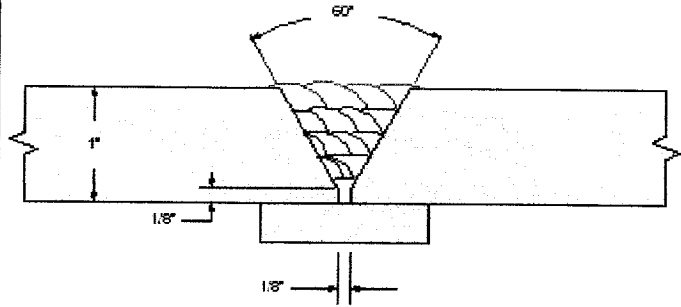


Procedure Qualification Record

PQR 25-SMAW-CF8MnMn MOD Rev 0 Date 2/21/2005 By Ricardo M. Suria Ref. WPS 25-SMAW-CF8MnMn MOD
 Company MetalTek International Carondelet Division Welding Process SMAW Process Type Manual

JOINT

Joint Type Butt Weld Type Single Bevel V Groove
 Backing Yes Backing Type Nonfusing-Metal
 Backing Material Type Copper



BASE METALS

P-No Unassigned
 Grp No Unassigned To Grp No Unassigned
 Mat Spec Unassigned
 Grade CF8MnMn MOD To Grade CF8MnMn MOD
 Thickness 1.0" plate
 Diameter N/A
 Chem Analysis 18%Cr13%Ni2.8%Mn2.2%Mo
 Mech Prop Ts 58ksi Ys 29ksi

FILLER METALS

SFA Spec Unassigned AWS Spec Unassigned
 AWSClass B316NF F No Unassigned
 A No Unassigned
 Size Of Filler Metals 5/32" Diameter
 Solid Tublar N/A Weld Metal Thickness 1.0"
 Chem Analysis Metal 18%Cr15.4%Ni3.2%Mn2.8%Mo

GAS	Gas Composition (mixture)	Flow Rate
Shield	N/A	0
Trail	N/A	0
Back	N/A	0

POSITION

Groove Vertical Fillet N/A
 Vertical Progress Vertical Up

ELECTRICAL CHARACTERISTICS

Current DCEP
 Amps 140 Volts 22
 Transfer Mode N/A
 Electrode Wire Feed Speed N/A
 Tungsten Electrode Size N/A
 Tungsten Electrode Type N/A

PREHEAT

Pre Heat Temp Min 50°F
 Interpass Temp Min 50°F Max 300°F
 Pre Heat Maintenance None Required

POSTWELD HEAT TREATMENT

Not Required? Temperature
 Time
 Other N/A

TECHNIQUE

Travel Speed 8 IPM Pass Type Multi-Pass Bead Type Stringer&Weave
 Contact Tube to Work Distance N/A Gas Cup Size N/A
 Back Gouging Yes Peening No Interpass Cleaning Air Chipper/Wire Brush/Grinder

Welding Procedure

Layer/pass	Process	Filler metal class	Diameter	Cur. type	Amps	WFS	Volts	Travel spd.	Other
All	SMAW	Metrode B316NF	5/32"	DCEP	140	N/A	22	8 IPM	3/32" Thick Passes

Tensile Test Results

<u>Specimen No</u>	<u>Width</u>	<u>Thickness</u>	<u>Area</u>	<u>Ultimate Tensile Load Lb</u>	<u>Ultimate Unit Stress PSI</u>	<u>Character Of Failure And Location</u>
TS-2	.750"	1.00"	.750"	70,000	93,300	Weld Metal
TS-5	.750"	1.01"	.757"	71,000	93,700	Weld Metal

Guided Bend Test Results

<u>Specimen No</u>	<u>Type of Bend</u>	<u>Result</u>	<u>Remark</u>
TS-1	Side	Acceptable	No Discontinuities
TS-3	Side	Acceptable	No Discontinuities
TS-4	Side	Acceptable	No Discontinuities
TS-6	Side	Acceptable	No Discontinuities

Impact Required No

Fillet-Weld Test

Results Satisfactory N/A

Penetration Into Parent Metal N/A

Macro Results N/A

Welder Name Terry Stanfield Welder Clock Nbr 20027 Welder Stamp Nbr 10

Test Conducted By St. Louis Testing Laboratories Test Date 2/28/2005 Test Nbr 05P-0554

General Comments

Root & Intermediate Passes= Stringer Beads
Cap=Weave Beads
See attached magnetic permeability test results.

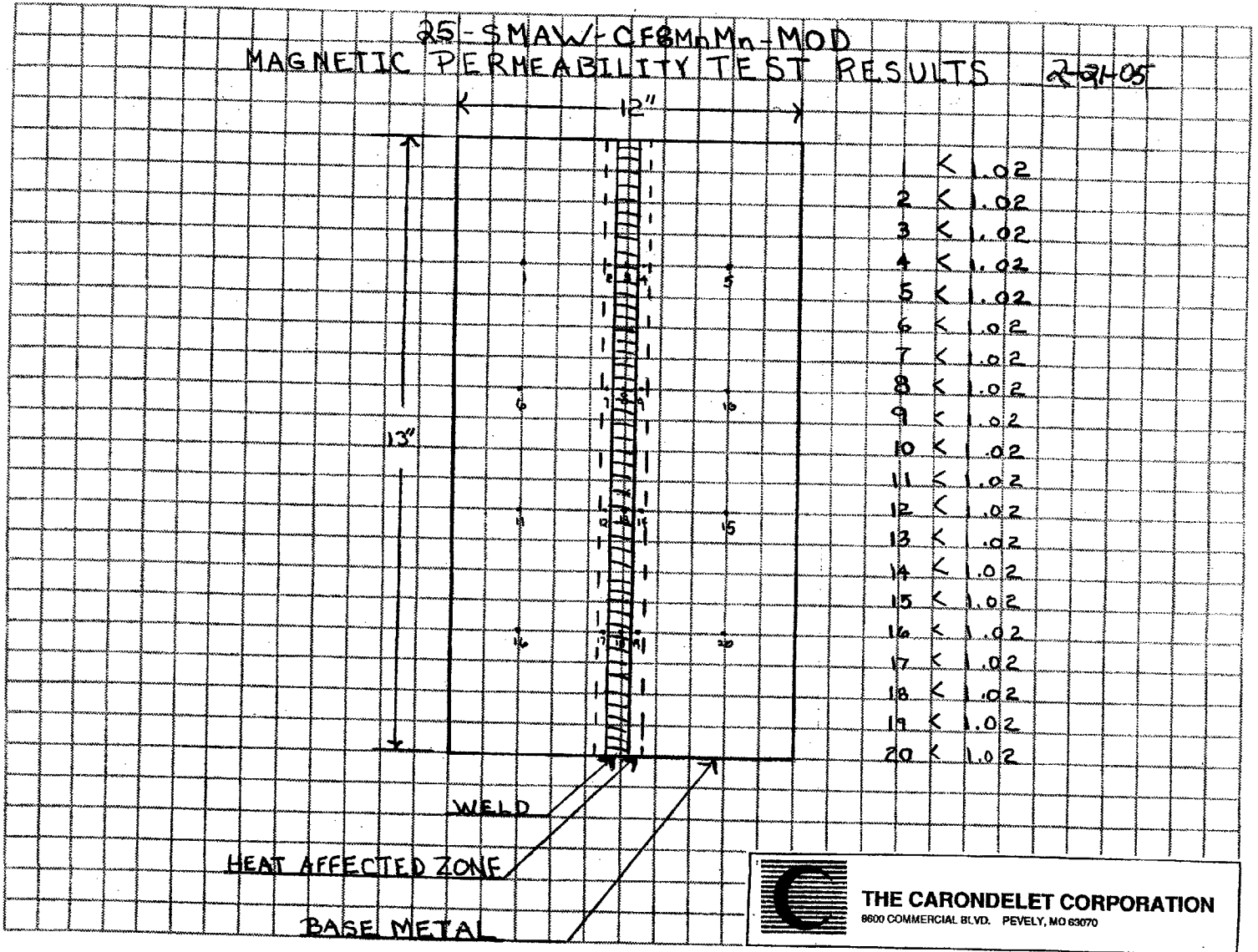
We certify that the statements in this record are correct and that the test coupons were prepared, welded, and tested in accordance with the requirements of Section IX of the ASME Code..

Signed  Date 2/28/2005

Ricardo M. Suria AWS-CWI # 93041371



Procedure Qualification Record





2810 Clark Avenue • St. Louis, MO 63103-2574 • (314) 531-8080 • FAX (314) 531-8085

METALTEK INTERNATIONAL
 8630 Commercial Blvd.
 Pevely, MO 63070

February 28, 2005
 Lab No. 05P-0554
 P.O. No. 12516
 Page 2 of 2
 (Revised Report 3-2-05)

Attention: Rick Suria

PROCEDURE QUALIFICATION

WELDER: TERRY STANFIELD
MATERIAL: 1" CF8MnMn, Mod
SPECIFICATION: ASME IX
ELECTRODE: B316NF
PROCESS: SMAW

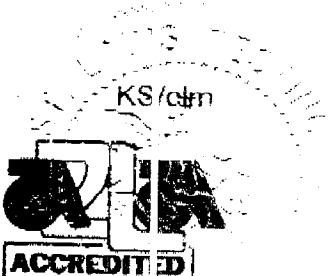
REDUCED SECTION TENSILE

SAMPLE ID	WIDTH INCHES	THICKNESS INCHES	AREA SQ. INCHES	ACTUAL LBS.	TENSILE STRENGTH PSI	FRACTURE
TS-2	.750	1.000	.7500	70,000	93,300	Weld Metal
TS-5	.750	1.010	.7575	71,000	93,700	Weld Metal

GUIDED BEND TEST

SAMPLE ID	BEND	RESULTS
TS-1	Side	Acceptable, No Discontinuities
TS-3	Side	Acceptable, No Discontinuities
TS-4	Side	Acceptable, No Discontinuities
TS-6	Side	Acceptable, No Discontinuities

[Signature]
 Karl Schmitz, Director
 Materials Testing
 CWI No. 92120161



Certificate No. 0397-21
 Certificate No. 0397-22

AN OFFICIAL COPY OF TEST REPORT WILL BE PROVIDED BY THIS LABORATORY ON REQUEST. DO NOT REPRODUCE, NOT OFFICIAL WITHOUT THE RAISED SEAL OF ST. LOUIS TESTING LABORATORIES, INC. SEE REVERSE FOR CONDITIONS.

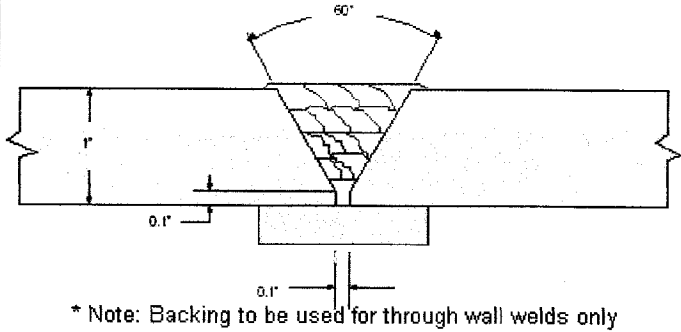


Welding Procedure Specification

WPS 25-SMAW-CF8MnMn MOD Rev 0 Date 2/28/2005 By Ricardo M. Suria Ref. PQR 25-SMAW-CF8MnMn MOD
 Company MetalTek International Carondelet Division Welding Process SMAW Process Type Manual

JOINT

Joint Type Butt Weld Type Single Bevel V Groove
 Backing See Sketch Note Backing Type Nonfusing-Metal
 Backing Material Type Copper



BASE METALS

P-No Unassigned
 Grp No Unassigned To Grp No Unassigned
 Mat Spec Unassigned
 Grade CF8MnMn MOD To Grade CF8MnMn MOD
 Thickness 3/16" to 2.0"
 Diameter N/A
 Chem Analysis 18%Cr13%Ni2.8%Mn2.2%Mo
 Mech Prop Ts 58ksi Ys29ksi

FILLER METALS

SFA Spec Unassigned AWS Spec Unassigned
 AWS Class Metrode B316NF F No Unassigned
 A No Unassigned
 Size Of Filler Metals 5/32" Diameter
 Solid Tubular N/A Welding Thickness Range 0.0" to 2.0"
 Chem Analysis Metal 18%Cr15.4%Ni3.2%Mn2.8%Mo

GAS	Gas Composition (mixture)	Flow Rate
Shield	N/A	0
Trail	N/A	0
Back	N/A	0

POSITION

Groove Flat&Vertical Fillet N/A
 Vertical Progress Vertical Up

ELECTRICAL CHARACTERISTICS

Current DCEP
 Amps 120 to 160 Volts 19 to 25
 Transfer Mode N/A
 Electrode Wire Feed Speed N/A
 Tungsten Electrode Size N/A
 Tungsten Electrode Type N/A

PREHEAT

Pre Heat Temp Min 50°F
 Interpass Temp Min 50°F Max 300°F
 Pre Heat Maintenance None Required

POSTWELD HEAT TREATMENT

Not Required? Temperature
 Time
 Other No Postweld Heat Treatment

TECHNIQUE

Travel Speed 7 to 9 IPM Pass Type Multi Pass Bead Type Stringer&Weave
 Contact Tube to Work Distance N/A Gas Cup Size N/A
 Back Gouging All full Penetration Welds Peening No Interpass Cleaning Air Chipper/Wire Brush/Grinder

Welding Procedure

Layer/pass	Process	Filler metal class	Diameter	Cur. type	Amps	WFS	Volts	Travel spd.	Other
All	SMAW	Metrode B316NF	5/32"	DCEP	120 to 160	N/A	19 to 25	7 to 9	3/32" to 3/16" Thick Passes

General Comments Root & Intermediate Passes= Stringer Beads
 Cap=Weave Beads

Signed Ricardo M. Suria Date 2/28/2005
 Ricardo M. Suria AWS-CWI # 93041371



Welder Performance Qualification

WPQ SMAW-CF8MnMn MOD-TS-3G **Rev** 0
Welder Name Terry Stanfield **Clock Nbr** 20027 **Stamp Nbr** 10
Welding Process Used SMAW **Type** Manual
WPS Followed 25-SMAW-CF8MnMn MOD
Base Material CF8MnMn MOD **Thickness** 1.0"

<u>Manual or Semiautomatic Variables used</u>	<u>Actual Values</u>	<u>Range Qualified</u>
Backing Metal	Non-fusing/Back Welded	Non-fusing/Back Welded
ASME P-No to P-No	Unassigned	Same Unassigned
Plate Pipe	1.0" Plate	3/16" to Max Welded
Filler Metal SFA	Unassigned	Same Unassigned
Filler Metal Classification	B316NF	B316NF
Filler Metal F-No	Unassigned	Unassigned
Filler Metal for GTAW	N/A	N/A
Weld Deposit Thickness	1.0"	0.0" to Max Welded
Welding Position	3G	1G,3G & 1F,2F,3F
Progression	Vertical	Vertical
Backing Gas for GTAW	N/A	N/A
GMAW Transfer Mode	N/A	N/A
GTAW Welding Current Type Polarity	N/A	N/A

<u>Machine Welding Variables used</u>	<u>Actual Values</u>	<u>Range Qualified</u>	<u>Machine Welding Variables used</u>	<u>Actual Values</u>	<u>Range Qualified</u>
Direct Remote Visual Control	N/A	N/A	Welding Position Machine	N/A	N/A
Automatic Voltage Control	N/A	N/A	Consumable Insert	N/A	N/A
Automatic Joint Tracking	N/A	N/A	Backing Machine	N/A	N/A

Guided Bend Test Results

<u>Sample No</u>	<u>Result</u>	<u>Comments</u>	<u>Guided Bend Tests Type</u>	<u>Side</u>
TS-1	Acceptable	No Discontinuities		
TS-3	Acceptable	No Discontinuities		
TS-4	Acceptable	No Discontinuities		
TS-6	Acceptable	No Discontinuities		

Visual Examination Results Acceptable

Radiographic Test Results N/A

Fillet Weld Fracture Test N/A **Length and Percent of Defects** N/A

Macro Test Fusion N/A **Fillet Leg Size** N/A **Concavity / Convexity** N/A


Welding Test Conducted By Ricardo M. Suria

Mechanical Tests Conducted By St. Louis Testing Laboratories **Laboratory Test No** 05P-0554

Comments **Organization** MetalTek International Carondelet Division

Do to the nature of casting excavations the above welder is allowed to perform full penetration welds as well as partial penetration welds using the same Performance Qualification Record.

We certify that the statements in this record are correct and that the test coupons were prepared, welded, and tested in accordance with the requirements of Section IX of the ASME Code.

By  **Date** 2/28/2005
 Ricardo M. Suria AWS-CWI #93041371

