E.W. Howell

REQUEST FOR INFORMATION
No. 00008

TITLE: Thermally Cut Holes

DATE: 8/10/2009

PROJECT: BNL CCWF-II

JOB:

TO: Attn: Allan Raphael
Brookhaven National Laboratory
Brookhaven Sciences Associates, LLC
Project Modernization Office
Upton, NY 11973-5000

STARTED:

COMPLETED:

REQUIRED: 8/17/2009

WORK IMPACT:	SCHEDULE IMPACT:	COST IMPACT:
Unknown	Unknown	Unknown

QUESTION:

August 10, 2009
Thermally Cut Holes

Please see attached section M2.5 of AISC manual 13th edition. This states thermally cut holes shall be permitted with a surface roughness not exceeding 1000 uin. Please approve the use of thermally cut holes for this project.

CC: File, Super

PROPOSED SOLUTION:

ANSWER:

Acceptable contingent upon using numerically controlled or mechanically guided equipment to form the holes (AISC 13th edition, commentary chapter M, section M2.5), surface roughness and limits on any gouges as recommended by AISC are met, and the formed holes are free of cracks. Contractor shall submit compliance report and obtain approval.

S. Muddappa
Giffels Partnership
08-24-09

Requested By: E.W. Howell

Date: _____

Signed: _____
Hans Laros

Reentrant corners, except reentrant corners of *beam copes* and weld access holes, shall meet the requirements of AWS D1.1, Section A5.16. If another specified contour is required it must be shown on the contract documents.

Beam copes and weld access holes shall meet the geometrical requirements of Section J1.6. Beam copes and weld access holes in shapes that are to be galvanized shall be ground. For shapes with a flange thickness not exceeding 2 in. (50 mm) the roughness of *thermally cut* surfaces of copes shall be no greater than a surface roughness value of 2,000 μin. (50 μm) as defined in ASME B46.1 Surface Texture (*Surface Roughness, Waviness, and Lay*). For beam copes and weld access holes in which the curved part of the access hole is thermally cut in ASTM A6/A6M hot-rolled shapes with a flange thickness exceeding 2 in. (50 mm) and welded built-up shapes with material thickness greater than 2 in. (50 mm), a preheat temperature of not less than 150 °F (66 °C) shall be applied prior to thermal cutting. The thermally cut surface of access holes in ASTM A6/A6M hot-rolled shapes with a flange thickness exceeding 2 in. (50 mm) and built-up shapes with a material thickness greater than 2 in. (50 mm) shall be ground and inspected for cracks using magnetic particle inspection in accordance with ASTM E709. Any crack is unacceptable regardless of size or location.

User Note: The AWS Surface Roughness Guide for Oxygen Cutting (AWS C4.1-77) sample 3 may be used as a guide for evaluating the surface roughness of *copes* in shapes with flanges not exceeding 2 in. (50 mm) thick.

3. Planing of Edges

Planing or finishing of sheared or *thermally cut* edges of plates or shapes is not required unless specifically called for in the contract documents or included in a stipulated edge preparation for welding.

4. Welded Construction

The technique of welding, the workmanship, appearance and quality of welds, and the methods used in correcting nonconforming work shall be in accordance with AWS D1.1 except as modified in Section J2.

5. Bolted Construction

Parts of bolted members shall be pinned or bolted and rigidly held together during assembly. Use of a *drift* pin in bolt holes during assembly shall not distort the metal or enlarge the holes. Poor matching of holes shall be cause for rejection.

Bolt holes shall comply with the provisions of the RCSC *Specification for Structural Joints Using ASTM A325 or A490 Bolts*, Section 3.3 except that *thermally cut* holes shall be permitted with a surface roughness profile not exceeding 1,000 μin. (25 μm) as defined in ASME B46.1. *Gouges* shall not exceed a depth of 1/16 in. (2 mm).