RETURN TO 396-SS

71-9044

CHEM-NUCLEAR SYSTEMS, INC.
220 Stoneridge Drive • Columbia, South Carolina 29210

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U.S. NUCLEAR REGULATORY COMMISSION
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Mail Section

April 24, 1987
611-0125-87

Mr. Charles E. MacDonald, Chief
Transportation Certification Branch
Division of Fuel Cycle and Material Safety, NMSS
United States Nuclear Regulatory Commission
Washington, D.C. 20555

Reference: Letter R.T. Anderson, CNSI to C.E. MacDonald, U.S. NRC,
Dated April 15, 1987

Dear Mr. MacDonald:

SUBJECT: Docket No. 71-9044

As indicated in the referenced letter, CNSI respectfully requests an amendment to the Model No. CNS 1-13G package. This submittal includes "as-built" engineering drawings, complete operating, maintenance and initial acceptance procedures for the subject cask in support of this application. Also enclosed is payment in the amount of $150.00 (one hundred and fifty dollars) for the initial fee in support of this amendment.

Please feel free to contact me if you or members of your staff have any questions concerning this submittal.

Very Truly Yours,

CHEM-NUCLEAR SYSTEMS, INC.

Robert T. Anderson

Robert T. Anderson
Director, Cask and Transportation Systems

RA/dsr

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APR 28 1987
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Enclosures: Ten copies Supplement To Docket No. 71-9044 for Chem-Nuclear Systems, Inc. CNS-13G Type B Radwaste Shipping Cask.

Log Apr-2-87
Remitter
Check No. 61-1760750 48
Amount $150
Fee Category 10 B
Type of Fee Amd
Date Check Rec'd 4/30/87
Date Completed 5/1/87
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DOCKET NO. 71-9044
CONTROL NO. 28129
DATE OF DOC. 04/24/87
DATE RCVD. 04/28/87
FCUF _____ PDR ✓
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FCTC ✓ OTHER _____
DATE 4/28/87 INITIAL CEC

SUPPLEMENT TO DOCKET NO. 71-9044

FOR

CHEM-NUCLEAR SYSTEMS, INC.

CNS 1-13G

TYPE B RADWASTE SHIPPING CASK

USA/9044/B( )F

CNSI Document No. CNSI 9044-S1

Revision No. --

Date: April 24, 1987

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1.0 GENERAL INFORMATION

1.1 Introduction

The purpose of this supplement to Docket No. 71-9044 is to provide handling, maintenance and initial package acceptance information specific to the model CNS 1-13G Cask licensed by the US Nuclear Regulatory Commission (NRC) and owned/operated by Chem-Nuclear Systems, Inc. The Supplement articulated herein provides the necessary guidance for compliance with the applicable requirements of Code of Federal Regulations, Title 10, Part 71 (10CFR71).

1.2 Applicability

This supplement is applicable only to CNS 1-13G Casks licensed by the NRC under Certificate of Compliance No. 9044 and owned/operated by the Chem-Nuclear Systems, Inc.

1.3 Package Description

Steel encased, lead shielded cask for fissile, solid metal or metal oxides by-product material. The cask is a right circular cylinder 68 inches high by 38-1/2 inches in diameter. The cask has a cavity which is 54 inches high by 26-1/2 inches in diameter. The cask side wall consists of a 1/2-inch thick inner steel shell, a 5-inch lead shell, and a 1/2-inch thick outer steel shell. The outer base of the cask is comprised of a 1/8-inch steel shim plate and backing ring and a 1/2-inch steel plate welded to form a 5/8-inch thick base which is integrally welded to the outer steel shell of the side wall. The cask lid is a lead-filled flanged plug. The cask closure is sealed by a silicone rubber gasket. Positive closure is accomplished by six one inch diameter studs. The cask is equipped with a cavity drain line and plug.

The cask is provided with two lifting ears bolted to the cask body 180° apart. Two additional ear mounting hole patterns are provided for optional lifting ears. The closure lid is provided with a single lifting lug. a double-walled steel cylinder protective overpack encloses the cask during transport and is bolted to a steel pallet with 2-inch diameter studs. The protective overpack is equipped with two rectangular lifting loops and two tie-down ears. The cask packaging weight is approximately 25,500 pounds.

2.0 CHEM-NUCLEAR SYSTEMS, INC. "AS BUILT" DRAWINGS

2.1 The CNS 1-13G Cask is fabricated in accordance with the following CNSI Drawings:

2.1.1 Drawing No. C-110-B-06402-001, Rev.-

2.1.2 Drawing No. C-110-B-06402-002, Rev.-

2.1.3 Drawing No. C-110-B-06402-003, Rev.-

2.1.4 Drawing No. C-110-B-06402-004, Rev.-

2.2 A CNS 1-13G anxiliary shielded inner container and shoring plug are fabricated in accordance with CNSI Drawing Nos. 8651-E-02, Rev. A and 8651-C-01, Rev. B.

2.3 The above listed drawings are attached to this supplement.

3.0 OPERATING PROCEDURES

This section provides generic instruction for loading and unloading the CNS 1-13G cask. Detailed procedures developed, reviewed, and approved following requirements of the CNSI Q.A. program are issued to authorized users.

3.1 Loading Procedure

CAUTION: **TREAT THE INSIDE SURFACES OF THE OVERPACK AND THE LINER OR DRUM IN THE CASK AS CONTAMINATED.**

3.1.1 Remove the overpack.

3.1.1.1 Remove the lead/wire security seals.

3.1.1.2 Remove the ten (10) 2-inch bolts from the overpack.

3.1.1.3 Remove the two (2) 1-1/2 inch bolts from the side of the overpack.

3.1.1.4 Remove the tie-down cables/chains.

3.1.1.5 Attach crane to overpack and remove.

3.2 Prepare To Load Cask

NOTE: THIS CASK MAY BE LOADED UNDERWATER. IF THIS IS THE CASE, FOLLOW THE PROCEDURE FOR WET LOADING, SECTION 3.2.2.

3.2.1 Procedure for Dry Loading:

CAUTION: DO NOT LIFT THE CASK BY THE LIFTING LUG ON THE CASK LID.

3.2.1.1 Remove cask from trailer, if necessary, by attaching crane to cask lifting lugs.

3.2.1.2 Remove the cask lid.

3.2.1.2.1 Remove the six (6) 1-inch bolts from the cask lid.

3.2.1.2.2 Attach crane to lid lifting lug and remove lid.

3.2.1.2.3 Visually inspect the lid gasket for any cracks or tears. Replace gasket if it is damaged. Inspect and clean the gasket seating surfaces.

3.2.1.2.4 Visually inspect the cask cavity to verify integrity. Remove any liquids or foreign materials.

3.2.1.2.5 Visually inspect the baseplate to cask shell weld for any indications or other defects apparent to the naked eye. This weld should be indication free.

3.2.1.3 Using crane and suitable rigging, load the liner or drum into the cask.

NOTE: CLEAN THE LINER OR DRUM BEFORE PLACING IT IN THE CASK, TREATING DEBRIS REMOVED AS CONTAMINATED.

3.2.1.4 Replace the cask lid.

3.2.1.4.1	Attach crane to lid and position on the cask using the alignment pins.
3.2.1.4.2	Visually inspect the cask lid closure bolts for signs of cracking or other visual signs of defects. Replace any defective materials.
3.2.1.4.3	Replace the six (6) 1-inch bolts on the cask lid. Torque bolts to 220 $\pm$ 22 ft.-lbs. (160 $\pm$ 16 ft.-lbs., if lubricated), using a star pattern.
NOTE:	**TIGHTEN ALL BOLTS HAND-TIGHT BEFORE STARTING THE TORQUE SEQUENCE.**

3.2.2 Procedure for Wet Loading

CAUTION: DO NOT LIFT THE CASK BY THE LIFTING LUG ON THE CASK LID.

3.2.2.1 Remove the cask from trailer by attaching crane to cask lifting lugs.

3.2.2.2 Remove the cask lid.

3.2.2.2.1	Remove the six (6) 1-inch bolts from the cask lid.
3.2.2.2.2	Attach crane to lid lifting lug and remove lid.
3.2.2.2.3	Visually inspect the lid gasket for any cracks or tears. Replace gasket if it is damaged. Inspect and clean the gasket seating surfaces.
3.2.2.2.4	Visually inspect the cask cavity to verify integrity. Remove any liquids or foreign materials.

3.2.2.2.5 Visually inspect the baseplate to cask shell weld for any indications or other defects apparent to the naked eye. This weld should be indication free.

3.2.2.3 Prepare to lower cask into pool.

NOTE: TREAT ANY LIQUID FROM THE CASK DRAIN AS CONTAMINATED.

3.2.2.3.1 Remove the cask drain plug.

3.2.2.3.2 Visually inspect the drain plug for signs of cracking or other visual signs of defects. Replace if defective.

3.2.2.3.3 To ensure proper operation of cask drain line, add demineralized water to cask cavity or lower cask into pool. Water should flow freely from the cask drain line. If water does not flow freely, inspect drain line for obstruction.

3.2.2.3.4 Attach crane to cask lifting lugs and lower into pool.

3.2.2.3.5 If necessary, detach crane from cask and load liner or drum into cask.

3.2.2.4 Replace cask lid on cask.

NOTE: LID MAY BE REPLACED AFTER CASK IS REMOVED FROM POOL.

3.2.2.4.1 Attach crane to cask lid and position on cask using the alignment pins.

3.2.2.4.2 Disconnect crane from lid.

3.2.2.5 Remove cask from pool.

3.2.2.5.1 Lift cask out of pool and allow water to drain into pool.

3.2.2.5.2 After cask is completely drained, place sealant on drain plug and reinstall into drain line.

3.2.2.5.3 Replace the six (6) 1-inch bolts on the cask lid. Torque bolts to 220 ± 22 ft.-lbs. (160 ± 16 ft.-lbs., if lubricated), using a star pattern.

NOTE: TIGHTEN ALL THE BOLTS HAND-TIGHT BEFORE STARTING THE TORQUE SEQUENCE.

3.2.2.5.4 Decontaminate all external surfaces of the cask.

3.2.2.6 Replace cask on trailer.

3.2.2.6.1 Attach crane to cask lifting lugs and place on cask baseplate in the same configuration as received.

3.2.3 Replace the overpack.

3.2.3.1 Attach crane to overpack and place overpack into proper position over cask.

3.2.3.2 Visually inspect all overpack bolts for signs of cracking or other visual signs of defects. Replace any defective materials.

3.2.3.3 Replace the ten (10) 2-inch bolts in the baseplate. Torque bolts to 400 ± 40 ft.-lbs. (300 ± 30 ft.-lbs., if lubricated).

3.2.3.4 Replace the two (2) 1-1/2 inch bolts on side of the overpack. Torque bolts to 300 ± 30 ft.-lbs. (200 ± 20 ft.-lbs., if lubricated).

3.2.3.5 Place seal wires through the 1-1/2 inch bolts on side of cask overpack.

3.2.3.6 Replace chains/cables on overpack.

3.2.4 Before the cask leaves facility, confirm:

3.2.4.1 That any external lifting lugs are properly covered.

3.2.4.2 That trailer placarding and cask labeling meet D.O.T. specifications (CFR Title 49, Part 172).

3.2.4.3 That exterior radiation levels do not exceed 200 mR/hr on contact, 10 mR/hr at 2 meters, and 2 mR/hr in tractor cab, in accordance with 49 CFR 173.441.

3.2.4.4 That outer package is sealed with anti-tamper seals.

3.2.4.5 That the cask drain plug is sealed and securely installed.

3.3 Unloading Procedure

NOTE: UPON RECEIPT OF CASK, PERFORM SURVEY FOR DIRECT RADIATION AND REMOVABLE CONTAMINATION USING APPROVED PROCEDURES TO ASSSURE COMPLAINCE WITH APPLICABLE REQUIREMENTS OF 10 CFR 20.205.

3.3.1 Remove the overpack.

3.3.1.1 Remove the lead/wire security seals.

3.3.1.2 Remove the ten (10) 2-inch bolts from the overpack.

3.3.1.3 Remove the two (2) 1-1/2 inch bolts from the side of the overpack.

3.3.1.4 Remove the tie-down cables/chains.

3.3.1.5 Attach crane to overpack and remove overpack.

3.3.2 Remove the cask lid.

CAUTION: TREAT THE UNDERSIDE OF THE LID, THE SURFACES OF THE CASK, ANY BOLTS OR SEALS REMOVED AS CONTAMINATED.

3.3.2.1 Remove the six (6) 1-inch bolts from the cask lid.

3.3.2.2 Attach crane to lid lifting lug and remove lid.

3.3.3 The health physics technician shall conduct a radiation and contamination survey to determine offloading precautions.

3.3.4 If directed by the health physics technician, vacate all personnel from the immediate area except the crane operator and a rigger. The rigger shall stand in clear view of the crane operator.

3.3.5 Remove contents of cask.

3.3.5.1 Attach appropriate lifting device to the liner or drum.

3.3.5.2 Lift the liner or drum straight up out of the cask and allow any liquid to drip off into the cask.

3.3.5.3 Place the liner or drum in position for disposal or future handling.

3.3.6 The health physics technician shall survey the interior of the cask for radiation and contamination levels. Decontaminate if acceptable levels (as per site operations) are exceeded.

CAUTION: TREAT ANY LIQUID IN THE CASK OR USED IN THE DECONTAMINATION PROCESS AS CONTAMINATED

3.3.7 Visually inspect the inside of the cask for damage or for liquid accumulation. Contact Health Physics for instructions to remove any liquids or foreign material from cask. If the inside surfaces of the cask are damaged, remove the cask from service.

3.3.8 Place new liner or drum into cask.

NOTE: CLEAN THE LINER OR DRUM BEFORE PLACING IT INTO CASK. TREAT DEBRIS REMOVED AS CONTAMINATED.

3.3.8.1 Using appropriate lifting gear and crane, carefully lower the liner or drum into cask cavity. DO NOT damage the gasket seating surfaces, the side of the cask, or inner walls.

3.3.9 Replace cask lid.

3.3.9.1 Visually inspect the lid gasket for any cracks or tears. Replace gasket if it is damaged. Inspect and clean the gasket seating surfaces.

3.3.9.2 Visually inspect the cask lid closure bolts for signs of cracking or other visual signs of defects. Replace any defective materials.

3.3.9.3 Attach crane to lid and position on the cask using the alignment pins.

3.3.9.4 Replace the six (6) 1-inch bolts on the cask lid. Torque bolts to 220 ± 22 ft.-lbs (160 ± 16 ft.-lbs., if lubricated), using a star pattern.

NOTE: TIGHTEN ALL BOLTS HAND-TIGHT BEFORE STARTING THE TORQUE SEQUENCE.

3.3.10 Replace the overpack.

3.3.10.1 Attach crane to overpack and place overpack onto baseplate using the alignment pin.

3.3.10.2 Visually inspect all overpack bolts for signs of cracking or other visual signs of defects. Replace any defective materials.

3.3.10.3 Replace the ten (10) 2-inch bolts in the baseplate. Torque bolts to 400 + 40 ft.-lbs. (300 ± 30 ft.-lbs., if lubricated).

3.3.10.4 Replace the two (2) 1-1/2 inch bolts on side of the overpack. Torque bolts to 300 ± 30 ft.-lbs. (200 ± 20 ft.-lbs., if lubricated).

3.3.10.5 Place seal wires through the 1-1/2 inch bolts on side of overpack.

3.3.10.6 Replace chains/cables on the overpack.

3.3.11 Before the cask leaves the facility, the following shall be confirmed:

3.3.11.1 That any external lifting lugs are properly covered.

3.3.11.2 That trailer placarding and cask labeling meet D.O.T. specifications (CFR Title 49, Part 172).

3.3.11.3 That exterior radiation and contamination levels conform to requirements as established in site radiation and contamination release procedures and D.O.T. requirements.

3.3.11.4 That the outer package is sealed with anti-tamper seals.

3.3.11.5 Check the cavity drain line to determine that the drain plug is properly installed using a pipe thread sealant.

4.0 ACCEPTANCE TEST AND MAINTENANCE PROGRAM

4.1 Initial Acceptance Test

During and after fabrication of a new cask, various tests and inspections are required prior to the first use of the cask. The tests and inspections required to be performed are enumerated below:

4.1.1 Visual inspection and dimensional verification of the entire cask and its accessories shall be performed to verify compliance with the requirements of appropriate drawings, specifications, applicable codes and other pertinent data indicating qualitative and quantitative acceptable criteria. All visual inspection shall be carried out either directly or remotely as described hereafter. The following shall be inspected: surface condition, dimension, finishes, shape, locations, details, size of holes, cleanliness, etc.

4.1.2 Lifting Lugs Load Test shall also be performed. The Load Test of all lifting lugs shall be performed in accordance with a procedure approved by Chem-Nuclear Systems, Inc. Each lug shall be load tested to one and a half times the calculated load capacity of the lug and held ten minutes as a minimum. After the load test, all welding on the lugs will be examined by dye penetrant testing using the procedure approved by Chem-Nuclear Systems, Inc. and performed by qualified personnel. Dye Penetrant Test shall meet the requirements of ASME Code Section III, Division I Subsection NB, Article NB-5000 and Section V, Article 6. Test Reports shall be documented and included in the Quality Assurance Records of the cask.

4.1.3 Seal Integrity shall also be performed prior to first use of the cask. A Leak Test shall be applied to the cask to assure leak tightness of the seals. The cask shall be pneumatically pressurized to 15 psi and while under pressure, seals are soap bubble checked for leakage acceptance criteria - no visible bubbles. Test Report shall be documented and included in the Quality Assurance Records of the cask.

4.1.4 Test for Shielding Integrity shall be performed after the lead pouring operations. A Gamma Scan shall be applied to verify lead thickness, shielding capacity and to determine existence of any voids or impurities in the poured lead. The Gamma Scan procedure shall specify an acceptance criteria for verification that the nominal lead thickness is not less than 5 inches. The Gamma Scan must show no greater than ten percent loss of shielding at any point based on a four inch grid spacing. The Gamma Scan shall be performed by qualified personnel in accordance with a procedure approved by Chem-Nuclear Systems, Inc. Results of the Gamma Scan shall be documented and included in the Quality Assurance Records of the cask.

4.1.5 The baseplate to the cask shell weld shall be liquid penetrant inspected in accordance with ASME Code Section III, Division I,, Subsection NB, Article NB-5000 and Section V, Article 6, for the root pass and final weld. Test Reports shall be documented and included in The Quality Assurance Records of the cask.

4.2 Maintenance Program

The Chem-Nuclear Systems, Inc. maintenance requirements for the CNS 1-13G Cask are articulated in this section. These requirements reflect the specific operating conditions, limitations and regulatory requirements.

4.2.1 Painted Surfaces

A. Painted surfaces shall be cleaned by steam or pressurized hot water using standard commercial equipment, chemical solutions, and procedures. There are no special precautions required in this cleaning operation.

B. Chipped or scratched surfaces shall be retouched or repainted using Chem-Nuclear Systems, Inc. approved paints.

C. Alignment stripes shall be repainted when they are chipped, peeled off, faded, or not legible. Only localized surface preparation (sanding and cleaning) is required prior to repainting of alignment stripes.

4.2.2 Structural Members and Welds

A. All structural members and welds shall have been checked prior to initial use of the cask. Inspections of structural members and welds (except as specified in 4.2.2.D and 4.2.2.E) are not required during routine use unless the cask has been involved in an accident or has been lifted improperly or in an overload condition. In those cases, inspection must be performed as follows:

Drop or Accident - All accessible structrual members, welds, ratchet binders, shall be visually inspected. In addition, all accessible welds must be dye penetrant tested. The Dye Pentrant Test shall be performed by qualified personnel using a Chem-Nuclear Systems, Inc. approved procedure. Dye Penetrant Test shall meet the requirements of ASME Code, Section III, Division 1 Subsection NB, Article NB-5000 and Section V, Article 6. The Gamma Scan must be repeated and evaluated to the initial acceptance criteria. Test reports shall be documented and included in the Quality Assurance Records of the cask.

Improper or Overload Lift - All welds on the primary or secondary lid which were used during the time of improper or overload lift shall be load tested and dye penetrant tested. Load and Dye Penetrant Test shall be performed in the same manner as delineated in the above paragraphs.

B. Whenever the cask requires total repainting and is sandblasted, all structural members and welds shall be visually inspected for any indications. Suspect members and welds shall be dye penetrant tested. Dye Penetrant Test shall be performed in the same manner as delineated in the above paragraphs.

C. Weld repairs if any shall be performed by qualified personnel using Chem-Nuclear Systems, Inc. approved procedures. Welding shall meet the requirements of ASME Code Section IX and/or AWS D1.1.

D. The baseplate to cask shell weld shall be visually inspected prior to each use in accordance with ASME Code Section III, Division 1, Subsection NB, Article NB-5000 and Section V, Article 9.

E. The baseplate to cask shell weld shall be dye penetrant tested annually in accordance with ASME Code Section III, Division I, Subsection NB, Article NB-5000 and Section V, Article 6.

4.2.3 Gasket Integrity

A. All Gaskets shall be inspected for proper installation prior to each cask loading.

B. All Gaskets shall be replaced once a year as a minimum regardless of condition.

C. Gaskets which are damaged must be replaced or repaired. Damages may include cuts, nicks, chips, indentations, or any other defects apparent to the naked eye which would affect sealing functions.

D. Any painted surfaces in contact with the gaskets shall be maintained in good condition. Any paint surface defect shall be properly retouched or repaired per paragraph 4.2.1.B.

4.2.4 Fasteners

A. All fasteners shall be inspected for damage after each use. Fasteners shall be replaced if the following conditions exist:

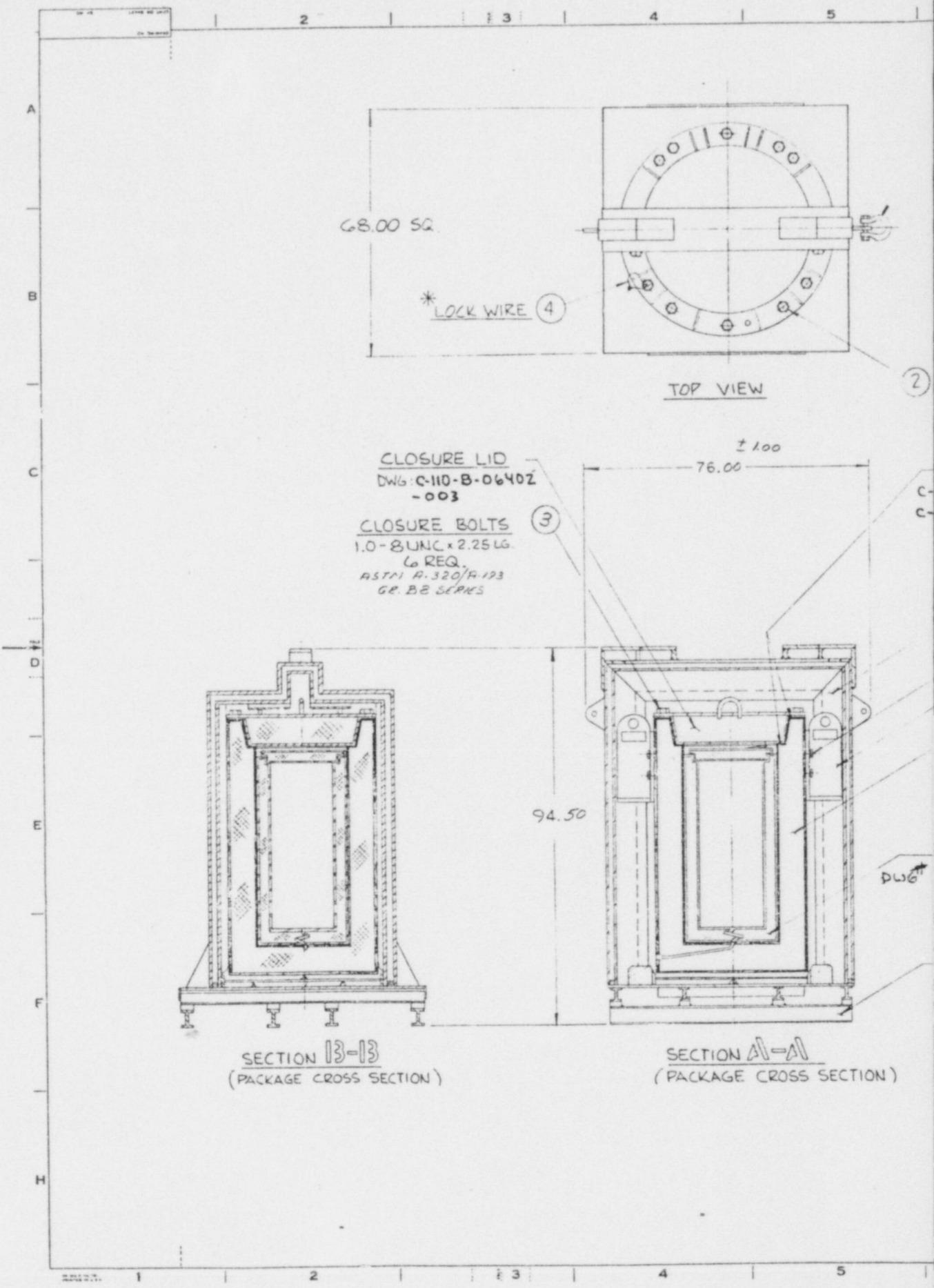
- Deformed or stripped threads.
- Cracked or deformed hexs on bolt heads or nuts.
- Elongated or scored grip length area on bolts or studs.
- Severe rusting or corrosion pitting.

B. Fasteners shall be inspected for cleanliness and presence of lubricant in the threads prior to use. Any fastener found dirty shall be cleaned and relubricated.

5.0 QUALITY ASSURANCE

5.1 On December 21, 1978 Chem-Nuclear Systems, Inc. filed with the NRC a description if its Quality Assurance Program in accordance with 10 CFR 71.51(a). The Chem-Nuclear Systems, Inc. Quality Assurance Program was initially approved by the NRC on October 26, 1979 and Approval Certificate No. 0231 was issued. The Chem-Nuclear Systems, Inc. Quality Assurance Program was subsequently reapproved on September 6, 1983, and January 23, 1985. Under this certificate, the continued use of the program is authorized.

5.2 The Licensed CNS 1-13G Casks owned by Chem-Nuclear Systems, Inc. which are certified under the provisions of 10 CFR 71 and built after January 1979 are designed, fabricated, assembled, tested, modified, maintained and repaired in accordance with a Nuclear Regulatory Commission approved Quality Assurance Program (Docket #71-0231).


68.00 SQ.
*LOCK WIRE (4)
TOP VIEW
(2)
CLOSURE LID
DWG: C-110-B-06402
-003
CLOSURE BOLTS
(3)
1.0-8 UNC x 2.25 LG.
6 REQ.
ASTM A-320/A-193
GR. B8 SERIES
± 1.00
76.00
94.50
SECTION B-B
(PACKAGE CROSS SECTION)
SECTION A-A
(PACKAGE CROSS SECTION)

(1) * TIE DOWN SHACKLE

HEX HD. BOLT
2.0-4.5 UNC-2A x 4.5 LG.
ASTM A449 (OR EQUAL)
(10 REQD)

SEAL (SEE DWG#)
110-B-06402-003 G3 OR G5 (UPPER)
110-B-06402-003 G4 (LOWER)
(LOCATION OPTIONAL)

OVERPACK
DWG. C-110-B-06402-002

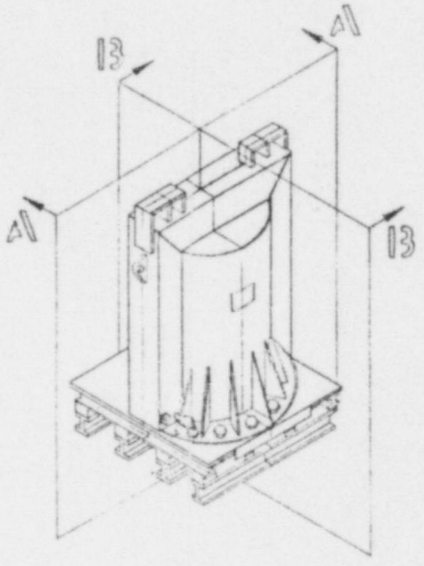
HEX HD. BOLT
REF DWG C-110-B-06402-003

NORMAL LIFTING EAR
SEE NOTE 1

SHIPPING CASK BODY
DWG.- C-110-B-06402-003

LINER (ALL LINERS OPTIONAL)
C-110-B-06402-004 G1 (SHOWN)
C-110-B-06402-004 G2

BASE
DWG.- C-110-B-06402-002



ISOMETRIC VIEW
OF MODEL 1-13G PACKAGE

TI APERTURE CARD

Also Available On Aperture Card

NOTE :

1. REDUNDANT LIFTING EARS (NOT SHOWN) ARE USED FOR CERTAIN IN-PLANT OPERATIONS, (DWG # C-110-B-06402-003)
2. BASE AND OVERPACK INSIDE & OUTSIDE ARE PAINTED WITH RUSTOLEUM GRAY OR EQUIV.
3. DIMENSIONS AND TOLERANCES INDICATE MAXIMUM VARIATIONS BETWEEN PACKAGES AND ARE NOT INDICATIVE OF "FIT" OR INTERCHANGEABILITY.
4. NOMINAL DIMENSIONS FOR STRUCTURAL SHAPES, PLATES, TUBES, ETC. WILL FALL WITHIN STANDARD MILL TOLERANCES.
5. ALL OTHER DIMENSIONS ARE ± 0.50 UNLESS SHOWN OTHERWISE.
6. PACKAGING WT = 25,500 lbs (+ or - 1000 lbs) WITHOUT LINER
   30,650 lbs (+ or - 1000 lbs) WITH LINER
7. THE OVERPACK LIFTING EARS ARE BOLTED CLOSED DURING TRANSPORT WITH A STL. FLAP WHICH IS MARKED TO DENOTE THAT THEY ARE NOT TO BE USED FOR TIE-DOWN OR TO LIFT THE ENTIRE PACKAGE. (C-110-B-06402-002) P5

* NOT SAFETY RELATED COMPONENT, SHOWN FOR CLARITY ONLY.

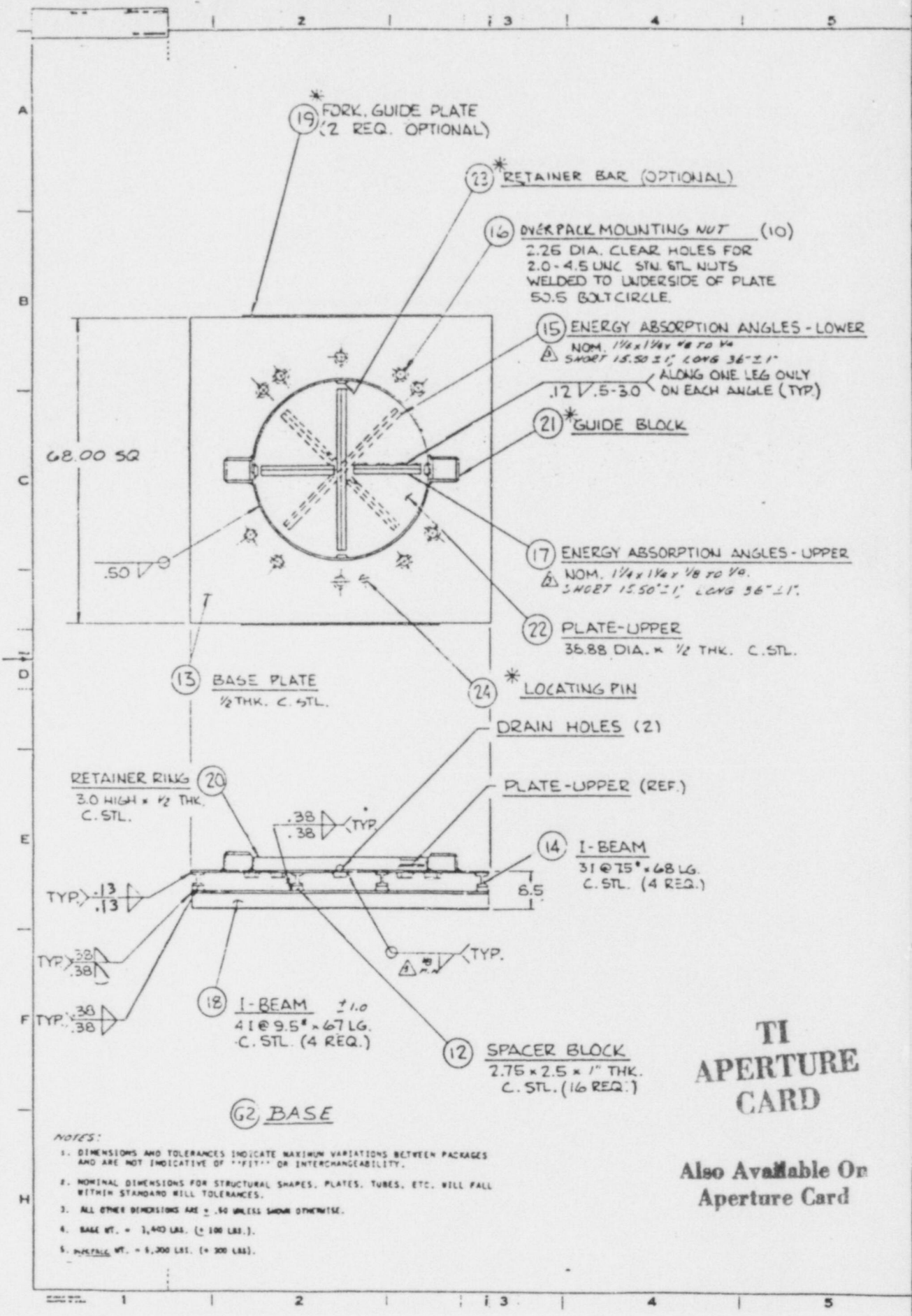
TOLERANCE UNLESS OTHERWISE NOTED: FRAC ± DEC ± ANG ±	CHECKED 4-22-87	APPROVED 4-23-87 ENG	SCALE —

CHEM-NUCLEAR SYSTEMS, INC.

TITLE: 1-13G SHIPPING CONTAINER

C-110-B-06402-001 —

8705110229-01

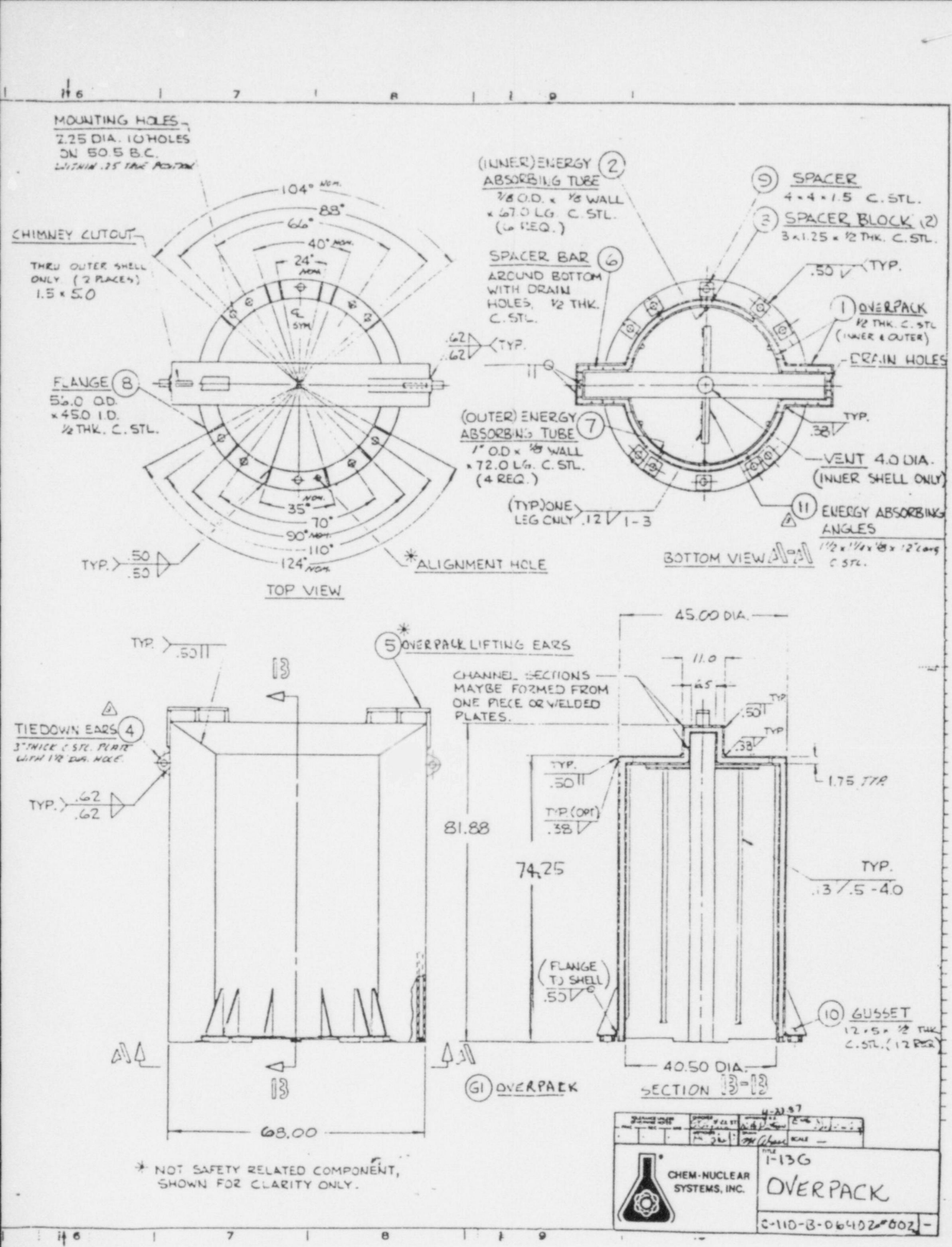


NOTES:

1. DIMENSIONS AND TOLERANCES INDICATE MAXIMUM VARIATIONS BETWEEN PACKAGES AND ARE NOT INDICATIVE OF "FIT" OR INTERCHANGEABILITY.
2. NOMINAL DIMENSIONS FOR STRUCTURAL SHAPES, PLATES, TUBES, ETC. WILL FALL WITHIN STANDARD MILL TOLERANCES.
3. ALL OTHER DIMENSIONS ARE ± .50 UNLESS SHOWN OTHERWISE.
4. BASE WT. = 3,440 LBS. (± 100 LBS.).
5. PACKAGE WT. = 6,200 LBS. (± 300 LBS).

TI APERTURE CARD

Also Available On Aperture Card



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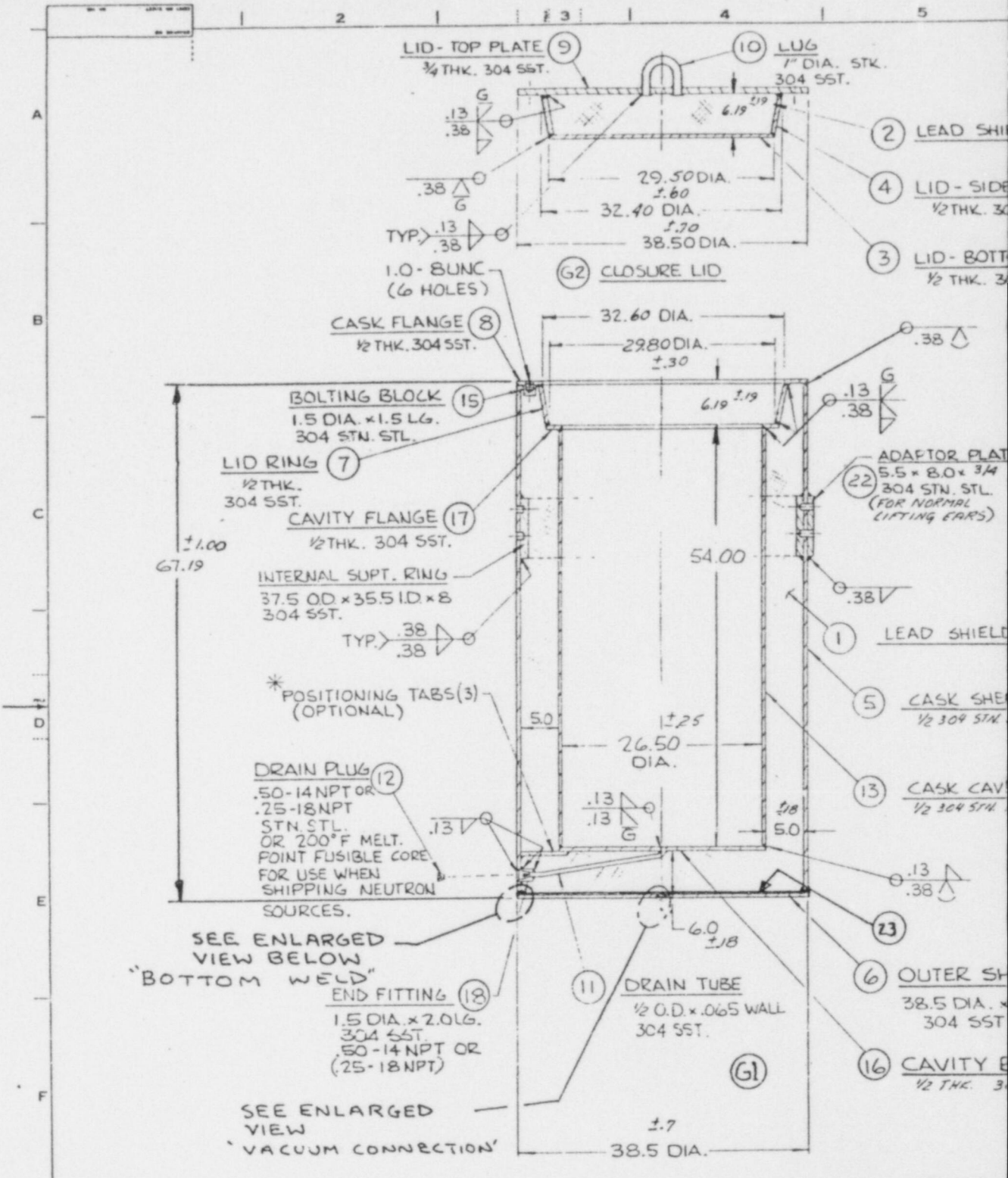


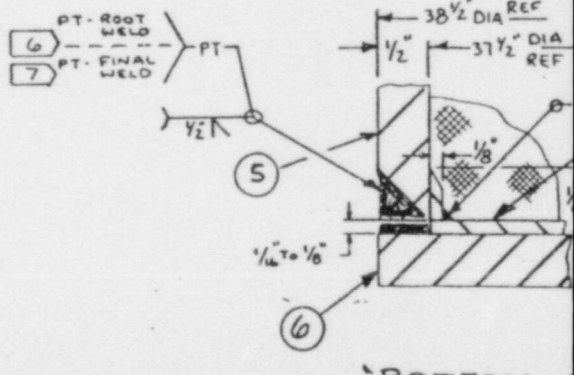
NOTES:

1. DIMENSIONS AND TOLERANCES INDICATE MAXIMUM VARIATIONS BETWEEN PACKAGES AND ARE NOT INDICATIVE OF "FIT" OR INTERCHANGEABILITY.
2. NOMINAL DIMENSIONS FOR STRUCTURAL SHAPES, PLATES, TUBES, ETC. WILL FALL WITHIN STANDARD MILL TOLERANCES.
3. ALL OTHER DIMENSIONS ARE ± 0.50 UNLESS SHOWN OTHERWISE.
4. CASK ASSEMBLY WT = 19,100 LBS (+ OR - 700 LBS).
5. LID WT = 2000 LBS (+ OR -150 LBS).

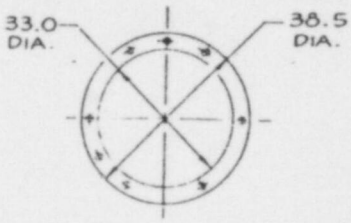
(G) WELDS SHALL BE VISUALLY EXAMINED IN ACCORDANCE WITH ASME CODE SECTION III, DIVISION 1, SUBSECTION NB, ARTICLE NB-5000 AND SECTION V, ARTICLE 9.

(G) CONTINUOUS WELD SHALL BE LIQUID PENETRANT (PT) INSPECTED IN ACCORDANCE WITH ASME CODE, SECTION III, DIVISION 1, SUBSECTION NB, ARTICLE NB-5000 AND SECTION V, ARTICLE 6. PT TO BE PERFORMED AFTER INITIAL (ROOT) PASS + AFTER FINAL WELD FOR 1/2" BEVEL WELD).

* NOT SAFETY RELATED COMPONENT, SHOWN FOR CLARITY ONLY.

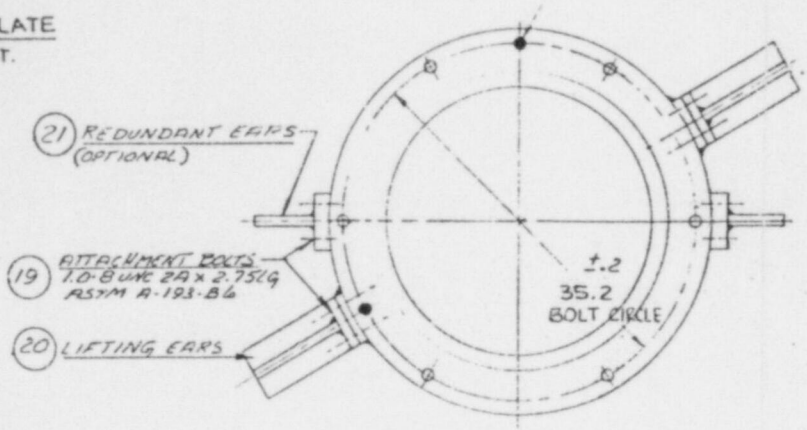


"BOTTOM W

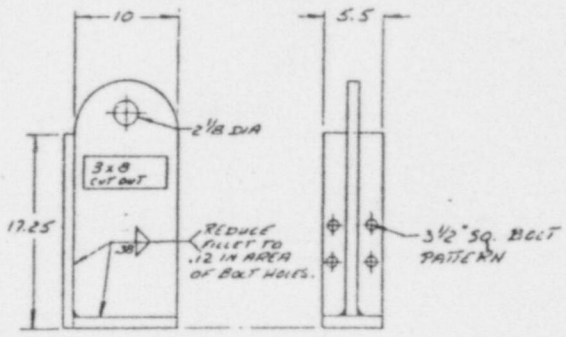


(14) * LOCATING PINS (2)

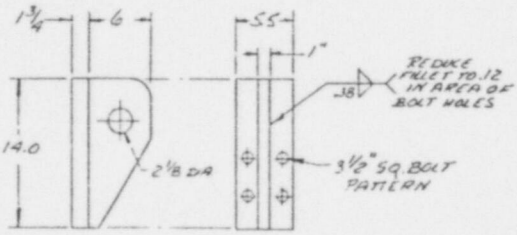
(G5) SEAL-UPPER (OPTIONAL)
1/4" THK. SILICONE RUBBER
30-60 DUROMETER



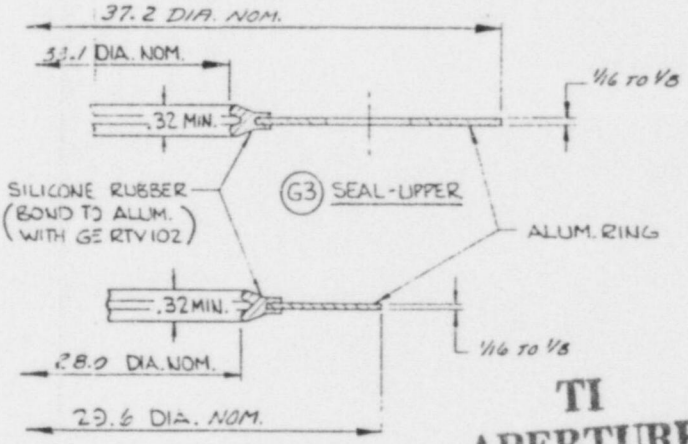
TOP VIEW OF CASK



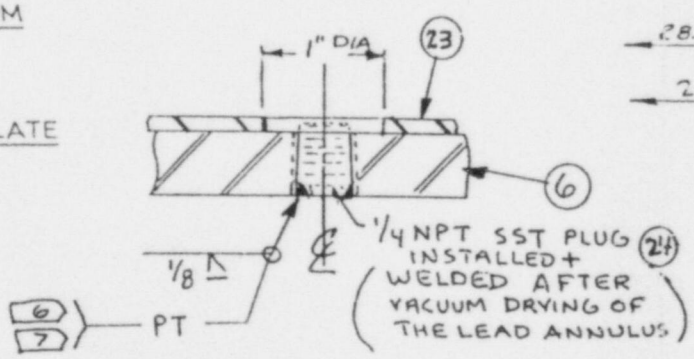
LIFTING EARS
304 STN. STL. 1" THICK



REDUNDANT EARS
304 STN. STL.



(G4) SEAL-LOWER



'VACUUM CONNECTION'

(23) BACKUP RING
1/8" THK
304 SST
DIM'S SHOWN

TI APERTURE CARD

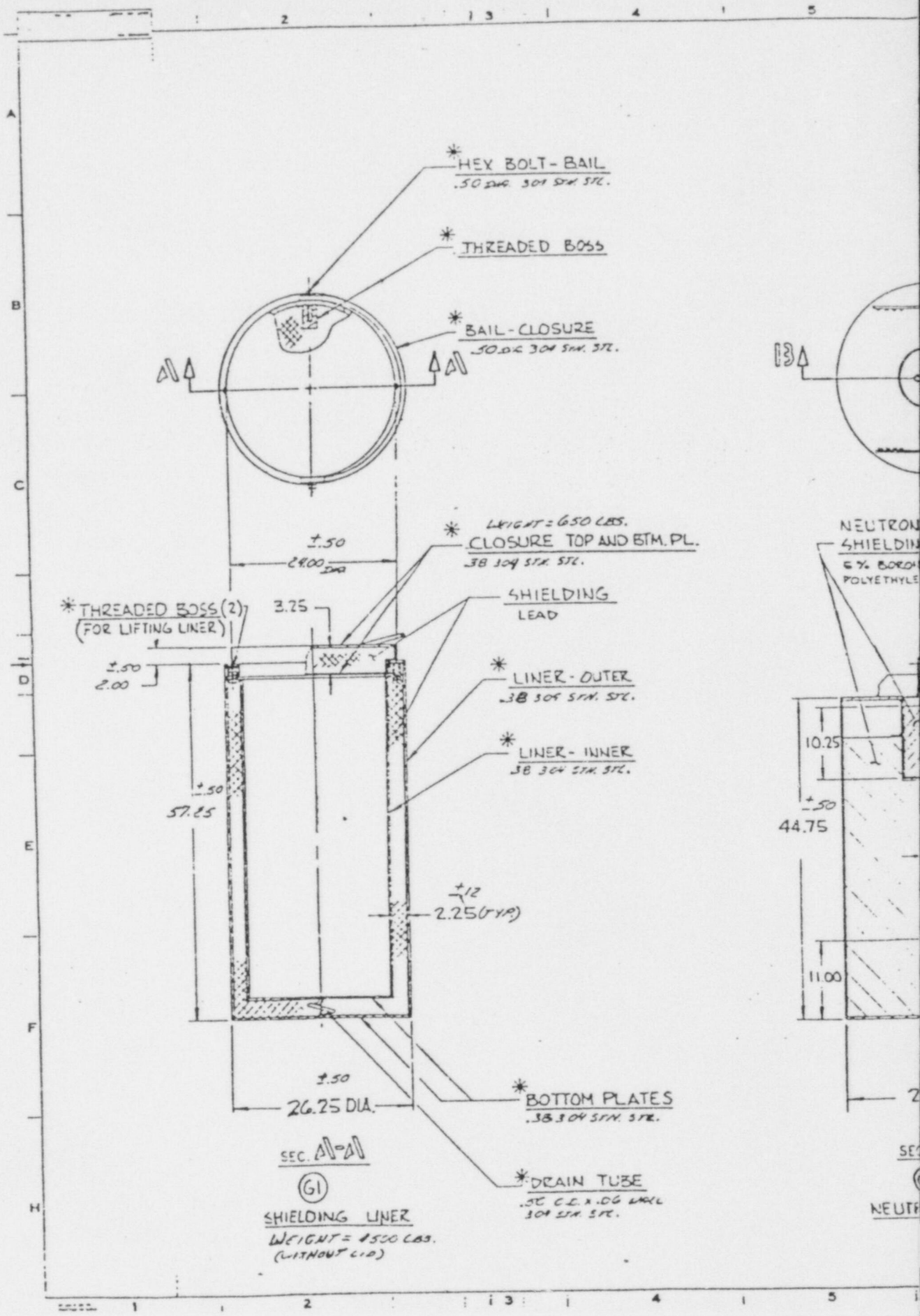
Also Available On Aperture Card

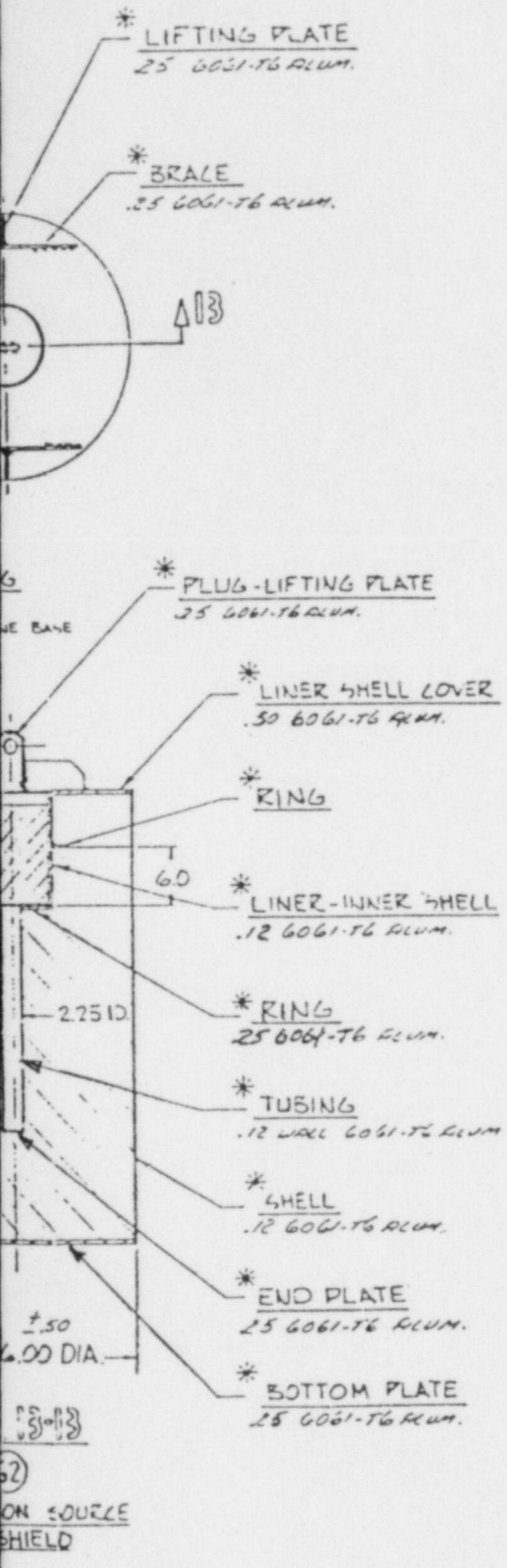
8705110229-03

CHEM-NUCLEAR SYSTEMS, INC.

1-13G SHIPPING CASK

C-110-B-06402-003


HEX BOLT - BAIL
.50 DIA. 304 STN. STL.
THREADED BOSS
BAIL - CLOSURE
.50 DIA 304 STN. STL.
WEIGHT = 650 LBS.
CLOSURE TOP AND BTM. PL.
3B 304 STN. STL.
±.50
29.00 DIA
THREADED BOSS (2)
(FOR LIFTING LINER)
3.25
SHIELDING
LEAD
±.50
2.00
LINER - OUTER
3B 304 STN. STL.
LINER - INNER
3B 304 STN. STL.
±.50
57.25
±.12
2.25 (TYP)
±.50
26.25 DIA.
BOTTOM PLATES
.38 304 STN. STL.
DRAIN TUBE
.5" C.L. x .06 WALL
304 STN. STL.
SEC. A-A
(61)
SHIELDING LINER
WEIGHT = 1500 LBS.
(WITHOUT C.O)
NEUTRON
SHIELDIN
6% BORO
POLYETHYLE
10.25
±.50
44.75
11.00
SE
NEUTR



TI APERTURE CARD

Also Available On Aperture Card

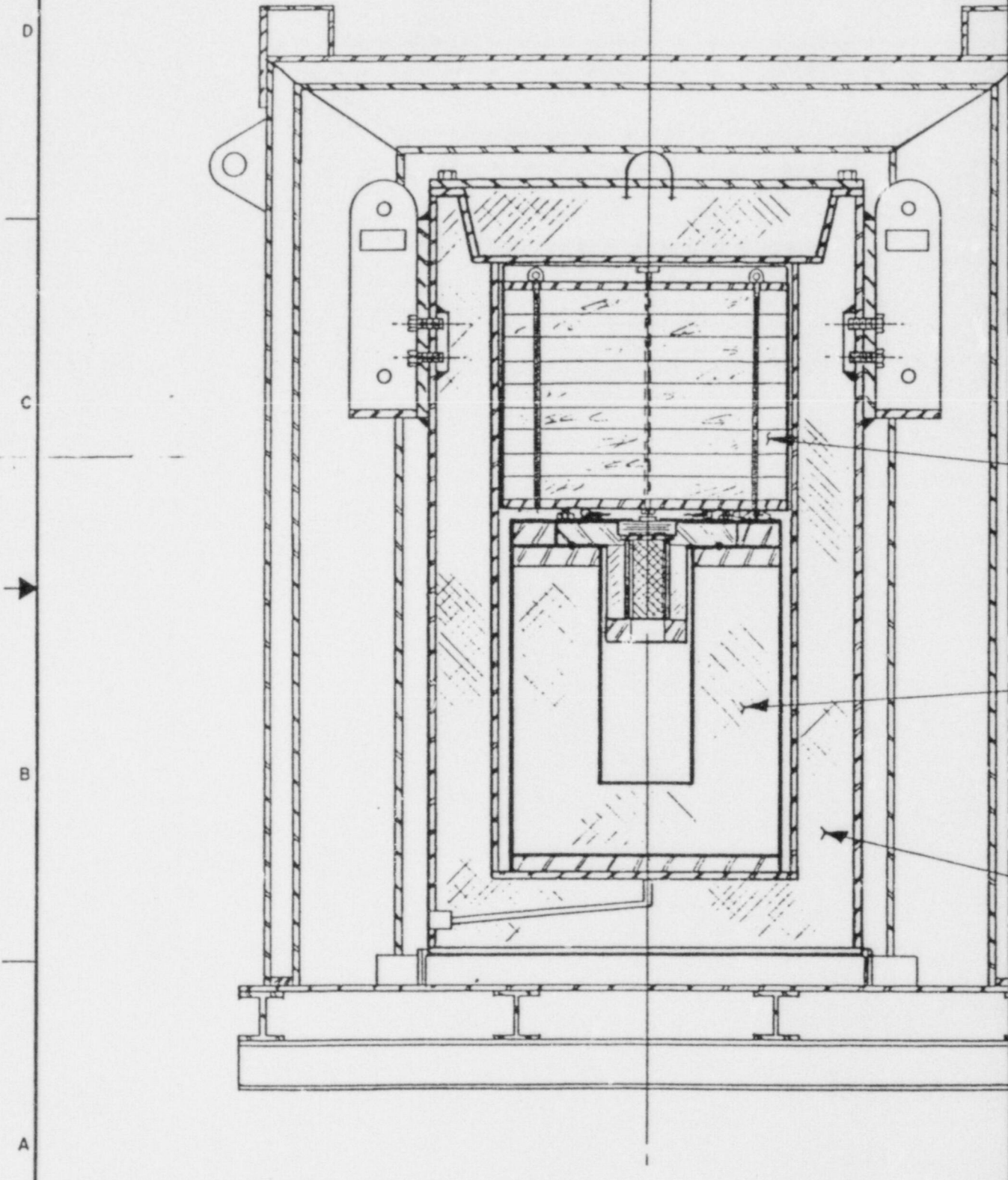
NOTES:)

1. DIMENSIONS AND TOLERANCES INDICATE MAXIMUM VARIATIONS BETWEEN PACKAGES AND ARE NOT INDICATIVE OF "FIT" OR INTERCHANGEABILITY.
2. NOMINAL DIMENSIONS FOR STRUCTURAL SHAPES, PLATES, TUBES, ETC. WILL FALL WITHIN STANDARD MILL TOLERANCES.
3. ALL OTHER DIMENSIONS ARE ± 0.50 UNLESS SHOWN OTHERWISE.
4. ASSEMBLY WELDS ARE NOT SAFETY RELATED

* NOT SAFETY RELATED COMPONENT SHOWN FOR CLARITY ONLY.

CHEM-NUCLEAR SYSTEMS, INC.		TITLE 1-13G CASK LINERS	
		C-110-B-06402-004	—

8705110229-04



REVISED PER ECO # C-110-8651-C-01-002

REVISED SHORING PLUG
REVISED TITLE

SCALE

TOLERANCE UNLESS OTHERWISE NOTED

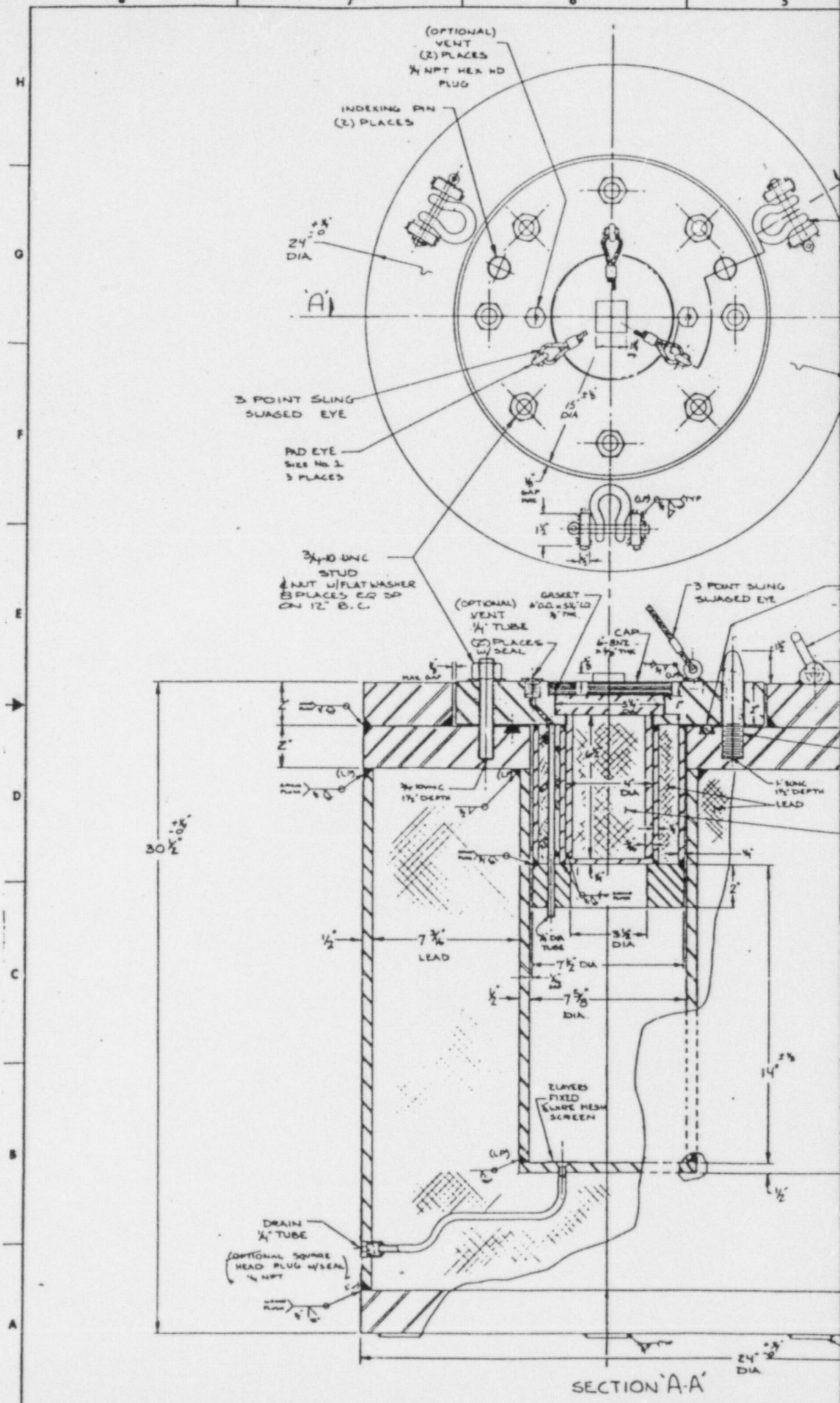
REV. D | REV. C | REV. B | REV. A

TI
APERTURE
CARD

Also Available On
Aperture Card

8705110229-05

Q.A. CRWolf	DATE 3-22-84	CHEM-NUCLEAR SYSTEMS, INC.	TITLE CASK. COMPOSITE ASS'Y.
DRAWN M. IAHERN	DATE 11/1/83		
CHECKED [signature]	11-7-83		
APPROVED [signature]	11-16-83		DRAWING NUMBER 8651-C-01 REV. B


(OPTIONAL) VENT (2) PLACES ¾ NPT HEX HD PLUG
INDEXING PIN (2) PLACES
24" DIA
A
3 POINT SLING SWAGED EYE
PAD EYE SIZE No. 1 3 PLACES
15" DIA
3/4-10 UNC STUD & NUT W/FLAT WASHER 8 PLACES EQ SP ON 12" B.C.
(OPTIONAL) VENT ¼" TUBE (2) PLACES W/SEAL
GASKET
CAP
3 POINT SLING SWAGED EYE
2"
¾" UNC 1½" DEPTH
4" DIA
1" UNC 1½" DEPTH
LEAD
30½"
½"
7 3/16" LEAD
3⅛" DIA
7½" DIA
½"
7 5/8" DIA
14"
SLOTTED FIXED GLARE MESH SCREEN
½"
DRAIN ¼" TUBE
(OPTIONAL SQUARE HEAD PLUG W/SEAL ¼ NPT
24" DIA
SECTION A-A

ZONE	LTR	DESCRIPTION	DATE	APPROVED
	A	ADDED WELD SYMBOLS, ADDITIONAL DIMENSIONING MATL. CALLOUTS	4/89	

'A'

BODY SHACKLE (7/8" SIZE) TYP 3 PLACES

3/8" SILICONE OR NEOPRENE O-RING

BODY SHACKLE TYP 3 PLACES

1" DIA INDEXING PIN 5" LONG TYP 2 PLACES

PLUG MACHINED TO A SLIDING FIT WITH LID

5 1/2" LEAD

2"

STANDOFF 3/4" x 2" x 2" 3 PLACES

NOTES:

1) ALL WELDS TO BE CONTINUOUS, FREE OF CRACKS & CREVICES & WELD SPLATTER REMOVED FOR EASE OF DECONTAMINATION.

2) WELDING SHALL BE PERFORMED BY WELDERS QUALIFIED PER ASME SECTION IX PROCEDURES SHALL BE SUBMITTED AND APPROVED PRIOR TO FABRICATION.

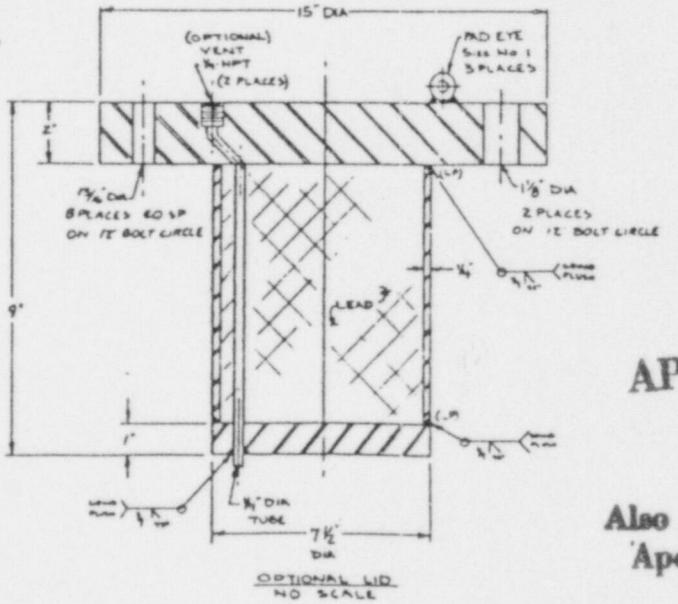
3) ALL WETTED SURFACES TO BE COMMERCIALLY SANDBLASTED AND COATED WITH PRIMER PAINT.

4) LEAD INTEGRITY AND SHIELDING EFFECTIVENESS - GAMMA SCAN OR PROBE REQUIRED TO INSURE SHIELDING INTEGRITY. LOSS OF SHIELDING AT ANY POINT IN EXCESS OF 10% WILL REQUIRE REMEDY BY THE FABRICATOR.

5) SHIELD BODY WEIGHT - 4900 lbs
LID WEIGHT 200 lbs
CONTENTS WEIGHT - 250 lbs (MAX)
EST. LOADED WEIGHT - 5350 lbs

6) MATL: STEEL - ASTM A-36
LEAD - PIG LEAD CHEMICAL GRADE ASTM B29-55 (1966 REAPPROVAL)

7) ALL LIQUID PENETRANT EXAMINATIONS (LP) WILL BE PERFORMED IN ACCORDANCE WITH THE CRITERIA DEFINED IN PARA 6.7.6 OF AWS D1.1.



OPTIONAL LID
NO SCALE

TI APERTURE CARD

Also Available On Aperture Card

8705110229-06

				CHEM-NUCLEAR SYSTEMS, INC.	
				CASK AUXILIARY SHIELD	
				E	8651-E-02 A