		WPS NO.: **DATE :** **PQR NO.:**

CLIENT : **LOCATION :**	**Hindustan Petroleum Corporation Limited**

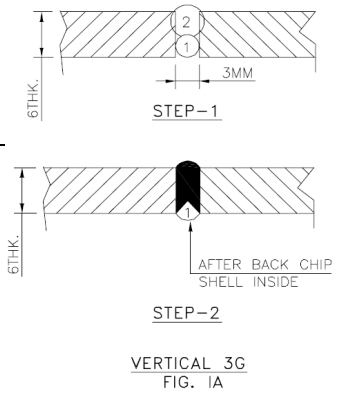
QW-482 - WELDING PROCEDURE SPECIFICATION

(REF. SPECIFICATION : ASME SECTION IX)

JOINT DESIGN (QW 402)

SKETCH / DETAIL : 1 (A)

Type	:	SQ BUTT
Backing	:	NO
Backing Material Type / Grade	:	NA
WELDING PROCESS	:	**SMAW** TYPE : **MANUAL**



BASE METALS (QW 403)

Material Specification	:	IS 2062 / EQ.	To	IS 2062 / EQ.
Type / Grade No.	:	GR.B	To	GR.B
P. No.	:	1	To	1
Group No.	:	1	To	1
Thick of Coupon	:	6 mm		
Thickness Range	:	6 mm		

FILLER MATERIAL (QW 404)

Spec. No. (SFA)	:	5.1	Filler Size	:	**3.15** mm
AWS No. (CLASS)	:	E 6013	Electrode Flux Type	:	-
A. No.:	:	1	Backing / Storage	:	As per Manuf. Std.
F. No.:	:	2	Consumable Insert	:	None
Make	:	**ESAB/ADVANI/D&H**			

POSITION (QW 405)

Position of Groove	:	**3G**	Position of Fillet	:	NA
AWS No. (CLASS)	:	**UPHILL**			

PREHEAT (QW 406)

Preheat Temp. (Min)	:	NA
Interpass Temp. (Max)	:	NA
Preheat Maint	:	NA

POST WELD HEAT TREATMENT (QW 407)

Temperature	:	NA
Time	:	NA
Other	:	NA

GAS (QW 408)

Shielding Gas	:	NA	Flowrate	:	NA
Percentage Comp.	:	NA	Gas Backing	:	NA
Trailing	:	NA	Purging	:	NA

ELECTRICAL CHARACTERISTICS (QW 409)

Current Mode	:	DC
Volts	:	18 to 30
Electrical Polarity	:	STRAIGHT
Amperage	:	80 TO 140
Tungsten Electrode Size & Type	:	NA
Mode of Metal Transfer (GMAW)	:	NA
Elect. Wire - Feed,Speed,Range	:	NA
Other	:	NA

TECHNIQUE (QW 410)

String or weave Bead	:	String / Weaving
Orifice or Gas Cup Size	:	NA
Initial / Interpass Cleaning	:	Wire Brushing
Method of back gauging	:	Grinding
Oscillation	:	NA
Contact Tube to work distance	:	NA
Multiple of Single Pass (/ side)	:	Multiple
Multiple of Single Electrode	:	Single
Travel Speed Range	:	SEE TABLE
Peening	:	NA

WELDING PROCEDURE

Pass No.	Welding Process	Filler Material		Current & Voltage			Travel Speed	Heat Input
		Class	Dia	Type & Pol.	Amps Range	Volts Range	mm / min	kJ / mm
ROOT	SMAW	E6013	3.15	STRAIGHT	80 to 120	20 to 24	85 to 100	
SUB. PASS	SMAW	E6013	3.15	STRAIGHT	90 to 130	24 to 28	90 to 125	
AFTER BACK CHIP	-	-	-	-	-		-	
FINAL	SMAW	E6013	3.15	STRAIGHT	90 to 130	24 to 28	90 ot 125	

APPROVAL NAME : SIGNATURE : DATE :		**HINDUSTAN PETROLUEM CORP. LTD**	

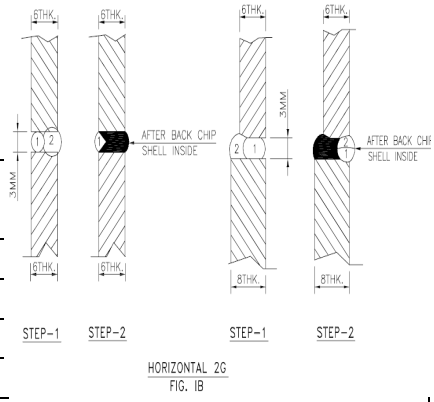
		WPS NO.: **DATE :** **PQR NO.:**
CLIENT : **LOCATION :**	**Hindustan Petroleum Corporation Limited**	

QW-482 - WELDING PROCEDURE SPECIFICATION

(REF. SPECIFICATION : ASME SECTION IX)

JOINT DESIGN (QW 402) — SKETCH / DETAIL : 1 (B)

Type	:	SQ BUTT		
Backing	:	NO		
Backing Material Type / Grade	:	NA		
WELDING PROCESS	:	**SMAW**	TYPE :	**MANUAL**



BASE METALS (QW 403)

Material Specification	:	IS 2062 / EQ.	To	IS 2062 / EQ.
Type / Grade No.	:	GR.B	To	GR.B
P. No.	:	1	To	1
Group No.	:	1	To	1
Thick of Coupon	:	6 mm		
Thickness Range	:	6 to 8 mm		

FILLER MATERIAL (QW 404)

Spec. No. (SFA)	:	**5.1**	Filler Size	:	**3.15** / **4** mm
AWS No. (CLASS)	:	**E 6013**	Electrode Flux Type	:	-
A. No.:	:	1	Backing / Storage	:	As per Manuf. Std.
F. No.:	:	2	Consumable Insert	:	None
Make	:	**ESAB/ADVANI/D&H**			

POSITION (QW 405)

Position of Groove	:	**2G**	Position of Fillet	:	NA
AWS No. (CLASS)	:	**-**			

PREHEAT (QW 406)			**POST WELD HEAT TREATMENT (QW 407)**		
Preheat Temp. (Min)	:	NA	Temperature	:	NA
Interpass Temp. (Max)	:	NA	Time	:	NA
Preheat Maint	:	NA	Other	:	NA

GAS (QW 408)

Shielding Gas	:	NA	Flowrate	:	NA
Percentage Comp.	:	NA	Gas Backing	:	NA
Trailing	:	NA	Purging	:	NA

ELECTRICAL CHARACTERISTICS (QW 409)			**TECHNIQUE (QW 410)**		
Current Mode	:	DC	String of weave Bead	:	String / Weaving
Volts	:	20 to 28	Orifice or Gas Cup Size	:	NA
Electrical Polarity	:	**REVERSE**	Initial / Interpass Cleaning	:	Wire Brushing
Amperage	:	80 TO 140	Method of back gauging	:	Grinding
Tungsten Electrode Size & Type	:	NA	Oscillation	:	NA
Mode of Metal Transfer (GMAW)	:	NA	Contact Tube to work distance	:	NA
Elect. Wire - Feed,Speed,Range	:	NA	Multiple of Single Pass (/ side)	:	Multiple
Other	:	NA	Multiple of Single Electrode	:	Single
			Travel Speed Range	:	SEE TABLE
			Peening	:	NA

WELDING PROCEDURE

Pass No.	Welding Process	Filler Material		Current & Voltage			Travel Speed	Heat Input
		Class	Dia	Type & Pol.	Amps Range	Volts Range	mm / min	kJ / mm
ROOT	SMAW	E6013	3.15	STRAIGHT	80 to 115	20 to 24	80 to 100	
SUB. PASS	SMAW	E6013	4	STRAIGHT	120 to 190	24 to 28	100 to 150	
AFTER BACK CHIP	-	-	-	-	-		-	
SUB. PASS	SMAW	E6013	4	STRAIGHT	120 to 180	24 to 28	100 ot 150	
FINAL	SMAW	E6013	4	STRAIGHT	120 to 180	24 to 28	100 ot 150	

APPROVAL		**HINDUSTAN PETROLUEM CORP. LTD**	
NAME : SIGNATURE : DATE :			

		WPS NO.: **DATE :** **PQR NO.:**

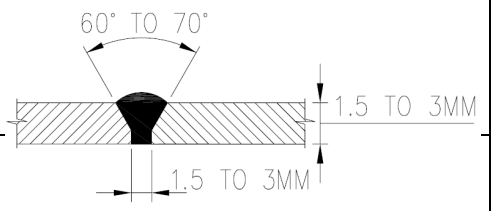
CLIENT : **LOCATION :**	**Hindustan Petroleum Corporation Limited**

QW-482 - WELDING PROCEDURE SPECIFICATION

(REF. SPECIFICATION : ASME SECTION IX)

JOINT DESIGN (QW 402) — SKETCH / DETAIL : 1 (B)

Type	:	SINGLE "V"			
Backing	:	NO			
Backing Material Type / Grade	:	NA			
WELDING PROCESS	:	**SMAW**	TYPE : **MANUAL**		



BASE METALS (QW 403)

Material Specification	:	IS 2062 / EQ.	To	IS 2062 / EQ.	
Type / Grade No.	:	GR.B	To	GR.B	
P. No.	:	1	To	1	
Group No.	:	1	To	1	
Thick of Coupon	:	10 mm			
Thickness Range	:	6 to 20 mm			

FILLER MATERIAL (QW 404)

Spec. No. (SFA)	:	**5.1**	Filler Size	:	**3.15** / **4** mm
AWS No. (CLASS)	:	**E 6013**	Electrode Flux Type	:	-
A. No.:	:	1	Backing / Storage	:	As per Manuf. Std.
F. No.:	:	2	Consumable Insert	:	None
Make	:	**ESAB/ADVANI/D&H**			

POSITION (QW 405)

Position of Groove	:	**3G**	Position of Fillet	:	NA
AWS No. (CLASS)	:	**-**			

PREHEAT (QW 406)

Preheat Temp. (Min)	:	NA
Interpass Temp. (Max)	:	NA
Preheat Maint	:	NA

POST WELD HEAT TREATMENT (QW 407)

Temperature	:	NA
Time	:	NA
Other	:	NA

GAS (QW 408)

Shielding Gas	:	NA	Flowrate	:	NA
Percentage Comp.	:	NA	Gas Backing	:	NA
Trailing	:	NA	Purging	:	NA

ELECTRICAL CHARACTERISTICS (QW 409)

Current Mode	:	DC
Volts	:	20 to 28
Electrical Polarity	:	STRAIGHT
Amperage	:	80 TO 140
Tungsten Electrode Size & Type	:	NA
Mode of Metal Transfer (GMAW)	:	NA
Elect. Wire - Feed,Speed,Range	:	NA
Other	:	NA

TECHNIQUE (QW 410)

String of weave Bead	:	String / Weaving
Orifice or Gas Cup Size	:	NA
Initial / Interpass Cleaning	:	Wire Brushing
Method of back gauging	:	Grinding
Oscillation	:	NA
Contact Tube to work distance	:	NA
Multiple of Single Pass (/ side)	:	Multiple
Multiple of Single Electrode	:	Single
Travel Speed Range	:	SEE TABLE
Peening	:	NA

WELDING PROCEDURE

Pass No.	Welding Process	Filler Material		Current & Voltage			Travel Speed	Heat Input
		Class	Dia	Type & Pol.	Amps Range	Volts Range	mm / min	kJ / mm
ROOT	SMAW	E6013	3.15	STRAIGHT	80 to 115	20 to 24	80 to 100	
SUB. PASS	SMAW	E6013	4	STRAIGHT	120 to 190	24 to 28	100 to 150	
AFTER BACK CHIP	-	-	-	-	-		-	
SUB. PASS	SMAW	E6013	4	STRAIGHT	120 to 180	24 to 28	100 ot 150	
FINAL	SMAW	E6013	4	STRAIGHT	120 to 180	24 to 28	100 ot 150	

APPROVAL NAME : SIGNATURE : DATE :		**HINDUSTAN PETROLUEM CORP. LTD**

		WPS NO.: **DATE :** **PQR NO.:**

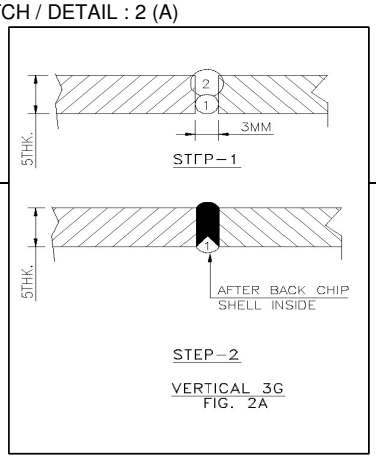
CLIENT :	**Hindustan Petroleum Corporation Limited**
LOCATION :	**MAHUL TERMINAL**

QW-482 - WELDING PROCEDURE SPECIFICATION

(REF. SPECIFICATION : ASME SECTION IX)

JOINT DESIGN (QW 402)

SKETCH / DETAIL : 2 (A)



Type	:	SQ BUTT			
Backing	:	NO			
Backing Material Type / Grade	:	NA			
WELDING PROCESS	:	**SMAW**	TYPE :	**MANUAL**	

BASE METALS (QW 403)

Material Specification	:	IS 2062 / EQ.	To	IS 2062 / EQ.
Type / Grade No.	:	GR.B	To	GR.B
P. No.	:	1	To	1
Group No.	:	1	To	1
Thick of Coupon	:	5 mm		
Thickness Range	:	5 mm		

FILLER MATERIAL (QW 404)

Spec. No. (SFA)	:	5.1	Filler Size	:	**3.15** mm
AWS No. (CLASS)	:	E 6013	Electrode Flux Type	:	-
A. No.:	:	1	Backing / Storage	:	As per Manuf. Std.
F. No.:	:	2	Consumable Insert	:	None
Make	:	**ESAB/ADVANI/D&H**			

POSITION (QW 405)

Position of Groove	:	**3G**	Position of Fillet	:	NA
AWS No. (CLASS)	:	**UPHILL**			

PREHEAT (QW 406)

Preheat Temp. (Min)	:	NA
Interpass Temp. (Max)	:	NA
Preheat Maint	:	NA

POST WELD HEAT TREATMENT (QW 407)

Temperature	:	NA
Time	:	NA
Other	:	NA

GAS (QW 408)

Shielding Gas	:	NA	Flowrate	:	NA
Percentage Comp.	:	NA	Gas Backing	:	NA
Trailing	:	NA	Purging	:	NA

ELECTRICAL CHARACTERISTICS (QW 409)

Current Mode	:	DC
Volts	:	18 to 30
Electrical Polarity	:	STRAIGHT
Amperage	:	80 TO 140
Tungsten Electrode Size & Type	:	NA
Mode of Metal Transfer (GMAW)	:	NA
Elect. Wire - Feed,Speed,Range	:	NA
Other	:	NA

TECHNIQUE (QW 410)

String of weave Bead	:	String / Weaving
Orifice or Gas Cup Size	:	NA
Initial / Interpass Cleaning	:	Wire Brushing
Method of back gauging	:	Grinding
Oscillation	:	NA
Contact Tube to work distance	:	NA
Multiple of Single Pass (/ side)	:	Multiple
Multiple of Single Electrode	:	Single
Travel Speed Range	:	SEE TABLE
Peening	:	NA

WELDING PROCEDURE

Pass No.	Welding Process	Filler Material		Current & Voltage			Travel Speed	Heat Input
		Class	Dia	Type & Pol.	Amps Range	Volts Range	mm / min	kJ / mm
ROOT	SMAW	E6013	3.15	STRAIGHT	80 to 120	20 to 24	85 to 100	
SUB. PASS	SMAW	E6013	3.15	STRAIGHT	90 to 130	24 to 28	90 to 125	
AFTER BACK CHIP	-	-	-	-	-		-	
FINAL	SMAW	E6013	3.15	STRAIGHT	90 to 130	24 to 28	90 ot 125	

APPROVAL NAME : SIGNATURE : DATE :		**HINDUSTAN PETROLUEM CORP. LTD**	

		WPS NO.: **DATE :** **PQR NO.:**

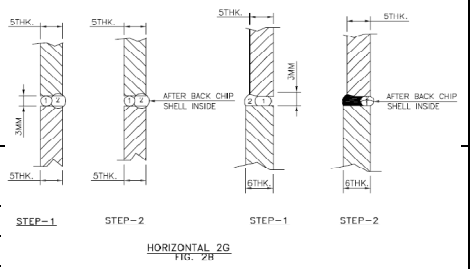
CLIENT : **LOCATION :**	**Hindustan Petroleum Corporation Limited**

QW-482 - WELDING PROCEDURE SPECIFICATION

(REF. SPECIFICATION : ASME SECTION IX)

JOINT DESIGN (QW 402) — SKETCH / DETAIL : 2(B)

Type	:	SQ BUTT			
Backing	:	NO			
Backing Material Type / Grade	:	NA			
WELDING PROCESS	:	**SMAW**		TYPE : **MANUAL**	



BASE METALS (QW 403)

Material Specification	:	IS 2062 / EQ.	To	IS 2062 / EQ.	
Type / Grade No.	:	GR.B	To	GR.B	
P. No.	:	1	To	1	
Group No.	:	1	To	1	
Thick of Coupon	:	5 mm			
Thickness Range	:	5 mm			

FILLER MATERIAL (QW 404)

Spec. No. (SFA)	:	**5.1**	Filler Size	:	**3.15** / **4** mm
AWS No. (CLASS)	:	**E 6013**	Electrode Flux Type	:	-
A. No.:	:	1	Backing / Storage	:	As per Manuf. Std.
F. No.:	:	2	Consumable Insert	:	None
Make	:	**ESAB/ADVANI/D&H**			

POSITION (QW 405)

Position of Groove	:	**2G**	Position of Fillet	:	NA
AWS No. (CLASS)	:	**-**			

PREHEAT (QW 406)			**POST WELD HEAT TREATMENT (QW 407)**		
Preheat Temp. (Min)	:	NA	Temperature	:	NA
Interpass Temp. (Max)	:	NA	Time	:	NA
Preheat Maint	:	NA	Other	:	NA

GAS (QW 408)

Shielding Gas	:	NA	Flowrate	:	NA
Percentage Comp.	:	NA	Gas Backing	:	NA
Trailing	:	NA	Purging	:	NA

ELECTRICAL CHARACTERISTICS (QW 409)			**TECHNIQUE (QW 410)**		
Current Mode	:	DC	String of weave Bead	:	String / Weaving
Volts	:	20 to 28	Orifice or Gas Cup Size	:	NA
Electrical Polarity	:	**STRAIGHT**	Initial / Interpass Cleaning	:	Wire Brushing
Amperage	:	80 TO 140	Method of back gauging	:	Grinding
Tungsten Electrode Size & Type	:	NA	Oscillation	:	NA
Mode of Metal Transfer (GMAW)	:	NA	Contact Tube to work distance	:	NA
Elect. Wire - Feed,Speed,Range	:	NA	Multiple of Single Pass (/ side)	:	Multiple
Other	:	NA	Multiple of Single Electrode	:	Single
			Travel Speed Range	:	SEE TABLE
			Peening	:	NA

WELDING PROCEDURE

Pass No.	Welding Process	Filler Material		Current & Voltage			Travel Speed	Heat Input
		Class	Dia	Type & Pol.	Amps Range	Volts Range	mm / min	kJ / mm
ROOT	SMAW	E6013	3.15	STRAIGHT	80 to 115	20 to 24	80 to 100	
SUB. PASS	SMAW	E6013	4	STRAIGHT	120 to 180	24 to 28	100 to 150	
AFTER BACK CHIP	-	-	-	-	-		-	
SUB. PASS	SMAW	E6013	4	STRAIGHT	120 to 180	24 to 28	100 ot 150	
FINAL	SMAW	E6013	4	STRAIGHT	120 to 180	24 to 28	100 ot 150	

APPROVAL NAME : SIGNATURE : DATE :		**HINDUSTAN PETROLUEM CORP. LTD**	

		WPS NO.: **DATE :** **PQR NO.:**
CLIENT : **LOCATION :**	**Hindustan Petroleum Corporation Limited**	

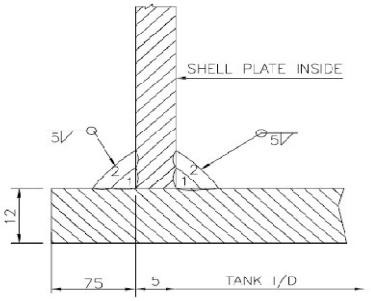
QW-482 - WELDING PROCEDURE SPECIFICATION

(REF. SPECIFICATION : ASME SECTION IX)

JOINT DESIGN (QW 402)

SKETCH / DETAIL : 3

Type	:	T FILLET
Backing	:	NO
Backing Material Type / Grade	:	NA
WELDING PROCESS	:	**SMAW** TYPE : **MANUAL**



SHELL TO BOTTOM PLATE JOINT
FIG. 3

BASE METALS (QW 403)

Material Specification	:	IS 2062 / EQ.	To	IS 2062 / EQ.
Type / Grade No.	:	GR.B	To	GR.B
P. No.	:	1	To	1
Group No.	:	1	To	1
Thick of Coupon	:	5 mm		
Thickness Range	:	5 mm		

FILLER MATERIAL (QW 404)

Spec. No. (SFA)	:	5.1	Filler Size	:	**3.15** / **4** mm
AWS No. (CLASS)	:	E 7018	Electrode Flux Type	:	-
A. No.:	:	1	Backing / Storage	:	As per Manuf. Std.
F. No.:	:	2	Consumable Insert	:	None
Make	:	**ESAB/ADVANI/D&H**			

POSITION (QW 405)

Position of Groove	:	**-**	Position of Fillet	:	**2F**
AWS No. (CLASS)	:	**-**			

PREHEAT (QW 406)

Preheat Temp. (Min)	:	NA
Interpass Temp. (Max)	:	NA
Preheat Maint	:	NA

POST WELD HEAT TREATMENT (QW 407)

Temperature	:	NA
Time	:	NA
Other	:	NA

GAS (QW 408)

Shielding Gas	:	NA	Flowrate	:	NA
Percentage Comp.	:	NA	Gas Backing	:	NA
Trailing	:	NA	Purging	:	NA

ELECTRICAL CHARACTERISTICS (QW 409)

Current Mode	:	DC
Volts	:	20 to 28
Electrical Polarity	:	STRAIGHT
Amperage	:	80 TO 180
Tungsten Electrode Size & Type	:	NA
Mode of Metal Transfer (GMAW)	:	NA
Elect. Wire - Feed,Speed,Range	:	NA
Other	:	NA

TECHNIQUE (QW 410)

String of weave Bead	:	String / Weaving
Orifice or Gas Cup Size	:	NA
Initial / Interpass Cleaning	:	Wire Brushing
Method of back gauging	:	Grinding
Oscillation	:	NA
Contact Tube to work distance	:	NA
Multiple of Single Pass (/ side)	:	Multiple
Multiple of Single Electrode	:	Single
Travel Speed Range	:	SEE TABLE
Peening	:	NA

WELDING PROCEDURE

Pass No.	Welding Process	Filler Material		Current & Voltage			Travel Speed	Heat Input
		Class	Dia	Type & Pol.	Amps Range	Volts Range	mm / min	kJ / mm
ROOT	SMAW	E7018	3.15	REVERSE	100 to 135	20 to 24	80 to 120	
SUB. PASS	SMAW	E7018	4	REVERSE	120 to 190	24 to 28	90 to 150	

APPROVAL NAME : SIGNATURE : DATE :		**HINDUSTAN PETROLUEM CORP. LTD**	

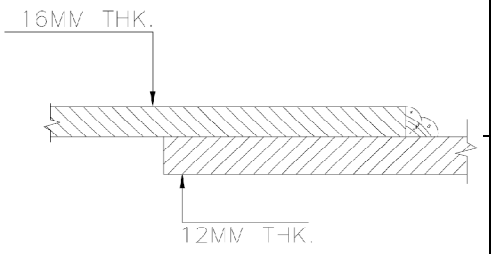
		WPS NO.: **DATE :** **PQR NO.:**

CLIENT : **LOCATION :**	**Hindustan Petroleum Corporation Limited**

QW-482 - WELDING PROCEDURE SPECIFICATION

(REF. SPECIFICATION : ASME SECTION IX)

JOINT DESIGN (QW 402) — SKETCH / DETAIL : 3A



Type	:	T FILLET
Backing	:	NO
Backing Material Type / Grade	:	NA
WELDING PROCESS	:	**SMAW** TYPE : **MANUAL**

BASE METALS (QW 403)

Material Specification	:	IS 2062 / EQ.	To	IS 2062 / EQ.
Type / Grade No.	:	GR.B	To	GR.B
P. No.	:	1	To	1
Group No.	:	1	To	1
Thick of Coupon	:	5 mm		
Thickness Range	:	5 mm		

FILLER MATERIAL (QW 404)

Spec. No. (SFA)	:	5.1	Filler Size	:	**3.15** / **4** mm
AWS No. (CLASS)	:	E 7018	Electrode Flux Type	:	-
A. No.:	:	1	Backing / Storage	:	As per Manuf. Std.
F. No.:	:	2	Consumable Insert	:	None
Make	:	**ESAB/ADVANI/D&H**			

POSITION (QW 405)

Position of Groove	:	**-**	Position of Fillet	:	**2F**
AWS No. (CLASS)	:	**-**			

PREHEAT (QW 406)

Preheat Temp. (Min)	:	NA
Interpass Temp. (Max)	:	NA
Preheat Maint	:	NA

POST WELD HEAT TREATMENT (QW 407)

Temperature	:	NA
Time	:	NA
Other	:	NA

GAS (QW 408)

Shielding Gas	:	NA	Flowrate	:	NA
Percentage Comp.	:	NA	Gas Backing	:	NA
Trailing	:	NA	Purging	:	NA

ELECTRICAL CHARACTERISTICS (QW 409)

Current Mode	:	DC	String of weave Bead	:	String / Weaving
Volts	:	20 to 28	Orifice or Gas Cup Size	:	NA
Electrical Polarity	:	STRAIGHT	Initial / Interpass Cleaning	:	Wire Brushing
Amperage	:	80 TO 180	Method of back gauging	:	Grinding
Tungsten Electrode Size & Type	:	NA	Oscillation	:	NA
Mode of Metal Transfer (GMAW)	:	NA	Contact Tube to work distance	:	NA
Elect. Wire - Feed,Speed,Range	:	NA	Multiple of Single Pass (/ side)	:	Multiple
Other	:	NA	Multiple of Single Electrode	:	Single
			Travel Speed Range	:	SEE TABLE
			Peening	:	NA

TECHNIQUE (QW 410)

WELDING PROCEDURE

Pass No.	Welding Process	Filler Material		Current & Voltage			Travel Speed	Heat Input
		Class	Dia	Type & Pol.	Amps Range	Volts Range	mm / min	kJ / mm
ROOT	SMAW	E7018	3.15	REVERSE	100 to 135	20 to 24	80 to 120	
SUB. PASS ROOT 2	SMAW	E7018	4	REVERSE	120 to 190	24 to 28	90 to 150	
SUB. PASS ROOT 3	SMAW	E7018	4	REVERSE	120 to 190	24 to 28	90 to 150	
SUB. PASS 4 TO 5	SMAW	E7018	4	REVERSE	120 to 190	24 to 28	90 to 150	

APPROVAL NAME : SIGNATURE :		**HINDUSTAN PETROLUEM CORP. LTD**	

DATE :			

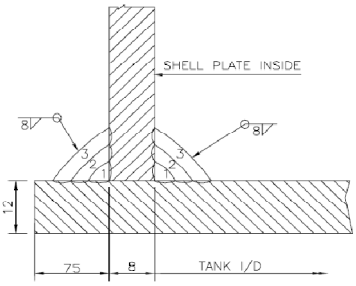
		WPS NO.: **DATE :** **PQR NO.:**
CLIENT : **LOCATION :**	**Hindustan Petroleum Corporation Limited**	

QW-482 - WELDING PROCEDURE SPECIFICATION

(REF. SPECIFICATION : ASME SECTION IX)

JOINT DESIGN (QW 402) — SKETCH / DETAIL : 4

Type	:	T FILLET			
Backing	:	NO			
Backing Material Type / Grade	:	NA			
WELDING PROCESS	:	**SMAW**		TYPE : **MANUAL**	



SHELL TO BOTTOM PLATE JOINT
FIG.4

BASE METALS (QW 403)

Material Specification	:	IS 2062 / EQ.	To	IS 2062 / EQ.	
Type / Grade No.	:	GR.B	To	GR.B	
P. No.	:	1	To	1	
Group No.	:	1	To	1	
Thick of Coupon	:	8 mm			
Thickness Range	:	8 mm			

FILLER MATERIAL (QW 404)

Spec. No. (SFA)	:	5.1	Filler Size	:	**3.15** / **4** mm
AWS No. (CLASS)	:	E 7018	Electrode Flux Type	:	-
A. No.:	:	1	Backing / Storage	:	As per Manuf. Std.
F. No.:	:	2	Consumable Insert	:	None
Make	:	**ESAB/ADVANI/D&H**			

POSITION (QW 405)

Position of Groove	:	-	Position of Fillet	:	**2F**
AWS No. (CLASS)	:	-			

PREHEAT (QW 406)

Preheat Temp. (Min)	:	NA
Interpass Temp. (Max)	:	NA
Preheat Maint	:	NA

POST WELD HEAT TREATMENT (QW 407)

Temperature	:	NA
Time	:	NA
Other	:	NA

GAS (QW 408)

Shielding Gas	:	NA	Flowrate	:	NA
Percentage Comp.	:	NA	Gas Backing	:	NA
Trailing	:	NA	Purging	:	NA

ELECTRICAL CHARACTERISTICS (QW 409)

Current Mode	:	DC
Volts	:	20 to 28
Electrical Polarity	:	STRAIGHT
Amperage	:	80 TO 180
Tungsten Electrode Size & Type	:	NA
Mode of Metal Transfer (GMAW)	:	NA
Elect. Wire - Feed,Speed,Range	:	NA
Other	:	NA

TECHNIQUE (QW 410)

String of weave Bead	:	String / Weaving
Orifice or Gas Cup Size	:	NA
Initial / Interpass Cleaning	:	Wire Brushing
Method of back gauging	:	Grinding
Oscillation	:	NA
Contact Tube to work distance	:	NA
Multiple of Single Pass (/ side)	:	Multiple
Multiple of Single Electrode	:	Single
Travel Speed Range	:	SEE TABLE
Peening	:	NA

WELDING PROCEDURE

Pass No.	Welding Process	Filler Material		Current & Voltage			Travel Speed	Heat Input
		Class	Dia	Type & Pol.	Amps Range	Volts Range	mm / min	kJ / mm
INSIDE								
ROOT	SMAW	E7018	3.15	REVERSE	100 to 135	20 to 24	80 to 120	
SUB. PASS (2)	SMAW	E7018	4	REVERSE	120 to 190	24 to 28	90 to 150	
SUB. PASS (3)	SMAW	E7018	4	REVERSE	120 to 190	24 to 28	90 to 150	
OUTSIDE								
1ST PASS	SMAW	E7018	3.15	REVERSE	100 to 135	20 to 24	90 to 120	
SUB. PASS (2)	SMAW	E7018	4	REVERSE	120 to 190	24 to 28	100 to 150	
FINAL (3)	SMAW	E7018	4	REVERSE	120 to 190	24 to 28	100 to 150	

APPROVAL NAME : SIGNATURE :		**HINDUSTAN PETROLUEM CORP. LTD**	

DATE :			

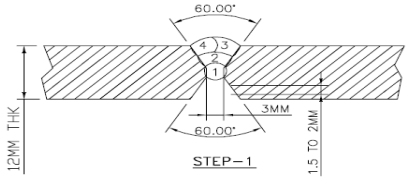
		WPS NO.: **DATE :** **PQR NO.:**
CLIENT : **LOCATION :**	**Hindustan Petroleum Corporation Limited**	

QW-482 - WELDING PROCEDURE SPECIFICATION

(REF. SPECIFICATION : ASME SECTION IX)

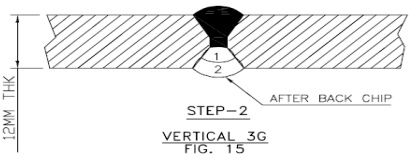
JOINT DESIGN (QW 402) — SKETCH / DETAIL : 4

Type	:	DOUBLE "V"
Backing	:	NO
Backing Material Type / Grade	:	NA
WELDING PROCESS	:	**SMAW** TYPE : **MANUAL**



BASE METALS (QW 403)

Material Specification	:	IS 2062 / EQ.	To	IS 2062 / EQ.
Type / Grade No.	:	GR.B	To	GR.B
P. No.	:	1	To	1
Group No.	:	1	To	1
Thick of Coupon	:	12 mm		
Thickness Range	:	12 to 24 mm		



FILLER MATERIAL (QW 404)

Spec. No. (SFA)	:	5.1	Filler Size	:	**3.15** / **4** mm
AWS No. (CLASS)	:	E 7018	Electrode Flux Type	:	-
A. No.:	:	1	Backing / Storage	:	As per Manuf. Std.
F. No.:	:	2	Consumable Insert	:	None
Make	:	**ESAB/ADVANI/D&H**			

POSITION (QW 405)

Position of Groove	:	**3G**	Position of Fillet	:	**2F**
AWS No. (CLASS)	:	**-**			

PREHEAT (QW 406)

Preheat Temp. (Min)	:	NA
Interpass Temp. (Max)	:	NA
Preheat Maint	:	NA

POST WELD HEAT TREATMENT (QW 407)

Temperature	:	NA
Time	:	NA
Other	:	NA

GAS (QW 408)

Shielding Gas	:	NA	Flowrate	:	NA
Percentage Comp.	:	NA	Gas Backing	:	NA
Trailing	:	NA	Purging	:	NA

ELECTRICAL CHARACTERISTICS (QW 409)

Current Mode	:	DC
Volts	:	20 to 28
Electrical Polarity	:	REVERSE
Amperage	:	80 TO 180
Tungsten Electrode Size & Type	:	NA
Mode of Metal Transfer (GMAW)	:	NA
Elect. Wire - Feed,Speed,Range	:	NA
Other	:	NA

TECHNIQUE (QW 410)

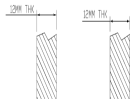
String of weave Bead	:	String / Weaving
Orifice or Gas Cup Size	:	NA
Initial / Interpass Cleaning	:	Wire Brushing
Method of back gauging	:	Grinding
Oscillation	:	NA
Contact Tube to work distance	:	NA
Multiple of Single Pass (/ side)	:	Multiple
Multiple of Single Electrode	:	Single
Travel Speed Range	:	SEE TABLE
Peening	:	NA

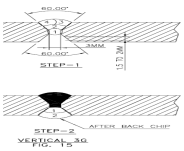
WELDING PROCEDURE

Pass No.	Welding Process	Filler Material		Current & Voltage			Travel Speed	Heat Input
		Class	Dia	Type & Pol.	Amps Range	Volts Range	mm / min	kJ / mm
INSIDE								
ROOT	SMAW	E7018	3.15	REVERSE	100 to 135	20 to 24	80 to 120	
SUB. PASS (2)	SMAW	E7018	4	REVERSE	120 to 190	24 to 28	90 to 150	
SUB. PASS (3)	SMAW	E7018	4	REVERSE	120 to 190	24 to 28	90 to 150	
BACK SIDE								
1ST PASS	SMAW	E7018	3.15	REVERSE	100 to 135	20 to 24	90 to 120	
SUB. PASS (2)	SMAW	E7018	4	REVERSE	120 to 190	24 to 28	100 to 150	
FINAL (3)	SMAW	E7018	4	REVERSE	120 to 190	24 to 28	100 to 150	

APPROVAL	**VISHAL STRUCTURALS PVT. LTD.**	**HINDUSTAN PETROLUEM CORP. LTD**	
NAME :			
SIGNATURE :			

DATE :			


12MM THK.
12MM THK.



VERTICAL 3G
FIG. 15

		WPS NO.: **DATE :** **PQR NO.:**

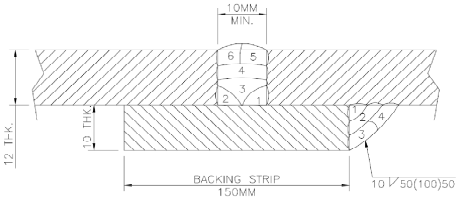
CLIENT : **LOCATION :**	**Hindustan Petroleum Corporation Limited**

QW-482 - WELDING PROCEDURE SPECIFICATION

(REF. SPECIFICATION : ASME SECTION IX)

JOINT DESIGN (QW 402) SKETCH / DETAIL : 5

Type	:	SQUARE BUTT WITH BACKING STRIP & FILLET
Backing	:	YES
Backing Material Type / Grade	:	NA
WELDING PROCESS	:	**SMAW** TYPE : **MANUAL**



ANNULAR TO ANNULAR PLATE JOINT
FIG. 5

BASE METALS (QW 403)

Material Specification	:	IS 2062 / EQ.	To	IS 2062 / EQ.
Type / Grade No.	:	GR.B	To	GR.B
P. No.	:	1	To	1
Group No.	:	1	To	1
Thick of Coupon	:	12 mm		
Thickness Range	:	12 to 16 mm		

FILLER MATERIAL (QW 404)

Spec. No. (SFA)	:	**5.1**	Filler Size	:	**3.15** / **4** mm
AWS No. (CLASS)	:	**E 7018**	Electrode Flux Type	:	-
A. No.:	:	1	Backing / Storage	:	As per Manuf. Std.
F. No.:	:	4	Consumable Insert	:	None
Make	:	**ESAB/ADVANI/D&H**			

POSITION (QW 405)

Position of Groove	:	**1G**	Position of Fillet	:	**2F**
AWS No. (CLASS)	:	**-**			

PREHEAT (QW 406)			**POST WELD HEAT TREATMENT (QW 407)**		
Preheat Temp. (Min)	:	NA	Temperature	:	NA
Interpass Temp. (Max)	:	NA	Time	:	NA
Preheat Maint	:	NA	Other	:	NA

GAS (QW 408)

Shielding Gas	:	NA	Flowrate	:	NA
Percentage Comp.	:	NA	Gas Backing	:	NA
Trailing	:	NA	Purging	:	NA

ELECTRICAL CHARACTERISTICS (QW 409)			**TECHNIQUE (QW 410)**		
Current Mode	:	DC	String of weave Bead	:	String
Volts	:	20 to 28	Orifice or Gas Cup Size	:	NA
Electrical Polarity	:	**REVERSE**	Initial / Interpass Cleaning	:	Wire Brushing
Amperage	:	90 TO 190	Method of back gauging	:	Grinding
Tungsten Electrode Size & Type	:	NA	Oscillation	:	NA
Mode of Metal Transfer (GMAW)	:	NA	Contact Tube to work distance	:	NA
Elect. Wire - Feed,Speed,Range	:	NA	Multiple of Single Pass (/ side)	:	Multiple
Other	:	NA	Multiple of Single Electrode	:	Single
			Travel Speed Range	:	SEE TABLE
			Peening	:	NA

WELDING PROCEDURE

Pass No.	Welding Process	Filler Material		Current & Voltage			Travel Speed	Heat Input
		Class	Dia	Type & Pol.	Amps Range	Volts Range	mm / min	kJ / mm
ROOT (1,2)	SMAW	E7018	3.15	REVERSE	100 to 135	20 to 24	90 to 120	
SUB. PASS (3)	SMAW	E7018	4	REVERSE	120 to 190	24 to 28	100 to 150	
SUB. PASS (4)	SMAW	E7018	4	REVERSE	120 to 190	24 to 28	100 to 150	
FINAL (5,6)	SMAW	E7018	3.15	REVERSE	100 to 135	20 to 24	90 ot 120	

APPROVAL NAME : SIGNATURE : DATE :		**HINDUSTAN PETROLUEM CORP. LTD**	

		WPS NO.: **DATE :** **PQR NO.:**

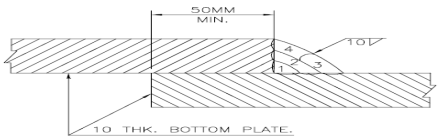
CLIENT : **LOCATION :**	**Hindustan Petroleum Corporation Limited**

QW-482 - WELDING PROCEDURE SPECIFICATION

(REF. SPECIFICATION : ASME SECTION IX)

JOINT DESIGN (QW 402) SKETCH / DETAIL : 6

Type	:	LAP FILLET
Backing	:	NO
Backing Material Type / Grade	:	NA
WELDING PROCESS	:	**SMAW** TYPE : **MANUAL**



BOTTOM TO BOTTOM PLATE JOINT
FIG. 6

BASE METALS (QW 403)

Material Specification	:	IS 2062 / EQ.	To	IS 2062 / EQ.
Type / Grade No.	:	GR.B	To	GR.B
P. No.	:	1	To	1
Group No.	:	1	To	1
Thick of Coupon	:	10 mm		
Thickness Range	:	10 to 16 mm		

FILLER MATERIAL (QW 404)

Spec. No. (SFA)	:	**5.1**	Filler Size	:	**3.15** / **4** mm
AWS No. (CLASS)	:	**E 6013**	Electrode Flux Type	:	-
A. No.:	:	1	Backing / Storage	:	As per Manuf. Std.
F. No.:	:	2	Consumable Insert	:	None
Make	:	**ESAB/ADVANI/D&H**			

POSITION (QW 405)

Position of Groove	:	**-**	Position of Fillet	:	**2F**
AWS No. (CLASS)	:	**-**			

PREHEAT (QW 406)			**POST WELD HEAT TREATMENT (QW 407)**		
Preheat Temp. (Min)	:	NA	Temperature	:	NA
Interpass Temp. (Max)	:	NA	Time	:	NA
Preheat Maint	:	NA	Other	:	NA

GAS (QW 408)

Shielding Gas	:	NA	Flowrate	:	NA
Percentage Comp.	:	NA	Gas Backing	:	NA
Trailing	:	NA	Purging	:	NA

ELECTRICAL CHARACTERISTICS (QW 409)			**TECHNIQUE (QW 410)**		
Current Mode	:	DC	String of weave Bead	:	String
Volts	:	20 to 28	Orifice or Gas Cup Size	:	NA
Electrical Polarity	:	**Electrode-Straight**	Initial / Interpass Cleaning	:	Wire Brushing
Amperage	:	90 TO 190	Method of back gauging	:	Grinding
Tungsten Electrode Size & Type	:	NA	Oscillation	:	NA
Mode of Metal Transfer (GMAW)	:	NA	Contact Tube to work distance	:	NA
Elect. Wire - Feed,Speed,Range	:	NA	Multiple of Single Pass (/ side)	:	Multiple
Other	:	NA	Multiple of Single Electrode	:	Single
			Travel Speed Range	:	SEE TABLE
			Peening	:	NA

WELDING PROCEDURE

Pass No.	Welding Process	Filler Material		Current & Voltage			Travel Speed	Heat Input
		Class	Dia	Type & Pol.	Amps Range	Volts Range	mm / min	kJ / mm
ROOT	SMAW	E6013	3.15	STRAIGHT	80 to 120	20 to 24	80 to 120	
SUB. PASS	SMAW	E6013	4	STRAIGHT	90 to 190	24 to 28	90 to 150	
FINAL	SMAW	E6013	4	STRAIGHT	90 to 190	24 to 28	90 ot 150	

APPROVAL		**HINDUSTAN PETROLUEM CORP. LTD**	
NAME :			
SIGNATURE :			
DATE :			

		WPS NO.: **DATE :** **PQR NO.:**

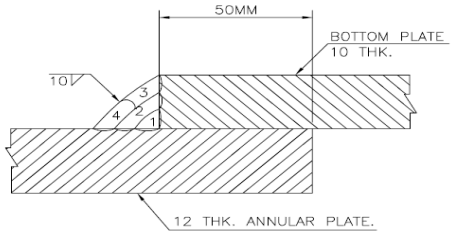
CLIENT :	**Hindustan Petroleum Corporation Limited**
LOCATION :	**MAHUL TERMINAL**

QW-482 - WELDING PROCEDURE SPECIFICATION

(REF. SPECIFICATION : ASME SECTION IX)

JOINT DESIGN (QW 402) — SKETCH / DETAIL : 7

Type	:	LAP FILLET
Backing	:	NO
Backing Material Type / Grade	:	NA
WELDING PROCESS	:	**SMAW** TYPE : **MANUAL**



BOTTOM TO ANNULAR PLATE JOINT
FIG.7

BASE METALS (QW 403)

Material Specification	:	IS 2062 / EQ.	To	IS 2062 / EQ.
Type / Grade No.	:	GR.B	To	GR.B
P. No.	:	1	To	1
Group No.	:	1	To	1
Thick of Coupon	:	12 mm		
Thickness Range	:	12 to 16 mm		

FILLER MATERIAL (QW 404)

Spec. No. (SFA)	:	**5.1**	Filler Size	:	**3.15** / **4** mm
AWS No. (CLASS)	:	**E 7018**	Electrode Flux Type	:	-
A. No.:	:	1	Backing / Storage	:	As per Manuf. Std.
F. No.:	:	4	Consumable Insert	:	None
Make	:	**ESAB/ADVANI/D&H**			

POSITION (QW 405)

Position of Groove	:	**-**	Position of Fillet	:	**2F**
AWS No. (CLASS)	:	**-**			

PREHEAT (QW 406)

Preheat Temp. (Min)	:	NA
Interpass Temp. (Max)	:	NA
Preheat Maint	:	NA

POST WELD HEAT TREATMENT (QW 407)

Temperature	:	NA
Time	:	NA
Other	:	NA

GAS (QW 408)

Shielding Gas	:	NA	Flowrate	:	NA
Percentage Comp.	:	NA	Gas Backing	:	NA
Trailing	:	NA	Purging	:	NA

ELECTRICAL CHARACTERISTICS (QW 409)

Current Mode	:	DC
Volts	:	20 to 28
Electrical Polarity	:	**Electrode-Straight**
Amperage	:	90 TO 190
Tungsten Electrode Size & Type	:	NA
Mode of Metal Transfer (GMAW)	:	NA
Elect. Wire - Feed,Speed,Range	:	NA
Other	:	NA

TECHNIQUE (QW 410)

String of weave Bead	:	String
Orifice or Gas Cup Size	:	NA
Initial / Interpass Cleaning	:	Wire Brushing
Method of back gauging	:	Grinding
Oscillation	:	NA
Contact Tube to work distance	:	NA
Multiple of Single Pass (/ side)	:	Multiple
Multiple of Single Electrode	:	Single
Travel Speed Range	:	SEE TABLE
Peening	:	NA

WELDING PROCEDURE

Pass No.	Welding Process	Filler Material		Current & Voltage			Travel Speed	Heat Input
		Class	Dia	Type & Pol.	Amps Range	Volts Range	mm / min	kJ / mm
ROOT (1)	SMAW	E7018	3.15	REVERSE	80 to 120	20 to 24	80 to 120	
SUB. PASS (2)	SMAW	E7018	4	REVERSE	90 to 190	24 to 28	90 to 150	
FINAL (3,4)	SMAW	E7018	4	REVERSE	90 to 190	24 to 28	90 ot 150	

APPROVAL NAME : SIGNATURE : DATE :		**HINDUSTAN PETROLUEM CORP. LTD**	

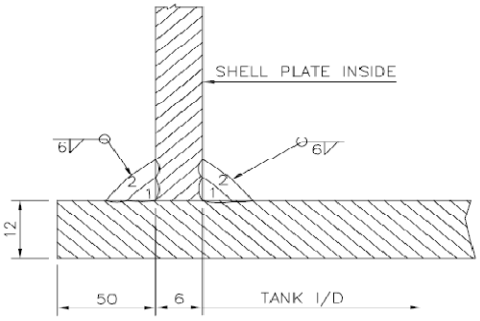
		WPS NO.: **DATE :** **PQR NO.:**
CLIENT : **LOCATION :**	**Hindustan Petroleum Corporation Limited**	

QW-482 - WELDING PROCEDURE SPECIFICATION

(REF. SPECIFICATION : ASME SECTION IX)

JOINT DESIGN (QW 402) — SKETCH / DETAIL : 8

Type	:	T FILLET			
Backing	:	NO			
Backing Material Type / Grade	:	NA			
WELDING PROCESS	:	**SMAW**	TYPE :	**MANUAL**	



SHELL TO BOTTOM PLATE JOINT
FIG.8

BASE METALS (QW 403)

Material Specification	:	IS 2062 / EQ.	To	IS 2062 / EQ.	
Type / Grade No.	:	GR.B	To	GR.B	
P. No.	:	1	To	1	
Group No.	:	1	To	1	
Thick of Coupon	:	6 mm			
Thickness Range	:	6 mm			

FILLER MATERIAL (QW 404)

Spec. No. (SFA)	:	**5.1**	Filler Size	:	**3.15** / **4** mm
AWS No. (CLASS)	:	**E 7018**	Electrode Flux Type	:	-
A. No.:	:	1	Backing / Storage	:	As per Manuf. Std.
F. No.:	:	2	Consumable Insert	:	None
Make	:	**ESAB/ADVANI/D&H**			

POSITION (QW 405)

Position of Groove	:	**-**	Position of Fillet	:	**2F**
AWS No. (CLASS)	:	**-**			

PREHEAT (QW 406)

Preheat Temp. (Min)	:	NA
Interpass Temp. (Max)	:	NA
Preheat Maint	:	NA

POST WELD HEAT TREATMENT (QW 407)

Temperature	:	NA
Time	:	NA
Other	:	NA

GAS (QW 408)

Shielding Gas	:	NA	Flowrate	:	NA
Percentage Comp.	:	NA	Gas Backing	:	NA
Trailing	:	NA	Purging	:	NA

ELECTRICAL CHARACTERISTICS (QW 409)

Current Mode	:	DC
Volts	:	20 to 28
Electrical Polarity	:	**Electrode-Straight**
Amperage	:	80 TO 180
Tungsten Electrode Size & Type	:	NA
Mode of Metal Transfer (GMAW)	:	NA
Elect. Wire - Feed,Speed,Range	:	NA
Other	:	NA

TECHNIQUE (QW 410)

String of weave Bead	:	String
Orifice or Gas Cup Size	:	NA
Initial / Interpass Cleaning	:	Wire Brushing
Method of back gauging	:	Grinding
Oscillation	:	NA
Contact Tube to work distance	:	NA
Multiple of Single Pass (/ side)	:	Multiple
Multiple of Single Electrode	:	Single
Travel Speed Range	:	SEE TABLE
Peening	:	NA

WELDING PROCEDURE

Pass No.	Welding Process	Filler Material		Current & Voltage			Travel Speed	Heat Input
		Class	Dia	Type & Pol.	Amps Range	Volts Range	mm / min	kJ / mm
ROOT	SMAW	E7018	3.15	REVERSE	100 to 135	20 to 24	80 to 120	
SUB. PASS	SMAW	E7018	4	REVERSE	90 to 190	24 to 28	90 to 150	

APPROVAL NAME : SIGNATURE : DATE :		**HINDUSTAN PETROLUEM CORP. LTD**	

		WPS NO.: **DATE :** **PQR NO.:**
CLIENT : **LOCATION :**	**Hindustan Petroleum Corporation Limited** **MAHUL TERMINAL**	

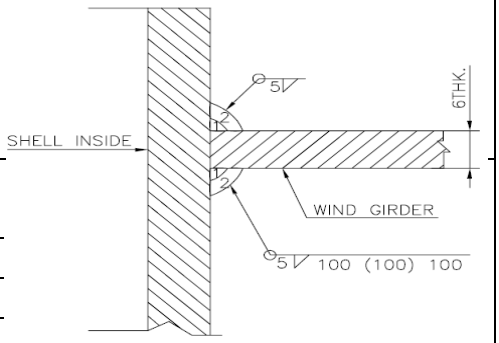
QW-482 - WELDING PROCEDURE SPECIFICATION

(REF. SPECIFICATION : ASME SECTION IX)

JOINT DESIGN (QW 402)

SKETCH / DETAIL : 9

Type	:	T FILLET			
Backing	:	NO			
Backing Material Type / Grade	:	NA			
WELDING PROCESS	:	**SMAW**	TYPE : **MANUAL**		



WIND GIRDER TO SHELL JOINT
FIG. 9

BASE METALS (QW 403)

Material Specification	:	IS 2062 / EQ.	To	IS 2062 / EQ.	
Type / Grade No.	:	GR.B	To	GR.B	
P. No.	:	1	To	1	
Group No.	:	1	To	1	
Thick of Coupon	:	6 mm			
Thickness Range	:	6 mm			

FILLER MATERIAL (QW 404)

Spec. No. (SFA)	:	**5.1**	Filler Size	:	**3.15** / **4** mm
AWS No. (CLASS)	:	**E 6013**	Electrode Flux Type	:	-
A. No.:	:	1	Backing / Storage	:	As per Manuf. Std.
F. No.:	:	2	Consumable Insert	:	None
Make	:	**ESAB/ADVANI/D&H**			

POSITION (QW 405)

Position of Groove	:	**-**	Position of Fillet	:	**2F**
AWS No. (CLASS)	:	**-**			

PREHEAT (QW 406)

Preheat Temp. (Min)	:	NA
Interpass Temp. (Max)	:	NA
Preheat Maint	:	NA

POST WELD HEAT TREATMENT (QW 407)

Temperature	:	NA
Time	:	NA
Other	:	NA

GAS (QW 408)

Shielding Gas	:	NA	Flowrate	:	NA
Percentage Comp.	:	NA	Gas Backing	:	NA
Trailing	:	NA	Purging	:	NA

ELECTRICAL CHARACTERISTICS (QW 409)

Current Mode	:	DC
Volts	:	20 to 28
Electrical Polarity	:	**Straight**
Amperage	:	80 TO 180
Tungsten Electrode Size & Type	:	NA
Mode of Metal Transfer (GMAW)	:	NA
Elect. Wire - Feed,Speed,Range	:	NA
Other	:	NA

TECHNIQUE (QW 410)

String of weave Bead	:	String
Orifice or Gas Cup Size	:	NA
Initial / Interpass Cleaning	:	Wire Brushing
Method of back gauging	:	Grinding
Oscillation	:	NA
Contact Tube to work distance	:	NA
Multiple of Single Pass (/ side)	:	Multiple
Multiple of Single Electrode	:	Single
Travel Speed Range	:	SEE TABLE
Peening	:	NA

WELDING PROCEDURE

Pass No.	Welding Process	Filler Material		Current & Voltage			Travel Speed	Heat Input
		Class	Dia	Type & Pol.	Amps Range	Volts Range	mm / min	kJ / mm
ONE SIDE CONT.								
ROOT (1)	SMAW	E6013	3.15	STRAIGHT	80 to 120	20 to 24	80 to 120	
SUB. PASS (2)	SMAW	E6013	4	STRAIGHT	90 to 190	24 to 28	90 to 150	
2nd STITCH FILLET 100 (100) 100								
ROOT (1)	SMAW	E6013	3.15	STRAIGHT	80 to 120	20 to 24	80 to 120	
SUB. PASS (2)	SMAW	E6013	4	STRAIGHT	90 to 190	24 to 28	90 to 150	

APPROVAL NAME : SIGNATURE : DATE :		**HINDUSTAN PETROLUEM CORP. LTD**	

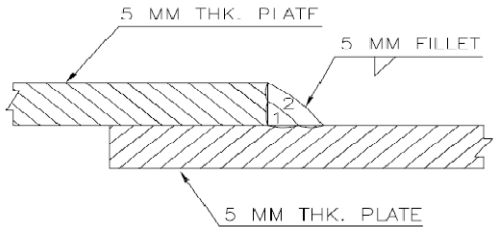
		WPS NO.: **DATE :** **PQR NO.:**
CLIENT : **LOCATION :**	**Hindustan Petroleum Corporation Limited**	

QW-482 - WELDING PROCEDURE SPECIFICATION

(REF. SPECIFICATION : ASME SECTION IX)

JOINT DESIGN (QW 402)

SKETCH / DETAIL : 10 (A)



ROOF,DECK, PONTOON TOP
LAP JOINTS
FIG.10 A

Type	:	LAP FILLET		
Backing	:	NO		
Backing Material Type / Grade	:	NA		
WELDING PROCESS	:	**SMAW**	TYPE :	**MANUAL**

BASE METALS (QW 403)

Material Specification	:	IS 2062 / EQ.	To	IS 2062 / EQ.
Type / Grade No.	:	GR.B	To	GR.B
P. No.	:	1	To	1
Group No.	:	1	To	1
Thick of Coupon	:	5 mm		
Thickness Range	:	5 mm		

FILLER MATERIAL (QW 404)

Spec. No. (SFA)	:	**5.1**	Filler Size	:	**3.15** / **4** mm
AWS No. (CLASS)	:	**E 6013**	Electrode Flux Type	:	-
A. No.:	:	1	Backing / Storage	:	As per Manuf. Std.
F. No.:	:	2	Consumable Insert	:	None
Make	:	**ESAB/ADVANI/D&H**			

POSITION (QW 405)

Position of Groove	:	**-**	Position of Fillet	:	**2F**
AWS No. (CLASS)	:	**-**			

PREHEAT (QW 406)

Preheat Temp. (Min)	:	NA
Interpass Temp. (Max)	:	NA
Preheat Maint	:	NA

POST WELD HEAT TREATMENT (QW 407)

Temperature	:	NA
Time	:	NA
Other	:	NA

GAS (QW 408)

Shielding Gas	:	NA	Flowrate	:	NA
Percentage Comp.	:	NA	Gas Backing	:	NA
Trailing	:	NA	Purging	:	NA

ELECTRICAL CHARACTERISTICS (QW 409)

Current Mode	:	DC	String of weave Bead	:	String
Volts	:	20 to 28	Orifice or Gas Cup Size	:	NA
Electrical Polarity	:	**Straight**	Initial / Interpass Cleaning	:	Wire Brushing
Amperage	:	80 TO 180	Method of back gauging	:	Grinding
Tungsten Electrode Size & Type	:	NA	Oscillation	:	NA
Mode of Metal Transfer (GMAW)	:	NA	Contact Tube to work distance	:	NA
Elect. Wire - Feed,Speed,Range	:	NA	Multiple of Single Pass (/ side)	:	Multiple
Other	:	NA	Multiple of Single Electrode	:	Single
			Travel Speed Range	:	SEE TABLE
			Peening	:	NA

TECHNIQUE (QW 410)

WELDING PROCEDURE

Pass No.	Welding Process	Filler Material		Current & Voltage			Travel Speed	Heat Input
		Class	Dia	Type & Pol.	Amps Range	Volts Range	mm / min	kJ / mm
ROOT (1)	SMAW	E6013	3.15	STRAIGHT	80 to 120	20 to 24	80 to 120	
SUB. PASS (2)	SMAW	E6013	4	STRAIGHT	90 to 190	24 to 28	90 to 150	

APPROVAL NAME : SIGNATURE : DATE :		**HINDUSTAN PETROLUEM CORP. LTD**	

		WPS NO.: **DATE :** **PQR NO.:**

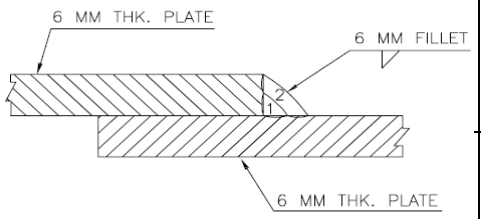
CLIENT : **LOCATION :**	**Hindustan Petroleum Corporation Limited**

QW-482 - WELDING PROCEDURE SPECIFICATION

(REF. SPECIFICATION : ASME SECTION IX)

JOINT DESIGN (QW 402) — SKETCH / DETAIL : 10 (B)

Type	:	LAP FILLET
Backing	:	NO
Backing Material Type / Grade	:	NA
WELDING PROCESS	:	**SMAW** TYPE : **MANUAL**



DECK, PONTOON BOTTOM
LAP JOINTS
FIG.10 B

BASE METALS (QW 403)

Material Specification	:	IS 2062 / EQ.	To	IS 2062 / EQ.
Type / Grade No.	:	GR.B	To	GR.B
P. No.	:	1	To	1
Group No.	:	1	To	1
Thick of Coupon	:	6 mm		
Thickness Range	:	6 mm		

FILLER MATERIAL (QW 404)

Spec. No. (SFA)	:	**5.1**	Filler Size	:	**3.15** / **4** mm
AWS No. (CLASS)	:	**E 6013**	Electrode Flux Type	:	-
A. No.:	:	1	Backing / Storage	:	As per Manuf. Std.
F. No.:	:	2	Consumable Insert	:	None
Make	:	**ESAB/ADVANI/D&H**			

POSITION (QW 405)

Position of Groove	:	**-**	Position of Fillet	:	**2F**
AWS No. (CLASS)	:	**-**			

PREHEAT (QW 406)

Preheat Temp. (Min)	:	NA
Interpass Temp. (Max)	:	NA
Preheat Maint	:	NA

POST WELD HEAT TREATMENT (QW 407)

Temperature	:	NA
Time	:	NA
Other	:	NA

GAS (QW 408)

Shielding Gas	:	NA	Flowrate	:	NA
Percentage Comp.	:	NA	Gas Backing	:	NA
Trailing	:	NA	Purging	:	NA

ELECTRICAL CHARACTERISTICS (QW 409)

Current Mode	:	DC	String of weave Bead	:	String
Volts	:	20 to 28	Orifice or Gas Cup Size	:	NA
Electrical Polarity	:	**Straight**	Initial / Interpass Cleaning	:	Wire Brushing
Amperage	:	80 TO 180	Method of back gauging	:	Grinding
Tungsten Electrode Size & Type	:	NA	Oscillation	:	NA
Mode of Metal Transfer (GMAW)	:	NA	Contact Tube to work distance	:	NA
Elect. Wire - Feed,Speed,Range	:	NA	Multiple of Single Pass (/ side)	:	Multiple
Other	:	NA	Multiple of Single Electrode	:	Single
			Travel Speed Range	:	SEE TABLE
			Peening	:	NA

TECHNIQUE (QW 410)

WELDING PROCEDURE

Pass No.	Welding Process	Filler Material		Current & Voltage			Travel Speed	Heat Input
		Class	Dia	Type & Pol.	Amps Range	Volts Range	mm / min	kJ / mm
ROOT (1)	SMAW	E6013	3.15	STRAIGHT	80 to 120	20 to 24	80 to 120	
SUB. PASS (2)	SMAW	E6013	4	STRAIGHT	90 to 190	24 to 28	90 to 150	

APPROVAL NAME : SIGNATURE : DATE :		**HINDUSTAN PETROLUEM CORP. LTD**

		WPS NO.: **DATE :** **PQR NO.:**

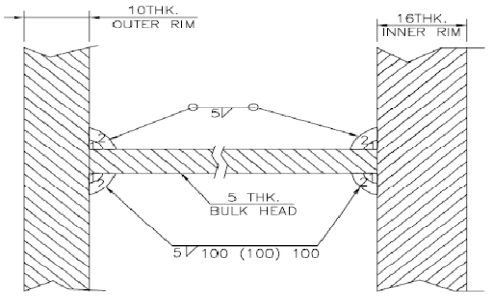
CLIENT : **LOCATION :**	**Hindustan Petroleum Corporation Limited**

QW-482 - WELDING PROCEDURE SPECIFICATION

(REF. SPECIFICATION : ASME SECTION IX)

JOINT DESIGN (QW 402) — SKETCH / DETAIL : 11

Type	:	T FILLET		
Backing	:	NO		
Backing Material Type / Grade	:	NA		
WELDING PROCESS	:	**SMAW**	TYPE :	**MANUAL**



BULK HEAD TO INNER RIM AND OUTER RIM
VERTICAL JOINT
FIG. 11

BASE METALS (QW 403)

Material Specification	:	IS 2062 / EQ.	To	IS 2062 / EQ.
Type / Grade No.	:	GR.B	To	GR.B
P. No.	:	1	To	1
Group No.	:	1	To	1
Thick of Coupon	:	5 mm		
Thickness Range	:	5 mm		

FILLER MATERIAL (QW 404)

Spec. No. (SFA)	:	**5.1**	Filler Size	:	**3.15** / **4** mm
AWS No. (CLASS)	:	**E 6013**	Electrode Flux Type	:	-
A. No.:	:	1	Backing / Storage	:	As per Manuf. Std.
F. No.:	:	2	Consumable Insert	:	None
Make	:	**ESAB/ADVANI/D&H**			

POSITION (QW 405)

Position of Groove	:	**-**	Position of Fillet	:	**3F**
AWS No. (CLASS)	:	**-**			

PREHEAT (QW 406)

Preheat Temp. (Min)	:	NA
Interpass Temp. (Max)	:	NA
Preheat Maint	:	NA

POST WELD HEAT TREATMENT (QW 407)

Temperature	:	NA
Time	:	NA
Other	:	NA

GAS (QW 408)

Shielding Gas	:	NA	Flowrate	:	NA
Percentage Comp.	:	NA	Gas Backing	:	NA
Trailing	:	NA	Purging	:	NA

ELECTRICAL CHARACTERISTICS (QW 409)

Current Mode	:	DC
Volts	:	20 to 28
Electrical Polarity	:	**Straight**
Amperage	:	80 TO 180
Tungsten Electrode Size & Type	:	NA
Mode of Metal Transfer (GMAW)	:	NA
Elect. Wire - Feed,Speed,Range	:	NA
Other	:	NA

TECHNIQUE (QW 410)

String of weave Bead	:	String
Orifice or Gas Cup Size	:	NA
Initial / Interpass Cleaning	:	Wire Brushing
Method of back gauging	:	Grinding
Oscillation	:	NA
Contact Tube to work distance	:	NA
Multiple of Single Pass (/ side)	:	Multiple
Multiple of Single Electrode	:	Single
Travel Speed Range	:	SEE TABLE
Peening	:	NA

WELDING PROCEDURE

Pass No.	Welding Process	Filler Material		Current & Voltage			Travel Speed	Heat Input
		Class	Dia	Type & Pol.	Amps Range	Volts Range	mm / min	kJ / mm
ONE SIDE CONT.								
ROOT (1)	SMAW	E6013	3.15	STRAIGHT	80 to 120	20 to 24	80 to 120	
SUB. PASS (2)	SMAW	E6013	3.15	STRAIGHT	90 to 190	24 to 28	90 to 150	
2nd SITCH FILLET 100 (100) 100								
ROOT (1)	SMAW	E6013	3.15	STRAIGHT	80 to 120	20 to 24	80 to 120	
SUB. PASS (2)	SMAW	E6013	3.15	STRAIGHT	90 to 190	24 to 28	90 to 150	

APPROVAL	**VISHAL STRUCTURALS PVT. LTD.**	**HINDUSTAN PETROLUEM CORP. LTD**	
NAME :			
SIGNATURE :			
DATE :			

Note : 1) For 5mm to 16mm joint separate WPS has to be made using E7018 Rod
2) Inner joint bulk head shall have doublers plate

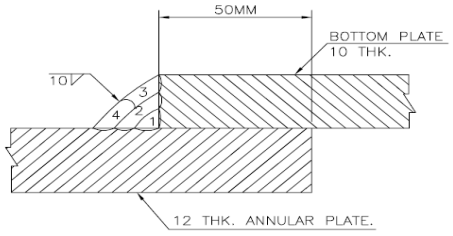
		WPS NO.: **DATE :** **PQR NO.:**
CLIENT : **LOCATION :**	**Hindustan Petroleum Corporation Limited**	

QW-482 - WELDING PROCEDURE SPECIFICATION

(REF. SPECIFICATION : ASME SECTION IX)

JOINT DESIGN (QW 402) — SKETCH / DETAIL : 7

Type	:	LAP FILLET			
Backing	:	NO			
Backing Material Type / Grade	:	NA			
WELDING PROCESS	:	**SMAW**		TYPE : **MANUAL**	



BOTTOM TO ANNULAR PLATE JOINT
FIG.7

BASE METALS (QW 403)

Material Specification	:	IS 2062 / EQ.	To	IS 2062 / EQ.	
Type / Grade No.	:	GR.B	To	GR.B	
P. No.	:	1	To	1	
Group No.	:	1	To	1	
Thick of Coupon	:	16 mm			
Thickness Range	:	5 to 16 mm			

FILLER MATERIAL (QW 404)

Spec. No. (SFA)	:	**5.1**	Filler Size	:	**3.15** / **4** mm
AWS No. (CLASS)	:	**E 7018**	Electrode Flux Type	:	-
A. No.:	:	1	Backing / Storage	:	As per Manuf. Std.
F. No.:	:	4	Consumable Insert	:	None
Make	:	**ESAB/ADVANI/D&H**			

POSITION (QW 405)

Position of Groove	:	**-**	Position of Fillet	:	**2F**
AWS No. (CLASS)	:	**-**			

PREHEAT (QW 406)

Preheat Temp. (Min)	:	NA
Interpass Temp. (Max)	:	NA
Preheat Maint	:	NA

POST WELD HEAT TREATMENT (QW 407)

Temperature	:	NA
Time	:	NA
Other	:	NA

GAS (QW 408)

Shielding Gas	:	NA	Flowrate	:	NA
Percentage Comp.	:	NA	Gas Backing	:	NA
Trailing	:	NA	Purging	:	NA

ELECTRICAL CHARACTERISTICS (QW 409)

Current Mode	:	DC
Volts	:	20 to 28
Electrical Polarity	:	**Electrode-Straight**
Amperage	:	90 TO 190
Tungsten Electrode Size & Type	:	NA
Mode of Metal Transfer (GMAW)	:	NA
Elect. Wire - Feed,Speed,Range	:	NA
Other	:	NA

TECHNIQUE (QW 410)

String of weave Bead	:	String
Orifice or Gas Cup Size	:	NA
Initial / Interpass Cleaning	:	Wire Brushing
Method of back gauging	:	Grinding
Oscillation	:	NA
Contact Tube to work distance	:	NA
Multiple of Single Pass (/ side)	:	Multiple
Multiple of Single Electrode	:	Single
Travel Speed Range	:	SEE TABLE
Peening	:	NA

WELDING PROCEDURE

Pass No.	Welding Process	Filler Material		Current & Voltage			Travel Speed	Heat Input
		Class	Dia	Type & Pol.	Amps Range	Volts Range	mm / min	kJ / mm
ONE SIDE CONT.								
ROOT (1)	SMAW	E6013	3.15	STRAIGHT	80 to 120	20 to 24	80 to 120	
SUB. PASS (2)	SMAW	E6013	3.15	STRAIGHT	90 to 190	24 to 28	90 to 150	
2nd SITCH FILLET 100 (100) 100								
ROOT (1)	SMAW	E6013	3.15	STRAIGHT	80 to 120	20 to 24	80 to 120	
SUB. PASS (2)	SMAW	E6013	3.15	STRAIGHT	90 to 190	24 to 28	90 to 150	

APPROVAL	**VISHAL STRUCTURALS PVT. LTD.**	**HINDUSTAN PETROLUEM CORP. LTD**	
NAME :			

SIGNATURE : DATE :			

		WPS NO.: **DATE :** **PQR NO.:**

CLIENT : **LOCATION :**	**Hindustan Petroleum Corporation Limited**

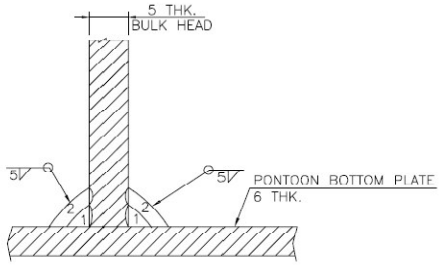
QW-482 - WELDING PROCEDURE SPECIFICATION

(REF. SPECIFICATION : ASME SECTION IX)

JOINT DESIGN (QW 402)

SKETCH / DETAIL : 12

Type	:	T FILLET
Backing	:	NO
Backing Material Type / Grade	:	NA
WELDING PROCESS	:	**SMAW** TYPE : **MANUAL**



BULK HEAD TO PONTOON TOP AND BOTTOM PLATE
BULK HEAD TO TOP AND BOTTOM DECK PLATE
FIG.12

BASE METALS (QW 403)

Material Specification	:	IS 2062 / EQ.	To	IS 2062 / EQ.
Type / Grade No.	:	GR.B	To	GR.B
P. No.	:	1	To	1
Group No.	:	1	To	1
Thick of Coupon	:	5 mm		
Thickness Range	:	5 mm		

FILLER MATERIAL (QW 404)

Spec. No. (SFA)	:	**5.1**	Filler Size	:	**3.15** / **4** mm
AWS No. (CLASS)	:	**E 6013**	Electrode Flux Type	:	-
A. No.:	:	1	Backing / Storage	:	As per Manuf. Std.
F. No.:	:	2	Consumable Insert	:	None
Make	:	**ESAB/ADVANI/D&H**			

POSITION (QW 405)

Position of Groove	:	**-**	Position of Fillet	:	**2F**
AWS No. (CLASS)	:	**-**			

PREHEAT (QW 406)

Preheat Temp. (Min)	:	NA
Interpass Temp. (Max)	:	NA
Preheat Maint	:	NA

POST WELD HEAT TREATMENT (QW 407)

Temperature	:	NA
Time	:	NA
Other	:	NA

GAS (QW 408)

Shielding Gas	:	NA	Flowrate	:	NA
Percentage Comp.	:	NA	Gas Backing	:	NA
Trailing	:	NA	Purging	:	NA

ELECTRICAL CHARACTERISTICS (QW 409)

Current Mode	:	DC	String of weave Bead	:	String
Volts	:	20 to 28	Orifice or Gas Cup Size	:	NA
Electrical Polarity	:	**Straight**	Initial / Interpass Cleaning	:	Wire Brushing
Amperage	:	80 TO 180	Method of back gauging	:	Grinding
Tungsten Electrode Size & Type	:	NA	Oscillation	:	NA
Mode of Metal Transfer (GMAW)	:	NA	Contact Tube to work distance	:	NA
Elect. Wire - Feed,Speed,Range	:	NA	Multiple of Single Pass (/ side)	:	Multiple
Other	:	NA	Multiple of Single Electrode	:	Single
			Travel Speed Range	:	SEE TABLE
			Peening	:	NA

TECHNIQUE (QW 410)

WELDING PROCEDURE

Pass No.	Welding Process	Filler Material		Current & Voltage			Travel Speed	Heat Input
		Class	Dia	Type & Pol.	Amps Range	Volts Range	mm / min	kJ / mm
ROOT (1)	SMAW	E6013	3.15	STRAIGHT	80 to 120	20 to 24	80 to 120	
SUB. PASS (2)	SMAW	E6013	4	STRAIGHT	90 to 190	24 to 28	90 to 150	

APPROVAL	**VISHAL STRUCTURALS PVT. LTD.**	**HINDUSTAN PETROLUEM CORP. LTD**	
NAME : SIGNATURE : DATE :			

Note : Submit separate WPS for Bulkhead to Pontoon top / Deck top welding

		WPS NO.: **DATE :** **PQR NO.:**
CLIENT : **LOCATION :**	**Hindustan Petroleum Corporation Limited** **MAHUL TERMINAL**	

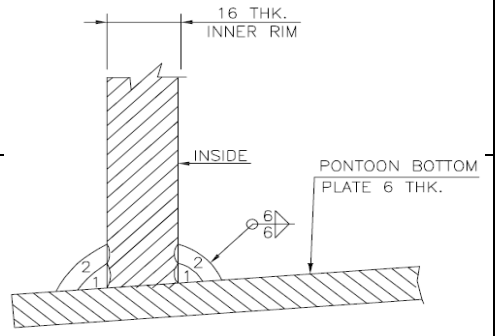
QW-482 - WELDING PROCEDURE SPECIFICATION

(REF. SPECIFICATION : ASME SECTION IX)

JOINT DESIGN (QW 402)

SKETCH / DETAIL : 13

Type	:	T FILLET			
Backing	:	NO			
Backing Material Type / Grade	:	NA			
WELDING PROCESS	:	**SMAW**		TYPE : **MANUAL**	



INNER RIM TO PONTOON BOTTOM JOINT
FIG. 13

BASE METALS (QW 403)

Material Specification	:	IS 2062 / EQ.	To	IS 2062 / EQ.	
Type / Grade No.	:	GR.B	To	GR.B	
P. No.	:	1	To	1	
Group No.	:	1	To	1	
Thick of Coupon	:	6 mm			
Thickness Range	:	6 mm			

FILLER MATERIAL (QW 404)

Spec. No. (SFA)	:	**5.1**	Filler Size	:	**3.15** / **4** mm
AWS No. (CLASS)	:	**E 7018**	Electrode Flux Type	:	-
A. No.:	:	1	Backing / Storage	:	As per Manuf. Std.
F. No.:	:	4	Consumable Insert	:	None
Make	:	**ESAB/ADVANI/D&H**			

POSITION (QW 405)

Position of Groove	:	**-**	Position of Fillet	:	**2F**
AWS No. (CLASS)	:	**-**			

PREHEAT (QW 406)

Preheat Temp. (Min)	:	NA
Interpass Temp. (Max)	:	NA
Preheat Maint	:	NA

POST WELD HEAT TREATMENT (QW 407)

Temperature	:	NA
Time	:	NA
Other	:	NA

GAS (QW 408)

Shielding Gas	:	NA	Flowrate	:	NA
Percentage Comp.	:	NA	Gas Backing	:	NA
Trailing	:	NA	Purging	:	NA

ELECTRICAL CHARACTERISTICS (QW 409)

Current Mode	:	DC
Volts	:	20 to 28
Electrical Polarity	:	**Straight**
Amperage	:	80 TO 180
Tungsten Electrode Size & Type	:	NA
Mode of Metal Transfer (GMAW)	:	NA
Elect. Wire - Feed,Speed,Range	:	NA
Other	:	NA

TECHNIQUE (QW 410)

String of weave Bead	:	String
Orifice or Gas Cup Size	:	NA
Initial / Interpass Cleaning	:	Wire Brushing
Method of back gauging	:	Grinding
Oscillation	:	NA
Contact Tube to work distance	:	NA
Multiple of Single Pass (/ side)	:	Multiple
Multiple of Single Electrode	:	Single
Travel Speed Range	:	SEE TABLE
Peening	:	NA

WELDING PROCEDURE

Pass No.	Welding Process	Filler Material		Current & Voltage			Travel Speed	Heat Input
		Class	Dia	Type & Pol.	Amps Range	Volts Range	mm / min	kJ / mm
INSIDE								
ROOT (1)	SMAW	E7018	3.15	REVERSE	100 to 135	20 to 24	80 to 120	
SUB. PASS (2)	SMAW	E7018	4	REVERSE	130 to 190	24 to 28	90 to 150	
OUTSIDE								
ROOT (1)	SMAW	E7018	3.15	REVERSE	100 to 135	20 to 24	80 to 120	
SUB. PASS (2)	SMAW	E7018	4	REVERSE	130 to 190	24 to 28	90 to 150	

APPROVAL NAME : SIGNATURE :		**HINDUSTAN PETROLUEM CORP. LTD**

DATE :			

Note : Joint at the point where Outer rim & Lap of Bottom Deck plate meet shall be like

a) Bottom deck has to be made Sq Butt joint for 100 mm length
WPS Pg (a) should be submitted separately
Hence Joggly not needed

		WPS NO.: **DATE :** **PQR NO.:**
CLIENT : **LOCATION :**	**Hindustan Petroleum Corporation Limited**	

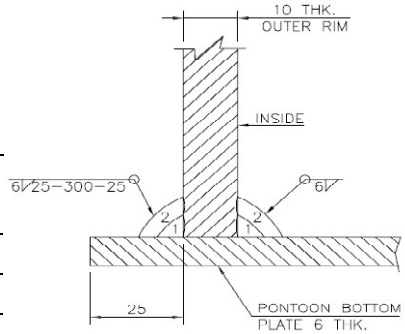
QW-482 - WELDING PROCEDURE SPECIFICATION

(REF. SPECIFICATION : ASME SECTION IX)

JOINT DESIGN (QW 402)

SKETCH / DETAIL : 14

Type	:	T FILLET
Backing	:	NO
Backing Material Type / Grade	:	NA
WELDING PROCESS	``	**SMAW** TYPE : **MANUAL**



OUTER RIM TO PONTOON BOTTOM JOINT
FIG. 14

BASE METALS (QW 403)

Material Specification	:	IS 2062 / EQ.	To	IS 2062 / EQ.
Type / Grade No.	:	GR.B	To	GR.B
P. No.	:	1	To	1
Group No.	:	1	To	1
Thick of Coupon	:	6 mm		
Thickness Range	:	6 mm		

FILLER MATERIAL (QW 404)

Spec. No. (SFA)	:	**5.1**	Filler Size	:	**3.15** / **4** mm
AWS No. (CLASS)	:	**E 6013**	Electrode Flux Type	:	-
A. No.:	:	1	Backing / Storage	:	As per Manuf. Std.
F. No.:	:	2	Consumable Insert	:	None
Make	:	**ESAB/ADVANI/D&H**			

POSITION (QW 405)

Position of Groove	:	**-**	Position of Fillet	:	**2F**
AWS No. (CLASS)	:	**-**			

PREHEAT (QW 406)

Preheat Temp. (Min)	:	NA
Interpass Temp. (Max)	:	NA
Preheat Maint	:	NA

POST WELD HEAT TREATMENT (QW 407)

Temperature	:	NA
Time	:	NA
Other	:	NA

GAS (QW 408)

Shielding Gas	:	NA	Flowrate	:	NA
Percentage Comp.	:	NA	Gas Backing	:	NA
Trailing	:	NA	Purging	:	NA

ELECTRICAL CHARACTERISTICS (QW 409)

Current Mode	:	DC
Volts	:	20 to 28
Electrical Polarity	:	**Straight**
Amperage	:	80 TO 180
Tungsten Electrode Size & Type	:	NA
Mode of Metal Transfer (GMAW)	:	NA
Elect. Wire - Feed,Speed,Range	:	NA
Other	:	NA

TECHNIQUE (QW 410)

String of weave Bead	:	String
Orifice or Gas Cup Size	:	NA
Initial / Interpass Cleaning	:	Wire Brushing
Method of back gauging	:	Grinding
Oscillation	:	NA
Contact Tube to work distance	:	NA
Multiple of Single Pass (/ side)	:	Multiple
Multiple of Single Electrode	:	Single
Travel Speed Range	:	SEE TABLE
Peening	:	NA

WELDING PROCEDURE

Pass No.	Welding Process	Filler Material		Current & Voltage			Travel Speed	Heat Input
		Class	Dia	Type & Pol.	Amps Range	Volts Range	mm / min	kJ / mm
ONE SIDE CONT.								
ROOT (1)	SMAW	E6013	3.15	STRAIGHT	80 to 120	20 to 24	80 to 120	
SUB. PASS (2)	SMAW	E6013	4	STRAIGHT	90 to 190	24 to 28	90 to 150	
2nd STITCH FILLET 100 (100) 100								
ROOT (1)	SMAW	E6013	3.15	STRAIGHT	80 to 120	20 to 24	80 to 120	
SUB. PASS (2)	SMAW	E6013	4	STRAIGHT	90 to 190	24 to 28	90 to 150	

APPROVAL NAME : SIGNATURE :		**HINDUSTAN PETROLUEM CORP. LTD**	

DATE :			

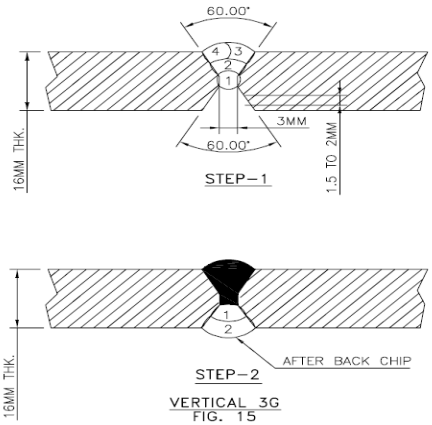
		WPS NO.: **DATE :** **PQR NO.:**
CLIENT : **LOCATION :**	**Hindustan Petroleum Corporation Limited**	

QW-482 - WELDING PROCEDURE SPECIFICATION

(REF. SPECIFICATION : ASME SECTION IX)

JOINT DESIGN (QW 402)

SKETCH / DETAIL : 15



Type	:	DOUBLE V BUTT		
Backing	:	NO		
Backing Material Type / Grade	:	NA		
WELDING PROCESS	:	**SMAW**	TYPE :	**MANUAL**

BASE METALS (QW 403)

Material Specification	:	IS 2062 / EQ.	To	IS 2062 / EQ.
Type / Grade No.	:	GR.B	To	GR.B
P. No.	:	1	To	1
Group No.	:	1	To	1
Thick of Coupon	:	16 mm		
Thickness Range	:	16 mm		

FILLER MATERIAL (QW 404)

Spec. No. (SFA)	:	**5.1**	Filler Size	:	**3.15** mm
AWS No. (CLASS)	:	**E 7018**	Electrode Flux Type	:	-
A. No.:	:	1	Backing / Storage	:	As per Manuf. Std.
F. No.:	:	4	Consumable Insert	:	None
Make	:	**ESAB/ADVANI/D&H**			

POSITION (QW 405)

Position of Groove	:	**3G**	Position of Fillet	:	**NA**
AWS No. (CLASS)	:	**UPHILL**			

PREHEAT (QW 406)			**POST WELD HEAT TREATMENT (QW 407)**		
Preheat Temp. (Min)	:	NA	Temperature	:	NA
Interpass Temp. (Max)	:	NA	Time	:	NA
Preheat Maint	:	NA	Other	:	NA

GAS (QW 408)

Shielding Gas	:	NA	Flowrate	:	NA
Percentage Comp.	:	NA	Gas Backing	:	NA
Trailing	:	NA	Purging	:	NA

ELECTRICAL CHARACTERISTICS (QW 409)			**TECHNIQUE (QW 410)**		
Current Mode	:	DC	String of weave Bead	:	String / Weaving
Volts	:	20 to 28	Orifice or Gas Cup Size	:	NA
Electrical Polarity	:	**Straight**	Initial / Interpass Cleaning	:	Wire Brushing
Amperage	:	80 TO 130	Method of back gauging	:	Grinding
Tungsten Electrode Size & Type	:	NA	Oscillation	:	NA
Mode of Metal Transfer (GMAW)	:	NA	Contact Tube to work distance	:	NA
Elect. Wire - Feed,Speed,Range	:	NA	Multiple of Single Pass (/ side)	:	Multiple
Other	:	NA	Multiple of Single Electrode	:	Single
			Travel Speed Range	:	SEE TABLE
			Peening	:	NA

WELDING PROCEDURE

Pass No.	Welding Process	Filler Material		Current & Voltage			Travel Speed	Heat Input
		Class	Dia	Type & Pol.	Amps Range	Volts Range	mm / min	kJ / mm
ROOT (1)	SMAW	E7018	3.15	REVERSE	80 to 120	20 to 24	80 to 100	
SUB. PASS (2)	SMAW	E7018	3.15	REVERSE	90 to 130	24 to 28	90 to 125	
SUB. PASS (3,4)	SMAW	E7018	3.15	REVERSE	90 to 130	24 to 28	90 to 125	
AFTER BACK CHIP								
1ST PASS	SMAW	E7018	3.15	REVERSE	90 to 130	24 to 28	90 to 125	
FINAL	SMAW	E7018	3.15	REVERSE	90 to 130	24 to 28	90 to 125	

APPROVAL	**VISHAL STRUCTURALS PVT. LTD.**	**HINDUSTAN PETROLUEM CORP. LTD**	
NAME :			
SIGNATURE :			

DATE :			

		WPS NO.: **DATE :** **PQR NO.:**

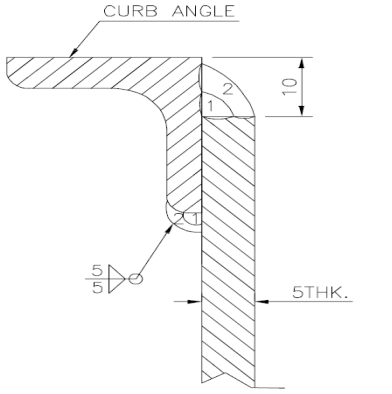
CLIENT :	**Hindustan Petroleum Corporation Limited**
LOCATION :	**MAHUL TERMINAL**

QW-482 - WELDING PROCEDURE SPECIFICATION

(REF. SPECIFICATION : ASME SECTION IX)

JOINT DESIGN (QW 402)

SKETCH / DETAIL : 16



CURB ANGLE TO SHELL JOINT
FIG. 16

Type	:	LAP FILLET			
Backing	:	NO			
Backing Material Type / Grade	:	NA			
WELDING PROCESS	``	**SMAW**		TYPE : **MANUAL**	

BASE METALS (QW 403)

Material Specification	:	IS 2062 / EQ.	To	IS 2062 / EQ.	
Type / Grade No.	:	GR.B	To	GR.B	
P. No.	:	1	To	1	
Group No.	:	1	To	1	
Thick of Coupon	:	5 mm			
Thickness Range	:	5 mm			

FILLER MATERIAL (QW 404)

Spec. No. (SFA)	:	**5.1**	Filler Size	:	**3.15** / **4** mm
AWS No. (CLASS)	:	**E 6013**	Electrode Flux Type	:	-
A. No.:	:	1	Backing / Storage	:	As per Manuf. Std.
F. No.:	:	2	Consumable Insert	:	None
Make	:	**ESAB/ADVANI/D&H**			

POSITION (QW 405)

Position of Groove	:	**-**	Position of Fillet	:	**2F**
AWS No. (CLASS)	:	**-**			

PREHEAT (QW 406)			**POST WELD HEAT TREATMENT (QW 407)**		
Preheat Temp. (Min)	:	NA	Temperature	:	NA
Interpass Temp. (Max)	:	NA	Time	:	NA
Preheat Maint	:	NA	Other	:	NA

GAS (QW 408)

Shielding Gas	:	NA	Flowrate	:	NA
Percentage Comp.	:	NA	Gas Backing	:	NA
Trailing	:	NA	Purging	:	NA

ELECTRICAL CHARACTERISTICS (QW 409)			**TECHNIQUE (QW 410)**		
Current Mode	:	DC	String of weave Bead	:	String
Volts	:	20 to 28	Orifice or Gas Cup Size	:	NA
Electrical Polarity	:	**Electrode-Straight**	Initial / Interpass Cleaning	:	Wire Brushing
Amperage	:	80 TO 180	Method of back gauging	:	Grinding
Tungsten Electrode Size & Type	:	NA	Oscillation	:	NA
Mode of Metal Transfer (GMAW)	:	NA	Contact Tube to work distance	:	NA
Elect. Wire - Feed,Speed,Range	:	NA	Multiple of Single Pass (/ side)	:	Multiple
Other	:	NA	Multiple of Single Electrode	:	Single
			Travel Speed Range	:	SEE TABLE
			Peening	:	NA

WELDING PROCEDURE

Pass No.	Welding Process	Filler Material		Current & Voltage			Travel Speed	Heat Input
		Class	Dia	Type & Pol.	Amps Range	Volts Range	mm / min	kJ / mm
ROOT (1)	SMAW	E6013	3.15	STRAIGHT	80 to 120	20 to 24	80 to 120	
SUB. PASS (2)	SMAW	E6013	4	STRAIGHT	90 to 190	24 to 28	90 to 150	

APPROVAL NAME : SIGNATURE : DATE :		**HINDUSTAN PETROLUEM CORP. LTD**	

Note : L 75 X 75 X 8 only has to be used

		WPS NO.: **DATE :** **PQR NO.:**
CLIENT : **LOCATION :**	**Hindustan Petroleum Corporation Limited**	

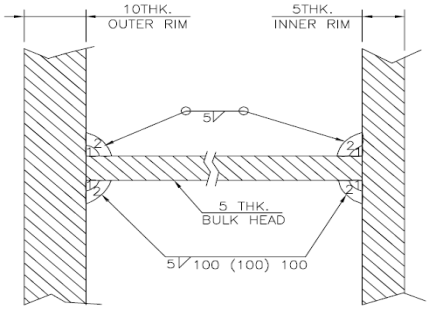
QW-482 - WELDING PROCEDURE SPECIFICATION

(REF. SPECIFICATION : ASME SECTION IX)

JOINT DESIGN (QW 402)

SKETCH / DETAIL : 17

Type	:	T FILLET			
Backing	:	NO			
Backing Material Type / Grade	:	NA			
WELDING PROCESS	:	**SMAW**	TYPE : **MANUAL**		



BULK HEAD TO INNER RIM AND OUTER RIM
VERTICAL JOINT
FIG. 17

BASE METALS (QW 403)

Material Specification	:	IS 2062 / EQ.	To	IS 2062 / EQ.	
Type / Grade No.	:	GR.B	To	GR.B	
P. No.	:	1	To	1	
Group No.	:	1	To	1	
Thick of Coupon	:	5 mm			
Thickness Range	:	5 mm			

FILLER MATERIAL (QW 404)

Spec. No. (SFA)	:	**5.1**	Filler Size	:	**3.15** mm
AWS No. (CLASS)	:	**E 7018**	Electrode Flux Type	:	-
A. No.:	:	1	Backing / Storage	:	As per Manuf. Std.
F. No.:	:	4	Consumable Insert	:	None
Make	:	**ESAB/ADVANI/D&H**			

POSITION (QW 405)

Position of Groove	:	**-**	Position of Fillet	:	**3F**
AWS No. (CLASS)	:	**-**			

PREHEAT (QW 406)

Preheat Temp. (Min)	:	NA
Interpass Temp. (Max)	:	NA
Preheat Maint	:	NA

POST WELD HEAT TREATMENT (QW 407)

Temperature	:	NA
Time	:	NA
Other	:	NA

GAS (QW 408)

Shielding Gas	:	NA	Flowrate	:	NA
Percentage Comp.	:	NA	Gas Backing	:	NA
Trailing	:	NA	Purging	:	NA

ELECTRICAL CHARACTERISTICS (QW 409)

Current Mode	:	DC
Volts	:	20 to 28
Electrical Polarity	:	**Straight**
Amperage	:	80 TO 180
Tungsten Electrode Size & Type	:	NA
Mode of Metal Transfer (GMAW)	:	NA
Elect. Wire - Feed,Speed,Range	:	NA
Other	:	NA

TECHNIQUE (QW 410)

String of weave Bead	:	String / Weaving
Orifice or Gas Cup Size	:	NA
Initial / Interpass Cleaning	:	Wire Brushing
Method of back gauging	:	Grinding
Oscillation	:	NA
Contact Tube to work distance	:	NA
Multiple of Single Pass (/ side)	:	Multiple
Multiple of Single Electrode	:	Single
Travel Speed Range	:	SEE TABLE
Peening	:	NA

WELDING PROCEDURE

Pass No.	Welding Process	Filler Material		Current & Voltage			Travel Speed	Heat Input
		Class	Dia	Type & Pol.	Amps Range	Volts Range	mm / min	kJ / mm
ONE SIDE CONT.								
ROOT (1)	SMAW	E7018	3.15	REVERSE	80 to 120	20 to 24	80 to 120	
SUB. PASS (2)	SMAW	E7018	3.15	REVERSE	90 to 190	24 to 28	90 to 150	
2ND SIDE STITCH FILLET 100 (100) 100								
ROOT (1)	SMAW	E7018	3.15	REVERSE	80 to 120	20 to 24	80 to 120	
SUB. PASS (2)	SMAW	E7018	3.15	REVERSE	90 to 190	24 to 28	90 to 150	

APPROVAL NAME : SIGNATURE : DATE :		**HINDUSTAN PETROLUEM CORP. LTD**	

		WPS NO.: **DATE :** **PQR NO.:**

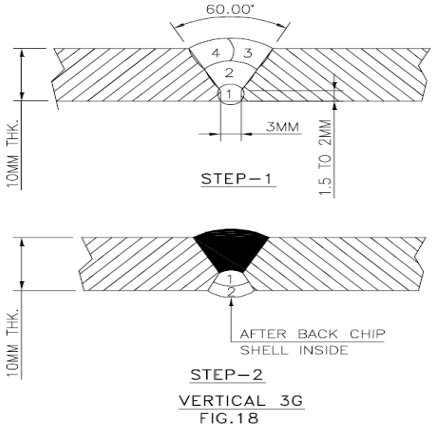
CLIENT : **LOCATION :**	**Hindustan Petroleum Corporation Limited**

QW-482 - WELDING PROCEDURE SPECIFICATION

(REF. SPECIFICATION : ASME SECTION IX)

JOINT DESIGN (QW 402)

SKETCH / DETAIL : 18



Type	:	Single V Full Pen Butt Joint		
Backing	:	NO		
Backing Material Type / Grade	:	Chip Back to Sound metal & reweld		
WELDING PROCESS	:	**SMAW**	TYPE :	**MANUAL**

BASE METALS (QW 403)

Material Specification	:	IS 2062 / EQ.	To	IS 2062 / EQ.
Type / Grade No.	:	GR.B	To	GR.B
P. No.	:	1	To	1
Group No.	:	1	To	1
Thick of Coupon	:	10 mm		
Thickness Range	:	1.76 to 20 mm		

FILLER MATERIAL (QW 404)

Spec. No. (SFA)	:	**5.1**	Filler Size	:	**3.15** mm
AWS No. (CLASS)	:	**E 6013**	Electrode Flux Type	:	-
A. No.:	:	1	Backing / Storage	:	As per Manuf. Std.
F. No.:	:	2	Consumable Insert	:	None
Make	:	**ESAB/ADVANI/D&H**			

POSITION (QW 405)

Position of Groove	:	**3G**	Position of Fillet	:	**NA**
AWS No. (CLASS)	:	**UPHILL**			

PREHEAT (QW 406)			**POST WELD HEAT TREATMENT (QW 407)**		
Preheat Temp. (Min)	:	NA	Temperature	:	NA
Interpass Temp. (Max)	:	NA	Time	:	NA
Preheat Maint	:	NA	Other	:	NA

GAS (QW 408)

Shielding Gas	:	NA	Flowrate	:	NA
Percentage Comp.	:	NA	Gas Backing	:	NA
Trailing	:	NA	Purging	:	NA

ELECTRICAL CHARACTERISTICS (QW 409)			**TECHNIQUE (QW 410)**		
Current Mode	:	DC	String of weave Bead	:	String / Weaving
Volts	:	18 to 20	Orifice or Gas Cup Size	:	NA
Electrical Polarity	:	**Electrode - Negative**	Initial / Interpass Cleaning	:	Wire Brushing
Amperage	:	100 TO 120	Method of back gauging	:	Grinding
Tungsten Electrode Size & Type	:	NA	Oscillation	:	NA
Mode of Metal Transfer (GMAW)	:	NA	Contact Tube to work distance	:	NA
Elect. Wire - Feed,Speed,Range	:	NA	Multiple of Single Pass (/ side)	:	Multiple
Other	:	NA	Multiple of Single Electrode	:	Single
			Travel Speed Range	:	SEE TABLE
			Peening	:	NA

WELDING PROCEDURE

Pass No.	Welding Process	Filler Material		Current & Voltage			Travel Speed	Heat Input
		Class	Dia	Type & Pol.	Amps Range	Volts Range	mm / min	kJ / mm
ROOT	SMAW	E6013	3.15	STRAIGHT	90 to 95	22 to 24	65 to 90	0.275
HOT PASS	SMAW	E6013	3.15	STRAIGHT	90 to 95	18 to 20	85 to 90	0.238
FILLING	SMAW	E6013	4	STRAIGHT	100 to 120	18 to 20	85 to 90	0.238
CAPPING	SMAW	E6013	3.15	STRAIGHT	90 to 95	22 to 24	65 to 90	0.275
AFTER BACK CHIP								
SUB PASS	SMAW	E6013	3.15	STRAIGHT	90 to 95	18 to 20	85 to 90	0.238
FINAL	SMAW	E6013	4	STRAIGHT	100 to 120	22 to 24	65 to 90	0.275

APPROVAL NAME : SIGNATURE : DATE :		**HINDUSTAN PETROLUEM CORP. LTD**	

		WPS NO.: **DATE :** **PQR NO.:**

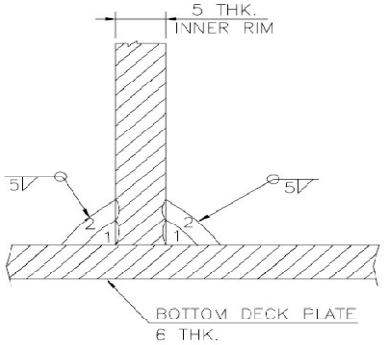
CLIENT : **LOCATION :**	**Hindustan Petroleum Corporation Limited**

QW-482 - WELDING PROCEDURE SPECIFICATION

(REF. SPECIFICATION : ASME SECTION IX)

JOINT DESIGN (QW 402) SKETCH / DETAIL : 19

Type	:	T FILLET
Backing	:	NO
Backing Material Type / Grade	:	NA
WELDING PROCESS	``	**SMAW** TYPE : **MANUAL**



INNER RIM TO BOTTOM DECK
FIG.19

BASE METALS (QW 403)

Material Specification	:	IS 2062 / EQ.	To	IS 2062 / EQ.
Type / Grade No.	:	GR.B	To	GR.B
P. No.	:	1	To	1
Group No.	:	1	To	1
Thick of Coupon	:	5 mm		
Thickness Range	:	5 mm		

FILLER MATERIAL (QW 404)

Spec. No. (SFA)	:	**5.1**	Filler Size	:	**3.15** / **4** mm
AWS No. (CLASS)	:	**E 6013**	Electrode Flux Type	:	-
A. No.:	:	1	Backing / Storage	:	As per Manuf. Std.
F. No.:	:	2	Consumable Insert	:	None
Make	:	**ESAB/ADVANI/D&H**			

POSITION (QW 405)

Position of Groove	:	**-**	Position of Fillet	:	**2F**
AWS No. (CLASS)	:	**-**			

PREHEAT (QW 406)

Preheat Temp. (Min)	:	NA
Interpass Temp. (Max)	:	NA
Preheat Maint	:	NA

POST WELD HEAT TREATMENT (QW 407)

Temperature	:	NA
Time	:	NA
Other	:	NA

GAS (QW 408)

Shielding Gas	:	NA	Flowrate	:	NA
Percentage Comp.	:	NA	Gas Backing	:	NA
Trailing	:	NA	Purging	:	NA

ELECTRICAL CHARACTERISTICS (QW 409)

Current Mode	:	DC
Volts	:	20 to 28
Electrical Polarity	:	**Straight**
Amperage	:	80 TO 180
Tungsten Electrode Size & Type	:	NA
Mode of Metal Transfer (GMAW)	:	NA
Elect. Wire - Feed,Speed,Range	:	NA
Other	:	NA

TECHNIQUE (QW 410)

String of weave Bead	:	String
Orifice or Gas Cup Size	:	NA
Initial / Interpass Cleaning	:	Wire Brushing
Method of back gauging	:	Grinding
Oscillation	:	NA
Contact Tube to work distance	:	NA
Multiple of Single Pass (/ side)	:	Multiple
Multiple of Single Electrode	:	Single
Travel Speed Range	:	SEE TABLE
Peening	:	NA

WELDING PROCEDURE

Pass No.	Welding Process	Filler Material		Current & Voltage			Travel Speed	Heat Input
		Class	Dia	Type & Pol.	Amps Range	Volts Range	mm / min	kJ / mm
ROOT (1)	SMAW	E6013	3.15	STRAIGHT	80 to 120	20 to 24	80 to 120	
SUB. PASS (2)	SMAW	E6013	4	STRAIGHT	90 to 190	24 to 28	90 to 150	

APPROVAL NAME : SIGNATURE : DATE :		**HINDUSTAN PETROLUEM CORP. LTD**	

		WPS NO.: **DATE :** **PQR NO.:**

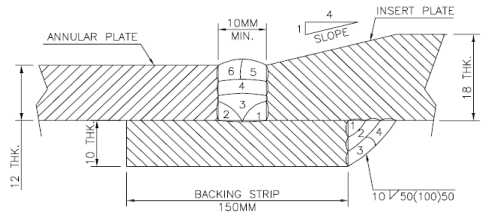
CLIENT : **LOCATION :**	**Hindustan Petroleum Corporation Limited**

QW-482 - WELDING PROCEDURE SPECIFICATION

(REF. SPECIFICATION : ASME SECTION IX)

JOINT DESIGN (QW 402) — SKETCH / DETAIL : 20

Type	:	SQUARE BUTT WITH BACKING STRIP
Backing	:	YES
Backing Material Type / Grade	:	NA
WELDING PROCESS	:	**SMAW** TYPE : **MANUAL**



ANNULAR TO CLEAN OUT BOTTOM INSERT PLATE JOINT
FIG.20

BASE METALS (QW 403)

Material Specification	:	IS 2062 / EQ.	To	IS 2062 / EQ.
Type / Grade No.	:	GR.B	To	GR.B
P. No.	:	1	To	1
Group No.	:	1	To	1
Thick of Coupon	:	12 mm		
Thickness Range	:	12 to 16 mm		

FILLER MATERIAL (QW 404)

Spec. No. (SFA)	:	**5.1**	Filler Size	:	**3.15** / **4** mm
AWS No. (CLASS)	:	**E 7018**	Electrode Flux Type	:	-
A. No.:	:	1	Backing / Storage	:	As per Manuf. Std.
F. No.:	:	4	Consumable Insert	:	None
Make	:	**ESAB/ADVANI/D&H**			

POSITION (QW 405)

Position of Groove	:	**-**	Position of Fillet	:	**2F**
AWS No. (CLASS)	:	**-**			

PREHEAT (QW 406)

Preheat Temp. (Min)	:	NA
Interpass Temp. (Max)	:	NA
Preheat Maint	:	NA

POST WELD HEAT TREATMENT (QW 407)

Temperature	:	NA
Time	:	NA
Other	:	NA

GAS (QW 408)

Shielding Gas	:	NA	Flowrate	:	NA
Percentage Comp.	:	NA	Gas Backing	:	NA
Trailing	:	NA	Purging	:	NA

ELECTRICAL CHARACTERISTICS (QW 409)

Current Mode	:	DC	String of weave Bead	:	String
Volts	:	20 to 28	Orifice or Gas Cup Size	:	NA
Electrical Polarity	:	**REVERSE**	Initial / Interpass Cleaning	:	Wire Brushing
Amperage	:	90 TO 190	Method of back gauging	:	Grinding
Tungsten Electrode Size & Type	:	NA	Oscillation	:	NA
Mode of Metal Transfer (GMAW)	:	NA	Contact Tube to work distance	:	NA
Elect. Wire - Feed,Speed,Range	:	NA	Multiple of Single Pass (/ side)	:	Multiple
Other	:	NA	Multiple of Single Electrode	:	Single
			Travel Speed Range	:	SEE TABLE
			Peening	:	NA

TECHNIQUE (QW 410)

WELDING PROCEDURE

Pass No.	Welding Process	Filler Material		Current & Voltage			Travel Speed	Heat Input
		Class	Dia	Type & Pol.	Amps Range	Volts Range	mm / min	kJ / mm
ROOT (1,2)	SMAW	E7018	3.15	REVERSE	100 to 135	20 to 24	90 to 120	
SUB. PASS (3)	SMAW	E7018	4	REVERSE	120 to 190	24 to 28	100 to 150	
SUB. PASS (4)	SMAW	E7018	4	REVERSE	120 to 190	24 to 28	100 to 150	
FINAL (5,6)	SMAW	E7018	3.15	REVERSE	100 to 135	20 to 24	90 ot 120	

APPROVAL NAME : SIGNATURE : DATE :		**HINDUSTAN PETROLUEM CORP. LTD**	

		WPS NO.: **DATE :** **PQR NO.:**

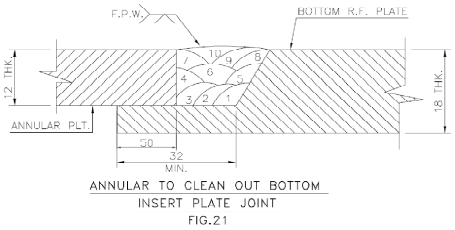
CLIENT : **LOCATION :**	**Hindustan Petroleum Corporation Limited**

QW-482 - WELDING PROCEDURE SPECIFICATION

(REF. SPECIFICATION : ASME SECTION IX)

JOINT DESIGN (QW 402) SKETCH / DETAIL : 21

Type	:	SQUARE BUTT W/BACKING PLT. FOR COD
Backing	:	YES
Backing Material Type / Grade	:	NA
WELDING PROCESS	:	**SMAW** TYPE : **MANUAL**



BASE METALS (QW 403)

Material Specification	:	IS 2062 / EQ.	To	IS 2062 / EQ.
Type / Grade No.	:	GR.B	To	GR.B
P. No.	:	1	To	1
Group No.	:	1	To	1
Thick of Coupon	:	12 mm		
Thickness Range	:	12 to 16 mm		

FILLER MATERIAL (QW 404)

Spec. No. (SFA)	:	**5.1**	Filler Size	:	**3.15** / **4** mm
AWS No. (CLASS)	:	**E 7018**	Electrode Flux Type	:	-
A. No.:	:	1	Backing / Storage	:	As per Manuf. Std.
F. No.:	:	4	Consumable Insert	:	None
Make	:	**ESAB/ADVANI/D&H**			

POSITION (QW 405)

Position of Groove	:	**1 G**	Position of Fillet	:	**-**
AWS No. (CLASS)	:	**-**			

PREHEAT (QW 406)			**POST WELD HEAT TREATMENT (QW 407)**		
Preheat Temp. (Min)	:	NA	Temperature	:	NA
Interpass Temp. (Max)	:	NA	Time	:	NA
Preheat Maint	:	NA	Other	:	NA

GAS (QW 408)

Shielding Gas	:	NA	Flowrate	:	NA
Percentage Comp.	:	NA	Gas Backing	:	NA
Trailing	:	NA	Purging	:	NA

ELECTRICAL CHARACTERISTICS (QW 409)			**TECHNIQUE (QW 410)**		
Current Mode	:	DC	String of weave Bead	:	String
Volts	:	20 to 28	Orifice or Gas Cup Size	:	NA
Electrical Polarity	:	**REVERSE**	Initial / Interpass Cleaning	:	Wire Brushing
Amperage	:	90 TO 190	Method of back gauging	:	Grinding
Tungsten Electrode Size & Type	:	NA	Oscillation	:	NA
Mode of Metal Transfer (GMAW)	:	NA	Contact Tube to work distance	:	NA
Elect. Wire - Feed,Speed,Range	:	NA	Multiple of Single Pass (/ side)	:	Multiple
Other	:	NA	Multiple of Single Electrode	:	Single
			Travel Speed Range	:	SEE TABLE
			Peening	:	NA

WELDING PROCEDURE

Pass No.	Welding Process	Filler Material		Current & Voltage			Travel Speed	Heat Input
		Class	Dia	Type & Pol.	Amps Range	Volts Range	mm / min	kJ / mm
ROOT (1,2)	SMAW	E7018	3.15	REVERSE	100 to 135	20 to 24	90 to 120	
SUB. PASS (3)	SMAW	E7018	4	REVERSE	120 to 190	24 to 28	100 to 150	
SUB. PASS (4)	SMAW	E7018	4	REVERSE	120 to 190	24 to 28	100 to 150	
FINAL (5 TO 10)	SMAW	E7018	3.15	REVERSE	100 to 135	20 to 24	90 ot 120	

APPROVAL		**HINDUSTAN PETROLUEM CORP. LTD**	
NAME :			
SIGNATURE :			
DATE :			

Note : WPS for 10mm to insert plate joint should be submitted separately

		WPS NO.: **DATE :** **PQR NO.:**

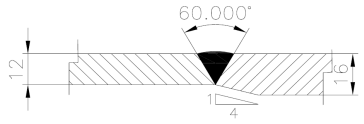
CLIENT : **LOCATION :**	**Hindustan Petroleum Corporation Limited**

QW-482 - WELDING PROCEDURE SPECIFICATION

(REF. SPECIFICATION : ASME SECTION IX)

JOINT DESIGN (QW 402) SKETCH / DETAIL : 22

Type	:	SQUARE BUTT W/BACKING PLT. FOR COD
Backing	:	YES
Backing Material Type / Grade	:	NA
WELDING PROCESS	:	**SMAW** TYPE : **MANUAL**



BASE METALS (QW 403)

Material Specification	:	IS 2062 / EQ.	To	IS 2062 / EQ.	
Type / Grade No.	:	GR.B	To	GR.B	ANNULAR TO CLEAN OUT BOTTOM JOINT
P. No.	:	1	To	1	
Group No.	:	1	To	1	
Thick of Coupon	:	12 mm			
Thickness Range	:	12 to 16 mm			

FILLER MATERIAL (QW 404)

Spec. No. (SFA)	:	**5.1**	Filler Size	:	**3.15** / **4** mm
AWS No. (CLASS)	:	**E 7018**	Electrode Flux Type	:	-
A. No.:	:	1	Backing / Storage	:	As per Manuf. Std.
F. No.:	:	4	Consumable Insert	:	None
Make	:	**ESAB/ADVANI/D&H**			

POSITION (QW 405)

Position of Groove	:	**1 G**	Position of Fillet	:	**-**
AWS No. (CLASS)	:	**-**			

PREHEAT (QW 406)			**POST WELD HEAT TREATMENT (QW 407)**		
Preheat Temp. (Min)	:	NA	Temperature	:	NA
Interpass Temp. (Max)	:	NA	Time	:	NA
Preheat Maint	:	NA	Other	:	NA

GAS (QW 408)

Shielding Gas	:	NA	Flowrate	:	NA
Percentage Comp.	:	NA	Gas Backing	:	NA
Trailing	:	NA	Purging	:	NA

ELECTRICAL CHARACTERISTICS (QW 409)			**TECHNIQUE (QW 410)**		
Current Mode	:	DC	String of weave Bead	:	String
Volts	:	20 to 28	Orifice or Gas Cup Size	:	NA
Electrical Polarity	:	**REVERSE**	Initial / Interpass Cleaning	:	Wire Brushing
Amperage	:	90 TO 190	Method of back gauging	:	Grinding
Tungsten Electrode Size & Type	:	NA	Oscillation	:	NA
Mode of Metal Transfer (GMAW)	:	NA	Contact Tube to work distance	:	NA
Elect. Wire - Feed,Speed,Range	:	NA	Multiple of Single Pass (/ side)	:	Multiple
Other	:	NA	Multiple of Single Electrode	:	Single
			Travel Speed Range	:	SEE TABLE
			Peening	:	NA

WELDING PROCEDURE

Pass No.	Welding Process	Filler Material		Current & Voltage			Travel Speed	Heat Input
		Class	Dia	Type & Pol.	Amps Range	Volts Range	mm / min	kJ / mm
ROOT (1)	SMAW	E7018	3.15	REVERSE	100 to 135	20 to 24	90 to 120	
SUB. PASS (2)	SMAW	E7018	4	REVERSE	120 to 190	24 to 28	100 to 150	
FINAL (3 TO 4)	SMAW	E7018	3.15	REVERSE	100 to 135	20 to 24	90 ot 120	

APPROVAL		**HINDUSTAN PETROLUEM CORP. LTD**	
NAME :			
SIGNATURE :			
DATE :			

Note : WPS for 10mm to insert plate joint should be submitted separately

		WPS NO.: WPS-VSPL-026- REV 0 **DATE :** 11.11.2009 **PQR NO.:** PQR-VSPL- - REV 0

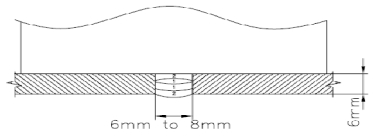
CLIENT : **Hindustan Petroleum Corporation Limited**
LOCATION : **MAHUL TERMINAL**

QW-482 - WELDING PROCEDURE SPECIFICATION

(REF. SPECIFICATION : ASME SECTION IX)

JOINT DESIGN (QW 402)

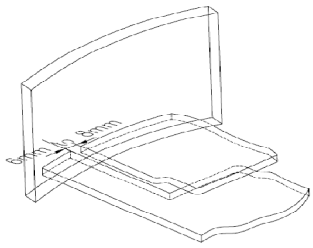
SKETCH / DETAIL : 23



Type	:	T FILLET			
Backing	:	NO			
Backing Material Type / Grade	:	NA			
WELDING PROCESS	:	**SMAW**	TYPE :	**MANUAL**	

BASE METALS (QW 403)

Material Specification	:	IS 2062 / EQ.	To	IS 2062 / EQ.	
Type / Grade No.	:	GR.B	To	GR.B	
P. No.	:	1	To	1	
Group No.	:	1	To	1	
Thick of Coupon	:	6 mm			
Thickness Range	:	6 mm			



OUTER RIM TO BOTTOM DECK LAP JOINT

FILLER MATERIAL (QW 404)

Spec. No. (SFA)	:	**5.1**	Filler Size	:	**3.15** / **4** mm
AWS No. (CLASS)	:	**E 6013**	Electrode Flux Type	:	-
A. No.:	:	1	Backing / Storage	:	As per Manuf. Std.
F. No.:	:	2	Consumable Insert	:	None
Make	:	**ESAB/ADVANI/D&H**			

POSITION (QW 405)

Position of Groove	:	**-**	Position of Fillet	:	**2F**
AWS No. (CLASS)	:	**-**			

PREHEAT (QW 406)

Preheat Temp. (Min)	:	NA
Interpass Temp. (Max)	:	NA
Preheat Maint	:	NA

POST WELD HEAT TREATMENT (QW 407)

Temperature	:	NA
Time	:	NA
Other	:	NA

GAS (QW 408)

Shielding Gas	:	NA	Flowrate	:	NA
Percentage Comp.	:	NA	Gas Backing	:	NA
Trailing	:	NA	Purging	:	NA

ELECTRICAL CHARACTERISTICS (QW 409)

Current Mode	:	DC
Volts	:	20 to 28
Electrical Polarity	:	**Straight**
Amperage	:	80 TO 180
Tungsten Electrode Size & Type	:	NA
Mode of Metal Transfer (GMAW)	:	NA
Elect. Wire - Feed,Speed,Range	:	NA
Other	:	NA

TECHNIQUE (QW 410)

String of weave Bead	:	String
Orifice or Gas Cup Size	:	NA
Initial / Interpass Cleaning	:	Wire Brushing
Method of back gauging	:	Grinding
Oscillation	:	NA
Contact Tube to work distance	:	NA
Multiple of Single Pass (/ side)	:	Multiple
Multiple of Single Electrode	:	Single
Travel Speed Range	:	SEE TABLE
Peening	:	NA

WELDING PROCEDURE

Pass No.	Welding Process	Filler Material		Current & Voltage			Travel Speed	Heat Input
		Class	Dia	Type & Pol.	Amps Range	Volts Range	mm / min	kJ / mm
ONE SIDE CONT.								
ROOT (1)	SMAW	E6013	3.15	STRAIGHT	80 to 120	20 to 24	80 to 120	
SUB. PASS (2)	SMAW	E6013	4	STRAIGHT	90 to 190	24 to 28	90 to 150	
2nd STITCH FILLET 100 (100) 100								
ROOT (1)	SMAW	E6013	3.15	STRAIGHT	80 to 120	20 to 24	80 to 120	
SUB. PASS (2)	SMAW	E6013	4	STRAIGHT	90 to 190	24 to 28	90 to 150	

APPROVAL	**VISHAL STRUCTURALS PVT. LTD.**	**HINDUSTAN PETROLUEM CORP. LTD**
NAME :		
SIGNATURE :		
DATE :		

WPS NO.:
DATE
WPS NO.:

CLIENT :	HINDUSTAN PETROLEUM CORPORATION LTD.
LOCATION :	

QW-482 - WELDING PROCEDURE SPECIFICATION
(REF. SPECIFICATION : ASME SECTION IX)

JOINT DESIGN (QW-402)				SKETCH / DETAIL:
Type	SQ. BUTT			
Backing	NO			FIG 1 (A)
Backing material Type / Grade	NA			
WELDINHG PROCESS	SWAM		TYPE	MANUAL
BASE METALS (QW 403)				
Material Specification	IS 2062 / EQ.	To	IS 2062 / EQ.	
Type / Grade No.	GR.B	To	GR.B	
P. No.	1	To	1	
Group No.	1	To	1	
Thick of Coupon	6 mm			
Thickness Range	6 mm			

FILLER MATERIAL (QW 404)			
Spec. No. (SFA)	5.1	Filler Size	:
AWS No. (CLASS)	E 6013	Electrode Flux Type	:
A. No. :	1	Backing / Storage	:
F. No. :	2	Consumable Insert	:
Make	**ESAB/ADVANI/D&H**		
POSITION (QW 405)			
Position of Groove	3G	Position of Fillet	:
Weld Progression	UPHILL		

PREHEAT (QW 406)		**POST WELD HEAT TREATMENT (QW 407)**	
Preheat Temp.(Min)	NA	Temperature	:
Interpass Temp.(Max)	NA	Time	:
Preheat Maint		Others	:

GAS (QW 408)			
Shielding Gas	NA	Flowrate	:
Percentage Comp.	NA	Gas Backing	:
Trailing	NA	Purging	:

ELECTRICAL CHARACTERISTICS (QW 409)		**TECHNIQUE (QW 410)**	
Current Mode	DC	String or weave Bead	:
Volts	18 to 30	Orifice or Gas Cup Size	:
Electrical Polarit	STRAIGHT	Initial / Interpass Cleanin	:
Amperage	80 TO 140	Method of back gauging	:
Tungsten Electrode Size & Type	NA	Oscillation	:
Mode of Metal Transfer (GMAW)	NA	Contact Tube to work dis	:
Elect. Wire - Feed,Speed,Range	NA	Multiple or Single Pass (	:
Other	NA	Multiple or Single Electrc	:
		Travel Speed Electrode	:
		Peening	

WELDING PROCEDURE

Pass No.	Welding Prc	Filler Material					
		Class	Dia	Type & Pol.	Amps Range	Volts Range	mm / min
AFTER BACK CHIP		E6013					

3.15 / 4 mm
-
As per Manuf. Std.
Non
NA
NA
NA
NA
NA
NA
NA
String / Weaving NA
Wire Brushing
Grinding
NA
NA
Multiple
Single
SEE TABLE
NA

Heat Input
kj / mm