1	(April 6, 2015)
2	Electroslag Welding - Narrow Gap (ESW-NG) Procedure
3	The ESW-NG procedure may be used for groove welds in bridge members and
4	member components up to four inches thick subject to the following requirements:
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6	Qualification Testing
7	Unless the Contractor submits previously performed qualification testing
8	documents, the Contractor shall provide the opportunity for Contracting
9	Agency representatives to witness all qualification testing.
10	
11	HAZ Specimens, Type and Number of Tests for ESW-NG
12	For all compression members including ESW-NG of compression members,
13	CVN testing of the HAZ is not required. However, for welds deposited by
14	ESW-NG on tension and reversal members, additional CVN tests of the HAZ
15	shall be performed to qualify the process. The CVN tests for the HAZ shall be
16	the following:
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18	1. Five specimens shall be removed from the quarter-thickness section
19	of the HAZ on each side of the procedure qualification welded joint in
20	accordance with the ESW-NG Tension Member CVN Test Plate
21	Detail as shown in the Plans.
22	
23	2. The weld fusion line shall be revealed by etching the transverse-to-
24	weld section.
25	
26	3. The notch location shall be in the base metal within 1/16 inch from
27	the weld fusion line. If the weld curvature does not permit the entire
28	notch to be placed within 1/16 inch from the fusion line, then one end
29	of the notch shall be placed on the fusion line while the remaining
30	portion of the notch extends away from the fusion line into the base
31	metal.
32	
33	If different grades of steel such as 36 and 50 or 50 and 50W are joined by
34	ESW-NG, the procedure qualification tests shall be conducted on the same
35	two grades of steel. If transition joints between thick and thin members are
36	made, the WPS shall be conducted on the same joint preparation (having the
37	same thicknesses and joint transition slope). The heat affected zone CVN
38	toughness specimens shall be extracted from both sides of the transition joint.
39	
40	Test Results Required for ESW-NG
41	HAZ
42	For CVN toughness determination in welds carrying applied tensile stress,
43	five specimens taken at the quarter-thickness location on both sides of the
44	ESW-NG weld shall be tested. The highest and lowest values shall be
45	discarded. The test is successful if the following criteria are achieved for
46	the three remaining tests:
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48	1. The average CVN toughness shall be a minimum of 15 foot-
49	pounds at 40F.
50	
51	2. No more than one specimen shall have a CVN toughness less
52	than 15 toot-pounds at 40F.

3. No specimen shall have a CVN toughness value below 10 footpounds at 40F.

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