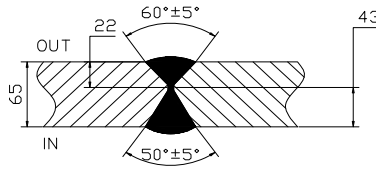


| <b>PROJECT DOCUMENT NO.</b>  |               |                                     |  |   |                |                 | <b>Page No.:</b><br>91 of 156 |      |     |     |      |       |       |   |   |   |   |      |      |         |     |     |     |        |         |     |     |       |       |     |          |     |     |        |        |
|--|---------------|-------------------------------------|--|---|----------------|-----------------|-------------------------------|------|-----|-----|------|-------|-------|---|---|---|---|------|------|---------|-----|-----|-----|--------|---------|-----|-----|-------|-------|-----|----------|-----|-----|--------|--------|
| <b>Facility</b>  | <b>Vendor</b> | <b>Unit</b>                         | <b>Document</b>  | <b>Discipline</b>   | <b>Sequenc</b> | <b>Revision</b> |                               |      |     |     |      |       |       |   |   |   |   |      |      |         |     |     |     |        |         |     |     |       |       |     |          |     |     |        |        |
| <b>PROJECT:</b>  |               | <b>ITEM :</b>                       |  | <b>CODE : ASME SEC .IX</b>  |                |                 |                               |      |     |     |      |       |       |   |   |   |   |      |      |         |     |     |     |        |         |     |     |       |       |     |          |     |     |        |        |
| <b>WPS NO. : WP-1600-PV-44</b>   |               | <b>SUPP. PQR NO. : PQ-PV-91</b>     |  | <b>REV. NO. : 01</b>  |                |                 |                               |      |     |     |      |       |       |   |   |   |   |      |      |         |     |     |     |        |         |     |     |       |       |     |          |     |     |        |        |
| <b>WELDING PROC.(es) : SMAW + SAW</b>  |               | <b>TYPE(es) : MANUAL /AUTOMATIC</b> |  | <b>DATE : 16.May.2009</b>   |                |                 |                               |      |     |     |      |       |       |   |   |   |   |      |      |         |     |     |     |        |         |     |     |       |       |     |          |     |     |        |        |
| <b>JOINTS (QW - 402) :</b>   |               |                                     | <b>DETAILS</b>   |   |                |                 |                               |      |     |     |      |       |       |   |   |   |   |      |      |         |     |     |     |        |         |     |     |       |       |     |          |     |     |        |        |
| JOINT DESIGN : <b>BUTT JOINT/ X GROOVE</b><br><br>BACKING : YES( ) NO( x )<br><br>BACKING MATERIAL : <b>N.A</b>  |               |                                     |  |   |                |                 |                               |      |     |     |      |       |       |   |   |   |   |      |      |         |     |     |     |        |         |     |     |       |       |     |          |     |     |        |        |
|  |               |                                     | <b>shell to Shell</b>  |   |                |                 |                               |      |     |     |      |       |       |   |   |   |   |      |      |         |     |     |     |        |         |     |     |       |       |     |          |     |     |        |        |
| <b>BASE METALS (QW - 403) :</b>  |               |                                     |  |   |                |                 |                               |      |     |     |      |       |       |   |   |   |   |      |      |         |     |     |     |        |         |     |     |       |       |     |          |     |     |        |        |
| P NO. : <b>1</b> Gr.No.: <b>2</b> TO P No.: <b>1</b> Gr.No. : <b>2</b><br>SPECIFICATION TYPE AND GRADE : <b>A516 Gr 70</b><br>TO SPECIFICATION TYPE AND GRADE : <b>A516 Gr 70</b><br><br>BASE METAL : GROOVE: <b>30 - 65 mm</b> FILLET : <b>N.A</b><br>LAVAN REFINERY UPGRADING & REVAMPINC GROOVE: FILLET : |               |                                     |  |   |                |                 |                               |      |     |     |      |       |       |   |   |   |   |      |      |         |     |     |     |        |         |     |     |       |       |     |          |     |     |        |        |
| <b>FILLER METALS (QW - 404) :</b>  |               |                                     |  |   |                |                 |                               |      |     |     |      |       |       |   |   |   |   |      |      |         |     |     |     |        |         |     |     |       |       |     |          |     |     |        |        |
| PROCESS :<br>SPEC NO. (SFA) :<br>AWS NO. :<br>F-NO. :<br>A-NO. :<br>SIZE OF FILLER METALS :<br>FILLER METAL TRADE NAME :<br><br>DEPOSITED WELD METAL :<br>ELECTRODE FLUX (CLASS) :<br>FLUX TRADE NAME :<br>CONSUMABLE INSERT :<br>ELECTRODE BAKING CONDITION :   |               |                                     |  | <table border="1" style="width:100%; border-collapse: collapse; text-align: center;"> <thead> <tr> <th>SMAW</th> <th>SAW</th> </tr> </thead> <tbody> <tr><td>5.1</td><td>5.17</td></tr> <tr><td>E7018</td><td>EH12K</td></tr> <tr><td>4</td><td>6</td></tr> <tr><td>1</td><td>1</td></tr> <tr><td>4 mm</td><td>4 mm</td></tr> <tr><td>HYUNDAI</td><td>AMA</td></tr> <tr><td>---</td><td>---</td></tr> <tr><td>≤ 7 mm</td><td>≤ 58 mm</td></tr> <tr><td>N.A</td><td>N.A</td></tr> <tr><td>BASIC</td><td>BASIC</td></tr> <tr><td>N.A</td><td>OPTT-121</td></tr> <tr><td>N.A</td><td>N.A</td></tr> <tr><td>NOTE 1</td><td>NOTE 1</td></tr> </tbody> </table> |                |                 |                               | SMAW | SAW | 5.1 | 5.17 | E7018 | EH12K | 4 | 6 | 1 | 1 | 4 mm | 4 mm | HYUNDAI | AMA | --- | --- | ≤ 7 mm | ≤ 58 mm | N.A | N.A | BASIC | BASIC | N.A | OPTT-121 | N.A | N.A | NOTE 1 | NOTE 1 |
| SMAW   | SAW           |                                     |  |   |                |                 |                               |      |     |     |      |       |       |   |   |   |   |      |      |         |     |     |     |        |         |     |     |       |       |     |          |     |     |        |        |
| 5.1  | 5.17          |                                     |  |   |                |                 |                               |      |     |     |      |       |       |   |   |   |   |      |      |         |     |     |     |        |         |     |     |       |       |     |          |     |     |        |        |
| E7018  | EH12K         |                                     |  |   |                |                 |                               |      |     |     |      |       |       |   |   |   |   |      |      |         |     |     |     |        |         |     |     |       |       |     |          |     |     |        |        |
| 4  | 6             |                                     |  |   |                |                 |                               |      |     |     |      |       |       |   |   |   |   |      |      |         |     |     |     |        |         |     |     |       |       |     |          |     |     |        |        |
| 1  | 1             |                                     |  |   |                |                 |                               |      |     |     |      |       |       |   |   |   |   |      |      |         |     |     |     |        |         |     |     |       |       |     |          |     |     |        |        |
| 4 mm   | 4 mm          |                                     |  |   |                |                 |                               |      |     |     |      |       |       |   |   |   |   |      |      |         |     |     |     |        |         |     |     |       |       |     |          |     |     |        |        |
| HYUNDAI  | AMA           |                                     |  |   |                |                 |                               |      |     |     |      |       |       |   |   |   |   |      |      |         |     |     |     |        |         |     |     |       |       |     |          |     |     |        |        |
| ---  | ---           |                                     |  |   |                |                 |                               |      |     |     |      |       |       |   |   |   |   |      |      |         |     |     |     |        |         |     |     |       |       |     |          |     |     |        |        |
| ≤ 7 mm   | ≤ 58 mm       |                                     |  |   |                |                 |                               |      |     |     |      |       |       |   |   |   |   |      |      |         |     |     |     |        |         |     |     |       |       |     |          |     |     |        |        |
| N.A  | N.A           |                                     |  |   |                |                 |                               |      |     |     |      |       |       |   |   |   |   |      |      |         |     |     |     |        |         |     |     |       |       |     |          |     |     |        |        |
| BASIC  | BASIC         |                                     |  |   |                |                 |                               |      |     |     |      |       |       |   |   |   |   |      |      |         |     |     |     |        |         |     |     |       |       |     |          |     |     |        |        |
| N.A  | OPTT-121      |                                     |  |   |                |                 |                               |      |     |     |      |       |       |   |   |   |   |      |      |         |     |     |     |        |         |     |     |       |       |     |          |     |     |        |        |
| N.A  | N.A           |                                     |  |   |                |                 |                               |      |     |     |      |       |       |   |   |   |   |      |      |         |     |     |     |        |         |     |     |       |       |     |          |     |     |        |        |
| NOTE 1   | NOTE 1        |                                     |  |   |                |                 |                               |      |     |     |      |       |       |   |   |   |   |      |      |         |     |     |     |        |         |     |     |       |       |     |          |     |     |        |        |
| <b>Note1:</b> ELECTRODE & FLUX BAKING ACCORDING TO ELECTRODE MANUFACTURER RECOMMENDATION   |               |                                     |  |   |                |                 |                               |      |     |     |      |       |       |   |   |   |   |      |      |         |     |     |     |        |         |     |     |       |       |     |          |     |     |        |        |
| <b>POSITIONS (QW - 405) :</b>  |               |                                     |  |   |                |                 |                               |      |     |     |      |       |       |   |   |   |   |      |      |         |     |     |     |        |         |     |     |       |       |     |          |     |     |        |        |
| POSITION(S) OF GROOVE : <b>1G</b><br>WELDING PROGRESSION : UP ( ) DOWN ( )<br>POSITION(S) OF FILLET : <b>N.A</b>   |               |                                     |  |   |                |                 |                               |      |     |     |      |       |       |   |   |   |   |      |      |         |     |     |     |        |         |     |     |       |       |     |          |     |     |        |        |
| <b>PREHEAT (QW - 406) :</b>  |               |                                     |  |   |                |                 |                               |      |     |     |      |       |       |   |   |   |   |      |      |         |     |     |     |        |         |     |     |       |       |     |          |     |     |        |        |
| PREHEAT TEMP. MIN. : <b>70 °c</b><br>INTERPASS TEMP. MAX. : <b>250 °c</b><br>PREHEAT MAINTENANCE : <b>PROPAN HEATING TORCH</b>   |               |                                     |  |   |                |                 |                               |      |     |     |      |       |       |   |   |   |   |      |      |         |     |     |     |        |         |     |     |       |       |     |          |     |     |        |        |
| <b>DOCUMENT No.:</b>   |               |                                     |  | <b>REV:</b>   |                |                 |                               |      |     |     |      |       |       |   |   |   |   |      |      |         |     |     |     |        |         |     |     |       |       |     |          |     |     |        |        |
|  |               |                                     |  |   |                |                 |                               |      |     |     |      |       |       |   |   |   |   |      |      |         |     |     |     |        |         |     |     |       |       |     |          |     |     |        |        |

