

NPG
R-945

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U. S. NAVAL PROVING GROUND
DAHLGREN, VIRGINIA

REPORT NO. 945

TASK ASSIGNMENT NPG-Re3c-321-4-52

1st Partial Report

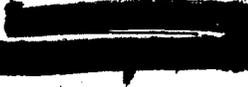
COUNTED IN

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 

Approved for Public Release

Declassified per NSWC/DL-AN-DX-1/78
dtd. Feb. 1978, NSWC, Dahlgren, Va.
Coff

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
Copy No.: 11
No. of Pages: 7

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. 9-25-51 194

IMPACT No. 39285
IMPACT DATE 9-25-51
BUIT No. F

OBJECT BALLISTIC TEST OF GENERAL SERVICE 3000 LB.
BOMB, T 55, VS. 8" CONCRETE TARGET

REFERENCE N.P.G. ~~FORM~~ Report 710945

DATED

Gauge 8" ^{PLATE} 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.~~

e/d

F(e/d, e)

TABLE II
APPENDIX B

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

R. W. Meyers
Ordering

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. F

OBJECT 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 10"
 OBLIQUITY 15°
 Impact dimensions 45" X 45"
 PENETRATION COMPLETE
 Flaking front 46" X 57"
 Flaking back 57" X 71"
 Dist. from top, bottom 125"
 Dist. from right, left 76"
 Dist. from nearest impact 0
 Dish 0
 Spur 0
 Cracks - Bulge 0
 Button (Thrown)(Started) _____
 Through Opening 34" 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) 2950#
 Length (uncapped) 94.50
 Fuze NONE
 Filler VERBULITE
 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.		<u>MEAN</u>					
Striking velocity (f.s.)		<u>791</u>					

REMARKS _____

Limit shots only

Acceptance or Rejection recommended

e/d _____

F(e/d, Θ) _____

N.P.G. Photo. No. N.P.G. 46279

TABLE III
APPENDIX B

U.S. Navy

CON. 24" TYPE 11-00 #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

T55 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 VERMILIONITE
 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.		<u>MEAN</u>					
Striking velocity (f.s.)		<u>945</u>					

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
6000 24" MIL TYPE A MISSILE #235

U. S. Navy

File No.

Butt Firing

U. S. Naval Proving Ground
Dahlgren, Va. 10-2-51 194

IMPACT No. 39307-A
IMPACT DATE 10-2-51
BUTT No. F

OBJECT BALLISTIC TEST OF GENERAL SERVICE

3000 LB. BOMB T55 WITH MULTIPLE CONCRETE SETUP.

REFERENCE N.P.G. LETTER Report 710,945

DATED _____

PLATE

BOMB

PROJECTILE

Gauge CONCRETE BLOCKS

Caliber 24"

Class #5 & 6

Maker _____

Maker _____

Type G. SERVICE

No. _____ Group _____

Lot No. _____ Year of Specification _____

Contract _____

Mark T55 Mod. _____ No. _____

Date received _____

Date received _____

Dimensions _____

~~Capped or uncapped~~ _____

No. of impact on plate _____

~~Weight (capped)~~ _____

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

Weight (uncapped) 2880#

OBLIQUITY 15°

Length (uncapped) 94"50

Impact dimensions 40" X 56"

Fuze NONE

PENETRATION COMPLETE

Filler VERMICULITE

Flaking front 62" X 68"

Flight by screen _____

Flaking back 60" X 66"

Condition after firing:-

Dist. from top, bottom 122"

~~EFFECTIVE~~ or INEFFECTIVE

Dist. from right, left 72"

BOMB BECKE UP

Dist. from nearest impact 0

Dish 0

Spur 0

Cracks - Bulge 0

Button (Thrown) (Started)

Through Opening 33" X 35"



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, @) _____

TABLE X

APPENDIX B

N.P.G. Photo. No. NP7 46495

W. Williams
Ch. Eng.

U. S. Navy

GUN: 24" TYPE A M100 #235

File No.

Butt Firing

U.S. Naval Proving Ground
Dahlgren, Va. 10-4-51 194

IMPACT NO. 39327-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

Caliber 23.915

Class -

Maker -

Maker -

Type G.S. BOMB

No. #4 #3 Group -

Lot No. - Year of Specification -

Contract -

Mark T55 Mod. - No. -

Date received -

Date received -

Dimensions -

~~Capped or uncapped~~ -

No. of impact on plate -

Weight (capped) -

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

Weight (uncapped) 2880#

OBLIQUITY 15°

Length (uncapped) 94.50"

Impact dimensions 34" x 55"

Fuze NONE

PENETRATION COMPLETE

Filler VERMICULITE

Flaking front 45" x 64"

Flight by screen -

Flaking back 40" x 55"

Condition after firing:-

Dist. from top, ~~bottom~~ 120"

EFFECTIVE or INEFFECTIVE

Dist. from ~~right~~, left 75"

INTACT ON NECK AND BODY

Dist. from nearest impact 0

SECTION - BASE PLATE PUSHED

Dish 0

IN - CONSIDERED TO BE

Spur 0

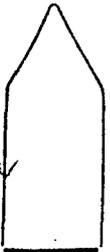
SATISFACTORY FROM PENETRATION

Cracks - Bulge 0

STANDPOINT

Button (Thrown) (Started)

Through Opening 33" x 55"



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>989</u>					

REMARKS

Limit shots only

Acceptance or Rejection recommended

e/d. _____

TABLE III

F(e/d, e) _____

APPENDIX B

N.P.G. Photo. No. NPA 46494

Withholding Ord. Eng.

U.S. Navy

EUR: 24" TYPE R111000 #235

File No.

Butt Firing

U. S. Naval Proving Ground
Dahlgren, Va. 10-9-51 194

IMPACT No. 39336-A
IMPACT DATE 10-9-51
BUTT No. F

OBJECT BALLISTIC TEST OF 3000 LB. GENERAL SERVICE
T55 BOMB

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

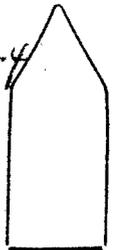
~~PLATE~~

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 COMPLETE
 Flaking front 41" X 50"
 Flaking back 43" X 52"
 Dist. from top, bottom 120"
 Dist. from right, left 72"
 Dist. from nearest impact 0
 Dish 0
 Spur 0
 Cracks - Bulge 0
 Button (Thrown) (Started)
 Through Opening 31" X 36"

Caliber 23.960
 Maker -
 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 NONE
 Filler VERMICULITE
 Flight by screen _____
 Condition after firing:-
~~EFFECTIVE or INEFFECTIVE~~
BOMB 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

Acceptance or Rejection recommended

e/d _____

F(e/d, θ) _____

N.P.G. Photo. No. NP946493

TABLE III
APPENDIX B

W. W. Meyers
Ord. Eng.

U. S. Navy

GUN: 24" TYPE 8 MCD # 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.I.S. BOMB T55

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

DATED _____

~~PLATE~~

BOMB

~~PROJECTILE~~

Gauge 10" CONCRETE TARGET #27

Caliber 24"

Class _____

Maker _____

Maker _____

Type G.I.S. BOMB

No. #27 Group _____

Lot No. _____ Year of Specification _____

Contract _____

Mark T55 Mod. - No. -

Date received _____

Date received _____

Dimensions _____

Capped or uncapped _____

No. of impact on plate _____

Weight (capped) _____

Thickness at impact 10"

Weight (uncapped) 2850.0#

OBLIQUITY 15°

Length (uncapped) 94.50"

Impact dimensions _____

Fuze NONE

PENETRATION 26" X 32"

Filler VERMICULITE

Flaking front 0

Flight by screen _____

Flaking back 0

Condition after firing: EFFECTIVE or ~~INEFFECTIVE~~

Dist. from top, ~~bottom~~ 126"

INTACT

Dist. from ~~right~~, left 72"

SLIGHT DEFORMATION

Dist. from nearest impact 0

ON NOSE SECTION

Dish 0

Spur 0

Cracks - Bulge 0

Button (Thrown)(Started) -

Through Opening 26" X 34"



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>OVER</u>					
Striking velocity (f.s.)		<u>971</u>					

REMARKS

USED 3-5# B. PDR. BOSTONS

UNCLASSIFIED

Limit shots only

Acceptance or Rejection recommended

e/d

TABLE VIII

F(e/d, @)

APPENDIX B

W.W. Meizer
Ord. Eng.

U. S. Navy

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

GUN: 24" TYPE A MOD 0 # 255

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 710.945

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:	-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>973</u>					

REMARKS

UNCLASSIFIED

Limit shots only

e/d _____

F(e/d, @) _____

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

600: 24" TYPE A MOD O #235

TABLE IX
APPENDIX B

~~Acceptance or Rejection recommended~~

W. W. M. ...
Ord. Eng.

U. S. Navy

File No.

Butt Firing

U. S. Naval Proving Ground
Dahlgren, Va. 10-29-51 194

IMPACT NO. 39403
IMPACT DATE 10-29-51
BUTT NO. F

OBJECT BALLISTIC TEST OF G.S. 3000 LB. Bomb

REFERENCE 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 1
 Thickness at impact 10"
 OBLIQUITY 30°
 Impact dimensions 38" X 42"
 PENETRATION COMPLETE
 Flaking front 54" X 58"
 Flaking back 65" X 69"
 Dist. from top, bottom 120"
 Dist. from right, left 62"
 Dist. from nearest impact 0
 Dish 0
 Spur 0
 Cracks - Bulge 0
 Button (Thrown)(Started) _____
 Through Opening 35" X 38"

BOMB

Caliber 23.950
 Maker _____
 Type GENERAL SERVICE
 Lot No. _____ Year of Specification _____
 Mark T55 Mod. - No. _____
 Date received _____
 Capped or uncapped _____
 Weight (capped) _____
 Weight (uncapped) 2810.0#
 Length (uncapped) 94.50
 Fuze NONE
 Filler VERMICULITE
 Flight by screen _____
 Condition after firing:-
EFFECTIVE or INEFFECTIVE
INTACT
MODERATE 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. BOOSTERS

UNCLASSIFIED

Limit shots only

e/d

F(e/d, @)

N.P.G. Photo. No.

TABLE X
APPENDIX B

Acceptance or Rejection recommended

LT. 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 MKT-55

V.S. 5/8" STS Plate at 15°

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

PLATE

Gauge 0.633

Class S.T.S.

Maker CARNEGIE ILLINOIS STEEL CORP.

No. 0175657 Group C-326-727

Contract NOBS 2664

Date received 3/3/50

Dimensions 9 1/2" X 34 1/2"

No. of impact on plate 3

Thickness at impact 1.62

OBLIQUITY 15°

Impact dimensions 31" X 33"

PENETRATION COMPLETE

Flaking front NONE

Flaking back NONE

Dist. from top, bottom 54"

Dist. from right, left 144"

Dist. from nearest impact 80"

Dish 5"

Spur 14"

Cracks - Bulge NONE

Button (Thrown)(Started) —

Through Opening 30" X 31"

PROJECTILE

Bomb

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 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.							
Striking velocity (f.s.)	1000	992					

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

Limit shots only _____
e/d _____
F(e/d, @) _____

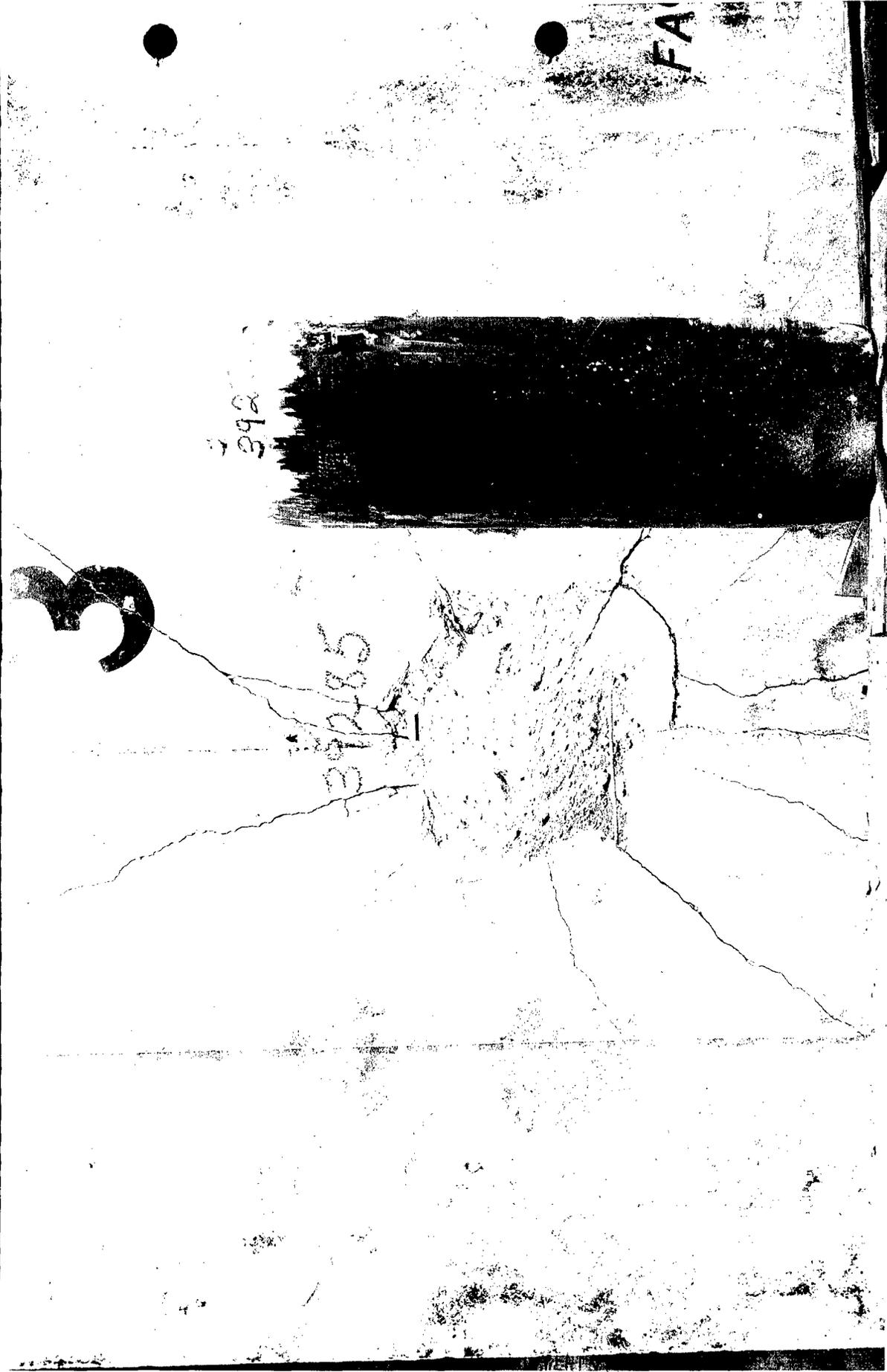
**TABLE XI
APPENDIX B**

Acceptance or Rejection recommended
J. L. Smith

N.P.G. Photo. No. _____
24" Gun TYPE A" No. 235

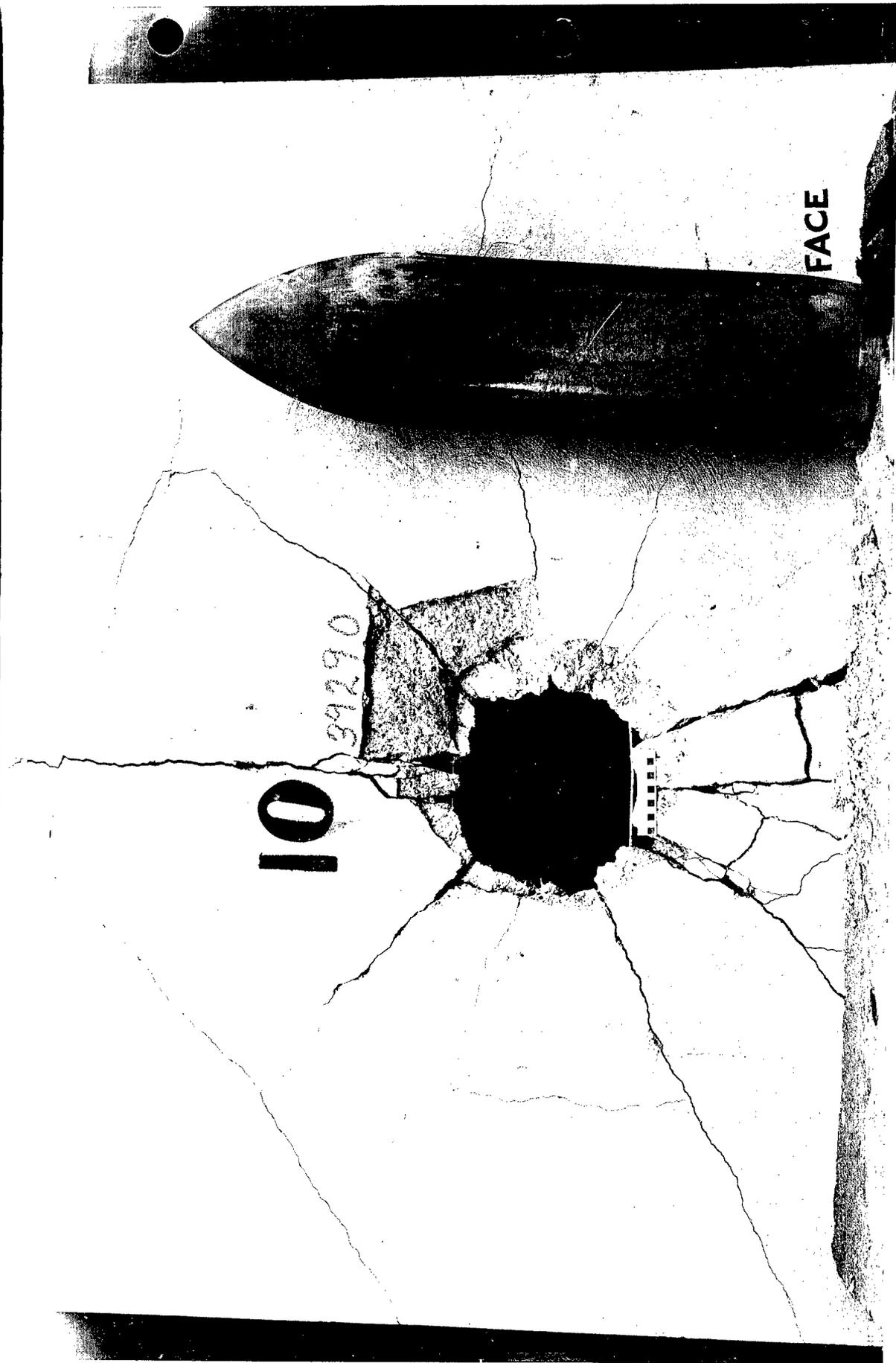
U. S. Navy

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

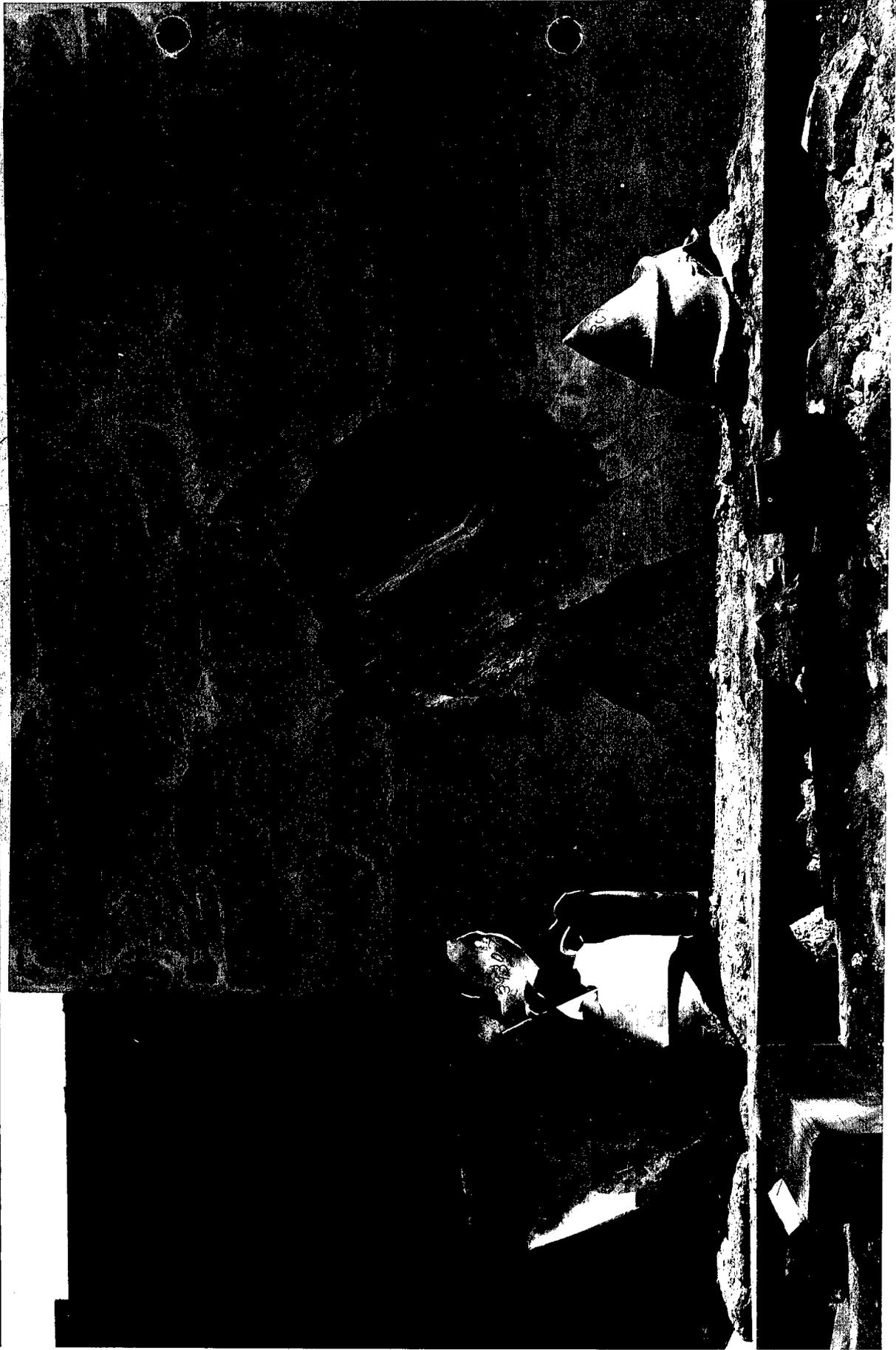


Service Bomb 155 vs. 10" Concrete block at 15° Obl.
1 October 1951 Bomb effective and intact. - Imp. No. 39303
Figure 3



NP9 46495

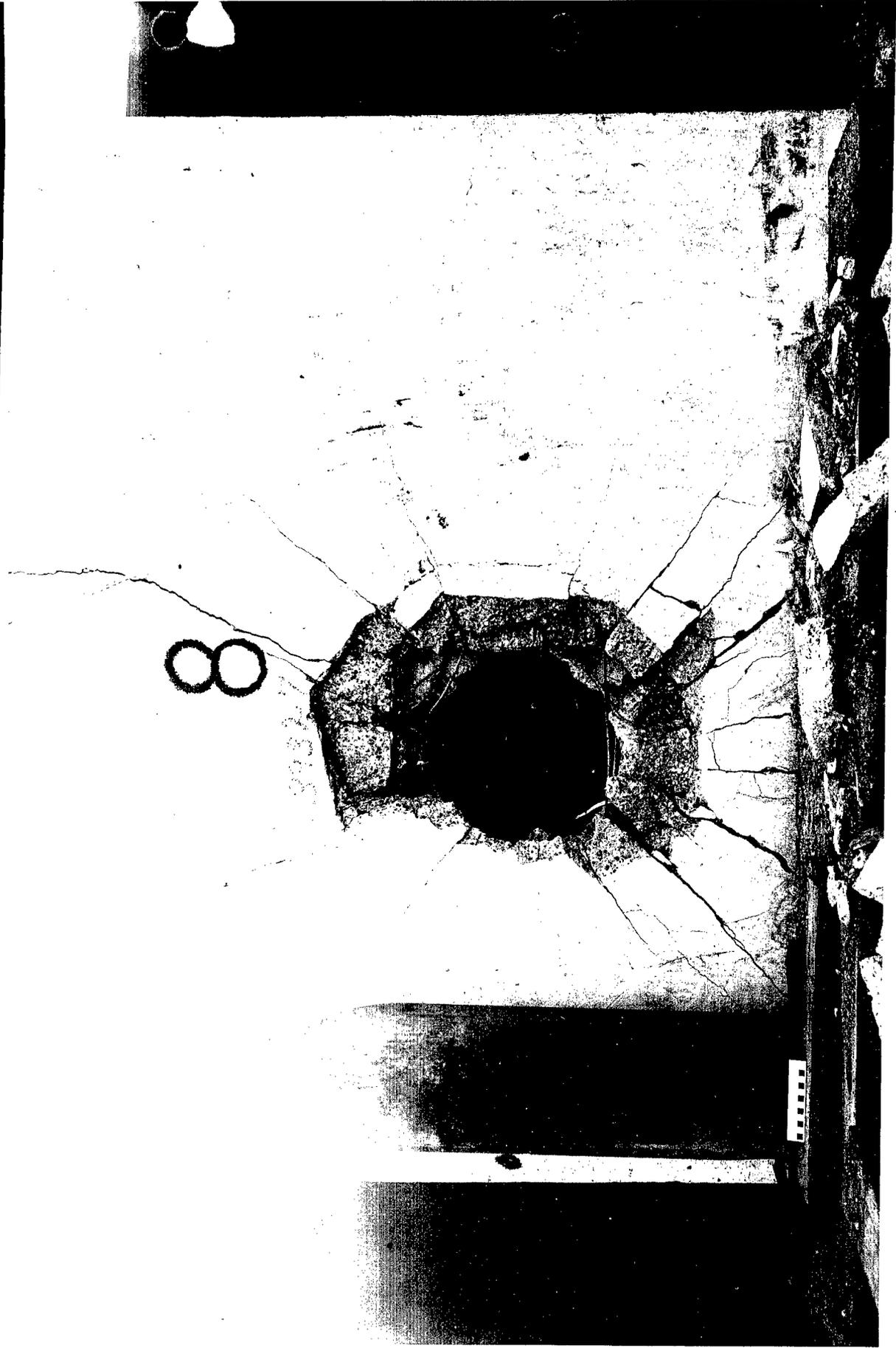
Test of 3000 lb. General Service Bomb T55 vs. 14" Concrete (8" and 6" blocks
back to Face) at 15° Obl. Str. Vel. 964 f/s - 2 October 1951 - Bomb broke up -
Imp. No. 39307



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



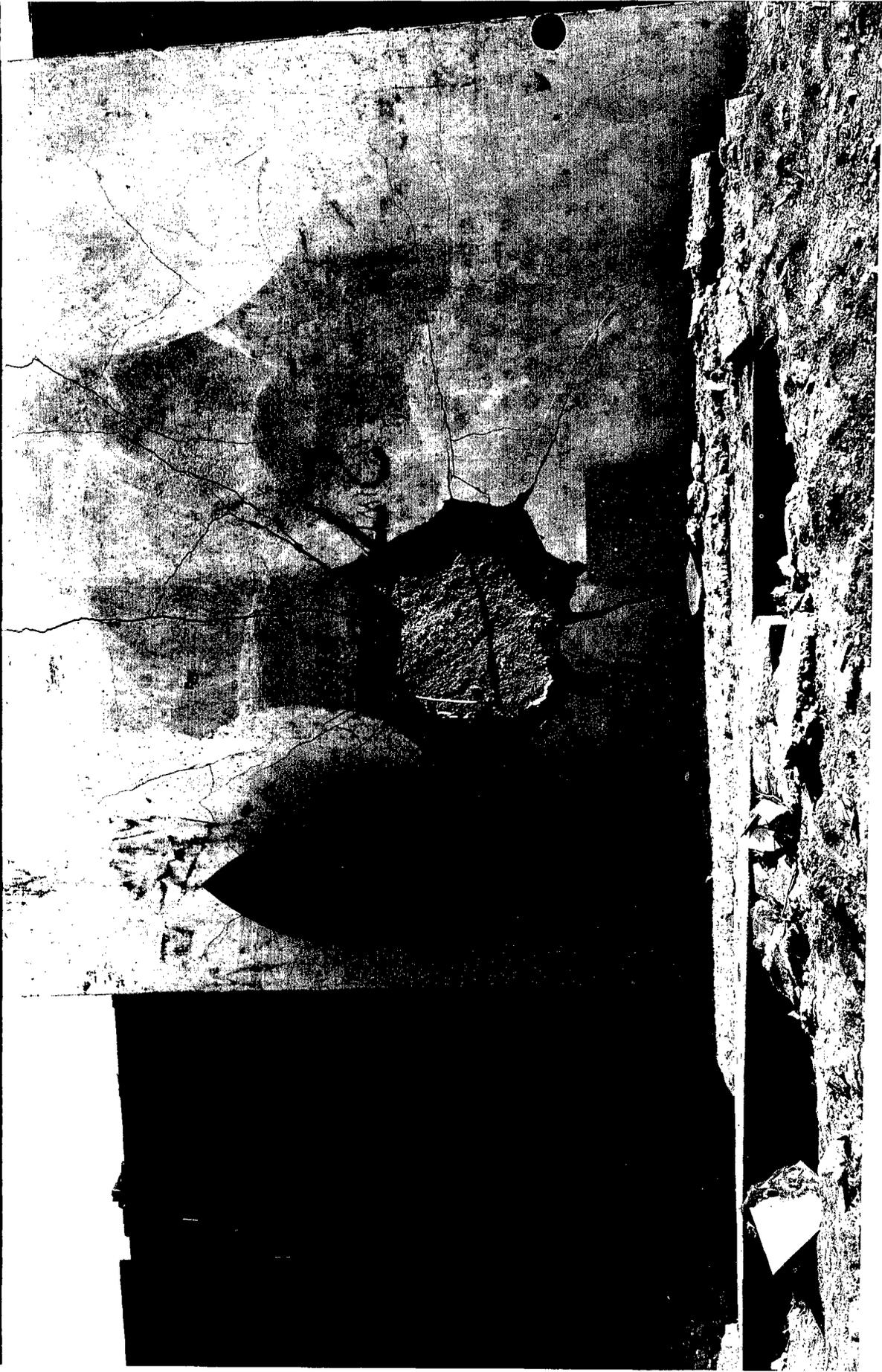
NP9 46493
Test of 3000 lb. General Service Bomb T55 vs 12" Concrete (2 - 6" blocks back
to Face) at 15° Obl. Str. Vel. 972 f/s 9 October 1951 - Imp. No. 39336 - Bomb
broke up

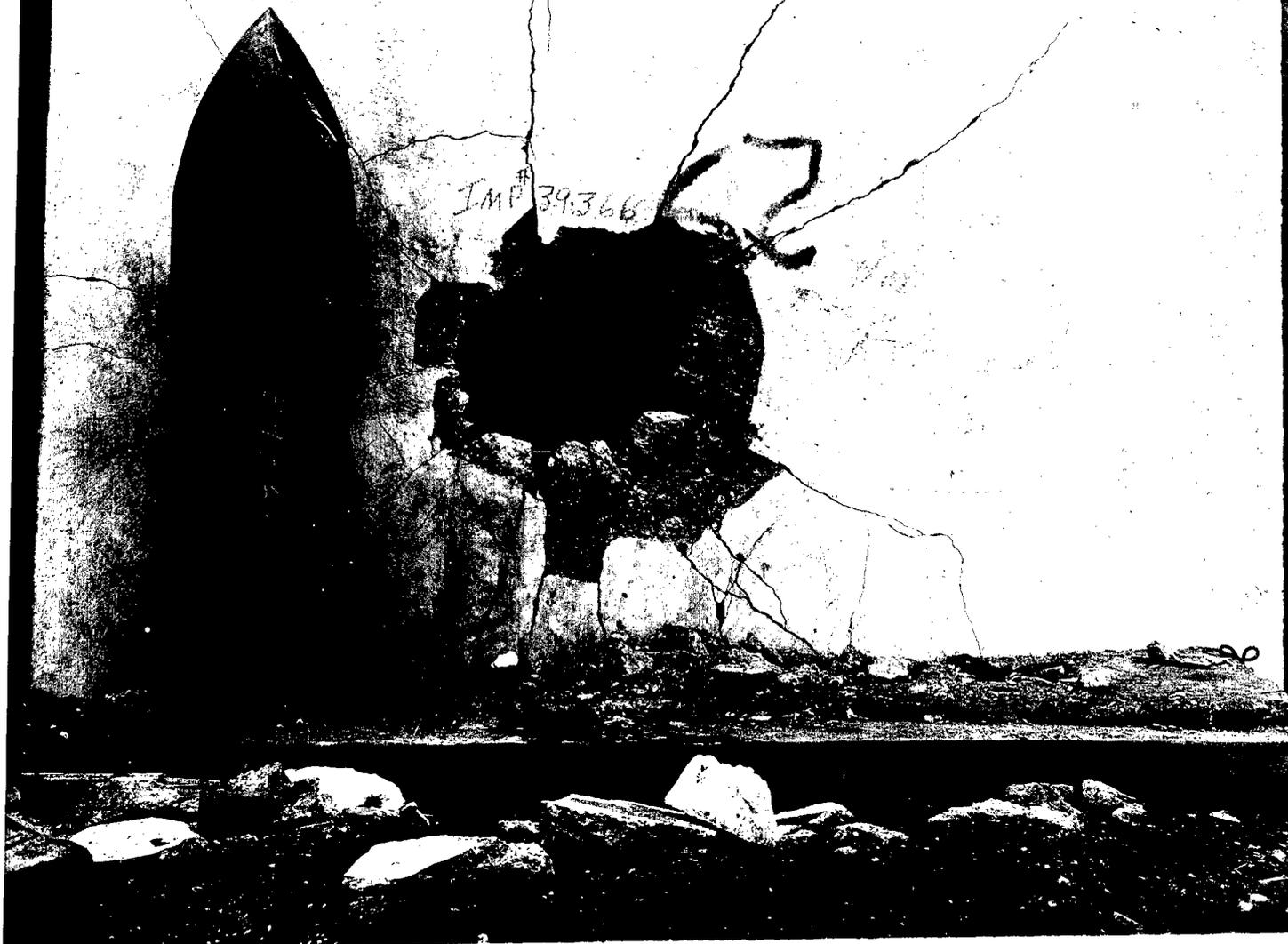
Figure 6



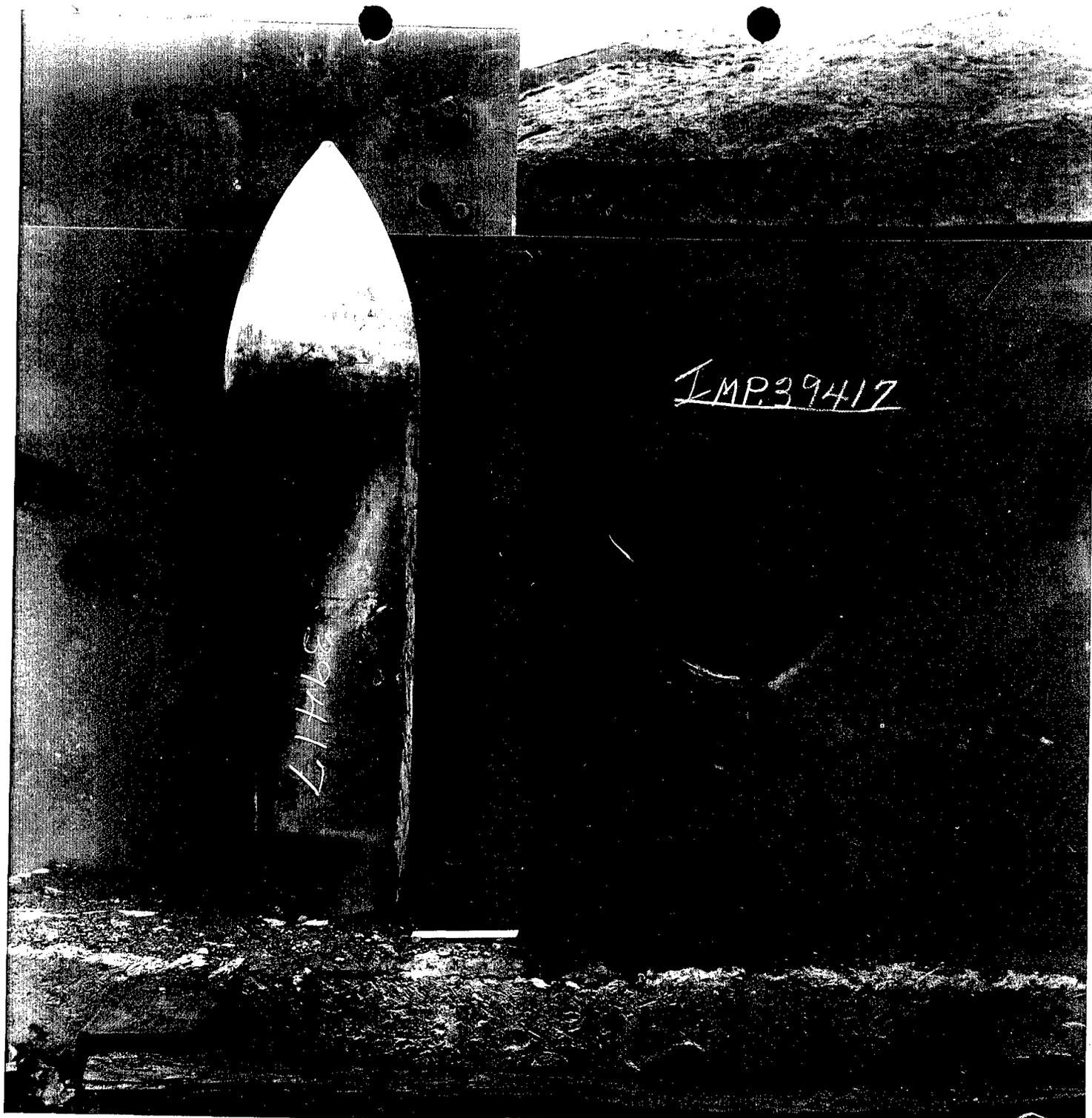
NP9 46492

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





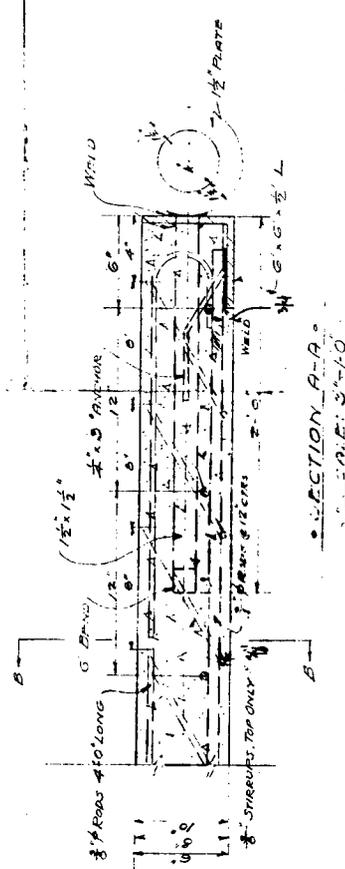
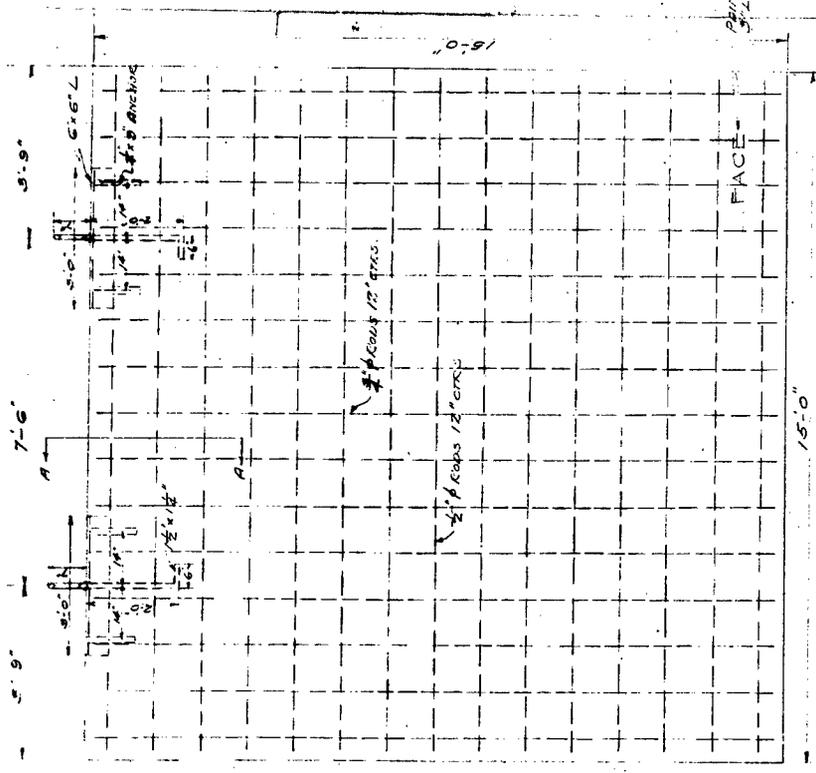
NP9 46491
Test of 3000 lb. General Service Bomb T55, vs 10" Concrete
block at 30° Obl. Str. Vel. 973 f/s - 17 October 1951 -
Imp. No. 39366 - Bomb effective and intact
Figure 8



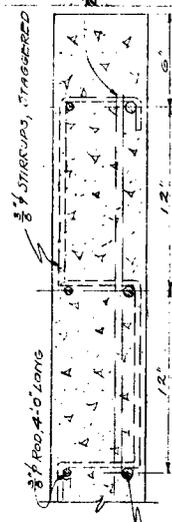
NP9-48424

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



SECTION A-A
SCALE: 3/4"=1'-0"



SECTION B-B
SCALE: 3/4"=1'-0"

APPENDIX "C"

FRONT ELEVATION
SCALE: 3/4"=1'-0"

NOTE: 5000# CONCRETE

2 #4 RODS TEMP. STEEL

REV	DATE	DESCRIPTION	BY
DES	11	U.S. NAVAL PROVING GROUND, DAHLGREN, VA.	
DRWN	11		
TR			
CHK	H.L.M.		
SUP			

6" x 6" AND 10"
REINFORCED CONCRETE
TARGETS

SCALE	AS NOTED
APPROVED	CAPT. U.S. NAVY, ORDNANCE OFFICER
DATE	MAR 10 1948
FILE	SM-1-10-1
	A. S. B.

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

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NPG REPORT NO. 945

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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

TABLE OF CONTENTS

	<u>Page</u>
SYNOPSIS	1
TABLE OF CONTENTS	2
AUTHORITY	3
REFERENCES	3
BACKGROUND	3
OBJECT OF TEST	3
PERIOD OF TEST	3
REPRESENTATIVES PRESENT	4
DESCRIPTION OF ITEM UNDER TEST	4
DESCRIPTION OF TEST EQUIPMENT	4
PROCEDURE	5
RESULTS AND DISCUSSION	5
CONCLUSIONS	6
APPENDIX A - SUMMARY OF FIRING CONDITIONS AND TEST RESULTS	TABLE I
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:
W. W. MEYERS, Plate Battery Officer
Terminal Ballistics Department

This report was reviewed by:
R. H. LYDDANE, Director of Research
Terminal Ballistics Department
W. B. ROBERTSON, Lieutenant Commander, USN
Terminal Ballistics Batteries Officer
Terminal Ballistics Department
R. T. RUBLE, Lieutenant Commander, USN
Terminal Ballistics Officer
Terminal Ballistics Department
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

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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)

DIV: Ordnance (22)

SEC: Bombs (5)

SUBJECT HEADINGS

Bombs, General purpose

Bombs - Ballistics (**OVER**)

Bombs - Performance

(Copies obtainable from ASTIA-DSC)

NTIS, Auth: *USNSWC notice, 14 Aug 75*

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