**NORTH CAROLINA DEPARTMENT OF TRANSPORTATION**  
**DOUBLE V GROOVE WITH BACK GOUGE**  
**WELDING PROCEDURE SPECIFICATION (WPS) AWS D1.5**

Specifications & Codes:  
NCDOT Standard Specifications/AASHTO/AWS D1.5, Section 2, 5 and 12

Material Specifications:  
ASTM A-36, A572, (A709-36, 50), (M270-GR250, 345) Unlimited Thickness

Welding Process:  
SMAW Manual or Semi- Automatic or Automatic:  
Manual

Filler Metal Specification:  
AWS A5.1 Classification:  
E-7018

Manufacturer:  
NCDOT Approved Electrodes Single or Multiple Pass both Weld

Root Treatment:  
DC Polarity:  
Positive Progression:  
N/A

Preheat Temp:  
100° minimum Interpass:  
450° maximum Post Heat:  
N/A

<table>
<thead>
<tr>
<th>Pass Num.</th>
<th>Electrode Size</th>
<th>Welding Current</th>
<th>Travel Speed</th>
<th>Position</th>
<th>Joint Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>All</td>
<td>1/8”</td>
<td>90-150</td>
<td>20-23</td>
<td>All</td>
<td>All</td>
</tr>
<tr>
<td>All</td>
<td>5/32”</td>
<td>120-200</td>
<td>21-24</td>
<td>All</td>
<td>SEE ATTACHMENT</td>
</tr>
</tbody>
</table>

**PREHEAT**

<table>
<thead>
<tr>
<th>Thickness</th>
<th>Min. Temp.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Up to 3/4”</td>
<td>100°</td>
</tr>
<tr>
<td>Over 3/4” to 1 1/2”</td>
<td>100°</td>
</tr>
<tr>
<td>Over 1 1/2” to 2 1/2”</td>
<td>150°</td>
</tr>
<tr>
<td>Over 2 1/2”</td>
<td>225°</td>
</tr>
</tbody>
</table>

COMMENTS:  
Remove all coating, rust, dirt and mill scale within one inch of the area to be welded. Remove all slag, spatter and weld discontinuities between passes. Clean the completed weld of all debris, slag and spatter.

WPS Description:  
Double V Groove With Back Gouge

Written By:  
Randy Dempsey, CWI/CWE, TT IV

Signature:  
[Signature]

WPS #:  
031711025

Authorized By:  
Steve Walton, Metals Engineer

Signature:  
[Signature]
DOUBLE V GROOVE with Back Gouge

JOINT DETAILS

Weld Symbol definitions per AWS A2.4:2007

Back Gouge

Back Gouge Required before welding side two

FIELD WELD SYMBOL

Double V Groove, w/ Groove Angle
Illustrations for a Double V-Groove with Back Gouge.

Runoff tabs are used to help with fit-up.

Each pass is cleaned.

Side 2 before back gouge.

Back gouge on the right is Adequate, left is not.

Completed weld.

NCDOT MATERIALS & TESTS UNIT (STEEL SECTION)