MEMORANDUM TO GROUP LEADERS & CONSULTANTS

SUBJECT: NEW FIELD WELDING NOTE & SUPPLEMENTAL SPECIFICATION

The attached revised Bridge Design standard notes sheets should be used for bridge projects beginning with the August 1999 letting. Your attention is directed to a new note entitled, "FIELD WELDING".

This change was required to address concerns about the quality of welding done by the Contractor's personnel. The note and the new Supplemental Specification allows for selective inspection and testing of field welding.

The attached new Supplemental Specification entitled "FIELD WELDING" will be included in all bridge projects beginning with the August 1999 letting.

Plans that are complete and that will be let in August 1999 or later must be revised to include this revision. Your cooperation in this matter is appreciated.

Randy R. Cannon, P.E.
Bridge Design Engineer

Attachments:

cc: Assistant Bridge Design Engineers

File: PC/REL
FIELD WELDING

South Carolina Department of Transportation Standard Specifications for Highway Construction, Edition of 1986 are revised as follows:

Subsection 709.22 "Structural Welding" is revised by removing the last sentence in paragraph A.1.(b) and all of part B "Field Welding" and replaced with the following Subsection 709.22B "Field Welding".

709.22B "Field Welding":

(1) General. All field welding, except welding of reinforced pile tips, temporary false-work (unless specified), SIP form-work, armor plate at bridge ends and armor plate at expansion joints shall be considered structural welding and shall be performed by a SCDOT certified welder. All field personnel welding structural steel, steel reinforcement, steel pile splices, and other types of field structural welds shall have been qualified to perform the type of welding in accordance with the qualification procedure of ANSI/AASHTO/AWS D 1.5 Bridge Welding Code as follows: A welder or tacker (hereafter known as "welder") may be qualified by preparing test specimens in accordance with section 5.22, figure 5.7A, Position 2G for limited thickness groove welding (butt welding) and section 5.23, figure 5.8A, Position 2F for fillet welding. Testing as shown in Figure 5.8B will not suffice for fillet welding qualification.

The above testing is minimum and will qualify the welder for general welding at the job site. By choice of the welder, he may qualify for additional positions and unlimited metal thickness as part of the above testing. Specialized welding and welding positions at the job site may require additional welder qualification testing if required by the Engineer.

The test specimens shall be prepared in the presence of and tested and evaluated by an independent laboratory person qualified as a Welding Inspector. All radiographic nondestructive testing shall be performed by an ASNT Level II or III technician. The independent laboratory shall furnish a welder qualification test report on company letterhead stationery stating the type welding approved, name of the welder, the welder's social security number, along with a statement that the welder is duly qualified as a field welder in accordance with the SCDOT requirements. The report shall show the name of the independent laboratory technician(s) making the evaluation and be signed by the independent laboratory manager.

The independent laboratory shall submit a copy of the report to: Research and Materials Engineer, Research and Materials Laboratory, SCDOT, P. O. Box 191, Columbia, SC 29202, for processing. The welder will be forwarded a SCDOT certification good for two years and renewable every two years provided the welder has been engaged in welding procedures during the preceding two year period.

A list of qualified independent laboratories capable of administering this testing may be obtained from the SCDOT Research and Materials Laboratory. An independent laboratory may request to be included on the list by furnishing to the Research and Materials Engineer a letter stating their qualifications to perform the testing and the names of their personnel who will be performing the evaluations.

(2) Submittals. The Contractor shall notify the Resident Construction Engineer and the Research and Material Engineer ten (10) calendar days prior to performing any field welding including the welding of reinforced pile tips, armored plated at bridge joints, temporary false-work and SIP form-work. The Contractor shall document this notification by completing the attached form Entitled "SCDOT Sample Welding Procedure Specification" and forwarding one copy each to the Resident Construction Engineer and the Research and Materials Engineer.
Date 99-07-19

SCDOT WELDING PROCEDURE SPECIFICATION

Material specification
Welding process
Manual or machine
Position of welding
Filler metal specification
Filler metal classification
Flux
Shielding gas Flow rate
Single or multiple pass
Single or multiple arc
Welding current
Polarity
Welding progression
Root treatment
Preheat and interpass temperature
Postheat temperature
Heat input Min. Max.
Welder's Name Certified Welder Required: Yes No
If required Welder's SCDOT Certification No.

WELDING PROCEDURE

<table>
<thead>
<tr>
<th>Pass No.</th>
<th>Electrode size</th>
<th>Welding current Amperes</th>
<th>Volts</th>
<th>Travel speed</th>
<th>Joint detail</th>
</tr>
</thead>
</table>

This procedure may vary due to fabrication sequence, fit-up, pass size, etc., within the limitations of variables given in AWS D1.5, section 5.

Procedure no. Contractor
Revision no. Authorized By
Date
WIDENING EXISTING CONCRETE STRUCTURE

The concept of the existing concrete structure shall be widened on the left side of the beam where the beam is 1/4". Prior to placing new concrete, the beam shall be tied and any necessary reinforcing steel shall be installed. The reinforcing steel shall be placed in positions in accordance with the specific requirements of the project. The concrete shall be placed in stages and each stage shall be consolidated and compacted to provide a uniform structure. The overall thickness of the concrete shall be 12" to 14", depending on the specific requirements of the project. The concrete shall be placed and consolidated in stages to ensure uniformity. The concrete shall be placed in stages and each stage shall be consolidated and compacted to provide a uniform structure. The overall thickness of the concrete shall be 12" to 14", depending on the specific requirements of the project. The concrete shall be placed and consolidated in stages to ensure uniformity.

STRUCTURAL STEEL

The structural steel shall be designed for vertical and horizontal loads, including wind loads and earthquake forces. The steel shall be designed in accordance with the American Institute of Steel Construction (AISC) specifications. The steel shall be designed to withstand the loads and moments acting on the structure. The steel shall be designed to ensure that the structure is safe and stable. The steel shall be designed to ensure that the structure is safe and stable.

ALLOWANCE FOR LOAD DEFLATION AND WIND LOADING

IN SETTING FORMS, STRUCTURAL STEEL, OR PRESTRESSED CONCRETE, A FACTOR OF SAFETY OF 1.5 IS RECOMMENDED TO COMPENSATE FOR COMPACTED CONCRETE LOAD DEFLATION AND WIND LOADING.

IN SETTING FALSEWORK AND FORMS FOR PRESTRESSED CONCRETE, A FACTOR OF SAFETY OF 1.6 IS RECOMMENDED TO COMPENSATE FOR LOAD DEFLATION AND CONTINUOUS LOADING. THE ALLOWANCE FOR LOAD DEFLATION PLUS THE ALLOWANCE FOR LOAD DEFLATION PLUS THE ALLOWANCE FOR CONTINUOUS LOADING.

CONTRACTOR'S OPTIONAL STAY-IN-PLACE FORMS

FORMS MAY BE STAYED IN PLACE FOR A PERIOD OF TIME AS REQUIRED TO ALLOW THE CONCRETE TO ACHIEVE THE REQUIRED STRENGTH. THE SPECIFICATIONS FOR FORMS MAY BE STAYED IN PLACE FOR A PERIOD OF TIME AS REQUIRED TO ALLOW THE CONCRETE TO ACHIEVE THE REQUIRED STRENGTH.

DEFINITION OF TERMS

Value Engineering Proposals: A value engineering proposal is an opportunity for the contractor to suggest changes to the design or construction of a project that would result in a lower cost for the owner. These proposals are typically submitted by the contractor and reviewed by the owner and design team. The goal is to identify areas where the project can be improved without compromising safety or quality. The proposals are reviewed and evaluated to determine if they are feasible and cost-effective.

Field Welding: Field welding is the process of welding materials in the field, rather than in a controlled environment such as a workshop or factory. Field welding is often necessary when large structures or components cannot be transported to a welding shop. Field welding often requires specialized equipment and techniques to ensure the weld is of the highest quality.

CONTRACTOR'S PROPOSAL

The contractor's proposal shall be submitted within the time specified in the contract documents. The proposal shall include the following:

1. A detailed estimate of the work to be performed
2. A schedule for the completion of the work
3. A description of the methods and procedures to be used
4. A list of materials and equipment required
5. A statement of the qualifications and experience of the contractor

The proposal shall be reviewed by the owner and design team to determine its feasibility and cost-effectiveness. The contractor's proposal is an important aspect of the bidding process and can significantly impact the final cost of the project. The contractor's proposal is an important aspect of the bidding process and can significantly impact the final cost of the project.