KUWAIT OIL COMPANY (K.S.C.)

A subsidiary of Kuwait Petroleum Corporation

إحـــدى شركـــات مؤسســـة البتـــرول الـكويتيـة
A Subsidiary of Kuwait Petroleum Corporation

PRODUCTION & PROJECTS (GAS) GROUP

GAS PROJECTS TEAM - II

Mutriba Remote Boosting Facility (MRBF)

at North Kuwait

Technical Specification

Annexure 1 to Appendix-13

Addendum To KOC STD

FOR

Piping Material Classes KOC-MP-010

KUWAIT OIL COMPANY (K.S.C.)
(Register of Commerce No. 21835)
Annexure 1 to Appendix-13
Mutriba Remote Boosting Facility (MRBF), at North Kuwait

Addendum to KOC STD for Piping Material Classes KOC-MP-010

This Addendum shall be read in conjunction with KOC Standard for Piping Material Classes (KOC-MP-010 Rev 2, dated 17/05/2022)

Amend Specification for Piping Material Classes as follows:

1) **Add** Clause 10.5

The fifth (5th) character in general indicates the following:

1- Valve Trim material 6 MOLY S/S (UNS S31254 / UNS N 08926)
2- Valve Trim material INCONEL 825
3- Valve Trim material INCONEL 625

2) **Update** Clause 11.0

Replace existing Piping Class Index with the revised Piping Class Index as shown in Table-2 below:

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TABLE-2 PIPING CLASS INDEX

PIPING CLASS	FLUIDS	SERVICES (Note 1)	DESIGN CONDITIONS		REMARKS
			Press Bar G	Temp Deg C	
C13A	Fuel Oil (Diesel) Inert Gas	DD - Dedicated Drains OF - Fuel Oil (Diesel) VA - Vent to Atmosphere IG – Inert Gas	19.6 17.7 13.8	-29 to +38 100 200	Carbon Steel 150LB RF CA: 1.5 mm
C13B	Plant Air Potable /Fresh Water Utility Water	AP - Plant Air VA - Vent to Atmosphere WD- Potable /Fresh Water WU-Utility Water/RO Water	15.5 15.2 14.8	-29 to +66 79 93	Galvanized Carbon Steel 150LB RF/FF CA: 1.5 mm
C15A	Non-Sour: Oily Water / Hydrocarbon Steam Process Water Inert Gas Fuel Oil (Diesel)	DH - Oily Drains CL – LP Steam Condensate CM – MP Steam Condensate SL – LP Steam SM – MP Steam WL – Tempered Water WP – Process Water GI – Nitrogen VA – Vent to Atmosphere WB- Boiler Feed Water AC – Combustion Air RL- Refrigerant Liquid RV- Refrigerant Vapour OF - Fuel Oil (Diesel) SG-SRU Gas	19.6 17.7 13.8 12.1 10.2 8.4	-29 to +38 100 200 250 300 350	Carbon Steel 150LB RF C/A: 3.0 mm
C15B / C15B1 / C15B2 / C15B3	Sour Service: Hydrocarbon Gas Hydrocarbon Oil Hydrocarbon Condensate Glycol / TEG Lean Amine / Solvent	BD - Blowdown & Relief DD - Dedicated Drains DP - Pressurized Drains FG - Fuel Gas / Pilot Gas GY - Lean Glycol /TEG PC - Process Condensate PG - Process Gas / Vapour PO - Process Oil VA - Vent to Atmosphere LA – Lean amine / Solvent PL – Process Liquids FL – LP Relief to LP Flare FH – HP Relief to HP Flare FA – Tank Vapour Flare GD- Glycol Drain DA- Amine / Solvent Drain	19.6 17.7 13.8 12.1	-29 to +38 100 200 250	Carbon Steel 150LB RF C/A: 3.0 mm Sour Service
C15K / C15K1 / C15K2 / C15K3	Sour Service (Low Temp): Hydrocarbon Gas Hydrocarbon Oil Hydrocarbon Condensate	BD - Blowdown & Relief DP - Pressurized Drains FG - Fuel Gas PC - Process Condensate PG - Process Gas / Vapour PL - Process Liquids DD - Dedicated Drains FH – HP Relief to HP Flare RF-Refrigerant	18.4 17.4 13.8 13.1	-46 to +38 100 200 220	Low Temp Carbon Steel 150LB RF C/A: 3.0 mm Sour Service

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TABLE-2 PIPING CLASS INDEX

PIPING CLASS	FLUIDS	SERVICES (Note 1)	DESIGN CONDITIONS		REMARKS
			Press Bar G	Temp Deg C	
C17B / C17B1 / C17B2 / C17B3	Sour Service: Hydrocarbon Oil Hydrocarbon Gas Process Liquids Caustic	PL - Process Liquids PO - Process Oil BD – Blowdown & Relief DD – Dedicated Drains AG- Acid Gas XJ-Caustic	19.6 17.7 13.8 12.1 10.2	-29 to +38 100 200 250 300	Carbon Steel 150LB RF C/A: 6.0 mm Sour Service
C35A	Non-Sour: Hydrocarbon Oil	DH - Oily Drains PO-Process Oil SM- MP Steam RL-Refrigerant Liquid RV-Refrigerant Vapor	51.1 46.6 43.8	-29 to +38 100 200	Carbon Steel 300 LB RF C/A: 3.0 mm
C35B / C35B1 / C35B2 / C35B3	Sour Service: Hydrocarbon Gas Hydrocarbon Oil Hydrocarbon Condensate Glycol / TEG	DD - Dedicated Drains DP - Pressurized Drains FG - Fuel Gas GY - Lean Glycol / TEG PC - Process Condensate PG - Process Gas / Vapour PL - Process Liquids PO- Process Oil BD – Blowdown & Relief LA-Lean Amine	51.1 46.6 43.8 39.8	-29 to +38 100 200 300	Carbon Steel 300LB RF C/A: 3.0 mm Sour Service
C35K / C35K1 / C35K2 / C35K3	Sour Service (Low Temp): Hydrocarbon Gas Hydrocarbon Oil Hydrocarbon Condensate	BD - Blowdown & Relief PC - Process Condensate PG - Process Gas / Vapour PL - Process Liquids DD - Dedicated Drains RF-Refrigerant PD-Pressurized Drains	48.0 45.3 42.5	-46 to +38 100 200	Low Temp Carbon Steel 300LB RF C/A: 3.0 mm Sour Service
C37B / C37B1 / C37B2 / C37B3	Sour Service: Hydrocarbon Oil	PL - Process Liquids BD – Blowdown & Relief DD – Dedicated Drains PO-Process Oil	51.1 46.6 43.8	-29 to +38 100 200	Carbon Steel 300LB RF C/A: 6.0 mm Sour Service
C65A	Non-Sour: Hydrocarbon Oil Steam/Oily Water	DH - Oily Drains PO-Process Oil SH - HP Steam WB –Boiler Feed Water (HP) CH – HP Condensate BD – Blow down and relief GH-Rich Glycol GY-Lean glycol/TEG	102.1 93.2 87.6 83.9 79.6	-29 to +38 100 200 250 300	Carbon Steel 600 LB RF C/A: 3.0 mm
C65B / C65B1 / C65B2 / C65B3	Sour Service: Hydrocarbon Gas Hydrocarbon Oil Hydrocarbon Condensate Glycol / TEG	BD - Blowdown & Relief DD - Dedicated Drains FG - Fuel Gas GY - Lean Glycol / TEG PC - Process Condensate PG - Process Gas / Vapour PL - Process Liquids PO-Process Oil LA-Lean Amine/TEG	102.1 93.2 87.6	-29 to +38 100 200	Carbon Steel 600LB RF C/A: 3.0 mm Sour Service
C65K / C65K1 / C65K2 / C65K3	Sour Service (Low Temp): Hydrocarbon Gas Hydrocarbon Oil Hydrocarbon Condensate	BD - Blowdown & Relief DD - Dedicated Drains PC - Process Condensate PG - Process Gas / Vapour PL – Process Liquid PD-Pressurized Drains RF-Refrigerant	96 90.7 85.1	-46 to +38 100 200	Low Temp Carbon Steel 600 LB RF C/A: 3.0 mm Sour Service
C67B / C67B1 / C67B2 / C67B3	Sour Service: Hydrocarbon Oil Hydrocarbon Gas	PL - Process Liquids PF – Production Fluid PG-Process Gas	102.1 93.2 87.6	-29 to +38 100 200	Carbon Steel 600LB RF C/A: 6.0 mm Sour Service

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PIPING CLASS	FLUIDS	SERVICES (Note 1)	DESIGN CONDITIONS		REMARKS
			Press Bar G	Temp Deg C	
C95B / C95B1 / C95B2 / C95B3	Sour Service: Hydrocarbon Oil Hydrocarbon Condensate Hydrocarbon Gas Lean Amine	PC - Process Condensate PL - Process Liquids PG- Process Gas LA-Lean Amine	153.2 139.8 131.4	-29 to +38 100 200	Carbon Steel 900LB RTJ C/A: 3.0 mm Sour Service
C97B / C97B1 / C97B2 / C97B3	Sour Service: Hydrocarbon Oil Hydrocarbon Gas	PL - Process Liquids PG-Process Gas	153.2 139.8 131.4	-3 to +38 100 200	Carbon Steel 900 LB RTJ C/A: 6.0 mm Sour Service
F10A	Brackish Water	DO - Open Drains (Water) WW- Well / Wash Water	13.4 10.6	-3 to +38 93	RTRP 150 LB FF C/A: 0.0 mm
F10B	Sour Service: Effluent Water Oily Water	DD - Dedicated Drains DP- Pressurized Drains WE- Effluent Water WO- Oily Water DH – Oily Drain WP-Produced Water	19.6 17.9	-3 to +38 93	SDSS <2", RTRP> 1 ½ " 150 LB FF/RF C/A: 0.0 mm Underground Sour Service
F30A	Brackish Water	WW- Well / Wash Water DO - Open Drains	35.6 28.1	-3 to + 38 93	RTRP 300 LB FF C/A: 0.0 mm
F30B	Sour Service: Effluent Water Oily Water	WE- Effluent Water WO- Oily Water DH-Oily Drain	47.0	-3 to + 93	SDSS < 2" RTRP> 1 ½ " 300 LB FF C/A: 0.0 mm Sour Service
D10B*	Sour Service: Oily Water	WO-Oily Water WE- Effluent Water	20.0 17.7 15.8	-29 to +38 100 200	SDSS 150LB RF C/A: 0.0mm Sour Service
D30B*	Sour Service: Oily Water	WO- Oily Water WE - Effluent Water	51.7 51.5 50.3	-29 to +38 100 150	SDSS 300LB RF C/A: 0.0 mm Sour Service
N10B	Sour Service: Hydrocarbon Gas Hydrocarbon Condensate	PG-Process Gas PC-Process Condensate	20.0 17.7 13.8	-90 to +38 100 200	Inconel 625 150LB RF C/A: 0.0mm Sour Service
N30B	Sour Service: Hydrocarbon Gas Hydrocarbon Condensate	WO- Oily Water WE - Effluent Water	51.7 51.5 50.3	-90 to +38 100 150	Inconel 625 300LB RF C/A: 0.0 mm Sour Service
Q15A	Brackish Water	WF - Firewater WW- Well / Wash Water XG- Foam	15.5 14.6	-29 to +66 93	SDSS <3" LELCS > 2" 150 LB RF C/A: 0.0 mm-SDSS C/A: 3.0 mm LEL-CS
Q15B	Sour Service: Hydrocarbon Oil Hydrocarbon Condensate Oily Water	DD - Dedicated Drains WO- Oily Water WE – Effluent Water WT – Treated Effluent Water WP – Produced Water	19.6 17.9	-29 to +38 93	SDSS <3" FBELCS > 2", 150 LB RF C/A: 0.0 mm-SDSS C/A: 3.0 mm-FBEL-CS Sour Service

**** THIS CLASS IS INTENDED FOR DESALTER EFFLUENT WATER / RECYCLE WATER AT ELEVATED TEMPERATURE.***

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Addendum to KOC STD for Piping Material Classes KOC-MP-010

TABLE-2 PIPING CLASS INDEX

PIPING CLASS	FLUIDS	SERVICES (Note 1)	DESIGN CONDITIONS		REMARKS
			Press Bar G	Temp Deg C	
Q15K	**Sour Service: (Low Temp)** **Oily Water** **Hydrocarbon Oil** **Hydrocarbon Condensate**	**DD - Dedicated Drains**	19.6 19.2 17.9	-46 to +38 50 93	SDSS < 3" FBEL LTCS > 2", 150 LB RF C/A: 0.0 mm-SDSS, C/A: 3.0 mm-FBEL-LTCS, Sour Service
Q35A	**Brackish Water**	**WF- Fire Water** **WW-Well / Wash Water**	35.6 28.1	-29 to +66 93	SDSS < 3" LELCS > 2" 300 LB RF C/A: 0.0 mm-SDSS 3.0 mm – LEL-CS
Q35B	**Sour Service:** **Hydrocarbon Oil** **Hydrocarbon Condensate** **Oily Water**	**DD- Dedicated Drains** **WE- Effluent Water** **WO- Oily Water** **WT – Treated Effluent Water** **WP-Produced Water**	51.1 47	-29 to +38 93	SDSS < 3" FBELCS > 2" 300 LB RF C/A: 0.0 mm SDSS, 3.0 mm FBEL-CS Sour Service:
Q35K	**Sour Service: (Low Temp)** **Oily Water** **Hydrocarbon Oil** **Hydrocarbon Condensate**	**DD- Dedicated Drains**	51.1 47	-46 to +38 93	SDSS < 3" FBEL LTCS > 2", 300 LB RF C/A: 0.0 mm-SDSS, 3.0 mm-FBEL-LTCS, Sour Service
Q65B	**Sour Service:** **Hydrocarbon Oil** **Hydrocarbon Condensate** **Oily Water**	**DD- Dedicated Drains** **WE- Effluent Water** **WO- Oily Water** **WT – Treated Effluent Water** **WP-Produced Water**	102.1 100.2 94.2	-29 to + 38 50 93	SDSS < 3" FBELCS > 2" 600 LB RF C/A: 0.0 mm SDSS, 3.0 mm FBEL-CS Sour Service
S10A	**Instrument Air** **Plant Air** **Methanol Inhibitor** **Antifoam Agent** **Demulsifier** **Oxygen Scavenger** **Biocide** **MEA Solution**	**AI-Instrument Air** **DC- Chemical Drain** **VA- Vent to Atmosphere** **XA- Methanol** **XB- Scale Inhibitor** **XC- Corrosion Inhibitor** **XD- Antifoam** **XE- Demulsifier** **XH- Oxygen Scavenger** **XL-Biocide** **XM- pH Adjustment MEA** **XI-Caustic** **OL-Lube Oil**	19 16.2 13.7	-29 to +38 100 200	316 L / 316 Stainless Steel 150LB RF C/A: 0.0 mm (Note-2)
S10B	**Sour Service:** **Hydrocarbon Gas** **Hydrocarbon Condensate** **Glycol / TEG** **Rich Amine / Solvent**	**BD-Blowdown & Relief** **DD-Dedicated Drains** **GH-Rich Glycol / TEG** **PC-Process Condensate** **PG-Process Gas / Vapour** **PL-Process Liquids** **VA-Vent to Atmosphere** **RA – Rich Amine / Solvent** **AG- Acid Gas** **WP-Process Water** **FG-Fuel Gas**	19 16.2 13.7	-90 to +38 100 200	316 L / 316 Stainless Steel 150LB RF C/A: 0.0mm Sour Service

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TABLE-2 PIPING CLASS INDEX

PIPING CLASS	FLUIDS	SERVICES (Note 1)	DESIGN CONDITIONS		REMARKS
			Press Bar G	Temp Deg C	
S30A	Methanol Inhibitor Antifoam Agent Demulsifier Oxygen Scavenger Biocide MEA Solution Scale Inhibitor Corrosion Inhibitor Lube Oil	DC- Chemical Drain VA- Vent to Atmosphere XA- Methanol XB- Scale Inhibitor XC- Corrosion Inhibitor XD- Antifoam XE- Demulsifier XH- Oxygen Scavenger XL-Biocide XM- pH Adjustment MEA OL-Lube Oil	41.4 34.8 29.2	-29 to +38 100 200	316 L / 316 Stainless Steel 300LB RF C/A: 0.0mm (Note-2)
S30B	Sour Service: Hydrocarbon Gas Hydrocarbon Condensate Glycol / TEG Rich Amine / Solvent	BD-Blowdown & Relief DD-Dedicated Drains GH-Rich Glycol / TEG PC-Process Condensate PG-Process Gas / Vapour PL-Process Liquids RA – Rich Amine / Solvent FG-Fuel Gas	49.6 42.2 35.7	-90 to +38 100 200	316 L/316 Stainless Steel 300LB RF C/A: 0.0mm Sour Service
S60A	Methanol Inhibitor Antifoam Agent Demulsifier Oxygen Scavenger Biocide MEA Solution Lube Oil	DC- Chemical Drain VA- Vent to Atmosphere XA- Methanol XB- Scale Inhibitor XC- Corrosion Inhibitor XD- Antifoam XE- Demulsifier XH- Oxygen Scavenger XL-Biocide XM- pH Adjustment MEA OL-Lube Oil	99.3 84.4 58.3	-29 to +38 100 200	316 L/316 Stainless Steel 600LB RF C/A: 0.0mm (Note-2)
S60B	Sour Service: Hydrocarbon Gas Hydrocarbon Condensate Glycol / TEG Rich Amine/Solvent	BD-Blowdown & Relief DD-Dedicated Drains GH-Rich Glycol / TEG PC-Process Condensate PG-Process Gas / Vapour PL-Process Liquids FG-Fuel Gas RA-Rich Amine	99.3 84.4 58.3	-90 to +38 100 200	316 L/316 Stainless Steel 600LB RF C/A: 0.0mm Sour Service
S90A	Methanol Inhibitor Antifoam Agent Demulsifier Oxygen Scavenger Biocide MEA Solution	DC- Chemical Drain VA- Vent to Atmosphere XA- Methanol XB- Scale Inhibitor XC- Corrosion Inhibitor XD- Antifoam XE- Demulsifier XH- Oxygen Scavenger XL-Biocide XM- pH Adjustment	148.9 126.6 107.0	-29 to+38 100 200	316 L/316 Stainless Steel 900 LB-RTJ C/A: 0.0 mm
S90B	Sour Service: Hydrocarbon Gas Hydrocarbon Condensate	BD-Blowdown & Relief DD-Dedicated Drains PC-Proc. Condensate PG-Proc. Gas / Vapour PL-Process Liquids RA-Rich Amine	148.9 126.6 107.0	-90 to+38 100 200	316 L/316 Stainless Steel 900LB -RTJ C/A: 0.0 mm Sour Service

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NOTE:
1. Fluid services listed in Piping class index are copied from 'KOC-MP-010'. This may include services which may not be required for the project.

2. Suitability of 316L SS material for all chemical services shall be confirmed by chemical injection package vendor.

3. New piping classes for services like HP Steam, Hot oil and any other services as per process requirement shall be developed by contractor and included in their project specific Piping Material Specification as and when materials selection / Licensor data / Process conditions will be available.

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3) **Update** Clause 12.0

Update following piping classes as specified below.

1) Piping Material Class – C13A:

Modify project specific addendum to piping class 'C13A' as shown below.

a) **Modify** forged flanges, fittings and valves to a normalized material (A105 to A105N).
b) **Modify** branch table to use 'reducing tee' in accordance with ASME B16.9. **Delete** all reference to stub-in'.

HEADER SIZE NPS (IN)	BRANCH SIZE NPS (IN)											
	3/4	1	1½	2	3	4	6	8	10	12	14	16
3/4	T											
1	RT	T										
1½	RT	RT	T									
2	RT	RT	RT	T								
3	SOL	SOL	RT	RT	T							
4	SOL	SOL	RT	RT	RT	T						
6	SOL	SOL	SOL	W	RT	RT	T					
8	SOL	SOL	SOL	W	W	RT	RT	T				
10	SOL	SOL	SOL	W	W	RT	RT	RT	T			
12	SOL	SOL	SOL	W	W	W	RT	RT	RT	T		
14	SOL	SOL	SOL	W	W	W	RT	RT	RT	RT	T	
16	SOL	SOL	SOL	W	W	W	RT	RT	RT	RT	RT	T

PIPING CLASS C13A

BRANCH REINFORCEMENT TABLE

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2) Piping Material Class – C13B:

Modify project specific addendum to piping class 'C13B' as shown below.

a) **Modify** forged flanges and fittings to a normalized material (A105 to A105N).
b) **Modify** branch table to use 'reducing tee' in accordance with ASME B16.9. **Delete** all reference to 'stub-in'.

HEADER SIZE NPS (IN)	3/4	1	1½	2	3	4	6	8	10	12	14	16
3/4	T											
1	RT	T										
1½	RT	RT	T									
2	RT	RT	RT	T								
3	TOL	TOL	RT	RT	T							
4	TOL	TOL	RT	RT	RT	T						
6	TOL	TOL	TOL	W	RT	RT	T					
8	TOL	TOL	TOL	W	W	RT	RT	T				
10	TOL	TOL	TOL	W	W	RT	RT	RT	T			
12	TOL	TOL	TOL	W	W	W	RT	RT	RT	T		
14	TOL	TOL	TOL	W	W	W	RT	RT	RT	RT	T	
16	TOL	TOL	TOL	W	W	W	RT	RT	RT	RT	RT	T
BRANCH SIZE NPS (IN)												

PIPING CLASS C13B

BRANCH REINFORCEMENT TABLE

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3) Piping Material Class – C15A:

Modify project specific addendum to piping class 'C15A' as shown below.

a) **Modify** branch table to use 'reducing tee' in accordance with ASME B16.9. **Delete** all reference to 'stub-in'.
b) **Modify** gaskets to spiral wound type.
c) Add note-5, Ball valve shall not be used in steam service.

HEADER SIZE NPS (IN)	3/4	1	1½	2	3	4	6	8	10	12	14	16	18	20	24
3/4	T														
1	RT	T													
1½	RT	RT	T												
2	RT	RT	RT	T											
3	SOL	SOL	RT	RT	T										
4	SOL	SOL	RT	RT	RT	T									
6	SOL	SOL	SOL	W	RT	RT	T								
8	SOL	SOL	SOL	W	W	RT	RT	T							
10	SOL	SOL	SOL	W	W	RT	RT	RT	T						
12	SOL	SOL	SOL	W	W	W	RT	RT	RT	T					
14	SOL	SOL	SOL	W	W	W	RT	RT	RT	RT	T				
16	SOL	SOL	SOL	W	W	W	RT	RT	RT	RT	RT	T			
18	SOL	SOL	SOL	W	W	W	W	RT	RT	RT	RT	RT	T		
20	SOL	SOL	SOL	W	W	W	W	RT	RT	RT	RT	RT	RT	T	
24	SOL	SOL	SOL	W	W	W	W	W	RT	RT	RT	RT	RT	RT	T

BRANCH SIZE NPS (IN)

PIPING CLASS C15A

BRANCH REINFORCEMENT TABLE

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4) Piping Material Class – C15B:

Modify project specific addendum to piping class 'C15B' as shown below.

a) Modify trim materials to specify required valve trim material and create separate Piping Material Class for each trim material as below and delete note-4.

Class C15B-Trim material –SS316 L
Class C15B1-Trim material –6 MOLY S/S (UNS S31254 / UNSN 08926)
Class C15B2-Trim material –INCONEL 825
Class C15B3-Trim material –INCONEL 625

b) **Modify** branch table to use 'reducing tee' in accordance with ASME B16.9. **Delete** all reference to 'stub-in'.

c) Modify Note 8 to read as:

For SS316L Trim Valves: "Ball material for ball valves of size 14" and below shall be SS316L and for sizes 16" and above carbon steel (A216 WCB / A105N) + 3 mm SS316L weld overlay.
For 6 MOLY S/S / Alloy 825/ 625 trim valves: "Ball material of ball valves of size 4" and below shall be 6 MOLY S/S / Alloy 825 / 625 and for sizes 6" and above carbon steel (A216 WCB / A105N) + 3 mm 6 MOLY S/S / Alloy 825/ 625 weld overlay.

HEADER SIZE NPS (IN)	BRANCH SIZE NPS (IN)																				
	3/4	1	1½	2	3	4	6	8	10	12	14	16	18	20	24	28	30	32	36	40	42	48
3/4	T																					
1	RT	T																				
1½	RT	RT	T																			
2	RT	RT	RT	T																		
3	W	W	RT	RT	T																	
4	W	W	RT	RT	RT	T																
6	W	W	W	W	RT	RT	T															
8	W	W	W	W	W	RT	RT	T														
10	W	W	W	W	W	RT	RT	RT	T													
12	W	W	W	W	W	W	RT	RT	RT	T												
14	W	W	W	W	W	W	RT	RT	RT	RT	T											
16	W	W	W	W	W	W	RT	RT	RT	RT	RT	T										
18	W	W	W	W	W	W	W	RT	RT	RT	RT	RT	T									
20	W	W	W	W	W	W	W	RT	RT	RT	RT	RT	RT	T								
24	W	W	W	W	W	W	W	W	RT	RT	RT	RT	RT	RT	T							
28	W	W	W	W	W	W	W	W	W	RT	RT	RT	RT	RT	RT	T						
30	W	W	W	W	W	W	W	W	RT	RT	RT	RT	RT	RT	RT	RT	T					
32	W	W	W	W	W	W	W	W	W	W	RT	RT	RT	RT	RT	RT	RT	T				
36	W	W	W	W	W	W	W	W	W	W	W	RT	RT	RT	RT	RT	RT	RT	T			
40	W	W	W	W	W	W	W	W	W	W	W	W	RT	RT	RT	RT	RT	RT	RT	T		
42	W	W	W	W	W	W	W	W	W	W	W	W	RT	RT	RT	RT	RT	RT	RT	RT	T	
48	W	W	W	W	W	W	W	W	W	W	W	W	W	W	RT	RT	RT	RT	RT	RT	RT	T

PIPING CLASS C15B, C15B1, C15B2, C15B3

BRANCH REINFORCEMENT TABLE

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Addendum to KOC STD for Piping Material Classes KOC-MP-010

5) Piping Material Class – C15K:

Modify project specific addendum to piping class 'C15K' as shown below.

a) Modify trim materials and create separate Piping Material Class for each trim material as below and delete note-4.

Class C15K-Trim material –SS316 L
Class C15K1-Trim material –6 MOLY S/S (UNS S31254 / UNSN 08926)
Class C15K2-Trim material –INCONEL 825
Class C15K3-Trim material –INCONEL 625

b) **Modify** branch table to use 'reducing tee' in accordance with ASME B16.9. **Delete** all reference to 'stub-in'.

c) Modify Note 9 to read as:

For SS316L Trim Valves: "Ball material for ball valves of size 14" and below shall be SS316L & for sizes 16" and above LTCS (ASTM A 350 LF2 / A 352 LCB)) + 3 mm SS316L weld overlay.
For 6 MOLY S/S / Alloy 825/ 625 trim valves: "Ball material of ball valves of size 4" and below shall be 6 MOLY S/S / Alloy 825 / 625 and for sizes 6" and above LTCS (ASTM A 350 LF2 / A 352 LCB) + 3 mm 6 MOLY S/S / Alloy 825/ 625 weld overlay.

HEADER SIZE NPS (IN)	BRANCH SIZE NPS (IN)																		
	3/4	1	1½	2	3	4	6	8	10	12	14	16	18	20	24	28	30	32	36	40
3/4	T																			
1	RT	T																		
1½	RT	RT	T																	
2	RT	RT	RT	T																
3	W	W	RT	RT	T															
4	W	W	RT	RT	RT	T														
6	W	W	W	W	RT	RT	T													
8	W	W	W	W	W	RT	RT	T												
10	W	W	W	W	W	RT	RT	RT	T											
12	W	W	W	W	W	W	RT	RT	RT	T										
14	W	W	W	W	W	W	RT	RT	RT	RT	T									
16	W	W	W	W	W	W	RT	RT	RT	RT	RT	T								
18	W	W	W	W	W	W	W	RT	RT	RT	RT	RT	T							
20	W	W	W	W	W	W	W	RT	RT	RT	RT	RT	RT	T						
24	W	W	W	W	W	W	W	W	RT	RT	RT	RT	RT	RT	T					
28	W	W	W	W	W	W	W	W	W	RT	RT	RT	RT	RT	RT	T				
30	W	W	W	W	W	W	W	W	RT	RT	RT	RT	RT	RT	RT	RT	T			
32	W	W	W	W	W	W	W	W	W	W	RT	RT	RT	RT	RT	RT	RT	T		
36	W	W	W	W	W	W	W	W	W	W	W	RT	RT	RT	RT	RT	RT	RT	T	
40	W	W	W	W	W	W	W	W	W	W	W	W	RT	RT	RT	RT	RT	RT	RT	T

PIPING CLASS C15K, C15K1, C15K2, C15K3

BRANCH REINFORCEMENT TABLE

KUWAIT OIL COMPANY (K.S.C.)
(Register of Commerce No. 21835)
Annexure 1 to Appendix-13
Mutriba Remote Boosting Facility (MRBF), at North Kuwait

Addendum to KOC STD for Piping Material Classes KOC-MP-010

6) Piping Material Class – C17B:
Modify project specific addendum to piping class 'C17B' as shown below.

a) Modify trim materials and create separate Piping Material Class for each trim material as below and delete note-5.

Class C17B-Trim material –SS316 L
Class C17B1-Trim material –6 MOLY S/S (UNS S31254 / UNSN 08926)
Class C17B2-Trim material –INCONEL 825
Class C17B3-Trim material –INCONEL 625

b) **Modify** branch table to use 'reducing tee' in accordance with ASME B16.9. **Delete** all reference to 'stub-in'.

c) Modify Note 10 to read as:

For SS316L Trim Valves: "Ball material for ball valves of size 14" and below shall be SS316L and for sizes 16" and above carbon steel (A216 WCB / A105N) + 3 mm SS316L weld overlay.

For 6 MOLY S/S / Alloy 825/ 625 trim valves: "Ball material of ball valves of size 4" and below shall be 6 MOLY S/S / Alloy 825 / 625 and for sizes 6" and above carbon steel (A216 WCB / A105N) + 3 mm 6 MOLY S/S / Alloy 825/ 625 weld overlay.

HEADER SIZE NPS (IN)	BRANCH SIZE NPS (IN)															
		3/4	1	1½	2	3	4	6	8	10	12	14	16	18	20	24
3/4		T														
1		RT	T													
1½		RT	RT	T												
2		W	W	W	T											
3		W	W	W	RT	T										
4		W	W	W	W	RT	T									
6		W	W	W	W	RT	RT	T								
8		W	W	W	W	W	RT	RT	T							
10		W	W	W	W	W	W	RT	RT	T						
12		W	W	W	W	W	W	W	RT	RT	T					
14		W	W	W	W	W	W	W	RT	RT	RT	T				
16		W	W	W	W	W	W	W	W	RT	RT	RT	T			
18		W	W	W	W	W	W	W	W	RT	RT	RT	RT	T		
20		W	W	W	W	W	W	W	W	W	RT	RT	RT	RT	T	
24		W	W	W	W	W	W	W	W	W	RT	RT	RT	RT	RT	T

PIPING CLASS C17B, C17B1, C17B2, C17B3

BRANCH REINFORCEMENT TABLE

KUWAIT OIL COMPANY (K.S.C.)
(Register of Commerce No. 21835)
Annexure 1 to Appendix-13
Mutriba Remote Boosting Facility (MRBF), at North Kuwait

Addendum to KOC STD for Piping Material Classes KOC-MP-010

7) Piping Material Class – C35A:

Modify project specific addendum to piping class 'C35A' as shown below.

A) Modify branch table to use 'reducing tee' in accordance with ASME B16.9. **Delete** all reference to 'stub-in'.

HEADER SIZE NPS (IN)	BRANCH SIZE NPS (IN)															
	½	¾	1	1½	2	3	4	6	8	10	12	14	16	18	20	24
½	T															
¾	RT	T														
1	RT	RT	T													
1½	RT	RT	RT	T												
2	SOL	SOL	SOL	SOL	T											
3	SOL	SOL	SOL	SOL	RT	T										
4	SOL	SOL	SOL	SOL	W	RT	T									
6	SOL	SOL	SOL	SOL	W	RT	RT	T								
8	SOL	SOL	SOL	SOL	W	W	RT	RT	T							
10	SOL	SOL	SOL	SOL	W	W	W	RT	RT	T						
12	SOL	SOL	SOL	SOL	W	W	W	W	RT	RT	T					
14	SOL	SOL	SOL	SOL	W	W	W	W	RT	RT	RT	T				
16	SOL	SOL	SOL	SOL	W	W	W	W	W	RT	RT	RT	T			
18	SOL	SOL	SOL	SOL	W	W	W	W	W	RT	RT	RT	RT	T		
20	SOL	SOL	SOL	SOL	W	W	W	W	W	W	RT	RT	RT	RT	T	
24	SOL	SOL	SOL	SOL	W	W	W	W	W	W	RT	RT	RT	RT	RT	T

PIPING CLASS C35A

BRANCH REINFORCEMENT TABLE

KUWAIT OIL COMPANY (K.S.C.)
(Register of Commerce No. 21835)
Annexure 1 to Appendix-13
Mutriba Remote Boosting Facility (MRBF), at North Kuwait

Addendum to KOC STD for Piping Material Classes KOC-MP-010

8) Piping Material Class – C35B:

Modify project specific addendum to piping class 'C35B' as shown below.

a) Modify trim materials and create separate Piping Material Class for each trim material as below and delete note 4.

Class C35B-Trim material –SS316 L
Class C35B1-Trim material –6 MOLY S/S (UNS S31254 / UNSN 08926)
Class C35B2-Trim material –INCONEL 825
Class C35B3-Trim material –INCONEL 625

b) **Modify** branch table to use 'reducing tee' in accordance with ASME B16.9. **Delete** all reference to 'stub-in'

c) Modify Note 9 to read as:

For SS316L Trim Valves: "Ball material for ball valves of size 14" and below shall be SS316L and for sizes 16" and above carbon steel (A216 WCB / A105N) + 3 mm SS316L weld overlay.
For 6 MOLY S/S / Alloy 825/ 625 trim valves: "Ball material of ball valves of size 4" and below shall be 6 MOLY S/S / Alloy 825 / 625 and for sizes 6" and above carbon steel (A216 WCB / A105N) + 3 mm 6 MOLY S/S / Alloy 825/ 625 weld overlay.

HEADER SIZE NPS (IN)	BRANCH SIZE NPS (IN)																				
	3/4	1	1½	2	3	4	6	8	10	12	14	16	18	20	24	28	30	32	36	40	42	48
3/4	T																					
1	RT	T																				
1½	RT	RT	T																			
2	RT	RT	RT	T																		
3	W	W	RT	RT	T																	
4	W	W	RT	RT	RT	T																
6	W	W	W	W	RT	RT	T															
8	W	W	W	W	W	RT	RT	T														
10	W	W	W	W	W	RT	RT	RT	T													
12	W	W	W	W	W	W	RT	RT	RT	T												
14	W	W	W	W	W	W	RT	RT	RT	RT	T											
16	W	W	W	W	W	W	RT	RT	RT	RT	RT	T										
18	W	W	W	W	W	W	W	RT	RT	RT	RT	RT	T									
20	W	W	W	W	W	W	W	RT	RT	RT	RT	RT	RT	T								
24	W	W	W	W	W	W	W	W	RT	RT	RT	RT	RT	RT	T							
28	W	W	W	W	W	W	W	W	W	RT	RT	RT	RT	RT	RT	T						
30	W	W	W	W	W	W	W	W	RT	RT	RT	RT	RT	RT	RT	RT	T					
32	W	W	W	W	W	W	W	W	W	W	RT	RT	RT	RT	RT	RT	RT	T				
36	W	W	W	W	W	W	W	W	W	W	W	RT	RT	RT	RT	RT	RT	RT	T			
40	W	W	W	W	W	W	W	W	W	W	W	W	RT	RT	RT	RT	RT	RT	RT	T		
42	W	W	W	W	W	W	W	W	W	W	W	W	RT	RT	RT	RT	RT	RT	RT	RT	T	
48	W	W	W	W	W	W	W	W	W	W	W	W	W	W	RT	RT	RT	RT	RT	RT	RT	T

PIPING CLASS C35B, C35B1, C35B2, C35B3

BRANCH REINFORCEMENT TABLE

KUWAIT OIL COMPANY (K.S.C.)
(Register of Commerce No. 21835)
Annexure 1 to Appendix-13
Mutriba Remote Boosting Facility (MRBF), at North Kuwait

Addendum to KOC STD for Piping Material Classes KOC-MP-010

9) Piping Material Class – C35K:

Modify project specific addendum to piping class 'C35K' as shown below.

a) Modify trim materials and create separate Piping Material Class for each trim material as below and delete note-4.

Class C35K-Trim material –SS316 L
Class C35K1-Trim material –6 MOLY S/S (UNS S31254 / UNSN 08926)
Class C35K2-Trim material –INCONEL 825
Class C35K3-Trim material –INCONEL 625

b) **Modify** branch table to use 'reducing tee' in accordance with ASME B16.9. **Delete** all reference to 'stub-in'.

c) Modify Note 9 to read as:

For SS316L Trim Valves: "Ball material for ball valves of size 14" and below shall be SS316L and for sizes 16" and above LTCS (ASTM A 350 LF2 / A 352 LCB) + 3 mm SS316L weld overlay. For 6 MOLY S/S / Alloy 825/ 625 trim valves: "Ball material of ball valves of size 4" and below shall be 6 MOLY S/S / Alloy 825 / 625 and for sizes 6" and above LTCS (ASTM A 350 LF2 / A 352 LCB) + 3 mm 6 MOLY S/S / Alloy 825/ 625 weld overlay.

HEADER SIZE NPS (IN)	BRANCH SIZE NPS (IN)														
	3/4	1	1½	2	3	4	6	8	10	12	14	16	18	20	24
3/4	T														
1	RT	T													
1½	RT	RT	T												
2	RT	RT	RT	T											
3	W	W	RT	RT	T										
4	W	W	RT	RT	RT	T									
6	W	W	W	W	RT	RT	T								
8	W	W	W	W	W	RT	RT	T							
10	W	W	W	W	W	RT	RT	RT	T						
12	W	W	W	W	W	W	RT	RT	RT	T					
14	W	W	W	W	W	W	RT	RT	RT	RT	T				
16	W	W	W	W	W	W	RT	RT	RT	RT	RT	T			
18	W	W	W	W	W	W	W	RT	RT	RT	RT	RT	T		
20	W	W	W	W	W	W	W	RT	RT	RT	RT	RT	RT	T	
24	W	W	W	W	W	W	W	W	RT	RT	RT	RT	RT	RT	T

PIPING CLASS C35K, C35K1, C35K2, C35K3

BRANCH REINFORCEMENT TABLE

KUWAIT OIL COMPANY (K.S.C.)
(Register of Commerce No. 21835)
Annexure 1 to Appendix-13
Mutriba Remote Boosting Facility (MRBF), at North Kuwait

Addendum to KOC STD for Piping Material Classes KOC-MP-010

10) Piping Material Class – C37B:
Modify project specific addendum to piping class 'C37B' as shown below.

a) Modify trim materials and create separate Piping Material Class for each trim material as below and delete note 5.

Class C37B-Trim material –SS316 L
Class C37B1-Trim material –6 MOLY S/S (UNS S31254 / UNSN 08926)
Class C37B2-Trim material –INCONEL 825
Class C37B3-Trim material –INCONEL 625

b) **Modify** branch table to use 'reducing tee' in accordance with ASME B16.9. **Delete** all reference to 'stub-in'.

c) Modify Note 10 to read as:

For SS316L Trim Valves: "Ball material for ball valves of size 14" and below shall be SS316L and for sizes 16" and above carbon steel (A216 WCB / A105N) + 3 mm SS316L weld overlay. For 6 MOLY S/S / Alloy 825/ 625 trim valves: "Ball material of ball valves of size 4" and below shall be 6 MOLY S/S / Alloy 825 / 625 and for sizes 6" and above carbon steel (A216 WCB / A105N) + 3 mm 6 MOLY S/S / Alloy 825/ 625 weld overlay.

PIPING CLASS C37B, C37B1, C37B2, C37B3

BRANCH REINFORCEMENT TABLE

HEADER SIZE NPS	3/4	1	1½	2	3	4	6	8	10	12	14	16	18	20	24
3/4	T														
1	RT	T													
1½	RT	RT	T												
2	W	W	W	T											
3	W	W	W	RT	T										
4	W	W	W	W	RT	T									
6	W	W	W	W	RT	RT	T								
8	W	W	W	W	W	RT	RT	T							
10	W	W	W	W	W	W	RT	RT	T						
12	W	W	W	W	W	W	W	RT	RT	T					
14	W	W	W	W	W	W	W	RT	RT	RT	T				
16	W	W	W	W	W	W	W	W	RT	RT	RT	T			
18	W	W	W	W	W	W	W	W	RT	RT	RT	RT	T		
20	W	W	W	W	W	W	W	W	W	RT	RT	RT	RT	T	
24	W	W	W	W	W	W	W	W	W	RT	RT	RT	RT	RT	T

BRANCH SIZE NPS (IN)

KUWAIT OIL COMPANY (K.S.C.)
(Register of Commerce No. 21835)
Annexure 1 to Appendix-13
Mutriba Remote Boosting Facility (MRBF), at North Kuwait

Addendum to KOC STD for Piping Material Classes KOC-MP-010

11) Piping Material Class – C65A:

Modify project specific addendum to piping class 'C65A' as shown below.

a) Modify branch table to use 'reducing tee' in accordance with ASME B16.9. **Delete** all reference to 'stub-in'.

HEADER SIZE NPS (IN)	BRANCH SIZE NPS (IN)																
	3/4	1	1½	2	3	4	6	8	10	12	14	16	18	20	24	28	30
3/4	T																
1	RT	T															
1½	RT	RT	T														
2	RT	RT	RT	T													
3	SOL	SOL	RT	RT	T												
4	SOL	SOL	RT	RT	RT	T											
6	SOL	SOL	SOL	W	RT	RT	T										
8	SOL	SOL	SOL	W	W	RT	RT	T									
10	SOL	SOL	SOL	W	W	RT	RT	RT	T								
12	SOL	SOL	SOL	W	W	W	RT	RT	RT	T							
14	SOL	SOL	SOL	W	W	W	RT	RT	RT	RT	T						
16	SOL	SOL	SOL	W	W	W	RT	RT	RT	RT	RT	T					
18	SOL	SOL	SOL	W	W	W	W	RT	RT	RT	RT	RT	T				
20	SOL	SOL	SOL	W	W	W	W	RT	RT	RT	RT	RT	RT	T			
24	SOL	SOL	SOL	W	W	W	W	W	RT	RT	RT	RT	RT	RT	T		
28	SOL	SOL	SOL	W	W	W	W	W	W	RT	RT	RT	RT	RT	RT	T	
30	SOL	SOL	SOL	W	W	W	W	W	RT	RT	RT	RT	RT	RT	RT	RT	T

PIPING CLASS C65A

BRANCH REINFORCEMENT TABLE

KUWAIT OIL COMPANY (K.S.C.)
(Register of Commerce No. 21835)
Annexure 1 to Appendix-13
Mutriba Remote Boosting Facility (MRBF), at North Kuwait

Addendum to KOC STD for Piping Material Classes KOC-MP-010

12) Piping Material Class – C65B:

Modify project specific addendum to piping class 'C65B' as shown below.

a) Modify trim materials and create separate Piping Material Class for each trim material as below and delete note 4:

Class C65B-Trim material –SS316 L
Class C65B1-Trim material –6 MOLY S/S (UNS S31254 / UNSN 08926)
Class C65B2-Trim material –INCONEL 825
Class C65B3-Trim material –INCONEL 625

b) **Modify** branch table to use 'reducing tee' in accordance with ASME B16.9. **Delete** all reference to 'stub-in'.

c) Modify Note 9 to read as:

For SS316L Trim Valves: "Ball material for ball valves of size 14" and below shall be SS316L and for sizes 16" and above carbon steel (A216 WCB / A105N) + 3 mm SS316L weld overlay. For 6 MOLY S/S / Alloy 825/ 625 trim valves: "Ball material of ball valves of size 4" and below shall be 6 MOLY S/S / Alloy 825 / 625 and for sizes 6" and above carbon steel (A216 WCB / A105N) + 3 mm 6 MOLY S/S / Alloy 825/ 625 weld overlay.

d) **Modify** plug valves by adding trim material as ALLOY 625 (UNS N06625) + STELLITE SEATS.

HEADER SIZE NPS (IN)	BRANCH SIZE NPS (IN)																					
	3/4	1	1½	2	3	4	6	8	10	12	14	16	18	20	24	28	30	32	36	40	42	48
3/4	T																					
1	RT	T																				
1½	RT	RT	T																			
2	RT	RT	RT	T																		
3	W	W	RT	RT	T																	
4	W	W	RT	RT	RT	T																
6	W	W	W	W	RT	RT	T															
8	W	W	W	W	W	RT	RT	T														
10	W	W	W	W	W	RT	RT	RT	T													
12	W	W	W	W	W	W	RT	RT	RT	T												
14	W	W	W	W	W	W	RT	RT	RT	RT	T											
16	W	W	W	W	W	W	RT	RT	RT	RT	RT	T										
18	W	W	W	W	W	W	W	RT	RT	RT	RT	RT	T									
20	W	W	W	W	W	W	W	RT	RT	RT	RT	RT	RT	T								
24	W	W	W	W	W	W	W	W	RT	RT	RT	RT	RT	RT	T							
28	W	W	W	W	W	W	W	W	W	RT	RT	RT	RT	RT	RT	T						
30	W	W	W	W	W	W	W	W	RT	RT	RT	RT	RT	RT	RT	RT	T					
32	W	W	W	W	W	W	W	W	W	W	RT	RT	RT	RT	RT	RT	RT	T				
36	W	W	W	W	W	W	W	W	W	W	W	RT	RT	RT	RT	RT	RT	RT	T			
40	W	W	W	W	W	W	W	W	W	W	W	W	RT	RT	RT	RT	RT	RT	RT	T		
42	W	W	W	W	W	W	W	W	W	W	W	W	RT	RT	RT	RT	RT	RT	RT	RT	T	
48	W	W	W	W	W	W	W	W	W	W	W	W	W	W	RT	RT	RT	RT	RT	RT	RT	T

PIPING CLASS C65B, C65B1, C65B2, C65B3

BRANCH REINFORCEMENT TABLE

KUWAIT OIL COMPANY (K.S.C.)
(Register of Commerce No. 21835)
Annexure 1 to Appendix-13
Mutriba Remote Boosting Facility (MRBF), at North Kuwait

Addendum to KOC STD for Piping Material Classes KOC-MP-010

13) Piping Material Class – C65K:

Modify project specific addendum to piping class 'C65K' as shown below.

a) Modify trim materials and create separate Piping Material Class for each trim material as below and delete note 4:
Class C65K-Trim material –SS316 L
Class C65K1-Trim material –6 MOLY S/S (UNS S31254 / UNSN 08926)
Class C65K2-Trim material –INCONEL 825
Class C65K3-Trim material –INCONEL 625

b) **Modify** branch table to use 'reducing tee' in accordance with ASME B16.9. **Delete** all reference to 'stub-in'.

c) Modify Note 8 to read as:
For SS316L Trim Valves: "Ball material for ball valves of size 14" and below shall be SS316L and for sizes 16" and above LTCS (ASTM A 350 LF2 / A 352 LCB) + 3 mm SS316L weld overlay.
For 6 MOLY S/S / Alloy 825/ 625 trim valves: "Ball material of ball valves of size 4" and below shall be 6 MOLY S/S / Alloy 825 / 625 and for sizes 6" and above LTCS (ASTM A 350 LF2 / A 352 LCB) + 3 mm 6 MOLY S/S / Alloy 825/ 625 weld overlay.

HEADER SIZE NPS (IN)	BRANCH SIZE NPS (IN)														
	3/4	1	1½	2	3	4	6	8	10	12	14	16	18	20	24
3/4	T														
1	RT	T													
1½	RT	RT	T												
2	RT	RT	RT	T											
3	W	W	RT	RT	T										
4	W	W	RT	RT	RT	T									
6	W	W	W	W	RT	RT	T								
8	W	W	W	W	W	RT	RT	T							
10	W	W	W	W	W	RT	RT	RT	T						
12	W	W	W	W	W	W	RT	RT	RT	T					
14	W	W	W	W	W	W	RT	RT	RT	RT	T				
16	W	W	W	W	W	W	RT	RT	RT	RT	RT	T			
18	W	W	W	W	W	W	W	RT	RT	RT	RT	RT	T		
20	W	W	W	W	W	W	W	RT	RT	RT	RT	RT	RT	T	
24	W	W	W	W	W	W	W	W	RT	RT	RT	RT	RT	RT	T

PIPING CLASS C65K, C65K1, C65K2, C65K3

BRANCH REINFORCEMENT TABLE

KUWAIT OIL COMPANY (K.S.C.)
(Register of Commerce No. 21835)
Annexure 1 to Appendix-13
Mutriba Remote Boosting Facility (MRBF), at North Kuwait

Addendum to KOC STD for Piping Material Classes KOC-MP-010

14) Piping Material Class – C67B:
Modify project specific addendum to piping class 'C67B' as shown below.

a) Modify trim materials and create separate Piping Material Class for each trim material as below and delete note 5:
Class C67B-Trim material –SS316 L
Class C67B1-Trim material –6 MOLY S/S (UNS S31254 / UNSN 08926)
Class C67B2-Trim material –INCONEL 825
Class C67B3-Trim material –INCONEL 625
b) **Modify** branch table to use 'reducing tee' in accordance with ASME B16.9. **Delete** all reference to 'stub-in'.
c) **Modify** plug valves by adding trim material as ALLOY 625 (UNS N06625) + STELLITE SEATS.
d) Modify Note 10 to read as:
For SS316L Trim Valves: "Ball material for ball valves of size 14" and below shall be SS316L and for sizes 16" and above carbon steel (A216 WCB / A105N) + 3 mm SS316L weld overlay.
For 6 MOLY S/S / Alloy 825/ 625 trim valves: "Ball material of ball valves of size 4" and below shall be 6 MOLY S/S / Alloy 825 / 625 and for sizes 6" and above carbon steel (A216 WCB / A105N) + 3 mm 6 MOLY S/S / Alloy 825/ 625 weld overlay.

PIPING CLASS C67B, C67B1, C67B2, C67B3

BRANCH REINFORCEMENT TABLE

HEADER SIZE NPS (IN)	BRANCH SIZE NPS (IN)																
	3/4	T															
	1	RT	T														
	1½	RT	RT	T													
	2	W	W	W	T												
	3	W	W	W	RT	T											
	4	W	W	W	W	RT	T										
	6	W	W	W	W	RT	RT	T									
	8	W	W	W	W	W	RT	RT	T								
	10	W	W	W	W	W	W	RT	RT	T							
	12	W	W	W	W	W	W	W	RT	RT	T						
	14	W	W	W	W	W	W	W	RT	RT	RT	T					
	16	W	W	W	W	W	W	W	W	RT	RT	RT	T				
	18	W	W	W	W	W	W	W	W	RT	RT	RT	RT	T			
	20	W	W	W	W	W	W	W	W	W	RT	RT	RT	RT	T		
	24	W	W	W	W	W	W	W	W	W	RT	RT	RT	RT	RT	T	
	THRU																
	48	W	W	W	W	W	W	W	W	W	RT	RT	RT	RT	RT	RT	RT	T
		3/4	1	1½	2	3	4	6	8	10	12	14	16	18	20	24	THRU	48

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Addendum to KOC STD for Piping Material Classes KOC-MP-010

15) Piping Material Class – C95B:
Modify project specific addendum to piping class 'C95B' as shown below.

a) **Modify** trim materials and create separate Piping Material Class for each trim material as below and delete note 4:
Class C95B-Trim material –SS316 L
Class C95B1-Trim material –6 MOLY S/S (UNS S31254 / UNSN 08926)
Class C95B2-Trim material –INCONEL 825
Class C95B3-Trim material –INCONEL 625

b) **Modify** branch table to use 'reducing tee' in accordance with ASME B16.9. **Delete** all reference to 'stub-in'.

c) Modify Note 9 to read as:
For SS316L Trim Valves: "Ball material for ball valves of size 14" and below shall be SS316L and for sizes 16" and above carbon steel (A216 WCB / A105N) + 3 mm SS316L weld overlay. For 6 MOLY S/S / Alloy 825/ 625 trim valves: "Ball material of ball valves of size 4" and below shall be 6 MOLY S/S / Alloy 825 / 625 and for sizes 6" and above carbon steel (A216 WCB / A105N) + 3 mm 6 MOLY S/S / Alloy 825/ 625 weld overlay.

HEADER SIZE NPS	¾	1	1½	2	3	4	6	8	10	12	14	16	18	20	24
¾	T														
1	RT	T													
1½	RT	RT	T												
2	W	W	W	T											
3	W	W	W	RT	T										
4	W	W	W	W	RT	T									
6	W	W	W	W	RT	RT	T								
8	W	W	W	W	W	RT	RT	T							
10	W	W	W	W	W	W	RT	RT	T						
12	W	W	W	W	W	W	W	RT	RT	T					
14	W	W	W	W	W	W	W	RT	RT	RT	T				
16	W	W	W	W	W	W	W	W	RT	RT	RT	T			
18	W	W	W	W	W	W	W	W	RT	RT	RT	RT	T		
20	W	W	W	W	W	W	W	W	W	RT	RT	RT	RT	T	
24	W	W	W	W	W	W	W	W	W	RT	RT	RT	RT	RT	T

BRANCH SIZE NPS (IN)

PIPING CLASS C95B, C95B1, C95B2, C95B3

BRANCH REINFORCEMENT TABLE

KUWAIT OIL COMPANY (K.S.C.)
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Mutriba Remote Boosting Facility (MRBF), at North Kuwait

Addendum to KOC STD for Piping Material Classes KOC-MP-010

16) Piping Material Class – C97B:
Modify project specific addendum to piping class 'C97B' as shown below.

a) Modify trim materials and create separate Piping Material Class for each trim material as below and delete not-5:
Class C97B-Trim material –SS316 L
Class C97B1-Trim material –6 MOLY S/S (UNS S31254 / UNSN 08926)
Class C97B2-Trim material –INCONEL 825
Class C97B3-Trim material –INCONEL 625

b) Modify Note 11 to read as:
For SS316L Trim Valves: "Ball material for ball valves of size 14" and below shall be SS316L and for sizes 16" and above carbon steel (A216 WCB / A105N) + 3 mm SS316L weld overlay.
For 6 MOLY S/S / Alloy 825/ 625 trim valves: "Ball material of ball valves of size 4" and below shall be 6 MOLY S/S / Alloy 825 / 625 and for sizes 6" and above carbon steel (A216 WCB / A105N) + 3 mm 6 MOLY S/S / Alloy 825/ 625 weld overlay.

c) **Modify** branch table to use 'reducing tee' in accordance with ASME B16.9. **Delete** all references to 'stub-in'.

HEADER SIZE NPS	BRANCH SIZE NPS (IN)														
	3/4		T												
	1		RT												
	1½		RT	T											
	2		W	W	T										
	3		W	W	RT	T									
	4		W	W	W	RT	T								
	6		W	W	W	RT	RT	T							
	8		W	W	W	W	RT	RT	T						
	10		W	W	W	W	W	RT	RT	T					
	12		W	W	W	W	W	W	RT	RT	T				
	14		W	W	W	W	W	W	RT	RT	RT	T			
	16		W	W	W	W	W	W	W	RT	RT	RT	T		
	18		W	W	W	W	W	W	W	RT	RT	RT	RT	T	
	20		W	W	W	W	W	W	W	W	RT	RT	RT	RT	T	
	24		W	W	W	W	W	W	W	W	RT	RT	RT	RT	RT	T
		3/4	1	1½	2	3	4	6	8	10	12	14	16	18	20	24

PIPING CLASS C97B, C97B1, C97B2, C97B3

BRANCH REINFORCEMENT TABLE

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Addendum to KOC STD for Piping Material Classes KOC-MP-010

17) Piping Material Class – F10A:

Modify project specific addendum to piping class 'F10A' as shown below.

a) **Add** note13, The underground RTRP pipeline shall not have any flanged joint. In case it is inevitable, a suitable pit (similar to a valve pit) to facilitate maintenance shall be provided as illustrated in KOC-L-002.
b) **Add** note 14, The design, supply, installation, commissioning and hand over of the RTRP piping systems shall be by a specialized manufacturer/vendor approved by KOC. All guarantees/ warranties for the RTRP piping systems should be by the EPC contractor for the specified design conditions and project requirements for the entire design life of the plant and facility.

18) Piping Material Class – F10B:

Modify project specific addendum to piping class 'F10B' as shown below.

a) **Add** note 19, Body bonnet bolting material for all Super Duplex Stainless Steel valve shall be super duplex stainless steel.
b) **Add** note 20, The underground RTRP pipeline shall not have any flanged joint. In case it is inevitable, a suitable pit (similar to a valve pit) to facilitate maintenance shall be provided as illustrated in KOC-L-002.
c) **Add** note 21, The design, supply, installation, commissioning and hand over of the RTRP piping systems shall be by a specialized manufacturer/vendor approved by KOC. All guarantees/ warranties for the RTRP piping systems should be by the EPC contractor for the specified design conditions and project requirements for the entire design life of the plant and facility.

19) Piping Material Class – F30A:

Modify project specific addendum to piping class 'F30A' as shown below.

a) **Add** note 11, Body bonnet bolting material for all Super Duplex Stainless Steel valve shall be super duplex stainless steel.
b) **Add** note 12, The underground RTRP pipeline shall not have any flanged joint. In case it is inevitable, a suitable pit (similar to a valve pit) to facilitate maintenance shall be provided as illustrated in KOC-L-002.
c) **Add** note 13, The design, supply, installation, commissioning and hand over of the RTRP piping systems shall be by a specialized manufacturer/vendor approved by KOC. All guarantees/ warranties for the RTRP piping systems should be by the EPC contractor for the specified design conditions and project requirements for the entire design life of the plant and facility.

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Addendum to KOC STD for Piping Material Classes KOC-MP-010

20) Piping Material Class – Q15A:

Modify project specific addendum to piping class 'Q15A' as shown below.

a) **Modify** branch table to use 'reducing tee' in place of all 'stub-in's and, in accordance with ASME B16.9 for branch sizes above 3" Also, **delete** all reference to 'stub-in'.

HEADER SIZE NPS	¾	1	1½	2	3	4	6	8	10	12	14	16	18	20	24	THRU	30
¾	T																
1	RT	T															
1½	RT	RT	T														
2	RT	RT	RT	T													
3	SS	SS	SS	SS	T												
4	SS	SS	SS	SS	RT	T											
6	SS	SS	SS	SS	RT	RT	T										
8	SS	SS	SS	SS	W	RT	RT	T									
10	SS	SS	SS	SS	W	W	RT	RT	T								
12	SS	SS	SS	SS	W	W	W	RT	RT	T							
14	SS	SS	SS	SS	W	W	W	RT	RT	RT	T						
16	SS	SS	SS	SS	W	W	W	W	RT	RT	RT	T					
18	SS	SS	SS	SS	W	W	W	W	RT	RT	RT	RT	T				
20	SS	SS	SS	SS	W	W	W	W	W	RT	RT	RT	RT	T			
24	SS	SS	SS	SS	W	W	W	W	W	RT	RT	RT	RT	RT	T		
THRU																	
30	SS	SS	SS	SS	W	W	W	W	W	RT	RT	RT	RT	RT	RT		T
	¾	1	1½	2	3	4	6	8	10	12	14	16	18	20	24	THRU	30
	BRANCH SIZE NPS (IN)																

Note: Branch connection between SDSS piping NPS 2" and below and liquid epoxy lined piping shall be made by providing a NPS 3 epoxy lined flanged branch and making the connection with NPS 3 SDSS reducing (of NPS 2 and below) flange.

PIPING CLASS Q15A

BRANCH REINFORCEMENT TABLE

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Addendum to KOC STD for Piping Material Classes KOC-MP-010

21) Piping Material Class – Q15B:

Modify project specific addendum to piping class 'Q15B' as shown below.

a) **Modify** branch table to use 'reducing tee' in place of all 'stub-in's and, in accordance with ASME B16.9 for branch sizes above 3" Also, **delete** all reference to 'stub-in'.
b) Add note- 17 Use SDSS bolting for SDSS flanged joints.

BRANCH REINFORCEMENT TABLE

HEADER SIZE NPS	BRANCH SIZE NPS (IN)	¾	1	1½	2	3	4	6	8	10	12	14	16	18	20	24	THRU	36
	¾	T																
	1	RT	T															
	1½	RT	RT	T														
	2	RT	RT	RT	T													
	3	SS	SS	SS	SS	T												
	4	SS	SS	SS	SS	RT	T											
	6	SS	SS	SS	SS	RT	RT	T										
	8	SS	SS	SS	SS	W	RT	RT	T									
	10	SS	SS	SS	SS	W	W	RT	RT	T								
	12	SS	SS	SS	SS	W	W	W	RT	RT	T							
	14	SS	SS	SS	SS	W	W	W	RT	RT	RT	T						
	16	SS	SS	SS	SS	W	W	W	W	RT	RT	RT	T					
	18	SS	SS	SS	SS	W	W	W	W	RT	RT	RT	RT	T				
	20	SS	SS	SS	SS	W	W	W	W	W	RT	RT	RT	RT	T			
	24	SS	SS	SS	SS	W	W	W	W	W	RT	RT	RT	RT	RT	T		
	THRU																	
	36	SS	SS	SS	SS	W	W	W	W	W	RT	RT	RT	RT	RT	RT		T

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Addendum to KOC STD for Piping Material Classes KOC-MP-010

22) Piping Material Class – Q15K:

Modify project specific addendum to piping class 'Q15K' as shown below.

a) **Modify** branch table to use 'reducing tee' in place of all 'stub-in's and, in accordance with ASME B16.9 for branch sizes above 3" Also, **delete** all reference to 'stub-in'.
b) **Add note-8** Use SDSS bolting for SDSS flanged joints.

HEADER SIZE NPS (IN)	3/4	1	1½	2	3	4	6	8	10	12	14	16	18	20	24
3/4	T														
1	RT	T													
1½	RT	RT	T												
2	RT	RT	RT	T											
3	SS	SS	SS	SS	T										
4	SS	SS	SS	SS	RT	T									
6	SS	SS	SS	SS	RT	RT	T								
8	SS	SS	SS	SS	W	RT	RT	T							
10	SS	SS	SS	SS	W	RT	RT	RT	T						
12	SS	SS	SS	SS	W	W	RT	RT	RT	T					
14	SS	SS	SS	SS	W	W	RT	RT	RT	RT	T				
16	SS	SS	SS	SS	W	W	RT	RT	RT	RT	RT	T			
18	SS	SS	SS	SS	W	W	W	RT	RT	RT	RT	RT	T		
20	SS	SS	SS	SS	W	W	W	RT	RT	RT	RT	RT	RT	T	
24	SS	SS	SS	SS	W	W	W	W	RT	RT	RT	RT	RT	RT	T

BRANCH SIZE NPS (IN)

PIPING CLASS Q15K

BRANCH REINFORCEMENT TABLE

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Addendum to KOC STD for Piping Material Classes KOC-MP-010

23) Piping Material Class – Q35A:

Modify project specific addendum to piping class 'Q35A' as shown below.

A) Modify branch table to use 'reducing tee' in place of all 'stub-in's and, in accordance with ASME B16.9 for branch sizes above 3" Also, **delete** all reference to 'stub-in'.

HEADER SIZE NPS	¾	1	1½	2	3	4	6	8	10	12	14	16	18	20	24	THRU	30
¾	T																
1	RT	T															
1½	RT	RT	T														
2	RT	RT	RT	T													
3	SS	SS	SS	SS	T												
4	SS	SS	SS	SS	RT	T											
6	SS	SS	SS	SS	RT	RT	T										
8	SS	SS	SS	SS	W	RT	RT	T									
10	SS	SS	SS	SS	W	W	RT	RT	T								
12	SS	SS	SS	SS	W	W	W	RT	RT	T							
14	SS	SS	SS	SS	W	W	W	RT	RT	RT	T						
16	SS	SS	SS	SS	W	W	W	W	RT	RT	RT	T					
18	SS	SS	SS	SS	W	W	W	W	RT	RT	RT	RT	T				
20	SS	SS	SS	SS	W	W	W	W	W	RT	RT	RT	RT	T			
24	SS	SS	SS	SS	W	W	W	W	W	RT	RT	RT	RT	RT	T		
THRU																	
30	SS	SS	SS	SS	W	W	W	W	W	RT	RT	RT	RT	RT	RT		T
	¾	1	1½	2	3	4	6	8	10	12	14	16	18	20	24	THRU	30
	BRANCH SIZE NPS (INCH)																

PIPING CLASS Q35A

BRANCH REINFORCEMENT TABLE

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Addendum to KOC STD for Piping Material Classes KOC-MP-010

24) Piping Material Class – Q35B:

Modify project specific addendum to piping class 'Q35B' as shown below.

A) Modify branch table to use 'reducing tee' in place of all 'stub-in's and, in accordance with ASME B16.9 for branch sizes above 3" Also, **delete** all reference to 'stub-in'.

HEADER SIZE NPS	¾	1	1½	2	3	4	6	8	10	12	14	16	18	20	24	THRU	32
¾	T																
1	RT	T															
1½	RT	RT	T														
2	RT	RT	RT	T													
3	SS	SS	SS	SS	T												
4	SS	SS	SS	SS	RT	T											
6	SS	SS	SS	SS	RT	RT	T										
8	SS	SS	SS	SS	W	RT	RT	T									
10	SS	SS	SS	SS	W	W	RT	RT	T								
12	SS	SS	SS	SS	W	W	W	RT	RT	T							
14	SS	SS	SS	SS	W	W	W	RT	RT	RT	T						
16	SS	SS	SS	SS	W	W	W	W	RT	RT	RT	T					
18	SS	SS	SS	SS	W	W	W	W	RT	RT	RT	RT	T				
20	SS	SS	SS	SS	W	W	W	W	W	RT	RT	RT	RT	T			
24	SS	SS	SS	SS	W	W	W	W	W	RT	RT	RT	RT	RT	T		
THRU																	
36	SS	SS	SS	SS	W	W	W	W	W	RT	RT	RT	RT	RT	RT		T
	¾	1	1½	2	3	4	6	8	10	12	14	16	18	20	24	THRU	32
	BRANCH SIZE NPS (IN)																

PIPING CLASS Q35B

BRANCH REINFORCEMENT TABLE

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Addendum to KOC STD for Piping Material Classes KOC-MP-010

25) Piping Material Class – Q35K:

Modify project specific addendum to piping class 'Q35K' as shown below.

A) **Modify** branch table to use 'reducing tee' in place of all 'stub-in's and, in accordance with ASME B16.9 for branch sizes above 3" Also, **delete** all reference to 'stub-in'.

HEADER SIZE NPS	¾	1	1½	2	3	4	6	8	10	12	14	16	18	20	24
¾	T														
1	RT	T													
1½	RT	RT	T												
2	RT	RT	RT	T											
3	SS	SS	SS	SS	T										
4	SS	SS	SS	SS	RT	T									
6	SS	SS	SS	SS	RT	RT	T								
8	SS	SS	SS	SS	W	RT	RT	T							
10	SS	SS	SS	SS	W	W	RT	RT	T						
12	SS	SS	SS	SS	W	W	W	RT	RT	T					
14	SS	SS	SS	SS	W	W	W	RT	RT	RT	T				
16	SS	SS	SS	SS	W	W	W	W	RT	RT	RT	T			
18	SS	SS	SS	SS	W	W	W	W	W	RT	RT	RT	T		
20	SS	SS	SS	SS	W	W	W	W	W	RT	RT	RT	RT	T	
24	SS	SS	SS	SS	W	W	W	W	W	RT	RT	RT	RT	RT	T

BRANCH SIZE NPS (IN)

PIPING CLASS Q35K

BRANCH REINFORCEMENT TABLE

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Addendum to KOC STD for Piping Material Classes KOC-MP-010

26) Piping Material Class – Q65B:

Modify project specific addendum to piping class 'Q65B' as shown below.

A) **Modify** branch table to use 'reducing tee' in place of all 'stub-in's and, in accordance with ASME B16.9 for branch sizes above 3" Also, **delete** all reference to 'stub-in'.

HEADER SIZE NPS	¾	1	1½	2	3	4	6	8	10	12	14	16	18	20	24	THRU	36
¾	T																
1	RT	T															
1½	RT	RT	T														
2	RT	RT	RT	T													
3	SS	SS	SS	SS	T												
4	SS	SS	SS	SS	RT	T											
6	SS	SS	SS	SS	RT	RT	T										
8	SS	SS	SS	SS	W	RT	RT	T									
10	SS	SS	SS	SS	W	W	RT	RT	T								
12	SS	SS	SS	SS	W	W	W	RT	RT	T							
14	SS	SS	SS	SS	W	W	W	RT	RT	RT	T						
16	SS	SS	SS	SS	W	W	W	W	RT	RT	RT	T					
18	SS	SS	SS	SS	W	W	W	W	RT	RT	RT	RT	T				
20	SS	SS	SS	SS	W	W	W	W	W	RT	RT	RT	RT	T			
24	SS	SS	SS	SS	W	W	W	W	W	RT	RT	RT	RT	RT	T		
THRU																	
36	SS	SS	SS	SS	W	W	W	W	W	RT	RT	RT	RT	RT	RT		T
	¾	1	1½	2	3	4	6	8	10	12	14	16	18	20	24	THRU	36
	BRANCH SIZE NPS (IN)																

PIPING CLASS Q65B

BRANCH REINFORCEMENT TABLE

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Addendum to KOC STD for Piping Material Classes KOC-MP-010

27) Piping Material Class – S10A:

A) **Modify** branch table to use 'reducing tee' in accordance with ASME B16.9. **Delete** all reference to 'stub-in'.

HEADER SIZE NPS	BRANCH SIZE NPS (IN)											
	½	¾	1	1½	2	3	4	6	8	10	12	
½	T											
¾	RT	T										
1	RT	RT	T									
1½	RT	RT	RT	T								
2	SOL	SOL	SOL	SOL	T							
3	SOL	SOL	SOL	SOL	RT	T						
4	SOL	SOL	SOL	SOL	W	RT	T					
6	SOL	SOL	SOL	SOL	W	RT	RT	T				
8	SOL	SOL	SOL	SOL	W	W	RT	RT	T			
10	SOL	SOL	SOL	SOL	W	W	W	RT	RT	T		
12	SOL	SOL	SOL	SOL	W	W	W	W	RT	RT	T	

PIPING CLASS S10A

BRANCH REINFORCEMENT TABLE

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Addendum to KOC STD for Piping Material Classes KOC-MP-010

28) Piping Material Class – S10B:

Modify project specific addendum to piping class 'S10B' as shown below.

A) Modify branch table to use 'reducing tee' in accordance with ASME B16.9. **Delete** all reference to 'stub-in'.

HEADER SIZE NPS	¾	1	1½	2	3	4	6	8	10	12	14	16	18	20	24	THRU	60
¾	T																
1	RT	T															
1½	RT	RT	T														
2	W	W	W	T													
3	W	W	W	RT	T												
4	W	W	W	W	RT	T											
6	W	W	W	W	RT	RT	T										
8	W	W	W	W	W	RT	RT	T									
10	W	W	W	W	W	W	RT	RT	T								
12	W	W	W	W	W	W	W	RT	RT	T							
14	W	W	W	W	W	W	W	RT	RT	RT	T						
16	W	W	W	W	W	W	W	W	RT	RT	RT	T					
18	W	W	W	W	W	W	W	RT	RT	RT	RT	RT	T				
20	W	W	W	W	W	W	W	W	W	RT	RT	RT	RT	T			
24	W	W	W	W	W	W	W	W	W	RT	RT	RT	RT	RT	T		
THRU																	
60	W	W	W	W	W	W	W	W	W	RT	RT	RT	RT	RT	RT		T
	¾	1	1½	2	3	4	6	8	10	12	14	16	18	20	24	THRU	60
	BRANCH SIZE NPS (IN)																

PIPING CLASS S10B

BRANCH REINFORCEMENT TABLE

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Mutriba Remote Boosting Facility (MRBF), at North Kuwait

Addendum to KOC STD for Piping Material Classes KOC-MP-010

29) Piping Material Class – S30A:

Modify project specific addendum to piping class 'S30A' as shown below.

A) Modify branch table to use 'reducing tee' in accordance with ASME B16.9. **Delete** all reference to 'stub-in'.

HEADER SIZE NPS	½	¾	1	1½	2	3	4	6	8	10	12
½	T										
¾	RT	T									
1	RT	RT	T								
1½	RT	RT	RT	T							
2	SOL	SOL	SOL	SOL	T						
3	SOL	SOL	SOL	SOL	RT	T					
4	SOL	SOL	SOL	SOL	W	RT	T				
6	SOL	SOL	SOL	SOL	W	RT	RT	T			
8	SOL	SOL	SOL	SOL	W	W	RT	RT	T		
10	SOL	SOL	SOL	SOL	W	W	W	RT	RT	T	
12	SOL	SOL	SOL	SOL	W	W	W	W	RT	RT	T

BRANCH SIZE NPS (IN)

PIPING CLASS S30A

BRANCH REINFORCEMENT TABLE

KUWAIT OIL COMPANY (K.S.C.)
(Register of Commerce No. 21835)
Annexure 1 to Appendix-13
Mutriba Remote Boosting Facility (MRBF), at North Kuwait

Addendum to KOC STD for Piping Material Classes KOC-MP-010

30) Piping Material Class – S30B:

Modify project specific addendum to piping class 'S30B' as shown below.

A) Modify branch table to use 'reducing tee' in accordance with ASME B16.9. **Delete** all reference to 'stub-in'.

HEADER SIZE NPS (IN)	BRANCH SIZE NPS (IN)														
	3/4	1	1½	2	3	4	6	8	10	12	14	16	18	20	24
3/4	T														
1	RT	T													
1½	RT	RT	T												
2	RT	RT	RT	T											
3	W*	W*	RT	RT	T										
4	W*	W*	RT	RT	RT	T									
6	W	W	W	W	RT	RT	T								
8	W	W	W	W	W	RT	RT	T							
10	W	W	W	W	W	RT	RT	RT	T						
12	W	W	W	W	W	W	RT	RT	RT	T					
14	W	W	W	W	W	W	RT	RT	RT	RT	T				
16	W	W	W	W	W	W	RT	RT	RT	RT	RT	T			
18	W	W	W	W	W	W	W	RT	RT	RT	RT	RT	T		
20	W	W	W	W	W	W	W	RT	RT	RT	RT	RT	RT	T	
24	W	W	W	W	W	W	W	W	RT	RT	RT	RT	RT	RT	T

PIPING CLASS S30B

BRANCH REINFORCEMENT TABLE

KUWAIT OIL COMPANY (K.S.C.)
(Register of Commerce No. 21835)
Annexure 1 to Appendix-13
Mutriba Remote Boosting Facility (MRBF), at North Kuwait

Addendum to KOC STD for Piping Material Classes KOC-MP-010

31) Piping Material Class – S60A:

Modify project specific addendum to piping class 'S60A' as shown below.

A) Modify branch table to use 'reducing tee' in accordance with ASME B16.9. **Delete** all reference to 'stub-in'.

HEADER SIZE NPS (IN)	BRANCH SIZE NPS (IN)									
	3/4	1	1½	2	3	4	6	8	10	12
3/4	T									
1	RT	T								
1½	RT	RT	T							
2	RT	RT	RT	T						
3	SOL	SOL	RT	RT	T					
4	SOL	SOL	RT	RT	RT	T				
6	SOL	SOL	SOL	W	RT	RT	T			
8	SOL	SOL	SOL	W	W	RT	RT	T		
10	SOL	SOL	SOL	W	W	RT	RT	RT	T	
12	SOL	SOL	SOL	W	W	W	RT	RT	RT	T

PIPING CLASS S60A

BRANCH REINFORCEMENT TABLE

KUWAIT OIL COMPANY (K.S.C.)
(Register of Commerce No. 21835)
Annexure 1 to Appendix-13
Mutriba Remote Boosting Facility (MRBF), at North Kuwait

Addendum to KOC STD for Piping Material Classes KOC-MP-010

32) Piping Material Class – S60B:

Modify project specific addendum to piping class 'S60B' as shown below.

A) Modify branch table to use 'reducing tee' in accordance with ASME B16.9. **Delete** all reference to 'stub-in'.

HEADER SIZE NPS (IN)	3/4	1	1½	2	3	4	6	8	10	12	14	16	18	20	24
3/4	T														
1	RT	T													
1½	RT	RT	T												
2	RT	RT	RT	T											
3	W	W	RT	RT	T										
4	W	W	RT	RT	RT	T									
6	W	W	W	W	RT	RT	T								
8	W	W	W	W	W	RT	RT	T							
10	W	W	W	W	W	RT	RT	RT	T						
12	W	W	W	W	W	W	RT	RT	RT	T					
14	W	W	W	W	W	W	RT	RT	RT	RT	T				
16	W	W	W	W	W	W	RT	RT	RT	RT	RT	T			
18	W	W	W	W	W	W	W	RT	RT	RT	RT	RT	T		
20	W	W	W	W	W	W	W	RT	RT	RT	RT	RT	RT	T	
24	W	W	W	W	W	W	W	W	RT	RT	RT	RT	RT	RT	T

BRANCH SIZE NPS (IN)

PIPING CLASS S60B

BRANCH REINFORCEMENT TABLE

KUWAIT OIL COMPANY (K.S.C.)
(Register of Commerce No. 21835)
Annexure 1 to Appendix-13
Mutriba Remote Boosting Facility (MRBF), at North Kuwait

Addendum to KOC STD for Piping Material Classes KOC-MP-010

33) Piping Material Class – S90A:

Modify project specific addendum to piping class 'S90A' as shown below.

A) Modify branch table to use 'reducing tee' in accordance with ASME B16.9. **Delete** all reference to 'stub-in'.

HEADER SIZE NPS	½	¾	1	1½	2	3	4	6	8	10	12
½	T										
¾	RT	T									
1	RT	RT	T								
1½	RT	RT	RT	T							
2	SOL	SOL	SOL	SOL	T						
3	SOL	SOL	SOL	SOL	RT	T					
4	SOL	SOL	SOL	SOL	W	RT	T				
6	SOL	SOL	SOL	SOL	W	RT	RT	T			
8	SOL	SOL	SOL	SOL	W	W	RT	RT	T		
10	SOL	SOL	SOL	SOL	W	W	W	RT	RT	T	
12	SOL	SOL	SOL	SOL	W	W	W	W	RT	RT	T

BRANCH SIZE NPS (IN)

PIPING CLASS S90A

BRANCH REINFORCEMENT TABLE

KUWAIT OIL COMPANY (K.S.C.)
(Register of Commerce No. 21835)
Annexure 1 to Appendix-13
Mutriba Remote Boosting Facility (MRBF), at North Kuwait

Addendum to KOC STD for Piping Material Classes KOC-MP-010

34) Piping Material Class – S90B:

Modify project specific addendum to piping class 'S90B' as shown below.

A) Modify branch table to use 'reducing tee' in accordance with ASME B16.9. **Delete** all reference to 'stub-in'.

HEADER SIZE NPS	¾	1	1½	2	3	4	6	8	10	12	14	16	18	20	24
¾	T														
1	RT	T													
1½	RT	RT	T												
2	W	W	W	T											
3	W	W	W	RT	T										
4	W	W	W	W	RT	T									
6	W	W	W	W	RT	RT	T								
8	W	W	W	W	W	RT	RT	T							
10	W	W	W	W	W	W	SI	RT	T						
12	W	W	W	W	W	W	W	RT	RT	T					
14	W	W	W	W	W	W	W	RT	RT	RT	T				
16	W	W	W	W	W	W	W	W	RT	RT	RT	T			
18	W	W	W	W	W	W	W	W	RT	RT	RT	RT	T		
20	W	W	W	W	W	W	W	W	W	RT	RT	RT	RT	T	
24	W	W	W	W	W	W	W	W	W	RT	RT	RT	RT	RT	T
	¾	1	1½	2	3	4	6	8	10	12	14	16	18	20	24

BRANCH SIZE NPS (IN)

PIPING CLASS S90B

BRANCH REINFORCEMENT TABLE