STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

PAT MCCRORY
GOVERNOR

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SECRETARY

North Carolina Department of Transportation
Materials & Tests Unit
Metals Section
Field Welder Test Program Guide

Scope:

The NCDOT Field Welder Certification Program, implemented on January 6, 2006, was developed and is maintained to better ensure that qualified personnel are performing the welding operations on NCDOT projects.

Weld Test Specifications:

The NCDOT Weld Test Certification Program was developed from the applicable sections of the North Carolina Department of Transportation Standard Specifications For Roads And Bridges [current edition], AWS D1.5 Bridge Welding Code [current edition] and AWS D1.1 Structural Welding Code [current edition]. 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.

MAILING ADDRESS:
NC DEPARTMENT OF TRANSPORTATION
MATERIALS & TESTS UNIT
1563 MAIL SERVICE CENTER
RALEIGH NC 27699-1563

TELEPHONE: 919-329-4000
FAX 919-733-8742

WEBSITE: WWW.NCDOT.GOV

LOCATION:
1801 BLUE RIDGE ROAD
RALEIGH NC 27607

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/data/forms/Lists/NonDOTFieldWelderRegistrationForm/NewForm.aspx?source=https://connect.ncdot.gov/data/forms/Pages/Confirmation-Page.aspx

Once 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.

NCDOT Weld Shop Facilities:

The test is conducted in our shop. We have for use 2 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 prebeveled.

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:

NCDOT, Division of Highways
Materials and Tests Unit
1350 Jammie Ct.
Winston Salem, NC 27106

If you use a GPS navigation device, enter the following address:
1350 Jammie Court, Rural Hall, NC 27106

If you use a map application on a smart phone, enter the following address:
1350 Jammie Court, Winston Salem, NC 27106

Tools, Equipment and Supplies Required For The Weld Test:

A-Electrode Oven

B-Hermetically sealed container of 7018 electrodes

C-Fillet Weld Gauge Set

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. Plates may be cleaned prior to welding and coupons prepped for testing after welding. **Grinding is not permitted during welding.** The welder may be permitted to clean with a wire wheel.

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

L- Metal Protractor

Weld Test Fee Schedule:
SMAW 1G - $250.00
SMAW 3G/4G - $500.00
SMAW 6G -$500.00

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

Field Welder Test Classifications:

1-SMAW 1G
Welder Qualification:
This weld test qualifies the welder to weld:
A-Fillet welds in the Flat [1F] and Horizontal [2F] positions.
B-Groove welds in the flat [1G] position.
C- Groove welds 1/8" to 3/4" material thickness.

Test Setup Description:
3/8" test plate, single V-groove with a 45 degree included angle. A backing bar is used and the root opening is 1/4". The plate is welded in the flat [1G] position using 1/8" 7018 electrodes.
Cleaning is with the following hand tools only: chipping hammers, picks, wire brushes, etc. Cleaning with a wire wheel in a grinder may be permitted. Altering of the weld bead passes either by grinding or filing will not be permitted. Once welding is completed the weld cap must be ground flush.

2- **SMAW 3G/4G**
Welder Qualification:
This weld test is qualifies the welder to weld:
A: Groove welds in any position, 1G, 2G, 3G and 4G. [Flat, Vertical, Horizontal and Overhead]
B-Groove welds 1/8" to 3/4" material thickness.
C- Groove welds on pipe 24" in diameter and over.
D- Fillet welds in any position, 1F, 2F, 3F and 4F. [Flat, Horizontal, Vertical, and Overhead]

Test Setup Description:
One 3/8" test plate, single V- groove with a 45 degree inclusive angle. A backing bar is used and the root opening is 1/4". This plate is welded in the Vertical Position [3G] using 1/8" 7018 electrodes.

One 3/8" test plate, single V- groove with a 45 degree inclusive angle. A backing bar is used and the root opening is 1/4". This plate is welded in the Overhead Position [4G] using 1/8" 7018 electrodes.

Cleaning is with hand tools only, chipping hammers, picks, wire brushes, etc. Cleaning with a wire wheel in a grinder may be permitted. There is no

altering of the weld bead passes either by grinding or filing. Once welding is completed the weld cap will be ground flush.

3- SMAW 6G

Welder Qualification:

This weld test is qualifies the welder to weld:
A: Groove welds in any position, 1G, 2G, 3G and 4G. [Flat, Horizontal, Vertical, and Overhead]
B-Groove welds 1/8" to 3/4" material thickness.
C- Groove welds on pipe 4" and greater in diameter.
D- Fillet welds in any position, 1F, 2F, 3F and 4F. [Flat, Horizontal, Vertical, and Overhead]

Test Setup Description:

One 6" Sch. 80 pipe coupon with a backing ring and a single V- groove angle of 60 degrees with a root opening of 1/4" welded at a fixed 45 degree [6G] position using 1/8" 7018 electrodes.

Cleaning is with hand tools only, chipping hammers, picks, wire brushes, etc. Cleaning with a wire wheel in a grinder may be permitted. There is no altering of the weld bead passes either by grinding or filing.

Testing and Acceptance:

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

If found visually acceptable the test coupon will be bend tested. Acceptance is based on criteria set in AWS D1.1 and AWS D1.5.
The welder will be notified of the test results once available. **Due to our work load this process can take several days.**

Successful Completion of Qualification Test:

A Field Welder Certification card will be mailed to the address provided. The welder must have the card available at all times when working on a NCDOT project. Field Welder Certification is valid for 5 years assuming compliance with applicable specifications.

Failure of Qualification Test:

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 a test failure and both plates will need to be welded when the welder retests.

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 weld test fee rates apply to retesting.

Revocation of the Field Welder Certification ID Card

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