


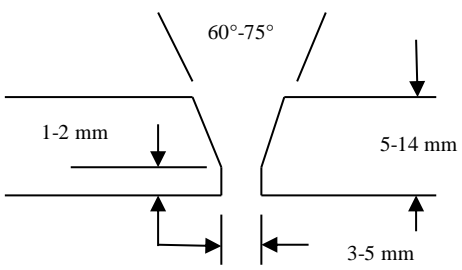
Marshal Engineering

Jerusalem

Preliminary

WELDING PROCEDURE SPECIFICATION

to ASME Section IX (QW – 482)

WPS No. P1-GT/SM		Rev. 0		Supporting PQR pending				
Prepared:	C. Daon	Title:	CWI	Date:	Jan. 17, 2013	Sign.		
Approved:		Title:		Date:		Sign.		
Welding Processes GTAW/SMAW		Type Manual						
JOINTS (QW – 402)			Sample welds					
Joint Design	Groove or Fillet							
Backing	No							
Root Opening	3-5 mm							
Root Face	0-2 mm							
Bevel Angle	30°-37 1/2°							
BASE METALS (QW – 403)								
P – No.	1	Group No.	1	to	P – No.	1	Group No.	1
or								
Specification Type and Grade					API 5L X42-X56			
to Specification Type and Grade					Same			

<u>Thickness Range</u>			
Base Metal:	Groove:	5 mm - 14 mm	Fillet: All
Pipe Diameter Range	Groove:	All	Fillet: All

FILLER METALS (QW – 404)		
	<u>GTAW</u>	<u>SMAW</u>
Specification No. (SFA)	5.18	5.1
AWS No. (Class)	ER 70S-2/3/6	E 7018
F – No.	6	4
A – No.	1	1
Size of Filler Metals (mm)	2.4	2.5, 3.25
<u>Maximum Weld Metal Thickness</u>		
Groove	19 mm	
Fillet	All	
Consumable Insert	No	
Retainers	No	

<u>POSITIONS (QW – 405)</u>				<u>POSTWELD HEAT TREAT (QW – 407)</u>				
Positions of Groove	All			Temperature Range	NA			
Welding Progression	Uphill			Time Range				
Positions of Fillet	All			Other				
<u>PREHEAT (QW – 406)</u>				<u>GAS (QW – 408)</u>				
Preheat Temp. Min.	50°			<u>Gas Composition</u>				
Interpass Temp. Max.	300°			<u>Gas</u>	<u>Mixture</u>	<u>Flow Rate</u>		
Preheat Maintenance	No			Shielding	Argon	99.9%	8-15 lpm	
				Other	None			
<u>ELECTRICAL CHARACTERISTICS (QW – 409)</u>								
Current AC or DC	DC			Polarity	GTAW-EN/SMAW-EP			
Amps (Range)	80-135/80-140			Volts (Range)	11-13/23-25			
Tungsten Electrode Size and Type				SFA 5.12 EWTh-2(red), 2.4 mm				
<u>TECHNIQUE (QW – 410)</u>								
<u>String or Weave Bead</u>				String, cap may be slight weave				
<u>GTAW Orifice or Gas Cup Size</u>				8-10 mm				
<u>Initial and Interpass Cleaning</u>				Brushing and/or grinding				
<u>Method of Back Gouging</u>				NA				
<u>Multiple or single Pass (per side)</u>				Multiple				
<u>Multiple or Single Electrodes</u>				Single				
<u>Peening</u>				No				
Weld Layer	Process	Filler Metal		Current		Volt Range	Travel Speed cm/min	Heat Input Kj/in
		Classification	Diameter mm	Type & Polarity	Amp. Range			
Root	GTAW	ER 70S-2/3/6	2.4	DCSP	80-135	11-13	8-10	NA
Rest	SMAW	E 7018	2.5	DCRP	80-110	23-25	8-12	
			3.25		110-140		8-12	
<u>Remarks:</u>								
<ol style="list-style-type: none"> Surfaces to be welded shall be free of pits, gouges, cracks, and other visible defects. The surfaces to be welded and adjoining base material shall have all oil, grease, dirt, moisture, and other foreign contaminants removed for a minimum distance of 1 inch on each side of the weld joint. Surface contaminants shall be removed by power brushing, grinding, and/or non-toxic cleaning solvents. Tack welds shall be completely removed or incorporated into the weld and shall be suitably prepared by grinding the surface smooth and feathering the edges. E7018 are low hydrogen electrodes. They must be baked for 2 hours at 300°C prior to use and then kept in portable ovens next to the welder. Electrodes may be rebaked only once. Vacuum packed electrodes may be used and then there is no need for initial baking. This WPS must be approved with a PQR as required by the ASME Code. The PQR shall be performed by a 3rd party recognized by the Israel Association of Engineers. 								