

فعالیت های رو زمینی در بسته های کاری تحت الارض

عمومي و مشترك



شماره پیمان:

.04 - . 14 - 9114

PIPING MATERIAL SPECIFICATION									
پروژه	بسته کاری	صادر کننده	تسهيلات	رشته	نوع مدرك	سر يال	نسخه		
BK	SSGRL	PEDCO	110	PI	SP	0001	D02		

شماره صفحه: ۱ از ۱۳

طرح نگهداشت و افزایش تولید ۲۷ مخزن

PIPING MATERIAL SPECIFICATION

نگهداشت و افزایش تولید میدان نفتی بینک

Rev.	NOV. 2021 Date	IFC Purpose of Issue/Status	H. Shahrokhi Prepared by:	M.Fakharian Checked by:	M.Mehrshad Approved by:	CLIENT Approval
200	NOV. 2021	IFC	H. Shahrokhi	M.Fakharian	M.Mehrshad	
D00						
D01	MAR. 2022	IFA	A.Khosravi	M.Fakharian	M.Mehrshad	
D02	SEP. 2022	AFD	M.Noori	M.Fakharian	M.Mehrshad	

Status:

IDC: Inter-Discipline Check IFC: Issued For Comment IFA: Issued For Approval AFD: Approved For Design AFC: Approved For Construction AFP: Approved For Purchase AFQ: Approved For Quotation IFI: Issued For Information AB-R: As-Built for CLIENT Review

AB-A: As-Built -Approved



· ۵۳ - · ۷۳ - 9 1 1 4

نگهداشت و افزایش تولید میدان نفتی بینک

فعالیت های رو زمینی در بسته های کاری تحت الارض

عمومي و مشترك







شماره صفحه: ۲ از ۱۳

REVISION RECORD SHEET

PAGE	D00	D01	D02	D03	D04
	X	Х	X	-	
1 2	X	X	X	 	
3	X X X				
4	X				
5	Х				
6	X X X X X X				
7	X				
8	X				
9	X	V			
10	+ \	Х			
11	X	Х	Х		
12 13	X				
14	X				
15	X X X				
16	Χ				
17	X				
18	Х				
19	1			ļ	
20				<u> </u>	
21					
22					
23 24	1				
25					
26					
27					
28					
29					
30					
31					
32					
33	+				
34 35	1				
36					
37					
38					
39					
40					
41					
42	-				
43	+			1	
44	+			1	
45 46	+				
46 47	1			†	
48	1				
49	İ			İ	
50					
51					
52					
53	-				
54	+			1	
<u>55</u>	+			 	
56 57	+			 	
57 58	+			†	
59	†				
60	1			1	
61					
62					
63					
64					
65		l		1	ı

PAGE	D00	D01	D02	D03	D04
66					
67 68					
69					
70 71			1		
72					
73			-		
74 75					
76					
77					
78 79					
80					
81 82					
82 83					
84					
85 86			1		
87					
88					
89 90					
91					
92					
93 94					
95					
96					
97 98					
99					
100 101					
102					
103					
104 105					
106					
107					
108 109					
110					
111	-		-		
112 113					
114					
115 116	1		1		
117					
118					
119 120	1		1		
121					
122					
123 124			 		
125					
126					
127 128			 		
129					
130					



فعالیت های رو زمینی در بسته های کاری تحت الارض





شماره پیمان:

.04 - . 14 - 9114

PIPING MATERIAL SPECIFICATION									
پروژه	بسته کاری	صادر کننده	تسهيلات	رشته	نوع مدرك	سر يال	نسخه		
BK	SSGRL	PEDCO	110	PI	SP	0001	D02		

شماره صفحه: ۳ از ۱۳

TABLE OF CONTENTS

1.0	INTRODUCTION	. 4
2.0	SCOPE	5
3.0	NORMATIVE REFERENCES	5
4.0	ABBREVIATIONS	6
5.0	PIPING COMPONENTS	8
6.0	GENERAL TESTING REQUIRMENTS	10
7.0	PIPING AND PIPELINE CLASSES	10
8.0	CLASS DESCRIPTION	13



.04 - . 14 - 9114

نگهداشت و افزایش تولید میدان نفتی بینک

فعالیت های رو زمینی در بسته های کاری تحت الارض

عمومي و مشتر ك







شماره صفحه: ٤ از ١٣

1.0 INTRODUCTION

شماره پیمان:

Binak oilfield in Bushehr province is a part of the southern oilfields of Iran, is located 20 km northwest of Genaveh city.

With the aim of increasing production of oil from Binak oilfield, an EPC/EPD Project has been defined by NIOC/NISOC and awarded to Petro Iran Development CLIENT (PEDCO). Also PEDCO (as General Contractor) has assigned the EPC-packages of the Project to "Hirgan Energy - Design and Inspection" JV.

As a part of the Project, construction of well location, access roads, wellhead facilities for 6 new wells (with electric power supply for 2 of them) and required modifications on 4 workover wells (with electric power supply) shall be done. In addition, construction of 6 new flowlines from new wells to Binak B/C unit (with extension of relevant manifold) are in the Project scope of work.

GENERAL DEFINITION

The following terms shall be used in this document.

CLIENT: National Iranian South Oilfields CLIENT (NISOC)

PROJECT: Binak Oilfield Development - Construction of New Well

Locations, Modifications on Workover Wells, Wellhead Facilities, Electrification Facilities, Flowlines and Extension

of Binak B/C Manifold

EPD/EPC CONTRACTOR (GC): Petro Iran Development Company (PEDCO)

EPC CONTRACTOR: Joint Venture of : Hirgan Energy – Design & Inspection (D&I)

Companies

VENDOR: The firm or person who will fabricate the equipment or

material.

EXECUTOR: Executor is the party which carries out all or part of

construction and/or commissioning for the project.

THIRD PARTY INSPECTOR (TPI): The firm appointed by EPD/EPC CONTRACTOR (GC) and

approved by CLIENT (in writing) for the inspection of goods.

SHALL: Is used where a provision is mandatory.

SHOULD: Is used where a provision is advisory only.

WILL: Is normally used in connection with the action by CLIENT

rather than by an EPC/EPD CONTRACTOR, supplier or

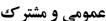
VENDOR.

MAY: Is used where a provision is completely discretionary.



فعالیت های رو زمینی در بسته های کاری تحت الارض

عمومي و مشتر ک







شماره صفحه: ٥ از ١٣

2.0 **SCOPE**

.04 - . 14 - 9114

The purpose of this specification is to supplement the requirements for BINAK new wellhead facilities and manifold extension.

NORMATIVE REFERENCES 3.0

API 6FA

3.1 LOCAL CODES AND STANDARDS

IPS-E-TP-350(1) **Engineering Standard for Linings** Material and Equipment Standard for Valves IPS-M-PI-110(1) Material Standard for Flanges and Fittings IPS-M-PI-150(2) Material and Equipment Standard for Line Pipe IPS-M-PI-190(3) **Engineering Standard for Onshore** IPS-E-PI-140(1) **Transportation Pipelines Engineering Standard for Piping Material** IPS-E-PI-221(1) Selection Engineering Standard for Plant Piping System IPS-E-PI-240(2)

3.2 INTERNATIONAL CODES AND STANDARDS

ASME B1.20.1 Pipe Threads General Purpose (Inch) Steel Pipe Flanges And Flanged Fittings **ASME B16.5** Factory-Made Wrought Steel Buttwelding Fittings **ASME B16.9** Face To Face And End To End Dimension Of Valve **ASME B16.10** Forged Steel Fittings, Socket Welding And **ASME B16.11** Threaded Nonmetallic Flat Gaskets For Pipe Flanges **ASME B16.21 ASME B16.25 Butt-Welding Ends ASME B16.34** Steel Valves, Flanged And Buttwelding Ends Steel Line Blanks **ASME B16.48 ASME B18.2.1** Square And Hex. Bolts And Screws, Inch Series Square And Hex. Nuts **ASME B18.2.2 Process Piping ASME B31.3** Pipeline Transportation Systems for Liquid **ASME B31.4** Hydrocarbons and Other Liquids Specification For Line Pipe API 5L Pipeline Valves API 6D Steel Plug Valves, Flanged Or Buttwelding Ends **API 599** Steel Gate Valves, Flanged And Buttwelding **API 600 Ends** Metallic Gaskets For Piping, Double-Jacketed, **API 601** Corrugated And Spiral Wound Compact Steel Gate Valves **API 602**

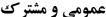
Specification for Fire Test For Valves

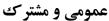


.04 - .14 - 4146

نگهداشت و افزایش تولید میدان نفتی بینک

فعالیت های رو زمینی در بسته های کاری تحت الارض









۱۳	از	٦:	صفحه	شماره	

• API 608	Metal Ball Valves-Flanged, Threaded, and Welding End
• BS-1868	Flanged And Butt-Welding Ends Steel Check Valves For Petroleum And Petrochemical Industries
• BS-1873	Flanged And Butt-Welding Ends Steel Globe Valves For Petroleum And Petrochemical Industries
• BS EN ISO 17292	Metal ball valves for petroleum, petrochemical and allied industries
• BS EN ISO 15761	Steel gate, globe and check valves for sizes DN 100 and smaller, for the petroleum and natural gas industries
• BS 6775 (PART 2)	Testing Of Valve Specification For Fire Type Testing Requirement
MSS SP-83	Class 300 and 6000 pipe unions, socket welding and threaded
MSS SP-80	Bronze Gate, globe angle and check valves
MSS SP-95	Swage Nipples And Ball Plugs
MSS SP-97	Forged Carbon Steel Branch Olet Fittings
• MSS SP-120	Ball Valves Threaded, Socket-Welding, Solder Joint, Grooved and Flared Ends
 ANSI/NACE MR0175/ ISO 15156 	Petroleum And Natural Gas Industries - Materials For Use In H2S Containing Environments In Oil And Gas Production

3.3 THE PROJECT DOCUMENTS

BK-GNRAL-PEDCO-000-PR-DC-0001 Process Design Criteria Piping Wall Thickness Calculation BK-SSGRL-PEDCO-110-PI-CN-0001 BK-SSGRL-PEDCO-110-PI-RT-0001 Piping Corrosion Study Material Selection Report

3.4 **ENVIRONMENTAL DATA**

Refer to "Process Basis of Design; Doc. No. BK-GNRAL-PEDCO-000-PR-DB-0001"

3.5 ORDER OF PRECEDENCE

In case of any conflict between the contents of this document or any discrepancy between this document and other project documents or reference standards, this issue must be reported to the CLIENT. The final decision in this situation will be made by CLIENT.

ABBREVIATIONS 4.0

#: **CLASS**

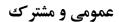
A/G: **ABOVE GROUND**



ECC:

نگهداشت و افزایش تولید میدان نفتی بینک

فعالیت های رو زمینی در بسته های کاری تحت الارض





شماره پیمان:		PIPING MATERIAL SPECIFICATION							
· ۵۳ – • ۷۳ – 9 ۱ ۸ ۴	پروژه	بسته کاری	صادر کننده	تسهيلات	رشته	نوع مدرك	سر يال	نسخه	شماره صفحه: ۷ از ۱۳
· · · · · · · · · · · · · · · · · · ·	BK	SSGRL	PEDCO	110	PI	SP	0001	D02	

ECCENTRIC

ASB: ASBESTOS

BB: BOLTED BONNET

BC: BOLTED COVER

BE: BEVEL ENDS

BLE: BEVELED LARGE END

BW: BUTT WELDING

C.A: CORROSION ALLOWANCE

CONC : CONCENTRIC

CS: CARBON STEEL

FB: FULL BORE

FLGD: FLANGED

FR: FLAT RING

GJ.: GASKET JOINT

GO: GEAR OPERATED

GR.: GRADE

HEX: HEXAGONAL

HO: HANDWHEEL OPERATED

LR: LONG RADIUS

MO: MOTOR OPERATED

NB: NOMINAL BORE

NPS: NOMINAL PIPE SIZE

NPT: NOMINAL PIPE THREAD

OS&Y: OUTSIDE SCREW & YOKE

PBE: PLAIN BOTH END

PSE: PLAIN SMALL END

PTFE: POLYTETRAFLUOROETHYLENE

RB: REDUCED BORE

RED: REDUCER/REDUCING

RF: RAISED FACE

S.S.: STAINLESS STEEL



فعالیت های رو زمینی در بسته های کاری تحت الارض

عمومي و مشترك



- ۵۳ –	٠٧٣ —	9114	

شماره پیمان:

PIPING MATERIAL SPECIFICATION									
پروژه	بسته کاری	صادر کننده	تسهيلات	رشته	نوع مدرك	سر يال	نسخه		
BK	SSGRL	PEDCO	110	PI	SP	0001	D02		

شماره صفحه: ۸ از ۱۳

SB: SCREWED BONNET

SCH: SCHEDULE SCR'D: SCREWED

SF: SERRATED FINISH
SG: SCREWED GLAND

SMLS: SEAMLESS

SPW: SPIRAL WOUND

STD: STANDARD

SW: SOCKET WELDING

TBE: THREADED BOTH ENDS

THK: THICKNESS

THRD: THREADED

TLE: THEREADED LARGE END

TR: TRIM

TSE: THEREADED SMALL END

UB: UNION BONNET
W.T: WALL THICKNESS
WB: WELDED BONNET

WN: WELDING NECK

XS: EXTRA STRONG

XXS: DOUBLE EXTRA STRONG

5.0 PIPING COMPONENTS

5.1 PIPE

- 5.1.1 For carbon steel pipes, dimensions shall conform to ASME B36.10M or API 5L where applicable. The nominal thickness for "Stainless Steel Pipe" shall be selected in accordance with ASME B36.19. Tolerances of pipes shall meet the requirements of IPS-M-PI-190(3).
- 5.1.2 End pipe for sizes 1/2" to 1 1/2" shall be plain end, for size 2"and above shall be beveled end. End of galvanized pipe shall be threaded.
- 5.1.3 For all Materials Carbon Content and CE=C+ (Mn/6) + (Cu+Ni)/15 + (Cr+Mo+V)/5 shall meet the requirements of IPS-M-PI-190(3). In addition, all the main piping and related



فعالیت های رو زمینی در بسته های کاری تحت الارض

عمومي و مشترك



	پیمان:	شماره
- ۲۷۰ – ۲۵۰	- 9114	

	PIPING MATERIAL SPECIFICATION								
پروژه	نسخه سریال نوع مدرک رشته تسهیلات صادرکننده بسته کاری پروژه								
BK	SSGRL	PEDCO	110	PI	SP	0001	D02		

شماره صفحه: ۹ از ۱۳

materials shall be according to the requirements of NACE MR 0175 / ISO 15156 and IPS-M-PI-190(3) for sour services.

5.1.4 Pipes with sizes 1/4",3/8",1¼",2½",3½",4½",5",7",9",14",18",22",shall not be used, except as may be required by equipment connections.

5.2 FITTING

- 5.2.1 Dimensions and tolerances for butt-weld fitting (be normally used for nominal diameter 2" and larger) shall conform to ASME B16.9.
- 5.2.2 Dimensions and tolerances for Socket weld fittings and/or screwed fitting (be normally used for nominal diameter 1 1/2" and smaller) shall conform to ASME B16.11.

5.3 FLANGES

- 5.3.1 Machining shall be in accordance with ASME B16.5. Roughness of RF shall be between 3.2 and 6.3 micrometers (125 to 250 micro inches AARH)
- 5.3.2 Orifice flanges shall conform to ASME B16.36. Quantities shown on Material Requisition must be understood as "pair" of orifice flanges supplied with assembly bolting.

5.4 VALVES

- 5.4.1 All socket welded ball valves of nominal sizes ½" to 1 ½" shall have extended ends (Sch. 160 nipples) with an overall length of 400mm.
- 5.4.2 Valve trim numbers for gate, globe and check valves are as API 600 (2015) Table 8.

5.5 GASKETS

5.5.1 Spiral wound gaskets shall conform to ASME B16.20 and Non-metallic flat gaskets shall conform to ASME B16.21.

5.6 BOLTS AND NUTS

- 5.6.1 Thread shall be in accordance with ASME B1.1 and Nuts shall conform to ASME B18.2.2.
- 5.6.2 Stud bolts shall be threaded full length and chamfered both ends. Length for standard flange assembly shall be in accordance with ASME B16.5. Stud bolts shall be supplied with 2 Heavy Hex nuts.

5.7 BRANCH CONNECTIONS

- 5.7.1 Branches shall be as specified in the individual line classes.
- 5.7.2 For pipe line to be pigged, tee or branch with 40% or more of the main line diameter shall be equipped with scraper guide bars.



.04 - . 14 - 9114

شماره پیمان:

نگهداشت و افزایش تولید میدان نفتی بینک

فعالیت های رو زمینی در بسته های کاری تحت الارض

عمومی و مشترک



PIPING MATERIAL

	PIPING MATERIAL SPECIFICATION							
نسخه سریال نوع مدرک رشته تسهیلات صادر کننده بسته کاری پروژه							نسخه	
BK	SSGRL	PEDCO	110	PI	SP	0001	D02	

شماره صفحه: ۱۰ از ۱۳

6.0 GENERAL TESTING REQUIRMENTS

- **6.1** Pressure testing of the following piping shall be in accordance with ASME B31.3 test procedures. The test pressure shall be held for a sufficient time to allow detection of any leaks and for a minimum time of 1 hour.
 - a) Metallic piping including carbon steel, lined carbon steel, stainless steel, corrosion resistant alloys and ductile iron but excluding copper shall normally be tested at 1.5 x the design pressure.

7.0 PIPING AND PIPELINE CLASSES

7.1 PIPING CLASSES NUMBERING

Each piping class is identified from two alphabetical characters which precede a two digit figure. The first alphabetical character indicates pressure rating of flange and the second alphabetical character indicates material as follows:

1st	alphabetical character	12	2nd alphabetical character
Α	Class 150	Ν	Carbon Steel
С	Class 300	S	Stainless Steel
F	Class 600	X	Non Metal Pipe
G	Class 900	Z	Galvanized Carbon Steel
Н	Class 1500		
L	Class 3000		
M	Class 5000		

The third figure indicates the design code and the forth figure indicates corrosion allowance for metallic as follows



فعالیت های رو زمینی در بسته های کاری تحت الارض

عمومی و مشترک





	پیمان:	ماره
۸۳	.~~_ 4116	

	PIPING MATERIAL SPECIFICATION								
پروژه	بسته کاری	صادر کننده	تسهيلات	رشته	نوع مدرك	سر يال	نسخه		
BK	SSGRL	PEDCO	110	PI	SP	0001	D02		

شماره صفحه: ۱۱ از ۱۳

3rd figure			4th fi		4th figure for non-metal pipe		
Fig.	Design standard	Fig.	C.A.	NACE MR 0175 / ISO 15156 Requirement	Fig.	Material type	
0	ASME B 31.3	0	0 mm	No	1	GRE	
	(For Inside of Plant)	1	1 mm	No	2	PE	
1	ASME B 31.4	2	1 mm	Yes		DTD /Daintaread	
	(For Liquid Pipeline)	4	3 mm	No	3	RTP (Reinforced Thermoplastic pipe)	
2	ASME B 31.8	5	3 mm	Yes			
	(For Gas Pipeline)	6	6 mm	No			
		7	6 mm	Yes			



.04 - . 74 - 9114

نگهداشت و افزایش تولید میدان نفتی بینک

فعالیت های رو زمینی در بسته های کاری تحت الارض

عمومي و مشترك



شماره پیمان:			PIPING MA	TERIAL S	PECIFI	CATION		
_ 91 <i>\</i> \\$	پروژه	بسته کاری	صادر کننده	تسهيلات	رشته	نوع مدرك	سر يال	نسخه
(1/()	BK	SSGRL	PEDCO	110	PI	SP	0001	D02

شماره صفحه: ۱۲ از ۱۳

7.2 SUMMARY OF PIPING AND PIPELINE CLASSES

Table 1: piping classes

Piping Class	ANSI Rating /Facing	Max Pipe Size (In)	Base Material	Max. TEMP. ⁰C	NACE MR 0175 / ISO 15156 Req.	C.A. (mm)	Service
AN01	150/RF	10	Carbon Steel	85		1	Diesel Oil
AN04	150/RF	16	Carbon Steel	85		3	Plant Air, Fire Water (AG)
AN05	150/RF	16	Carbon Steel	85	Yes	3	Crude Oil , Close Drain, Condensate, Fuel Gas
AX02	150/RF	4	HDPE	85		0	Fire Water(UG), Potable Water(UG)
AZ00	150/RF	4	Carbon Steel+Hot Dip Galv.	85		0	Instrument Air<4", Potable Water
AS00	150/RF	2	Stainless Steel	85		0	Chemical
CN05	300/RF	12	Carbon Steel	85	Yes	3	Crude Oil, Condensate
CS00	300/RF	2	Stainless Steel	85		0	Chemical
FN05	600/RF	6	Carbon Steel	85	Yes	3	Crude Oil
AN15	150/RF	4	Carbon Steel	85	YES	3	Crude Oil (Burn Pit)
LN15*	3000/RTJ	6	Carbon Steel	85	YES	3	Crude Oil
LN17*	3000/RTJ	6	Carbon Steel	85	YES	6	Crude Oil
MN17*	5000/RTJ	6	Carbon Steel	85	YES	6	Crude Oil

*Note: Test Pressure for individual wellhead components such as valves, flanges, stone traps and,... which are fabricated based on API 6A, will be specified based on this standard and minimum required thickness (t) to tolerate these test pressures has been summarized below based on Barlo's formula and 90% of SMYS:

t=PD/(2*(90%S)

Where:

- t: Minimum Required Thickness for Specified Test Pressure (mm)
- P: Test Pressure based on API 6A (psi)
- D: External Pipe Dia. (168.3 mm)
- S: Specified Minimum Yield Strength (52000 psi)

Class	P(psi)	t (mm)
LN15	6000	10.79
LN17	6000	10.79
MN17	7500	13.49



فعالیت های رو زمینی در بسته های کاری تحت الارض

عمومی و مشترک



ماره پیمان:	ش
.0414 - 414	

	PIPING MATERIAL SPECIFICATION							
پروژه	نسخه سریال نوع مدرک رشته تسهیلات صادر کننده بسته کاری پروژه							
BK	SSGRL	PEDCO	110	PI	SP	0001	D02	

شماره صفحه: ۱۳ از ۱۳

Test Pressure at filed will be calculated based on design pressure and Specification for Pipeline Flushing, cleaning and hydrostatic testing document No.: BK-GENRAL-PEDCO-000-PL-SP-0008.

8.0 CLASS DESCRIPTION

Class description has been summarized in Attachment #1.