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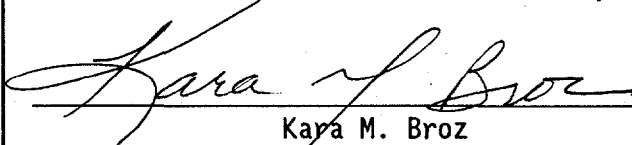
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Load Test - Test Report

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7. Abstract

This test report summarizes testing activities and documents the results of the load tests performed on-site and off-site to structural qualify the 52-inch equipment containers designed and fabricated under Project W-320.

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PROJECT W-320
52-INCH DIAMETER EQUIPMENT CONTAINER
LOAD TEST
TEST REPORT

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J. R. Bellomy
February 1995

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1.0 INTRODUCTION

Equipment has been designed and fabricated as part of Project W-320 to remotely remove existing contaminated equipment from tanks 241-C-106 and 241-AI-102. This equipment is known as the Project W-320 Equipment Removal System (ERS).

The major components of the ERS include the flexible receiver system, the strongback/hydraulic trailer, the 52-inch diameter equipment containers, the container shot loading system, the emergency container transport trailer, and the 20-ton heavy service gantry cranes. Other miscellaneous components necessary to support operation of the major components during equipment removal activities have also been designed and fabricated.

Removal of contaminated equipment from the tanks will be performed by locating the flexible receiver, flexible receiver spool piece assembly, and work platforms on a selected tank pit. The flexible receiver control trailer and high pressure water pump are then positioned near the tank and connected to the flexible receiver. A crane modified with special controls is located adjacent to the tank pit and connected to the flexible receiver and the piece of equipment to be removed. A 52-inch diameter container is bolted on the strongback/hydraulic trailer, and the strongback/hydraulic trailer positioned within the swing radius of the crane.

Once all equipment has been installed and operational checks performed, equipment removal activities are initiated. The 52-inch equipment container is raised to the vertical position with the strongback/hydraulic trailer. The crane is then used to pull the piece of contaminated equipment from the tank pit and through the flexible receiver. As the equipment is removed, the flexible receiver maintains tank confinement, decontaminates the equipment with a high pressure water spray, performs a radiological assessment (gamma assay) and applies a bag to the equipment. When the piece of equipment has been fully extracted and is at an established height, the flexible receiver bag is remotely tied and sheared. The crane then repositions the bagged piece of equipment at the flexible receiver leak containment bag assembly, where a secondary bag is remotely applied on the bottom end.

Following application of the leak containment bag, the bagged piece of equipment is raised and centered above the container with the crane. The equipment is then lowered into the container. Once the equipment is within the container, the strongback/hydraulic trailer is used to reposition the container from the vertical to the horizontal position. The crane is then disconnected and end caps are installed on the container.

After the container has been closed, the strongback/hydraulic trailer and container are located underneath the shot loading platform. The shot loading system is then used to place shot within the annulus area of the container as required for radiological shielding during transportation and storage. Equipment removal activities are concluded by transporting the loaded container (using the strongback/hydraulic trailer or the emergency container transport trailer) to the onsite storage facility where the gantry cranes are used for offloading.

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A total of there 52-inch diameter equipment containers have been designed and fabricated as part of Project W-320; 2 identical containers 49-foot long (Containers A and B) and 1 container 62-foot long (Container C). The 49-foot containers were specifically designed to support equipment removal activities at tank 241-C-106 while the 62-foot long container was designed to support equipment removal activities at tank 241-AY-102.

As part of the design verification associated with the 52-inch equipment containers, each of the containers were subjected to a load test. Container A was shipped with the strongback to the hydraulic trailer manufacturer and was successfully load tested during the factory acceptance testing of the hydraulic trailer. Container B and Container C were tested onsite following the delivery of the hydraulic trailer.

This test report summarizes the load testing performed to structurally qualify the 52-inch diameter equipment containers for their intended application. Test procedures and test results are included and/or discussed for all three of the equipment containers (A, B, and C).

2.0 DESCRIPTION OF TEST

The load test performed on Container A was conducted at the AMRO Fabricating Corporations facility in South El Monte, California. The load test was performed by AMRO on July 25, 1994 as part of the Factory Acceptance Test of the strongback/hydraulic trailer. Testing followed the AMRO prepared hydraulic trailer factory acceptance test procedure and was witnessed by members of Westinghouse Hanford Company (WHC) Projects, WHC Engineering Analysis and WHC Quality Assurance.

Load testing of Containers B and C was conducted at the ICF Kaiser Hanford Company (ICF KH) fabrication facility in the 3000 Area. Testing was performed following the procedure included in WHC-SD-W320-001 (Bellomy 1994). ICF KH Construction forces performed the test under the direction of WHC Projects. Testing was witnessed by members of WHC Engineering Analysis and WHC Quality Assurance.

3.0 TEST METHOD AND TEST EQUIPMENT

All three of the containers were load tested using the strongback/hydraulic trailer and the container test weight assembly (H-2-83735). Each container was located on the strongback/hydraulic trailer and bolted into position in accordance with assembly drawing H-2-83726. The test weight holder was bolted onto the top or forward end of each container and test weight plates were placed on the test weight holder and pinned into position.

Plates were added to the test weight assembly as required to achieve the desired weight required for testing. Each container was tested with a weight exceeding 125 percent of the heaviest piece of equipment planned to be removed under Project W-320 as a minimum.

After the installation of the test weight assembly, the containers were cycled from the horizontal position to vertical position and back to the horizontal position using the strongback/hydraulic trailer. Once a container was returned to the horizontal position, the test weight assembly was removed from

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the container and the container removed from the strongback. Following removal of the container from the strongback, a complete visual inspection of the container was performed to verify that the structural integrity of the container had not been compromised. Magnetic Particle testing was also performed on the inside and outside face of both vertical welds at each of the four attachment plates (all containers).

Container A was the first container fabricated and was used for qualification of the container, strongback, and hydraulic trailer designs. Initial testing of the strongback/hydraulic trailer was performed by lifting Container A and the test weight assembly with all 6 plates attached (14,000 pounds). This load (14,000 pounds) represented the loading identified on the strongback/hydraulic trailer load chart [reference WHC-SD-W320-DA-001, page A-46 (Mackey 1994)] plus an additional 25 percent. After this initial qualification, 2,000 pounds were removed from the test weight assembly. The testing of the trailer hydraulic system was then continued using Container A and the test weight assembly with 5 plates attached (12,000 pounds) which represented loading per the referenced load chart.

Containers B and C were both tested with the test weight assembly with 1 plate attached (4500 pounds). This weight (4,500 pounds) represented 125 percent of the weight of the heaviest piece of equipment planned to be removed under Project W-320.

4.0 TEST RESULTS

The visual inspections were acceptable and did not identify any signs of damage to any area of the containers as a result of the load tests.

The magnetic particle examinations did not reveal any weld defects induced as a result of the load test. One indication (3/8 inch slag inclusion) was identified on one of the inside welds of Container B. Research of the fabrication records indicated that the final magnetic particle examination of the inside welds had been overlooked during fabrication, which accounted for the presence of the defect. The slag inclusion was removed and the weld repaired. Following repair, a magnetic particle examination was performed on the weld repair area and found acceptable.

The completed test procedure and inspection records for the container load tests performed on site are included as Appendix A. The completed test procedure and inspection records for testing performed by AMRO Fabricating are included in the Certified Vendor Information (CVI) File for the Project W-320 Hydraulic Trailer, CVI file # 22642

5.0 CONCLUSIONS AND RECOMMENDATIONS

The container load tests were all determined successful. The testing demonstrates that the containers are structurally sound and will function as designed when used during equipment removal activities. No further load testing is required or recommended.

6.0 DISPOSITION OF TEST ITEMS

All testing was performed in accordance with the approved test procedure. Containers will be stored onsite until needed for testing and training.

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7.0 REFERENCES

Bellomy, J. R., 1994, Project W-320 52-inch diameter Equipment Container Load Test, WHC-SD-W320-TC-001, Revision 0, Westinghouse Hanford Company, Richland, Washington.

Mackey, T. C., 1994, Structural Analysis of the Equipment Removal System For Tanks 241-C-106 and 241-AY-102, WHC-SD-W320-DA-001, Revision 0, Westinghouse Hanford Company, Richland, Washington.

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APPENDIX A:

Completed Test Procedure and Inspection Records

WHC-SD-W320-TC-001
Revision 0

WHC-SD-W320-TRP-001
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PROJECT W-320
52-INCH-DIAMETER EQUIPMENT CONTAINER
LOAD TEST

J. R. Bellomy
August 1994

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CONTROLLED DOCUMENT
PCP NO. W-320-41

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PROJECT W-320
52-INCH-DIAMETER EQUIPMENT CONTAINER
LOAD TEST

1.0 TEST IDENTIFICATION

This test procedure establishes the requirements for the onsite load testing of the 52-in.-diameter equipment containers fabricated for use in equipment removal activities associated with Project W-320. A total of three 52-in.-diameter equipment containers have been fabricated under Project W-320: two are identical containers 49 ft in length (containers A and B; see drawing H-2-83724); the third container is 62 ft in length (container C; see drawing H-2-83728).

This test procedure includes requirements for load testing only containers B and C. Container A was load tested successfully as part of the factory acceptance test for the hydraulic trailer performed by the manufacturer of the hydraulic trailer. No further load testing of container A is required before field use.

This test procedure follows the format and content guidelines recommended for test procedures as prescribed in WHC-IP-1026, *Engineering Practice Guidelines*, Appendix K, "Test Plans, Specifications, Procedures and Reports."

2.0 GENERAL TEST DESCRIPTION

2.1 TEST OBJECTIVES

The objective of this test is to verify the structural integrity of the Project W-320 52-in.-diameter equipment containers by cycling the containers from the horizontal to the vertical position in the loaded condition. Successful completion of this test will demonstrate that each container is structurally adequate to perform its intended design function.

2.2 TEST METHOD

The container load test will be performed by installing each container on the strongback/hydraulic trailer, attaching a 4,500-lb test weight to the flanged end of the container, raising the container to the full vertical position, then returning it to the horizontal position. Following vertical cycling, the container will be removed from the hydraulic trailer and visually inspected for structural integrity. Magnetic particle inspection then will be performed on the container welds at the points where the container is attached to the strongback.

Containers B and C will be load tested. The test sequence is identical for both containers.

Note: The 4,500-lb test weight exceeds 125 percent of the weight of the heaviest piece of equipment planned for removal as part of Project W-320.

3.0 TEST CONDITION LIMITS

The following pre-test requirements shall be met or shall exist before testing begins.

3.1 ENVIRONMENTAL CONDITIONS

Testing shall be performed only on a calm day with wind conditions not expected to exceed 15 mi/h (weather forecasts may be obtained by calling the PNL weather forecaster at 373-2716). Testing shall cease and the container shall be returned to the horizontal position, if in the opinion of the Test Director, wind conditions might affect, at any time, the safe operation of the hydraulic trailer.

3.2 OPERATIONAL CONDITIONS AND PRE-TEST REQUIREMENTS

Before testing begins, the installation of the container on the strongback and the test weight on the container shall be verified. The hydraulic trailer shall be in a level condition and all operational checks shall have been performed successfully.

The hydraulic trailer shall be operated only under the direct supervision of the Test Director. The Test Director shall be familiar with all operational characteristics of the hydraulic and electrical systems of the hydraulic trailer and shall have had experience in operating the trailer.

4.0 TEST INSTRUMENTS AND CALIBRATION

No special test equipment or equipment calibration requirements are necessary to support performance of the test.

5.0 FACILITIES, EQUIPMENT, AND MATERIALS

5.1 TEST FACILITY

Testing may be performed at any location suitable for the safe operation of the hydraulic trailer. The trailer shall be positioned on a level, hard-packed gravel, asphalt, or concrete surface.

5.2 EQUIPMENT AND MATERIALS

The following equipment and materials shall be available to support testing:

- The W-320 strongback/hydraulic trailer
- 52-in. by 49-ft container - Container B (drawing H-2-83724)

- 52-in. by 62-ft container - Container C (drawing H-2-83728)
- Container test-weight assembly (drawing H-2-83735)
- $\frac{3}{8}$ -in.-thick plywood container test-weight gasket

- Bolting - container to strongback container-attachment assembly
 - Hex head bolts, $1\frac{1}{2}$ -6 UNC-2A by $5\frac{1}{2}$ -in.-long ASTM A325, Type 1, $2\frac{1}{2}$ -in. thread (total of 8 required)
 - Heavy hex nuts, $1\frac{1}{2}$ -6 UNC-2B, ASTM 194 GR 2H (total of 8 required)
 - Flat washers, $1\frac{1}{2}$ -in.-diameter ASTM F436 (total of 16 required)

- Bolting - strongback container-attachment assembly to strongback
 - Hex head bolts, 1-8 UNC-2A by $3\frac{1}{2}$ -in.-long ASTM A325 (total of 32 required)
 - Hex head bolts, 1-8 UNC-2A X $3\frac{1}{2}$ -in.-long, ASTM A325 (total of 16 required)
 - Flat Washers, 1-in.-diameter ASTM F436 (total of 48 required)

- Bolting - Test-weight assembly to container
 - Hex head bolts, 1-8 UNC-2A by $3\frac{3}{4}$ -in.-long ASTM A325 (total of 32 Required)
 - Flat Washers, 1-in.-diameter ASTM F436 (total of 32 required)
 - Plated oval ring hitch pin, $\frac{3}{8}$ -in.-diameter by $4\frac{1}{2}$ -in.-long with cotter pin

- Magnetic particle inspection equipment

- Two mobile boom cranes and rigging necessary to lift and position container test weight assembly and 52-in.-diameter equipment containers.

6.0 SAFETY

The following mandatory safety requirements are to be observed at all times during testing.

- Westinghouse Hanford Company (WHC) and/or ICF Kaiser Hanford Company (ICF KH) safety practices and standards of conduct shall be adhered to at all times.

- A test zone shall be established and roped off around the perimeter of the hydraulic trailer before testing begins. The test zone boundaries shall be established by the Test Director and the ICF KH Construction Manager. No personnel shall be allowed within the test zone at any time during the operation of the trailer hydraulic system without the authorization of the test director.

- Hard hats, substantial footwear, safety glasses, and gloves (as required) shall be worn by all personnel within the test zone.

- The Test Director shall be present at all times during operation of the hydraulic trailer and at any time the container is lifted from the horizontal position.
- Safety rails shall remain in position on the hydraulic trailer at all times.
- Personnel performing bolting operations or working on the hydraulic trailer deck in the strongback area or on the rear of the hydraulic trailer shall wear and use safety belts if scaffolding is not present.
- At the end of each shift and at any time the Test Director is not present, the container shall be in the horizontal position (all pressure shall be relieved from the main telescoping hydraulic cylinder), and electrical power to the hydraulic trailer shall be disconnected.

Note: Outrigger cylinders may remain loaded at the end of each shift and in the absence of the Test Director. Internal counterbalance valves are included in each of the outrigger hydraulic cylinders that lock the cylinders in position. The electrical system must be energized and a hydraulic pump must be in operation to load or unload the outrigger cylinders.

- The container test procedure as detailed in Section 11.0 shall be followed as detailed in the written sequence. Under no circumstances shall a procedural step or verification be bypassed.
- No adjustment shall be made to any of the hydraulic trailer hydraulic components without the authorization of the Test Director.

7.0 MAINTENANCE AND FAILURES

7.1 MAINTENANCE

Should the hydraulic trailer not be functioning or performing properly, the test shall cease, and adjustments/maintenance shall be performed as required. All maintenance and adjustments to the trailer hydraulic and electrical system shall be under the direct supervision of the Test Director.

7.2 FAILURES

Any observable evidence of an unsafe condition or failure of any component of the hydraulic trailer, the container, or the container test-weight assembly shall be brought immediately to the attention of the Test Director. The Test Director shall evaluate the condition and shall discontinue testing and return the container to the horizontal position in a safe manner, if the condition warrants. Testing may resume only after any required corrective actions have been performed.

8.0 TEST DATA

Test data shall be recorded in the space provided in Section 11.0, "Test Procedure." Copies of all supplemental inspection sheets (e.g., magnetic particle test reports, inspection reports) shall be attached to the test procedure.

9.0 PERSONNEL REQUIREMENTS

Special training requirements for test personnel shall be as noted in the following. There are no special training requirements for other test support personnel.

- Test Director - The Test Director shall be familiar with all operational characteristics of the hydraulic and electrical systems on the hydraulic trailer and shall have had experience operating the trailer.
- Nondestructive Examination Technician - Personnel performing magnetic particle inspections shall meet Level 2 Inspector qualifications in accordance with the American Society for Nondestructive Testing, SNT-TC-1A, *Personnel Qualification and Certification in Nondestructive Testing*, 1984 edition.

10.0 TEST WITNESSES

WHC Quality Assurance (QA) shall witness the tests for both of the containers to be tested. The designated QA representative shall be notified 24 hours before the test.

11.0 TEST PERFORMANCE

This section includes container test prerequisites and procedures for testing each of the containers. The containers may be tested in any order following completion of the prerequisites.

11.1 TEST PREREQUISITES

11.1.1 Hydraulic Trailer Positioning at the Test Facility

The following procedure shall be observed for positioning the hydraulic trailer at the test facility.

1. Locate the trailer at the test facility on a level, hard-packed gravel, asphalt, or concrete surface. Have 480-V, three-phase electrical power available to the hydraulic trailer.

2. Disconnect the tractor from the hydraulic trailer in accordance with the hydraulic trailer operations manual.
3. Remove all trailer packing materials installed by the trailer manufacturer.
4. Ensure that all handrail sections are installed around the front perimeter of the hydraulic trailer.

Note: Handrails are marked with unique identification numbers that correspond to position markings on the trailer side rail.

5. Install portable steps or secure a ladder at one or both handrail gate positions to provide access to the forward deck of the hydraulic trailer.
6. Ensure that the forward container support located on the trailer deck is located properly and bolted into position for testing of the first container.

Note: Both supports may be in position if the 49-ft container (container B) is to be tested first. If the 62-ft container (container C) is to be tested first, remove the center support from the trailer deck and store it at an appropriate location. Both supports are identical and are interchangeable.

7. Inspect the strongback/hydraulic trailer surface and remove any loose materials, bolting, or miscellaneous items.
8. Remove outrigger cylinder retainer brackets at each of the six outriggers and store in the control pendant box.
9. Install sand shoes (outrigger pads) on the six outrigger cylinders.

Note: The sand shoes are marked to correspond with their mating outrigger. Refer to the placard at the main hydraulic control console for outrigger identification. The top of each outrigger is also marked with the outrigger identification number. However, when the outriggers are retracted, the identification marking is concealed.

10. Remove bolting from the container strongback-attachment assembly; stake threads on removed bolts or paint bolts to identify them as used.

11.1.2 Container Positioning and Assembly

Refer to drawings H-2-83726, "49'- 62' X 52" Diameter Transport Assembly," as required during assembly operations.

1. Lift the selected container and position into the strongback and forward container support.

2. Bolt the container to the strongback in accordance with the bolting sequence and instructions provided in WHC-SD-W320-DA-003, *Bolting Sequence for Bolting the Container to the Strongback*.

11.1.3 Hydraulic Trailer Startup and Leveling

1. Establish and rope off the test zone perimeter around the hydraulic trailer. The test zone boundaries shall be established by the Test Director and the ICF KH Construction Manager.

WARNING: BEFORE OPERATING THE TRAILER HYDRAULIC SYSTEM, ENSURE THAT ALL AUTHORIZED TEST PERSONNEL ARE A SAFE DISTANCE AWAY FROM THE HYDRAULIC TRAILER. UNAUTHORIZED PERSONNEL AND PERSONNEL NOT PERFORMING A SPECIFIC TEST FUNCTION SHALL REMAIN OUTSIDE THE ROPED-OFF TEST ZONE.

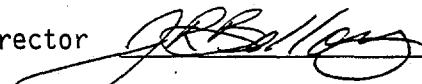
2. Perform pre-start safety checks, start the hydraulic trailer hydraulic system, and level the hydraulic trailer in accordance with the hydraulic trailer operations manual.

11.1.4 Optional Unloaded Container Lift

This section includes instructions for lifting the container in the unloaded condition before the load test is performed with the test weight installed. This section is an optional prerequisite included only to ensure that the hydraulic trailer is properly adjusted; this section may be waived at the discretion of the Test Director.

1. Verify that the container is properly positioned and prerequisites 11.1.1, 11.1.2, and 11.1.3 have been completed.

Test Director



Date 8-23-94

2. Lubricate the strongback hinge pins and base clevis bearing surfaces with LPS spray or an equivalent lubricant.
3. Lubricate the main hydraulic telescoping cylinder hinge pins by injecting grease and applying spray lubricant.

WARNING: BEFORE OPERATING THE TRAILER HYDRAULIC SYSTEM, ENSURE THAT ALL AUTHORIZED TEST PERSONNEL ARE A SAFE DISTANCE AWAY FROM THE HYDRAULIC TRAILER. UNAUTHORIZED PERSONNEL AND PERSONNEL NOT PERFORMING A SPECIFIC TEST FUNCTION SHALL REMAIN OUTSIDE THE ROPED-OFF TEST ZONE.

4. At the local control panel (Station 1) or from the remote control pendant (Station 2), briefly depress the black contact button labeled "STRONGBACK RAISE" and verify that the kicker cylinder pressure gauge reads a minimum of 2,000 lbf/in².
5. Using the hydraulic trailer remote control pendant (Station 2), raise the container to the full vertical position by continuously depressing the black contact button labeled "STRONGBACK RAISE."

Note: Raising the strongback/container will take approximately 15 min. When the container/strongback reaches the full vertical position (90 degrees) each of the rear kicker cylinders will contact a hard stop and trip a limit switch. Once the limit switch trips, a solenoid valve automatically actuates and diverts fluid flow from the main telescoping hydraulic cylinder to the hydraulic fluid reservoir.

- 6. Using the hydraulic trailer remote control pendant (Station 2), lower the container to the horizontal position by continuously depressing the black contact button labeled "STRONGBACK LOWER."
- 7. Ensure that the container and the strongback are properly seated at their forward support positions.
- 8. Shut down the hydraulic system and de-energize the electrical system in accordance with the trailer operations manual.

Note: The hydraulic trailer outriggers may remain in the deployed position or may be retracted at the discretion of the test director.

11.1.5 Installation of the Container Test Weight

Refer to drawing H-2-83735, "Test Weight Arrangement," as required during assembly operations.

- 1. Position the container test weight - test-weight holder (baseplate) at the forward end of the container. Handling and rigging of the test-weight assembly shall be in accordance with drawing H-2-83735.
- 2. Position the 1/2-in. plywood test-weight gasket between the test-weight holder and the container flange.
- 3. Bolt the container test weight to the container flange using 16, 1-8 UNC-2A by 3 1/2-in.-long ASTM A325 heavy hex bolts and 1-in.-diameter ASTM F436 flat washers. Bolts are to be snug tight only ("Snug tight" is the tightness resulting from the full effort of a man using an ordinary spud wrench).
- 4. Install one (1) test plate on the container test-weight holder and pin into place using the 1/2-in.-diameter by 4 1/2-in.-long plated oval ring hitch pin and cotter pin.

11.2 CONTAINER B PROOF-LOAD TEST

- 1. Verify that container B is properly positioned and that all test prerequisites have been completed.

Test Director JRB/102 Date 8-25-94

- 2. Lubricate the strongback hinge pins and base clevis bearing surfaces with LPS spray or an equivalent lubricant.

3. Lubricate the main hydraulic telescoping cylinder hinge pins by injecting grease and applying spray lubricant.

WARNING: BEFORE OPERATING THE TRAILER HYDRAULIC SYSTEM, ENSURE THAT ALL AUTHORIZED TEST PERSONNEL ARE A SAFE DISTANCE AWAY FROM THE HYDRAULIC TRAILER. UNAUTHORIZED PERSONNEL AND PERSONNEL NOT PERFORMING A SPECIFIC TEST FUNCTION SHALL REMAIN OUTSIDE THE ROPED-OFF TEST ZONE.

4. At the local control panel (Station 1) or from the remote control pendant (Station 2), briefly depress the black contact button labeled "STRONGBACK RAISE" and verify that the kicker cylinder pressure gauge reads a minimum of 2,000 lbf/in².
5. Using the hydraulic trailer remote control pendant (Station 2), raise the container to the full vertical position by continuously depressing the black contact button labeled "STRONGBACK RAISE."

Note: Raising the strongback/container will take approximately 15 min. When the container/strongback reaches the full vertical position (90 degrees), each of the rear kicker cylinders will contact a hard stop and trip a limit switch. Once the limit switch trips, a solenoid valve automatically actuates and diverts fluid flow from the main telescoping hydraulic cylinder to the hydraulic fluid reservoir.

6. Using the hydraulic trailer remote control pendant (Station 2), lower the container to the horizontal position by continuously depressing the black contact button labeled "STRONGBACK LOWER."
7. Ensure that the container and the strongback are properly seated at their forward support positions.
8. Shut down the hydraulic system and de-energize the electrical system in accordance with the hydraulic trailer operations manual.

Note: The hydraulic trailer outriggers may remain in the deployed position or may be retracted at the discretion of the Test Director.

9. Remove the container test-weight assembly from the container and mark the bolting (bolts and nuts) that is removed in such a way that it can be identified as used.
10. Unbolt the container from the strongback container-attachment assembly and mark the bolting that is removed in such a way that it can be identified as used.
11. Loosen the strongback container attachment assembly bolting and reposition the attachment assembly as necessary to facilitate removal of the container. Mark the bolting in such a way that it can be identified as used.
12. Remove the container from the strongback/hydraulic trailer and place on a minimum of two container supports.

- 13. Remove paint from the two vertical welds at each attachment plate (Figures 1 and 2) on the container (total of four plates) and perform a magnetic particle inspection of the welds.
- 14. Visually inspect the container and verify by signing in the space provided below that the structural integrity of the container was maintained and no signs of damage occurred as a result of testing.

Note: Visual inspection shall be the responsibility of the WHC QA representative and the Project Cognizant Engineer and/or Structural Engineer.

QA Representative J. J. [Signature] Date 8-25-94
 W320 Engineering J.R. [Signature] Date 8-25-94

- 15. When the test of container B has been completed, the Test Director shall sign below, verifying that the load test for container B is complete and that results have been accepted.

Test Director J.R. [Signature] Date 9-9-94
 QA Representative J.J. [Signature] Date 9-12-94

11.3 CONTAINER C PROOF-LOAD TEST

- 1. Verify that container C is properly positioned and all test prerequisites have been performed.

Test Director J.R. [Signature] Date 8-24-94

- 2. Lubricate the strongback hinge pins and base clevis bearing surfaces with LPS spray or an equivalent lubricant.
- 3. Lubricate the main hydraulic telescoping cylinder hinge pins by injecting grease and applying spray lubricant.

WARNING: BEFORE OPERATING THE TRAILER HYDRAULIC SYSTEM, ENSURE THAT ALL AUTHORIZED TEST PERSONNEL ARE A SAFE DISTANCE AWAY FROM THE HYDRAULIC TRAILER. UNAUTHORIZED PERSONNEL AND PERSONNEL NOT PERFORMING A SPECIFIC TEST FUNCTION SHALL REMAIN OUTSIDE THE ROPED-OFF TEST ZONE.

- 4. At the local control panel (Station 1) or from the remote control pendant (Station 2), briefly depress the black contact button labeled "STRONGBACK RAISE" and verify that the kicker cylinder pressure gauge reads a minimum of 2,000 lbf/in².
- 5. Using the hydraulic trailer remote control pendant (Station 2), raise the container to the full vertical position by continuously depressing the black contact button labeled "STRONGBACK RAISE."

Note: Raising the strongback/container will take approximately 15 min. When the container/strongback reaches the full vertical position

(90 degrees), each of the rear kicker cylinders will contact a hard stop and trip a limit switch. Once the limit switch trips, a solenoid valve automatically actuates and diverts fluid flow from the main telescoping hydraulic cylinder to the hydraulic fluid reservoir.

6. Using the hydraulic trailer remote control pendant (Station 2), lower the container to the horizontal position by continuously depressing the black contact button labeled "STRONGBACK LOWER."
 7. Ensure that the container and the strongback are properly seated at their forward support positions.
 8. Shut down the hydraulic system and de-energize the electrical system in accordance with the hydraulic trailer operations manual.
- Note: The hydraulic trailer outriggers may remain in the deployed position or may be retracted at the discretion of the Test Director.
9. Remove the container test-weight assembly from the container and mark the bolting (bolts and nuts) in such a way that it can be identified as used.
 10. Unbolt the container from the strongback container attachment assembly and mark the bolting in such a way that it can be identified as used.
 11. Loosen the strongback container attachment assembly bolting and reposition the attachment assembly as necessary to facilitate removal of the container. Mark the bolting in such a way that it can be identified as used.
 12. Remove the container from the strongback/hydraulic trailer and place on a minimum of two container supports.
 13. Remove paint from the two vertical welds at each attachment plate (Figures 1 and 2) on the container (total of four plates) and perform a magnetic particle inspection of the welds.
 14. Visually inspect the container and verify by signing in the space provided below that the structural integrity of the container was maintained and no signs of damage occurred as a result of testing.

Note: Visual inspection shall be the responsibility of the WHC QA representative and the Project Cognizant Engineer and/or Structural Engineer.

QA Representative  Date 8-25-94

W320 Engineering  Date 8-25-94

15. Once container C has been tested, the Test Director shall sign below, verifying that the load test for container C is complete and that results have been accepted.

Test Director JRB Date 9-9-94

QA Representative J. [Signature] Date 9-12-94

11.4 RETURN TO NORMAL

WARNING: BEFORE OPERATING THE TRAILER HYDRAULIC SYSTEM, ENSURE THAT ALL AUTHORIZED TEST PERSONNEL ARE A SAFE DISTANCE AWAY FROM THE HYDRAULIC TRAILER. UNAUTHORIZED PERSONNEL AND PERSONNEL NOT PERFORMING A SPECIFIC TEST FUNCTION SHALL REMAIN OUTSIDE THE ROPED-OFF TEST ZONE.

1. Retract hydraulic trailer outriggers and shut down the trailer hydraulic and electrical systems in accordance with the shutdown procedure included the hydraulic trailer operations manual.
2. Locate and bolt the strongback container attachment assemblies in their respective positions on the strongback. Bolting is to be hand tight only. Used bolts may be used provided they are marked as used and threads are not damaged.
3. If either of the forward supports on the hydraulic trailer has been removed, reinstall and bolt into position as directed by the Test Director.
4. If the hydraulic trailer is to be relocated, prepare it for transportation as directed by the Test Director.

12.0 DISPOSITION OF TEST ITEMS

At the conclusion of testing, all test items (equipment containers and test equipment) shall be relocated and/or stored as specified by the Test Director or the ICF KH Construction Manager.

13.0 DATA SHEETS

The Test Director shall review the test procedure ((Section 11.0) and ensure that verifications have been obtained where required. Copies of magnetic particle inspection reports and any QA surveillance reports generated as part of the test performance shall be attached to the test procedure.

Figure 1. 52-Inch-Diameter Equipment Container Weld
Magnetic Particle Test Locations, Detail 1.

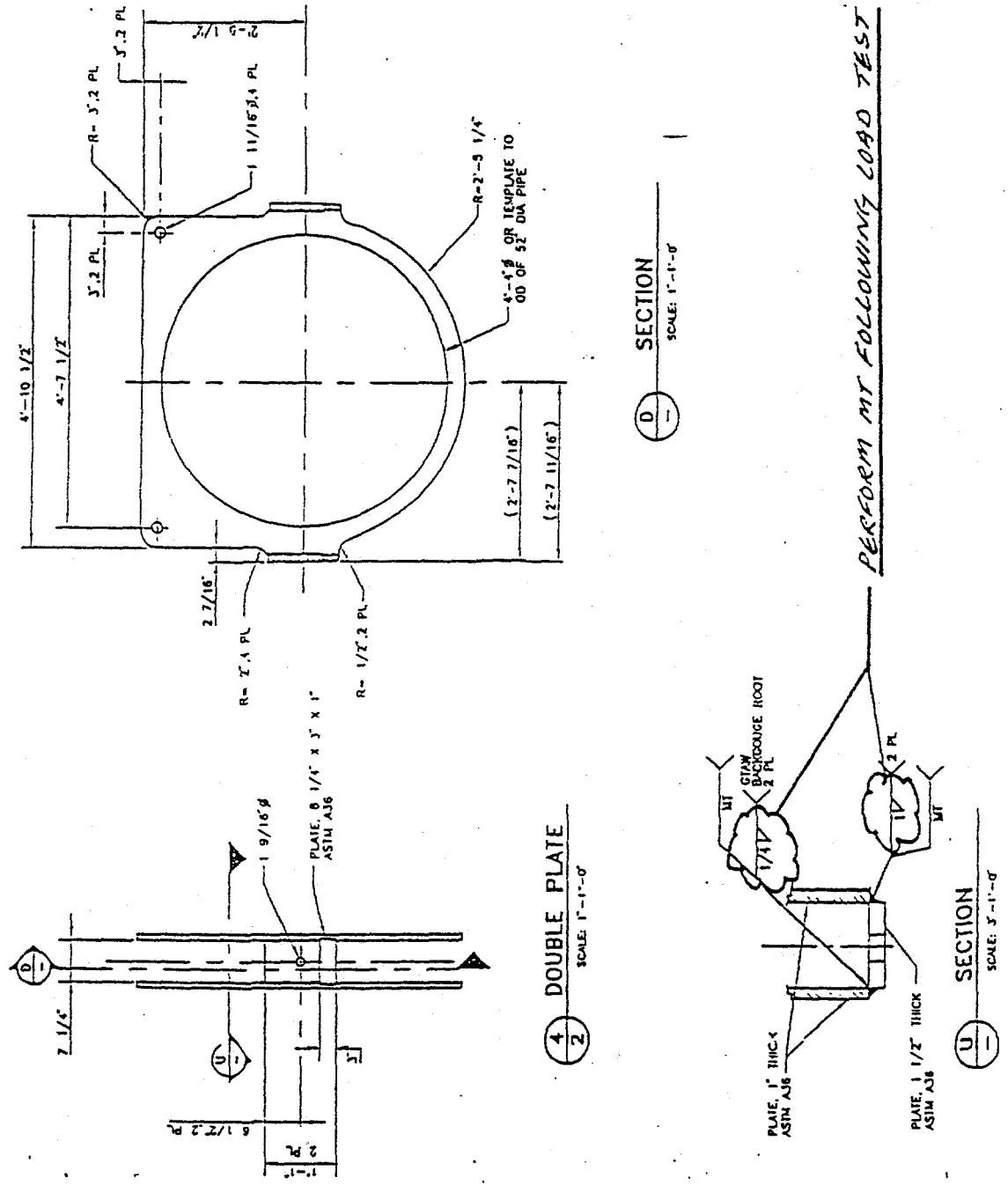
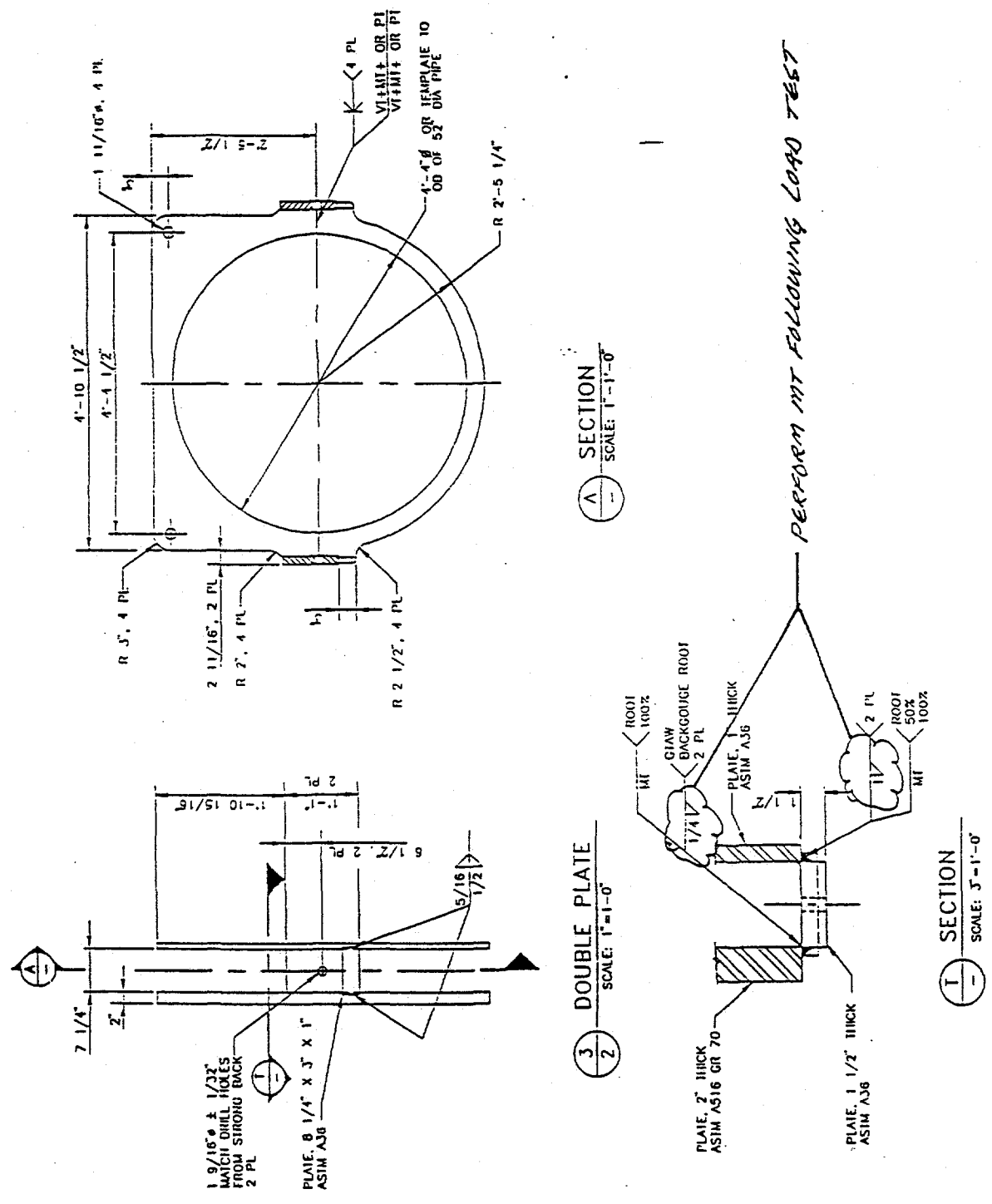


Figure 2. 52-Inch-Diameter Equipment Container Weld
 Magnetic Particle Test Locations, Detail 2.



KAISER ENGINEERS HANFORD			MAGNETIC PARTICLE EXAMINATION REPORT			
Report No. <i>W320-41-01</i>		W.O. No./Location <i>1241/216, 300000 N/E 4 A</i>		Procedure No.		Date <i>8-25-94</i>
Requested By <i>W.A. VAN PELT</i>		Material <i>CP</i>		Examination Standard <i>ASME SEC. V</i>		Acceptance Standard <i>AWS D1.1</i>
Particles Used: Dry <input checked="" type="checkbox"/> Wet <i>N/A</i> Color <i>RED 8A</i>			Weld/Part No. <i>CONTAINER "C"</i>		Welder <i>N/A</i>	
Equipment/Manufacturer <i>MAGNAFLUX A-90 M; TE # 0332</i>			Due: <i>5/23/95</i>	Coll	Prods	Yoke AC DC <i>N/A N/A</i>
Ampere Turns <i>N/A</i>		Prod Spacing <i>5"</i>		Amps <i>500</i>		Dwg. or Iso No. <i>N/A</i>
AREA	ACC.	REJ.	INDICATIONS			
<i>PLATE 1</i>	<input checked="" type="checkbox"/>		<i>AFTTEC LOAD TEST - PCI O&EC NO. 20.1-11.3</i>			
<i>PLATE 2</i>	<input checked="" type="checkbox"/>					
<i>PLATE 3</i>	<input checked="" type="checkbox"/>					
<i>PLATE 4</i>	<input checked="" type="checkbox"/>					
						<i>* WITNESS BY I.C.F. KH. A.I. C. Hoover</i>
Technician <i>[Signature]</i> Level <i>II</i> Interpretation By <i>[Signature]</i> Level <i>II</i> KEH Approval <i>N/R</i> Level						
Date <i>8/25/95</i>			Date <i>8/25/94</i>		Date	

ORIGINAL

SD#005

WHP-SD-W320-TRP-002
REVISION 8

**KAISER ENGINEERS
HANFORD**

MAGNETIC PARTICLE EXAMINATION REPORT

Report No. <i>W320-41-02</i>	W.O. No./Location <i>EC4289 12410144, 3000429</i>	Procedure No. <i>NDE 4A</i>	Date <i>8/25/94</i>
Requested By <i>W.A. Van Aelt</i>	Material <i>CS</i>	Examination Standard <i>ASME SEC. V</i>	Acceptance Standard <i>AMS D1.1</i>
Particles Used: Dry <input checked="" type="checkbox"/> Wet <input type="checkbox"/> Color <i>RED BA</i>	Weld/Part No. <i>CONTAINER "B"</i>	Welder <i>N/A</i>	
Equipment/Manufacturer <i>MAGNAFLUX A-90 M; TE #0332</i>	Coll <i>N/A</i> Prods <input checked="" type="checkbox"/>	Yoke <i>N/A</i> AC <i>N/A</i> DC <input checked="" type="checkbox"/>	
Ampere Turns <i>N/A</i>	Prod Spacing <i>5"</i>	Amps <i>500</i>	Dwg. or Iso No.

AREA	ACC.	REJ.	INDICATIONS
<i>PLATE 1</i>	<input checked="" type="checkbox"/>		<i>AFTER LOAD TEST - ACI OPER. NO. 20.1-11.3</i>
<i>PLATE 2</i>	<input checked="" type="checkbox"/>		
<i>PLATE 3</i>	<input checked="" type="checkbox"/>		
<i>PLATE 4</i>	<input checked="" type="checkbox"/>		

WITNESS BY *J.C.F. K.H.
A.I. - T.L. Morris*

Technician <i>[Signature]</i>	Level <i>II</i>	Interpretation By <i>[Signature]</i>	Level <i>II</i>	KEH Approval <i>N/R</i>	Level
Date <i>8/25/94</i>		Date <i>8/25/94</i>		Date	

SA # 009

KAISER ENGINEERS HANFORD			MAGNETIC PARTICLE EXAMINATION REPORT PCA W320-				
Report No. W320-41-05		W.O. No./Location EC4289 124/BLK. 300000 NDE 4A		Procedure No. NDE 4A		Date 8-29-94	
Requested By W.F. VANFELT		Material CS		Examination Standard ASME SEC V		Acceptance Standard AWS D1.1	
Particles Used: Dry <input checked="" type="checkbox"/> Wet <input type="checkbox"/> Color <u>RED</u>			Weld/Part No. CONTAINER "C"		Welder N/A		
Equipment/Manufacturer MAGNIA FLUX A90 MITE # 0332			DVE: 5-23-75 Coll <u>N/A</u> Prods <input checked="" type="checkbox"/>		Yoke <u>N/A</u> AC <u>N/A</u> DC <input checked="" type="checkbox"/>		
Ampere Turns <u>N/A</u>		Prod Spacing 5"		Amps 500		Dwg. or Iso No. H-2-83728 wt 3	
AREA	ACC.	REJ.	INDICATIONS				
SECT 1	✓						
2	✓						
3	✓						
4	✓						
SEC. 4	✓						
2	✓						
3	✓						
4	✓						
NOTE: THIS INSPECTION IS FOR THE 1/4" FILLET WELDS AT EACH LOCATION, THESE WELDS WERE NOT TESTED PRIOR TO THE LOAD TEST.							
* WITNESS BY ICF KH A.I. - T.L. Morris							
Technician <i>[Signature]</i>		Level II		Interpretation By <i>[Signature]</i>		Level II	
Date 8/30/94		Date 8/30/94		KEH Approval <i>[Signature]</i>		Level	

SA# 008

KAISER ENGINEERS HANFORD			MAGNETIC PARTICLE EXAMINATION REPORT			
Report No. W320-41-04		W.O. No./Location ERT2B9 124 BLDG. 300		Procedure No. NDE 4A		Date 8-29-94
Requested By W.P. VANDELT		Material C/S		Examination Standard ASME SEC. V		Acceptance Standard AMS A.1.1
Particles Used: Dry <input checked="" type="checkbox"/> Wet <input type="checkbox"/> Color <i>RED</i>			Weld/Part No. CONTAINER "B"		Welder N/A	
Equipment/Manufacturer MAGNA FLUX A-90			Coll N/A	Prods <input checked="" type="checkbox"/>	Yoke N/A	AC <input type="checkbox"/> DC <input checked="" type="checkbox"/>
Ampere Turns N/A		Prod Spacing 5"		Amps 500		Dwg. or Iso. No. H-2-83724-INT 3
AREA	ACC.	REJ.	INDICATIONS			
SECT 1	<input checked="" type="checkbox"/>		REFER TO SKETCH # W320-01-B # B3			
2	<input checked="" type="checkbox"/>					
3	<input checked="" type="checkbox"/>					
4	<input checked="" type="checkbox"/>					
SECT. 1	<input checked="" type="checkbox"/>					
2	<input checked="" type="checkbox"/>					
3		<input checked="" type="checkbox"/>	3/8" SLAG INCLUSION			
4	<input checked="" type="checkbox"/>					
NOTE: THIS INSPECTION IS FOR THE 1/4" FILLET WELDS AT EACH LOCATION, THESE WELDS WERE NOT TESTED PRIOR TO THE LOAD TEST.						
* WITNESS BY JCFRH A.I. - T.L. MORRIS						
Technician <i>[Signature]</i>		Level II	Interpretation By <i>[Signature]</i>		Level II	KEH Approval N/R
Date 8/30/94			Date 8/30/94			Date

