

North Carolina Department of Transportation Materials & Tests Unit (Metals Section)



Field Welder Test Program

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1.0 Scope

The Field Welder Certification Program is conducted by the Metals Section of the Materials & Tests Unit. The program is maintained to better ensure that qualified personnel are performing welding operations on NCDOT projects.

2.0 Minimum Requirements

Welders working on NCDOT projects must be a minimum of 18 years of age

3.0 Weld Test Specifications and Reference Standards

NCDOT Standard Specifications for Roads and Structures January 2018
AASHTO/AWS D1.5M/D1.5:2015 Bridge Welding Code
AWS D1.1/D1.1M:2015 Structural Welding Code - Steel

These codes document the fit up, positioning, and acceptance criteria for the test coupons. The weld test will be administered to these specifications. Shielded Metal Arc Welding [SMAW] is currently the only welding process in which a contract field welder may be certified.

4.0 Weld Test Scheduling

The first step in the weld test process is to submit an application. The link to the application is found here:

<https://connect.ncdot.gov/resources/Materials/Pages/FieldWelderCertificationProgram.aspx>

Click Field Welder Certification Program under applications. There are two application options, **NON NCDOT Employees** and **NCDOT Employees Only**. Select the correct application type and click the red link that's says **Click Here**.

Once the application is filled out, click "Send". You will be contacted shortly afterwards to schedule your test date.

It is important to keep in mind that this is a test. Your test proctor will assist with basic guidance related to coupon fit up and positioning, but beyond that, it is entirely up to the welder to complete the test. It is recommended that prior to testing, the welder should study, and practice as needed.

Weld testing begins at 8:00 AM and ends at 12:00 Noon sharp.

5.0 NCDOT Weld Shop Facilities

The test is conducted in our shop. We have for use two Lincoln Electric welding machines, stands for holding the weld test coupons, several weld screens and a work bench. We supply the plate sets with backing bars and pipe coupons with backing rings. The plate sets and pipe are pre-beveled.

Note: We do not have vending machines. You will need to bring your own drinks and food with you.

Smoking is permitted only in designated areas.

Mailing and Physical address

Mailing address:

NCDOT, Division of Highways
Materials and Tests Unit
509 Ward Blvd.
PO Box 3165
Wilson, NC 27895

Physical address:

NCDOT, Division of Highways
Materials and Tests Unit
490 Ward Blvd.
Wilson, NC 27893

Enter at the red arrow and drive around to the building in the red circle.



6.0 Tools, Equipment and Supplies Required for the Weld Test

A - Welding Machine Welding machine must have adequate power range to produce the amperage necessary to satisfy the WPS requirements (We have two Lincoln Electric welding machines that can be used)

B - Electrode Oven

C - Metal hermetically sealed container of E7018 electrodes

D - Wire Brush

E - Chipping Hammer

F - Clamps

G - Gas Torch

H - Scrap metal for adjusting machine settings

I - Welding helmets, gloves, safety glasses and any other PPE needed

J - Electric grinder with grinding wheels and wire wheels (Grinders may be used for cleaning coupons prior to welding and coupon prepping for testing after welding is complete.)

Grinding is not permitted during the welding test.

K - US state issued Driver's License or US state issued photo ID. **No other form of ID will be accepted.**

7.0 Weld Test Fee Schedule

SIP Welder - \$250.00

Bridge Welder [Limited] - \$500.00

Bridge welder -\$500.00

All applicants must register through RegOnline, accessed on the Field Welder Testing Program web page, prior to testing. Credit card payments may be made through RegOnline. A Check or Money Order made out to the North Carolina Department of Transportation, for the amount of the weld test, can be given to the testing supervisor before testing begins. **The welder being tested is responsible for making sure payment is received by NCDOT, even if the fee is paid by a 3rd party.**

8.0 Field Welder Test Classifications

A - SIP Welder

SMAW 1G - This test requires the technician to apply weld to a set of pre-beveled 3/8" thick x 3" x 7" plates that are joined to a 3/8" x 1" backing bar. The test coupon shall be in a fixed flat position. Rotating or moving the coupon is not permitted during testing.

Passing this test qualifies the technician to apply groove welds in the flat position on material that is 1/8" to 3/4" thick and fillet welds in the flat and horizontal positions on material that is 1/8" to unlimited thickness with backing, back gouging or both.

Cleaning is with hand tools only; chipping hammers, picks, wire brushes, etc. Altering of the weld bead passes either by grinding or filing will not be permitted. Once welding is completed and visually accepted, the weld cap will be ground flush. NCDOT will handle the remaining coupon preparations for testing.

B - Bridge Welder [Limited]

SMAW 3G/4G - This test requires the technician to apply weld to two sets of pre-beveled 3/8" thick x 3" x 7" plates that are joined to a 3/8" x 1" backing bar. The test coupons shall be in a fixed vertical and overhead positions. Rotating or moving the coupons is not permitted during testing. The technician must pass the vertical and overhead positions to receive a qualified status.

Passing this set of tests qualifies the technician to apply fillet welds on material that is 1/8" to unlimited thickness and groove welds on material that is 1/8" to 3/4" thick (including pipe that is 24" or greater in diameter) in any position with backing, back gouging or both.

Cleaning is with hand tools only; chipping hammers, picks, wire brushes, etc. Altering of the weld bead passes either by grinding or filing will not be permitted. Once welding is completed and visually accepted, the weld cap will be ground flush. NCDOT will handle the remaining coupon preparations for testing.

C - Bridge Welder

SMAW 6G - This test requires the technician to apply weld to a set of pre-beveled 6" diameter schedule 80 pipes that are joined by a pre-fabricated backing ring. The test coupon is mounted on a 45° angle and shall be in the fixed position during the weld test. Rotating or moving the coupon is not permitted during testing.

Passing this test qualifies the technician to apply fillet and groove welds on pipe or plate in any position on material that is 3/16" to unlimited thickness (including pipe that is 4" to unlimited diameter) with backing, back gouging or both.

Cleaning is with hand tools only; chipping hammers, picks, wire brushes, etc. Altering of the weld bead passes either by grinding or filing will not be permitted. Once welding is completed NCDOT will handle the coupon preparations for testing.

9.0 Testing and Acceptance

Each coupon will be visually inspected during welding based on AWS D1.5 and AWS D1.1 welding code. Should welds not meet these required standards, the test will be stopped and the welder will be informed of their options at the test proctor's discretion.

If the test coupons are found to be visually acceptable, the test coupon will be guided bend tested or radiographic tested. Acceptance is based on criteria set in AWS D1.5 and AWS D1.1.

The welder will be notified of the test results once available. **Due to our work load this process can take several days.**

10.0 Successful Completion of Qualification Test

A Technician Certification Card issued by the NCDOT Materials and Tests Unit will be mailed to the address provided. This card contains a 2D barcode that can be scanned by a smartphone or computer barcode reader to instantly display your current certifications. You must have this card and a photo ID with you any time you are on a DOT project in case verification of a technician certification is required.

Below is a link you can use to verify your certifications. Enter the technician name or NCDOT technician number and click search.

<https://apps.ncdot.gov/vendor/approvedproducts/Technician.aspx>

Field Welder Certification is valid for 5 years assuming compliance with applicable specifications is maintained.

11.0 Failure of Qualification Test

A welder who fails both SMAW 3G/4G test plates or SMAW 6G pipe test can retest as follows: 1) an immediate retest consisting of two test plates or pipes of the position failed. 2) A retest may be made provided there is evidence that the welder has had further training or practice. A complete retest of the types and positions failed shall be made.

A welder who fails only one of the plates on the SMAW 3G/4G test is required to retest within one month and weld two plates of the position failed. Both plates must pass. Not retesting in one month is considered a test failure and both plate positions shall be welded when the welder retests as indicated above.

If the welder fails a retest, then another weld test will not be scheduled for 90 days. A failure of this test starts a 180-day retest cycle.

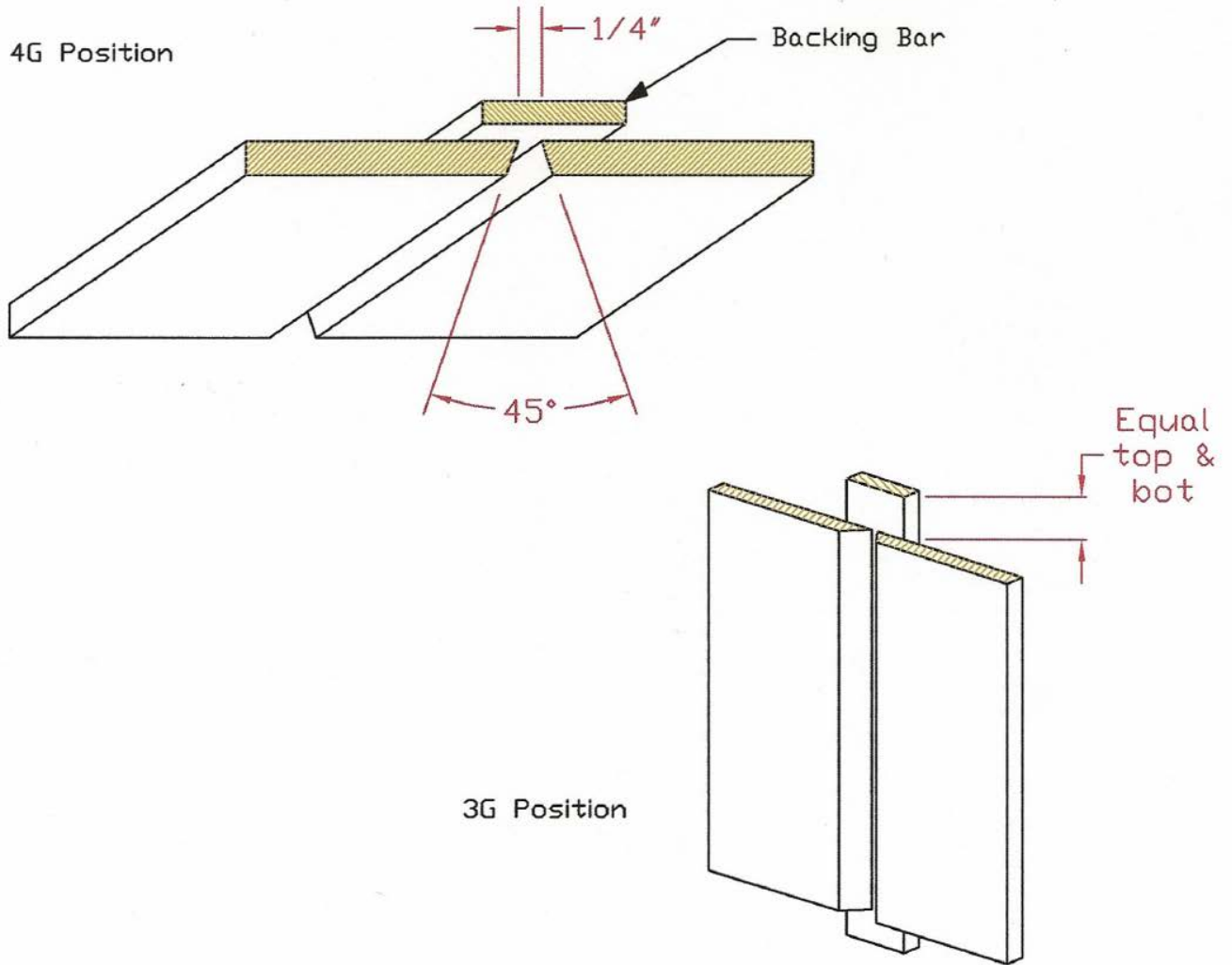
Note: The normal weld test fee rate applies for each retest.

12.0 Revocation of the Field Welder Certification

A welder who fails to comply with the applicable codes and/or specifications on an NCDOT project, may have their certification revoked. This revocation can either be temporarily or permanently, based on the severity of the issue or at the discretion of the State Materials Engineer and/or his designated representatives.

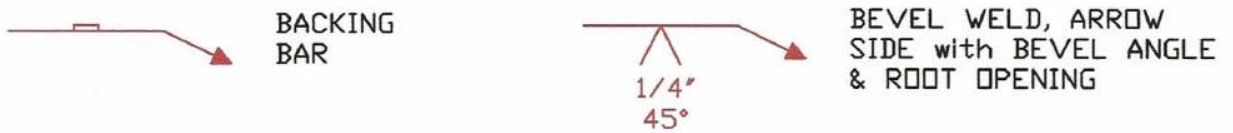
13.0 Drawings

3/8" Test Plate Drawing

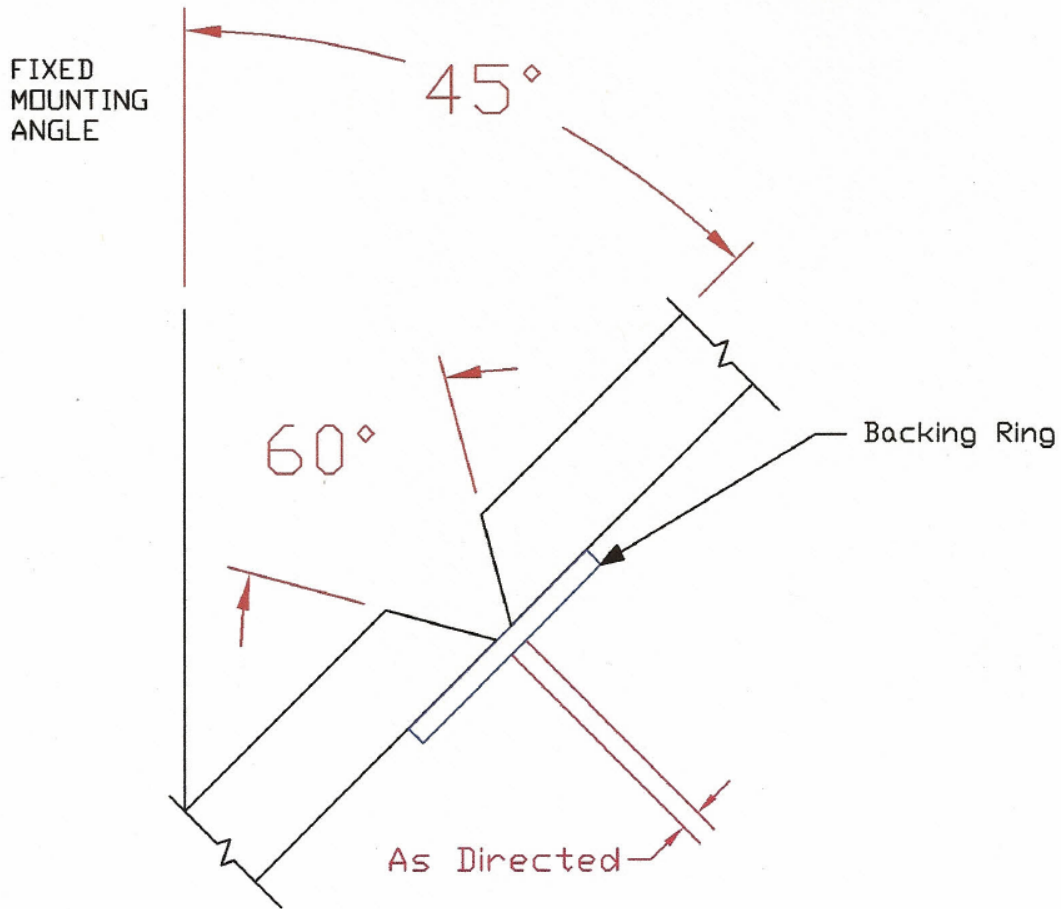


3G-4G GROOVE WELD
JOINT DETAILS

Weld Symbol definitions per AWS A2.4:2007



Pipe Test Drawing



6G PIPE JOINT DETAILS

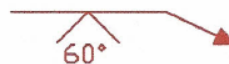
Weld Symbol definitions per AWS A2.4:2007



BACKING
BAR



WELD ALL
AROUND



BEVEL WELD, ARROW
SIDE with BEVEL
ANGLE