bengal at Ch. 128+000 Km including associated works (Mechanical, Piping & Terminal works) at Two (02) SV stations.

Note: Chainage shown above are tentative and for reference purpose only, there may be change in Chainage shown as per site condition during execution

3.0 PROJECT BRIEF

Summary of various stations envisaged in the proposed North East Gas Grid Phase-III of IGGL are as under:

A) SILIGURI – GANGTOK PIPELINE (SGPL)

Sr. No	Type of Station	Nos.	Location
1	Dispatch Terminal (DT / SGPL)	0	-----
2	Intermediate Pigging Station (IP/SGPL/01)	1	Tentatively at Lava
3	Receipt Terminal (RT/SGPL) with/ without Tap off	0	-----
4	Sectionalizing Valves with/without Tap off	3	Along the Siliguri-Gangtok route

 Energising Quality	CATHODIC PROTECTION DESIGN BASIS	Document No.	Rev
		C221052-00-CP-DB-4002	C1
		Page 5 of 13	

4.0 PIPELINE SIZE, LENGTH AND DESIGN CONDITIONS

A. SILIGURI GANGTOK PIPELINE

Spread	Approx. Length	DT/RT	SV	IP
Spread 2B	44.2 KM	0	1	0
Spread 2C	46.3 KM	0	2	1

4.1 Multi Products Pipeline Details

- A) Design Pressure: 92kg/Cm²
- B) Design Temperature; -29° TO +65°C
- C) Pipeline Size: - 12" (89.6KM).
- D) Pipeline Material: - API 5L Gr. X 70 PSL 2
- E) Pipeline Wall Thickness; -7.14mm / 8.38 mm
- F) Pipeline Total Length (APPROX.): - 90.5 Km (Approx.)
- G) Pipeline Corrosion Coating; - 3LPE (EXTERNAL

4.2 SITE CONDITIONS

Parameters	
Max / Min. Temperature	50/-5 °C
Design Temperature	50°C
Relative Humidity	95%
Altitude above Sea level	Up to 1000 Meters
Atmospheric pollution	Designed to withstand the site conditions, dust, vapour, Industrial Gases
Hazardous Area classification	Zone-2, Gas group IIA, IIB,
Control Room/ Electrical room/ D.G. Room/Guard	Safe area

 Energising Quality	CATHODIC PROTECTION DESIGN BASIS	Document No.	Rev
		C221052-00-CP-DB-4002	C1
		Page 6 of 13	

5.0 SCOPE

The scope of the document is to describe the basic information and design criteria which will be used for “PMC Services for North East Gas Grid Phase-III of IGGL.”.

The scope of specification shall provide the minimum requirements & form the basis for carrying detailed design engineering for CP system, sizing of various CP equipment's, their supply, installation, testing & commissioning of the Electrical system for New Pipeline & associated facility. This document also provides the general guidelines for preparation of CP specification, datasheets and other relevant documents.

In case of conflicting requirement of tender documents, following priority shall govern in general. However, in case of conflict, it shall be referred to Client for clarifications and decision of Client shall be final and binding with or without any cost implications (as per project scope)

- The requirements of any statutory body shall govern.
- Data Sheets
- This specification / Basis of design
- SOW and SOR
- Latest Code & Standards

6.0 STANDARDS

6.1 Cathodic Protection (CP) equipment and system design, manufacture, testing, installation and commissioning will comply with all latest applicable standards-

ASTM B418	Cast and Wrought Galvanic Zinc Anodes.
ASTM G57	Field Measurement of Soil Resistivity Using the Wenner Four-Electrode Method.
NACE SP0169	Control of external corrosion of underground or submerged metallic piping systems.
NACE SP0177	Mitigation of Alternating current and Lightning Effects on metallic structures and Corrosion control systems.
NACE SP0286	The electrical isolation of cathodically protected pipelines.
IS1554 Part-1	Specification for PVC insulated (heavy duty) electrical cables.
IS 694	Specification for PVC insulated cables.
IS: 8062	Cathodic Protection of Buried Pipeline/Structure for transportation of

 Energising Quality	CATHODIC PROTECTION DESIGN BASIS	Document No.	Rev
		C221052-00-CP-DB-4002	C1
		Page 7 of 13	

	Natural Gas, Oil & Liquids - Code of Practice".
NACE Publication 10A190	Measurement techniques related to criteria for CP of Underground or Submerged steel piping system (As defined in NACE standard RP0169-83)
NACE SP0572	Standard Practice for Design, Installation & Operation of Impressed Current Deep Ground beds
BS 7361 Part I	Code of Practice for Cathodic Protection for land and Marine applications
IS: 7098 Part I	XLPE insulated cables
NACE TM 0497	Measurement Techniques Related to Criteria for Cathodic Protection on Underground or Submerged Metallic Piping Systems
A.W. PEABODY	Book on control of pipeline corrosion

6.2 In case of imported equipment standards of the country of origin shall be applicable if these standards are equivalent or stringent than the applicable Indian standards.

6.3 The equipment shall also conform to the provisions of Indian Electricity rules and other statutory regulations currently in force in the country.

7.0 AREA CLASSIFICATION AND EQUIPMENT SELECTION

Classification of hazardous areas will be in accordance with API 500 and IS:5572. Following factors will be considered for selection of electrical equipment for use in hazardous area

Area Classification	Zone - 1 / Zone - 2
Gas Group	IIA and IIB

7.1 All electrical equipment installed in hazardous areas will be selected as per IS:5571.

7.2 All the electrical equipment for hazardous areas shall be of Ex-d type suitable for temp classification T3.

7.3 All electrical equipment for hazardous areas will be certified by PESO or equivalent independent testing agency.

Design Life of TCP System will be for at least two (2) Years considering the schedule of PNGRB for particular line or till the commissioning of PCP system whichever is later.

 Energising Quality	CATHODIC PROTECTION DESIGN BASIS	Document No.	Rev
		C221052-00-CP-DB-4002	C1
		Page 8 of 13	

8.0 CATHODIC PROTECTION SYSTEM DESIGN

8.1 Temporary Cathodic Protection (TCP) system

A	Type	Sacrificial
B	Design life	2 Year or till commissioning of PCP
C	Pipeline Coating	3LPE
D	Protective current densities	As mentioned in Table 1
E	Anode material (TCP)	Sacrificial Mg/Zn (Low potential as per specifications)
F	Electrical resistance probes	Shall be provided as per specifications
G	Polarization Cell	Solid state type (shall be provided as Per specifications)
H	Polarisation coupons	Shall be provided as per specification/scope of work
a	Size of exposed area of coupon	25mm X 25mm in housing of 100mmX100mm (as per requirement of NACE SP:104:2014)
b	No. of coupons & magnetic devised with reed switch	As per scope of work. Location To be decided by CP contractor in consultation with owner/consultant
c	Proposed location of E/R Probes/Polarisation Coupons	To be decided by CP Contractor during detail engineering in Consultation with owner/consultant
I	No. of test stations	At an average distance of 1km interval along the pipeline ROW and additional test stations as per specification. TLP/TS should be concrete/non-metallic pillar

TCP Pipeline Protection current density

Table#1

f Pipeline surrounding Resistivity	Minimum Protection current density* @30 deg C
	Temporary CP ($\mu\text{A}/\text{m}^2$)
Normal Soil (10-100 $\Omega\text{-M}$)	25
Marshy Area/ HDD (<10 $\Omega\text{-M}$)	50
High Resistivity Area (more than 100 $\Omega\text{-M}$.Resistivity)	15

Pipe to Soil "ON" potential shall not be more negative than (-)1.2V during TCP.

*Actual current density to be adopted shall be decided based upon soil and other environmental conditions, proximity of foreign pipelines and structures affecting interference. Where considered necessary for satisfactory protection of pipeline the current density shall be suitably increased by contractor. Where operating

 Energising Quality	CATHODIC PROTECTION DESIGN BASIS	Document No.	Rev
		C221052-00-CP-DB-4002	C1
		Page 9 of 13	

temperatures of U/G pipeline is above 30°C, such as CP Stations located near Compressor stations, protection Current Density shall be increased in minimum by 25% for every 10°C rise in temperature over 30°C up to a temperature of 60°C

9.0 PROTECTION OF PIPELINE AT HT LINE CROSSING

Where high voltage (66 KV and above) transmission line runs in parallel or crosses the pipeline, the pipeline shall be grounded through polarisation cells of suitable rating (solid state) & zinc anodes of minimum 20 kg net wt. each. Grounding shall be done at regular intervals of maximum 1 km where transmission lines run parallel within 25 meter of the pipeline or as resulted from interference study & mitigation report to ground any surges on the pipeline that would appear in case of transmission line faults.

Pipeline Interference study shall be carried out by modeling software's for short term and long term interferences for safe touch & step potentials along with AC corrosion study.

If any AC interference is observed along the pipeline due to low voltage electric lines, its mitigation will be carried out by means of earthing of pipeline through polarization cell has also been considered grounding to be used to eliminate Inter Anode Current flow. Galvanic Anode design consider the consumption rate, capacity & efficiency shall be as per code & engineering standard.

10.0 CP AT CASED CROSSINGS

10.1 Bare casing is always recommended with selecting higher thickness allowance as per API 1102.

10.2 Casing filler shall be avoided and use of bentonite shall be avoided.

10.3 If possible casing shall be avoided for crossings (Trench less methods shall be used for it).

11.0 CATHODIC PROTECTION DESIGN CRITERIA

11.1 Cathodic Protection Design Criteria

- a) Cathodic protection system shall be designed to meet the following criteria:
- b) The pipe to soil potential measurements shall be between (-) 850 mV (Off) & (-) 1180 mV (Off) polarized potentials with respect to a copper/ copper sulphate reference electrode.
- c) In rare circumstances a minimum polarisation shift of (-) 100 millivolts of cathodic polarization between the structure surface & a stable reference electrode shall indicate adequate levels of cathodic protection for the pipeline. The formation or decay of this polarisation can be measured to satisfy this criterion.

 Energising Quality	CATHODIC PROTECTION DESIGN BASIS	Document No.	Rev
		C221052-00-CP-DB-4002	C1
		Page 10 of 13	

Discretion to use any of the criteria listed above shall solely rest with the owner/ owner's representative.

- A positive potential swing of 50 to 100 mill volts shall be considered as sufficient to indicate the presence of an interaction situation (i.e. Interference on the pipeline) requiring investigation and incorporation of mitigation measures by the CONTRACTOR.

11.2 CP Cables

TCP Cables

TCP Cables shall be annealed high conductivity, tinned, stranded copper conductor, XLPE insulated 650/1100 V grade, armoured/un-armoured, PVC sheathed. The size of the copper conductor shall be 6 sq mm for anode cable from anode to buried junction box, 10 sq mm from junction box to test station, 10mm² from test station to pipeline. The size of the conductor shall be 6 sq mm for potential measurement, 10 sq.mm for current measurement and 25mm² for bonding, polarization cell / grounding cell/Earthing and surge diverter connection purpose. The anode cable from anode to junction box (buried) shall be unarmoured. The length of anode tail cable shall be sufficient enough to reach junction box (buried) in case of temporary CP anodes and up to test station in case of permanent CP sacrificial anodes. PE Sleeves shall be provided for unarmoured cables

Note- Underground buried junction box shall be provided only at locations where morethan two (02) nos. of anodes required for the pipeline protection.

12.0 CABLING SYSTEM

Cable laying philosophy

- A. Paved area: Cable tray/RCC trench
- B. Unpaved area: Directly buried with sand cushioning and brick covered, warningtape and cable marker.
- C. Type of cable trays: Galvanized prefabricated

13.0 STATUTORY APPROVAL

The submission of application on behalf of the Owner to Govt. Authority/ Central Electricity Authority, if required along with copies of required certificates complete in all respects, shall be done by the contractor well ahead of time so that the actual commissioning of are not delayed for want of approval from authority. The actual inspection of work by the Govt. inspector shall be arranged by the Contractor and necessary coordination and liaison work in this respect shall be the responsibility of the contractor. However, any fee paid to the Govt. Authority in this regard shall be reimbursed by the Owner on submission of bills with documentary evidence.

 Energising Quality	CATHODIC PROTECTION DESIGN BASIS	Document No.	Rev
		C221052-00-CP-DB-4002	C1
		Page 11 of 13	

The Inspection and acceptance of the work as above shall not absolve the Contractor from any of responsibilities under this contract.

13.0 DRAWINGS AND DESIGN DOCUMENTS

The following documents shall be submitted along with the offer:

- a) Filled up data sheet/Checklist.
- b) HSE Policy
- c) Bar Charts & Project completion schedule
- d) QAP
- e) Approx. dimensions of the system
- f) Catalogues for CP units, MMO & Sacrificial Anodes, polarization cells, spark gap arrestors, ER Probe, reference cells etc.

13.1 The following drawings (in three sets) & documents shall be submitted for approval within 3 weeks of award of contract.

- a) Various Procedures of CP system Installation Like- Soil survey (TCP), Thermit weld, Pin Brazing, Sacrificial anode (Zn/Mg/Ribbon) installations, Test stations installation, Cable laying, Installation of polarization cell, External ER probe, Surge diverter & grounding cell, connection & sealing of sacrificial anode, Earthing of above ground pipeline etc.
- b) Soil survey report and chemical analysis with marked location vulnerable area.
- c) QA & QC Procedures.
- d) List of two years operation and maintenance spare.
- e) Basis of system design and design calculations, equipment selection criteria and sizing calculations, formulae used.
- f) Detailed design calculations of TCP system (Complete Design Package).
- g) Equipment layout, Cable layout & schedule.
- h) Colour code identification for the various CP System cables used in the system.
- i) Procedure for field testing, pre-commissioning & commissioning of TCP.
- j) Procedure for Monitoring & maintenance of CP system.
- k) TLP's installation & erection details drawings.
- l) G.A. of TR/CPPSM unit.
- m) Schematic
- n) Wiring diagram for reference.
- o) Tentative Bill of Material

13.2 After the job completion, contractor shall prepare AS-BUILT drawings/data sheets and documents, submit catalogues/manuals

 Energising Quality	CATHODIC PROTECTION DESIGN BASIS	Document No.	Rev
		C221052-00-CP-DB-4002	C1
		Page 12 of 13	

(O&M) of major brought out items. Final certified as built drawings, documents and manuals etc. shall be submitted by the contractor to owner in bound volume with one set in soft copy (CD) plus five sets of prints to owner & one set to VCS.

Other drawings and documents shall be submitted by contractor along with AS-BUILT Drawings/Datasheets-

- a) Test documents & drawings for bought out items.
- b) Detailed commissioning report of pipeline CP system (Both TCP).

 Energising Quality	CATHODIC PROTECTION DESIGN BASIS	Document No.	Rev
		C221052-00-CP-DB-4002	C1
		Page 13 of 13	



Energising Quality

PROJECT NUMBER: C221052



TCP SCOPE OF WORK

TOTAL SHEETS

20

DOCUMENT NO.

C221052

00

CP

SOW

4002

INDRADHANUSH GAS GRID LIMITED

NORTH EAST GAS GRID PHASE-III OF IGGL

C1	14.11.2022	ISSUED FOR REVIEW	VV	RD	AA
RE V	DATE	DESCRIPTION	PREP	CHKD	APPR

ABBREVIATION

IGGL	Indradhanush Gas Grid Limited (IGGL)
PNGRB	Petroleum and Natural Gas Regulatory Board
OISD	Oil Industry Safety Directorate
CEA	Central Electricity Authority
SEA	State Electricity Authority
BS	British Standards
ICCP	Impressed Current Cathodic Protection
PCP	Temporary Cathodic Protection
MEDB	Main Electrical Distribution Board
TCP	Temporary Cathodic Protection
HDD	Horizontal directional drilling
MLV	Main Line valve
CPPSM	Cathodic Protection Power Supply Module
3LPE	3-Layer Polyethylene
NACE	National Association of Corrosion Engineers
ASTM	American Society for Testing and Materials
CIPL	Close Interval Potential Logging
CPTRU	Cathodic Protection Transformer Unit
DCVG	Direct Current Voltage Gradient
IJ	Insulation Joint

 Energising Quality	TCP SCOPE OF WORK	Document No.	Rev
		C221052-00-CP-SOW-4002	C1
		Page 2 of 35	

TABLE OF CONTENTS

1.0	DEFINITION.....	4
2.0	PROJECT BRIEF	5
3.0	PIPELINE SIZE, LENGTH AND DESIGN CONDITIONS.....	6
4.0	SCOPE.....	7
5.0	TIME SCHEDULE	8
6.0	STANDARDS	9
7.0	GUARANTEE	10
8.0	SCOPE OF WORK (SUPPLY, INSTALLATION, TESTING & COMMISSIONING) GENERAL 10	
9.0	TEMPORARY CATHODIC PROTECTION SYSTEM	11
10.0	TENTATIVE BILL OF MATERIAL	16
11.0	OTHER MISCELLANEOUS WORKS	17
12.0	WORK CONTRACT	18
13.0	SCOPE OF SUPPLY	18
14.0	STATUTORY APPROVAL OF WORKS	19
15.0	QUALITY ASSURANCE, INSPECTION AND TESTING	19
16.0	TESTING & COMMISSIONING	20
17.0	DRAWINGS, STANDARD SPECIFICATION AND INSTALLATION STANDARDS	21
18.0	DRAWINGS FOR TENDER PURPOSE ENCLOSED WITH CONSTRUCTION TENDER... 22	
19.0	SURVEY DRAWINGS/ DETAILS.....	23
20.0	RESOURCES FACILITIES	23
21.0	PROJECT SCHEDULING & MONITORING	23
22.0	PROJECT REVIEW MEETINGS	24
23.0	PROGRESS REPORTING PROFORMA	25
24.0	PROGRESS REPORTS	26
25.0	CONSTRUCTION	26
26.0	RULES & REGULATIONS.....	27
27.0	PROCEDURES.....	27
28.0	FIELD INSPECTION.....	27
29.0	ERECTION AND INSTALLATION.....	27
30.0	CONSTRUCTION AIDS, EQUIPMENT, TOOLS & TACKLES.....	28
31.0	ORDER OF WORKS/PERMISSIONS/RIGHT OF ENTRY/CARE OF EXISTING SERVICES 28	

 Energising Quality	TCP SCOPE OF WORK	Document No.	Rev
		C221052-00-CP-SOW-4002	C1
		Page 3 of 35	