APPROVED FOR

ENRICO FERMI

UNIT #2

DOCUMENT CONTROL

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CO.

LTR. NO.

SURVEILLANCE TEST PROGRAM

FOR B11-01-A

251" BOILING WATER REACTOR VESSEL

ENRICO FERMI 2

MPL # B11-A001

GENERAL ELECTRIC CO.
APED – SAN JOSE

VPF#
1976-100-4

CONTRACT 2667

GENERAL ELECTRIC
ATOMIC POWER EQUIPMENT DEPT.
SAN JOSE, CALIFORNIA

☐ Not Approved. Revise and re-submit for approval.

☒ Approved. No further action required.

☐ Approved With / Without comments Revise, proceed with fabrication and submit final copies.

☐ Refer to EDS #

Date:

GR Schmidt

Approval is in regard to general design and controlling dimensions. This does not constitute acceptance of any designs, materials or equipment which will not fulfill the functional or performance requirements established by the purchase contract. 18 Nov 70

G.E. CO. P.O. 205-H-399

REVISION 3

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SURVEILLANCE TEST PROGRAM
FOR
DETROIT EDISON REACTOR VESSEL

All base metal specimens shall be taken from two plates (Code G-3705) which are "trim offs" of two plates used in lower intermediate shell section of the reactor vessel. All weld specimens and heat affected zone specimens shall be taken from one test plate prepared from these two plate "trim offs."

1.0 Base Material

1.1 The base metal shall be taken from the two test plates "C" (Code G-3705), Reference Drawing E-232-899. The plates designated as Test "C_1", Test "C_2", Test "C_3" and Test "D" as shown in Fig. 1 shall be removed from these two plates and used for base material specimens.

1.2 The test plates (C_1, C_2, C_3, and D) shall be given a simulated stress relief for forty (40) hours at 1150° ± 25°F to insure that they represent the metallurgical condition of the lower intermediate shell plates of the reactor vessel after final fabrication.

2.0 Cutting of Base Material

2.1 Furnished are four test plates, C_1, C_2, C_3 and D, cut as shown in Figure 1 from Code G-3705.

2.2 The test plates shall be stenciled with paint as shown in Figures 2 and 5.

2.3 The dimensions as shown in Figures 2 and 5 are finished dimensions for each section obtained by machining or sawing off flame cut edges all around approximately 1" back from the edge.

2.4 The material must be used cautiously since there is very little extra material available.

3.0 General Instructions

3.1 All final cutting shall be done by machine.

3.2 Stencil all unused material with applicable Code Number and direction of rolling, with paint, and return to storage.

3.3 Specimen marking and mark orientation are of the utmost importance. Marking instructions must be followed. In case of a mistake, or if uncertain about the marking on a blank, do not use it for a finished specimen.

4.0 Base Metal Charpy Specimens

4.1 Specimen Requirements

4.1.1 Prepare the base metal charpy specimens in accordance with Figure 3 and Figure 14 from the plate test "D" (Code G-3705-2).

4.1.2 The specimens shall be taken from 1/4 thickness positions in the plate. The long axes of the specimens shall be parallel to the plate rolling direction. The specimen notches shall be perpendicular to the original plate surface and shall be controlled by the orientation of the end markings on the specimen blanks (see Figure 3 and Paragraph 15).

4.2 Specimen Preparation

4.2.1 Power hack saw two (2) blocks (Test "D_2" and "D_3") 2-1/4" x 7-3/8" x 11-1/2" from the test plate "D" (see Figure 2).

4.2.2 Stencil each sub-slab location with the proper marks before dividing the blocks into slabs and sub-slabs. The 1/4 T specimens near one surface shall be marked with F.A.B. Code in the series AM4 through AM5 and those near the other surface shall be marked with the series AM6 through AUC and DB6 through DBC. The top of the code symbols are on a line perpendicular to the plate surface. The notch shall be on the side adjacent to the top of the Code symbols on the specimen as shown in Figure 3 (see Paragraph 15).

4.2.3 Power hack saw each 2-1/4" x 7-3/8" x 11-1/2" block into two (2) 1/2" x 2-1/4" x 11-1/2" slabs at 1/4 T thickness levels, as shown in Figure 3.

4.2.4 Surface grind both 2-1/4" x 11-1/2" surfaces of each slab to a thickness of .405", as shown in Figure 3.

4.2.5 Cut off the unmarked edge of each of the slabs to the required finished specimen length (see Fig. 14).

4.2.6 Machine each of the four (4) slabs into fifteen (15) .405" x 2.165" x 1/2" sub-slabs each as shown in Figure 3, for a total of sixty (60) pieces. Allow sufficient stock for finish grinding.

4.2.7 Finish each specimen as shown in Figure 14, and place each in respective F.A.B. Code marked individual envelopes.

4.2.8 Remark one end of each finished specimen with its F.A.B. Code serial number if the original mark has been destroyed. Maintain original orientation of marking per paragraph 4.2.2. Start with the lowest mark and proceed serially.

4.2.9 Inspect, clean and dip each finished specimen in "Dip Seal Plastic" DS 300 Clear for prevention of rust and mechanical damage.

4.2.10 Fifty-three (53) specimens shall be packed in a vacuum sealed weld carton. The specimens shall be sent to the customer to comply with Paragraph 3.4 of Specification 21A 010, Revision 0.

4.2.11 The remaining seven (7) specimens shall be used by CE for testing purposes.

5.0 Base Metal Tensile Specimens

5.1 Specimen Requirements

5.1.1 Prepare the tensile specimens in accordance with Figure 4 and Figure 13 from the plate test "D", Code G-3705.

5.1.2 The specimens shall be taken from 1/4 thickness positions in the plate. The long axes of the specimens shall be parallel to the plate rolling direction.

5.2 Specimen Preparation

5.2.1 Power hack saw one (1) block (Test "D_1") 3-5/8" x 7-3/8" x 11-1/2" from the test plate "D" (see Figure 2).

5.2.2 Stencil each sub-slab location with the proper F.A.B. Code marks before dividing the block into slabs and sub-slabs. The 1/4 T specimens near one surface shall be marked with F.A.B. Code in the Series B5̈1 through B5̈C, and those near the other surface shall be marked with the series B5̈D through B5̈L and DJ1 through DJ5 (see Paragraph 15).

5.2.3 Power hack saw the 3-5/8" x 7-3/8" x 11-1/2" block into ten (10) 3-5/8" x 7-3/8" x 1/2" slabs as shown in Figure 4.

5.2.4 Power hack saw each 3-5/8" x 7-3/8" x 1/2" slab into two (2) 1/2" x 3-5/8" x 1/2" sub-slabs at the 1/4 T thickness levels, as shown in Figure 4, for a total of twenty (20) pieces.

5.2.5 Place the sub-slabs in respective F.A.B. Code marked individual envelopes for further processing (see Figure 4 and Paragraph 15).

5.2.6 Finish each specimen, as shown in Figure 13, and return to its individual envelope.

5.2.7 Remark one end of each finished specimen with its corresponding envelope F.A.B. Code number if the original mark has been destroyed. Start with the lowest mark and proceed serially.

5.2.8 Inspect, clean and dip each finished specimen in "Dip Seal Plastic" DS 300 Clear for prevention of rust and mechanical damage.

5.2.9 Fourteen (14) specimens shall be packed in a vacuum sealed weld carton. The specimens shall be sent to the customer to comply with Paragraph 3.5 of Specification 21A1010, Revision 0.

5.2.10 The remaining six (6) specimens shall be used by CE for testing purposes.

6.0 Test Plate Test "C_1", "C_2", and "C_3" (Figure 4 and 5)

6.1 The test plates, "C_1", "C_2" and "C_3", taken from the test plates Code G-3705-1 and G-3705-2 (Figure 1), shall be finished to 7-3/8" x 10" x 12" as shown in Figure 5 by machining off at least 1" of stock from all flame cut edges. Identifying marks as shown on Figure 5 shall be metal stamped on each plate with symbols at least 1/4" high. The rolling direction shall also be distinctly marked.

6.2 The finished plates, along with documents showing source, chemistry and all heat treatments, shall be sent to the customer to comply with Paragraphs 3.1.1 and 3.1.4 of Specification 21A1010, Revision 0.

7.0 Weld and Heat Affected Zone Material

7.1 The weld and heat affected zone material shall be taken from two (2) plate "trim offs" from the lower intermediate shell of the reactor vessel (Code G-3705-1 and G-3705-2) plate pieces "E" and "F" cut as shown in Fig. 1. Each piece is approximately 88" x 19-3/8" x 7-3/8" thick after the quenched end has been removed. The two (2) plates shall then be joined with a continuous central weld which is identical to the reactor vessel longitudinal weld. Note that the quenched edges of the plates must be the outer edges of the test plate after welding (see Figure 6 and 7).

7.2 The welded test plate (Figure 6) shall be given a simulated stress relief for forty (40) hours at 1150°F ± 25°F to insure that it, and the weld, represent the metallurgical condition of a vessel weld, as fabricated, in the reactor core region. X-rays of the weld shall be sent to the customer to comply with Paragraph 3.2.3 of Specification 21A1010, Revision 0. Do not repair the weld if defects are present.

8.0 Cutting of Weld and Heat Affected Zone Material

8.1 Furnished is a 7-3/8" x ≈ 38-3/4" x 88" plate with a central weld (see Figures 6 and 7).

8.2 The welded plate shall be flame cut into two (2) sections (7-3/8" x 38-3/4" x 59") and (7-3/8" x 38-3/4" x 28) as shown in Figure 7. Use the 7-3/8" x 38-3/4" x 59" section for the following; send the other to the customer as directed in Paragraph 14.1.

8.3 One plate shall be flame cut to 7-3/8" x 10" x 59" with the weld center as the centerline of the 10" side (see Figure 7). Stencil the cut-off material, using paint, with the appropriate code numbers and quenched edge identification and return to storage.

8.4 Power hack saw test "U" (7" x 10" x 7-3/8"), "V" (11-1/4" x 10" x 7-3/8"), "W" (10" x 7" x 7-3/8"), and "X" (10" x 2" x 7-3/8") plates from the 7-3/8" x 10" x 59" as shown on Figure 7.

8.5 The material must be used cautiously since there is very little other material available.

9.0 General Instructions

9.1 All final cutting shall be done by machine. No flame cutting will be allowed.

9.2 Specimen marking and mark orientation are of the utmost importance. Marking instructions must be followed. In case of a mistake, or if uncertain about the marking on a blank, do not use it for a finished specimen.

10.0 Weld Charpy Specimens

10.1 Specimen Requirements

10.1.1 Prepare the weld charpy specimens in accordance with Figure 8 and Figure 14 from the weld deposit material of the furnished plate test "U".

10.1.2 The long axis of the specimen shall be perpendicular to the weld direction and parallel to the plate surface with the middle of the specimen at the mid-plane of the weld, as shown in Figure 8. The specimen location in the stock material shall be recorded, approximately, by the numbering system (see Figure 8 and Paragraphs 10.2.2 and 15). The V-notch shall be perpendicular to the plate surface.

10.2 Sp. . on Preparation

10.2.1 Power hack saw the central weld section, 2-1/4" x 7-3/8" x 7", out of the test "U" plate with the weld center of the block as shown in Fig. 8.

10.2.2 Stencil each sub-slab location with the proper marking before dividing the block into slabs and sub-slabs. Ten (10) sub-slabs shall be taken at each of six (6) elevations. The first or top elevation shall be marked with F.A.B. Code in the series AÜD through AÜY. The second elevation shall be marked with the F.A.B. Code in the series AŸ1 through AŸC. The third elevation shall be marked with F.A.B. Code in the series AŸD through AŸY. The fourth elevation shall be marked with F.A.B. Code in the series BÏ1 through BÏC. The fifth elevation shall be marked with F.A.B. Code in the series BÏD through BÏY. The sixth elevation shall be marked with F.A.B. Code in the series B̈21 through B̈25 and D̈CD through D̈CL (see Paragraph 15).

The top of the code symbols are on a line perpendicular to the plate surface. The notch shall be on the side adjacent to the top of the code symbols on the specimens as shown in Figure 8.

10.2.3 Power hack saw the 2-1/4" x 7-3/8" x 7" weld block into six (6) 1/2" x 7" x 2-1/4" slabs (see Figure 8).

10.2.4 Surface grind both 7" x 2-1/4" surfaces of each slab to a thickness of .405 inches, as shown in Figure 8.

10.2.5 Cut the unmarked edge of each slab to the required finished specimen length (see Figure 14).

10.2.6 Machine ten (10) .405" x 2.165" x 1/2" sub-slabs out of each slab as shown in Figure 8 for a total of sixty (60) pieces. Allow sufficient stock for finish grinding.

10.2.7 Finish each specimen as shown in Figure 14 and place each in respective F.A.B. Code marked individual envelopes.

10.2.8 Re-mark one end of each specimen with its corresponding F.A.B. Code serial number as noted on the envelope if the original mark has been destroyed. Maintain original orientation of marking per Paragraph 10.2.2. Start with the envelope with the lowest mark and proceed serially.

10.2.9 Inspect, clean and dip each finished specimen in "Dip Seal Plastic" DS 300 Clear for prevention of rust and mechanical damage.

10.2.10 Fifty-three (53) specimens shall be packed in a vacuum sealed weld carton. The specimens will be sent to the customer to comply with Paragraph 3.6 of Specification 21A1010, Revision 0.

10.2.11 The remaining seven (7) specimens shall be used by CE for testing purposes.

11.0 Weld Tensile Specimens

11.1 Specimen Requirements

Prepare the weld tensile specimens, in accordance with Figure 9 and Figure 13, from the weld deposit material of the furnished plate test "V", as shown in Figure 7. The long axes of the specimens shall be parallel to the length of the weld and parallel to the top surface of the plate (see Figure 9). The gauge length of the specimens shall be of weld deposit material only. The threaded ends of the specimens may included heat affected zone or base metal. The approximate location of the specimens in the stock material shall be recorded by the marking system (see Fig. 9 and Paragraphs 11.2.3 and 15).

11.2 Specimen Preparation

11.2.1 Power hack saw the center of the weld 1" x 7-3/8" x 11-1/4" out of the test "V" plate with the weld center at the center of the block as shown in Figure 9. Stencil the outside sections, using paint, with the appropriate code numbers and return to storage.

11.2.2 Power hack saw the 1" x 7-3/8" x 11-1/4" block into three (3) 1" x 7-3/8" x 3-5/8" slabs, as shown in Figure 9. Stencil each slab 1, 2, and 3 before dividing the block (see Figure 9).

11.2.3 Stencil each sub-slab location with the proper marks after dividing the block into slabs. Three (3) sub-slabs shall be taken at each of six (6) elevations. The first or top elevation shall be marked with F.A.B. Code designations B5M, B5P, and B5T. The second elevation shall be marked with F.A.B. Code designations B5U, B5Y, and B61. The third elevation shall be marked with F.A.B. Code designations B62, B63, and B64. The fourth elevation shall be marked with F.A.B. Code designations B65, B66, and B67. The fifth elevation shall be marked with F.A.B. Code designations B6A, B6B, and B6C. The sixth elevation shall be marked with F.A.B. Code designations DK6, DK7, and DKA.

11.2.4 Power hack saw each slab into six (6) 1/2" x 1" x 3-5/8" sub-slabs, as shown in Figure 9, for a total of eighteen (18) pieces. Place the sub-slabs in serially marked individual envelopes for further processing.

11.2.5 Finish and inspect the specimens, as shown in Figure 13. Replace specimens in their respective envelopes.

11.2.6 Re-mark specimens on one end, serially, as shown in Figure 9 and Paragraph 15 if the original marks have been destroyed. Start with the envelope with the lowest mark and proceed serially.

11.2.7 Clean and dip each finished specimen in "Dip Seal Plastic" DS 300 Clear for prevention of rust and mechanical damage.

11.2.8 Thirteen (13) specimens shall be packed in a vacuum sealed weld carton. The specimens shall be sent to the customer to comply with Paragraph 3.7 of Specification 21A1010, Revision 0.

11.2.9 The remaining five (5) specimens shall be used by CE for testing purposes.

12.0 Heat Affected Zone Charpy Specimens

12.1 Specimen Requirements

12.1.1 Prepare the heat affected zone charpy specimens, in accordance with Figure 10 and Figure 14, from the welded material of the plate test "W" (see Fig 7).

12.1.2 The long axes of the specimens shall be perpendicular to the length of the weld and parallel to the top surfaces of the plate (see Figure 10). The radius of the V-notch of the specimens shall be at the edge of the weld. The axis of the V-notch orientation shall be controlled by the marking orientation. The location of the specimen in the stock material shall be recorded, approximately, by the marking system (see Fig. 10 and Paragraphs 12.2.2 and 15).

12.2 Specimen Preparation

12.2.1 Power hack saw the central section, 7" x 7-3/3" x 4-1/2" out of the plate test "W" with the weld center at the center of the block, as shown in Figure 10.

12.2.2 Stencil each sub-slab location with the proper mark before dividing the block into slabs and sub-slabs. Ten (10) sub-slabs shall be taken at each of six (6) elevations, for a total of sixty (60) pieces. The first or top elevation shall be marked with F.A.B. Code in the series B2̈6 through B2̈L. The second elevation shall be marked with F.A.B. Code in the series B3̈M to B3̈5. The third elevation shall be marked with F.A.B. Code in the series B3̈6 through B3̈L. The fourth elevation shall be marked with F.A.B. Code in the series B3̈M through B4̈5. The fifth elevation shall be marked with F.A.B. Code in the series B4̈6 through B4̈L. The sixth elevation shall be marked with F.A.B. Code in the series B4̈M through B4Y and DDM through DDY.

The top of the code symbols are on a line perpendicular to the plate surface. The notch shall be on the side adjacent to the top of the code symbols on the specimens as shown in Figure 10.

12.2.3 Power hack saw six (6) 1/2" x 7" x 4-1/2" slabs from 7" x 6-1/2" x 4-1/2" block (see Figure 10).

12.2.4 Surface grind both 7" x 4-1/2" surfaces of each slab to reduce the total thickness of the slab to .405". One of the faces is to have a 63 micro-inch finish for etching. Leave sufficient stock for etching and for finish grinding to specimen dimension.

12.2.5 Machine each slab into ten (10) .405" x 1/2" x 4-1/2" sub-slabs (see Figure 10) for a total of sixty (60) pieces.

12.2.6 Surface grind the remaining two (2) .405" x 4-1/2" sides of each sub-slab to .405" thickness. Leave sufficient stock for finish grinding to specimen dimension.

12.2.7 Lightly acid etch the side of each sub-slab which is adjacent to the first or last character of the F.A.B. Code symbol (whichever has the 63 micro-inch finish provided in Para. 12.2.4) to show the weld.

12.2.8 Scribe a line on the etched side of each sub-slab .080" below the surface which is adjacent to the top of the F.A.B. Code symbols and cut off the unmarked end 1.082" ± .010" from the intersection of this line and the edge of the weld as shown in Figures 11 and 14. DO NOT CUT OFF THE MARKED END.

12.2.9 Surface grind each sub-slab to remove the etch and to obtain the required finished specimen cross section (see Figure 14). Do not cut to length until later (Para. 12.2.12).

12.2.10 Locate, from the unmarked end, and machine the V-notch in accordance with Figure 14. See Notes 1 and 2, Figure 11.

12.2.11 Identify the unmarked end of each specimen with a single round nose punch mark or vibro tool mark. Do not upset the metal. Place the specimens in individual envelopes marked with the respective F.A.B. Code symbols for further processing.

12.2.12 Cut off the F.A.B. Code marked end to finished specimen length (see Figure 14) and immediately return the specimens to their respective F.A.B. Code marked envelopes.

12.2.13 Re-mark the same end of each specimen with its F.A.B. Code symbol. The proper end to re-mark is the one opposite to that identified in Paragraph 12.2.11. The original mark and its orientation as shown in Figure 14 and Paragraphs 12.2.2 and 15 must be maintained. Start with the lowest marked envelope and proceed serially.

12.2.14 Inspect, clean and dip each finished specimen in "Dip Seal Plastic" DS 300 Clear for prevention of rust and mechanical damage.

12.2.15 Fifty-three (53) specimens shall be packed in a vacuum sealed weld carton. The specimens shall be sent to the customer to comply with Paragraph 3.9 of Specification 21A1010, Revision 0.

12.2.16 The remaining seven (7) specimens shall be used by CE for testing purposes.

13.0 Heat Affected Zone Tensile Specimens

13.1 Specimen Requirements

Prepare the heat affected zone tensile specimens, in accordance with Figure 12 and Figure 13, from the welded material of the plate test "X" (Figure 7). The long axes of the specimens shall be perpendicular to the length of the weld and parallel to the top surface of the plate. The center of the specimen shall be in the heat affected zone adjacent to the edge of the weld metal. The approximate location of the specimens, in the stock material, shall be recorded by the marking system (see Figure 12 and Paragraphs 13.2.1 and 15).

13.2 Specimen Preparation

13.2.1 Stencil each sub-slab location before dividing the furnished block into slabs and sub-slabs. Three (3) sub-slabs shall be taken at each of six (6) elevations, for a total of eighteen (18) pieces. The first or top elevation shall be marked with F.A.B. Code B6D, B6E and B6J. The second elevation shall be marked with F.A.B. Codes B6K, B6L and B6M. The third elevation shall be marked with F.A.B. Codes B6P, B6T, and B6U. The fourth elevation shall be marked with F.A.B. Codes B6Y, B71, and B72. The fifth elevation shall be marked with F.A.B. Codes B73, B74 and B75. The sixth elevation shall be marked with F.A.B. Codes DLD, DLE, and DLJ.

13.2.2 Power hack saw three (3) 1/2" x 7-3/8" x 10" slabs from the 2" x 7-3/8" x 10" furnished blocks as shown in Figure 12.

13.2.3 Lightly acid etch each slab to reveal the weld. Place each slab in an individually marked envelope.

13.2.4 Lay out the location of the specimen blanks with the heat affected zone in their centers as shown in Figure 12.

13.2.5 Power hack saw six (6) 1/2" x 1/2" x 10" sub-slabs from each slab, for a total of eighteen (18) pieces. Cut one end 1-1/2" from one edge of the weld as shown in Figure 12. Then cut the other

end 3-5/8" from the first cut with the weld edge between the two cuts (abrasive wheel cut off permissible). Place the sub-slabs in serially marked individual envelopes for further processing.

13.2.6 Re-mark each specimen blank on one end with its F.A.B. Code designation. Start with the envelope with the lowest mark and proceed serially.

13.2.7 The 1/2" dimension which is a part of the 3-5/8" length dimension is added for machining purposes. See Figure No. 12.

13.2.8 Machine specimens as shown in Figure 13. Return Specimens to their respective envelopes.

13.2.9 Re-mark one end of each specimen with its F.A.B. Code number as shown in Figure 13 and Paragraphs 13.2.1 and 15 if the original mark has been destroyed. Start with the envelope with the lowest mark and proceed serially.

13.2.10 Inspect, clean and dip each finished specimen in "Dip Seal Plastic" DS 300 Clear for prevention of rust and mechanical damage.

13.2.11 Thirteen (13) specimens shall be packed in a vacuum sealed weld carton. The specimens shall be sent to the customer to comply with Paragraph 3.8 of Specification 21A1010, Revision 0.

13.2.11 The remaining five (5) specimens shall be used by CE for testing purposes.

14.0 Plate Pieces "E" and "F"

14.1 The remaining welded test plate fabricated from pieces "E" and "F" (see Paragraph 9.2), 38-3/4" x 28" x 7-3/8" thick, shall be sent to customer to comply with Paragraph 3.2.4 of Specification 21A1010, Revision 0. The plate shall be metal stamped "Detroit Edison Weld" and appropriate heat numbers of pieces used to fabricate as shown in Figure 7. Use symbols at least 1/4" high. Also, mark the rolling direction distinctly.

15.0 Three Digit, 20 Symbol Marking System (F.A.B. Code)

15.1 Introduction

15.1.1 CE at present is directing surveillance programs for numerous reactors. Several thousand specimens are to be handled. All of the specimens look alike, and a positive means for identification is required. The following items are to be monitored by the marking system:

(a) Reactor

(b) Type of Material - Interior Base
Exterior Base
Weld
Heat Affected Zone

(c) Location (within limits) on Stock Plate

15.1.2 The specimens must be handled remotely after irradiation, and the largest possible marking is required. The system (F.A.B. Code) uses three (3) digits and twenty (20) symbols and can accommodate 8,000 specimens. The sequence is shown in Paragraph 15.2 for the series assigned to this contract. Note that the middle digit in all cases has a double dot placed over it and shall be included as part of the marking system.

15.2 F.A.B. Code Series Numbers

15.2.1 The F.A.B. Code Series Numbers for Base Metal Charpy Specimens are:

AM̈M	AP̈P	AT̈P
AM̈P	AP̈T	AT̈T
AM̈T	AP̈U	AT̈U
AM̈U	AP̈Y	AT̈Y
AM̈Y	AT̈1	AÜ1
AP̈1	AT̈2	AÜ2
AP̈2	AT̈3	AÜ3
AP̈3	AT̈4	AÜ4
AP̈4	AT̈5	AÜ5
AP̈5	AT̈6	AÜ6
AP̈6	AT̈7	AÜ7
AP̈7	AT̈A	AÜA
AP̈A	AT̈B	AÜB
AP̈B	AT̈C	AÜC
AP̈C	AT̈D	DB̈6
AP̈D	AT̈E	DB̈7
AP̈E	AT̈J	DB̈A
AP̈J	AT̈K	DB̈B
AP̈K	AT̈L	DB̈C
AP̈L	AT̈M	
AP̈M		

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15.2.2 The F.A.B. Code Series Numbers for Weld Metal Charpy Specimens are:

AÜD	AŸD	BÏD
AÜE	AŸE	BÏE
AÜJ	AŸJ	BÏJ
AÜK	AŸK	BÏK
AÜL	AŸL	BÏL
AÜM	AŸM	BÏM
AÜP	AŸP	BÏP
AÜT	AŸT	BÏT
AÜU	AŸU	BÏU
AÜY	AŸY	BÏY
AŸ1	BÏ1	B2̈1
AŸ2	BÏ2	B2̈2
AŸ3	BÏ3	B2̈3
AŸ4	BÏ4	B2̈4
AŸ5	BÏ5	B2̈5
AŸ6	BÏ6	DC̈D
AŸ7	BÏ7	DC̈E
AŸA	BÏA	DC̈J
AŸB	BÏB	DC̈K
AŸC	BÏC	DC̈L

15.2.3 The F.A.B. Code Series Numbers for Heat Affected Zone Charpy Specimens are:

B2̈6	B3̈6	B4̈6
B2̈7	B3̈7	B4̈7
B2̈A	B3̈A	B4̈A
B2̈B	B3̈B	B4̈B
B2̈C	B3̈C	B4̈C
B2̈D	B3̈D	B4̈D
B2̈E	B3̈E	B4̈E
B2̈J	B3̈J	B4̈J
B2̈K	B3̈K	B4̈K
B2̈L	B3̈L	B4̈L
B2̈M	B3̈M	B4̈M
B2̈P	B3̈P	B4̈P
B2̈T	B3̈T	B4̈T
B2̈U	B3̈U	B4̈U
B2̈Y	B3̈Y	B4̈Y
B3̈1	B4̈1	DD̈M
B3̈2	B4̈2	DD̈P
B3̈3	B4̈3	DD̈T
B3̈4	B4̈4	DD̈U
B3̈5	B4̈5	DD̈Y

15.2.4 The F.A.B. Code Series Numbers for Base Metal Tensile Specimens are:

B5̈1	B5̈6	B5̈D	DJ̈1
B5̈2	B5̈7	B5̈E	DJ̈2
B5̈3	B5̈A	B5̈J	DJ̈3
B5̈4	B5̈B	B5̈K	DJ̈4
B5̈5	B5̈C	B5̈L	DJ̈5

15.2.5 The F.A.B. Code Series Numbers for Weld Metal Tensile Specimens are:

B5̈M	B6̈1	B6̈7	DK̈6
B5̈P	B6̈2	B6̈A	DK̈7
B5̈T	B6̈3	B6̈B	DK̈A
B5̈U	B6̈4	B6̈C	DK̈B
B5̈Y	B6̈5		DK̈C
	B6̈6		

15.2.6 The F.A.B. Code Series Numbers for Heat Affected Zone Tensile Specimens are:

B6̈D	B6̈M	B7̈1	DL̈D
B6̈E	B6̈P	B7̈2	DL̈E
B6̈J	B6̈T	B7̈3	DL̈J
B6̈K	B6̈U	B7̈4	DL̈K
B6̈L	B6̈Y	B7̈5	DL̈L

COMBUSTION ENGINEERING, INC.
ENGINEERING DEPARTMENT, CHATTANOOGA, TENN.
CHARGE NO. CONTRACT 2667
DESCRIPTION SPECIMEN TEST PROGRAM

JOB NO.
SHEET 16 OF
DATE 4-1-69 BY JOS
CHECK DATE BY

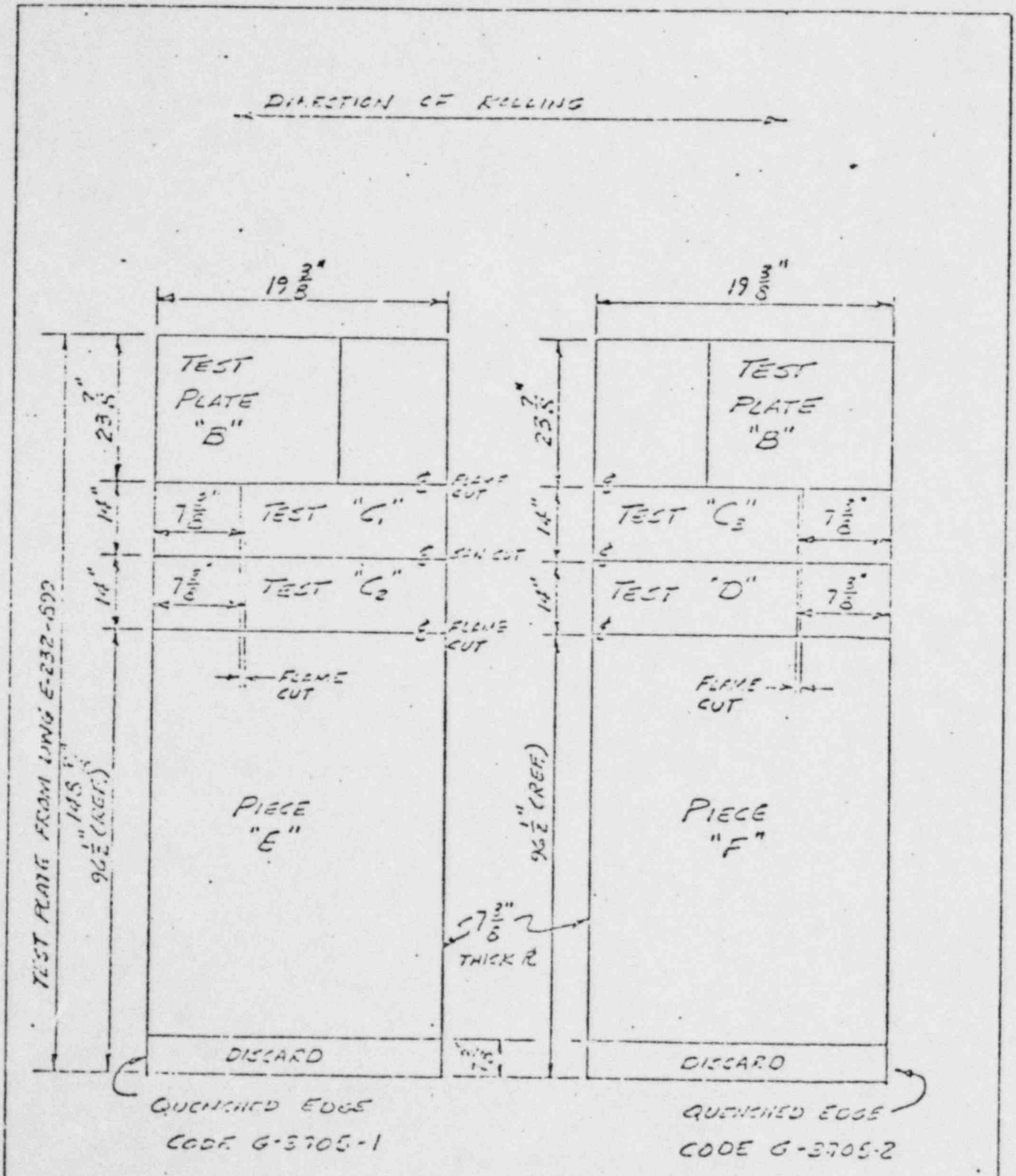


FIGURE NO. 1

TEST PLATE - TEST "D"
(BASE METAL)

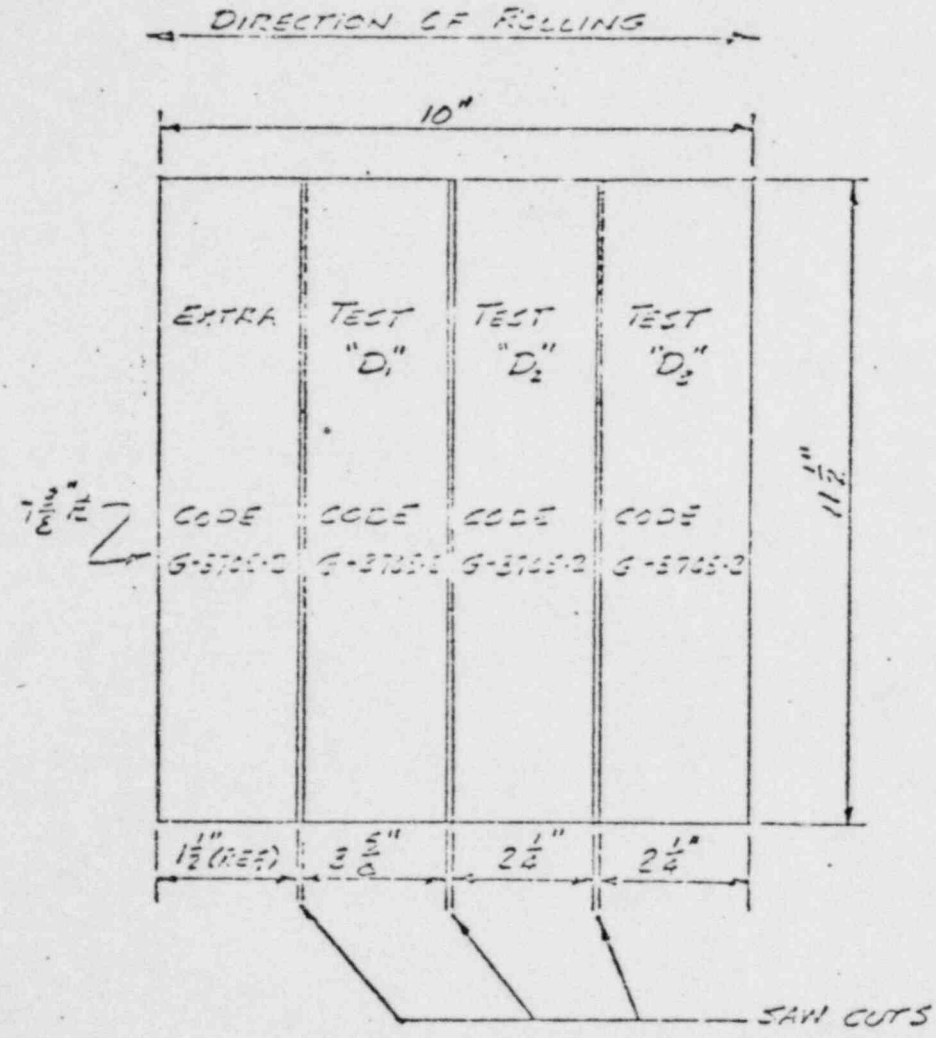


FIGURE NO. 2

COMBUSTION ENGINEERING, INC.
ENGINEERING DEPARTMENT, CHATTANOOGA, TENN.

CHARGE NO. CONTRACT 7467

DESCRIPTION SURVEILLANCE TEST PROGRAM

NUMBER ______
SHEET 15 OF ______
DATE 4-1-69 BY R.J.
CHECK DATE ______ BY ______

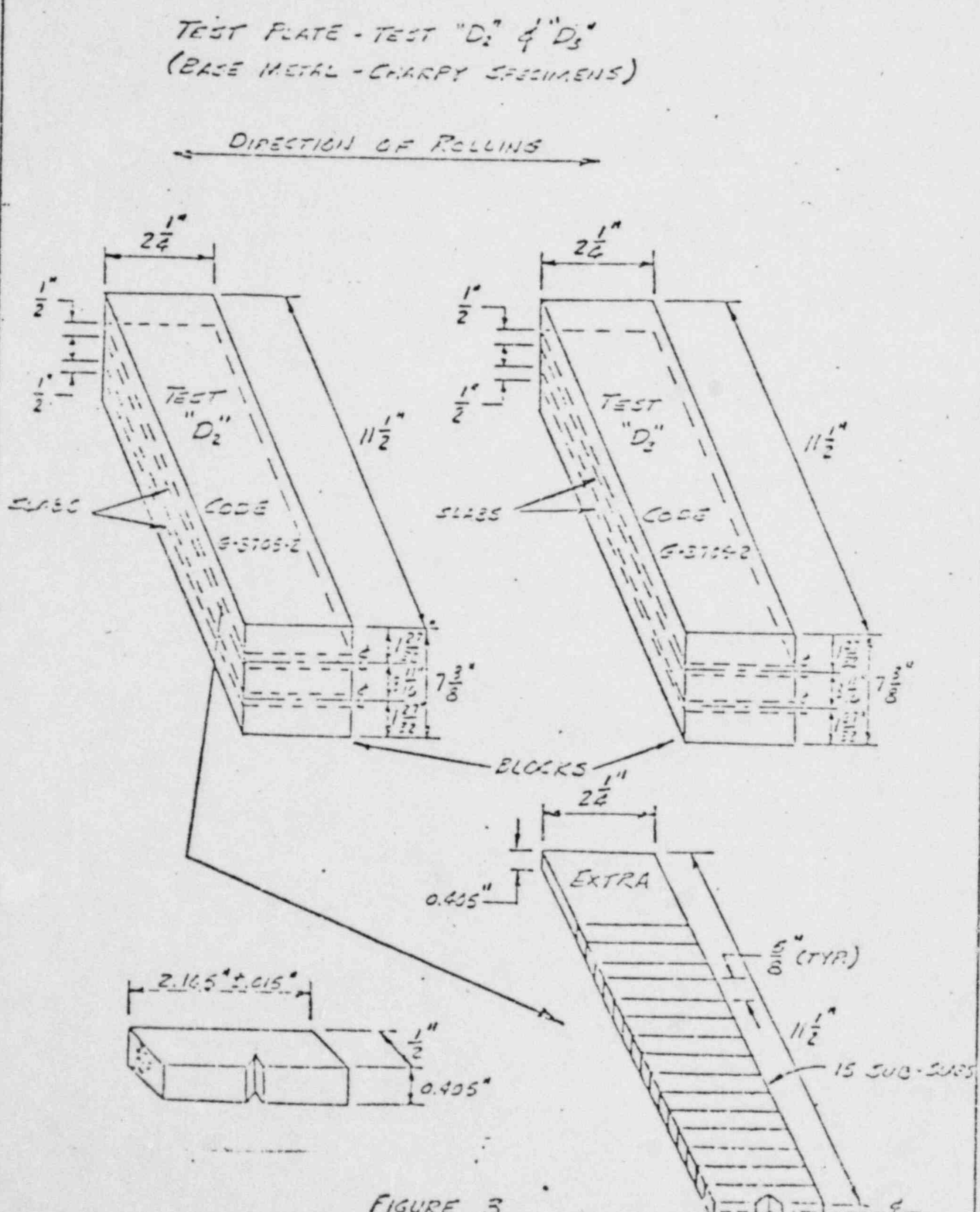


FIGURE 3

COMBUSTION ENGINEERING, INC.
ENGINEERING DEPARTMENT, CHATTANOOGA, TENN.
CHARGE NO. CONTRACT 2667
DESCRIPTION: SURVEILLANCE TEST PROGRAM

NUMBER
SHEET 19 OF
DATE 4-1-69 BY JDJ
CHECK DATE BY

TEST PLATE - TEST "D"
(BASE METAL - TENSILE SPECIMENS)

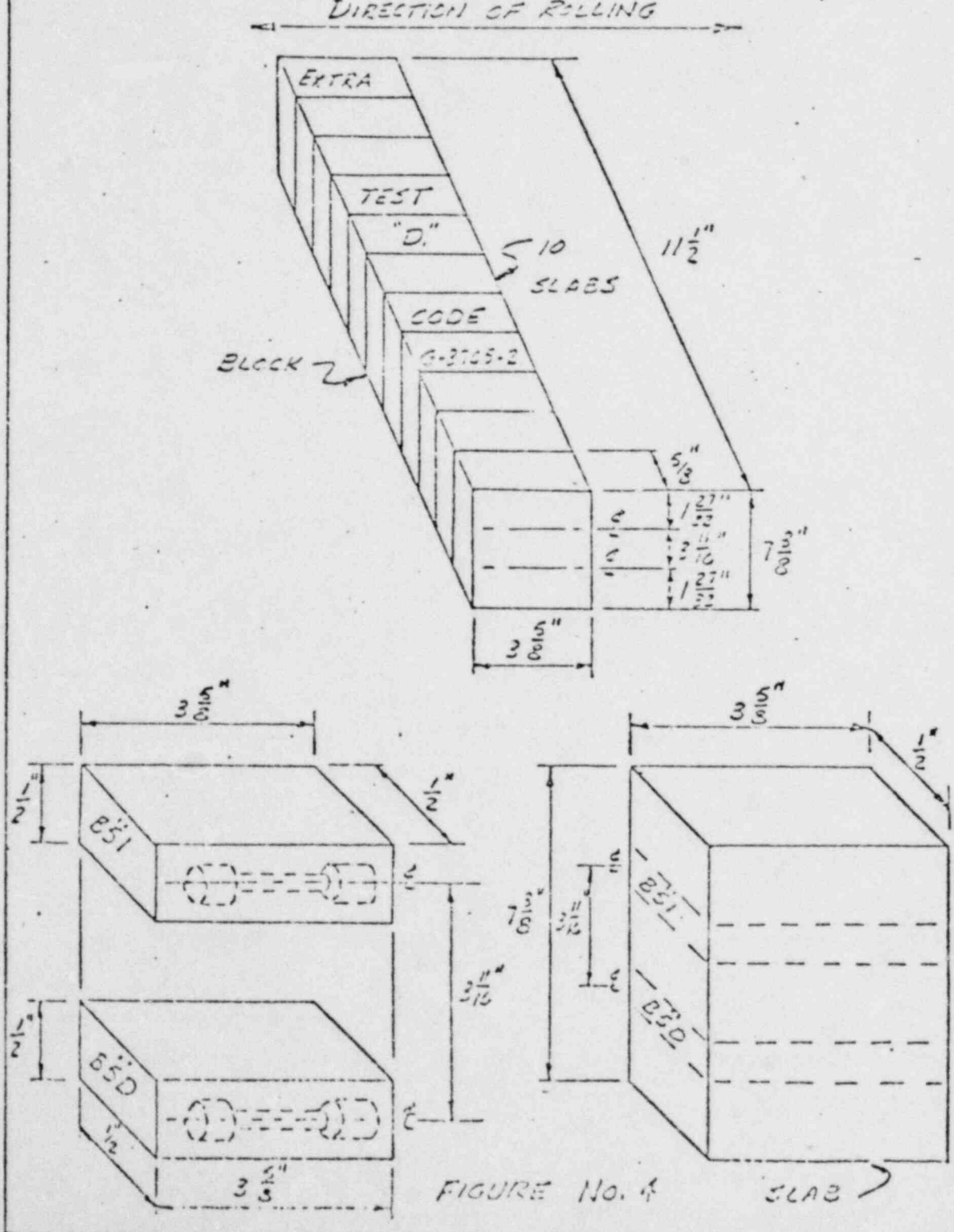


FIGURE NO. 4

COMBUSTION ENGINEERING, INC.
ENGINEERING DEPART. CHATTANOOGA, TENN.
CHARGE NO. CONTRACT 2467
DESCRIPTION SURVEILLANCE TEST PROGRAM

NUMBER
SHEET 20 OF
DATE 1-1-69 BY JDA
CHECK DATE BY

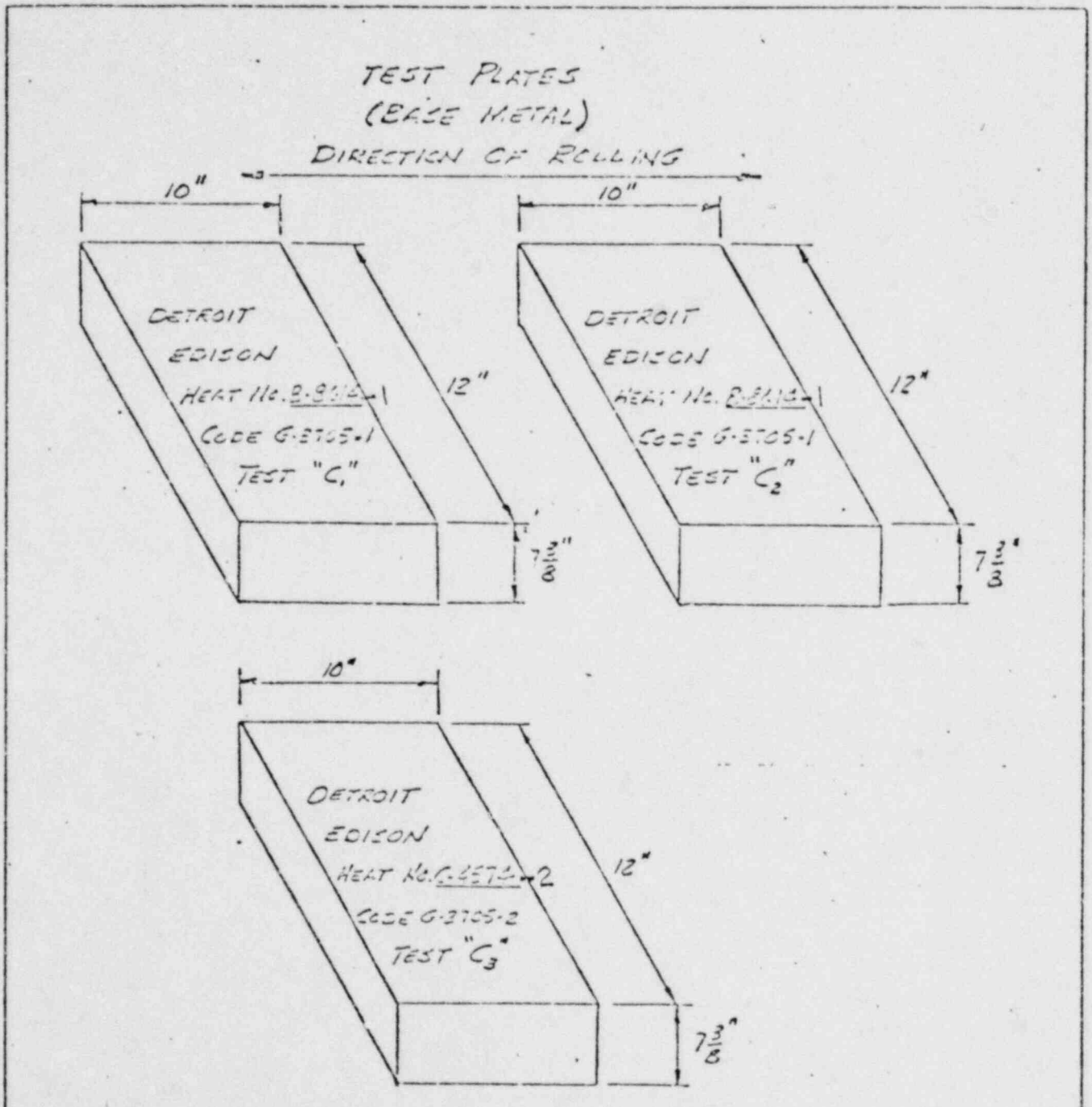


FIGURE No. 5

COMBUSTION ENGINEERING, INC.
ENGINEERING DEPART. NT, CHATTANOOGA, TENN.
CHARGE NO. CONTRACT 2467
DESCRIPTION SURVEILLANCE TEST DIAGRAM

NUMBER
SHT 21 OF
DATE 4-1-69 BY JCT
CHECK DATE BY

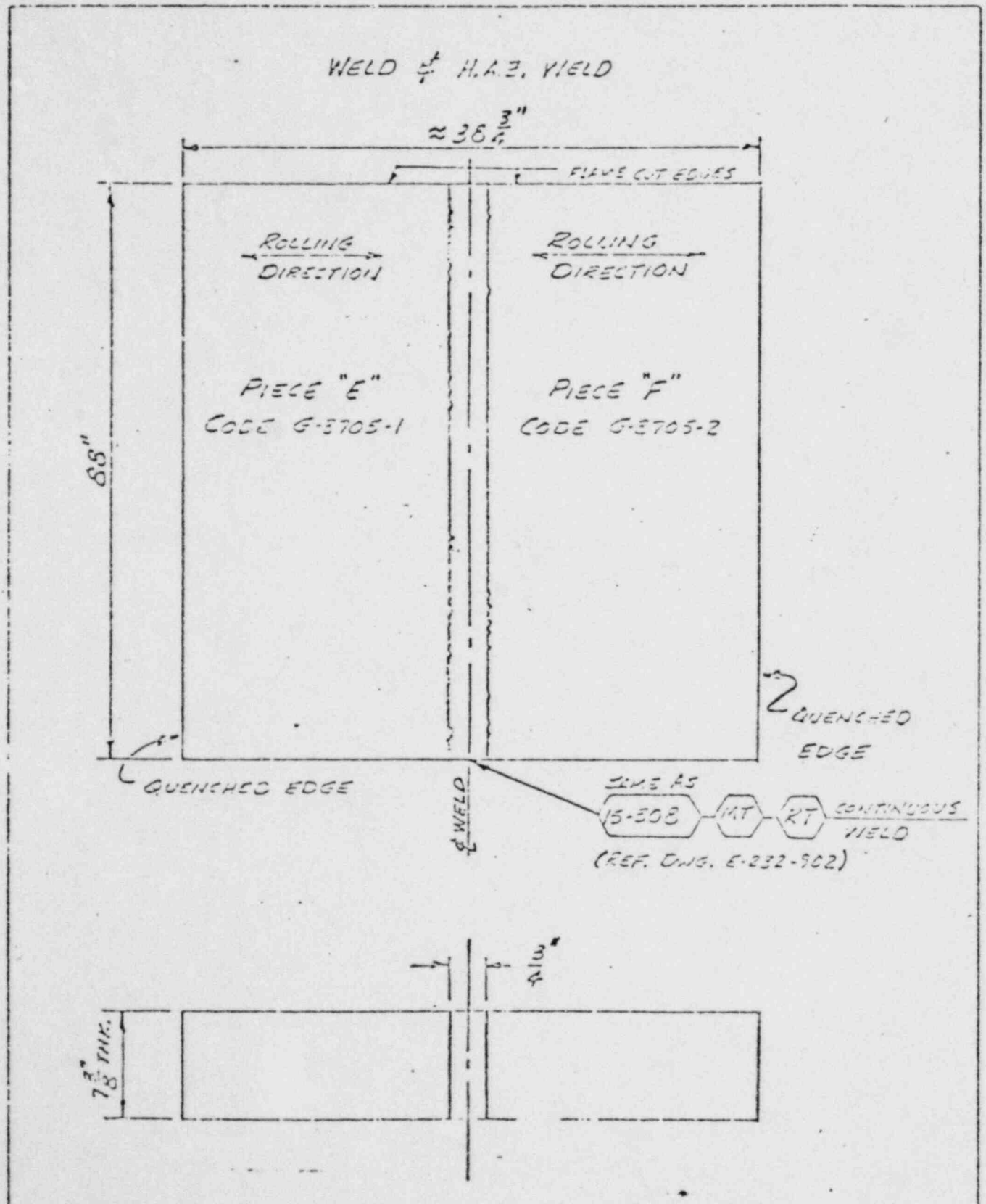


FIGURE No. 6

COMBUSTION ENGINEERING, INC.
ENGINEERING DEPARTMENT, CHATTANOOGA, TENN.
CHANGE NO. COLLUSION 2307
DESCRIPTION SURVEILLANCE TEST PROGRAM

NUMBER
SH 22 OF
DATE 4-1-69 BY JOJ
CHECK DATE BY

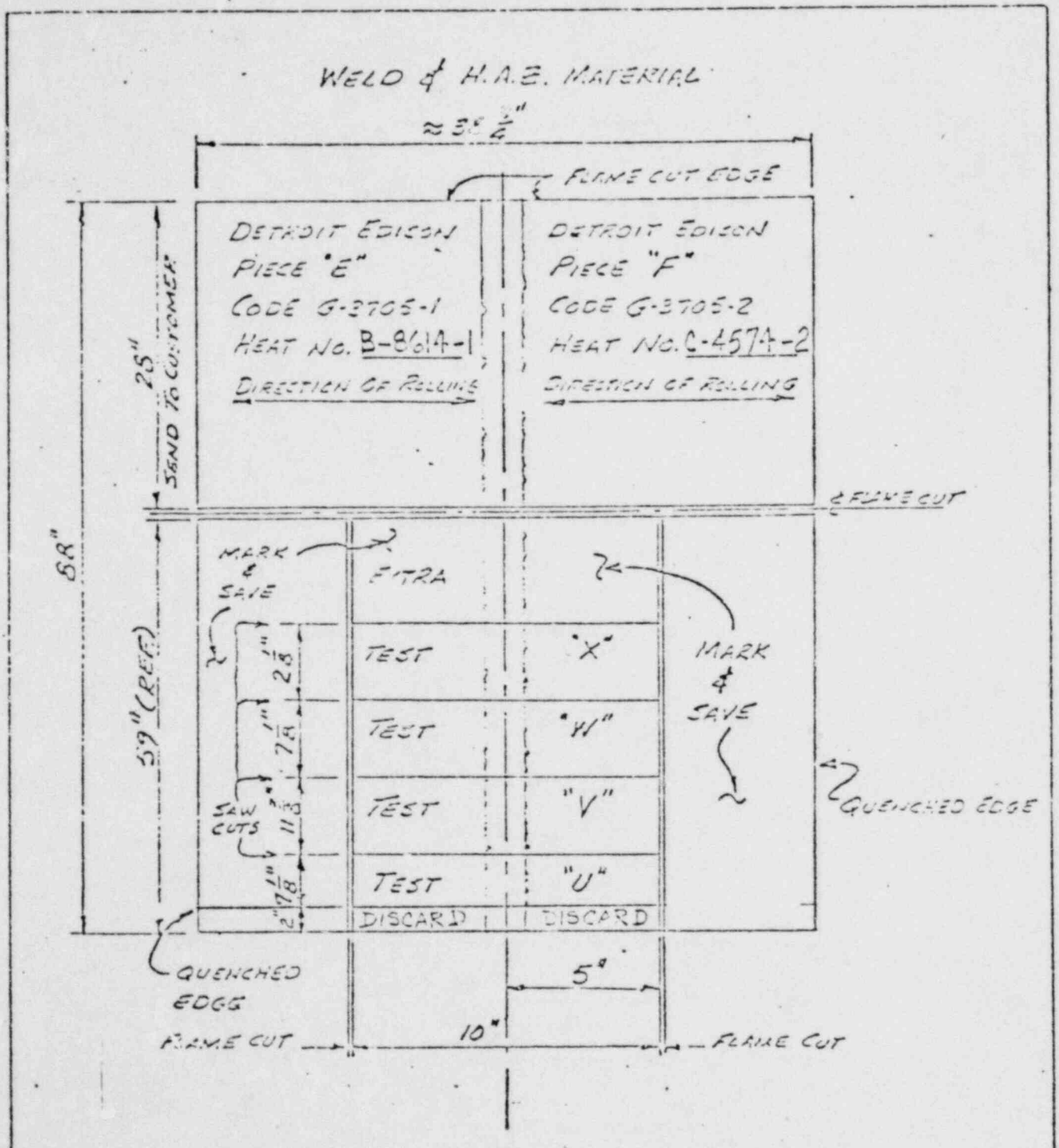


FIGURE NO. 7

COMBUSTION ENGINEERING, INC.
ENGINEERING DEPARTMENT, CHATTANOOGA, TENN.

CHARGE NO. CONTRACT 2467

DESCRIPTION SURVEILLANCE TEST PROGRAM

NUMBER

SH 23 OF

DATE 4-1-69 BY JQT

CHECK DATE BY

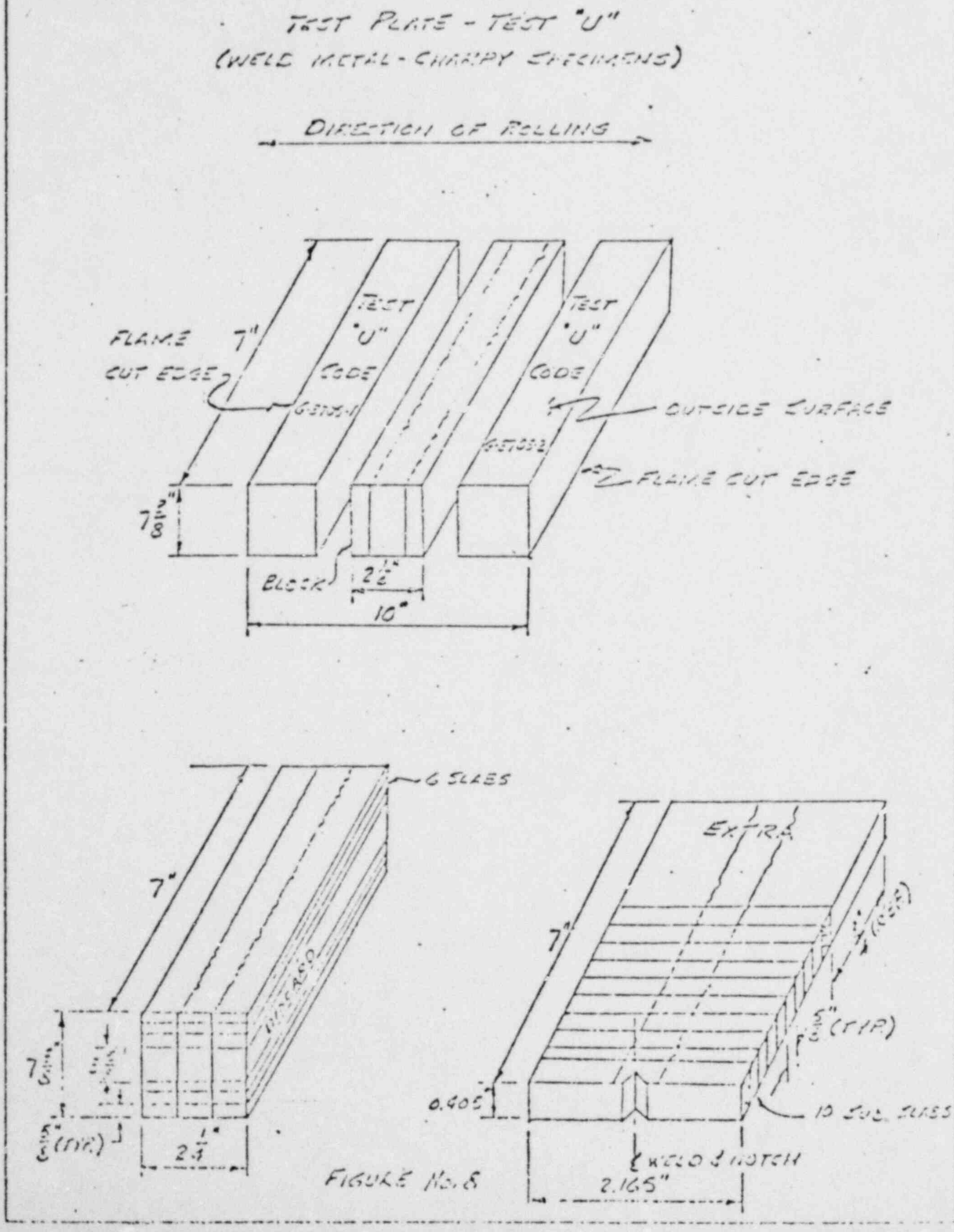
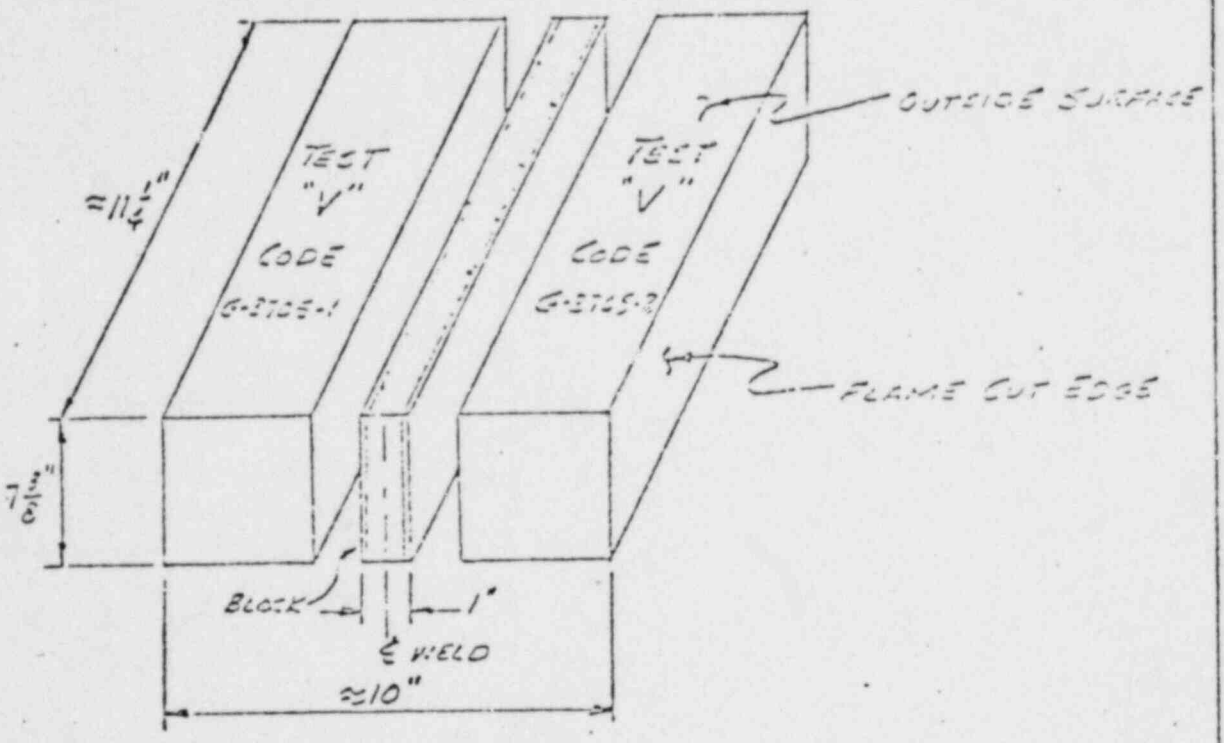


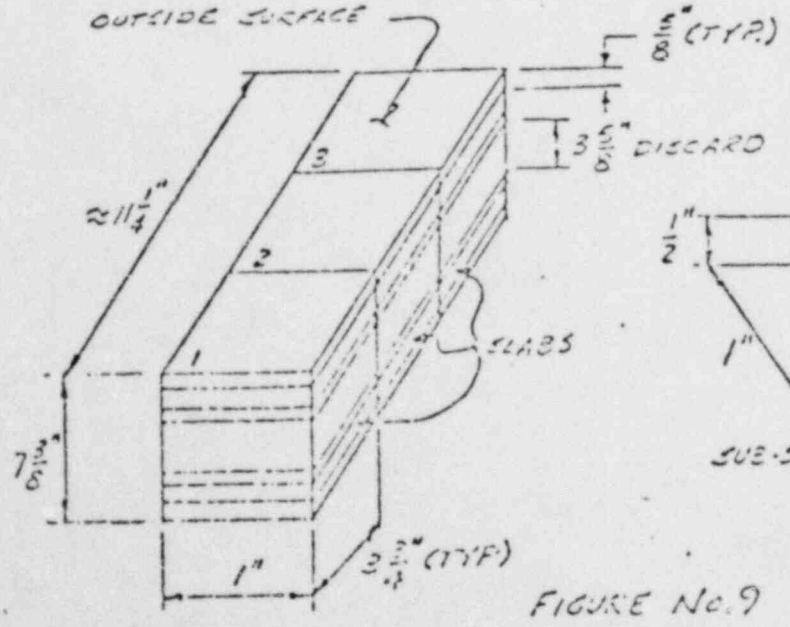
FIGURE No. 8

COMBUSTION ENGINEERING, INC.
ENGINEERING DEPT. CHATTANOOGA, TENN.
CHARGE NO. CONTRACT 2067
DESCRIPTION SURVEILLANCE TEST PROGRAM

NUMBER
SH 24 OF
DATE 4-1-67 BY J.O.T.
CHECK DATE BY

TEST PLATE - TEST "V"
(WELD METAL - TENSILE SPECIMENS)
DIRECTION OF ROLLING





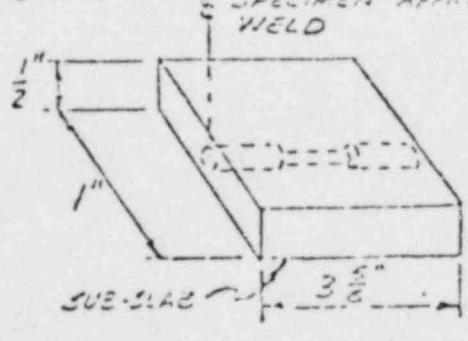
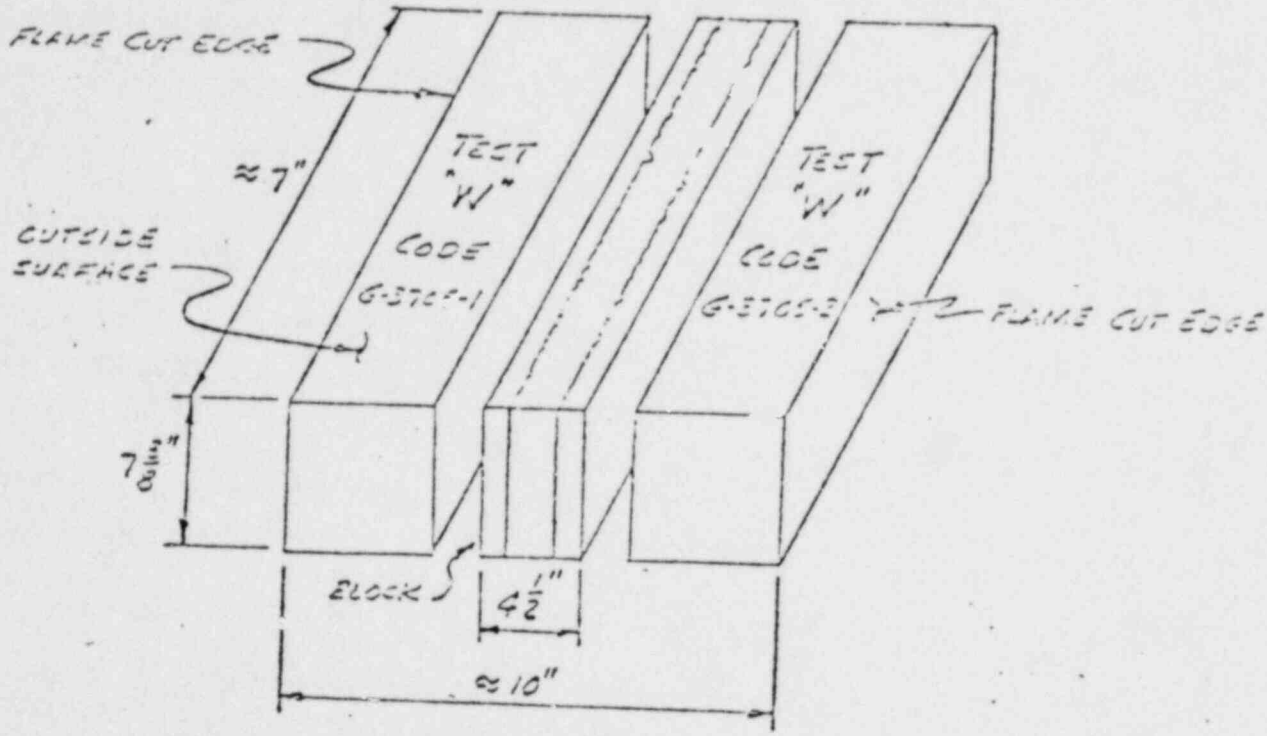


FIGURE No. 9

TEST PLATE - TEST "W"
(HEAT AFFECTED ZONE CHARPY SPECIMENS)
DIRECTION OF ROLLING



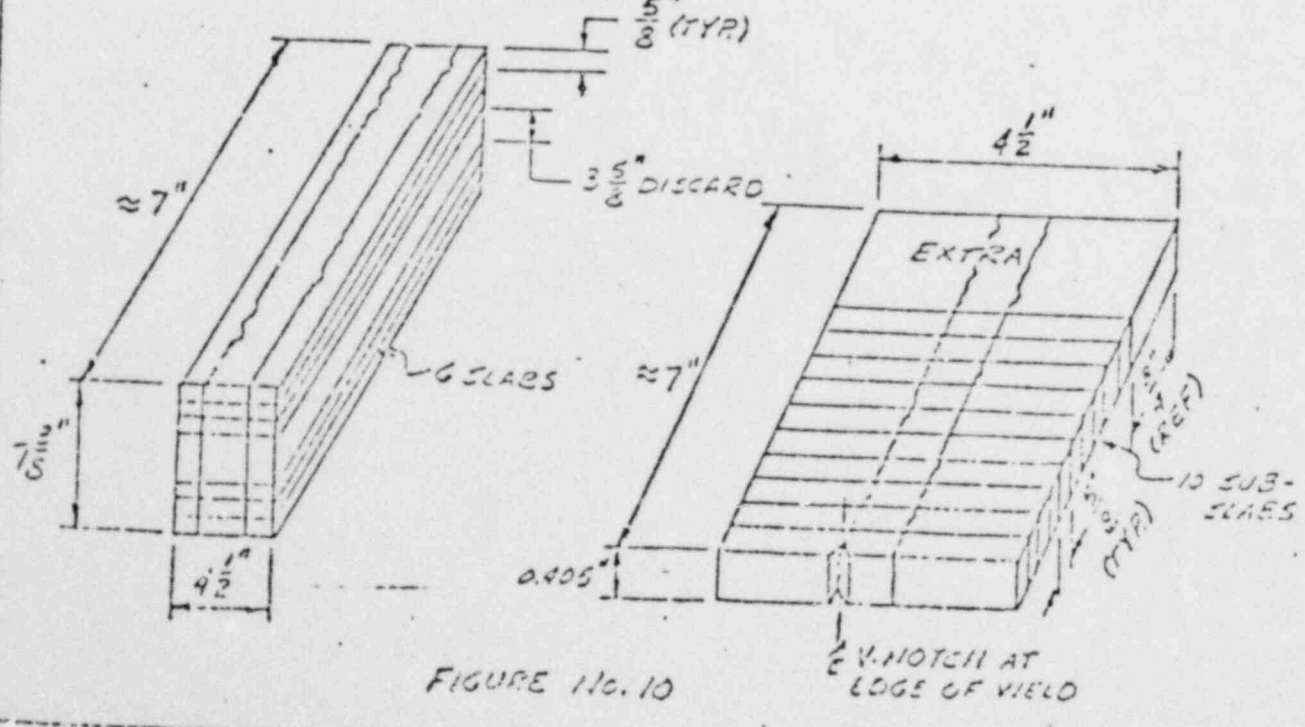
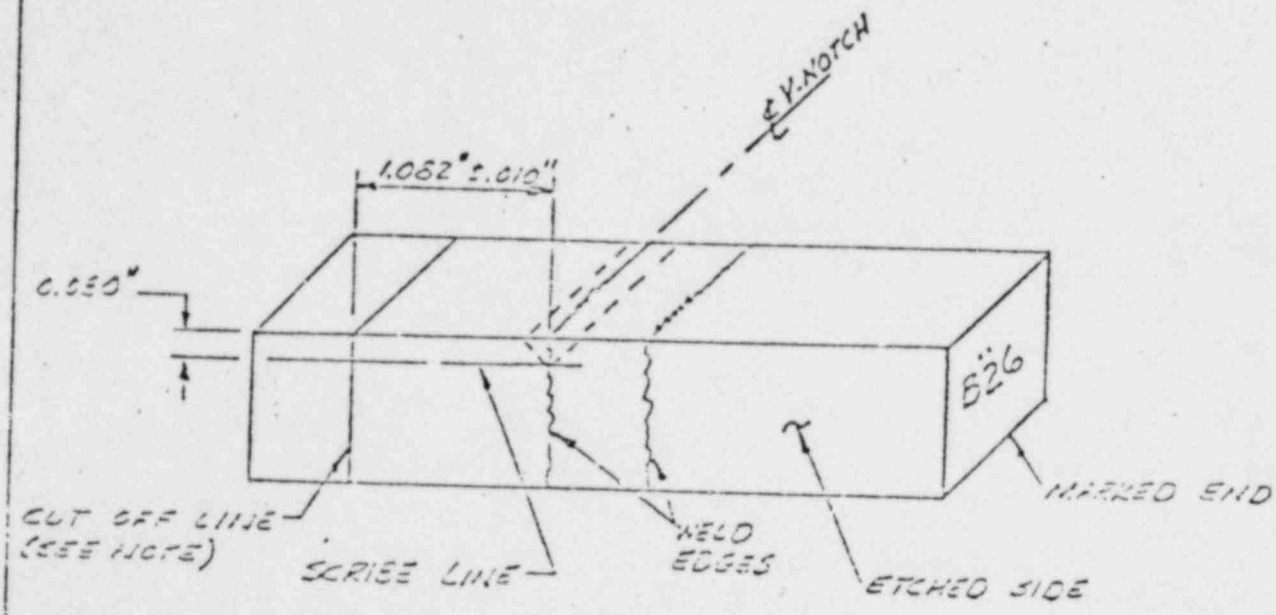


FIGURE NO. 10

COMBUSTION ENGINEERING, INC.
ENGINEERING DEPARTMENT, CHATTANOOGA, TENN.
CHARGE NO. [illegible]
DESCRIPTION [illegible]

NUMBER
SHEET 26 OF
DATE 4-1-69 BY [illegible]
CHECK DATE BY



SUB-SLAB

NOTE: ① CUT OFF LINE & V-NOTCH MAY BE LOCATED FROM EITHER WELD EDGE.

② BOTTOM OF NOTCH MUST INTERSECT WELD FUSION LINE.

FIGURE No. 11

COMBUSTION ENGINEERING, INC.
ENGINEERING DEPT. ENG. CHATTANOOGA, TENN.
CHARGE NO. [illegible]
DESCRIPTION [illegible]

NUMBER
SHT. 27 OF
DATE 4-1-62 BY [illegible]
CHECK DATE BY

TEST PLATE - TEST "X"
(HEAT AFFECTED ZONE - TENSILE SPECIMENS)
DIRECTION OF ROLLING

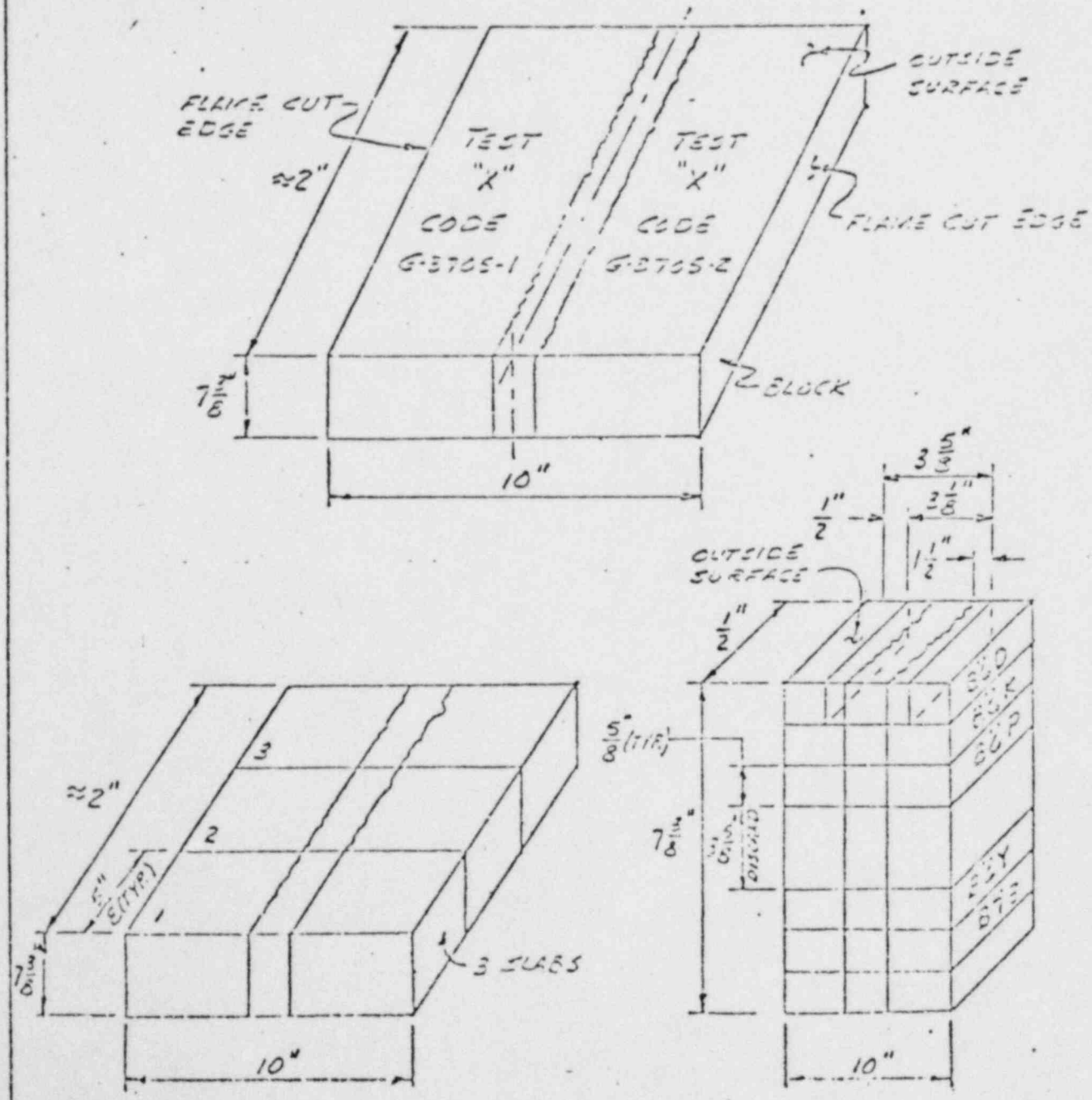
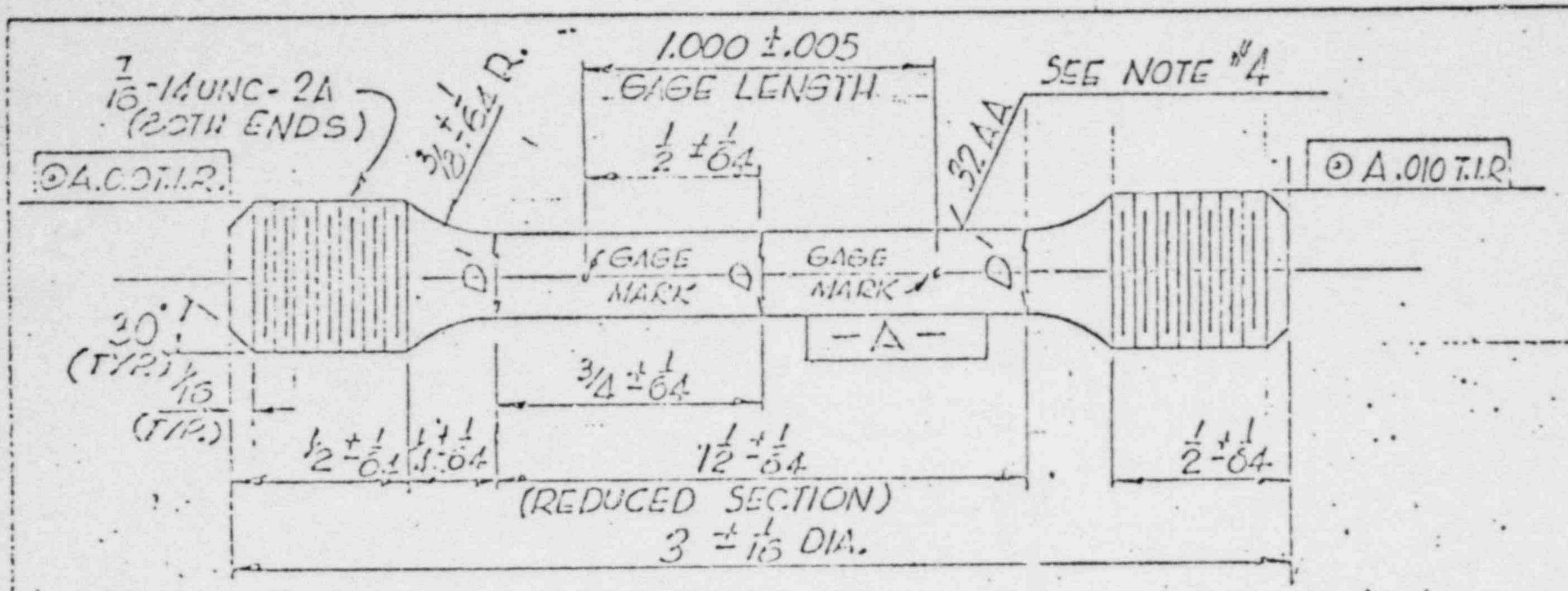


FIGURE NO. 12

COMBUSTION ENGINEERING, INC.
ENGINEERING DEPARTMENT, CHATTANOOGA, TENN.

CHARGE NO. [illegible]
DESCRIPTION [illegible]

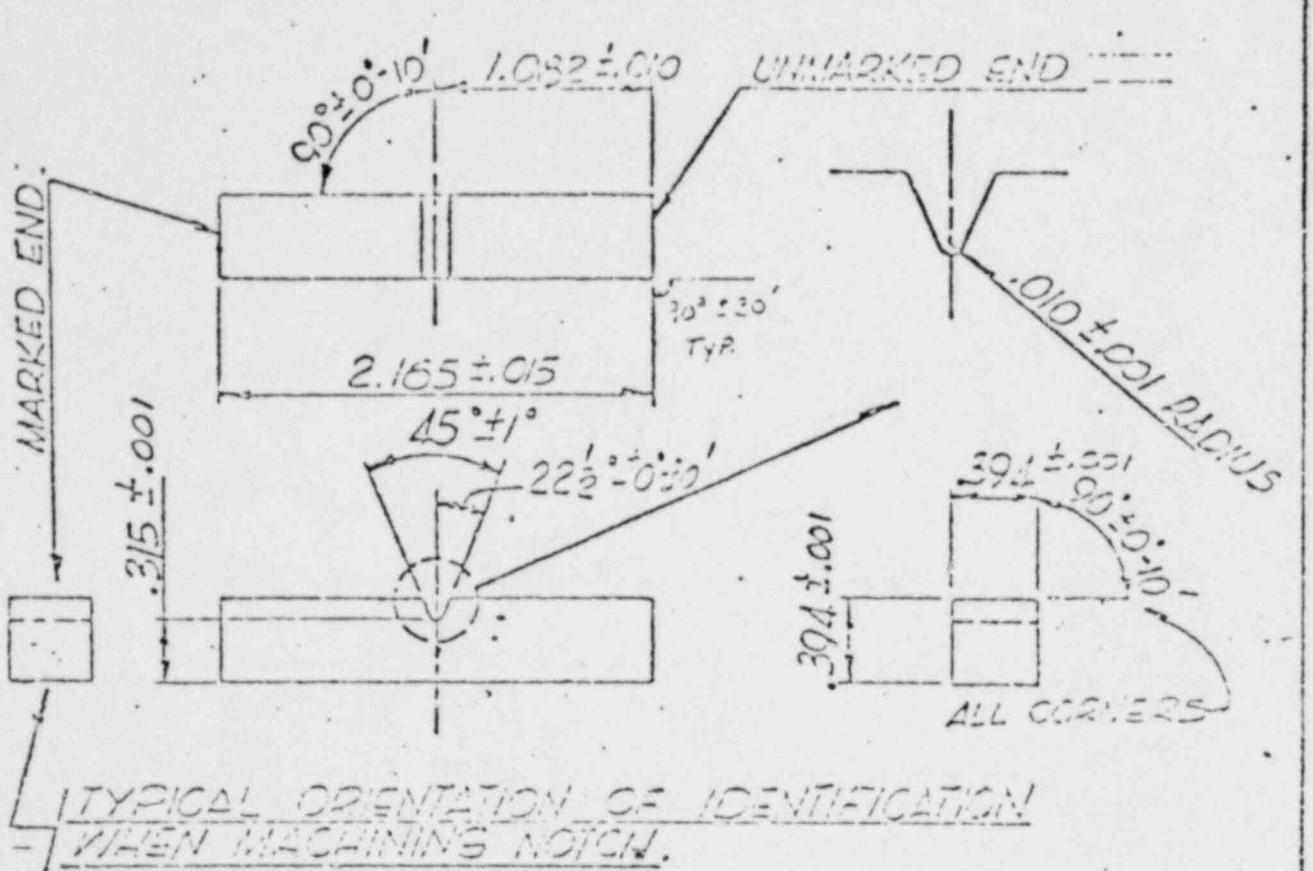
NUMBER ______
SHEET 33 OF ______
DATE 4-1-69 BY [illegible]
CHECK DATE ______ BY ______



NOTES:

1. D = .250 ±.001 DIA. AT CENTER OF REDUCED SECTION.
2. D' = ACTUAL 'D' DIA. +.002 TO .005 AT ENDS OF REDUCED SECTION, TAPERING TO 'D' AT CENTER.
3. USE PRESET EXTENSOMETER GAGE MARKER FOR PRICK PUNCHING GAGE MARKS.
4. POLISH REDUCED SECTION AND RADIUS TO 32 AA, REMAINDER AS TURNED.
5. EACH PIECE IS TO BE MARKED AS PER SPECIMEN BLANK FROM WHICH IT WAS MADE.
6. 100% DIMENSIONAL INSPECTION REQUIRED.

FIG. 13



TYPICAL ORIENTATION OF IDENTIFICATION WHEN MACHINING NOTCH.

NOTES:

1. FINISH GRIND ALL SURFACES, EXCEPT ENDS, TO 63 MICRO INCHES MAINTAINING CONTINUOUS FLOW OF COOLANT.
2. MACHINE UNMARKED END TO MAKE IT SQUARE. NO SPECIAL FINISH REQUIRED.
3. MARKED END OF BLANK DOES NOT REQUIRE MACHINING. PRESERVE ORIGINAL IDENTITY MARKS ON END OF BLANKS IF POSSIBLE. IF REMARKING IS REQUIRED, REMARK SAME END. CHARACTER, THEIR LOCATION & ORIENTATION ARE TO BE IDENTICAL TO THAT OF THE ORIGINAL MARKING.
4. MILL OR BROACH "V" NOTCH ON SIDE ADJACENT TO TOP OF IDENTIFICATION MARKS. BOTTOM OF "V" NOTCH SHALL BE MACHINED SMOOTHLY WITH NO CHATTER OR TOOL MARKS. MEASURE NOTCH LOCATION WITH RESPECT TO UNMARKED END.
5. REMOVE ALL BURRS.
6. 100% DIMENSIONAL INSPECTION REQUIRED.

FIG. 14