

NPG
R-945

28449 ADA 800062

U. S. NAVAL PROVING GROUND
DAHLGREN, VIRGINIA

REPORT NO. 945

TASK ASSIGNMENT NPG-Re3c-321-4-52

1st Partial Report

GUN FIRING TEST OF BOMBS,
GENERAL SERVICE 3000 LB., T55
ORDNANCE PROJECT TM2-9110

1st Partial Report Task
Assignment NPG-Re3c-321-4-52

Copy No. 11 Classification [REDACTED]

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dtd. Feb. 1978, NSWC, Dahlgren, Va.
conf

NPG REPORT NO. 945

U. S. NAVAL PROVING GROUND
DAHLGREN, VIRGINIA

UNCLASSIFIED

First Partial Report

on

Task Assignment NPG Re3c-321-4-52

First Partial Report

on

Gun Firing Test of Bombs,
General Service 3000 lb., T55
Ordnance Project TM2-9110

TECHNICAL REPORTS SECTION
STINFO BRANCH
BLDG. 305

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Project No.: NPG-Re3c-321-4-52
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Date:

UNCLASSIFIED

MAR 27 1952

Gun Firing Test of Bombs, General Service 3000 lb.,
 Ordnance Project TM2-9110

TABLE I

SUMMARY OF FIRING CONDITIONS AND TEST RESULTS

3000 lb. General Service T55 Bomb

Gun: 24" Type A No. 235

25 September 1951 through 5 November 1951

<u>Impact No.</u>	<u>Target</u>	<u>Obl.</u>	<u>Str. Vel. f/s</u>	<u>Pene.</u>	<u>Thru Opening</u>	<u>Remarks</u>
39285	8" Conc.	15°	580	C	36"x36"	E & I. No deformation.
39290	10" Conc.	15°	791	C	34"x34"	E & I. Very slight def.
39303	10" Conc.	15°	985	C	36"x36"	E & I. Slight def on nose.
39307	8"x6" Blks 14" Conc.	15°	964	C	33"x35"	Bomb broke up.
39327	2-6" Blks 12" Conc.	15°	989	C	33"x35"	Bomb intact on nose and body section - Base section pushed in and distorted.
39336	2-6" Blks 12" Conc.	15°	972	C	31"x36"	Bomb split long. - Broke open.
39354	10" Conc.	15°	971	C	26"x34"	E & I. Slight def on nose section.
39366	10" Conc.	30°	973	C	30"x42"	E & I. Very little def.
39403	10" Conc.	30°	1006	C	35"x38"	E & I. Mod. def on one side of nose section.
39417	0.633 STS	15°	992	C	30"x31"	E & I. No deformation.

File No.

Butt Firing

U. S. Naval Proving Ground
Dahlgren, Va. 9-25-51 194IMPACT No. 39285
IMPACT DATE 9-25-51
BUTT No. FOBJECT BALLISTIC TEST OF GENERAL SERVICE 3000 LB.
BOMB, T 55, VS. 8" CONCRETE TARGETREFERENCE N.P.G. ~~FORM~~ Report 70945

DATED

Gauge 8" CONCRETE TARGET
 Class
 Maker
 No. #3 Group
 Contract
 Date received
 Dimensions
 No. of impact on plate
 Thickness at impact 8"
 OBLIQUITY 15°
 Impact dimensions 32" x 35"
 PENETRATION C
 Flaking front 36" x 37"
 Flaking back 54" x 75"
 Dist. from top, bottom 12.6"
 Dist. from right, left 72"
 Dist. from nearest impact
 Dish
 Spur
 Cracks - Bulge
 Button (Thrown)(Started)
 Through Opening 36" x 36"

G.S. BOMB PROJECTILE
 Caliber
 Maker
 Type G.S. 3000# BOMB
 Lot No. Year of Specification
 Mark T 55 Mod. No.
 Date received
 Capped or uncapped
 Weight (capped)
 Weight (uncapped)
 Length (uncapped)
 Fuze NONE
 Filler VERMICULITE
 Flight by screen
 Condition after firing:-
 EFFECTIVE or ~~INEFFECTIVE~~
 INTACT
 NO DEFORMATION

BALLISTIC DATA

NOTE:	-1- Desired	-2- Oscillograph	-3- Chronograph	-4- Limit, estimated for this thickness of impact.	-5- Actual adjusted to nominal gauge.	-6- Limit, for nominal gauge, based on this impact only. (Adjusted from column 4)	-7- Limit, for nominal gauge, established from column 6 and previous impacts.
All limits are for this plate and this obliquity only.		<u>MEAN</u>					
Striking velocity (f.s.)		<u>580</u>					

REMARKS

USED 3-5# B.P.D.R. BOOSTERS

UNCLASSIFIED

Limit shots only

Acceptance or Rejection recommended

c/d

F(c/d, e)

N.P.G. Photo. No. NP9-46498

TABLE II
APPENDIX BH. W. Meyers
Ordnery

Navy

File No.

Butt Firing

U. S. Naval Proving Ground

Dahlgren, Va. 9-27-51 194

IMPACT NO. 39290
IMPACT DATE 9-27-51
BUTT NO. FOBJECT BALLISTIC TEST OF 3000 LB. GENERAL SERVICE
T55 BOMB

REFERENCE N.P.G. LETTER Report no. 945

DATED

PLATE

Bomb

PROJECTILE

Gauge 10" CONCRETE TARGET

Class

Maker

No. #10

Group

Contract

Date received

Dimensions

No. of impact on plate

Thickness at impact

OBLIQUITY

Impact dimensions

PENETRATION

Flaking front

Flaking back

Dist. from top, bottom

Dist. from right, left

Dist. from nearest impact

Dish

Spur

Cracks - Bulge

Button (Thrown)(Started)

Through Opening

Caliber 24"

Maker

Type

Lot No.

Year of Specification

Mark T55

Mod.

No.

Date received

Capped or uncapped

Weight (capped)

Weight (uncapped)

Length (uncapped)

Fuze

Filler

Flight by screen

Condition after firing:

EFFECTIVE or INEFFECTIVE

INTACT

VERY SLIGHT

DEFORMATION

BALLISTIC DATA

NOTE:	-1- Desired	-2- Oscillograph	-3- Chronograph	-4- Limit, estimated for this thickness of impact.	-5- Actual, adjusted to nominal gauge.	-6- Limit, for nominal gauge, based on this impact only. (Adjusted from column 4)	-7- Limit, for nominal gauge, established from column 6 and previous impacts.
All limits are for this plate and this obliquity only.		MEAN					
Striking velocity (f.s.)		791					

REMARKS

Limit shots only

e/d

F(e/d, θ)

N.P.G. Photo. No. N.P.G. 46277

Acceptance or Rejection recommended

TABLE III
APPENDIX B

U.S. Navy

GUN: 24" TYPE 11-100 #235

File No.

Butt Firing

U. S. Naval Proving Ground

Dahlgren, Va. 10-1-51 194

IMPACT No. 39303

IMPACT DATE 10-1-51

BUTT No. F

OBJECT BALLISTIC TEST OF 3000 LB. GENERAL SERVICE

T65 BOMB

REFERENCE N.P.G. LETTER Report No 945

DATED

PLATE

BOMB

PROJECTILE

Gauge 10" CONCRETE BLOCK, #30

Class

Maker

No. 30 Group

Contract

Date received

Dimensions

No. of impact on plate

Thickness at impact 10"

OBLIQUITY 15°

Impact dimensions 32" X 34"

PENETRATION COMPLETE

Flaking front 47" X 48"

Flaking back 58" X 64"

Dist. from top, bottom 127"

Dist. from right, left 75"

Dist. from nearest impact 0

Dish 0

Spur 0

Cracks - Bulge 0

Button (Thrown) (Started)

Through Opening 36" X 36"

Caliber 24"

Maker

Type G.S. BOMB

Lot No. Year of Specification

Mark T55 Mod. No.

Date received

Capped or uncapped

Weight (capped)

Weight (uncapped) 2910 #

Length (uncapped) 94.50

Fuze NONE

Filler VERMILITE

Flight by screen

Condition after firing:-

EFFECTIVE or INEFFECTIVE

INTACT

VERY SLIGHT DEFORMATION

BALLISTIC DATA

NOTE:	-1- Desired	-2- Oscillograph	-3- Chronograph	-4- Limit, estimated for this thickness of impact.	-5- Actual, adjusted to nominal gauge.	-6- Limit, for nominal gauge, based on this impact only. (Adjusted from column 4)	-7- Limit, for nominal gauge, established from column 6 and previous impacts.
All limits are for this plate and this obliquity only.		MEAN					
Striking velocity (f.s.)		985					

REMARKS

USED 3.5" R.I.M. BOOSTERS

UNCLASSIFIED

Limit shots only

Acceptance or Rejection recommended

e/d

F(e/d, θ)

N.P.G. Photo. No. 46496

TABLE IV

APPENDIX B

[Signature]
 [Signature]
 U.S. Navy

Gauge 24" R.I.M. Type A Bomb #235

File No.

Butt Firing

U. S. Naval Proving Ground
Dahlgren, Va. 10-2-51 194IMPACT No. 39307-A
IMPACT DATE 10-2-51
BUTT No. F

OBJECT BALLISTIC TEST OF GENERAL SERVICE

3000 LB. BOMB T-55 WITH MULTIPLE CONCRETE SETUP.

REFERENCE N.P.G. LETTER

Report 710, 945

DATED

PLATE

BOMB

PROJECTILE

Gauge CONCRETE BLOCKS
 Class #5 & 6
 Maker _____
 No. _____ Group _____
 Contract _____
 Date received _____
 Dimensions _____
 No. of impact on plate _____
 Thickness at impact 6" X 6" (12")
 OBLIQUITY 15°
 Impact dimensions 40" X 56"
 PENETRATION COMPLETE
 Flaking front 62" X 68"
 Flaking back 60" X 66"
 Dist. from top, bottom 122"
 Dist. from right, left 72"
 Dist. from nearest impact 0
 Dish 0
 Spur 0
 Cracks - Bulge 0
 Button (Thrown) (Started) _____
 Through Opening 33" X 35"

Caliber 24"
 Maker _____
 Type G. SERVICE
 Lot No. _____ Year of Specification _____
 Mark T-55 Mod. _____ No. _____
 Date received _____
 Capped or uncapped _____
 Weight (capped) _____
 Weight (uncapped) 2880#
 Length (uncapped) 94" 50
 Fuze NONE
 Filler VERMICULITE
 Flight by screen _____
 Condition after firing:-
EFFECTIVE or INEFFECTIVE
BOMB BECKE UP

BALLISTIC DATA

NOTE:	-1- Desired	-2- Oscillograph	-3- Chronograph	-4- Limit, estimated for this thickness of impact.	-5- Actual, adjusted to nominal gauge.	-6- Limit, for nominal gauge, based on this impact only. (Adjusted from column 4)	-7- Limit, for nominal gauge, established from column 6 and previous impacts.
All limits are for this plate and this obliquity only.		<u>MEAN</u>					
Striking velocity (f.s.)		<u>964</u>					

REMARKS

USED 3-5# B. PDR. BOOSTERS

UNCLASSIFIED

Limit shots only

Acceptance or Rejection recommended

e/d _____

F(e/d, θ) _____

N.P.G. Photo. No. NP 46495TABLE V
APPENDIX BW. Williams
A. A. Eng

U. S. Navy

GUN: 24" TYPE ARMED C #235

File No.

Butt Firing

U. S. Naval Proving Ground

Dahlgren, Va. 10-4-51 194

IMPACT NO. 39357-A

IMPACT DATE 10-4-51

BUTT NO. F

OBJECT BALLISTIC TEST OF GENERAL SERVICE 3000 LB.

Bomb T55 W/MULTIPLE CONCRETE TARGET

REFERENCE N.P.G. LETTER Report no. 945

DATED

PLATE

Bomb

PROJECTILE

Gauge 6" CONCRETE TARGET #4

Class -

Maker -

No. #4 #3 Group -

Contract -

Date received -

Dimensions -

No. of impact on plate -

Thickness at impact 6" x 6" (12")

OBLIQUITY 15°

Impact dimensions 34" x 55"

PENETRATION COMPLETE

Flaking front 45" x 64"

Flaking back 40" x 55"

Dist. from top, bottom 120"

Dist. from right, left 75"

Dist. from nearest impact 0

Dish 0

Spur 0

Cracks - Bulge 0

Button (Thrown) (Started)

Through Opening 33" x 55"

Caliber 23.915

Maker -

Type G.S. Bomb

Lot No. - Year of Specification -

Mark T55 Mod. - No. -

Date received -

Capped or uncapped -

Weight (capped) -

Weight (uncapped) 2880#

Length (uncapped) 94.50"

Fuze NONE

Filler VERMICULITE

Flight by screen -

Condition after firing:-

EFFECTIVE or INEFFECTIVE

INTACT ON NECK AND BODY

SECTION - BASE PLATE FUSED

IN - CONSIDERED TO BE

SATISFACTORY FROM PENETRATION

STANDPOINT



BALLISTIC DATA

NOTE:	-1- Desired	-2- Oscillograph	-3- Chronograph	-4- Limit, estimated for this thickness of impact.	-5- Actual, adjusted to nominal range.	-6- Limit, for nominal gauge, based on this impact only. (Adjusted from column 4)	-7- Limit, for nominal gauge, established from column 6 and previous impacts.
All limits are for this plate and this obliquity only.		MEAN					
Striking velocity (f.s.)		989					

REMARKS

Limit shots only

e/d.

F(e/d, e)

N.P.G. Photo. No. NPD 46494

TABLE III
APPENDIX B

Acceptance or Rejection recommended

10/10/51
Ord. Eng.

U. S. Navy

EOR: 24" TYPE R111110 #235

File No.

Butt Firing

U. S. Naval Proving Ground
Dahlgren, Va. 10-9-51 194IMPACT No. 39336-A
IMPACT DATE 10-9-51
BUTT No. FOBJECT BALLISTIC TEST OF 3000 LB. GENERAL SERVICE
T55 BOMBREFERENCE N.P.G. ~~LETTER~~ Report no 945

DATED

~~PLATE~~BOMB~~PROJECTILE~~Gauge 6" CONCRETE TARGET #2

Class

Maker

No. #2 Group -Contract -Date received -

Dimensions

No. of impact on plate -Thickness at impact 6" + 6" (12")OBLIQUITY 15°Impact dimensions 32" X 38"PENETRATION COMPLETEFlaking front 41" X 50"Flaking back 43" X 52"Dist. from top, bottom 120"Dist. from right, left 72"Dist. from nearest impact 0Dish 0Spur 0Cracks - Bulge 0Button (Thrown) (Started)Through Opening 31" X 36"Caliber 23.960Maker -Type G.S. BOMB

Lot No. Year of Specification

Mark Mod. No.

Date received

~~Capped or uncapped~~~~Weight (capped)~~Weight (uncapped) 2880#Length (uncapped) 94.50#Fuze NONEFiller VERMICULITE

Flight by screen

Condition after firing:-

~~EFFECTIVE~~ or INEFFECTIVEBOMB SPLIT OPEN LONGITUDINALLY

BALLISTIC DATA

NOTE:	-1- Desired	-2- Oscillograph	-3- Chronograph	-4- Limit, estimated for this thickness of impact.	-5- Actual, adjusted to nominal gauge.	-6- Limit, for nominal gauge, based on this impact only. (Adjusted from column 4)	-7- Limit, for nominal gauge, established from column 6 and previous impacts.
* All limits are for this plate and this obliquity only.		<u>MEAN</u>					
Striking velocity (f.s.)		<u>972</u>					

REMARKS

Limit shots only

e/d

F(e/d, θ)

N.P.G. Photo. No. NP946493~~Acceptance or Rejection recommended~~TABLE VIIAPPENDIX BW. H. MeyerOrd. Eng.U. S. NavyGUN: 24" TYPE 1100 #235

File No.

Butt Firing

U. S. Naval Proving Ground

Dahlgren, Va. 10-15-51 194

 IMPACT No. 39354
 IMPACT DATE 10-15-51
 BUTT No. F

OBJECT BALLISTIC TEST OF 3000 LB. G.S. BOMB T55

REFERENCE N.P.G. LETTER Report no 945

DATED

-PLATE-

Bomb

PROJECTILE

Gauge 10" CONCRETE TARGET #27

Class

Maker

No. #37 Group

Contract

Date received

Dimensions

No. of impact on plate

Thickness at impact 10"

OBLIQUITY 15°

Impact dimensions

PENETRATION 26" X 32"

Flaking front 0

Flaking back 0

Dist. from top, bottom 126"

Dist. from right, left 72"

Dist. from nearest impact 0

Dish 0

Spur 0

Cracks - Bulge 0

Button (Thrown)(Started)

Through Opening 26" X 34"

Caliber 24"

Maker

Type G.S. BOMB

Lot No. Year of Specification

Mark T55 Mod. - No. -

Date received

Capped or uncapped

Weight (capped)

Weight (uncapped) 2850.0#

Length (uncapped) 94.50"

Fuze NONE

Filler VERMICULITE

Flight by screen

Condition after firing:-

EFFECTIVE or INEFFECTIVE

INTACT

SLIGHT DEFORMATION

ON NOSE SECTION

BALLISTIC DATA

NOTE:	-1- Desired	-2- Oscillograph	-3- Chronograph	-4- Limit, estimated for this thickness of impact.	-5- Actual, adjusted to nominal gauge.	-6- Limit, for nominal gauge, based on this impact only. (Adjusted from column 4)	-7- Limit, for nominal gauge, established from column 6 and previous impacts.
All limits are for this plate and this obliquity only.		OVER					
Striking velocity (f.s.)		971					

REMARKS

USED 3-5# B. PDR. BASTENS

UNCLASSIFIED

Limit shots only

e/d

F(e/d, θ)

N.P.G. Photo. No. NP9 46492

TABLE VIII

APPENDIX B

Acceptance or Rejection recommended

 W.W. Meigs
 Ord. Eng.

U. S. Navy

GUN: 24" TYPE A MOD 0 # 235

File No.

Butt Firing

U. S. Naval Proving Ground

Dahlgren, Va. 10-12-51 194

IMPACT No. 39366

IMPACT DATE 10-17-51

BUTT No. 5

OBJECT BALLISTIC TEST OF 3000 LB. GENERAL SERVICE

Bomb T55

REFERENCE N.P.G. LETTER Report 720.945

DATED

PLATE

Gauge 10" CONCRETE TARGET #29

Class

Maker

No. 29 Group

Contract

Date received

Dimensions

No. of impact on plate

Thickness at impact

OBLIQUITY 30°

Impact dimensions 33" X 39"

PENETRATION COMPLETE

Flaking front 50" X 55"

Flaking back 62" X 82"

Dist. from top, bottom 134"

Dist. from right, left 75"

Dist. from nearest impact 0

Dish 0

Spur 0

Cracks - Bulge

Button (Thrown)(Started) 0

Through Opening 33" X 39"

Bomb

PROJECTILE

Caliber 23.960

Maker

Type GENERAL SERVICE

Lot No. Year of Specification

Mark T55 Mod. No.

Date received

Capped or uncapped

Weight (capped)

Weight (uncapped) 2870#

Length (uncapped) 94.50

Fuze NONE

Filler PERMILLITE

Flight by screen

Condition after firing:-

EFFECTIVE or INEFFECTIVE

INTACT

VERY LITTLE

DEFORMATION

BALLISTIC DATA

NOTE:

All limits are for this plate and this obliquity only.

-1-
Desired-2-
Oscillograph-3-
Chronograph-4-
Limit, estimated for this thickness of impact.-5-
Actual, adjusted to nominal gauge.-6-
Limit, for nominal gauge, based on this impact only. (Adjusted from column 4)-7-
Limit, for nominal gauge, established from column 6 and previous impacts.

Striking velocity (f.s.)

MEAN

973

REMARKS

UNCLASSIFIED

Limit shots only

e/d

F(e/d, θ)

N.P.G. Photo. No. NP9 46491

GUN: 24" TYPE A MOD O #235

TABLE IX
APPENDIX B

Acceptance or Rejection recommended

W. H. M. ...

Ord. Eng.

U. S. Navy

File No.

Butt Firing

U. S. Naval Proving Ground

Dahlgren, Va. 10-29-51 194IMPACT No. 39403IMPACT DATE 10-29-51BUTT No. FOBJECT BALLISTIC TEST OF G.S. 3000 LB. BombREFERENCE N.P.G. LETTER Report no. 945

DATED _____

PLATE

Gauge 10" CONCRETE TARGET

Class _____

Maker _____

No. #26 Group _____

Contract _____

Date received _____

Dimensions _____

No. of impact on plate 1Thickness at impact 10"OBLIQUITY 30°Impact dimensions 38" X 42"PENETRATION COMPLETEFlaking front 54" X 58"Flaking back 65" X 69"Dist. from top, bottom 120"Dist. from right, left 62"Dist. from nearest impact 0Dish 0Spur 0Cracks - Bulge 0

Button (Thrown)(Started) _____

Through Opening 35" X 38"

Bomb

Caliber 23.950

Maker _____

Type GENERAL SERVICE

Lot No. _____ Year of Specification _____

Mark 755 Mod. - No. _____

Date received _____

Capped or uncapped _____

Weight (capped) _____

Weight (uncapped) 2810.0#Length (uncapped) 94.50Fuze NONEFiller VERMICULITE

Flight by screen _____

Condition after firing:-

EFFECTIVE or INEFFECTIVEINTACTMODERATE DEFORMATION ON
ONE SIDE OF NOSE SECTION

BALLISTIC DATA

NOTE:	-1- Desired	-2- Oscillograph	-3- Chronograph	-4- Limit, estimated for this thickness of impact.	-5- Actual, adjusted to nominal gauge.	-6- Limit, for nominal gauge, based on this impact only. (Adjusted from column 4)	-7- Limit, for nominal gauge, established from column 6 and previous impacts.
All limits are for this plate and this obliquity only.		<u>MEAN</u>					
Striking velocity (f.s.)		<u>1006</u>					

REMARKS

USED 3-5" B.POR. BOOSTERSUNCLASSIFIED

Limit shots only

e/d _____

F(e/d, θ) _____

N.P.G. Photo. No. _____

TABLE X
APPENDIX BAcceptance or Rejection recommendedLT. E. L. HEVSTIK U.S. Navy

File No.

Butt Firing

U. S. Naval Proving Ground

Dahlgren, Va. 194

 IMPACT No. 39417
 IMPACT DATE 1 Nov. 1951
 BUTT No. "F"

 OBJECT Ballistic Test of 3000 lb G.S Bomb Mk T-55
V.S. 5/8" STS PLATE AT 15°

 REFERENCE N.P.G. LETTER Report No. 945 DATED _____

PLATE

PROJECTILE

Gauge 0.633Class S.T.S.Maker CARNEGIE ILLINOIS STEEL CORP.No. 0175657 Group C-326-727Contract NOBS 2664Date received 3/3/50Dimensions 9 1/2" X 34 7/8"No. of impact on plate 3Thickness at impact 1.62OBLIQUITY 15°Impact dimensions 31" X 33"PENETRATION COMPLETEFlaking front NONEFlaking back NONEDist. from top, bottom 54"Dist. from right, left 144"Dist. from nearest impact 80"Dish 5"Spur 14"Cracks - Bulge NONEButton (Thrown)(Started) —Through Opening 30" X 31"Caliber 24"

Maker _____

Type G.S.

Lot No. _____ Year of Specification _____

Mark T-55 Mod. _____ No. _____

Date received _____

Capped or uncapped _____

Weight (capped) _____

Weight (uncapped) 2855#Length (uncapped) 94 1/2"Fuze NONEFiller VERMICULITE

Flight by screen _____

Condition after firing:-

EFFECTIVE or INEFFECTIVEINTACTNO DEFORMATION

BALLISTIC DATA

NOTE:	-1- Desired	-2- Oscillograph	-3- Chronograph	-4- Limit, estimated for this thickness of impact.	-5- Actual, adjusted to nominal gauge.	-6- Limit, for nominal gauge, based on this impact only. (Adjusted from column 4)	-7- Limit, for nominal gauge, established from column 6 and previous impacts.
All limits are for this plate and this obliquity only.							
Striking velocity (f.s.)	1000	992					

 REMARKS Ball effective and intact. No deformation of plate due to impact.

Limit shots only

e/d _____

F(e/d, @) _____

N.P.G. Photo. No. _____

 TABLE XI
 APPENDIX B

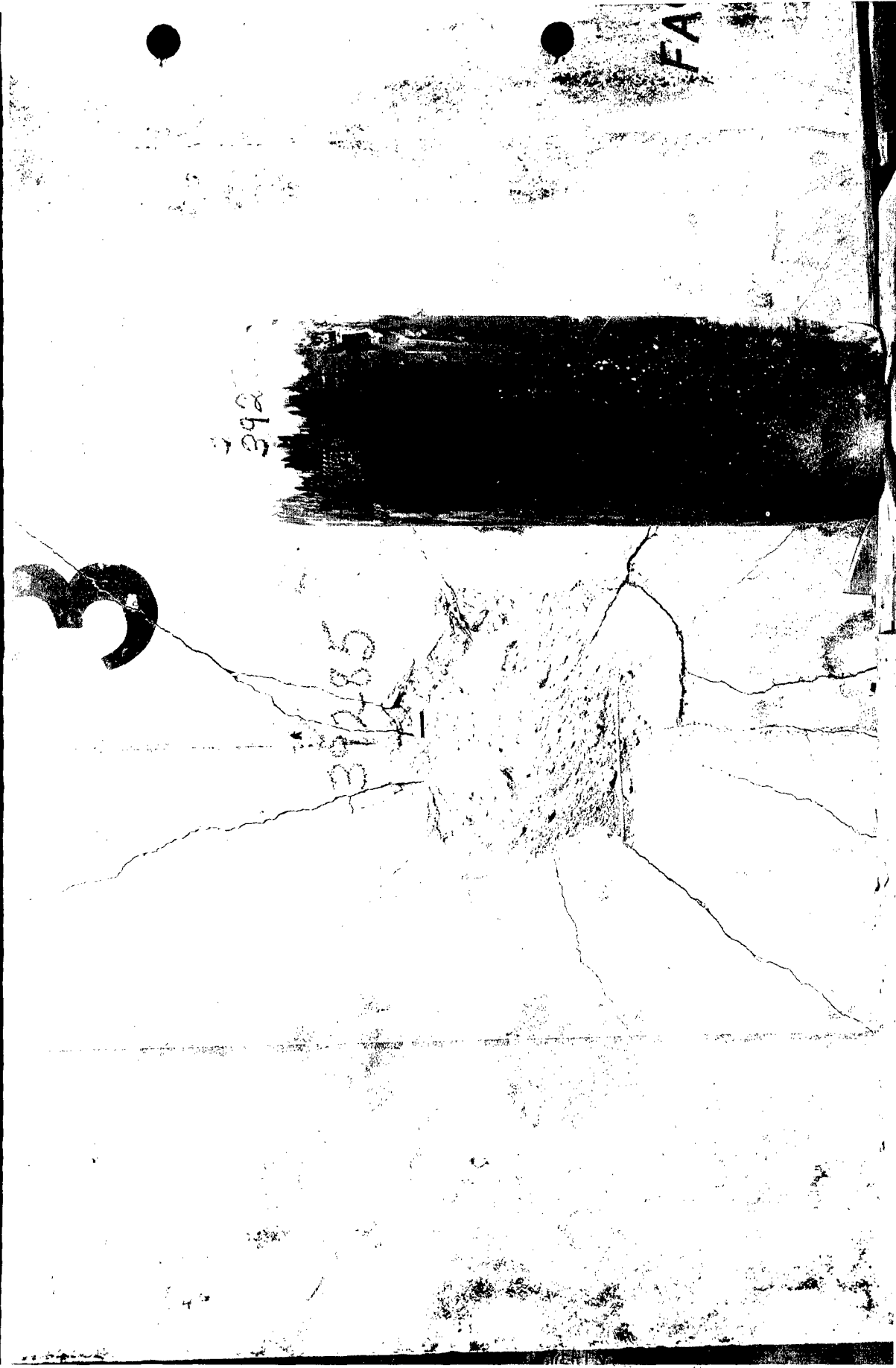
Acceptance or Rejection recommended

U. S. Navy

24" Gun TYPE A No. 235

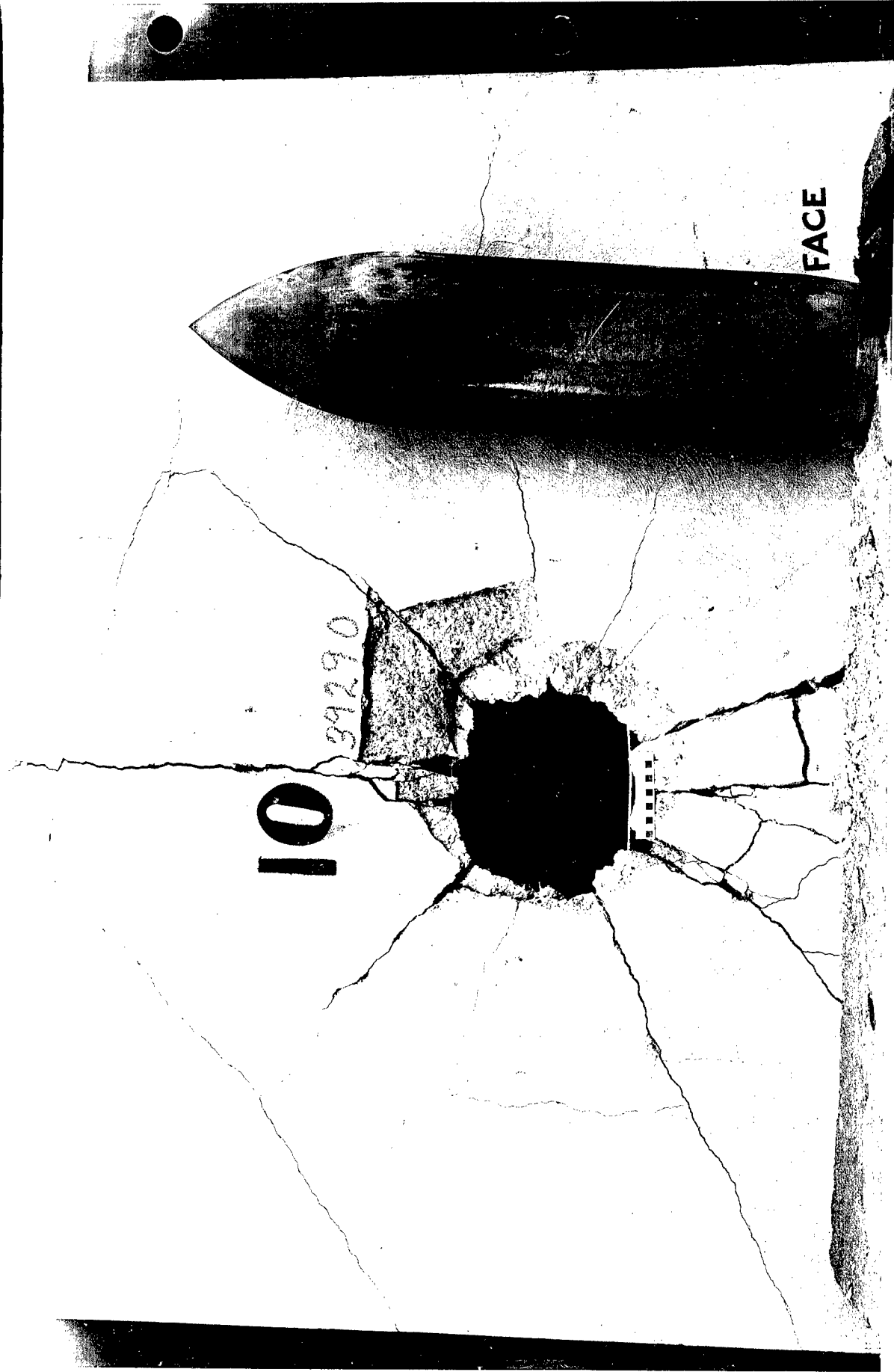
NP9 46498

Test of 3000 lb. General Service Bomb T55 vs. 8" Concrete target at 15° Obl.
Str. Vel 580 f/s - 25 September 1951 Bomb effective and intact - Imp. No. 39285
Figure 1

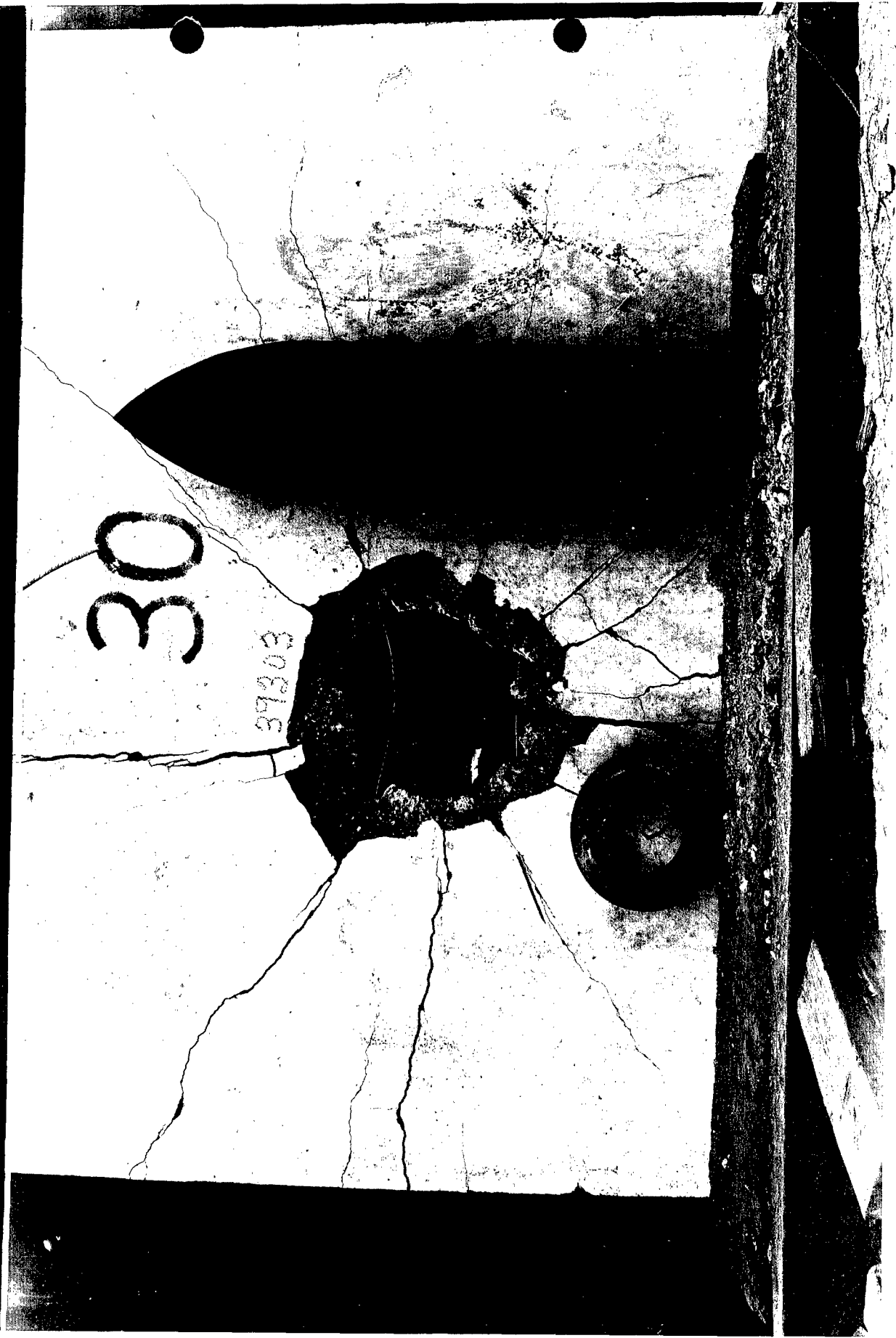


NP9 46497

Test of 3000 lb. General Service Bomb T55 vs. 10" Concrete target at 15° Obl.
Str. Vel 791 f/s - 27 September 1951 Bomb effective and intact - Imp. No. 39290
Figure 2



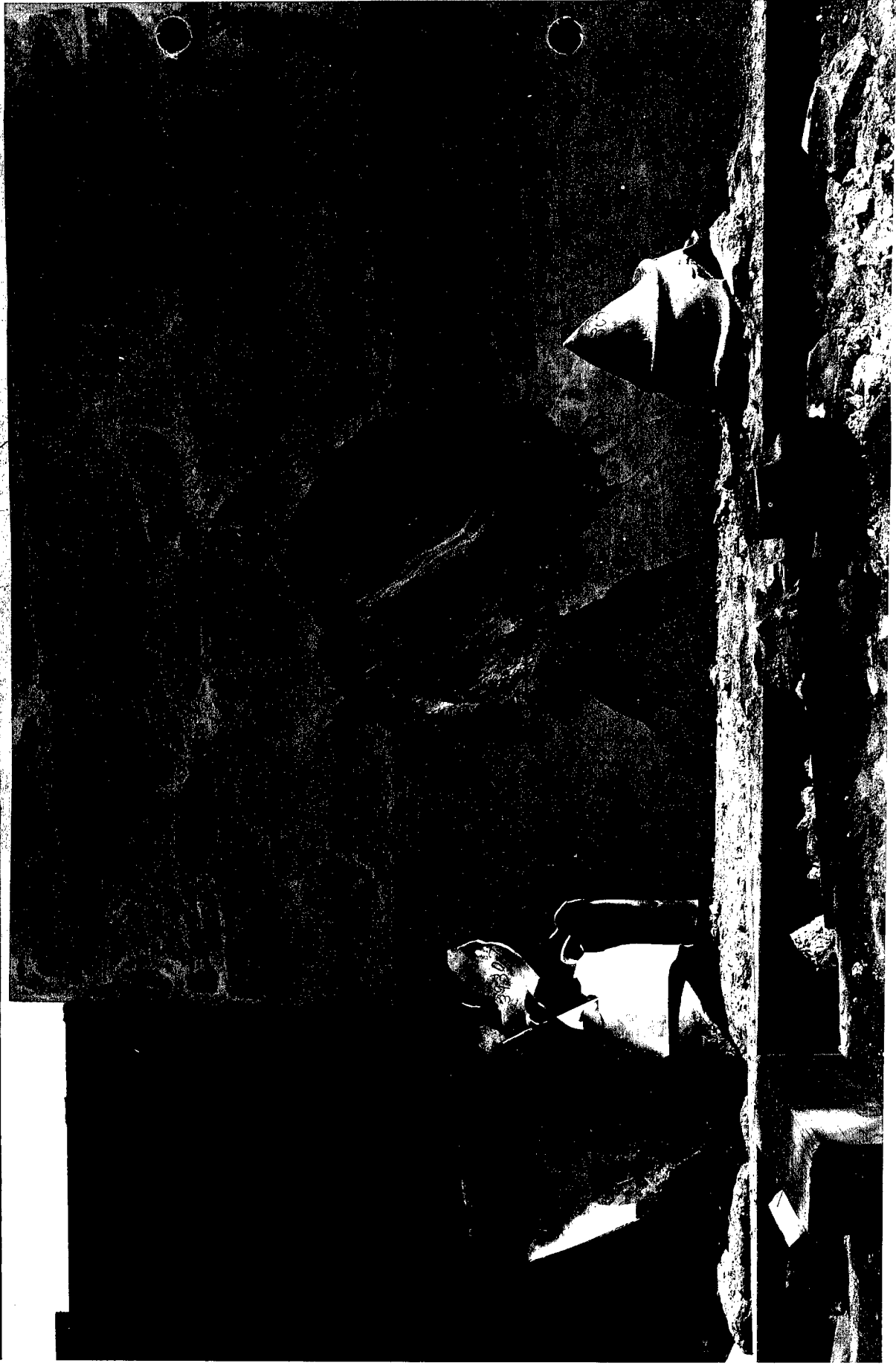
Gar. 1012 1012 1012 Service Bomb 155 vs. 10" Concrete block at 15° Obl.
Gar. 1012 1012 1012 1 October 1951 Bomb effective and intact. - Imp. No. 39303
Figure 3



NP9 46495

Test of 3000 lb. General Service Bomb T55 vs. 14" Concrete (8" and 6" blocks
back to Face) at 15° Obl. Str. Vel. 964 f/s - 2 October 1951 - Bomb broke up -
Imp. No. 39307

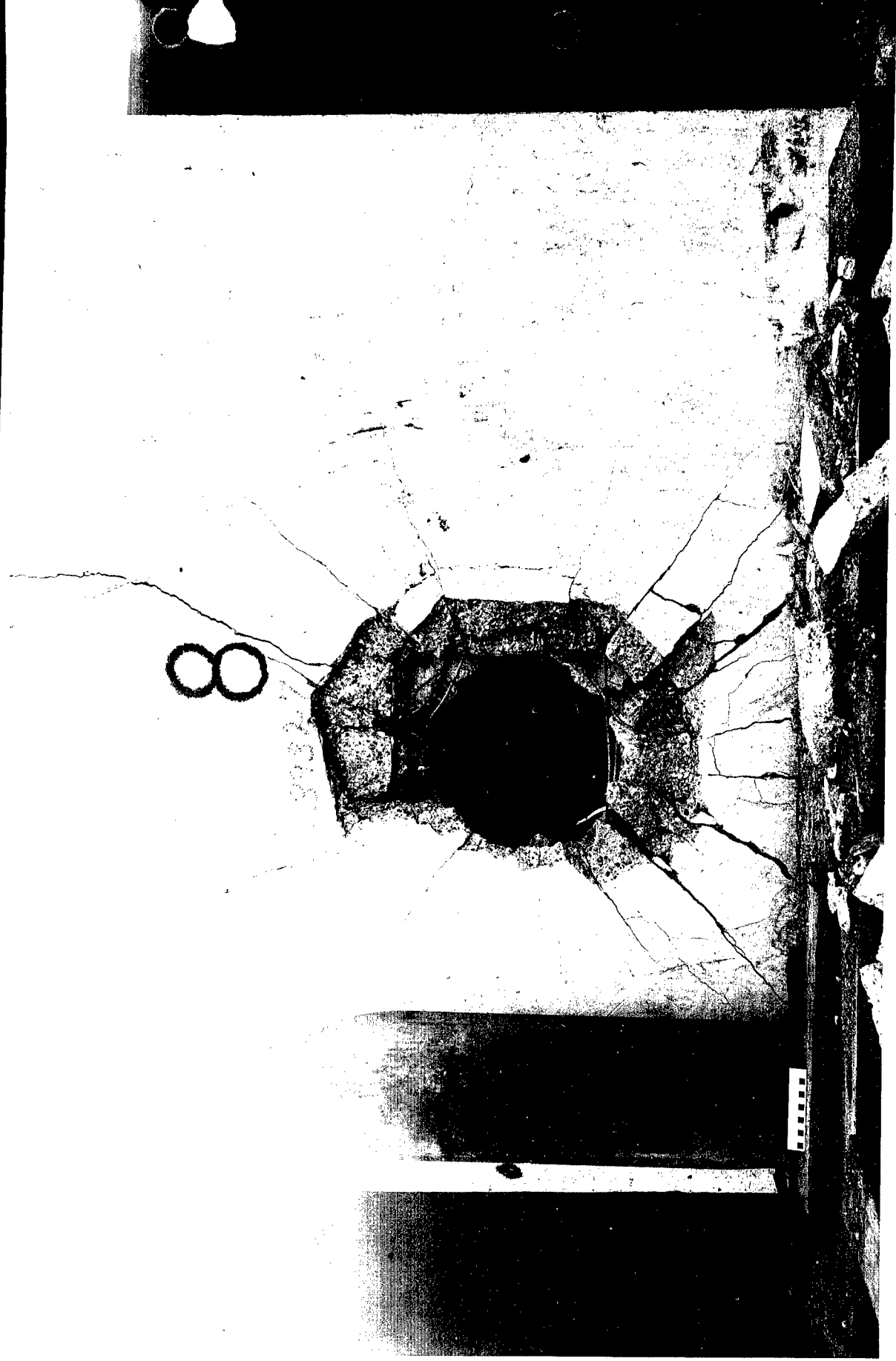
Figure 4



Nr 9 46494

Test of 3000 lb. General Service Bomb T55 vs. 12" Concrete (2 - 6" blocks
back to Face) at 15° Obl. Str. Vel. 989 f/s. 4 October 1951 - Imp. No. 39327 -
Bomb effective and intact

Figure 5



NP9 46493

Test of 3000 lb. General Service Bomb T55 vs 12" Concrete (2 - 6" blocks back to Face) at 15° Obl. Str. Vel. 972 f/s 9 October 1951 - Imp. No. 39336 - Bomb broke up

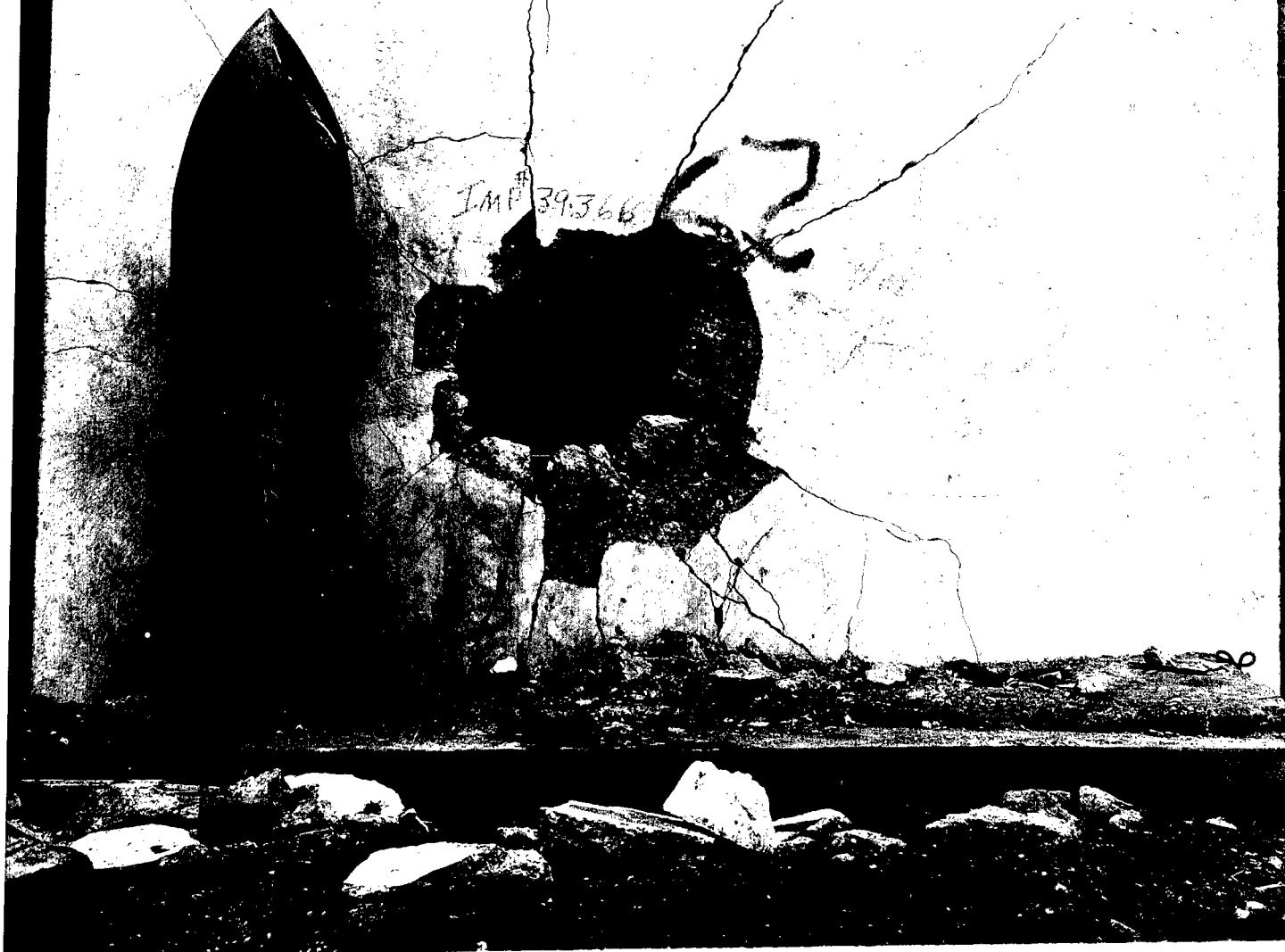
Figure 6



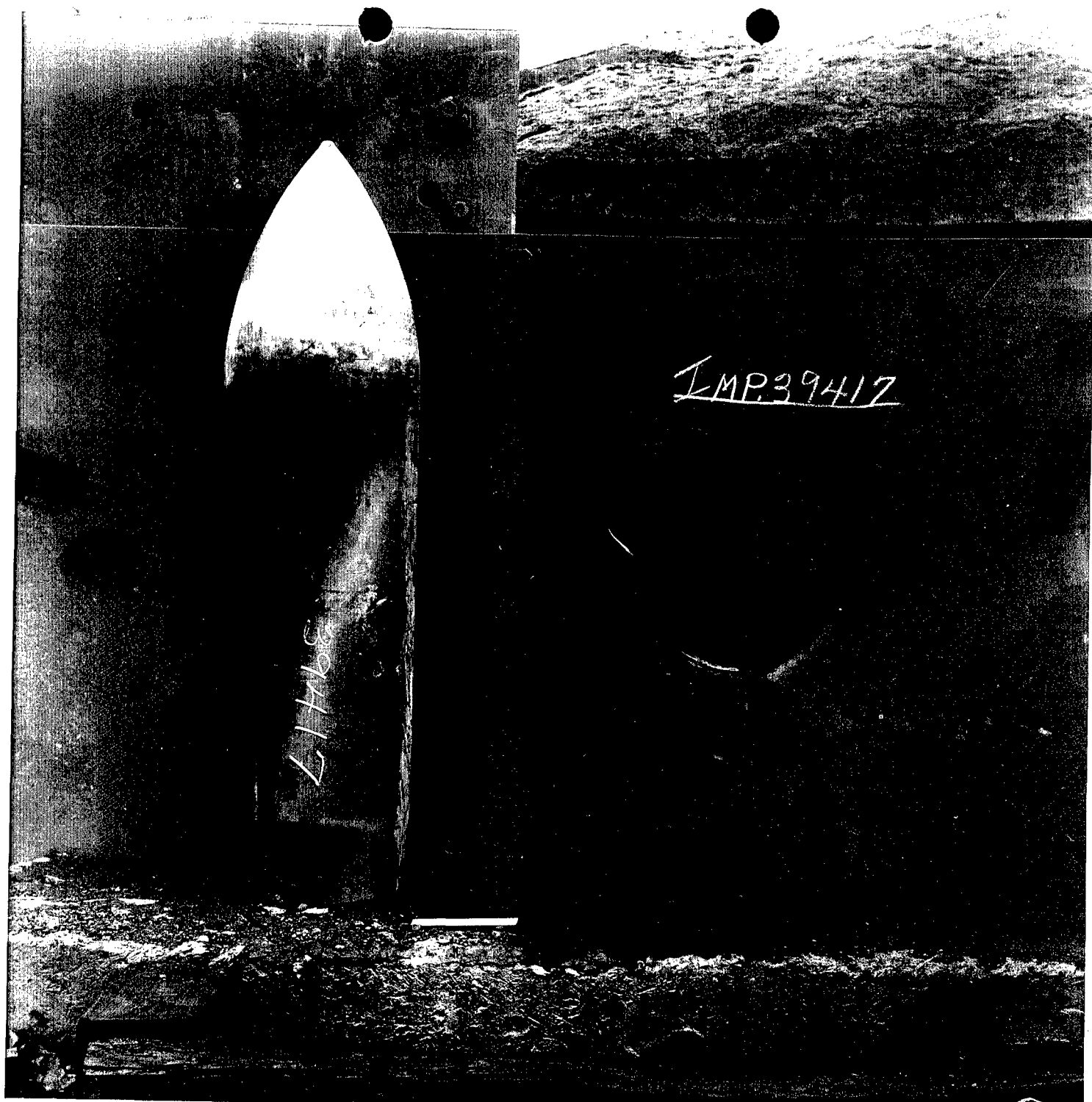
NP9 46492

Test of 3000 lb. General Service Bomb T55 vs 10" Concrete block at 15° Obl.
Str. Vel. 971 f/s 15 October 1951 - Imp. No. 39354 - Bomb effective and intact
Figure 7





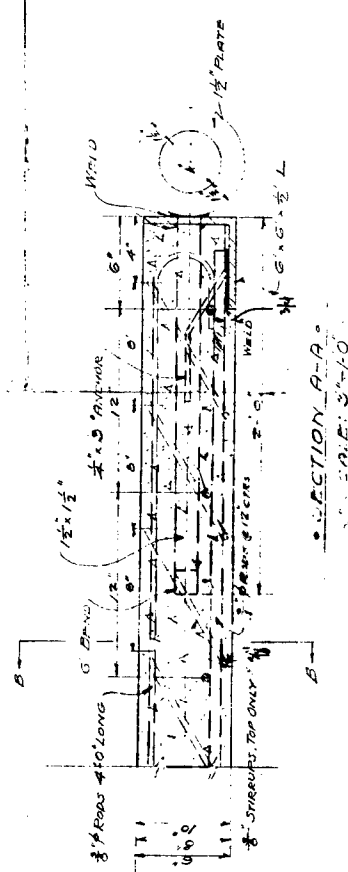
NP9 46491
Test of 3000 lb. General Service Bomb T55, vs 10" Concrete
block at 30° Obl. Str. Vel. 973 f/s - 17 October 1951 -
Imp. No. 39366 - Bomb effective and intact
Figure 8



NP9-48424

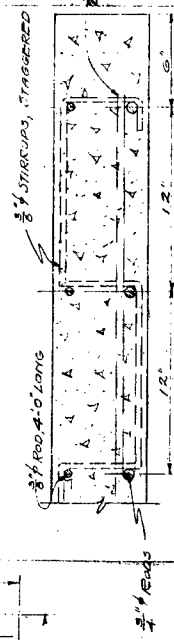
Test of 3000 lb. General Service Bomb T55, vs O'633 STS
Armor plate at 15° Obl. Str. Vel 992 f/s - 1 November 1951
Imp. No. 39417 - Bomb effective and intact.

Figure 10



Not
5000# CONCRETE

PRINT NOT LESS THAN
5" LONG



FRONT ELEVATION.
• SCALE: $\frac{1}{4}" = 1'-0"$

- SECTION B-B -
SCALE: 3"=1'-0"

APPENDIX C

[illegible]

Gun Firing Test of Bombs, General Service 3000 lb.,
Ordnance Project TM2-9110

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Gun Firing Test of Bombs, General Service 3000 lb.,
Ordnance Project TM2-9110

DISTRIBUTION (Continued)

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Gun Firing Test of Bombs, General Service 3000 lb.,
Ordnance Project TM2-9110

PART A

SYNOPSIS

1. This test was conducted to determine if the 3000 lb. General Service Bomb T55 will penetrate in an effective bursting condition a 10 inch reinforced concrete target at a striking velocity of 1000 f/s and at 15° obliquity.
2. From the test results as reported herein it is concluded that 3000 lb. General Service Bomb T55 will:
 - a. Remain effective and intact and in serviceable condition when fired through 10" reinforced concrete at either 15° and 30° obliquity and 1000 f/s striking velocity.
 - b. Remain effective and intact and in serviceable condition when fired through 0.633 STS armor plate at 15° obliquity and 1000 f/s striking velocity.
3. No metallurgical defects or design weaknesses were noted that would cause failure of the bomb under the conditions of the tests reported herein.

Gun Firing Test of Bombs, General Service 3000 lb.,
 Ordnance Project TM2-9110

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APPENDIX B - BUTT IMPACT RECORDS	TABLES
NPG PHOTOGRAPHS	II-XI (Incl) FIGURES 1-10 (Incl)
APPENDIX C - NPG DWG NO. 2434	1 (Only)
APPENDIX D - DISTRIBUTION	1-2 (Incl)

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Gun Firing Test of Bombs, General Service 3000 lb.,
 Ordnance Project TM2-9110

PART B

INTRODUCTION

1. AUTHORITY:

This test was authorized by references (b) and (c) and conducted under Task Assignment NPG-Re3c-321-4-52.

2. REFERENCES:

- a. ORDTM Restr ltr D.M.Lipnick/Ja/3776 of 16 Jun 1950 to BUORD
- b. BUORD Restr ltr Re3c-LME:fml NP9 of 19 Jan 1951 to NAVPROV
- c. BUORD Restr ltr Re3c-BEK:fml NP9 of 4 Aug 1951 to NAVPROV
- d. BUORD Restr ltr Re3c-LME:fml NP9 of 24 Sep 1951 to NAVPROV
- e. NPG Dr. No. 2434 of 3 Mar 1949

3. BACKGROUND:

By reference (a) the Ordnance Department requested estimates of costs to have the Naval Proving Ground construct reinforced concrete targets and test ten Bombs, General Service, 3000 lb., T55, currently under development. References (b) and (c) set up the Task Assignment and established funds for the test program and reference (d) was the directive under which the test program was conducted.

4. OBJECT OF TEST:

This test was conducted to determine if the 3000 lb., General Service Bomb, T55, will penetrate in an effective bursting condition the 10 inch reinforced concrete target described by reference (e) at a striking velocity of 1000 f/s and at 15° obliquity.

5. PERIOD OF TEST:

- | | |
|-------------------------------------|-------------|
| a. Dates of Project Letters | 19 Jan 1951 |
| | 4 Aug 1951 |
| | 24 Sep 1951 |
| b. Date Necessary Material Received | 15 Aug 1951 |
| c. Date Commenced Test | 25 Sep 1951 |
| d. Date Test Completed | 5 Nov 1951 |

Gun Firing Test of Bombs, General Service 3000 lb.,
Ordnance Project TM2-9110

6. REPRESENTATIVES PRESENT:

The following persons witnessed the ballistic tests on the dates shown:

<u>Name</u>	<u>Date</u>	<u>Activity</u>
L. M. Eidsness	25 Sep 1951	BUORD
F. D. Donehue	25 Sep 1951	BUORD
R. M. Kelly	25 Sep 1951	BUORD
A. L. Langlieb	25 Sep 1951	Picatinny Arsenal
D. M. Lipnick	25 Sep 1951	Picatinny Arsenal
LTCOL Wheeler	17 Oct 1951	Air Force Equipment Board
Mr. Frederickson	17 Oct 1951	Office Chief of Ordnance

PART C

DETAILS OF TEST

7. DESCRIPTION OF ITEM UNDER TEST:

Bomb, General Service, 3000 lb., T55 as supplied by the Ordnance Department for this test was 24" diameter and 94"5 in length overall. The bombs were inert loaded with vermiculite-cement and the bomb base was fitted with a special base plate to withstand the pressure of propellant gases during gunfiring. The base plate was also fitted with an eye bolt to assist in loading the bomb through the gun muzzle prior to firing. The bombs as tested weighed from 2810 lbs. to 2950 lbs.

8. DESCRIPTION OF TEST EQUIPMENT:

- a. Gun - 24" Smooth Bore Type A, Mod. 0, No. 235
- b. Propellant - 5"/38 smokeless powder SPDN 9830 plus Black Cannon Powder
- c. Targets - Concrete targets constructed according to NPG Dr. No. 2434 of 3 March 1949

Gun Firing Test of Bombs, General Service, 3000 lbs.,
Ordnance Project TM2-9110

9. PROCEDURE:

The bombs were gunfired from the 24" Smooth Bore Gun using a propellant charge of 3 sections of smokeless powder SPDN 9830 (5"/38 caliber) made up in 5"/54 bags. A 5 lb. pad of Black Cannon Powder was attached to each section to assist in proper ignition of the charge. The powder charge was centered in the 16" chamber of this gun on a wooden cradle. Velocities of the gunfired bombs were measured in standard manner by firing the magnetized bomb through coils and measuring time intervals with recording oscillographs. The target was supported in steel butts and was backed with a large sand pile to stop the bomb and assist in recovery.. Each fired bomb was recovered and examined for condition prior to firing the next bomb on this program.

10. RESULTS AND DISCUSSION:

As requested by reference (d) the first bomb was fired against 8" reinforced concrete at 15° obliquity and 580 f/s striking velocity. This bomb was recovered in satisfactory condition and at the request of the Bureau of Ordnance representatives the second bomb was fired against 10" reinforced concrete at 15° obliquity and 791 f/s striking velocity. This bomb was also recovered in satisfactory condition and the third bomb was fired against 10" reinforced concrete at 15° obliquity and 985 f/s striking velocity. This bomb also was recovered in satisfactory condition. The Bureau representatives then considered that it was worthwhile to establish the maximum thickness of reinforced concrete this bomb would penetrate at 15° obliquity and at striking velocities of approximately 1000 f/s. Accordingly the fourth bomb was fired against a 14" target consisting of an 8" and 6" target placed face to back and at 964 f/s striking velocity. The bomb failed at this test condition and the fifth and sixth bombs were fired against a 12" target consisting of two 6" targets placed face to back. The fifth bomb fired at 989 f/s was recovered with the nose and body section intact but with the base plate distorted and pushed in, probably due to the pressures of the propellant gases. This bomb was considered to be satisfactory from the standpoint of penetration and a sixth bomb was fired at the same conditions and at 972 f/s striking velocities. This bomb failed the test and so the seventh, eighth and ninth bombs were fired against 10" reinforced concrete. The seventh bomb was fired at 15° obliquity and at 971 f/s striking velocity and was recovered in satisfactory

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Gun Firing Test of Bombs, General Service 3000 lb.,
Ordnance Project TM2-9110

condition. It was considered that the bomb had proven its ability to withstand satisfactorily this test condition and the eighth and ninth bombs were tested against 10" concrete at 30° obliquity at striking velocities of 973 f/s and 1006 f/s respectively. Both bombs were recovered in satisfactory condition. The tenth bomb was fired against 0.633 STS armor plate at 15° obliquity and 992 f/s striking velocity and was recovered in satisfactory condition. The test conditions and results of these tests are tabulated on Table I Appendix (A) and are given in detail on Tables II through XI and Figures 1 through 10 of Appendix (B).

PART D

CONCLUSIONS

11. From the test results as reported herein it is concluded that:

- a. Bomb, General Service, 3000 lb., T55, will remain effective and intact, and in serviceable condition when fired against 10" reinforced concrete at 15° obliquity and 1000 f/s striking velocity.
- b. Bomb, General Service, 3000 lb., T55, will remain effective and intact, and in serviceable condition when fired through 10" reinforced concrete at 30° obliquity and 1000 f/s striking velocity.
- c. Bomb, General Service, 3000 lb., T55, will remain effective and intact, and in serviceable condition when fired against 0.633 STS armor plate at 15° obliquity and 1000 f/s striking velocity.
- d. No metallurgical defects or design weaknesses were noted that would cause weakness or failure of the bomb under the conditions of the tests reported herein.

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Gun Firing Test of Bombs, General Service 3000 lb.,
Ordnance Project TM2-9110

The tests upon which this report is based were conducted by:

W. W. MEYERS, Plate Battery Officer
Terminal Ballistics Department

This report was prepared by:

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Terminal Ballistics Department

This report was reviewed by:

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Terminal Ballistics Department

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Terminal Ballistics Batteries Officer
Terminal Ballistics Department

R. T. RUBLE, Lieutenant Commander, USN
Terminal Ballistics Officer
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C. C. BRAMBLE, Director of Research, Ordnance Group

APPROVED: IRVING T. DUKE
Rear Admiral, USN
Commander, Naval Proving Ground

C. T. Mauro
C. T. MAURO
Captain, USN
Ordnance Officer
By direction

AD-A800 062



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Naval Proving Ground, Dahlgren, Va

GUN FIRING TEST OF BOMBS, GENERAL SERVICE 300 LB

T55 ORDNANCE PROJECT TM2-9110, by W.W. Meyers.

Partial Rpt No, 1. 27 Mar 52, 7p, illus, tb. (Rpt No. 945)

SUBJECT HEADINGS

DIV: Ordnance (22)

Bombs, General purpose

SEC: Bombs (5)

Bombs - Ballistics (OVER)

Bombs - Performance

(Copies obtainable from ASTIA-DSC)

NTIS, Auth: USNSWC notice, 14 Aug 75