HANGER FIST/FAB Cancel

BROWN & ROOT, INC. CPSES JOB 35-1195	NUMBER	REVISION	ISSUE DATE	PAGE
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TITLE:

INSTALLATION OF INSPECTIONS OF ASME COMPONENT SUPPORTS, CLASS 1,2, & 3

ORIGINATOR: _____ DATE

REVIEWED BY: _____ 9/15/80 DATE

APPROVED BY: _____ Site QA Manager 9/15/80 DATE

VOID

1.0 TABLE OF CONTENTS

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1.0 REFERENCES

1.1 NDEP-200

2.0 GENERAL

2.1 PURPOSE AND SCOPE

This instruction delineates the criteria and requirements to be used when performing installation inspection of ASME component supports, Class 1, 2, and 3. If a conflict exists between this instruction and the support drawing, the drawing shall take precedence.

2.2 RESPONSIBILITY

The general mechanical superintendent is responsible for fabrication and installation of component supports.

The QC superintendent shall be responsible for the inspection of component supports in accordance with this procedure.

2.3 DOCUMENTATION

The results of component support inspections shall be documented on the "Quality Control Hanger Inspection Report" (see attachment 1). The information needed to complete this Report will be obtained from the construction hanger package and physical inspection of the component support. The Inspection Report Status Log (Attachment 5) shall be maintained by QC for the purpose of tracking "QC Hanger Inspection Report." All hold points on the Inspection Report shall be satisfied as applicable. The MWDC hold points shall be satisfied only for applications delineated in paragraph 4.2.

3.0 INSTRUCTION

3.1 MATERIALS

3.1.1 Traceability Marking Transfer

During construction activities, I.D. markings on bulk material shall be transfered prior to the material being cut. This operation shall be monitored by QC on a random surveillance basis. The surveillance activity will be documented at a minimum of once per shift on an "IR" and filed in the QA department. The "IR" shall note the hanger numbers of items in which marking transfer is witnessed.

3.1.2 Material Traceability Control

During fabrication, evidence of material acceptability will be provided through the use of a "Material Identification Log"

(Attachment #7) by the craft. The log shall then be presented to the QC inspector for material verification and signature. The log will remain as part of the construction hanger package.

At installation inspection, the QC inspector shall document the material type, grade and (heat number for class 1 only) on the "QC Hanger Inspection Report" using the information provided on the "Material Identification Log."

3.1.3 Material Dimensional Control

Component support material type and description shall be as shown on the "Bill of Materials" of the BRH and any applicable CMCs.

Component support material "cut lengths" shall be as shown in the detail sketch of the BRH and any applicable CMCs. The BRH/CMC "Bill of Materials" will not be used to verify material cut length.

3.1.4 Material Salvaging

Component support parts such as structural steel, snubbers, spring cans, etc., may be used on component supports other than those for which they are designated, provided traceability is maintained. The Material Identification Log in the hanger package shall identify from which hanger the substituted part came from and shall be verified by the QC inspector.

4.0 WELDING

4.1 WELDING INSPECTION REQUIREMENTS (GENERAL)

Weld filler material used in the welding of component supports shall be verified using the WFML in the construction "Hanger Package."

NOTE: QC surveillance of proper completion of the "Weld Filler Material Log" shall be verified by comparing the WPG against the WDC and WFML. This verification shall be documented by the inspector's initials and date on the WFML.

4.2 WELDING INSPECTION REQUIREMENT (FIT-UP)

Welding Engineering will enter weld numbers on the BRH for welds to pressure retaining members, full penetration welds except flare beveling on structural tubing, hangers with multiple processes or multi-filler materials or welds requiring NDE, other than visual and all Class 1 support welds. Inspection of fit-up will be required by QC for the above mentioned welds if delineated on a MWDC.

NOTE: Cleanliness and fit-up hold points may be inspected simultaneously.

The fit-up gap for butt weld joints shall not exceed 1/8 inch beyond the diameter of the electrode used at the root of the joint.

The fit-up gap for "T" fillet joints shall be as small as practical; however, it should not exceed 1/16 inch. If gap is in excess of 1/16 inch but not exceeding 5/32 inch, this condition will be considered acceptable provided the leg of the fillet weld is increased by the amount of separation in excess of 1/16 inch. (The increase in fillet size applies only when the excess separation exceeds 10% of the joint length.)

The fit-up gap for "lap" fillet weld joints shall not exceed 1/8 inch at any location along the length of the joint.

4.3 WELDING INSPECTION (FINAL)

Fillet weld sizes specified on the drawing are the minimum size required along the full length of the weld joint. Oversize fillet welds are acceptable providing they do not exceed twice the leg size specified on the drawing. Excessive distortion where oversize fillet welds are used should be avoided.

4.4 NONDESTRUCTIVE TESTING

All NDE will be as shown on drawings.

4.5 NDE INSPECTIONS

Each Inspector will be issued an "NDE Guide" (Attachment 6) which provides information on the acceptance criteria of welded supports.

5.0 ASSEMBLED HANGER REQUIREMENTS

5.1 FASTENERS

Fasteners will be as shown on the BRH and any applicable CMCs. Unless otherwise shown on the drawings, fasteners will be tightened securely. Full thread engagement of bolts and nuts is required.

NOTE: If screwed adjustment fit is questionable, inspector shall notify the Quality Engineering Department.

5.2 SWAY STRUTS

If sway struts are involved with a component support, they shall be installed as follows:

NOTE 1: The sway strut unit is composed of the pipe clamp assembly, Attachment 2, the rear bracket assembly, Attachment 3, and the sway strut assembly, Attachment 4.

NOTE 2: The pipe clamp assembly, Attachment 2, consists of the pipe clamp halves, clamp bolts, spacer and nuts, a threaded or non-threaded, high-strength pin, two flat washers and either high-strength nuts or cotter pins, depending on vendor.

NOTE 3: When assembled for inspection, the washers must be installed between the clamp halves with the high-strength pin. Under no circumstances shall the clamp bolts be interchanged with the high-strength pin.

NOTE 4: The rear bracket assembly consists of the rear bracket, two flat washers, and a high-strength pin held in position by cotter pins or split snap rings (Attachment 3). When inspecting this assembly, verify the washers are installed on the inside of the bracket arms, one on either side of the sway strut spherical bearing. If cotter pins are used, they should be the maximum size the hole will accommodate and shall be fully opened. If split snap rings are installed, they should be examined to verify the rings are not broken, sprung or deformed.

NOTE 5: The sway strut consists of the strut body, adjustable spherical bearing ends, and one or more jamb nuts (see Attachment 4). The spherical bearing should be tightly staked in the adjustable ends and shall have a washer on either side when installed. The sway strut should have the correct adjustment as per the design drawing and the jamb nut(s) shall be tight. If engagement sight holes are present on the strut body, thread engagement shall be verified.

NOTE 6: When correctly installed, the sway strut unit will allow misalignment up to 5° from sway strut centerline (10° included angle). The 5° of freedom is given by the spherical bearings and their relationship to the flat washers. Normally the thicker flat washers are installed on the clamp end, the thinner washers on the rear bracket end.

The location of the component support shall be as delineated on the BRH.

5.3 SWAY STRUT (MODIFICATION)

5.3.1 Sway Strut Modification with Socket Coupling and Fillet Weld

This method applies only to the following sway strut sizes:

1. ITT Grinnell, Fig. 211, size A, B, C, and 1.

Determine the actual "C-C" dimension required.

Cut excess length of pipe, including S.W. coupling take-out, so that each pipe section is approximately the same length (See Figure 1).

Reconnect pipe sections utilizing appropriate size and class 3000# S.W. coupling. Utilize vee blocks or other suitable jigs to assure proper alignment. All ITT Grinnell Figure 211 sizes (A, B, C, and 1) will require a 6000# S.W. coupling.

Welding shall be in accordance with the approved WPS. Fit-up shall be accomplished by the use of socket weld criteria (Attachments 9).

Reinstall the rod ends, rear bracket and pipe clamp as applicable, in preparation for installation.

5.3.2 Modification of NPSI Sway Strut Sizes SRS. 06 Through 36

Remove by grinding one end coupling weld.

Shorten pipe extension piece by amount necessary to achieve required "C-C" dimension.

NOTE: Remove the rod ends, rear bracket and pipe clamp where applicable.

Reweld in accordance with approved WPS.

5.3.3 Modification ITT Grinnell Sway Strut Size 2 or Larger

Remove the rod ends, rear bracket and pipe clamp where applicable.

Determine the actual "C-C" dimension required.

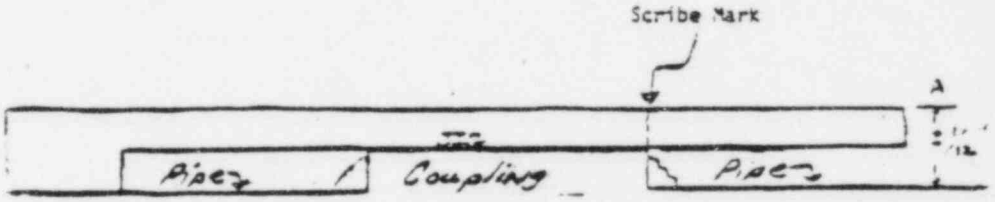
Cut excess length of pipe so that each pipe section is approximately the same length.

Butt weld the two ends together utilizing vee blocks or other suitable jigs to assure proper alignment. The weld shall be a full penetration butt weld with backing and made in accordance with an approved project butt welding procedure. Example: (WPS 11032)

5.3.4 Sway Strut Alignment & Fabrication Tolerance

Pipe centerline misalignment at joint shall not exceed ½° for sway struts utilizing socket welded couplings or butt weld joints (not socket welded end couplings as in 5.3.2 above).

This measurement should be made utilizing a jig as shown below:



If the measurement as taken from the top of the jig to the sway strut varies within the dimensional tolerance given at "A" above with readings taken at 90° intervals around the strut, then the alignment may be considered to be acceptable. This measurement should be taken from both ends of the coupling.

5.3.5 Inspection and Documentation of NF Components

All work and inspections shall be documented as follows:

A. All hold points shall be satisfied on the back side of a MWDC.

B. After the above has been completed and verified, denote on the "QC Hanger Inspection Report," comments section: Sway Strut Modification Acceptable, Inital and Date.

A record of modification must be included in the documentation package for the modified component.

5.4 SPRING HANGERS

When spring hangers are part of the support, provisions shall be made to verify stop installation. This verification shall be documented in the comments section of the QC Hanger Inspection Report by denoting "Spring Can Stops Installed," inital and date.

5.5 SNUBBERS

Temporary flat bar cut to the appropriate "pin-to-pin" length requirement may be used when snubbers or struts are not available for immediate installation. When supports are completed with the exception of items such as struts or snubbers, all other inspections may be performed and the applicable items signed as acceptable. Any such exceptions shall be noted on the "QC Hanger Inspection Report" placing an asterisk next to the inspection which cannot be completed. An explanation of the uncompleted inspections shall be entered in the comments section as per the following example:

EXAMPLE: Snubber (or strut) not installed.

5.6 LUBRITE PLATE

Check the support for correct hardware. Supports containing lubrite plate assemblies should come with a lubrite plate (2 for type "G" & "H" assemblies) a keeper (2 for type "G" & "H" assemblies for 14" thru 30" pipe) (the keeper is generally small slice of tubing), the pipe attachment (generally a channel, tee or wide flange assembly) and usually a pipe clamp.

The pipe attachment will have a smooth surface left unpainted where it mates with the lubrite plate. This surface should be coated with Liquid Lubricant AE-6 to protect it from rusting. Check the coating for good coverage. If the mating surface is not covered or the coating is damaged, apply additional Liquid Lubricant AE-6.

NOTE 1: The lubrite plate should not be in place when welding the keeper.

NOTE 2: Care should be taken to assure the surface where the lubrite plate will rest is level or follows the slope of the pipe and is aligned properly.

5.7 SHIMMING/GROUTING

Component support wall and ceiling plates must have a minimum of 80% bearing surface against the concrete face. The maximum allowable gap, for the remaining portion of the plate, shall not exceed 1/16 inch. If this criteria cannot be met, the plate must be grouted with a non-shrink epoxy grout.

5.8 TOLERANCES

For tolerances not given in the text of this Instruction, refer to those listed in Attachment #8.

Small bore hanger installation/tolerances shall be in accordance with this procedure and small bore general notes.

6.0 FINAL DOCUMENTATION REQUIREMENTS

When inspections are completed and a hanger is found acceptable, the QC Hanger Inspection Report shall be filled out, attached to the hanger package and both given to the QC supervisor or his designee for routing to the QA Vault. A transmittal shall be signed by the QC Inspector and given to the craft for their processing.

NCR number(s) shall be denoted on the QC Hanger Inspection Report.