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ANNEX 3.2 U. S. NAVY STRUCTURES

APPENDIX L - POSTSHOT PHOTOGRAPHS

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Annex 3.2

U. S. Navy Structures

Appendix L Postshot Photographs

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U. S. NAVY STRUCTURES

Appendix L
Postshot Photographs

by

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Director, Program 3

Approved by: ALVIN C. GRAVES
Scientific Director

Bureau of Yards and Docks
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February 1952

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CONTENTS

	Page
Structure 3.2.1a	9
Structure 3.2.1b	42
Structure 3.2.2a	55
Structure 3.2.2b	96
Structure 3.2.3a	161
Structure 3.2.3b	217
Structure 3.2.4a	278
Structure 3.2.4b	346
Structure 3.2.5	407
Structure 3.2.6	439
Structure 3.2.7a	466
Structure 3.2.7b	499

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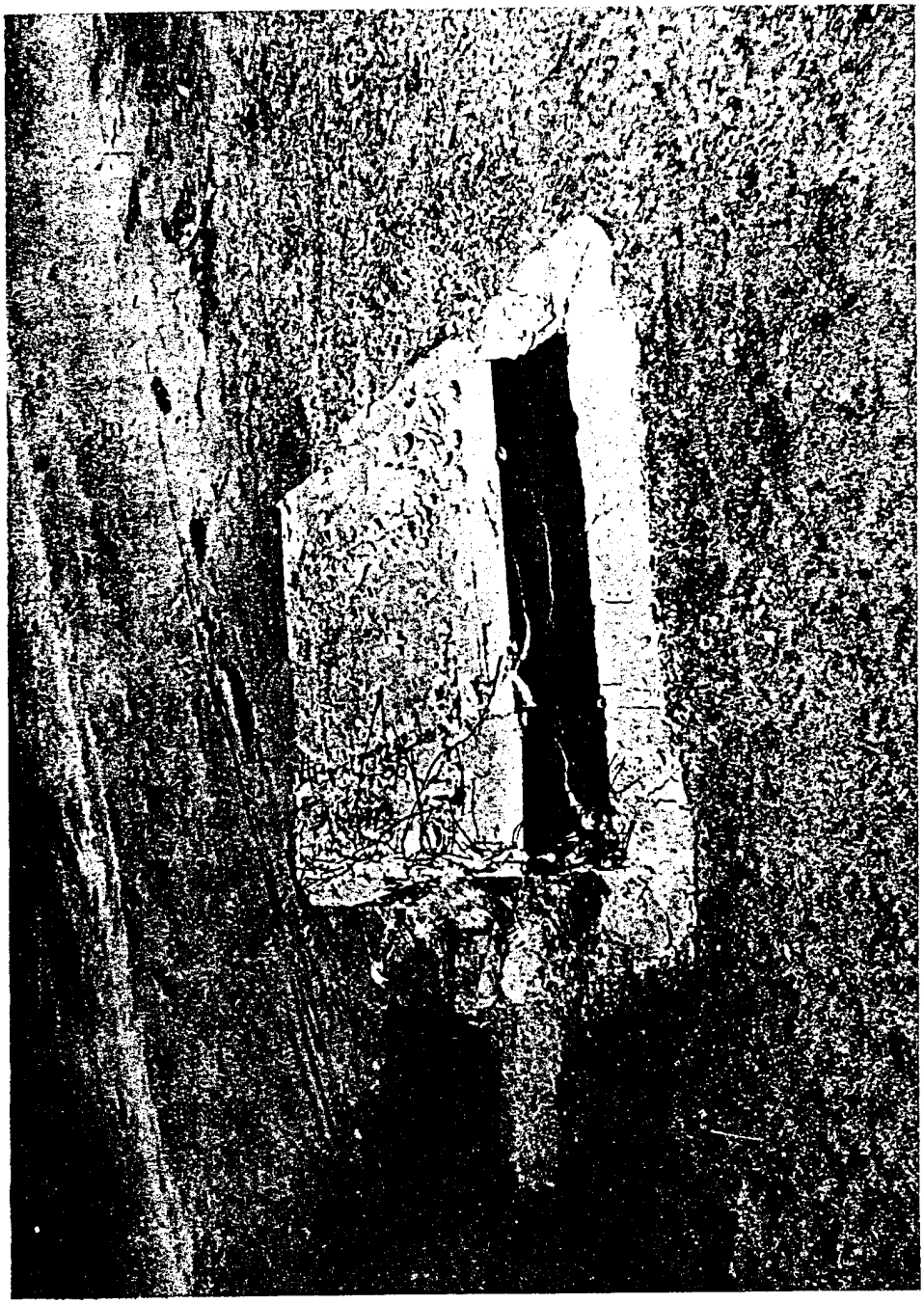


Fig. L.1 Post-shot Aerial View, Structure 3.2.1a

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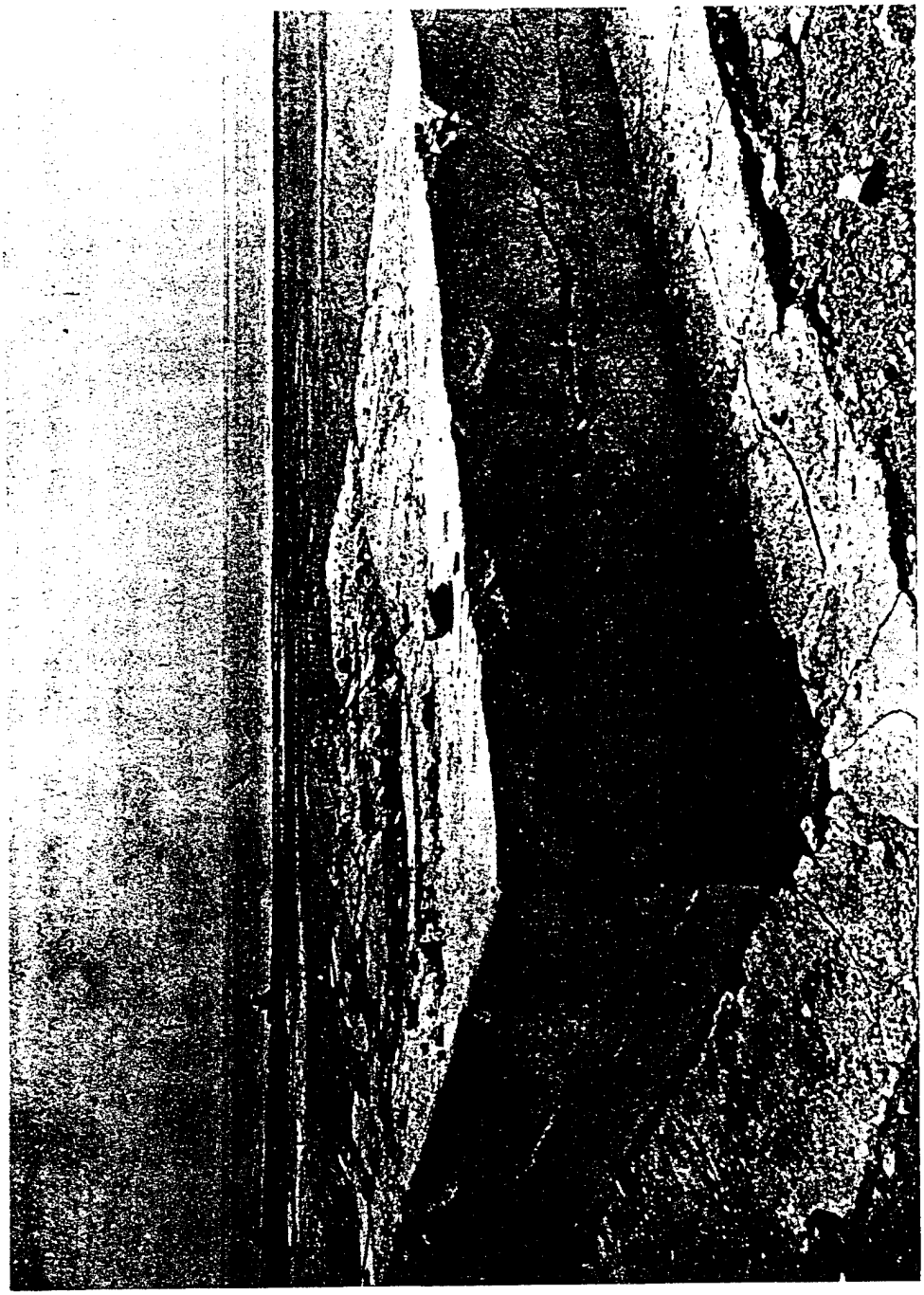


Fig. L.2 Roof Slab from Rear Showing 13-in. Dishing, Structure 3.2.1a

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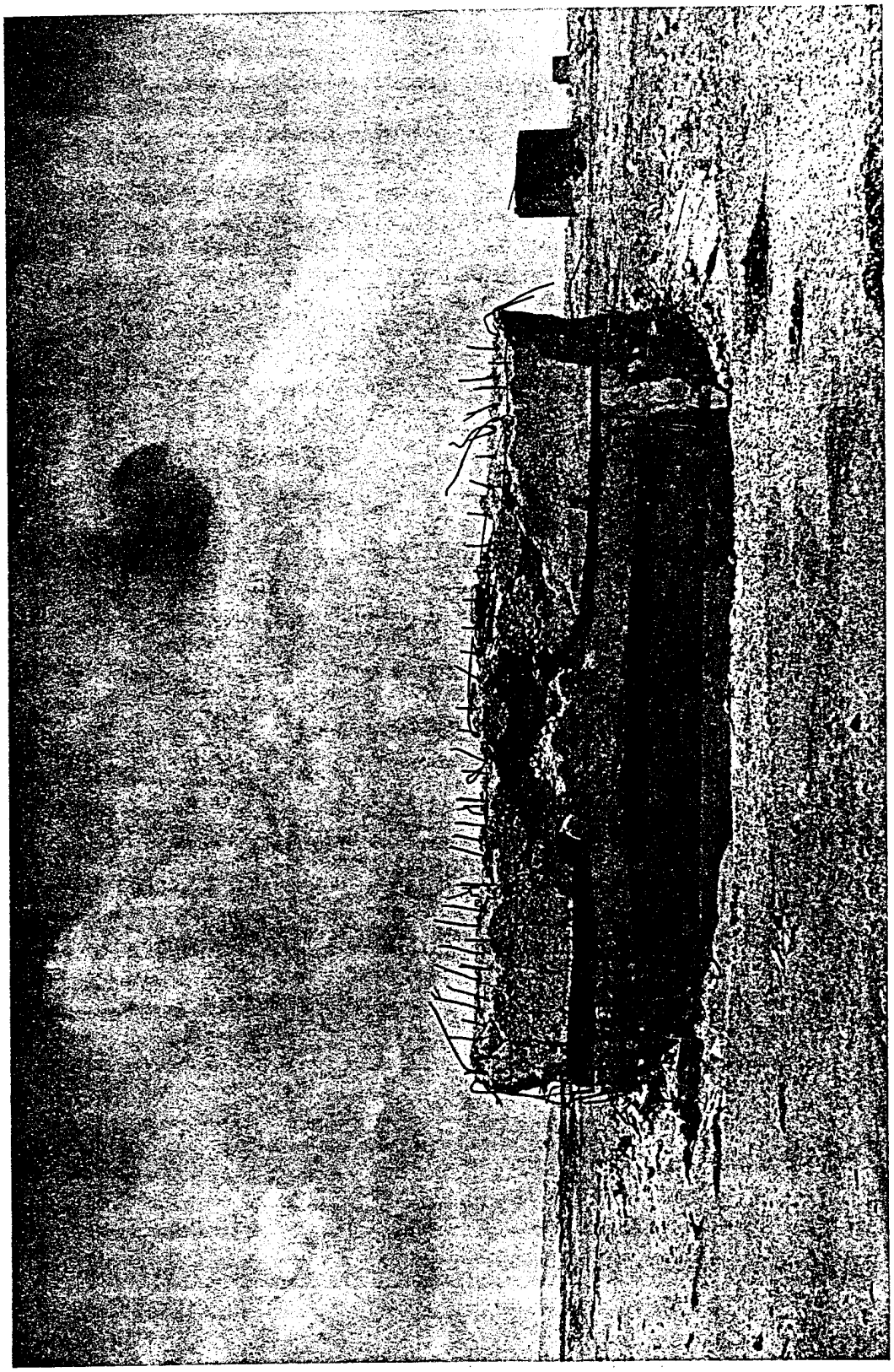


Fig. L.3 View Normal to Front Wall, Structure 3.2.1a

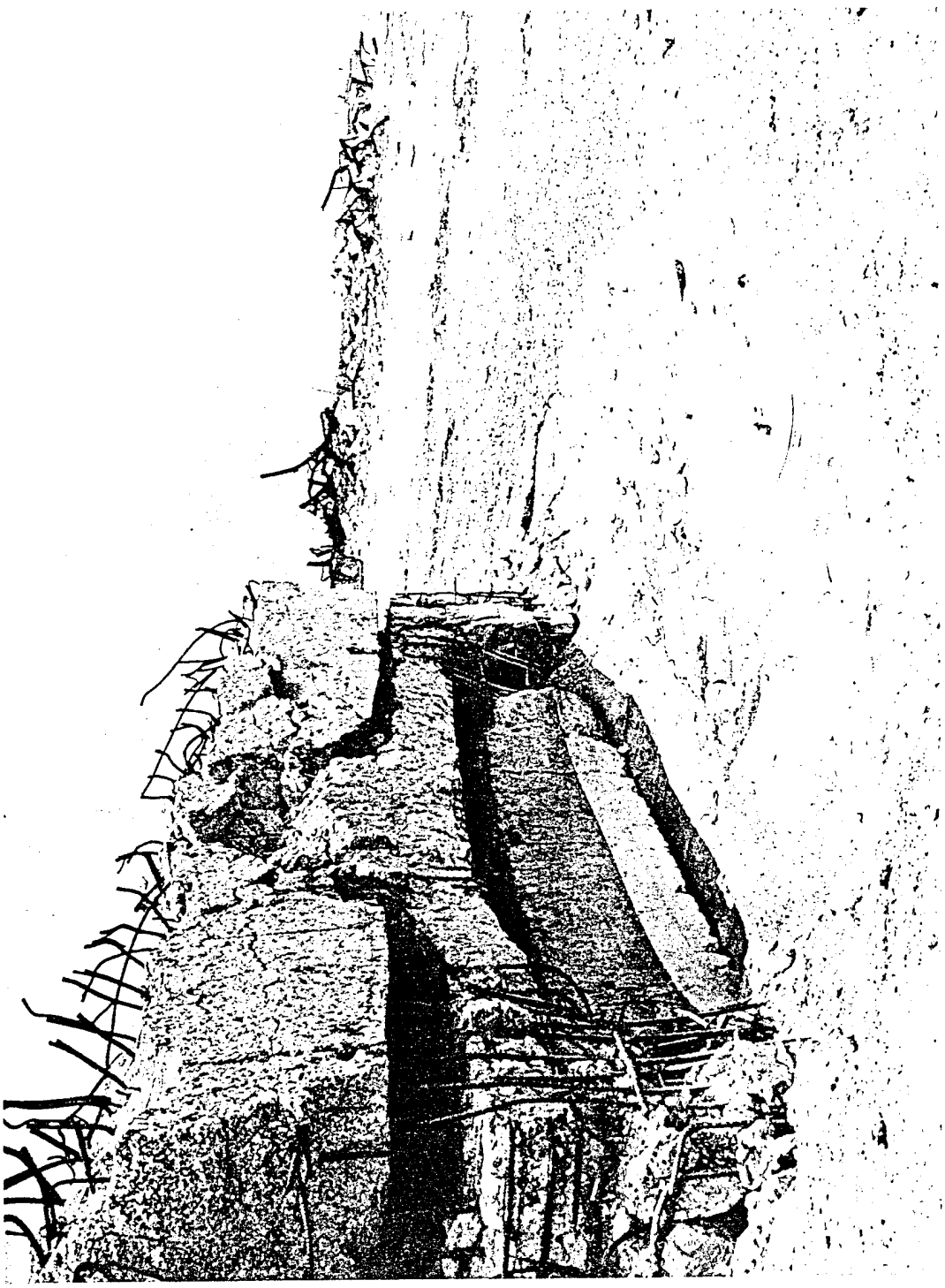


Fig. L.4 Deformed Front Bearing Wall and Slab Edge, Structure 3.2.1a

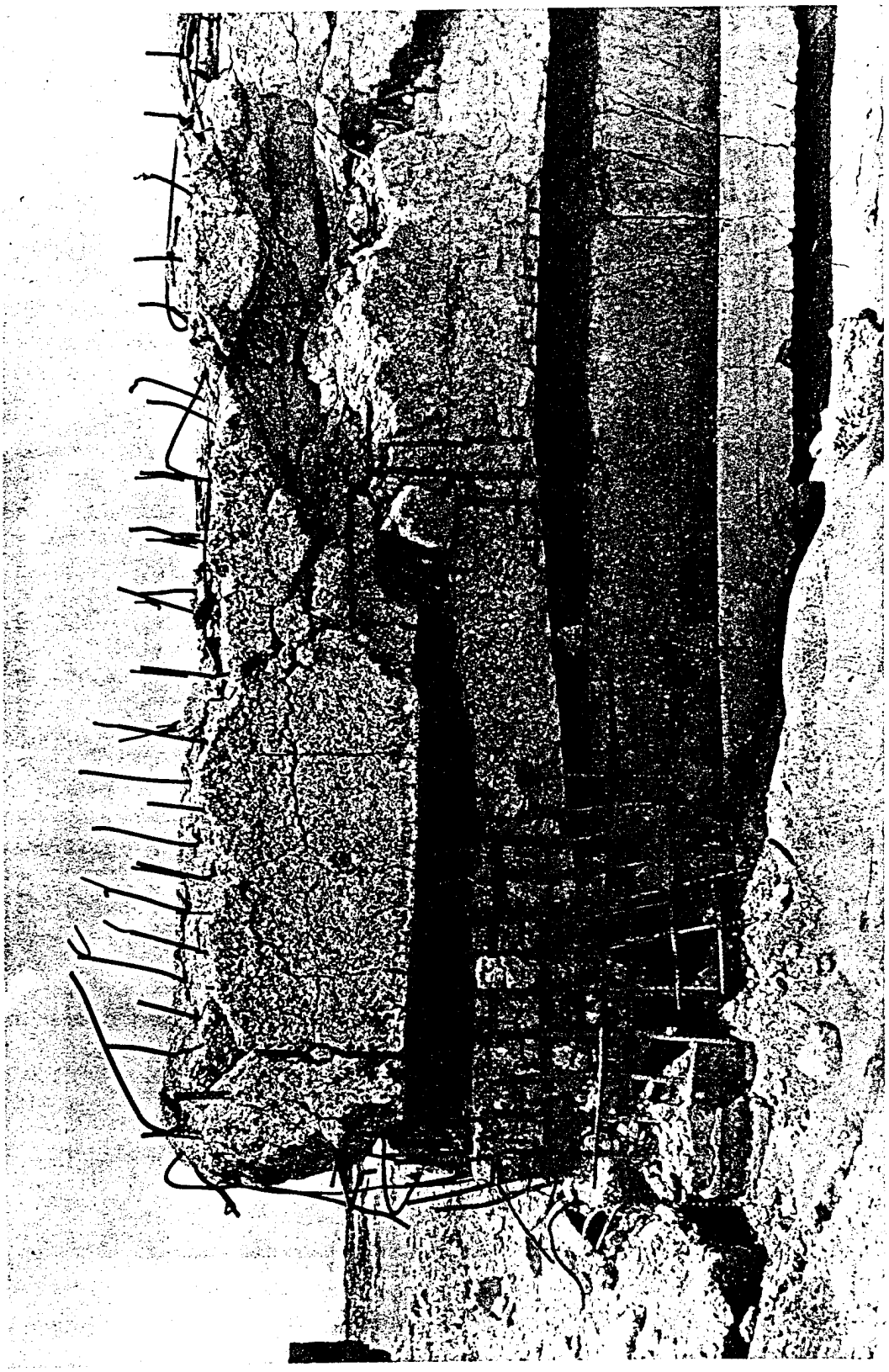


Fig. L.5 Left End Front Wall, Structure 3.2.1a



Fig. L.6 Close-up of Front Left Corner, Structure 3.2.1a

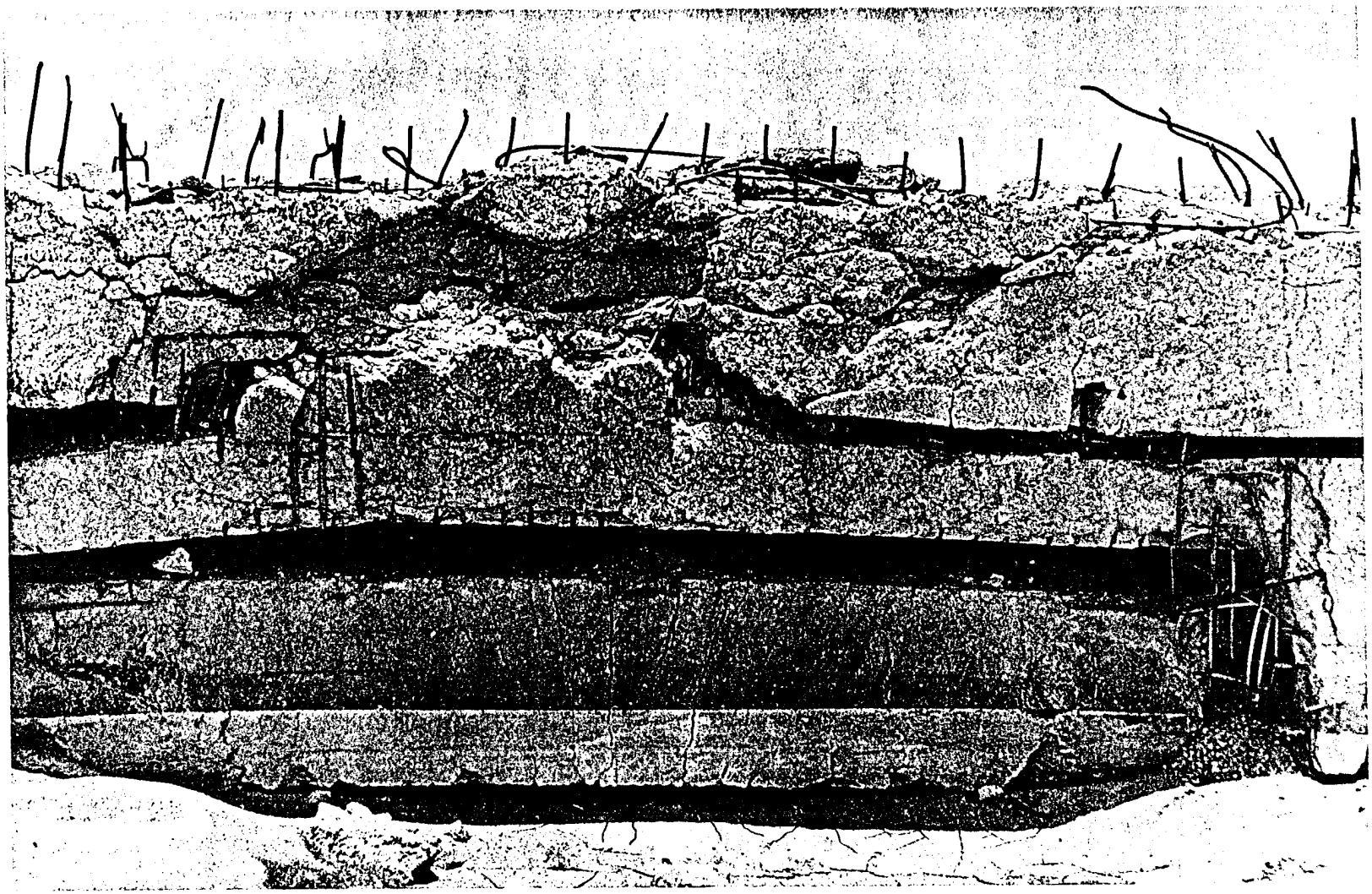


Fig. L.7 Center Section of Front Wall, Structure 3.2.1a

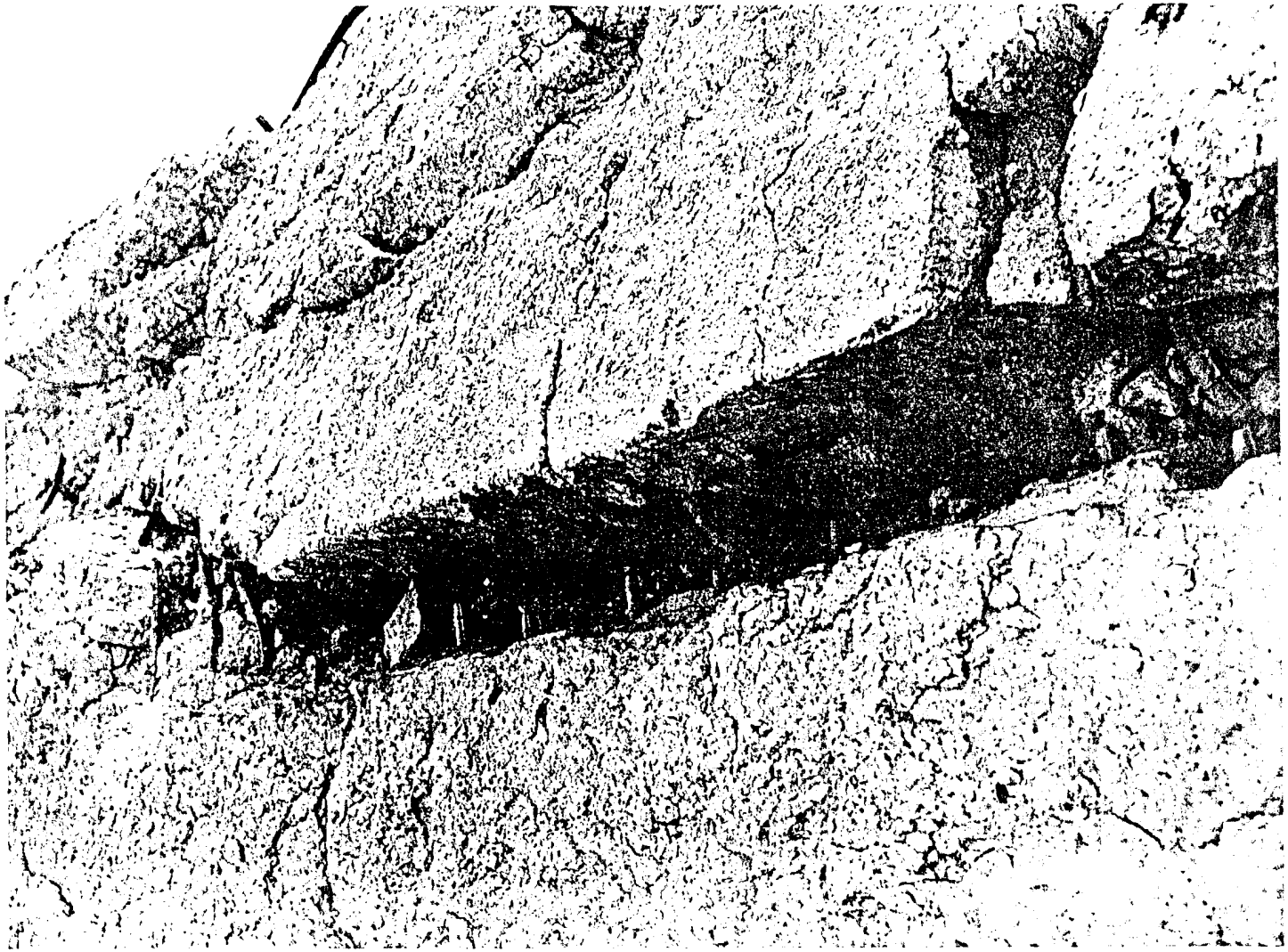


Fig. L.8 Opening in Front Edge of Roof Slab at Construction Joint Showing Dowel Failures, Structure 3.2.1a

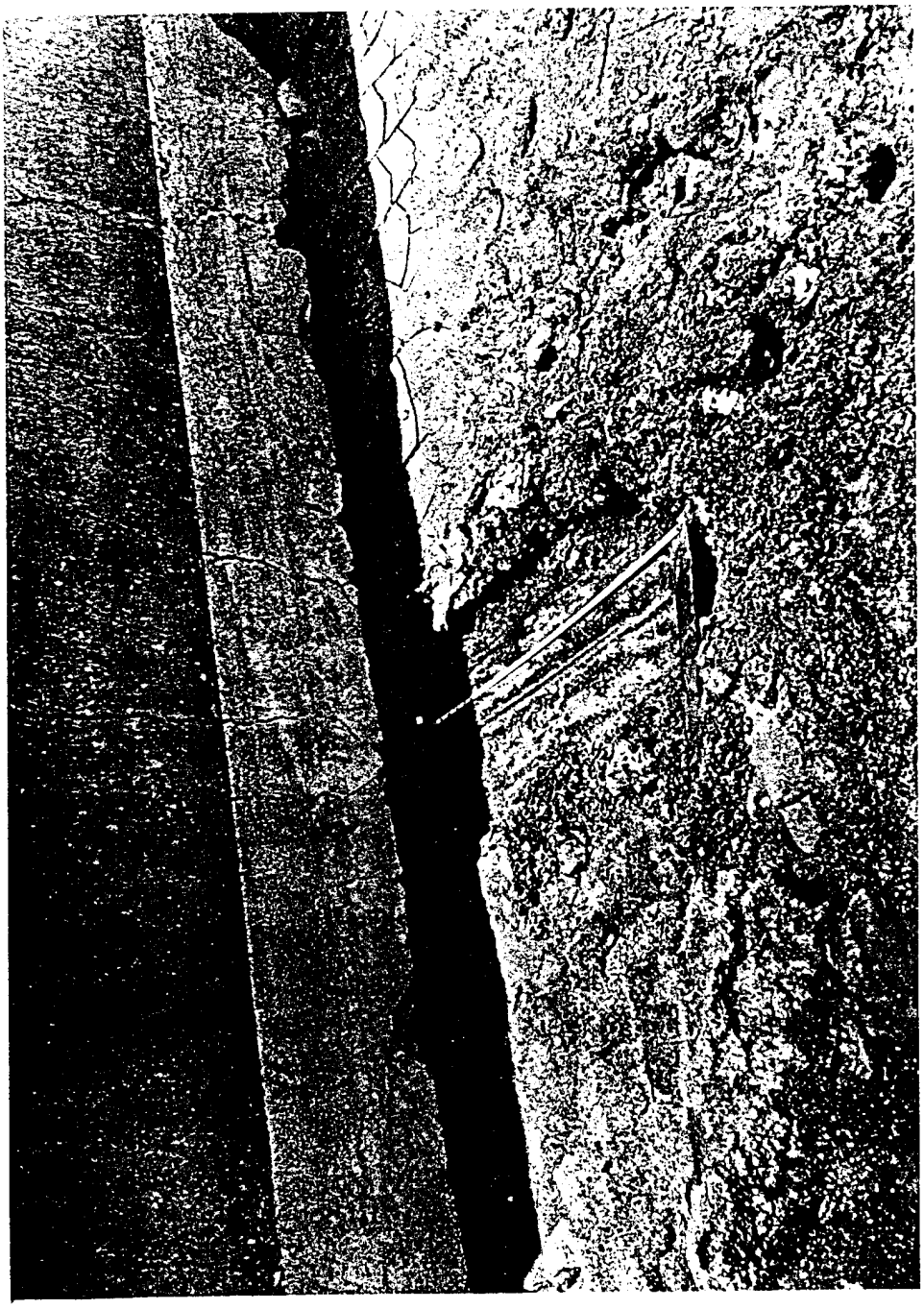


Fig. L.9 Close-up of Top Surface of Footing Slab at Center of Front Wall Showing Front Wall Deflection of 2½ ft, Structure 3.2.1a

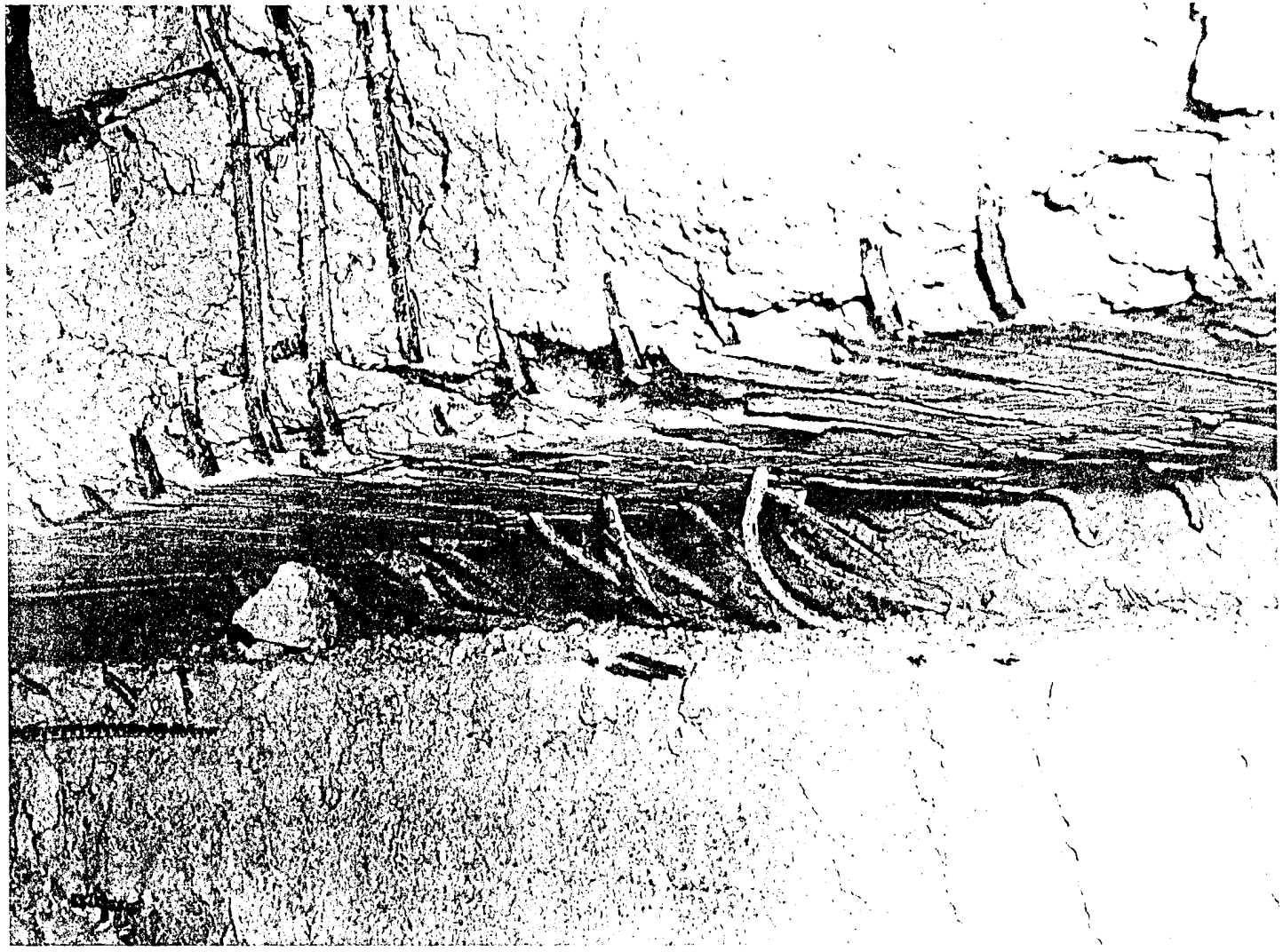


Fig. L.10 Undersurface of Roof Slab at Left Front Showing Dowel Scratches and Bottom of Shear Plane, Structure 3.2.1a

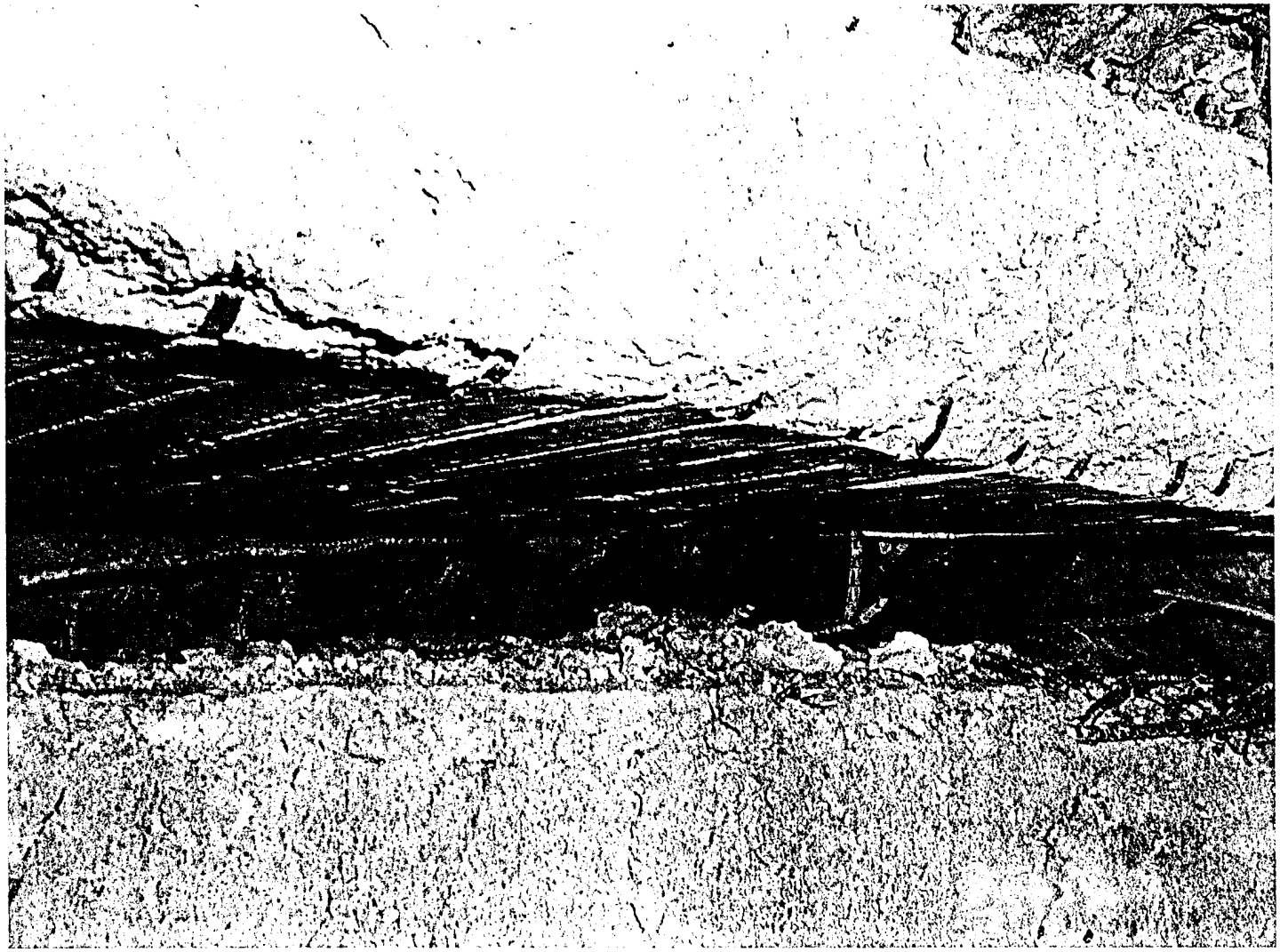


Fig. L.11 Undersurface of Roof Slab at Right Front, Structure 3.2.1a

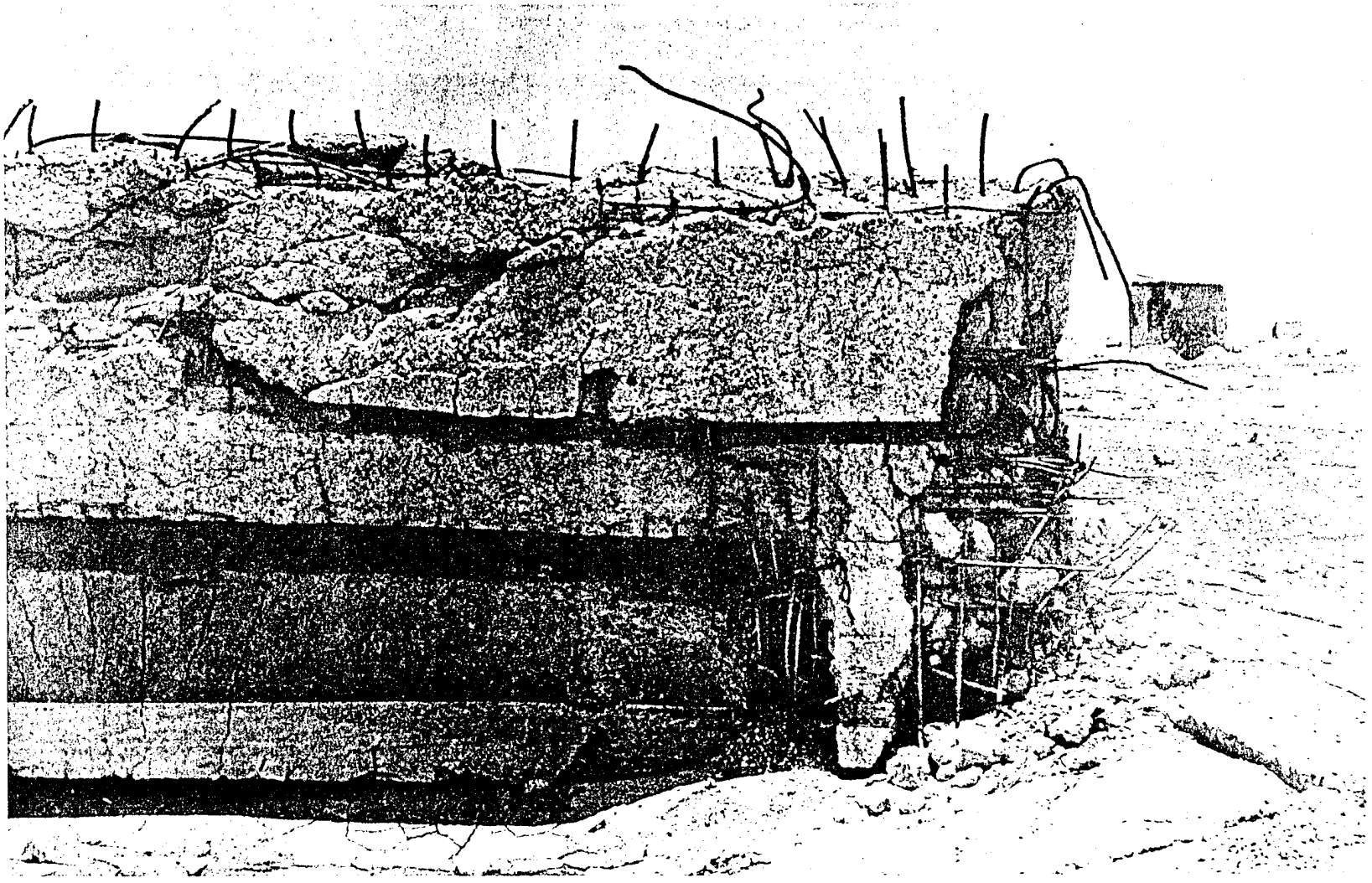


Fig. L.12 Right Front Corner from Front, Structure 3.2.1a

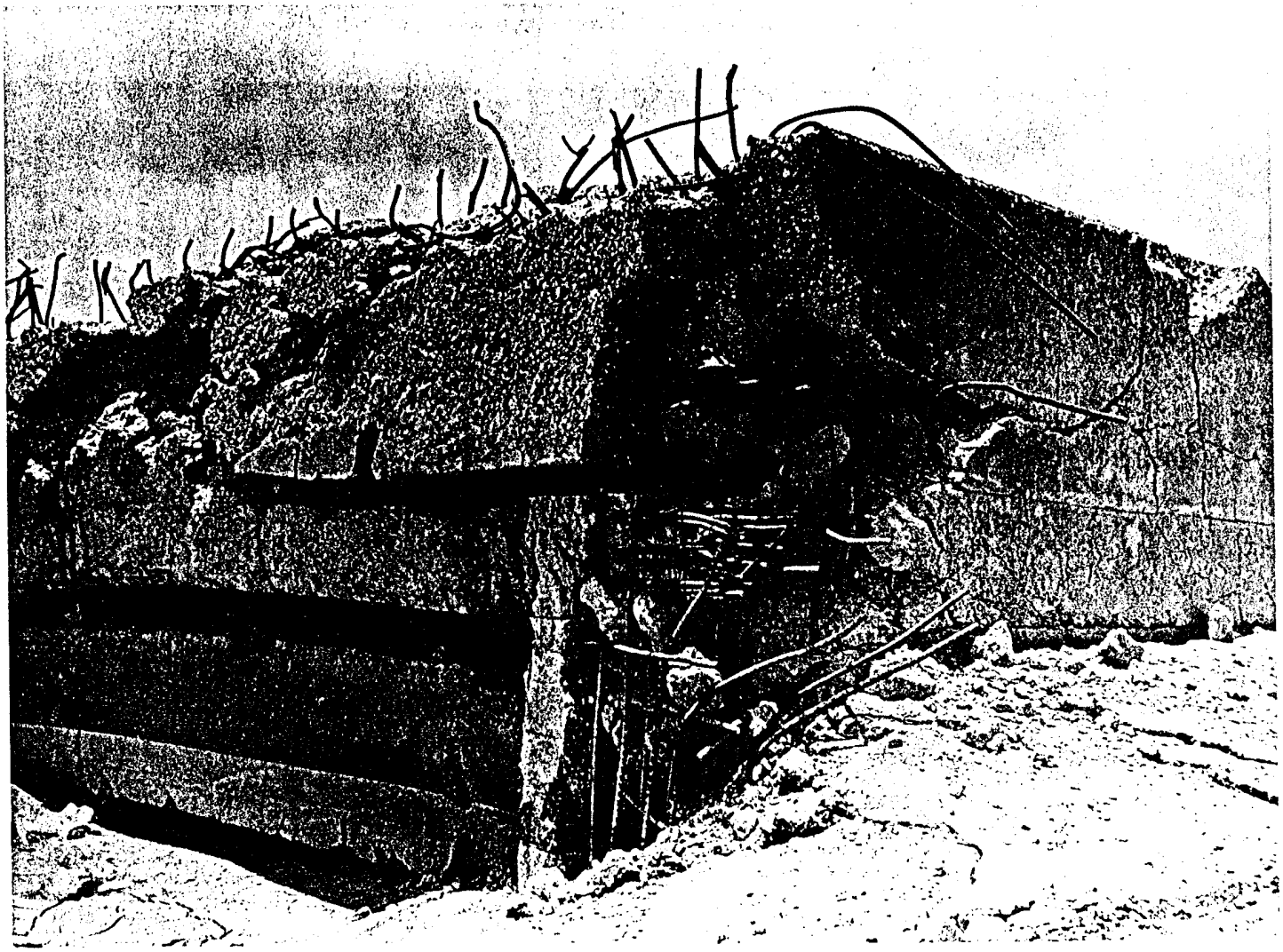


Fig. L.13 Right Front Corner from Side, Structure 3.2.1a

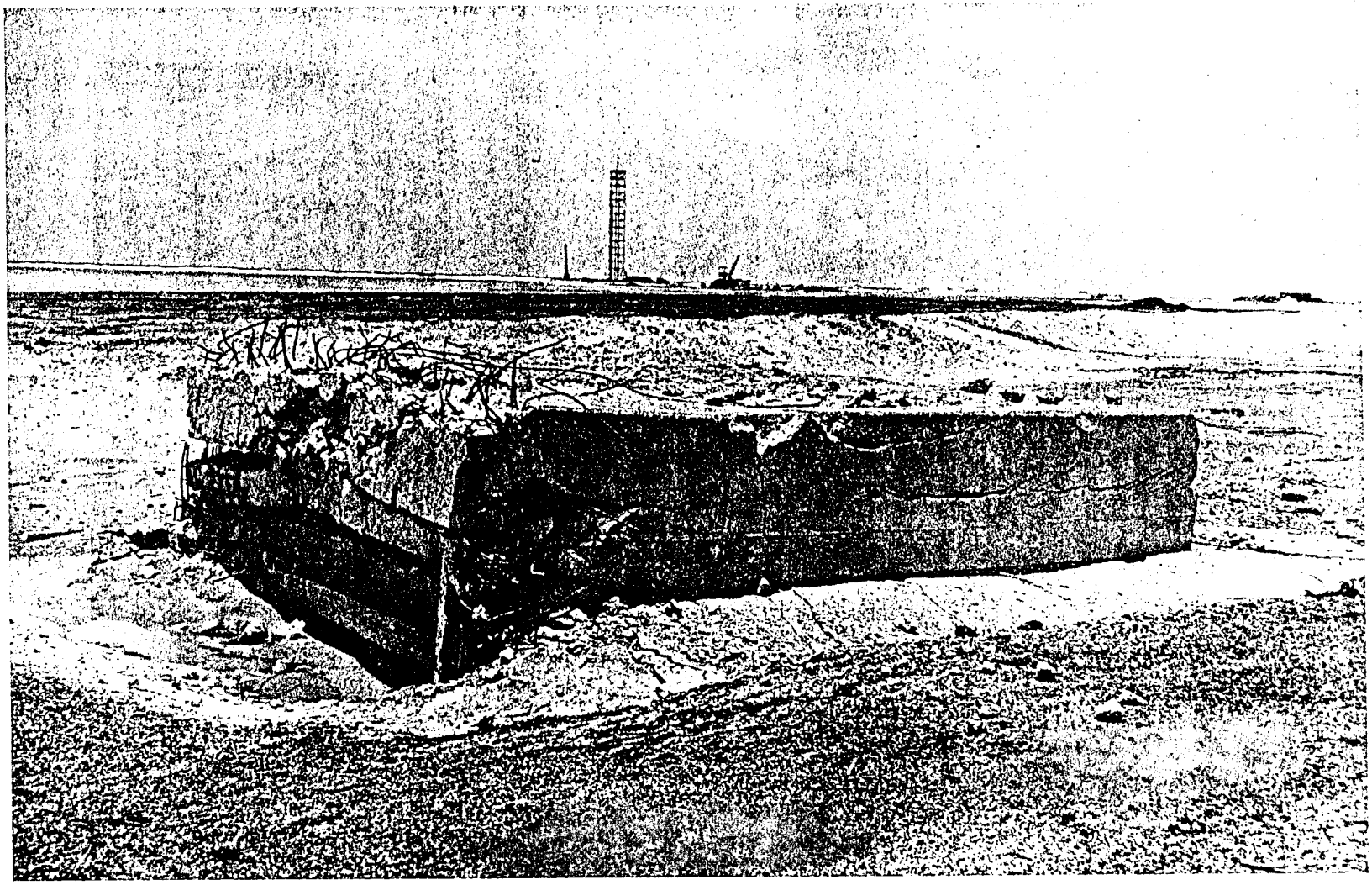


Fig. L.14 General View of Roof from Right Front, Structure 3.2.1a

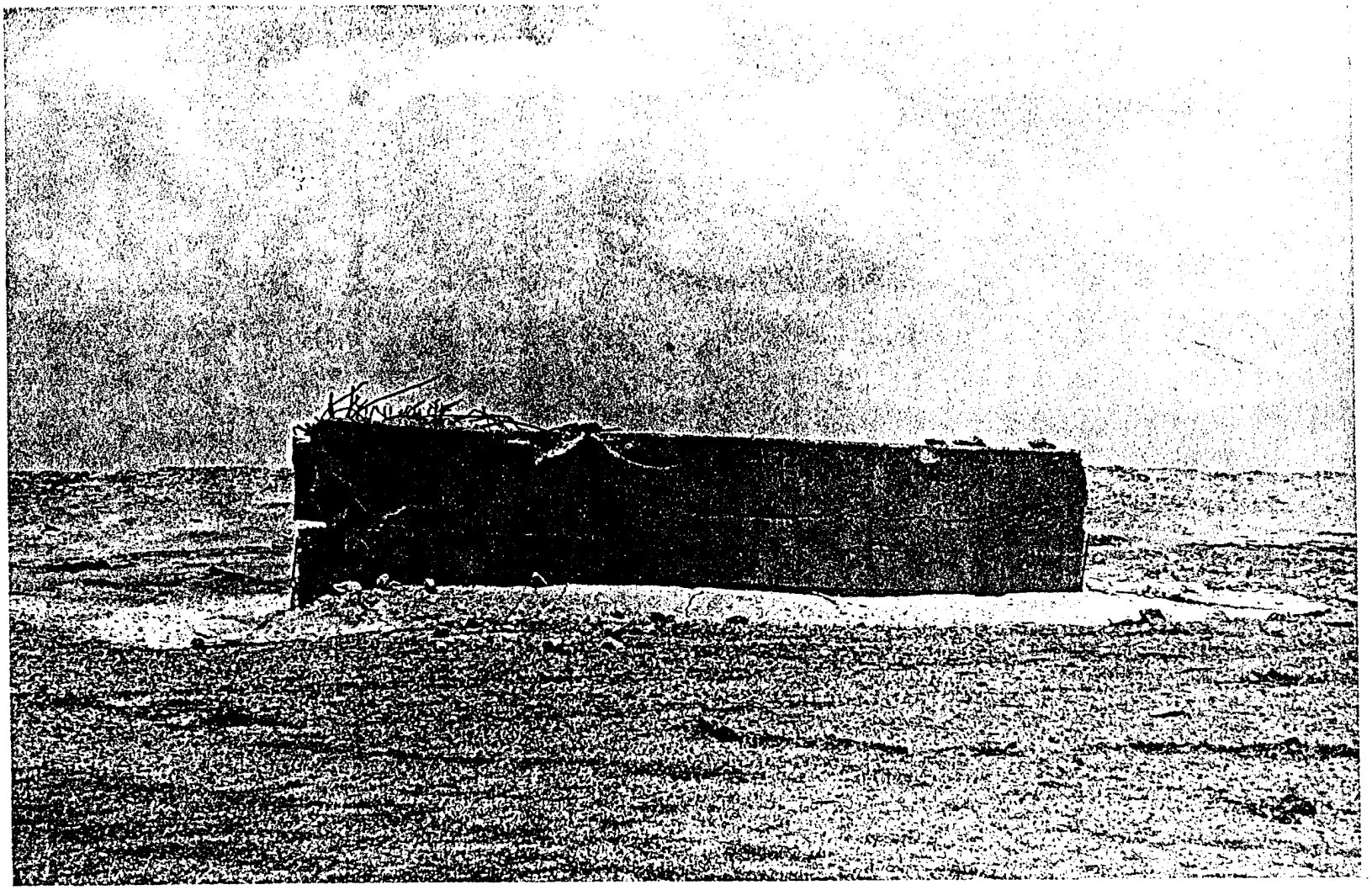


Fig. L.15 General View of Right Side, Structure 3.2.1a

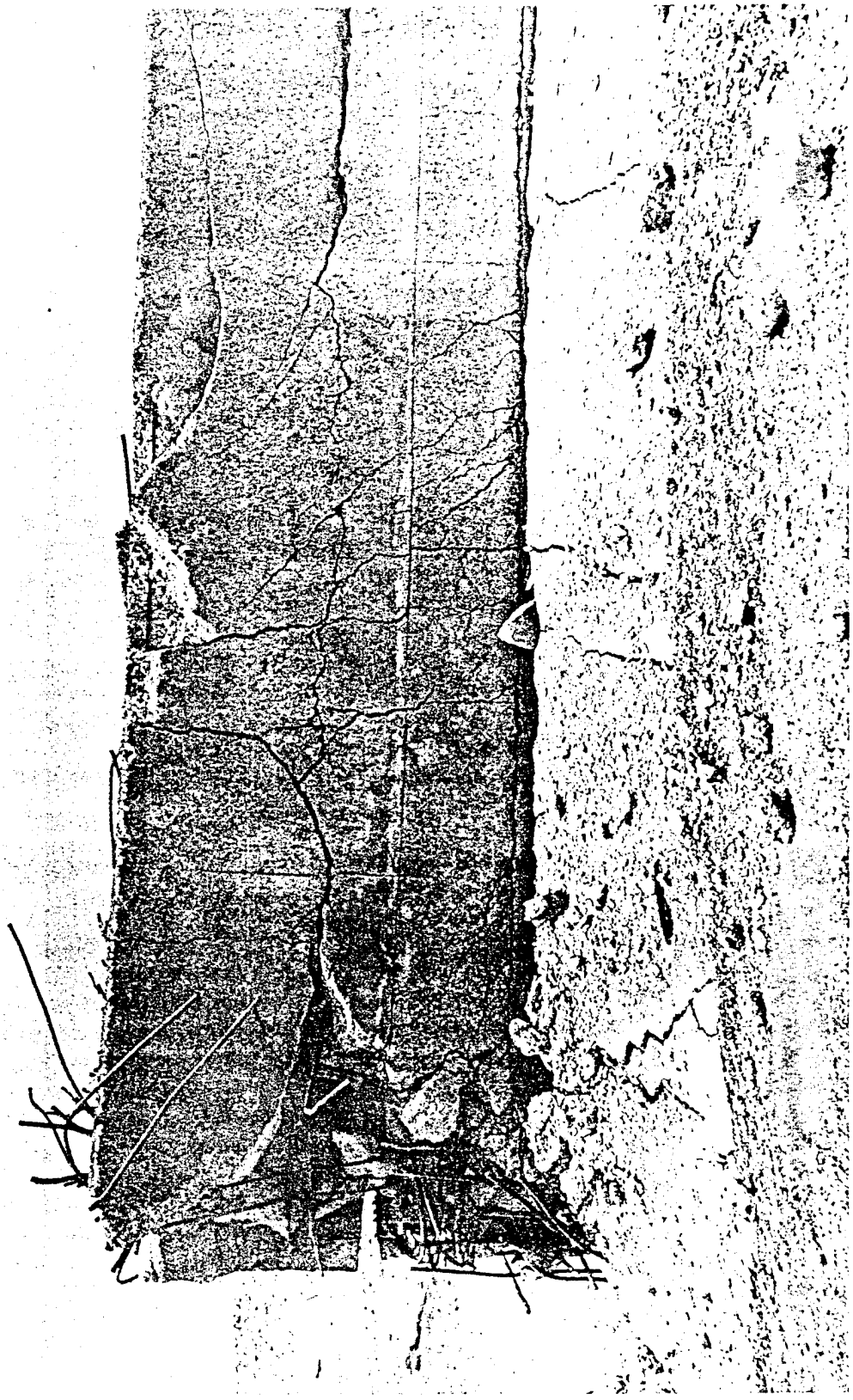


Fig. L.16 Left End of Right Edge of Slab, Structure 3.2.1a

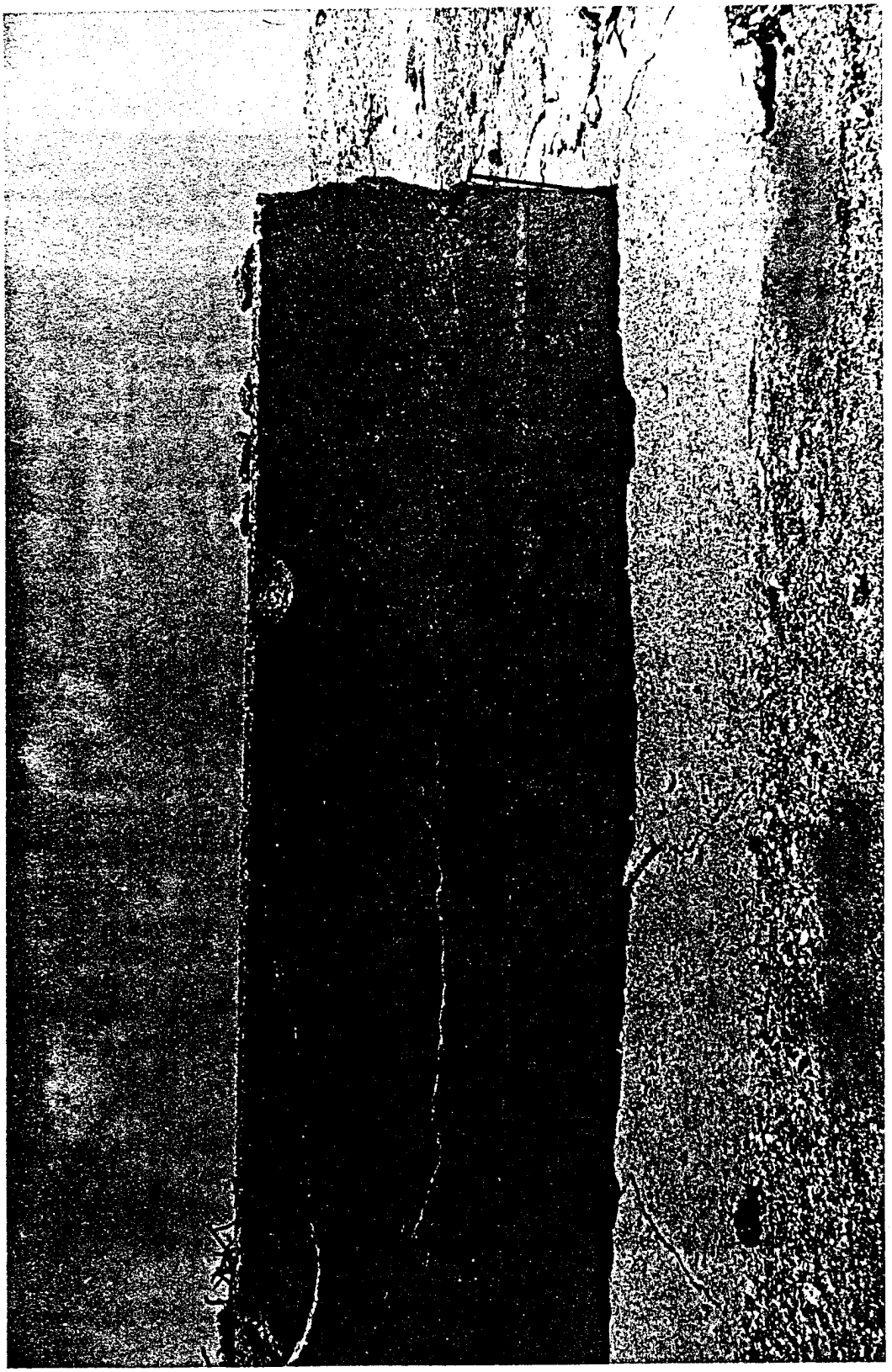


Fig. L.17 Right End of Right Edge of Slab, Structure 3.2.1a

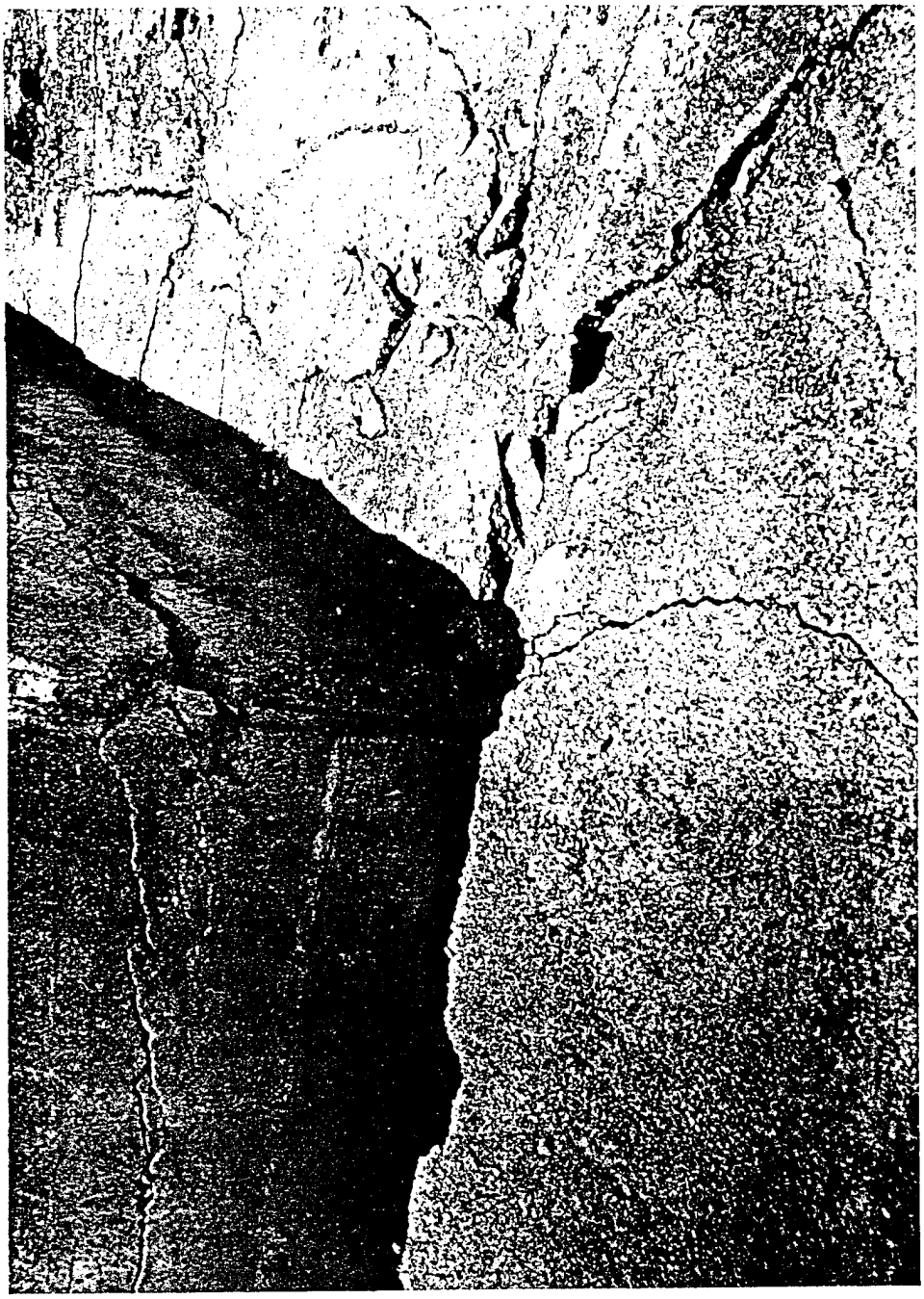


Fig. L.18 Concrete Apron at Right Rear Corner, Structure 3.2.1a

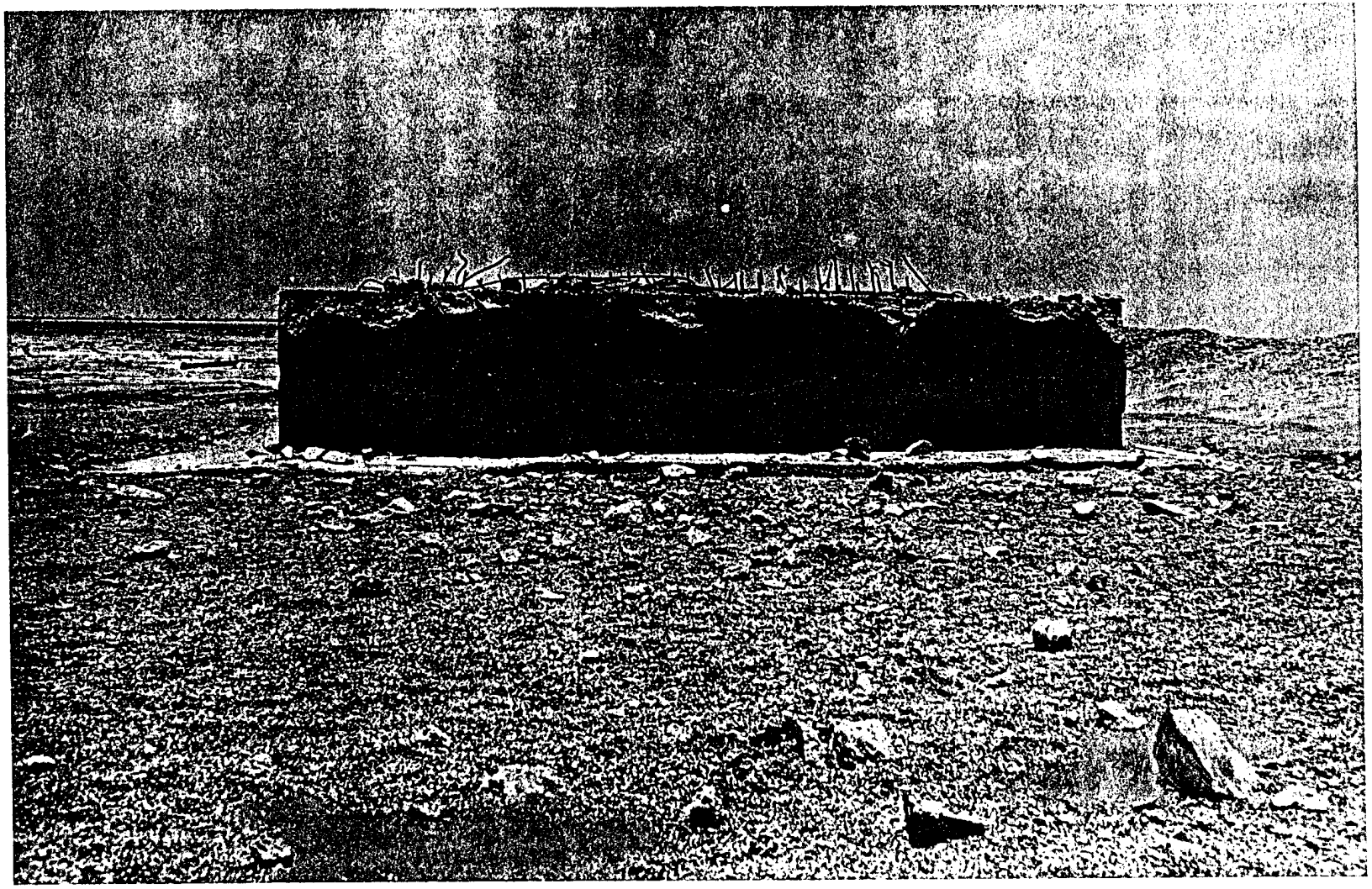


Fig. L.19 General View of Rear Wall, Structure 3.2.1a

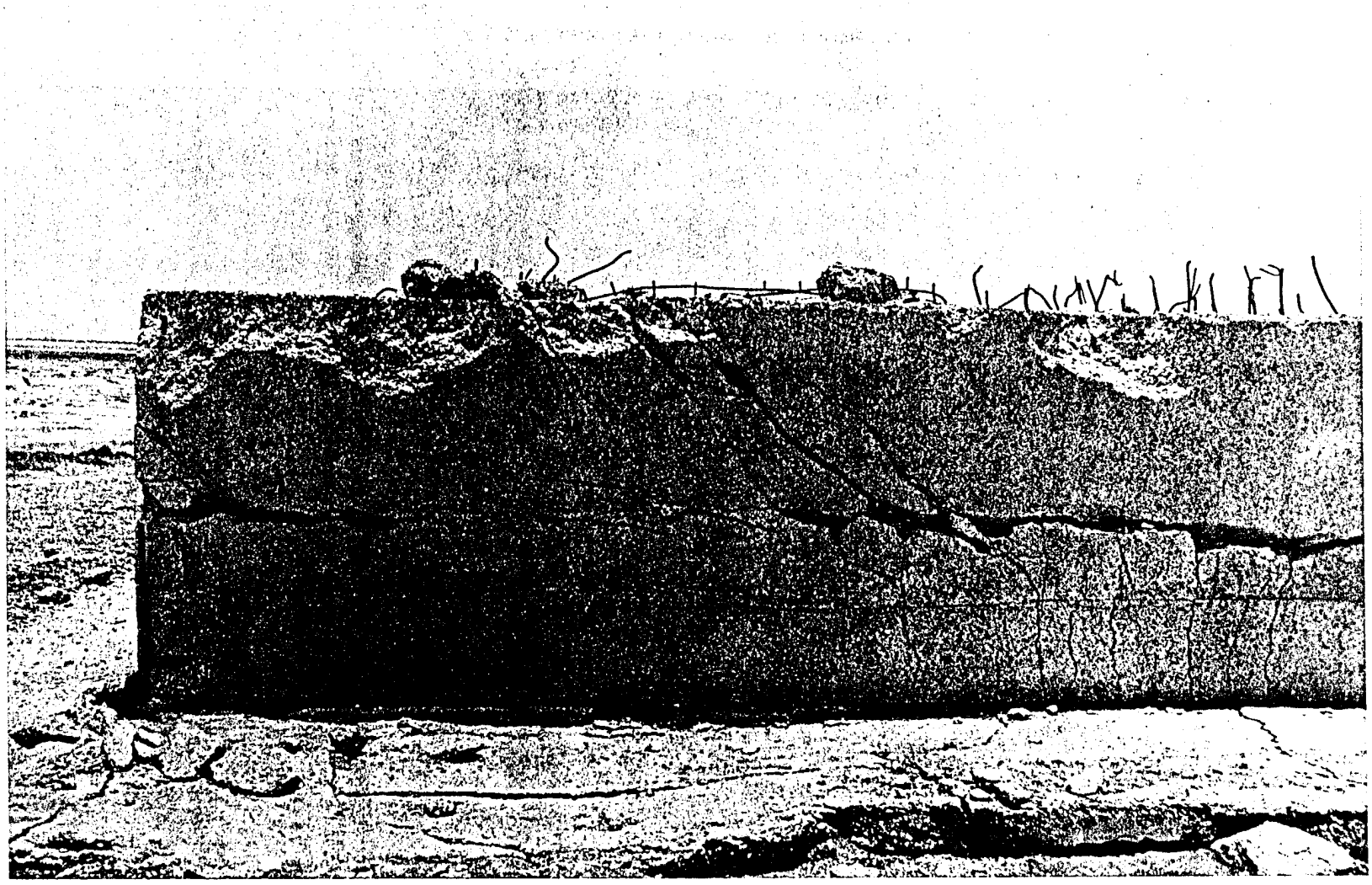


Fig. L.20 Left Half of Rear Wall, Structure 3.2.1a

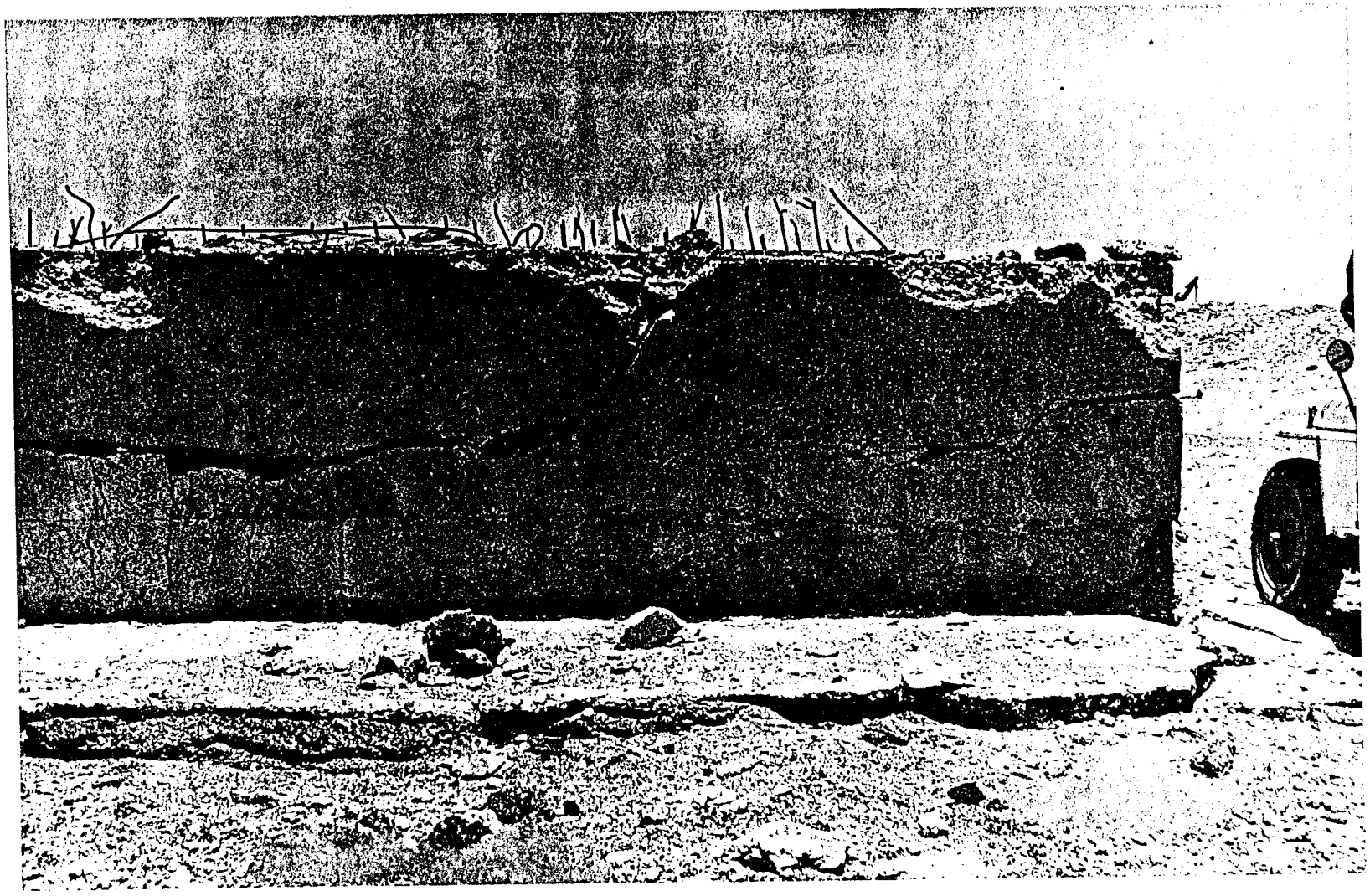


Fig. L.21 Right Half of Rear Wall, Structure 3.2.1a

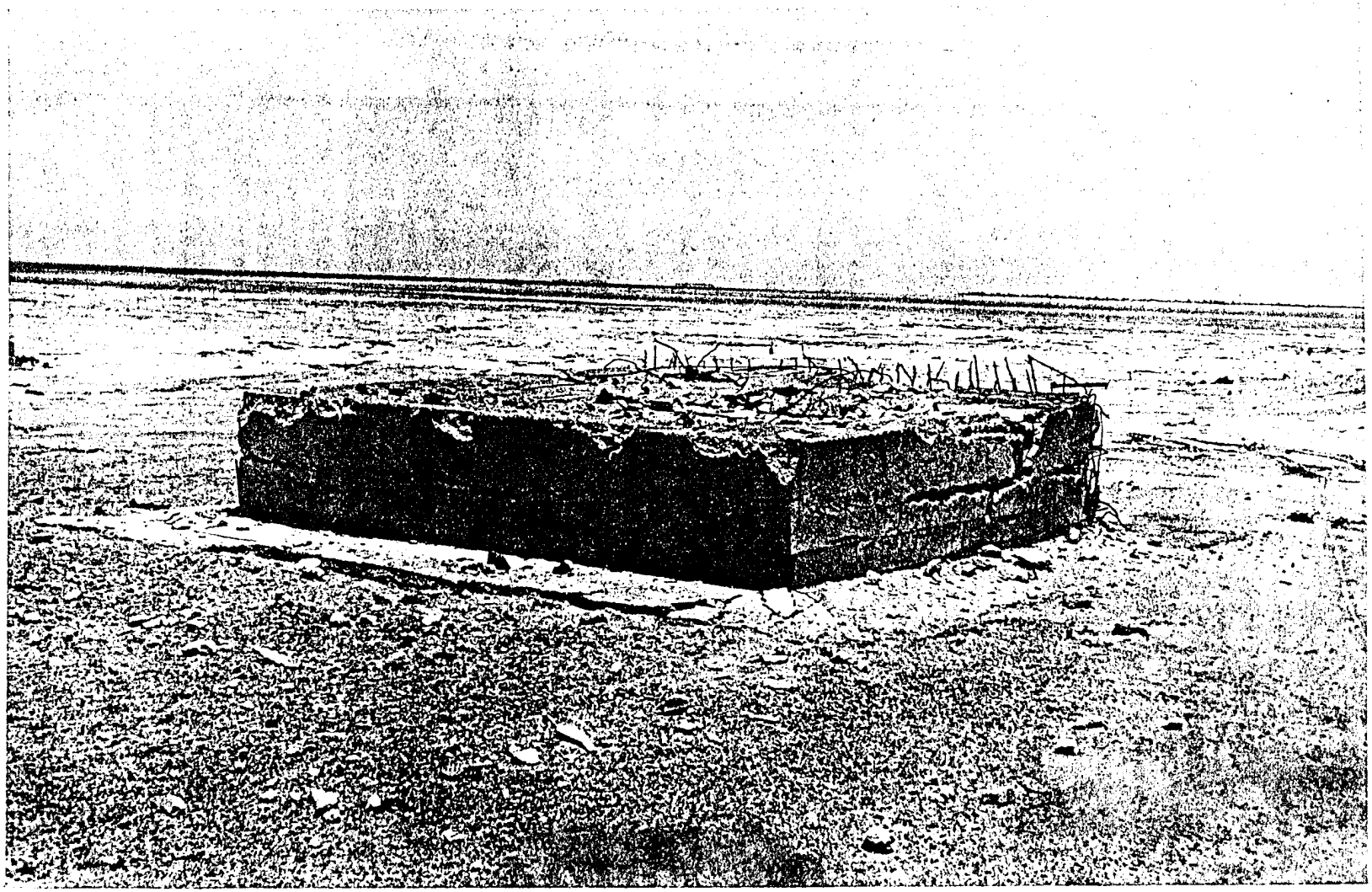


Fig. L.22 General View of Roof from Left Rear, Structure 3.2.1a

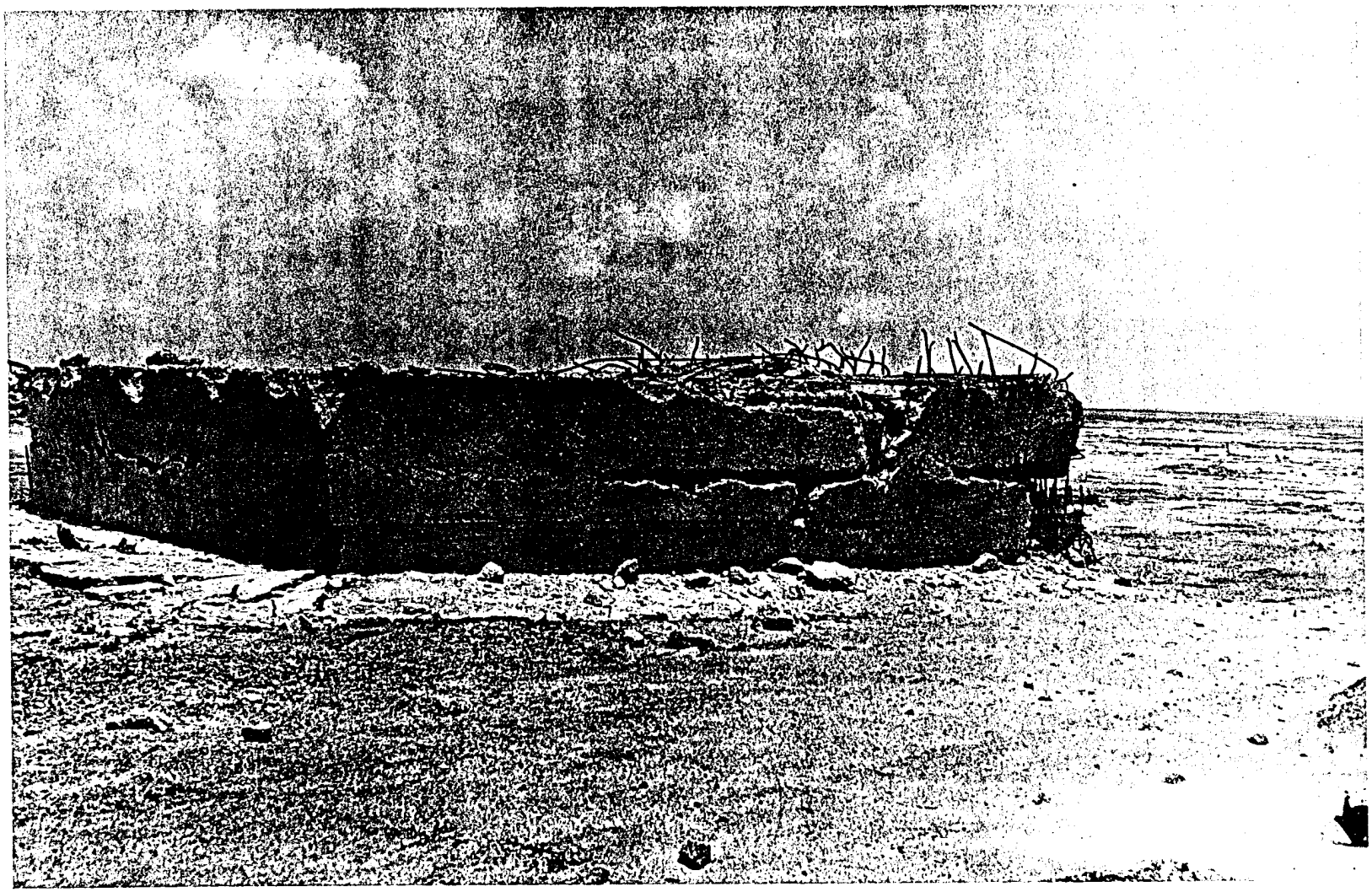


Fig. L.23 General View of Left Side from Left Rear, Structure 3.2.1a

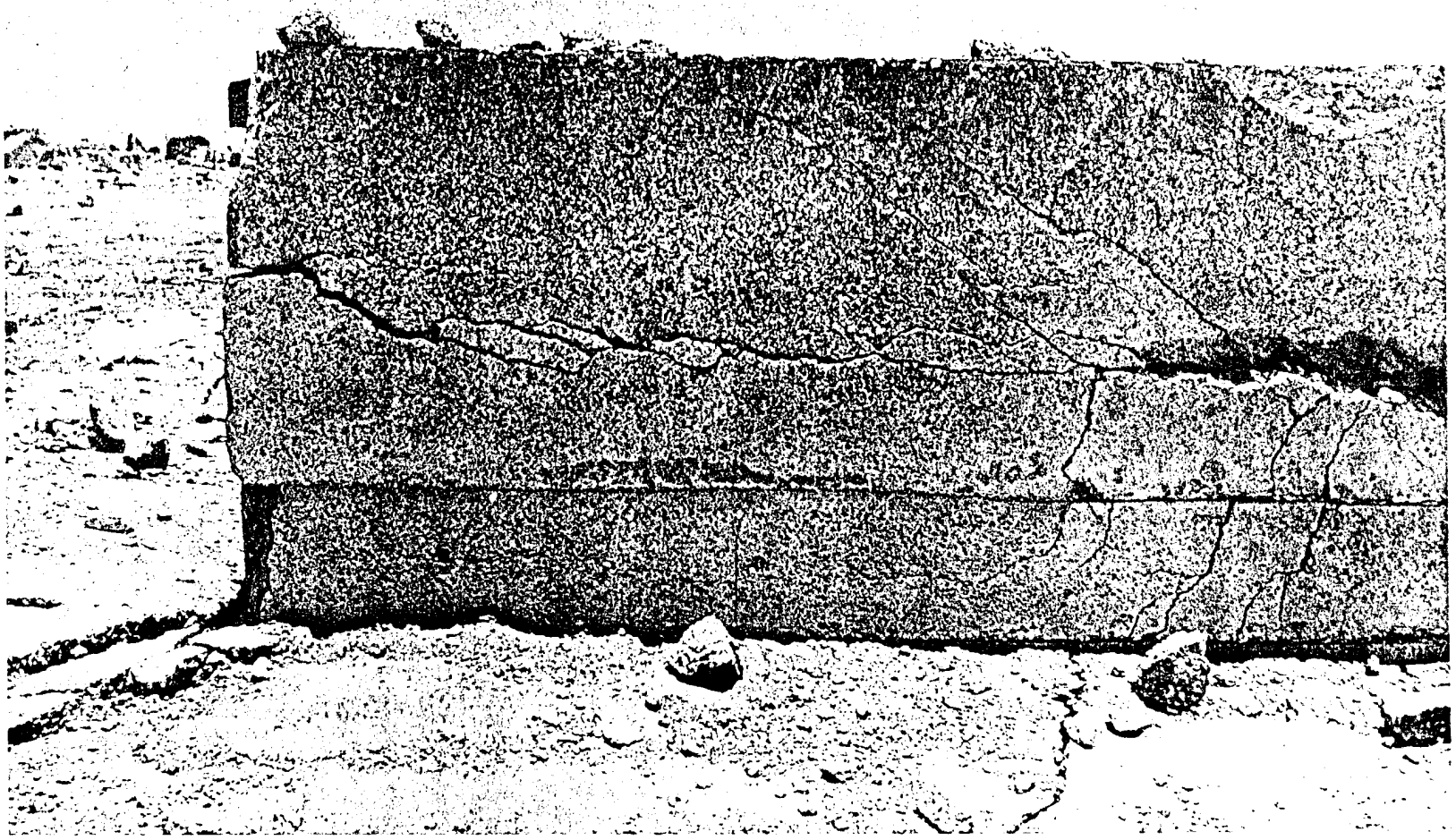


Fig. L.24 Left Half of Left Side Wall, Structure 3.2.1a

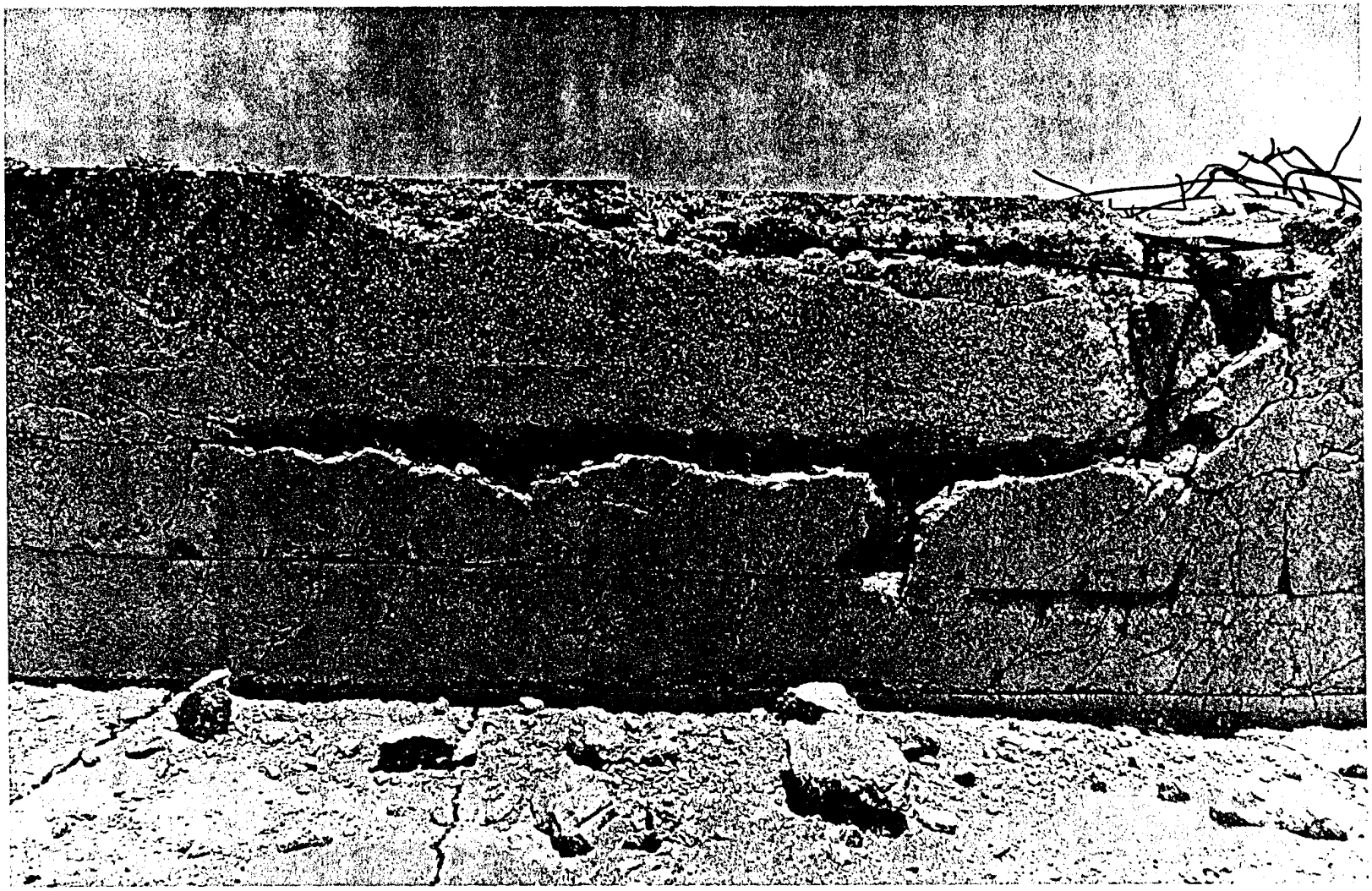


Fig. L.25 Center Section of Left Side Wall, Structure 3.2.1a

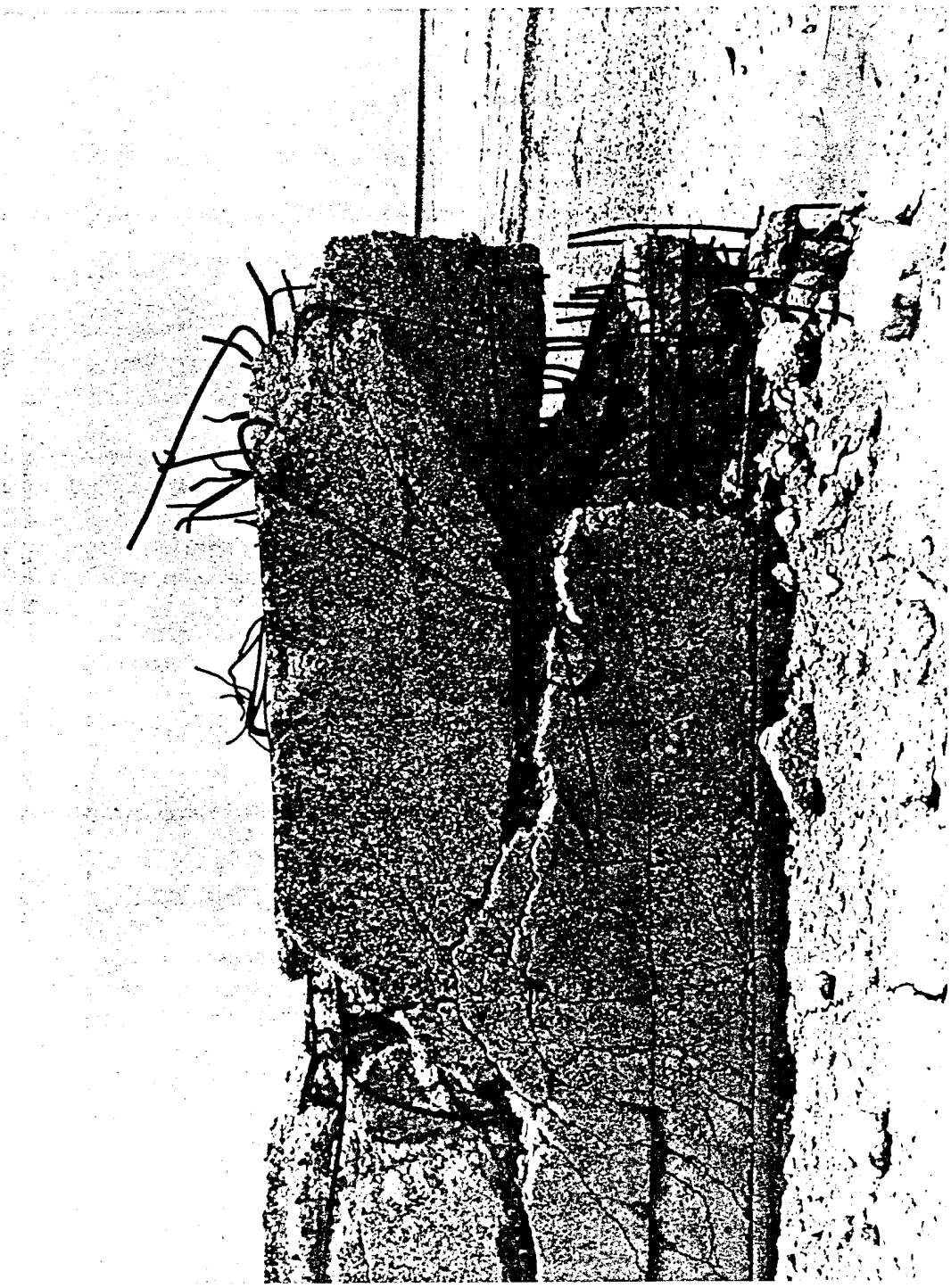


Fig. L.26 Right Half of Left Side Wall, Structure 3.2.1a

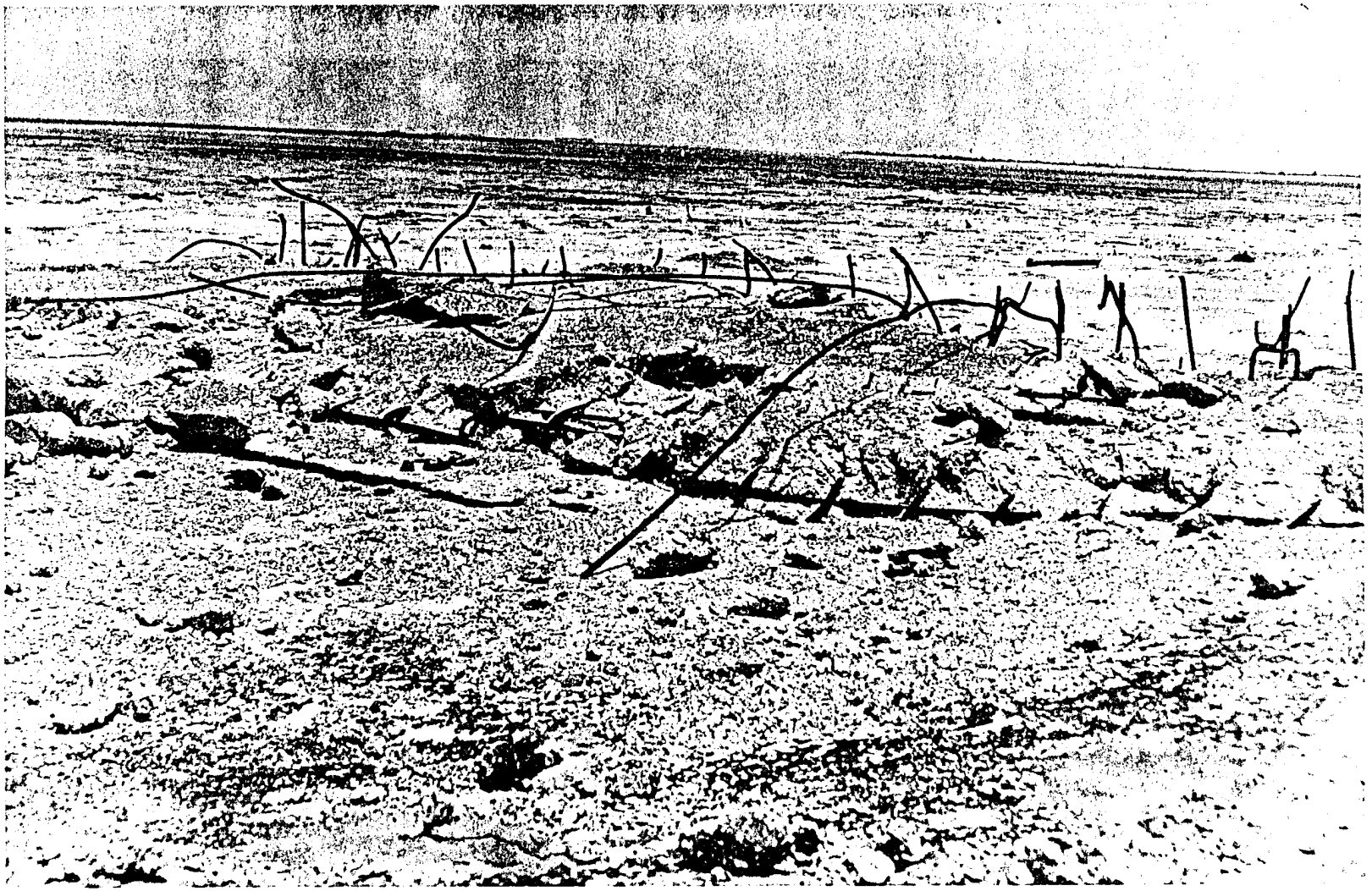


Fig. L.27 Front Edge of Roof from Left Rear Showing Top of Shear Plane, Structure 3.2.1a



Fig. L.28 Close-up of Shear Plane 8 ft Back from Front Edge, Structure 3.2.1a

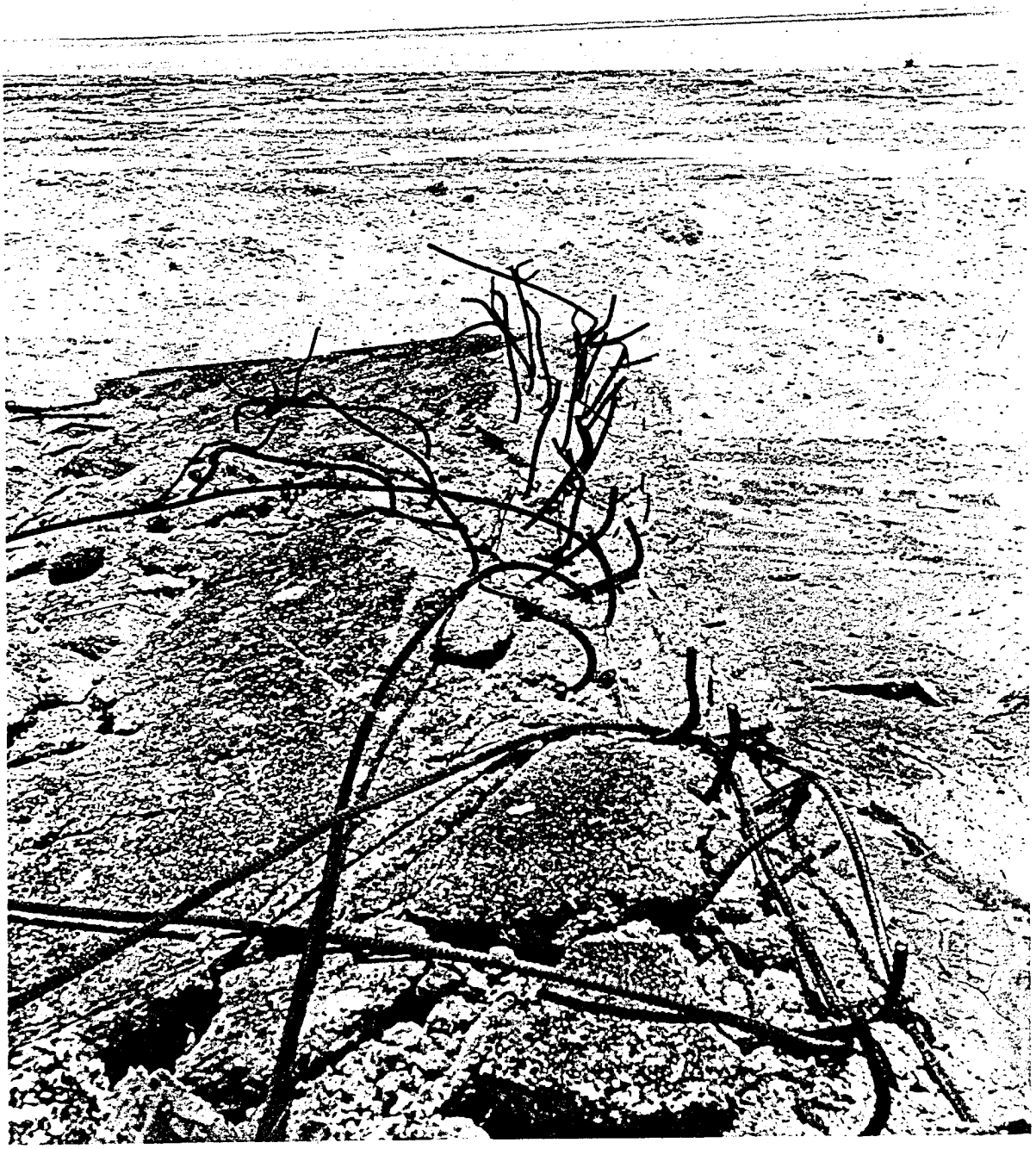


Fig. L.29 Exposed Steel along Top Front Corner, Structure 3.2.1a

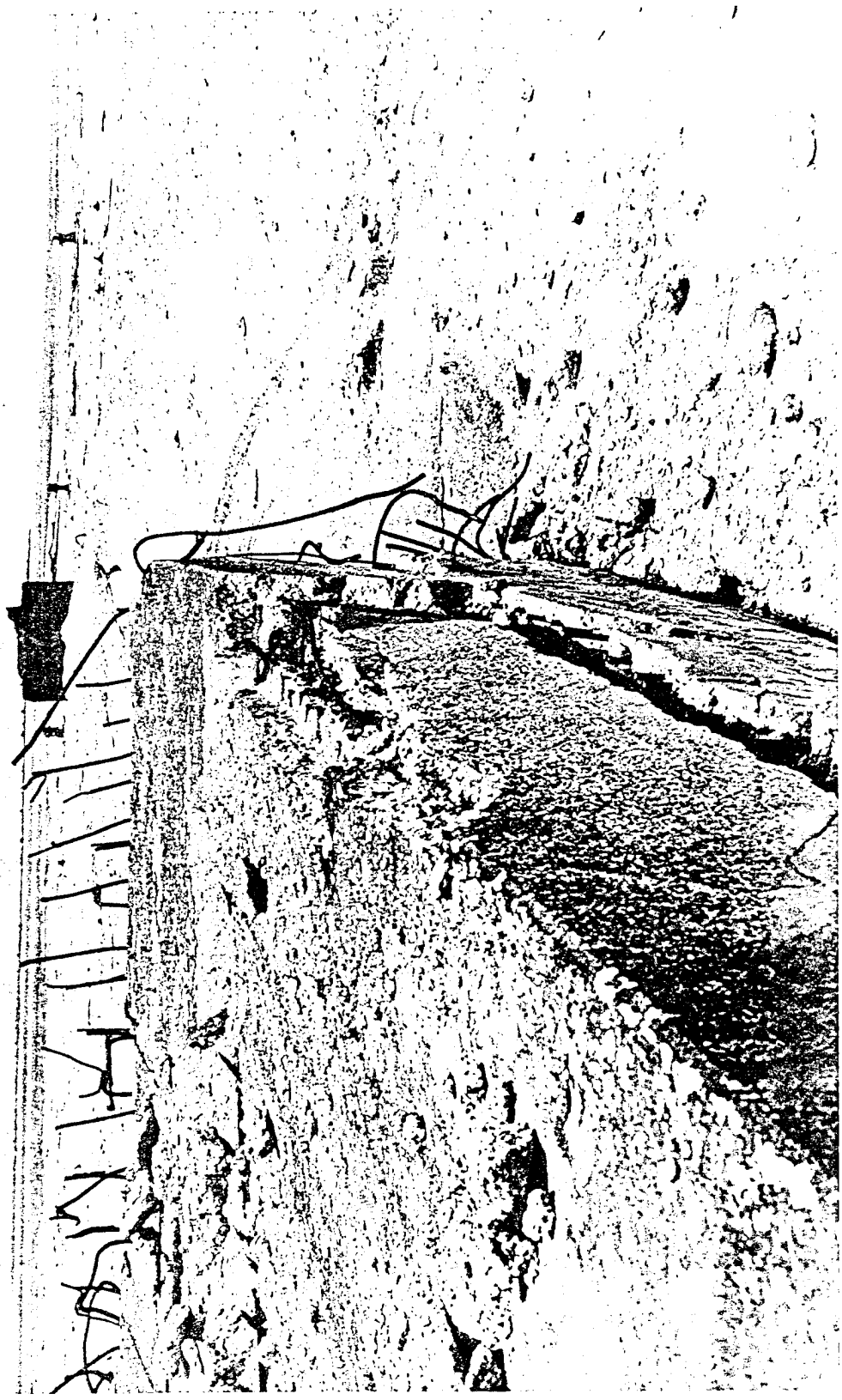


Fig. L.30 Left Front Corner from Rear, Structure 3.2.1a. Note separation along edge of slab.

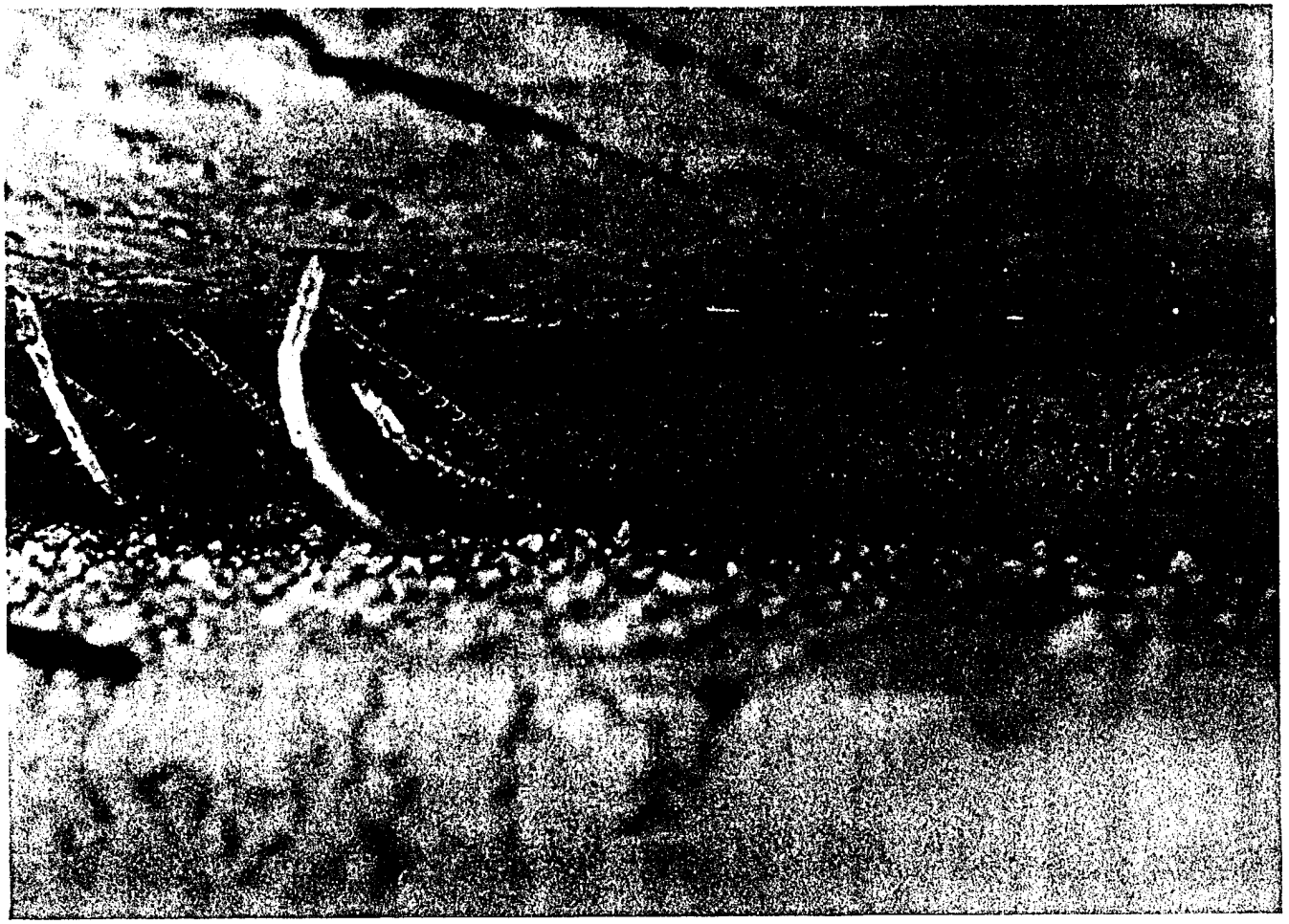


Fig. L.31 Close-up of Separation Between Roof Slab and Front Wall at Center, Structure 3.2.1a

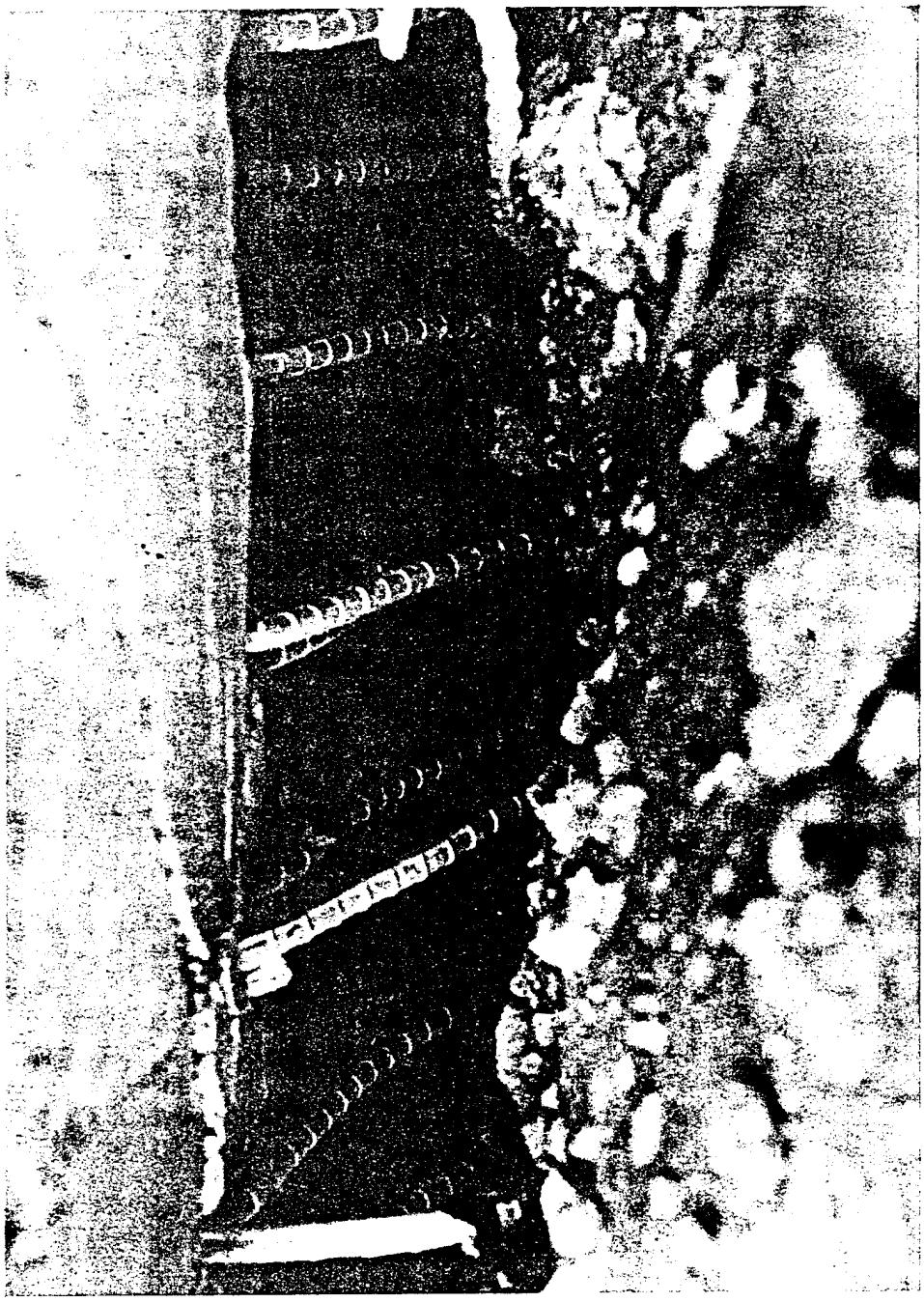


Fig. L.32 Close-up of Separation Between Roof Slab and Front Wall 6 ft from Right Corner, Structure 3.2.1a

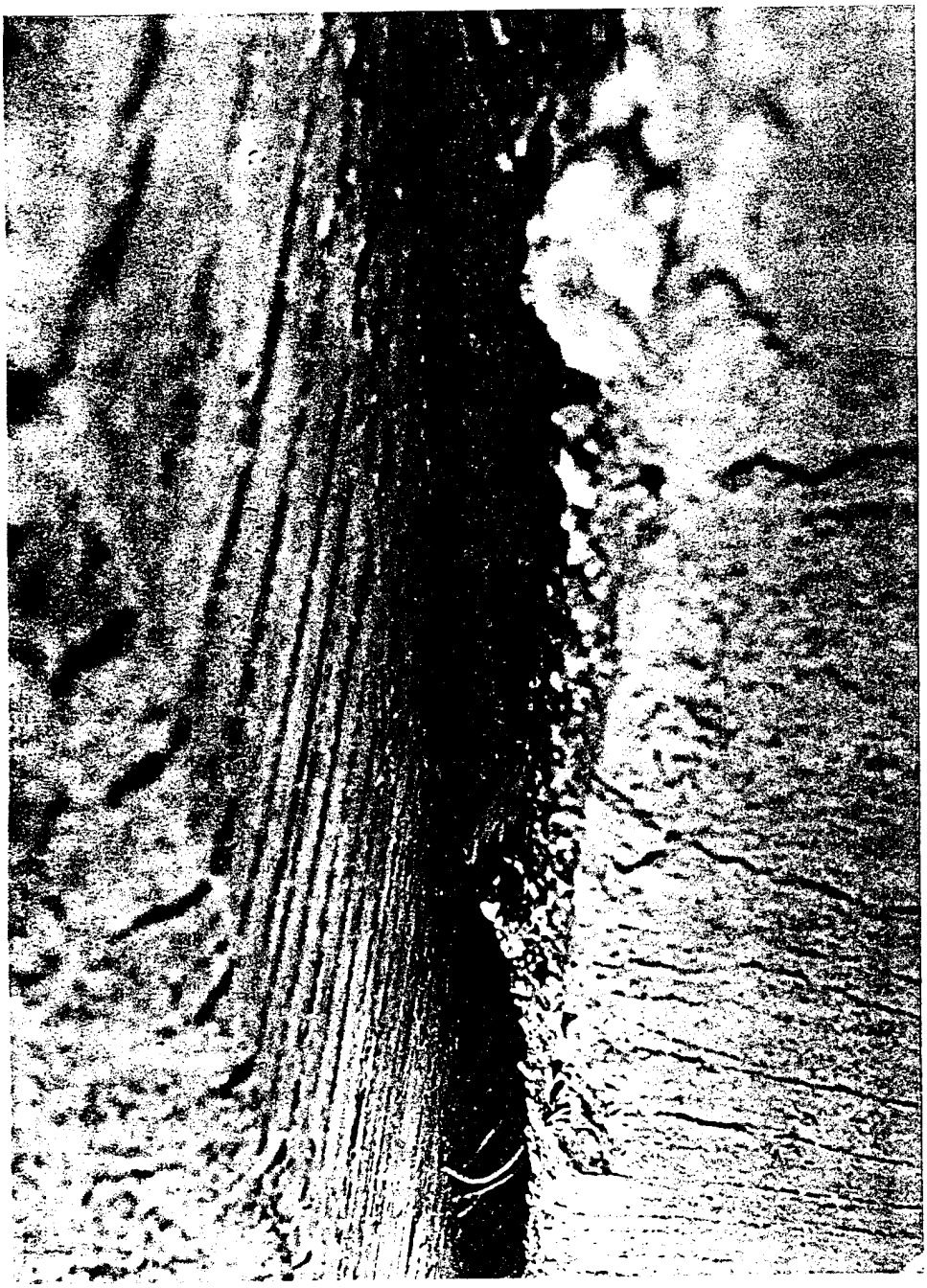


Fig. L.33 Separation Between Roof and Front Wall, Structure 3.2.1a



Fig. L.34 Postshot Aerial View Showing Location of Debris, Structure 3.2.1b

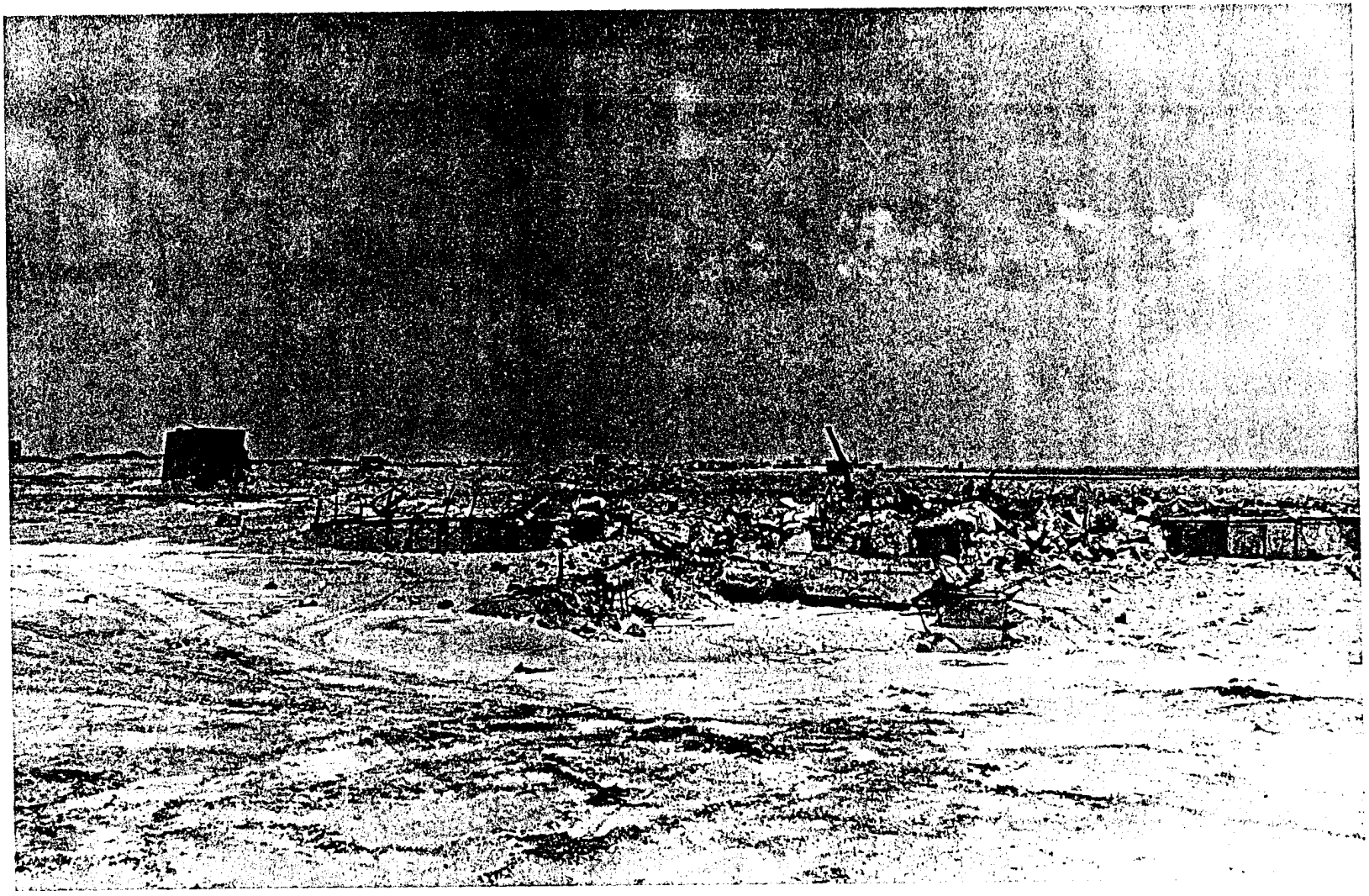


Fig. L.35 General View from Front, Structure 3.2.1b

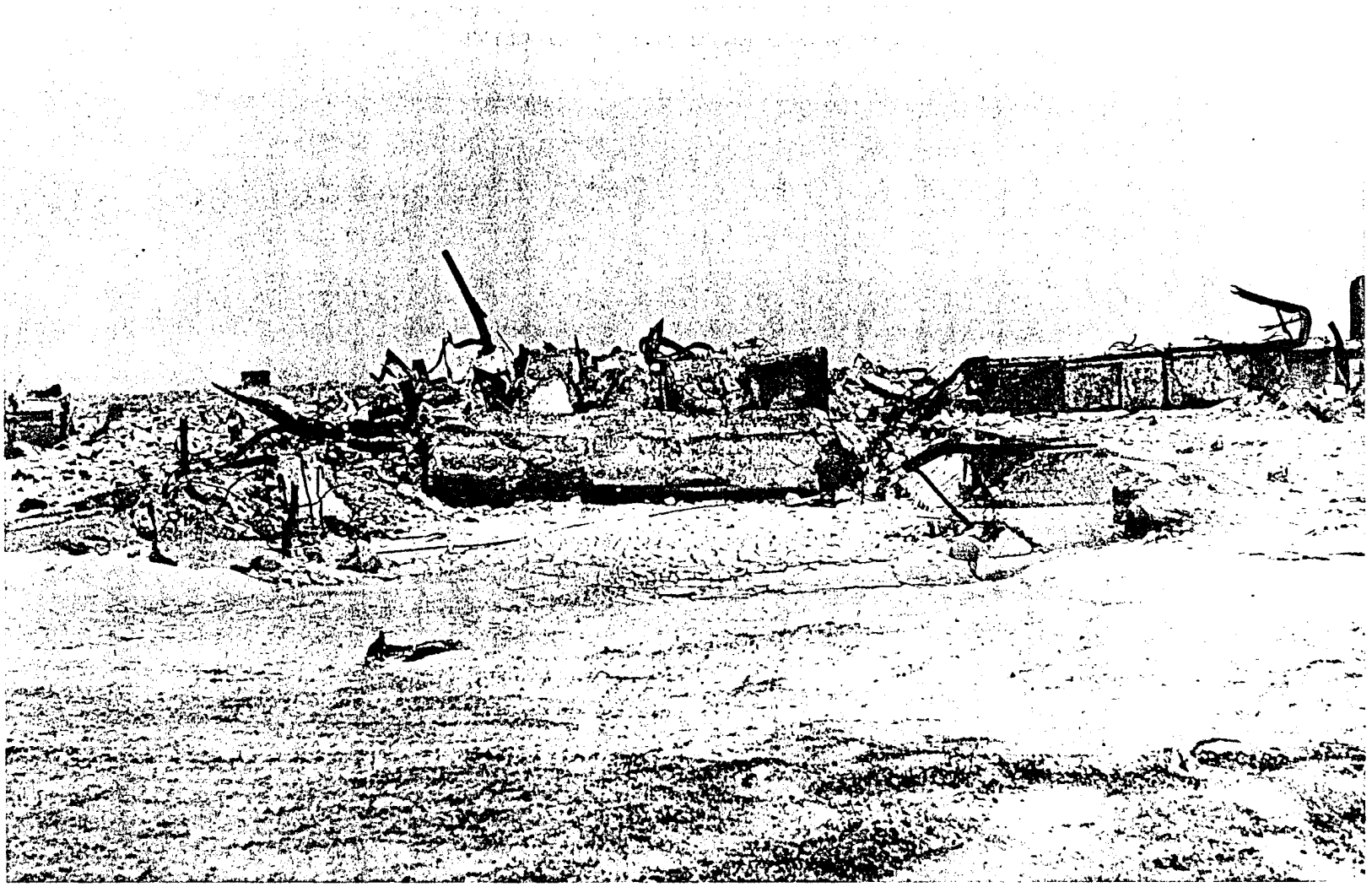


Fig. L.36 Front Bearing Wall Pushed to Rear, Structure 3.2.1b

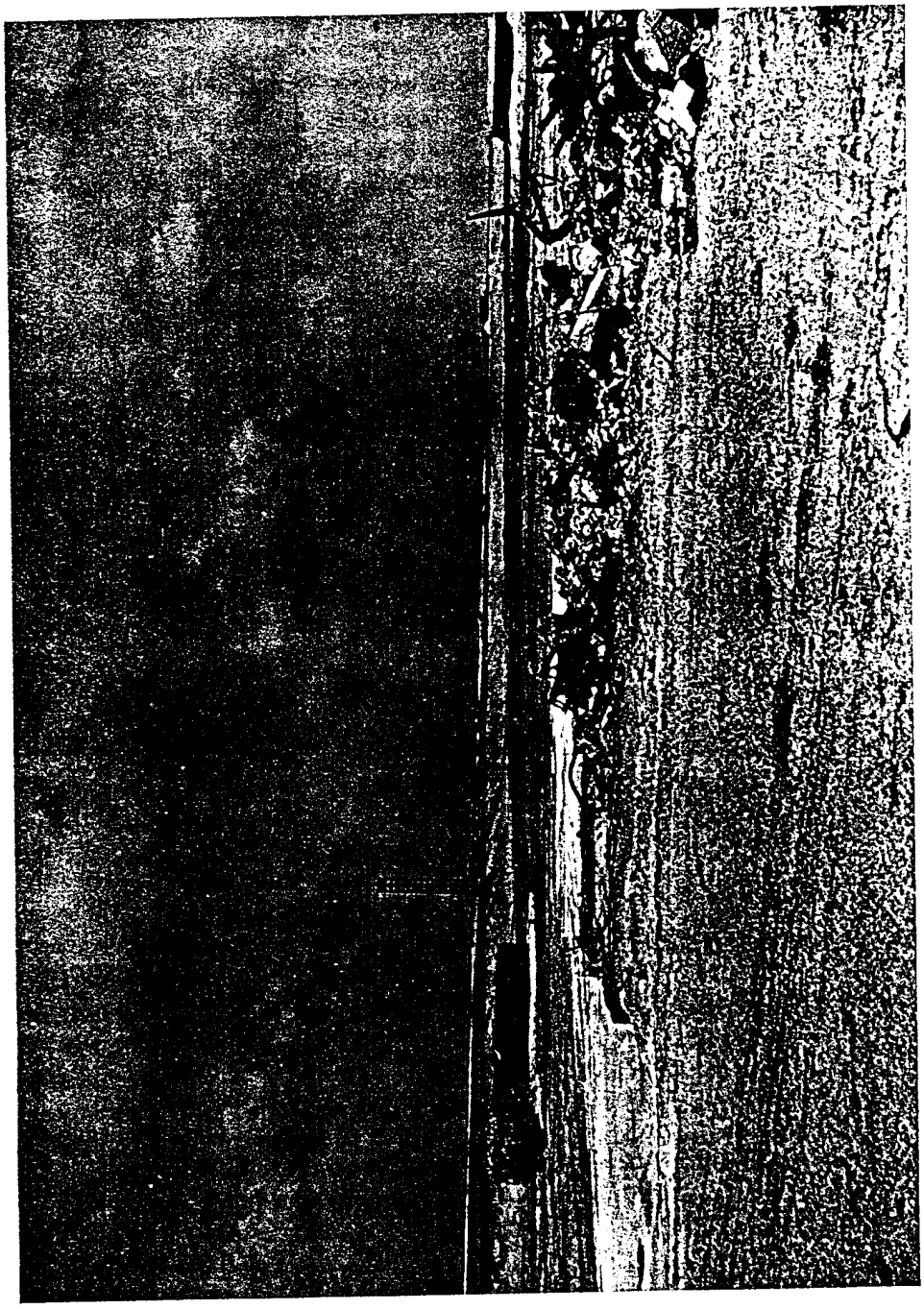


Fig. L.37 Right Side of Structure, 3.2.1b



Fig. L.38 Rubble at Right Rear, Structure 3.2.1b



Fig. L.39 Filled Cells from Right Edge of Slab, Structure 3.2.1b. Note twisted steel trusses in background.

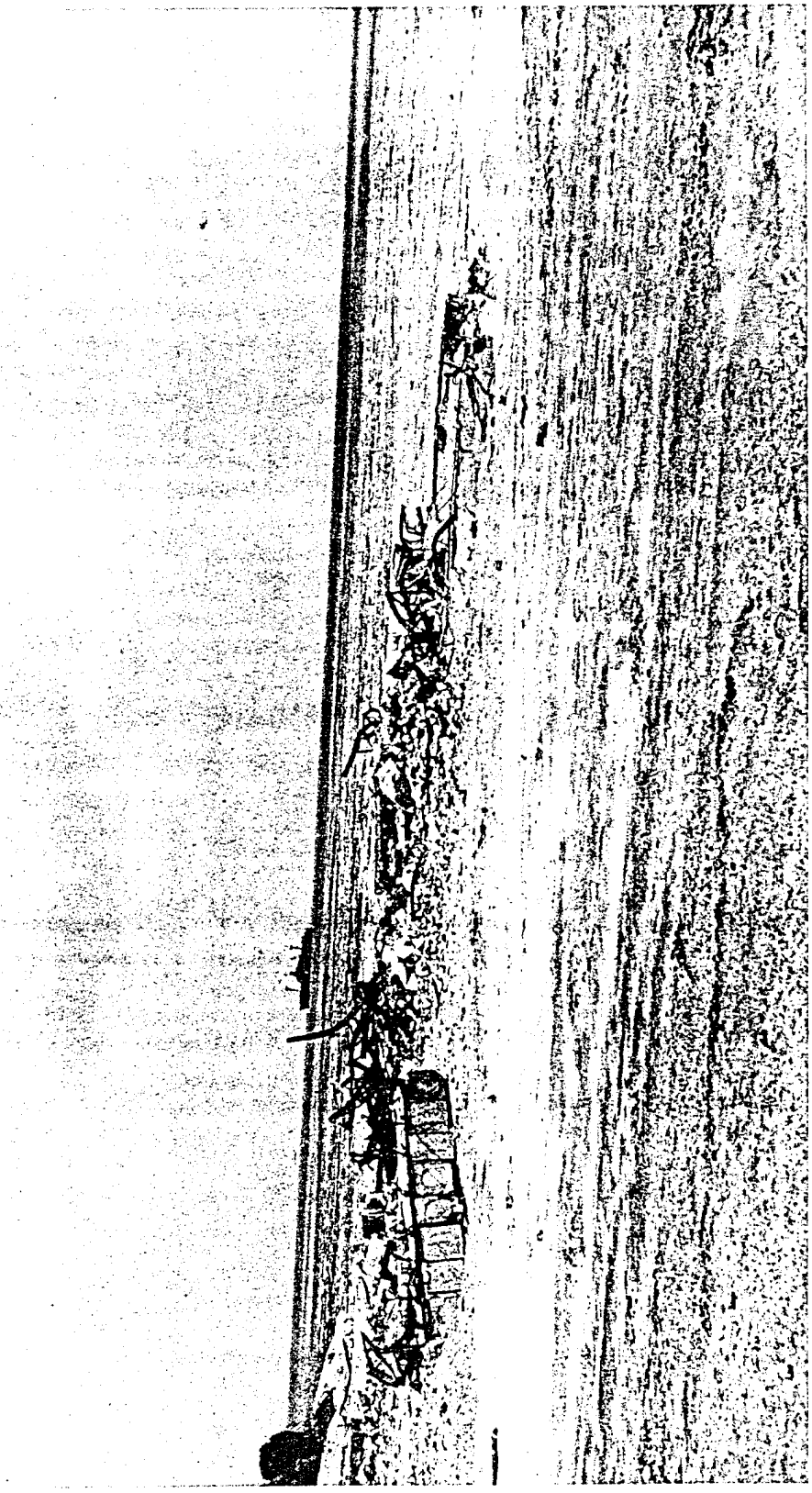


Fig. L.40 Rubble at Left, Structure 3.2.1b

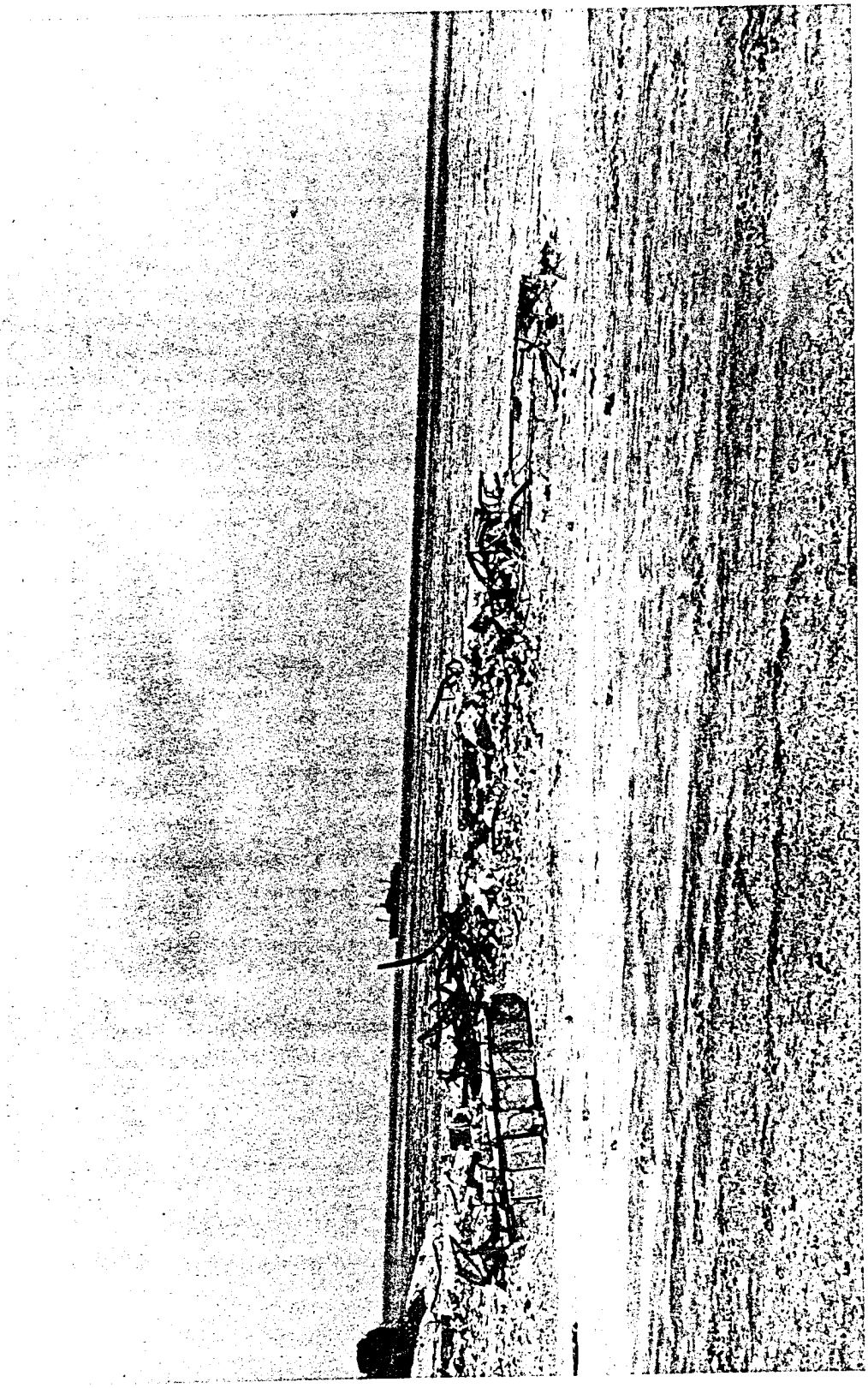


Fig. L.40 Rubble at Left, Structure 3.2.1b



Fig. L.39 Filled Cells from Right Edge of Slab, Structure 3.2.1b. Note twisted steel trusses in background.

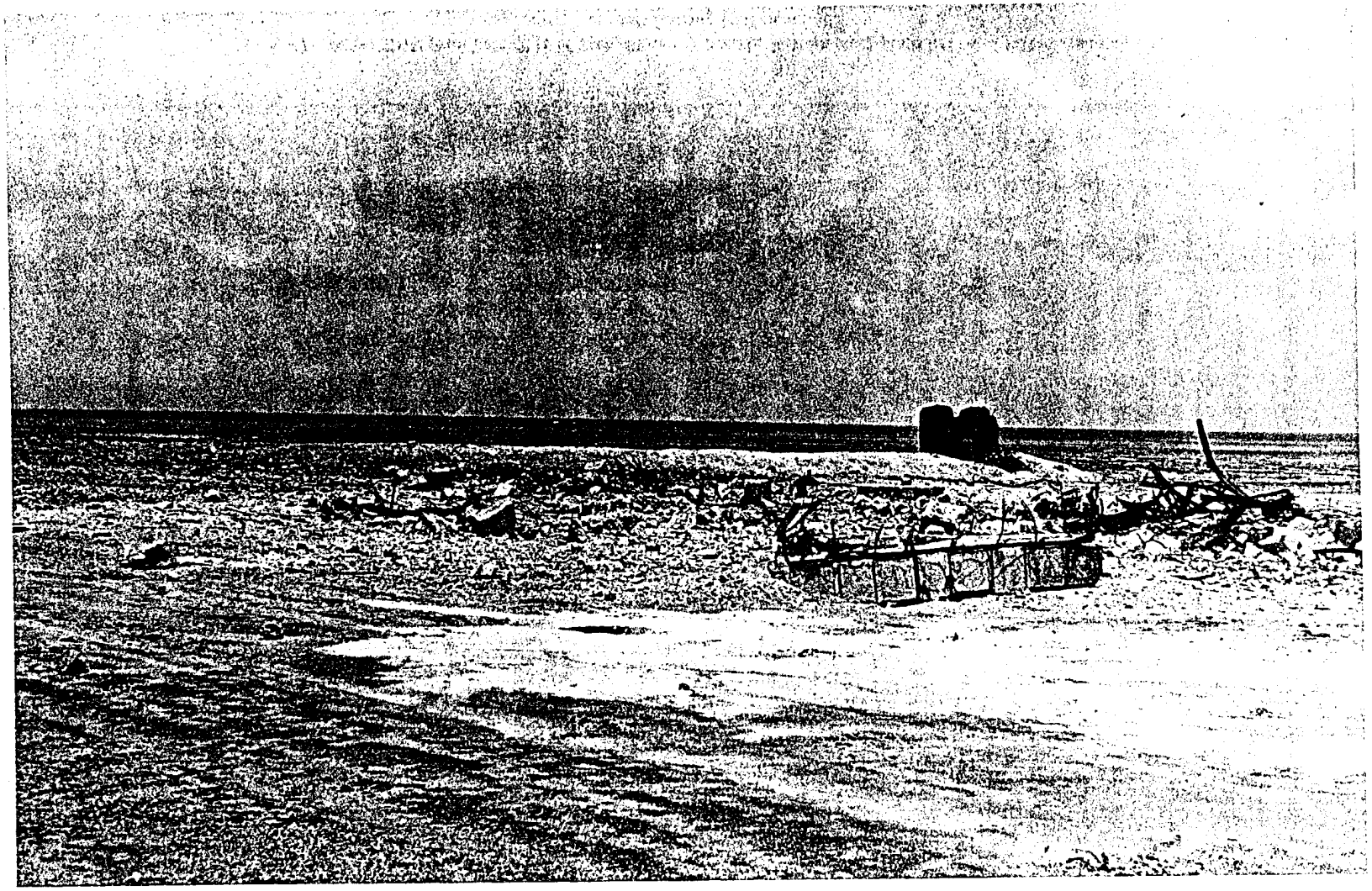


Fig. L.41 Rubble at Left Rear, Structure 3.2.1b

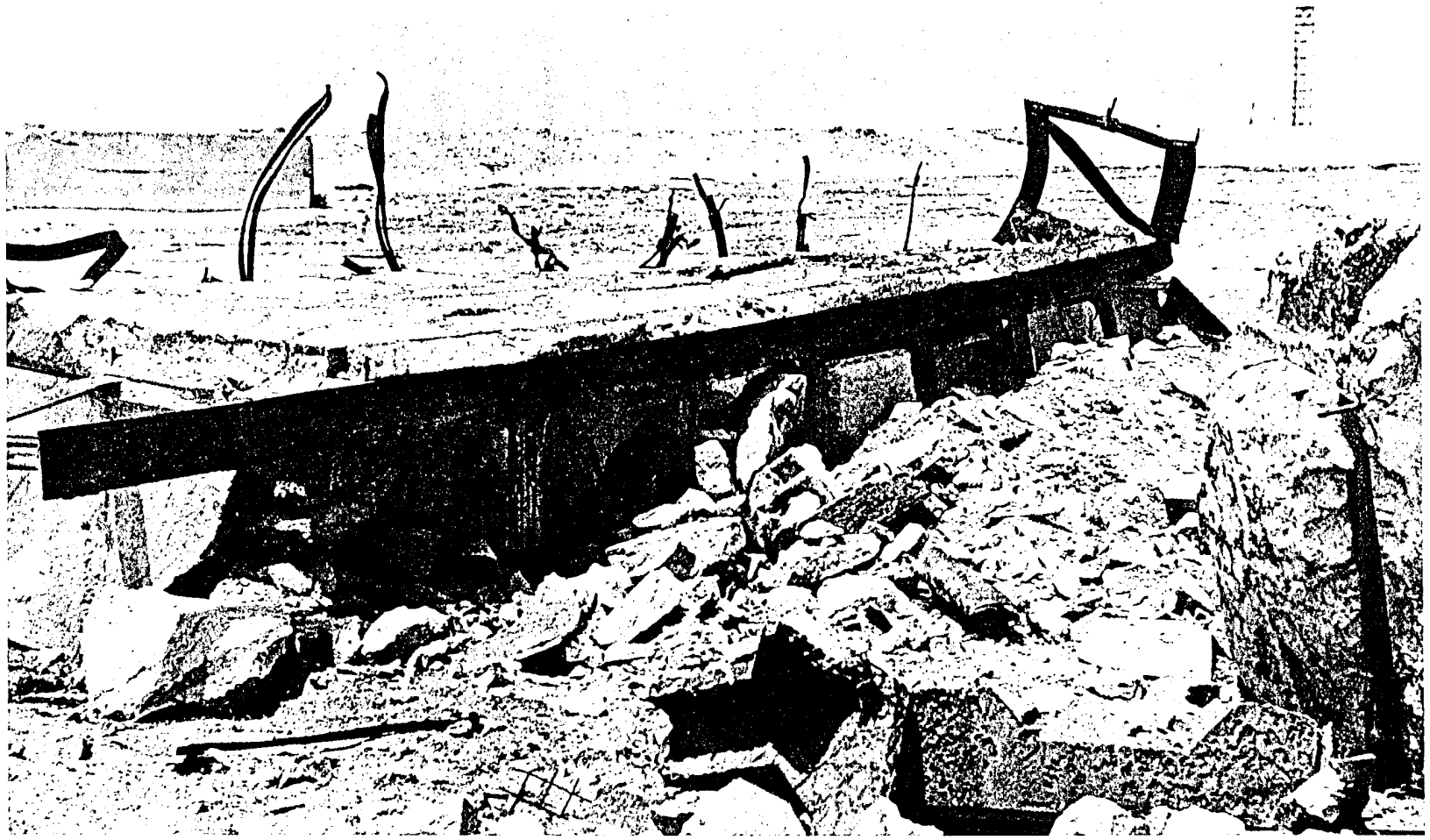


Fig. L.42 Filled Cells from Left Edge of Slab, Structure 3.2.1b. Bottom steel plate has weld failures where separation from left bearing wall occurred.

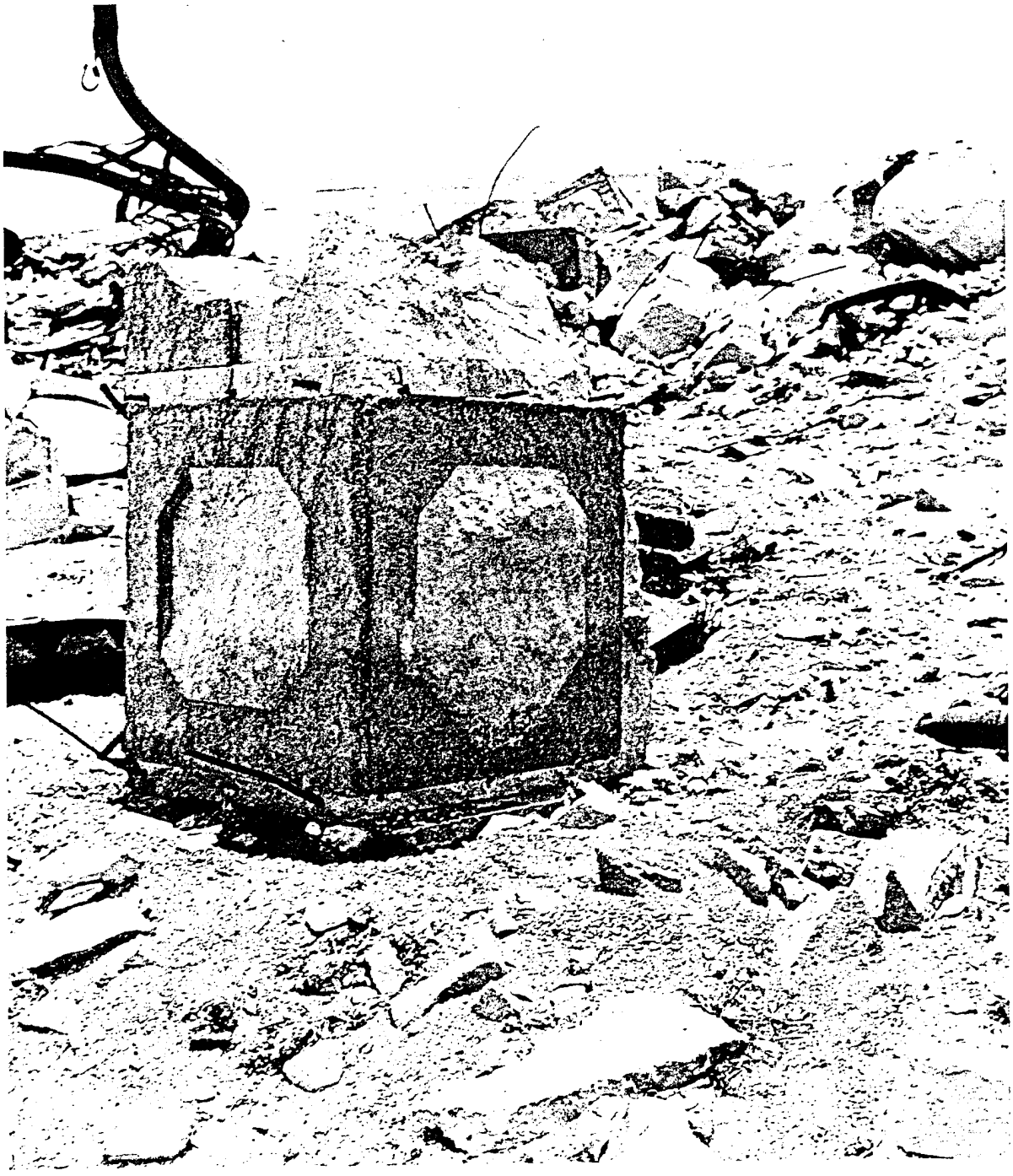


Fig. L.43 Typical Filled Cell Broken Loose from Slab, Structure 3.2.1b

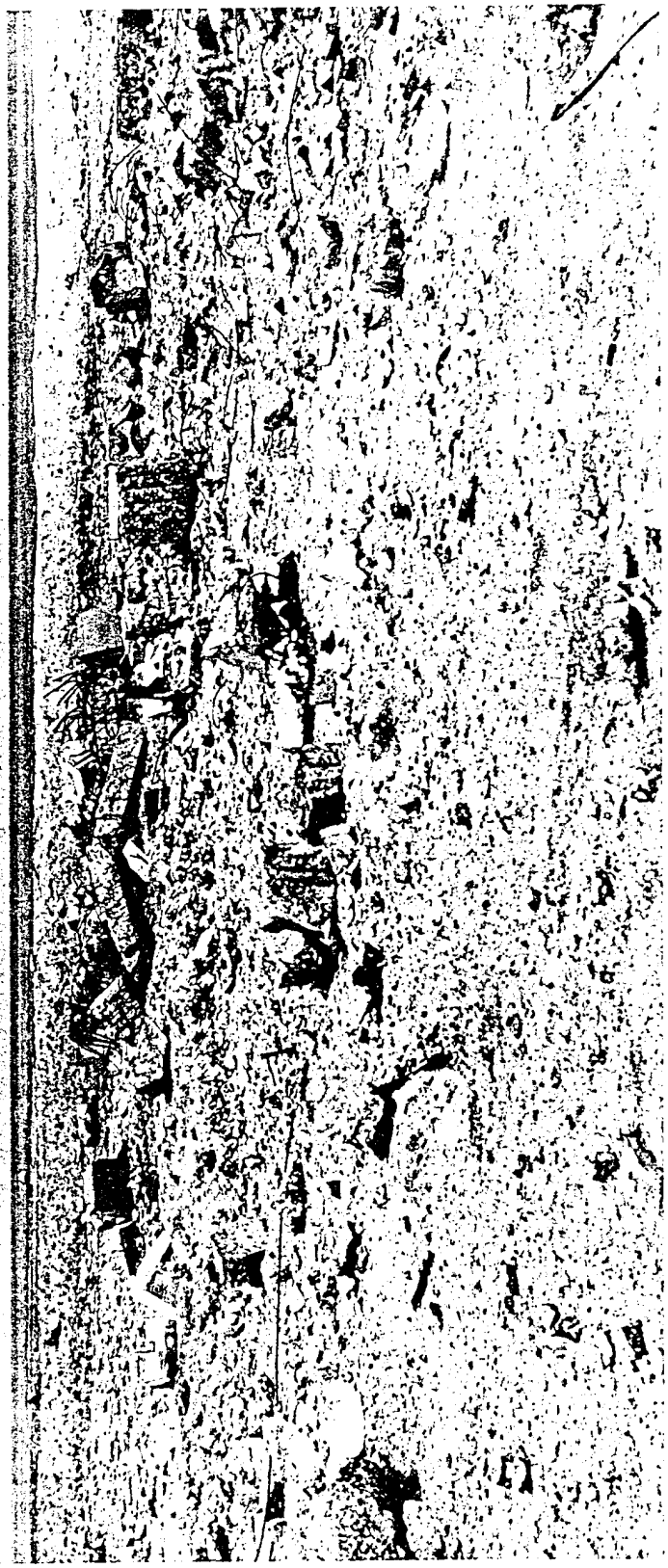


Fig. L.44 Debris at Rear of Structure, 3.2.1b. Top slab in background.



Fig. L.45 Close-up of Top Slab 150 ft behind Structure, 3.2.1b

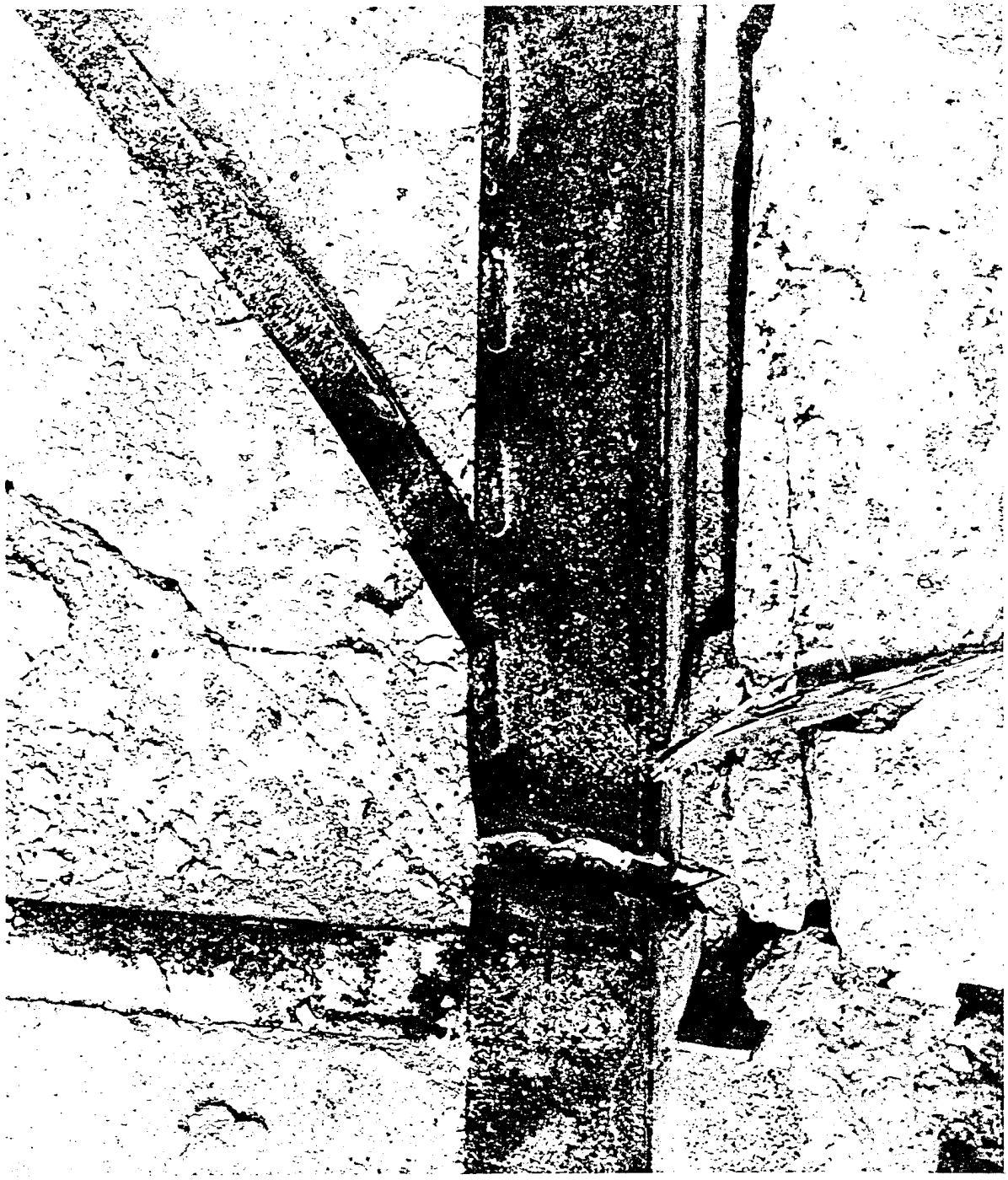


Fig. L.46 Welding Failures Where Truss in Slab Separated from Angle on Bearing Wall, Structure 3.2.1b



Fig. L.47 Postshot Aerial View, Structure 3.2.2a

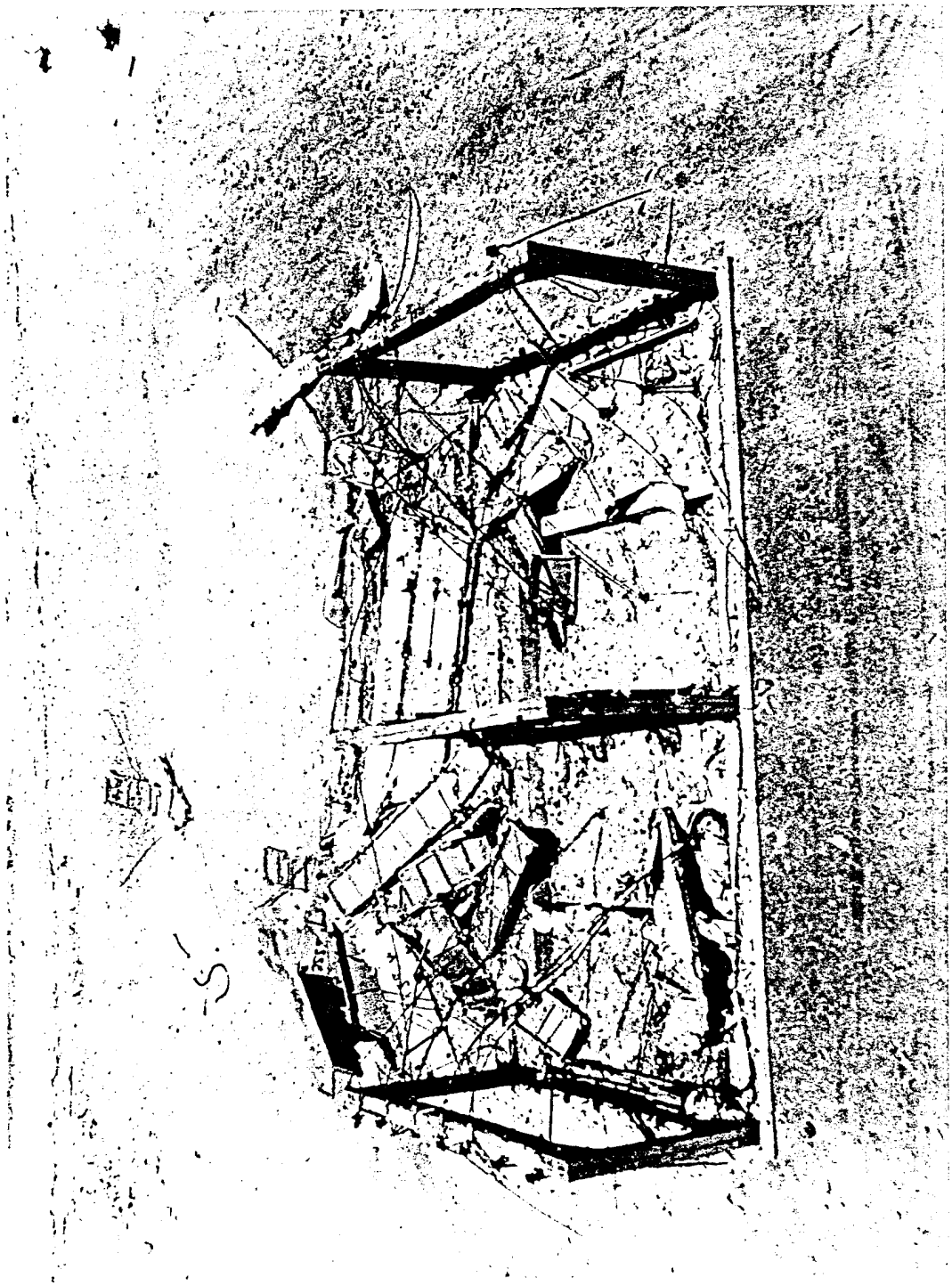


Fig. L.48 Close-up Aerial View from Front, Structure 3.2.2a

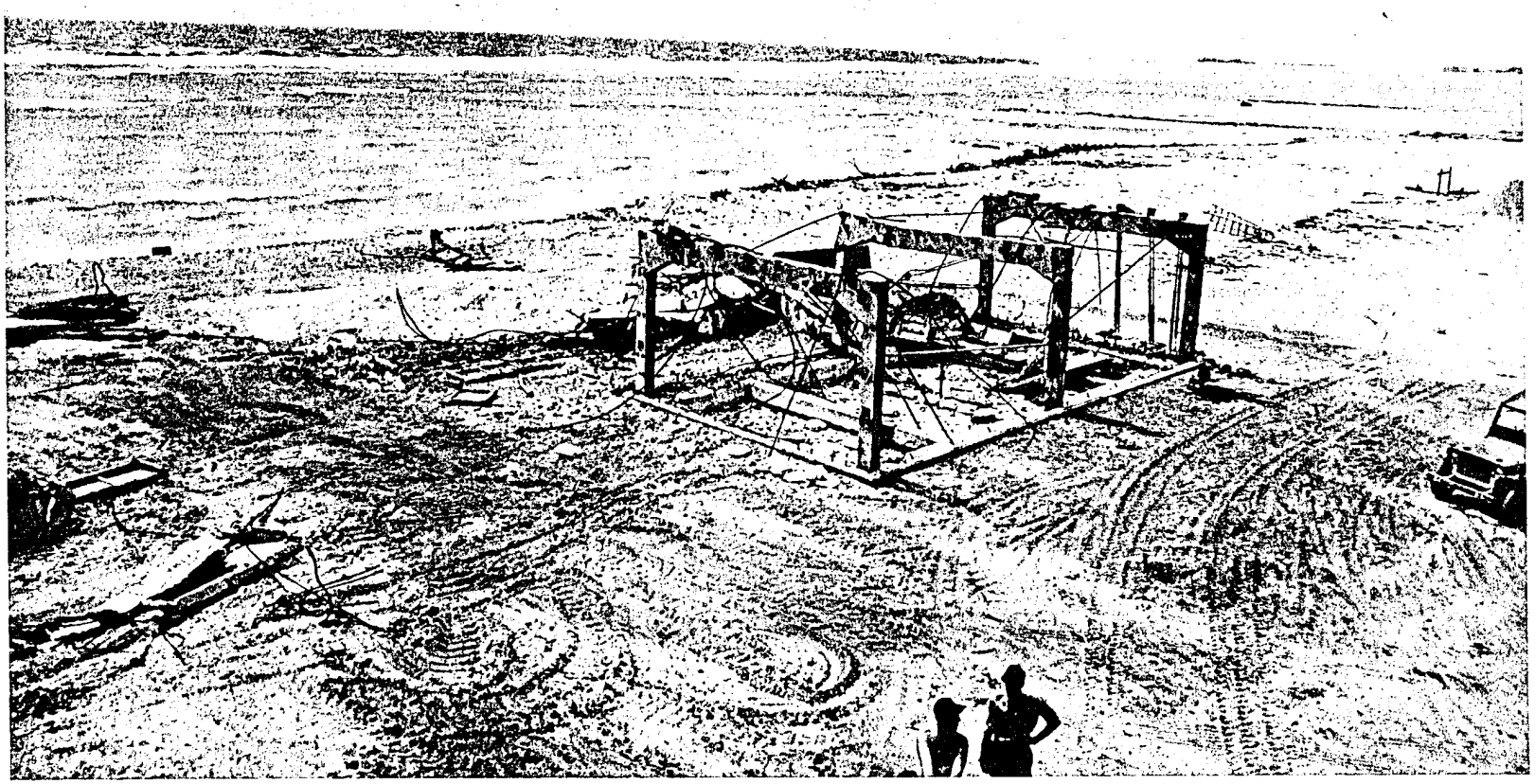


Fig. L.49 View from Left Front, Structure 3.2.2a

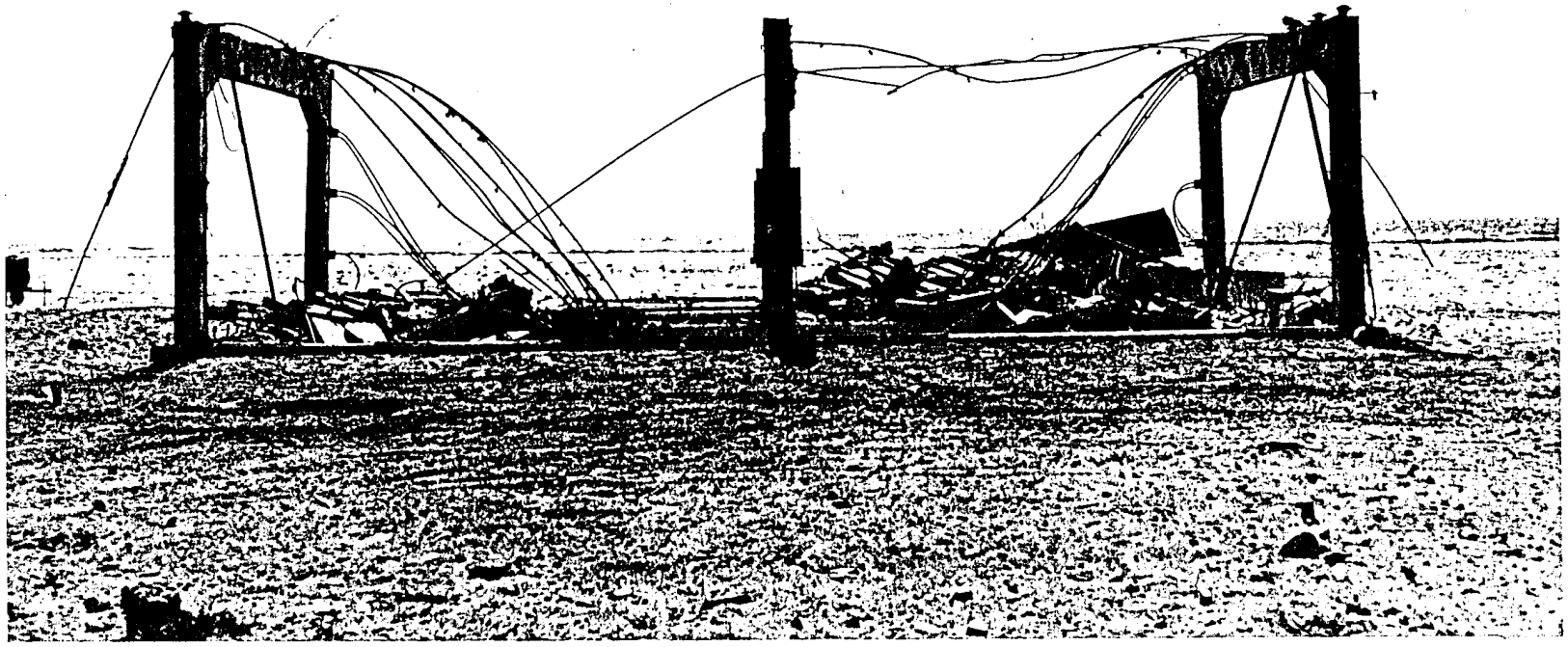


Fig. L.50 Front View, Structure 3.2.2a

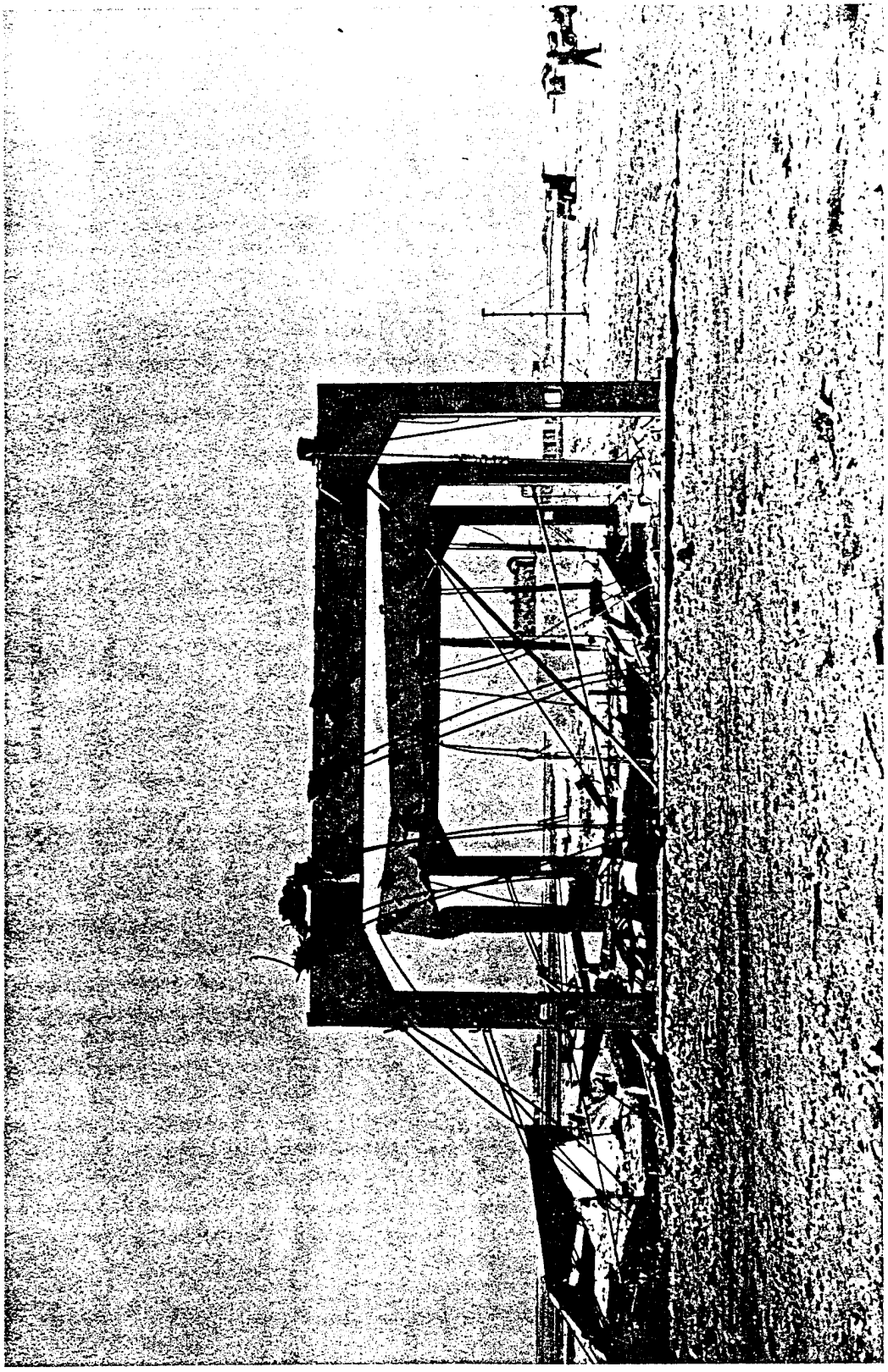


Fig. L.51 Left Side, Structure 3.2.2a

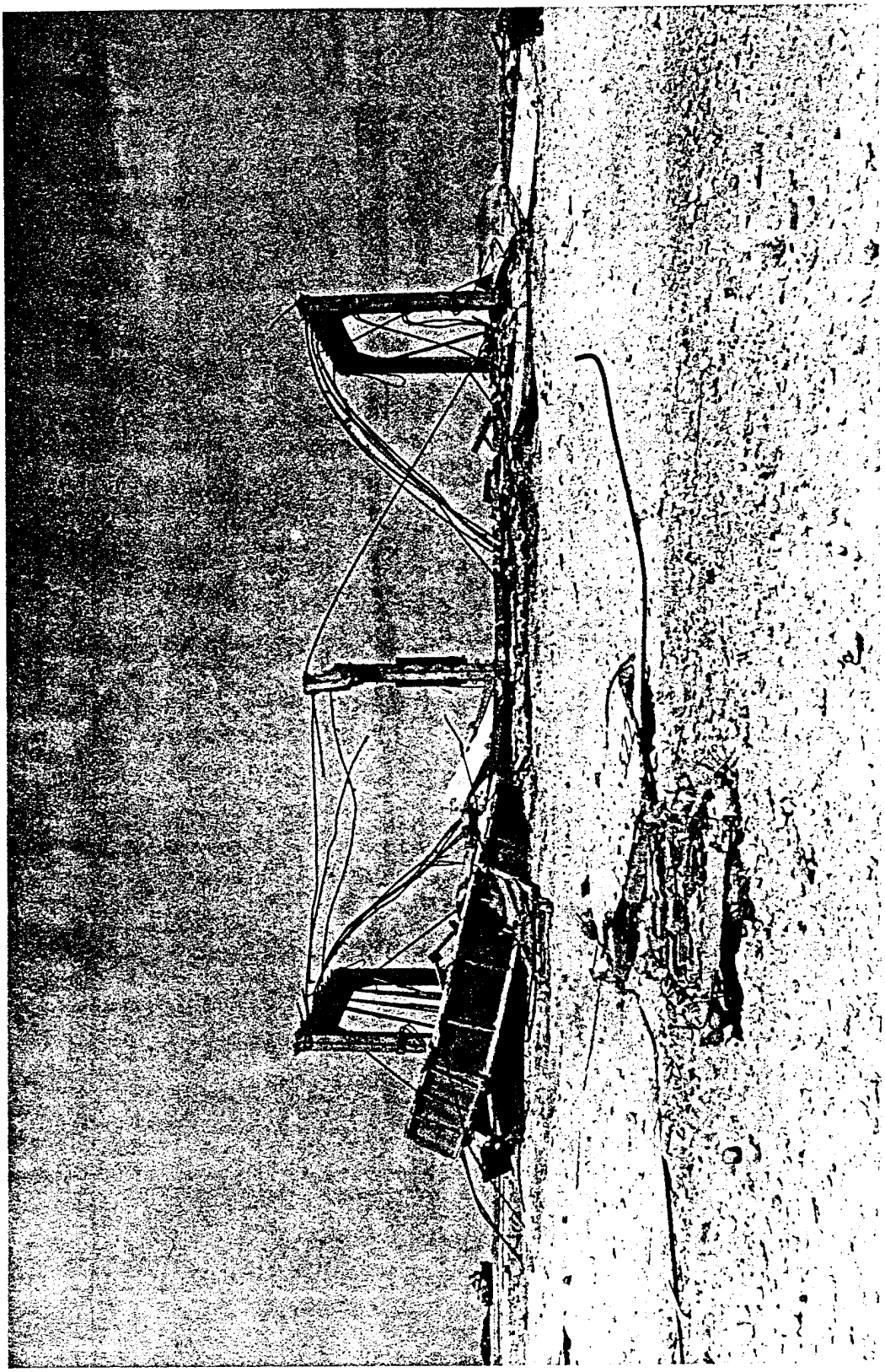


Fig. L.52 Rear View, Structure 3.2.2a

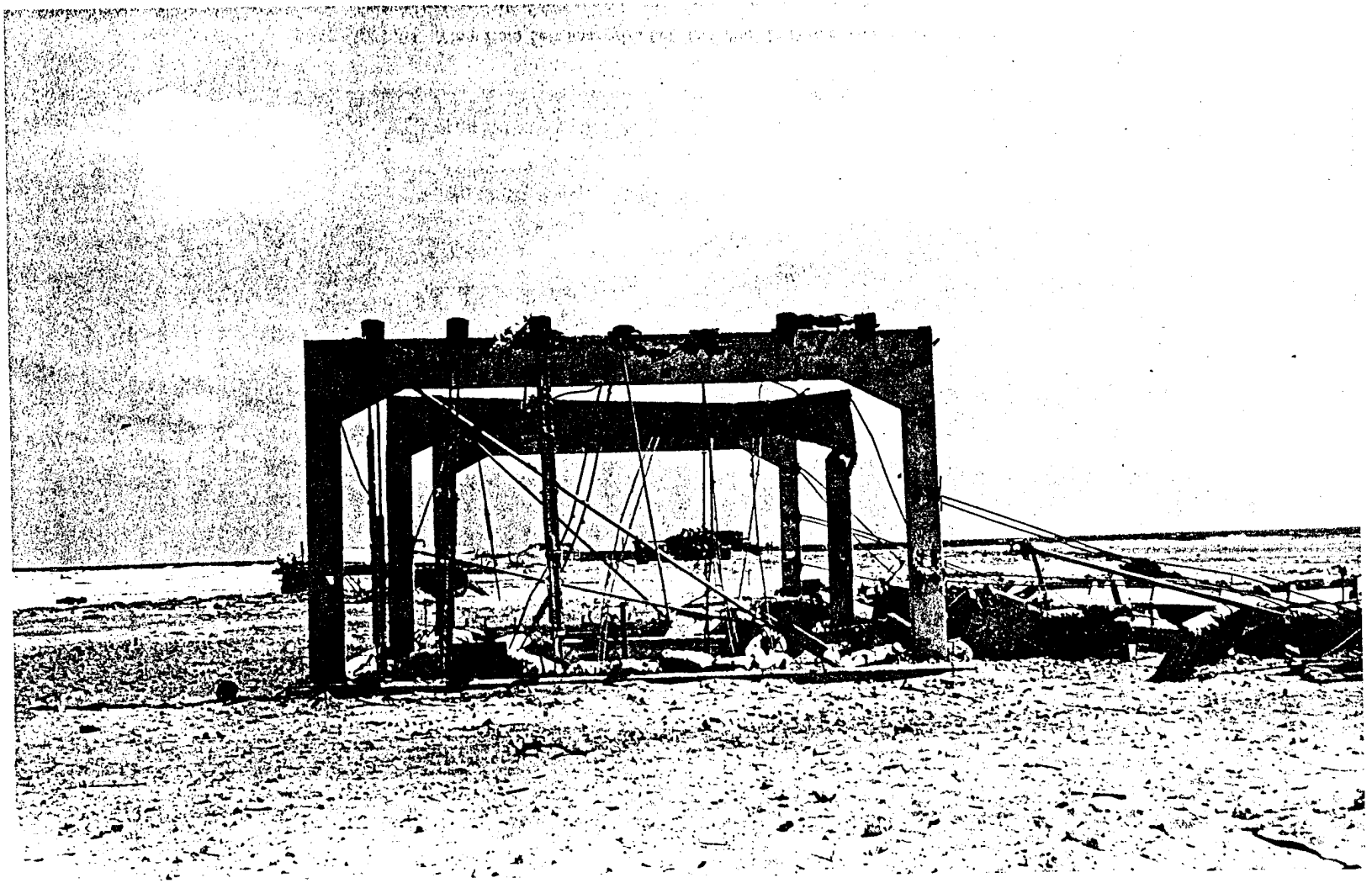


Fig. L.53 Right Side, Structure 3.2.2a

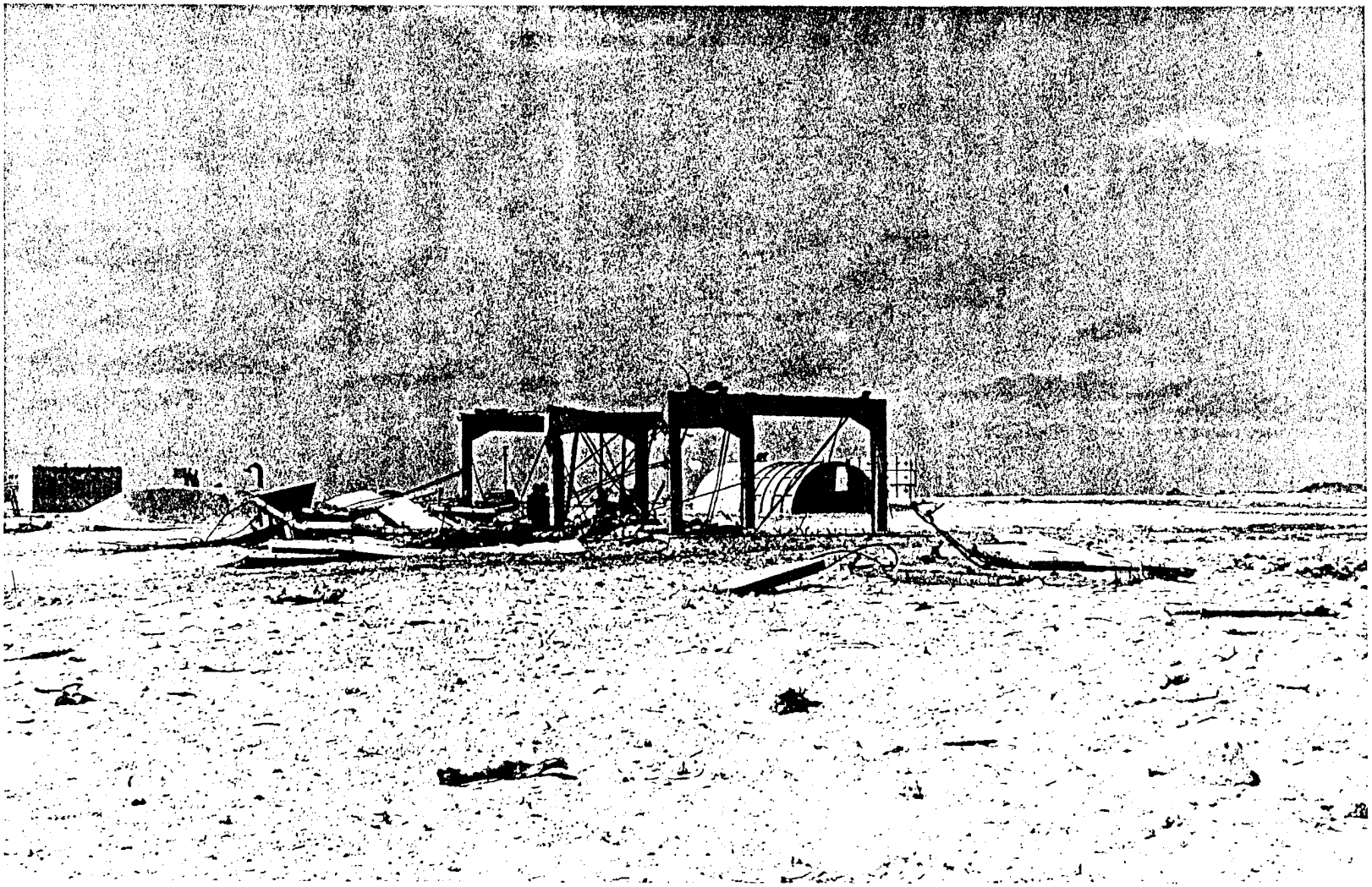


Fig. L.54 View from Left Rear with Left End Wall in Foreground, Structure 3.2.2a

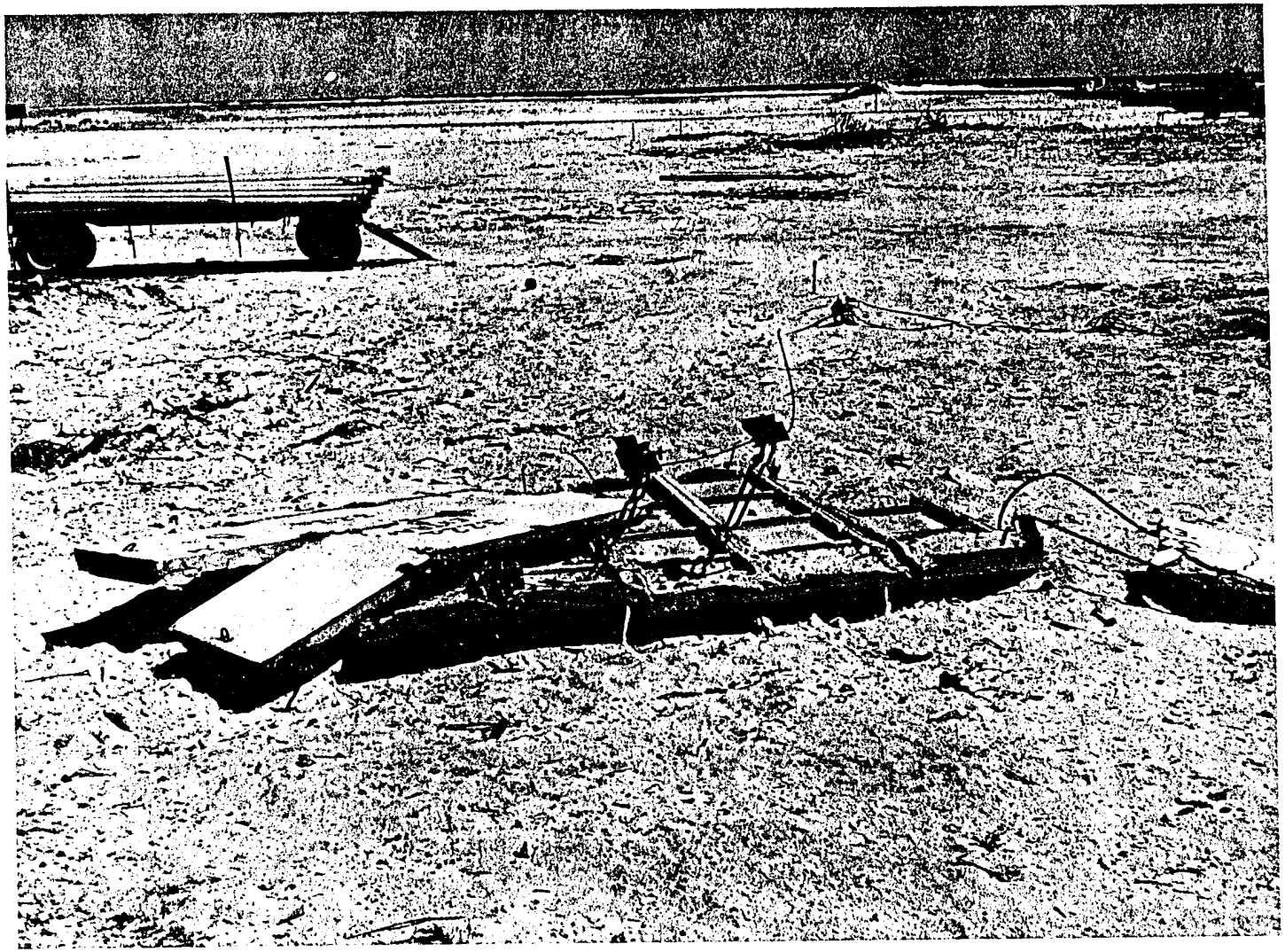


Fig. L.55 Close-up of Left End-wall Panels, Structure 3.2.2a

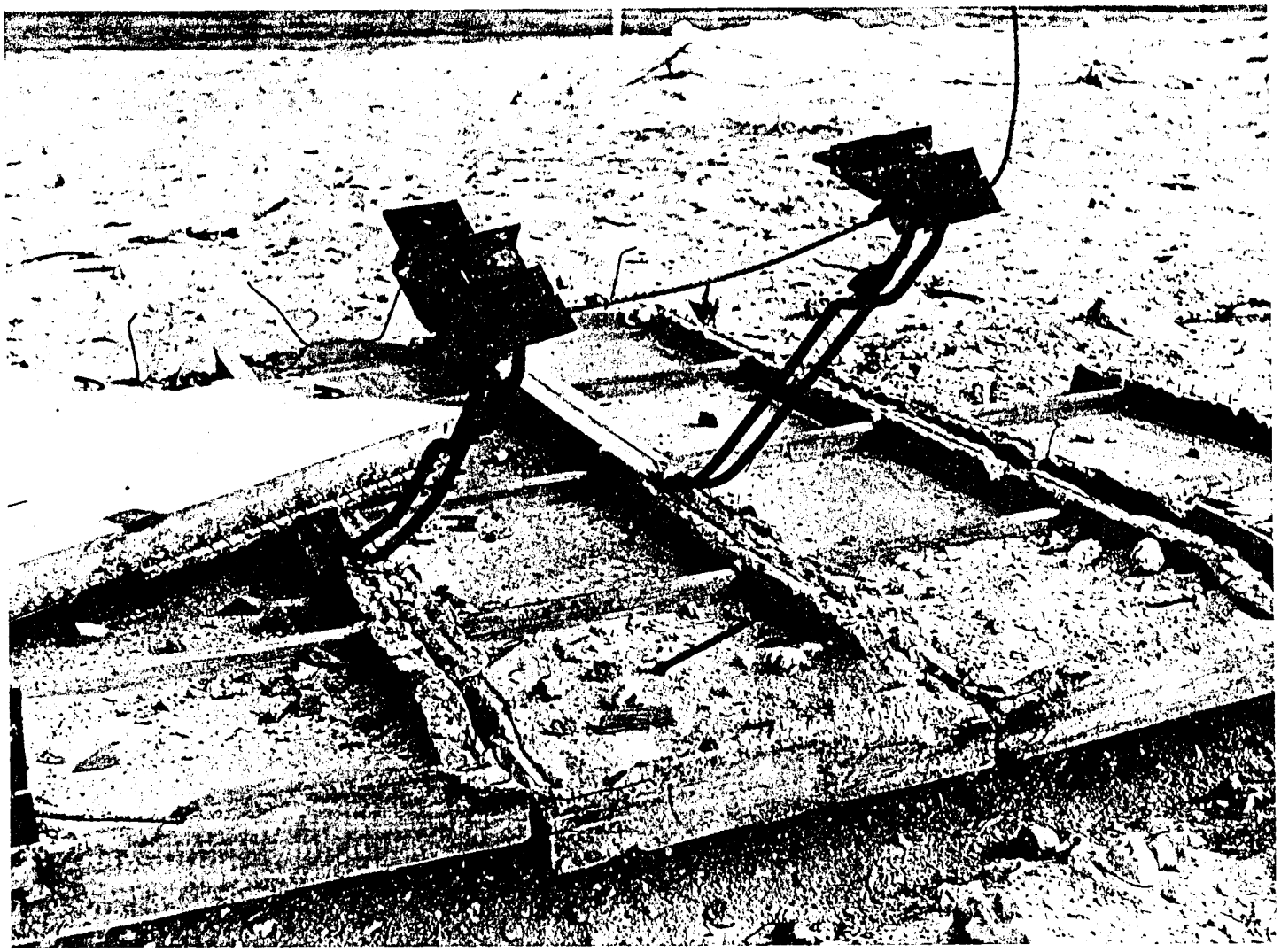


Fig. L.56 Failure of Connection Between Left End Panel and Roof Panel, Structure 3.2.2a. Channel pulled out of roof panel and bent severely.

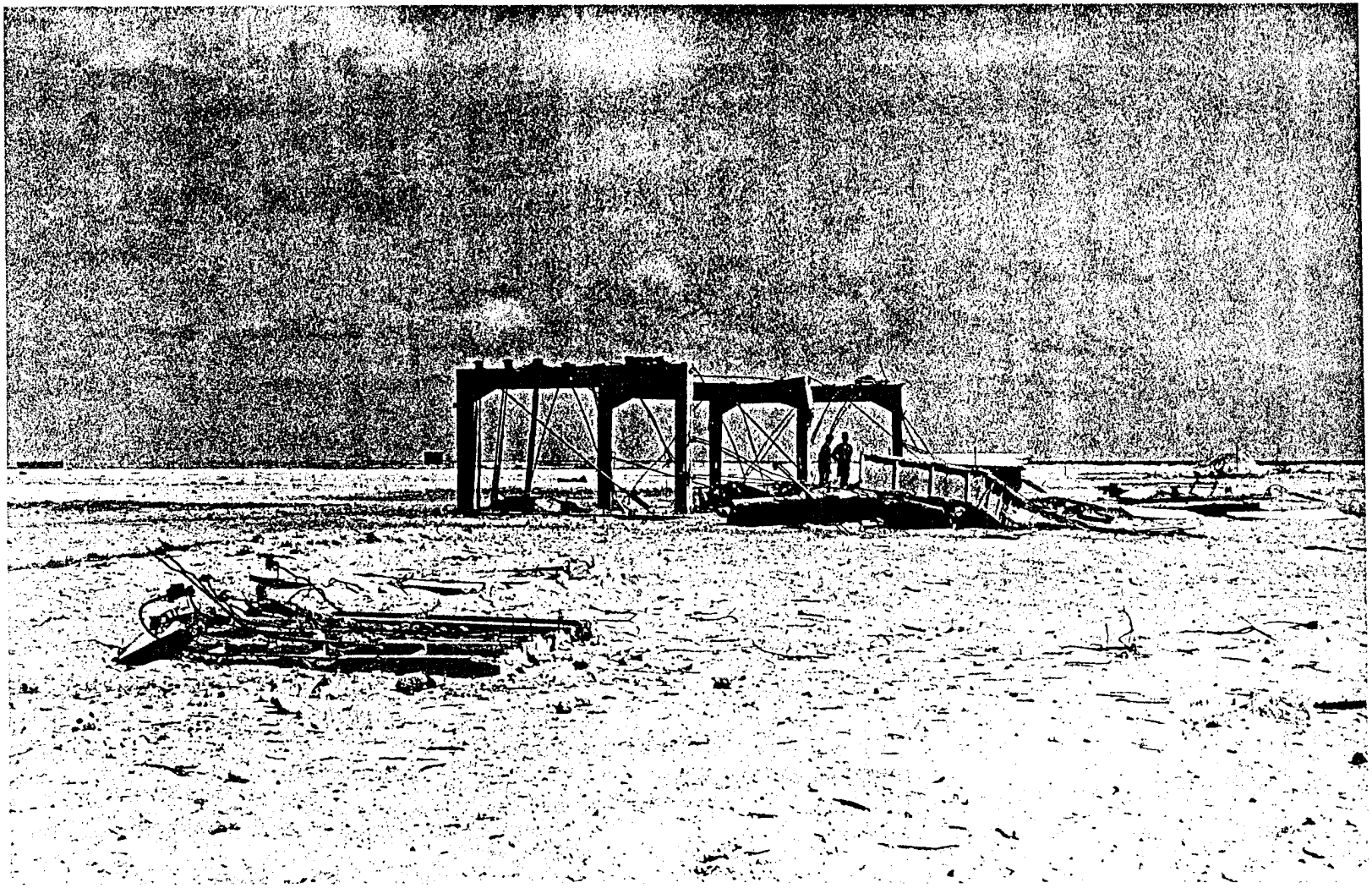


Fig. L.57 View from Right Rear with Right End Wall in Foreground, Structure 3.2.2a



Fig. L.58 Right End Panels Looking from Building, Structure 3.2.2a

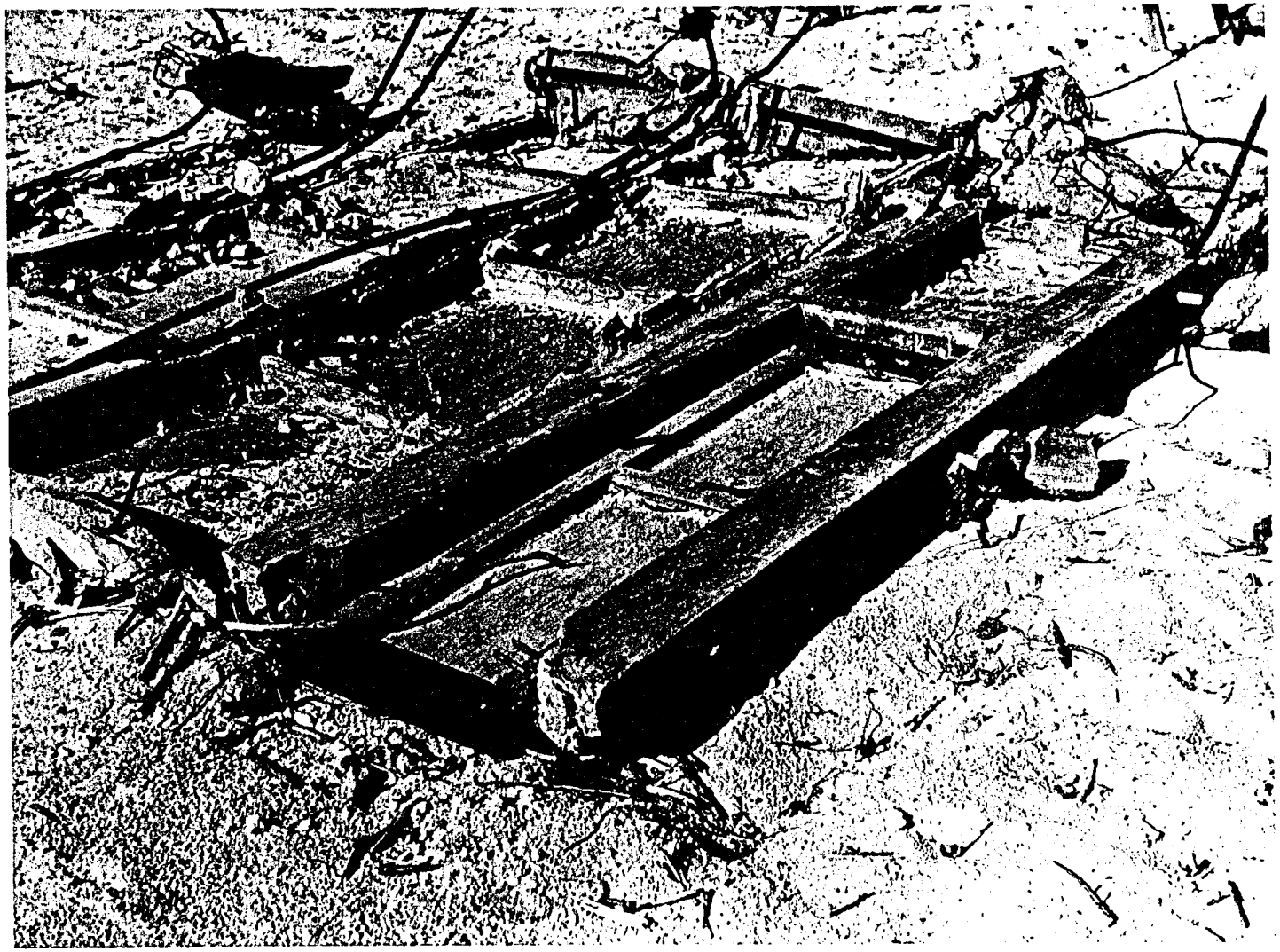


Fig. L.59 Relatively Undamaged Door in Place in End-wall Panel Which Carried 80 ft, Structure 3.2.2a

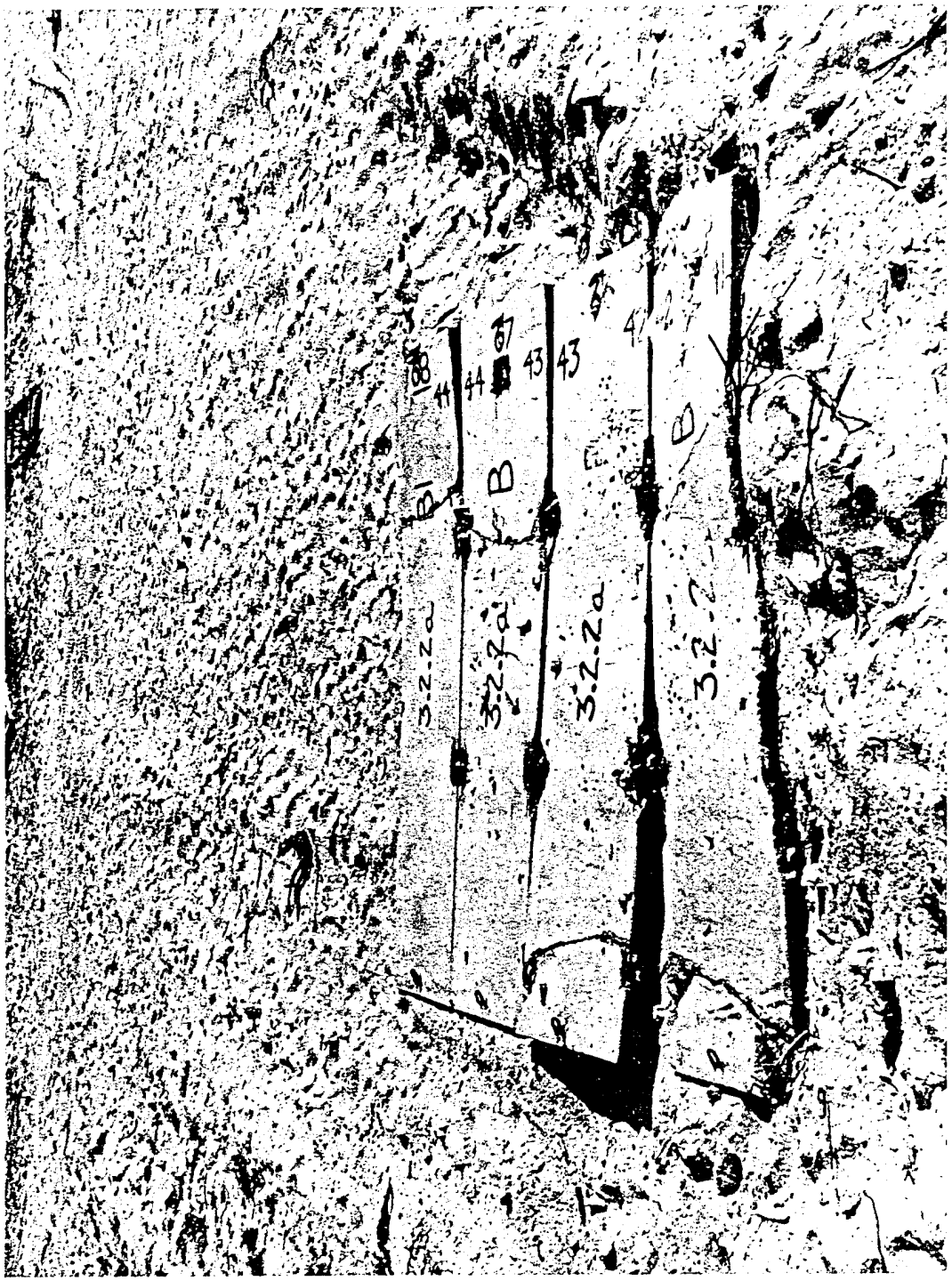


Fig. L.60 Panels from Left Half of Right End Wall Still Attached, Structure 3.2.2a. Blew out as a unit.

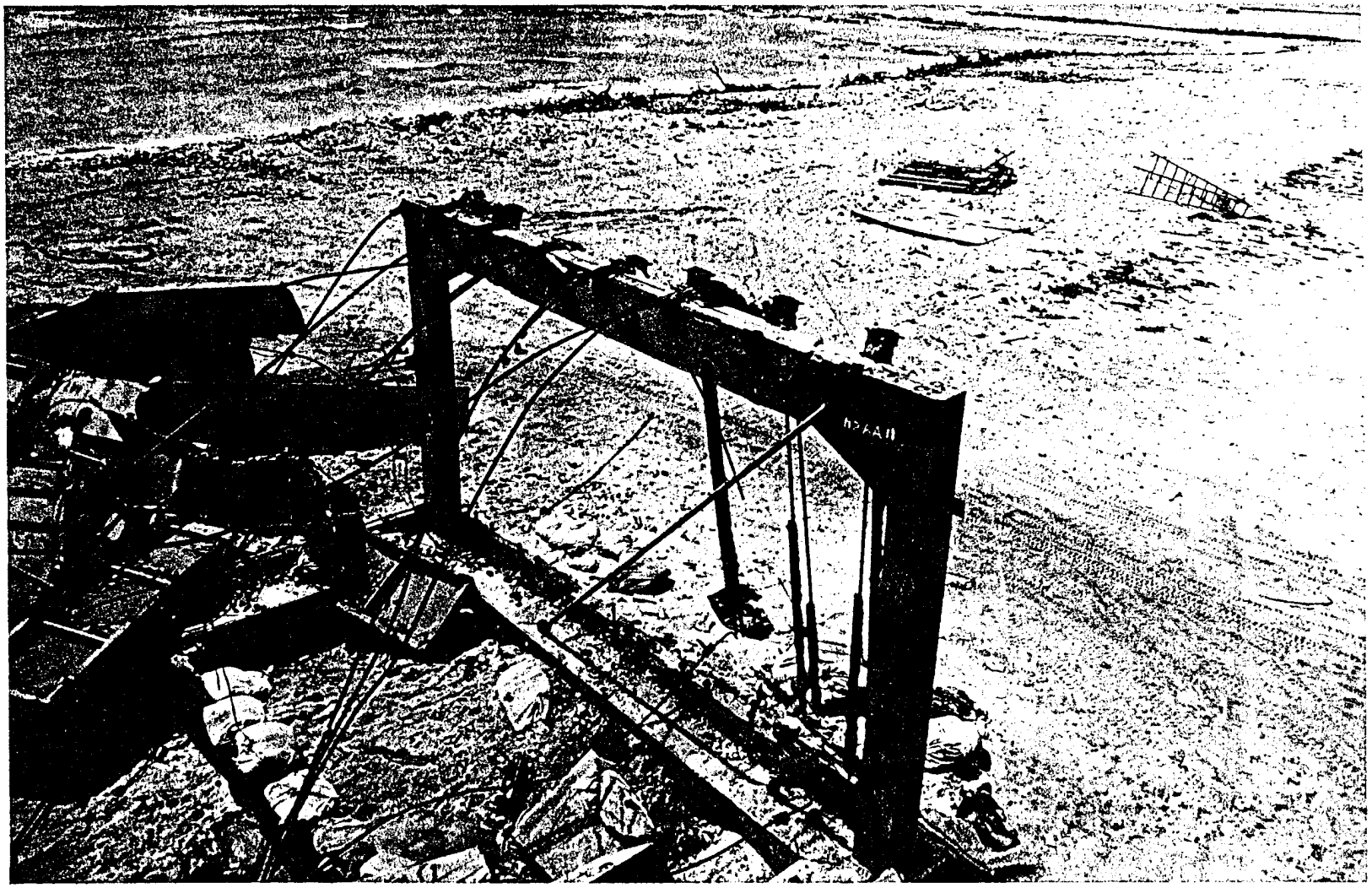


Fig. L.61 View Toward Right End Wall from Front Center, Structure 3.2.2a

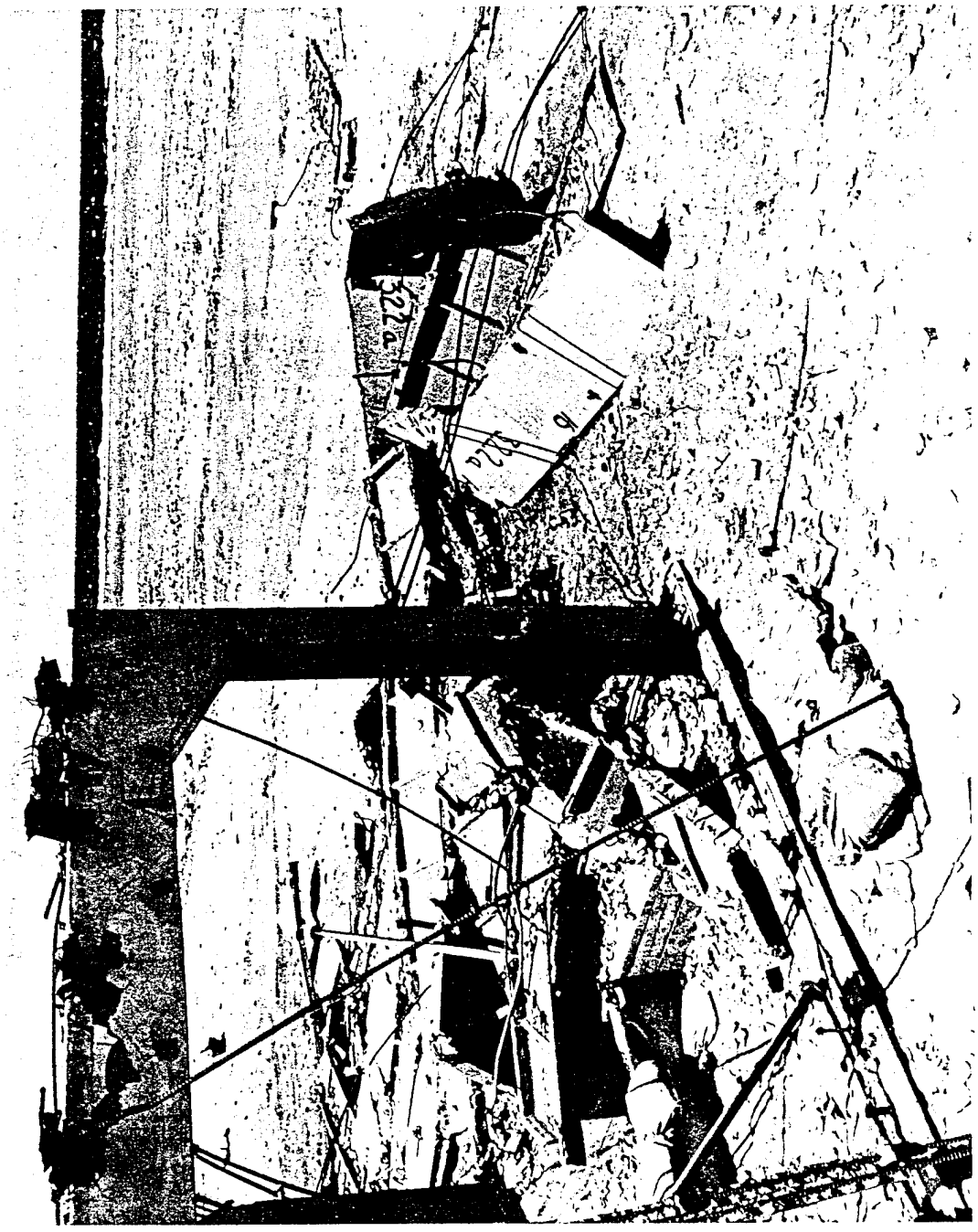


Fig. L.62 View Toward Rear from Right Side, Structure 3.2.2a

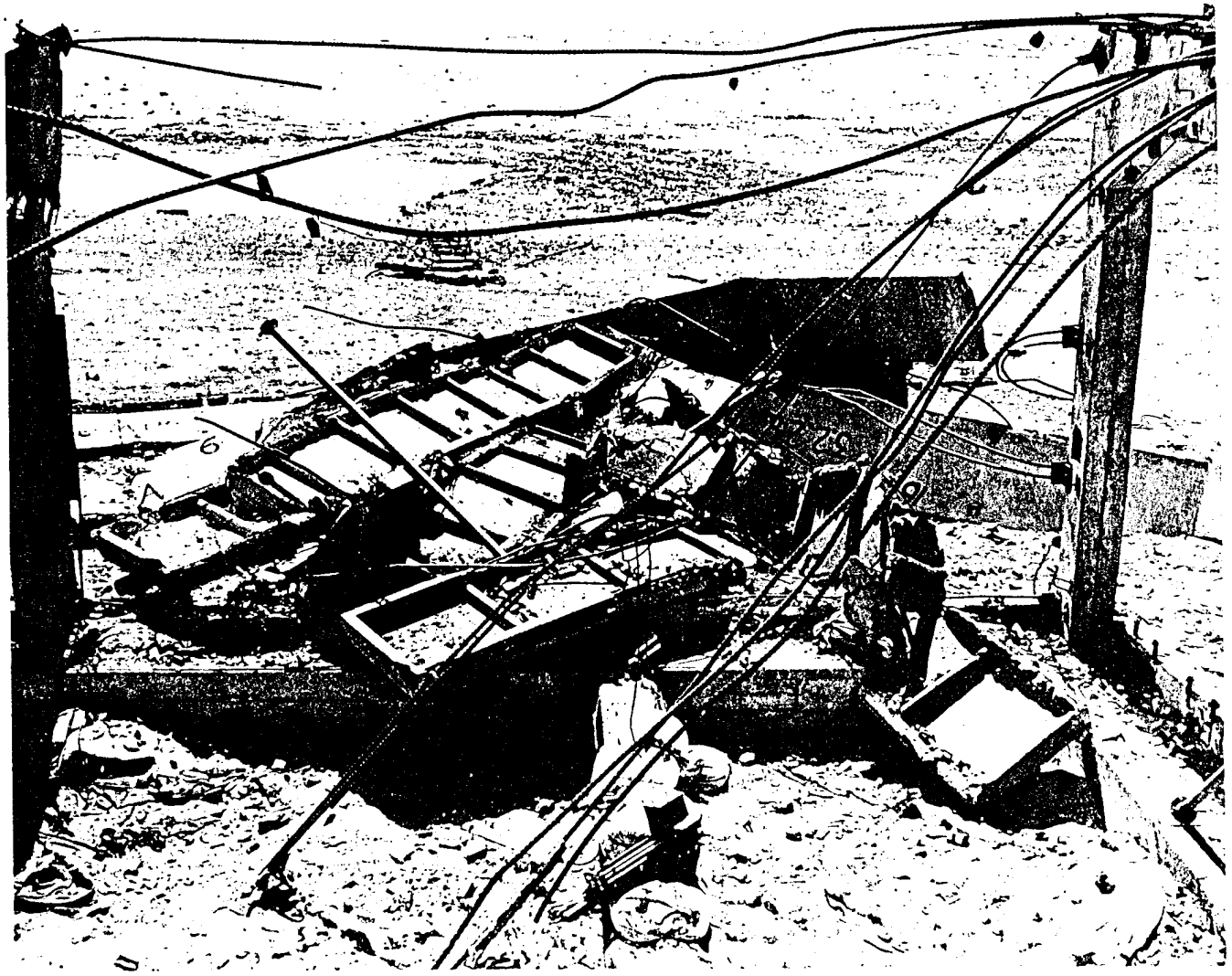


Fig. L.63 Panels behind Right Half of Structure, 3.2.2a. In places, front-wall panels lie beneath rear-wall panels.



Fig. L.64 Rear of Building from Front Center, Structure 3.2.2a

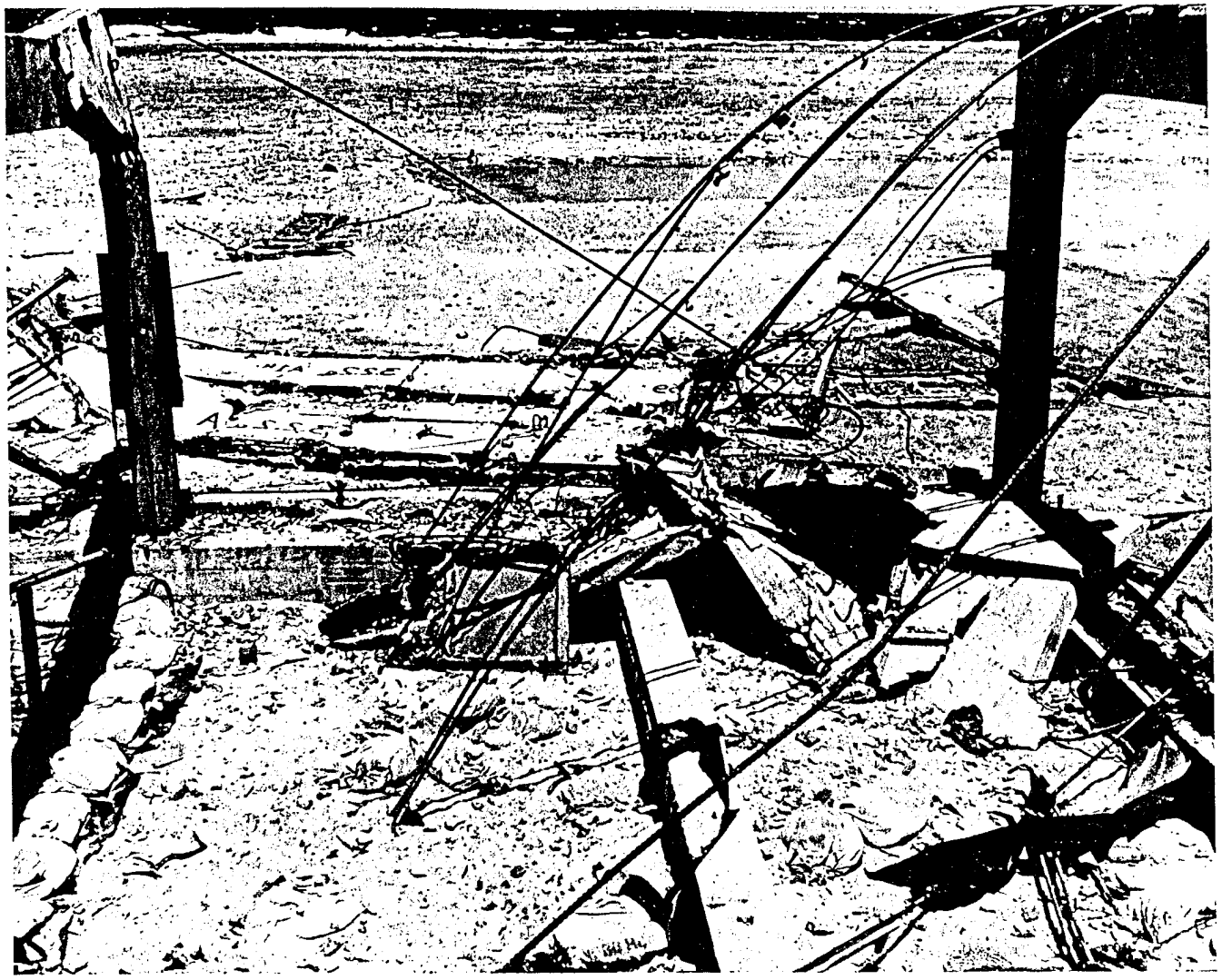


Fig. L.65 Panels behind Left Half of Building, Structure 3.2.2a. A front-wall panel lies farthest to rear except for roof panel in right background.

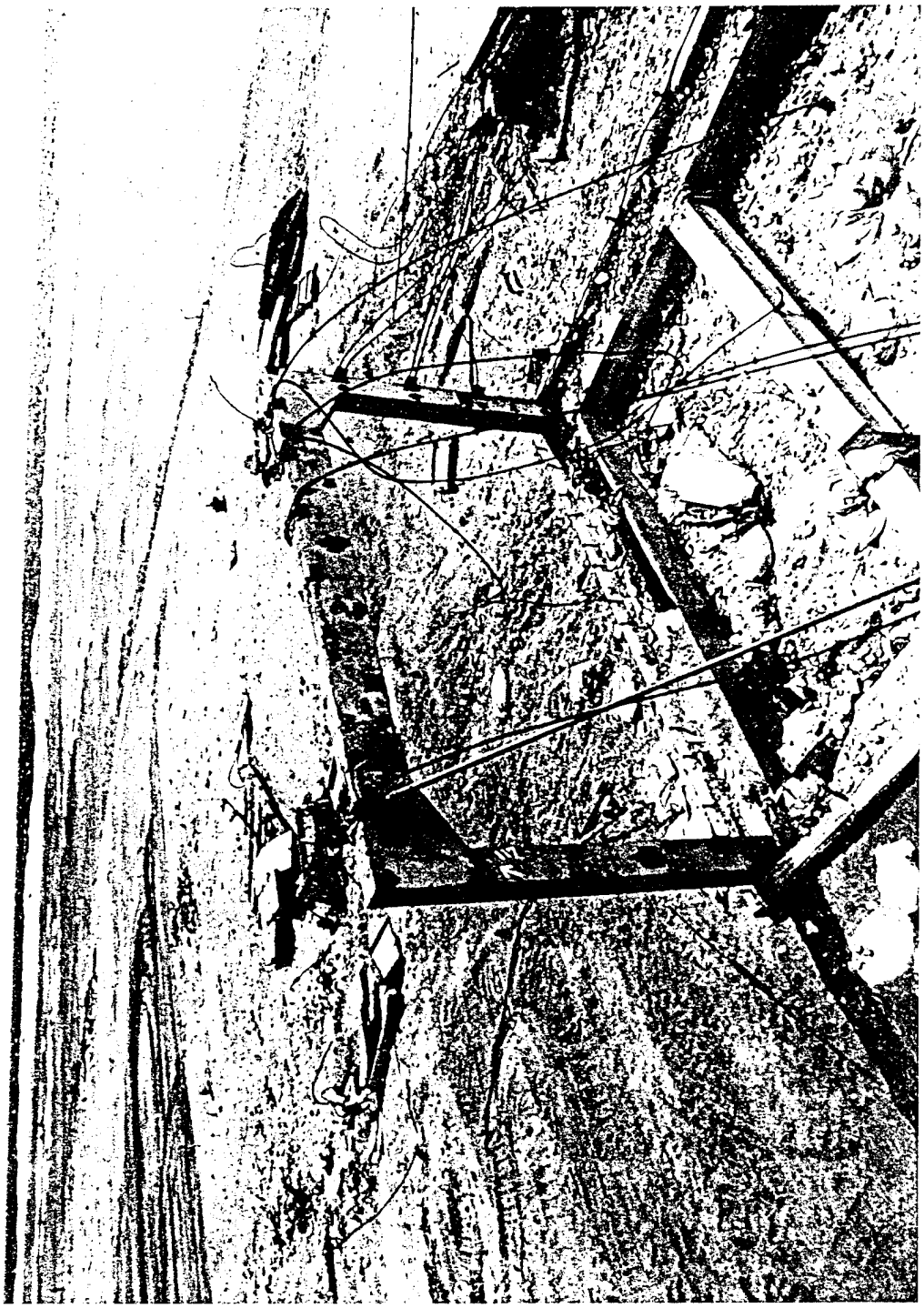


Fig. L.66 View of Left Side from Front Center, Structure 3.2.2a

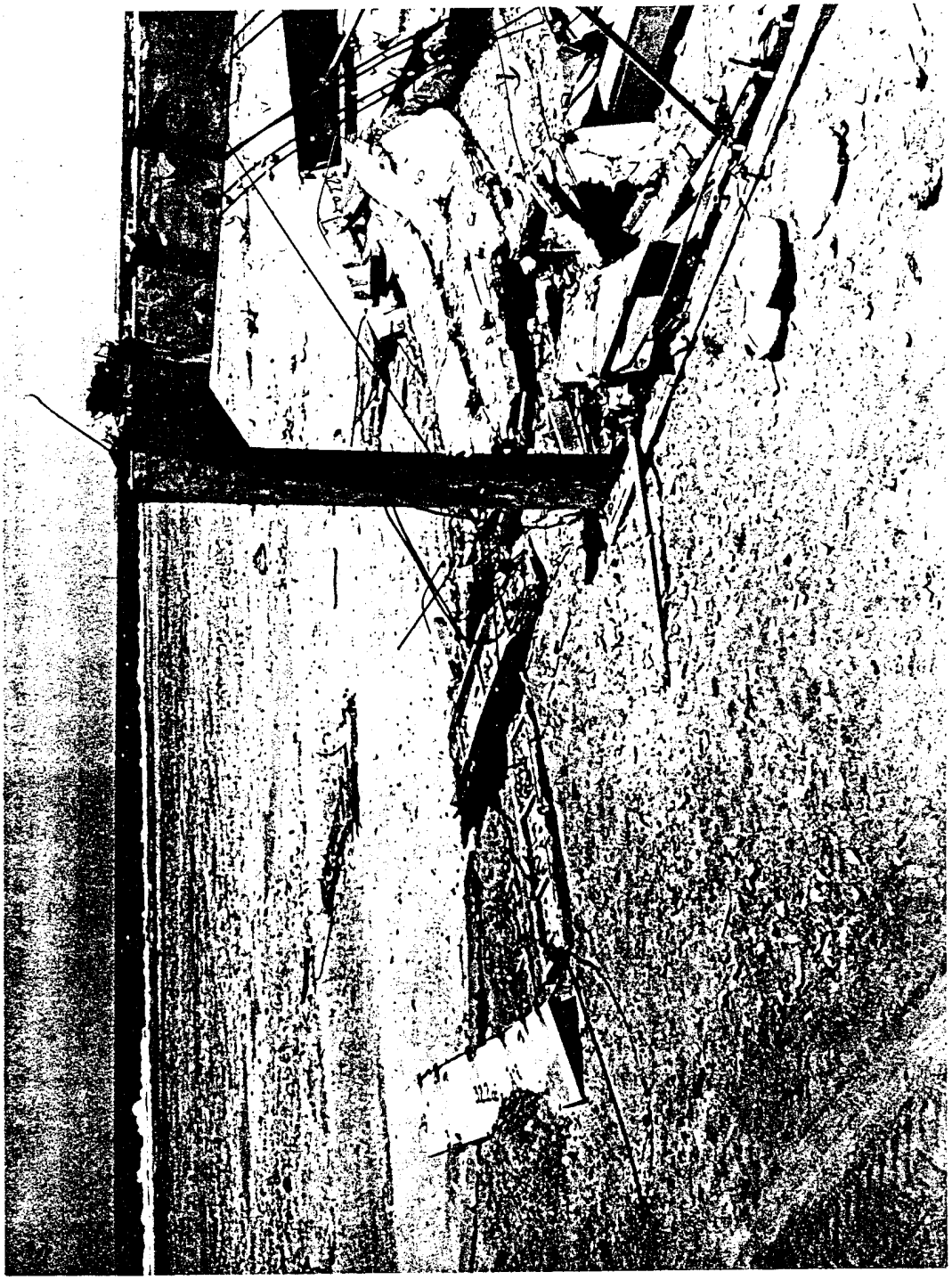


Fig. L.67 View toward Rear from Left Side, Structure 3.2.2a

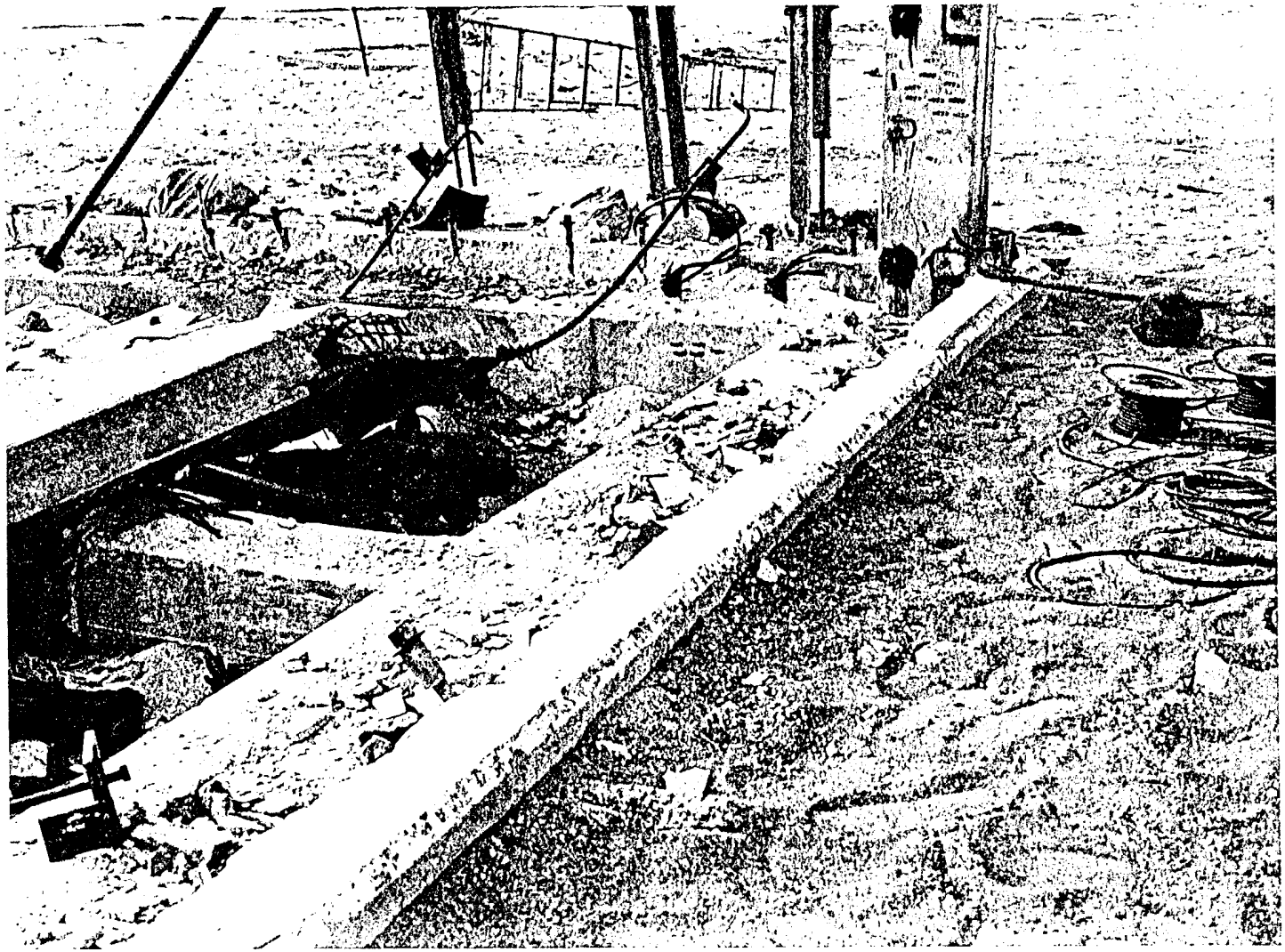


Fig. L.68 Anchor Bolts Bent In by Lower Panel on Right Front Side, Structure 3.2.2a. Concrete failed around pipe sleeves.



Fig. L.69 Lower Right Front Panel Inside Structure, 3.2.2a



Fig. L.70 Center Right Front Panel at Rear Interior, Structure 3.2.2a



Fig. L.71 Upper Right Front Panel Deformed 2 in. across 30-in. Width before Panel Gave Way at Ends, Structure 3.2.2a

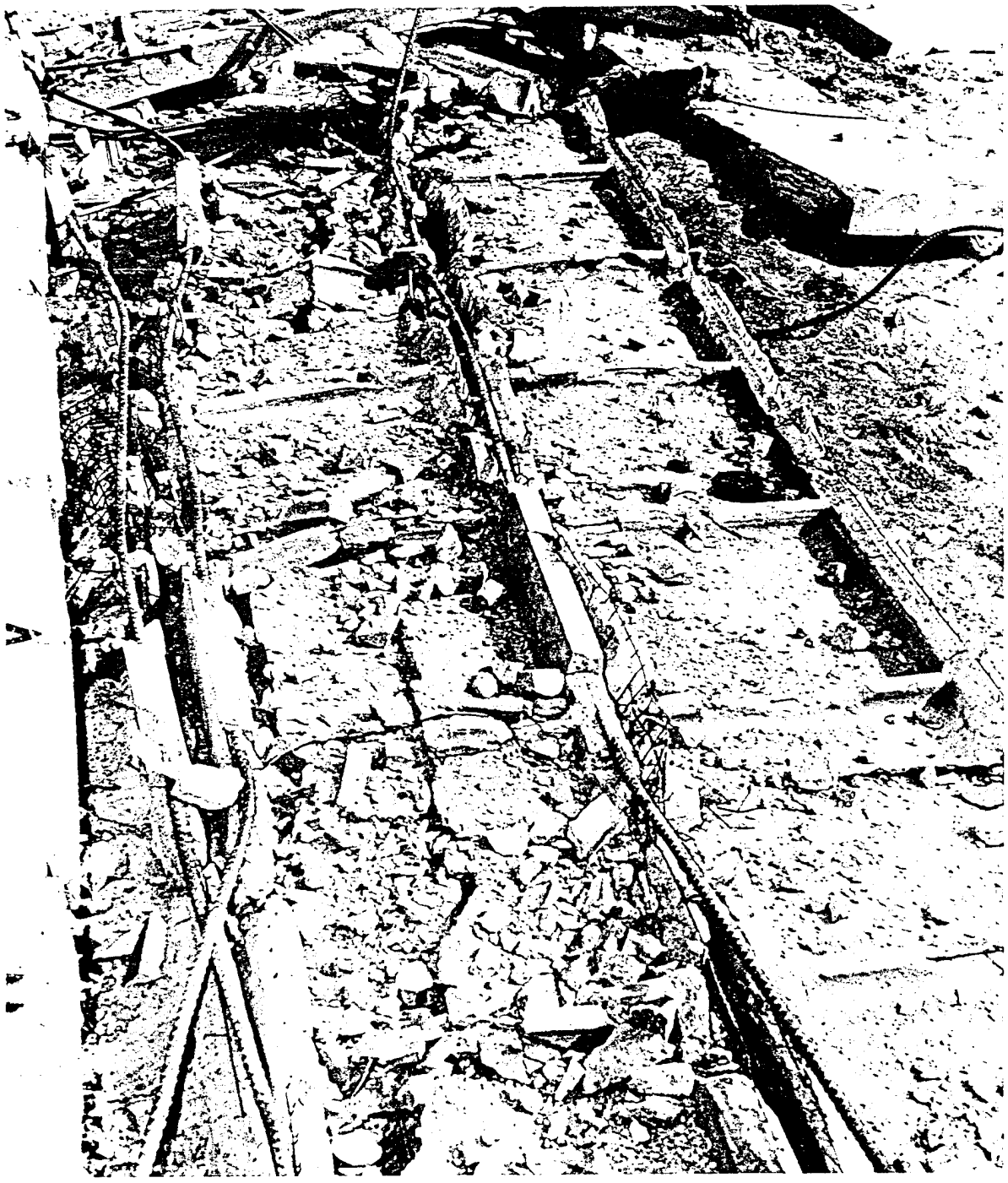


Fig. L.72 Downward Deformations in Roof Panels Which Occurred before Blast Wave Entered Structure, 3.2.2a

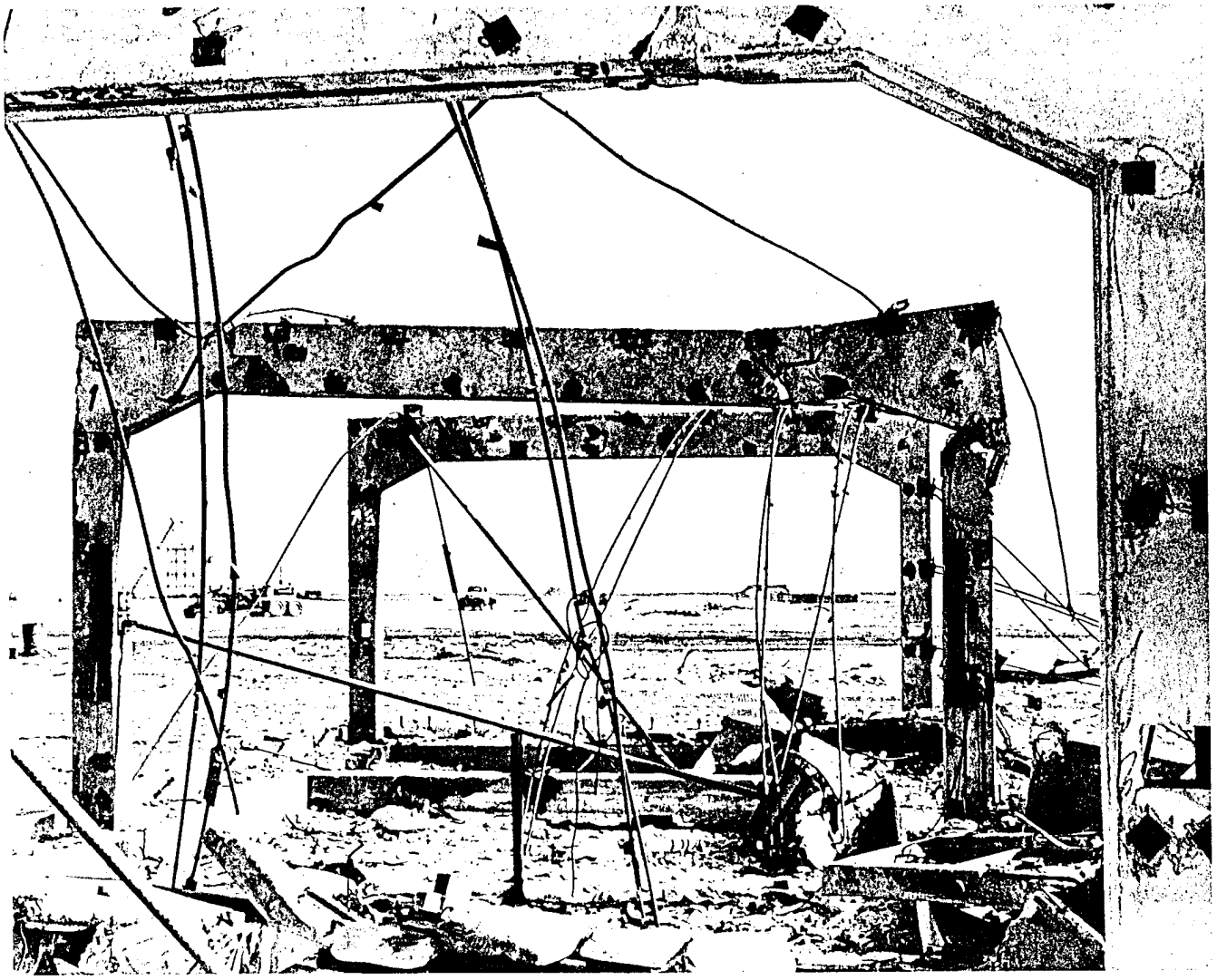


Fig. L.73 View from Right Side Showing How Tension Steel in Roof Panels Held at Ends of Building and Panels Pushed Up, the Concrete Around Steel Failing in Tension, Structure 3.2.2a. On center bent load was greater and bolts anchoring panels to bents failed.

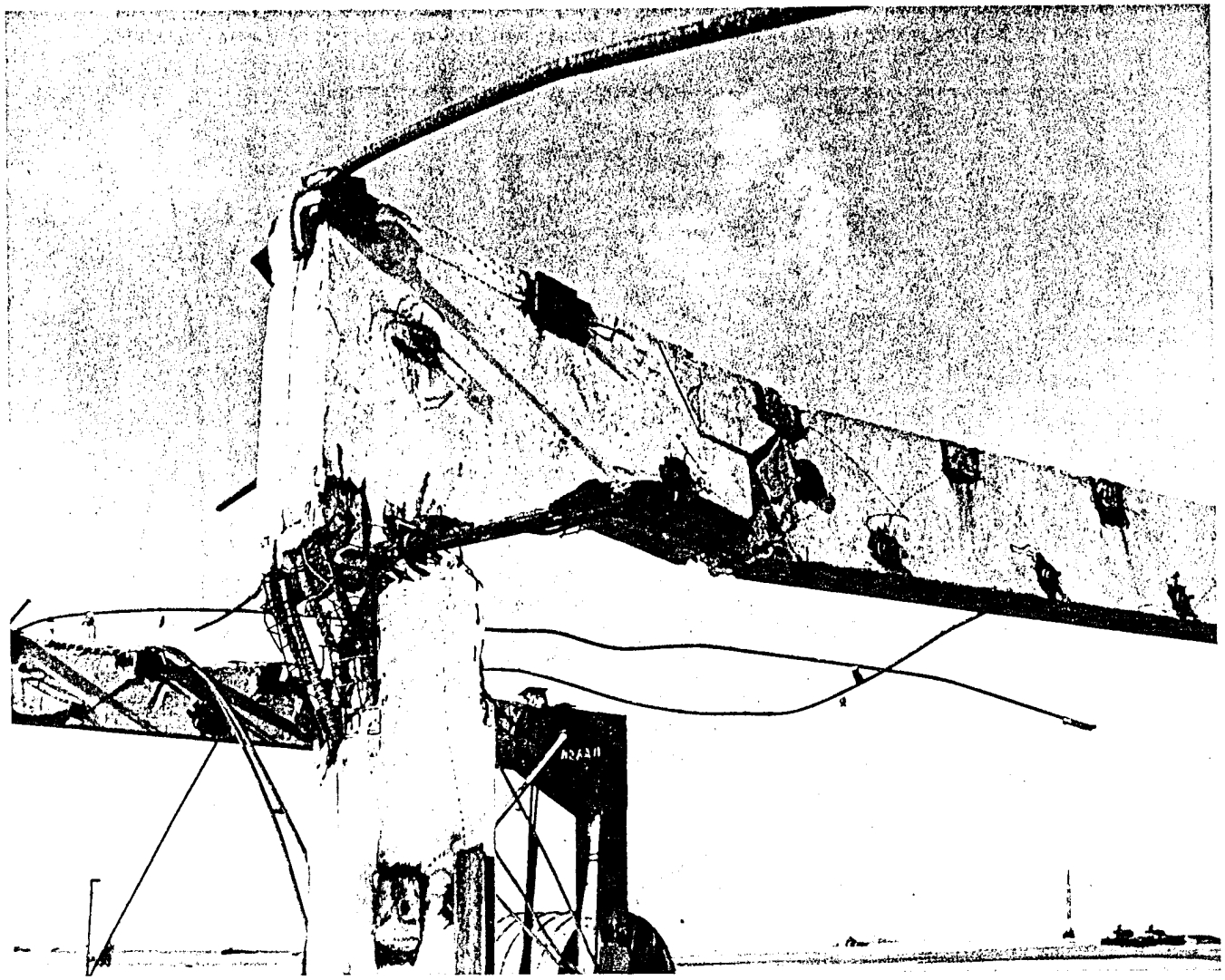


Fig. L.74 Moment Failure at Rear Haunch of Center Bent, Structure 3.2.2a

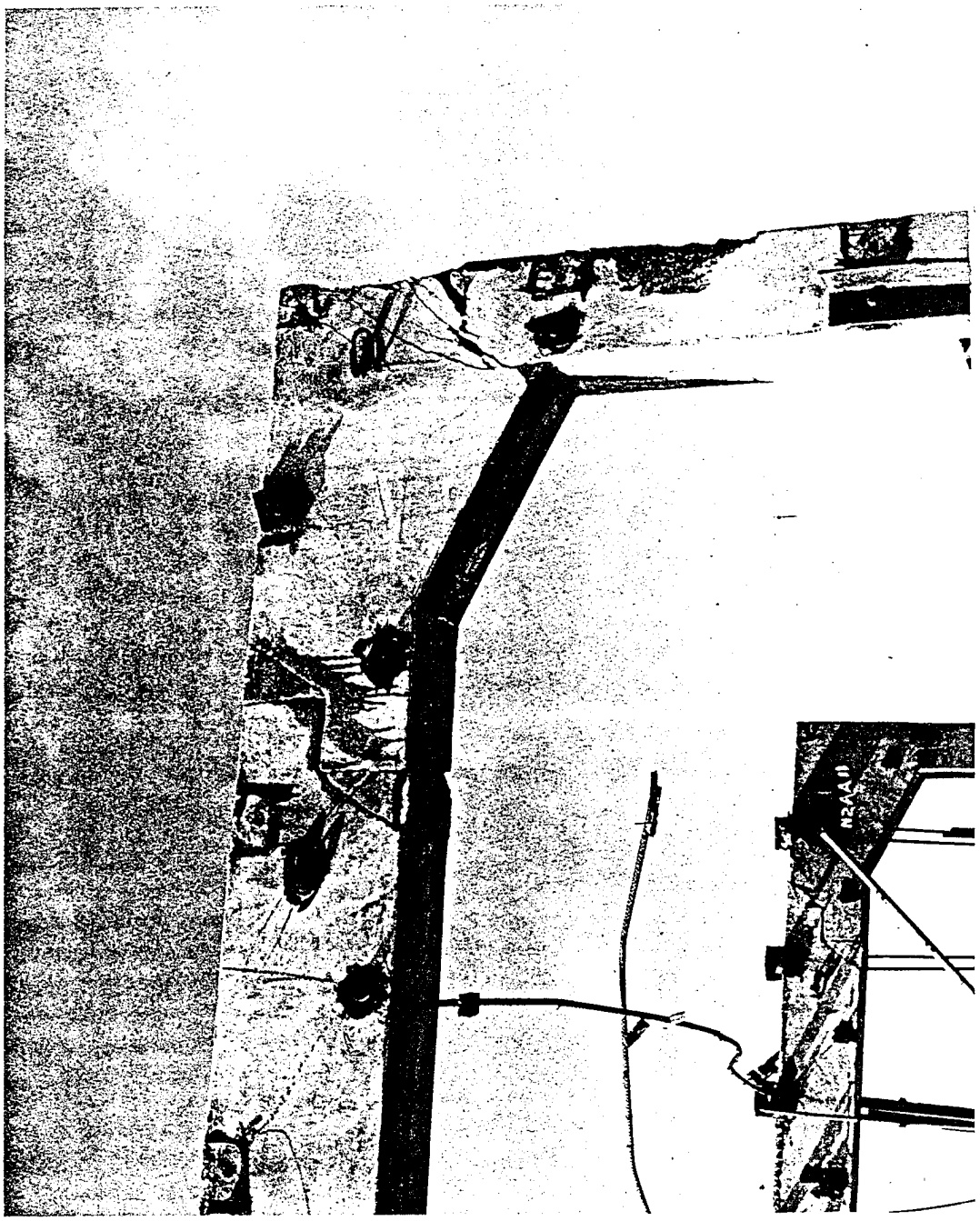


Fig. L.75 Front Haunch of Center Bent, Structure 3.2.2a

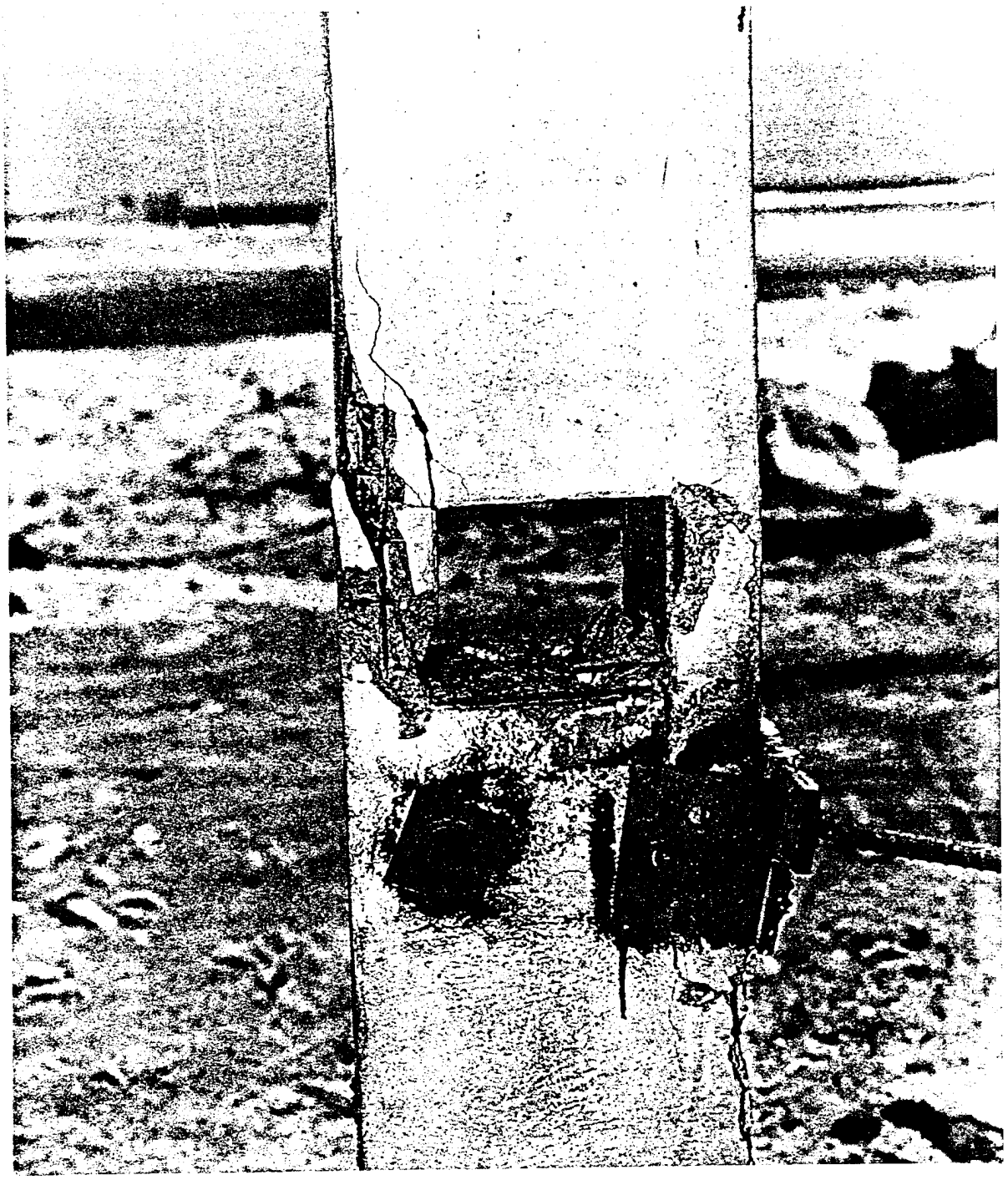


Fig. L.76 Moment at Grout Hole of Rear Column of Left Bent, Structure 3.2.2a



Fig. L.77 Rear Column of Center Bent, Structure 3.2.2a. Note anchor plates from rear panels bent inward, indicating inward pressure prior to front-wall failure.

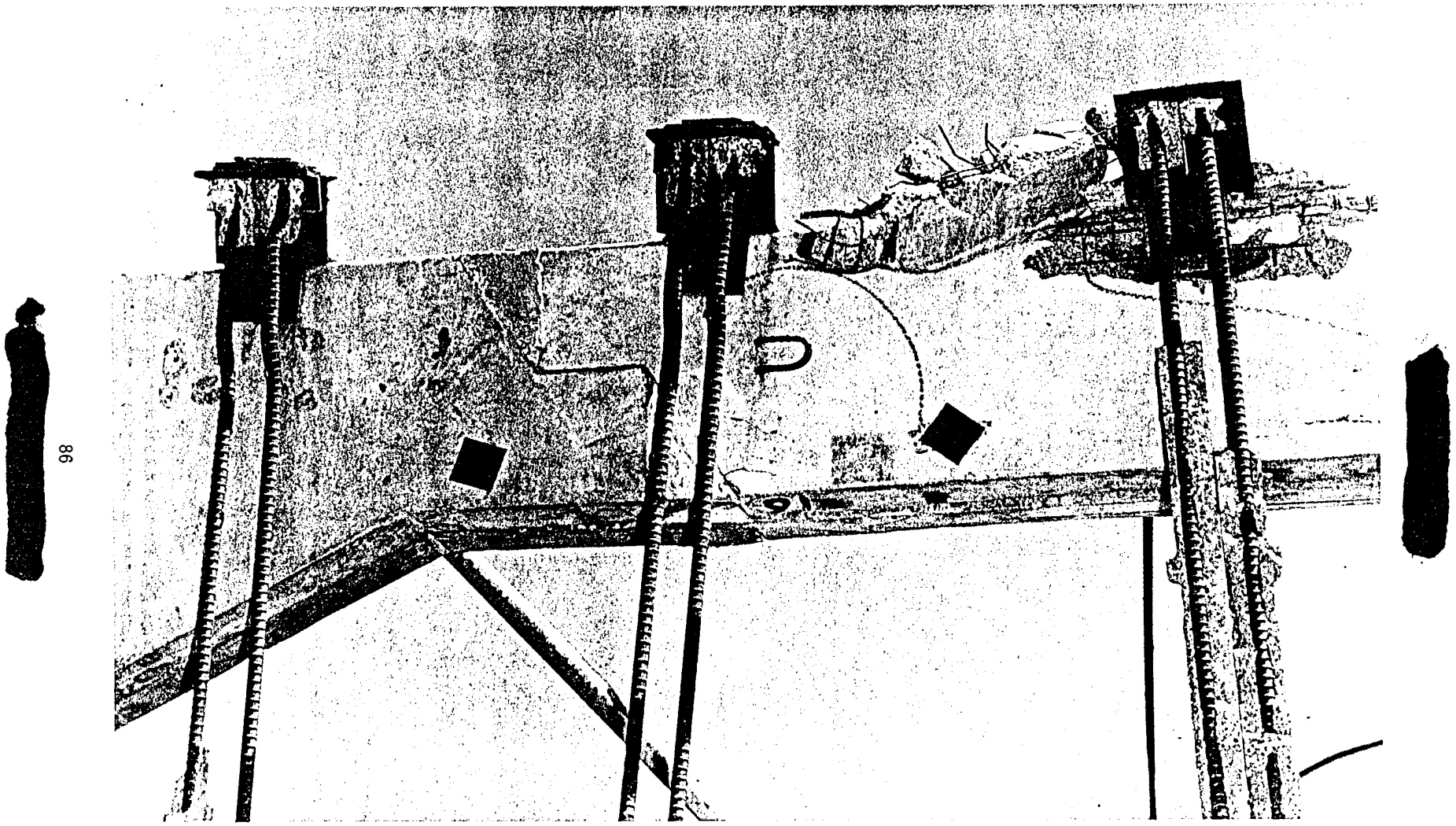


Fig. L.78 Front Panel Connection Failure Showing Separation of Plate from Panel and Bolt Elongation, Structure 3.2.2a. Note shear reinforcement at grout hole consisting of angles and dry-pack in grout hole.

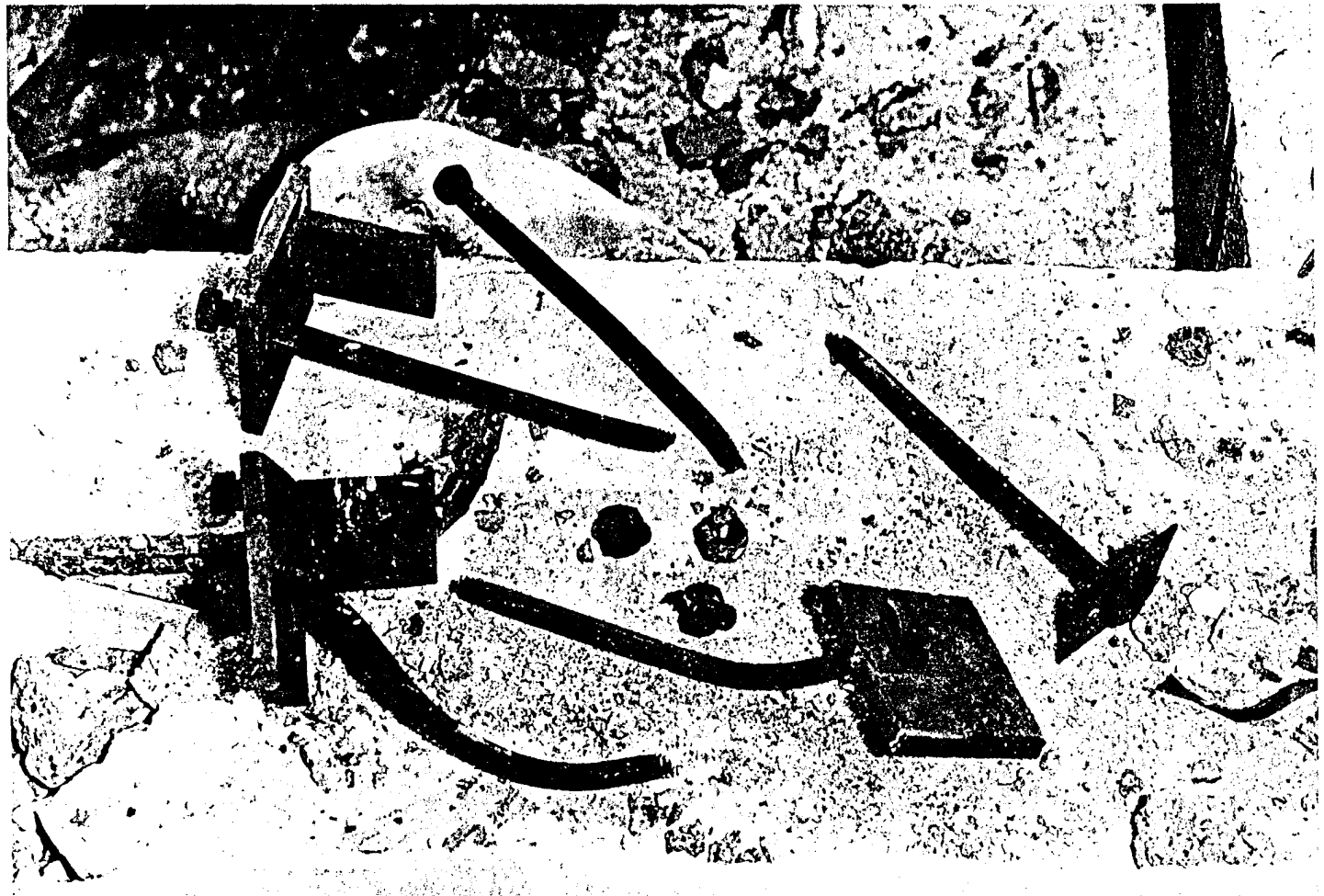


Fig. L.79 Tension Failure of Bolt Attaching Panel to Bent, Structure 3.2.2a



Fig. L.80 Typical Bent Bolt Failures, Structure 3.2.2a. Most failures occurred near nut.

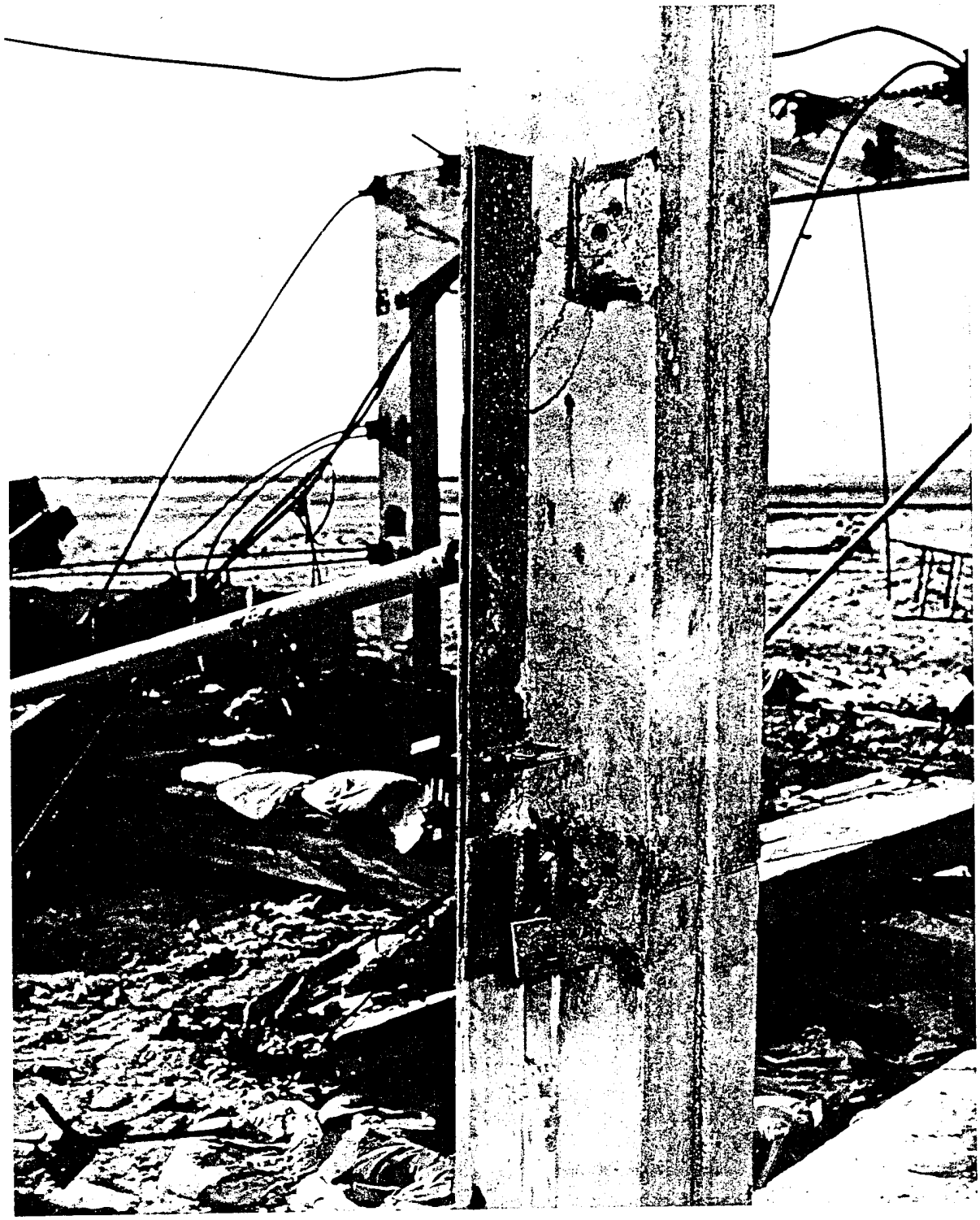


Fig. L.81 Steel from Right Side-wall Panels Which Remained Attached When Panels Blew Out, Structure 3.2.2a

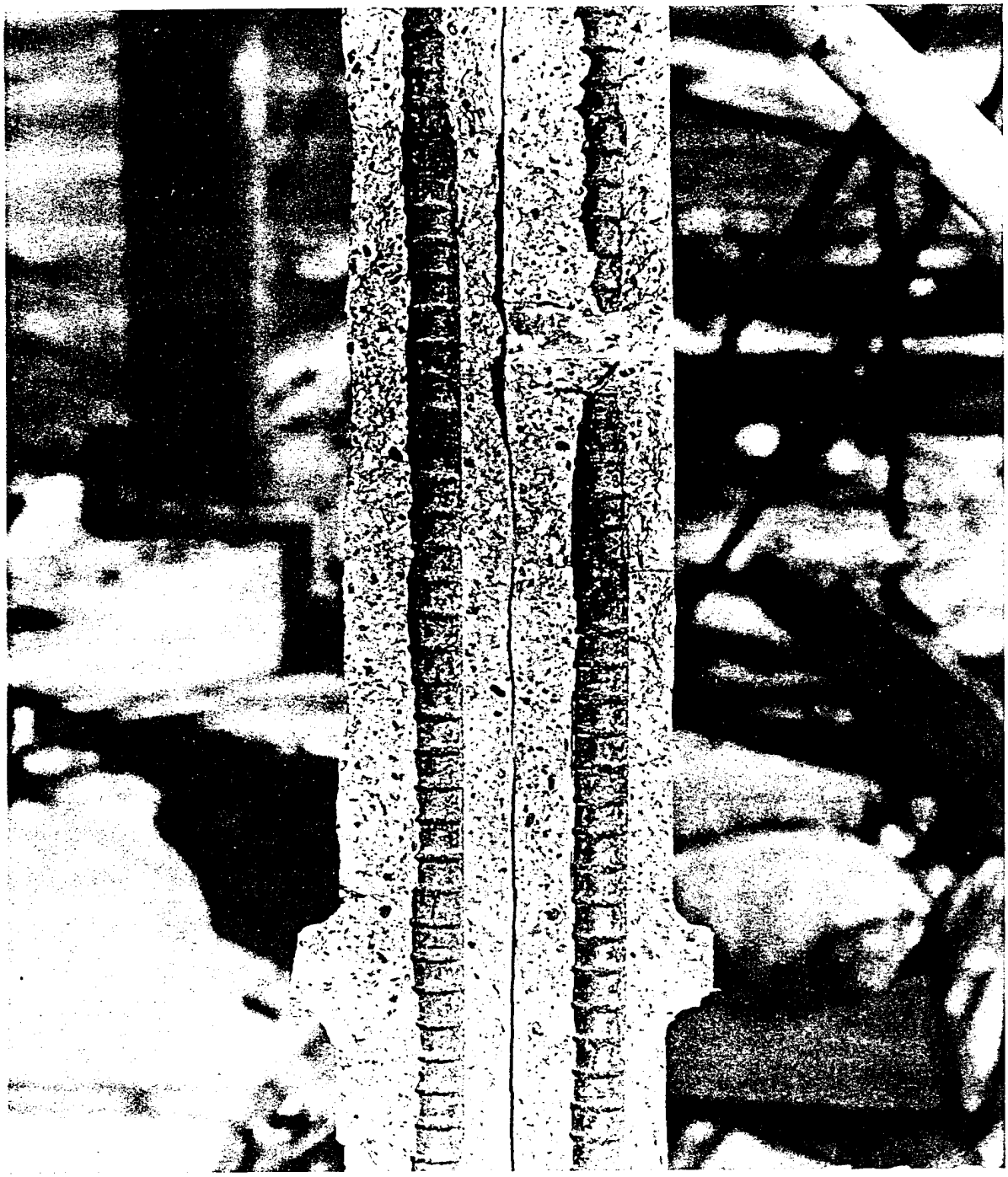


Fig. L.82 Failure of Concrete in Tension in Rib of Right Side Panel, Structure 3.2.2a

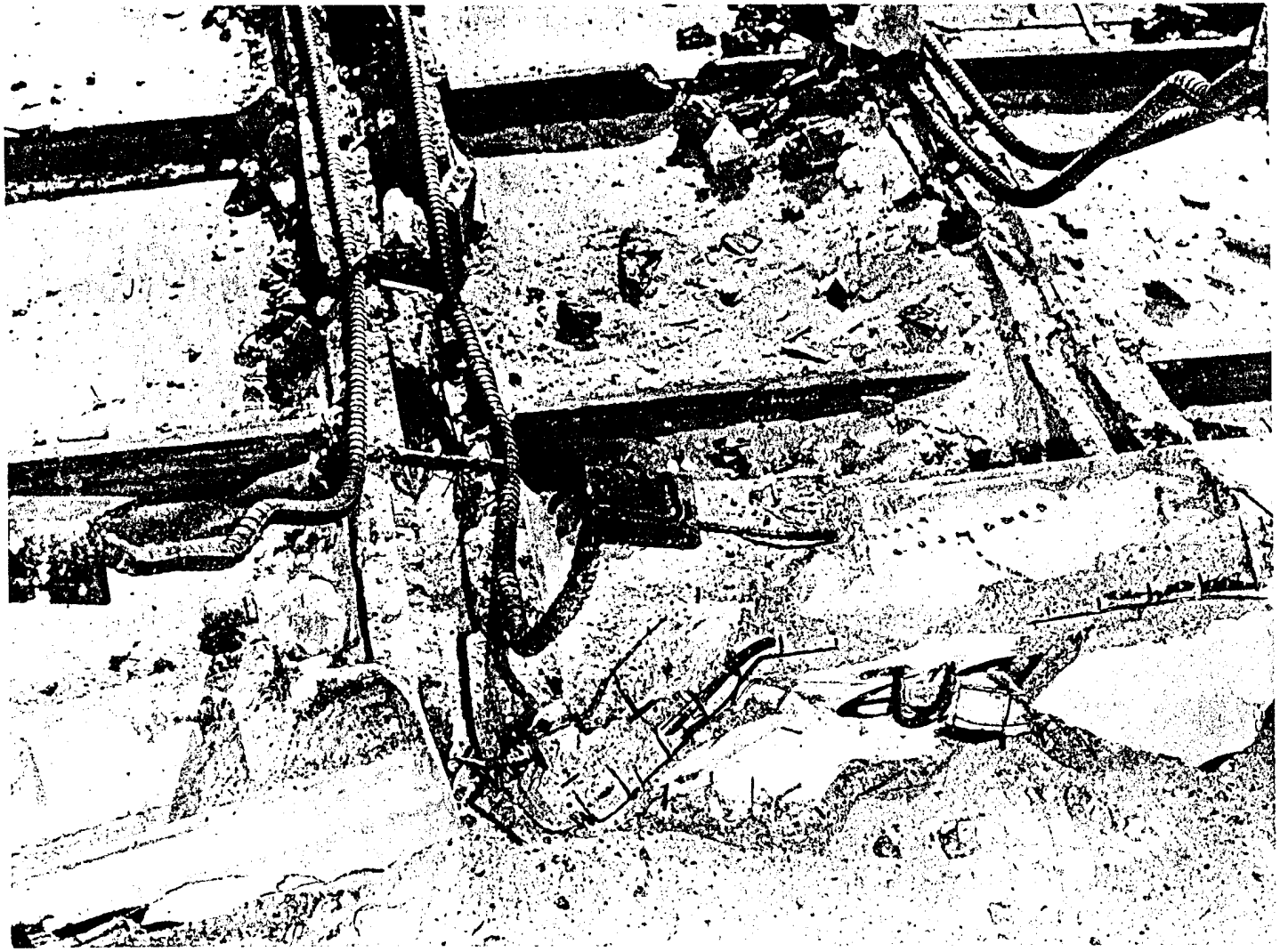


Fig. L.83 Welding Failure Between Top of Side Panel and Roof Panel, Structure 3.2.2a



Fig. L.84 Connection on Roof Panel Where Angle and Steel from Side Panel Pulled Out and Remained Attached to Roof Panel Through Splice Plate, Structure 3.2.2a

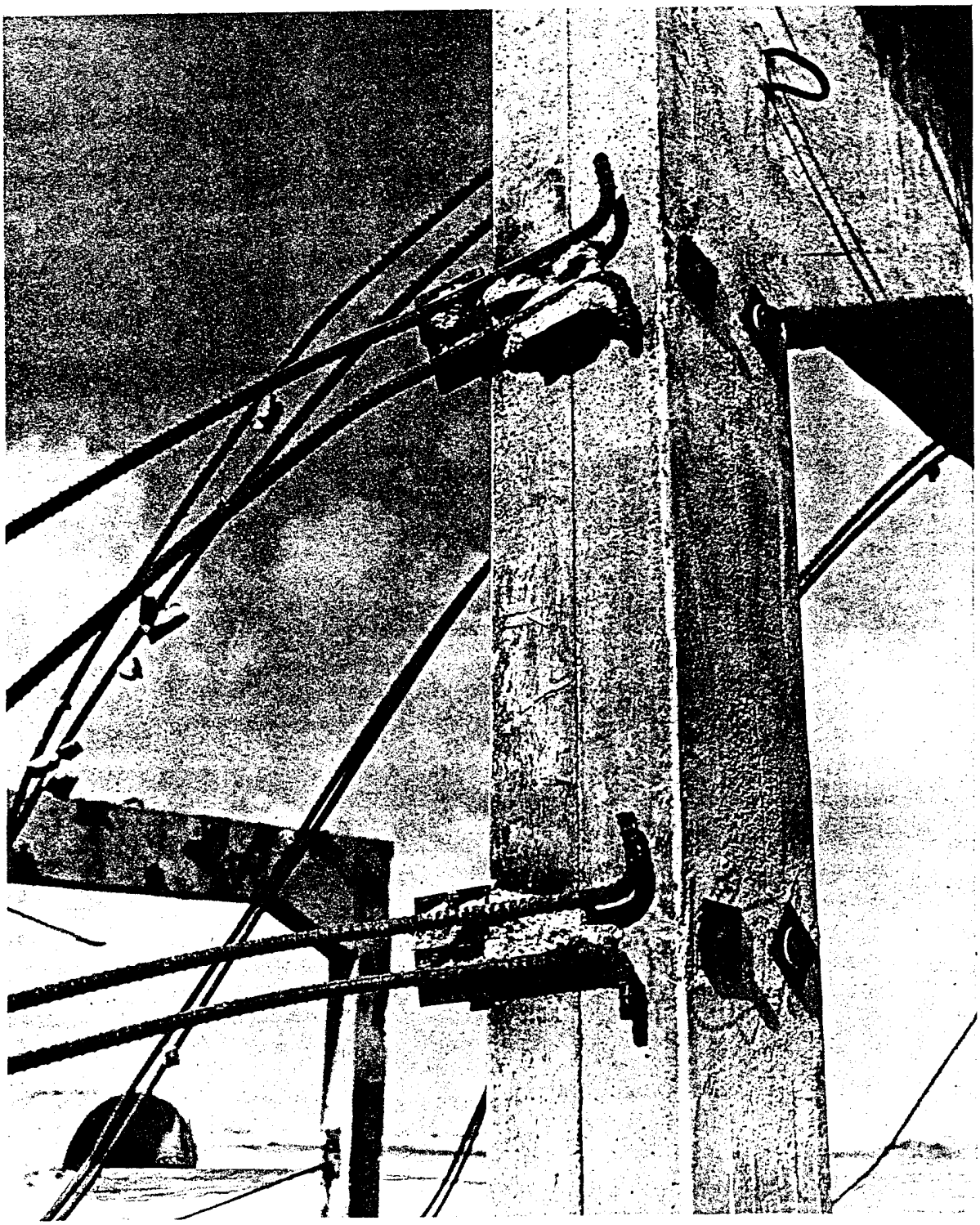


Fig. L.85 Steel from Rear Panels Which Remained When Panel Blew Back, Structure 3.2.2a

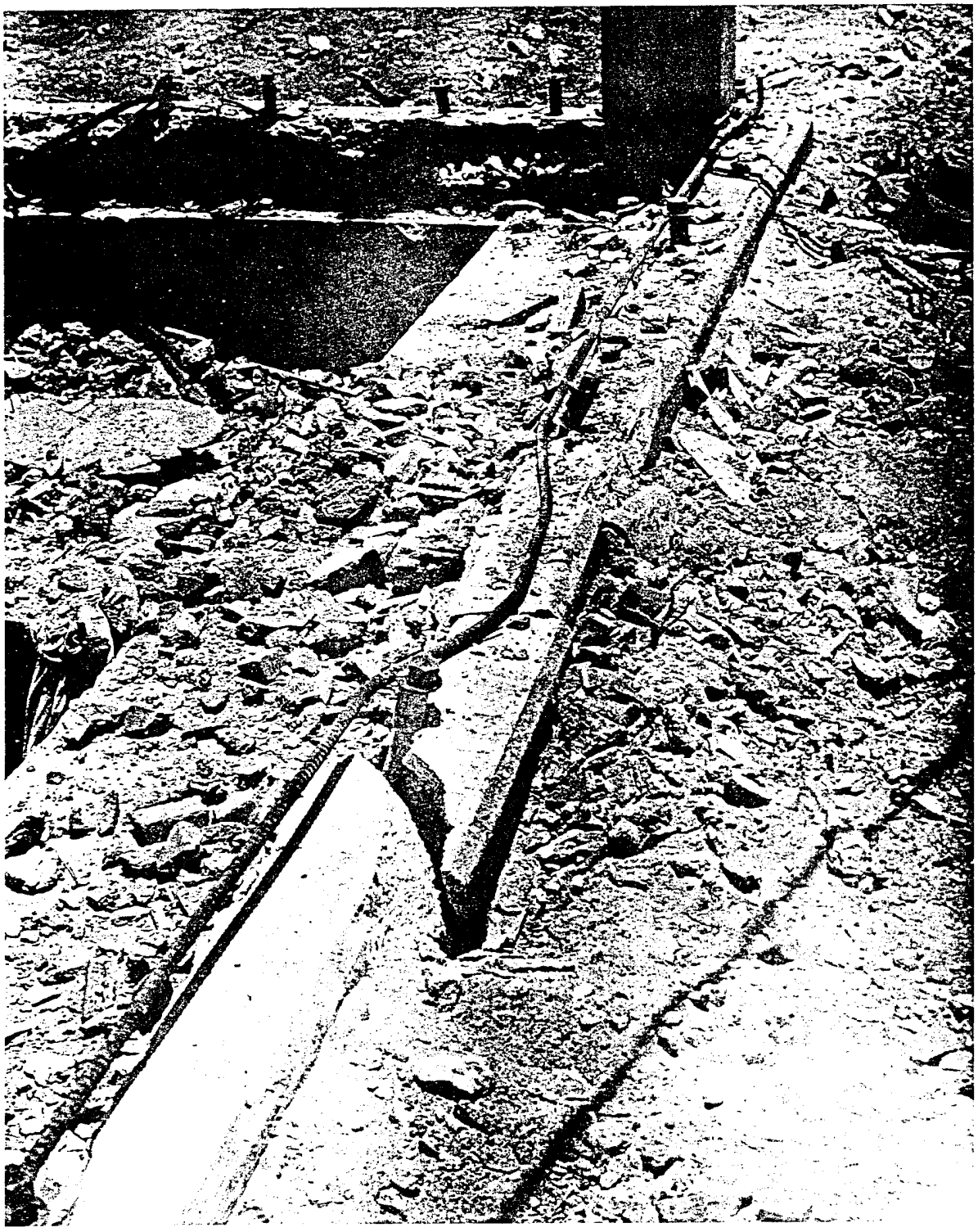


Fig. L.86 Left Rear Anchor Bolts Bent Back by Pressure from Interior, Structure 3.2.2a

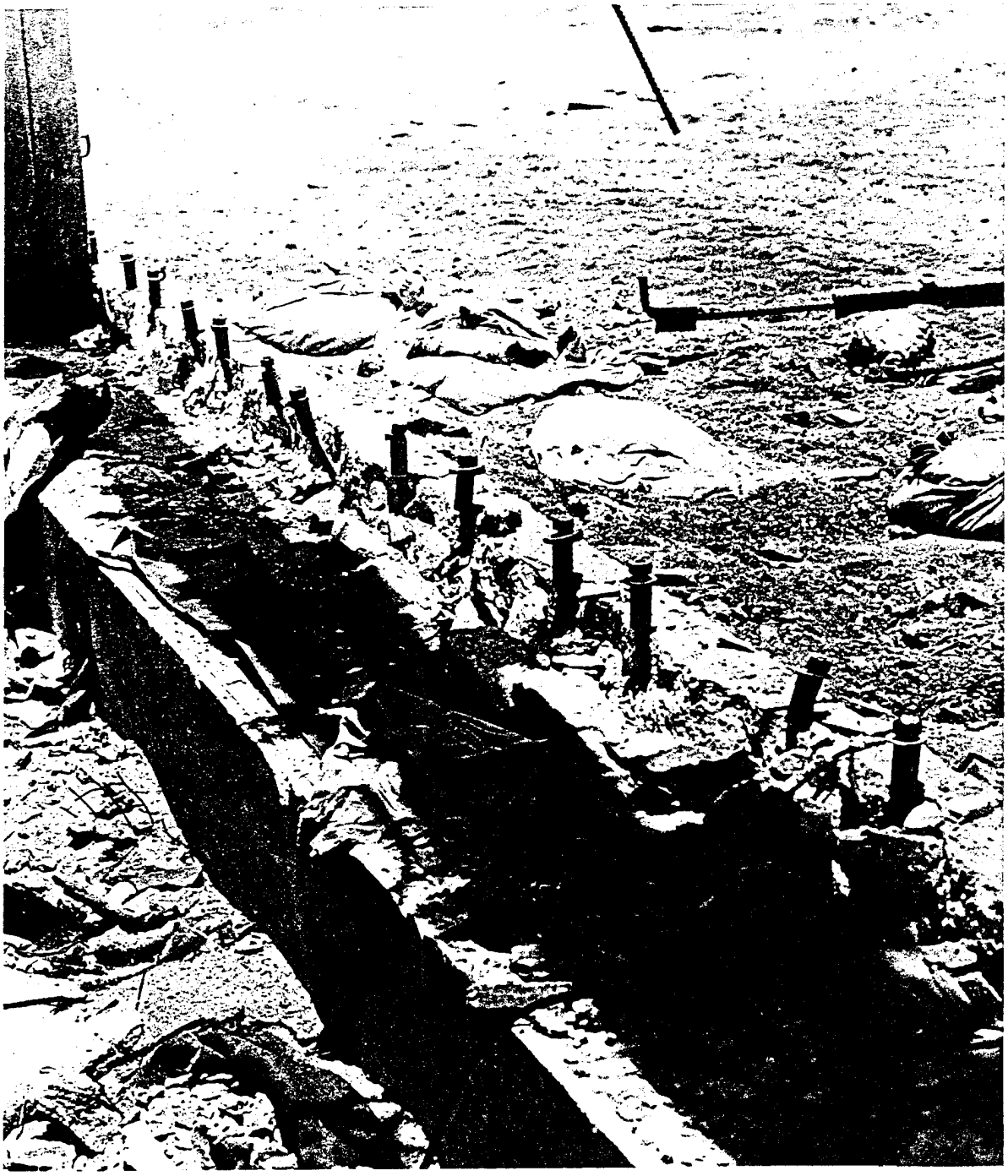


Fig. L.87 Left Side Anchor Bolts, Structure 3.2.2a. Double or "S" bend indicates exterior pressure before pressure entered building interior.

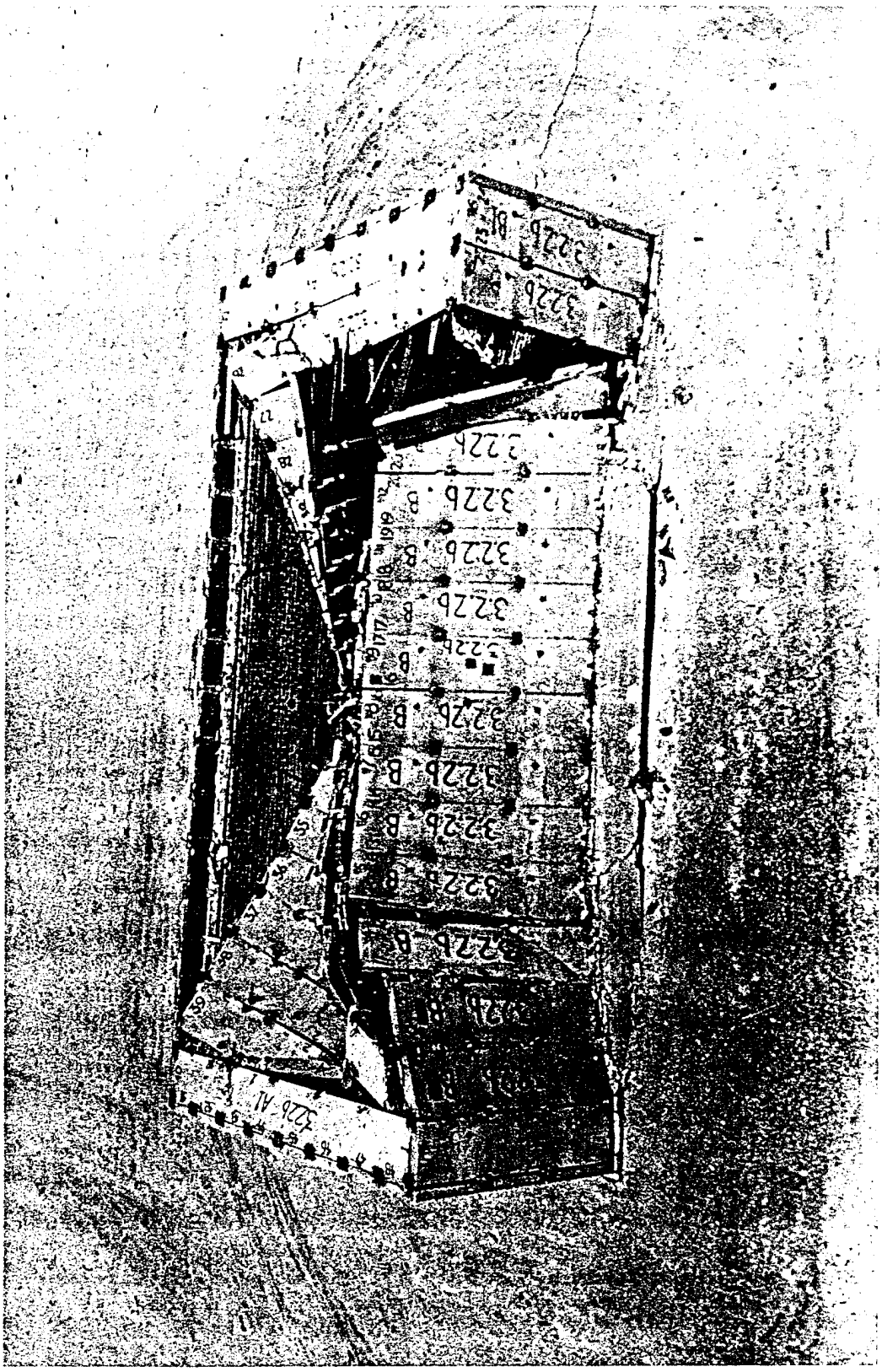


Fig. L.88 Postshot Aerial View from Front, Structure 3.2.2b

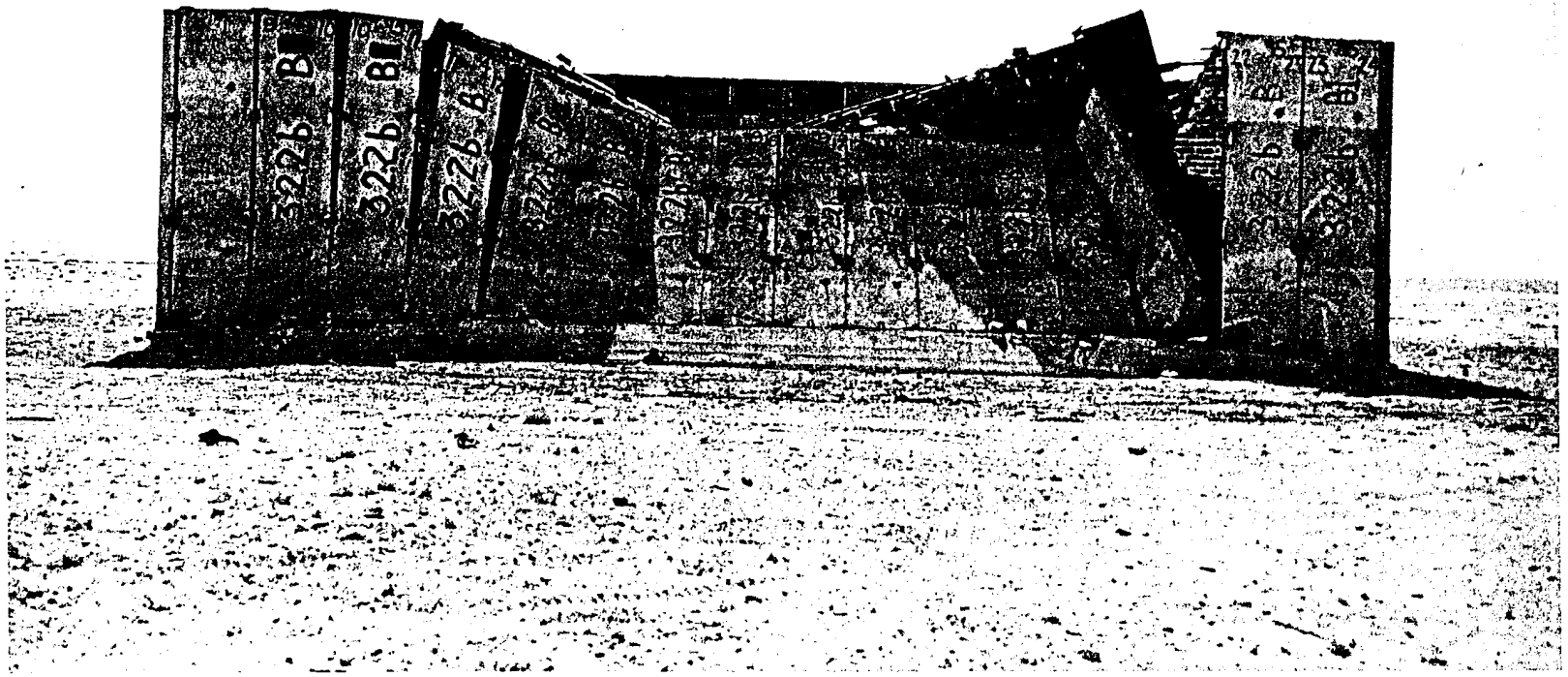


Fig. L.89 View Normal to Front Wall, Structure 3.2.2b

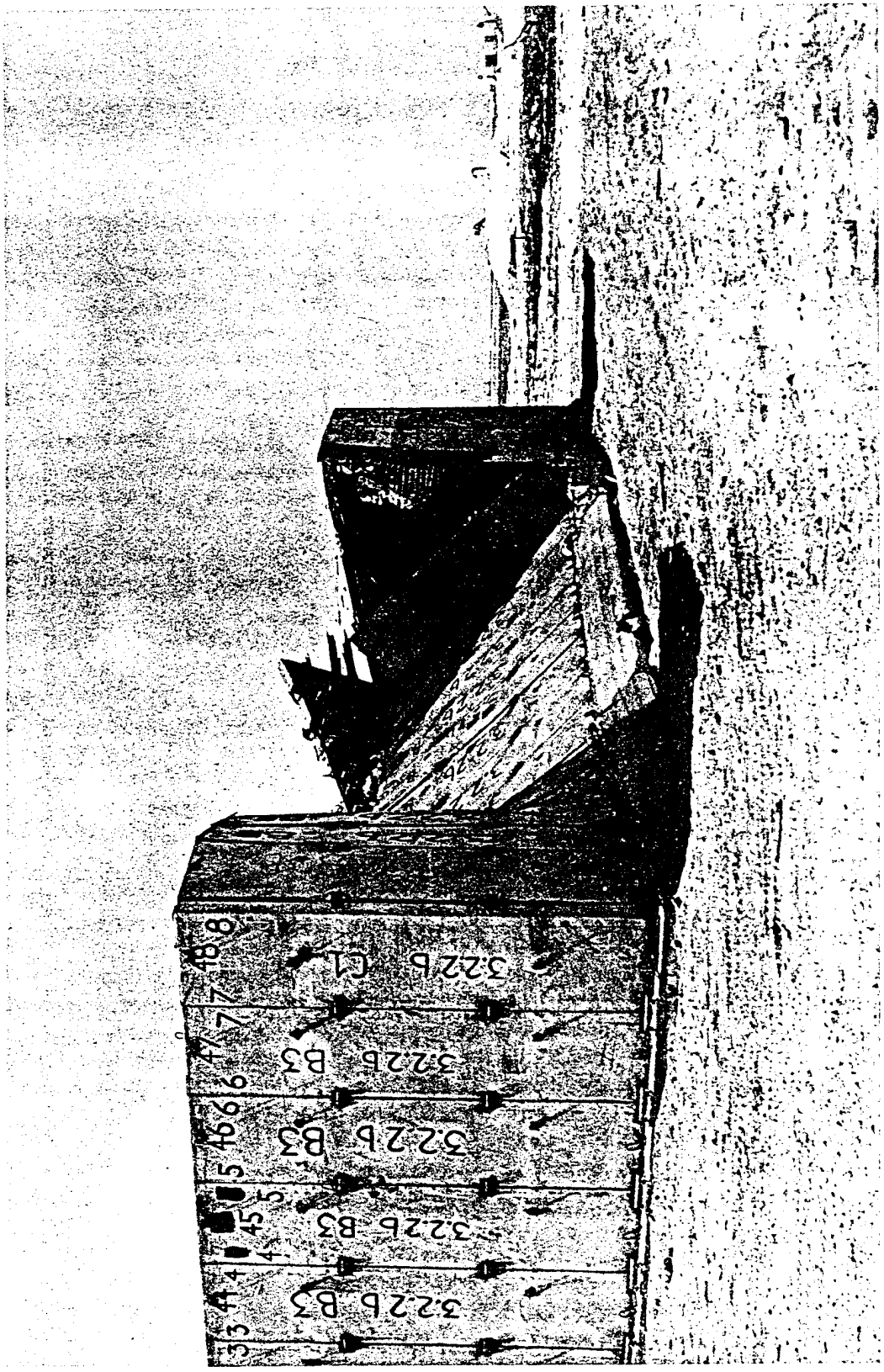


Fig. L.90 View from Left Front, Structure 3.2.2b

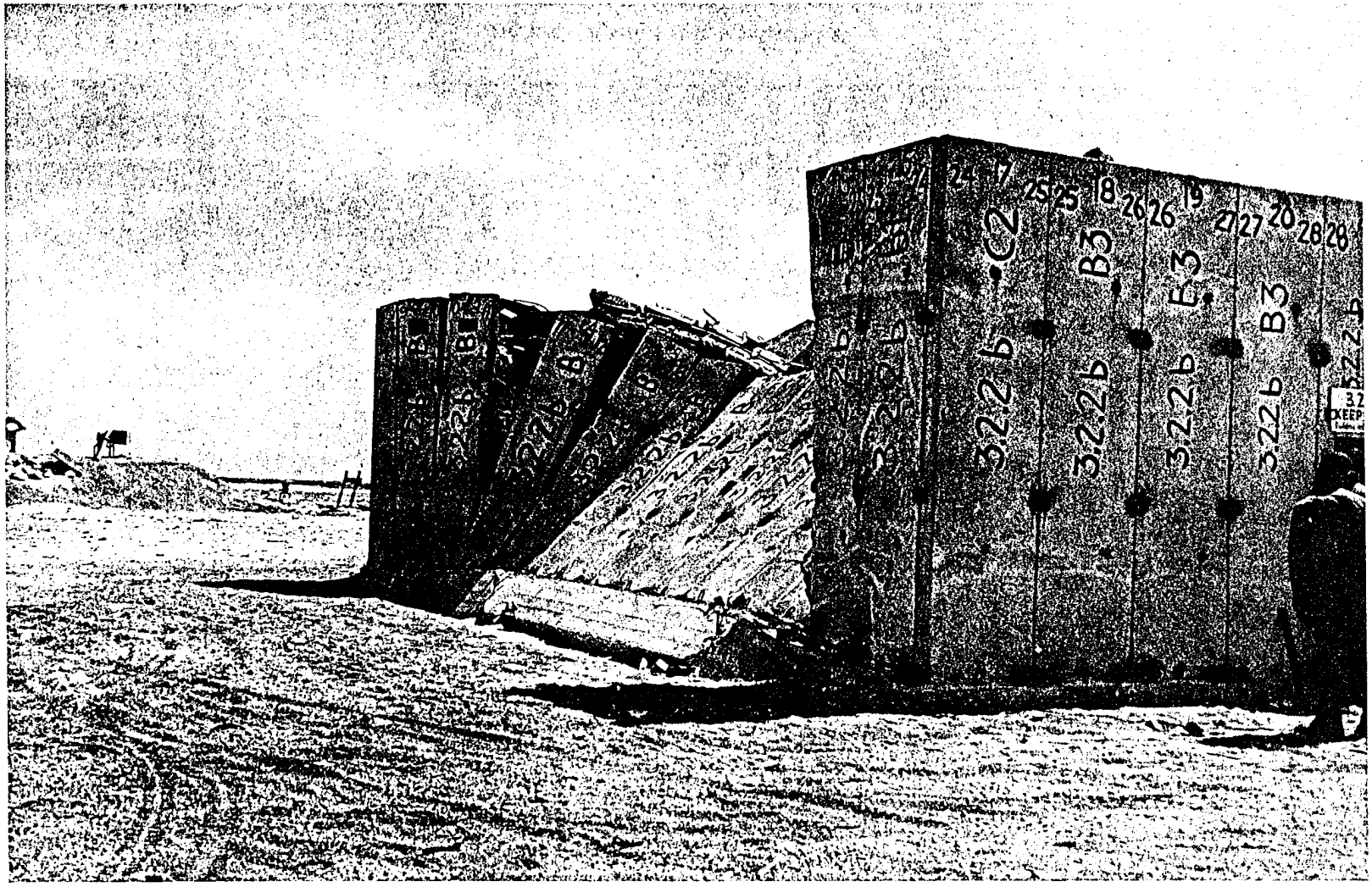


Fig. L.91 View from Right Front, Structure 3.2.2b

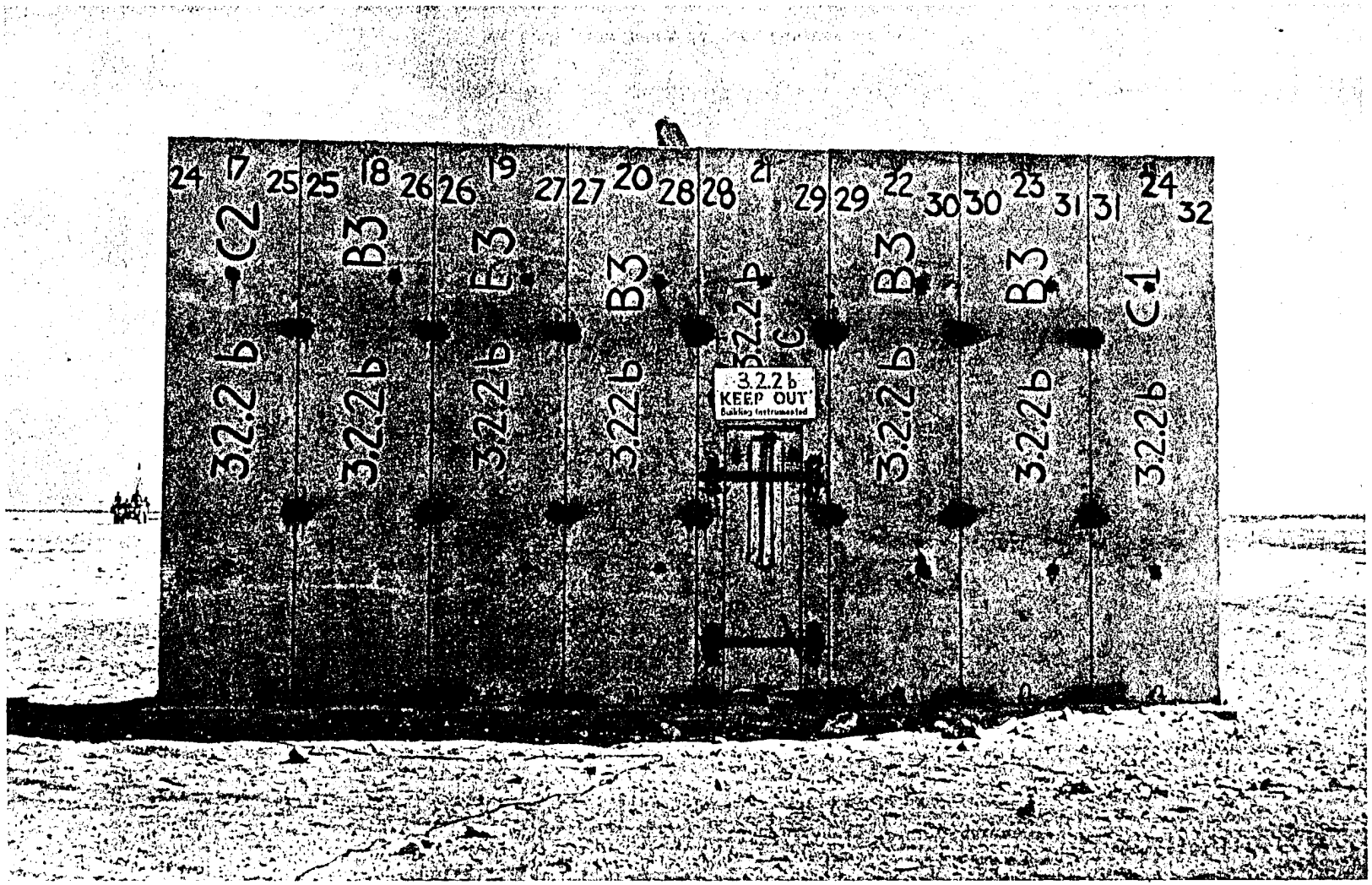


Fig. L.92 Right End Wall, Structure 3.2.2b

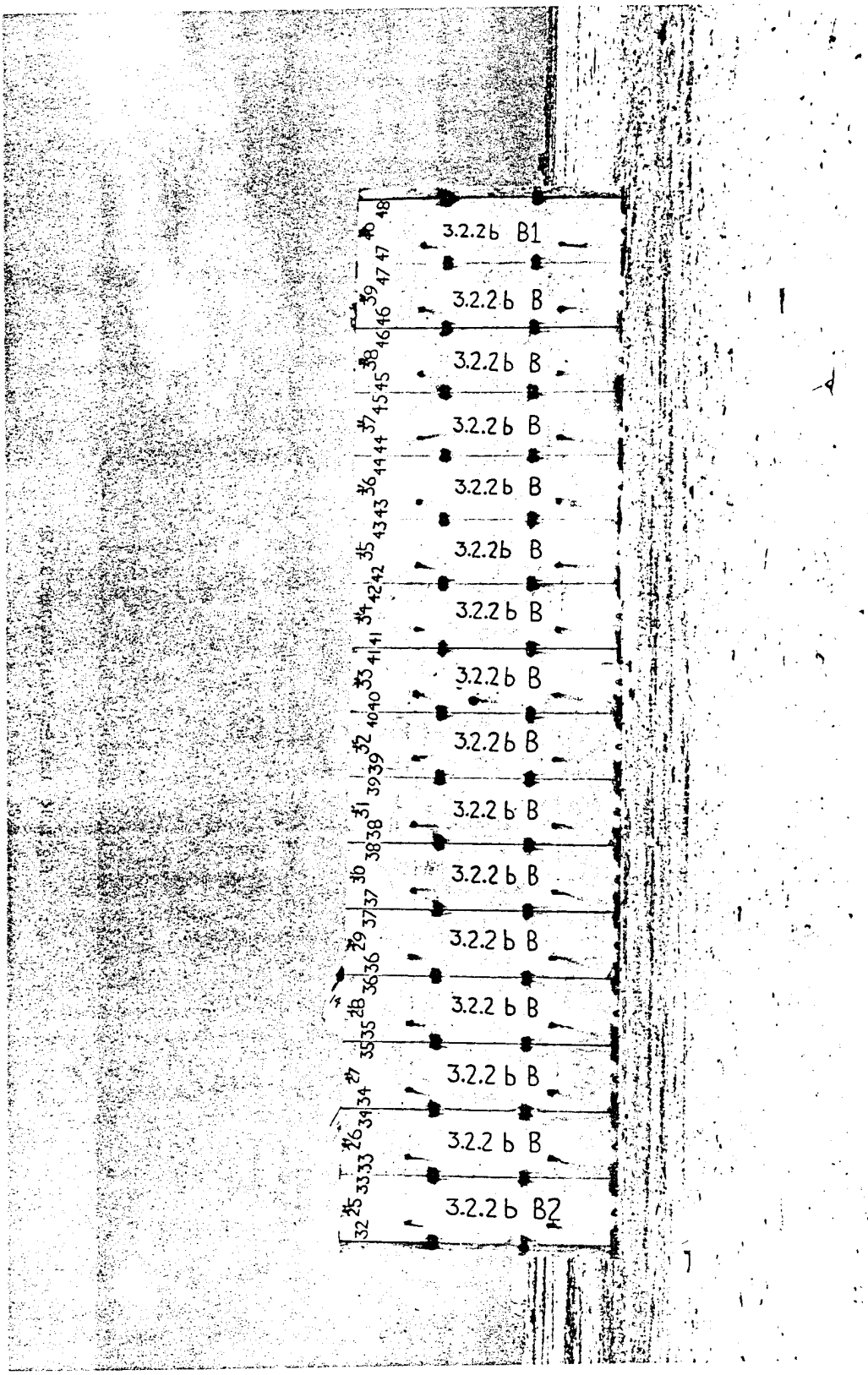


Fig. L.93 Rear Wall, Structure 3.2.2b

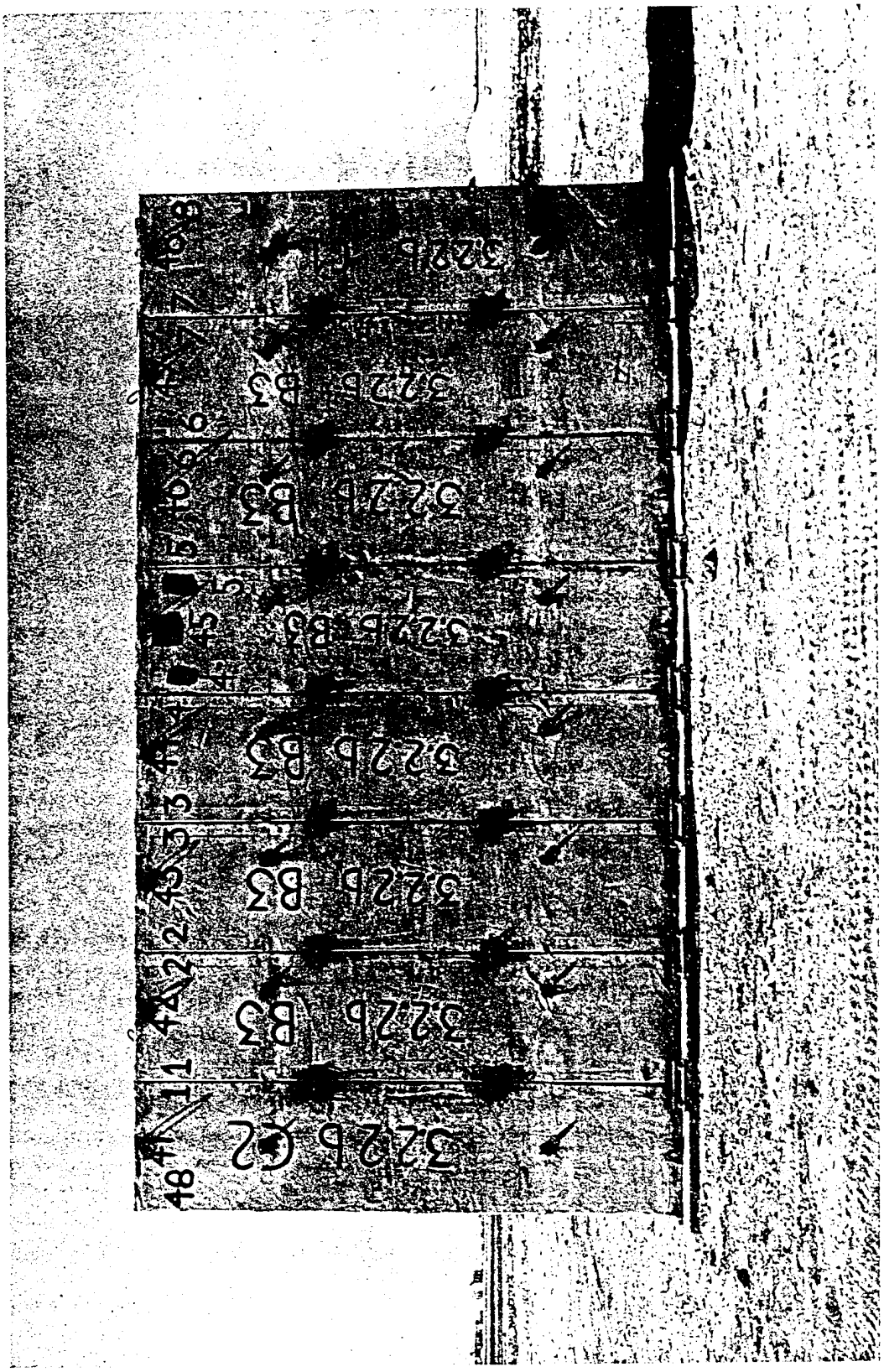


Fig. L.94 Left End Wall, Structure 3.2.2b

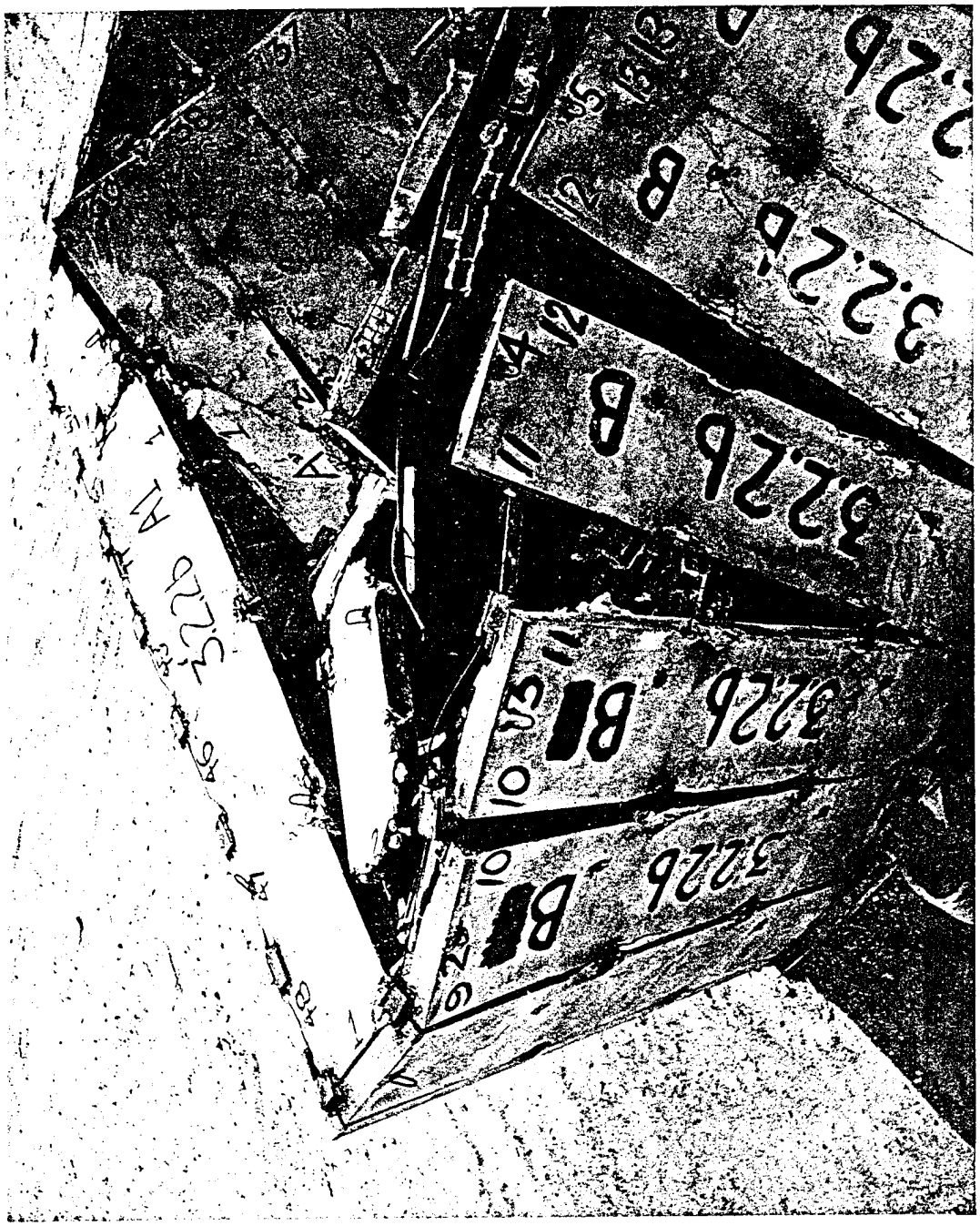


Fig. L.95 Left Side from Front Overhead, Structure 3.2.2b



Fig. L.96 Left Side from Rear Overhead, Structure 3.2.2b

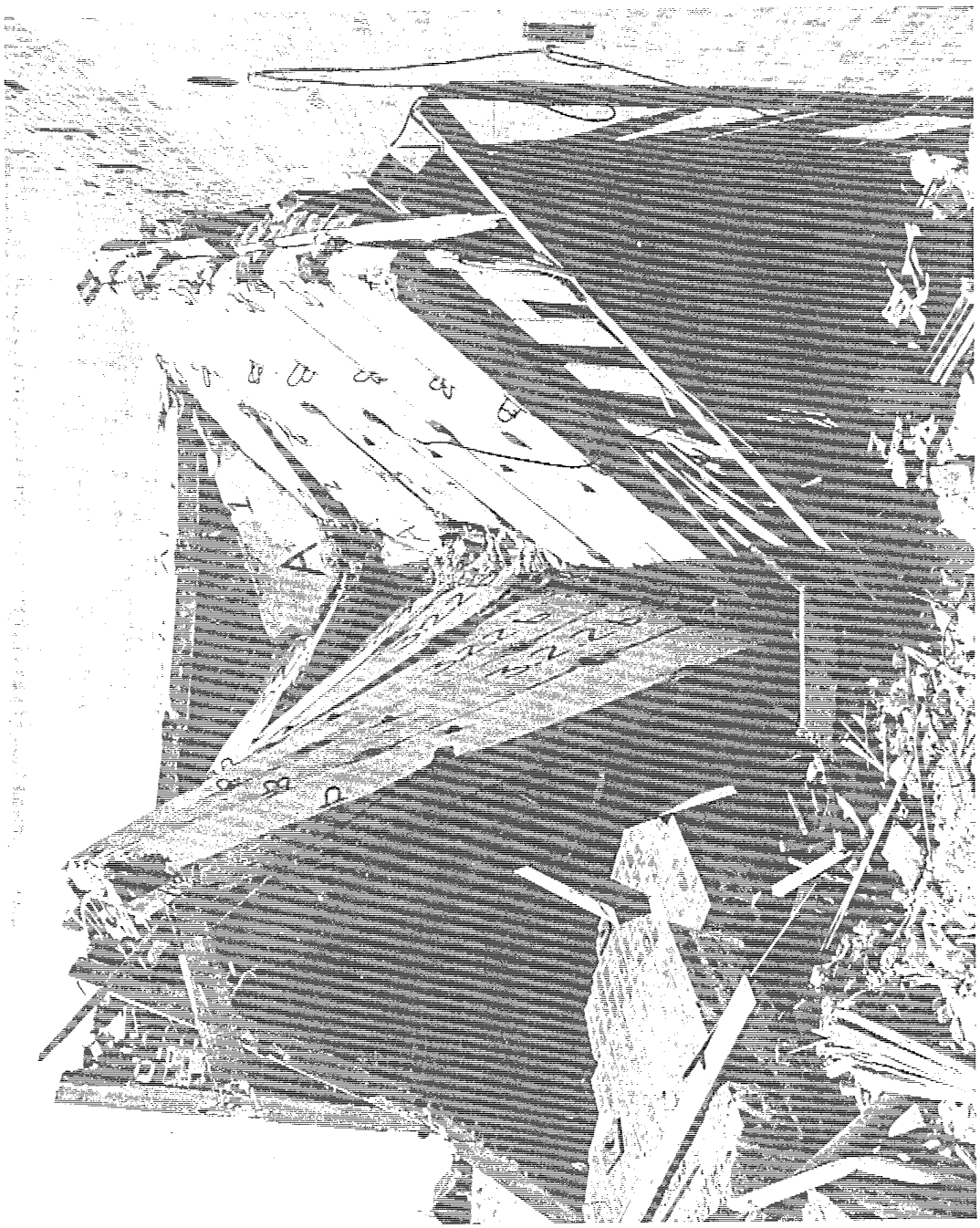


Fig. L.97 Left Side from Interior after Right Half of Roof was Removed, Structure 3.2.2b

Fig. L.98 Overhead View of Center of Structure from Front, Structure 3.2.2b

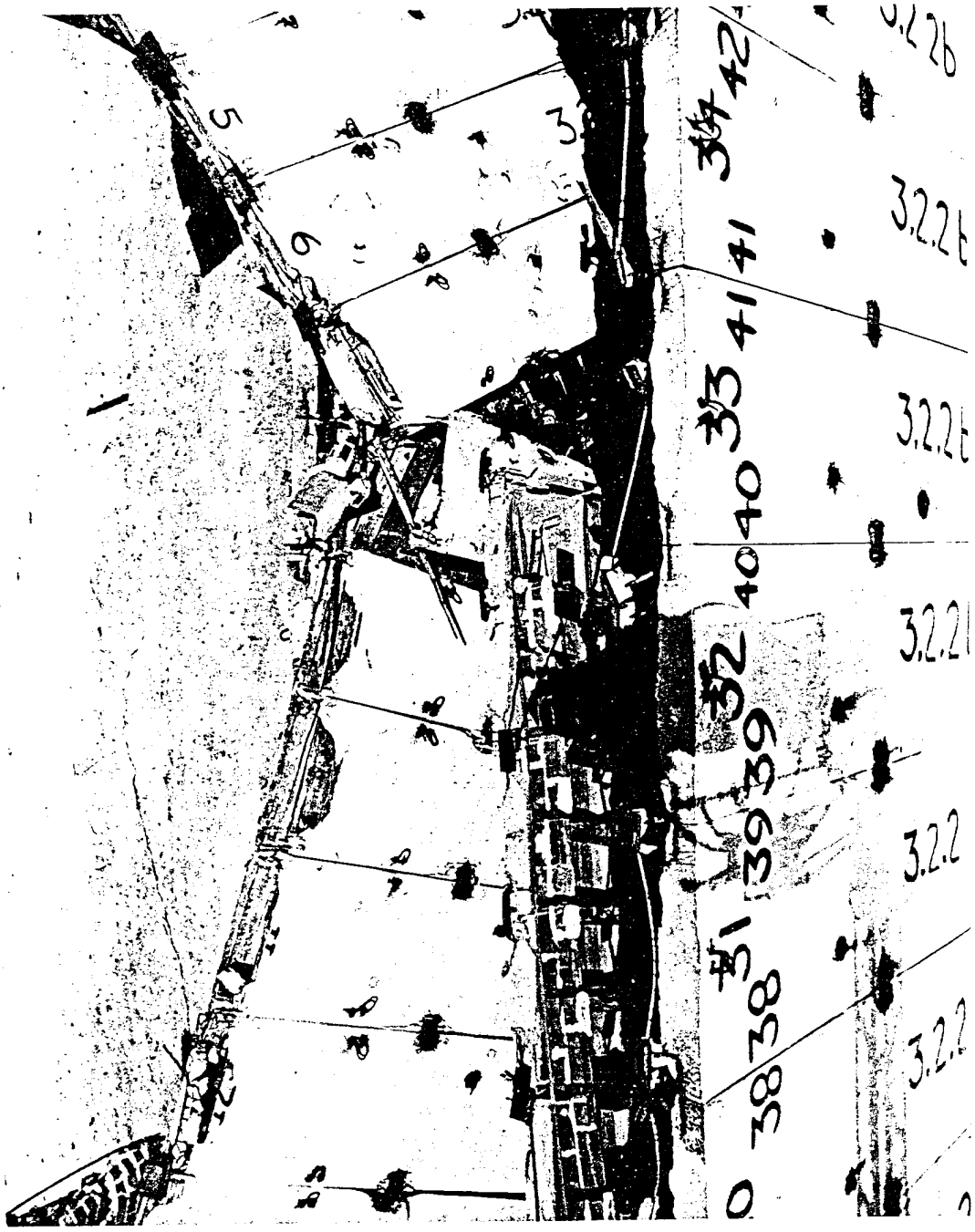


Fig. L.99 Overhead View of Center of Structure from Rear, Structure 3.2.2b



Fig. L.100 Right Side from Front Overhead, Structure 3.2.2b

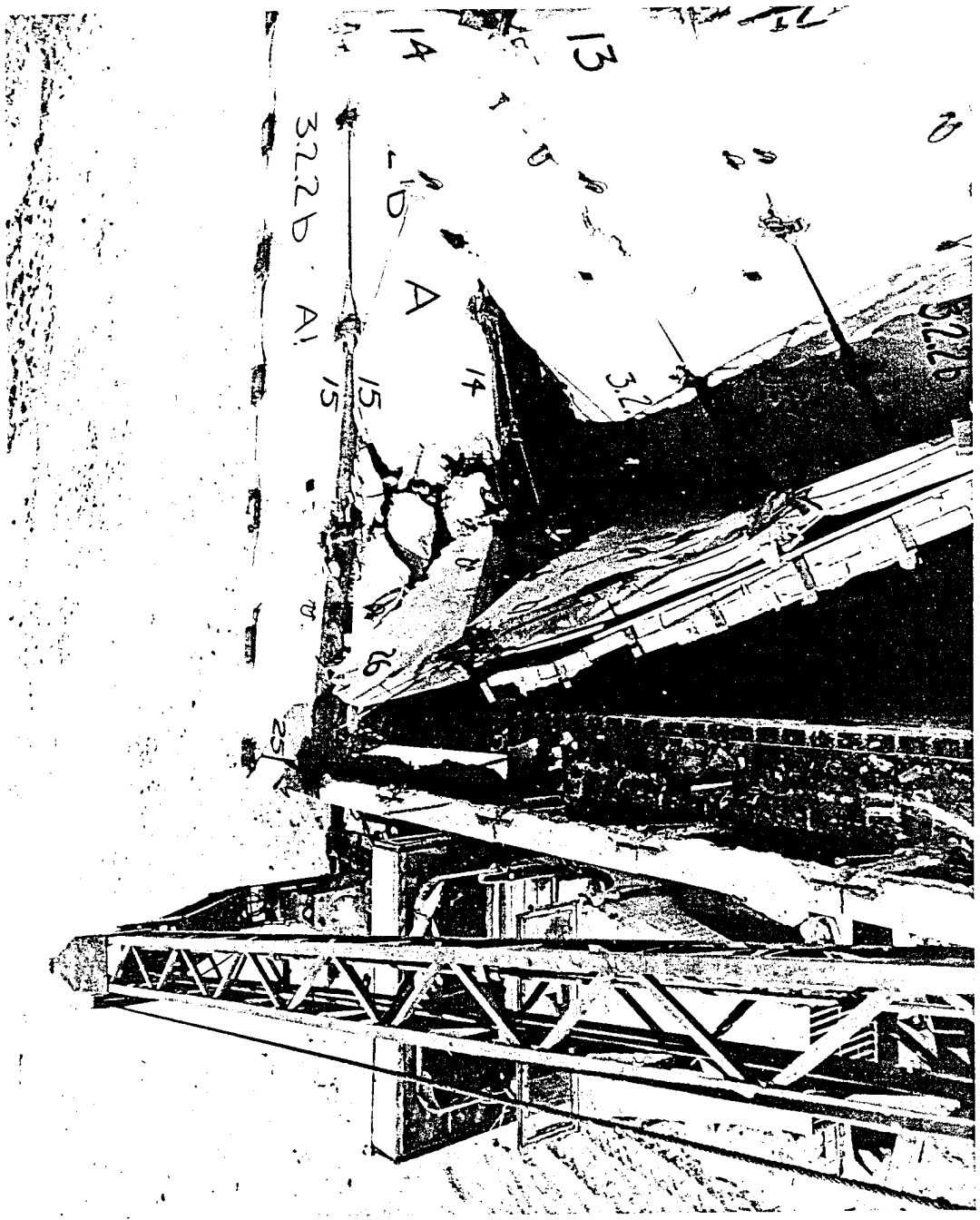


Fig. L.101 Right Side from Rear Overhead, Structure 3.2.2b

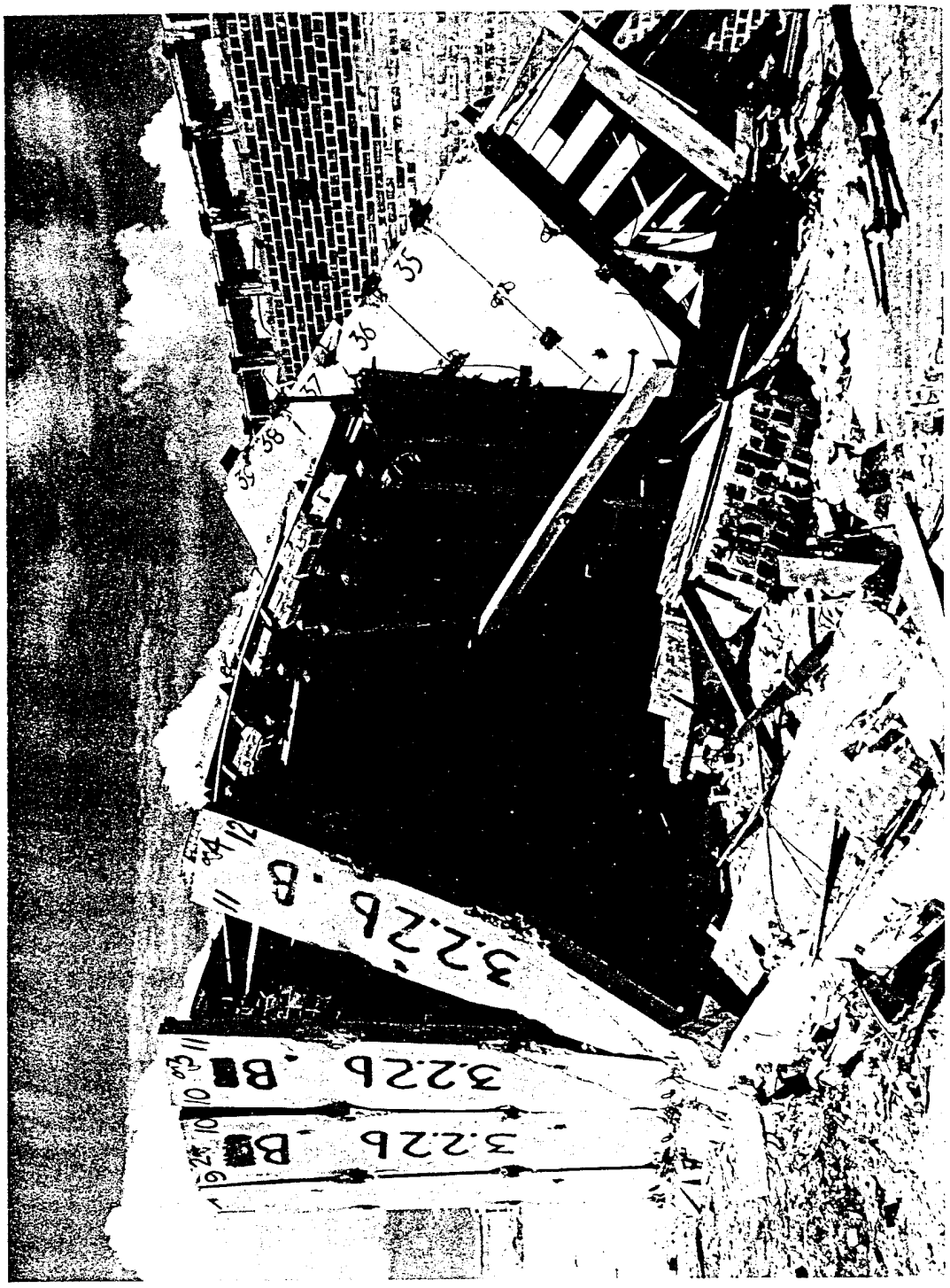


Fig. L.102 View of Left Half of Roof from Front after Removal of Right Half of Roof and Front Wall, Structure 3.2.2b

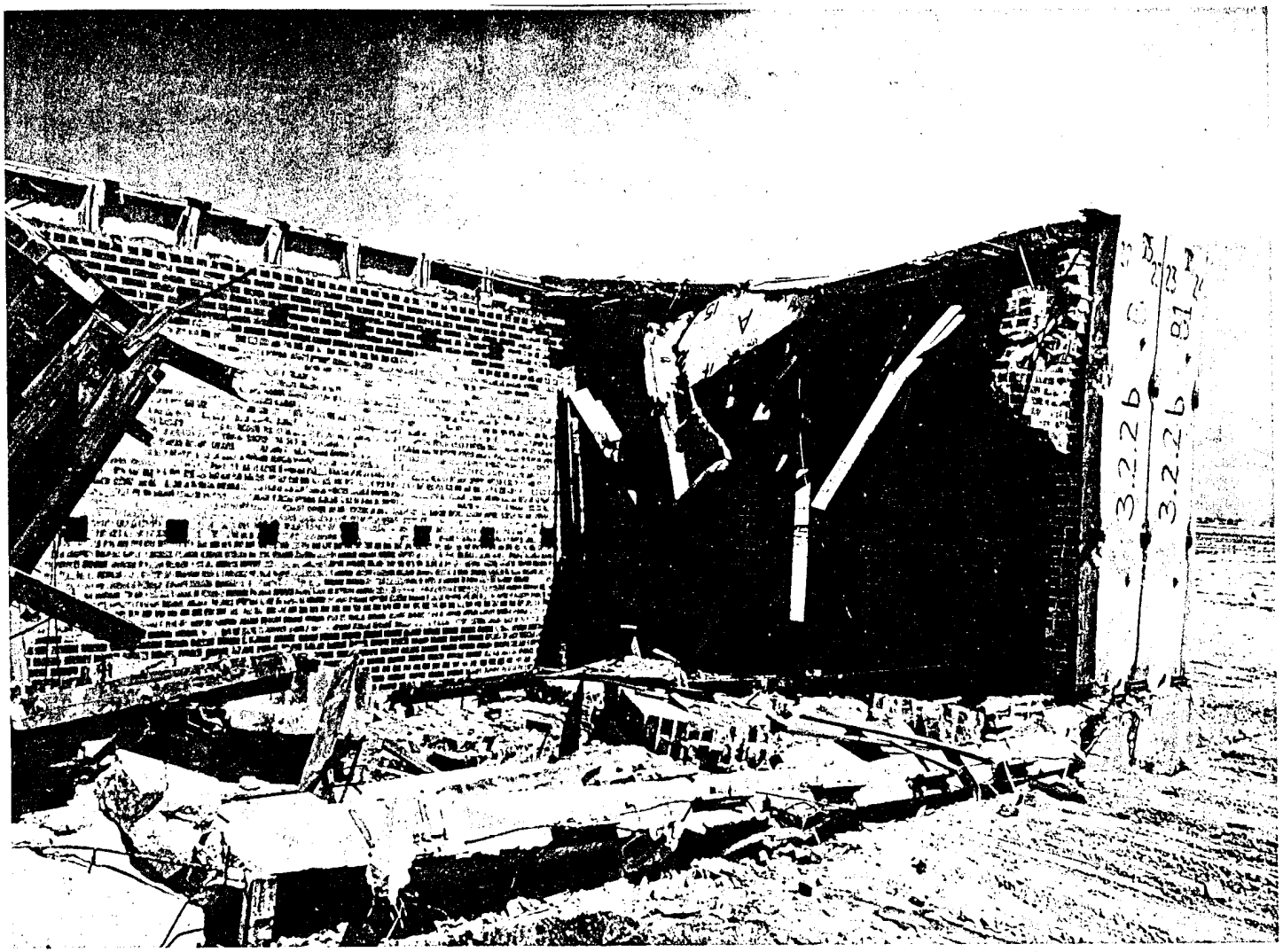


Fig. L.103 View of Right Side after Removal of Right Half of Roof and Front Wall, Structure 3.2.2b. Note crack in brick rear wall.



Fig. L.104 Left Front Corner, Structure 3.2.2b



Fig. L.105 Front Panels at Left Fold, Structure 3.2.2b



Fig. L.106 Front Panels at Left Center, Structure 3.2.2b

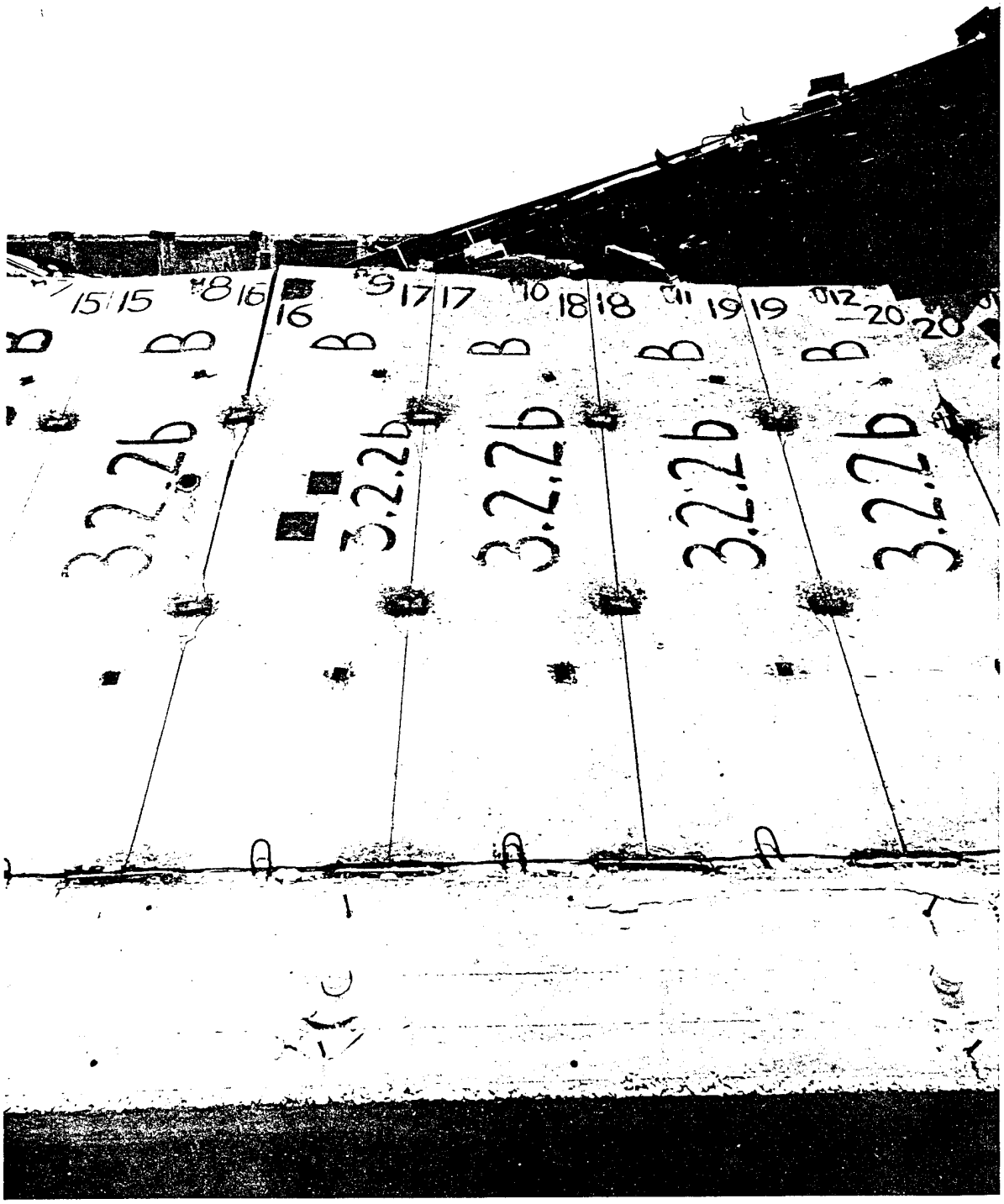


Fig. L.107 Front Panels at Right Center, Structure 3.2.2b



Fig. L.108 Front Panels at Right Fold, Structure 3.2.2b



Fig. L.109 Right Front Corner from Left, Structure 3.2.2b



Fig. L.110 Right Front Corner from Front, Structure 3.2.2b



Fig. L.111 Deformed Door in Place, Structure 3.2.2b

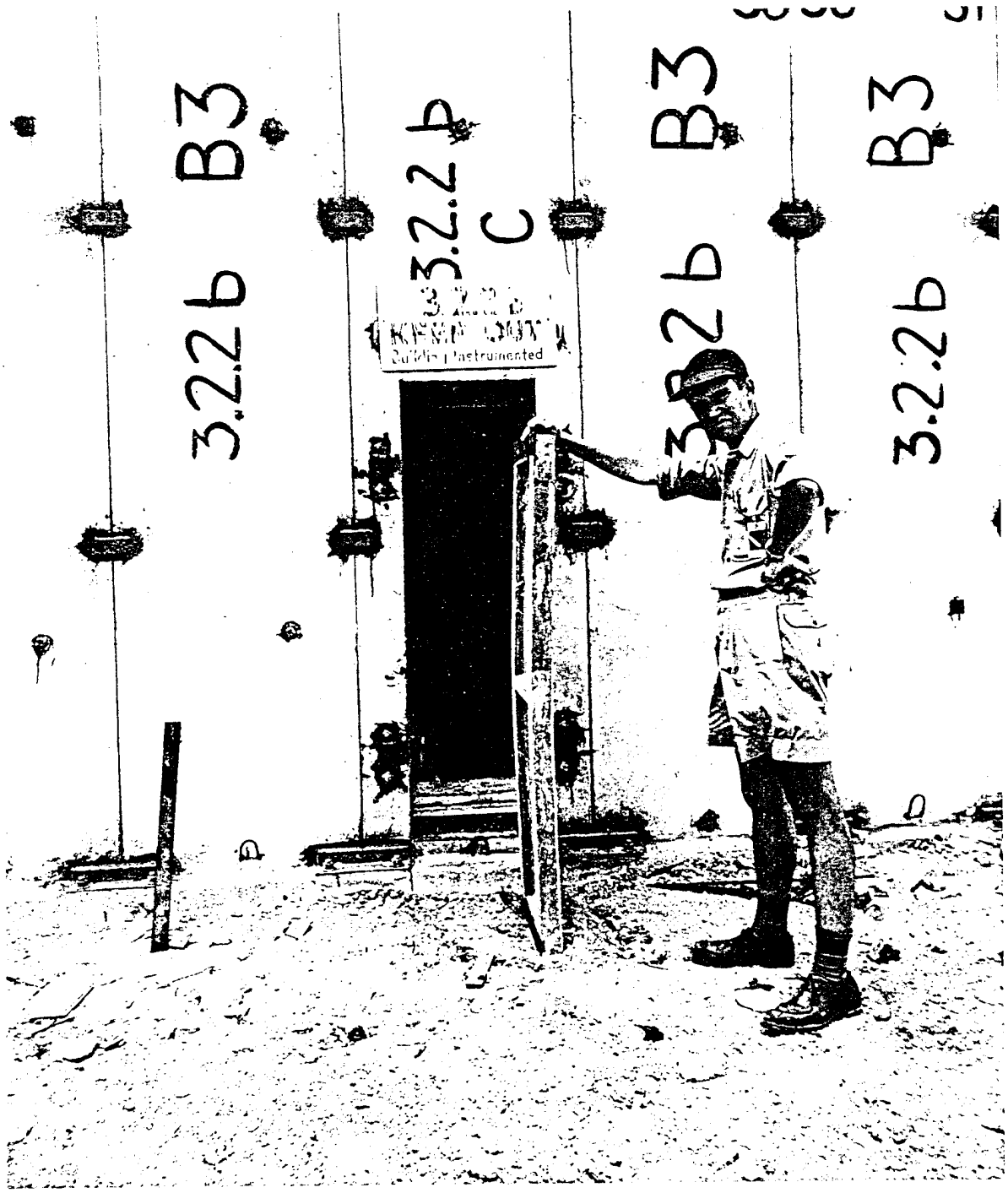


Fig. L.112 Door Showing 1⅛-in. Deformation, Structure 3.2.2b. Note burned black letters on sign.

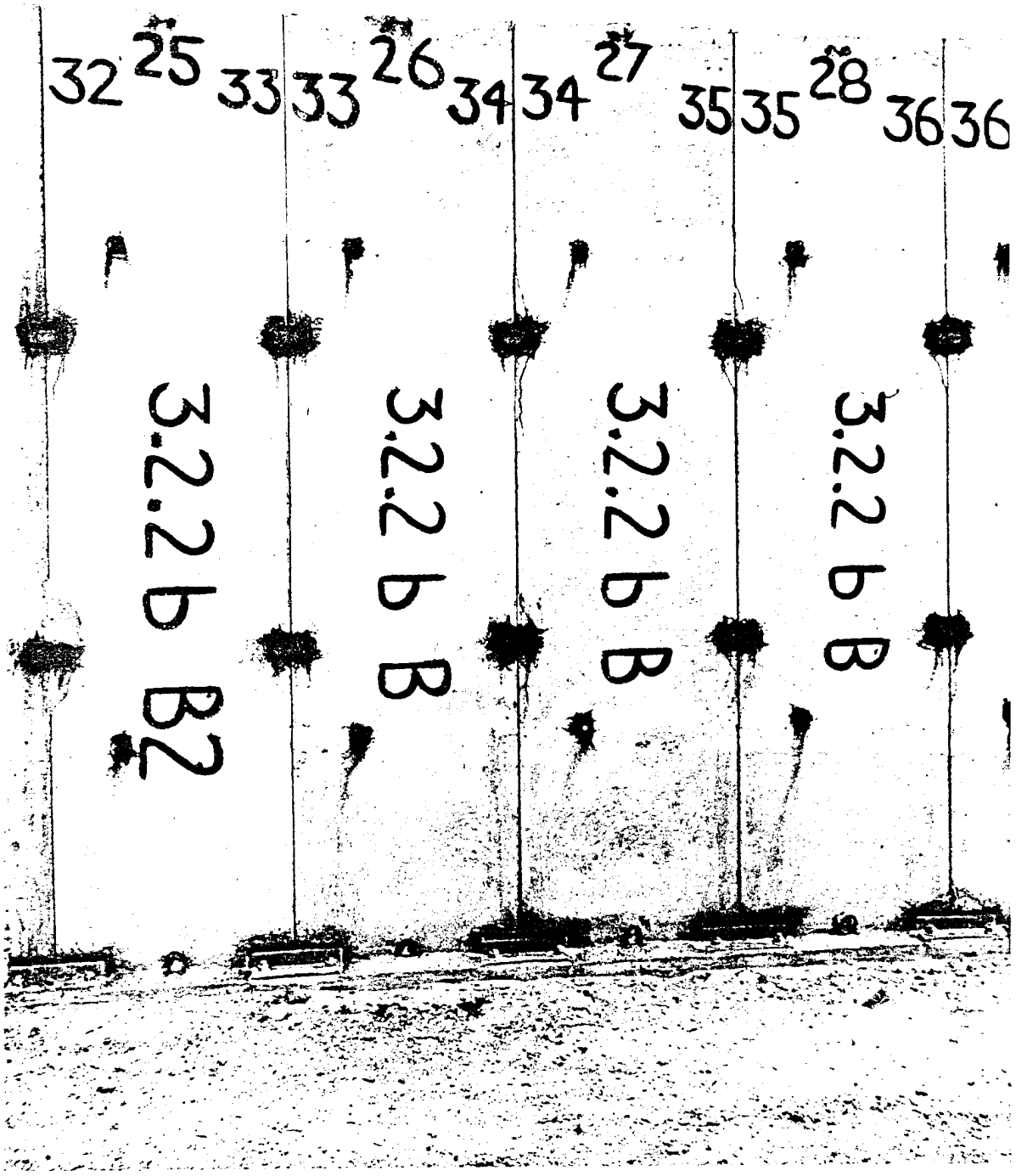


Fig. L.113 Left Corner of Rear Wall, Structure 3.2.2b. Note cracks at splice plates.

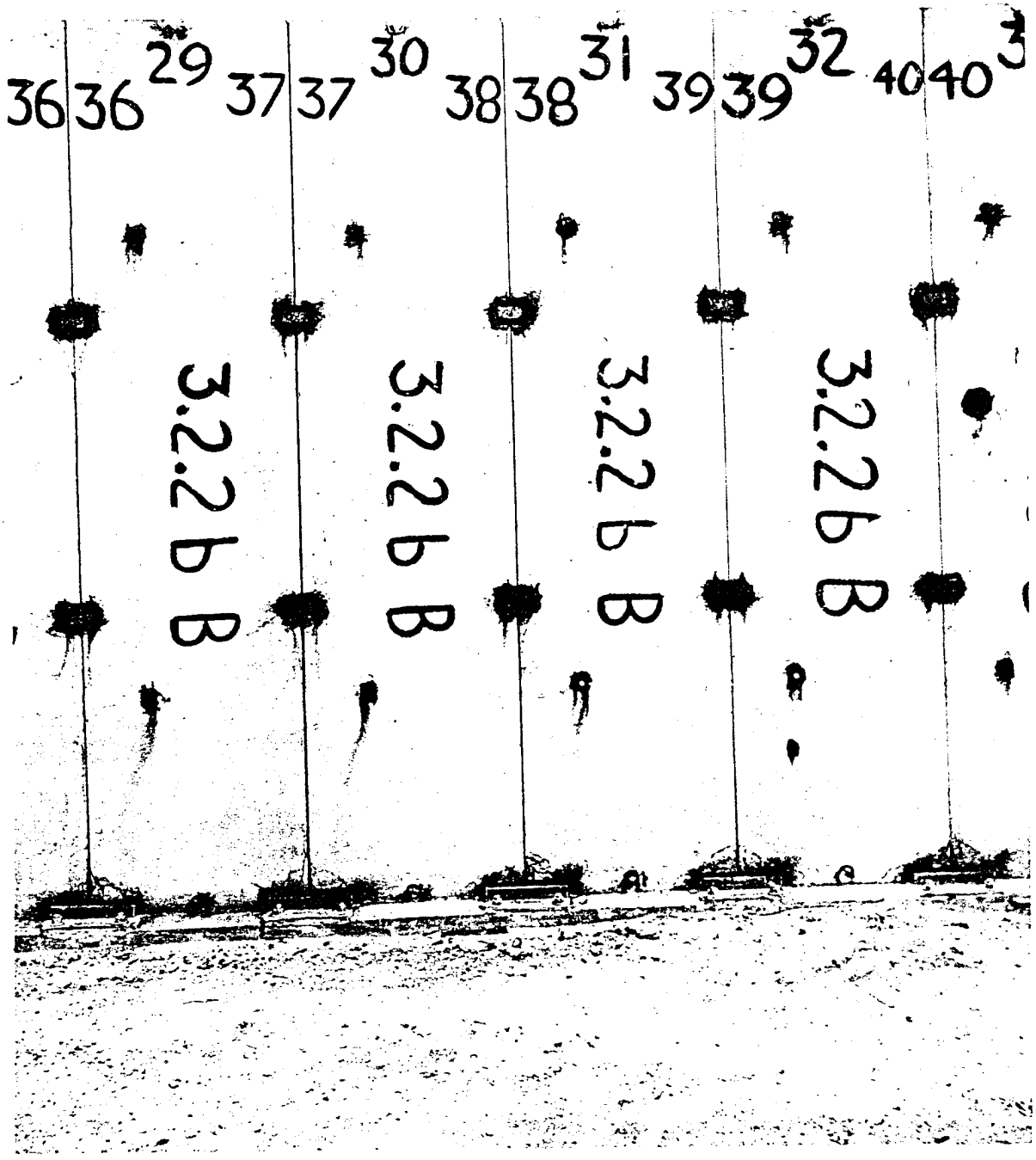


Fig. L.114 Rear-wall Panels at Left Center. Structure 3.2.2b. Note scabbing at base.

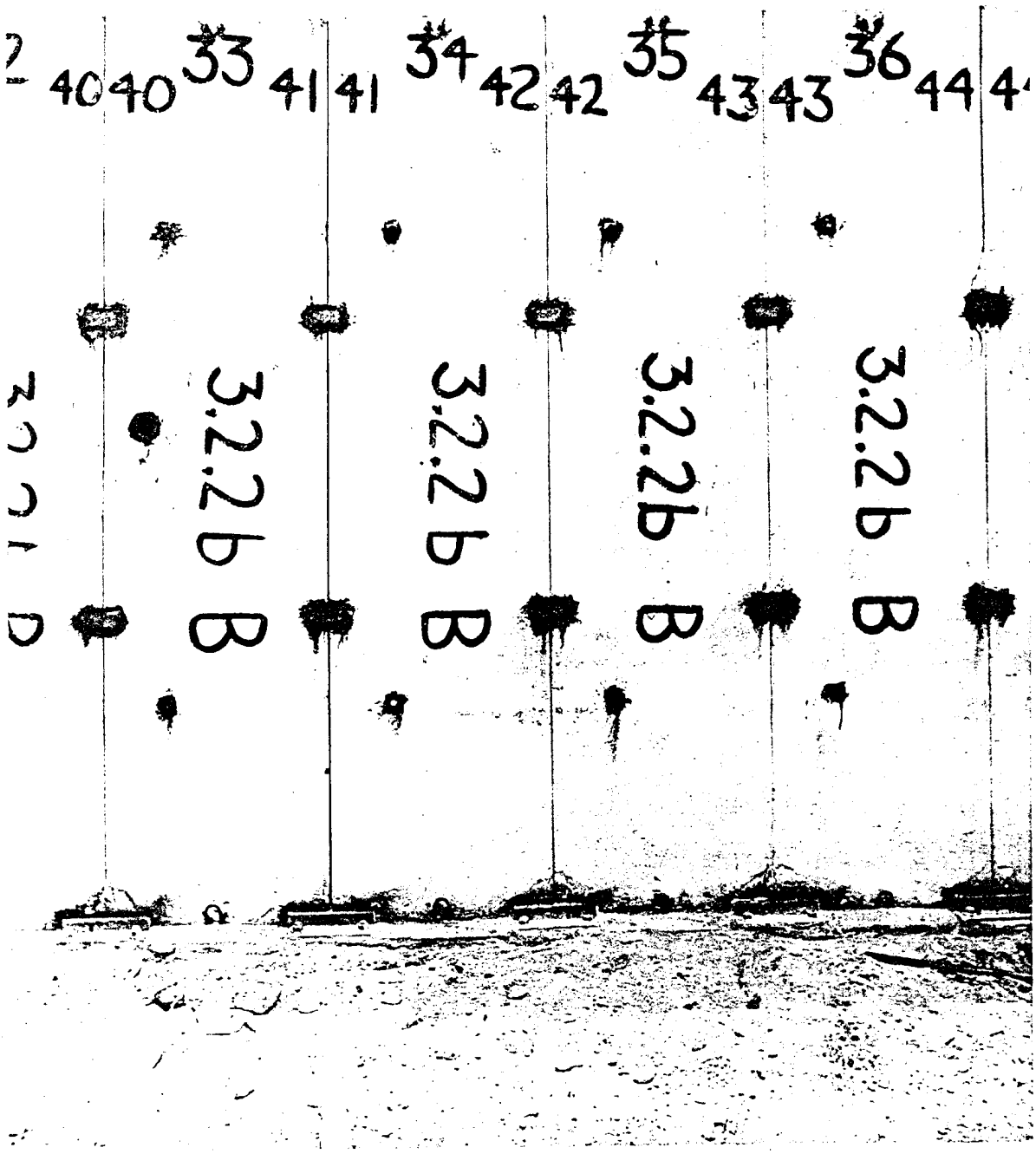


Fig. L.115 Rear-wall Panels at Right Center, Structure 3.2.2b

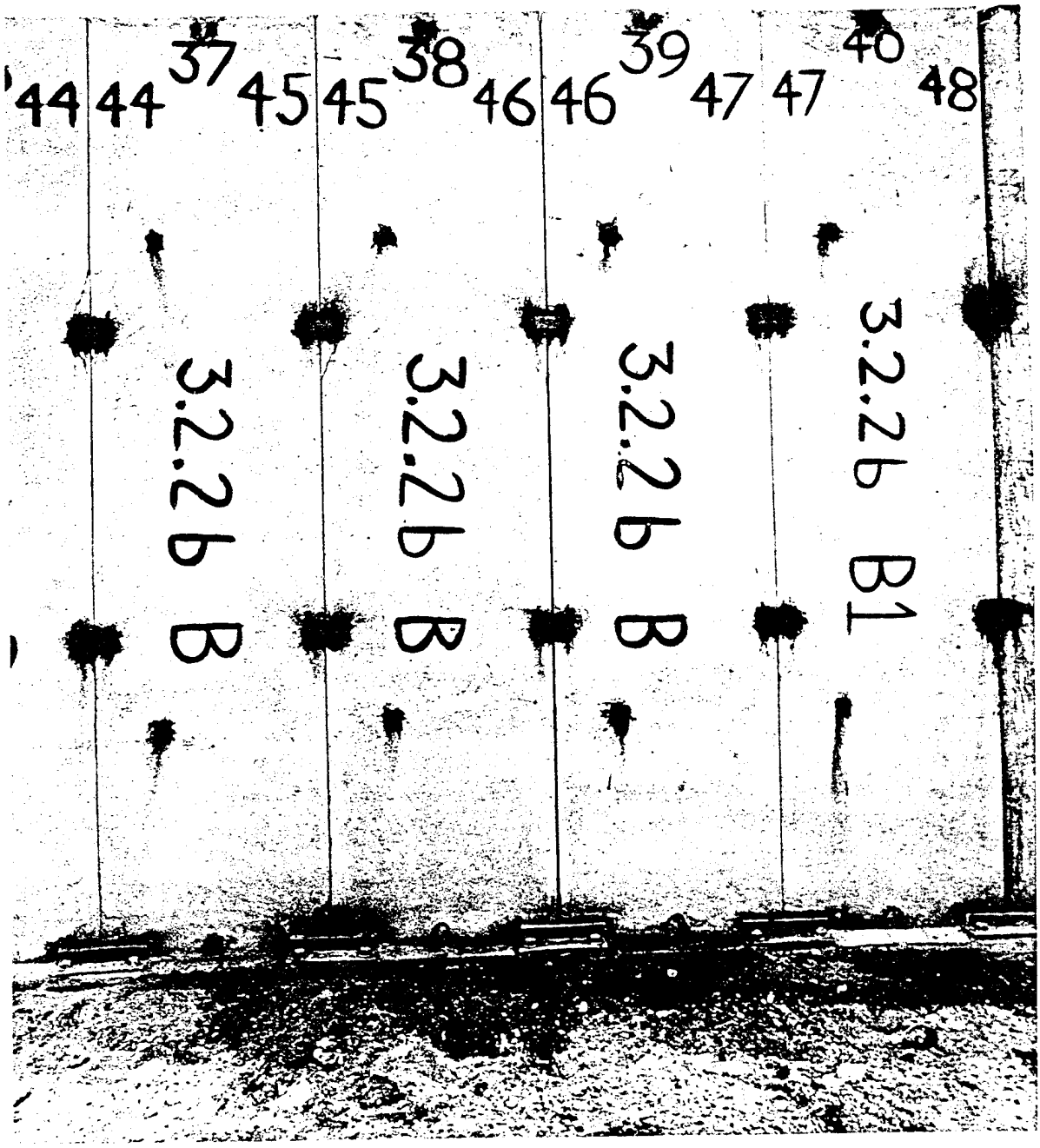


Fig. L.116 Right Corner of Rear Wall, Structure 3.2.2b



Fig. L.117 .Left Side Wall near Front Showing Cracks and Scabbing near Angles, Structure 3.2.2b

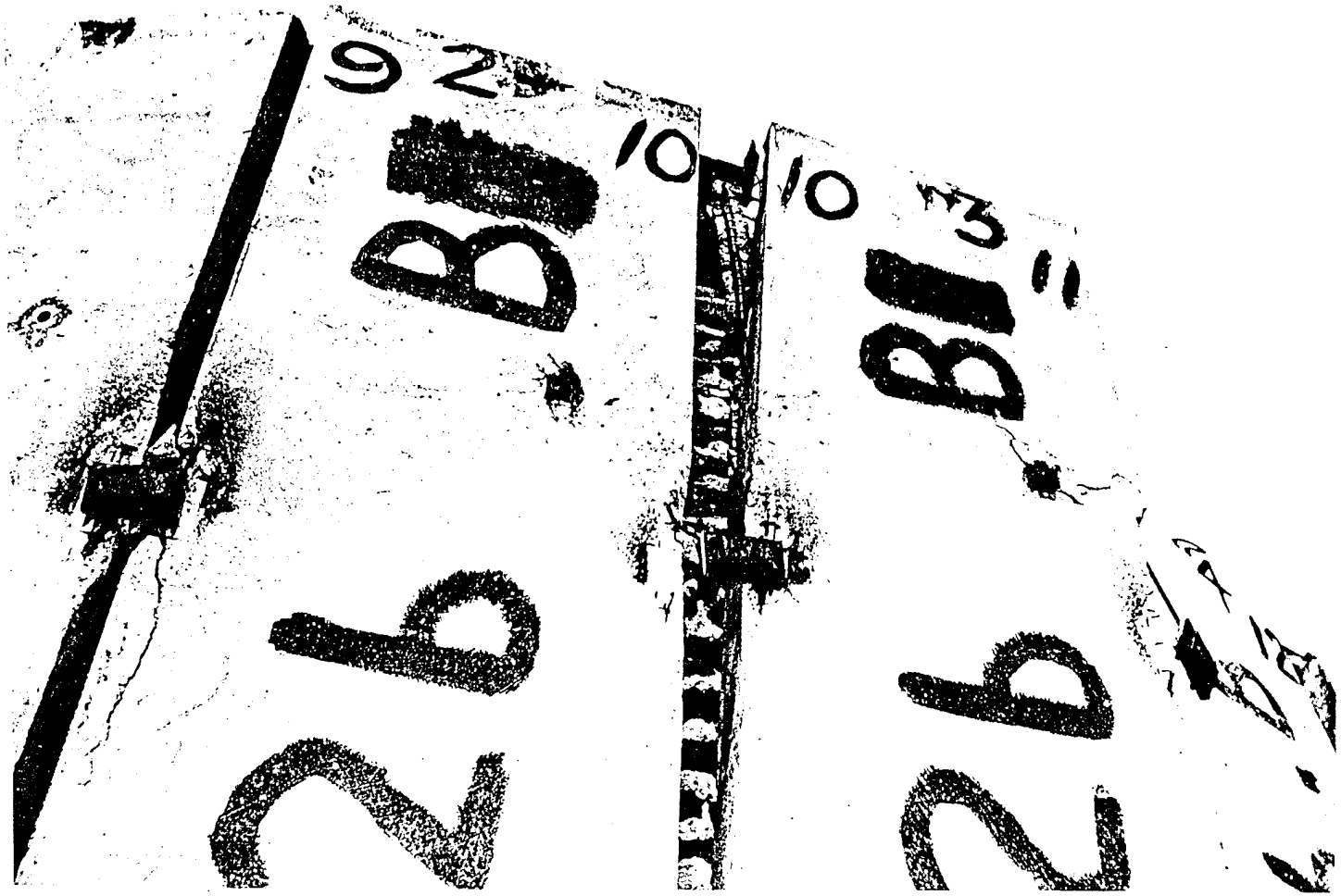


Fig. L.118 Failure at Splice Plate by Shearing of Reinforcing Bar, Structure 3.2.2b. Note tension steel at top of panel pulled out by connection to roof panel. View at left front fold.



Fig. L.119 Puncturing of Front Panel by Brick Anchor Bolts Pulling Out, Structure 3.2.2b

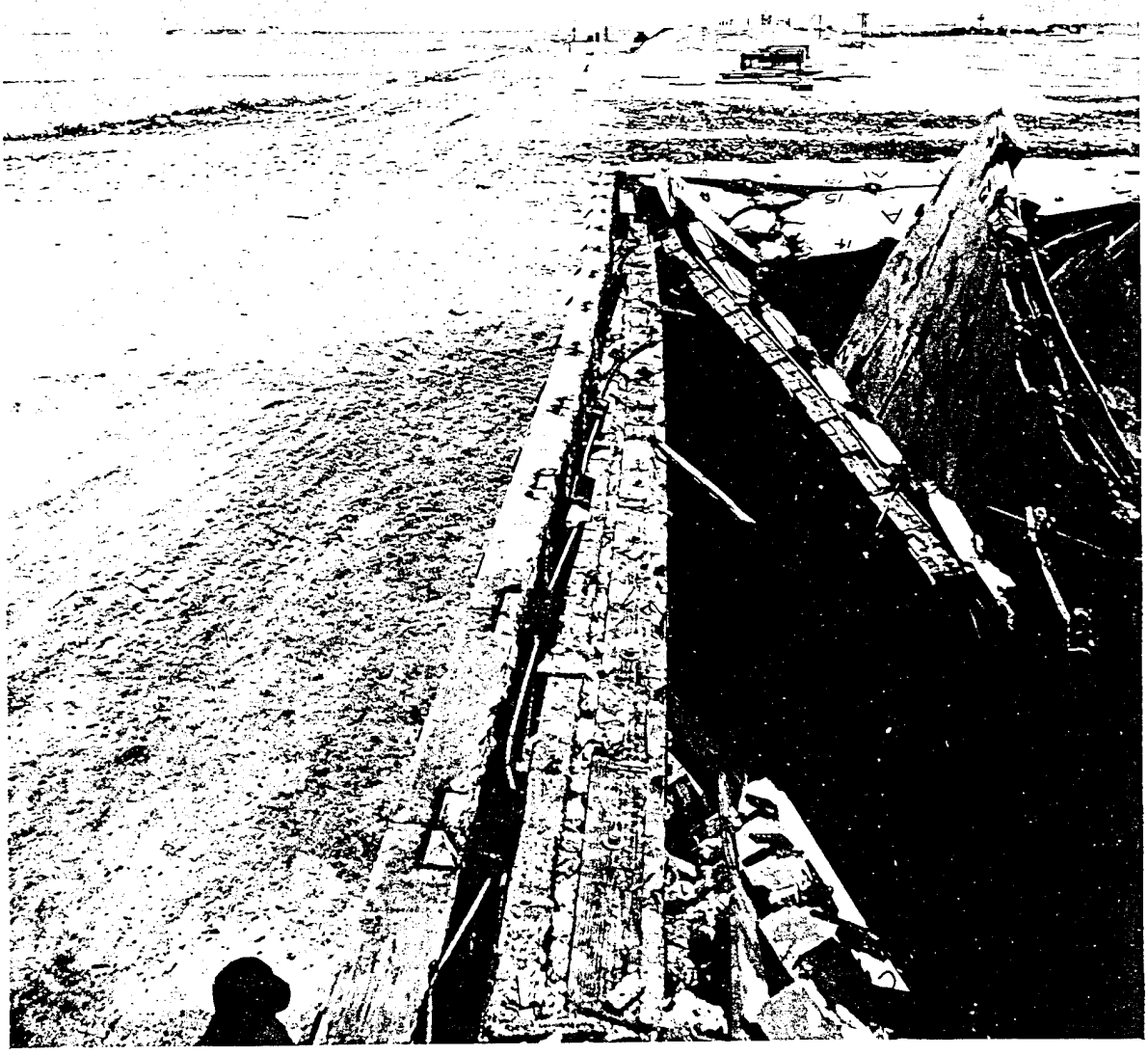


Fig. L.120 View Showing Dishing of Rear Wall and Welding Failures in Top Connections, Structure 3.2.2b

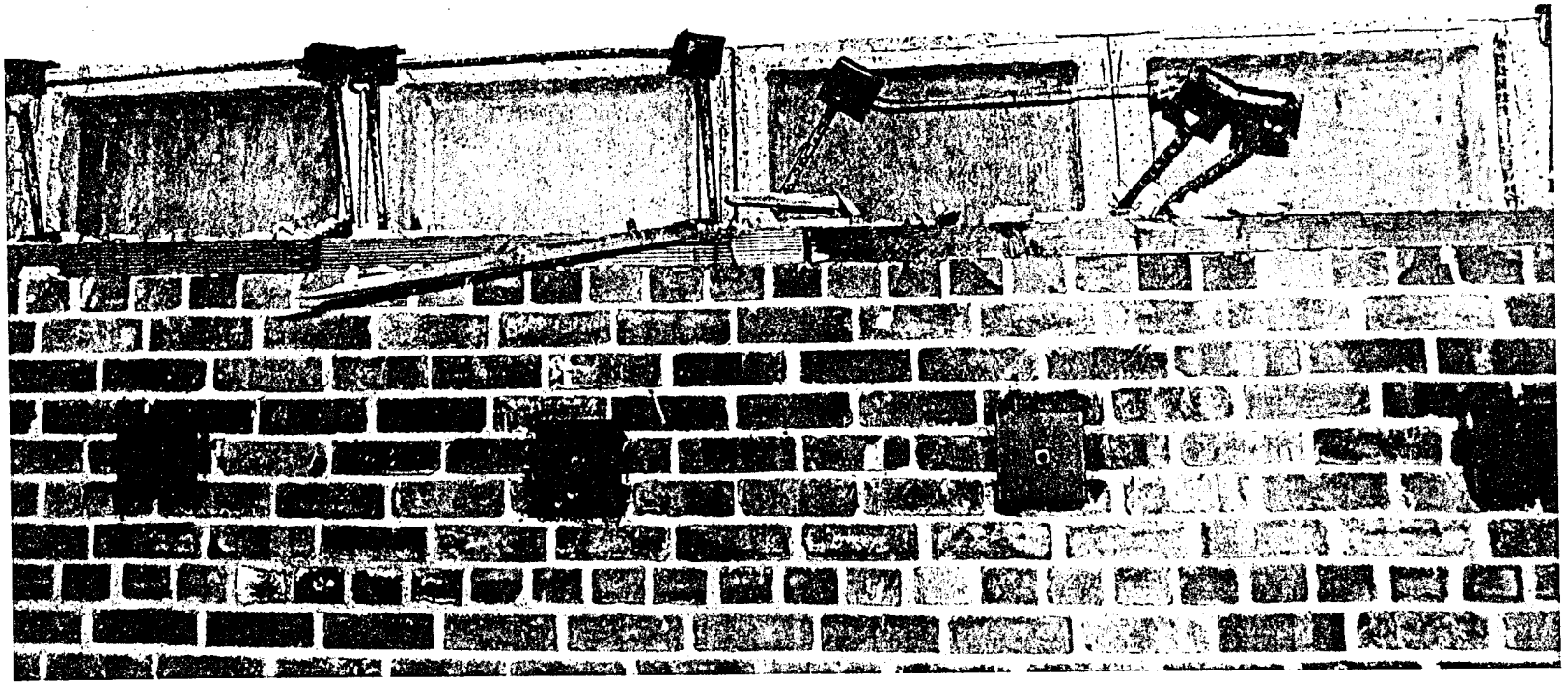


Fig. L.121 Close-up of Connection Failures atop Rear Wall, Structure 3.2.2b

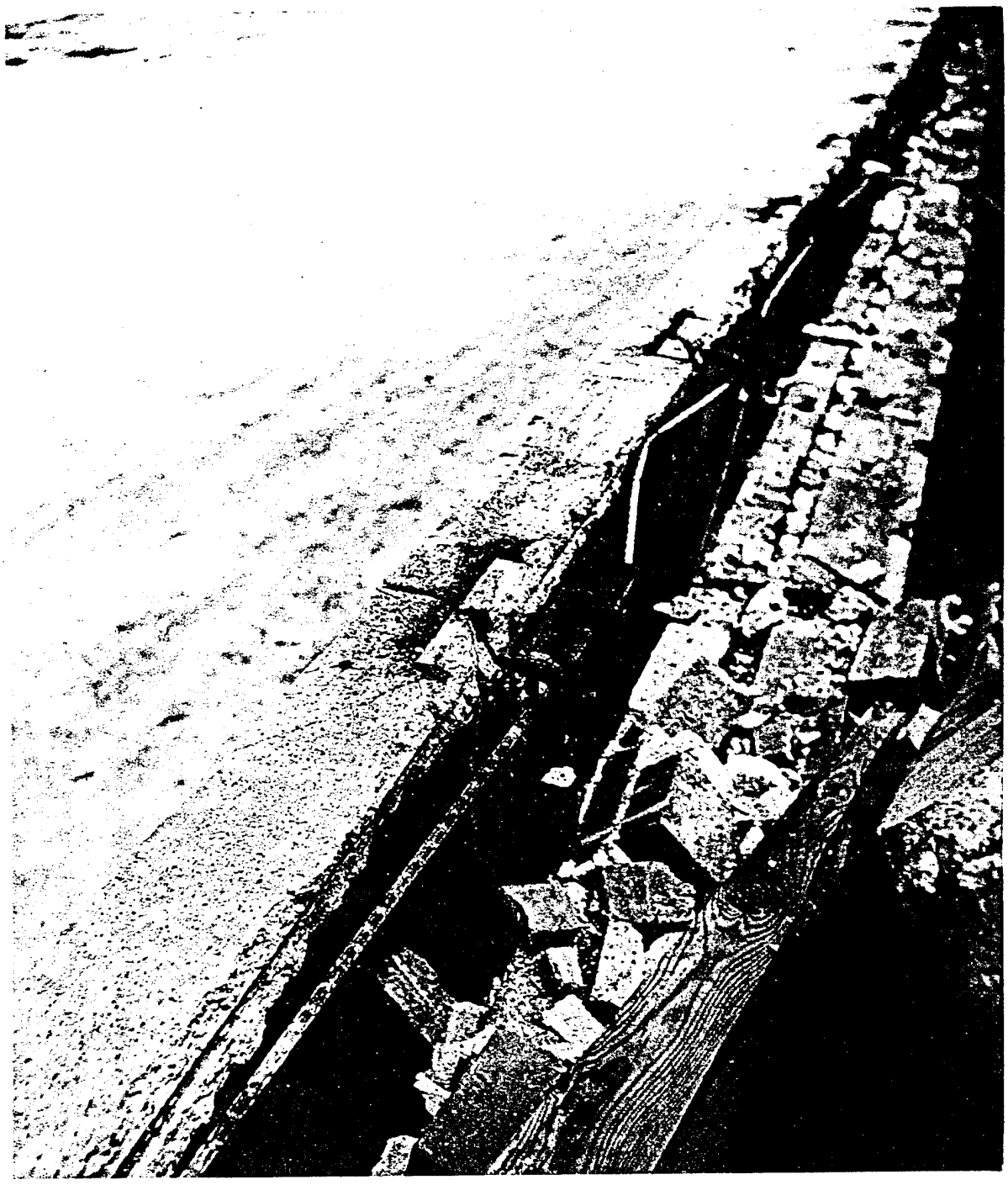


Fig. L.122 Close-up of Welding Failure at Connection Between Rear Panel and Roof Panel, Structure 3.2.2b

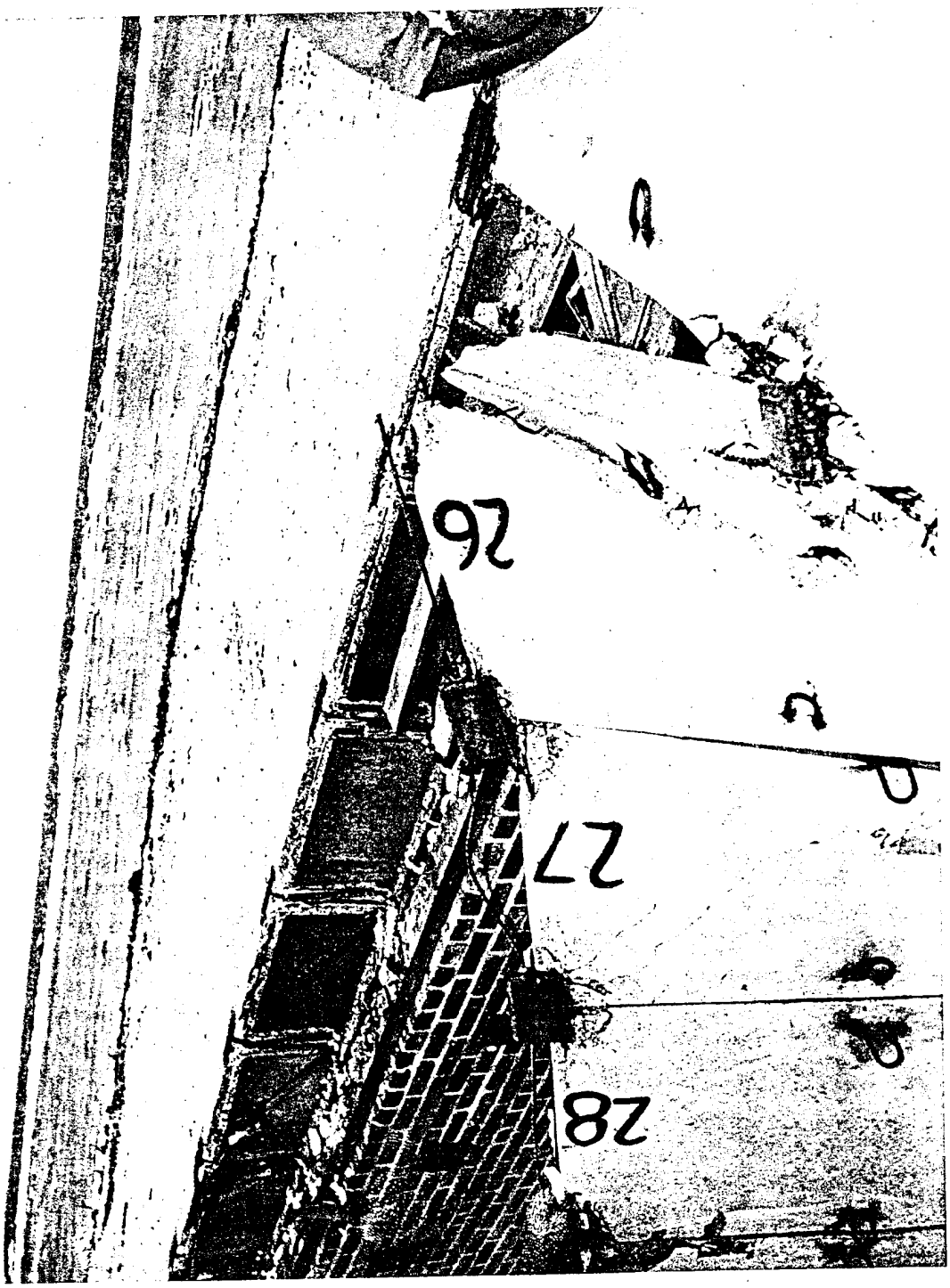


Fig. L.123 Right Rear Corner, Structure 3.2.2b. Note separation of angles from tension bars in rear-wall panels.

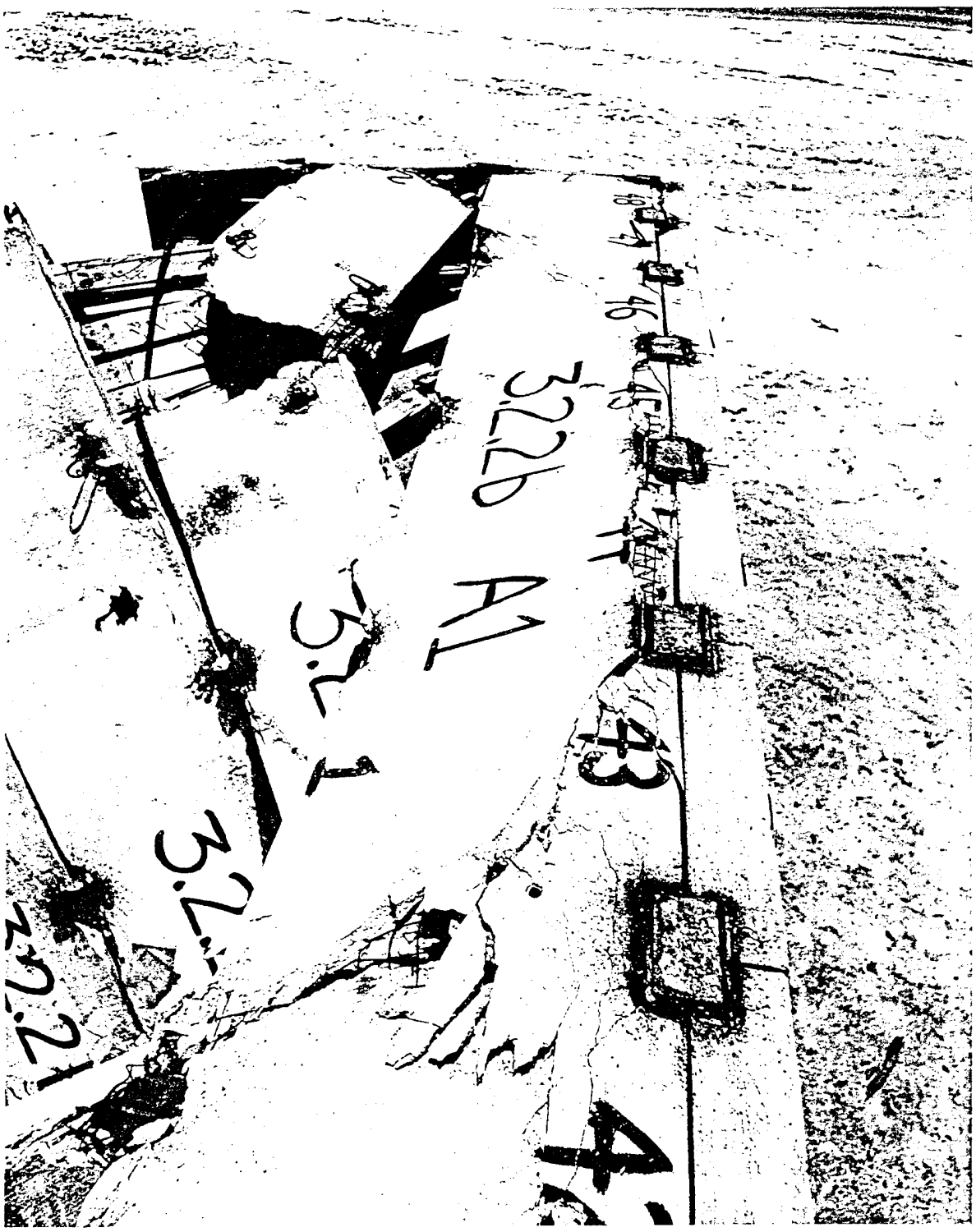


Fig. L.124 Atop Left Side Looking toward Front, Structure 3.2.2b

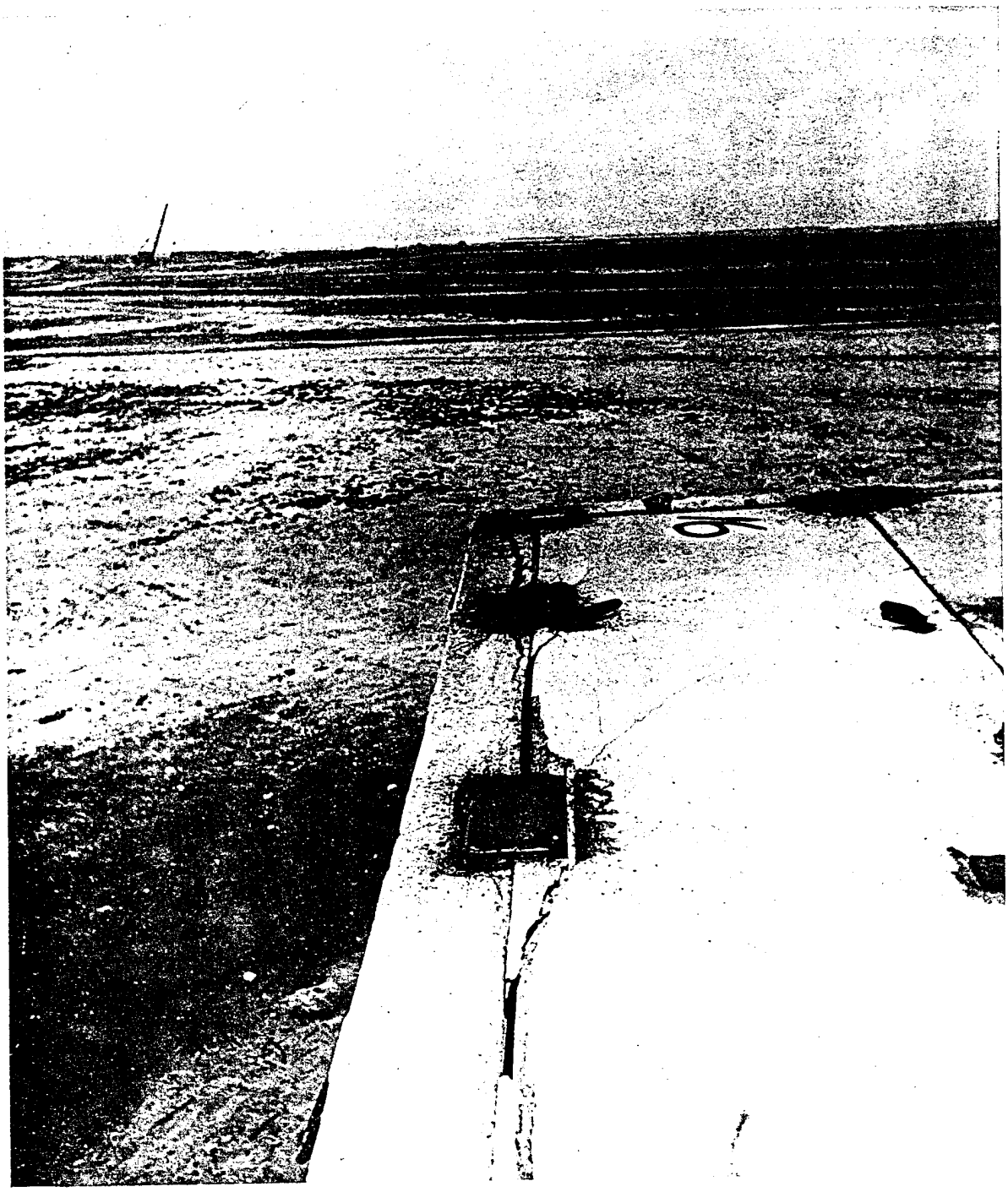


Fig. L.125 Atop Right Side Looking toward Front, Structure 3.2.2b. Note cracks at splice plates.

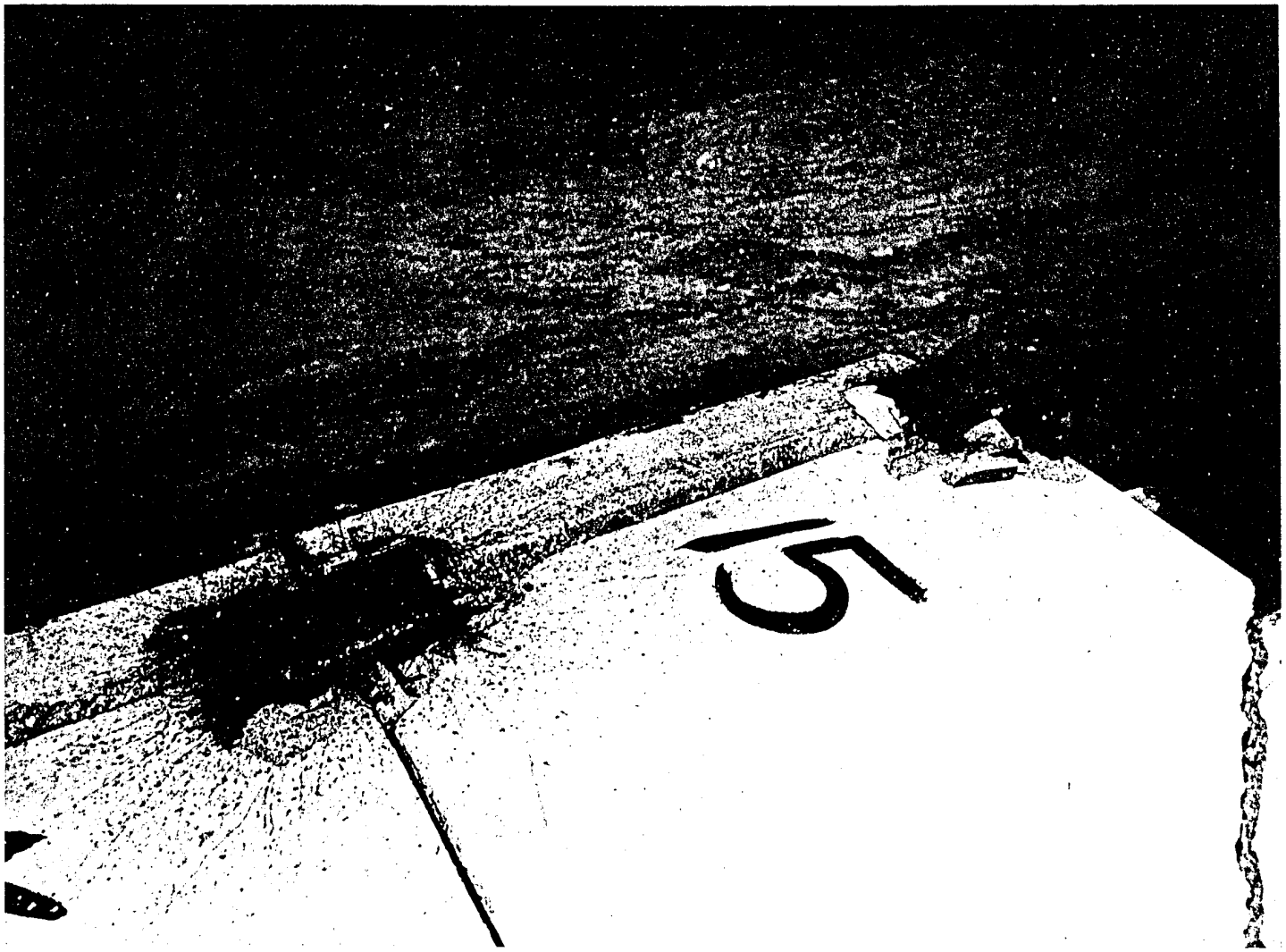


Fig. L.126 Atop Right Front Corner at Point of Roof Break Showing Stress at Splice Plate, Structure 3.2.2b

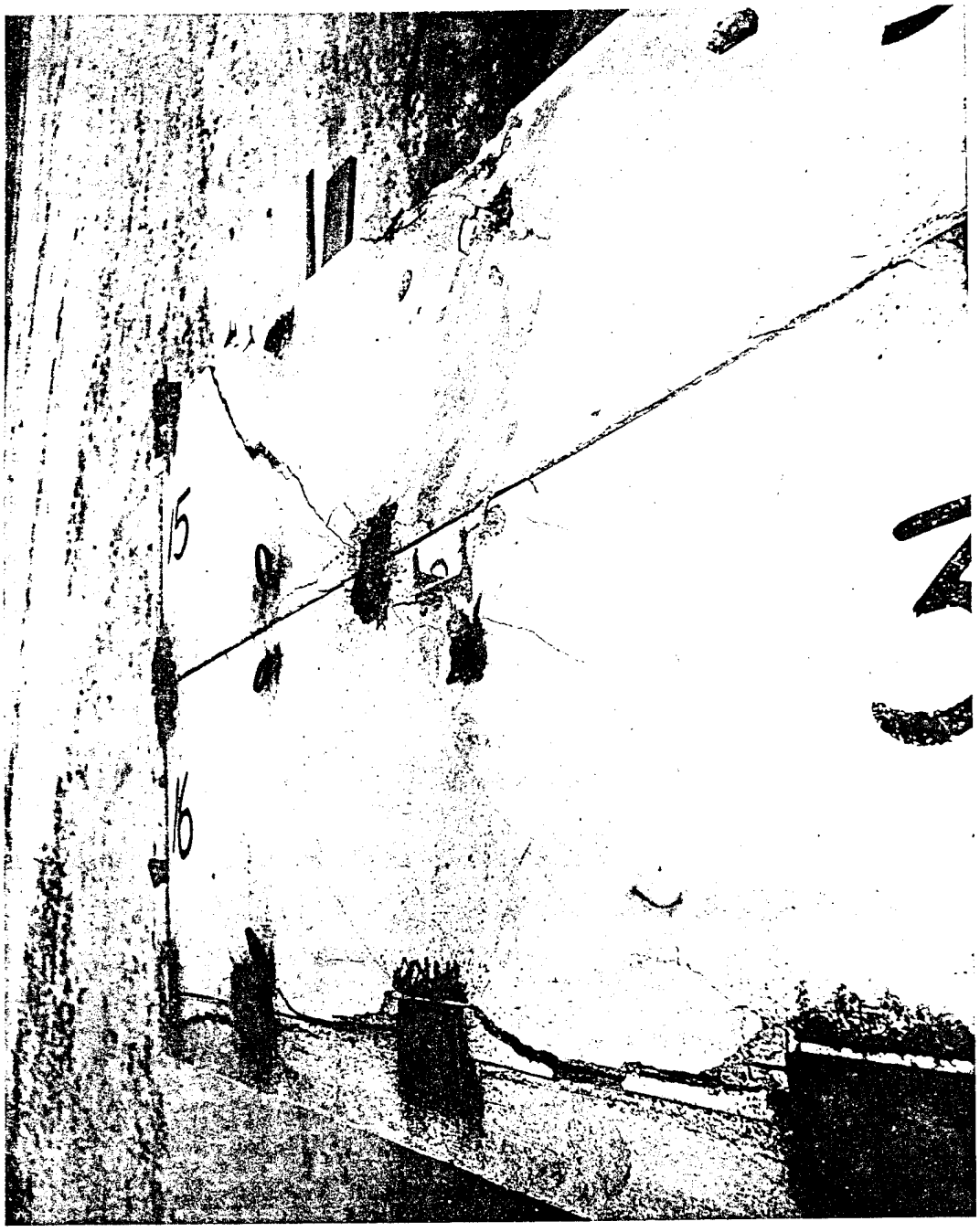


Fig. L.127 Front Half of Roof on Right Side, Structure 3.2.2b



Fig. L.128 Rear Half of Roof on Right Side, Structure 3.2.2b

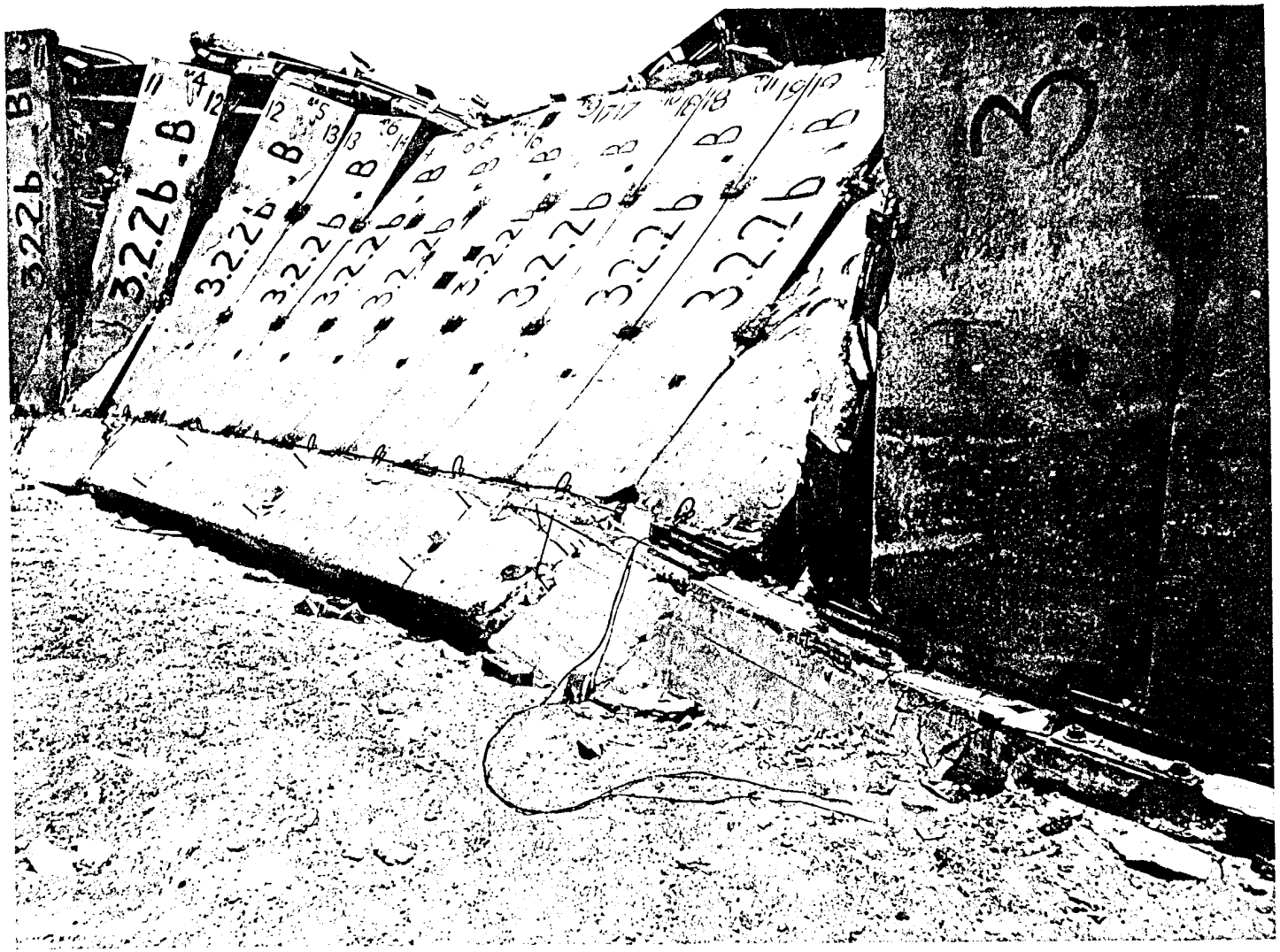

3.2.2b-B
3.2.2b-B
3.2.2b-B



Fig. L.130 Uplifted Panel Footing on Front Wall from Left after Partial Excavation to Expose Foundation on Which It Rested, Structure 3.2.2b

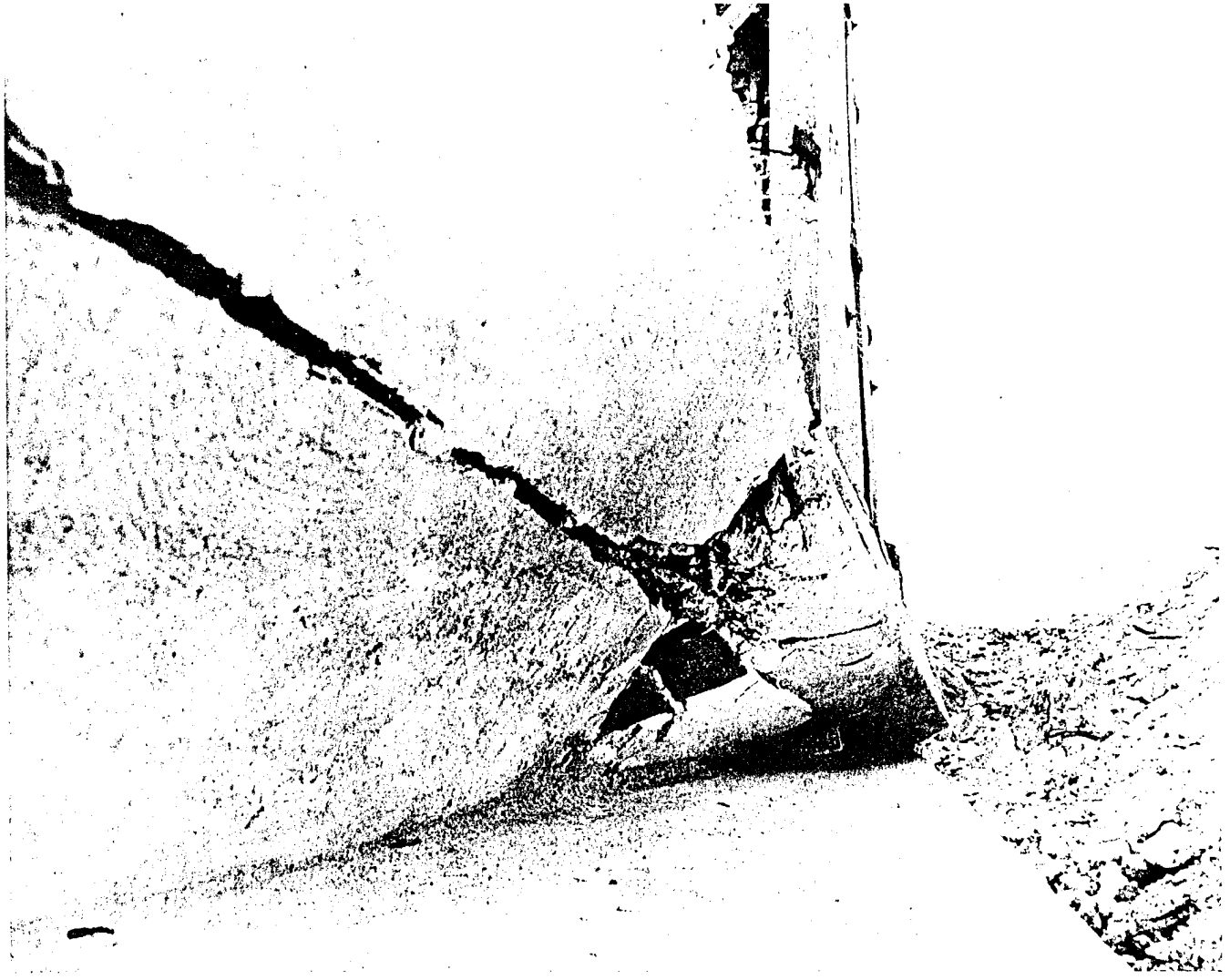


Fig. L.131 Undersurface of Front Panel Footing and Brick Wall, Structure 3.2.2b. Note lack of connection between footing and foundation slab.

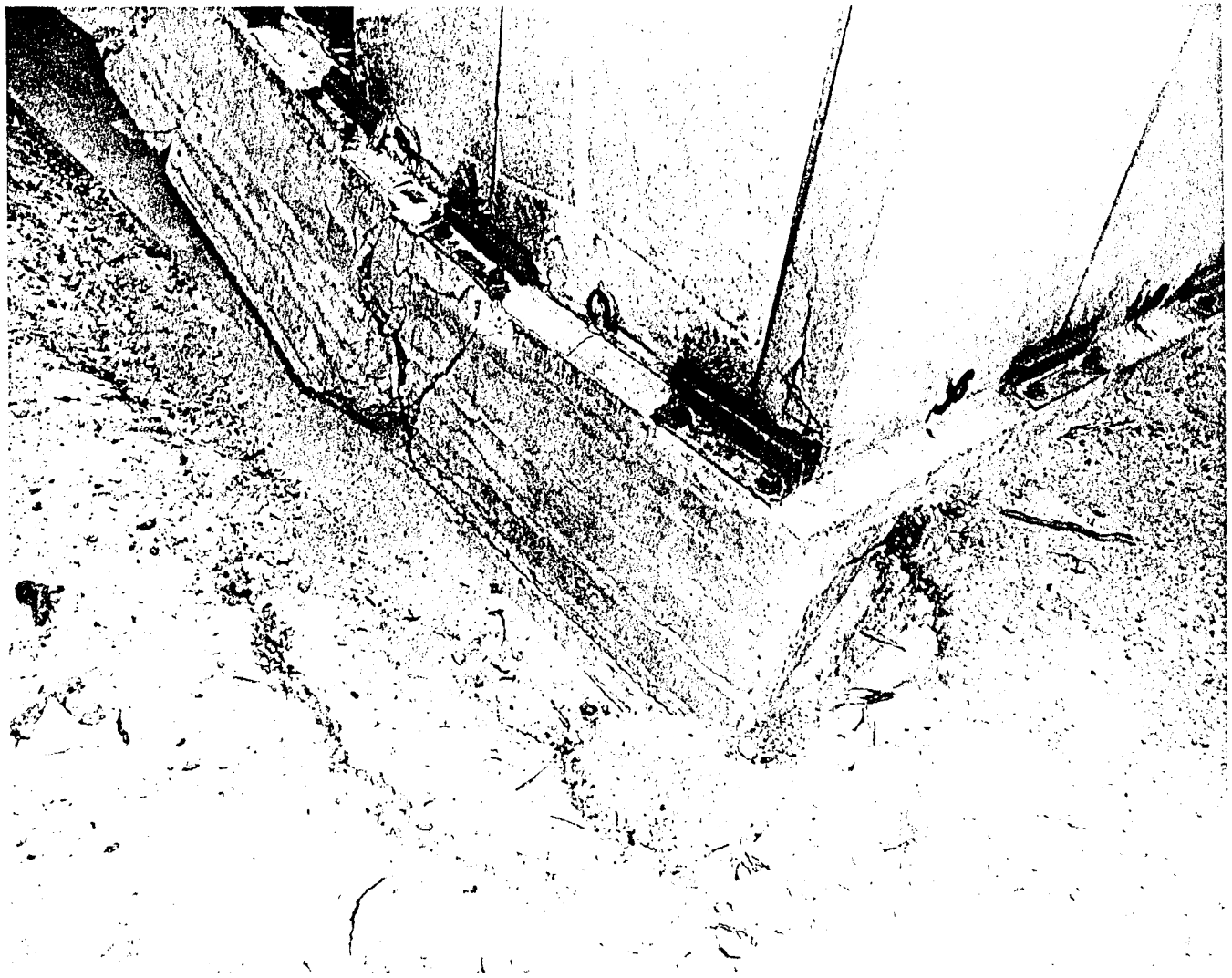


Fig. L.132 Right Front Corner Showing Footing Cracks, Structure 3.2.2b

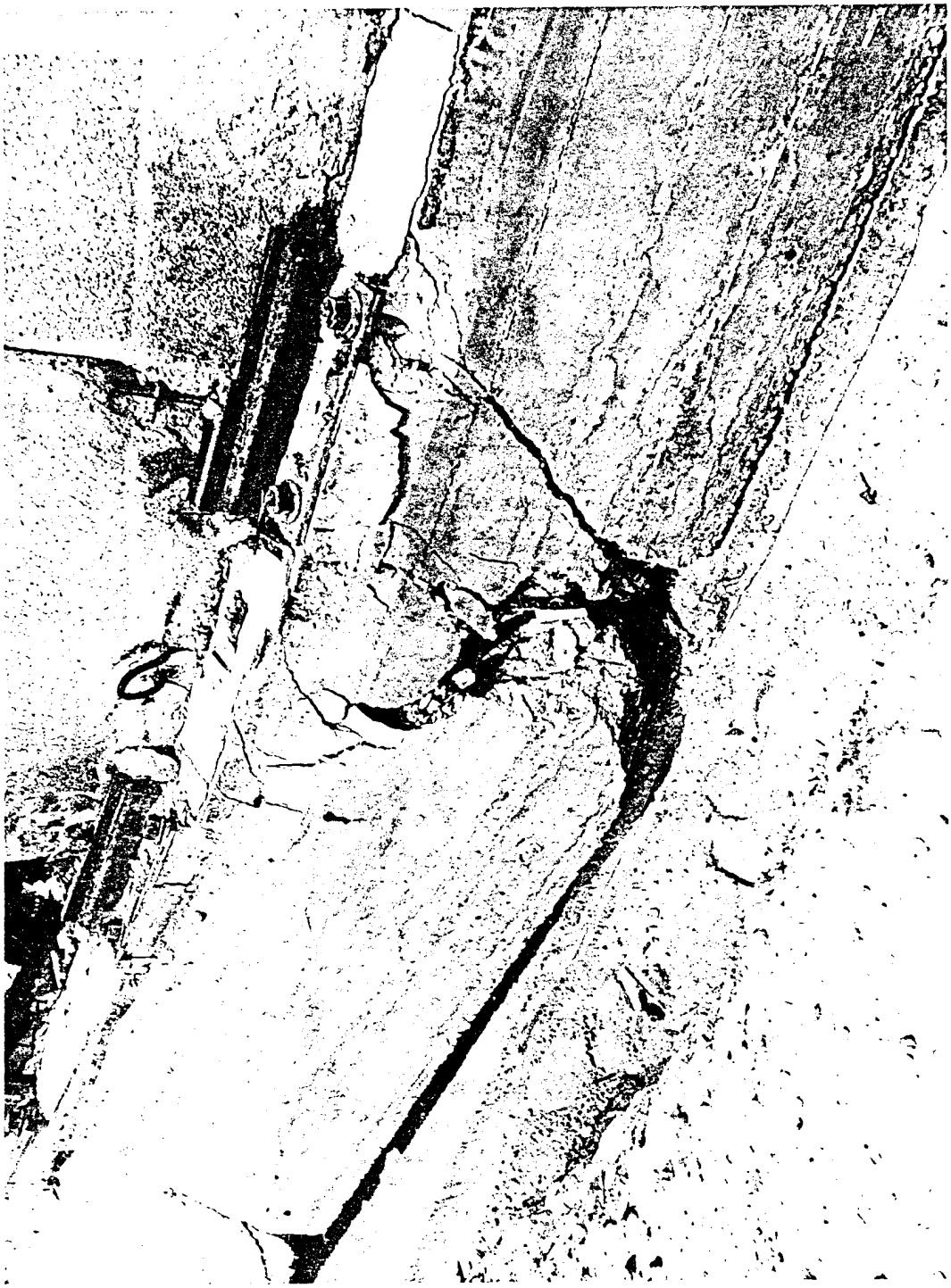


Fig. L.133 Close-up of Footing Near Right Corner, Structure 3.2.2b



Fig. L.134 Panel Footing 11 ft from Right Front Corner, Structure 3.2.2b

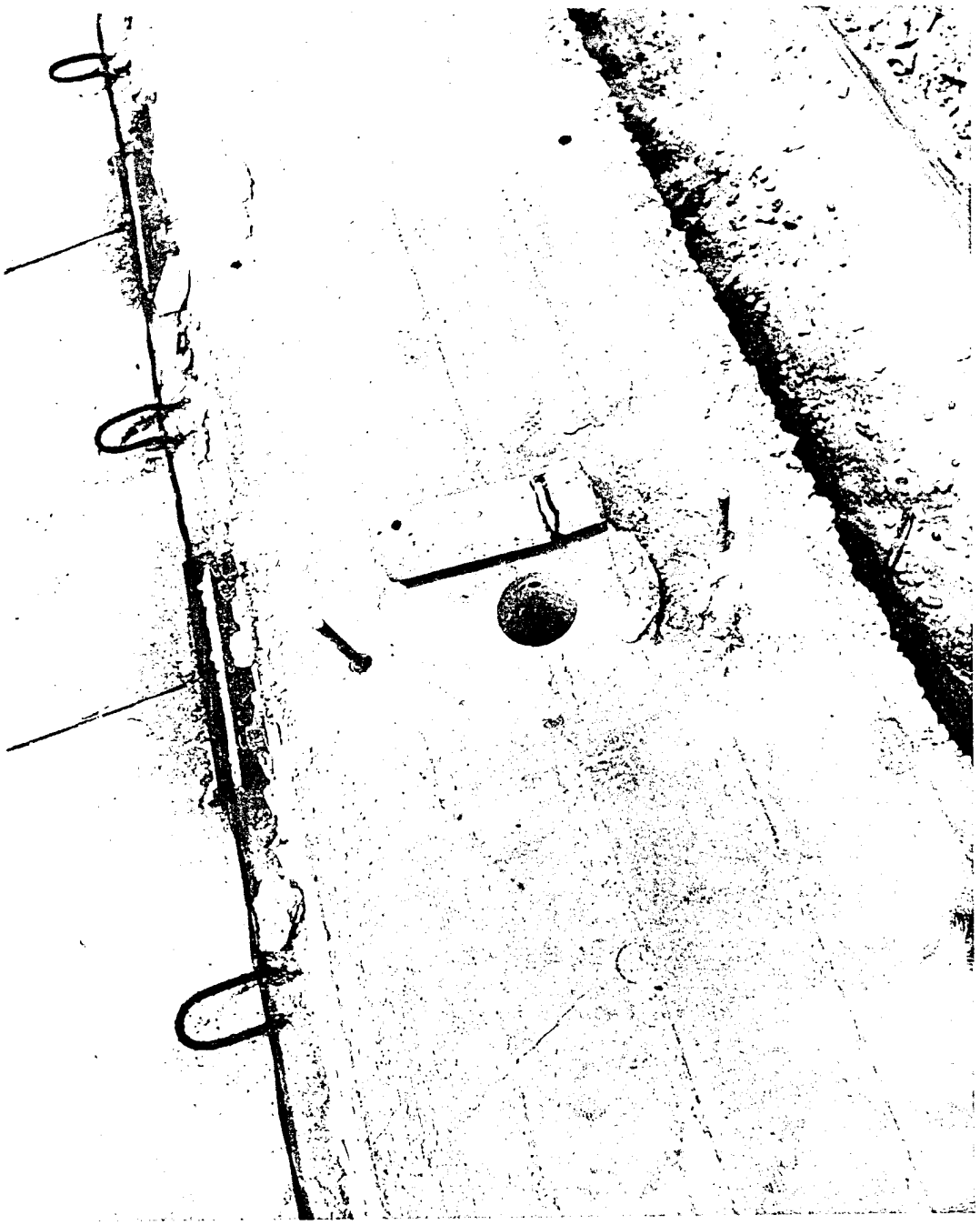


Fig. L.135 Uplifted Panel Footing Near Center, Structure 3.2.2b. Note 3-in. test cylinder.



Fig. L.136 Panel Footing 14 ft from Left Front Corner, Structure 3.2.2b

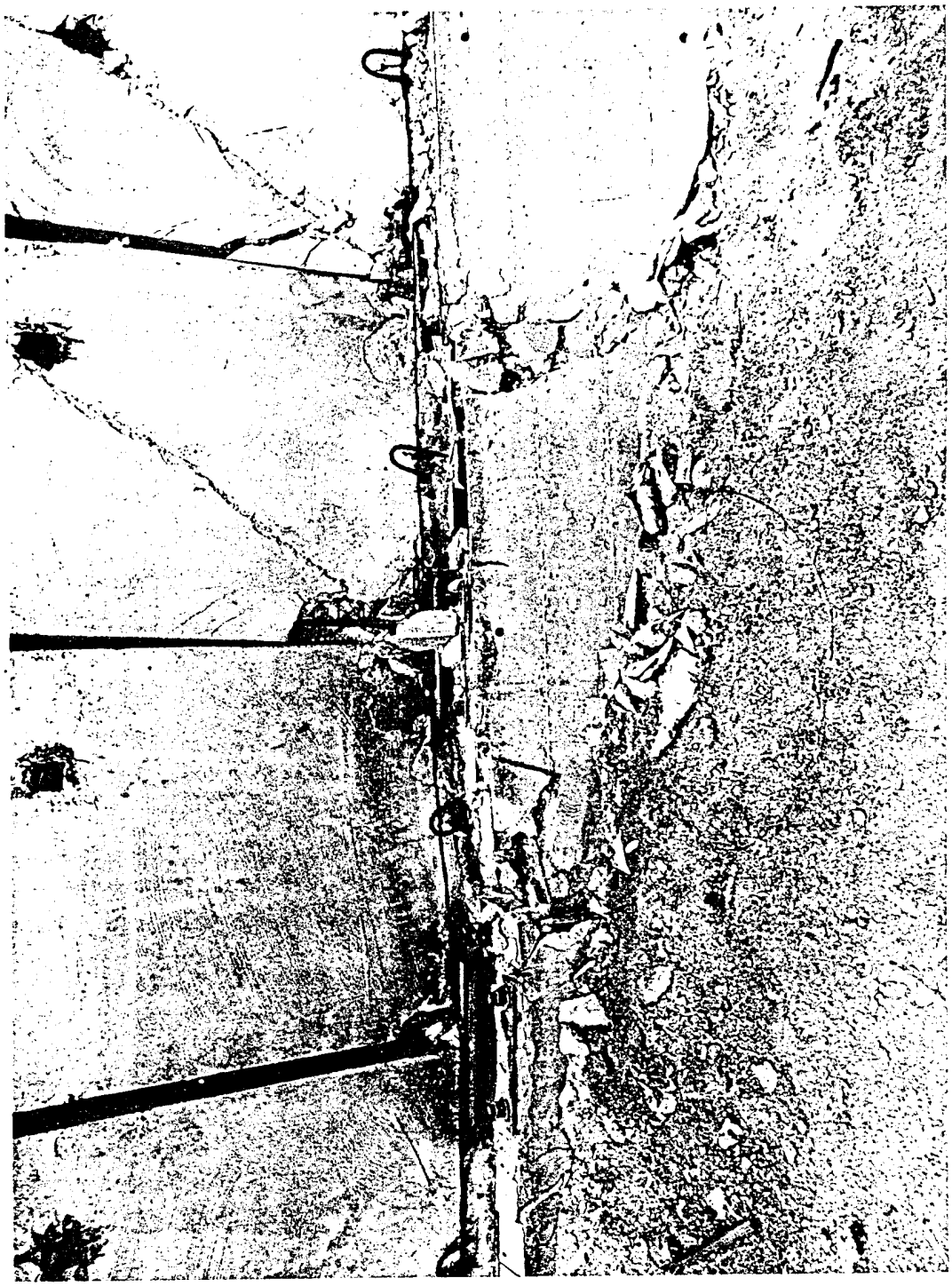


Fig. L.137 Panel Footing Near Front Corner, Structure 3.2.2b

[redacted]

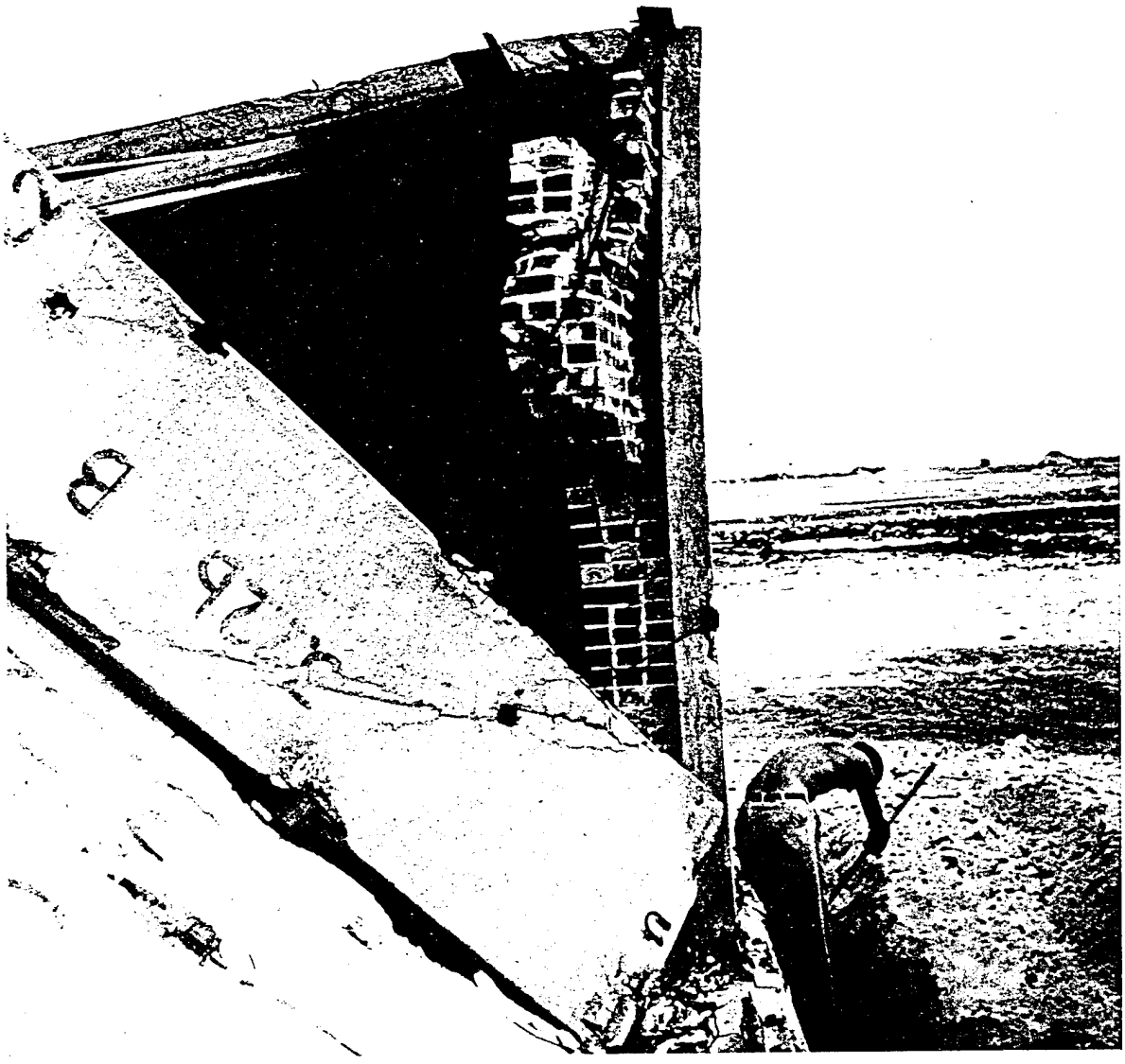


Fig. L.138 Right Front Corner Showing Overhanging Brick and Deformed Panel, Structure 3.2.2b

[redacted]



Fig. L.139 Close-up of Brick Near Right Front Corner, Structure 3.2.2b. Note breaks through brick rather than in mortar joints.

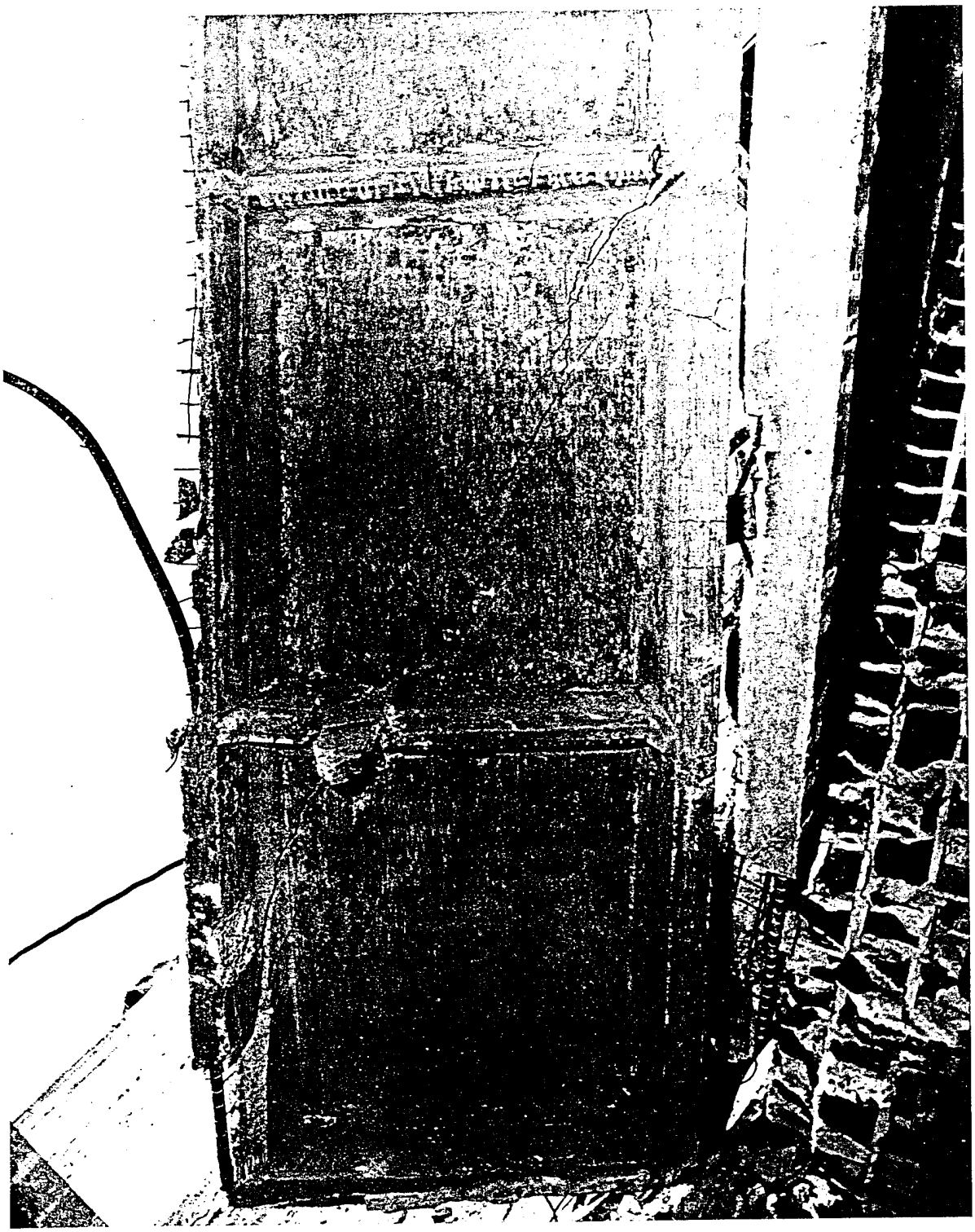


Fig. L.140 Deformations of Sub-ribs on Interior of Front Panel at Right Fold. Structure 3.2.2b

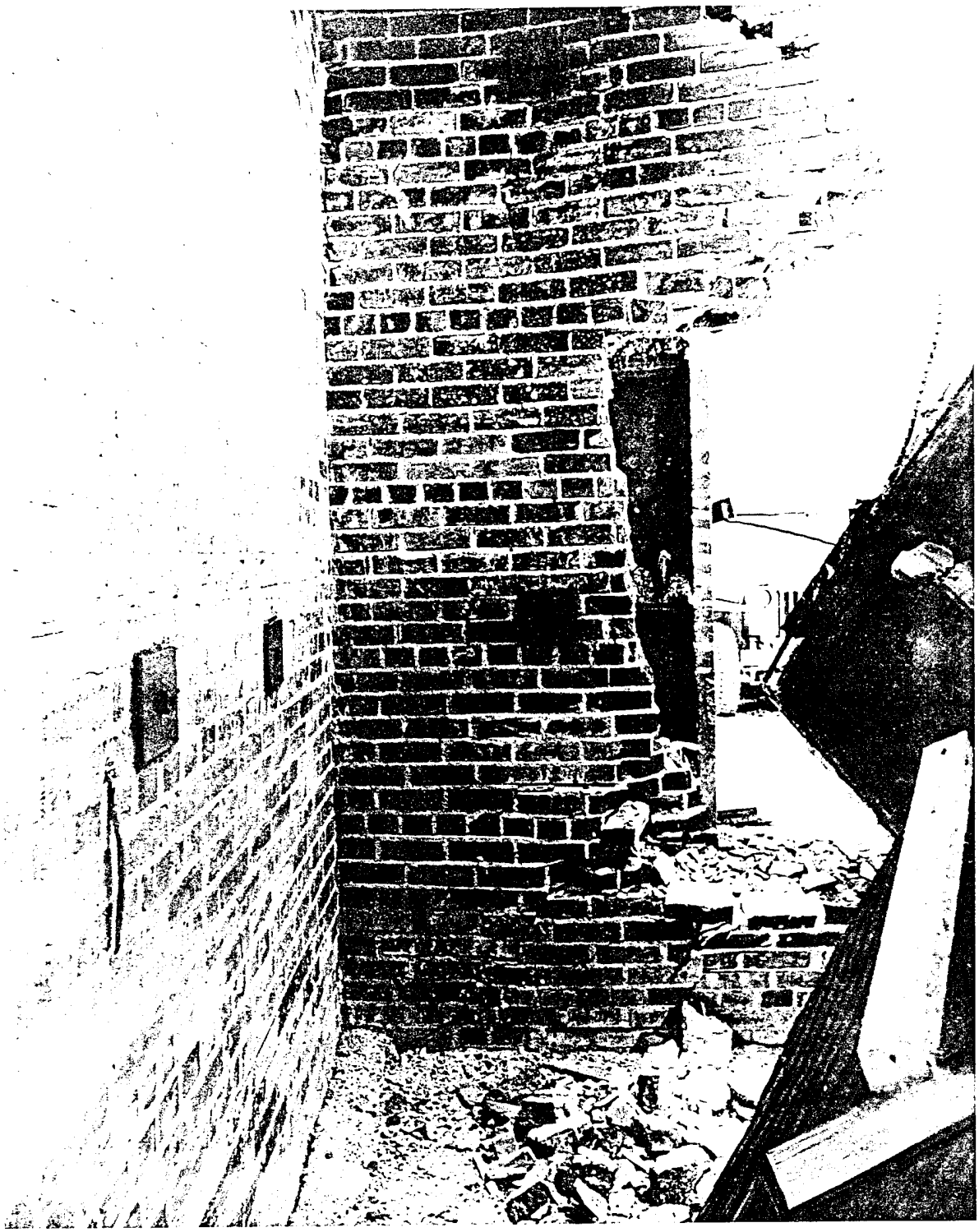


Fig. L.141 Interior of Brick Wall at Right Corner, Structure 3.2.2b

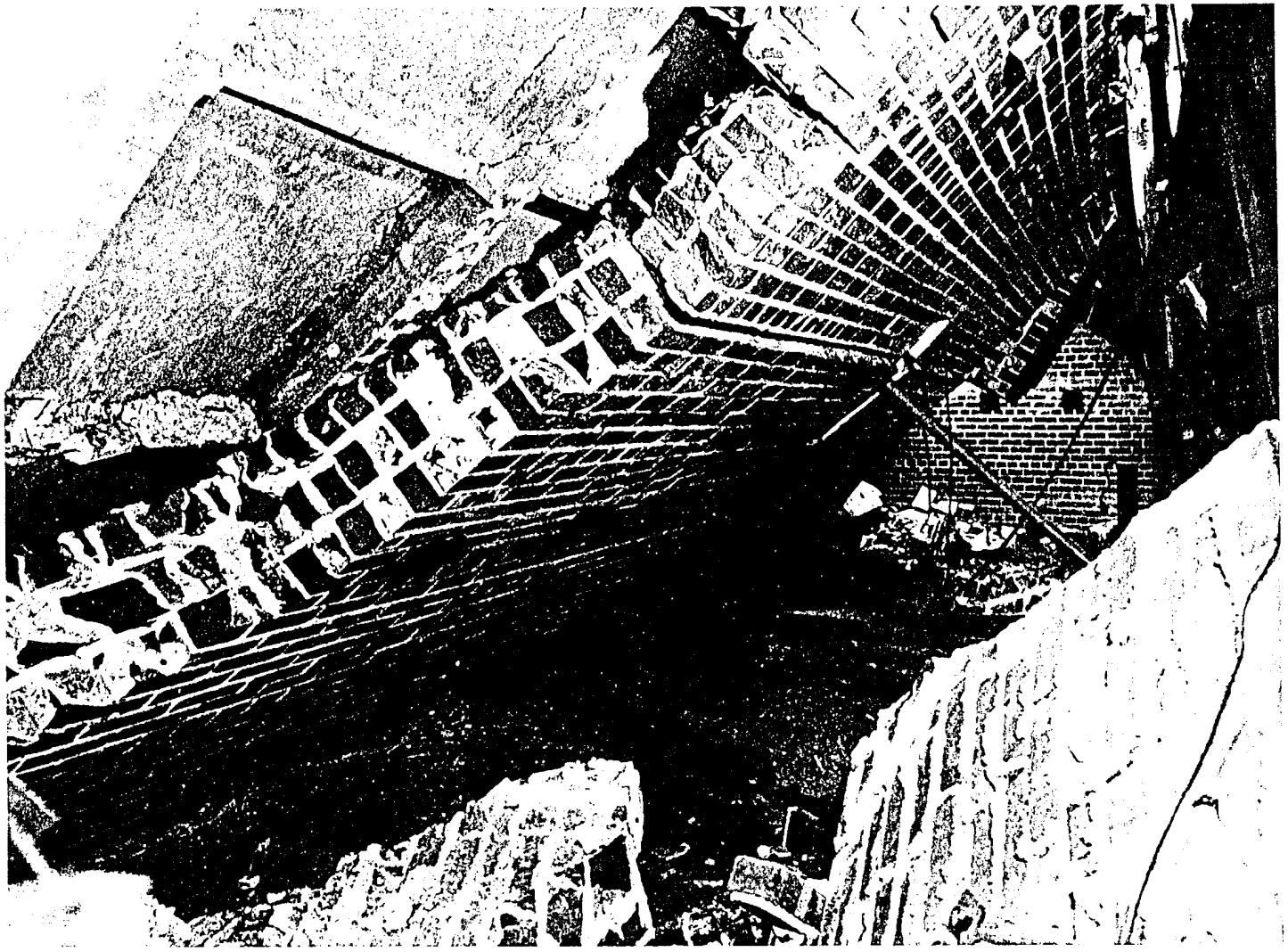


Fig. L.142 Brick Wall Hanging to Underside of Inclined Front Panels, Structure 3.2.2b

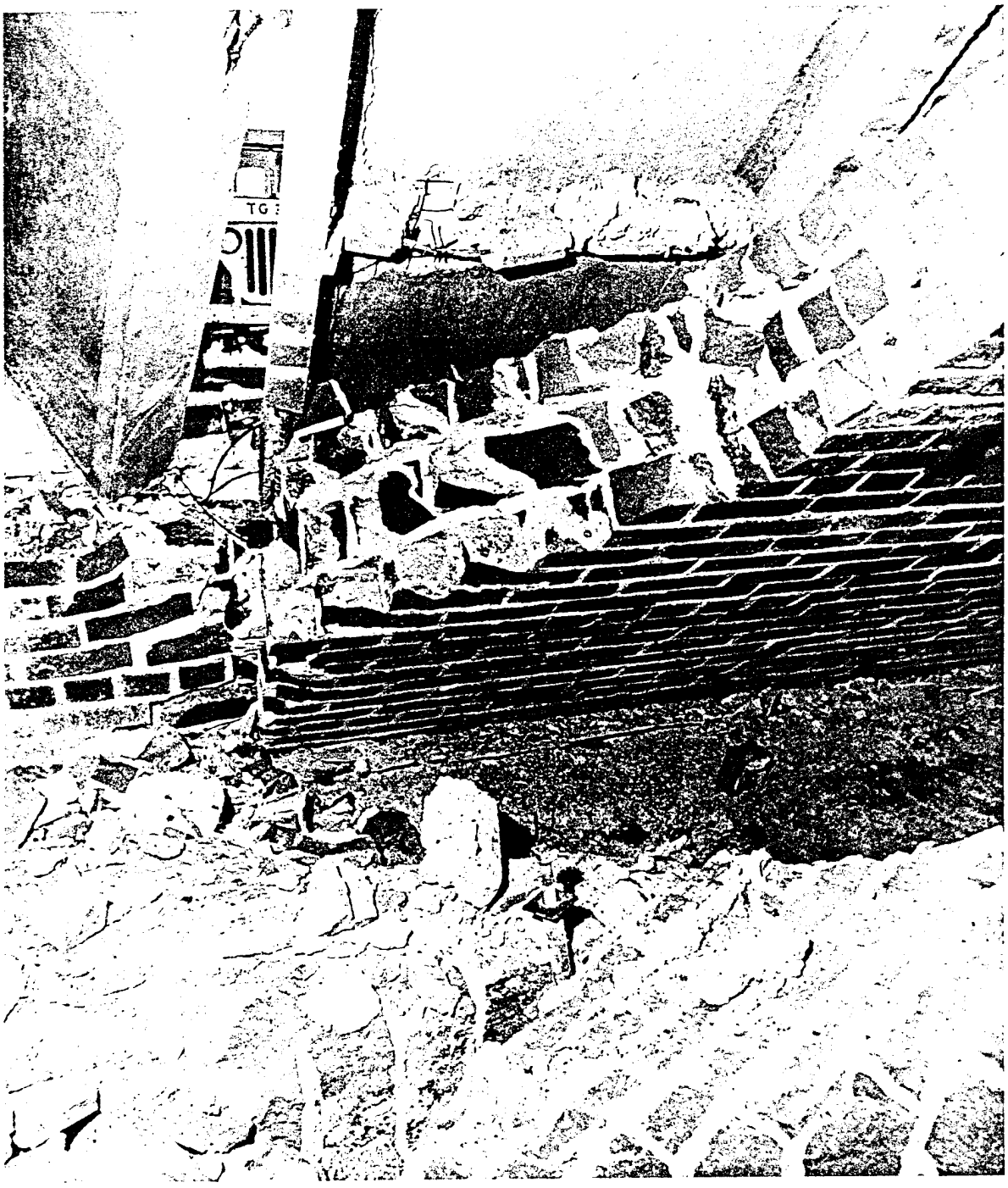


Fig. L.143 Interior Detail Showing Punctured Front-wall Panel, Structure 3.2.2b. Note brick anchor bolt in foreground which has been pulled out.



Fig. L.144 Interior View Showing Fractured Roof Joists, Structure 3.2.2b



Fig. L.145 Detail of Fracture Point in Roof Panel, Structure 3.2.2b. Note where top steel has pulled out and sheared mesh at corner.



Fig. L.146 Separation along Interior of Right End Wall Between Brick and Earth Due to Blast Pressure on Interior, Structure 3.2.2b

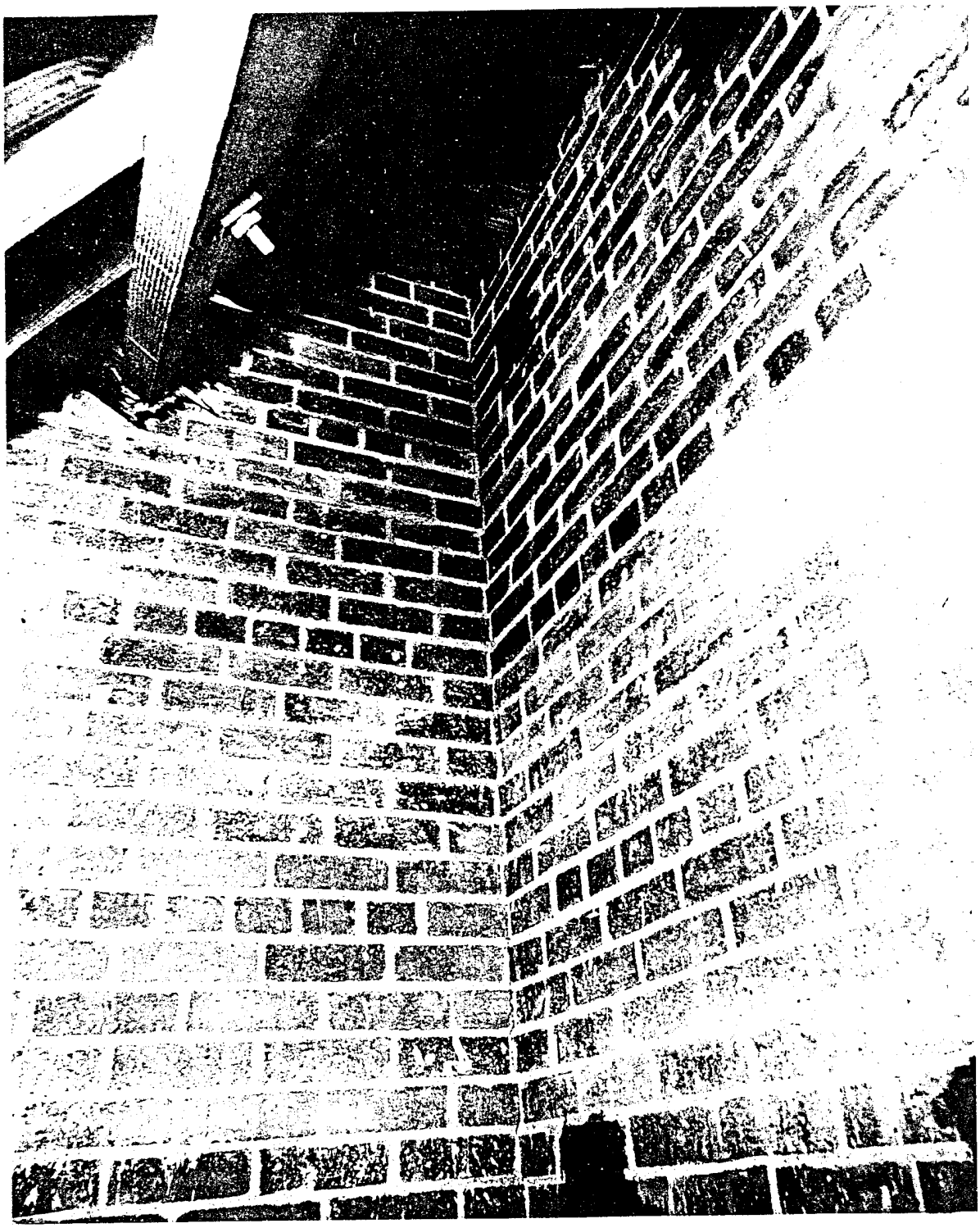


Fig. L.147 Crack in Brick at Left Rear Corner, Structure 3.2.2b



Fig. L.148 Diagonal Crack in Rear Brick Wall, Structure 3.2.2b



Fig. L.149 Interior View at Left Front Corner, Structure 3.2.2b

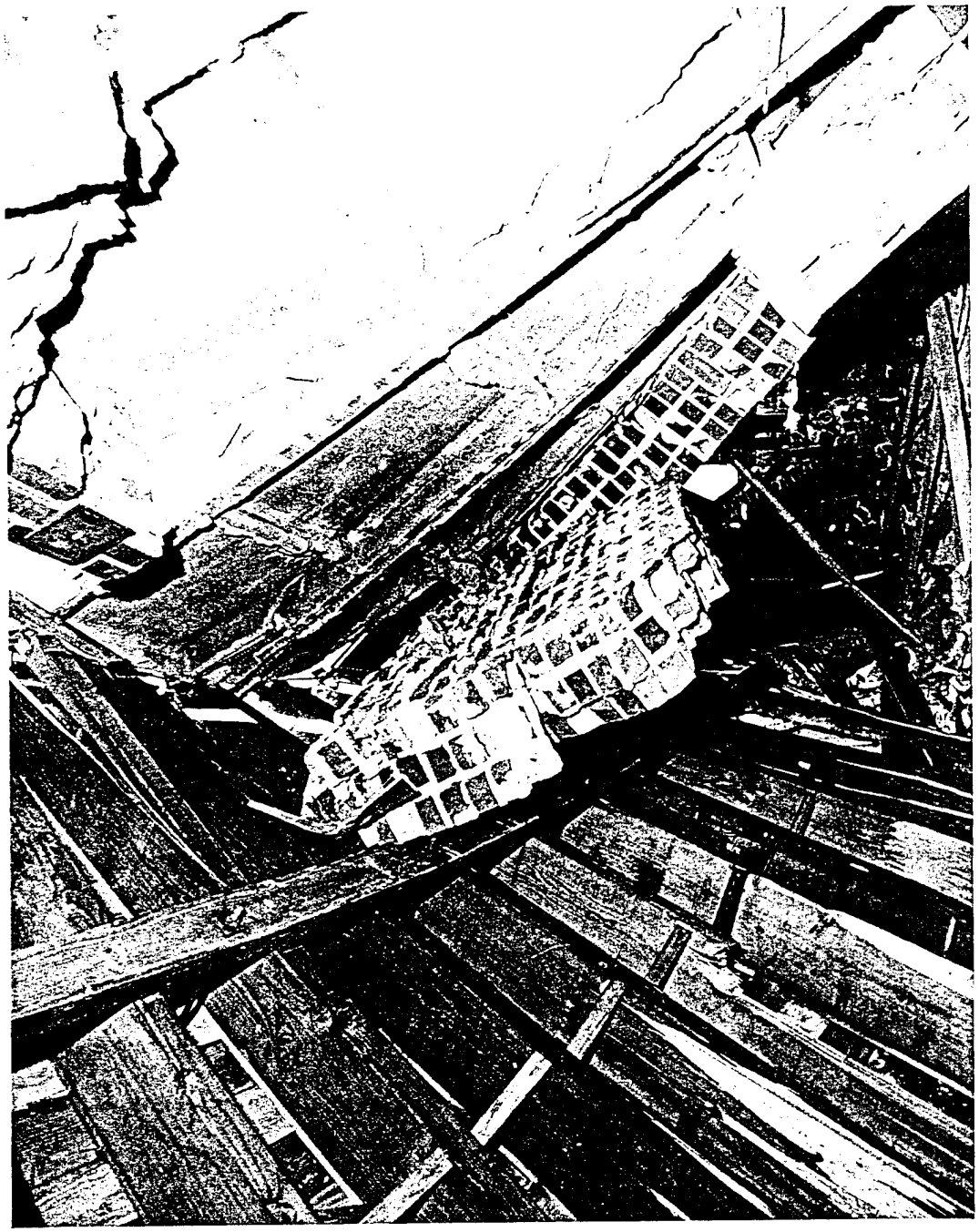


Fig. L.150 Looking toward Center Interior of Building from Left Front Corner, Structure 3.2.2b. Note hanging brick.

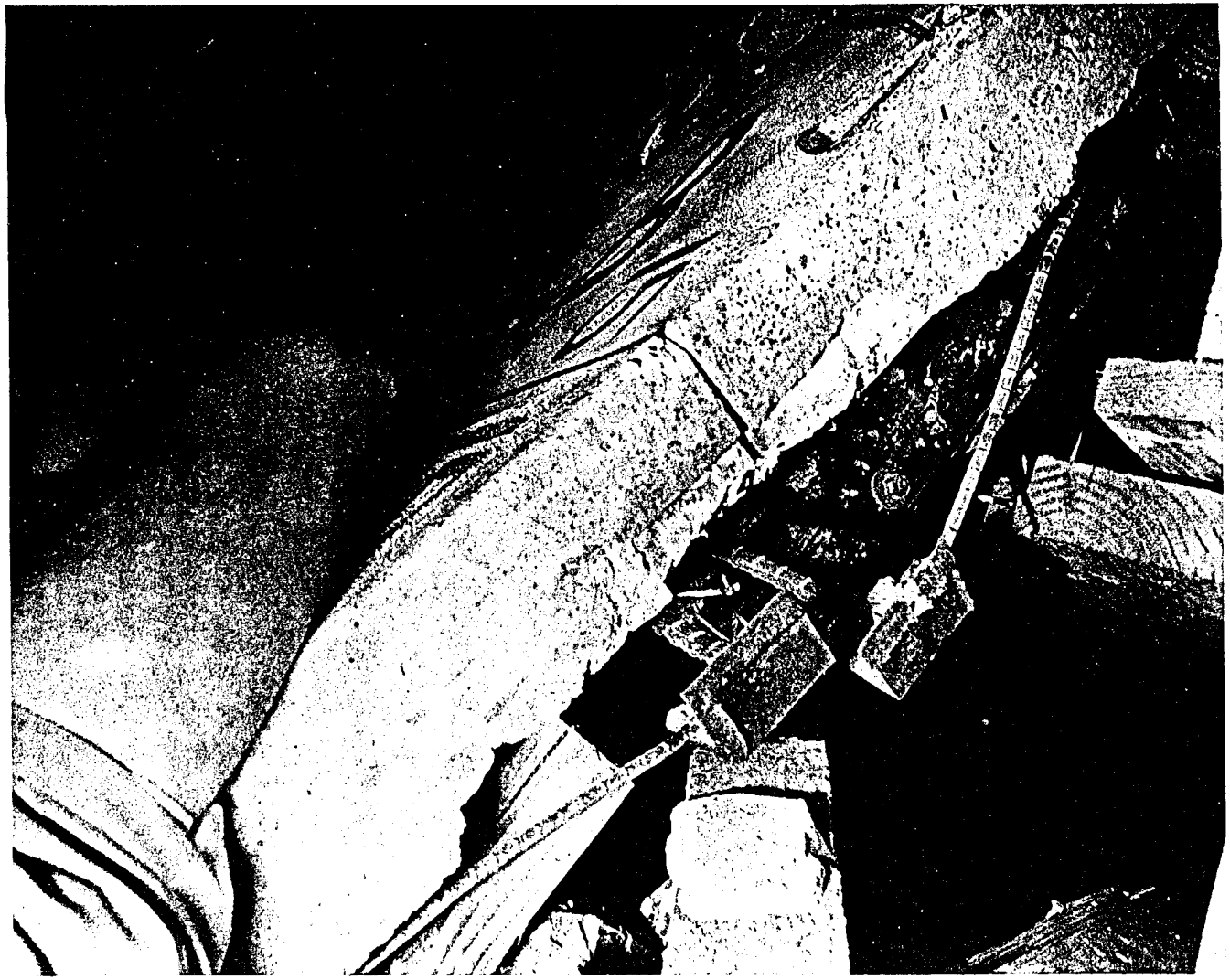


Fig. L.151 Weld Failure atop Front-wall Panel Where Splice Plate Tore Loose, Structure 3.2.2b

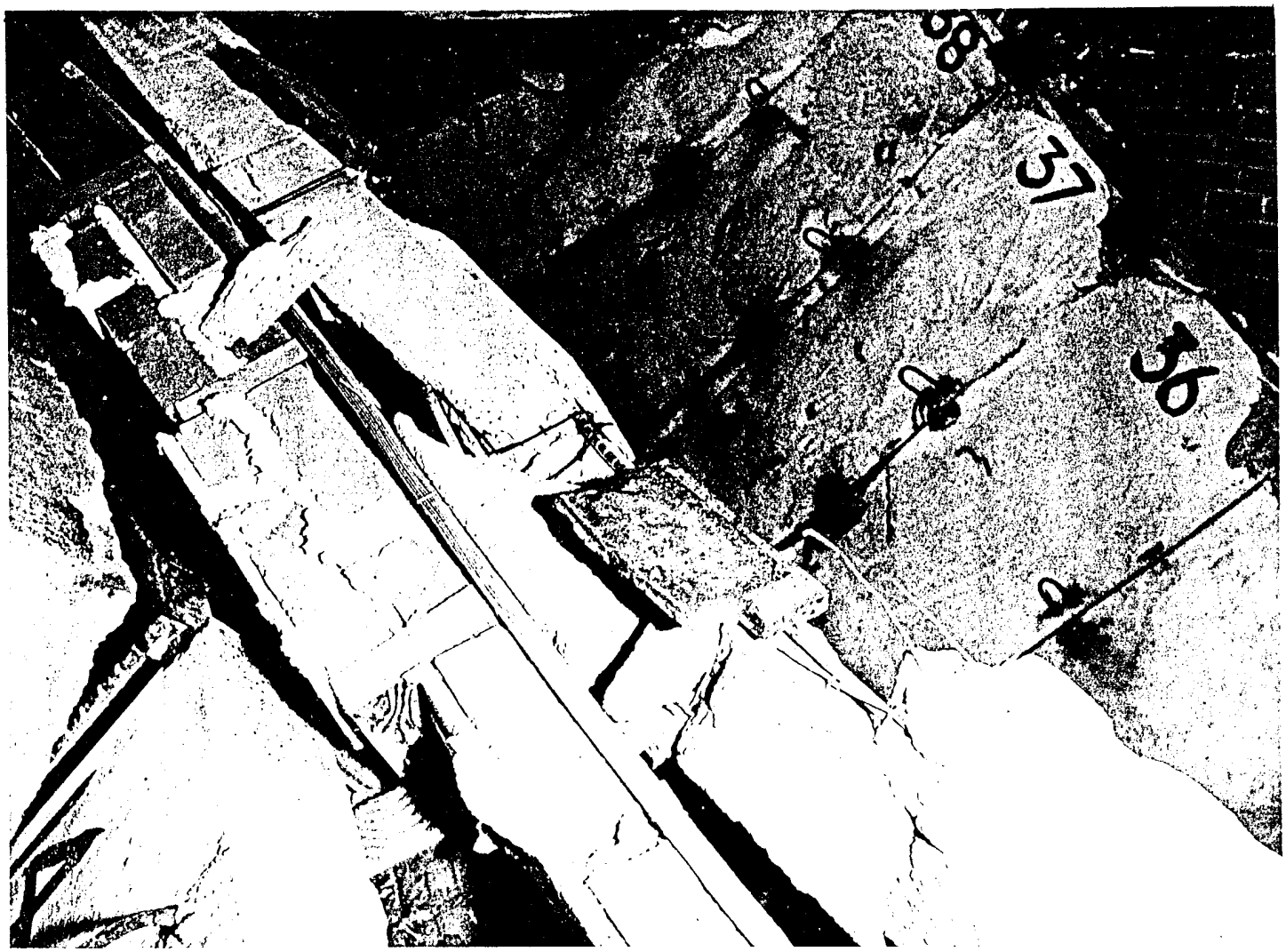


Fig. L.152 Weld Failure at Splice Plate Which Has Torn Loose from Angle atop Front-wall Panel, Structure 3.2.2b



Fig. L.153 Aerial View Taken from in Front of Structure Location, Structure 3.2.3a. Note end walls lying to the right and to the left of the foundation. Sections of roof can be seen about 100 ft behind foundation.



Fig. L.154 Aerial View Taken from Left Side, Structure 3.2.3a. Left end wall is in foreground. Rear wall is lying flat, with base still attached to foundation. Front wall is shattered.



Fig. L.155 General View of Front Foundation Edge, Structure 3.2.3a. Sand pile in right edge of photograph was dumped by a shovel and was not a result of the blast.



Fig. L.156 View along Front Edge of Foundation, Structure 3.2.3a. Isolated trusses are only remnants of front wall. Note the "S" curvature of these trusses.

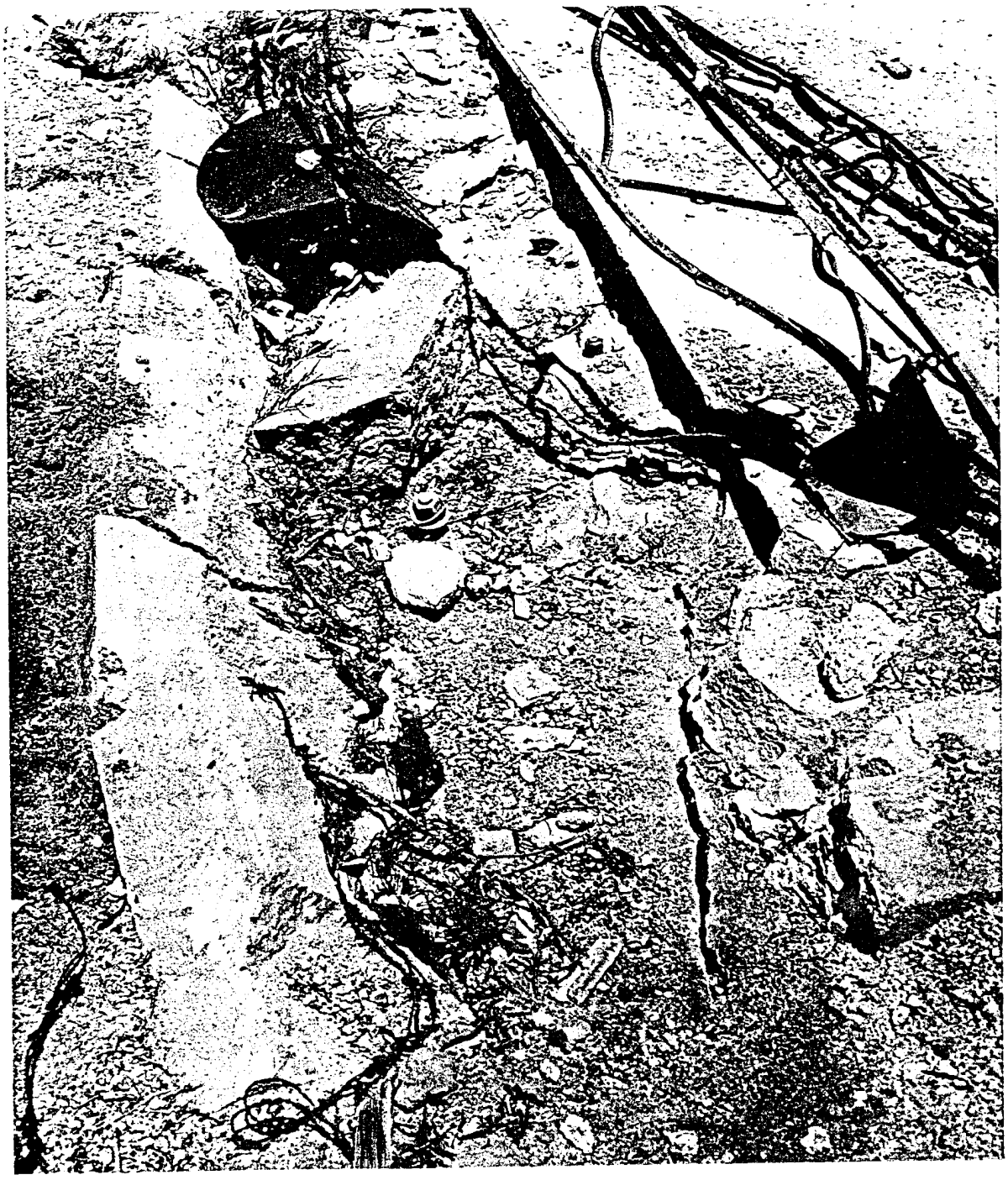


Fig. L.157 Detail View along Left Edge of Foundation, Structure 3.2.3a. Heavy foundation crack developed when left end wall was forced outward. Outer lip of foundation was broken loose by the same action.



Fig. L.158 Detail View of Base of Front Wall, Showing Small Piece of One Cell Still Remaining, Structure 3.2.3a

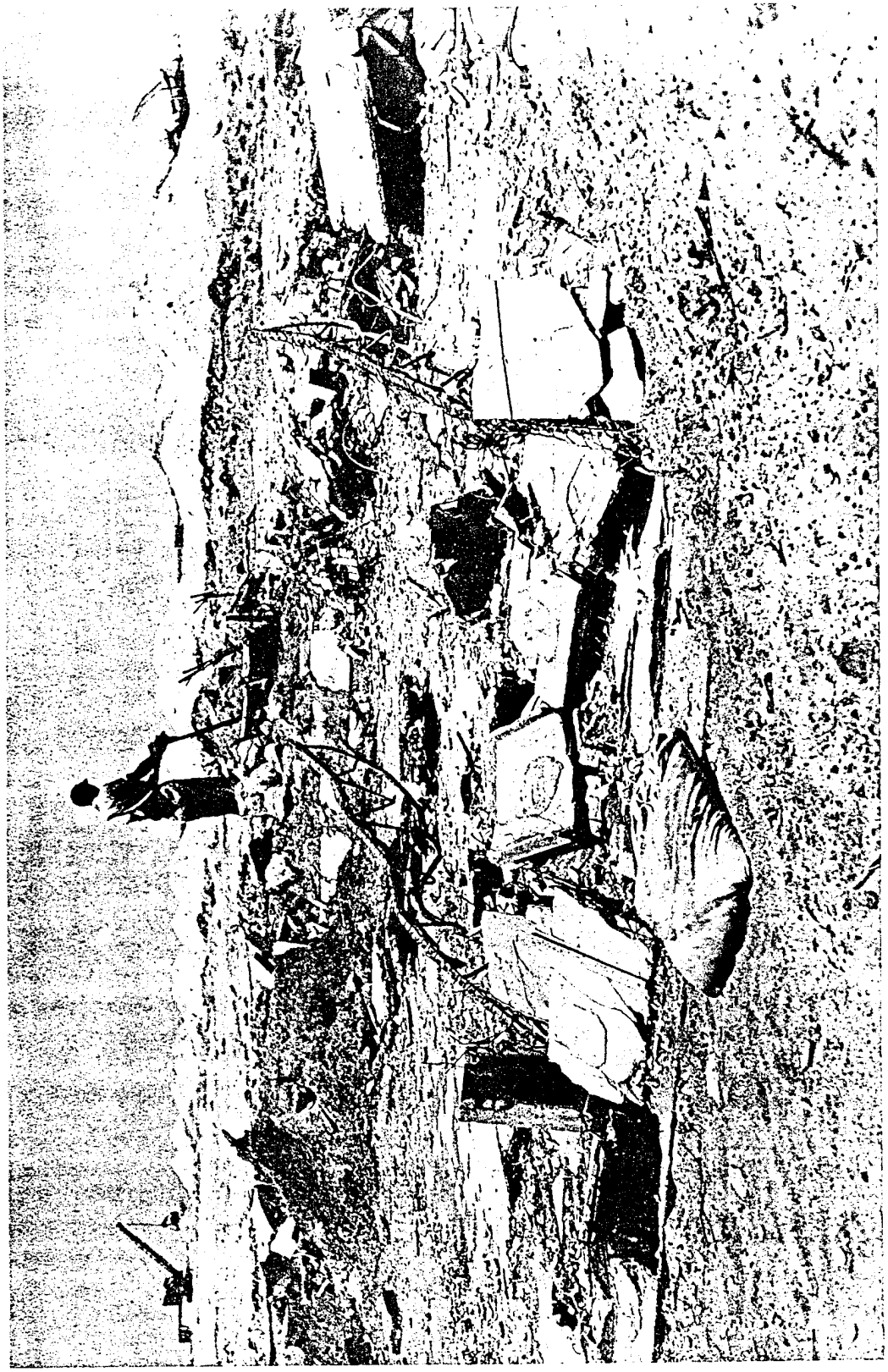


Fig. L.159 Right End of Front Foundation Line, Structure 3.2.3a. Parts of cells and two trusses remain.

[redacted]



Fig. L.160 Close-up View of Right End of Front Foundation Line, Structure 3.2.3a

[redacted]

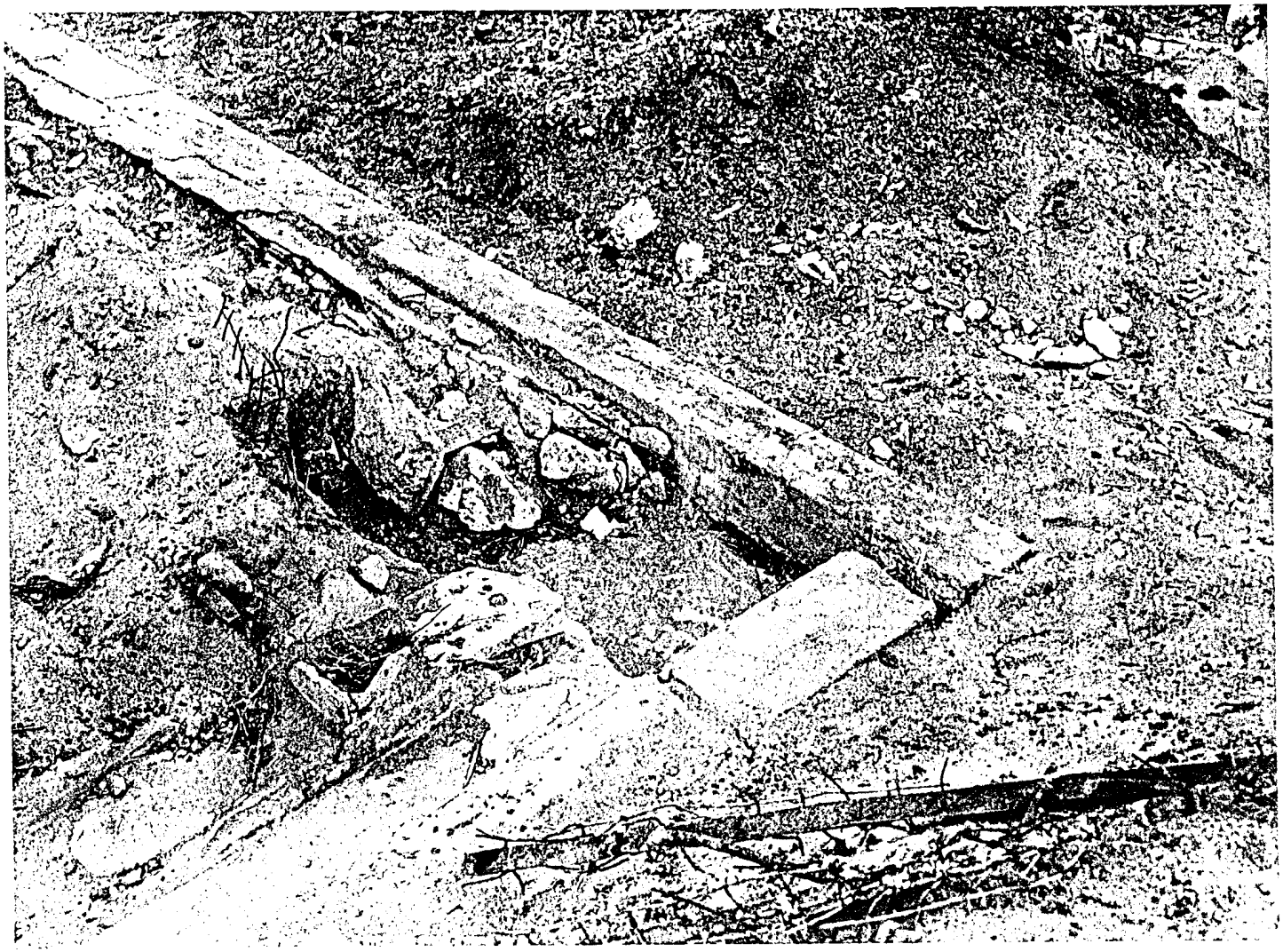


Fig. L.161 Front Right Corner of Foundation Cracked Loose When Right End Wall Was Forced Outward, Structure 3.2.3a

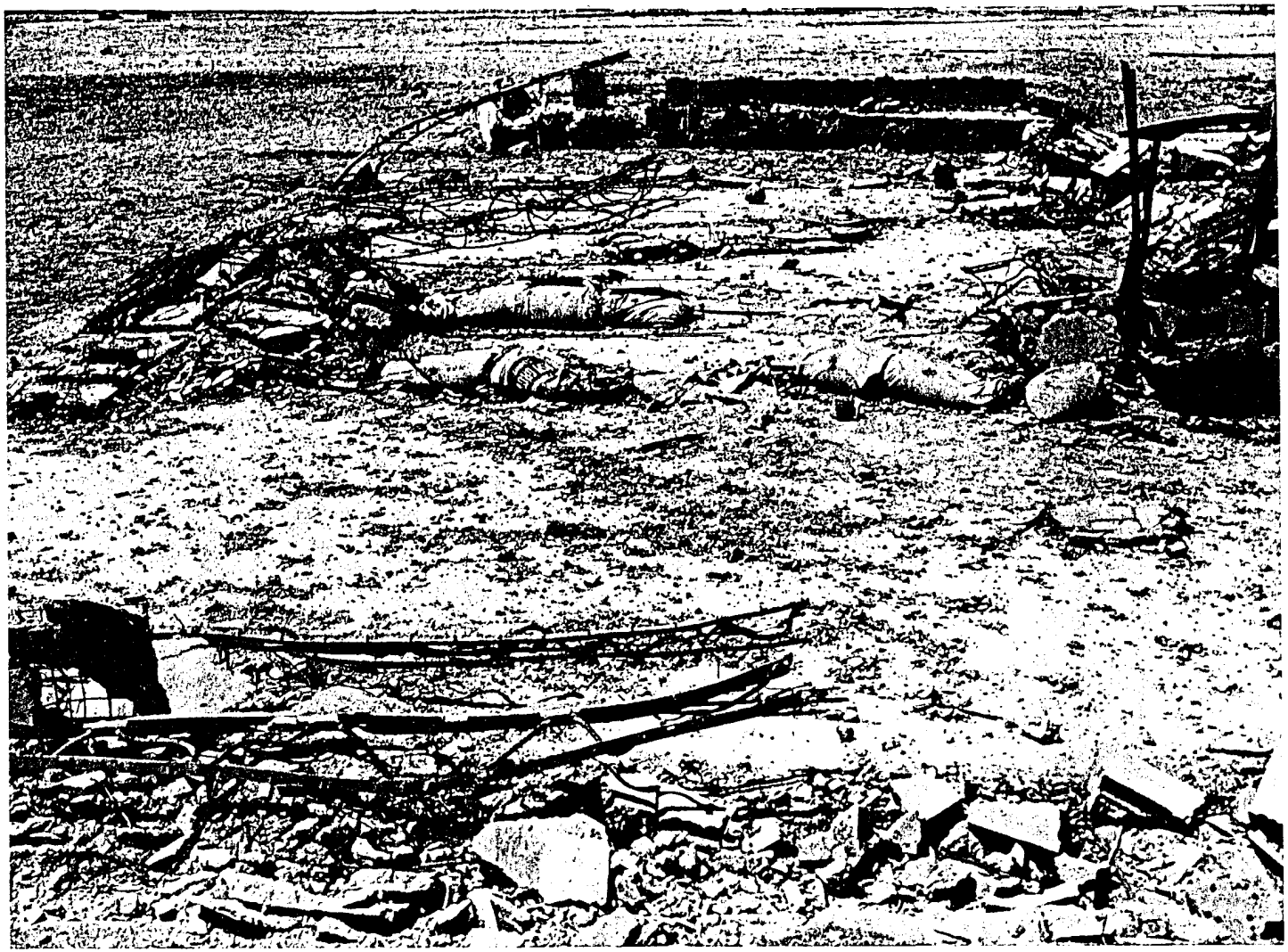


Fig. L.162 General View of Foundation, Structure 3.2.3a. Front edge is in left of photograph, and base of left end wall can be seen in center background.

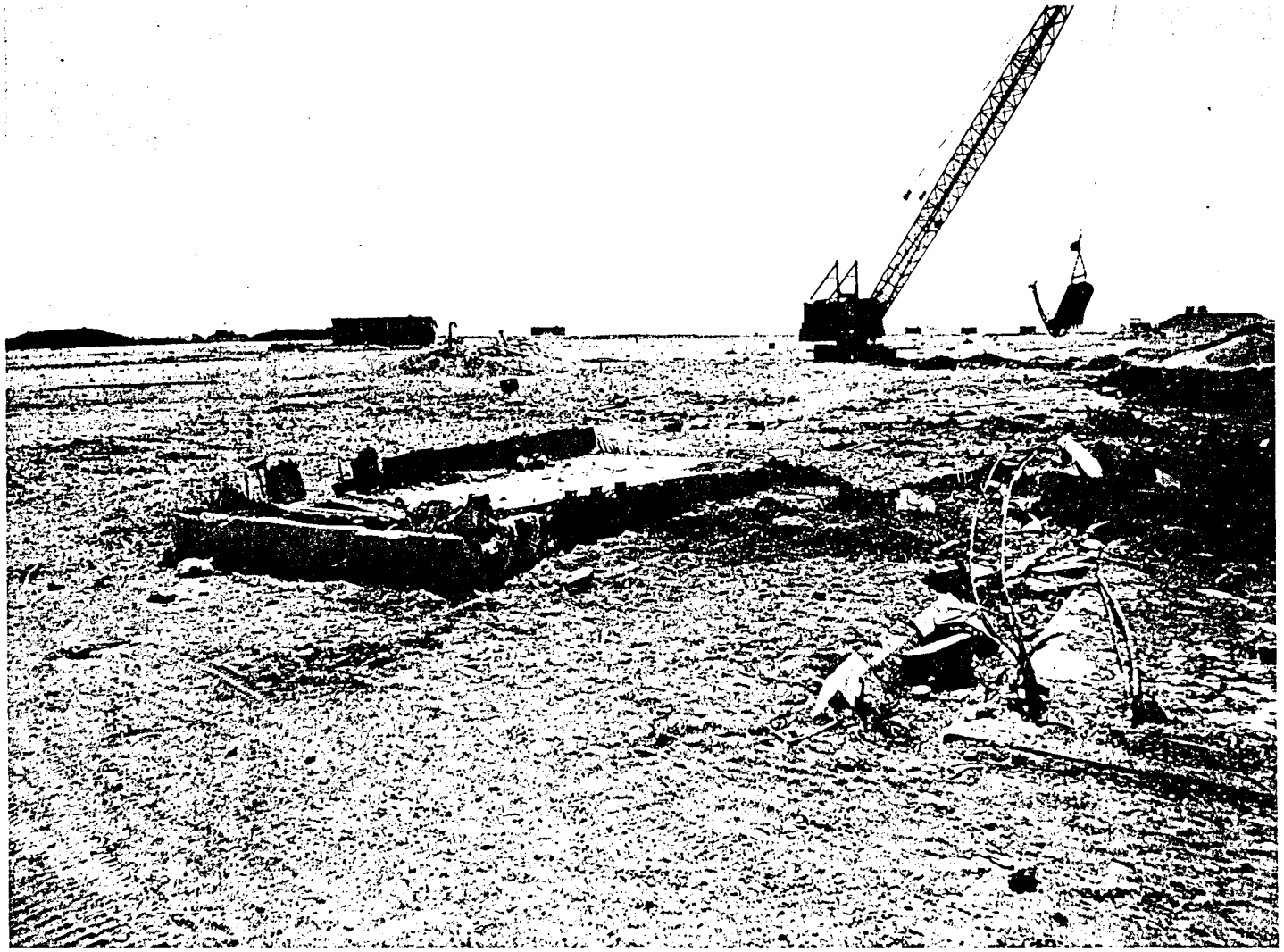


Fig. L.163 General View of Left End Wall, Displaced about 15 ft to Left of Foundation, Structure 3.2.3a. Left edge of foundation can be seen in right side of photograph.



Fig. L.164 Close-up View of Foundation Where Left End Wall Had Been Anchored, Structure 3.2.3a

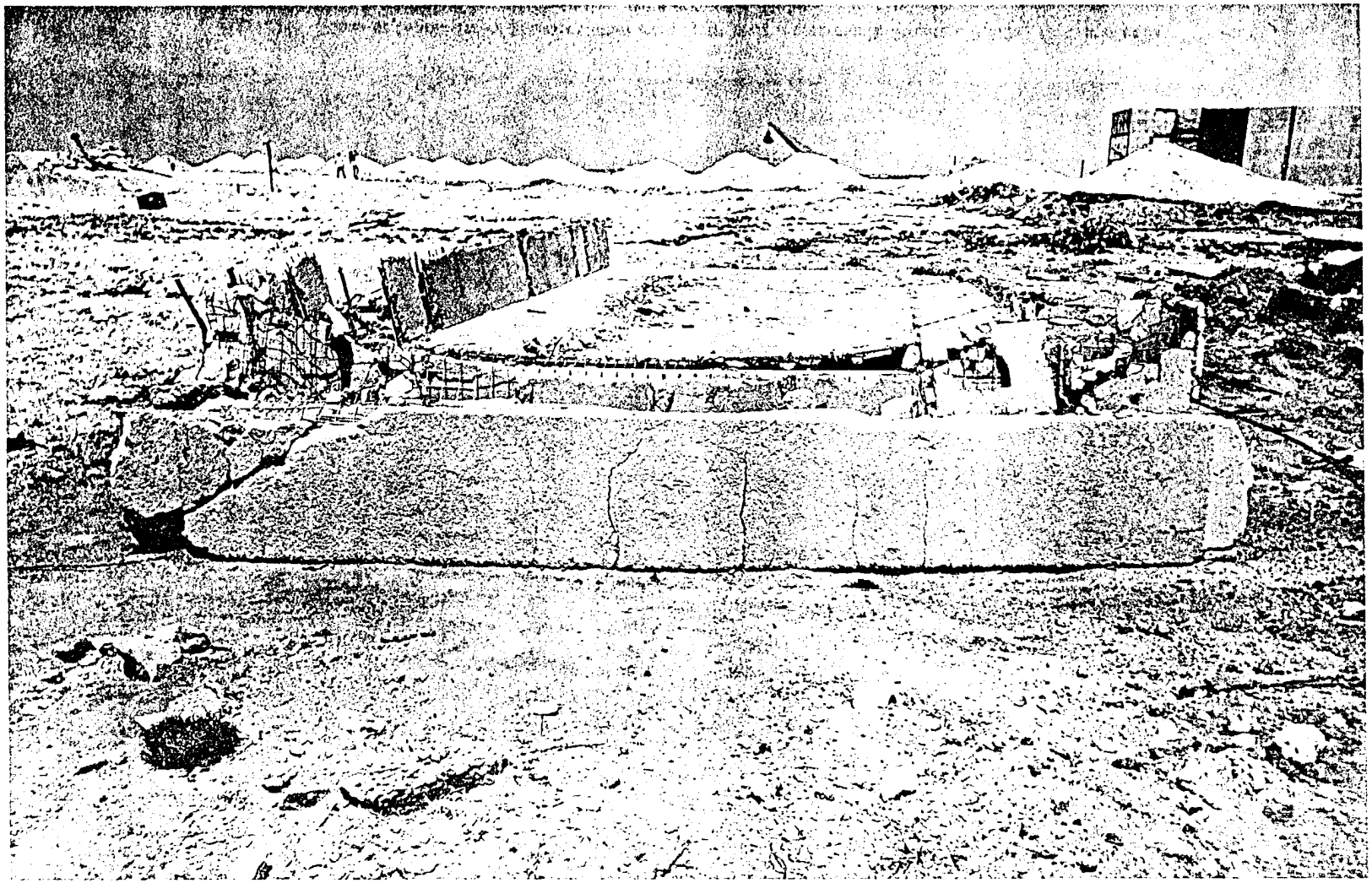


Fig. L.165 Front Edge of Left End Wall, Structure 3.2.3a. Note concave curvature of wall panels and pilaster corner.

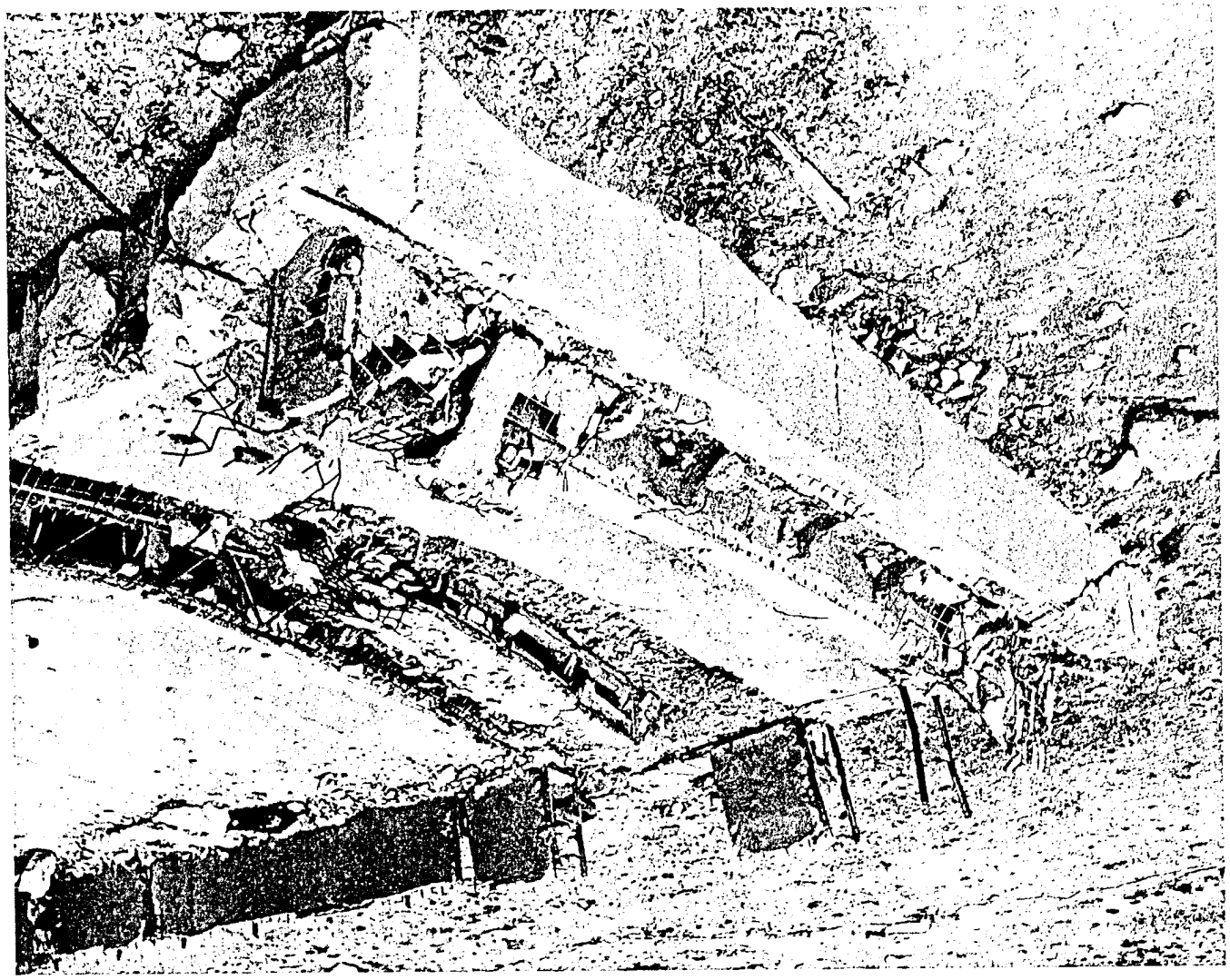


Fig. L.166 Plane of Separation of Pilaster Corner from Front Wall (Foreground), Structure 3.2.3a. Note how cells were severed.

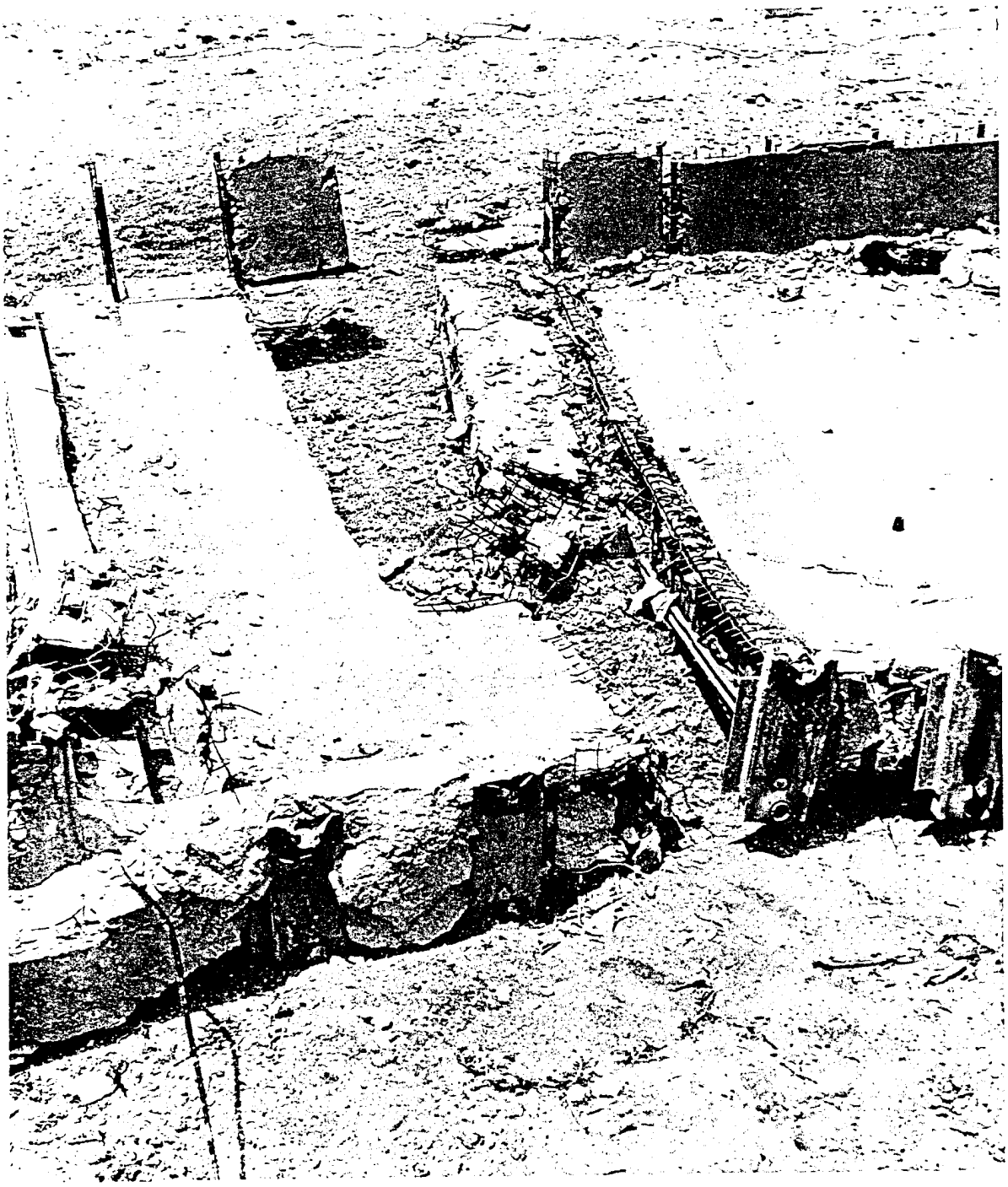


Fig. L.167 Split along Joint Line in Left End Wall, Structure 3.2.3a. Note how steel channels at base of wall pulled out over the anchor-bolt nuts.

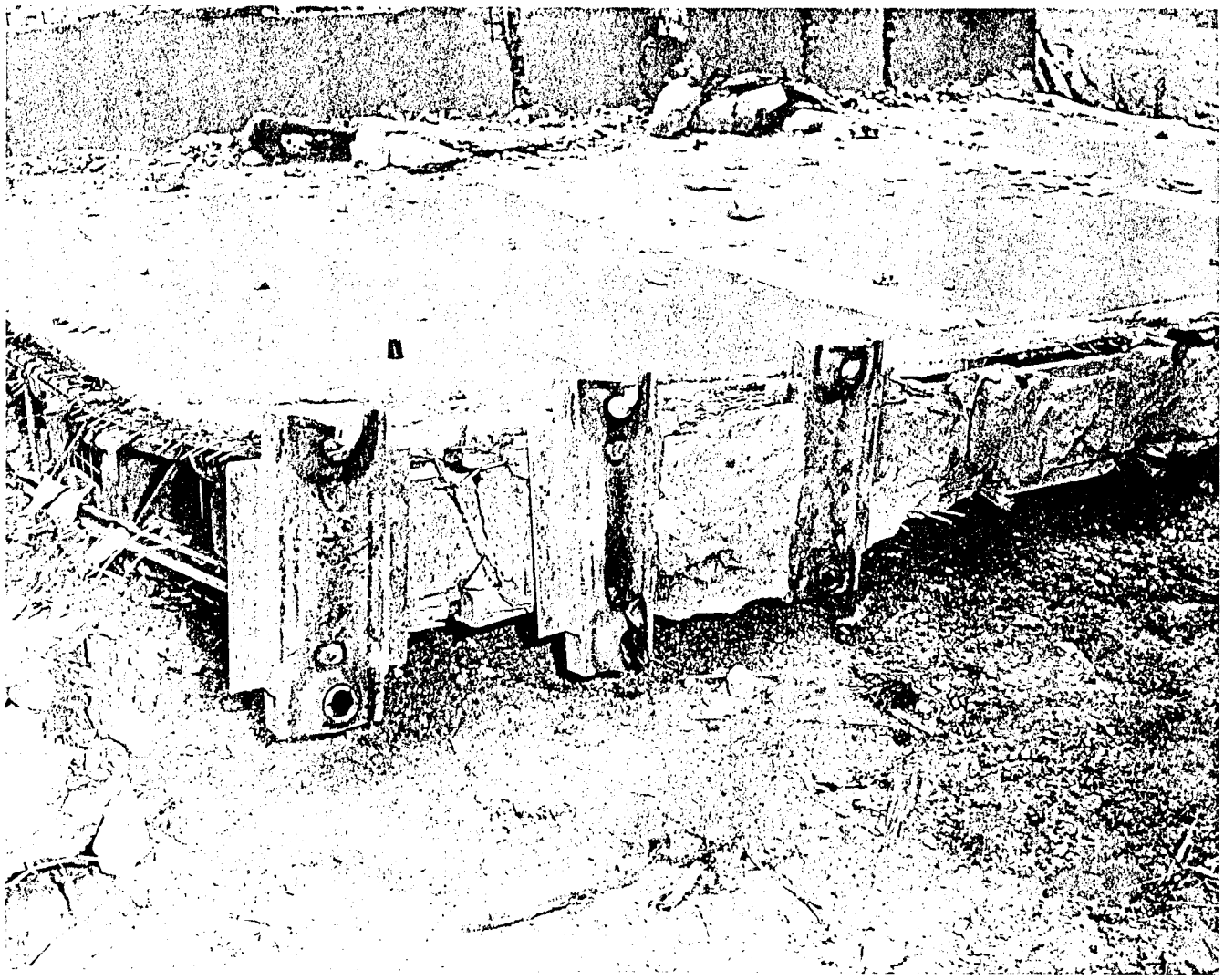


Fig. L.168 Detail View of Base of Left End Wall, Structure 3.2.3a. Note various types of failure at base connection: Channel at right of photo pulled over anchor-bolt nuts, channel in center ruptured, and truss chords in right of photograph pulled loose from channels, which remained anchored to foundation.

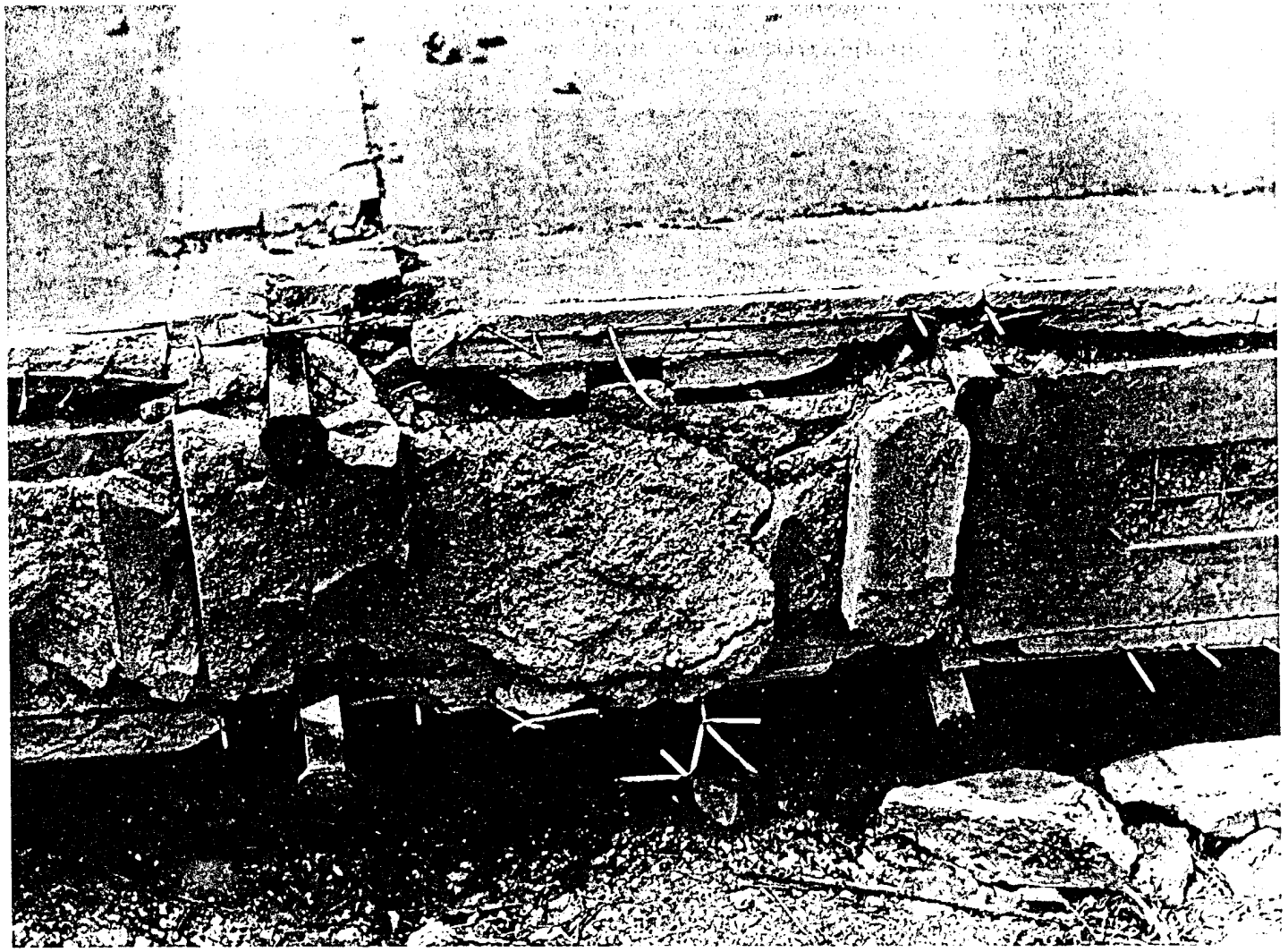


Fig. L.169 Close-up View of Truss Chords Shown in Preceding Photograph, Structure 3.2.3a. Note how parent metal of channel sheared out in left truss and how weld failed in right truss.

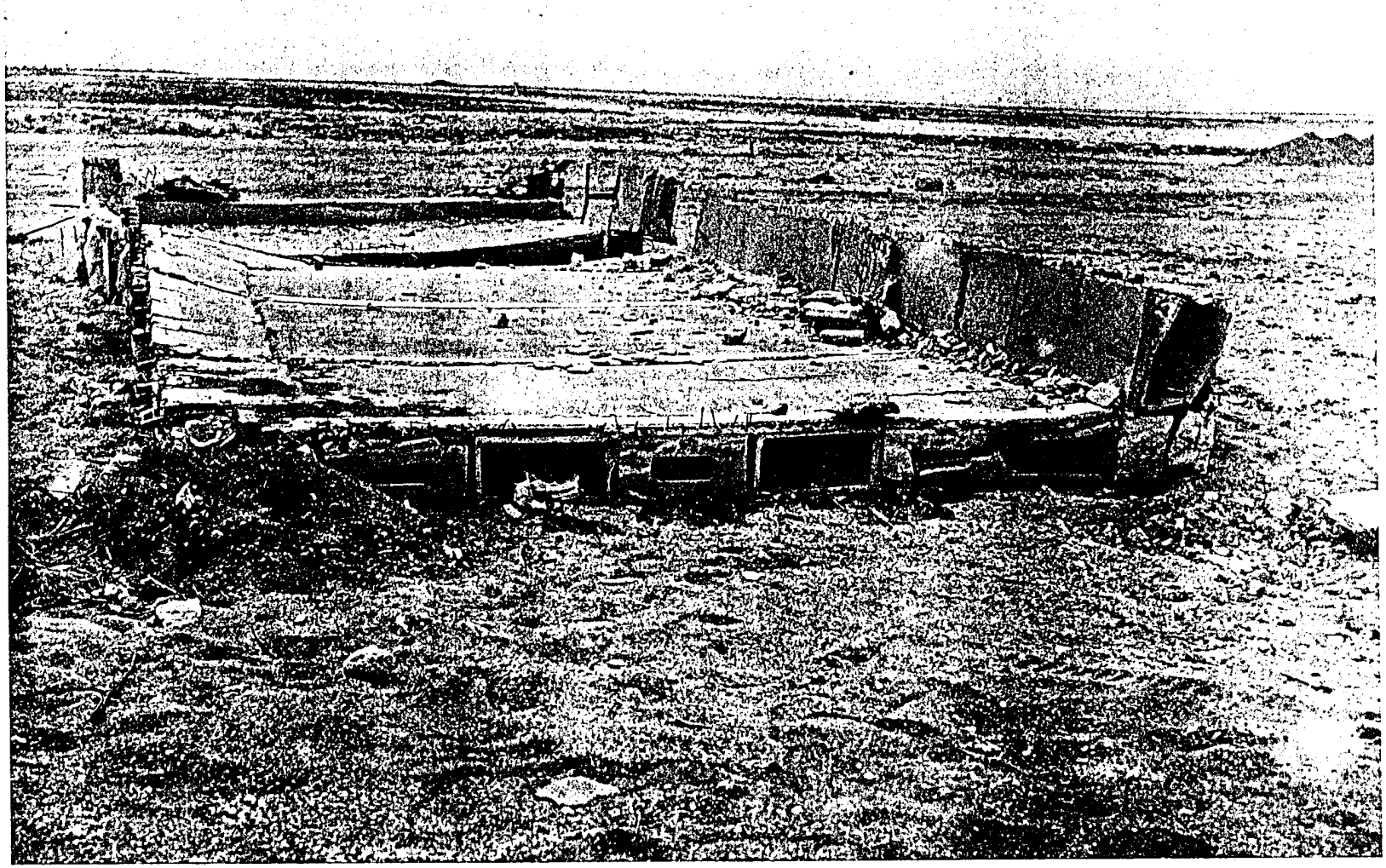


Fig. L.170 Rear Edge of Left End Wall, Structure 3.2.3a. Note curvature of wall panels. One row of roof cells remained attached to end wall.

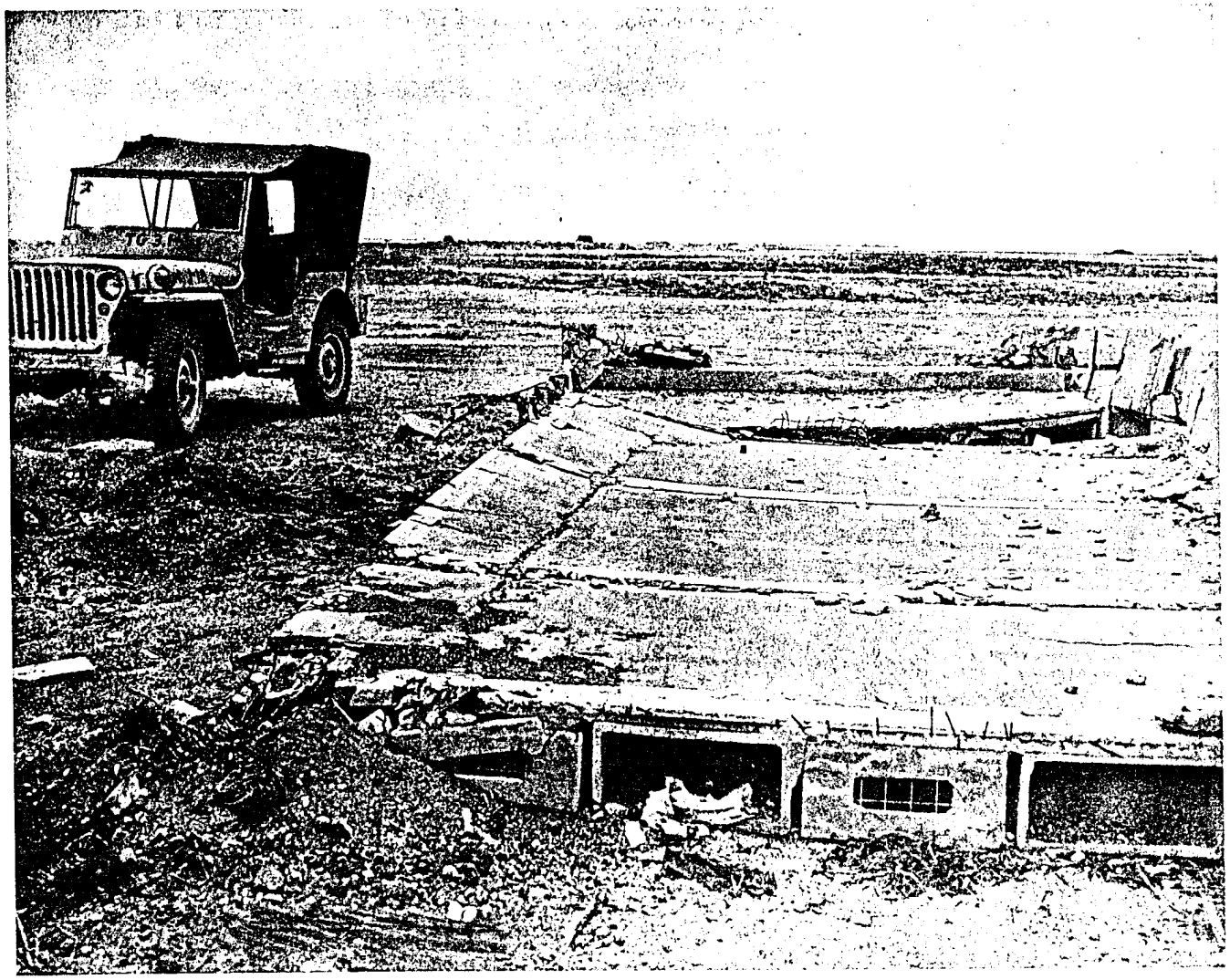


Fig. L.171 Detail View of Rear Edge of Left End Wall, Structure 3.2.3a. Note crack about 18 in. above base of wall.

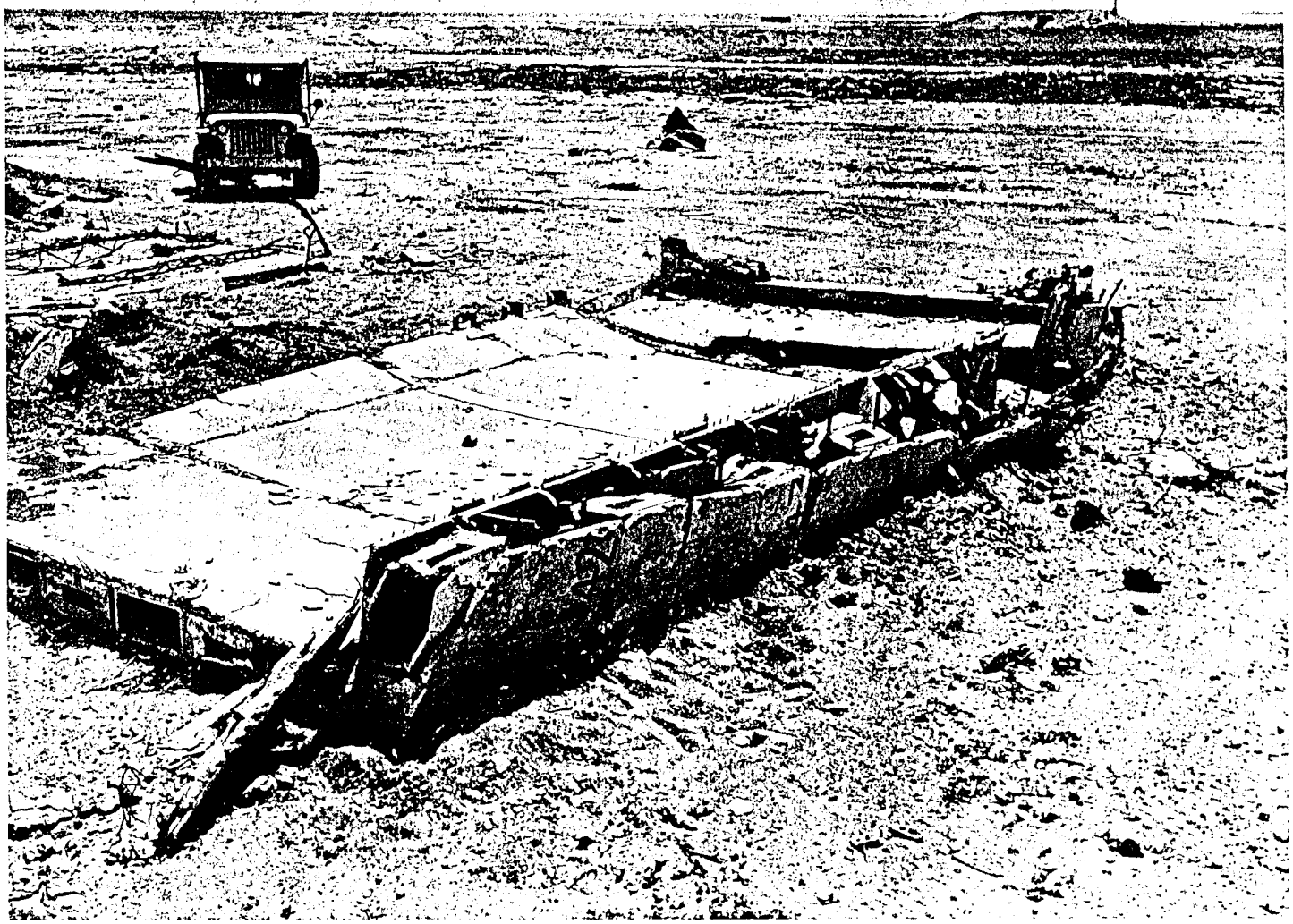


Fig. L.172 General View of Upper End of Left Wall, Structure 3.2.3a. Note distortion of cells where roof was severed from end wall.



Fig. L.173 Detail View of One Cell from Preceding Photograph, Structure 3.2.3a

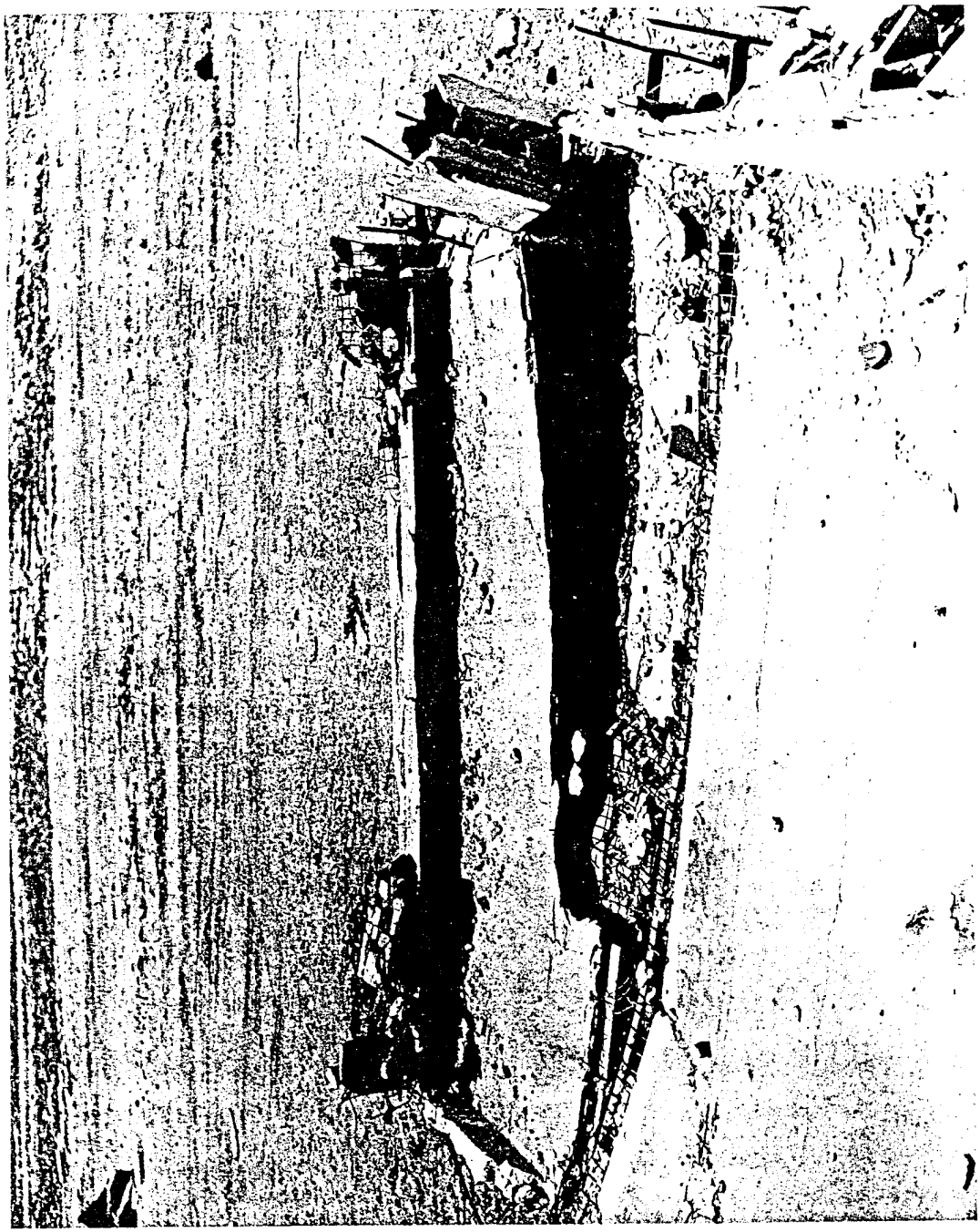


Fig. L.174 Detail View Showing Rupture Within an End-wall Panel, Structure 3.2.3a

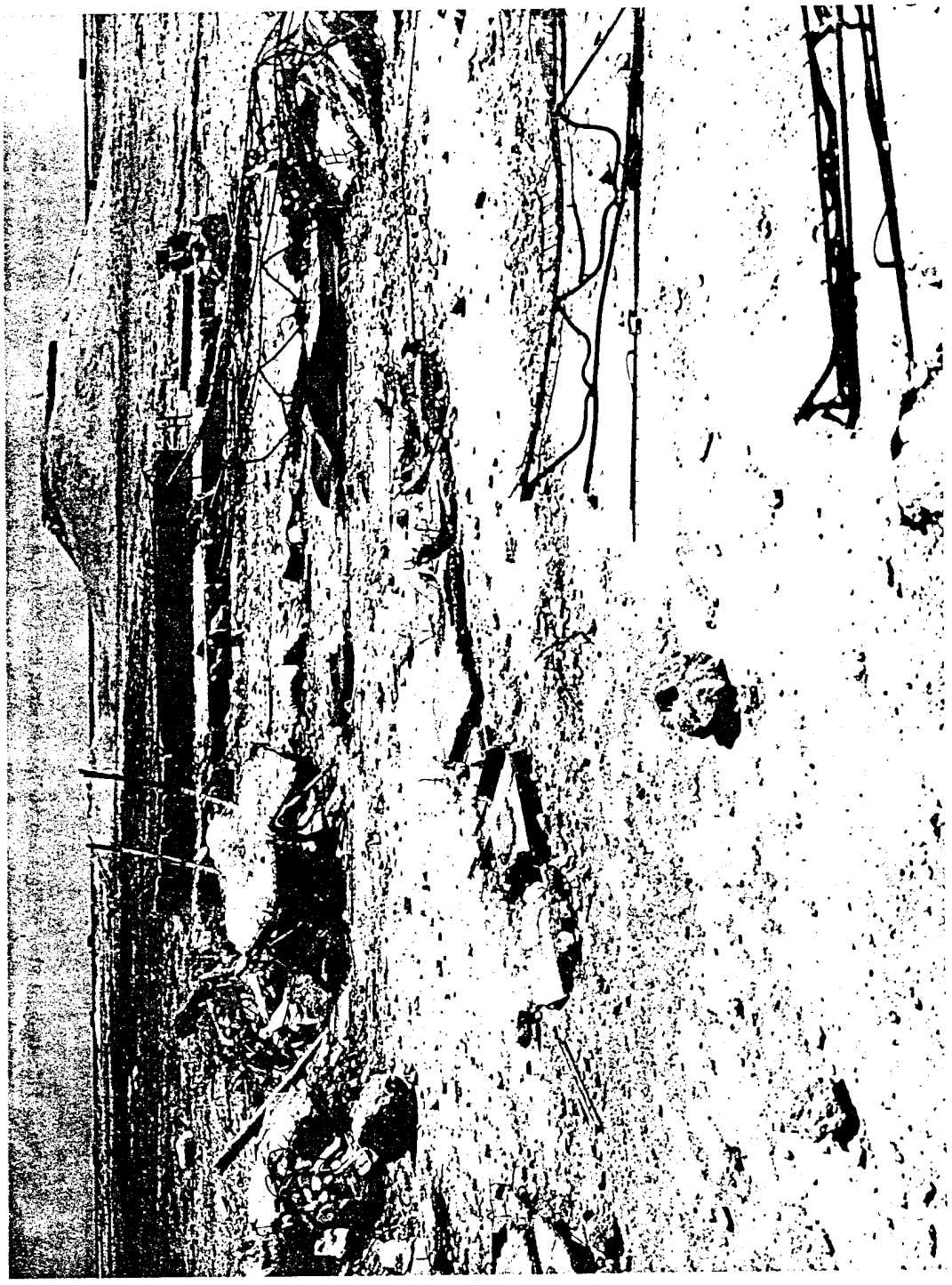


Fig. L.175 General View of Foundation, with Right End Wall in Background, Structure 3.2.3a

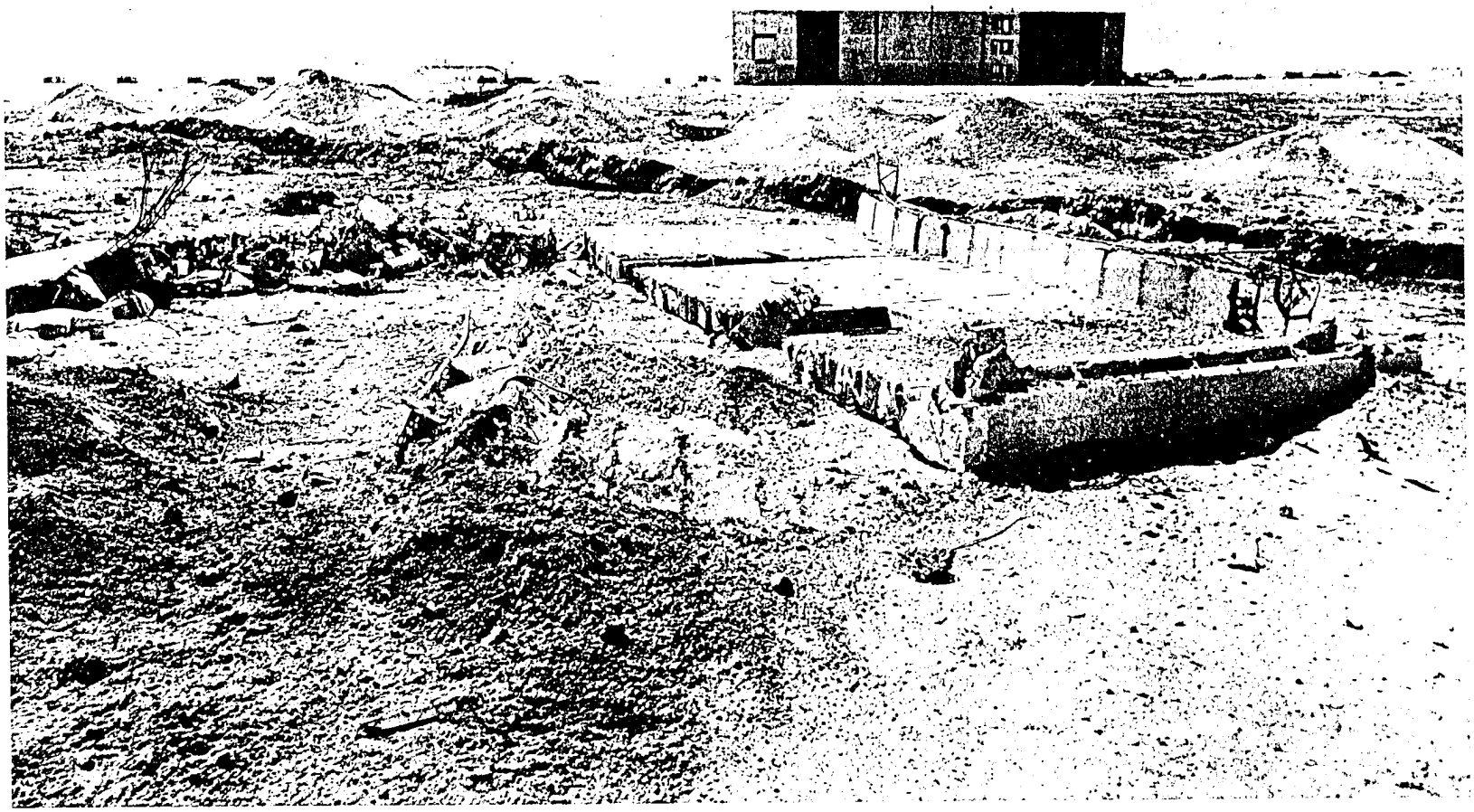


Fig. L.176 General View of Right End Wall, with Front End Displaced about 5 ft from Foundation, Structure 3.2.3a

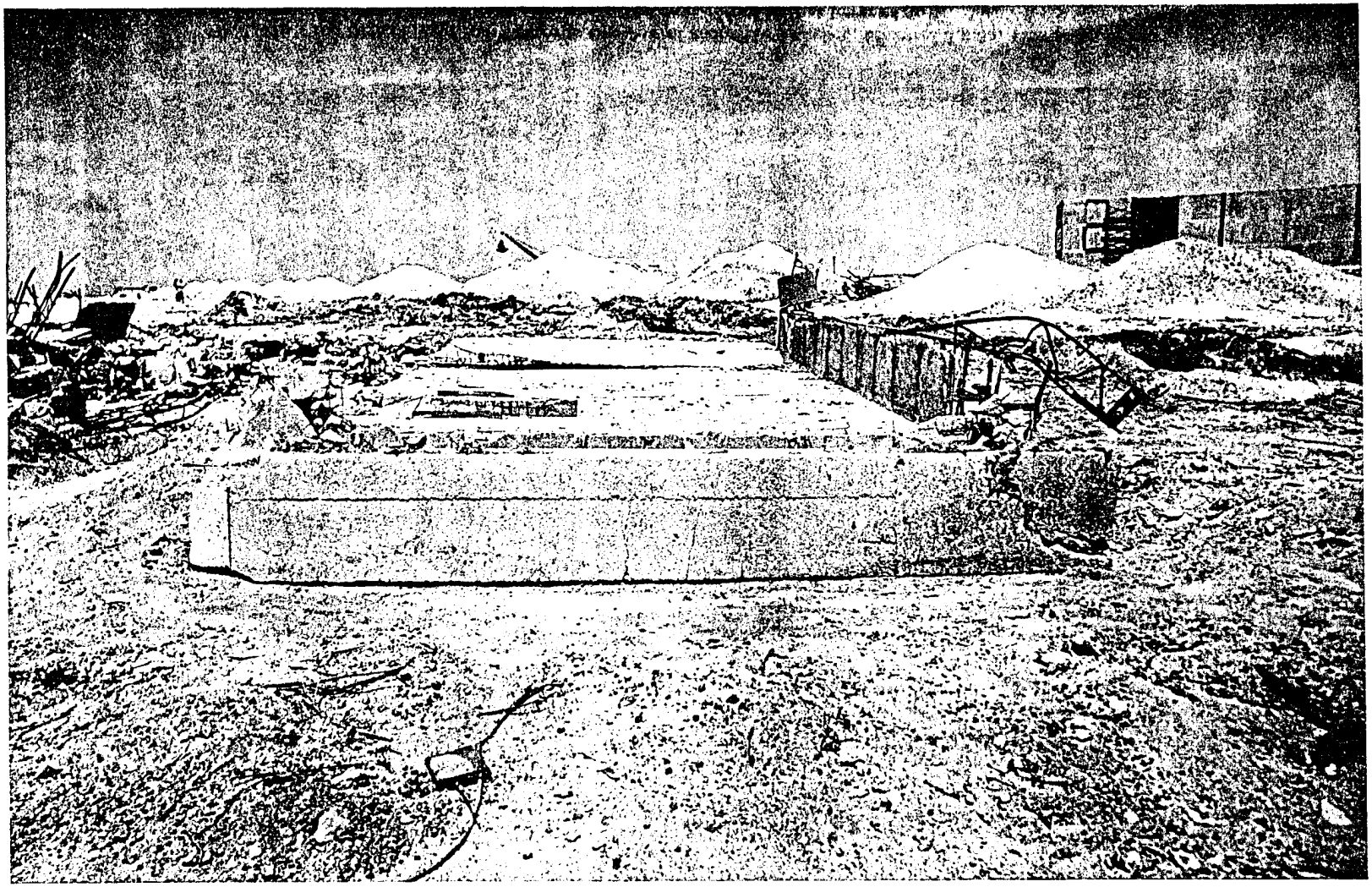


Fig. L.177 Front Edge of Right End Wall, Structure 3.2.3a. Note how edge row of roof cells remained with end wall. Internal truss can be seen distorted out of position by tearing action.

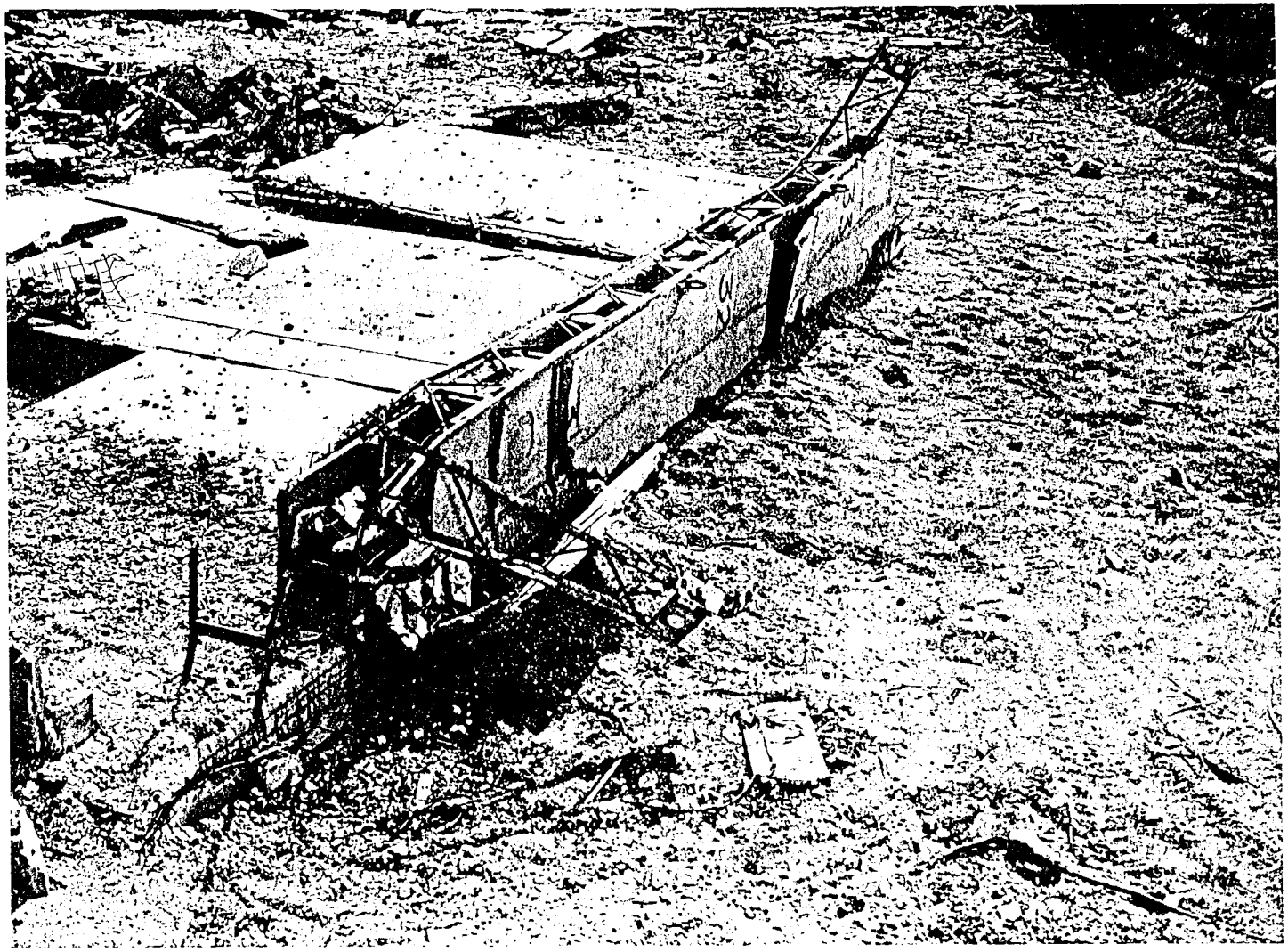


Fig. L.178 Top Edge of Right End Wall, with One Row of Roof Cells Attached, Structure 3.2.3a. Rear panel of end wall split away about 6 in. from rest of wall at lower edge.



Fig. L.179 Detail View of Split Between Rear Panel and Rest of End Wall, Structure 3.2.3a. Note right edge of rear wall in right center of photograph.



Fig. L.180 Rear Edge of Right End Wall, Structure 3.2.3a. Plaster corner was heavily damaged.



Fig. L.181 Detail View of Part of Cell from Rear-wall Panel Still Embedded in Corner Pilaster, Structure 3.2.3a



Fig. L.182 Base of Rear Panel of Right End Wall, Structure 3.2.3a. Trusses broke loose from channels by rupturing through weld.



Fig. L.183 Base of Right End Wall, Structure 3.2.3a. Trusses in center broke loose from anchorage by shearing out the base metal of the anchor channel. Remnants of front wall can be seen in foreground.

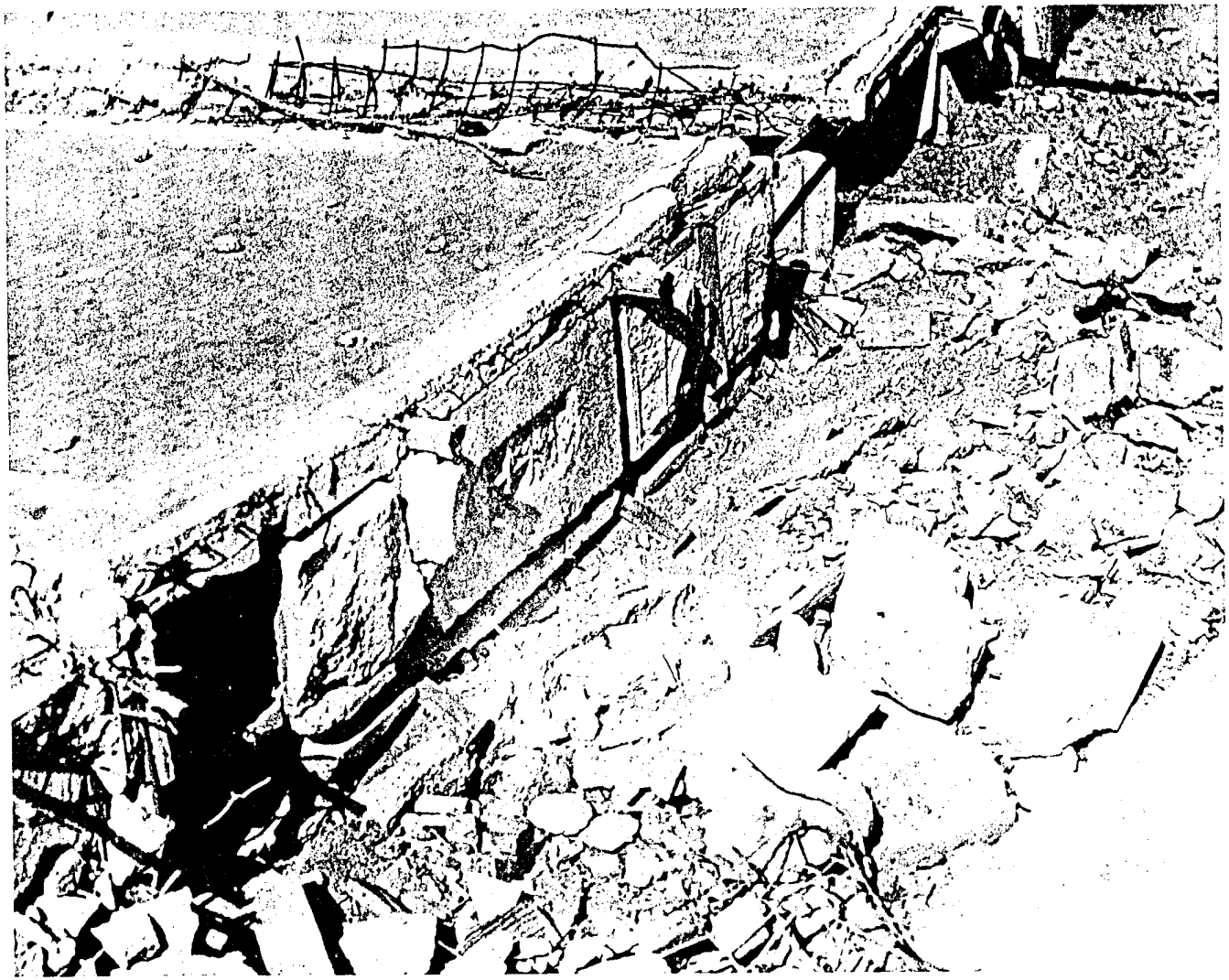


Fig. L.184 Detail View of Base of Rear Panel in Right End Wall, Structure 3.2.3a

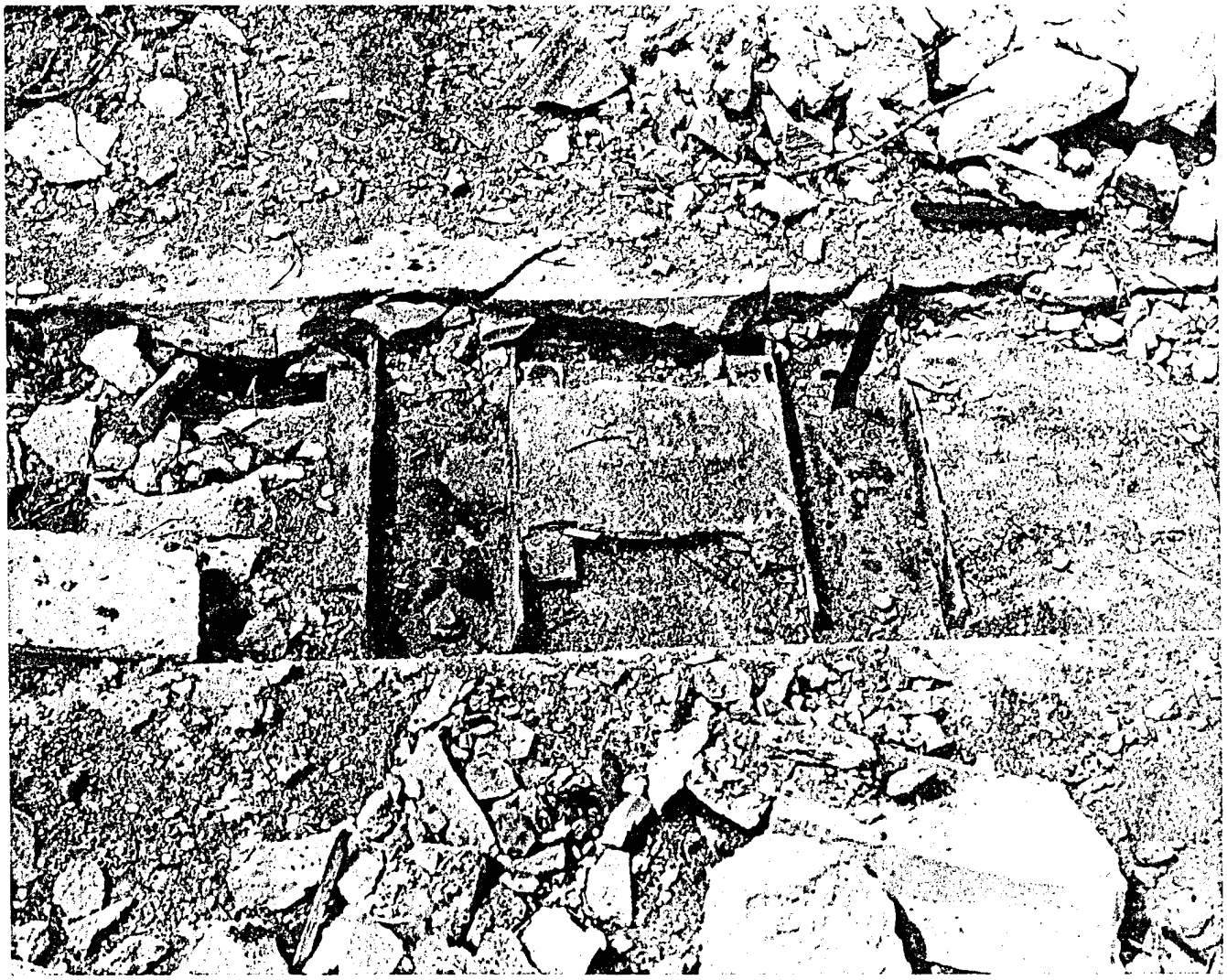


Fig. L.185 Channels That Were Welded to Trusses of Preceding Photograph Still Anchored to Foundation, Structure 3.2.3a

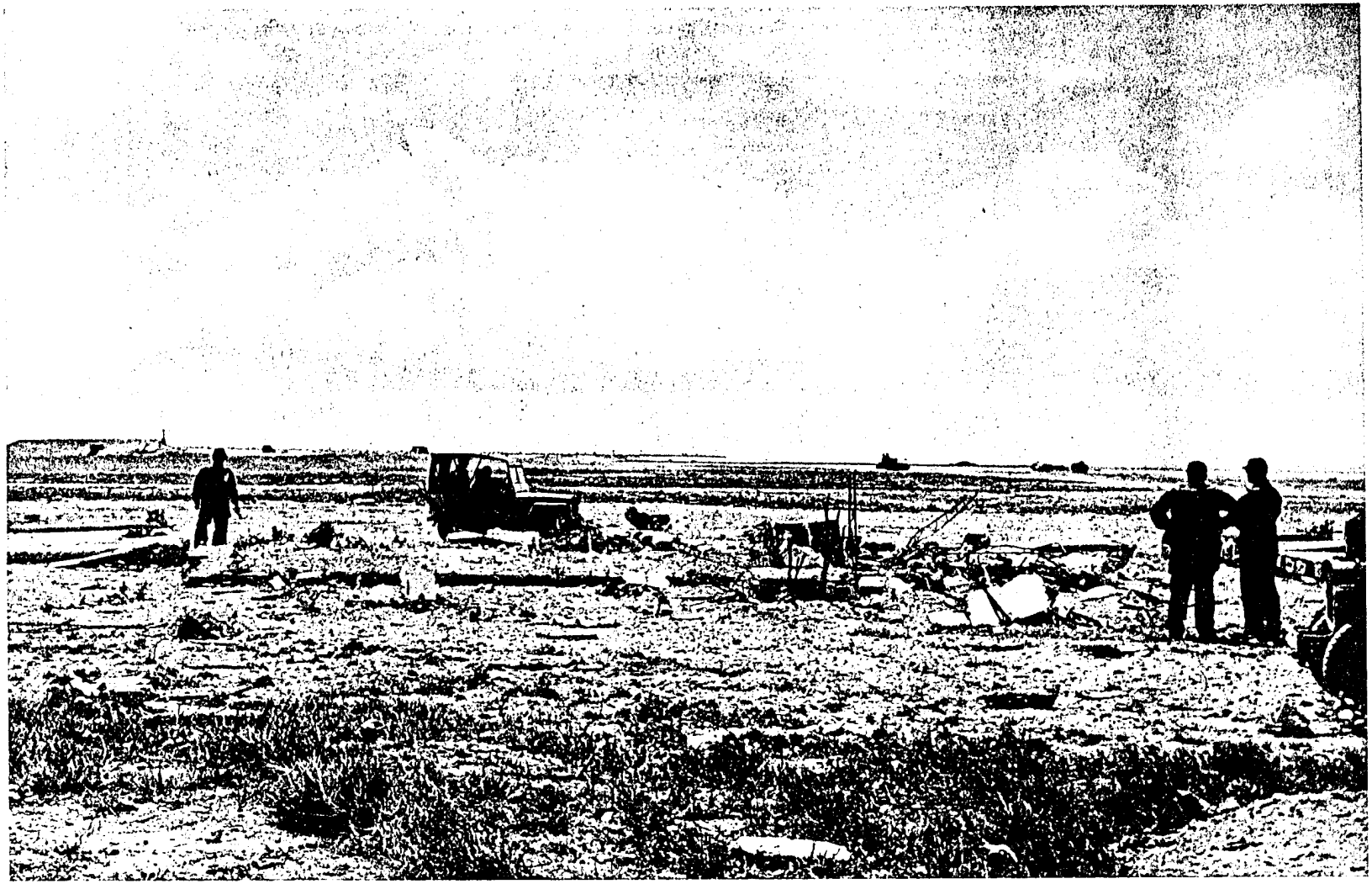


Fig. L.186 General View of Rear Wall, Taken from Rear, Structure 3.2.3a. Top edge of wall can be seen in left center of photograph.



Fig. L.187 Rear Wall, Structure 3.2.3a. Top edge line can be clearly seen. Note the very slight damage within panels.

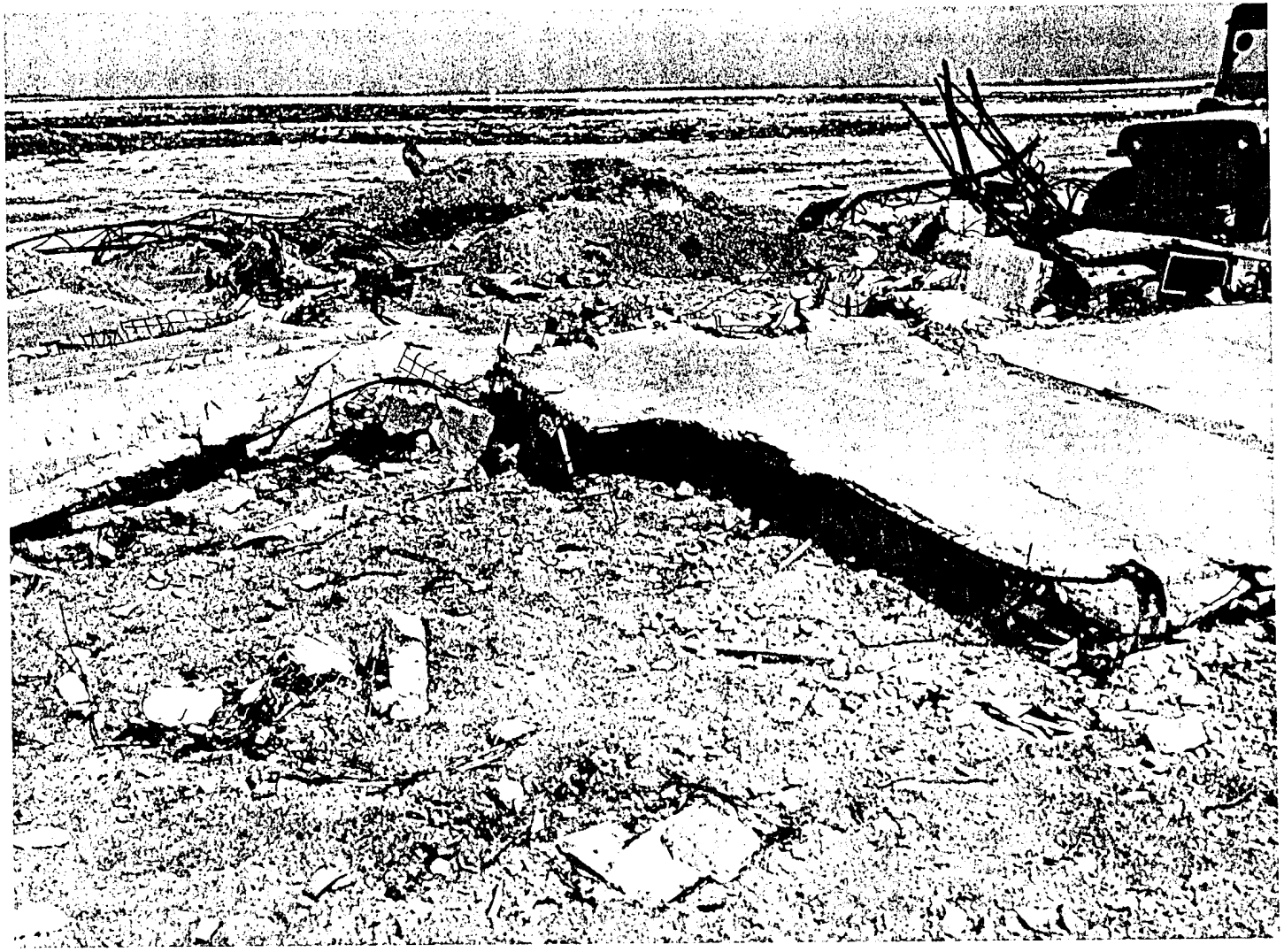


Fig. L.188 Detail View of Right Edge of Rear Wall, Structure 3.2.3a. Part of one row of cells was torn loose when right end wall rotated outward, taking corner pilaster with it.



Fig. L.189 Close-up View of Rear Wall, Taken from Left End, Structure 3.2.3a

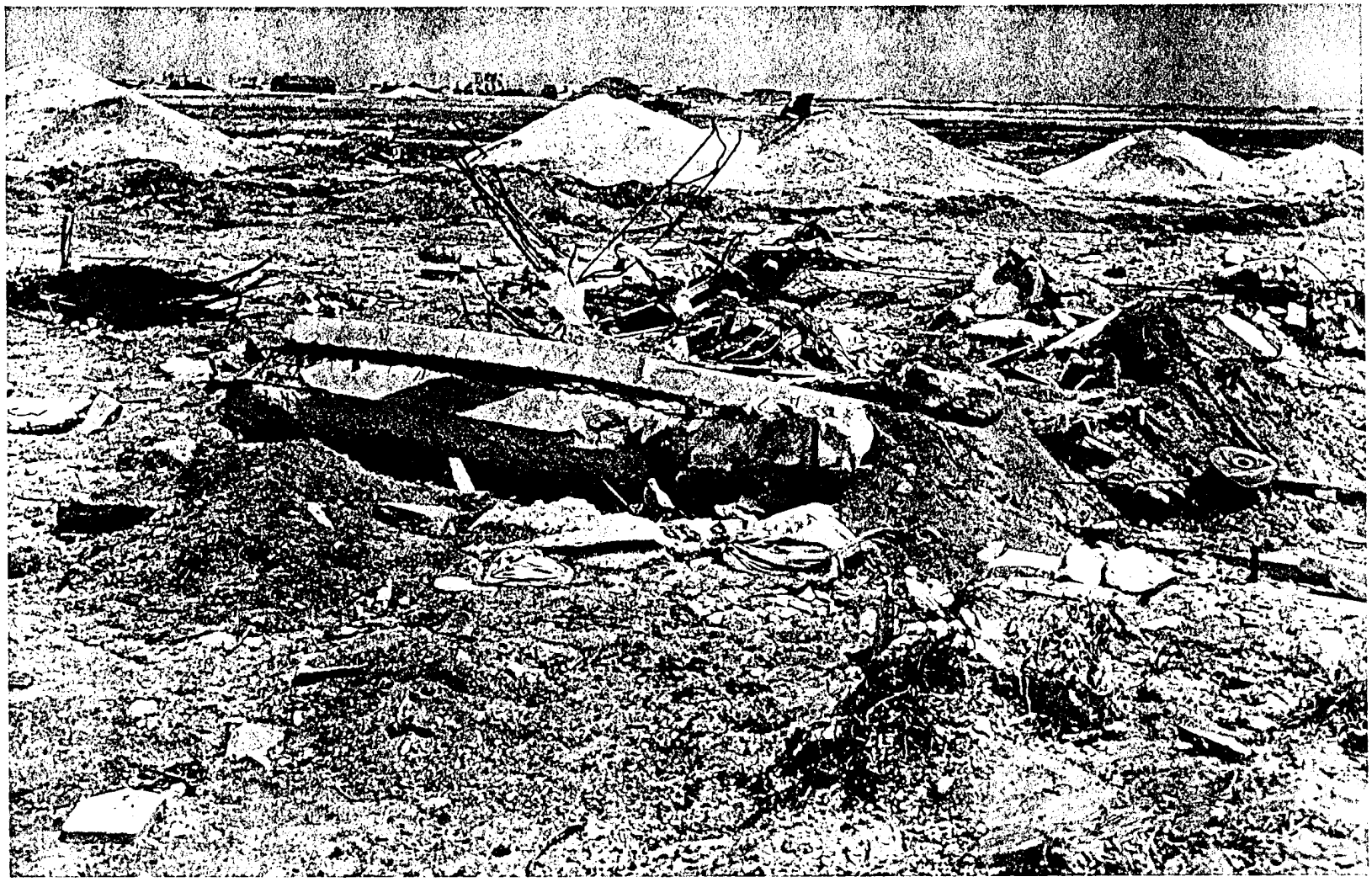


Fig. L.190 Left End of Rear Wall, Structure 3.2.3a. Pilaster corner was severely damaged, and the two panels closest to the left edge were heavily damaged. Earth was dumped later by a shovel operating in the vicinity.

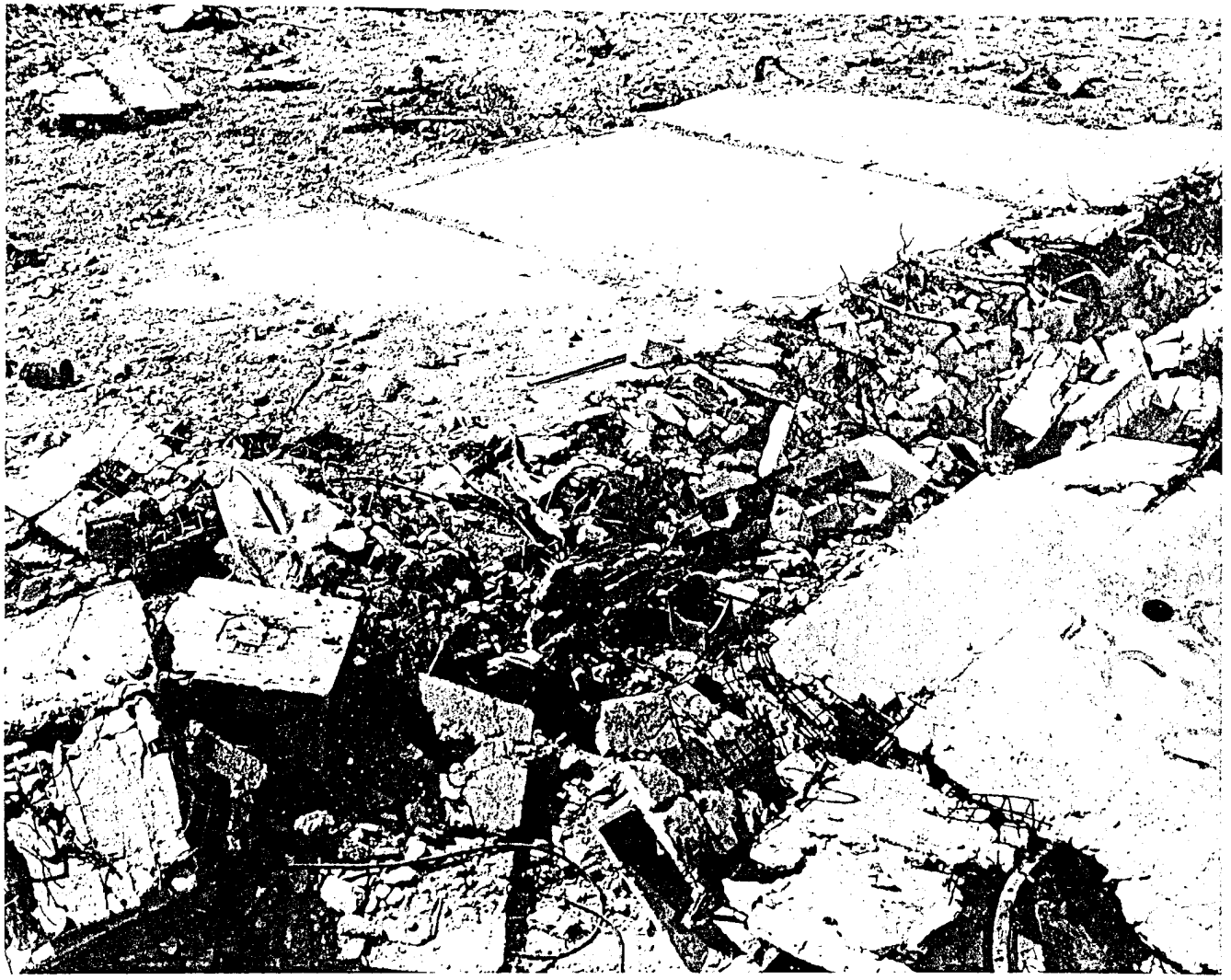


Fig. L.191 Base of Rear Wall with Trusses Still Attached to Foundation; Lower Row of Cells Collapsed; Structure 3.2.3a



Fig. L.192 Close-up View of Lower Row of Cells at Foundation Line of Rear Wall, Structure 3.2.3a. Earth dumped over cells obscures rest of panel, but it is generally undamaged.



Fig. L.193 Detail View of Rear-wall Truss, with One Chord Ruptured from Anchorage Channel but Other Chord Still Attached to Foundation, Structure 3.2.3a. Note severe bend in lower end of truss.

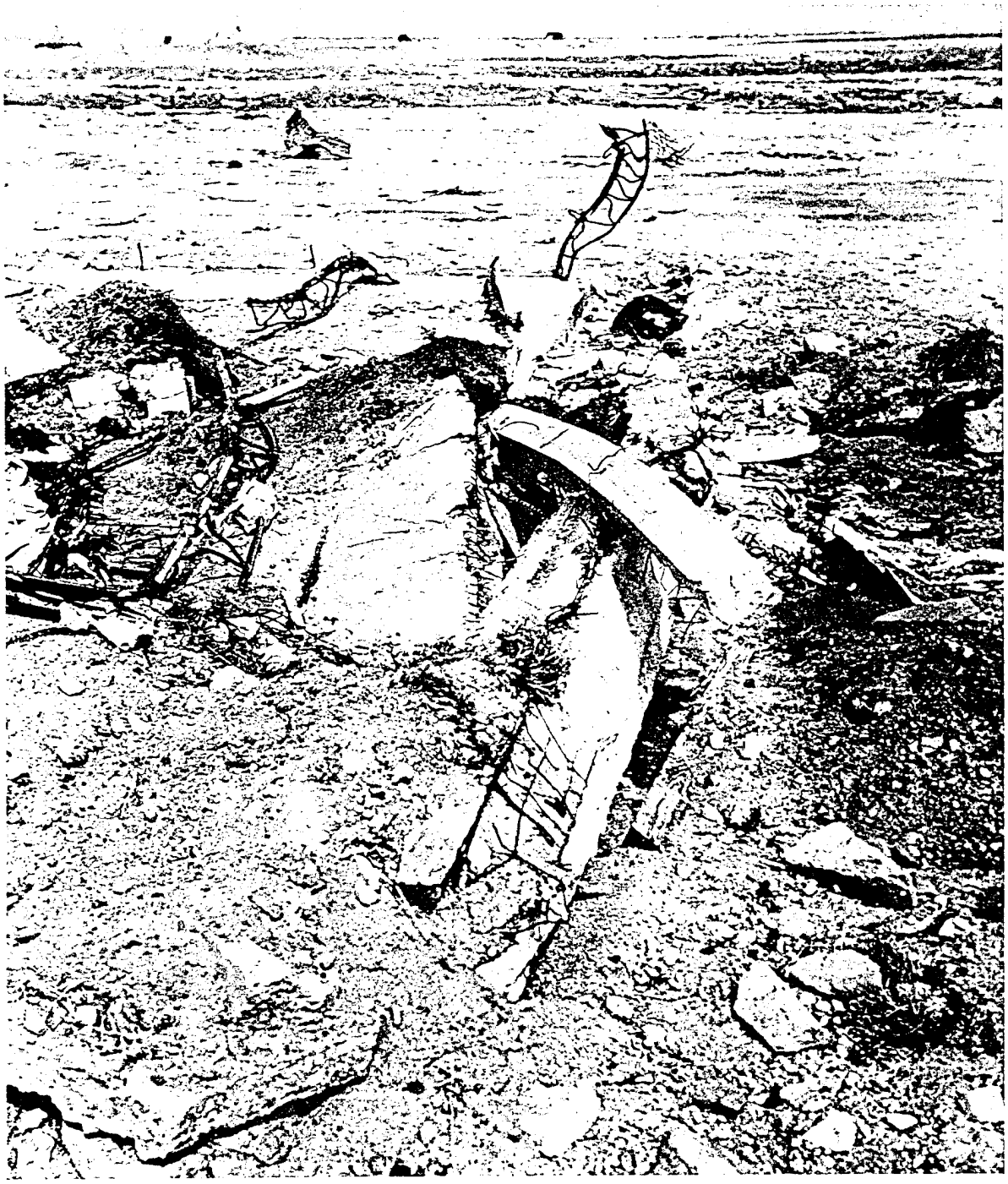


Fig. L.194 Destroyed Corner Pilaster and Adjacent Panel at Left Rear Corner of Structure, 3.2.3a

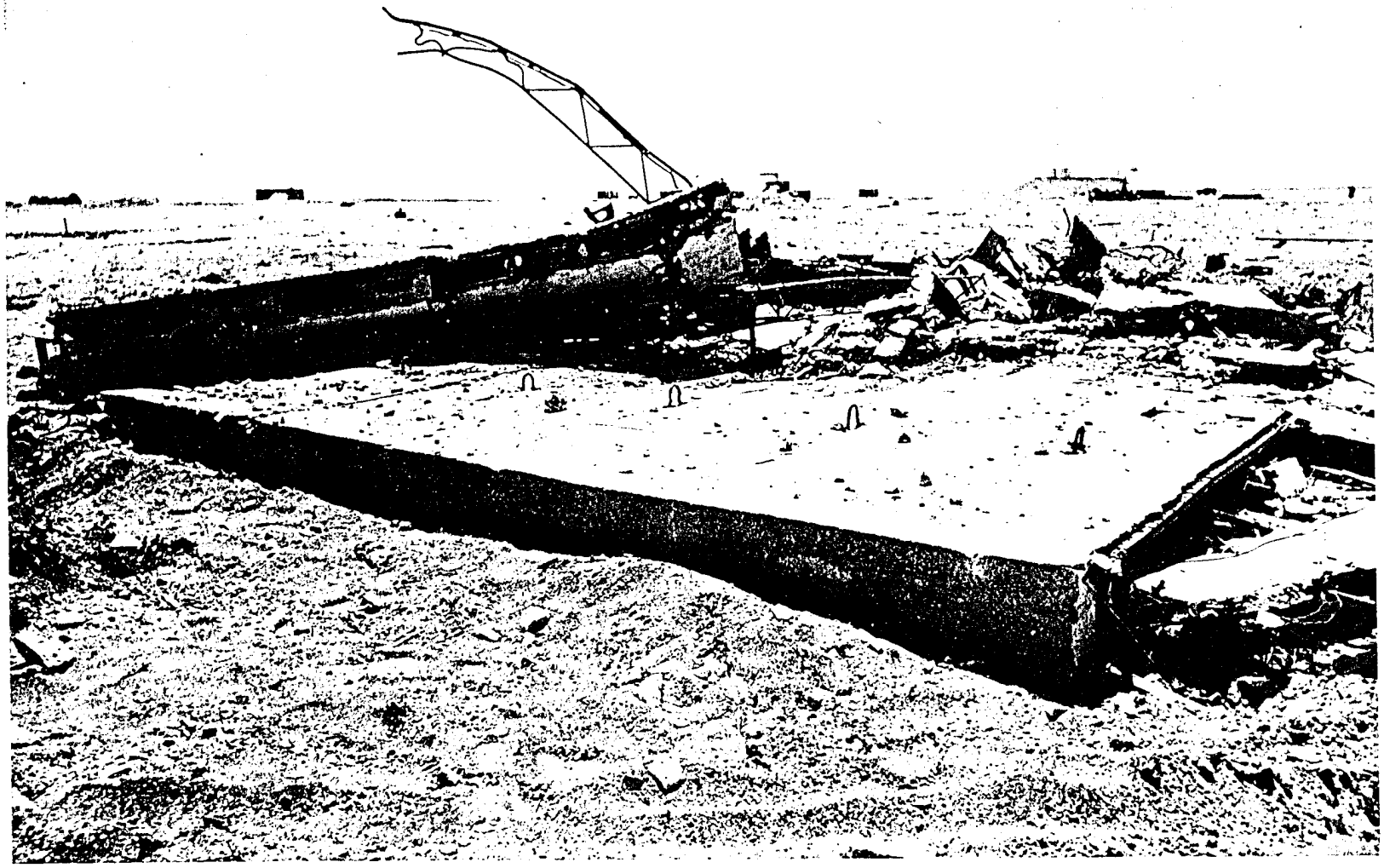


Fig. L.195 Left Half of Roof, Located about 100 ft behind Foundation, Structure 3.2.3a. Front edge of roof, in foreground, practically undamaged.



Fig. L.196 Part of Roof Panel from Left Edge Torn Loose from Rest of Roof Section, Structure 3.2.3a. This panel is the one that has one row of cells still attached to left end wall.

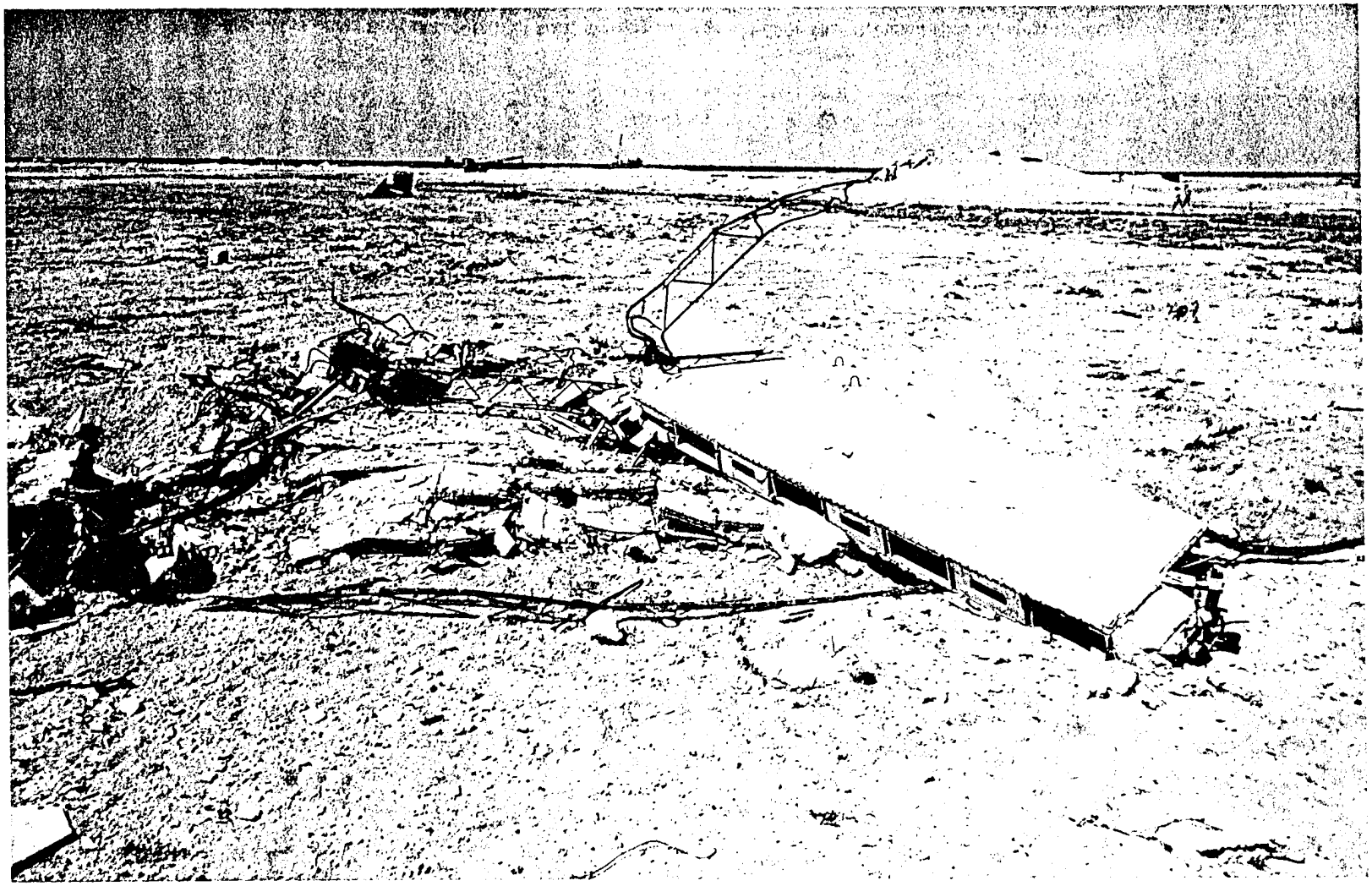


Fig. L.197 Rear Edge of Left Half of Roof, Structure 3.2.3a. Most of damage visible in photograph was caused by impact of landing after roof was hurled about 100 ft.



Fig. L.198 Rear Edge of Left Half of Roof, Showing Damage to Panels That Occurred upon Landing, Structure 3.2.3a

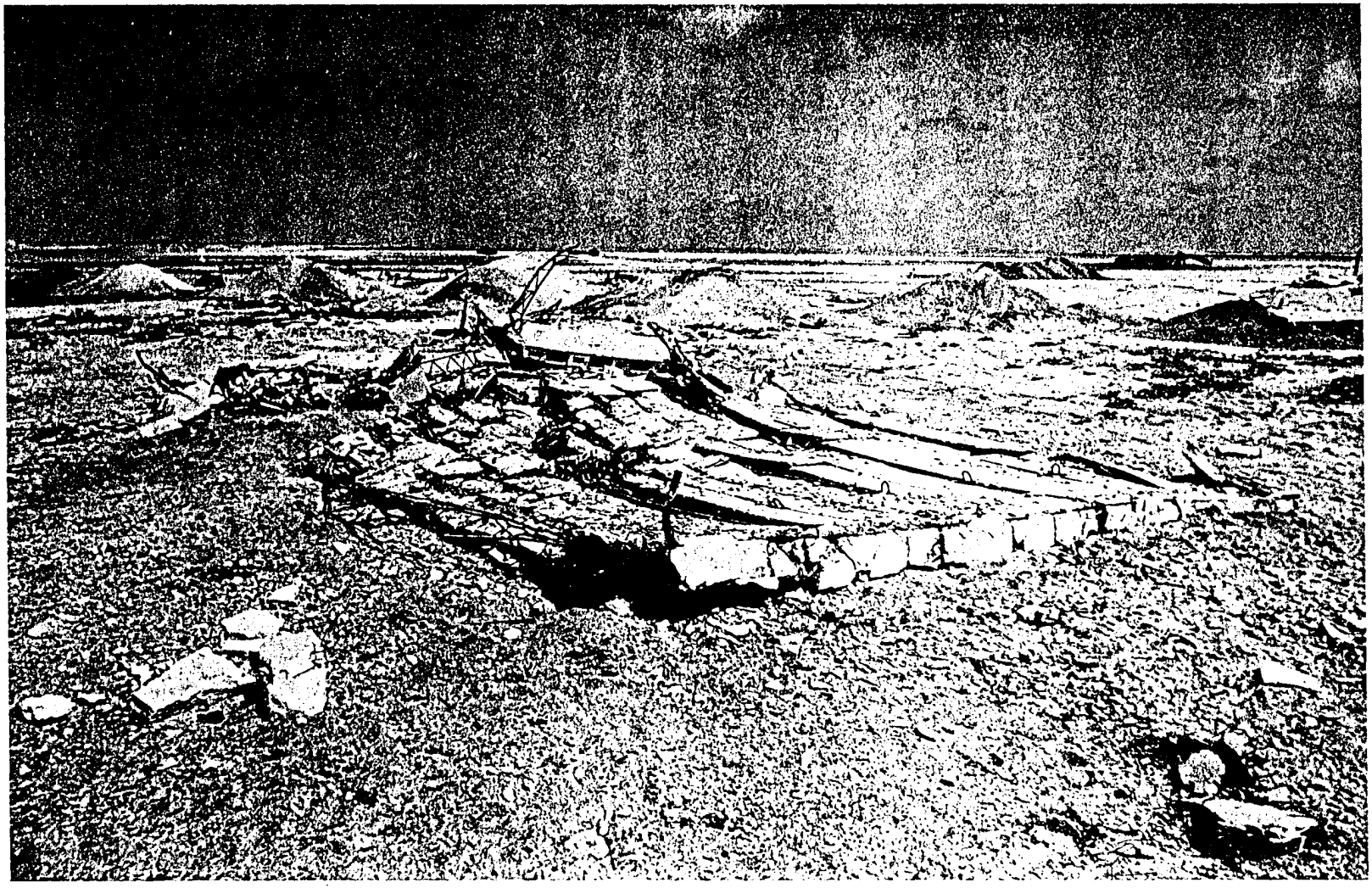


Fig. L.199 Right Half of Roof, with Front Edge in Foreground, Structure 3.2.3a. This section has its underside up. Rear edge struck ground first, dug in, and then entire section flipped over, causing extensive damage to panels.

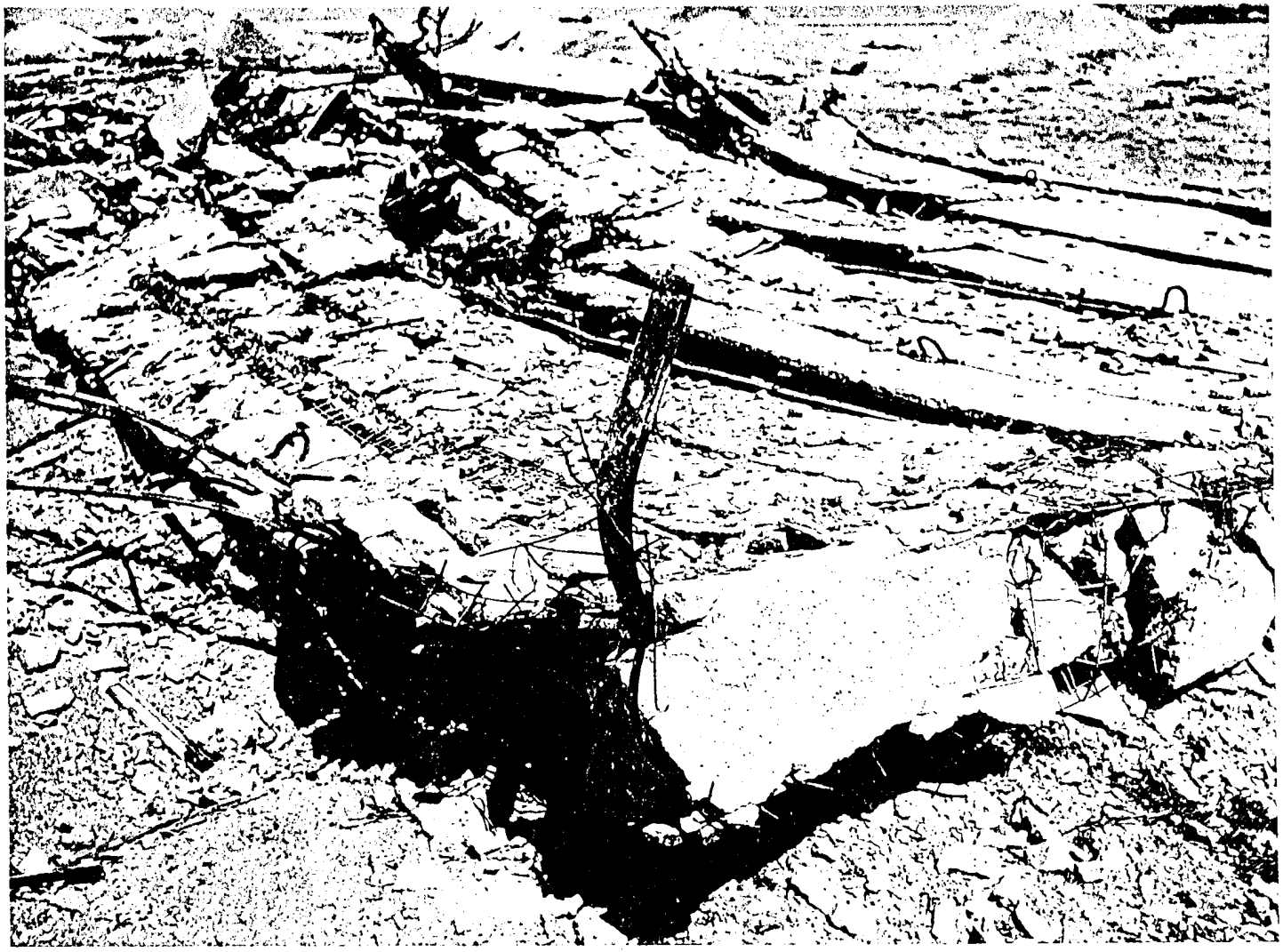


Fig. L.200 Detail View of Right Half of Roof, Structure 3.2.3a. The edge along the left side of photograph is the centerline of the original roof. Note how splice of edge truss ruptured through weld.



Fig. L.201 Detail View of Right End of Roof Edge Truss, Structure 3.2.3a

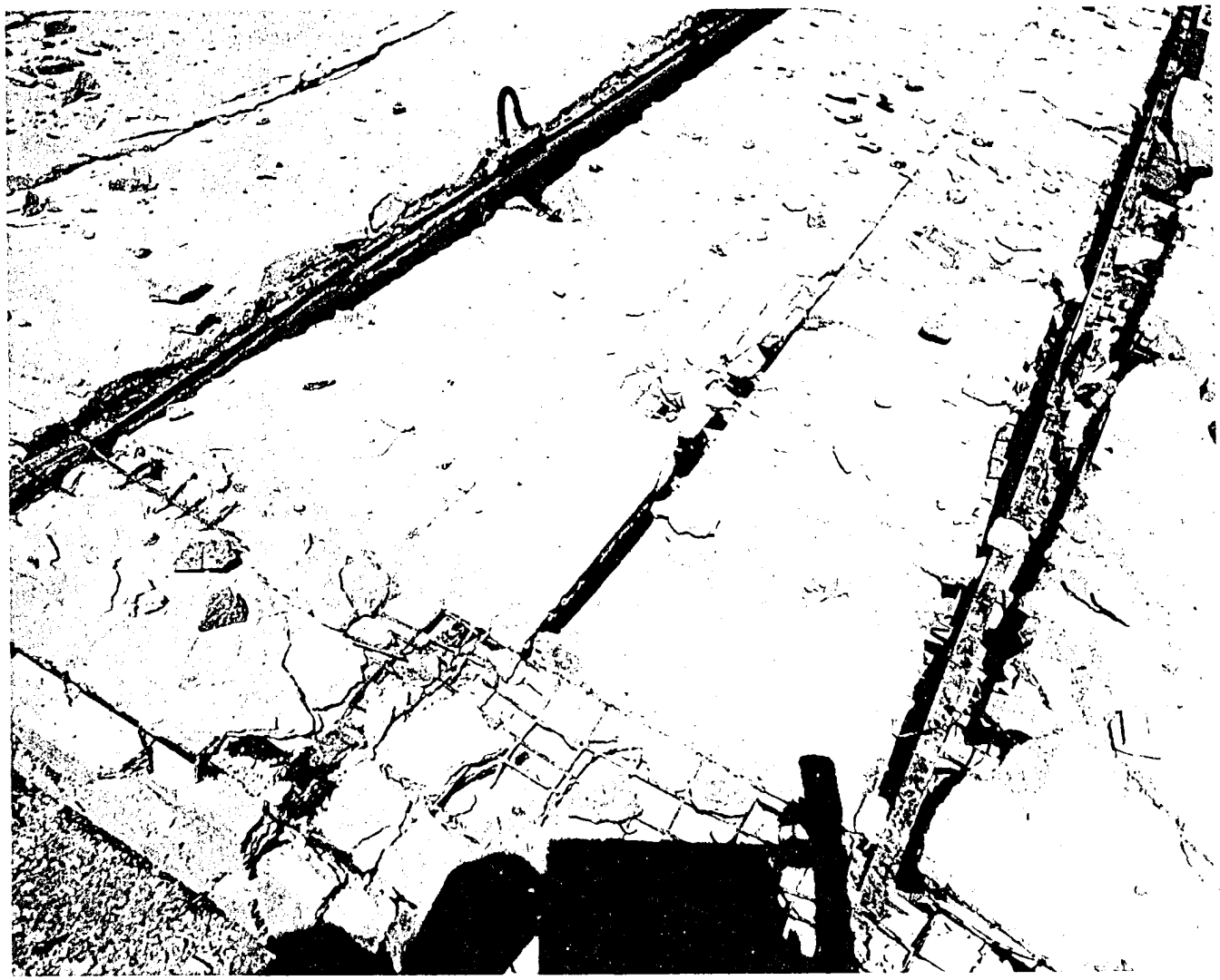


Fig. L.202 Detail View of Front Edge of Right Half of Roof, Showing Failure Planes along Truss Lines, Structure 3.2.3a

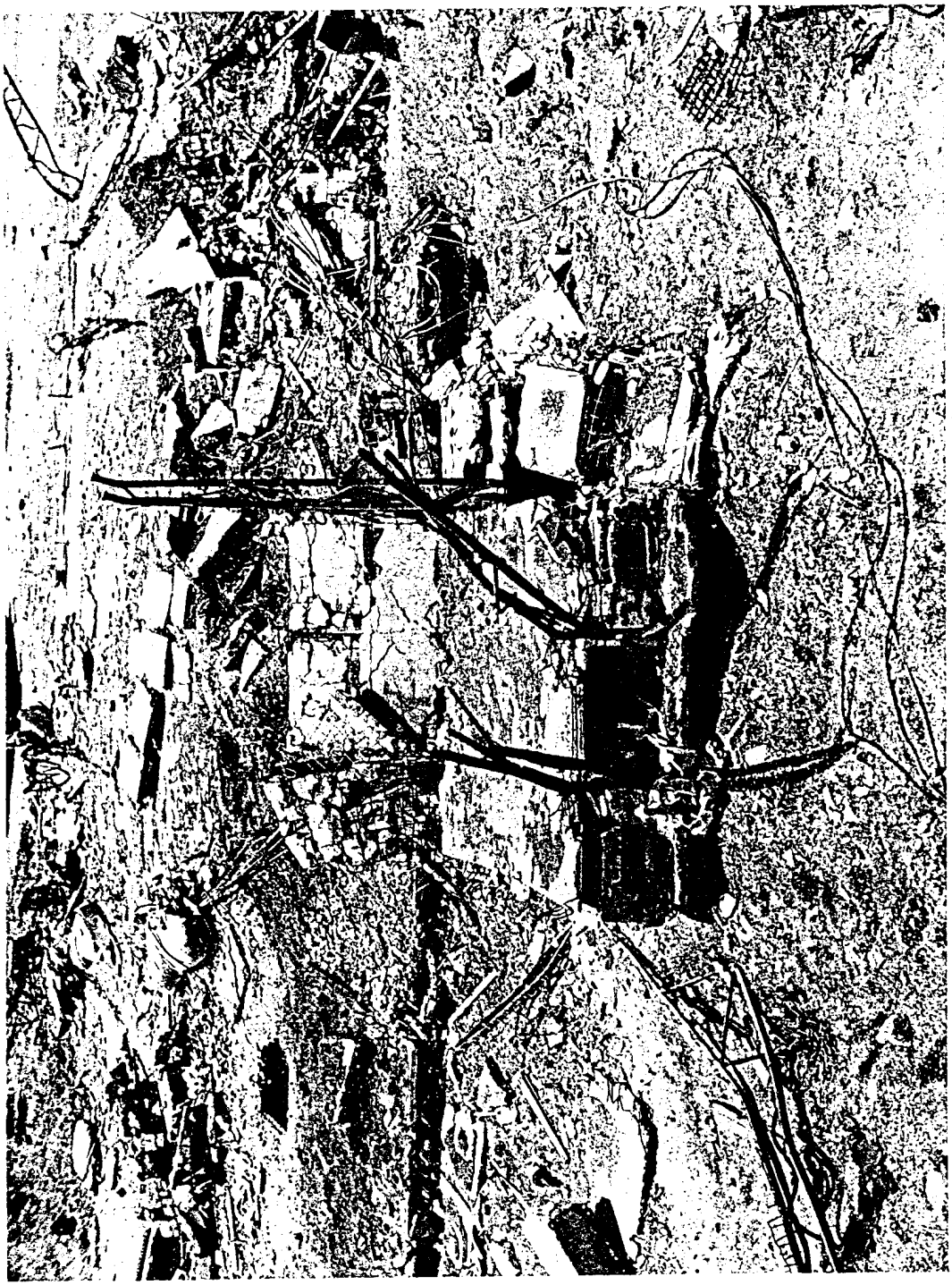


Fig. L.203 Remains of Front-wall Panel No. 25 after Being Hurled about 35 ft, Structure 3.2.3a



Fig. L.204 Remains of Front-wall Panel No. 24 (in Foreground) after Being Hurled about 50 ft, Structure 3.2.3a.
Panel 25 is visible in left center of photograph.



Fig. L.205 Remains of Front-wall Panel No. 28 after Being Hurled about 75 ft to the Rear, Structure 3.2.3a



Fig. L.206 Remains of Front-wall Panel No. 29 after Being Hurled about 90 ft to the Rear, Structure 3.2.3a

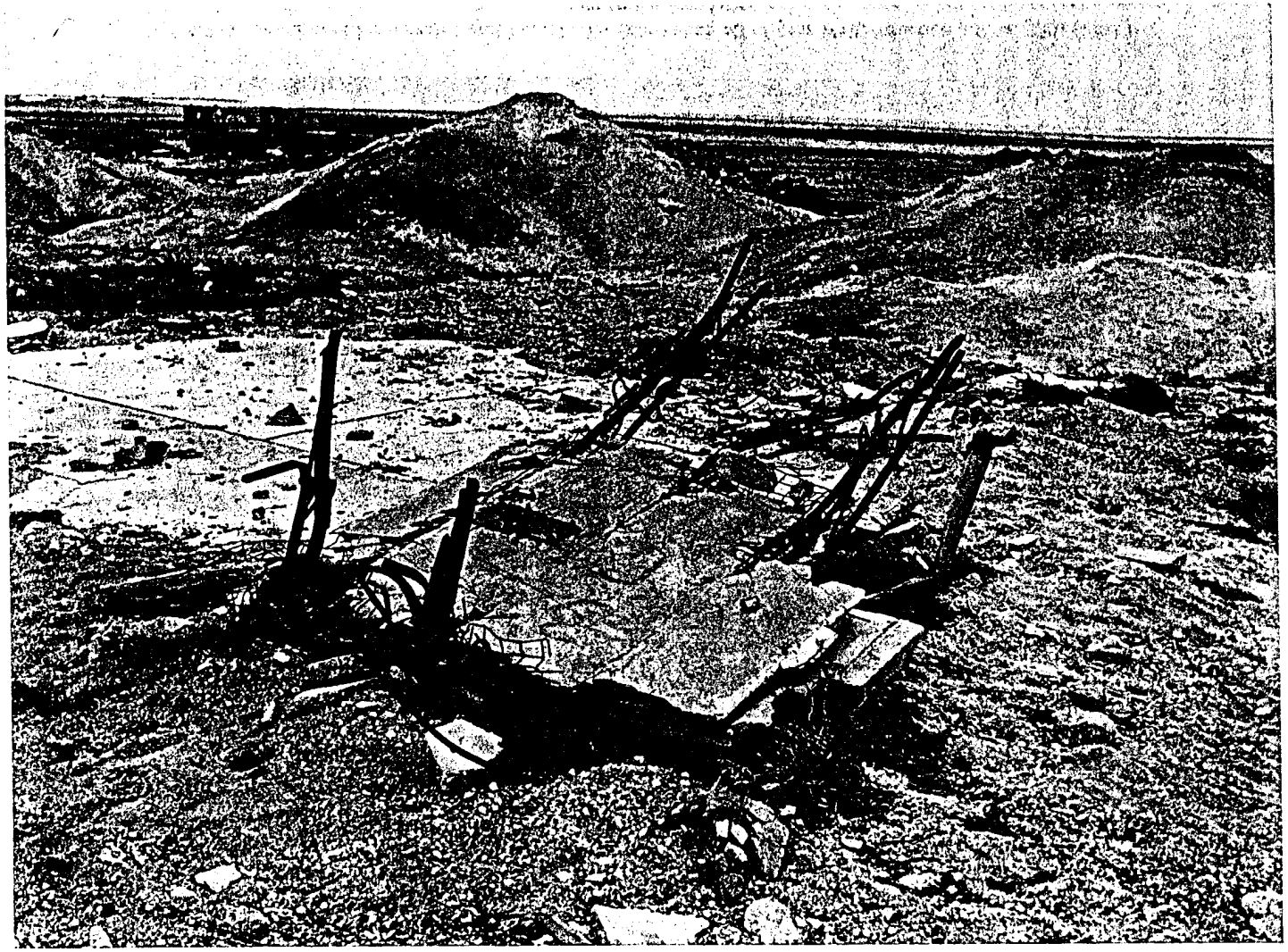


Fig. L.207 Remains of Front-wall Panel No. 27 after Being Hurled about 100 ft to the Rear, Structure 3.2.3a



Fig. L.208 Remains of Front-wall Panel No. 26 after Rebounding off of Rear Wall, Structure 3.2.3a. This panel is lying on the foundation.

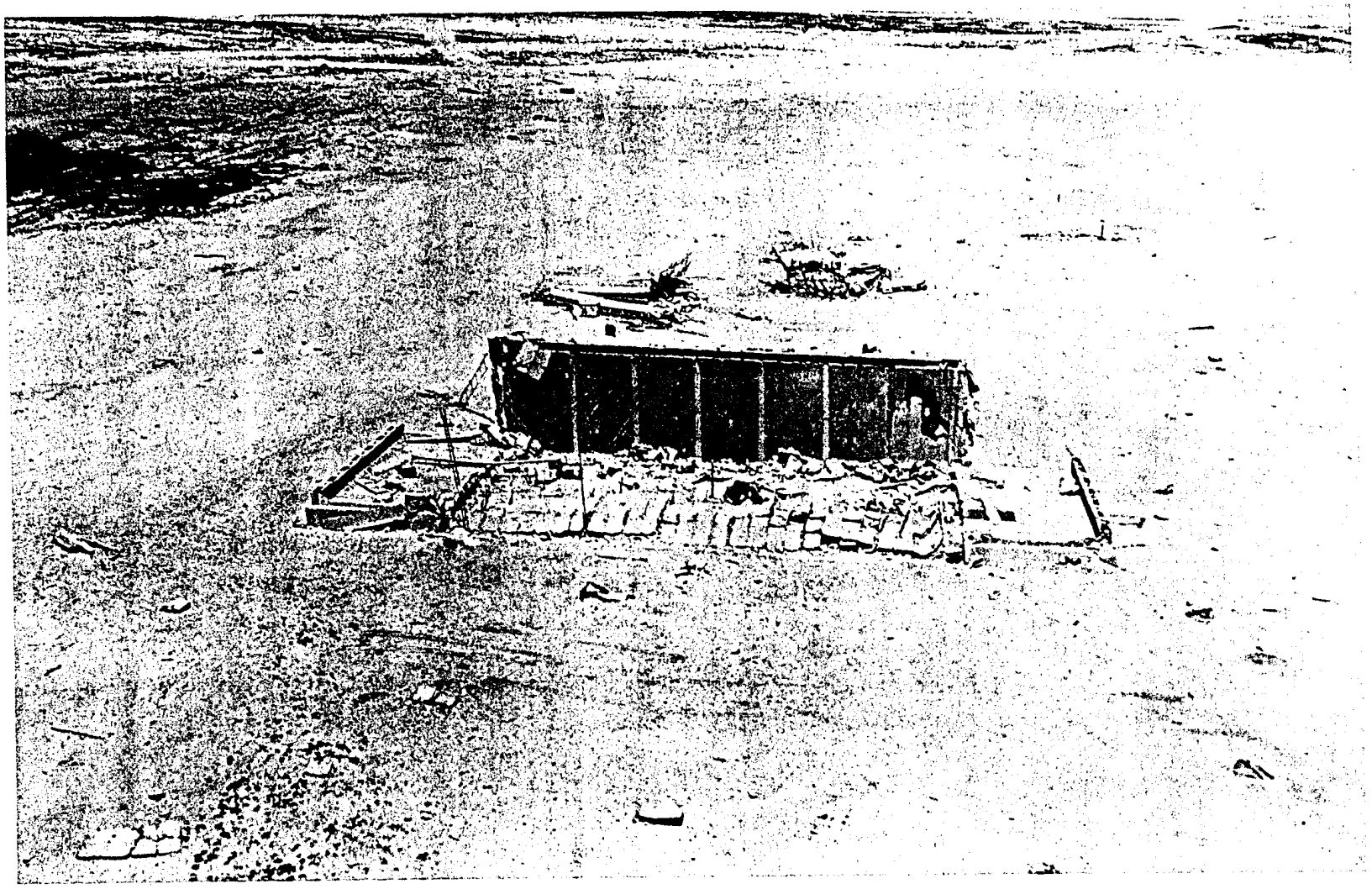


Fig. L.209 Aerial View of Structure Destroyed by Blast, Structure 3.2.3b. End walls are rotated outward, front wall is flattened and crushed, rear wall still stands, and roof can be seen about 75 ft to rear of structure.

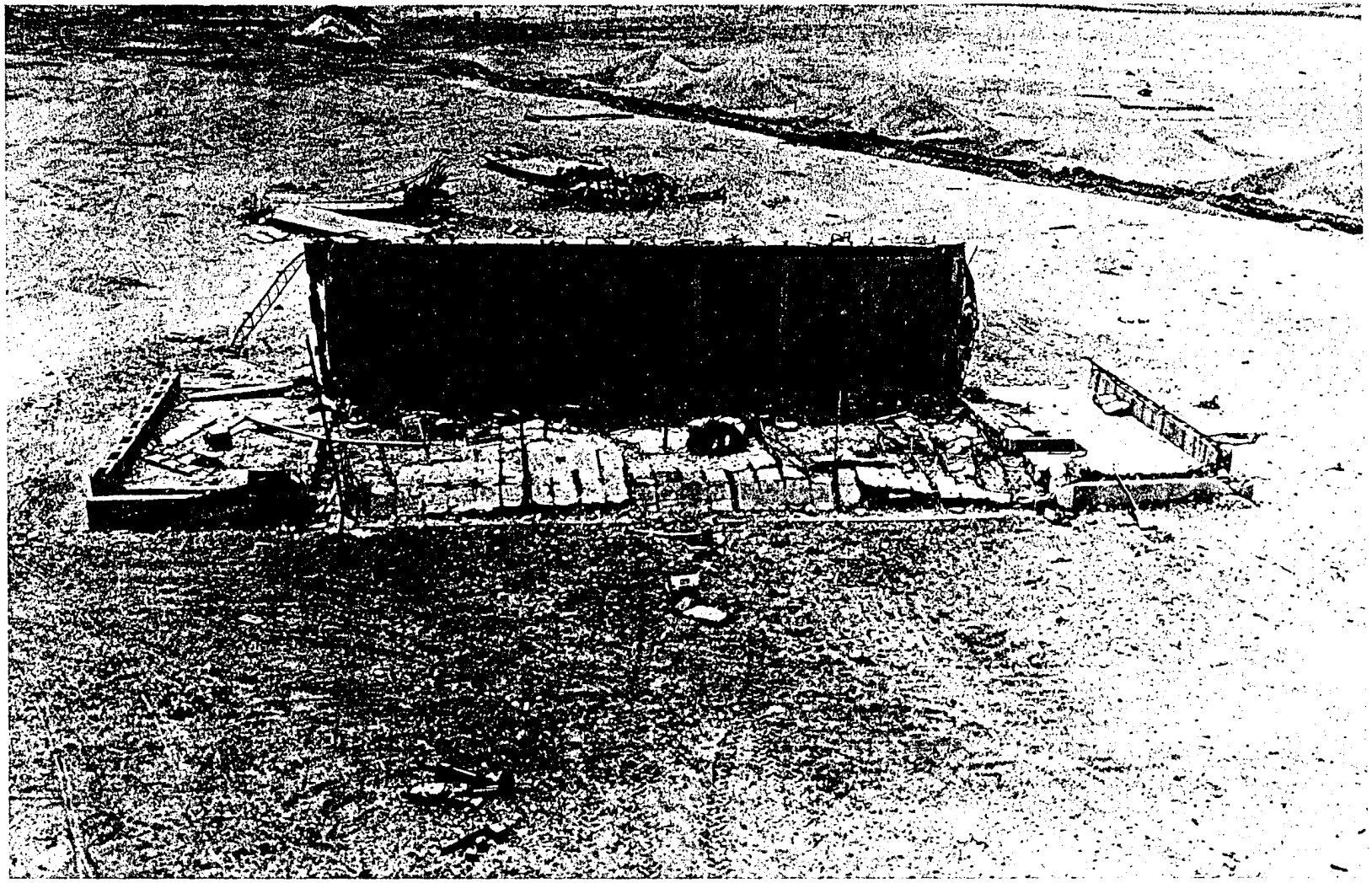


Fig. L.210 Aerial View of Structure Destroyed by Blast, Structure 3.2.3b. Inward collapse of front wall is clearly visible. Note no lateral displacement of end walls. Top rear wall is practically intact.

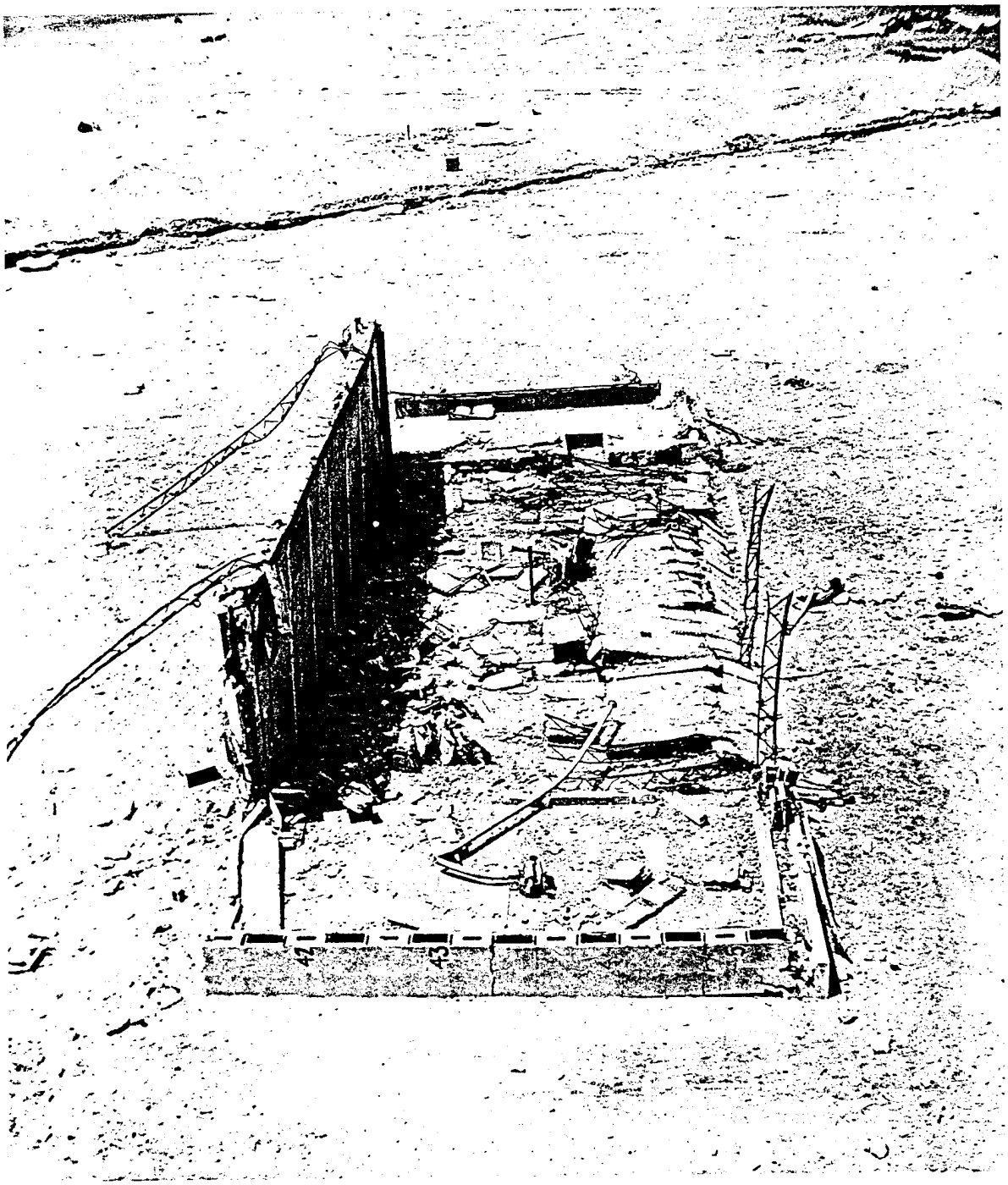


Fig. L.211 Side View of Structure after Blast, Structure 3.2.3a. Pattern of failure in front wall is clearly evident. Attitude of the two remaining roof trusses shows how roof tilted up and flipped over backward.

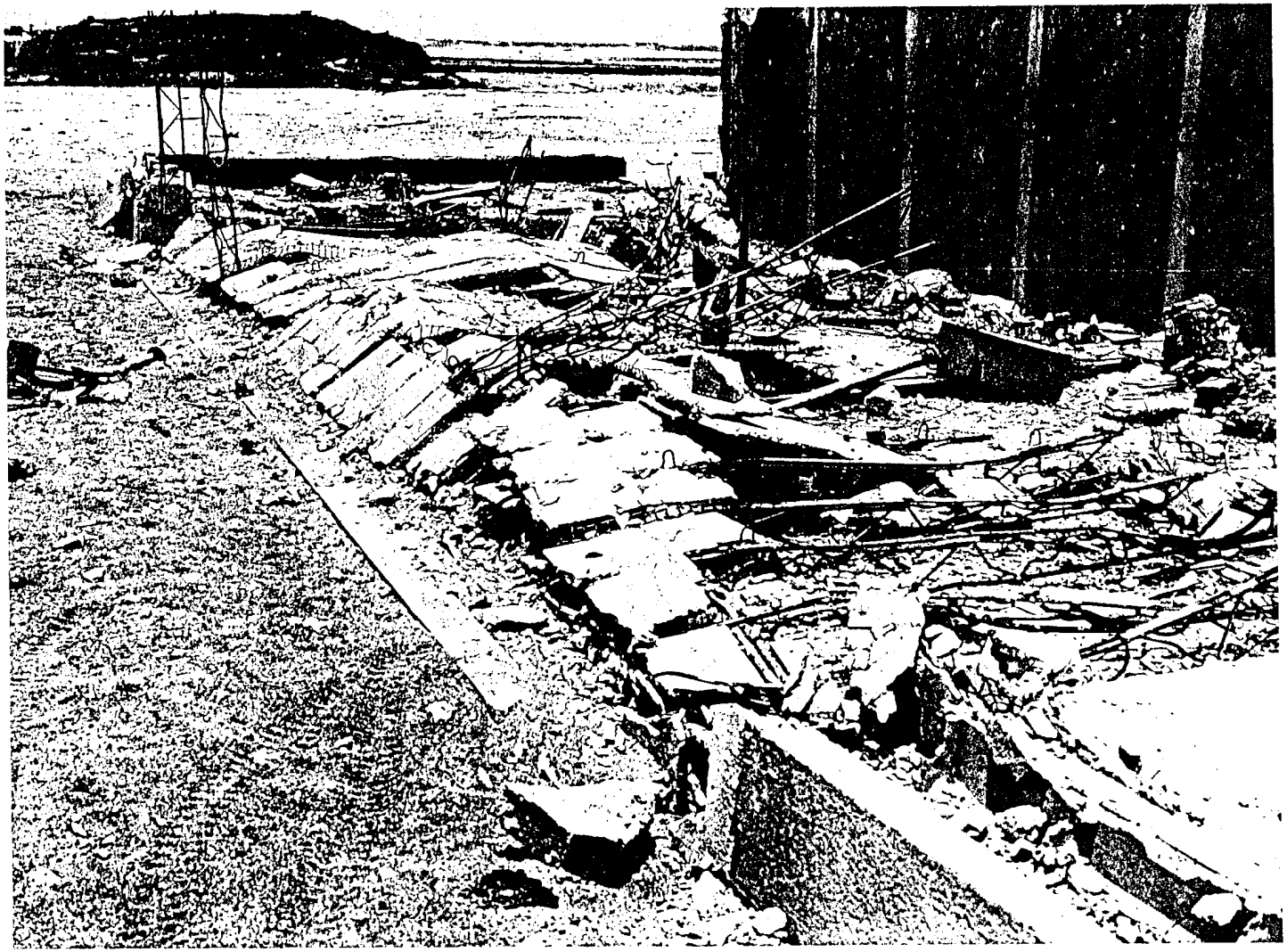


Fig. L.212 View along Front Edge of Foundation, Structure 3.2.3a. Note severe bending of front-wall panels at base. General "S" shape of front-wall trusses is clearly evident.

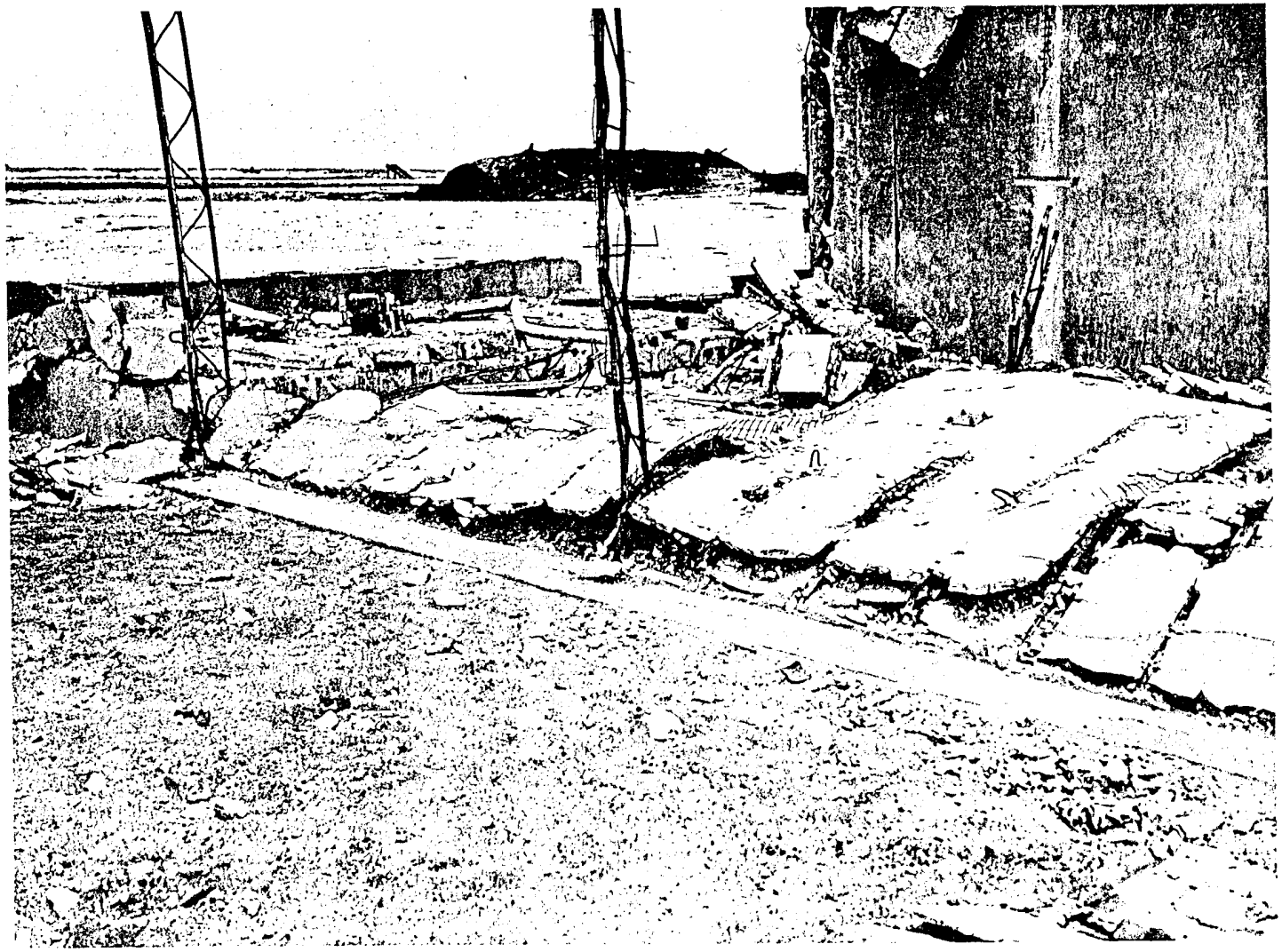


Fig. L.213 Lower Edge of Front-wall Panels, Showing Crushing of Cells and Trusses, Structure 3.2.3b. Note trusses still attached to foundation.

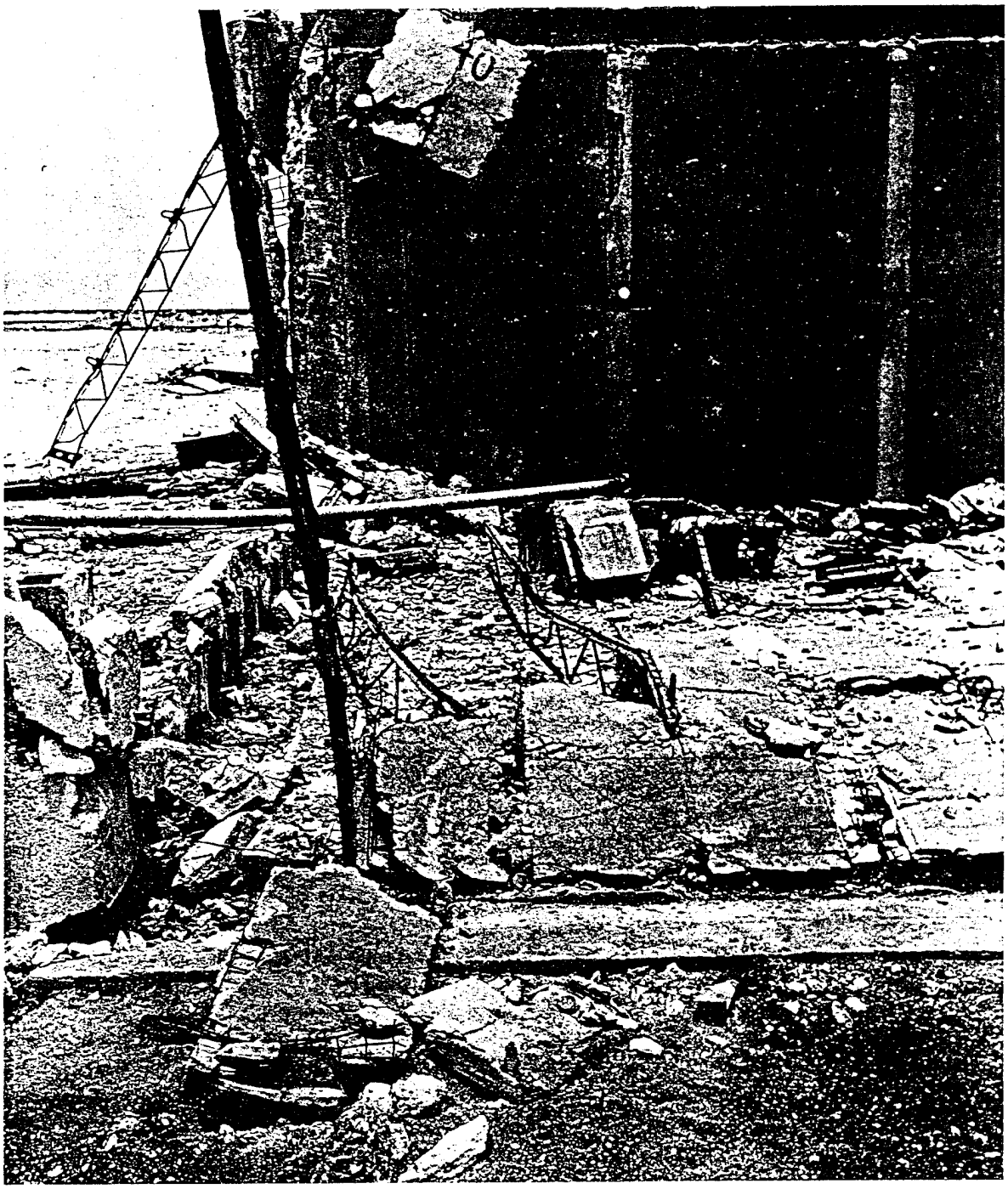


Fig. L.214 Left End of Front Wall, Showing Severe Crushing of Cells, Structure 3.2.3b. Note "S" shape assumed by trusses.

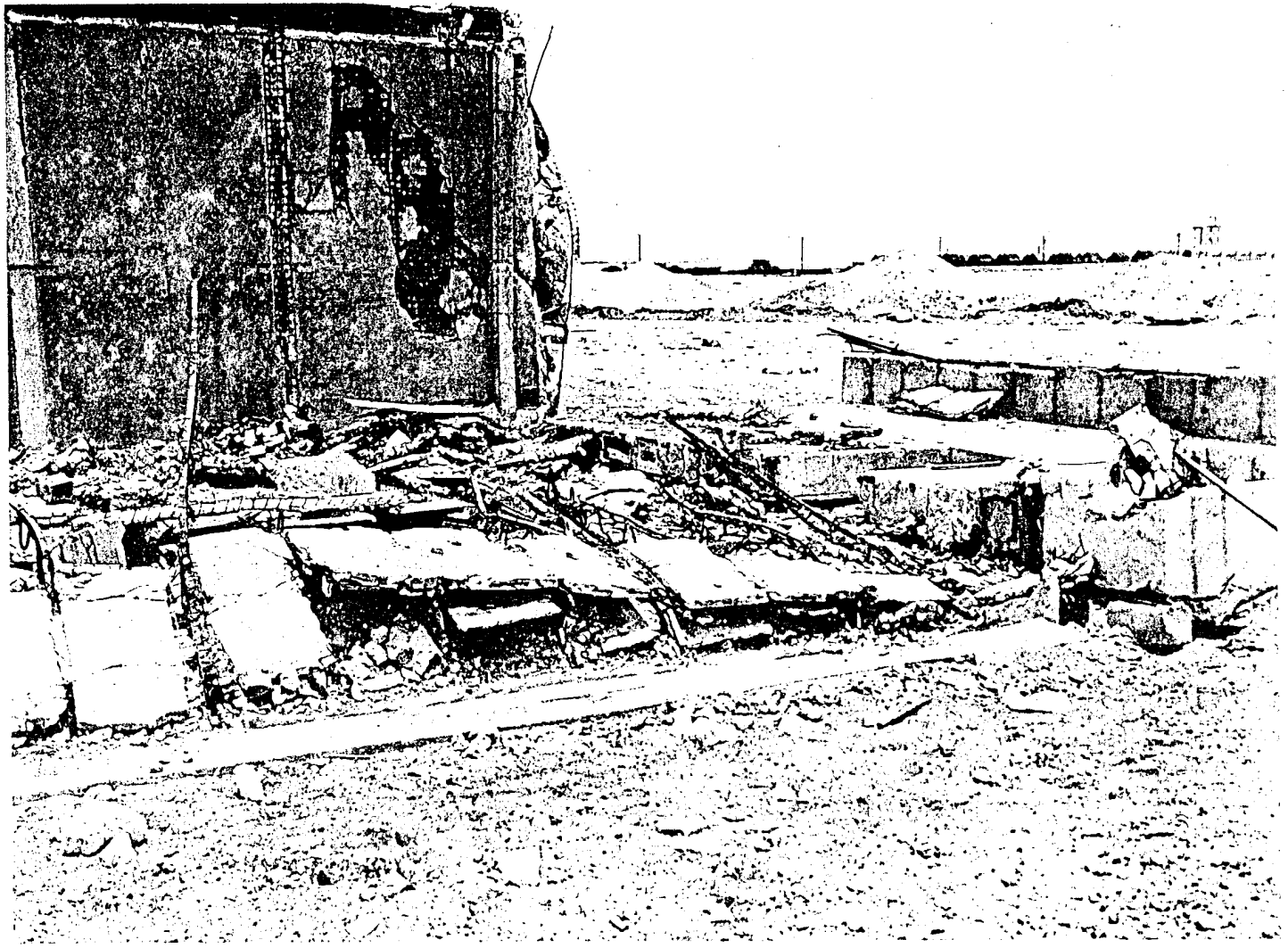


Fig. L.215 Right End of Front Wall at Foundation Line, Structure 3.2.3b. Cells are sprung open in one panel. Note where portions of right-hand front-wall panel struck the rear wall and broke loose large portions of concrete.

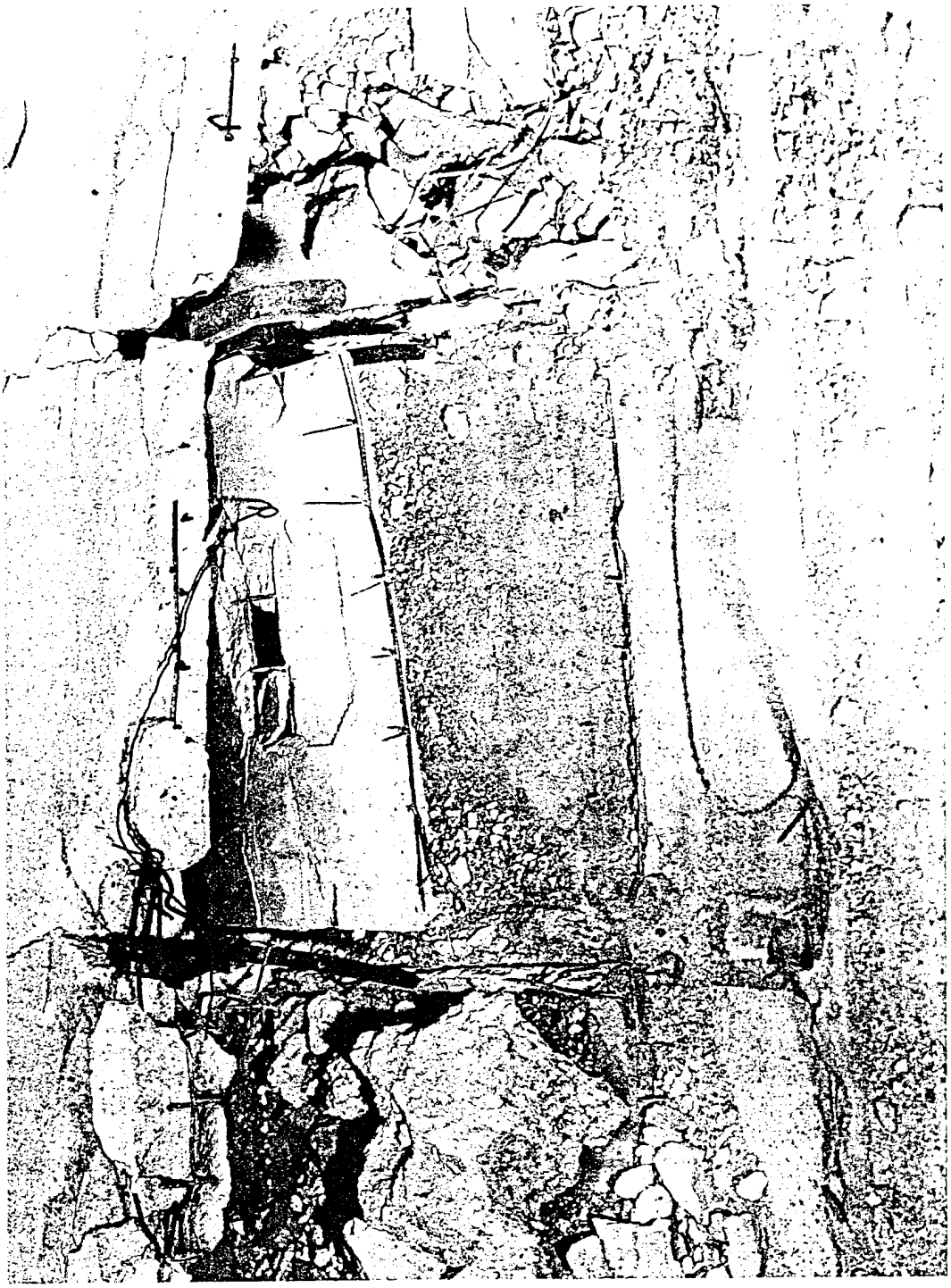


Fig. L.216 Detail View of Cell Pulled Loose from Its Anchorage, Structure 3.2.3b. Note also how truss failed in the weld.



Fig. L.217 Side View of Front-wall Panels, Structure 3.2.3b. Typical "S" shape of panels and trusses is clearly visible. This shape was caused by initial deflection of panel before rupture and then reverse bending during rotation after rupture from the roof.



Fig. L.218 Left Side View of Front Wall, Structure 3.2.3b. Base of right end wall can also be seen.



Fig. L.219 Right Side View of Front Wall, Structure 3.2.3b. Note debris piled against rear wall.



Fig. L.220 Right Side of Front Wall, Structure 3.2.3b. The missing portions broke loose during blast and struck the right-hand panel of the rear wall.

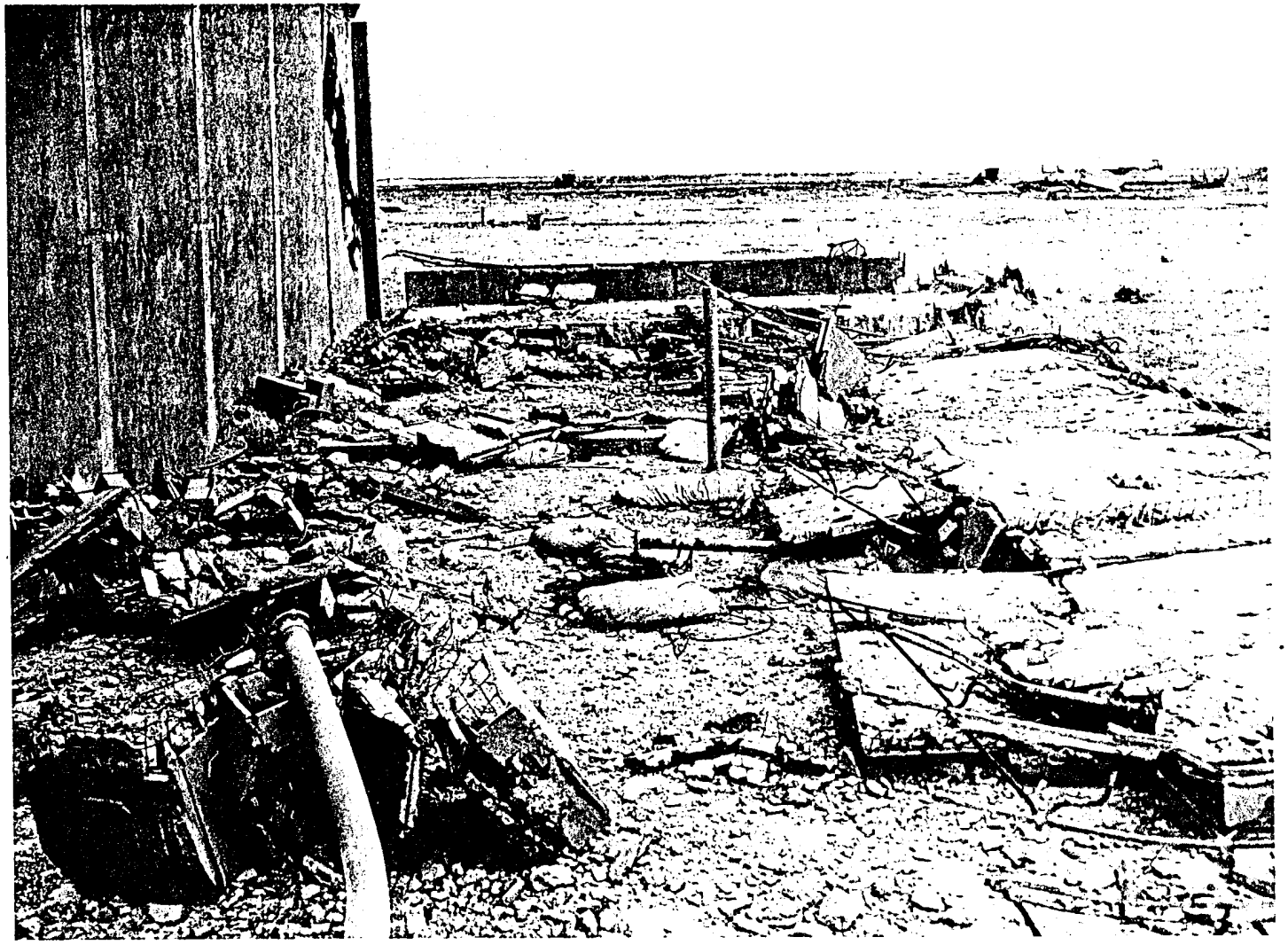


Fig. L.221 General View of Upper Edge of Front Wall, Structure 3.2.3b. This portion of wall suffered heavy damage when it was severed from the roof and also upon impact as it hit the foundation.

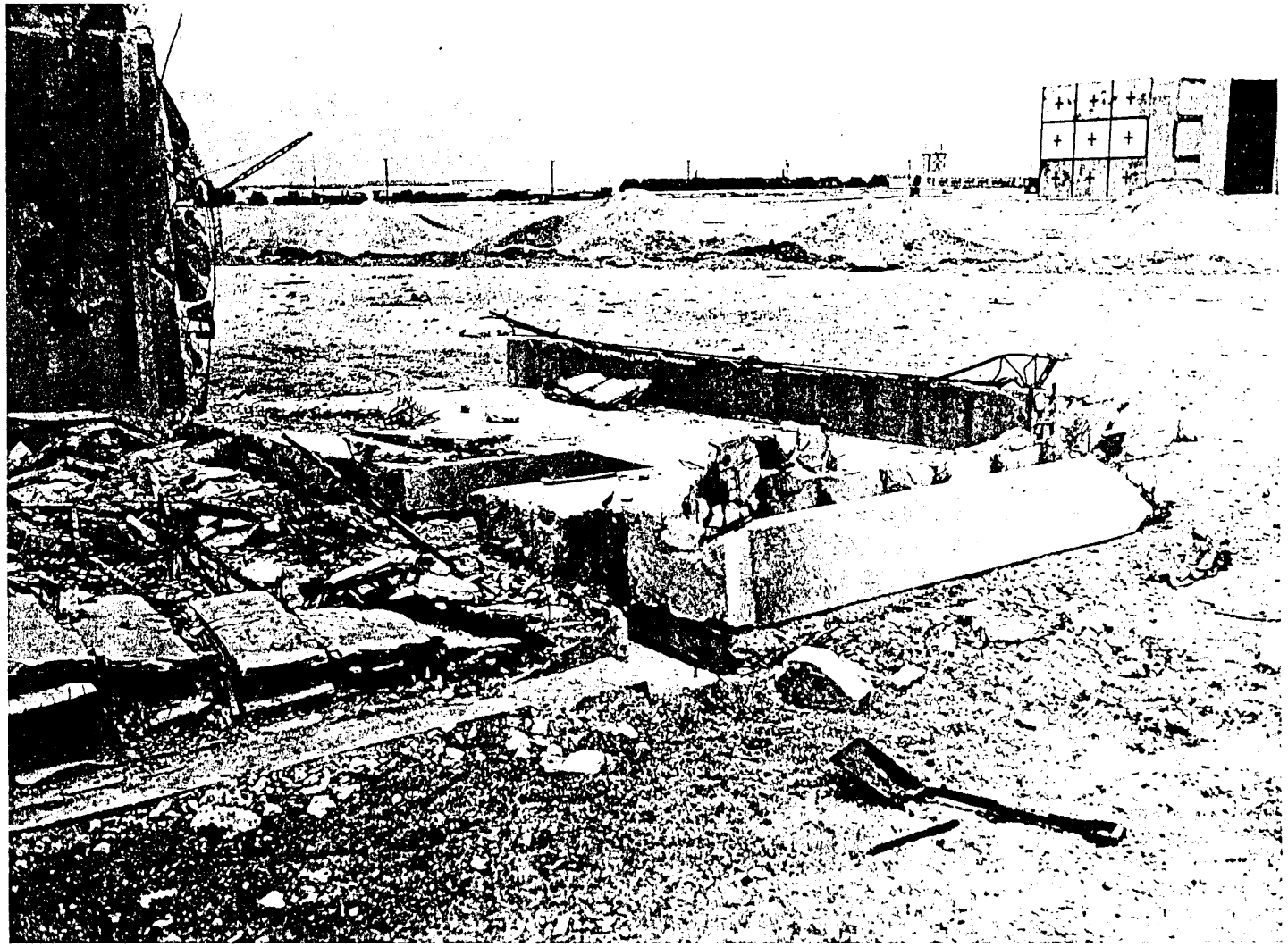


Fig. L.222 Right End Wall Rotated Outward to the Horizontal Position, but with No Lateral Displacement of the Base, Structure 3.2.3b. Note heavy crack in foundation at near corner of wall. See next photograph for detail.



Fig. L.223 Detail View of 2-in.-wide Crack in Foundation at Front Right Corner, Due to Outward Rotation of End Wall, Structure 3.2.3b. Note tension (bending) failures of pilaster dowels.

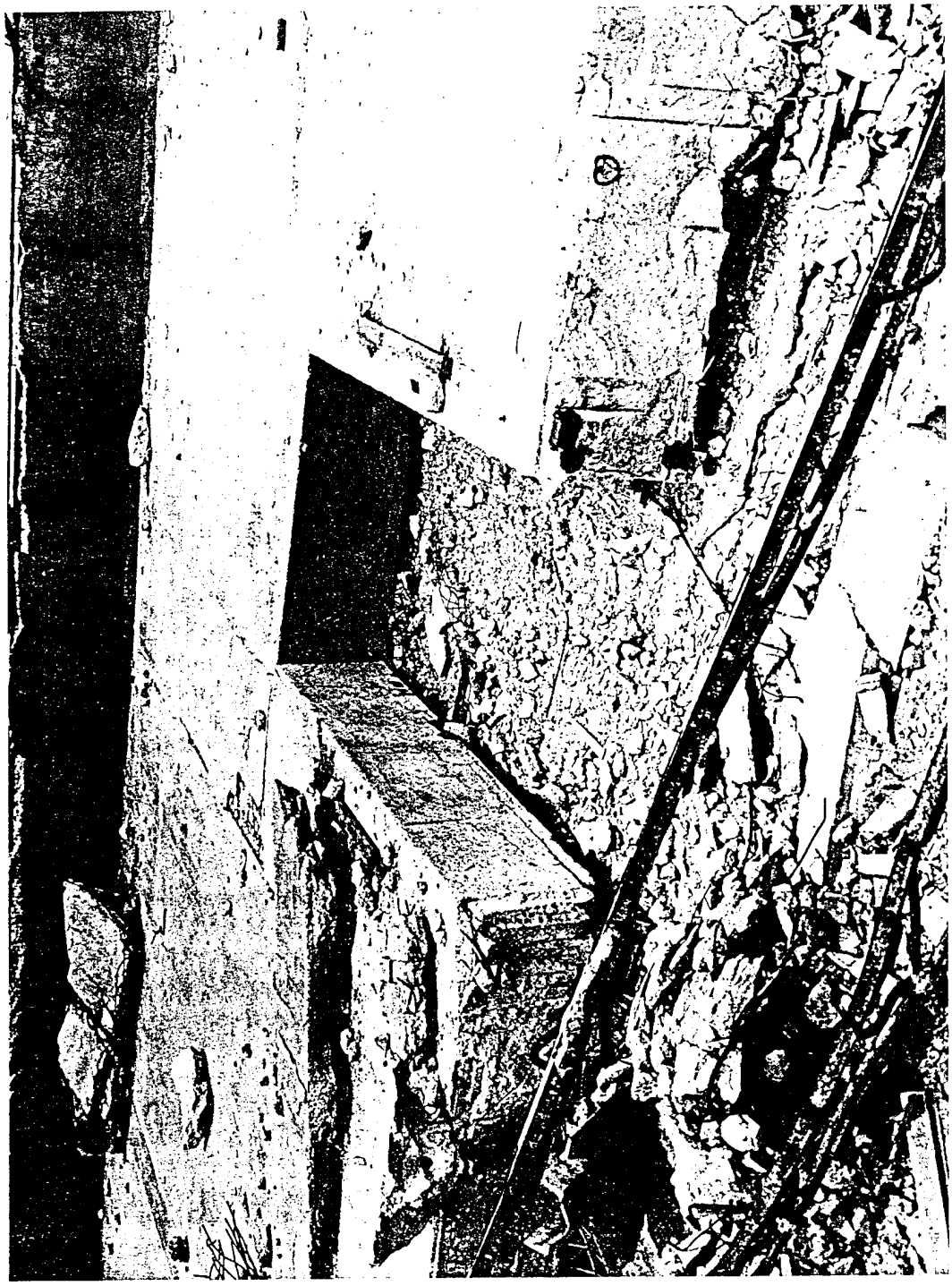


Fig. L.224 Base of Right End Wall, Structure 3.2.3b. Trusses pulled loose from channel anchorage. Note the practically undamaged condition of the panels in this wall.

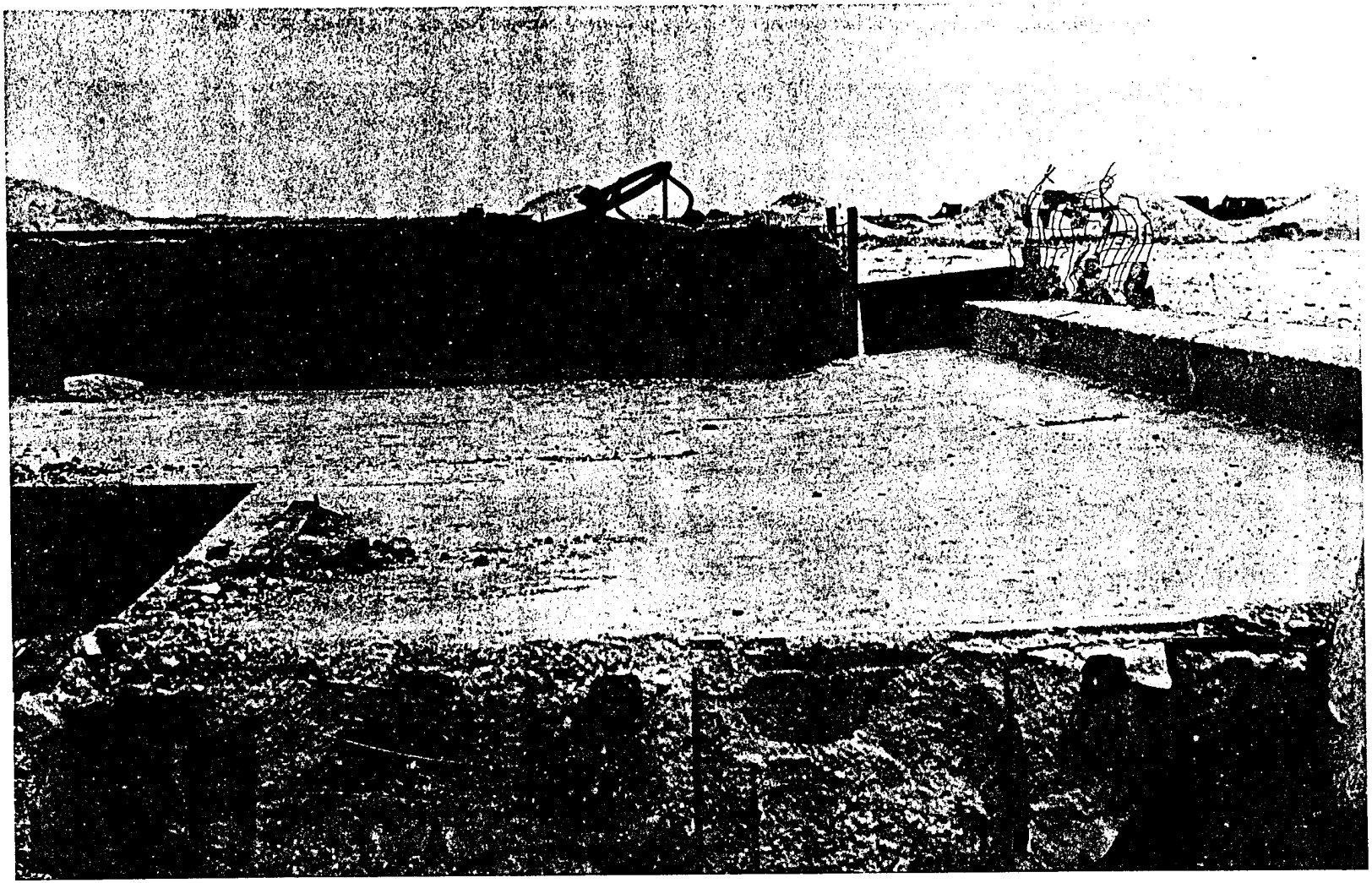


Fig. L.225 Detail View of Anchorage Failures, Structure 3.2.3b. Trusses pulled loose from channels by shearing out the base metal of the channel at the weld location.

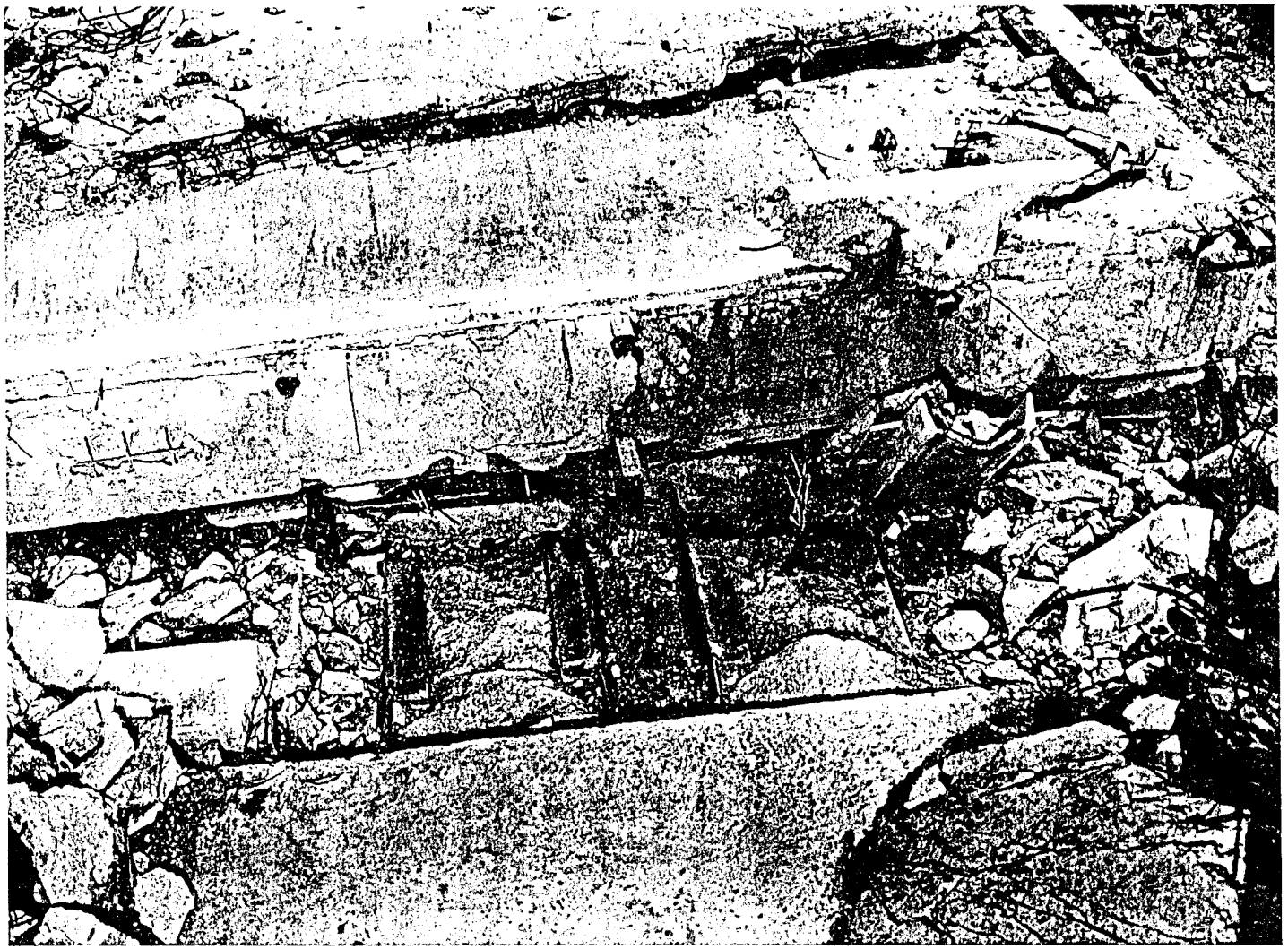


Fig. L.226 Detail View Showing Relative Positions of Anchorage Channels and Rest of End Wall, Structure 3.2.3b.
Note the almost simultaneous pulling up of one channel and failure of weld between truss and channel.

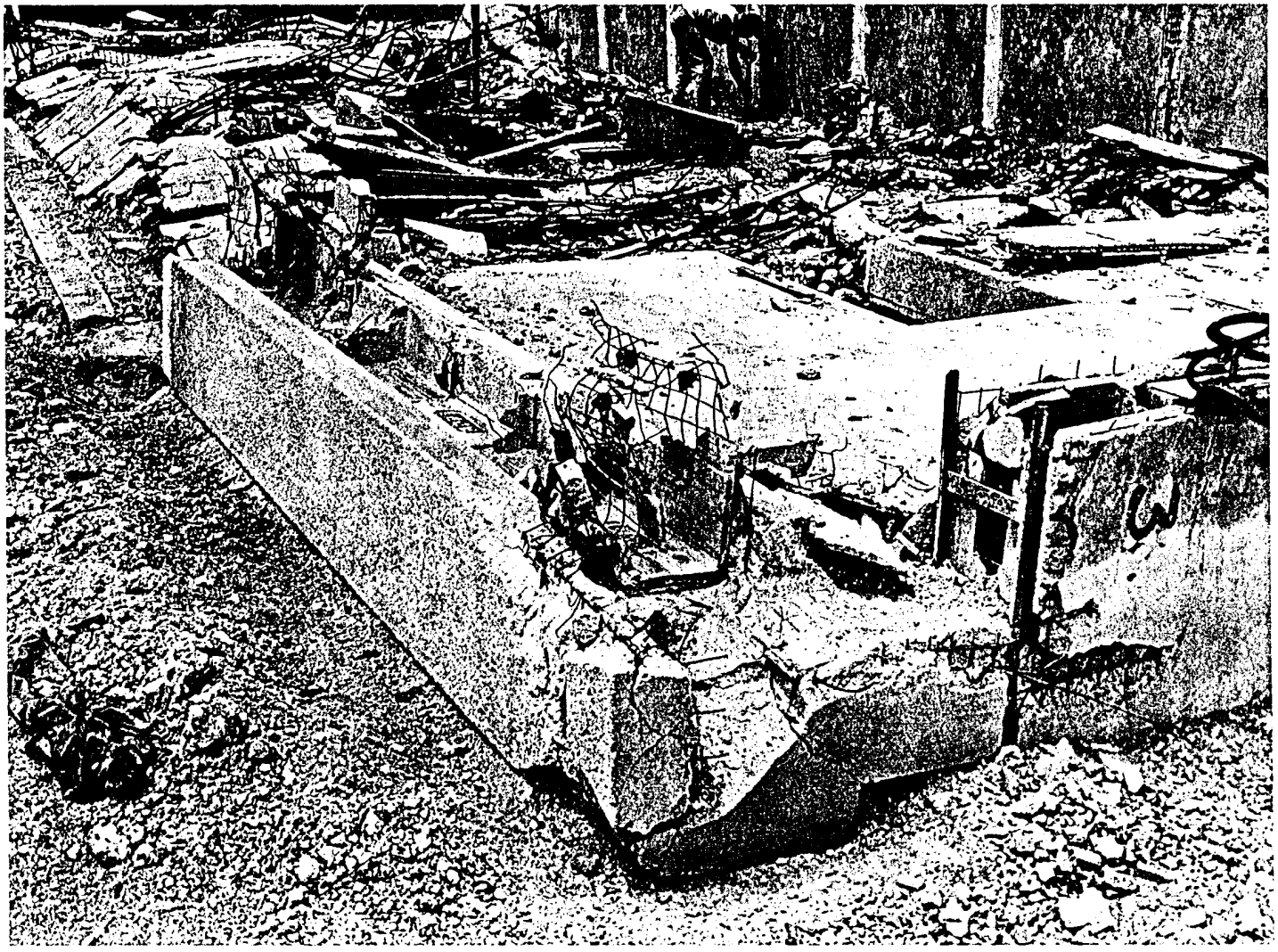


Fig. L.227 Pilaster Corner of Right End Wall, Structure 3.2.3b. Detail view of cell failures at this location is shown.

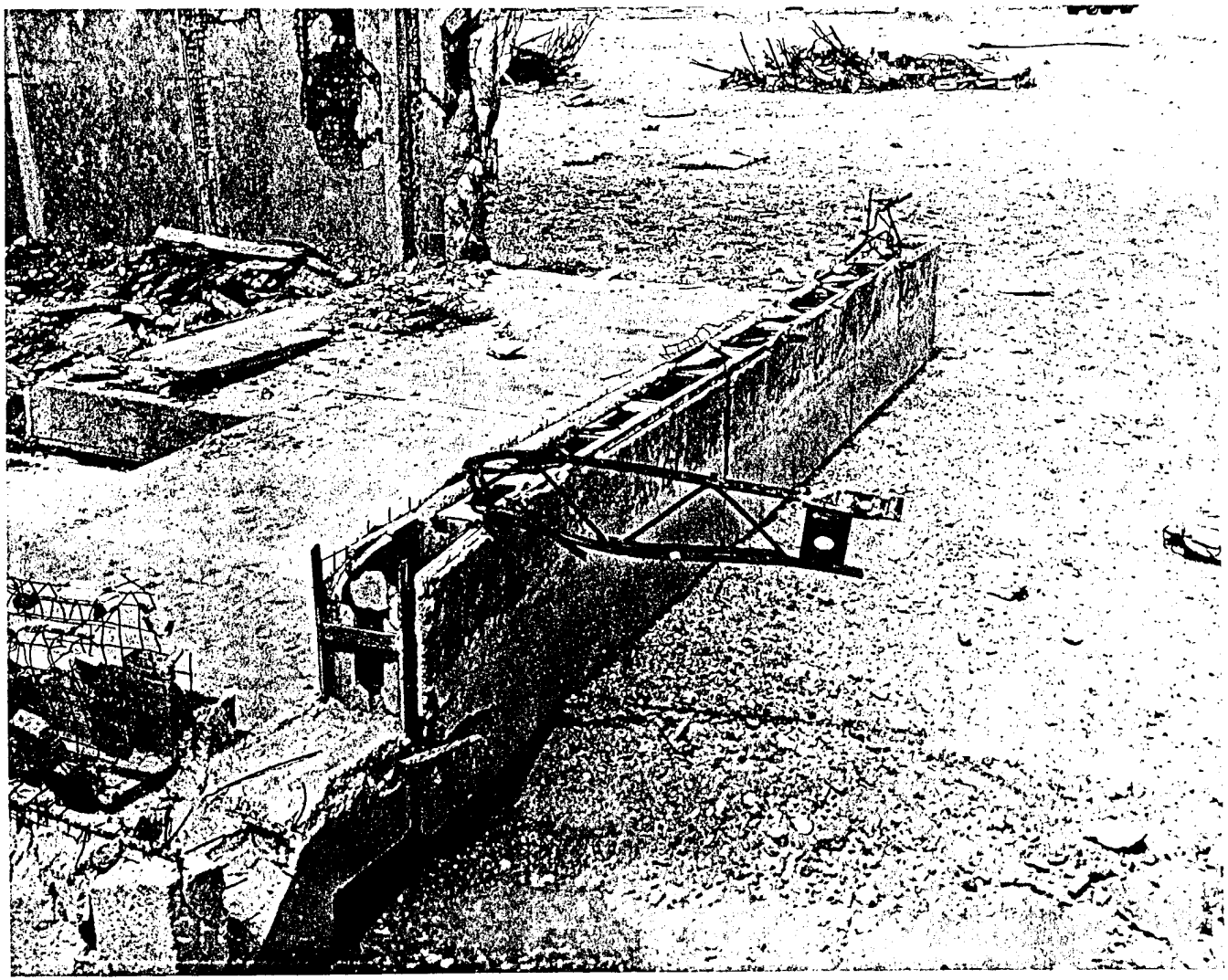


Fig. L.228 View Showing How Edge Row of Roof Cells Remained with End Wall, Structure 3.2.3b. Special transverse trusses between top of end wall and first roof truss caused this row of cells to act as a unit with the end wall. One of the transverse trusses can be seen along face of cell in left foreground.

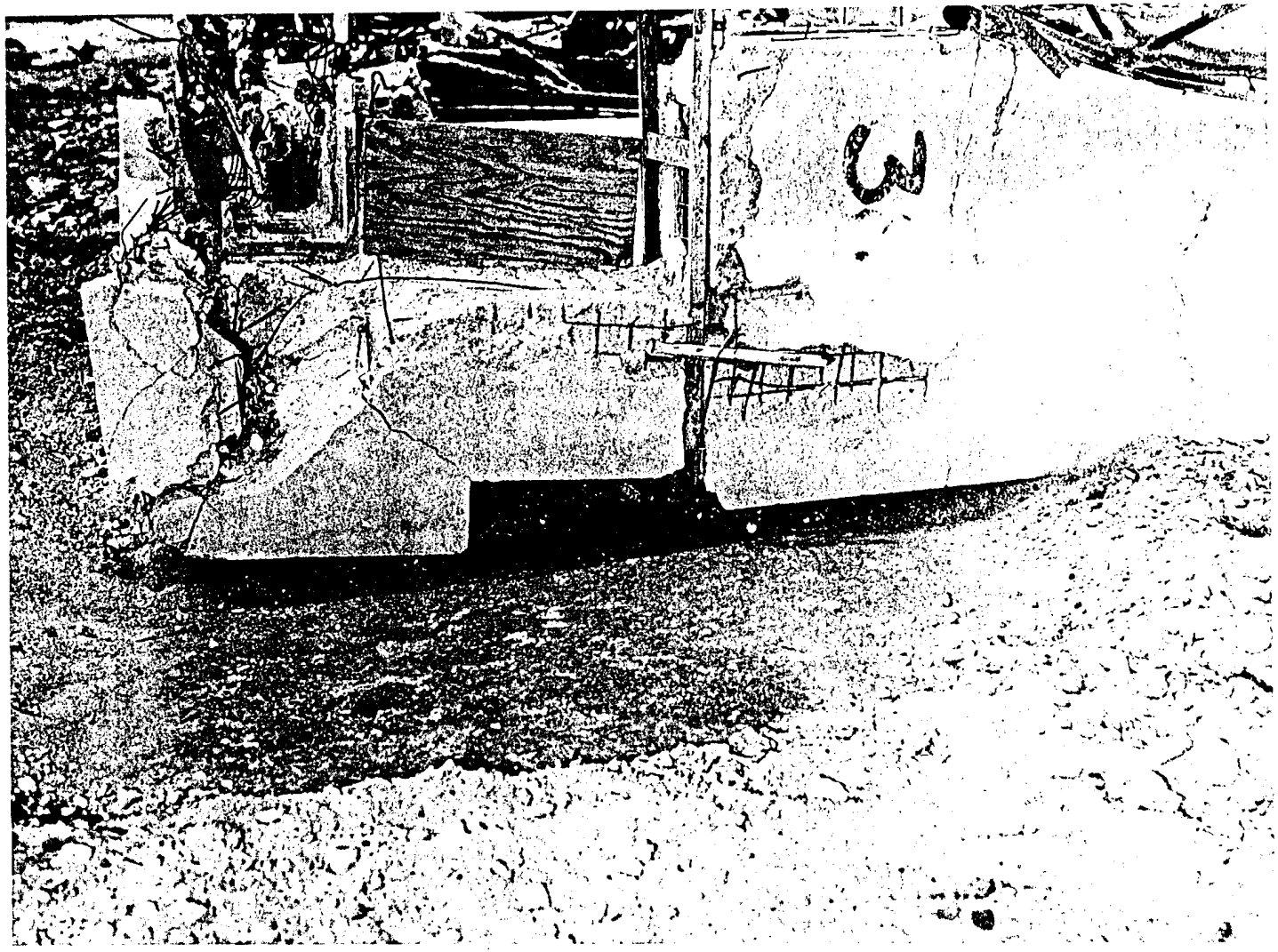


Fig. L.229 Slight Bend at First Cell Line Past Pilaster Corner, Caused by Projection of Pilaster upon Landing, Structure 3.2.3b. One of the transverse trusses mentioned in the preceding caption can be seen in center of this photograph.

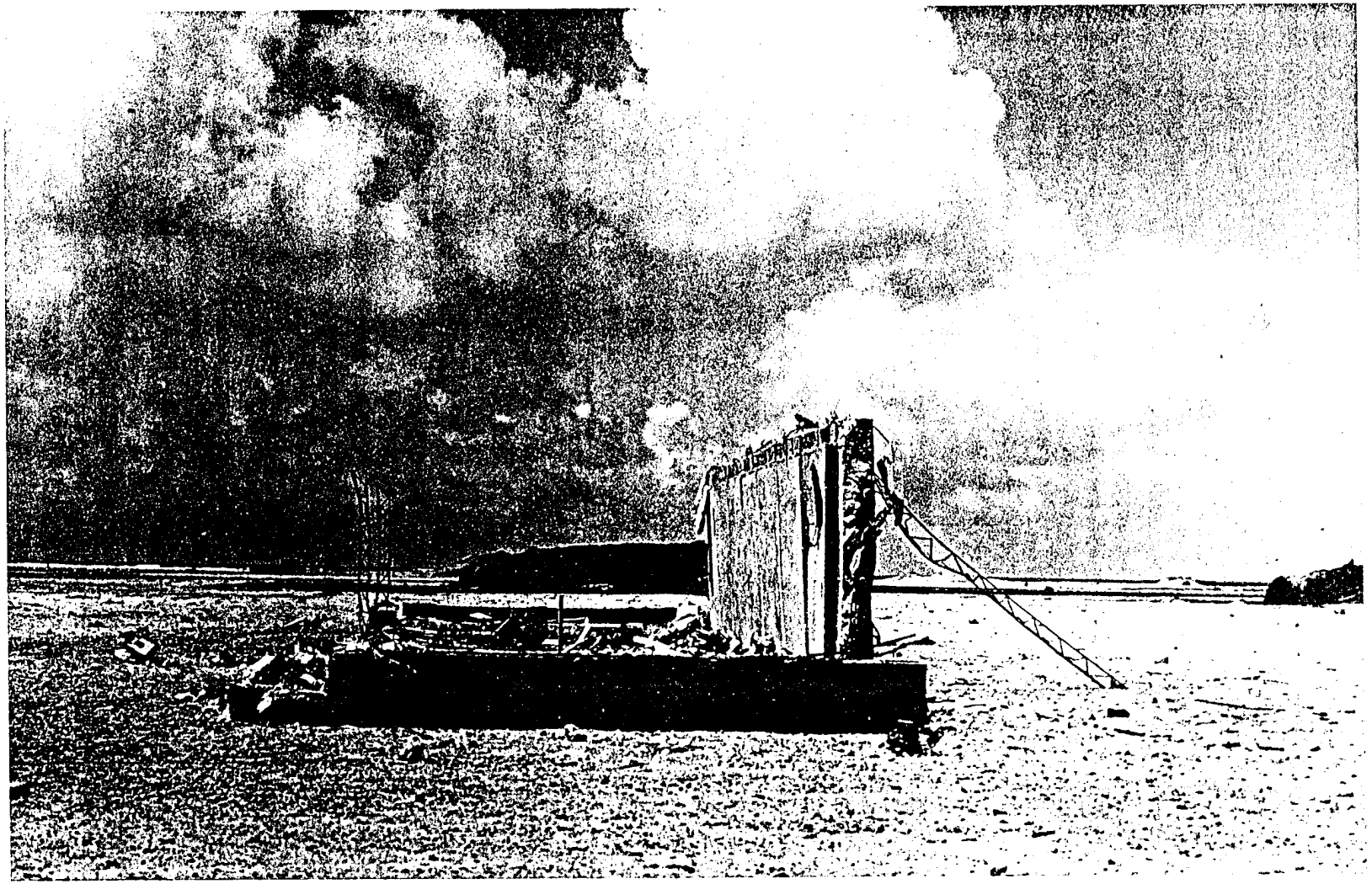


Fig. L.230 Top End of Right End Wall, with Edge Row of Roof Cells Attached and Intact in Foreground, Structure 3.2.3b

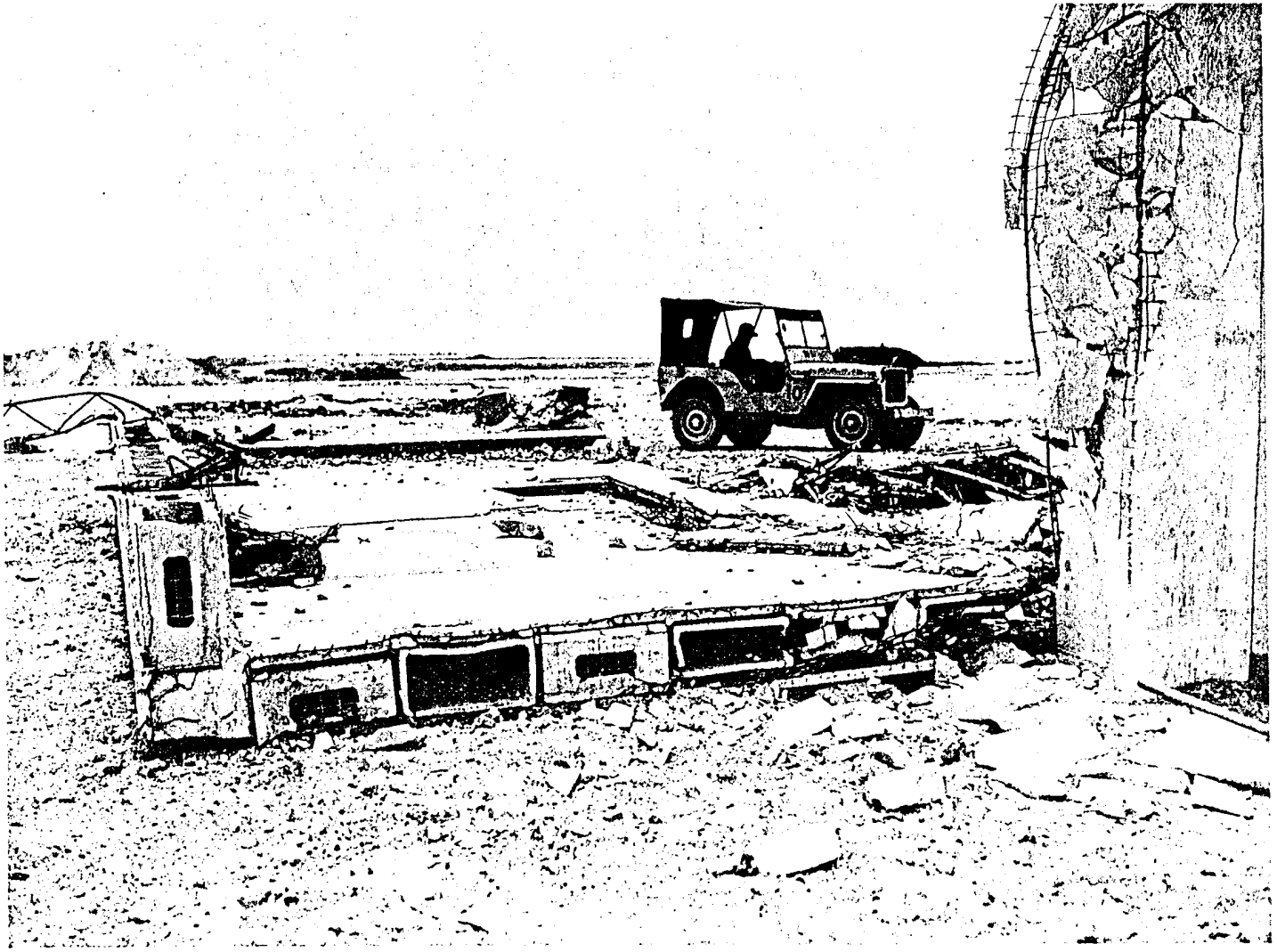


Fig. L.231 Rear Edge of Right End Wall, Structure 3.2.3b. Note that pilaster corner remained with rear wall and the panel shown here sheared out of the pilaster, rupturing the pilaster as the end wall rotated outward.



Fig. L.232 Detail View of Pilaster at Rear Right Corner, Showing How End Wall Ruptured Pilaster as It Rotated Outward, Structure 3.2.3b. Deflection inward of rear wall can be seen in this photograph.

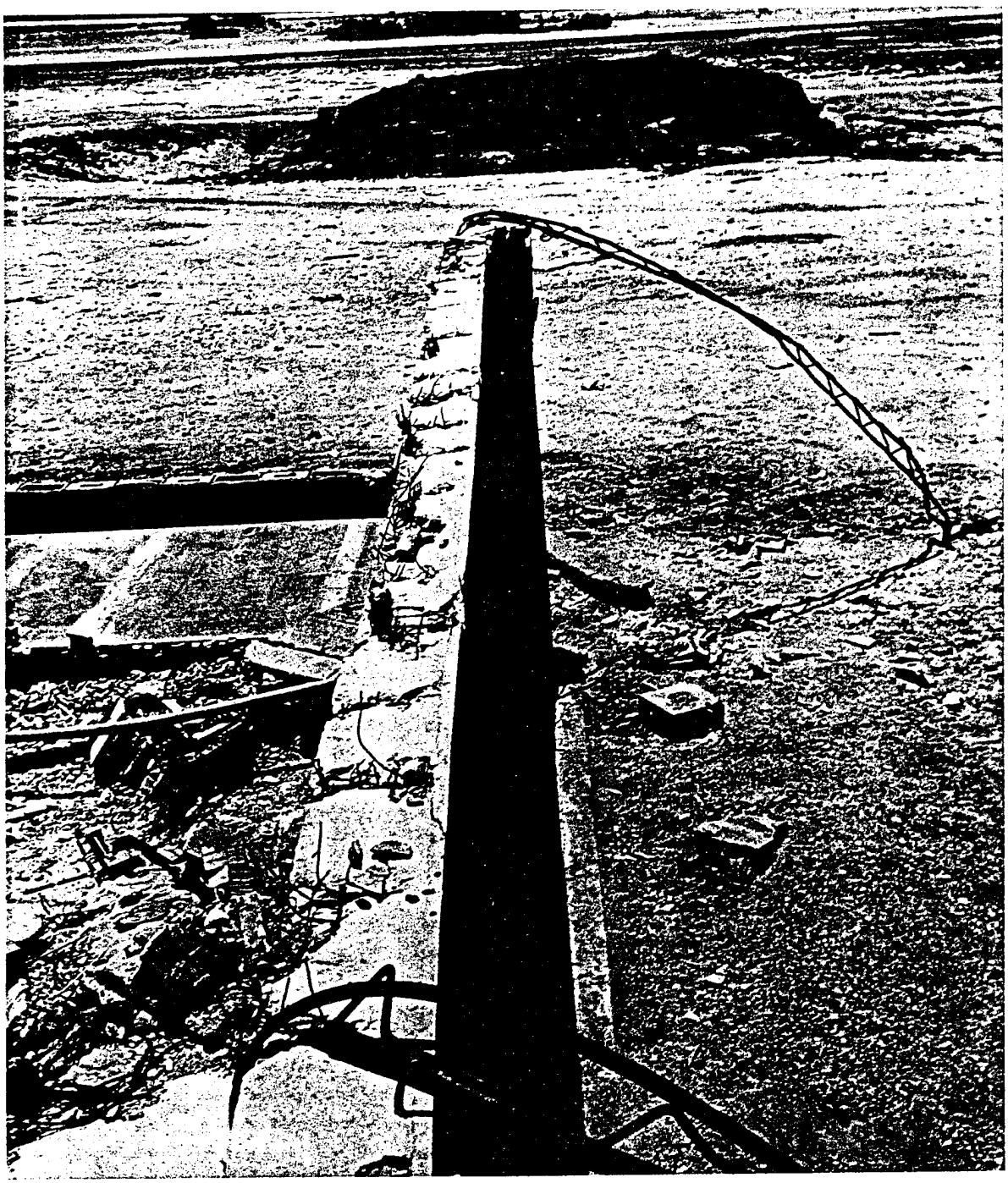


Fig. L.233 View along Top of Rear Wall, Structure 3.2.3b. Little damage was done to the top surface. Extreme bending of roof trusses as roof flipped over can be seen.

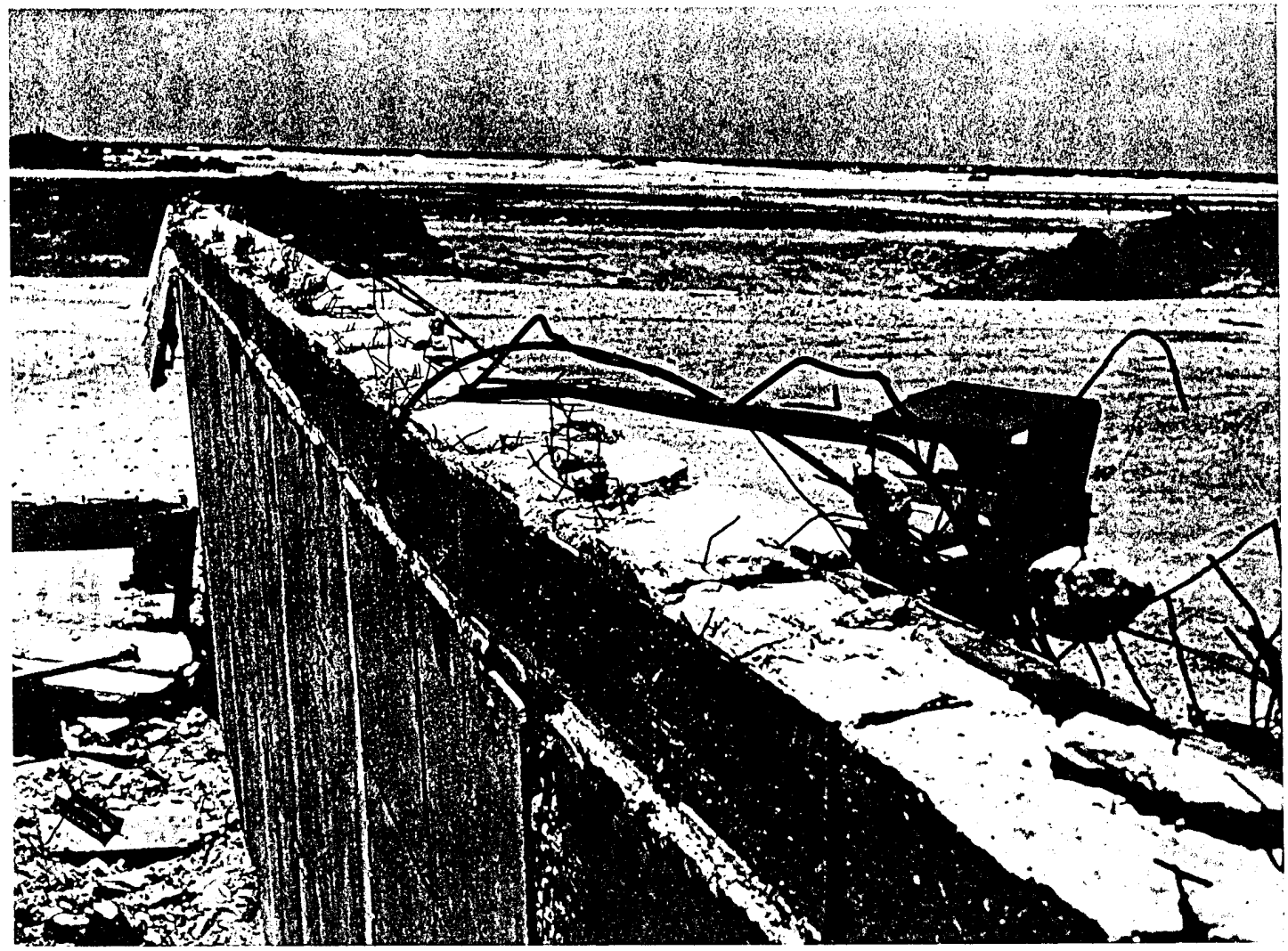


Fig. L.234 Detail of Bent Roof Truss, Structure 3.2.3b. Rest of roof trusses broke loose at weld to end plate and went with roof.

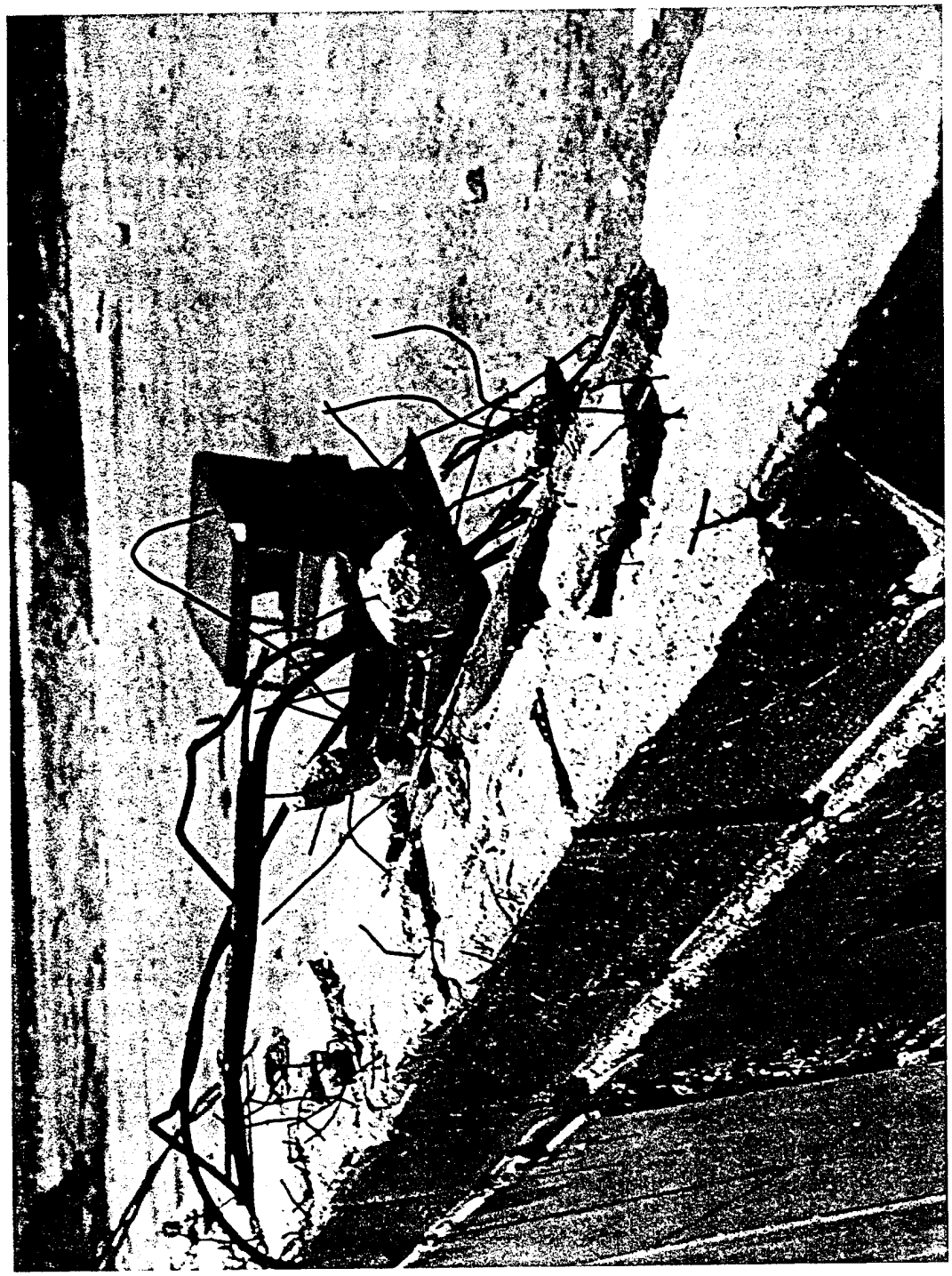


Fig. L.235 Close-up View of Top Edge of Rear Wall, Structure 3.2.3b

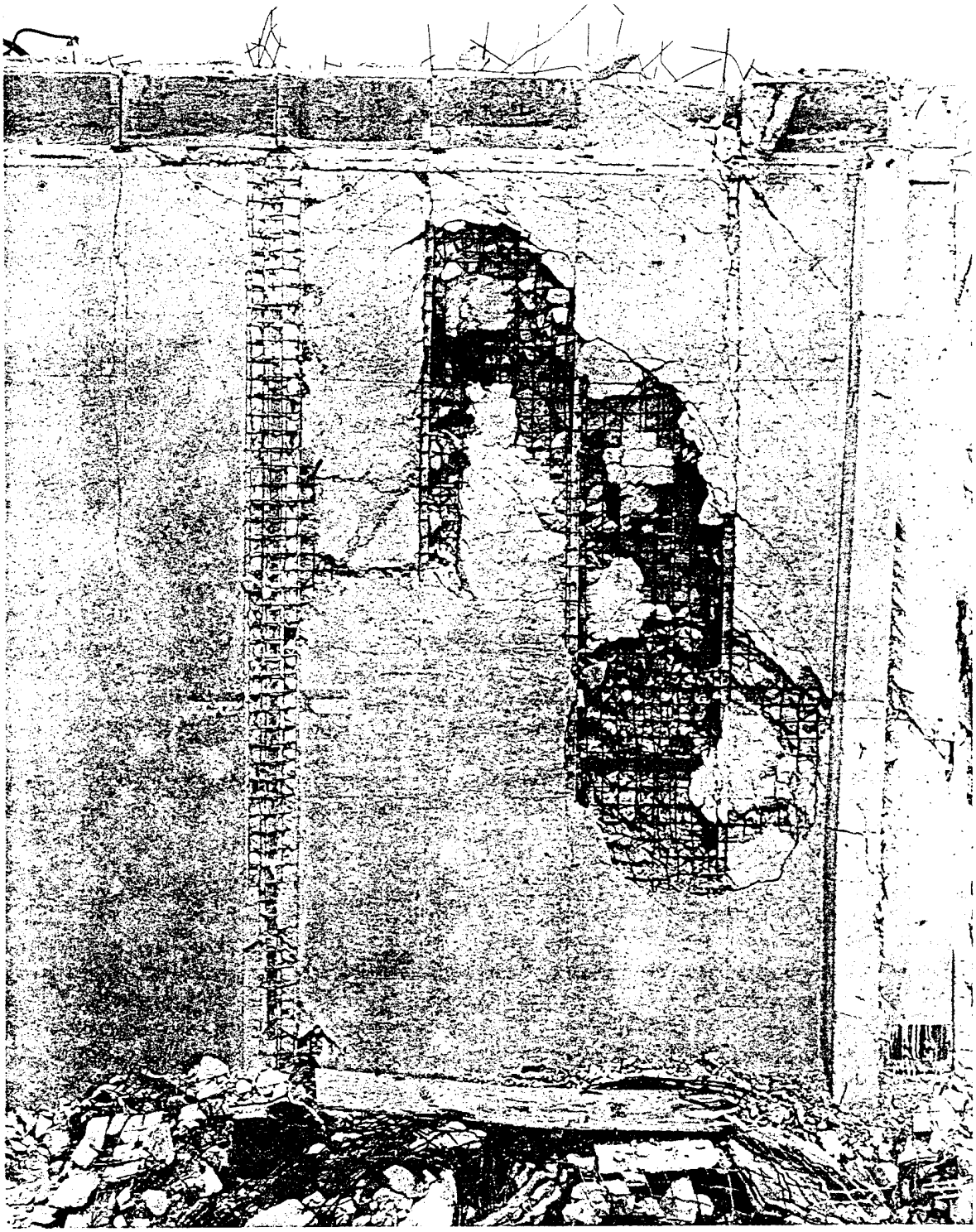


Fig. L.236 Detail View of Right-hand Panel of Rear Wall, Showing How Concrete Was Shattered When Struck by Portions of Front-wall Panels, Structure 3.2.3b



Fig. L.237 Detail View of Displacement Gauge Driven into Rear Wall, Structure 3.2.3b



Fig. L.238 Hole in Rear Wall Caused by Displacement Gauge Being Driven into It, Structure 3.2.3b. See preceding photograph.

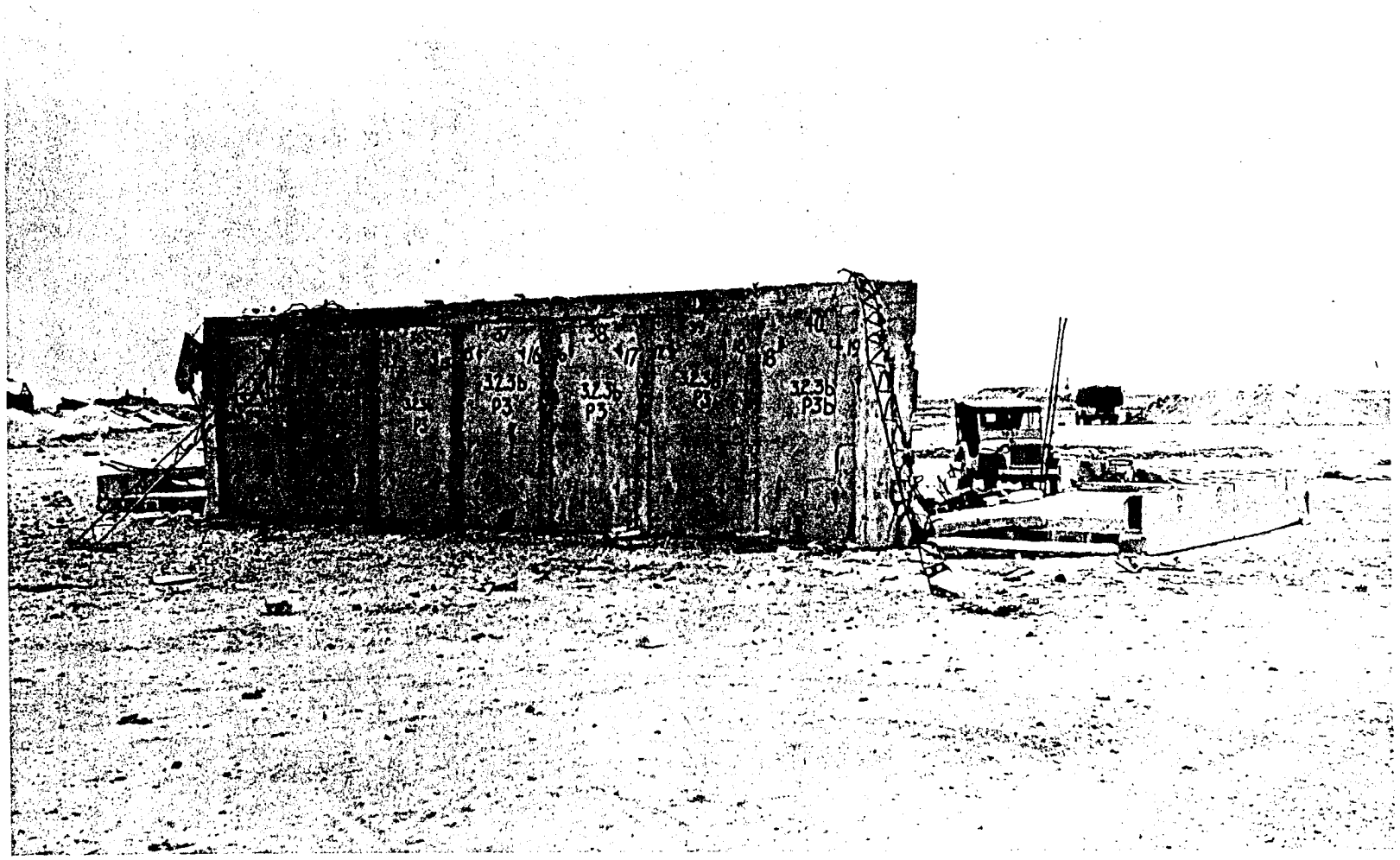


Fig. L.239 General View of Rear Wall, Taken from Rear, Structure 3.2.3b

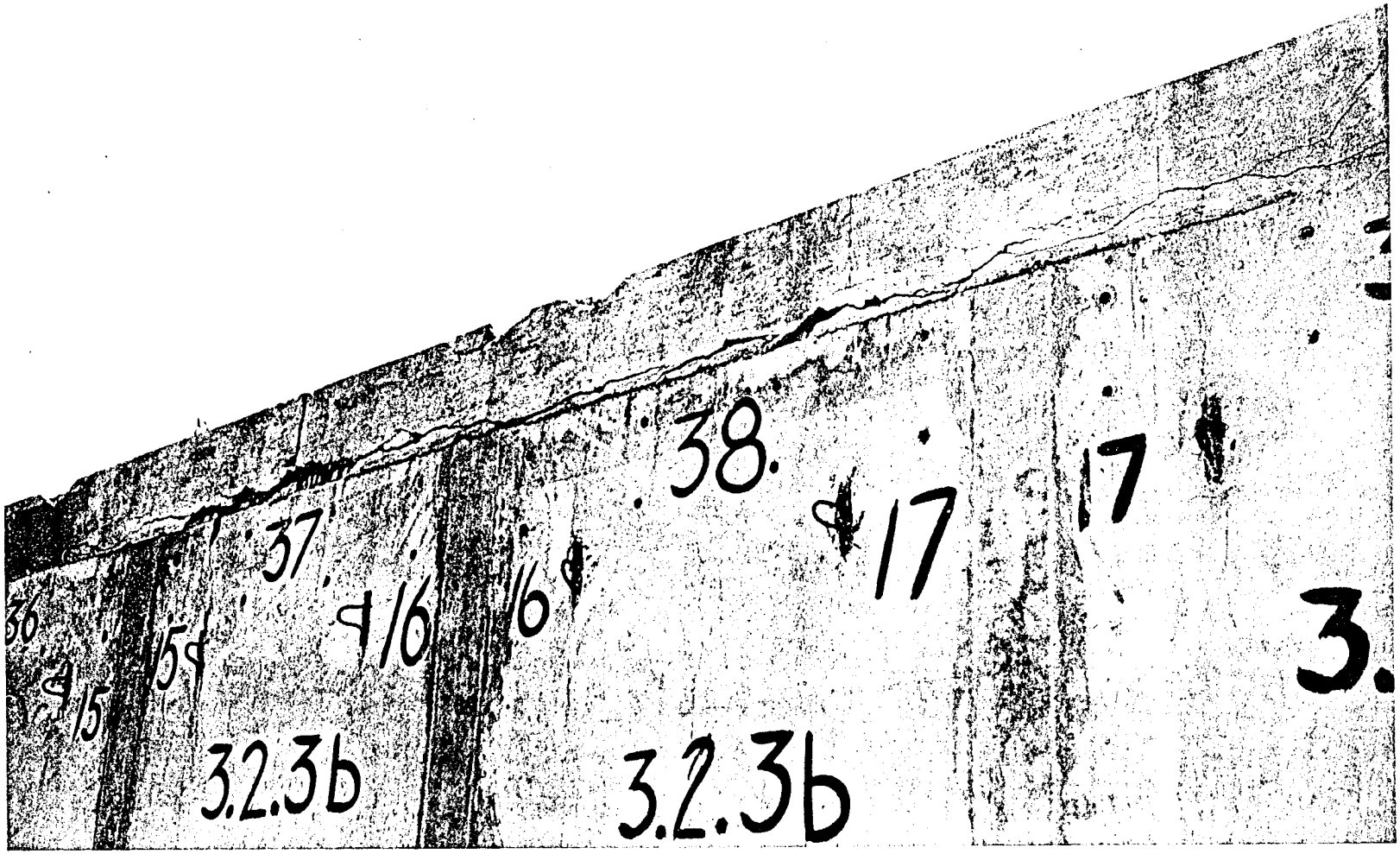


Fig. L.240 Upper Portion of Rear Wall in Center Section, Structure 3.2.3b

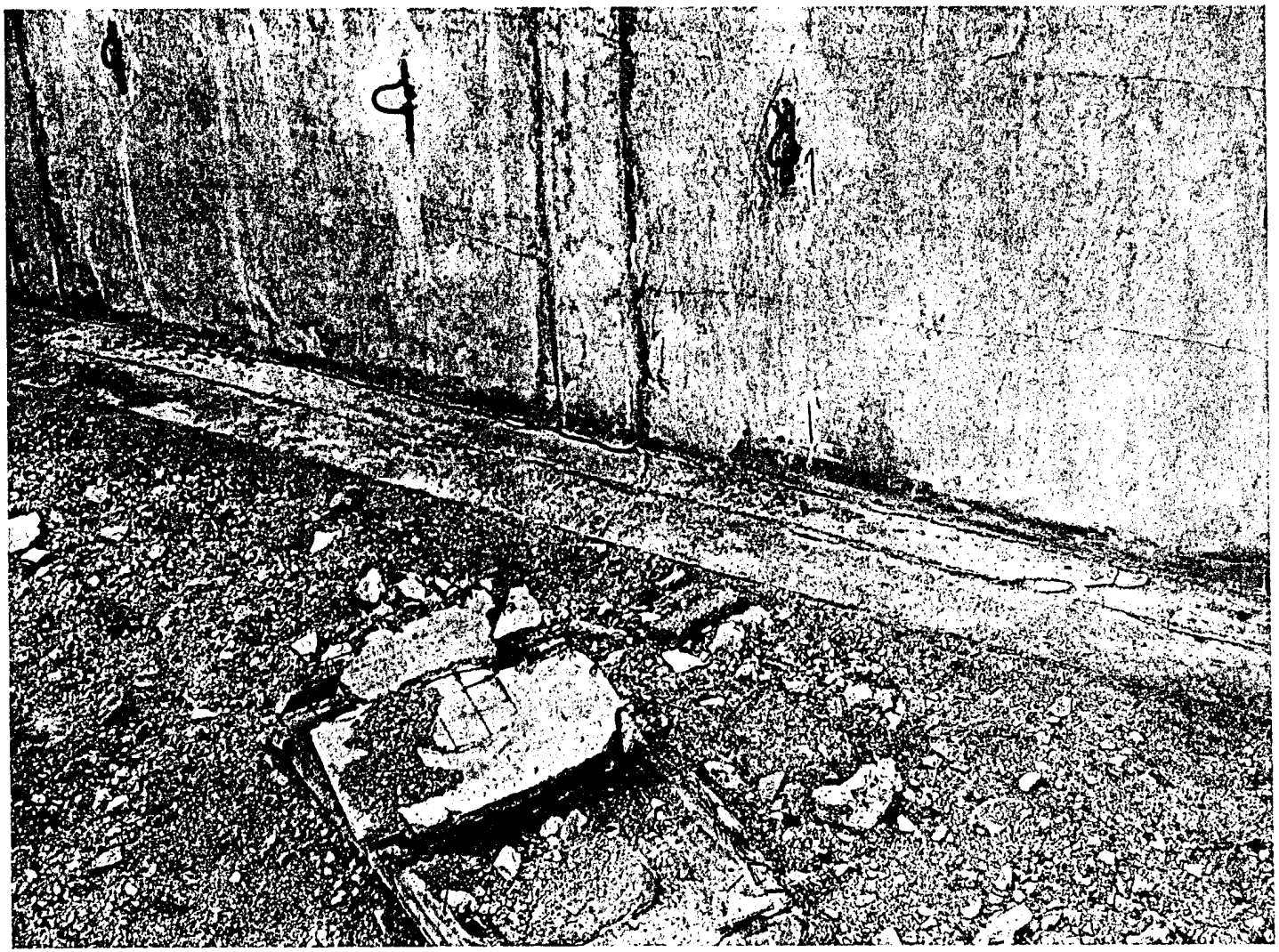


Fig. L.241 Detail View of Base of Rear Wall, Showing Cracks at Foundation Line and Fine Horizontal Cracks Between Cells in the Panels, Structure 3.2.3b

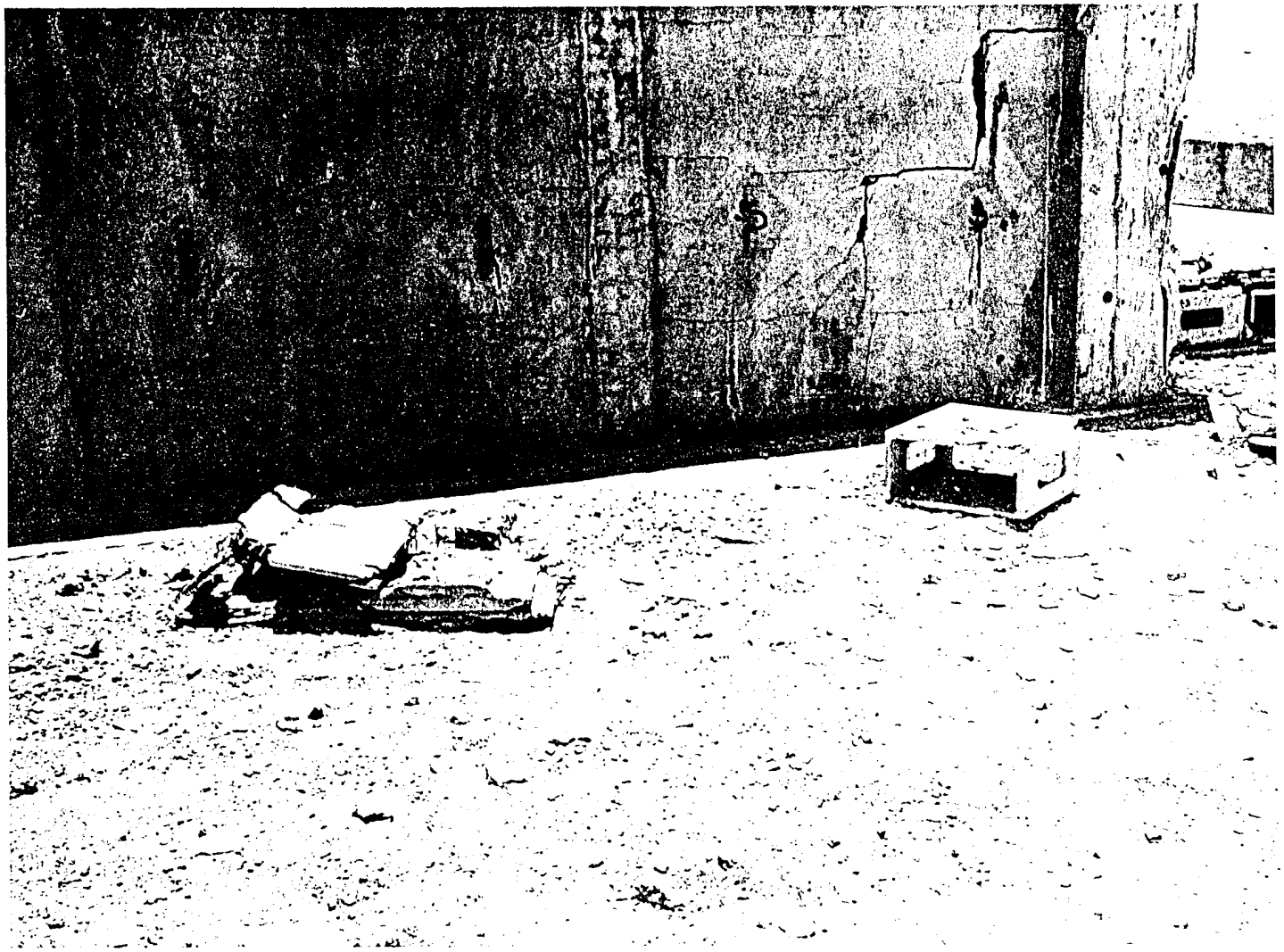


Fig. L.242 Left End of Rear Wall, Structure 3.2.3b. Heavy cracks along cell lines evident in panel adjacent to pilaster. Note one cell practically intact and another cell completely crushed.

[redacted]



Fig. L.243 Detail View of Cracks in Rear-wall Panel Adjacent to Pilaster, Structure 3.2.3b

[redacted]

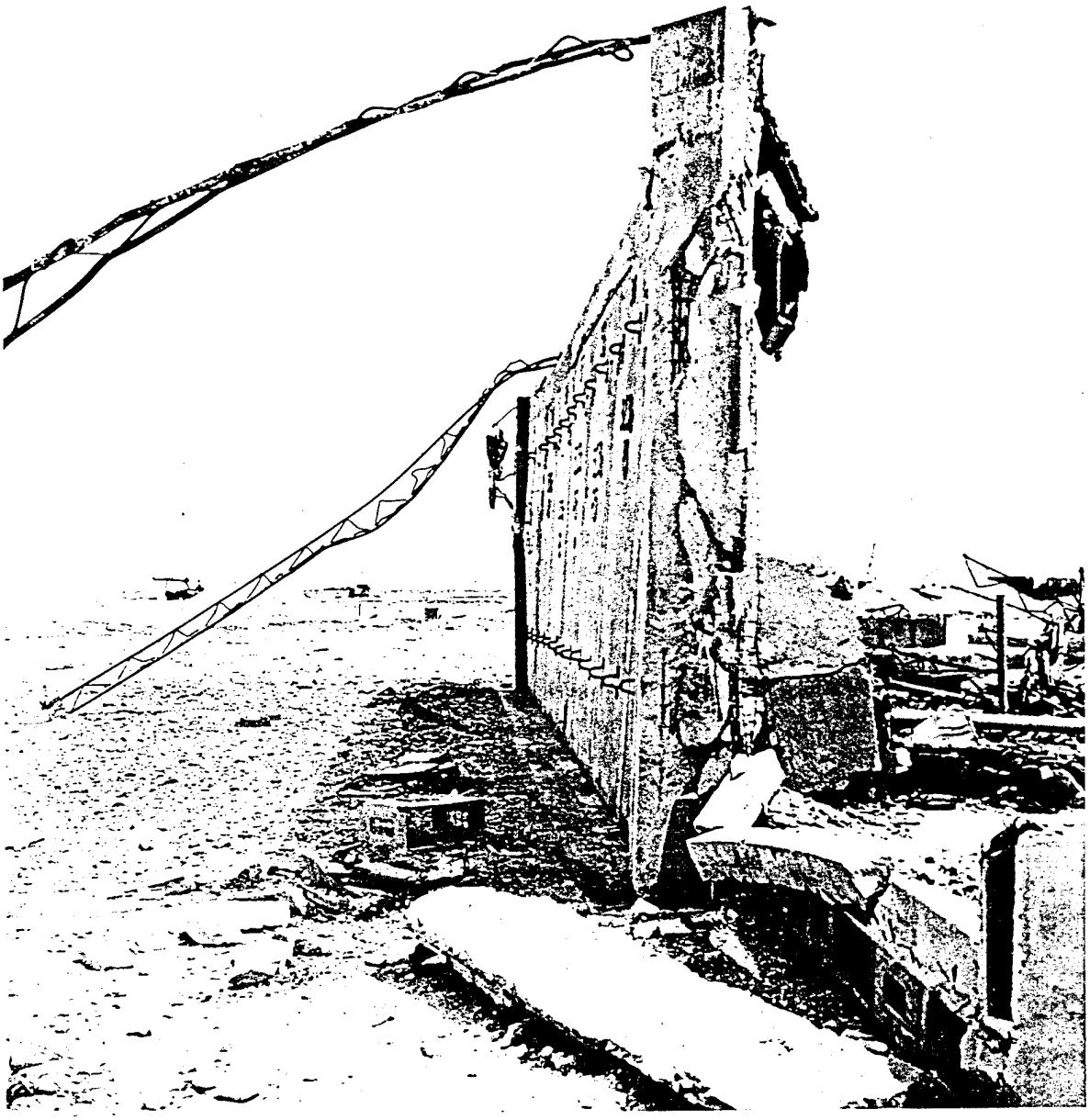


Fig. L.244 Side View of Rear Wall, Structure 3.2.3b. Note dishing inward of wall. Pilaster remained with rear wall but suffered heavy damage as left end wall rotated outward. Condition is similar to that at right end wall.

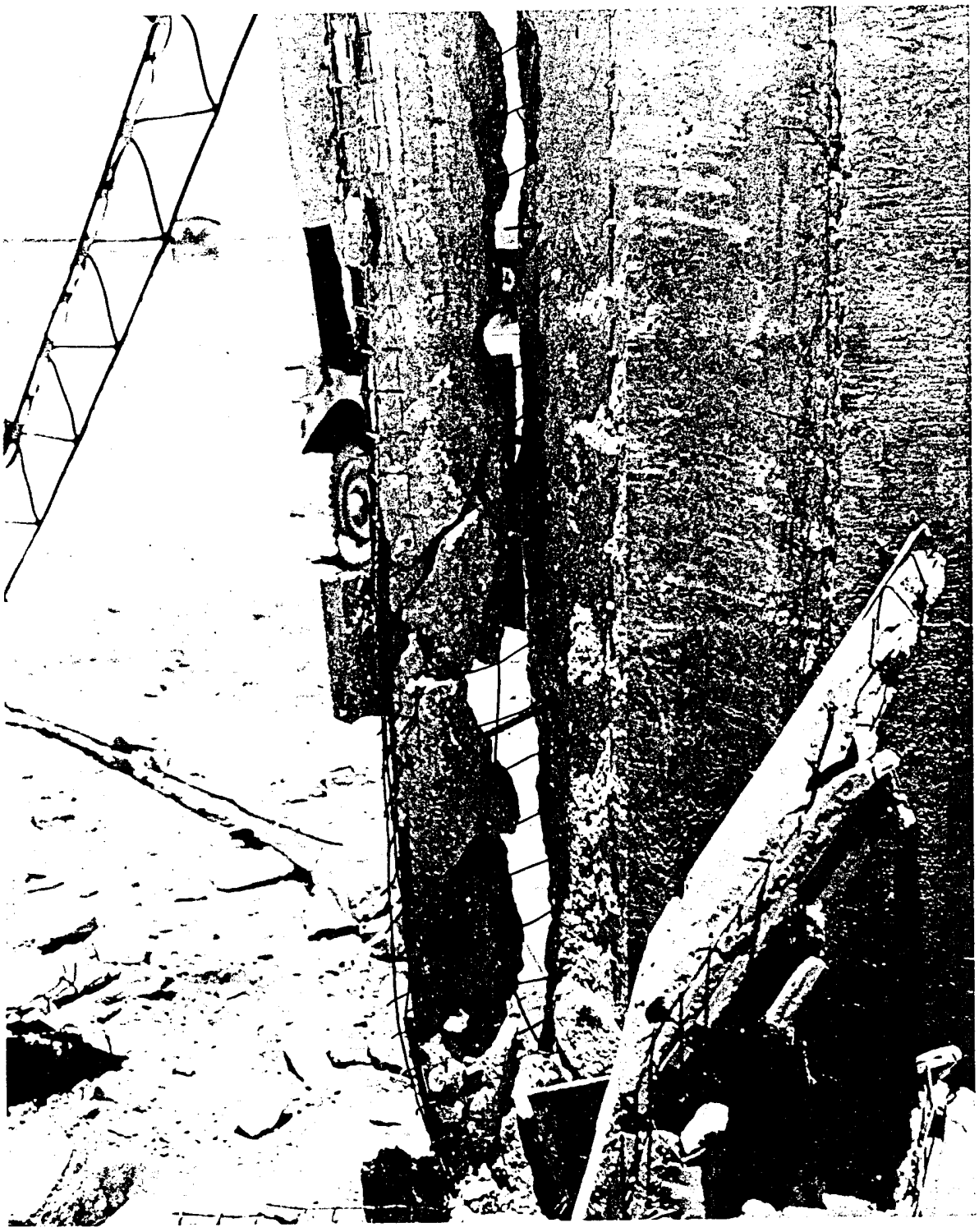


Fig. L.245 Detail View of Pilaster at Left Rear Corner, Showing Where End Wall Forced Pilaster to Split Open, Structure 3.2.3b.

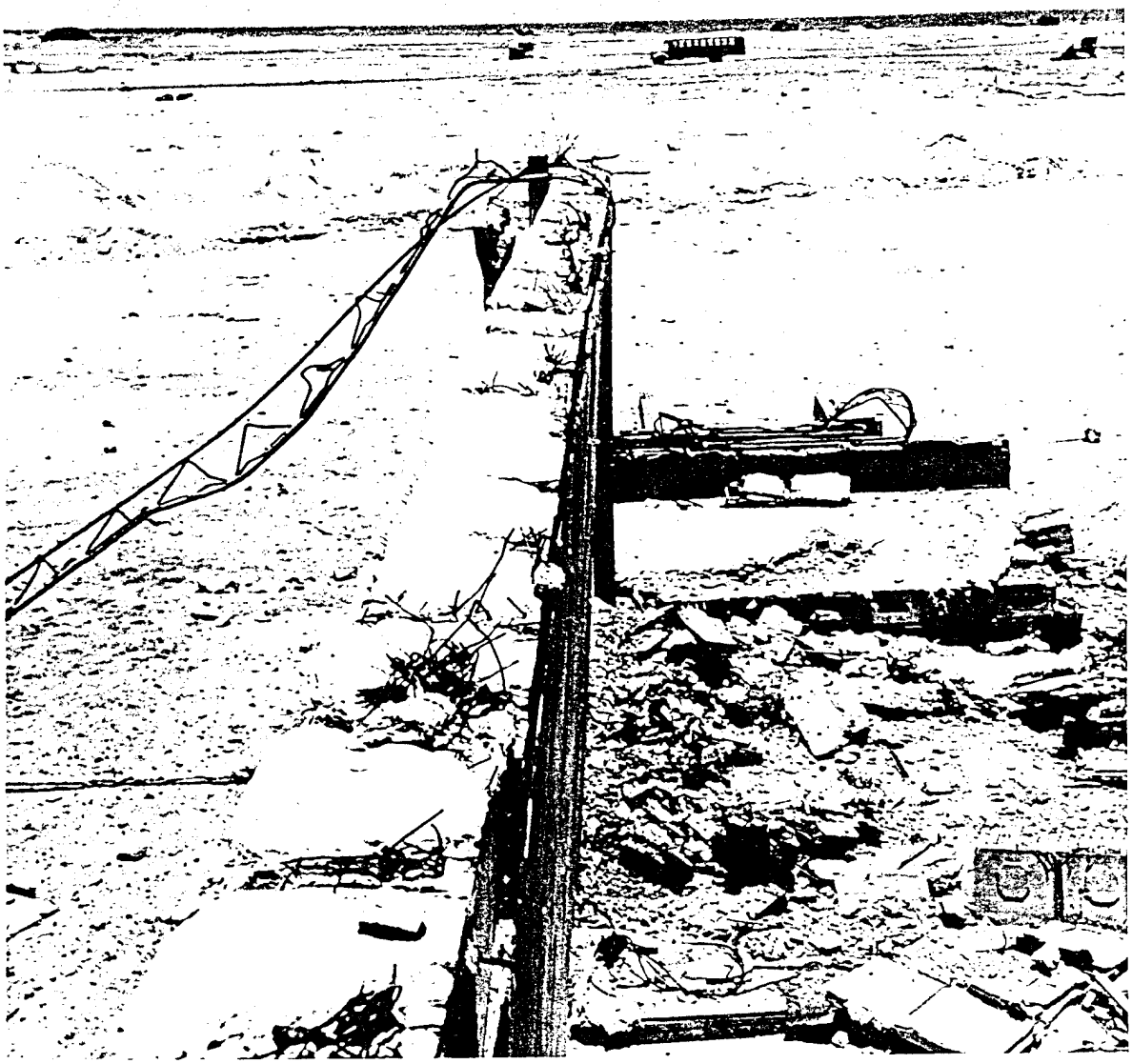


Fig. L.246 General View along Top of Rear Wall, Taken from Left End, Structure 3.2.3b



Fig. L.247 Detail of Roof Truss Bent Over Backward, Structure 3.2.3b

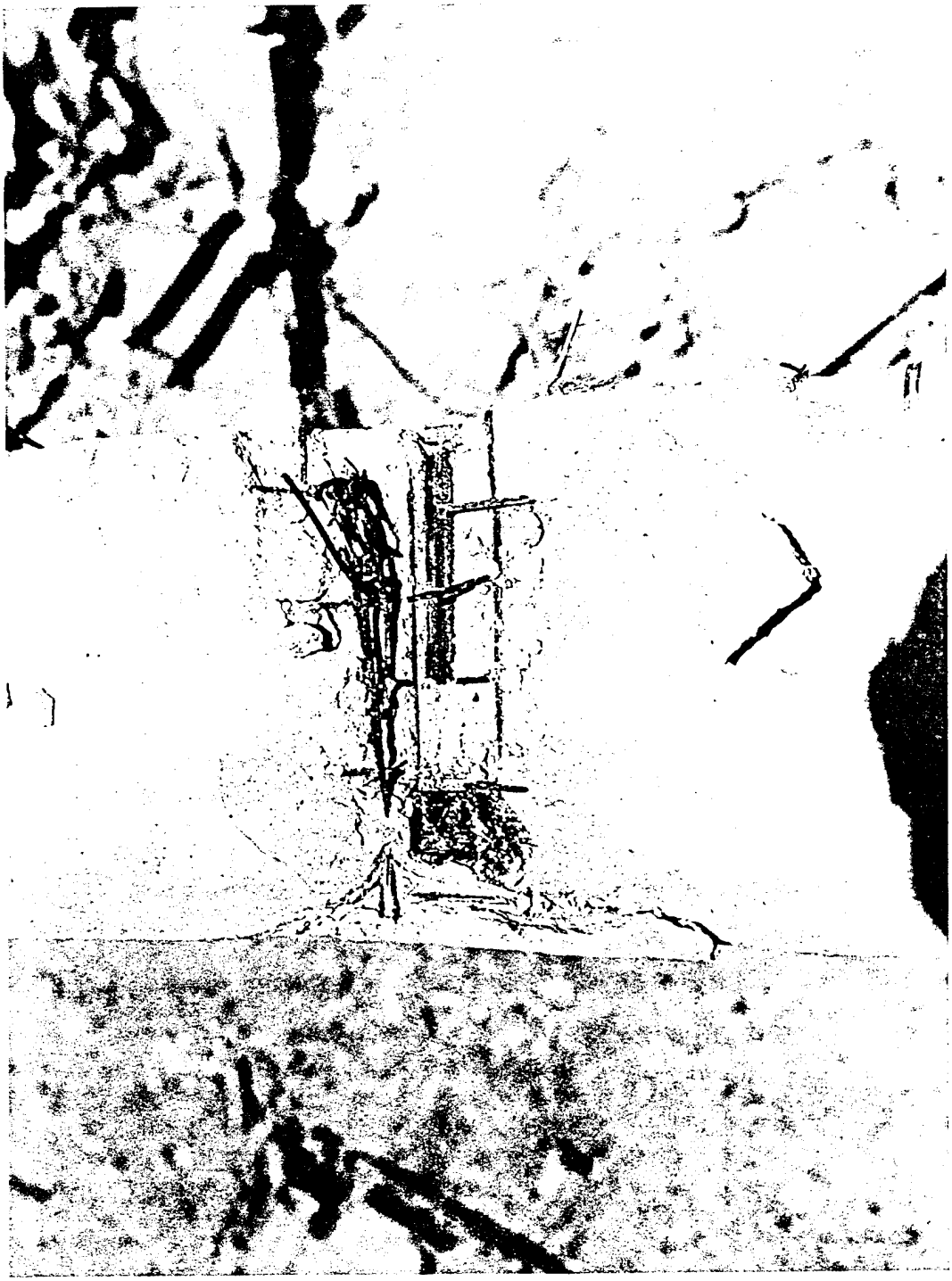


Fig. L.248 Detail View Showing Where Roof Truss Broke Loose from Truss End Through Weld, Structure 3.2.3b

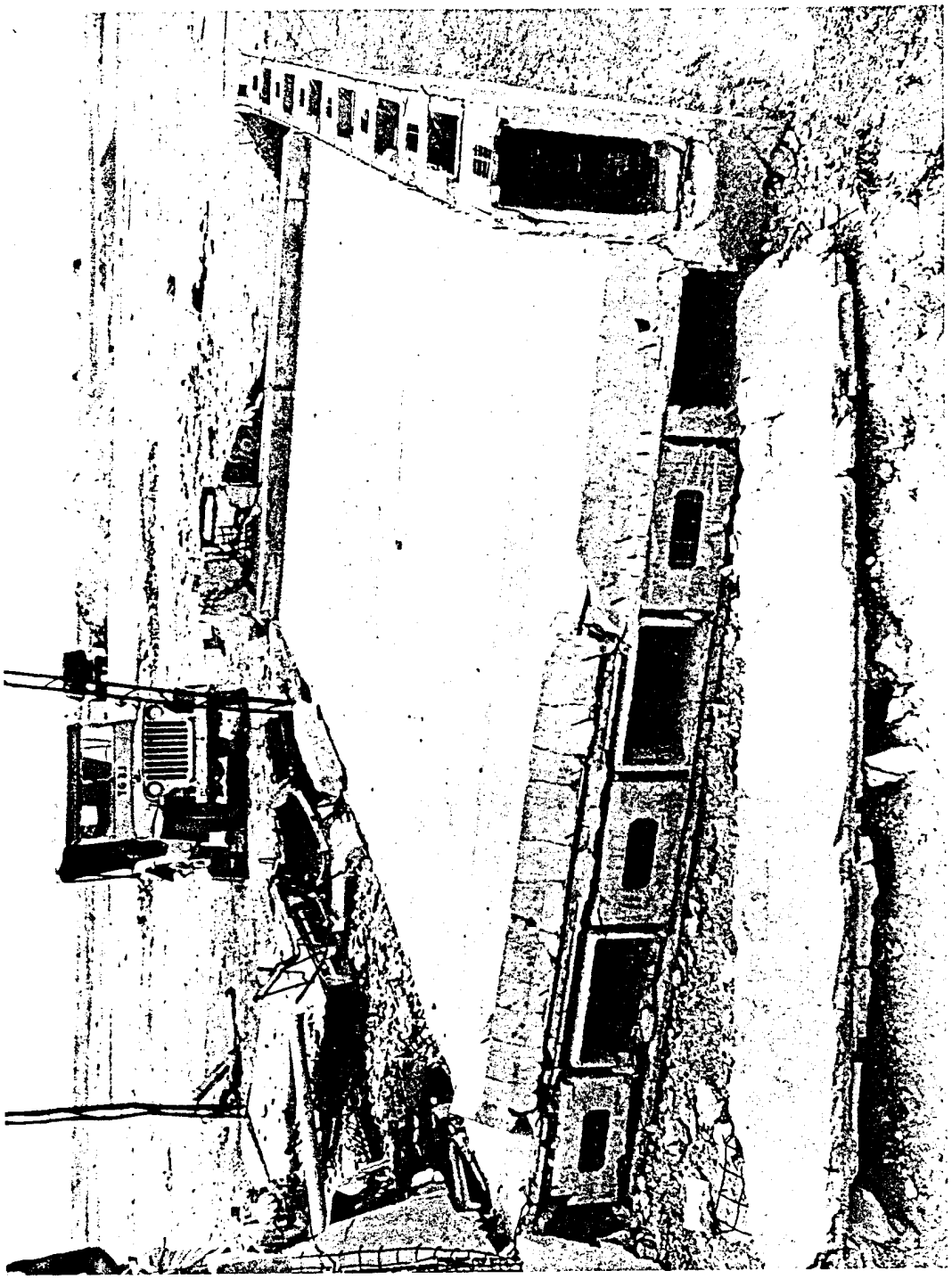


Fig. L.249 Rear Edge of Left End Wall, Structure 3.2.3b

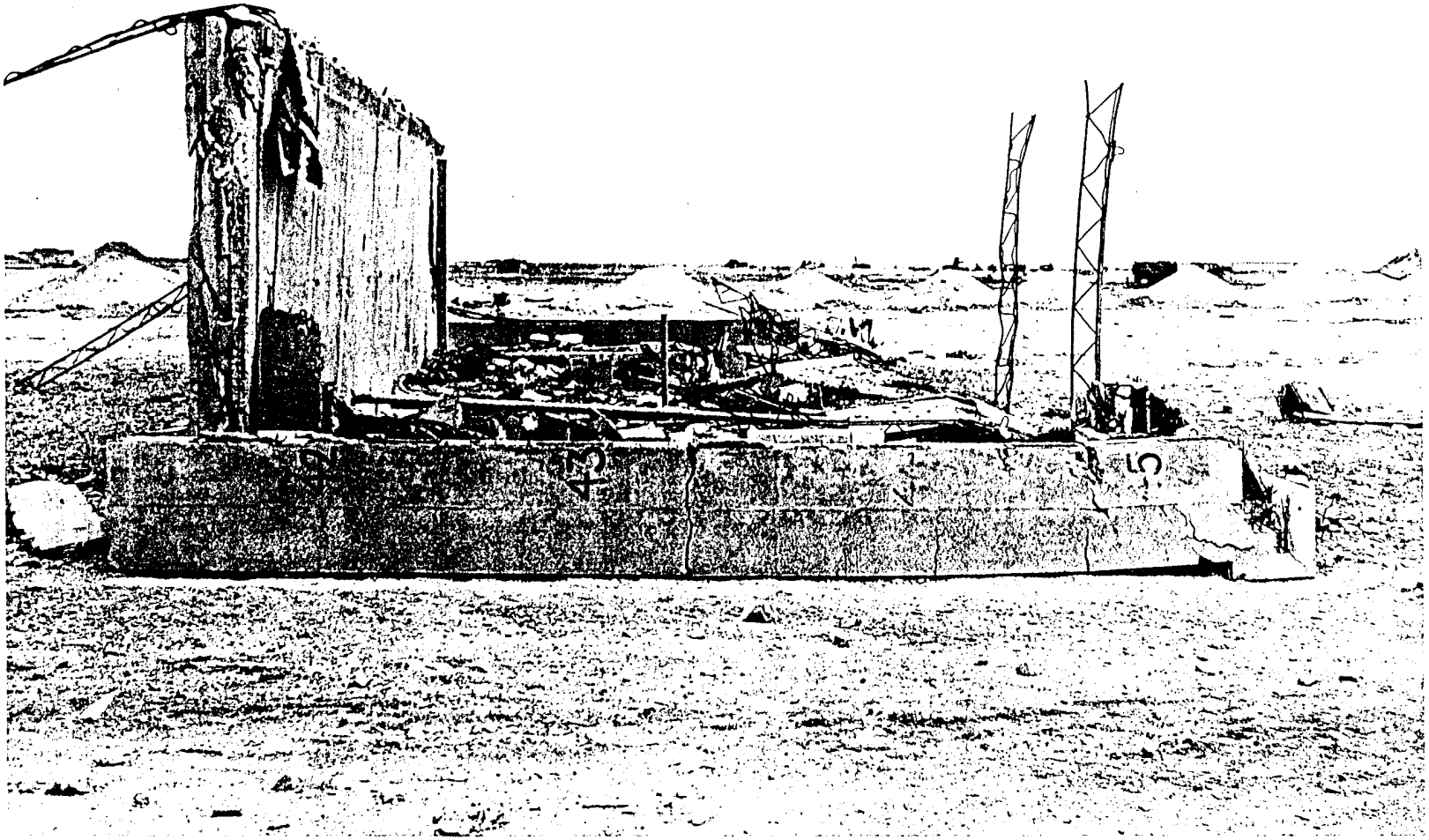


Fig. L.250 Top Edge of Left End Wall, with Left Edge Row of Roof Cells Attached, Structure 3.2.3b

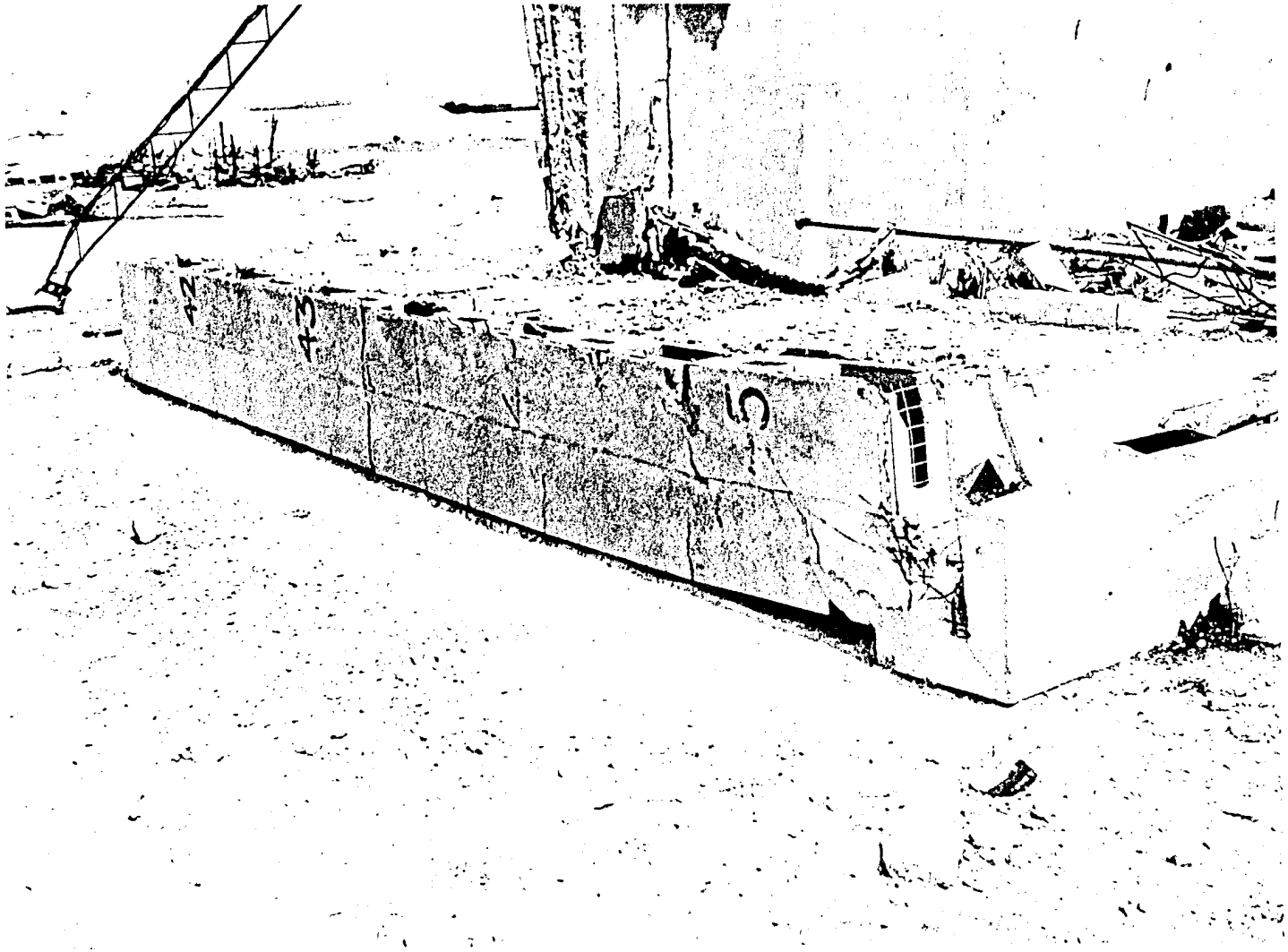


Fig. L.251 View of Top Edge of Left End Wall, Showing Slight Bending and Crack Caused by Projection on Pilaster during Landing, Structure 3.2.3b

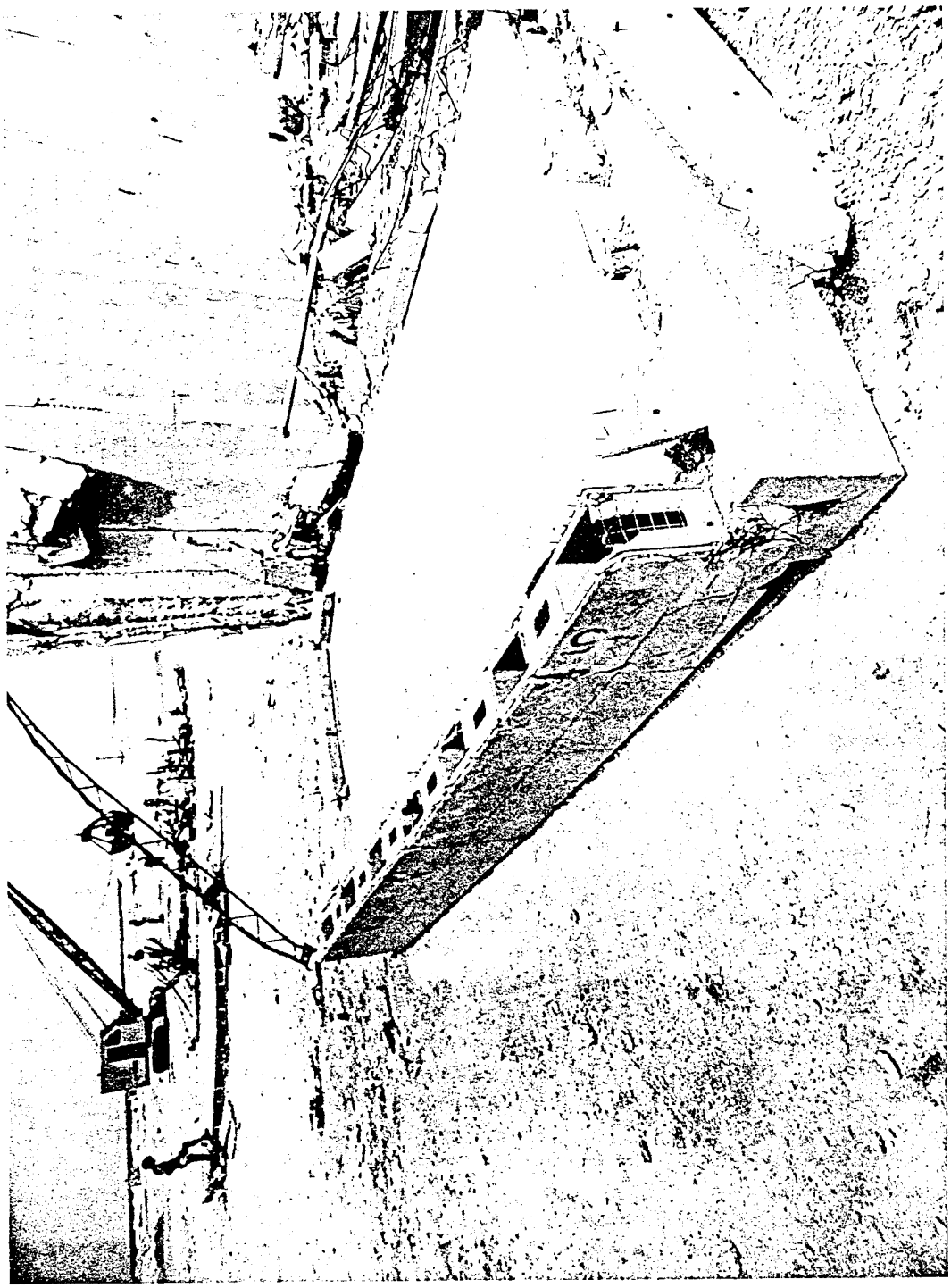


Fig. L.252 View along Plane where Main Section of Roof Was Severed from End-wall Unit, Structure 3.2.3b.
Note the clean cleavage.



Fig. L.253 View of Inside Face of Left End Wall, Structure 3.2.3b

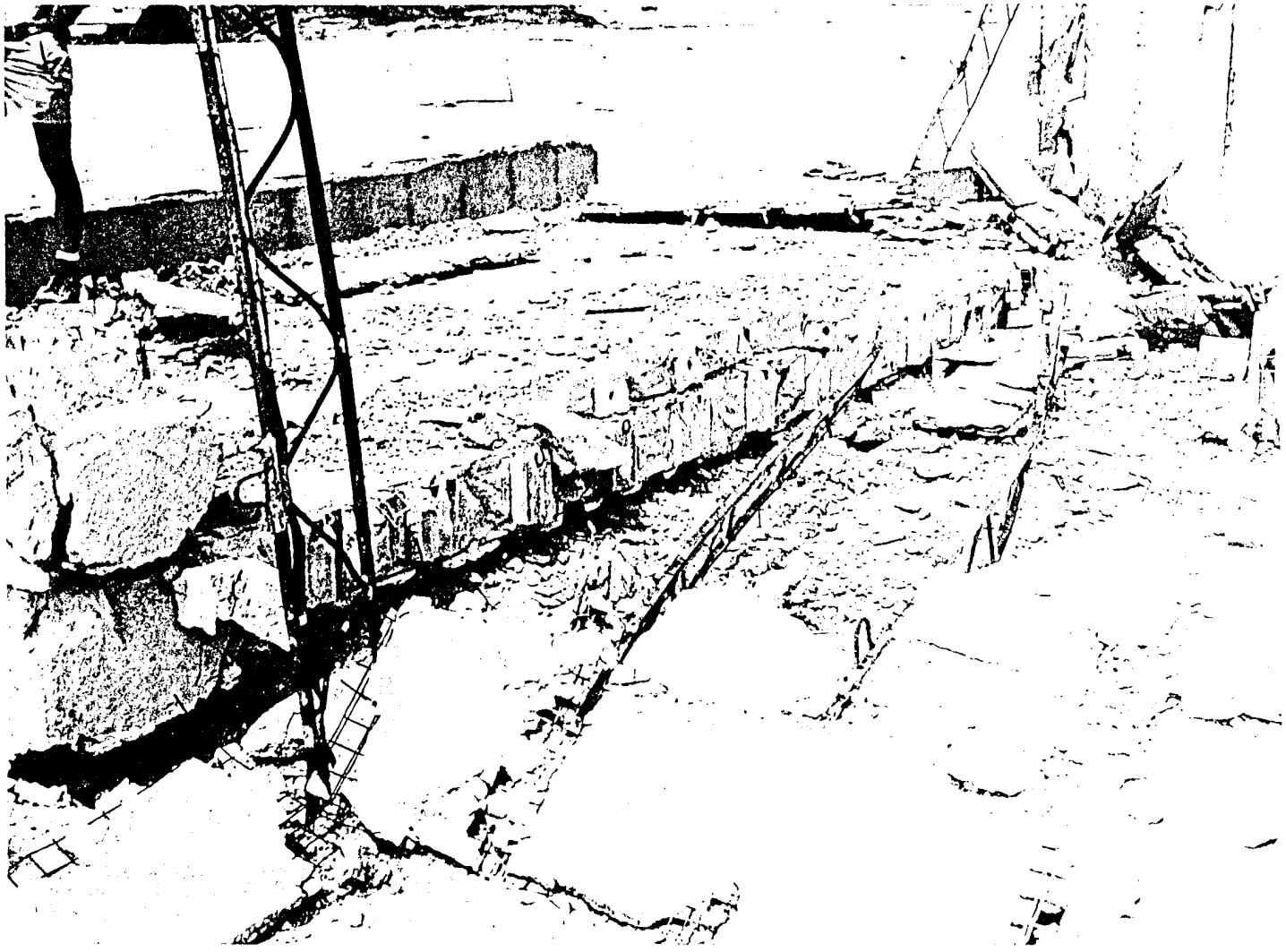


Fig. L.254 General View of Base of Left End Wall, Structure 3.2.3b. In all cases the trusses pulled loose from the channel sections used for anchorage.

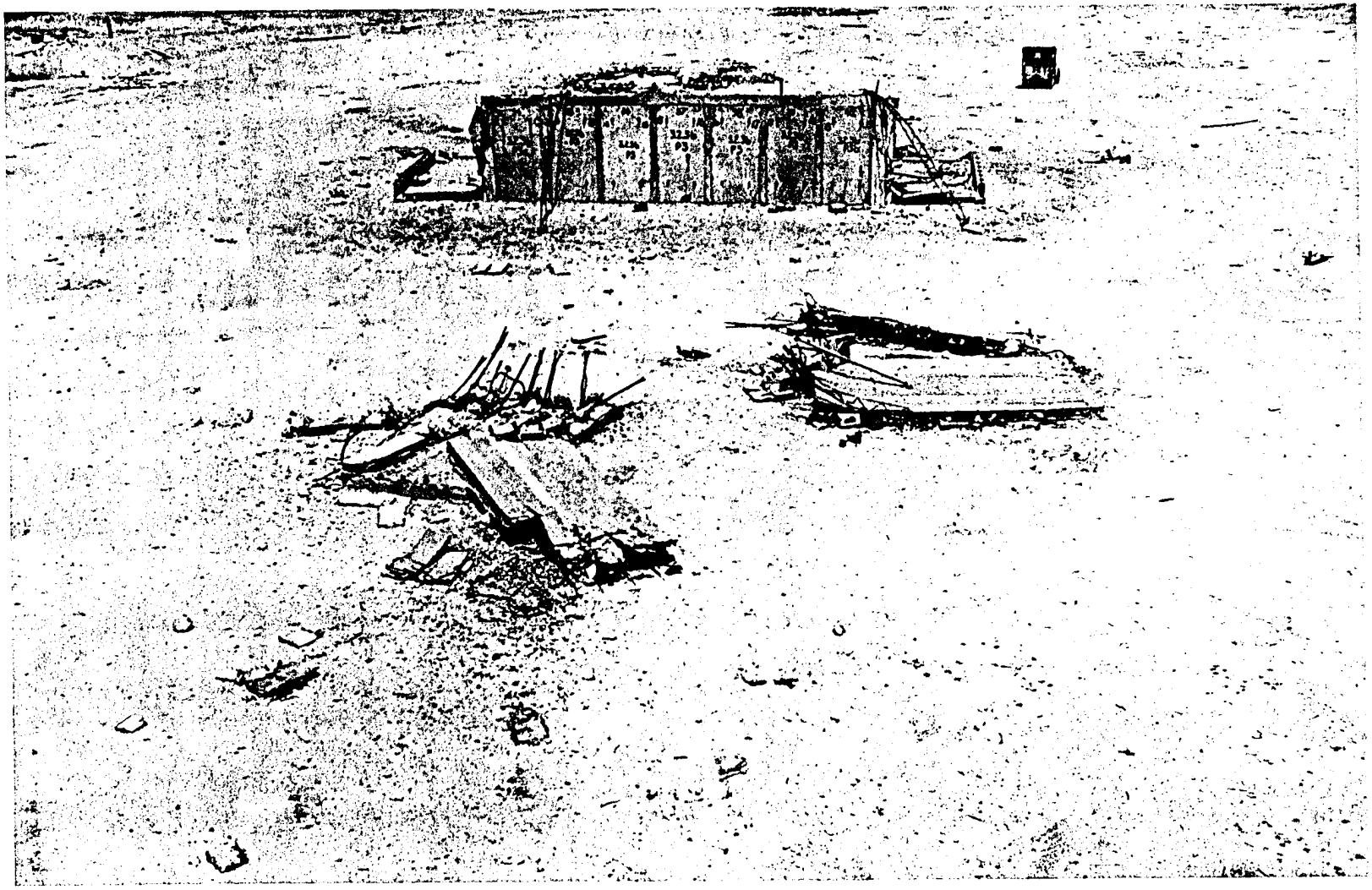


Fig. L.255 General View of Roof Sections, Taken from Rear, Structure 3.2.3b. Large section in the left center of photograph is the right half of roof, and section in right center is the left half of roof.



Fig. L.256 General View of Roof Sections as They Landed after Being Hurled about 75 ft, Structure 3.2.3b



Fig. L.257 General View of the Left Half of Roof Section, Lying Upside Down, Structure 3.2.3b

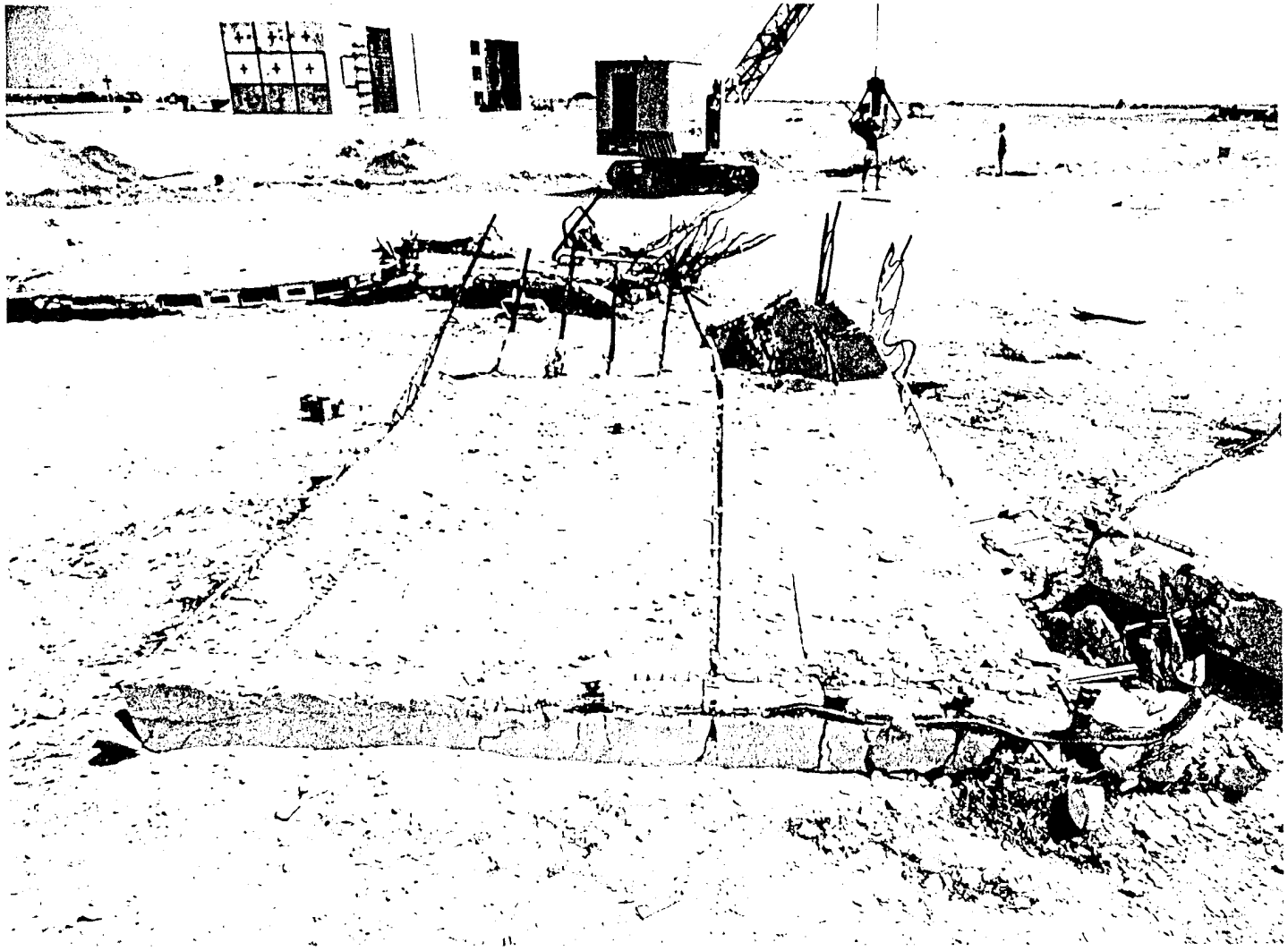


Fig. L.258 Detail View of Left Half of Roof Section, Structure 3.2.3b. Front edge of roof is in foreground.



Fig. L.259 Detail View of Underside of Front Edge of Roof, Structure 3.2.3b. Note how ends of trusses have pulled out.

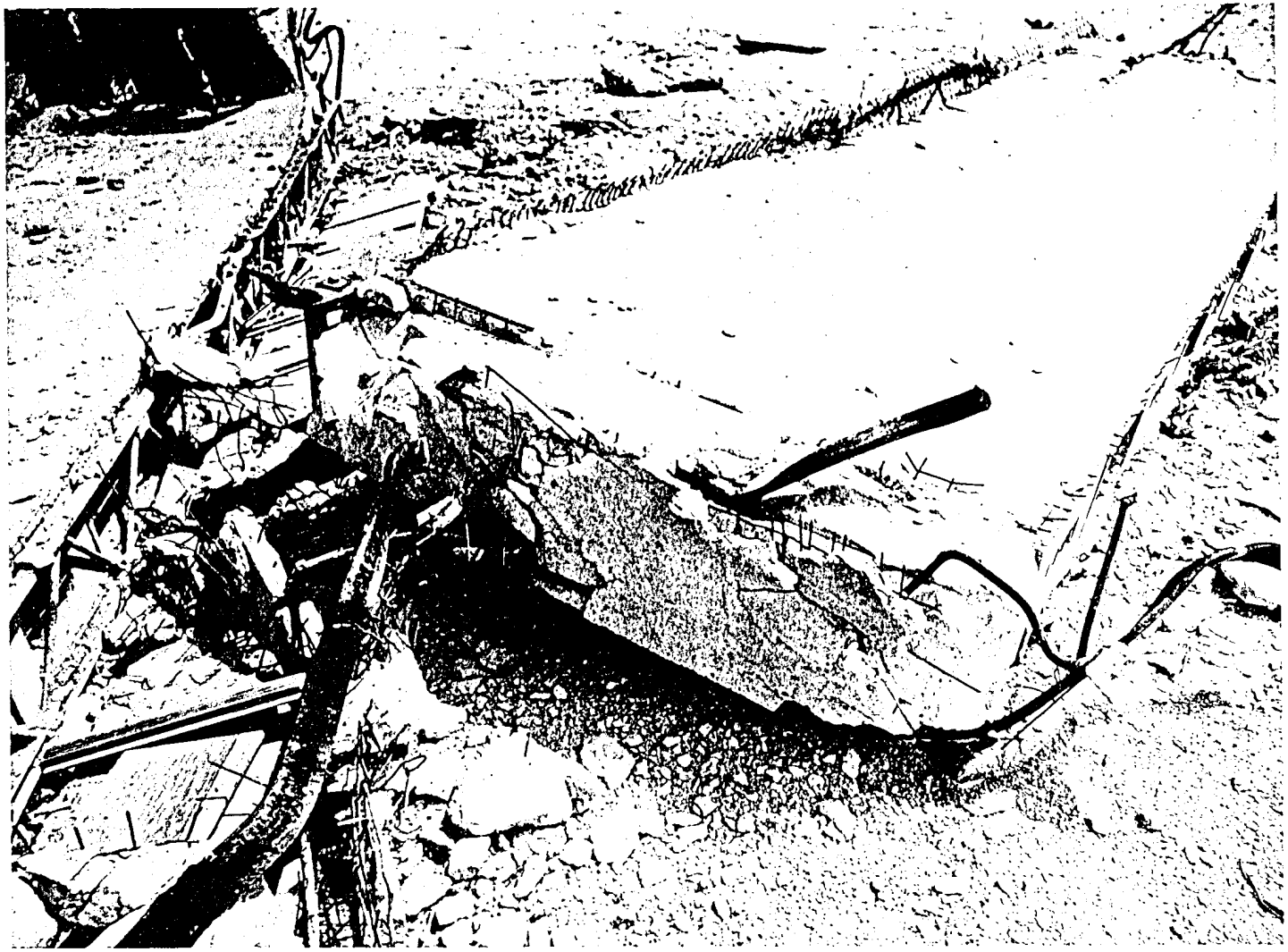


Fig. L.260 Detail View of Front Edge of Roof Panel, Structure 3.2.3b. Note breaks in the edge truss main bars.

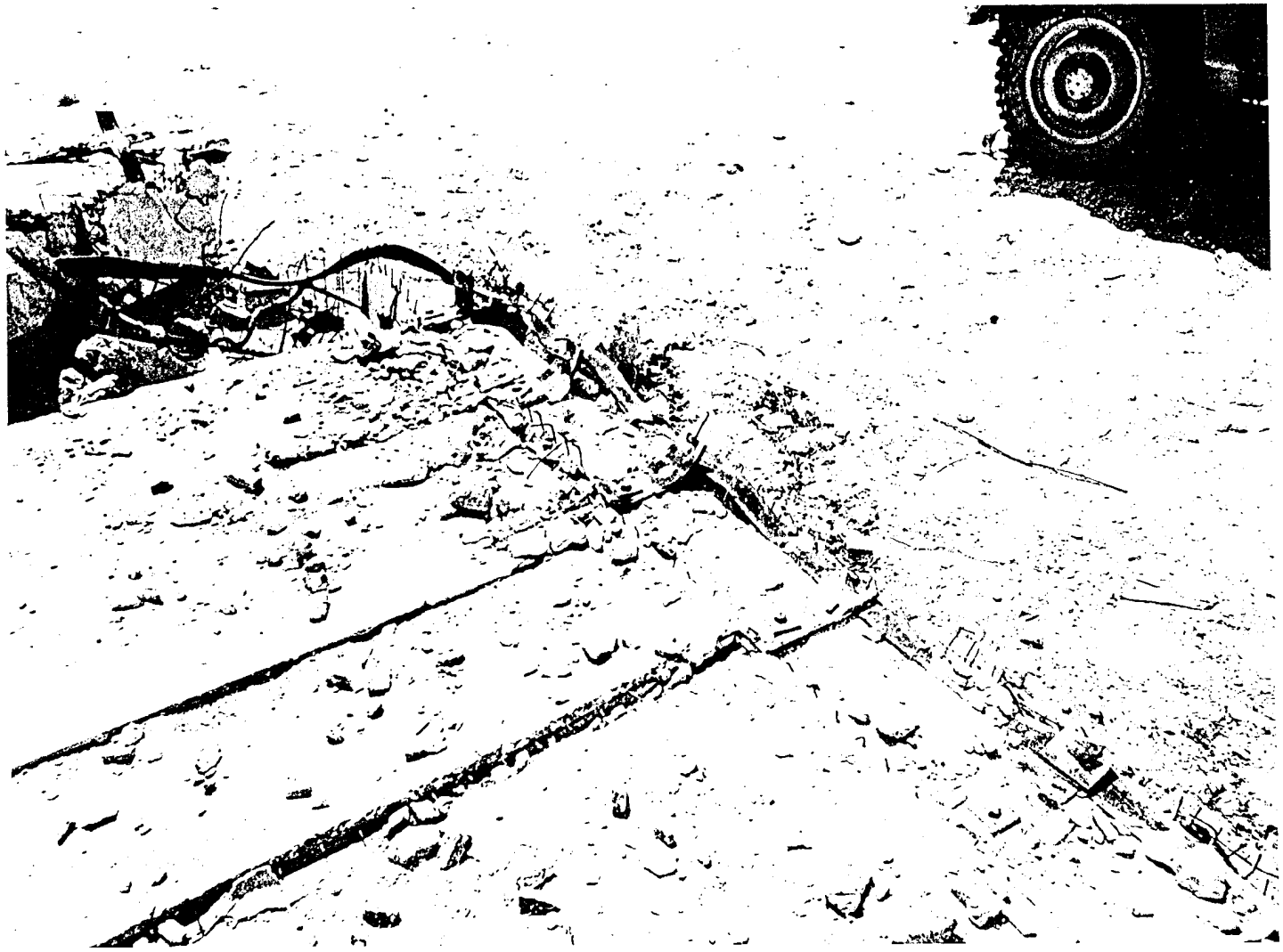


Fig. L.261 Detail View of Underside of Roof Section at Front Edge, Structure 3.2.3b. Short bars with bolts and washers still in place are the top ends of the front wall trusses. Note the deformation of these bars resulting from the tension forces applied by the front-wall panels as they deflected before failure.

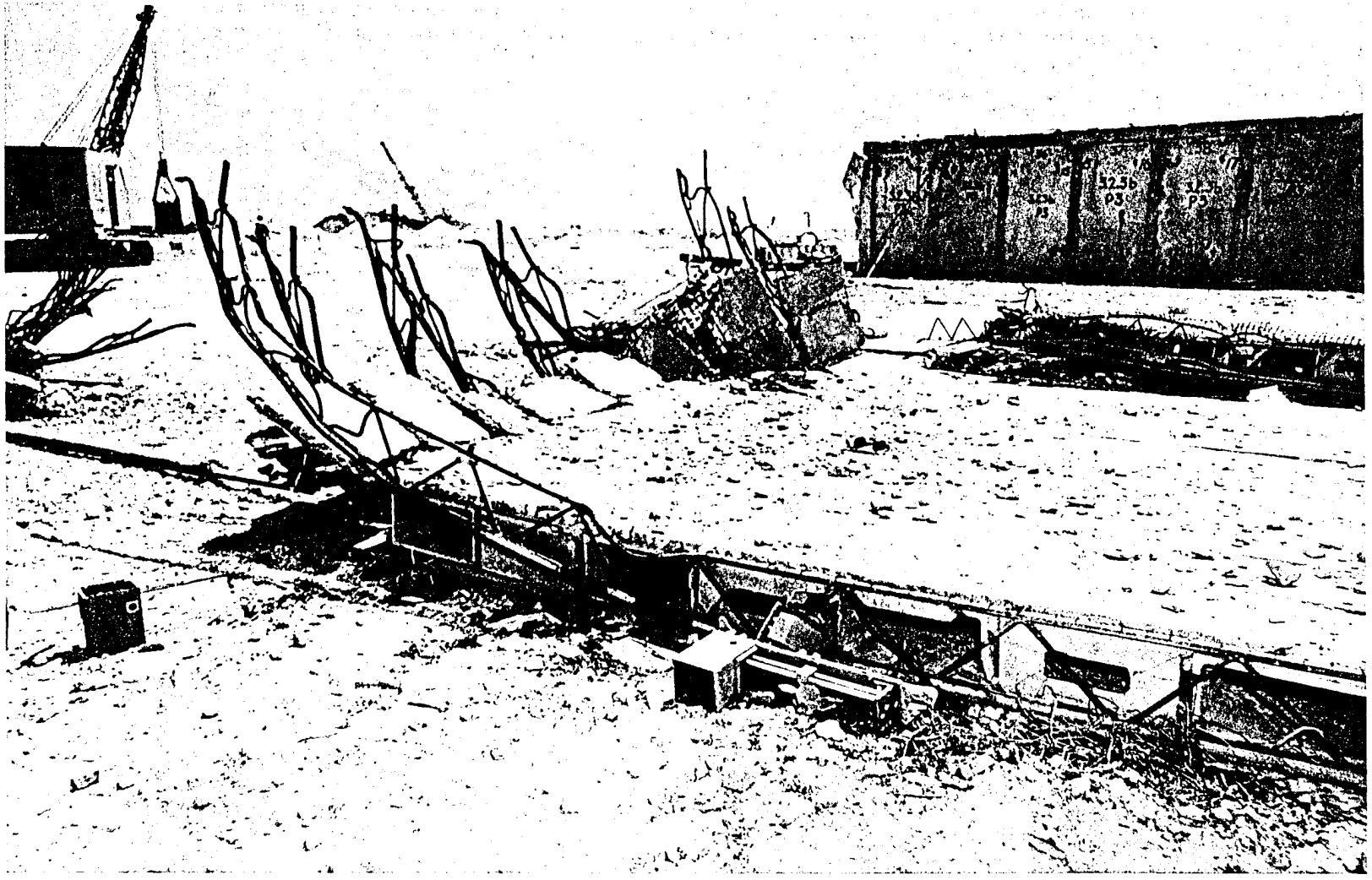


Fig. L.262 Edge View of Roof Panel That Split along a Line of Cells, Structure 3.2.3b

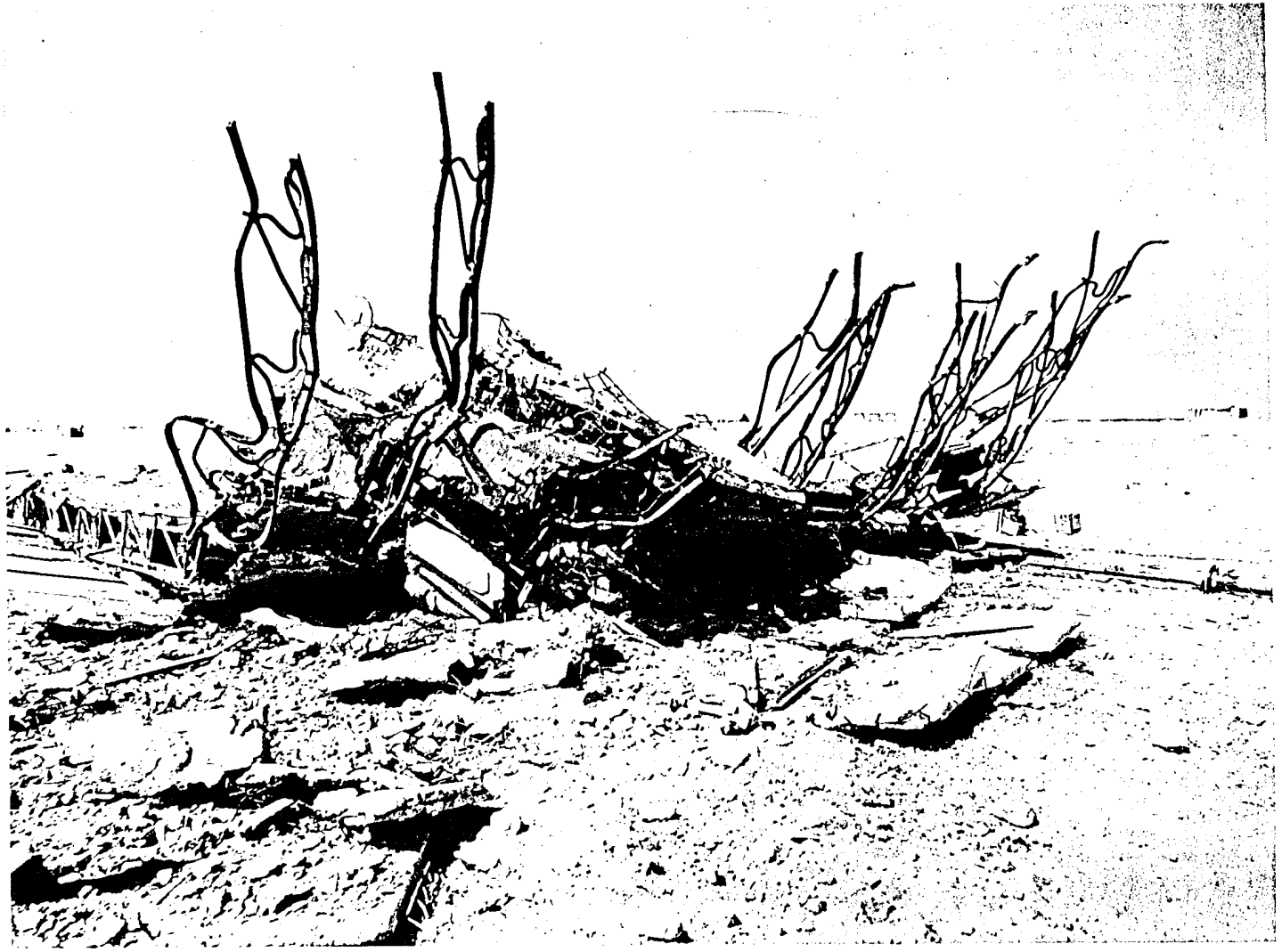


Fig. L.263 Rear Edge of Left Half of Roof, Structure 3.2.3b. This crushing and severe distortion was undoubtedly caused by the impact of landing. This section of the roof flipped over as the end shown dug into the earth.



Fig. L.264 General View of Right Half of Roof, Structure 3.2.3b. The left half can be seen in background.



Fig. L.265 Detail View of End of Roof Panel after Impact of Landing Destroyed the Cells and Crushed the Trusses, Structure 3.2.3b

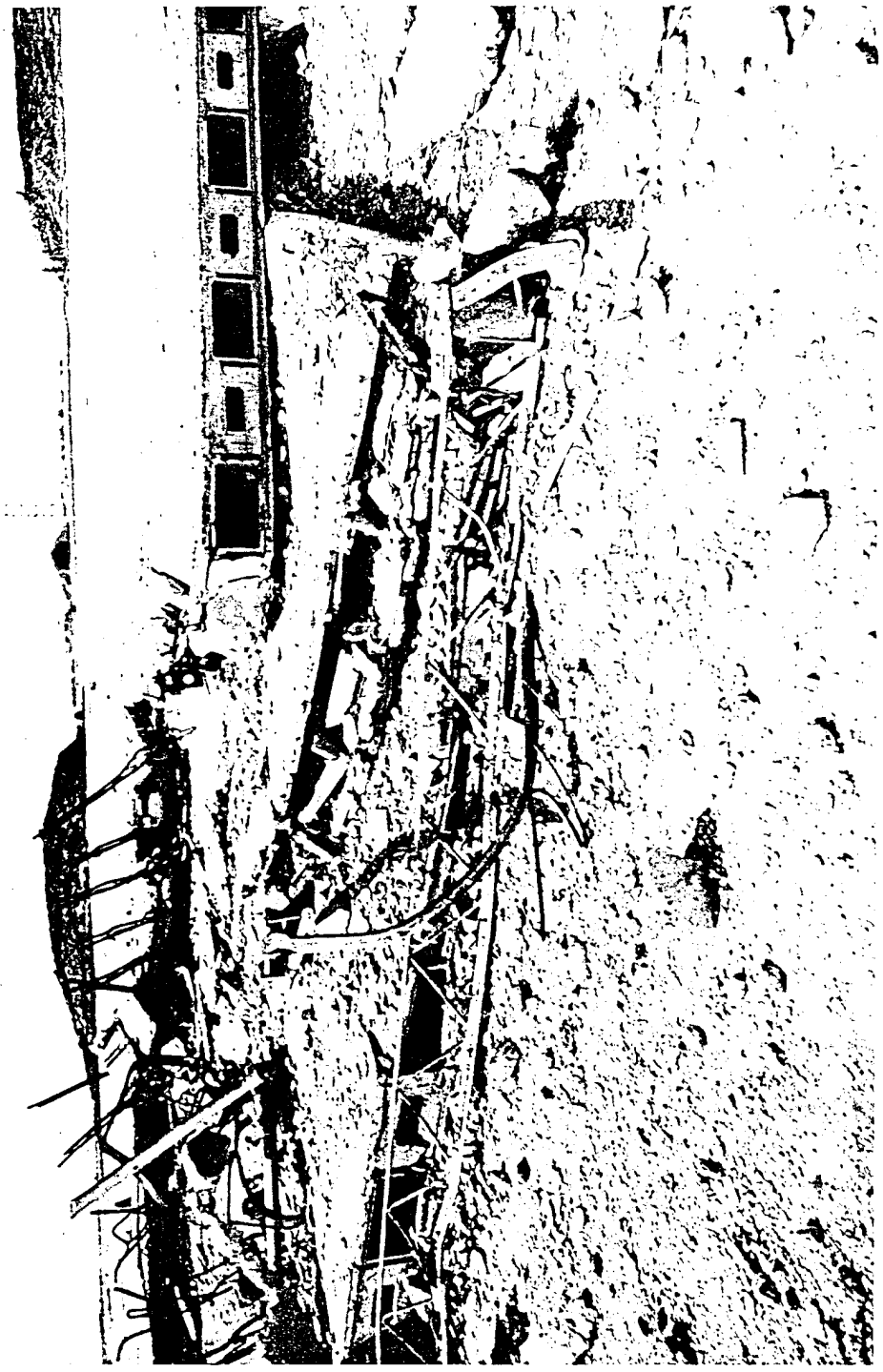


Fig. L.266 Edge View of Right Half of Roof Section, Structure 3.2.3b, Note how panel of top split along one row of cells.

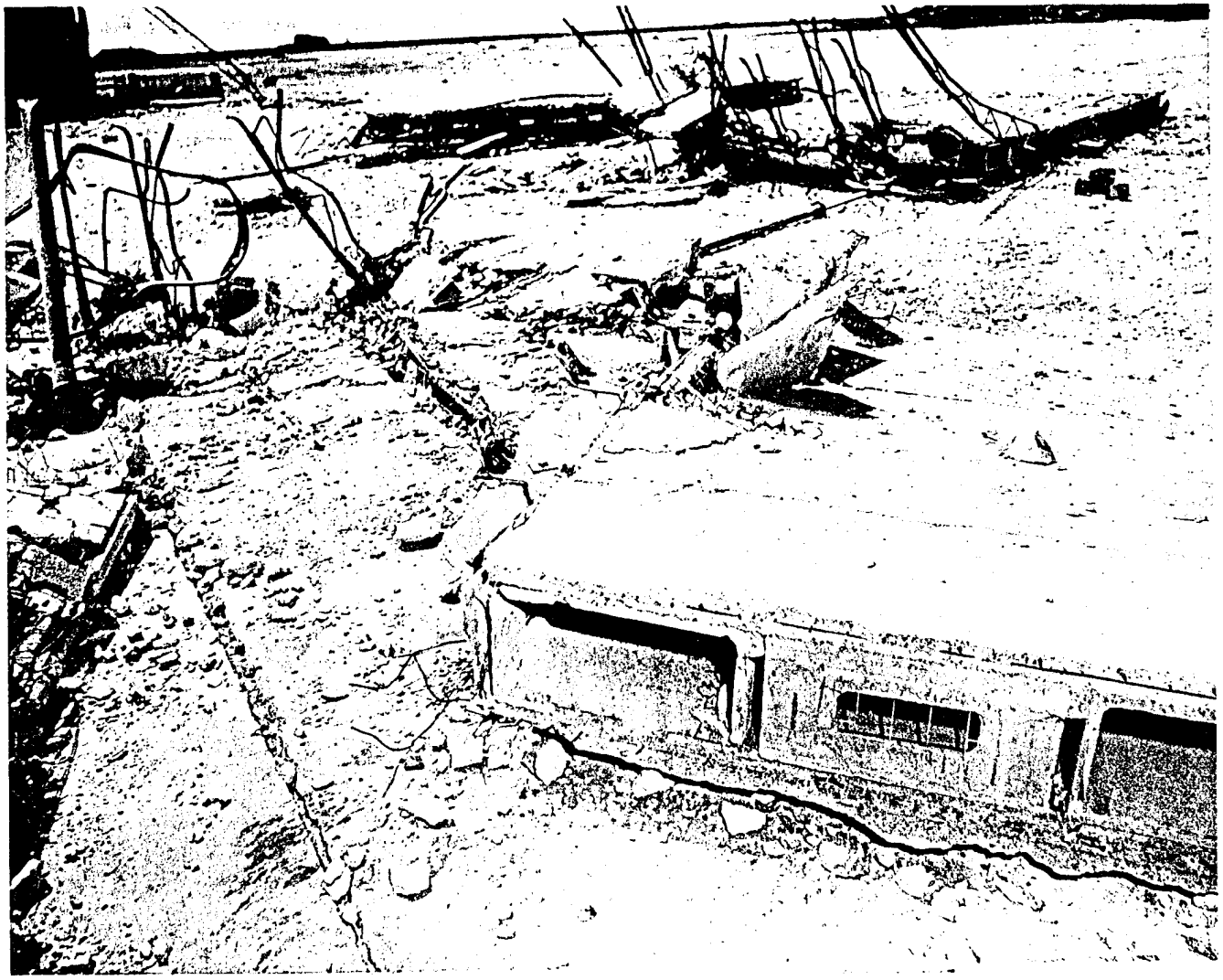


Fig. L.267 Detail View Showing Method of Failure within a Panel, Structure 3.2.3b.

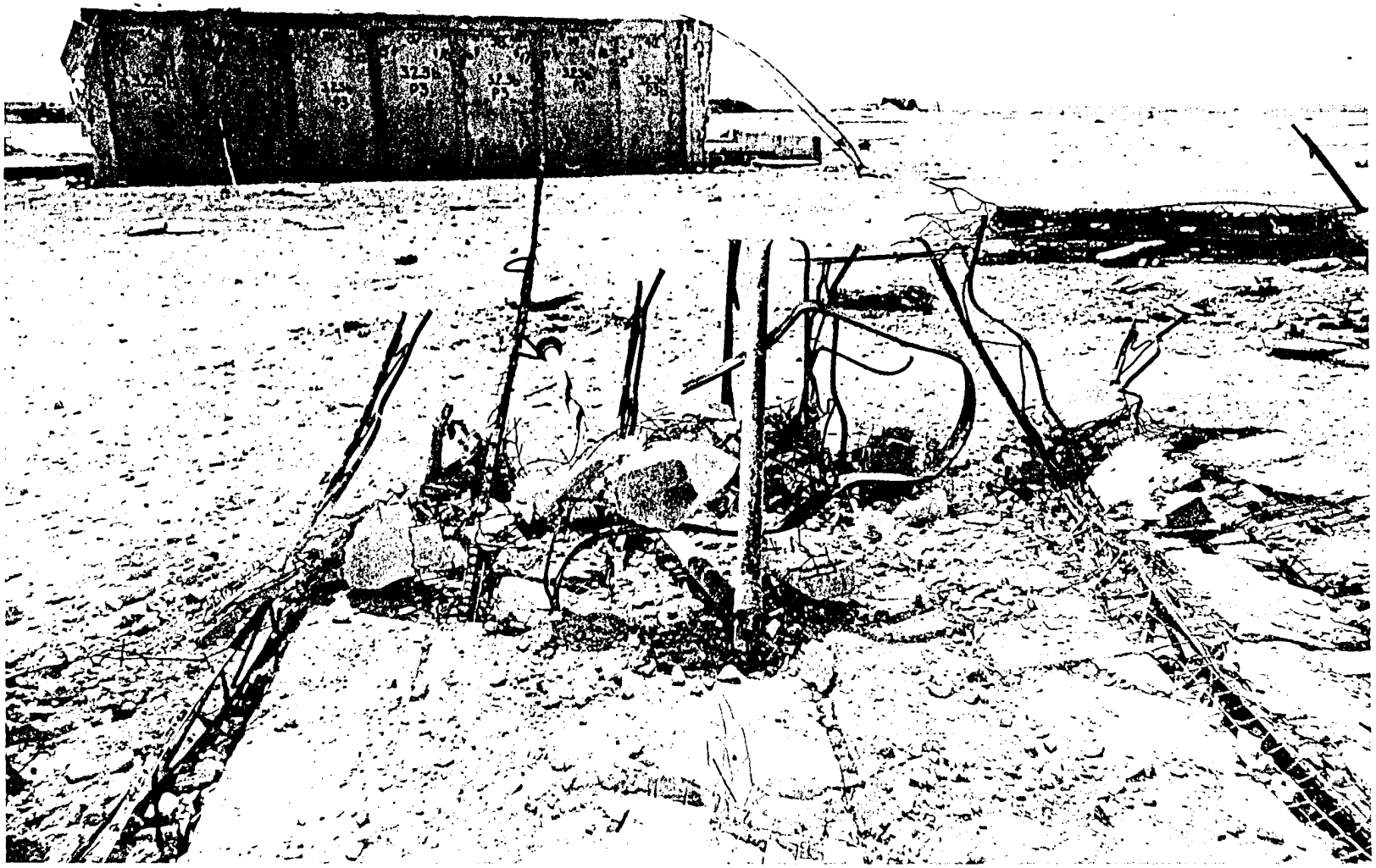


Fig. L.268 Rear End of Right Half of Roof Section, Structure 3.2.3b. This end struck the ground and suffered severe damage.



Fig. L.269 Detail View of One Roof Panel Showing Collapse of Most of the Cells, Apparently Caused upon Landing.
Structure 3.2.3b

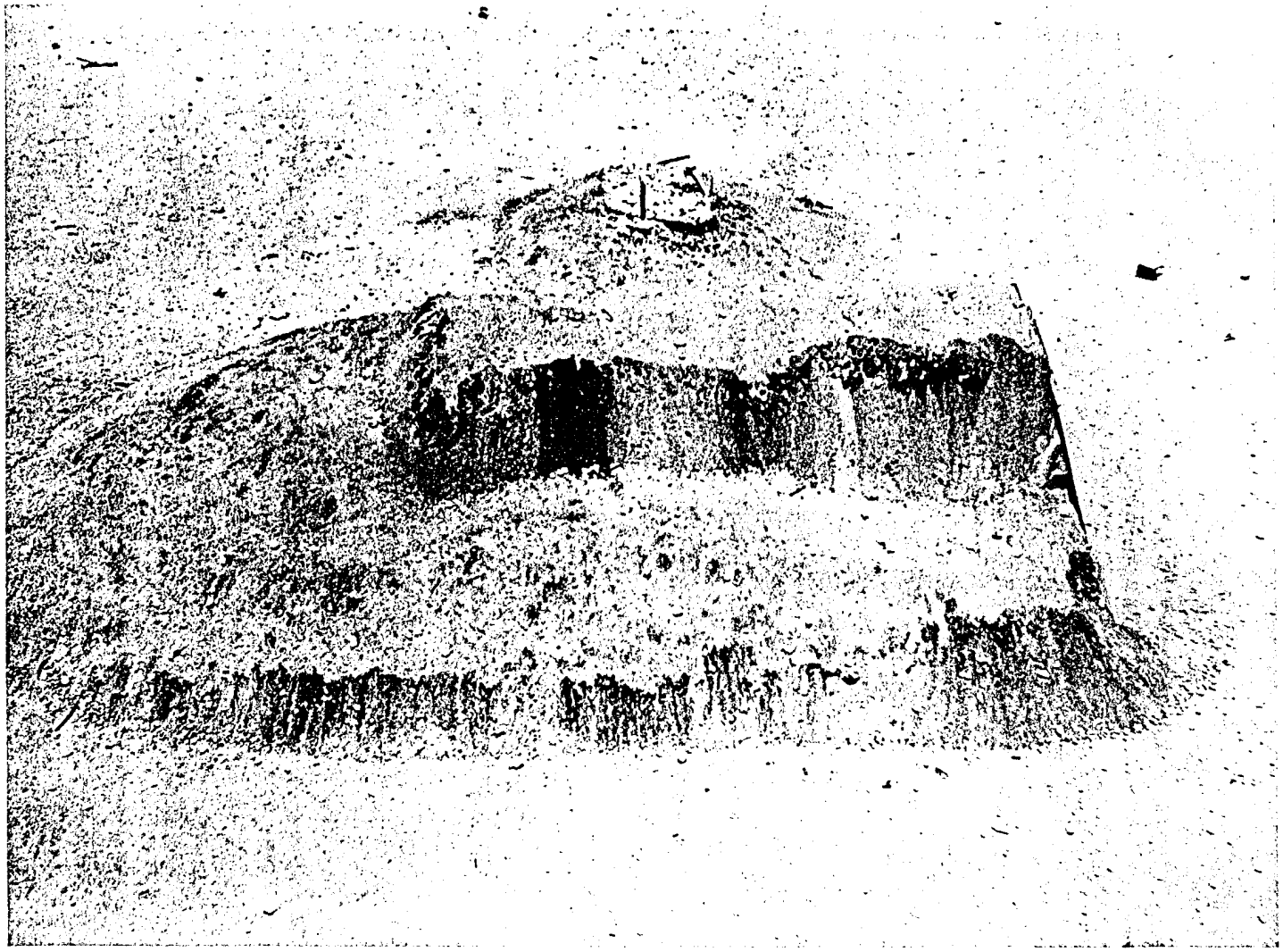


Fig. L.270 Aerial View of Structure after Blast, Structure 3.2.4a. Note how earth cover is pushed down rather than blown off.

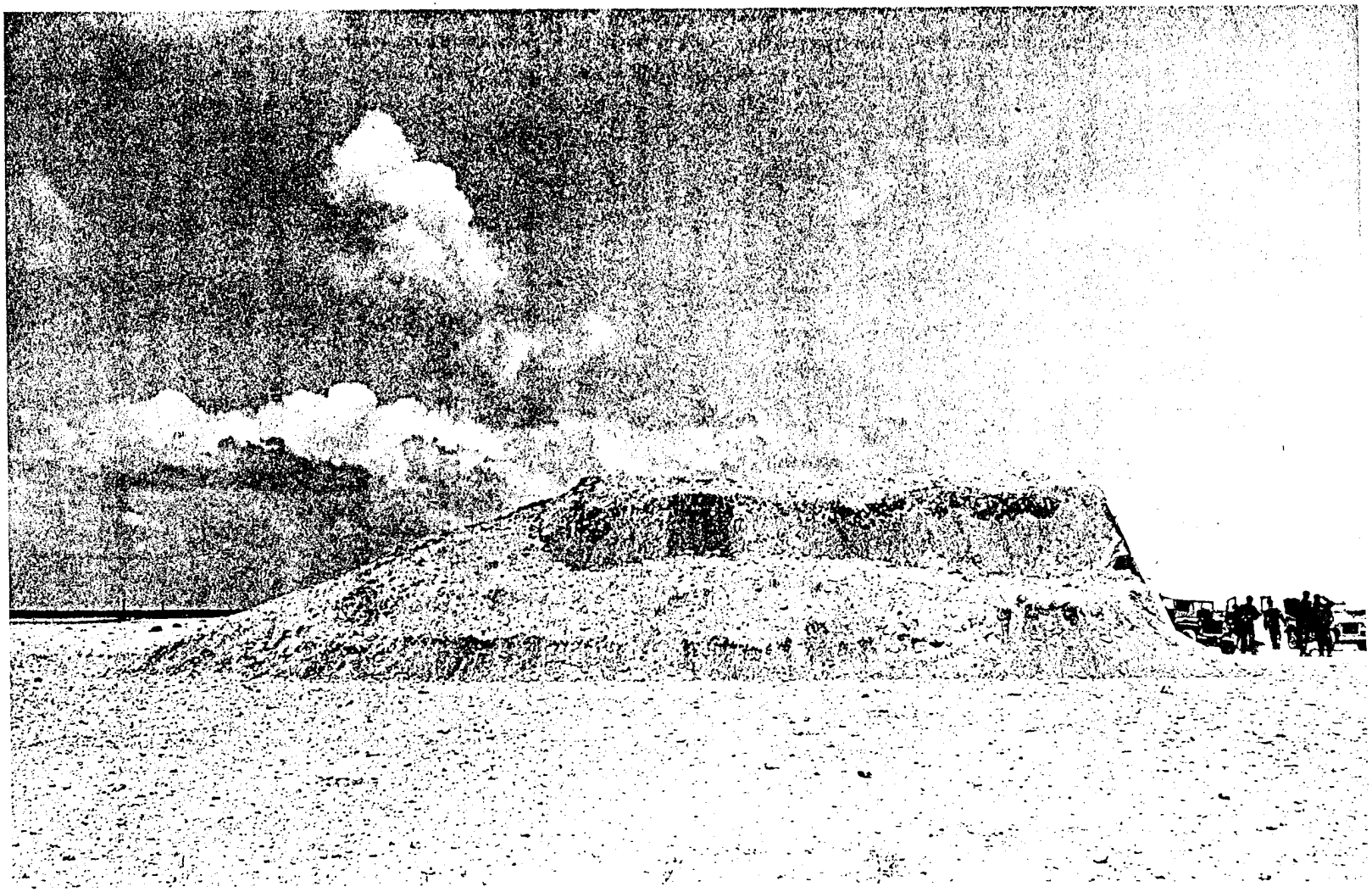


Fig. L.271 · General View from Blast Side, Structure 3.2.4a. Little fill was lost from the left slope, but earth cover along main section has been pushed down.

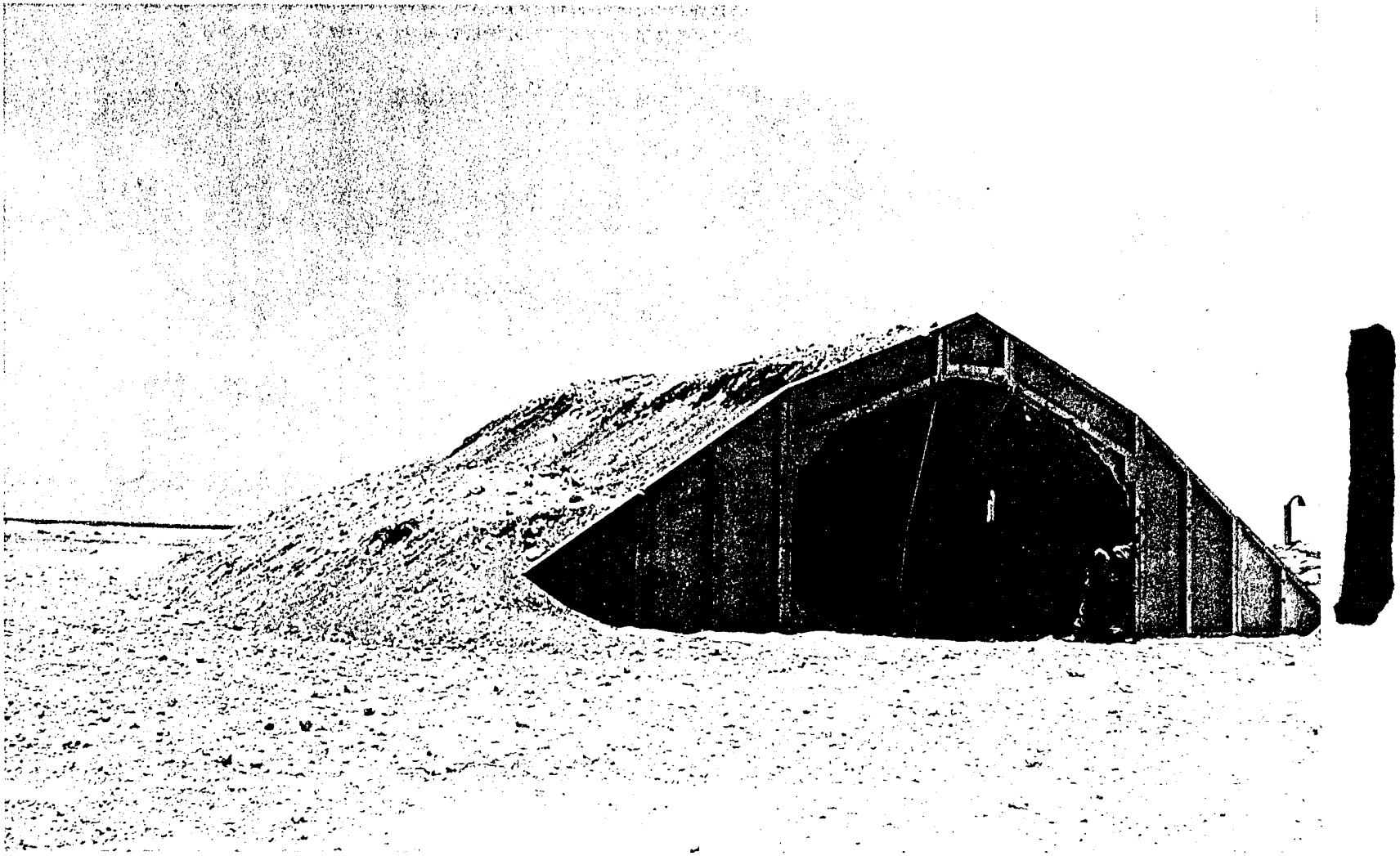


Fig. L.272 General View of Right End of Structure, 3.2.4a. This end wall was blown into the building. Little fill was lost at peak.

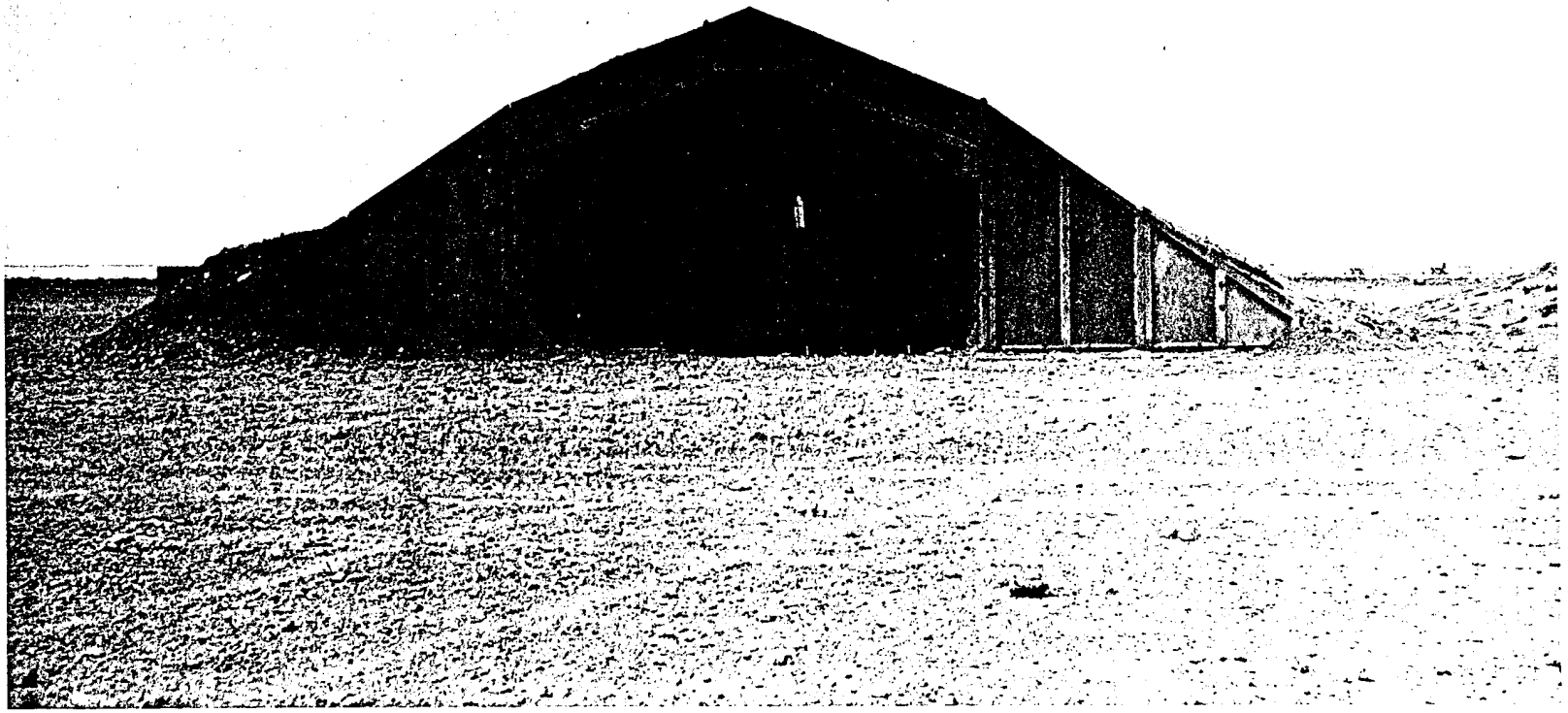


Fig. L.273 General View Normal to Right End, Structure 3.2.4a. Note how earth cover has been forced outward along sides.



Fig. L.274 General View along Rear Side of Structure, 3.2.4a. Earth cover has not been pushed down as much as it was on the front, but the pattern is similar.

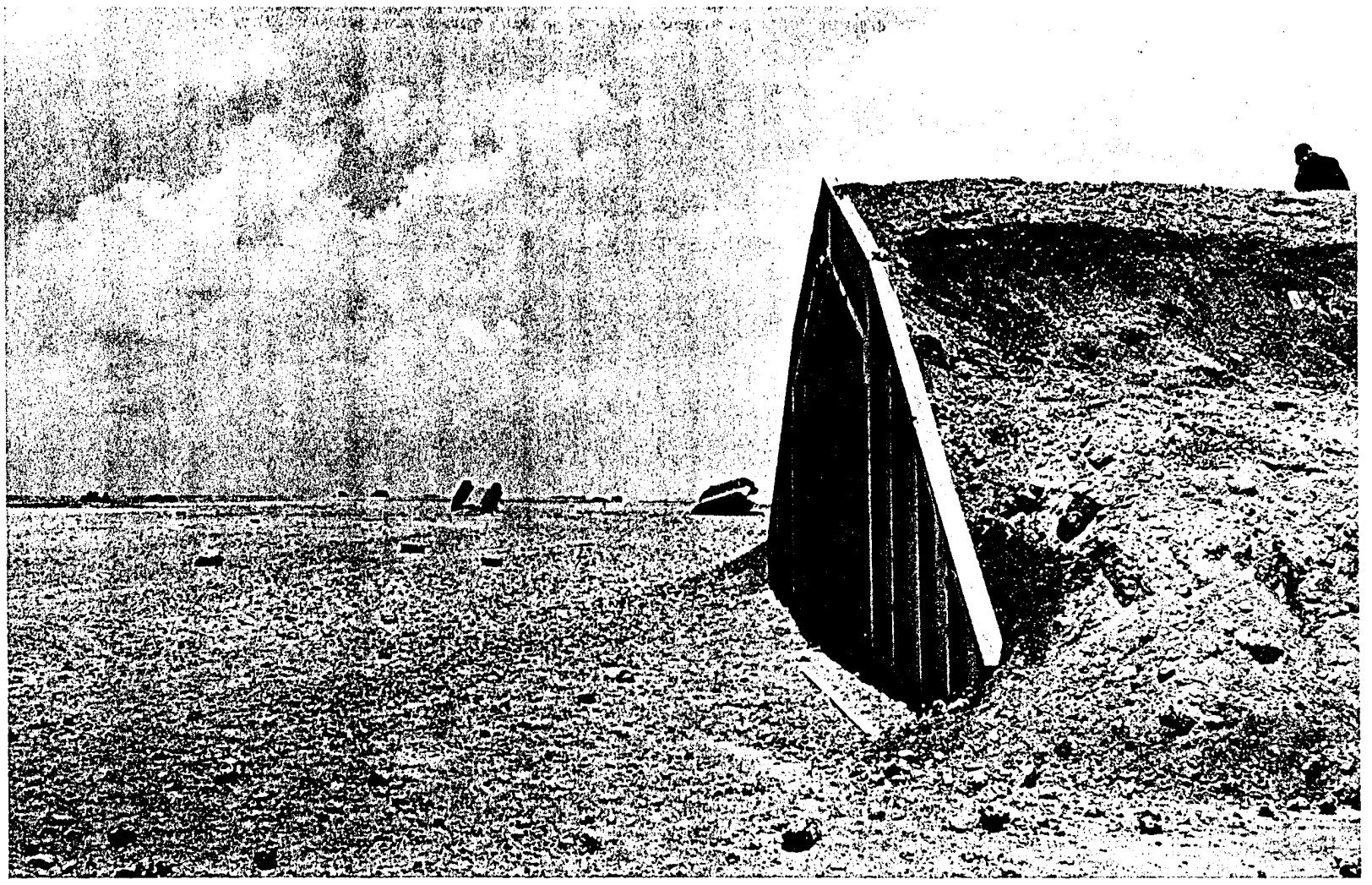


Fig. L.275 Close-up View of Earth Cover on Rear Face, Structure 3.2.4a

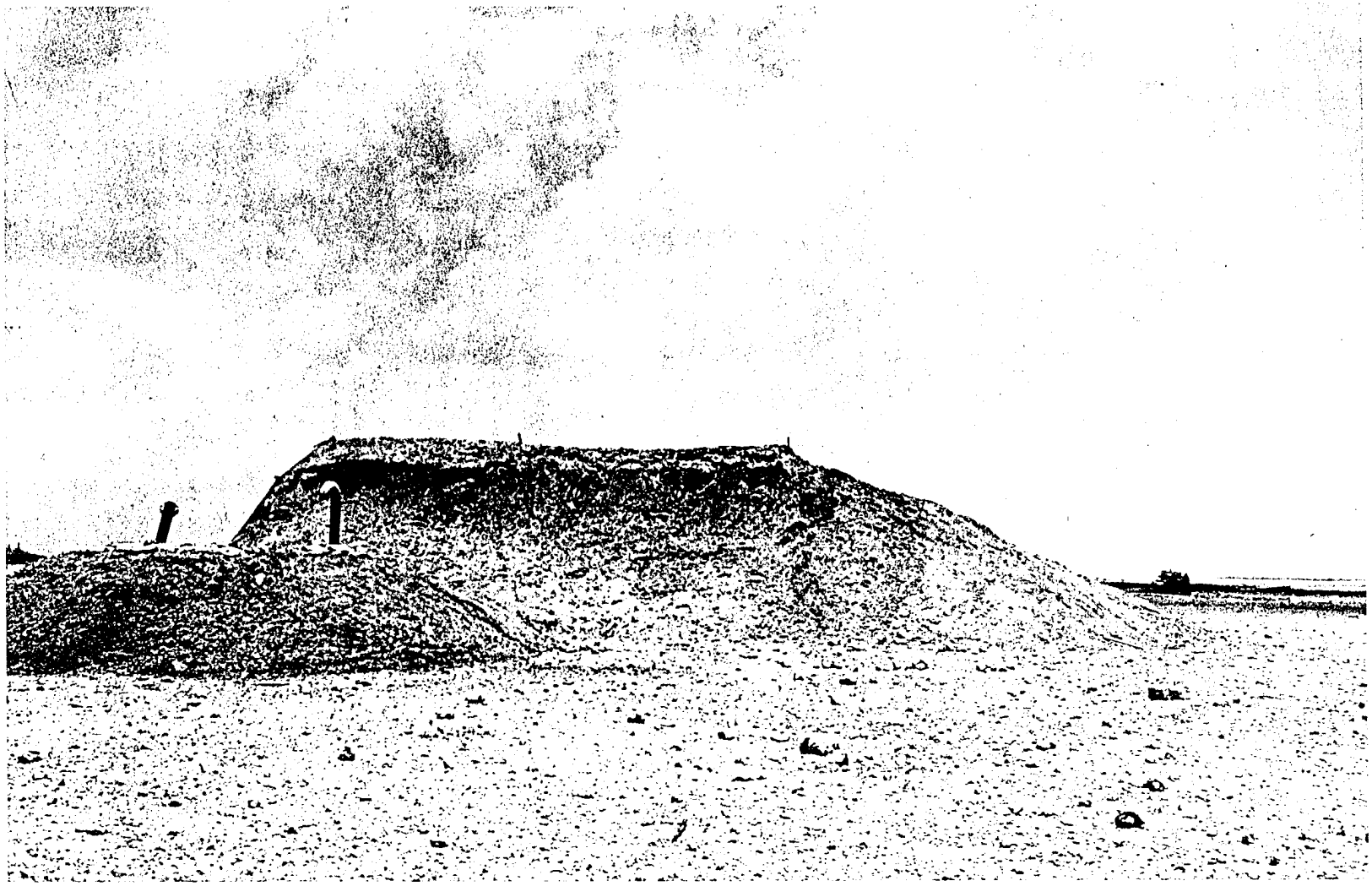


Fig. L.276 General View of Earth Cover on Rear Face, Structure 3.2.4a. Small mound of earth in left of photograph covers a recording shelter.



Fig. L.277 General View of Right End of Structure, 3.2.4a. Note earth cover being washed off with high-pressure water stream.

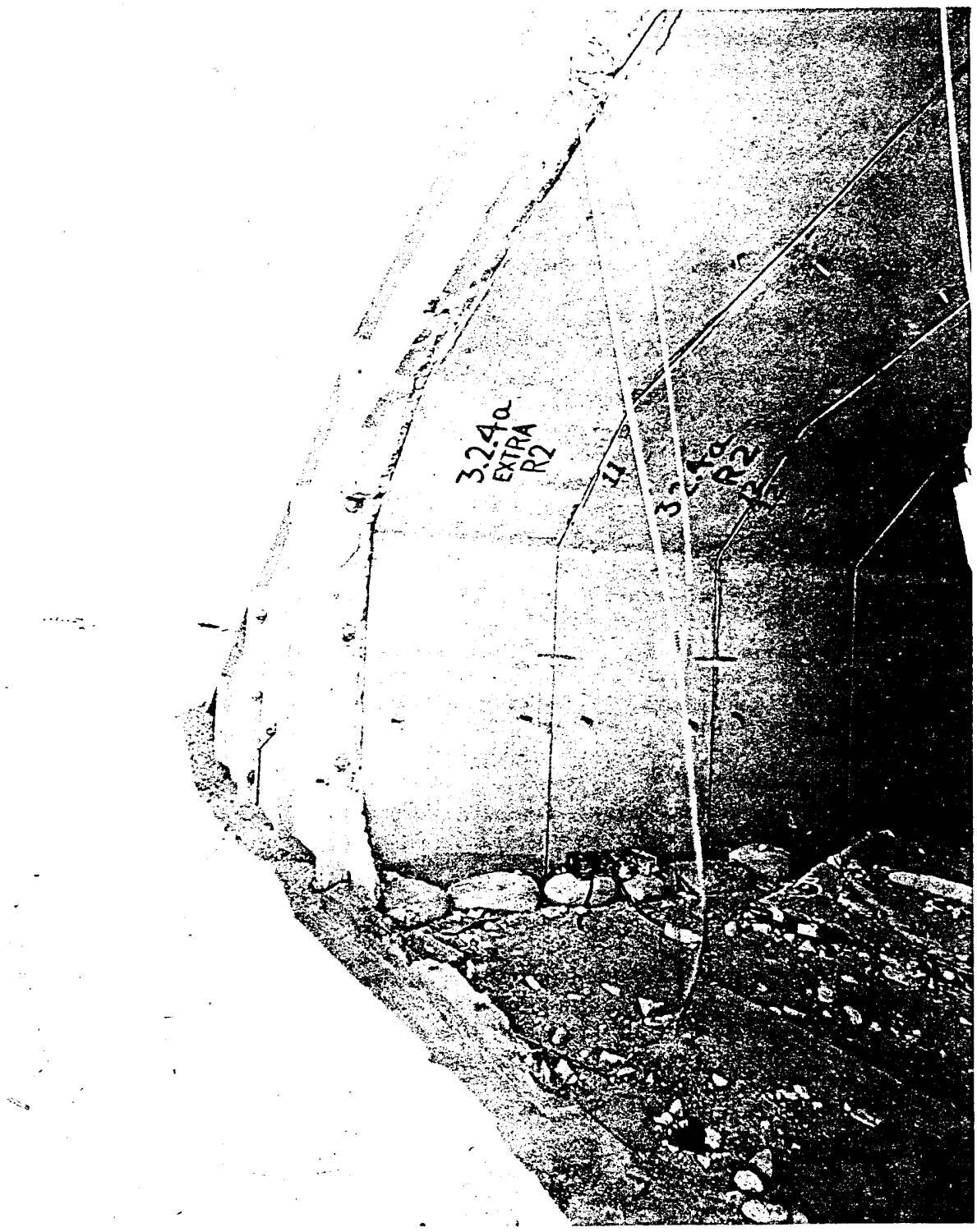


Fig. L.278 Detail View of Front Portion of Right End of Structure, 3.2.4a. Steel bars suspended from ribs overhead are only remains of end panel. Note the clean lines of cleavage.

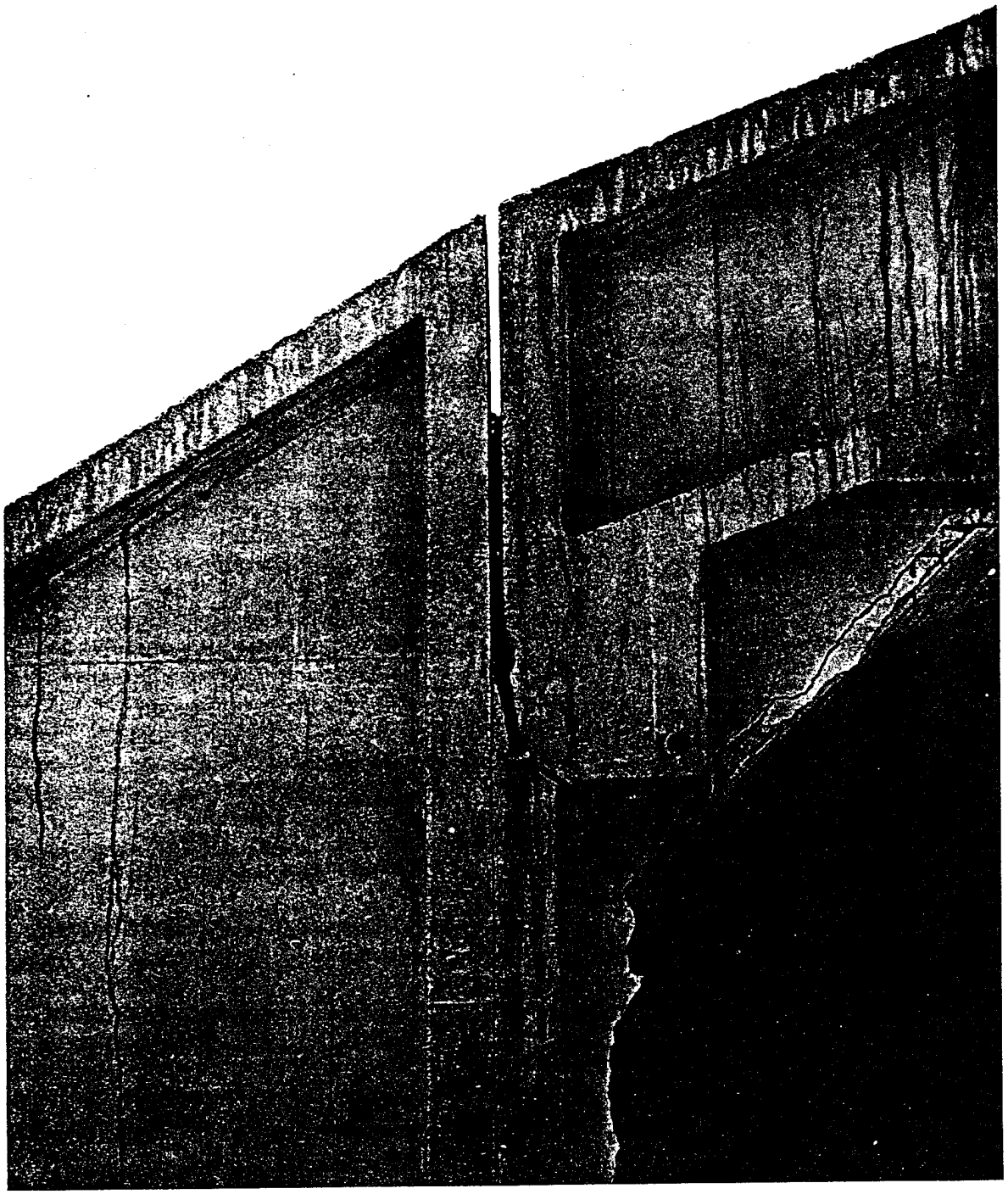


Fig. L.279 Detail View of Front Panel on Right End, Structure 3.2.4a. One-inch vertical opening shows general movement of structure away from blast.

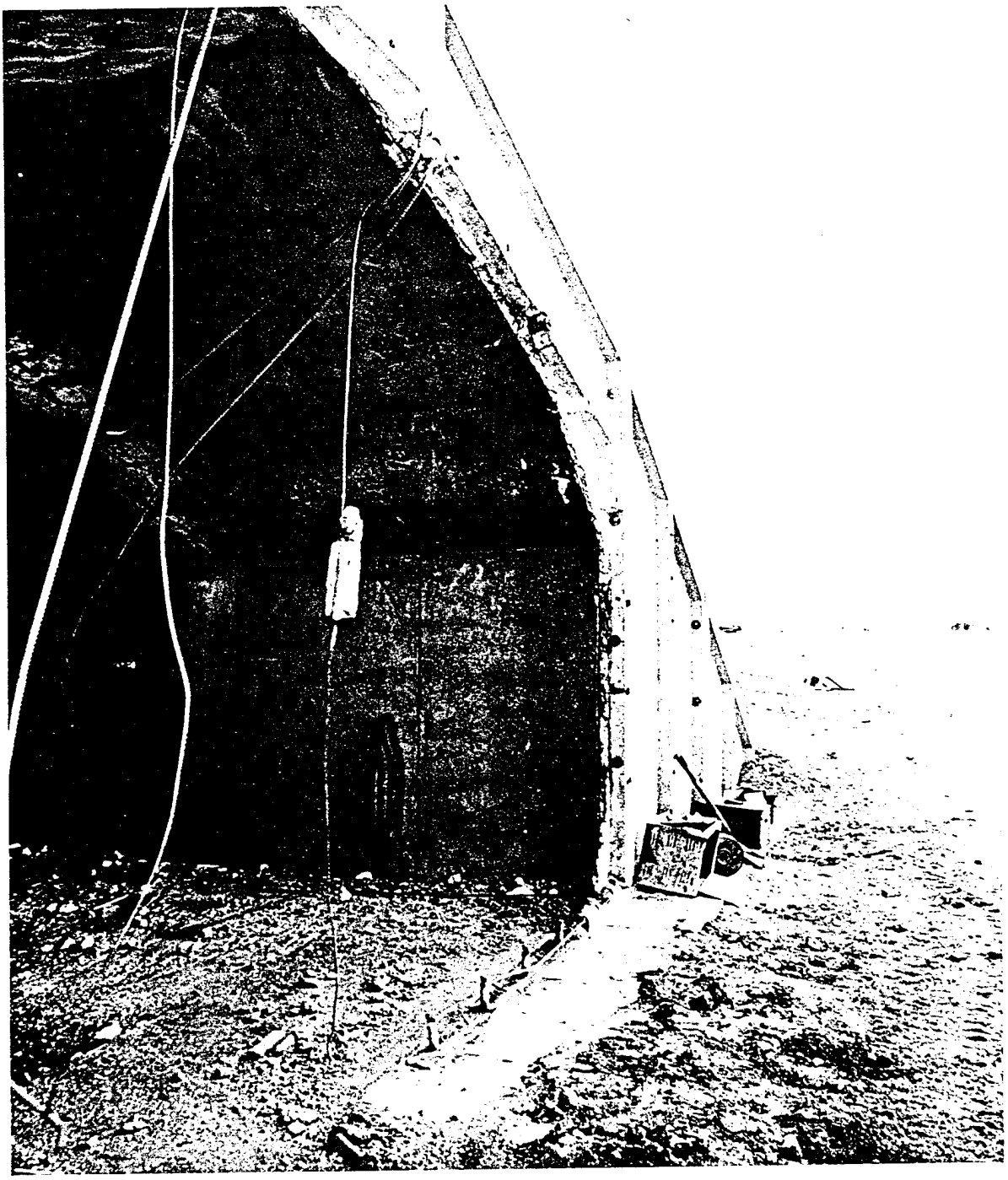


Fig. L.280 Close-up View of Rear Portion of Right End, Structure 3.2.4a. The base rib of the rear end panel was completely gone, but anchor bolts were not damaged. Bolt sleeves remained on bolts.

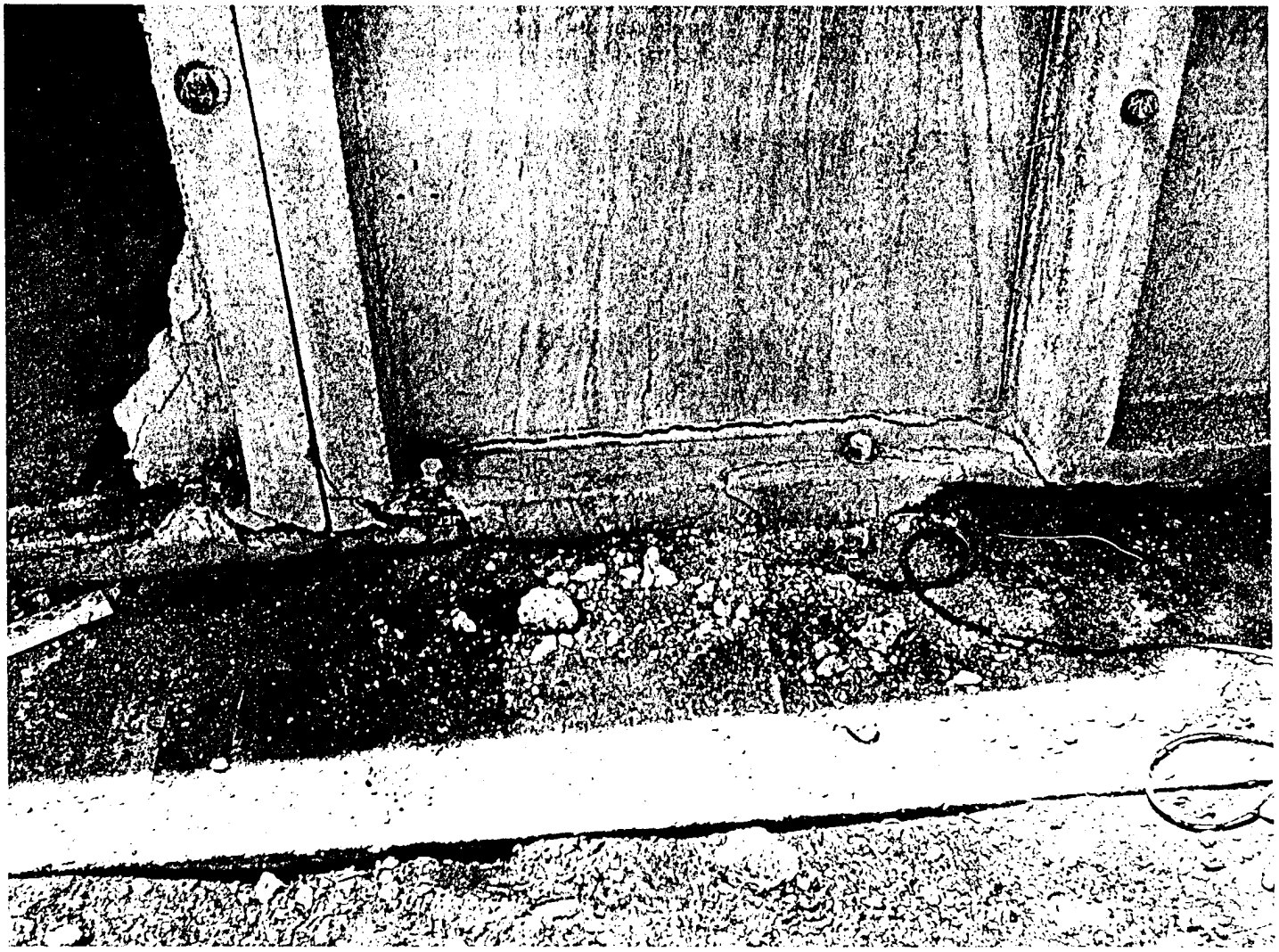


Fig. L.281 Crack along Base Rib of Rear Wing Wall, Structure 3.2.4a. This panel was subjected to shear forces (toward the right in this photograph) as the main structure deflected under blast loading.



Fig. L.282 Smaller Crack along Base Rib of Rear Wing Wall Panel Next to Panel Shown in the Preceding Photograph, Structure 3.2.4a



Fig. L.283 General View along Rear Wall after Earth Cover Was Washed Off, Structure 3.2.4a. No visible damage to any extent.

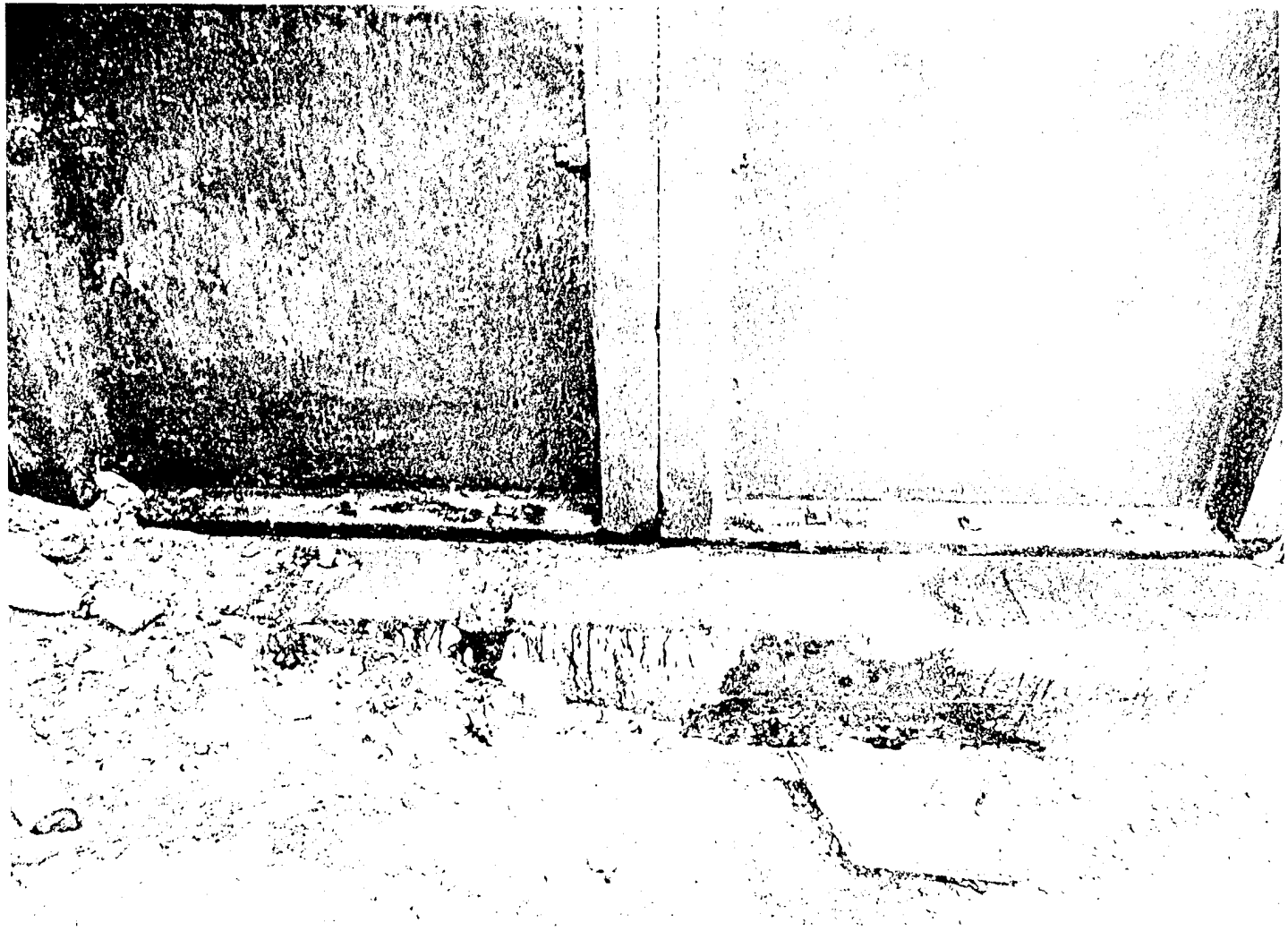


Fig. L.284 Detail View of Lower Ribs on Rear-wall Panels, Structure 3.2.4a. No cracking visible.

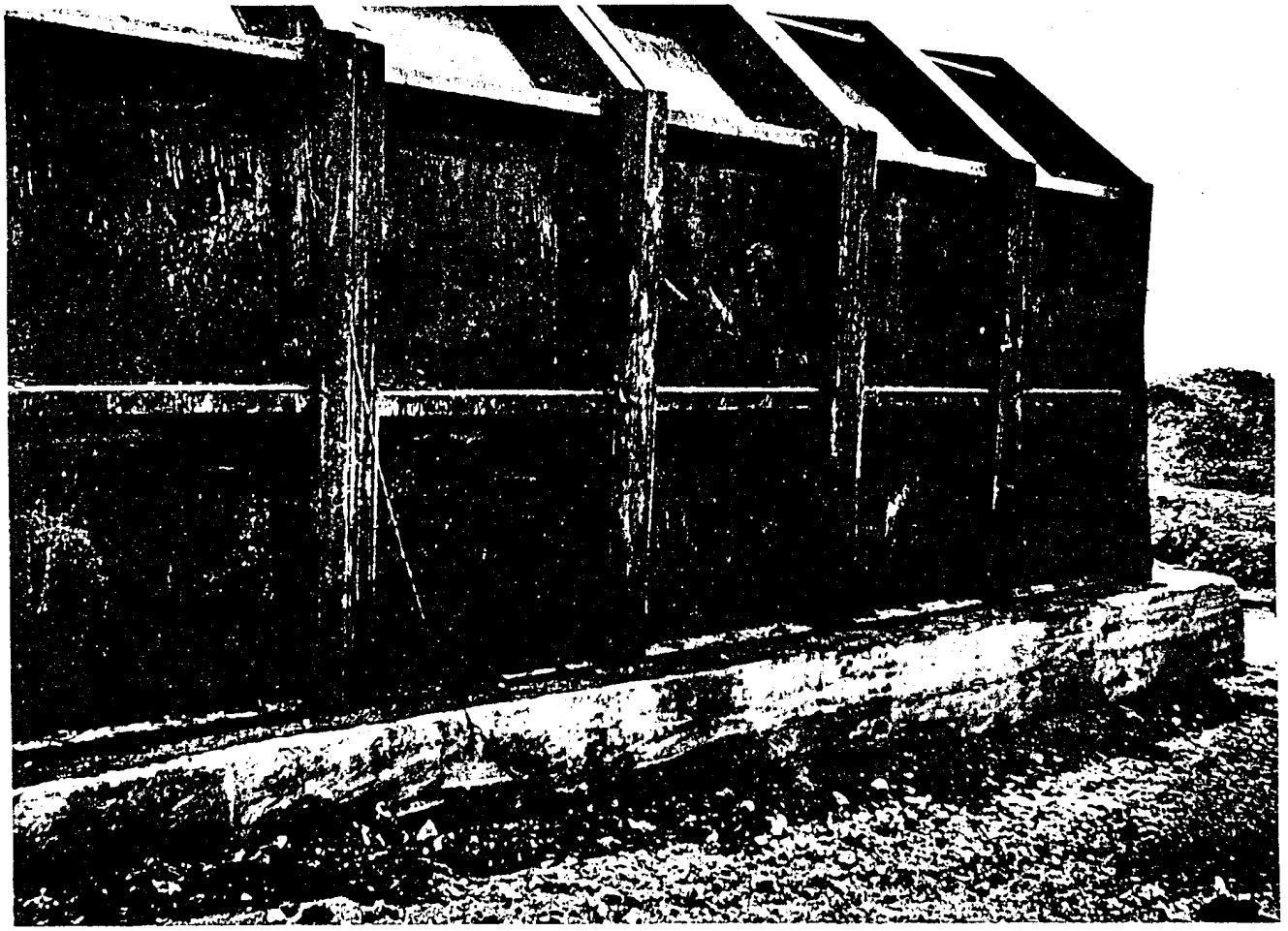


Fig. L.285 Left Half of Rear Wall after Removal of Earth Cover, Structure 3.2.4a. No damage.

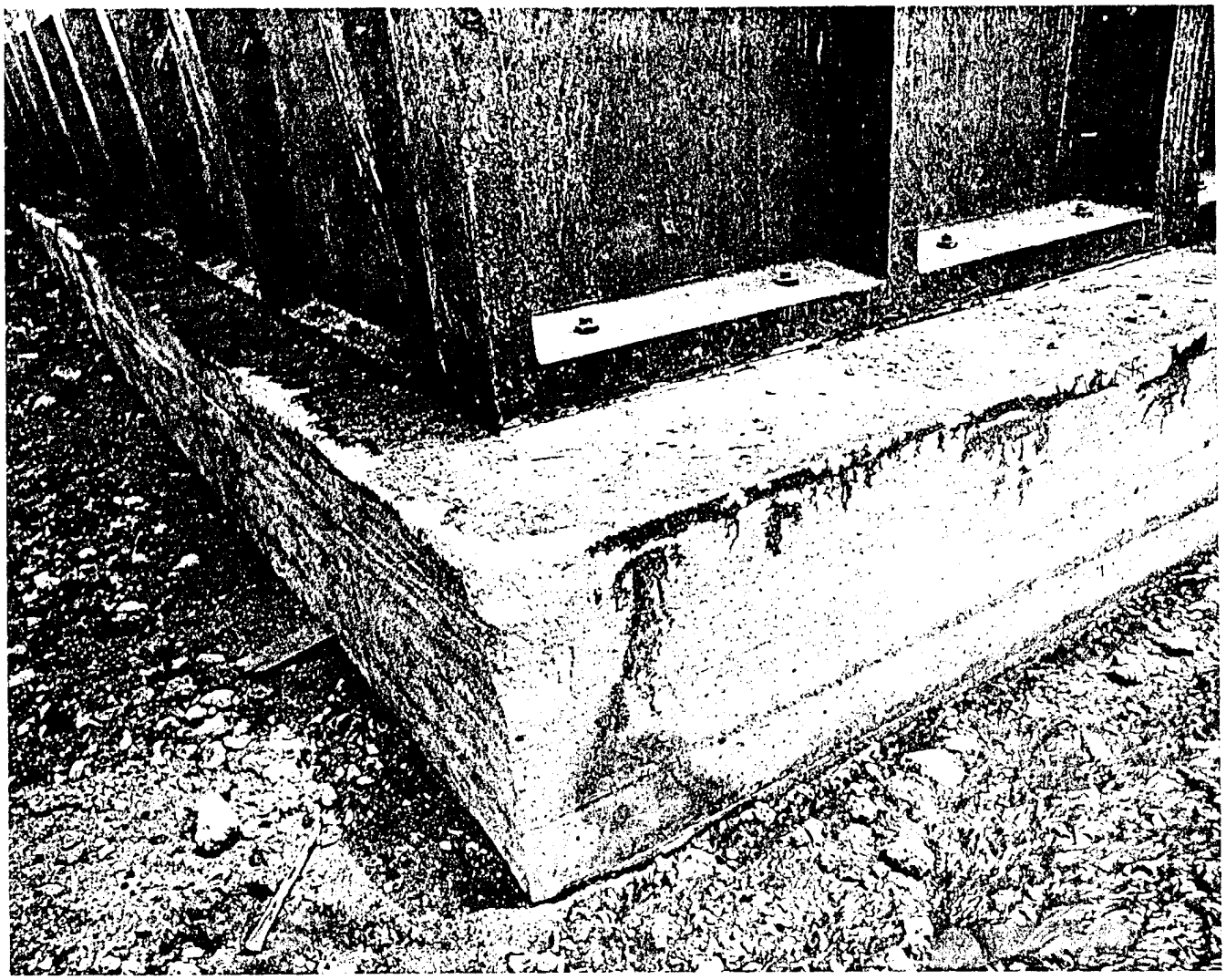


Fig. L.286 Detail View of Foundation at Left Rear Corner, Structure 3.2.4a. Small crack is barely visible in footing. This was the only crack found in the foundation of this structure.

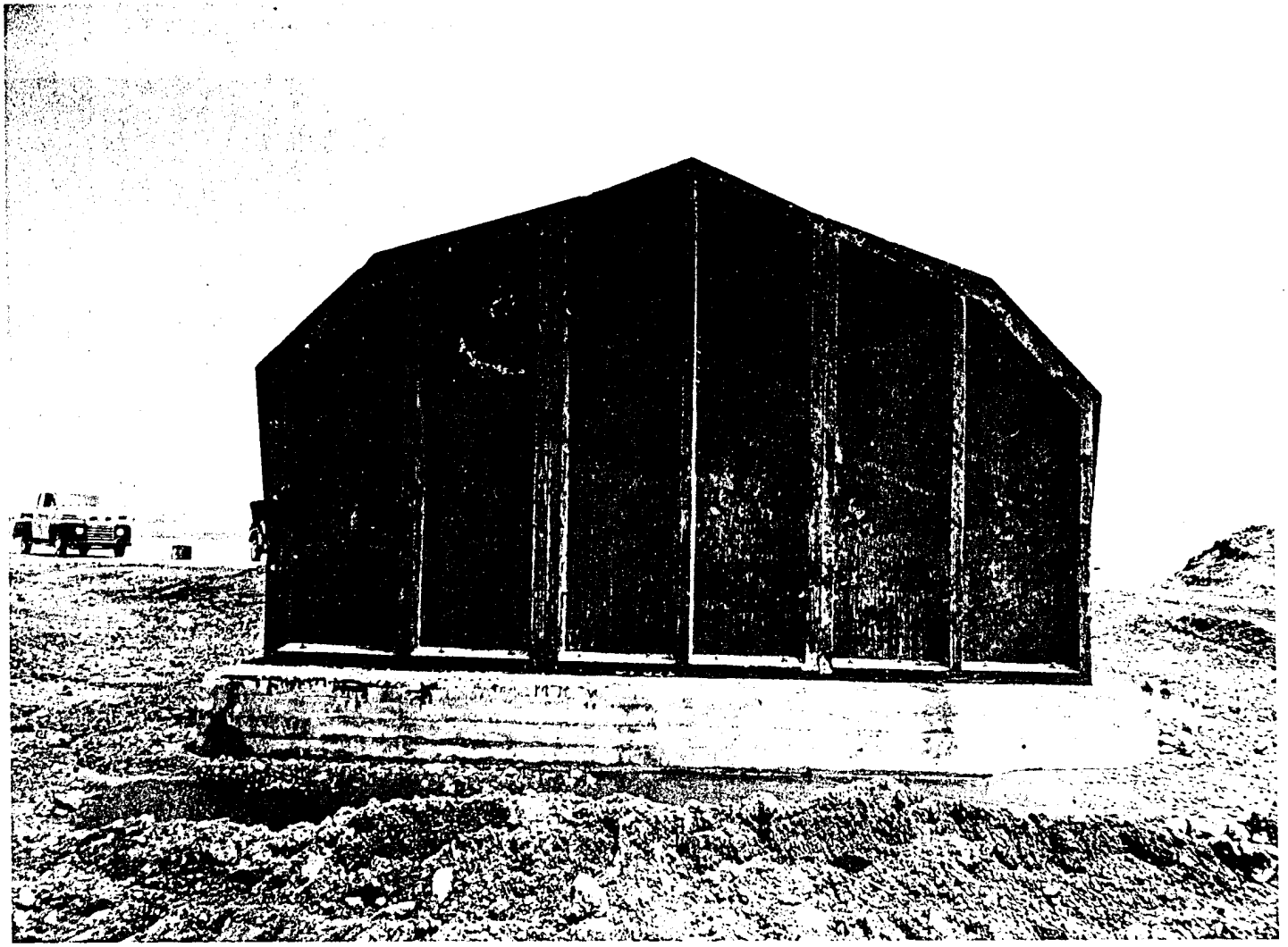


Fig. L.287 General View of Left End Wall after Removal of Earth Cover, Structure 3.2.4a. The two cracked sections in the panel in the left of the photograph were caused by debris that was hurled into the structure.



Fig. L.288 Close-up View of Hole in Rear Wall Caused by Door Panel Hitting It with Great Force, Structure 3.2.4a

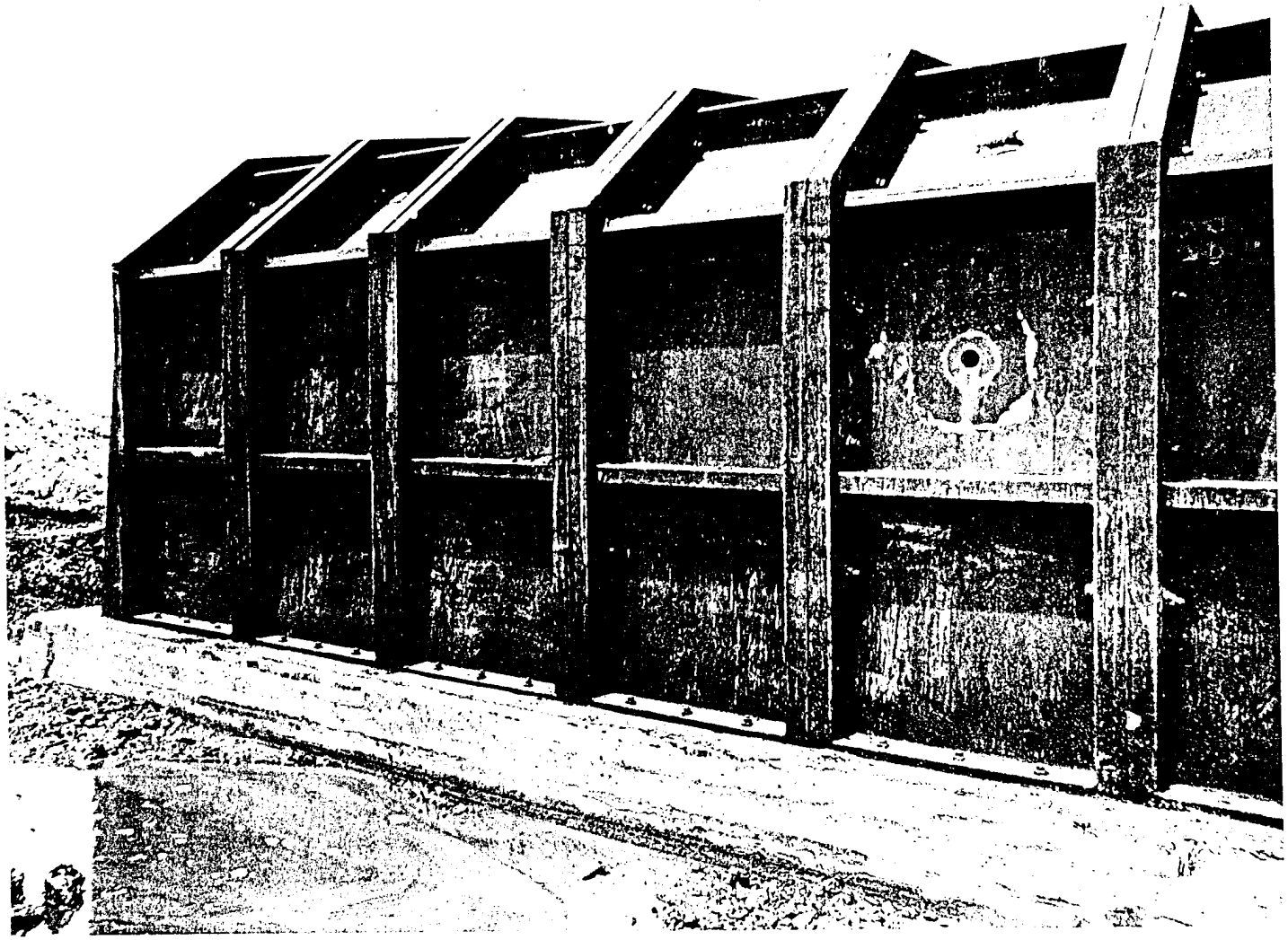


Fig. L.289 General View of Left Half of Front Face after Removal of Earth Cover, Structure 3.2.4a. Small holes show where pressure gauges had been installed.

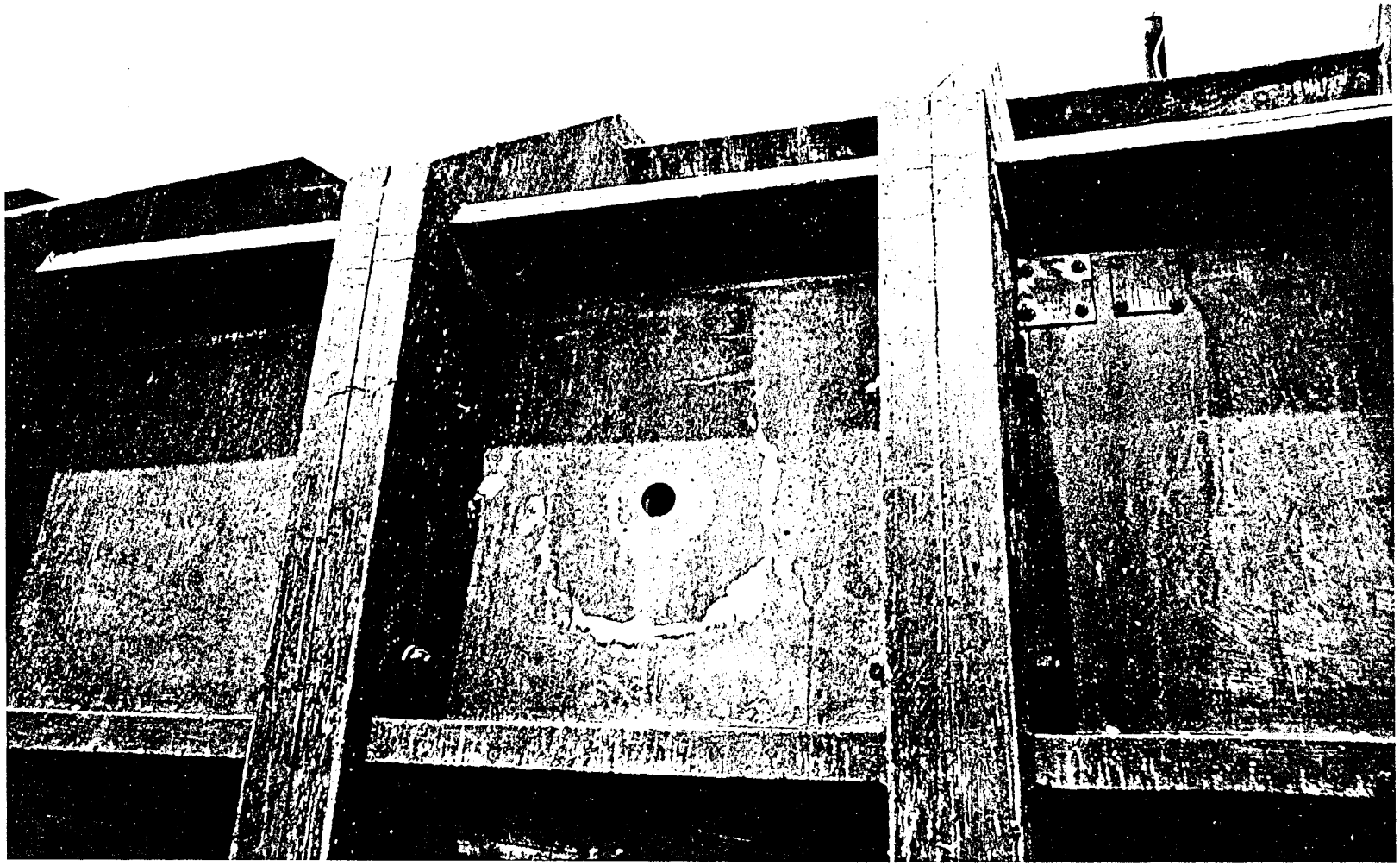


Fig. L.290 Close-up View of Center Portion of Front Wall, Structure 3.2.4a. Tension cracks are visible in the heavy reinforcing ribs near the haunch.

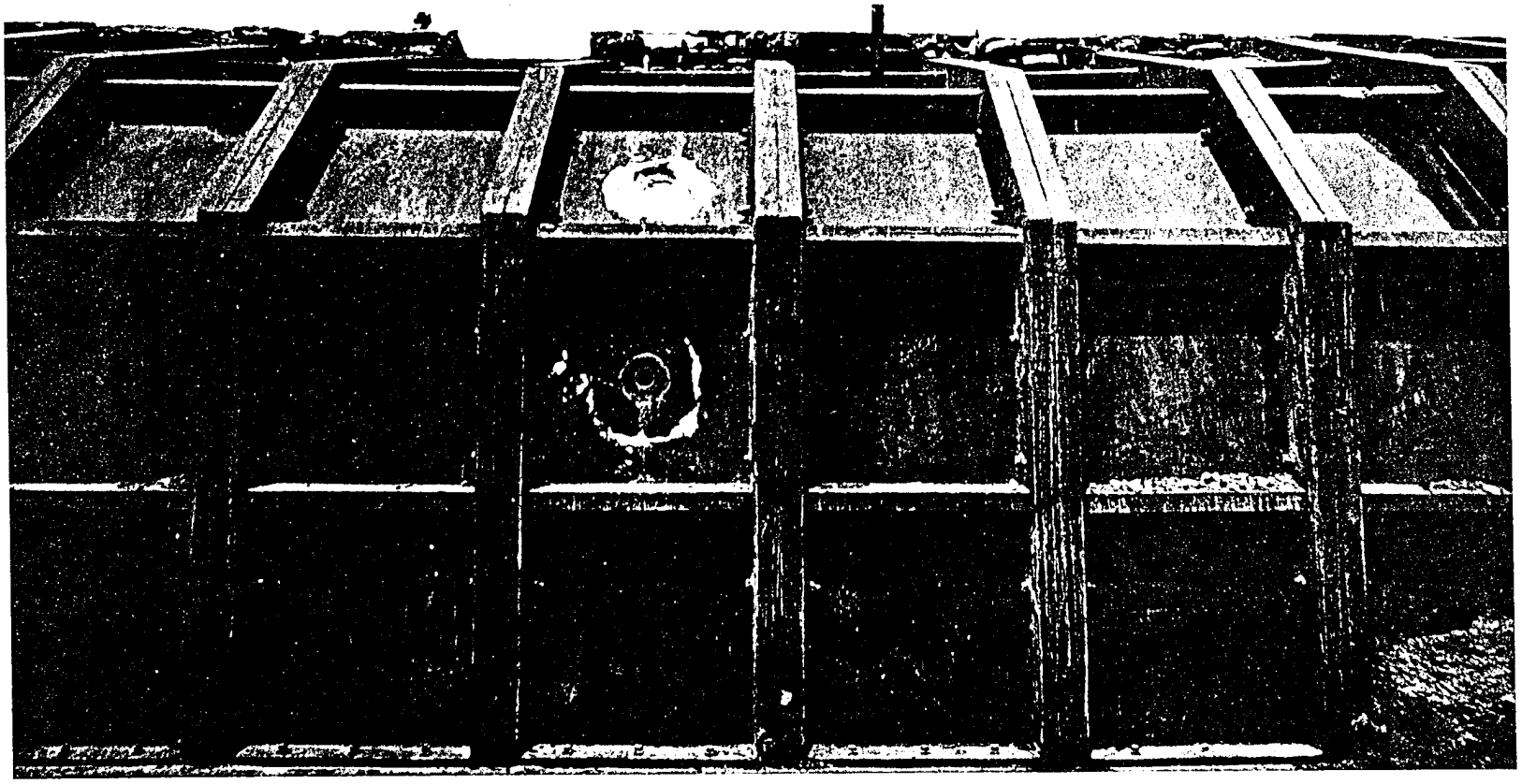


Fig. L.291 General View of Roof Portion of Front-wall Panels, Structure 3.2.4a. Damage to crown joint connection can be clearly seen. Note the vertical dishing of the roof portion of the panels.

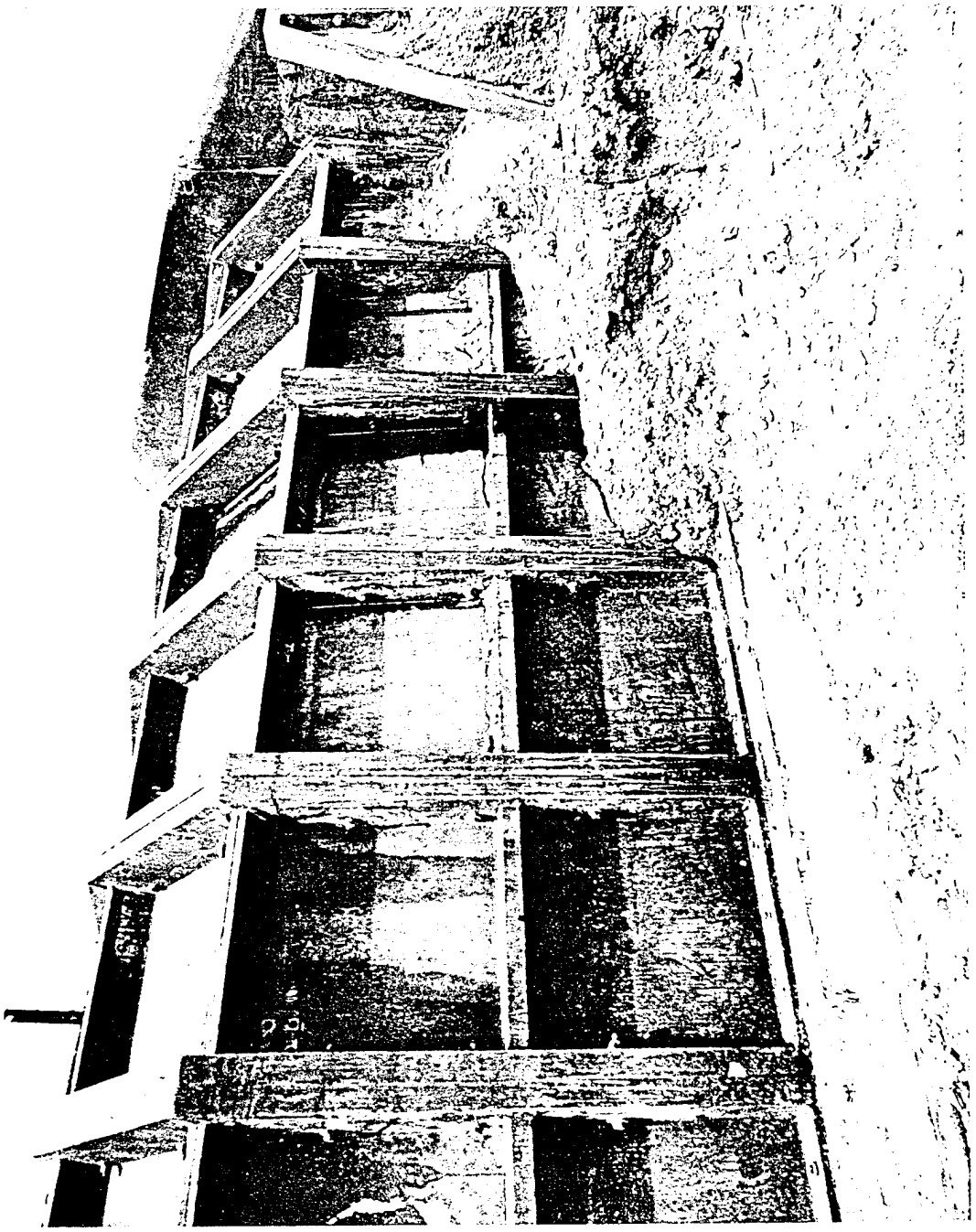


Fig. L.292 General View of Right Half of Front Wall after Removal of Earth Cover, Structure 3.2.4a

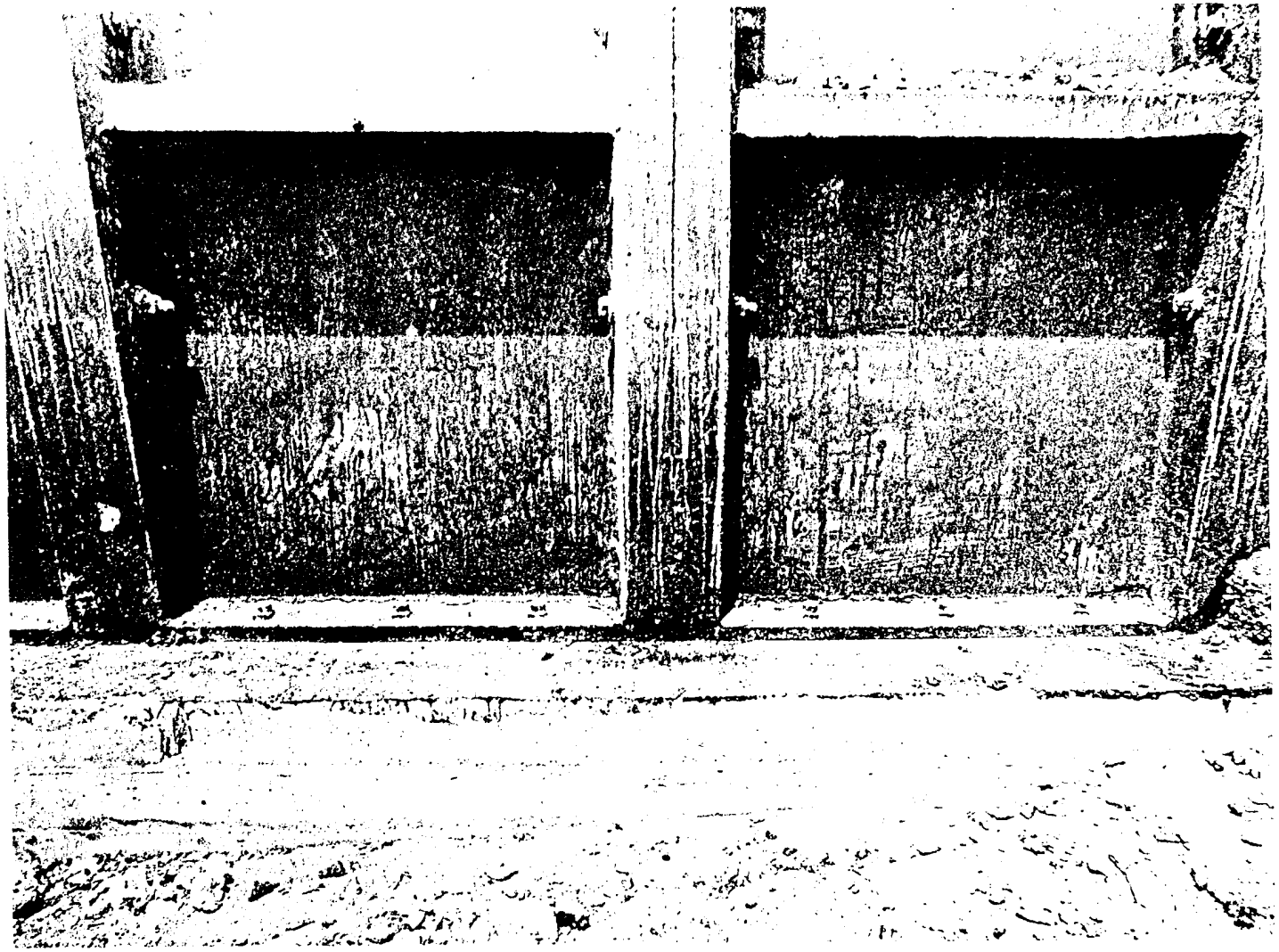


Fig. L.293 Detail View of Base Ribs of Front-wall Panels, Structure 3.2.4a. Slight cracking in ribs can be seen.



Fig. L.294 General View of Right Half of Roof, after Removal of Earth Cover, Structure 3.2.4a

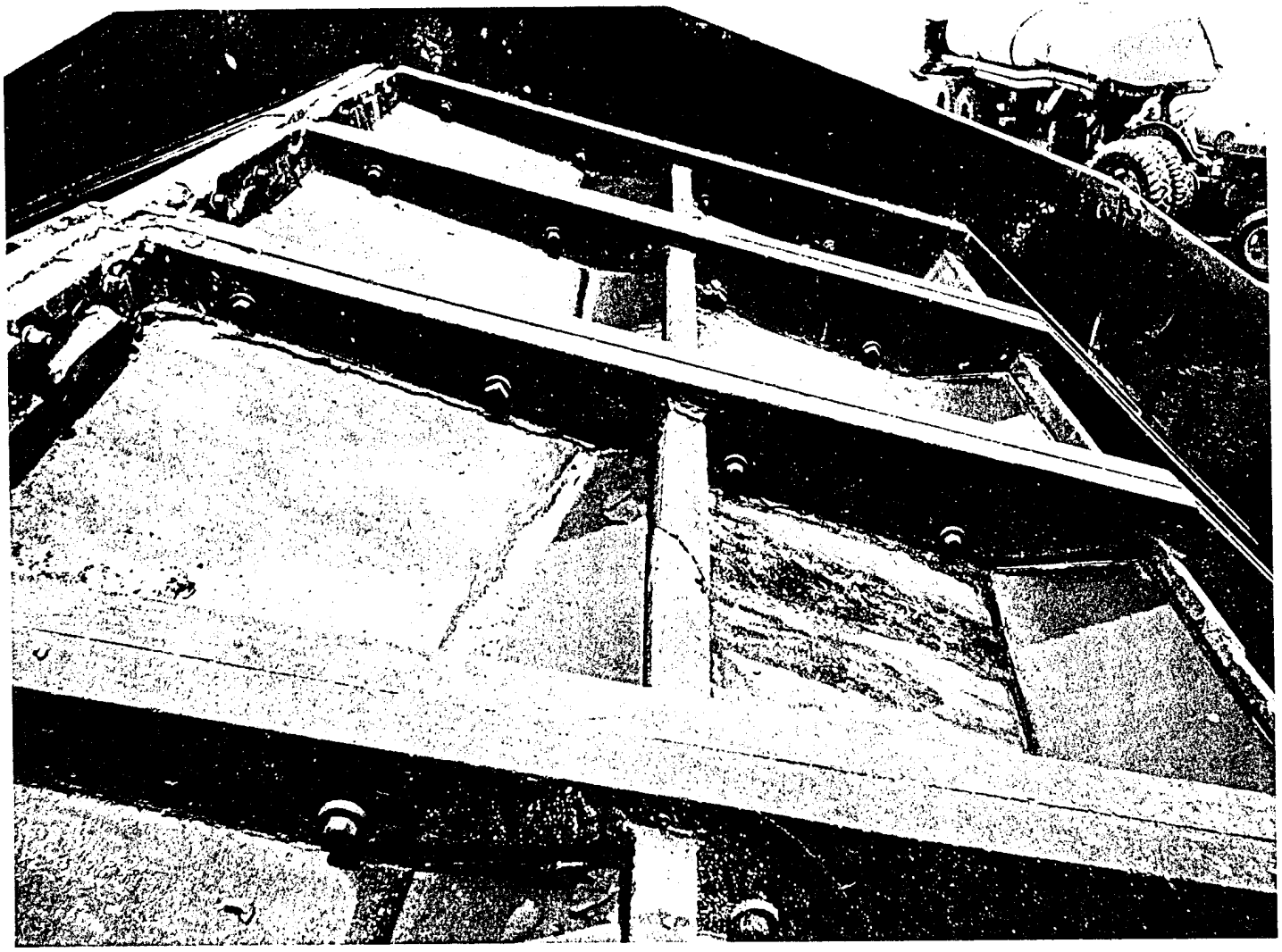


Fig. L.295 Detail View of Separation Between Rib and Diaphragm Section, Structure 3.2.4a. Separation is the greatest nearest to the crown.

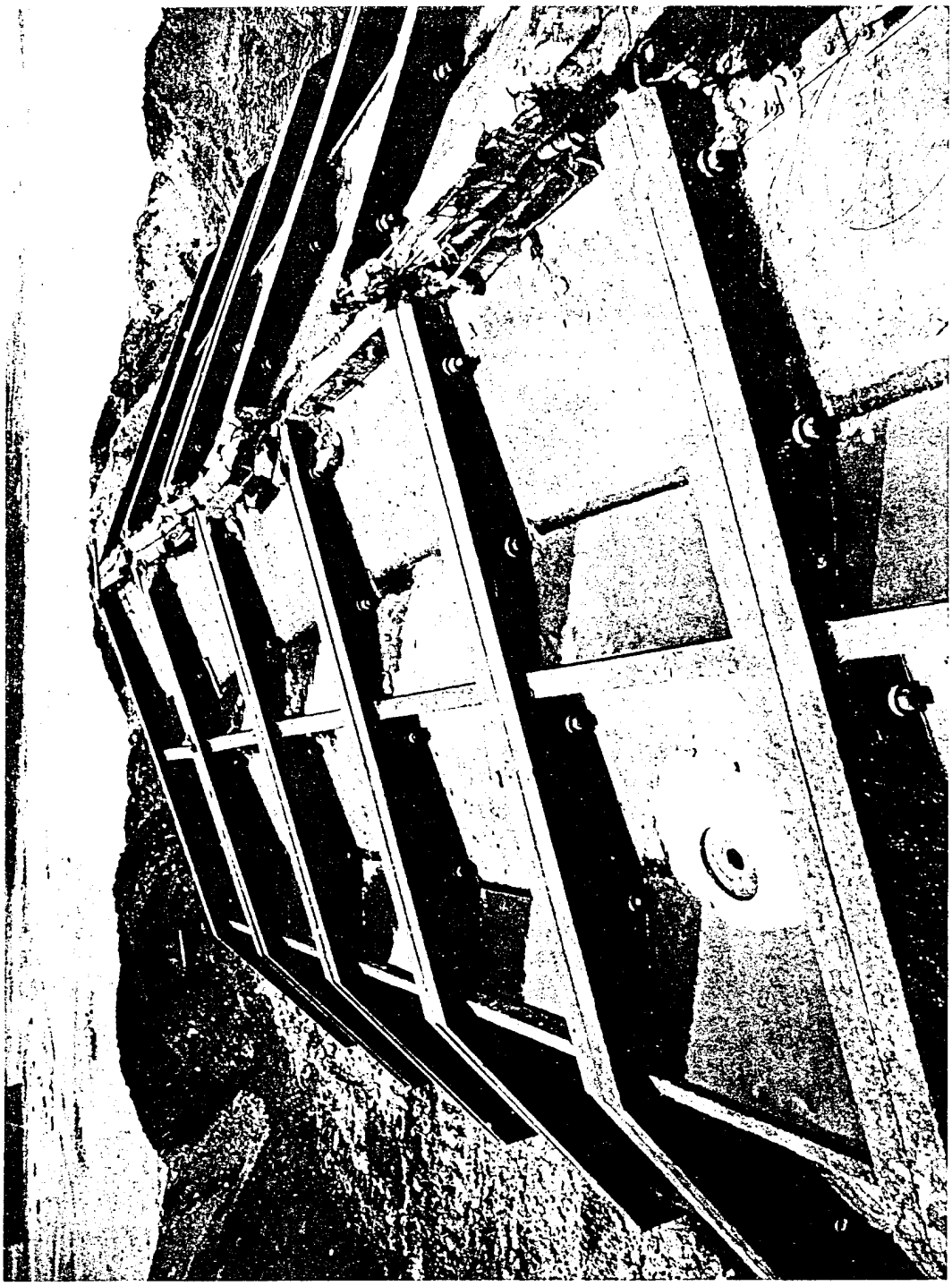


Fig. L.296 General View of Left Half of Roof, Structure 3.2.4a

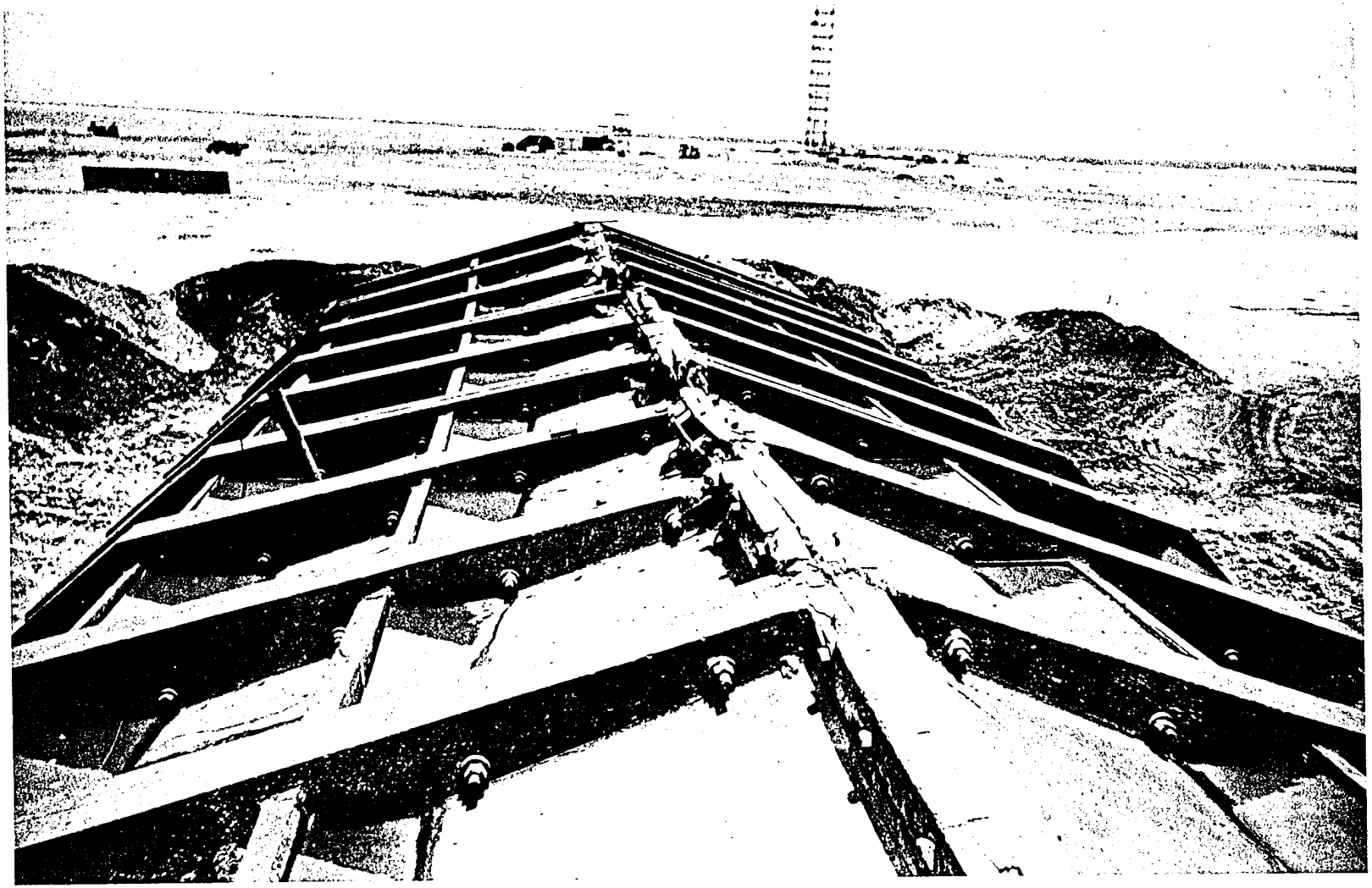


Fig. L.297 General View of Roof, Structure 3.2.4a

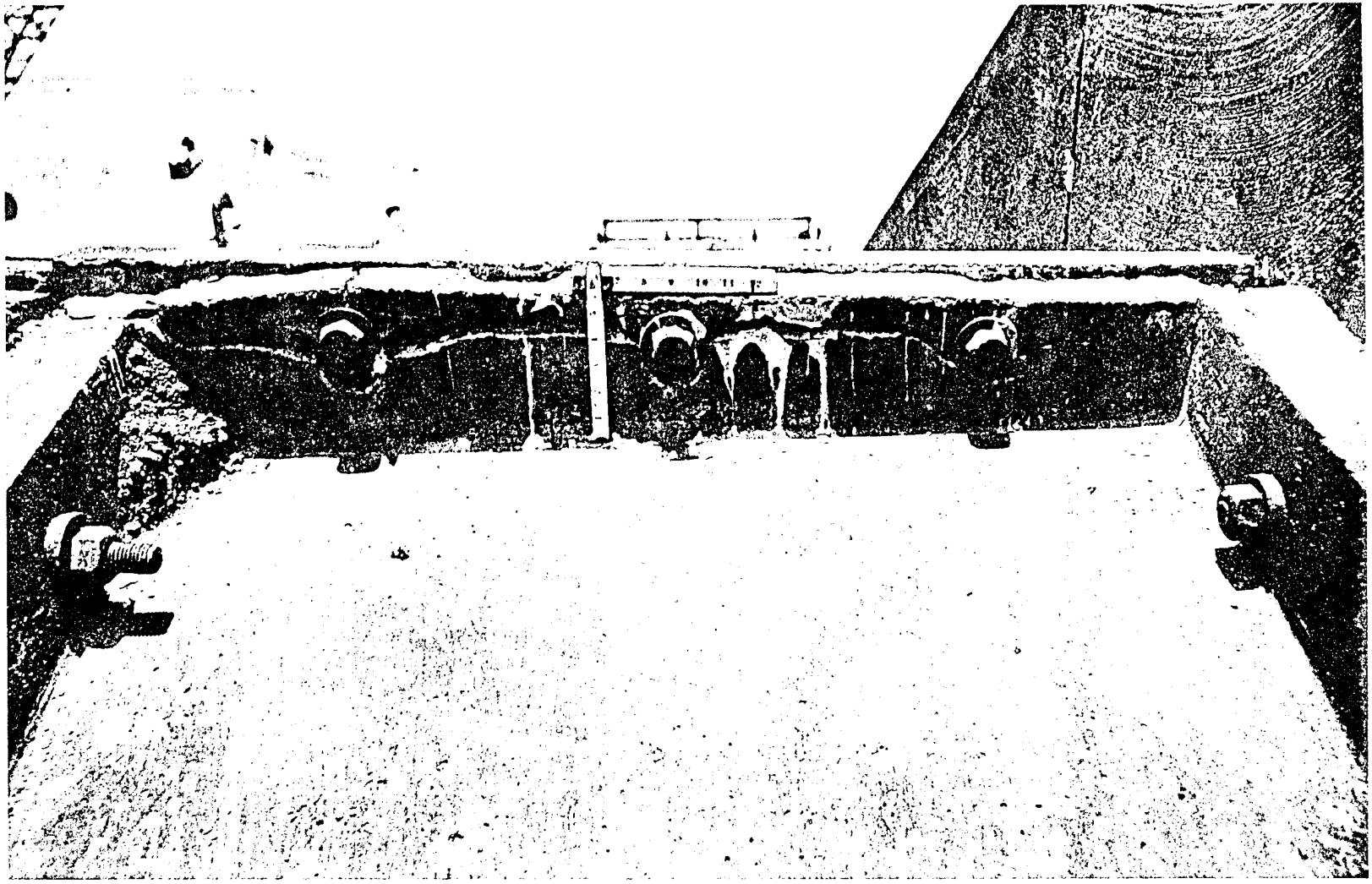


Fig. L.298 Crown Rib of Front-wall Panel No. 1, Structure 3.2.4a

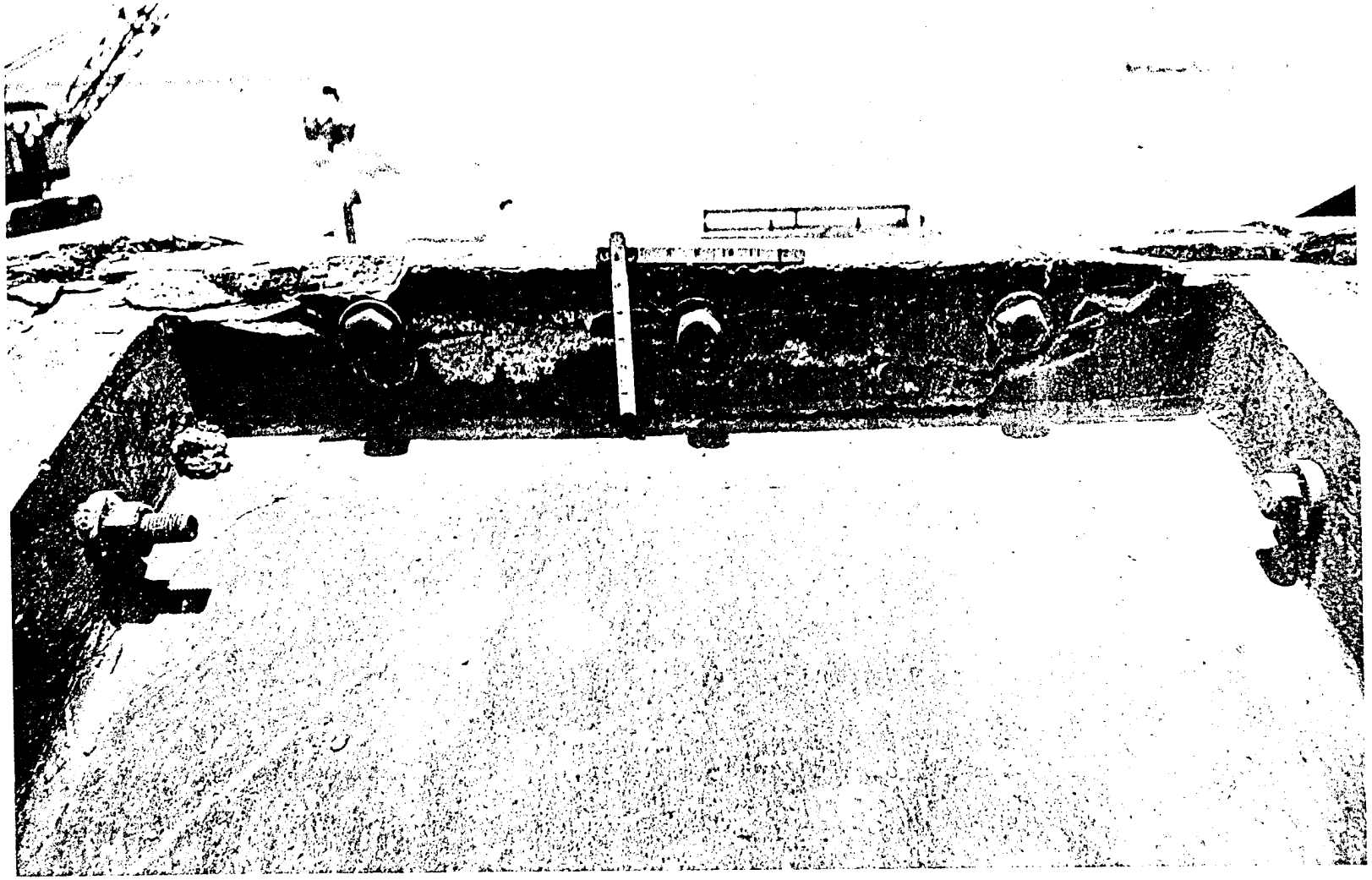


Fig. L.299 Crown Rib of Front-wall Panel No. 2, Structure 3.2.4a

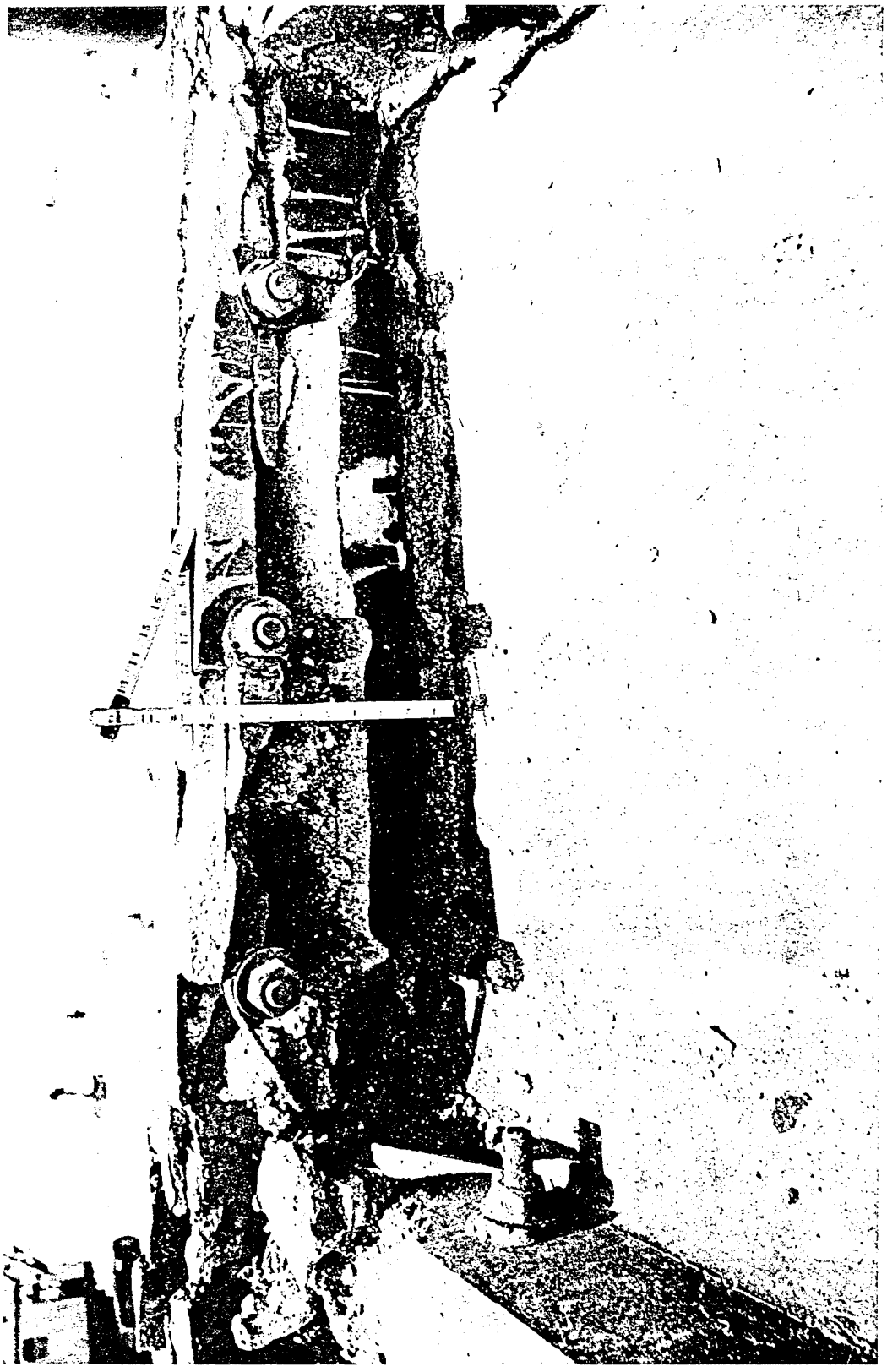


Fig. L.300 Crown Rib of Front-wall Panel No. 3, Structure 3.2.4a

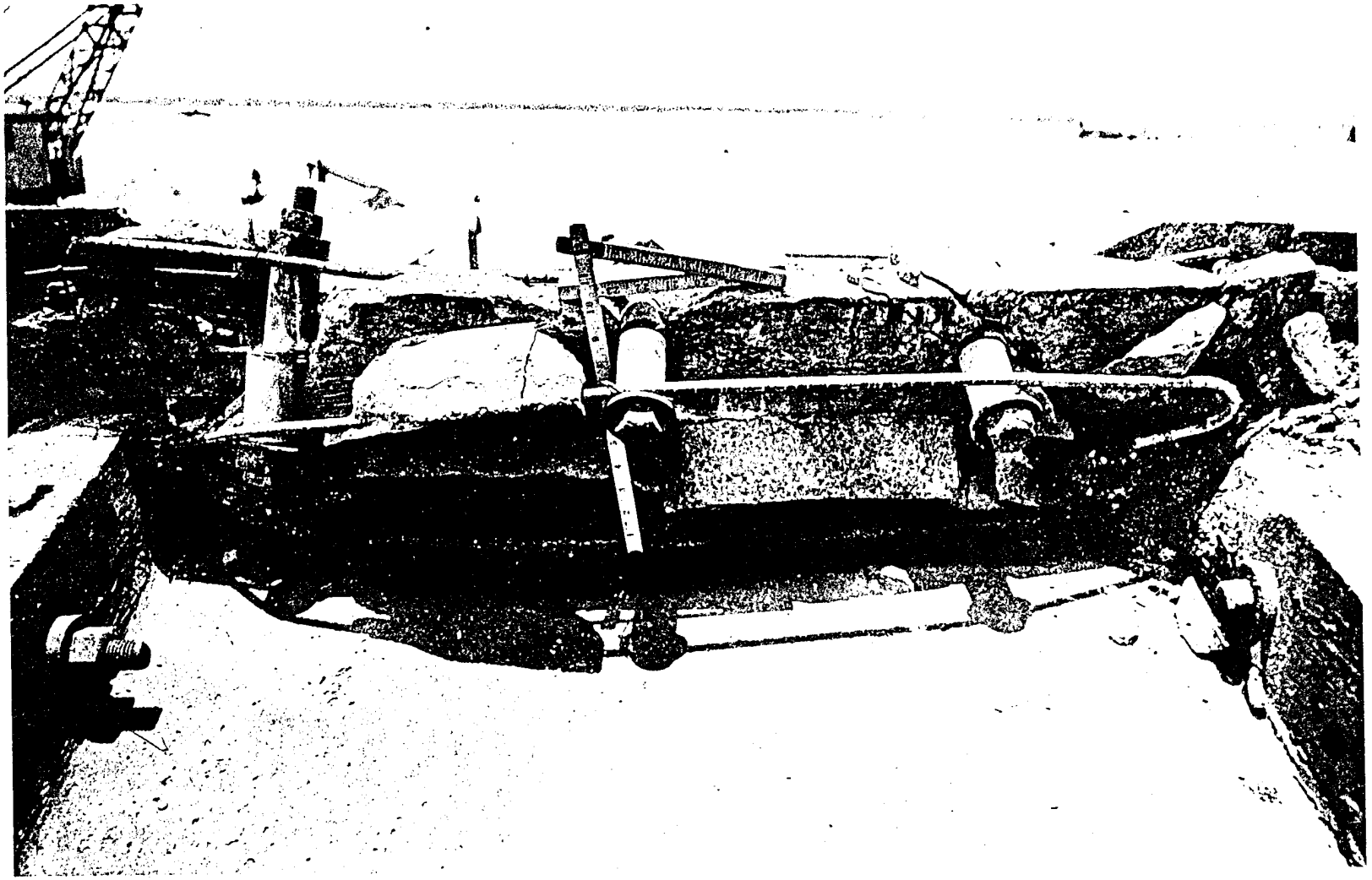


Fig. L.301 Crown Rib of Front-wall Panel No. 4, Structure 3.2.4a

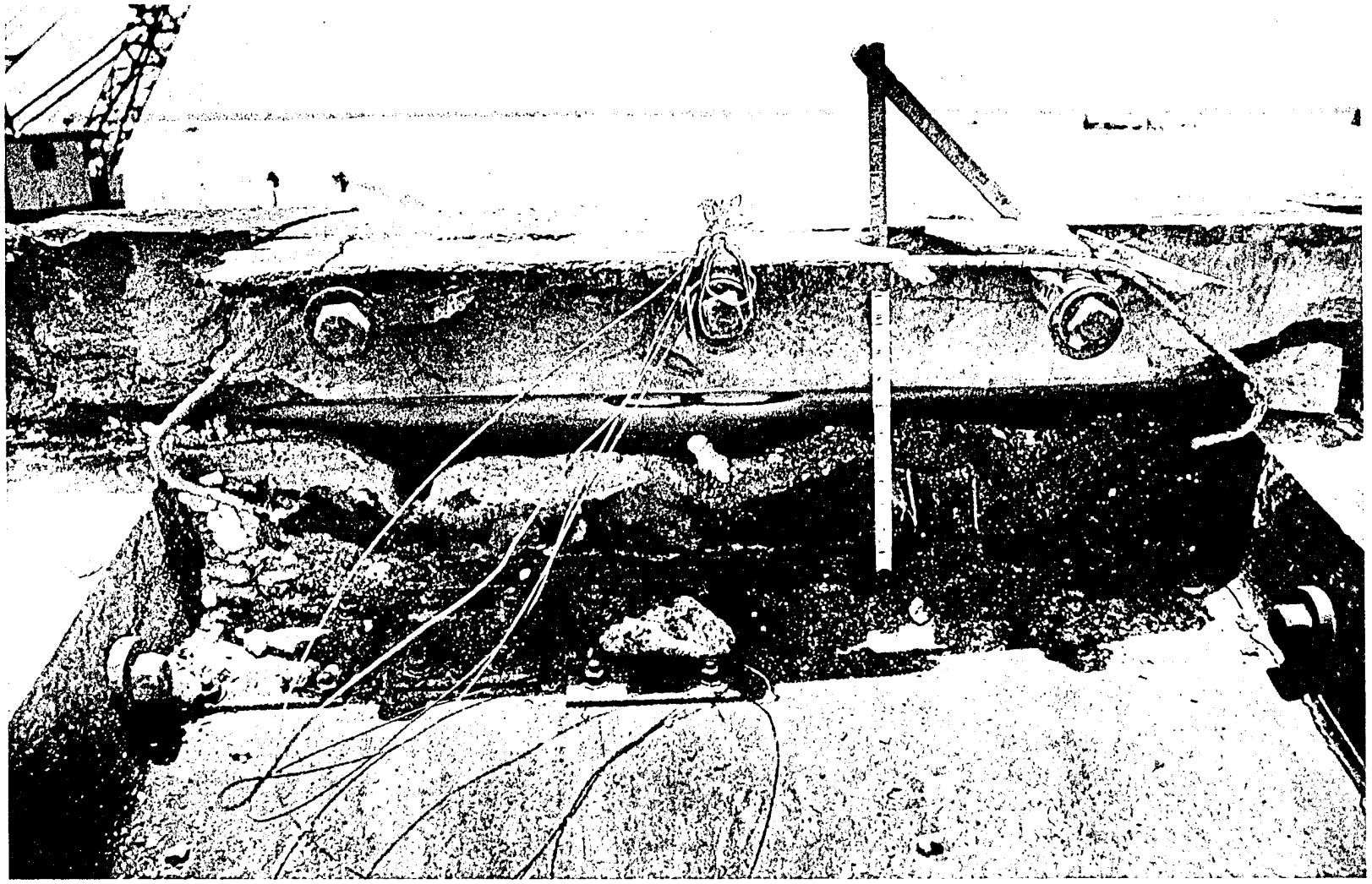


Fig. L.302 Crown Rib of Front-wall Panel No. 5, Structure 3.2.4a

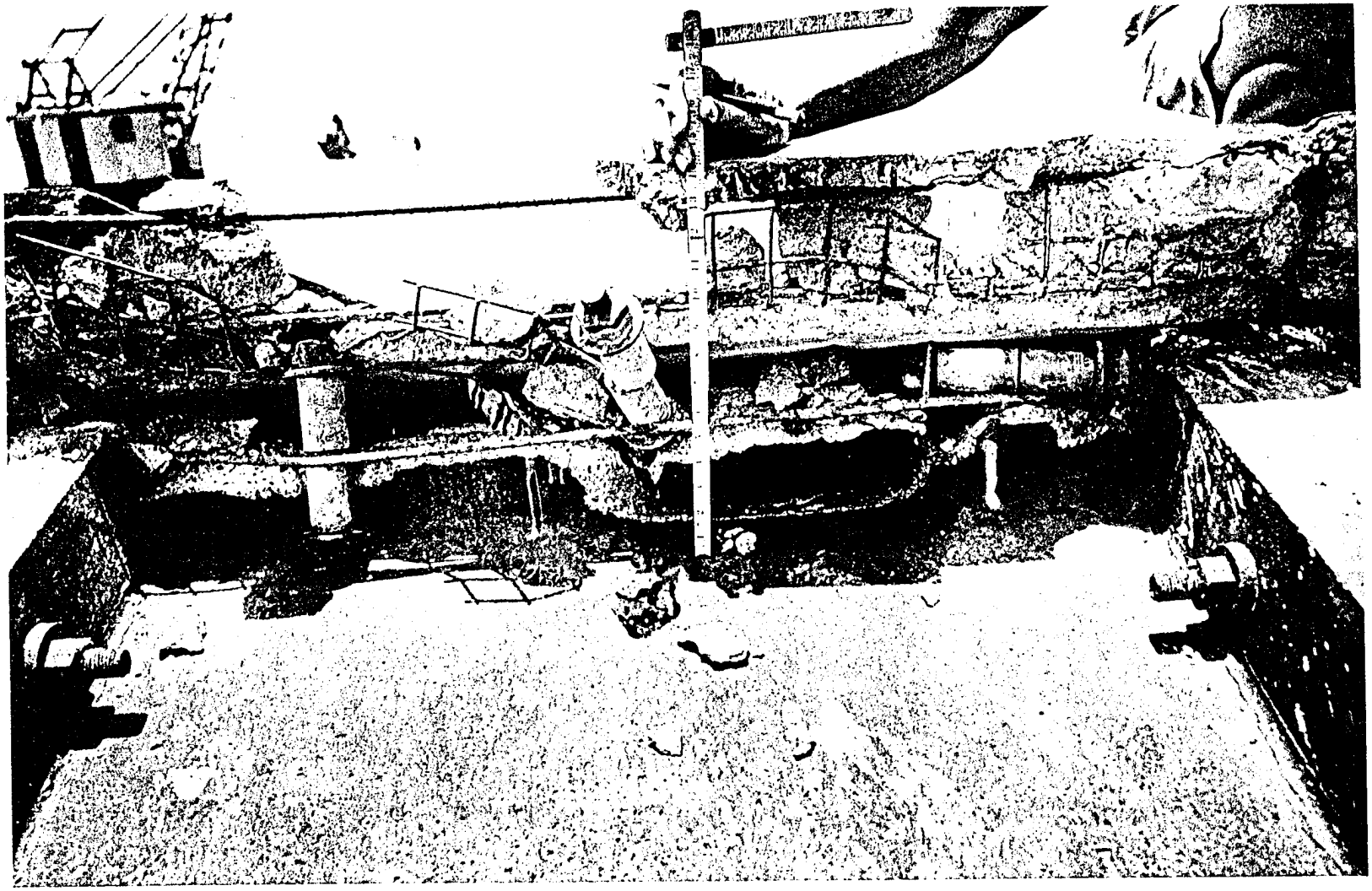


Fig. L.303 Crown Rib of Front-wall Panel No. 6, Structure 3.2.4a

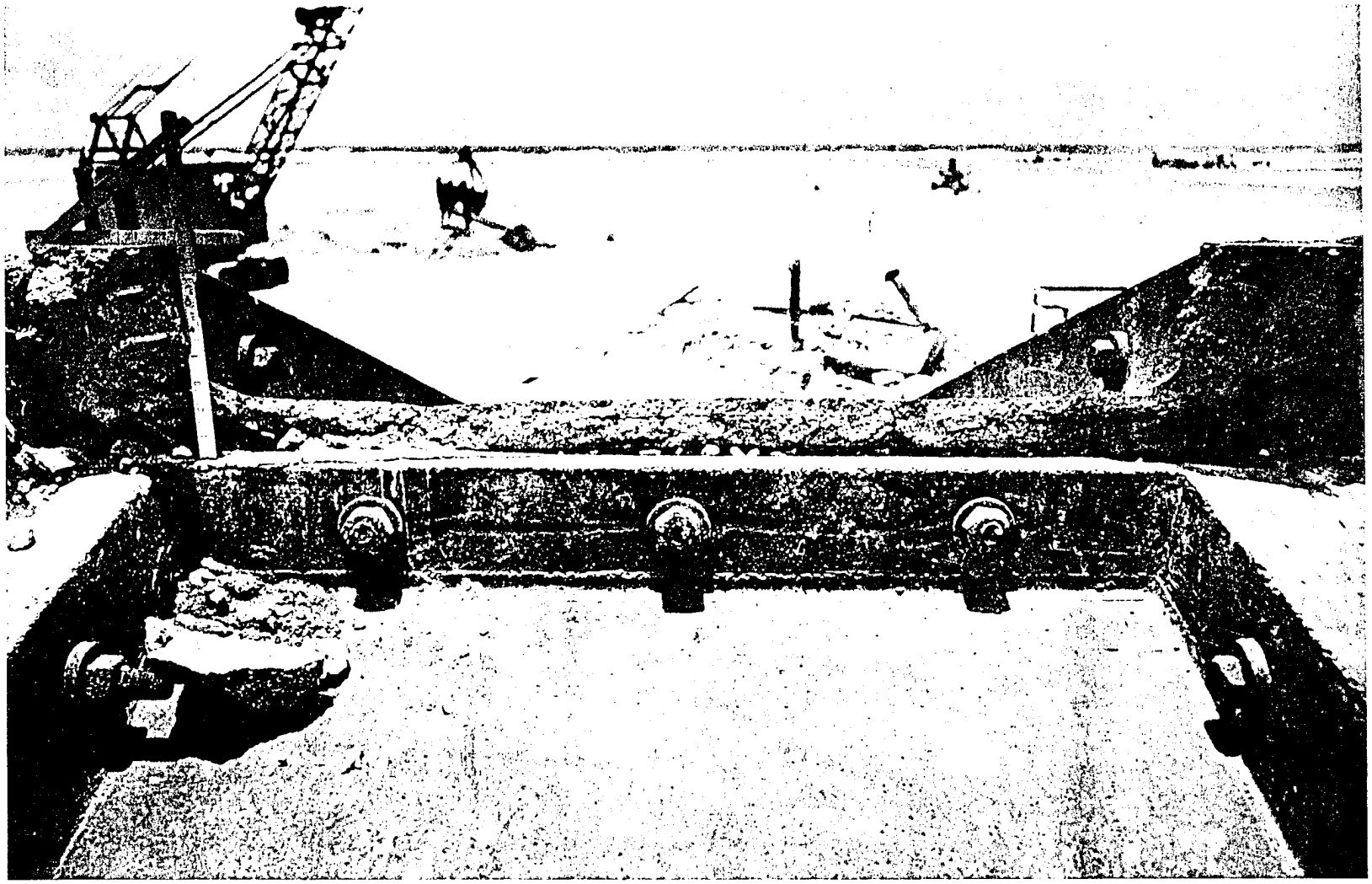


Fig. L.304 Crown Rib of Front-wall Panel No. 7, Structure 3.2.4a

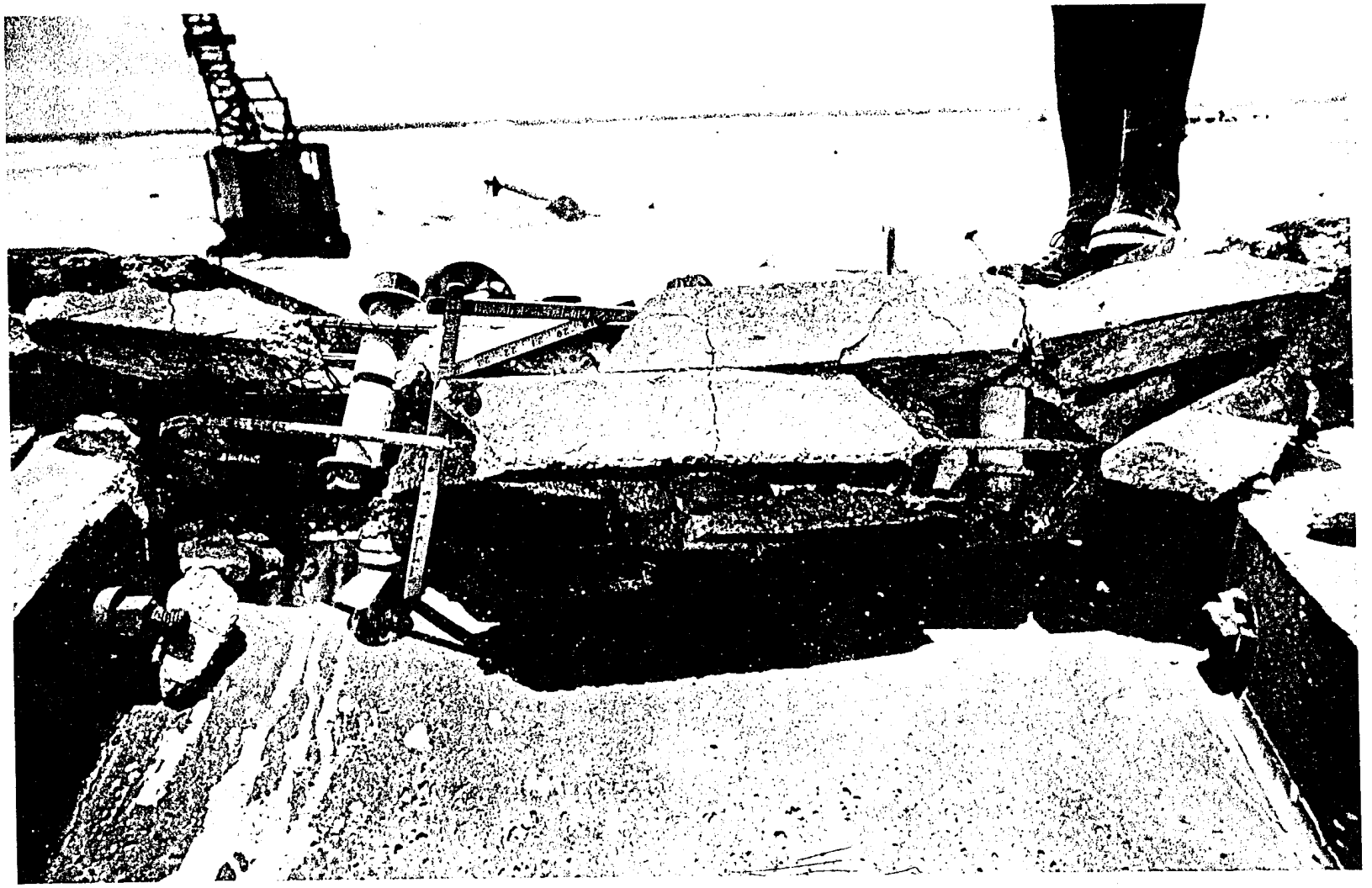


Fig. L.305 Crown Rib of Front-wall Panel No. 8, Structure 3.2.4a

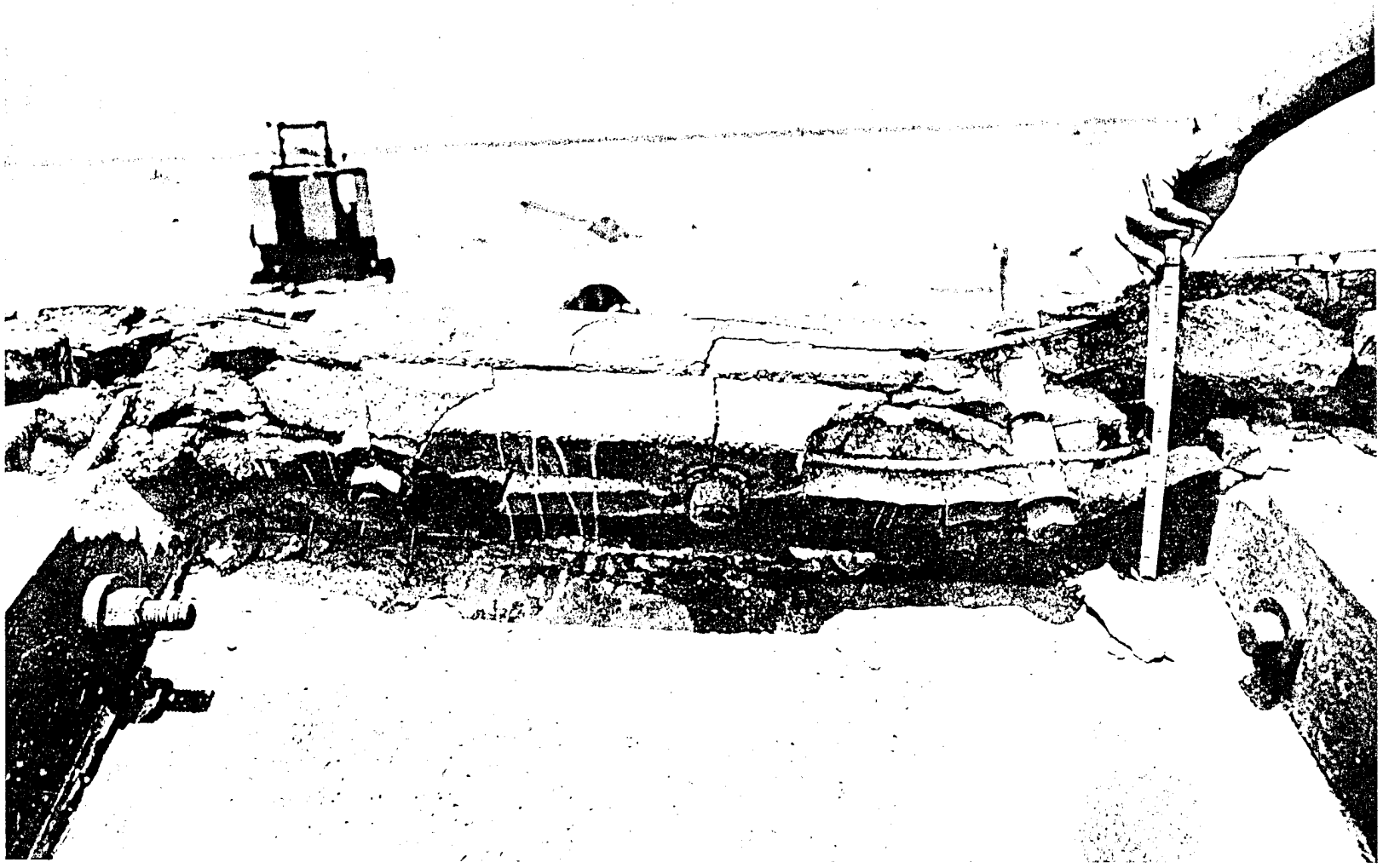


Fig. L.306 Crown Rib of Front-wall Panel No. 9, Structure 3.2.4a

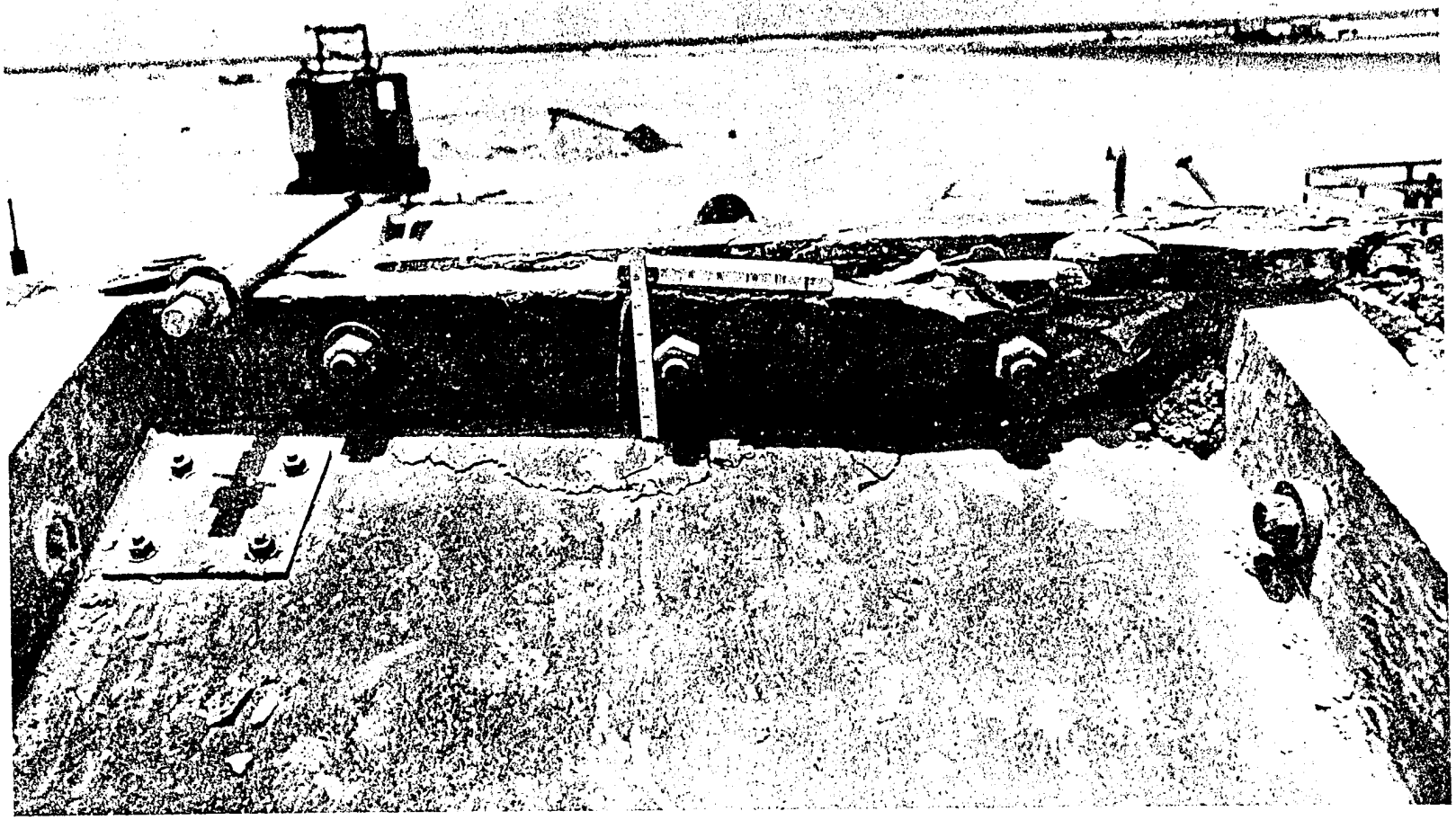


Fig. L.307 Crown Rib of Front-wall Panel No. 10, Structure 3.2.4a



Fig. L.308 General View of Left Half of Roof, Showing Rear Face of Crown Joint, Structure 3.2.4a

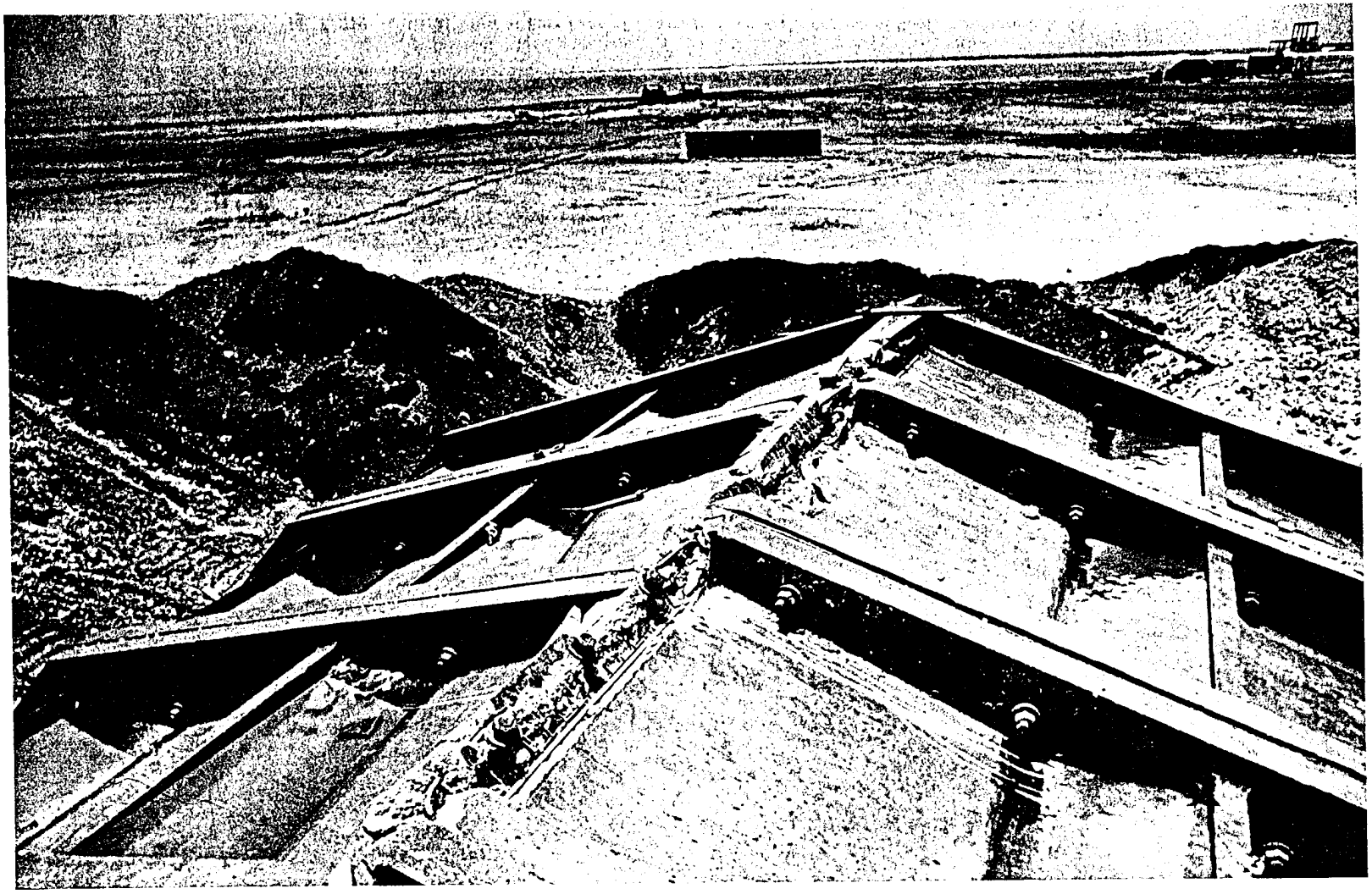


Fig. L.309 Detail View of Rear Face of Crown Joint on Left Portion of Roof, Structure 3.2.4a



Fig. L.310 General View of Rear Face of Crown Joint on Right Portion of Roof, Structure 3.2.4a

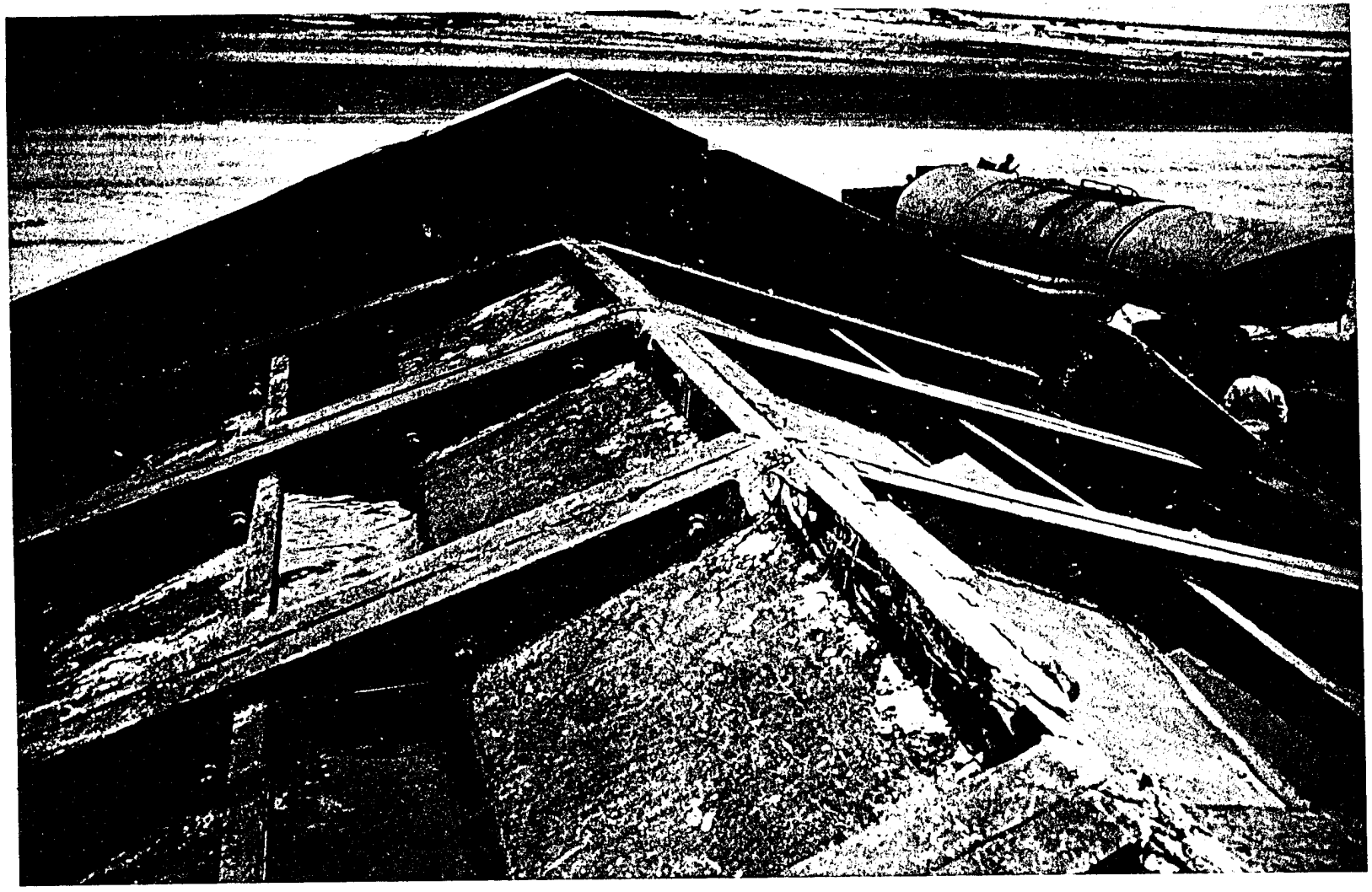


Fig. L.311 Detail View of Rear Face of Crown Joint on Right Portion of Roof, Structure 3.2.4a

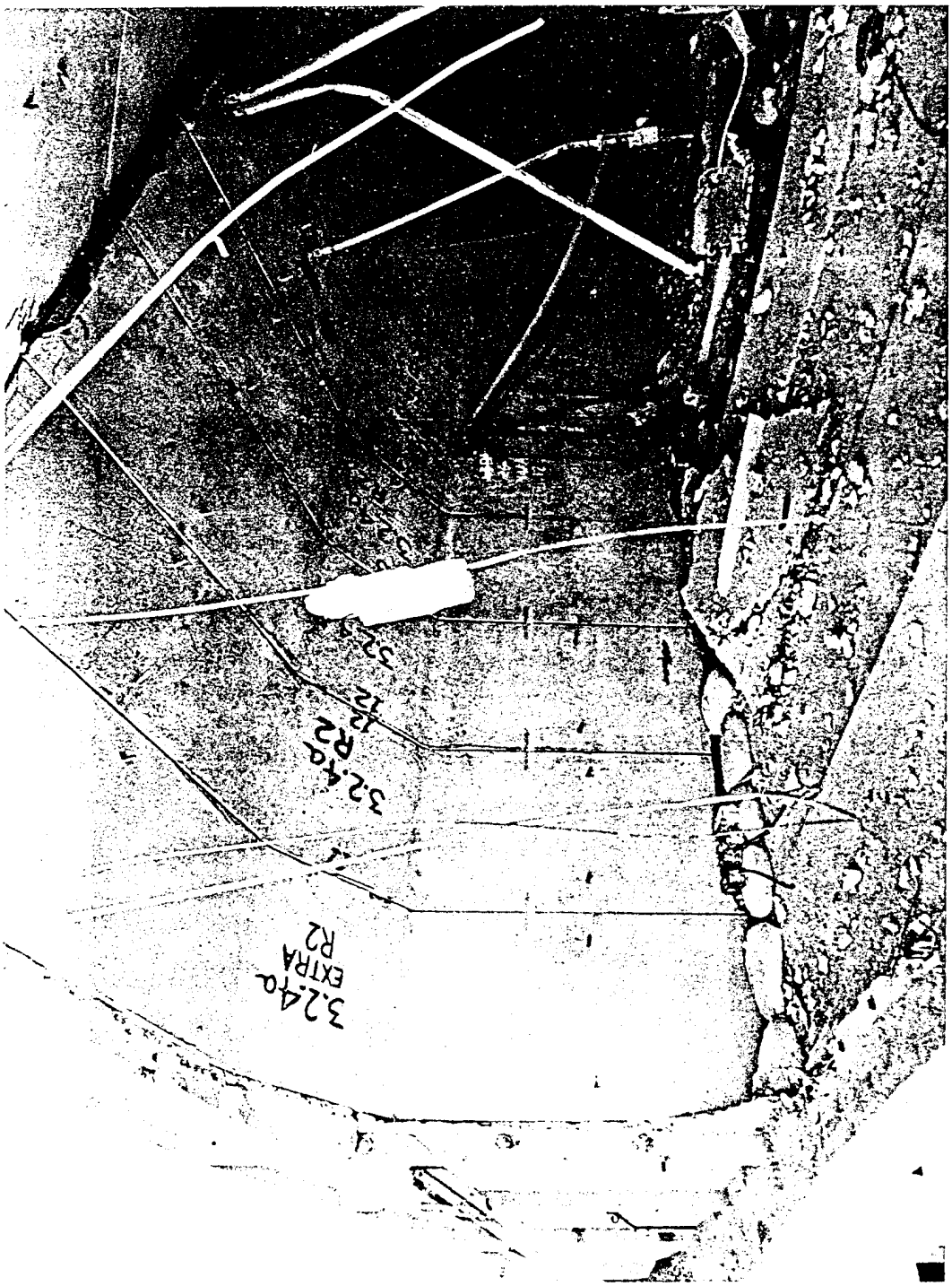


Fig. L.312 Interior View of Front-wall Panels, Structure 3.2.4a. Note section of end-wall panel lying on third-floor panel. See next photograph for detail view.



Fig. L.313 Upper Half of End Panel That Was Adjacent to Front Wall, Structure 3.2.4a. For general position of this piece, see preceding photograph.

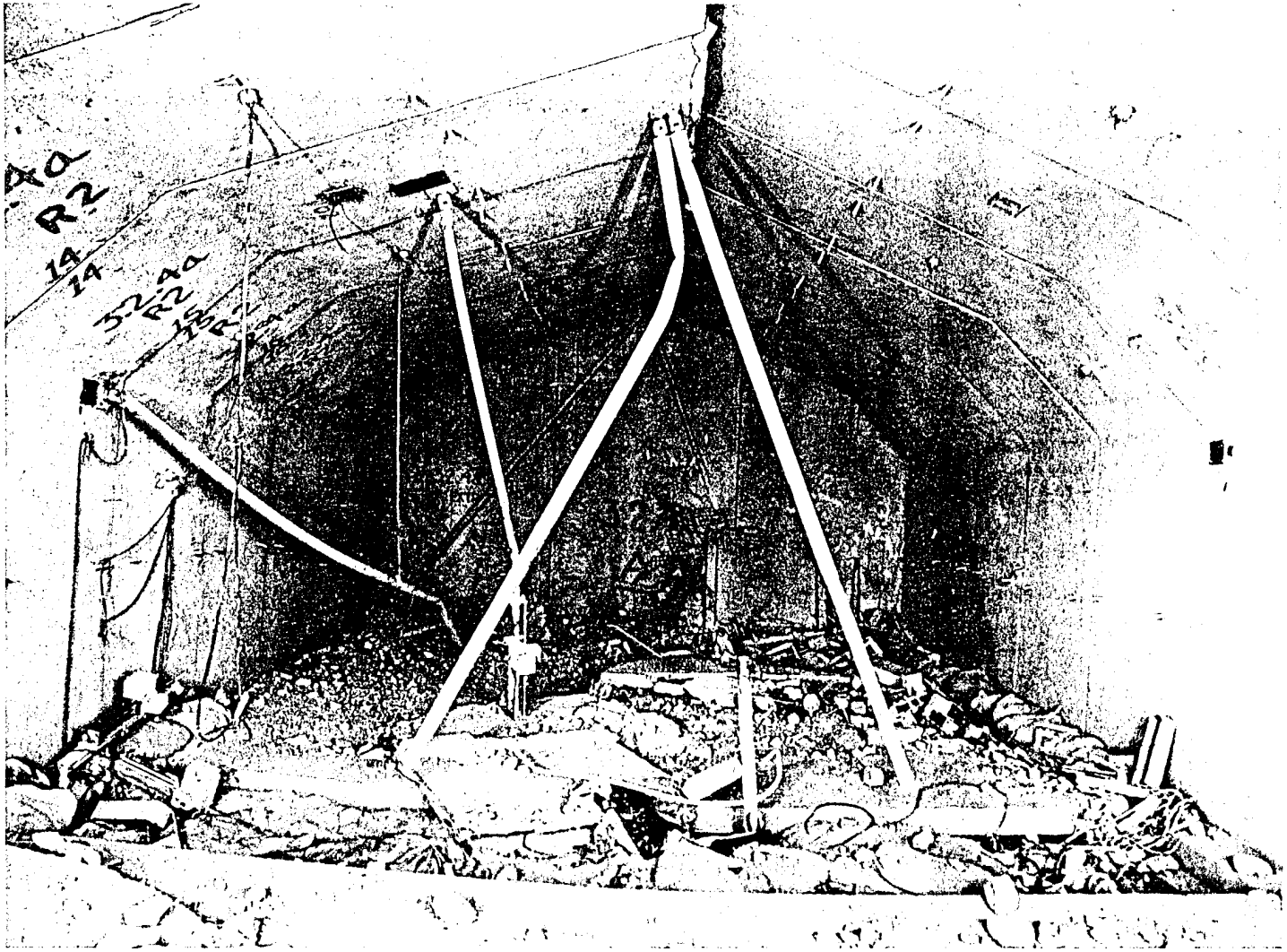


Fig. L.314 Interior View, Looking toward Left End Wall, Structure 3.2.4a. Most of the displacement gauge rods were struck with debris. Note the section of a panel lying across the floor just past the opening in the floor. See next photograph for detail view.

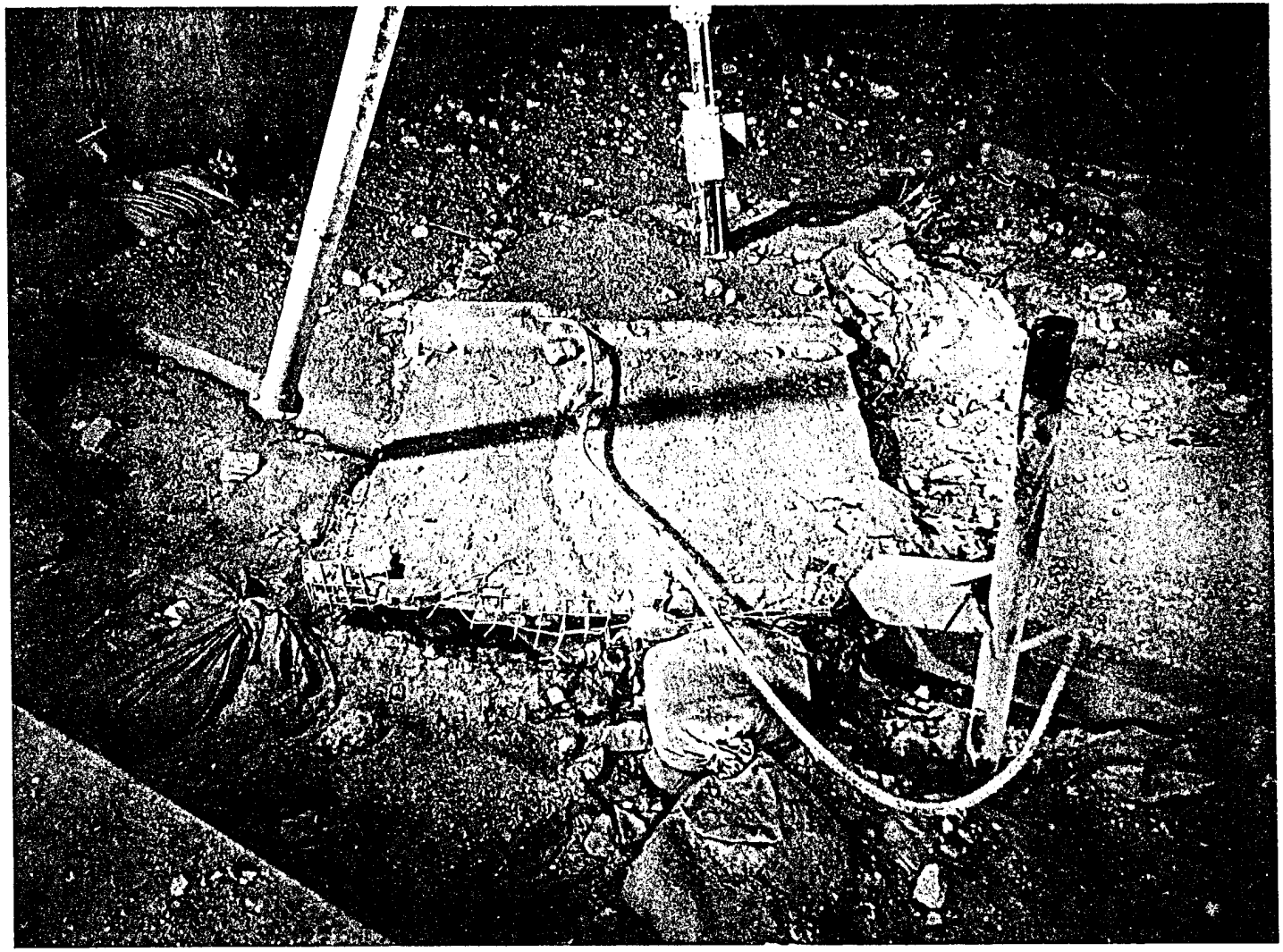


Fig. L.315 Lower Half of End Panel That Was Adjacent to Front Wall, Structure 3.2.4a. See previous photograph to determine general location. Note the distortion of the ⅞-in. steel reinforcing bar that was in the rib of this panel.

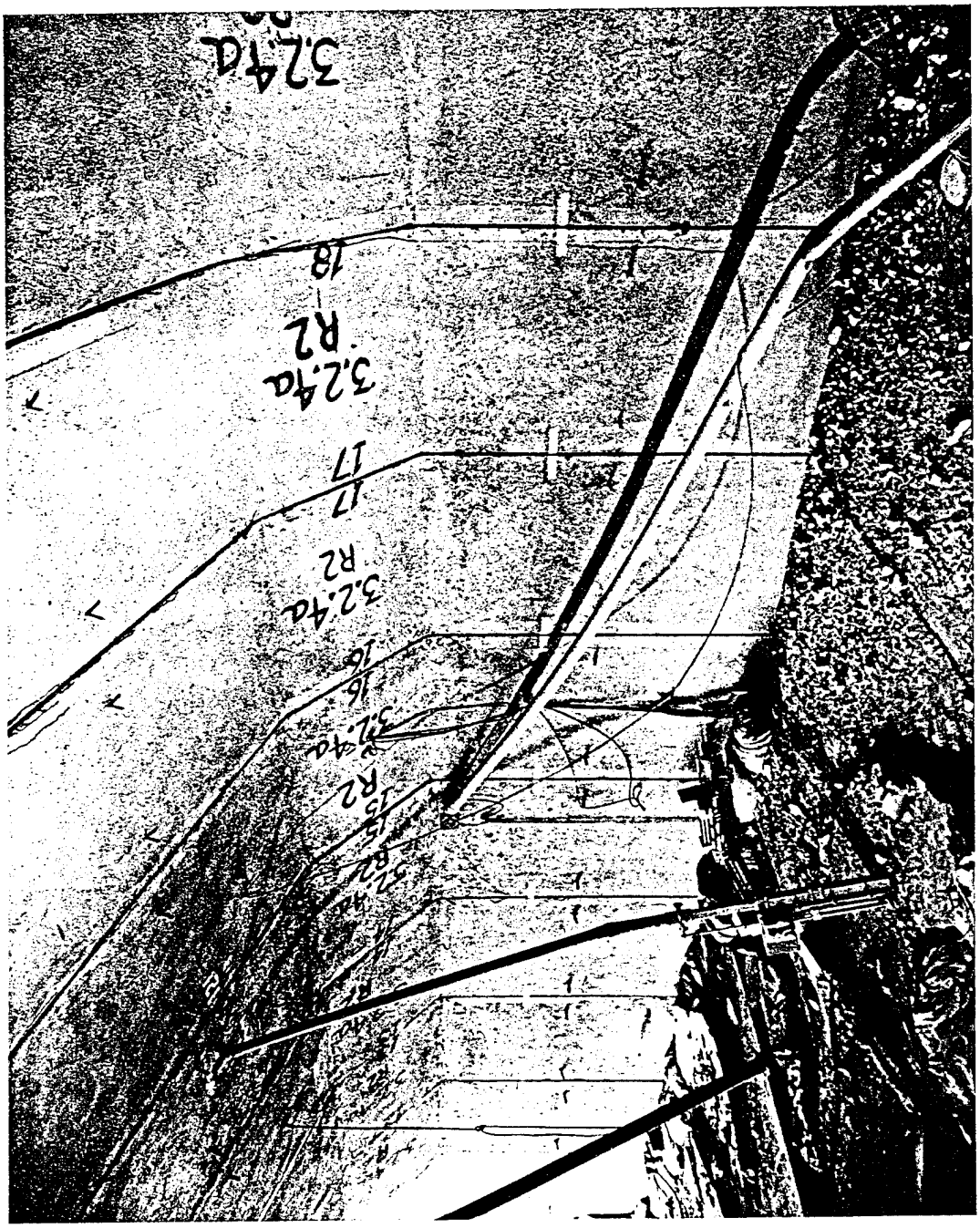


Fig. L.316 Interior View of Central Portion of Front Wall, Structure 3.2.4a. Open end of structure is to the left of photograph. Note the displacement-gauge rods knocked out of position and bent.

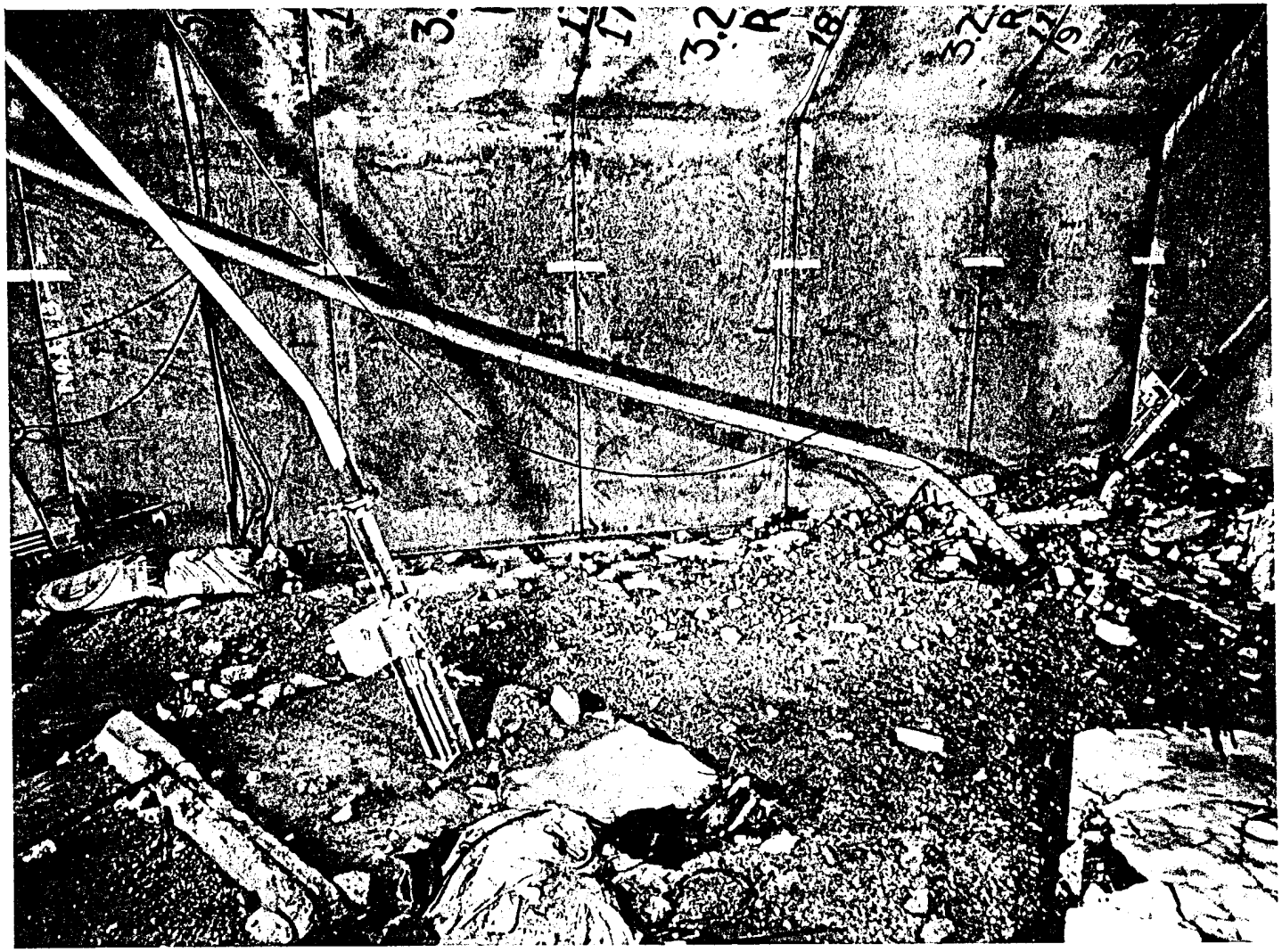


Fig. L.317 Interior View of Left End of Front Face, Structure 3.2.4a. White marks on wall are strips of masking tape marking a level line inside the structure before blast; this tape was applied as part of the project 3.2 preshot survey.

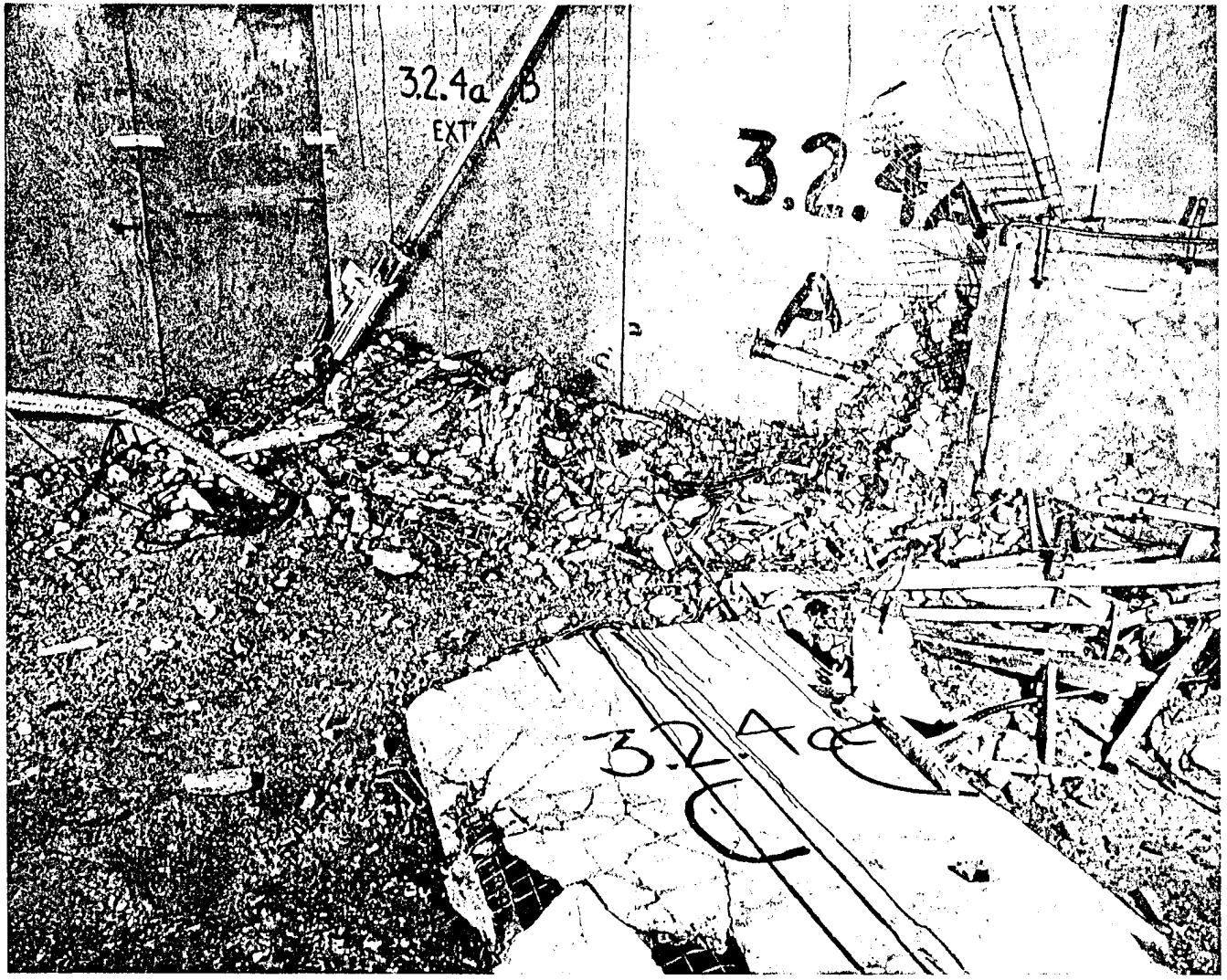


Fig. L.318 View of Left End Wall Adjacent to Front Wall, Structure 3.2.4a. Note the collection of debris at base of wall. Panel in foreground was middle panel (above door) in right end wall. The door panel can be seen lying against the left end wall. Bolts are still in door panel.

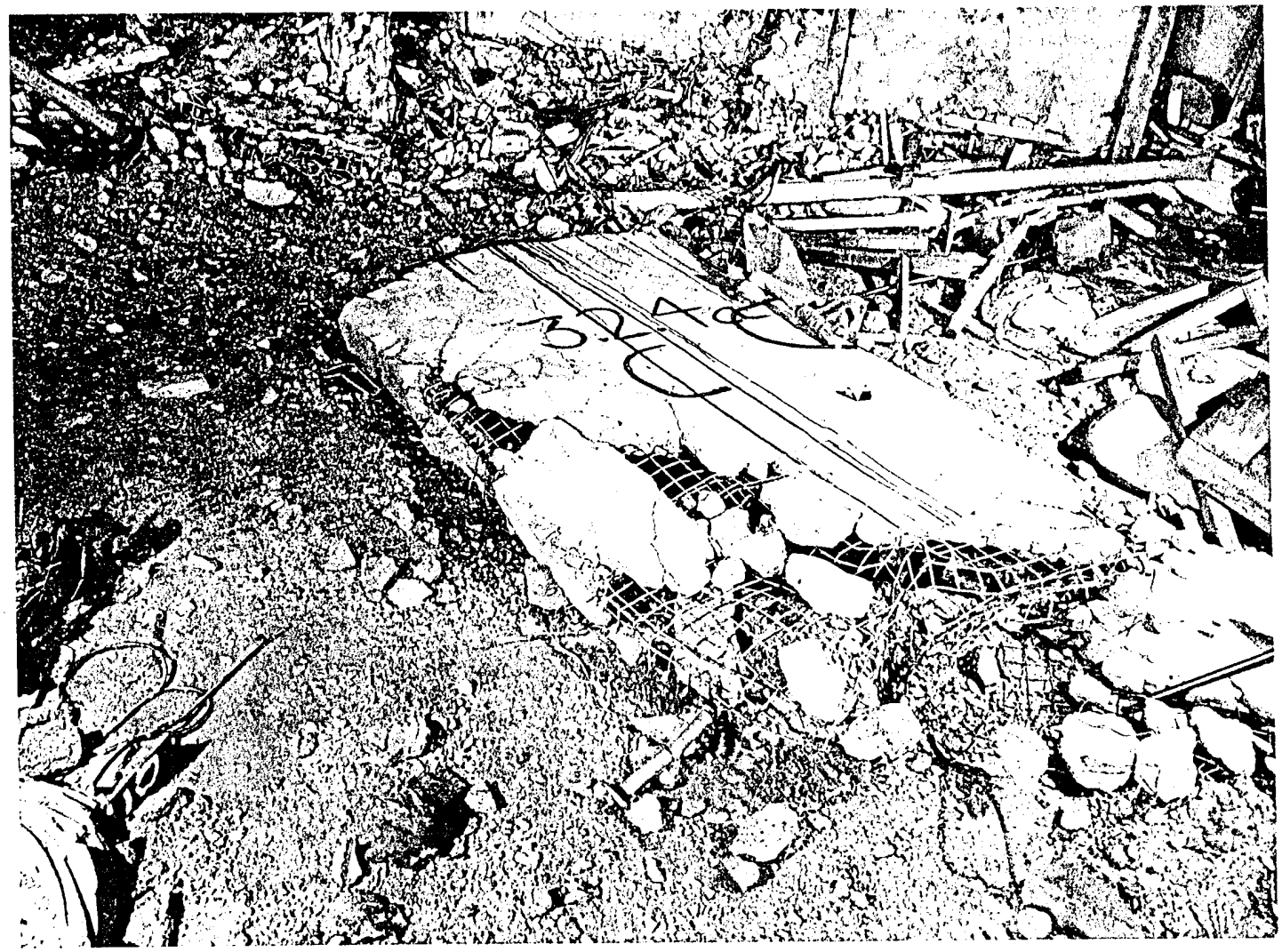


Fig. L.319 This Panel Was the Middle Panel (above Door) in the Right End Wall, Structure 3.2.4a

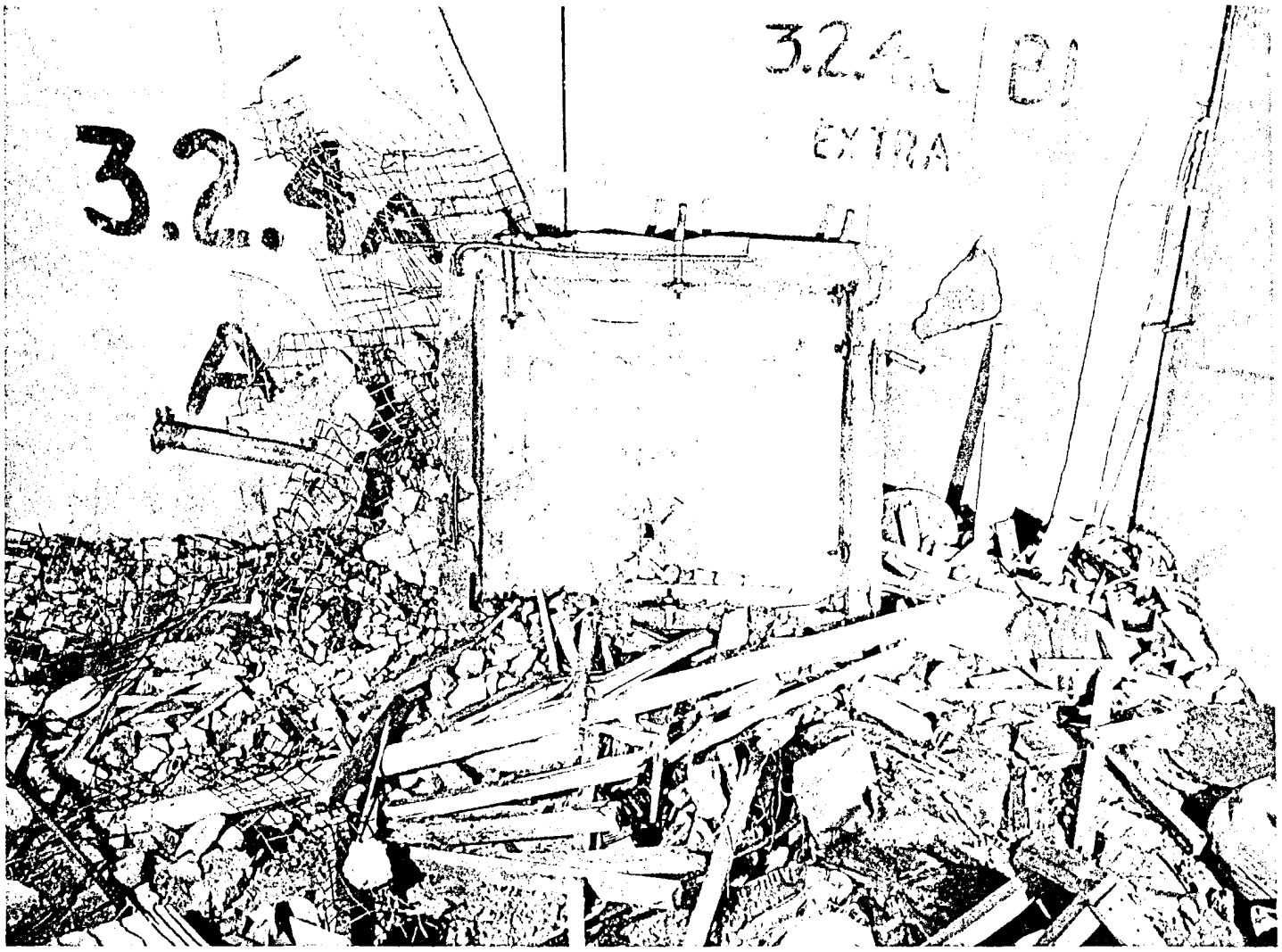


Fig. L.320 Detail View of Door Panel Lying Against Left End Wall, Structure 3.2.4a. Door panel has rotated 90° and is resting on its side. Note small triangular piece of concrete embedded in end wall just to the right of the door. This is where the door struck the end wall.

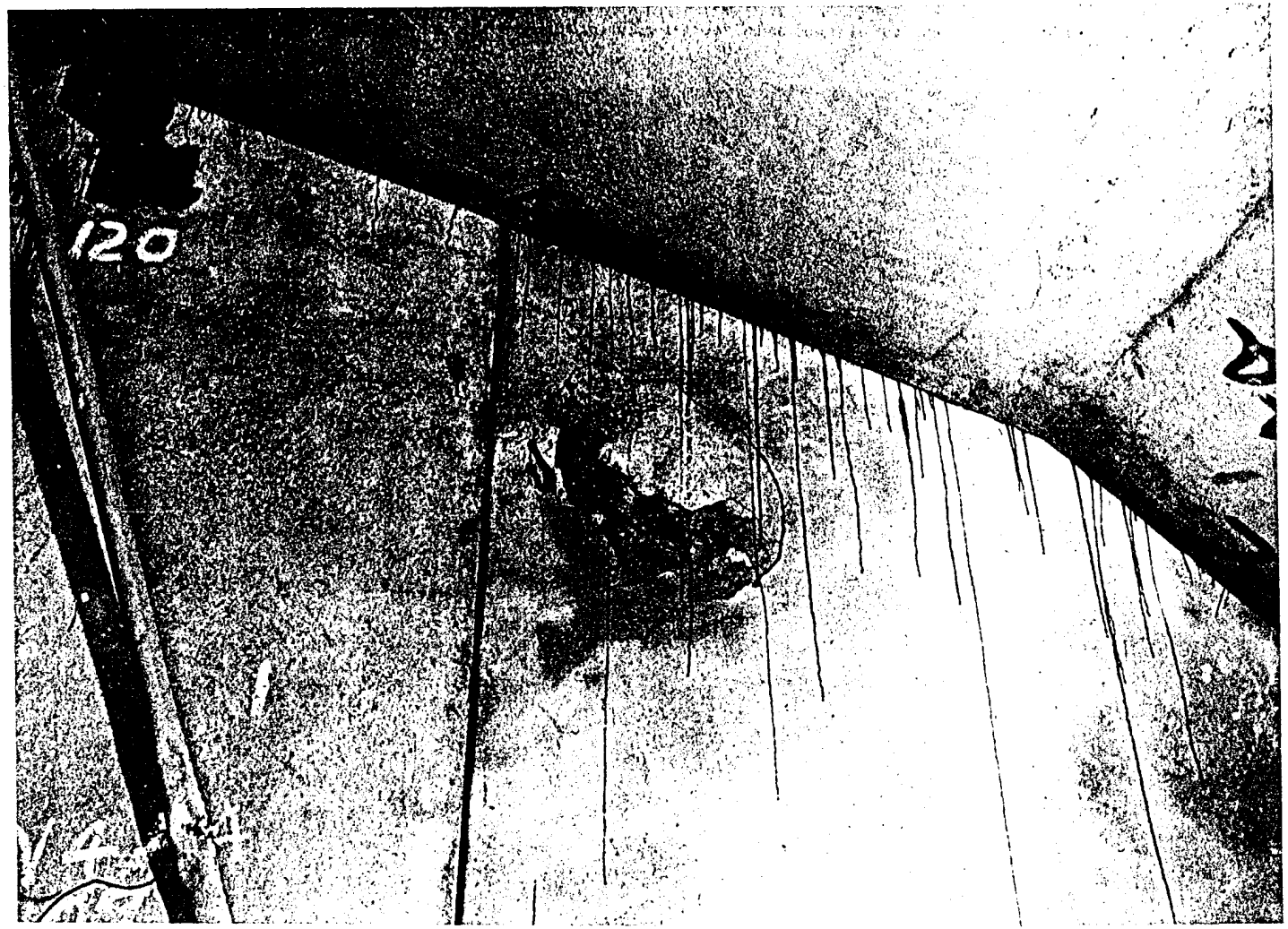


Fig. L.321 Detail View of Upper Portion of Left End Wall on the Rear Side of Center, Structure 3.2.4a. The hole in the end panel was made by a heavy piece of flying debris from the right end wall. Note that steel mesh is still intact in this hole.



Fig. L.322 Interior View of Rear Wall, Structure 3.2.4a. Open end is to the right of photograph.



Fig. L.323 Interior View of Precast Floor, Structure 3.2.4a. The deflection of these panels amounted to about 3 in. at center.

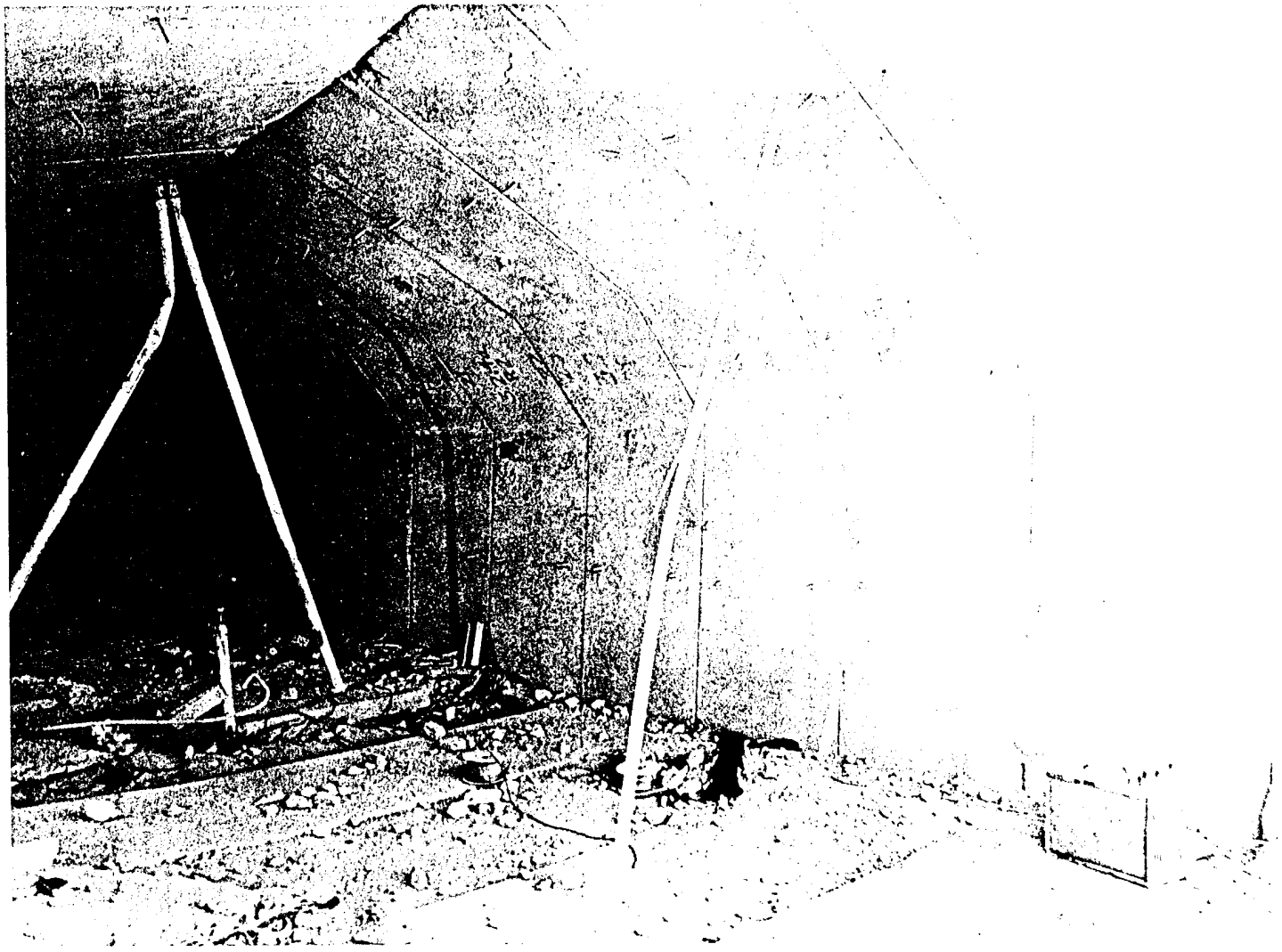


Fig. L.324 Interior View of Right Half of Rear Wall, Structure 3.2.4a. Steel bars hanging down are from right end-wall panels.



Fig. L.325 Deflection of Precast Floor Panels, Structure 3.2.4a. Maximum permanent deflection at the center of each panel was about 3 in. End panel had continuous support along one longitudinal edge and did not deflect.

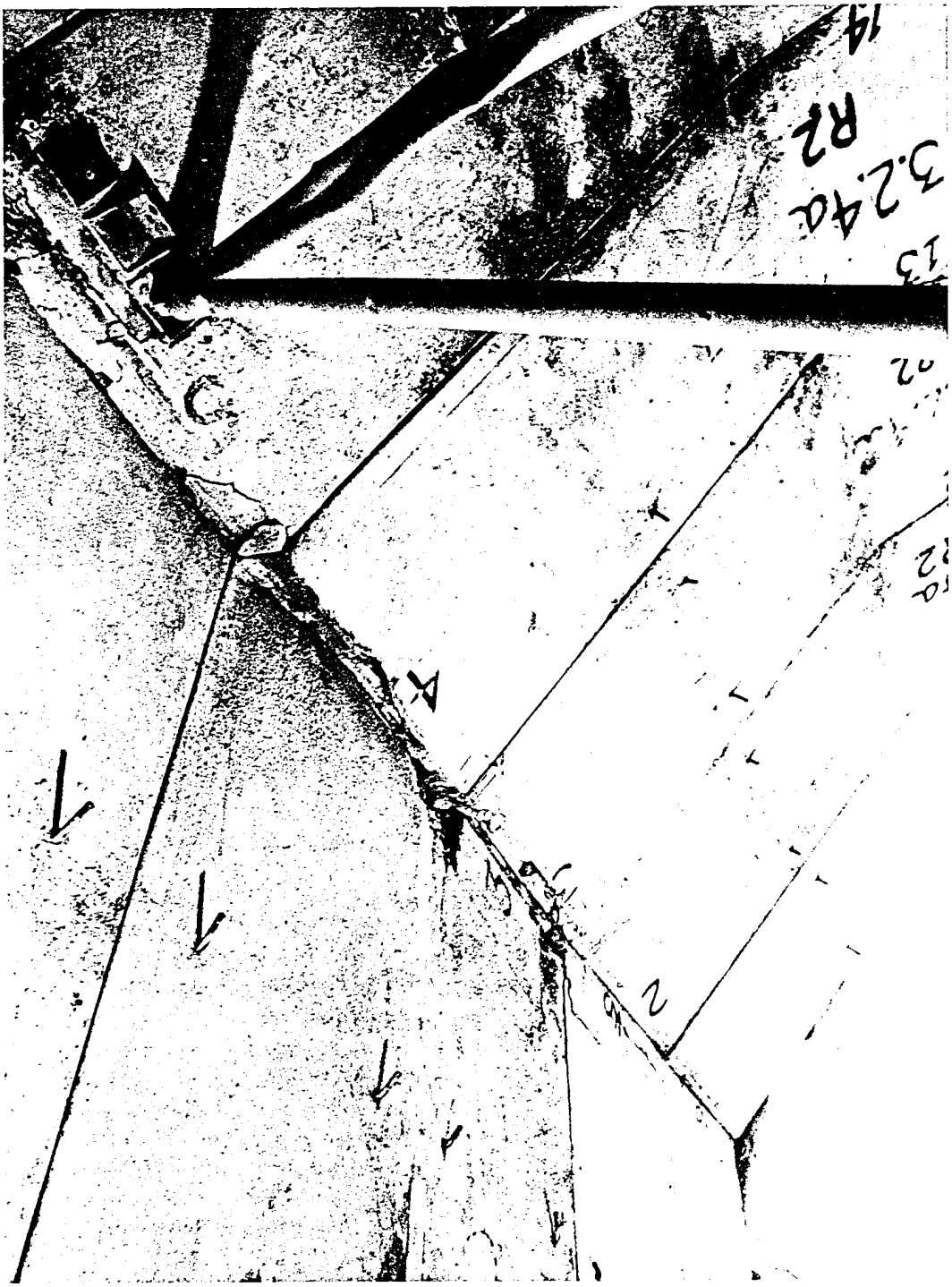


Fig. L. 326 Interior View of Right Half of Roof, Structure 3.2.4a. Panels in the center broke at the crown rib and telescoped over each other, but those at the end remained in place.

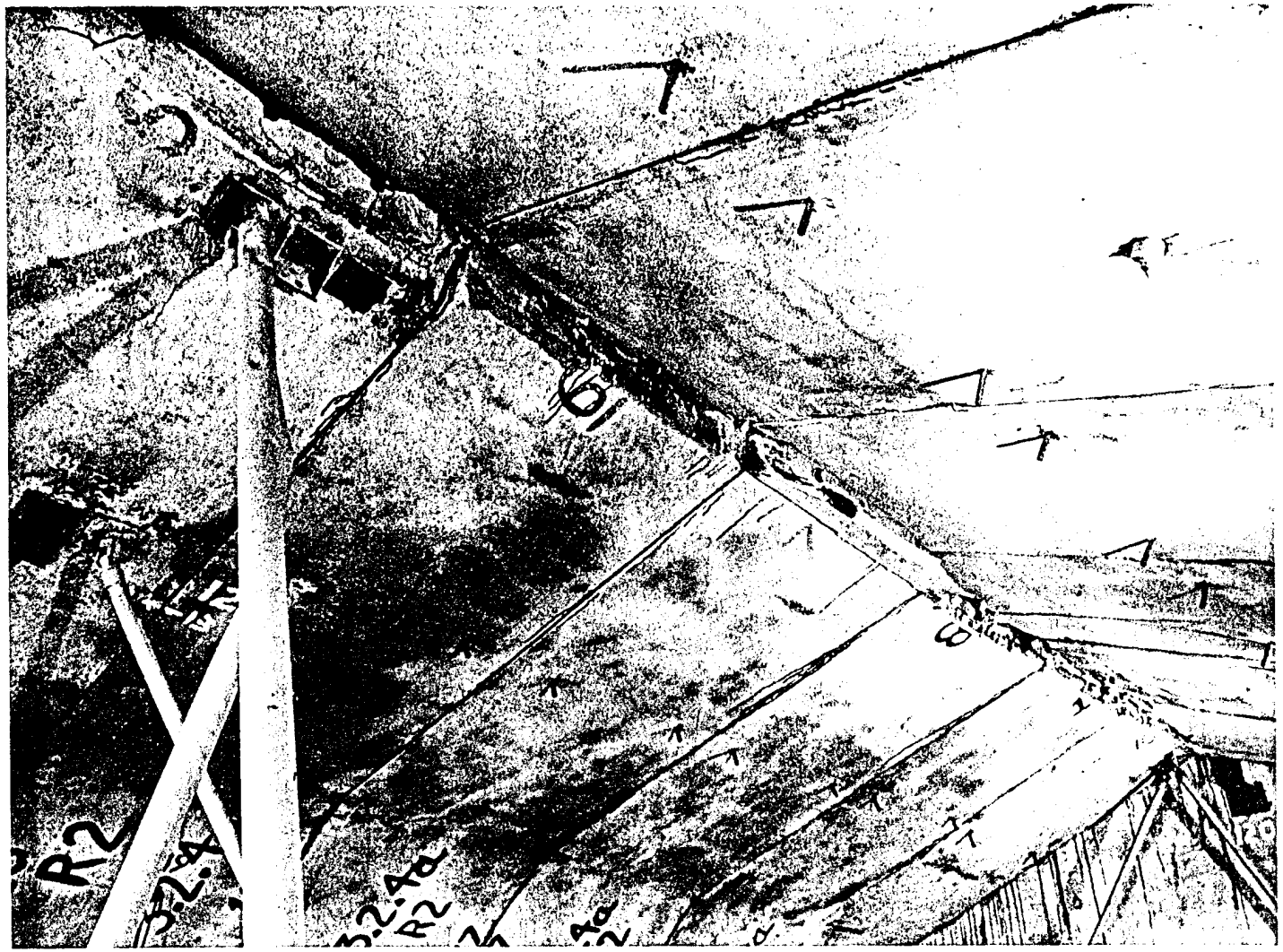


Fig. L.327 Interior View of Left Half of Roof, Structure 3.2.4a. Panels broke at crown rib and telescoped over each other as much as 8 in. (center panels). Panels at the end suffered cracking of the crown ribs but remained in place.

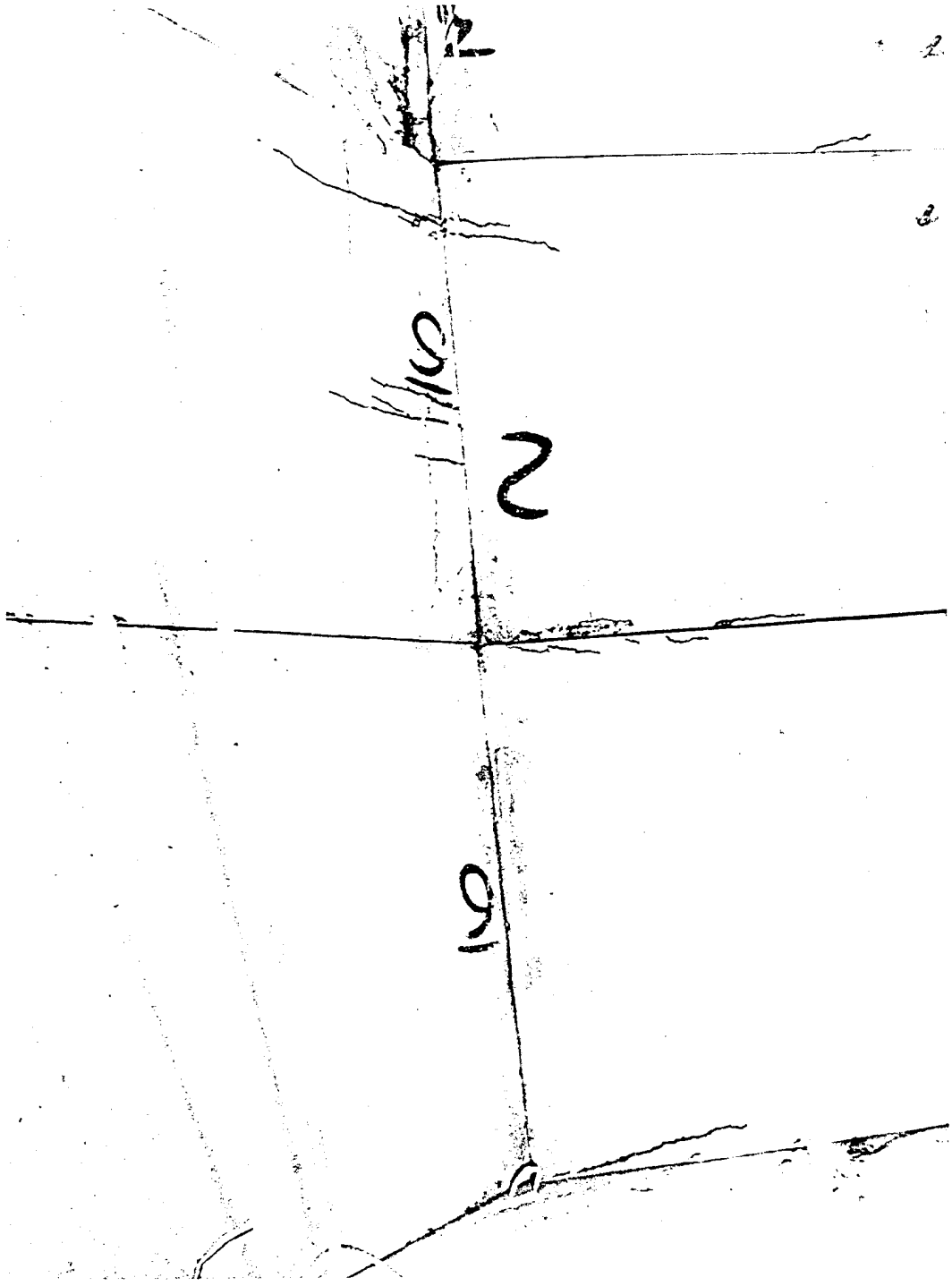


Fig. L.328 Underside of Crown Rib of Panels 1 and 2, Structure 3.2.4a

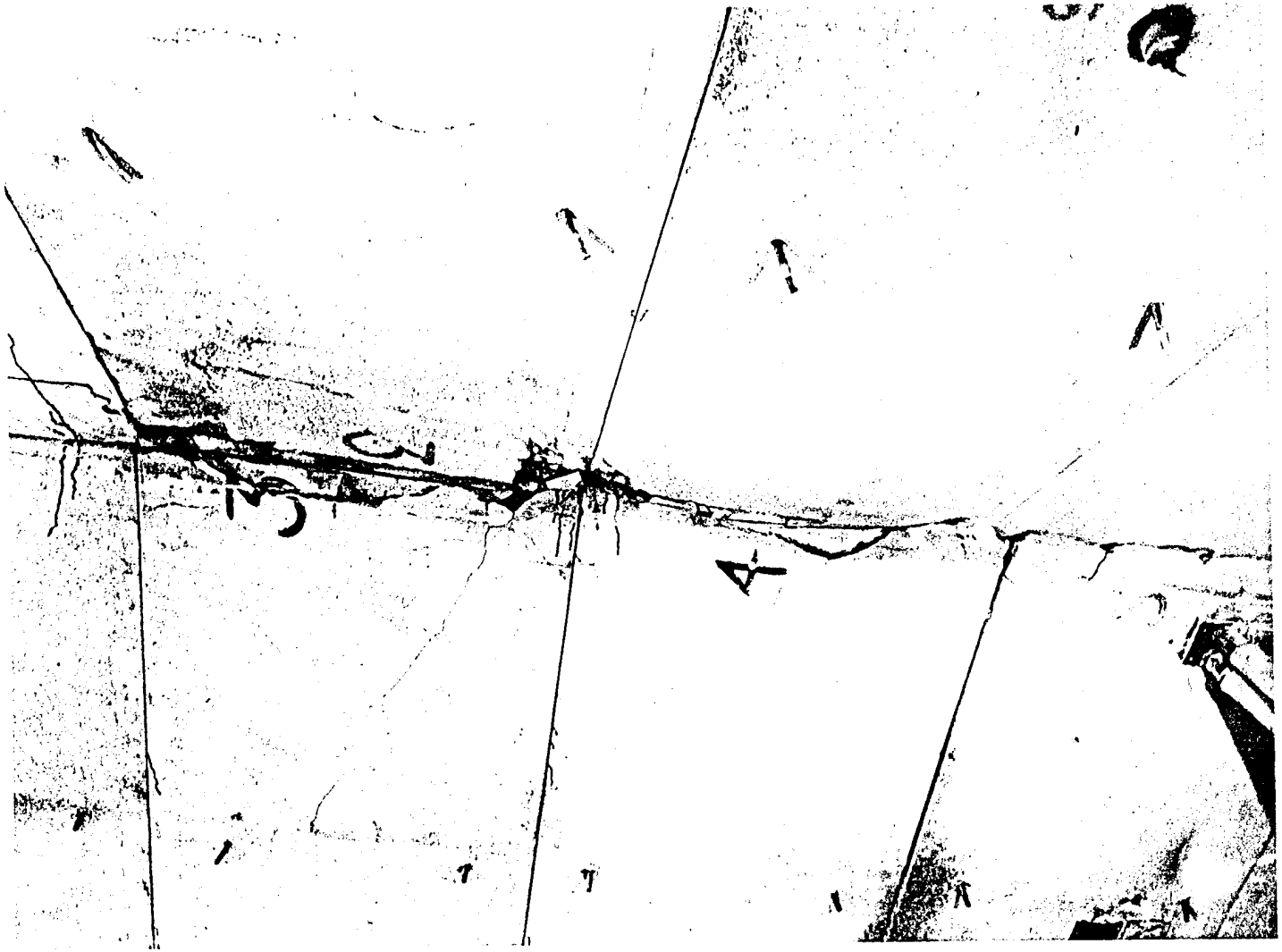


Fig. L.329 Underside of Crown Rib of Panels 3 and 4, Structure 3.2.4a

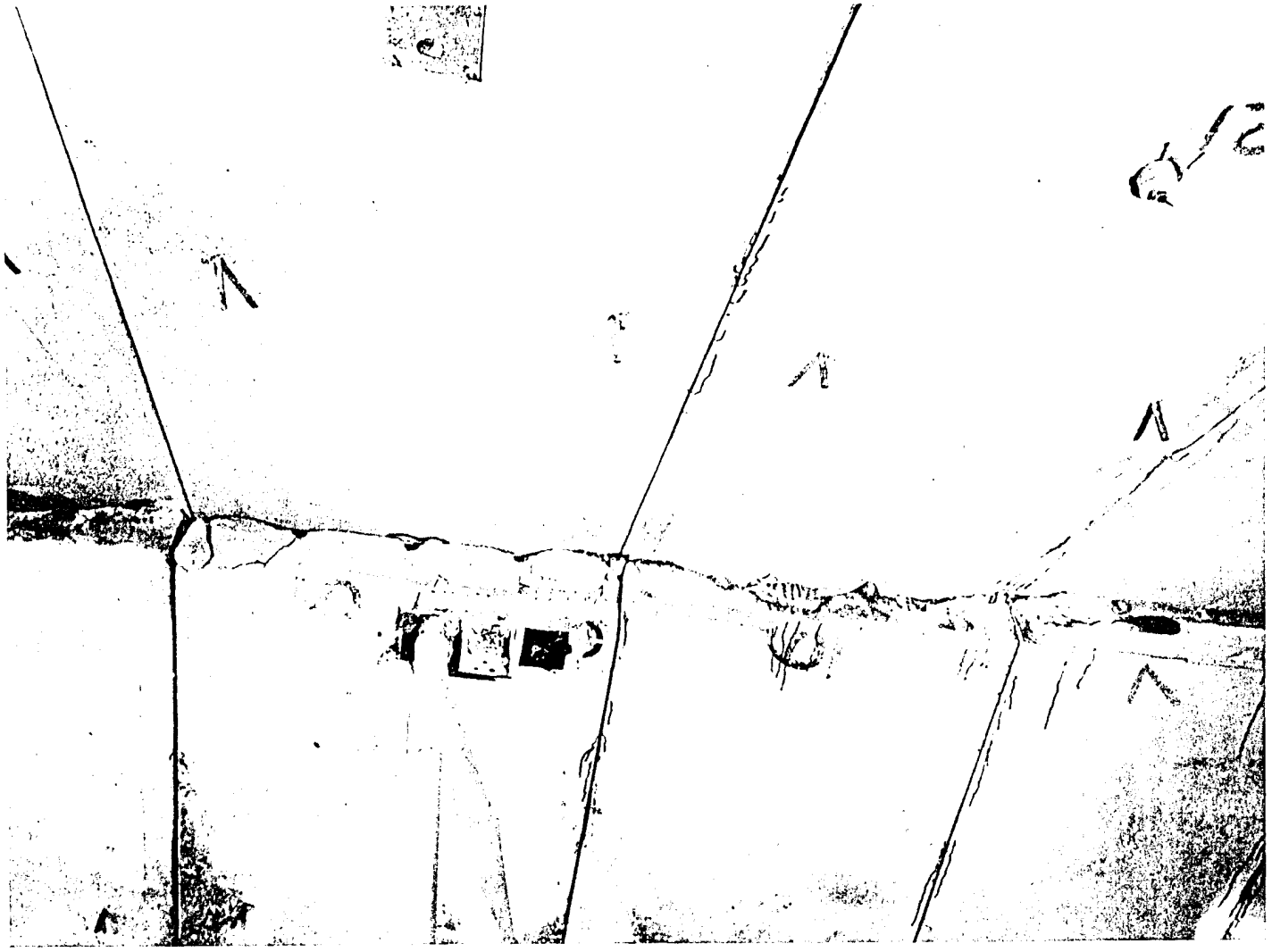


Fig. L.330 Underside of Crown Rib of Panels 5 and 6, Structure 3.2.4a

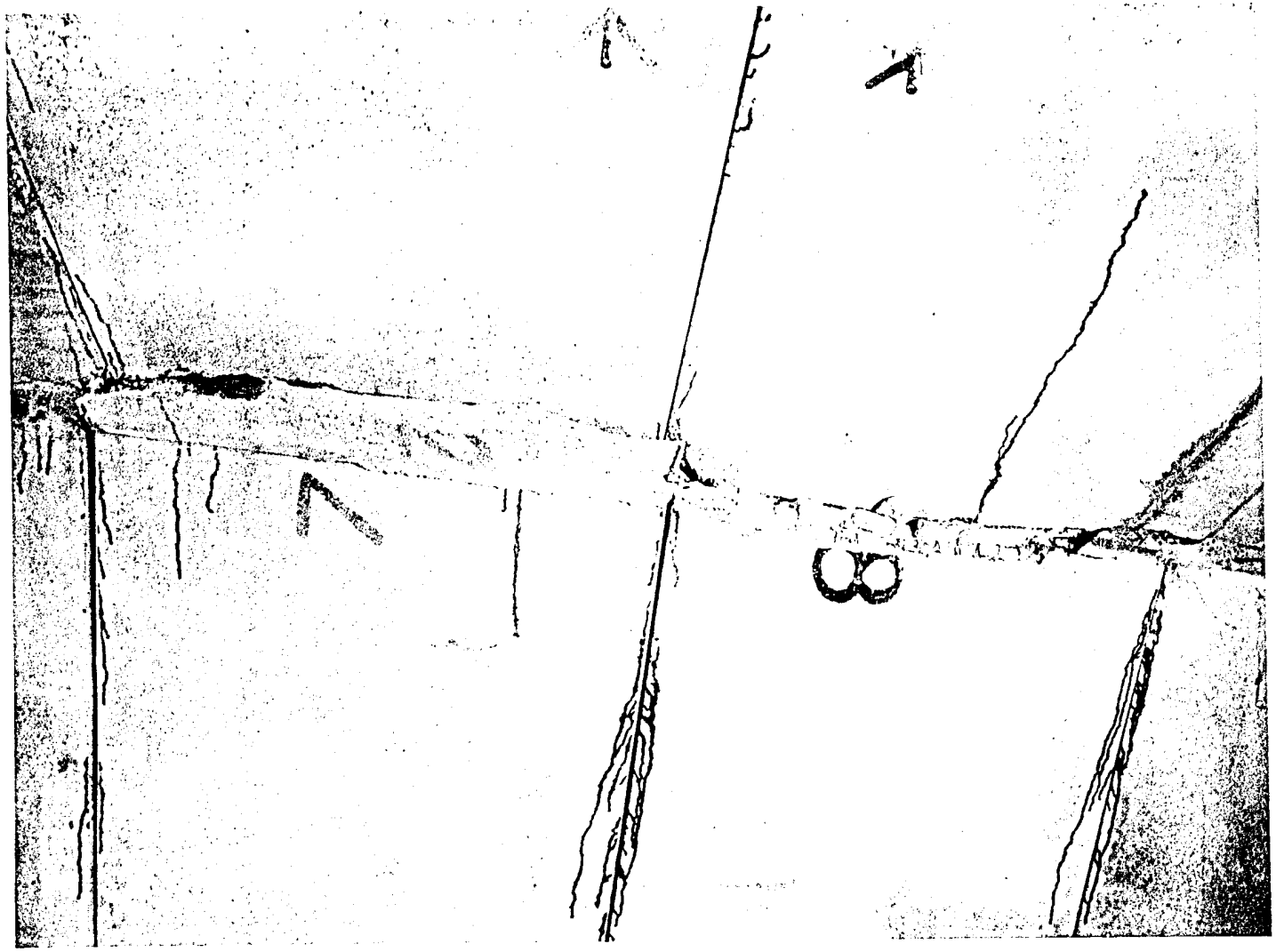


Fig. L.331 Underside of Crown Rib of Panels 7 and 8, Structure 3.2.4a. Note that the crown rib at panel 7 held, but the rear panel broke just behind this rib.



Fig. L. 332 Underside of Crown Rib of Panels 9 and 10, Structure 3.2.4a

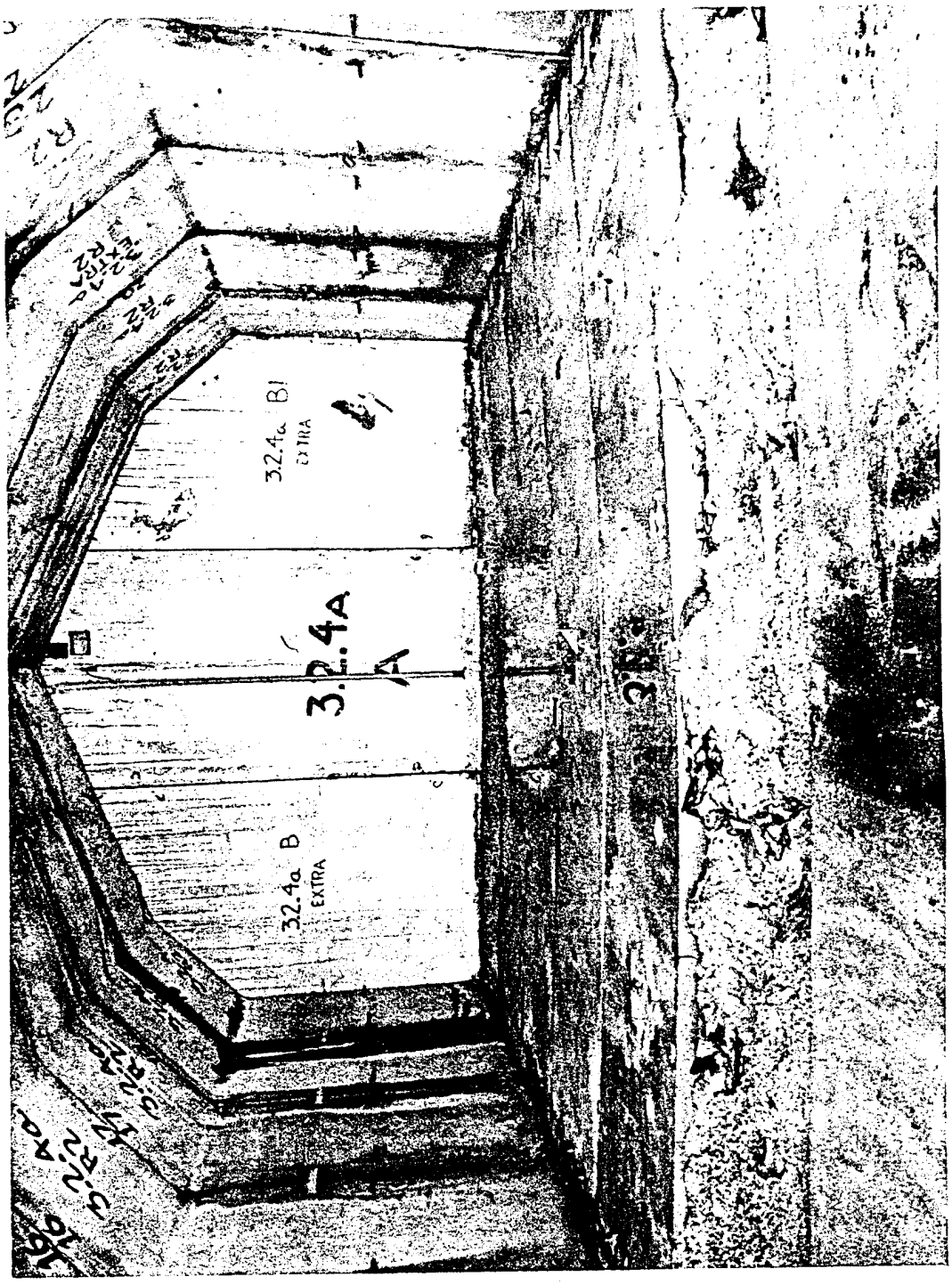


Fig. L.333 Interior View after Removal of Debris, Structure 3.2.4a



Fig. L.334 Interior View of Crown Joint after Removal of Debris and Earth Cover, Structure 3.2.4a

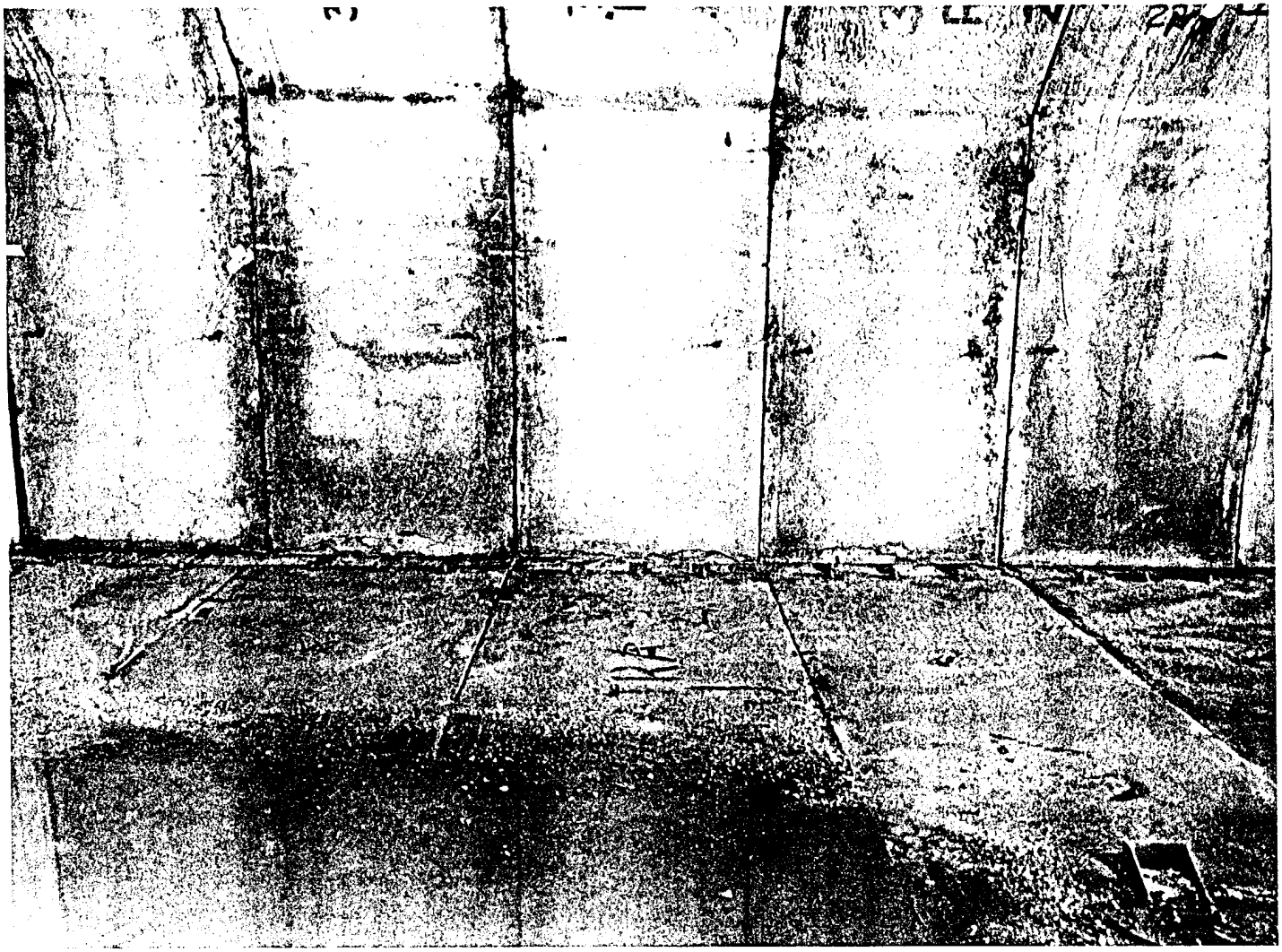


Fig. L.335 Interior View of Left Half of Rear Wall, Structure 3.2.4a. Tension cracks near base of each panel can be seen.

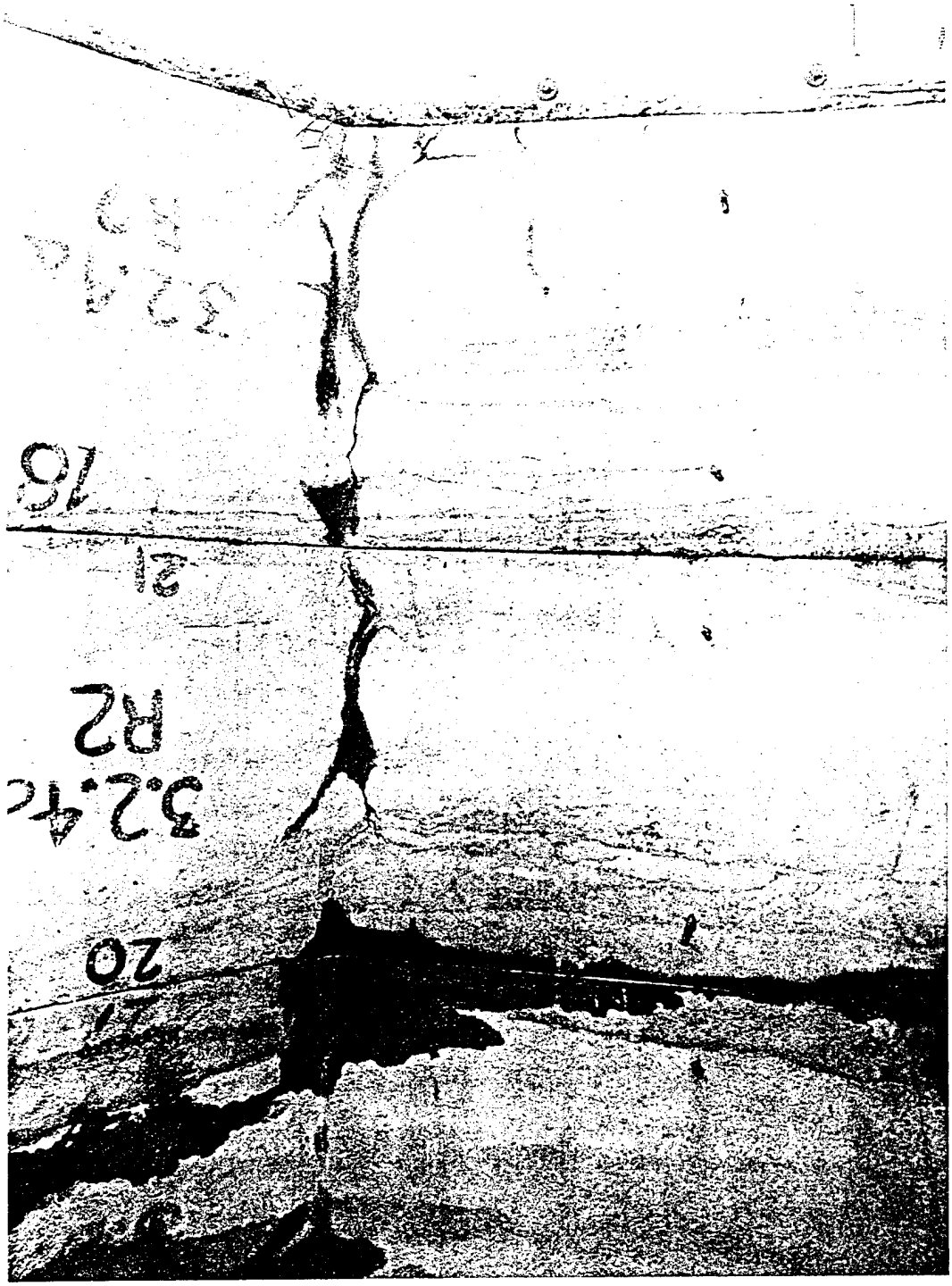


Fig. L.336 Detail Interior View of Tension Cracks at Lower Fold Point of Rear-wall Panels Adjacent to Right End, Structure 3.2.4a



Fig. L.337 Detail Interior View of Tension Cracks at Base of Rear-wall Panels Adjacent to Right End, Structure 3.2.4a

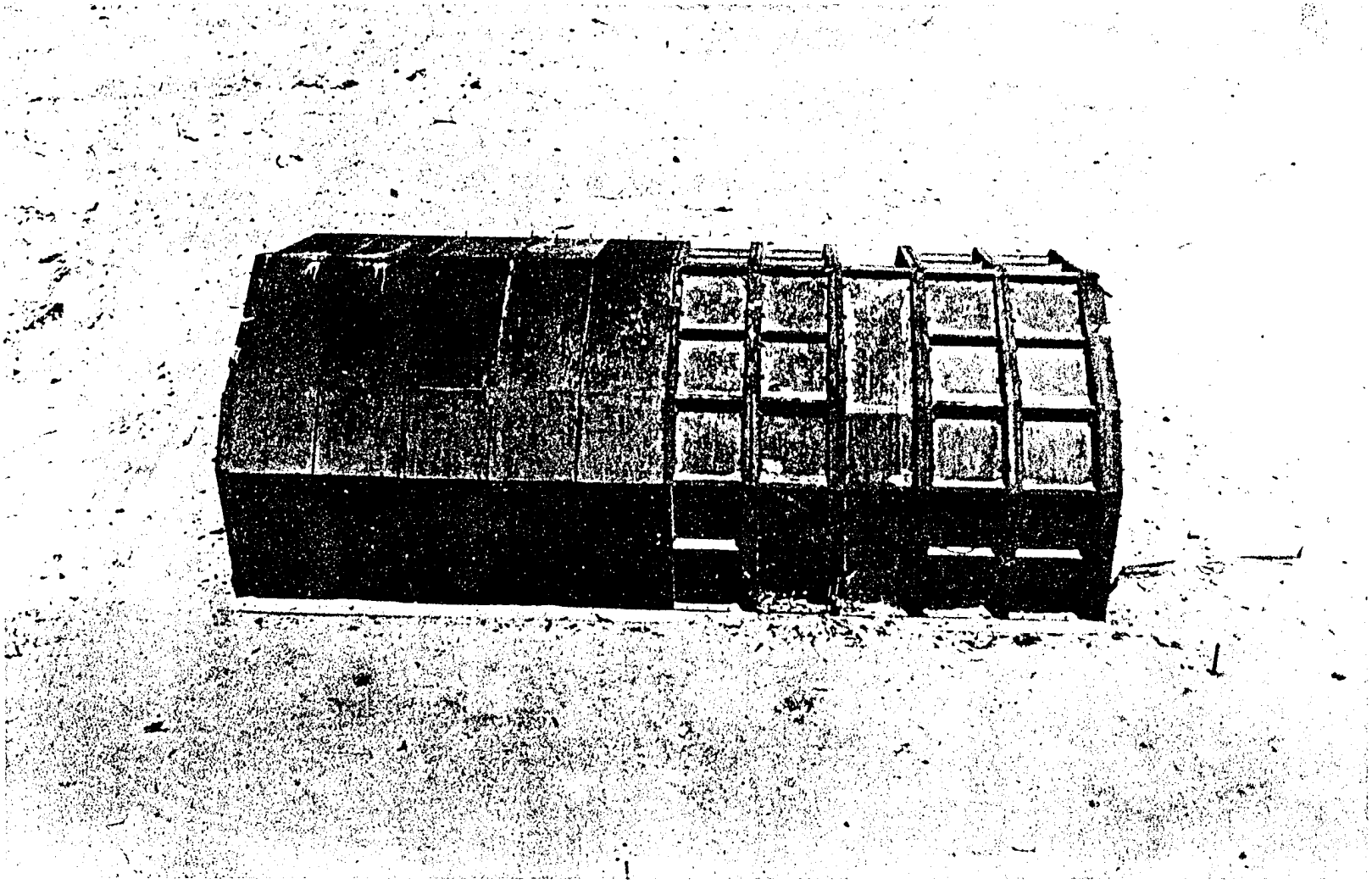


Fig. L.338 Overhead View of Structure from Blast Side (Front), Structure 3.2.4b

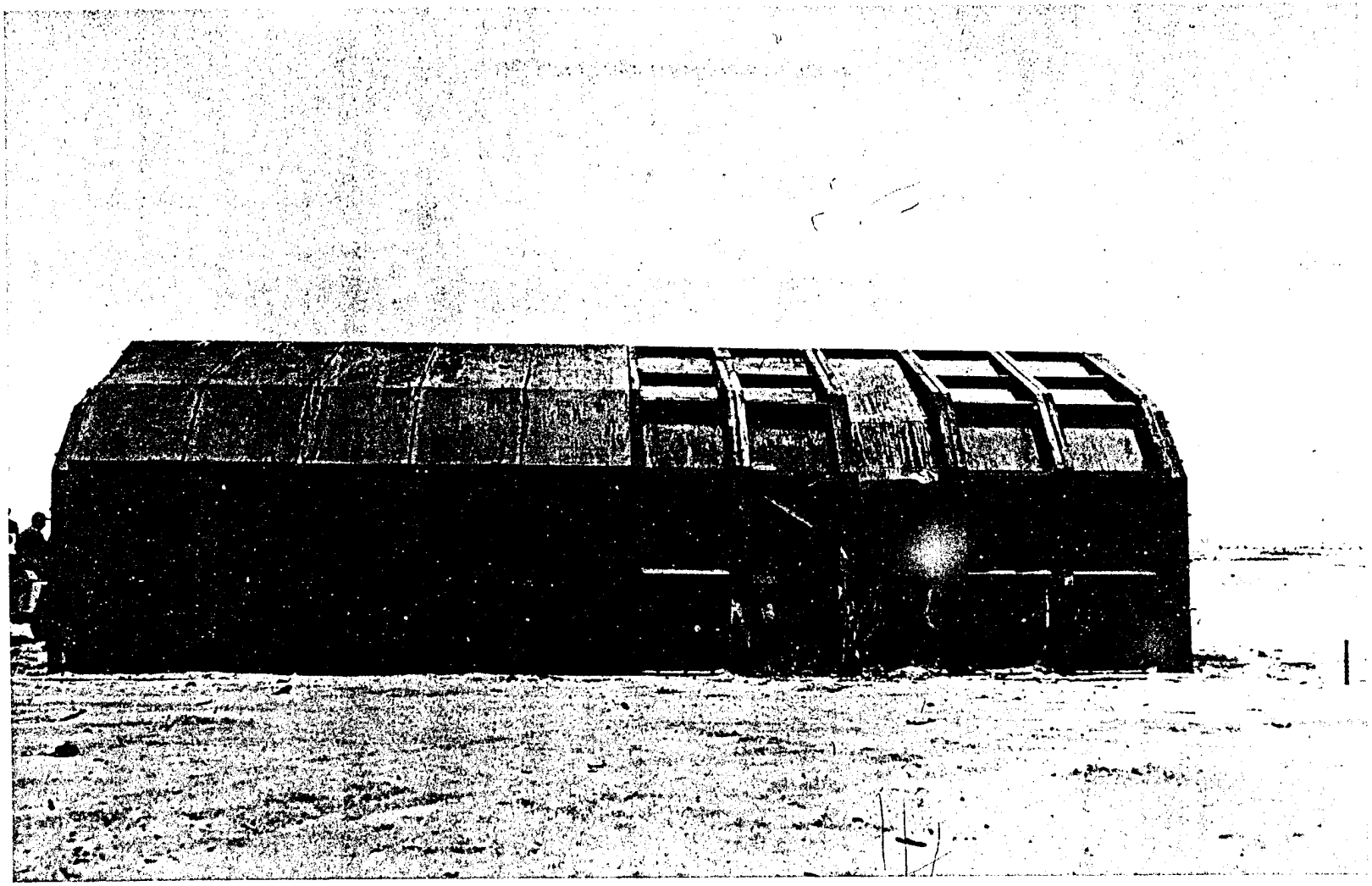


Fig. L.339 Front of Structure, 3.2.4b

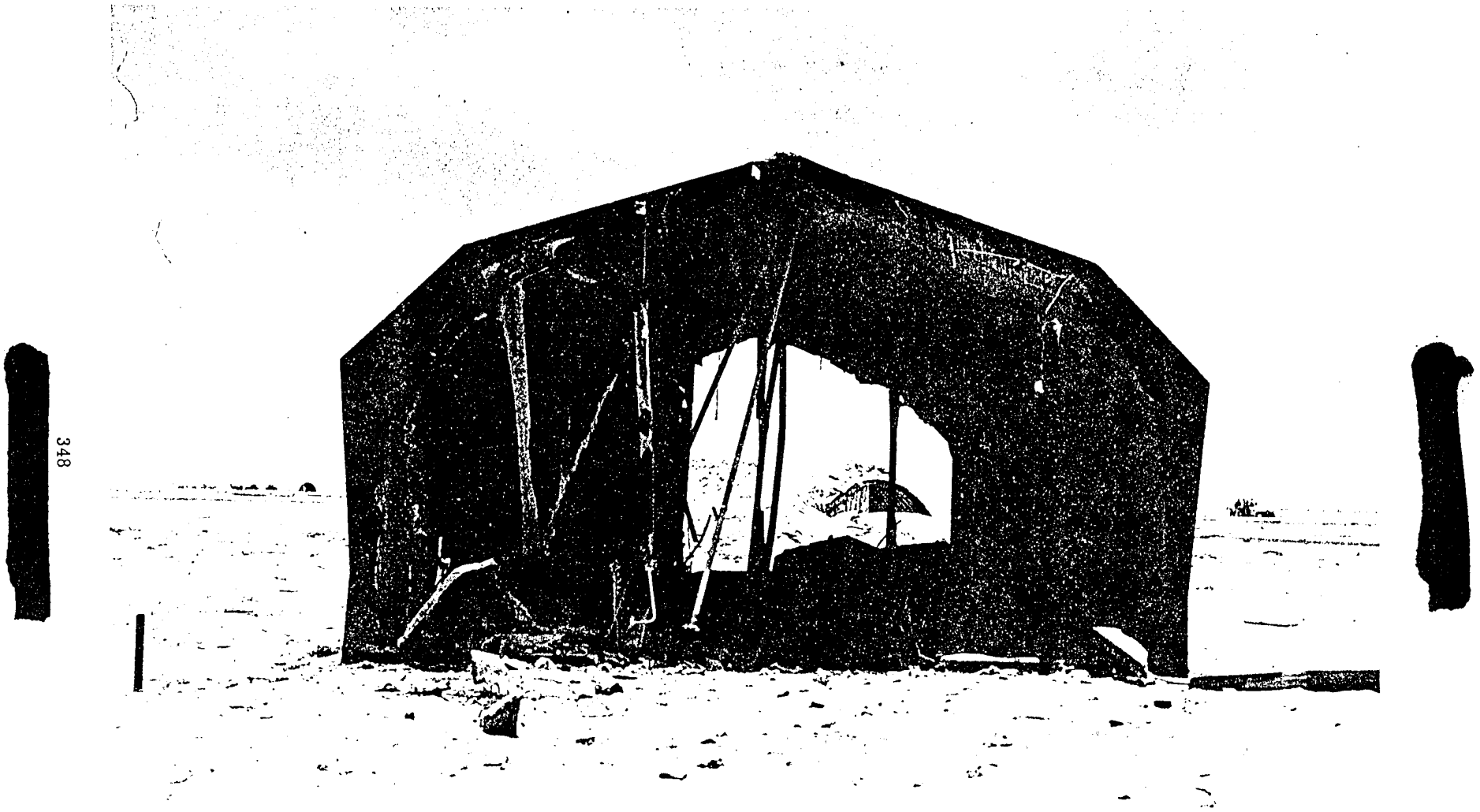


Fig. L.340 Right End of Structure, 3.2.4b

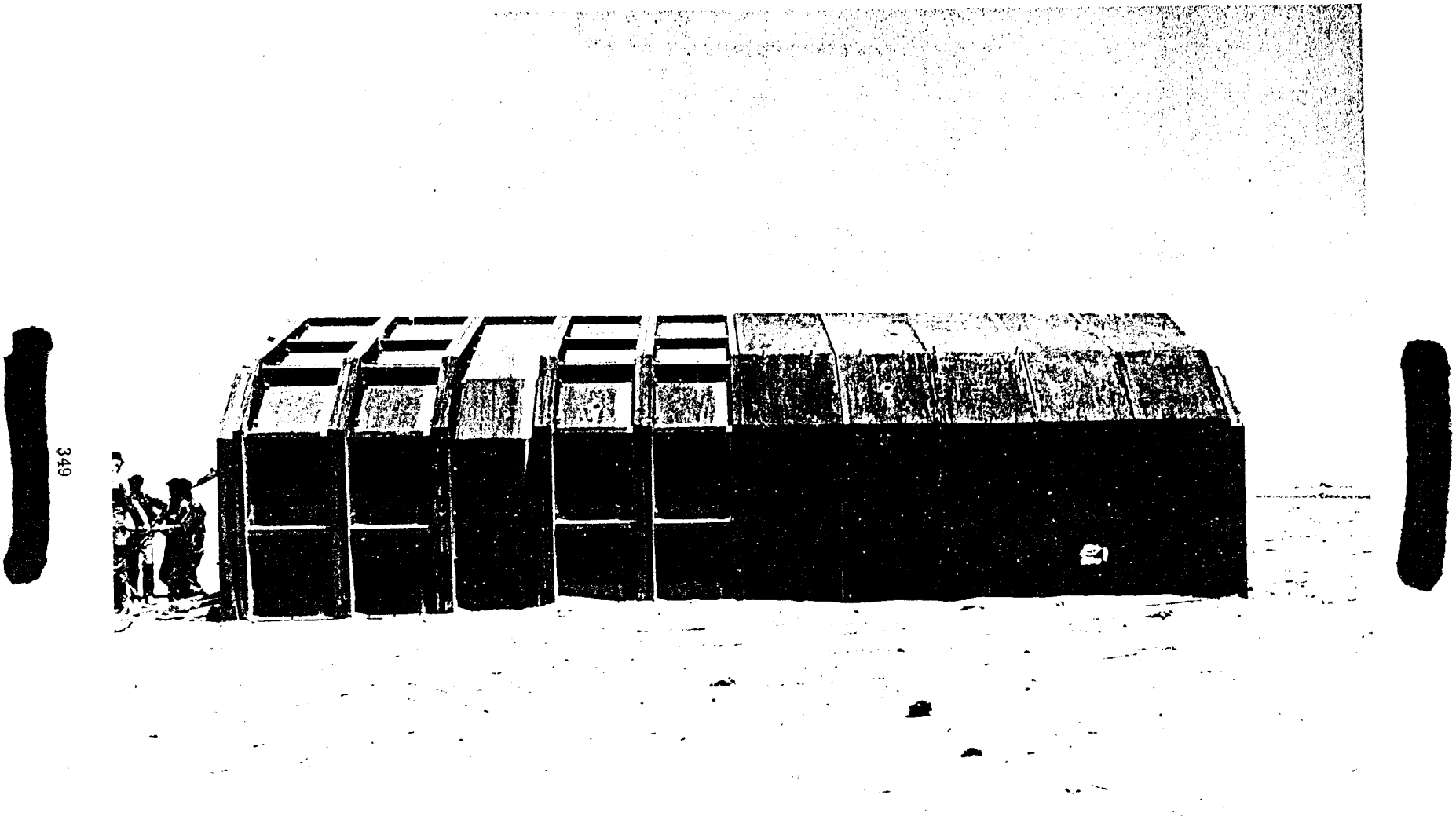


Fig. L.341 Rear of Structure, 3.2.4b

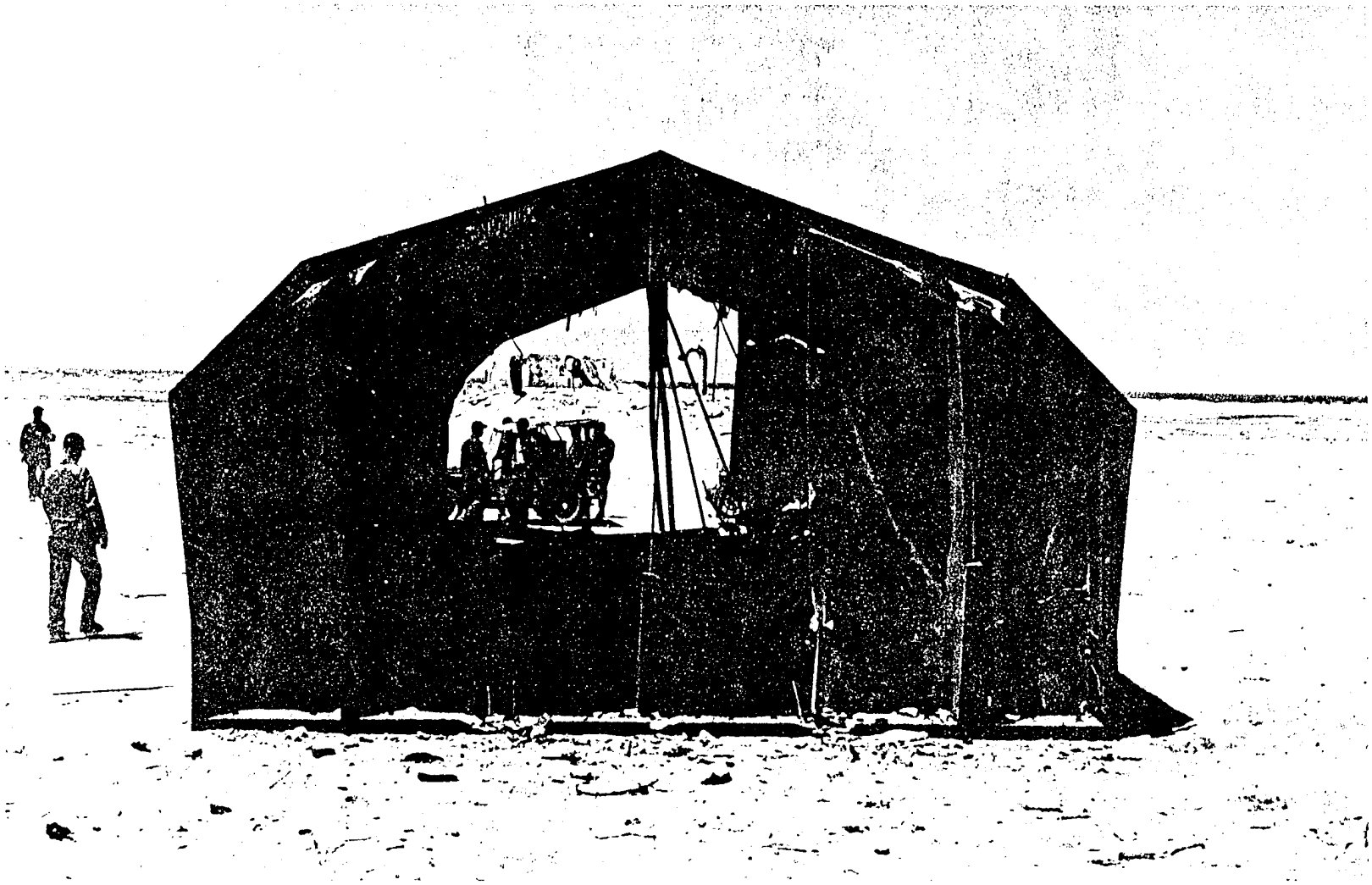


Fig. L.342 Left End of Structure, 3.2.4b

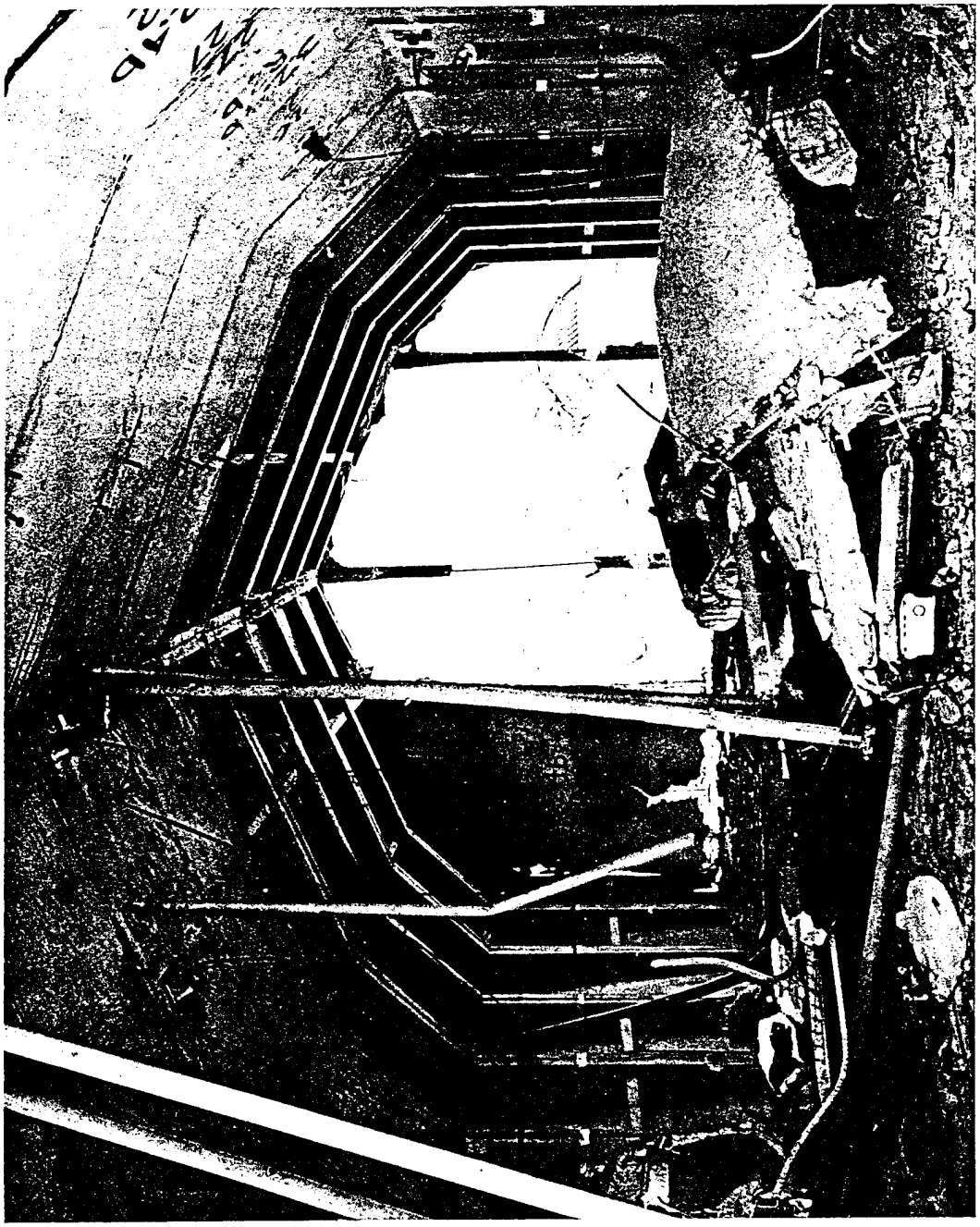


Fig. L.343 Interior View of End-wall Debris, Taken from Right End of Structure, 3.2.4b



Fig. L.344 Interior View of End-wall Debris, Taken from Left End of Structure, 3.2.4b

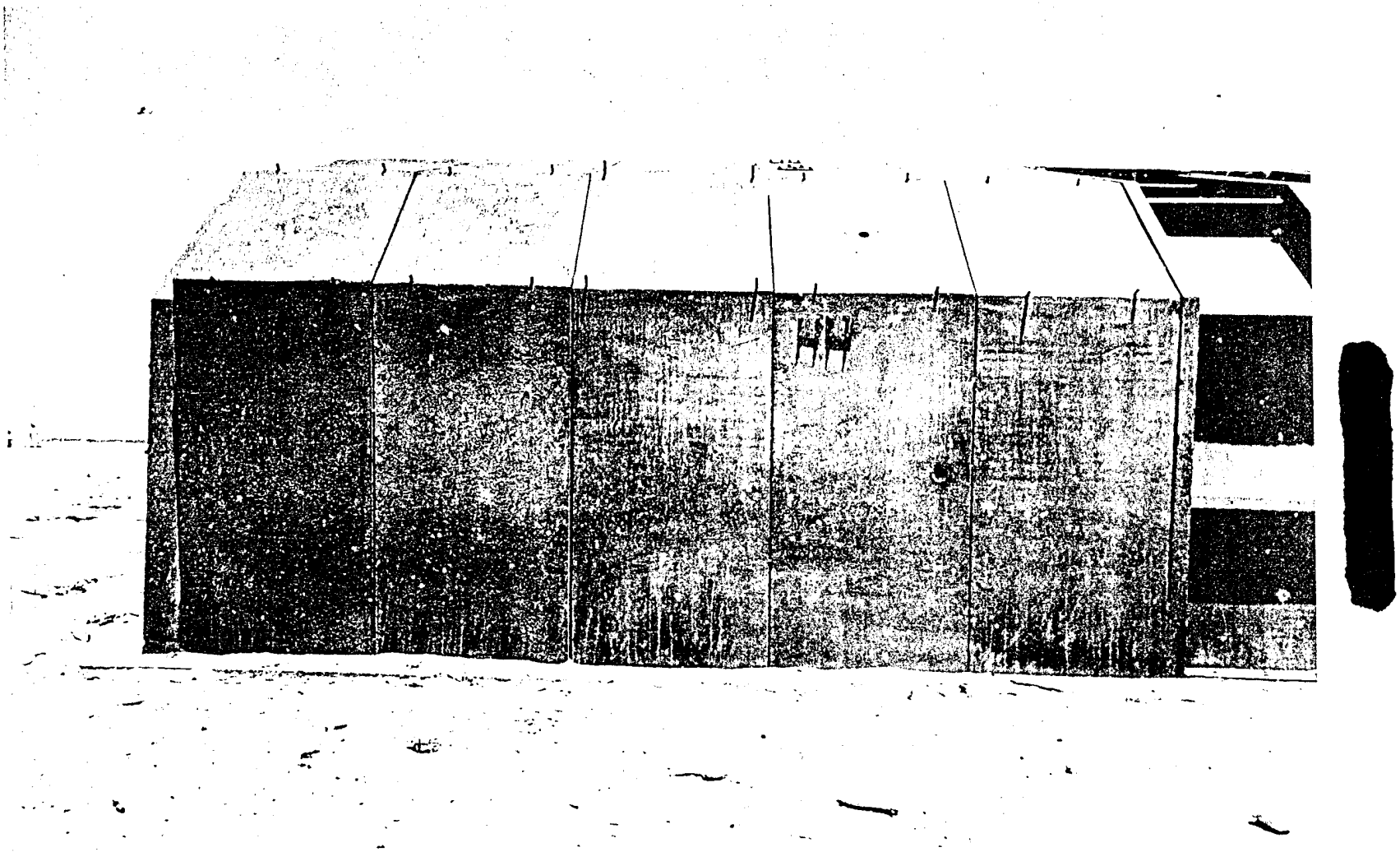


Fig. L.345 Left Front Panels with Ribs Inside, Structure 3.2.4b

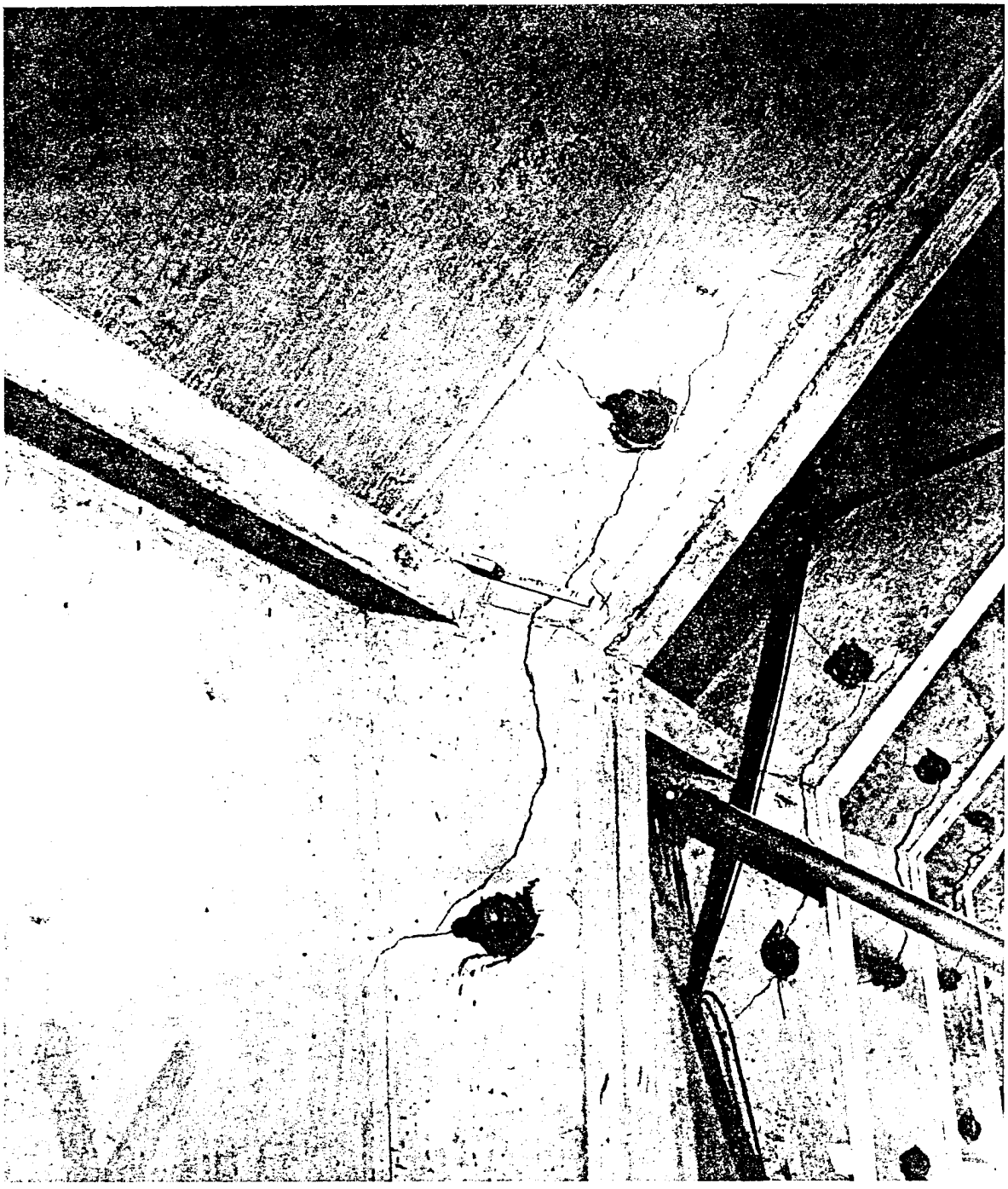


Fig. L.346 Interior View of Left Front Panels Showing Cracks in Rib at Bottom Fold, Taken from Center of Building, Structure 3.2.4b

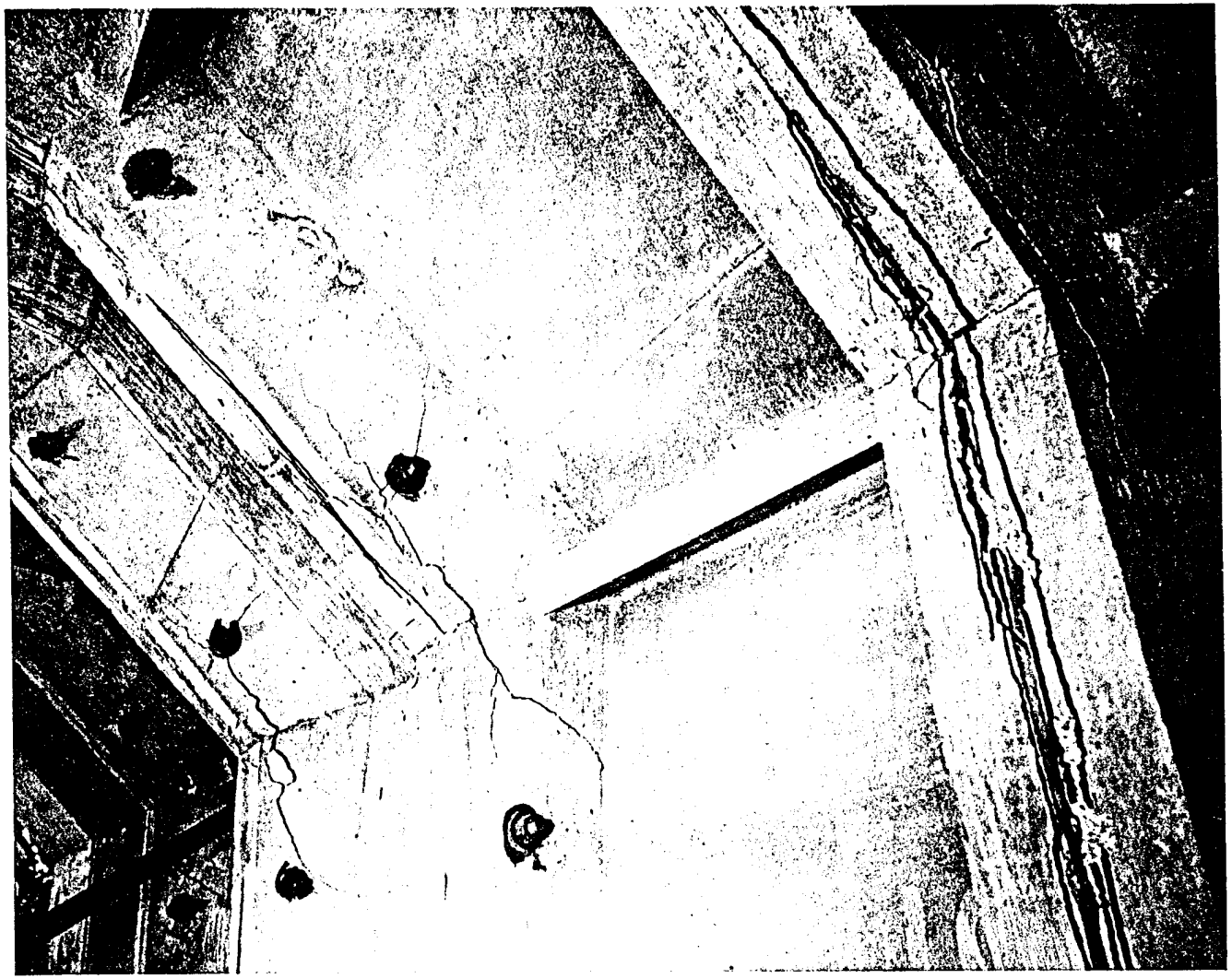


Fig. L.347 Interior View of Left Front Panels Showing Cracks in Rib at Bottom Fold, Taken from Left End of Building, Structure 3.2.4b

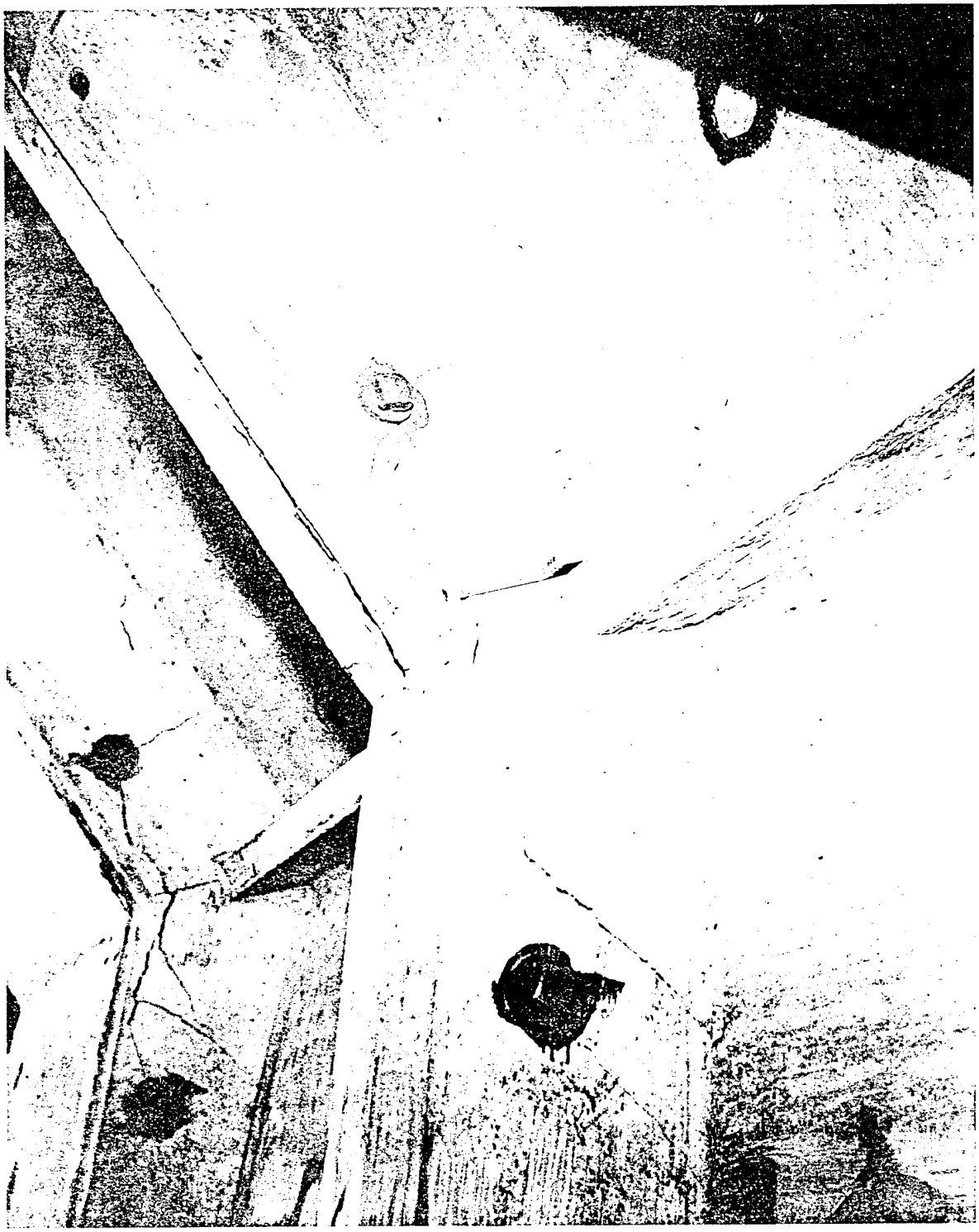


Fig. L.348 Detail View of Cracks in Ribs of Left Front Panels, Structure 3.2.4b

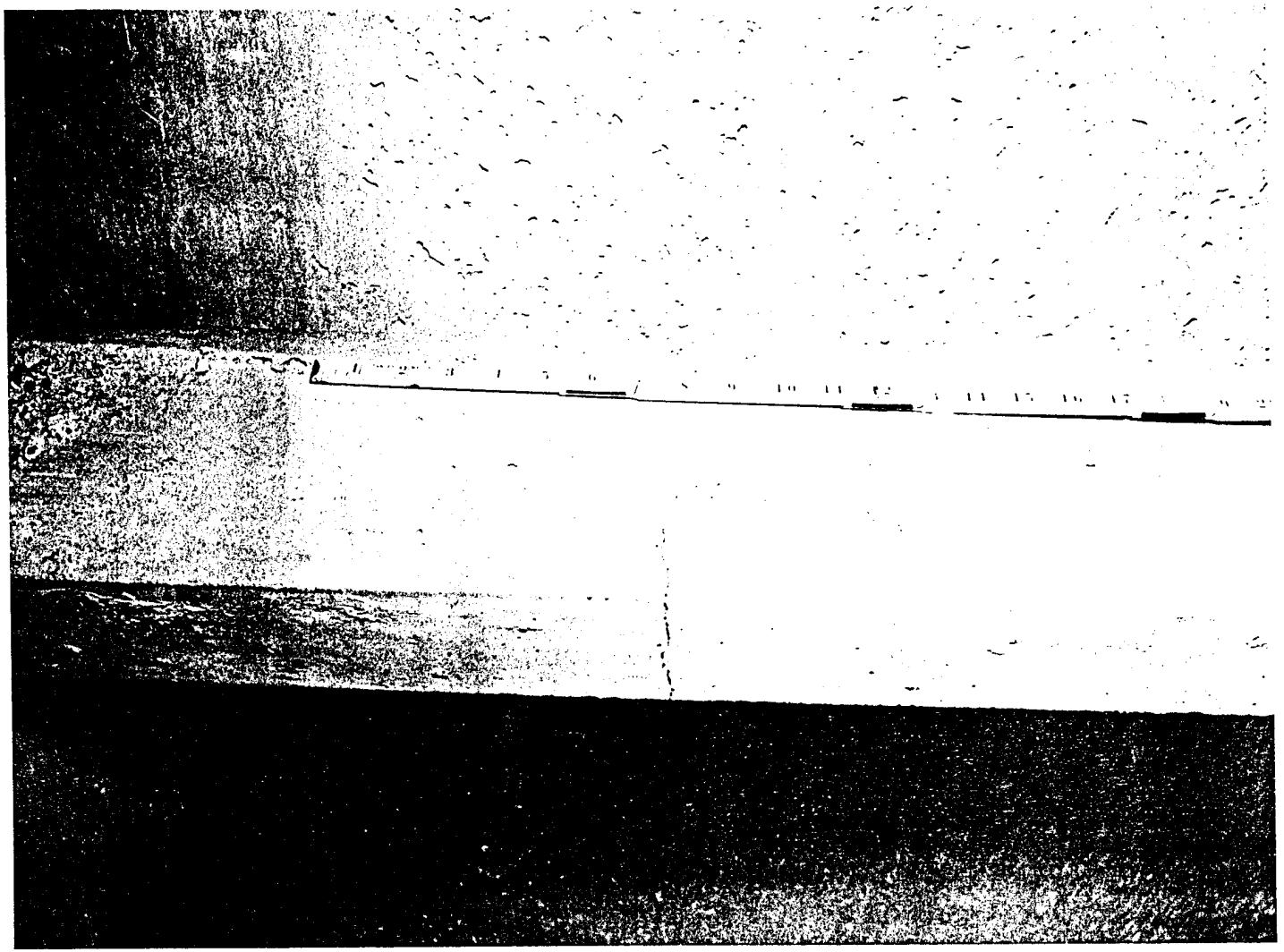


Fig. L.349 Typical Detail of Crack in Intermediate Rib in Center of Vertical Section of Left Front-wall Panels, Structure 3.2.4b

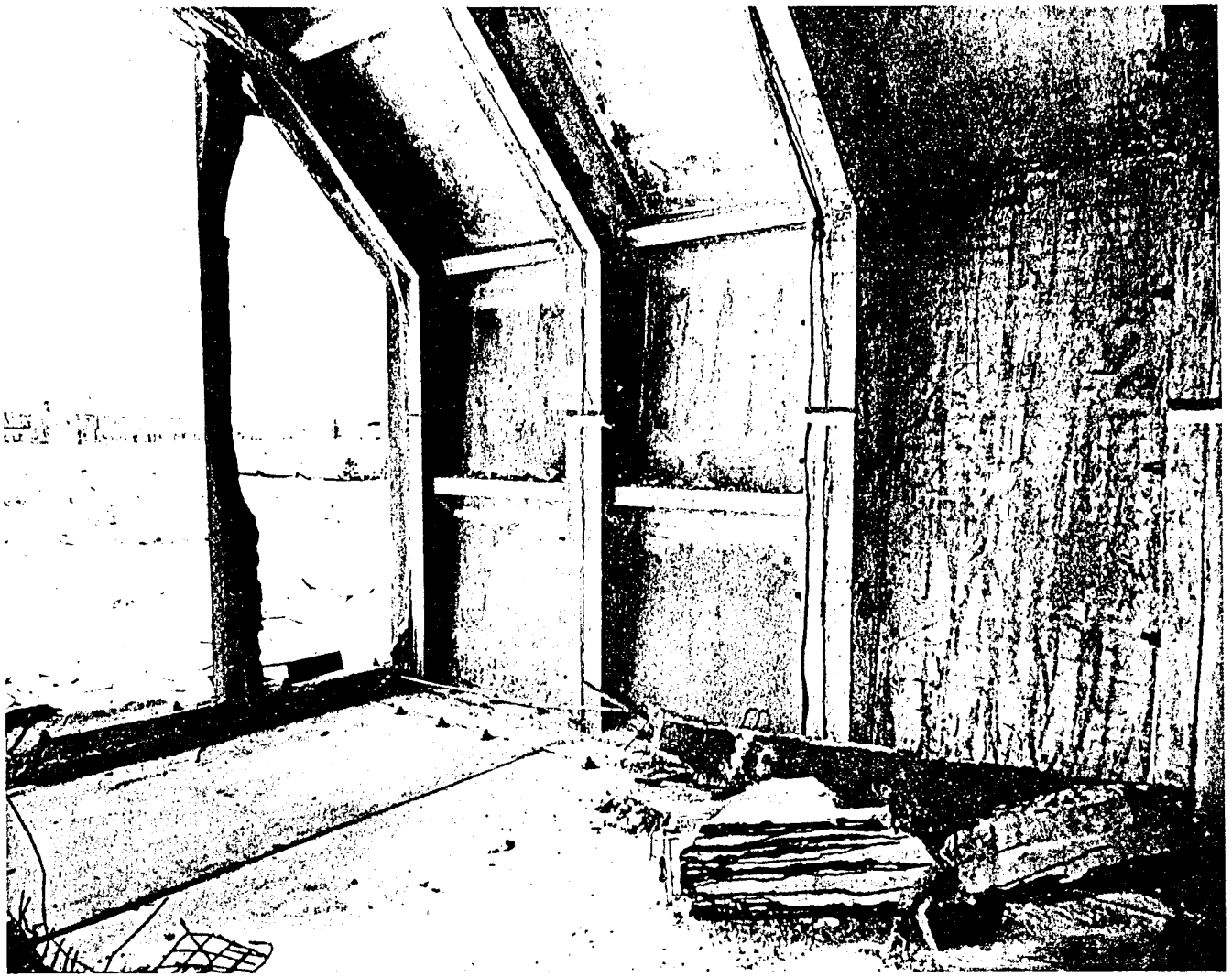


Fig. L.350 Interior View of Left Rear-wall Panels and Rear Left End Panel Ribs, Structure 3.2.4b



Fig. L.351 View of Right Front-wall Panels Showing Damage Gradation from Right End, Structure 3.2.4b

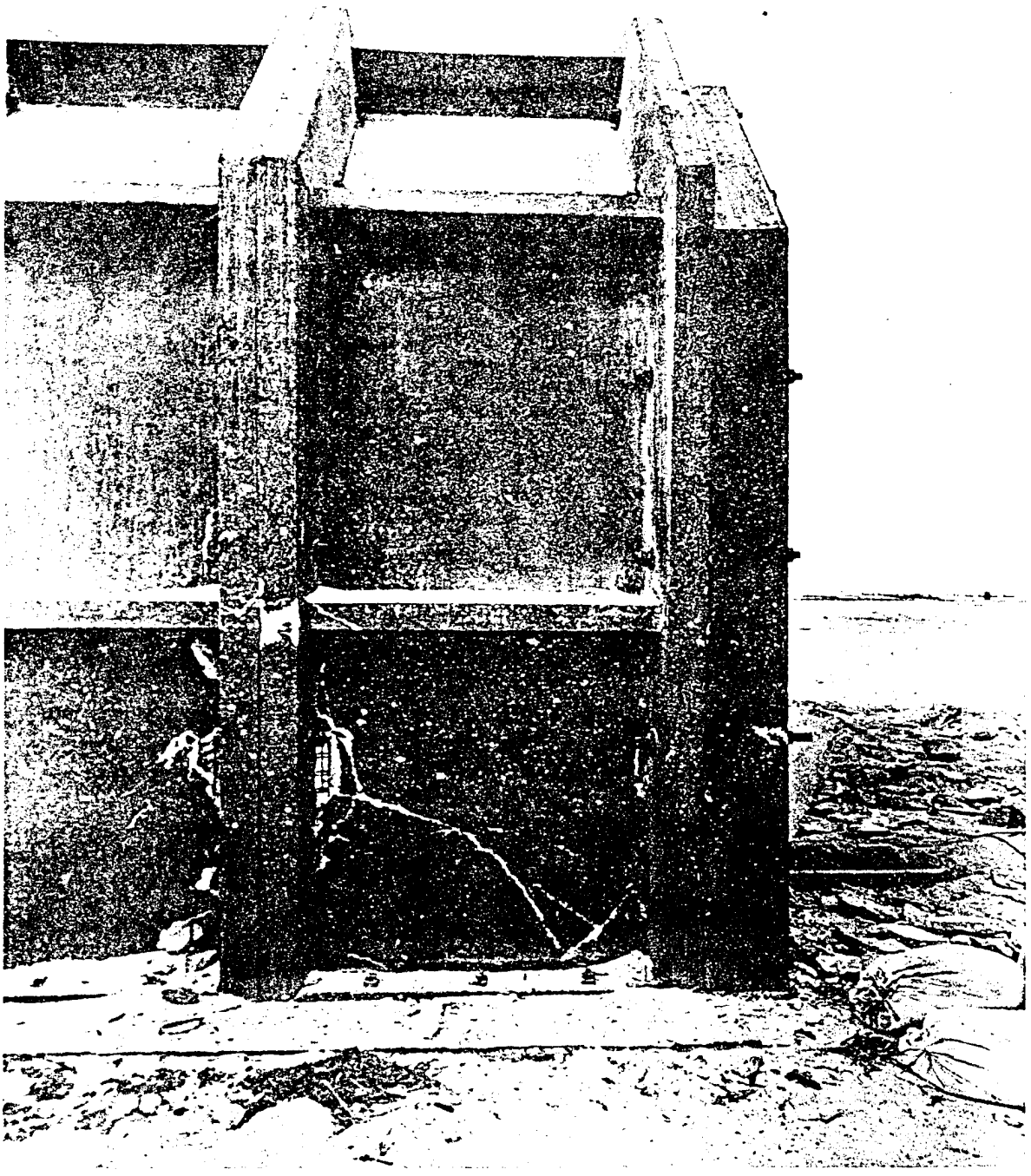


Fig. L.352 Exterior View of Ribs-out Panel Adjacent to Right End of Structure, 3.2.4b

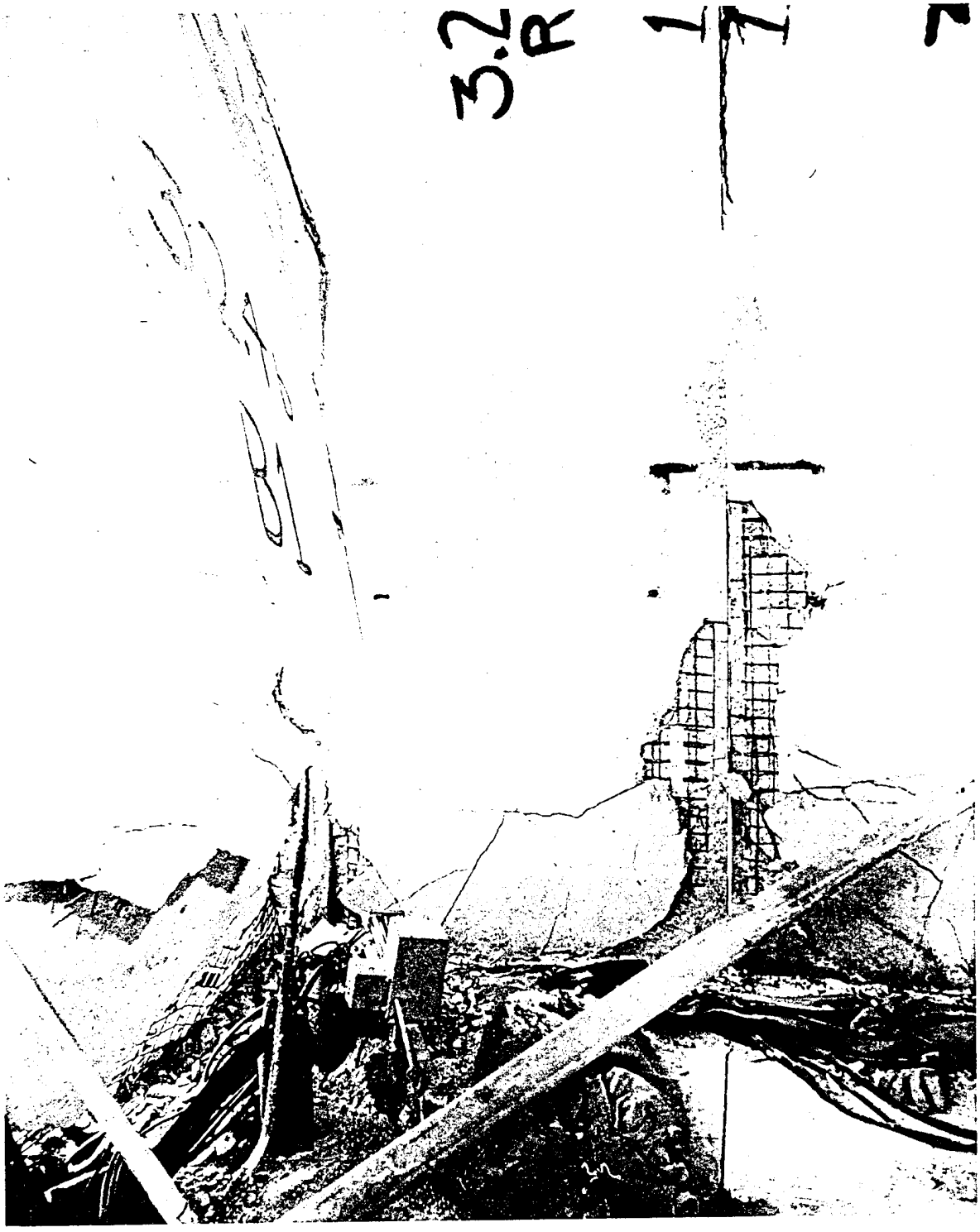


Fig. L.353 Interior View of Ribs-out Panel Adjacent to Right End of Structure, 3.2.4b

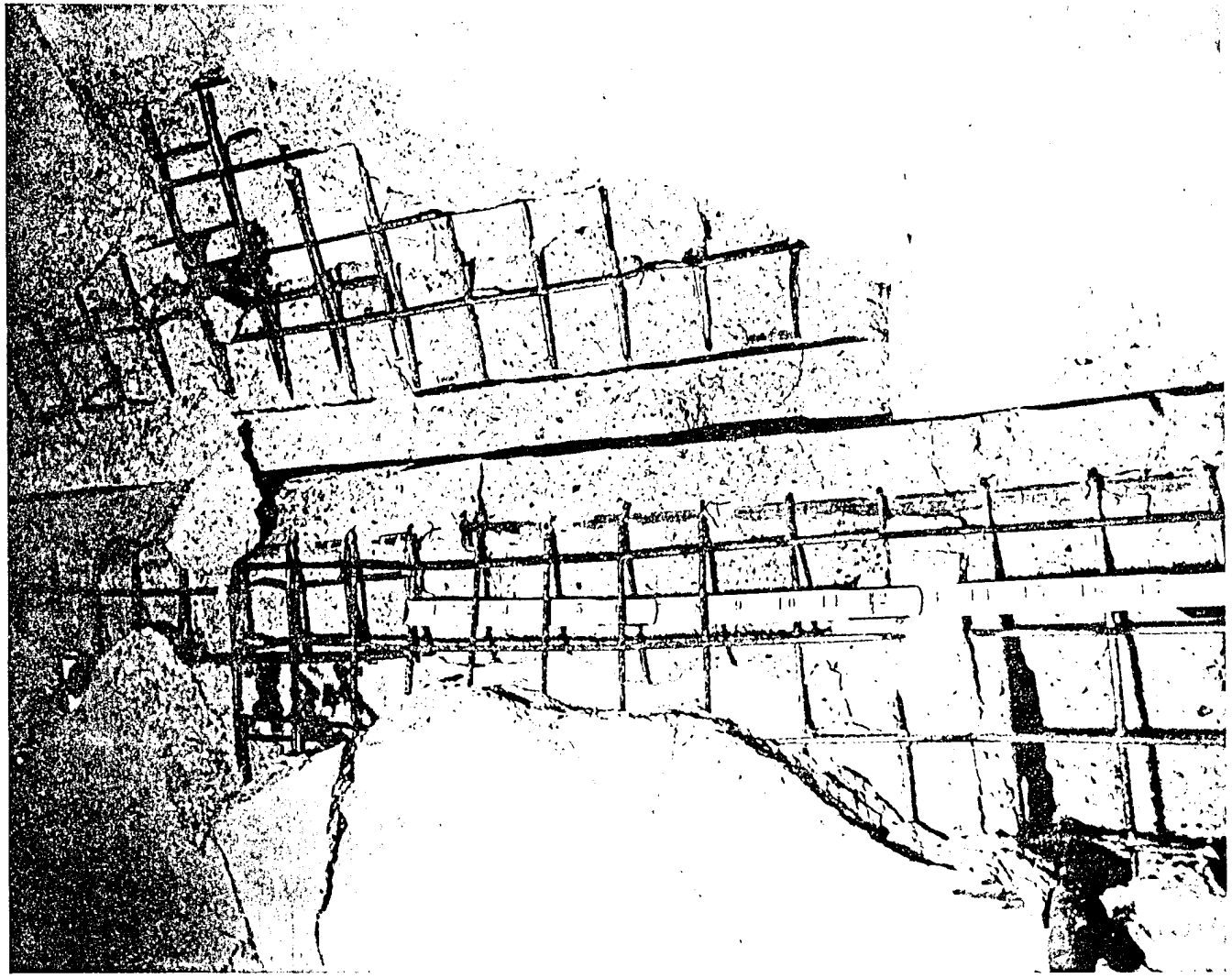


Fig. L.354 Interior Detail of Concrete Spalls at Edges of Panel Adjacent to Right End and the Adjacent Wall Panel, Structure 3.2.4b

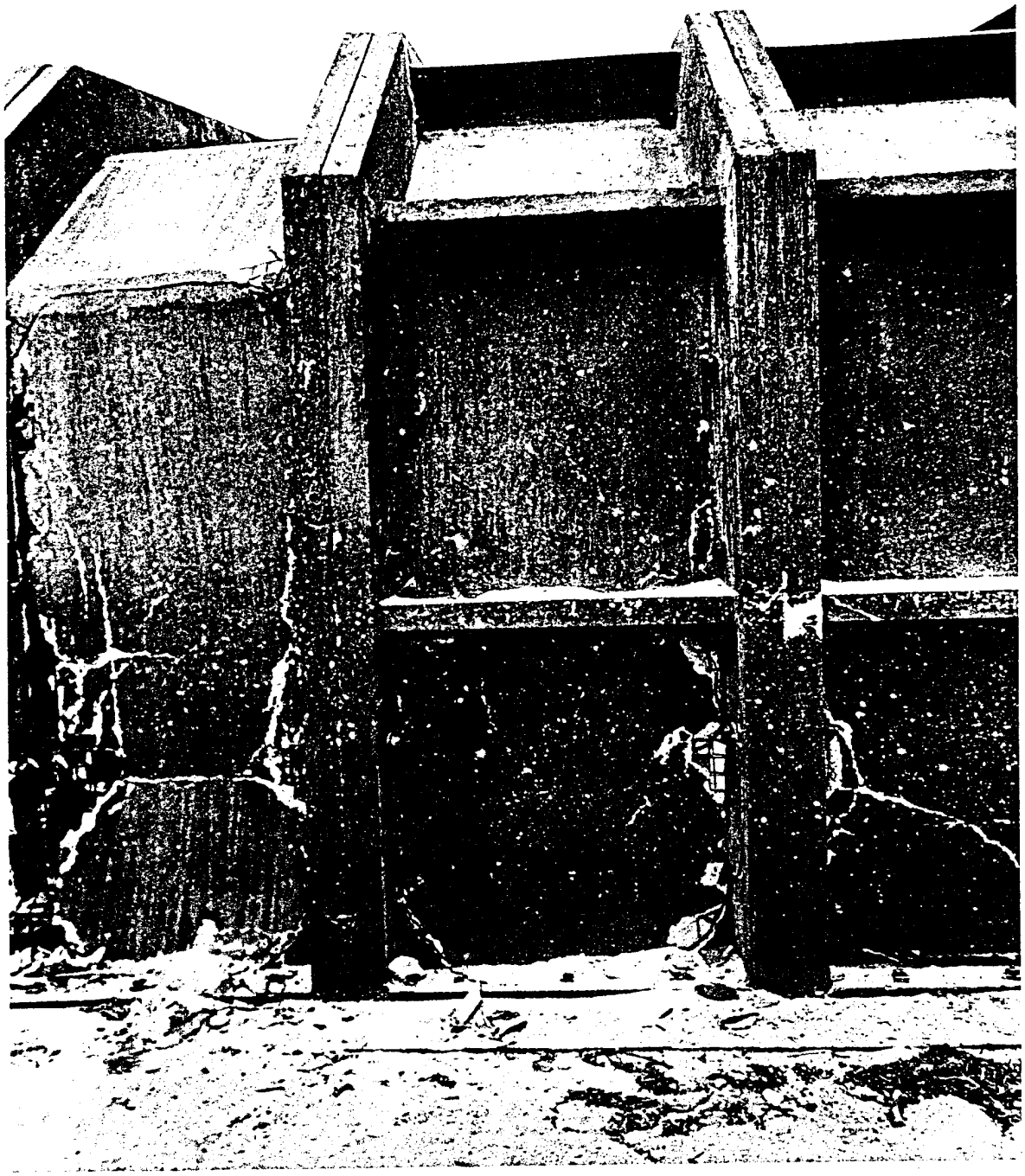


Fig. L.355 Exterior View of Ribs-out Panel Second from Right End of Structure, 3.2.4b

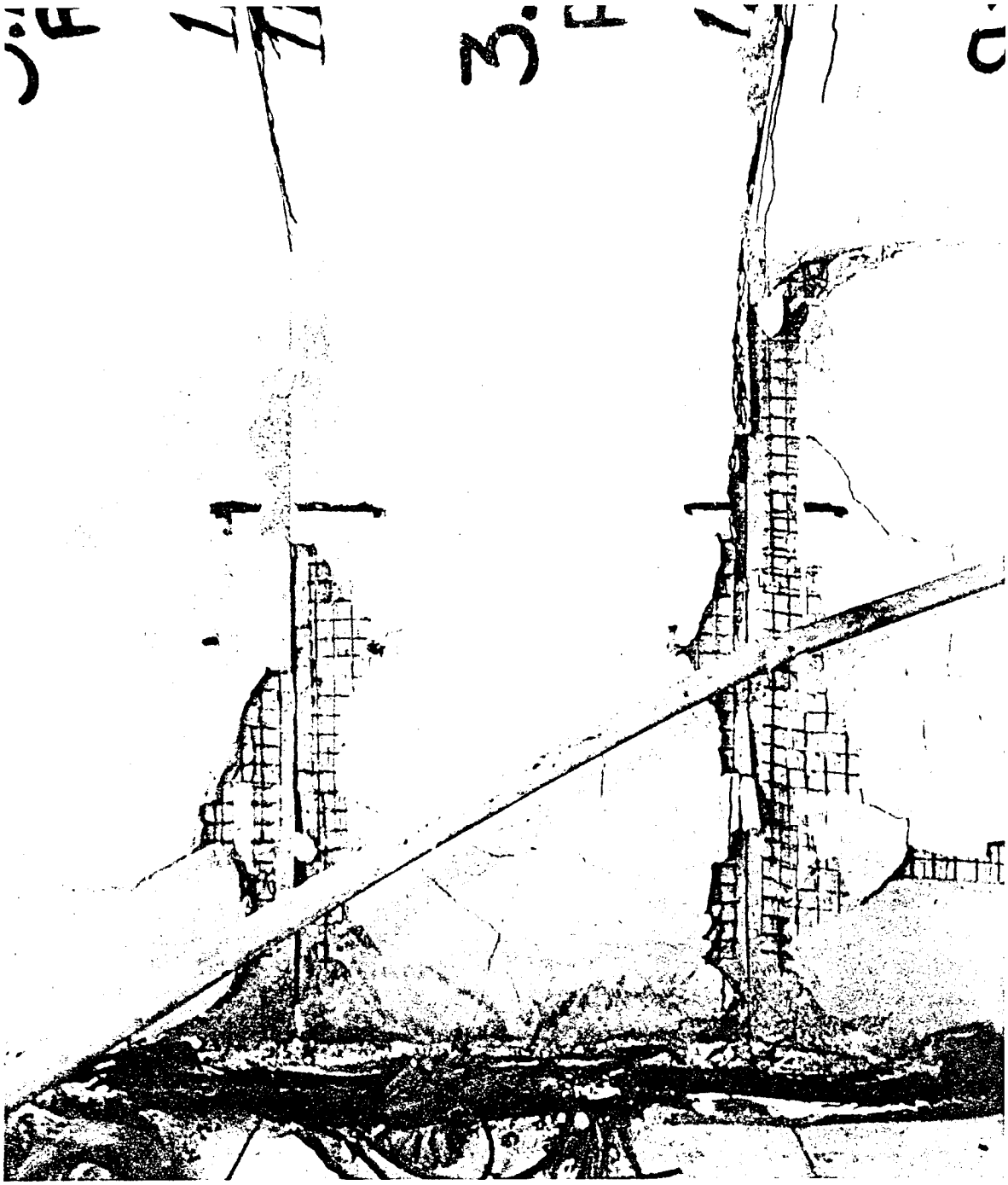


Fig. L.356 Interior View of Ribs-out Panel Second from Right End of Structure, 3.2.4b

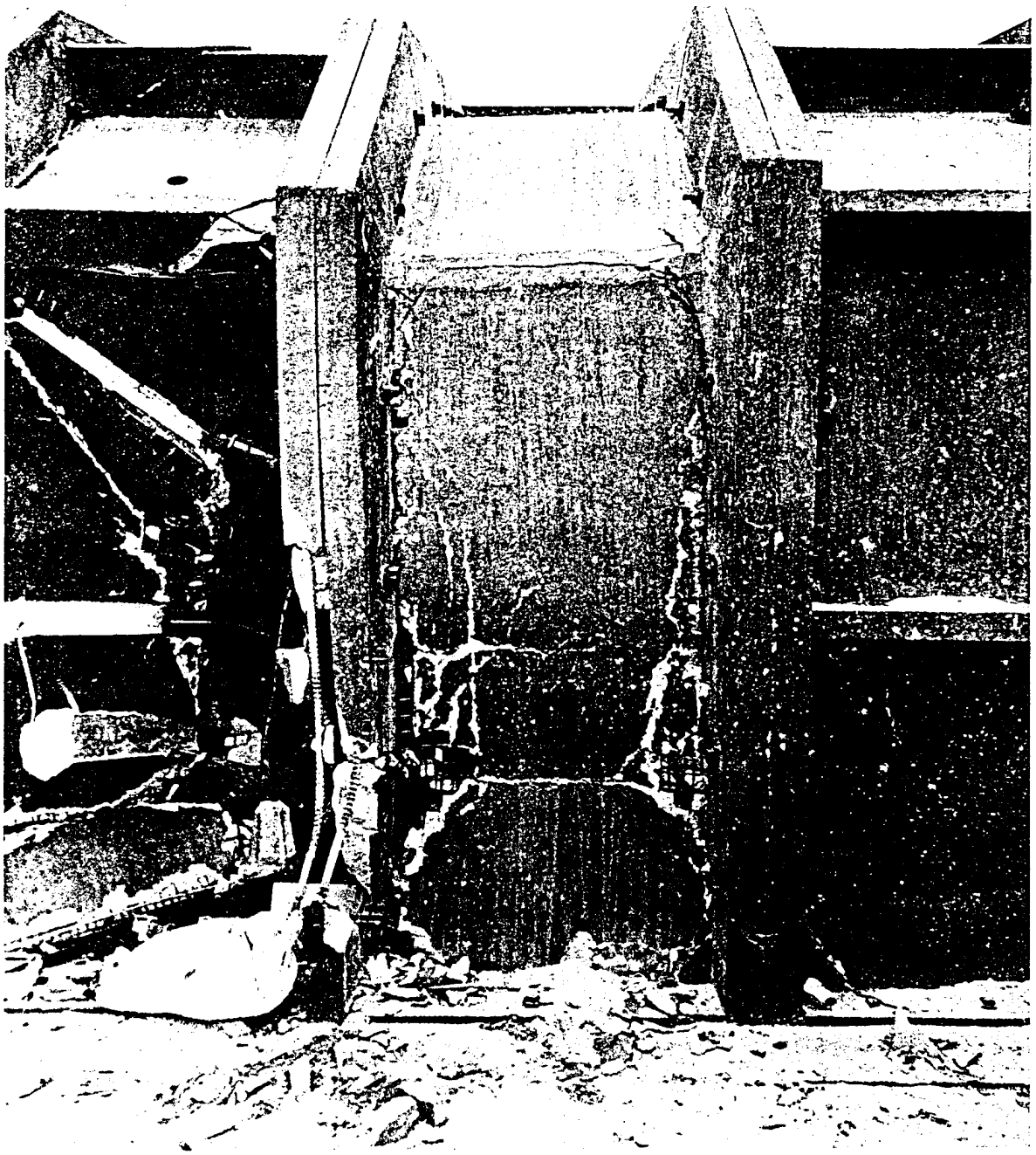


Fig. L.357 Exterior View of Ribs-out Panel Third from Right End of Structure, 3.2.4b

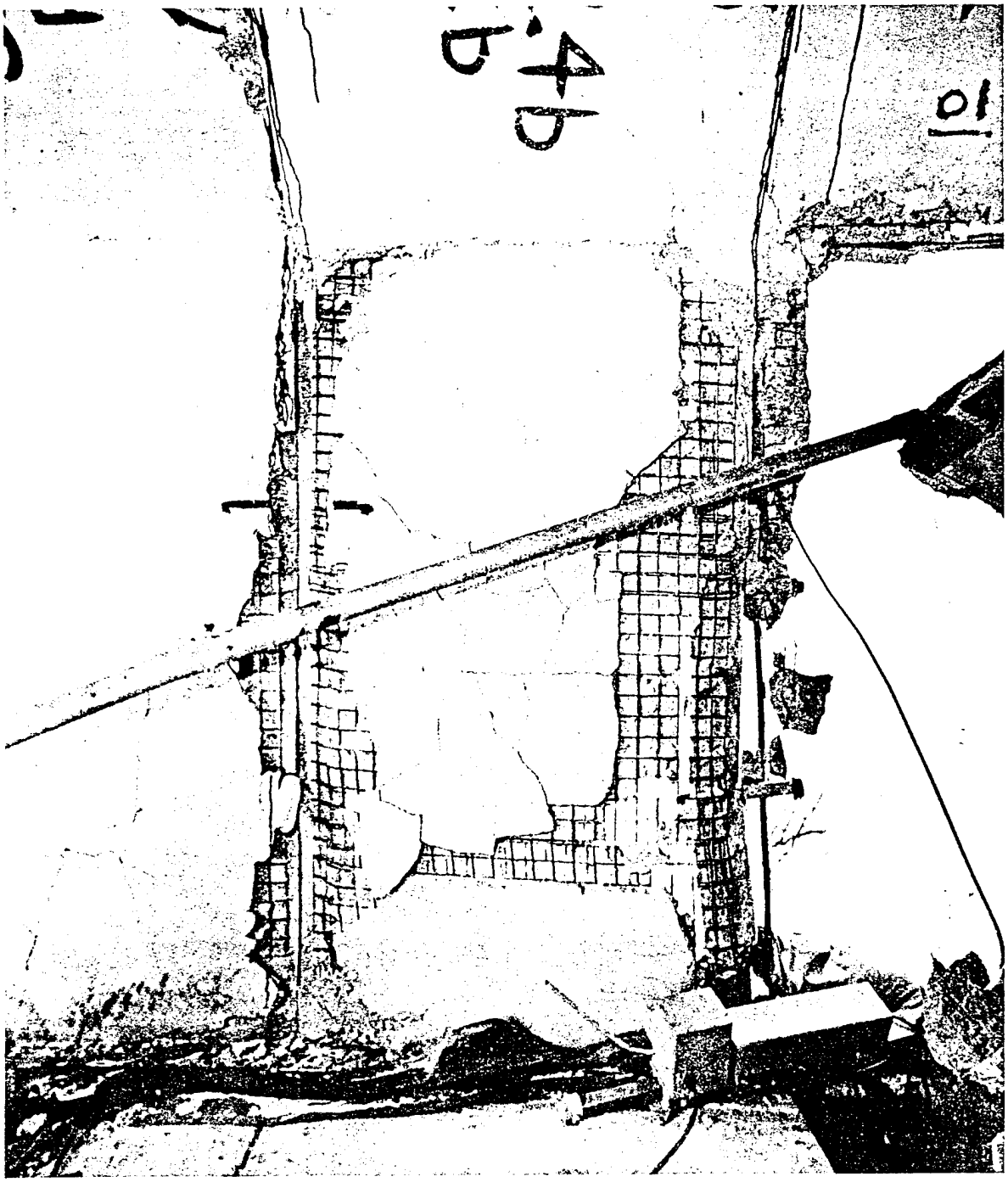


Fig. L.358 Interior View of Ribs-out Panel Third from Right End of Structure, 3.2.4b

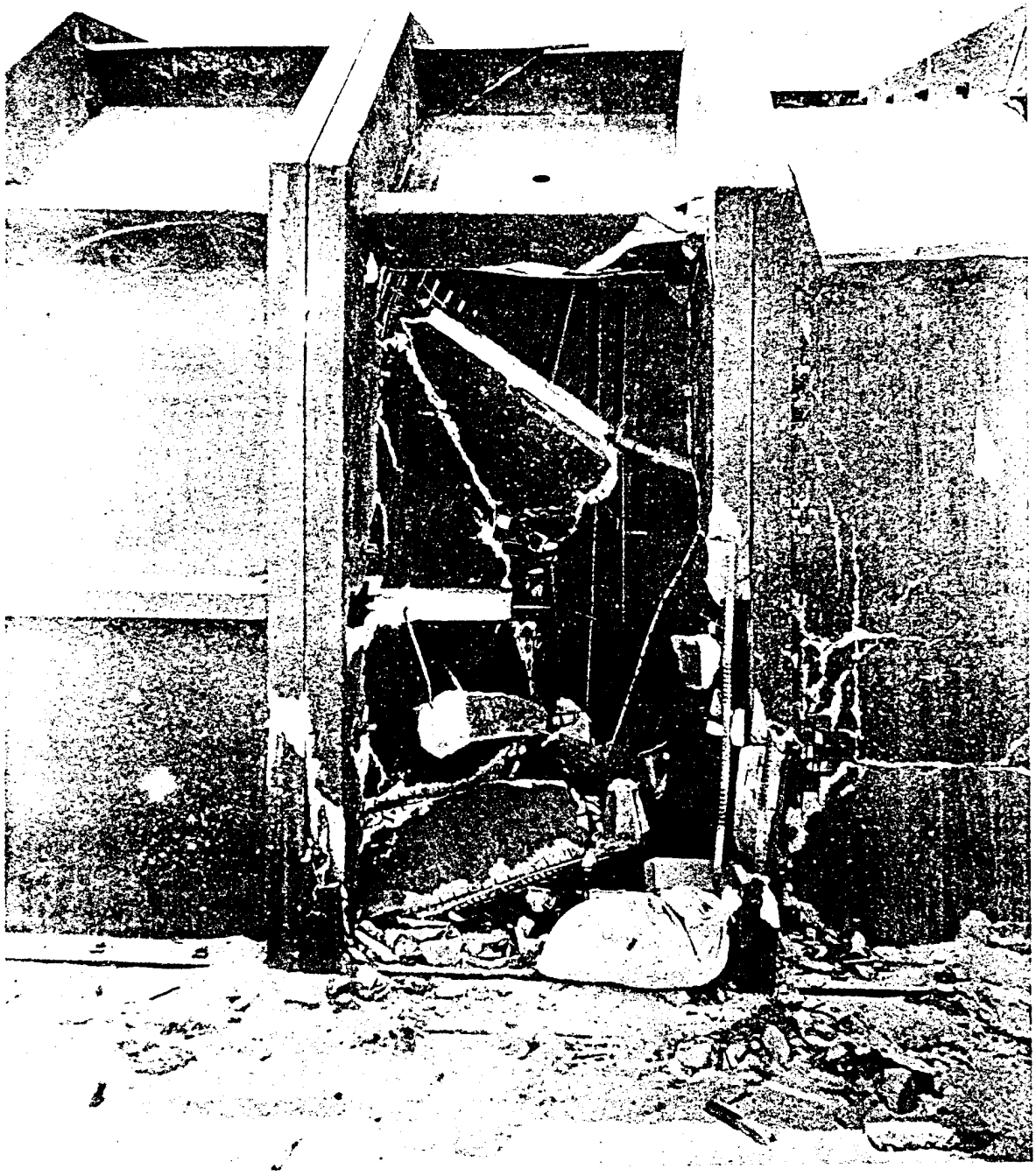


Fig. L.359 Exterior View of Ribs-out Panel Fourth from Right End of Structure, 3.2.4b

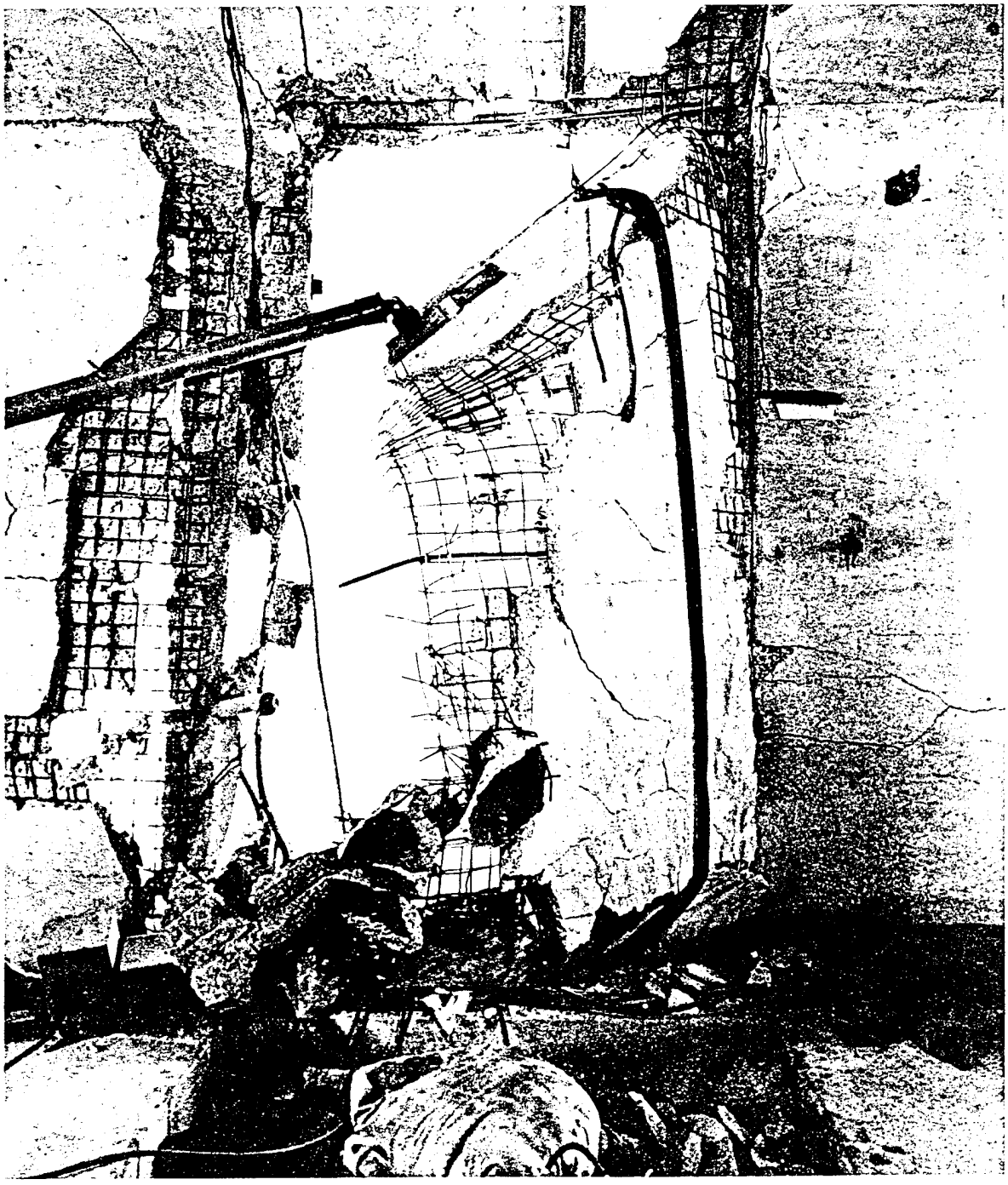


Fig. L.360 Interior View of Ribs-out Panel Fourth from Right End of Structure, 3.2.4b

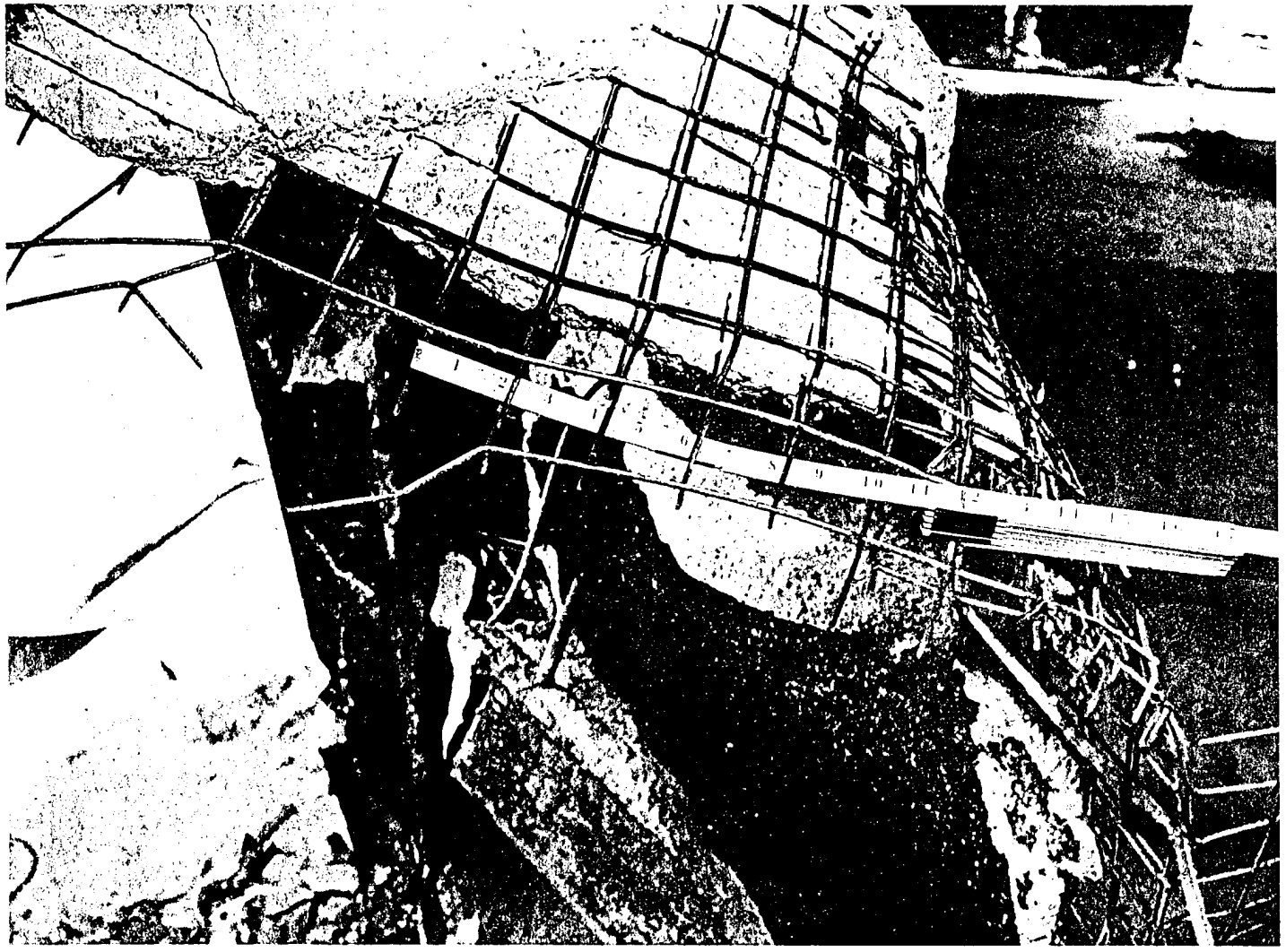


Fig. L.361 Interior Detail of Rib and Mesh Failure of Ribs-out Panel Fourth from Right End, Structure 3.2.4b

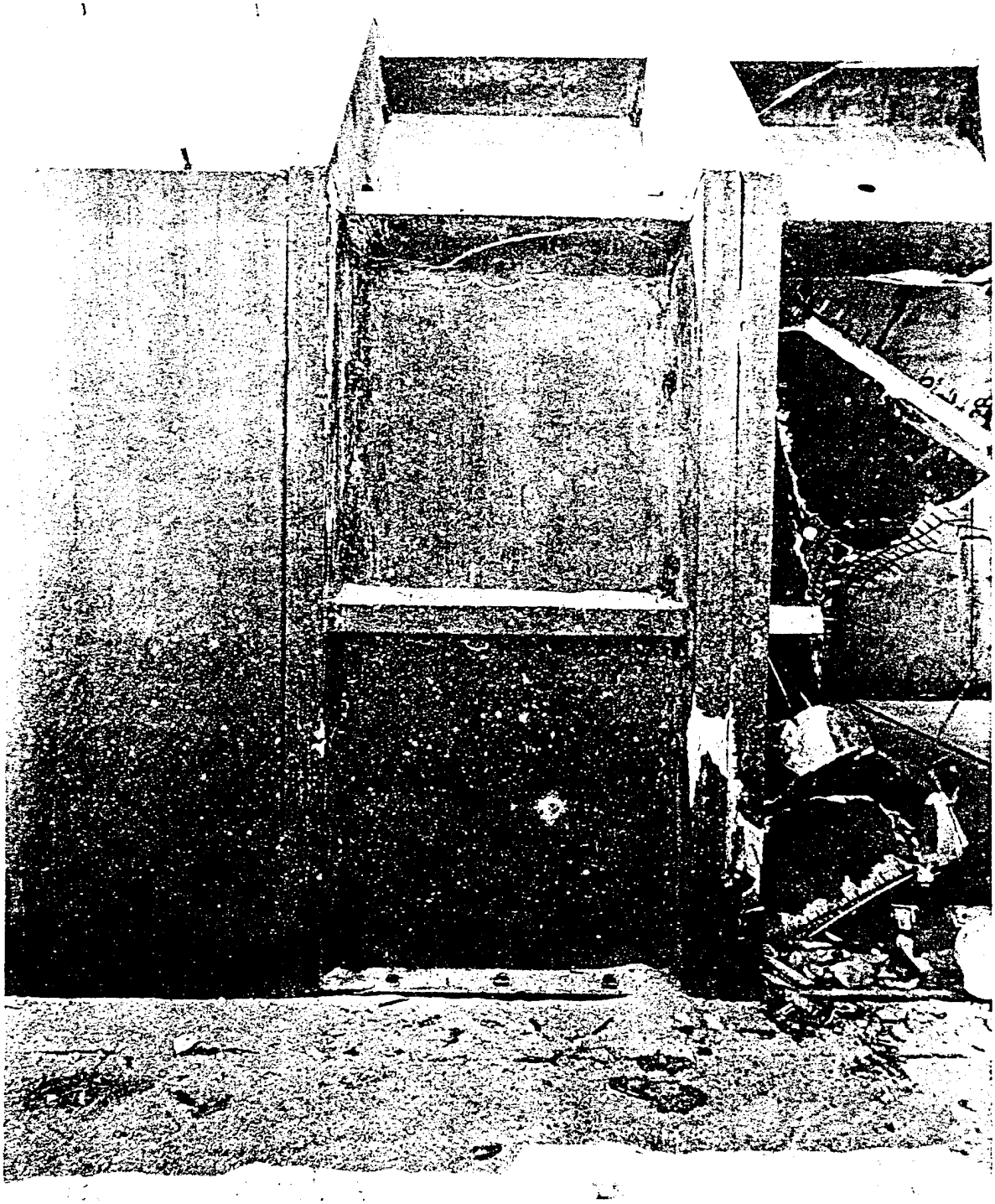


Fig. L.362 Exterior View of Ribs-out Panel Fifth from Right End of Structure, 3.2.4b



Fig. L.363 Interior View of Ribs-out Panel Fifth from Right End of Structure, 3.2.4b

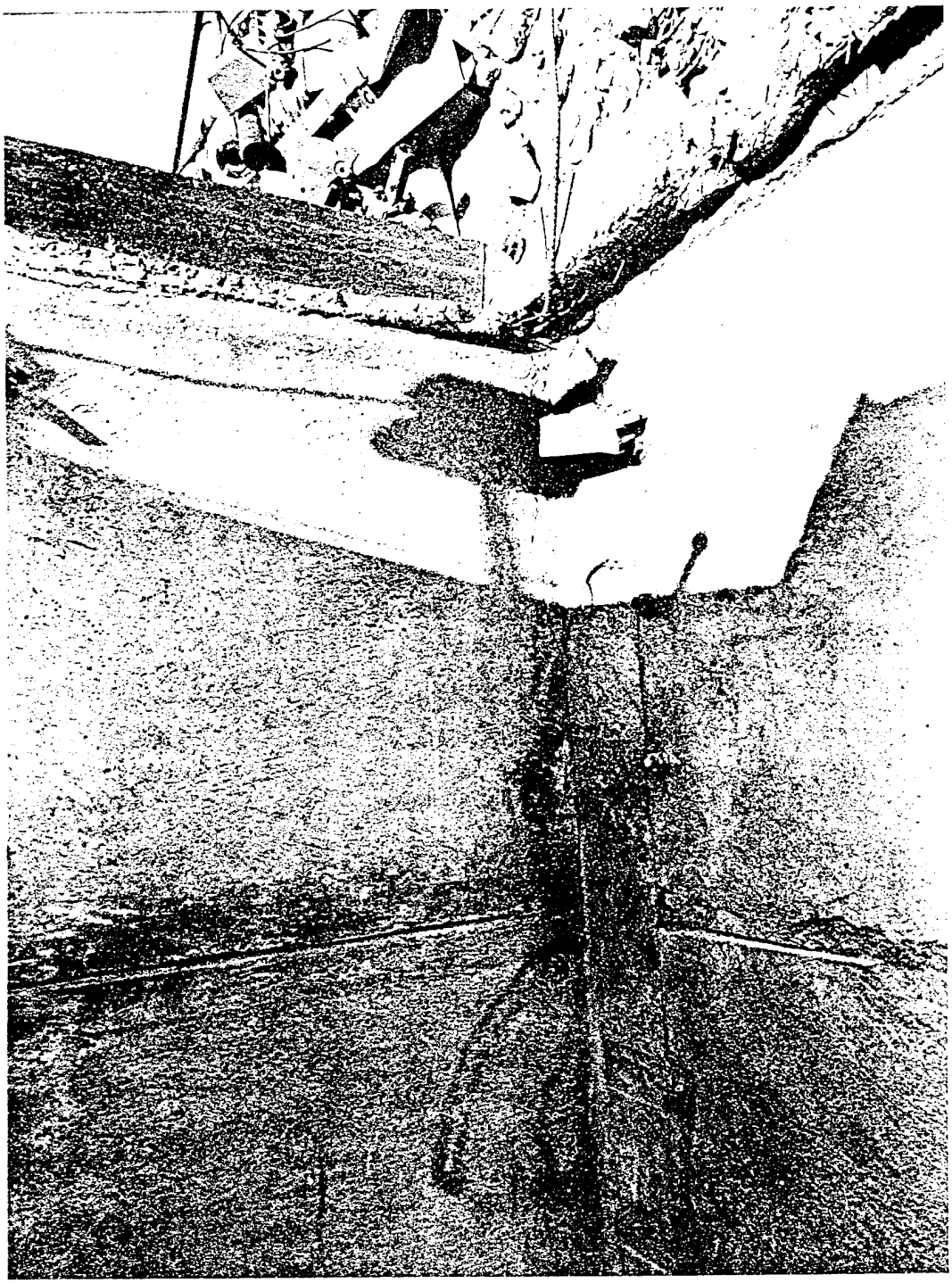


Fig. L.364 Typical Cracks at the Interior Base of Ribs-out Panels in the Rear Wall, Structure 3.2.4b



Fig. L.365 Exterior View of Front Right End Panel, Structure 3.2.4b. Note the center rib lying in center foreground.



Fig. L.366 Diagonal Exterior View of Front Right End Panel, Structure 3.2.4b

[redacted]

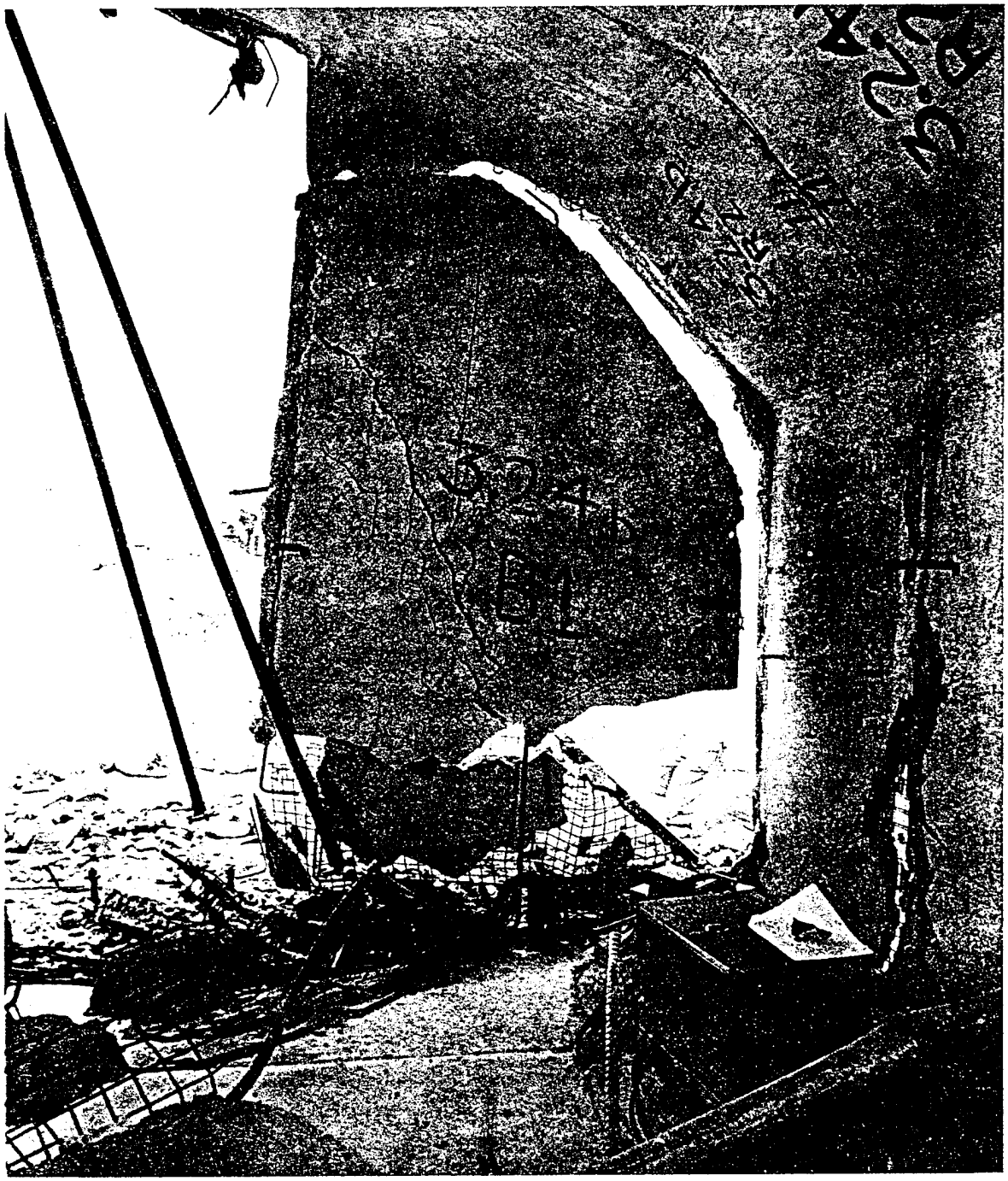


Fig. L.367 Interior View of Front Right End Panel, Structure 3.2.4b



Fig. L.368 Upper and Rear Ribs of the Rear Right End Panel, Structure 3.2.4b

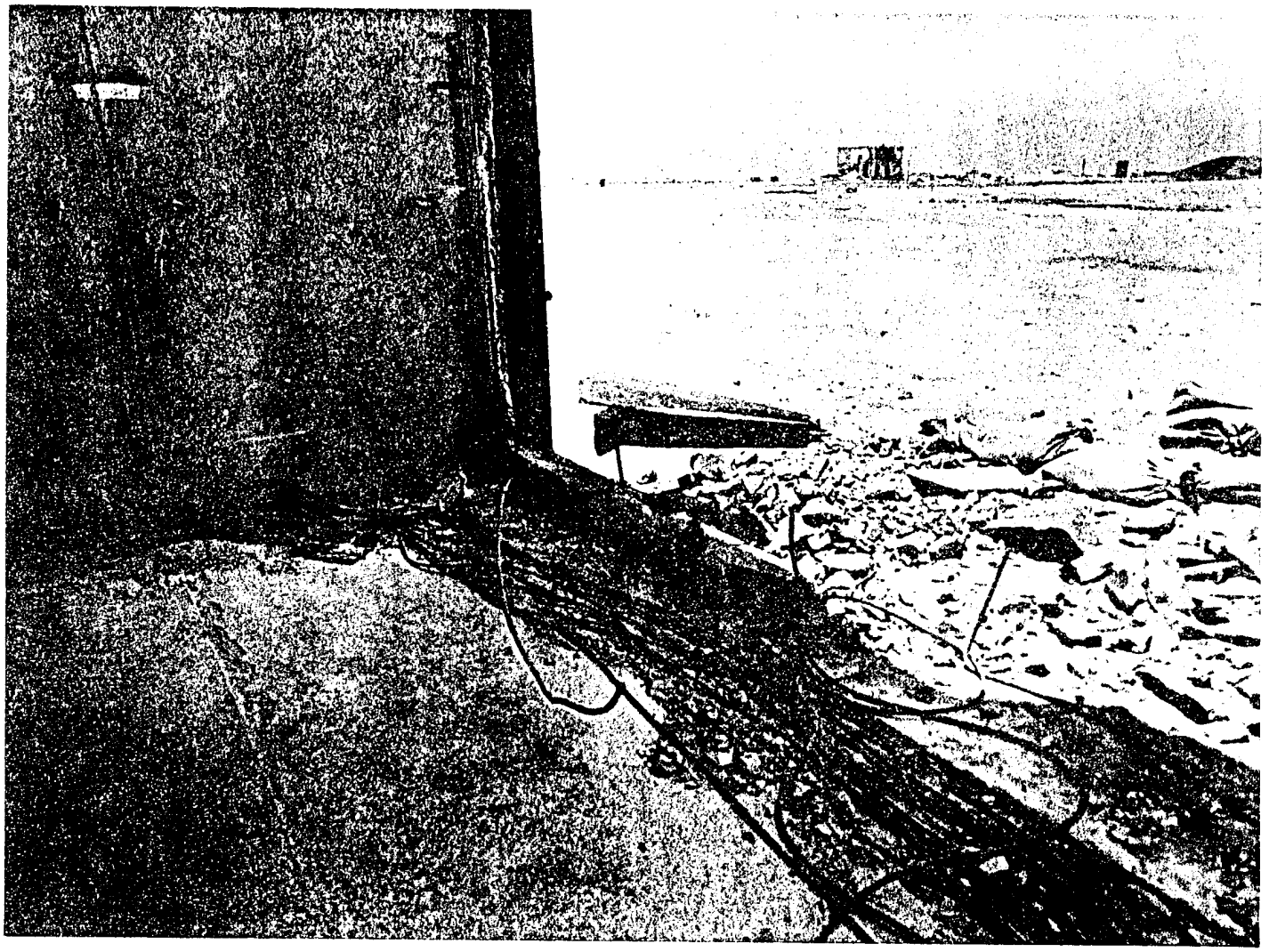


Fig. L.369 Bottom Rib and Rear Rib of Rear Right End Panel, Structure 3.2.4b

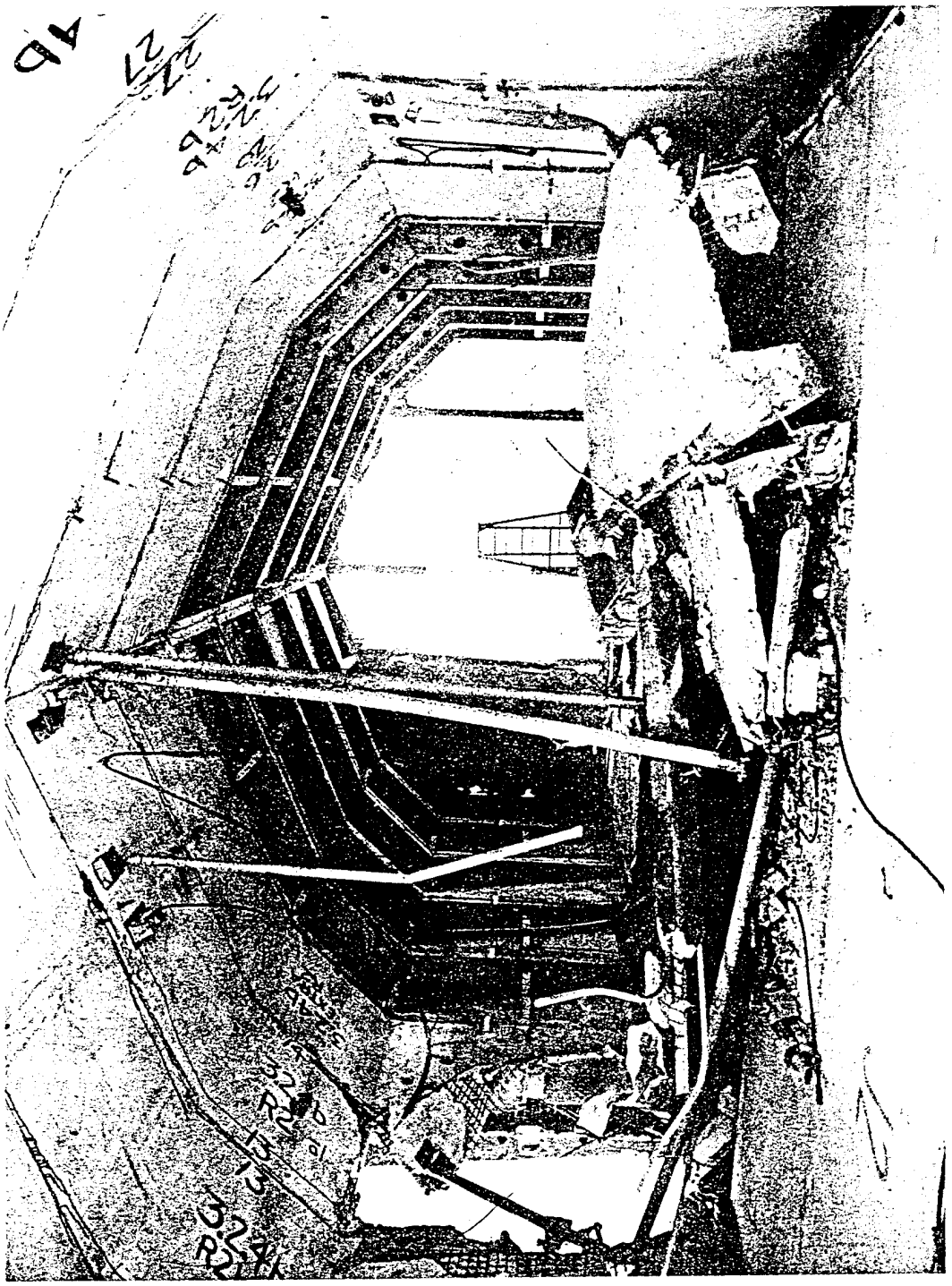


Fig. L.370 Final Position of Center and Rear Right End Panels in Right Foreground, Structure 3.2.4b

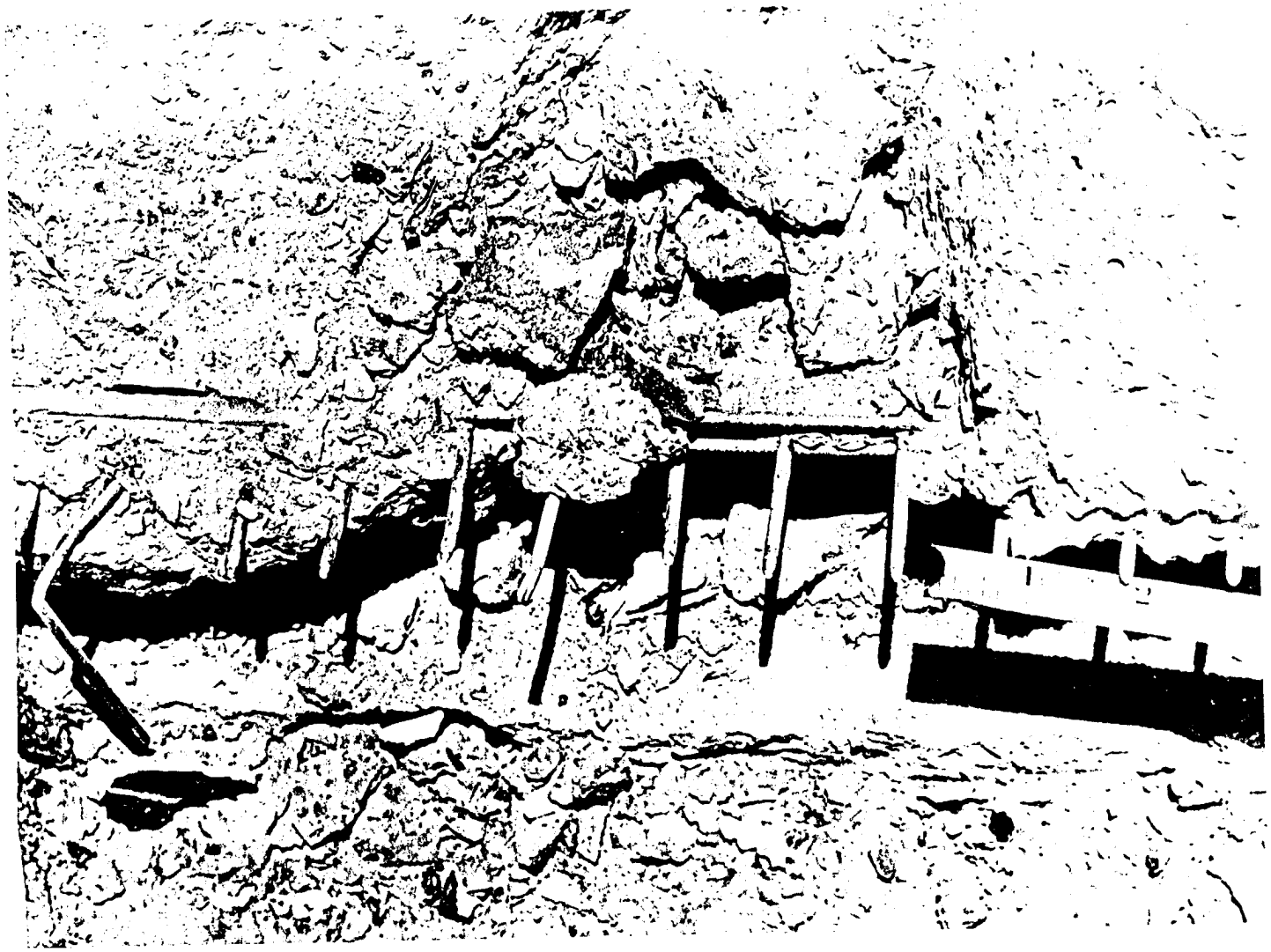


Fig. L.371 Typical Detail of Mesh Failure in End-wall Diaphragms, Structure 3.2.4b



Fig. L.372 Exterior View of Remaining Ribs of Center and Rear Left End Panels, Structure 3.2.4b

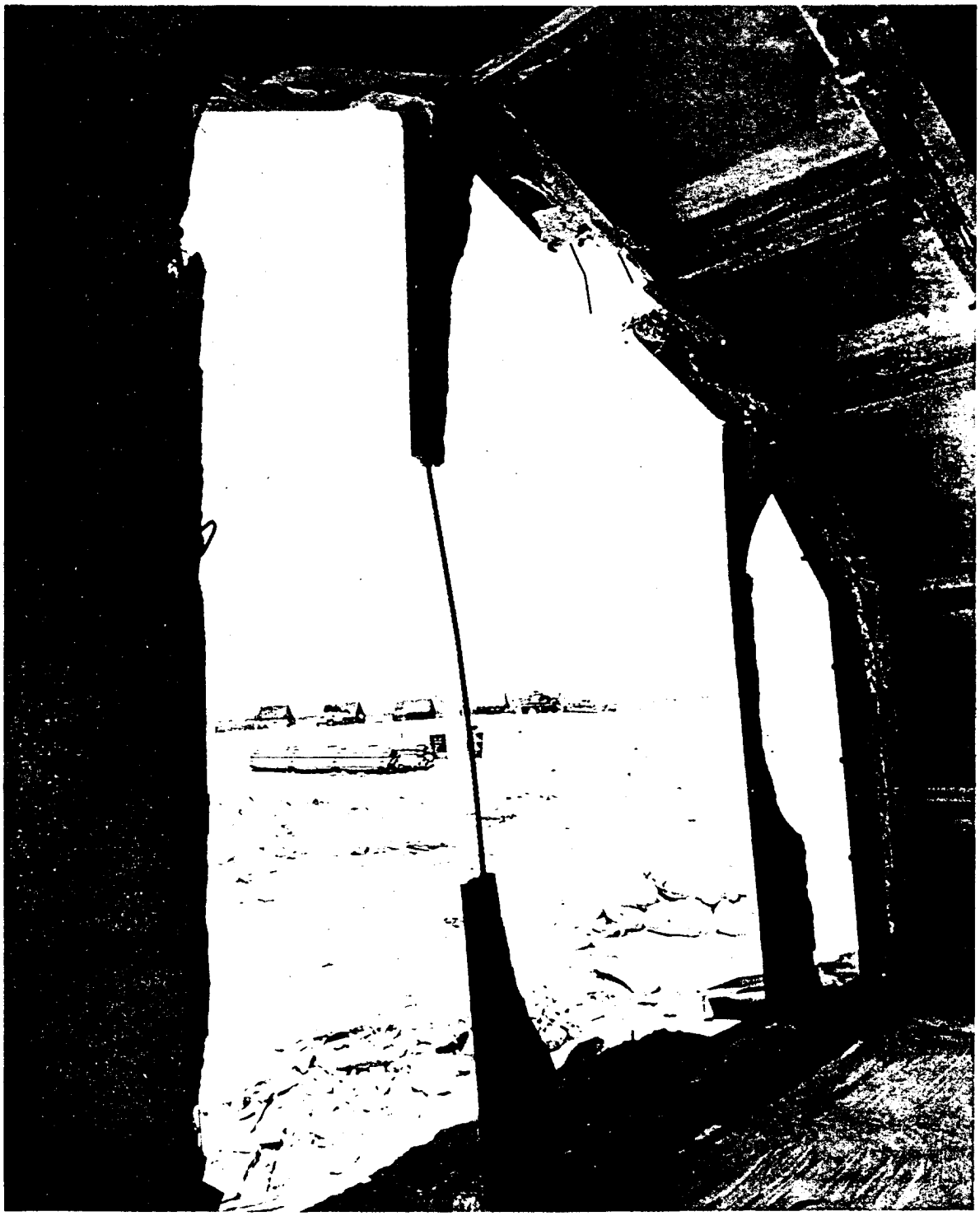


Fig. L.373 Interior View of Remaining Ribs of Center and Rear Left End Panels, Structure 3.2.4b

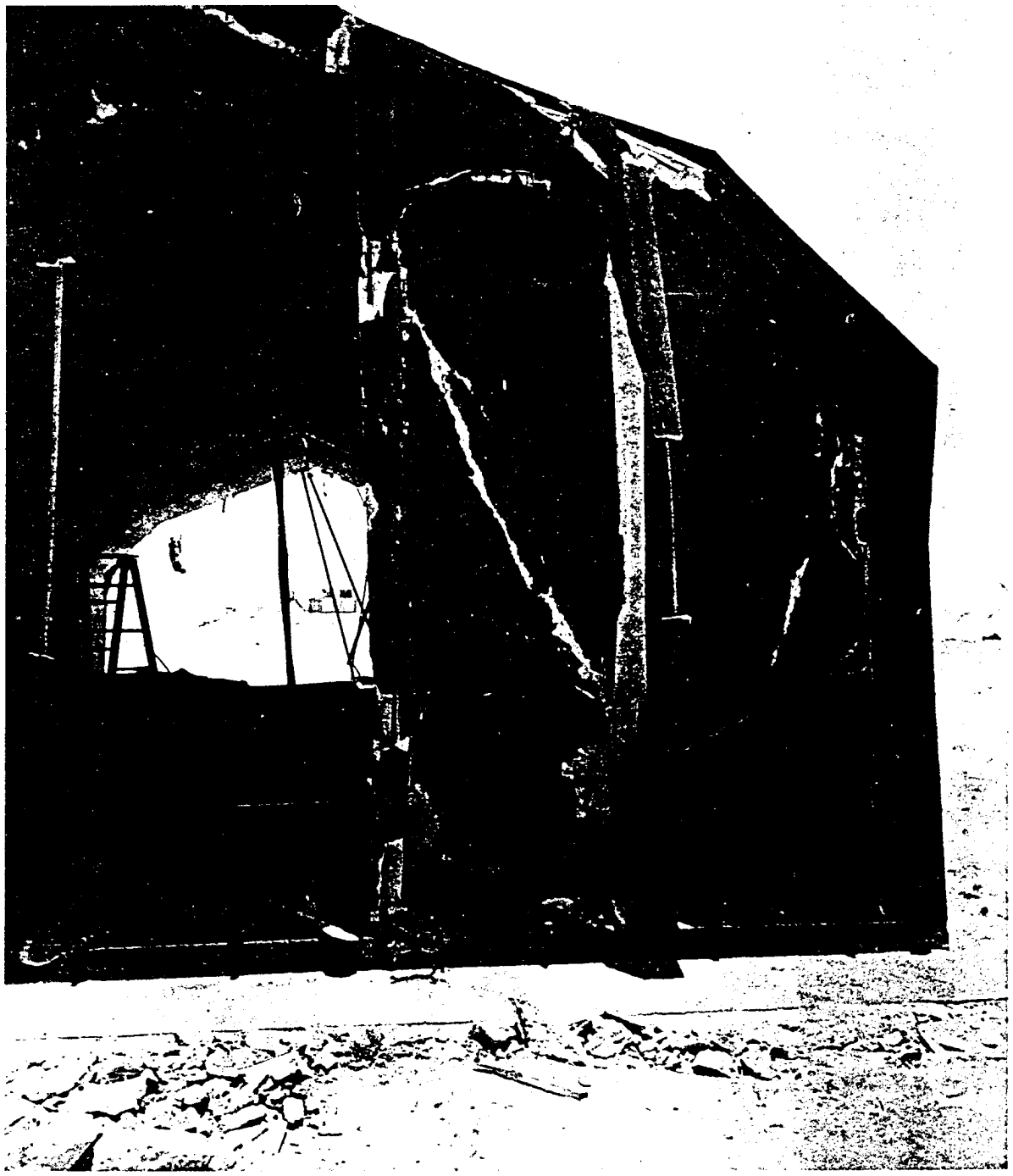


Fig. L.374 Exterior View of Front Left End Panel, Structure 3.2.4b



Fig. L.375 Diagonal Exterior View of Front Left End Panel, Structure 3.2.4b

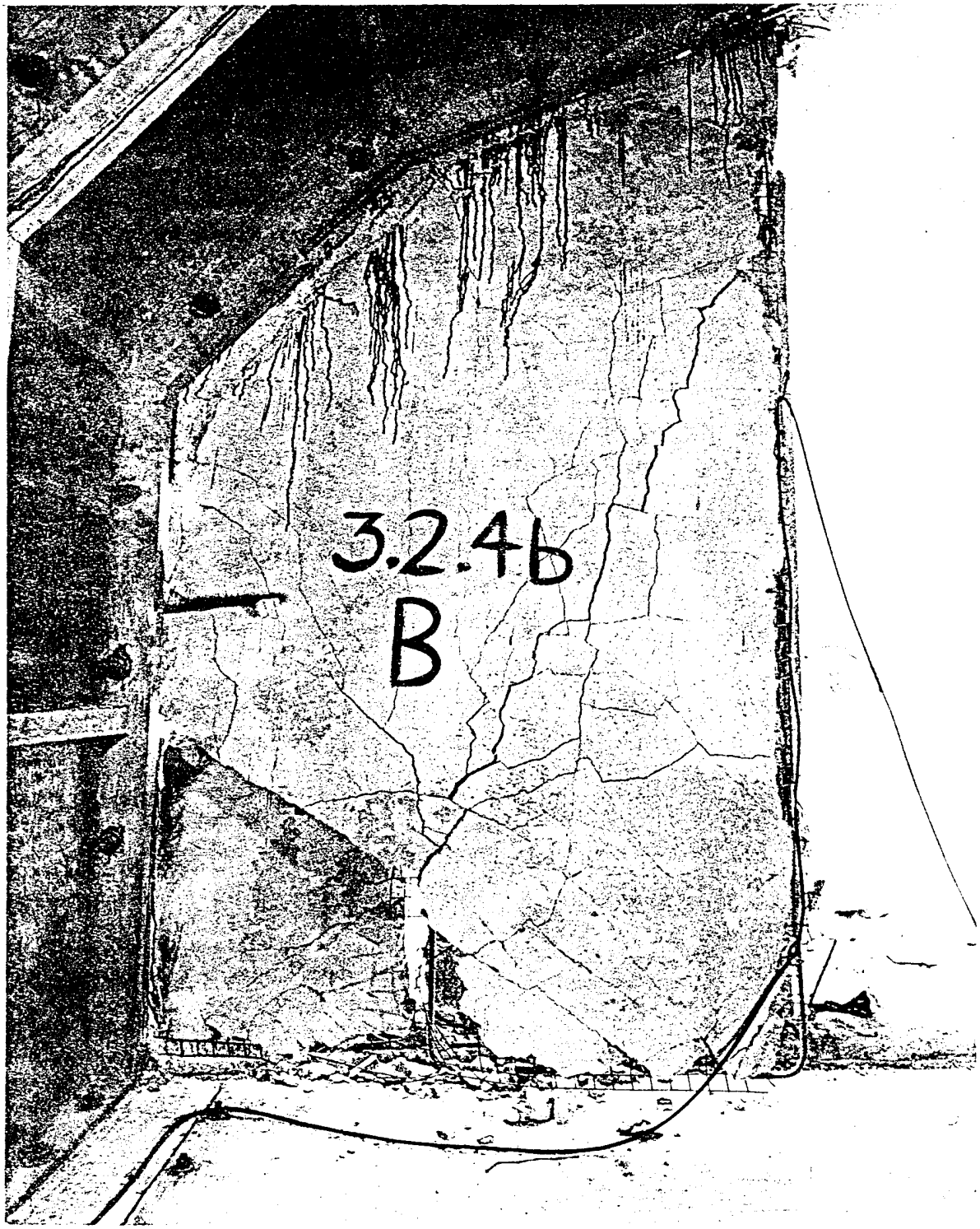


Fig. L 376 Interior View of Front Left End Panel, Structure 3.2.4b



Fig. L.377 Exterior View of Roof Sections, Taken from Right End, Structure 3.2.4b

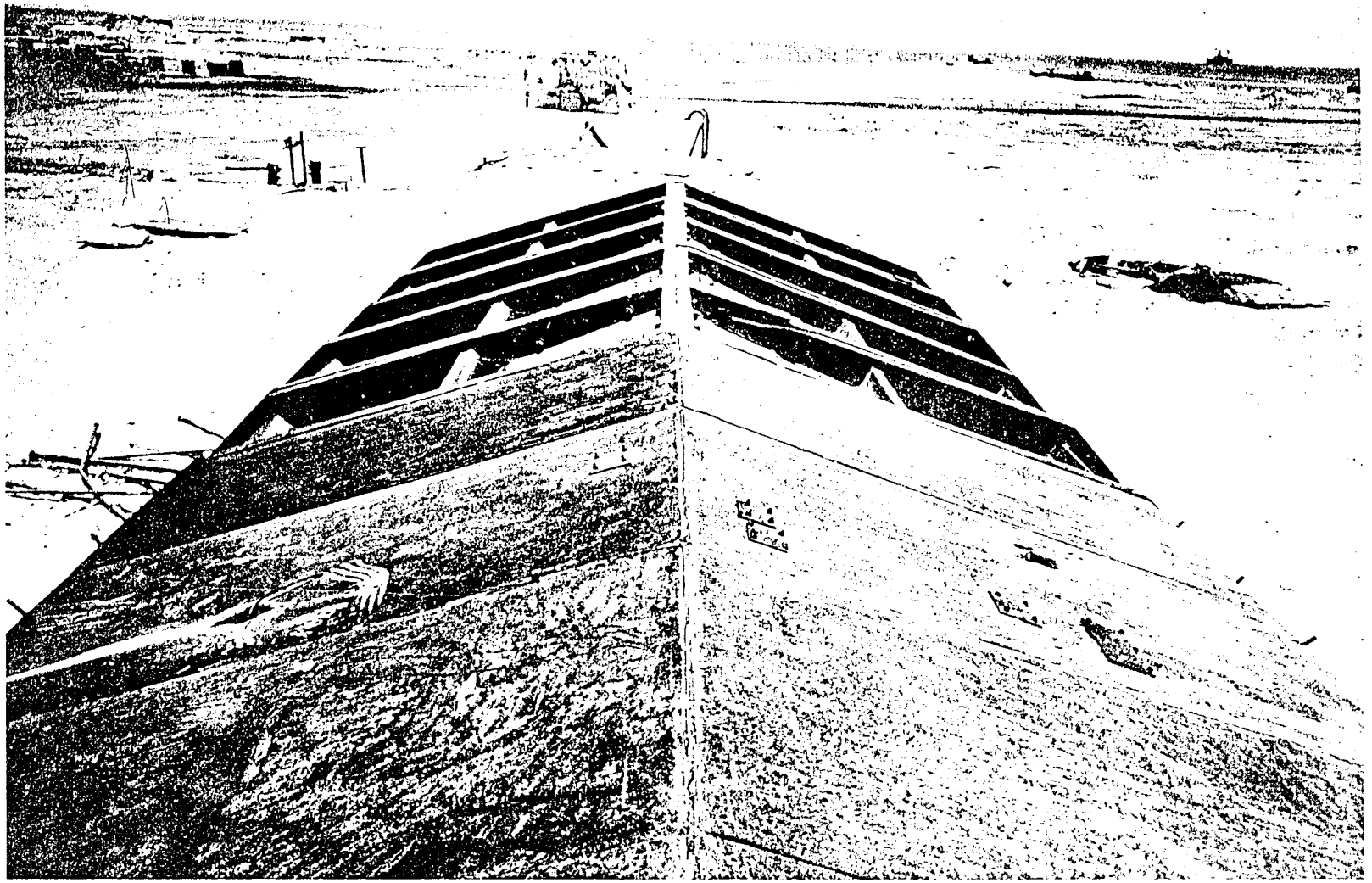


Fig. L.378 Exterior View of Roof Sections, Taken from Left End, Structure 3.2.4b

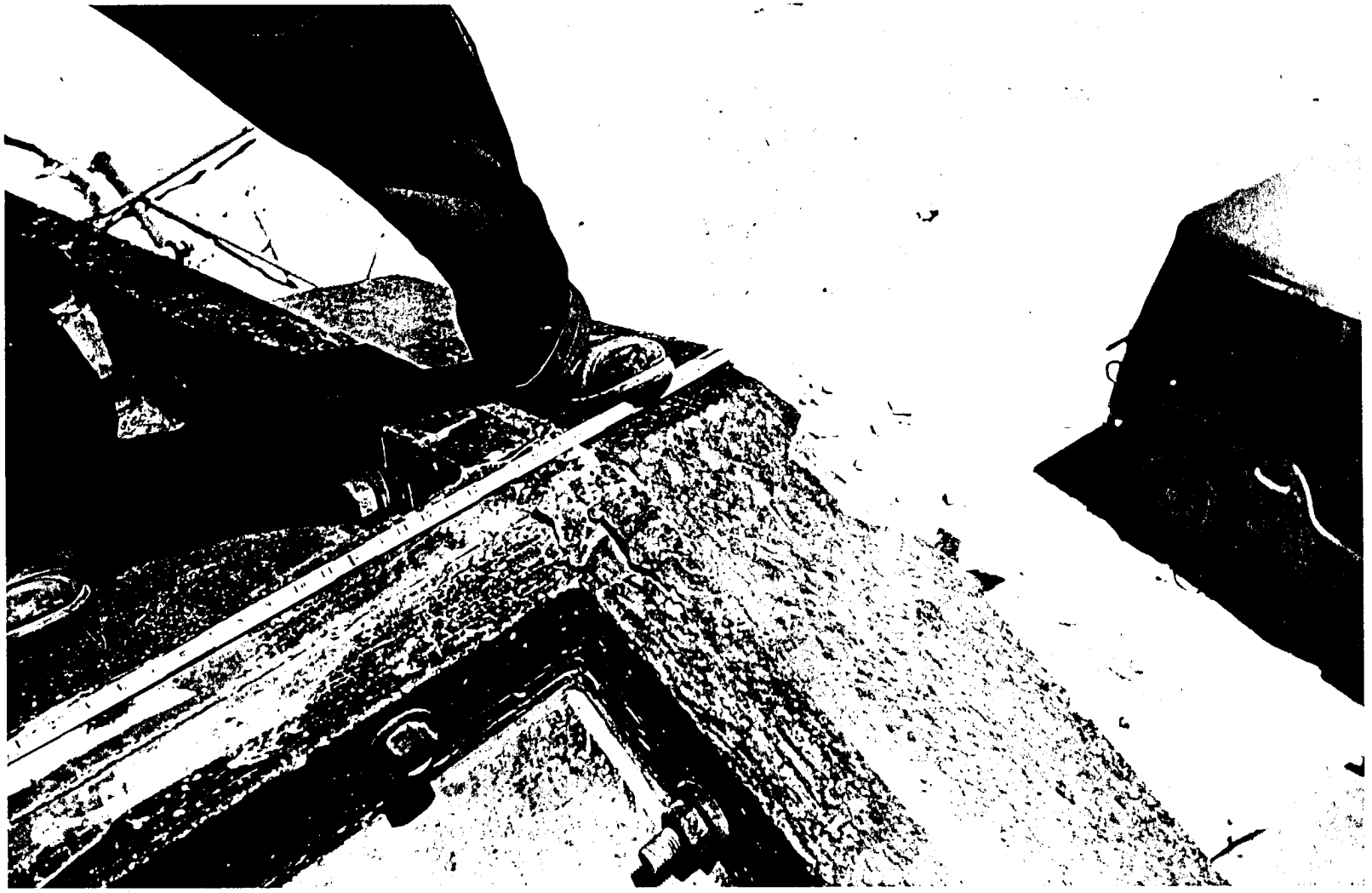


Fig. L.379 Detail View of Joint of Ribs-out Panels Adjacent to Right End of Structure, 3.2.4b



Fig. L.380 Detail View of Joint of Ribs-out Panels First and Second from Right End of Structure, 3.2.4b

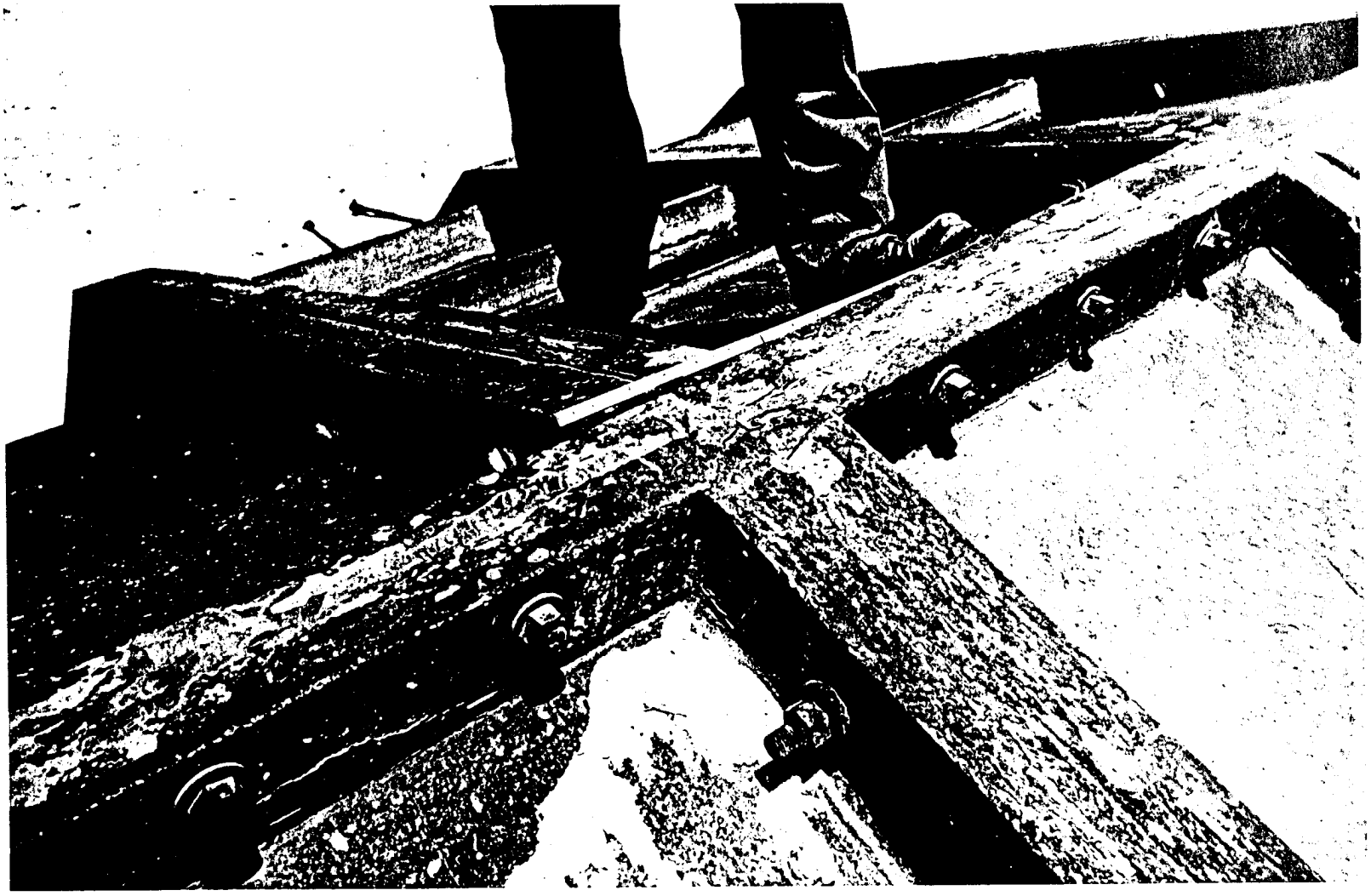


Fig. L.381 Detail View of Joint of Ribs-out Panels Second and Third from Right End of Structure, 3.2.4b

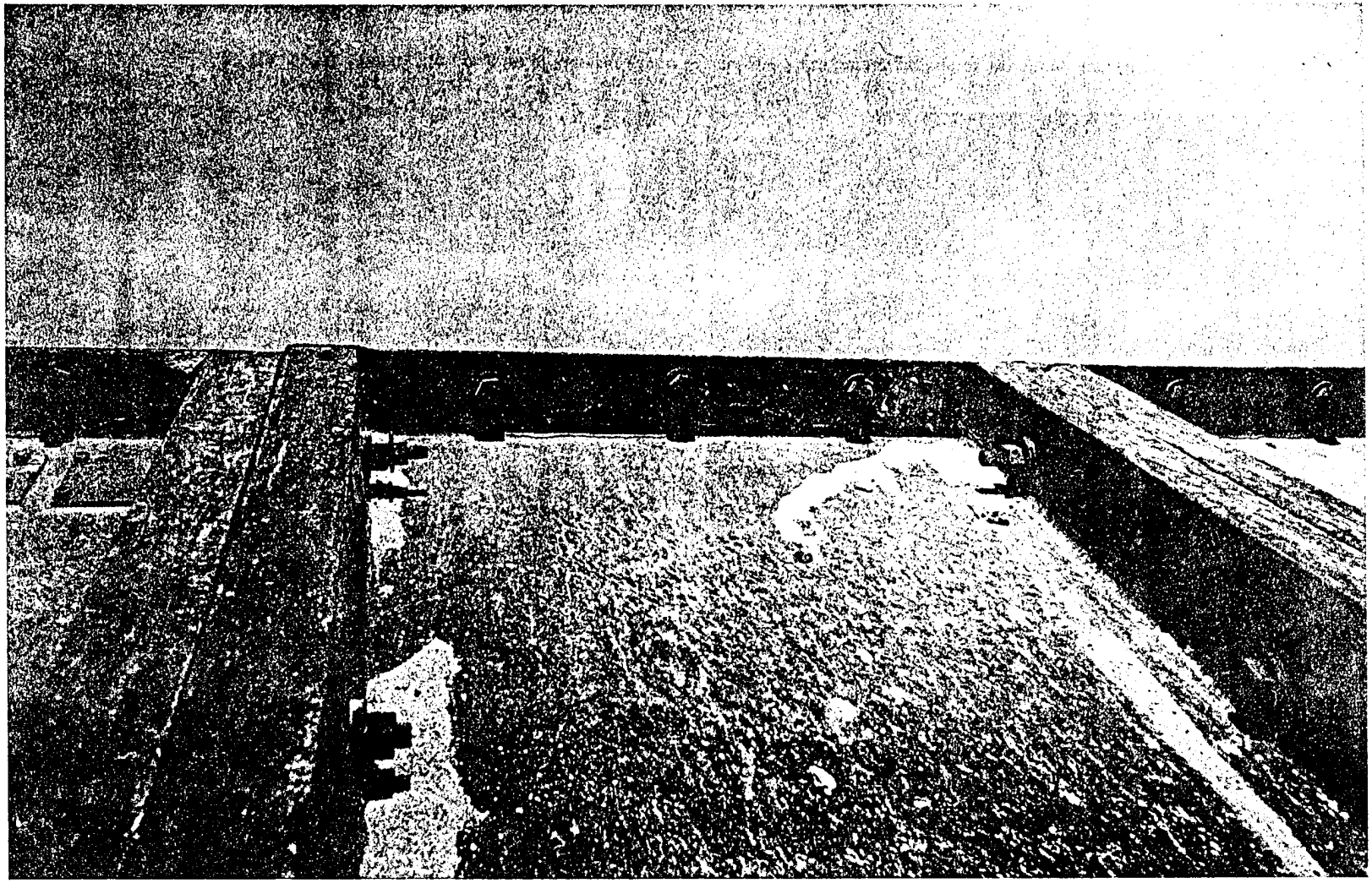


Fig. L.382 Roof Section Toward Crown of Ribs-out Panel Third from Right End of Structure, 3.2.4b



Fig. L.383 Roof Section Toward Base of Ribs-out Panel Third from Right End of Structure, 3.2.4b



Fig. L.384 Detail View of Joint of Ribs-out Panels Third and Fourth from Right End of Structure, 3.2.4b

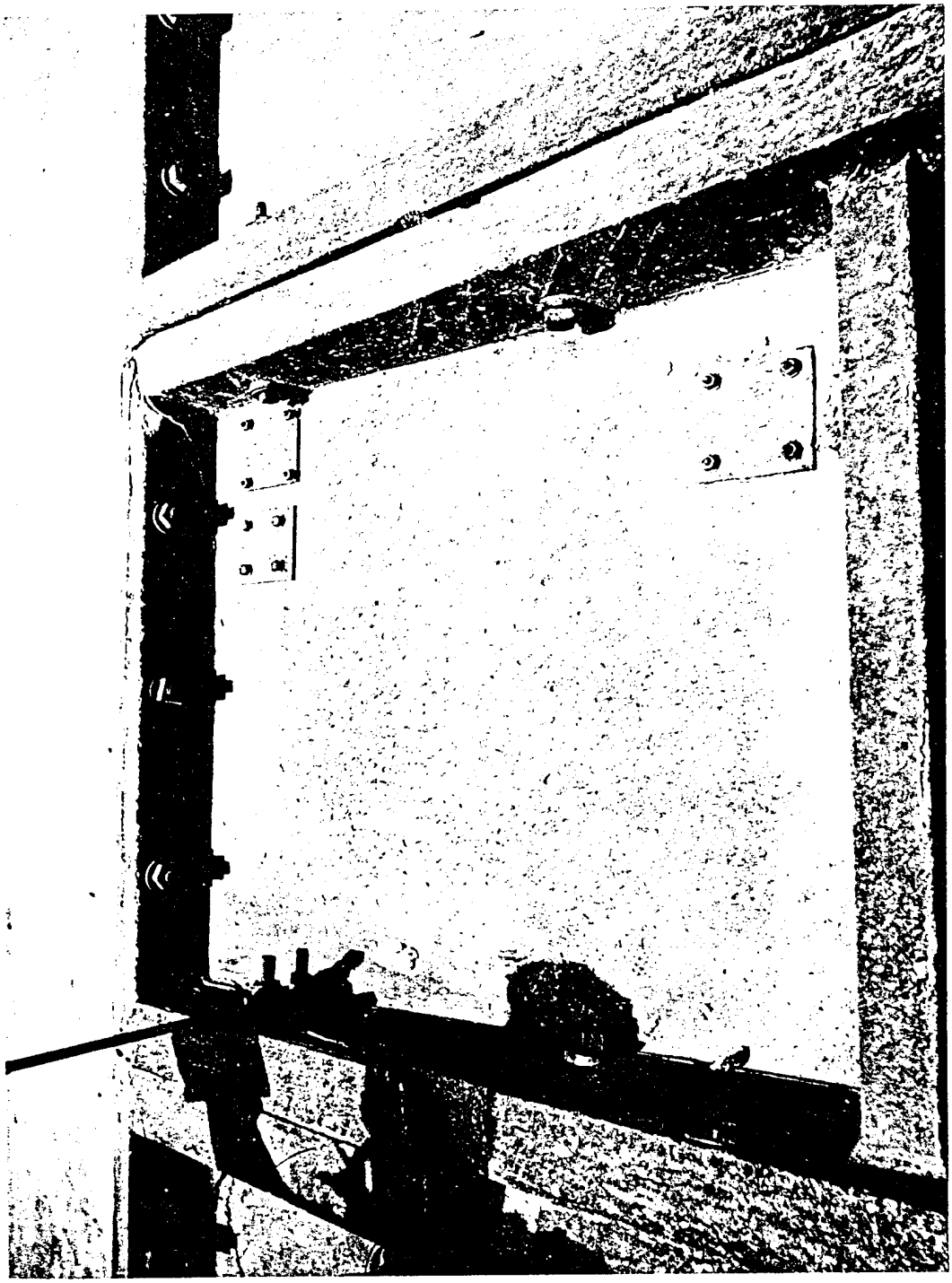


Fig. L.385 Roof Section Toward Crown of Ribs-out Panel Fourth from Right End of Structure, 3,2,4b



Fig. L.386 Roof Section Toward Base of Ribs-out Panel Fourth from Right End of Structure, 3.2.4b



Fig. L.387 Detail View of Joint of Ribs-out Panels Fourth and Fifth from Right End of Structure, 3.2.4b

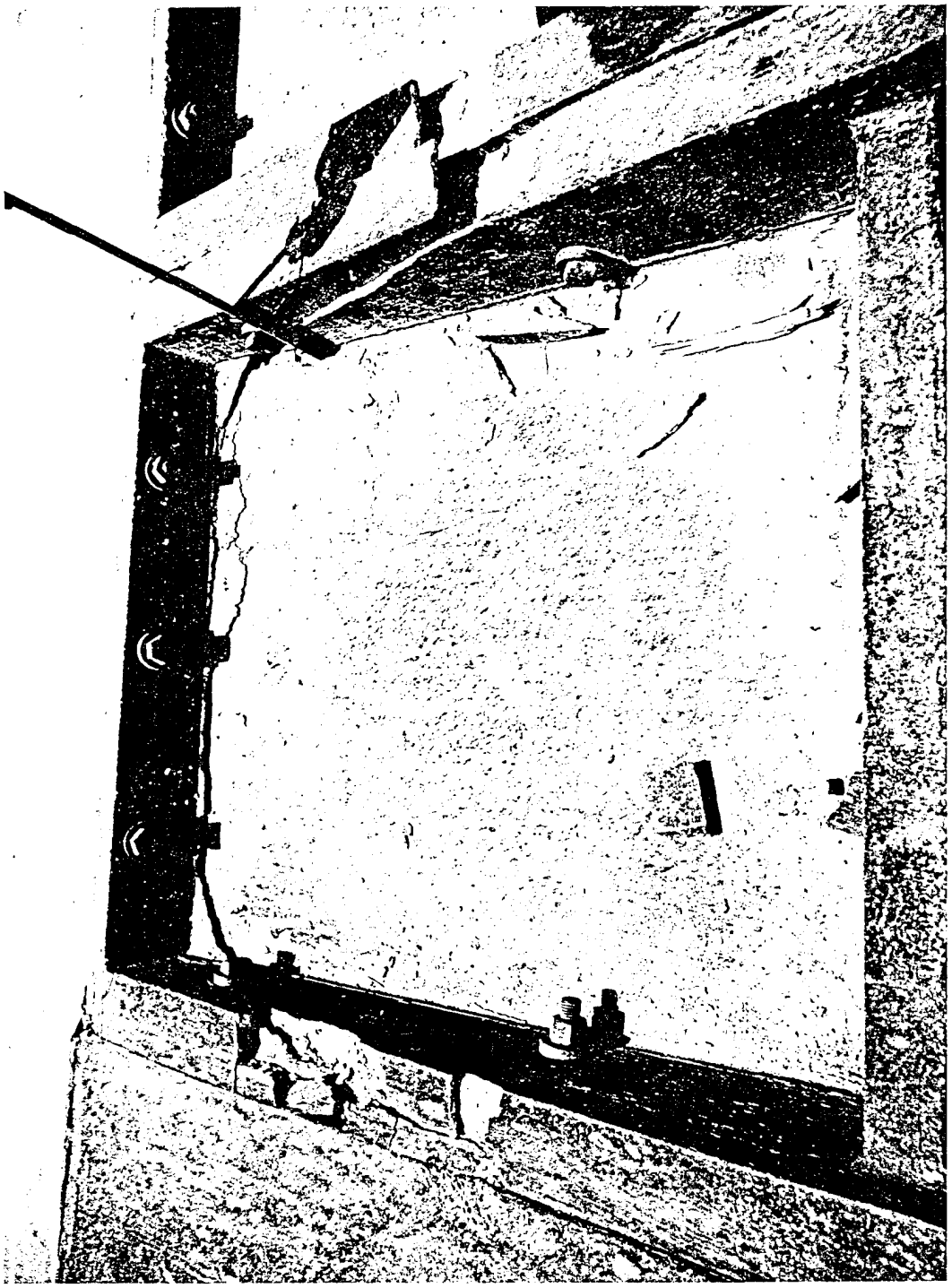


Fig. L.388 Roof Section Toward Crown of Ribs-out Panel Fifth from Right End of Structure, 3.2.4b

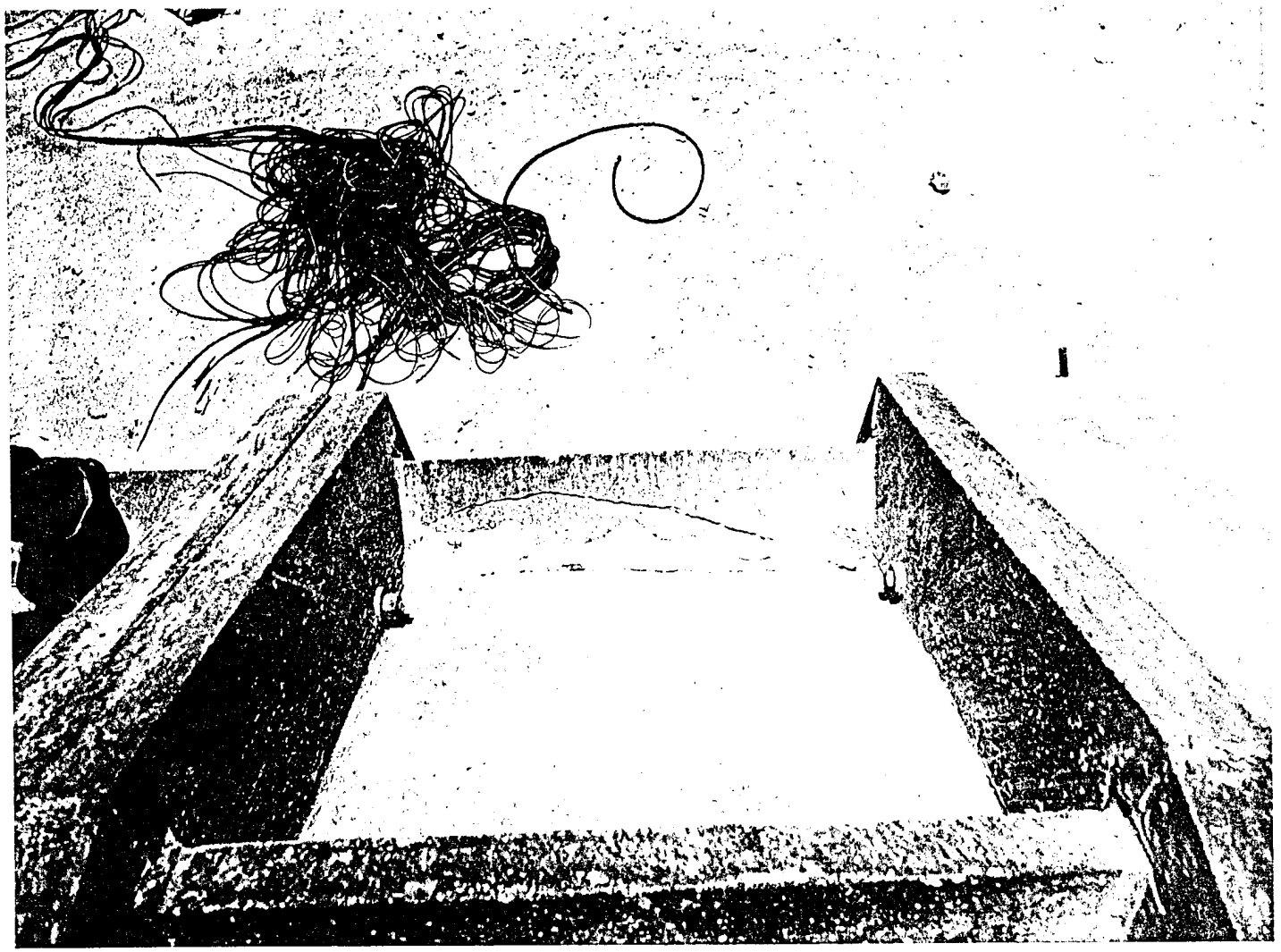


Fig. L.389 Roof Section toward Base of Ribs-out Panel Fifth from Right End of Structure, 3.2.4b

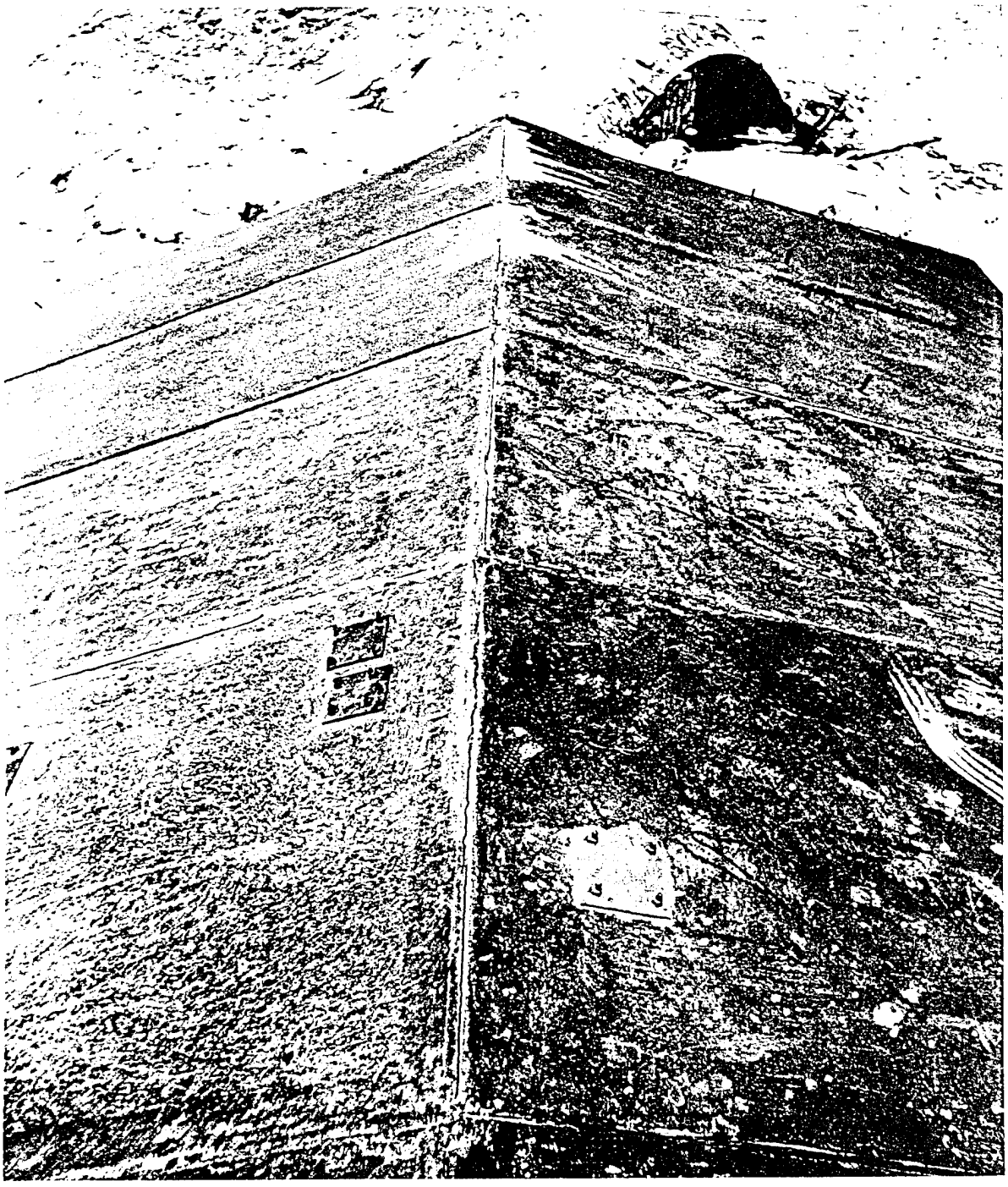


Fig. L.390 Detail of Crown Intersection of Ribs-in Panels, Structure 3.2.4b



Fig. L.391 Detail of Intersection of Left End Wall and Ribs-in Panels Adjacent to Left End, Structure 3.2.4b

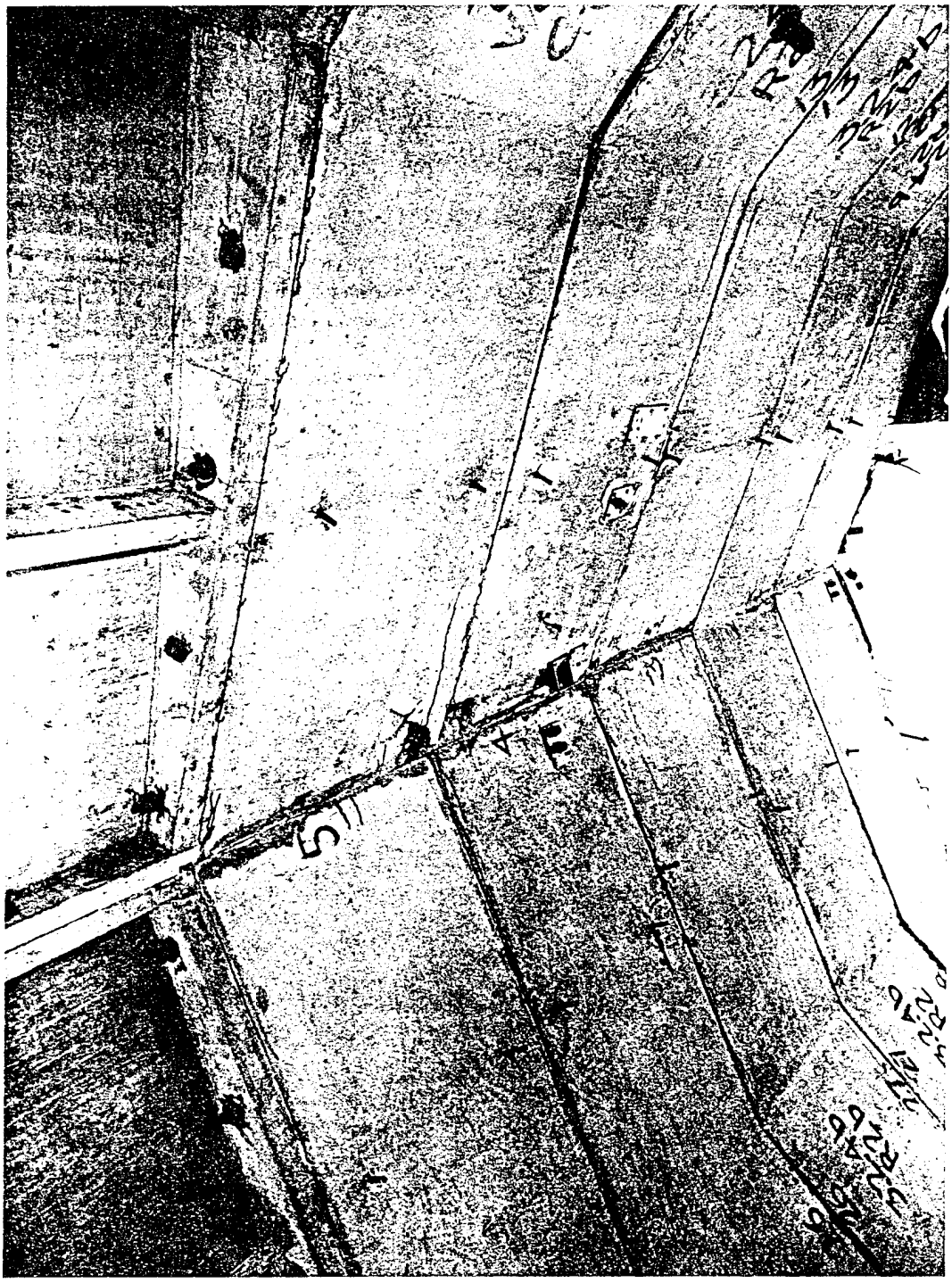


Fig. L.392 Interior View of Roof Section of Ribs-out Panels, Structure 3.2.4b

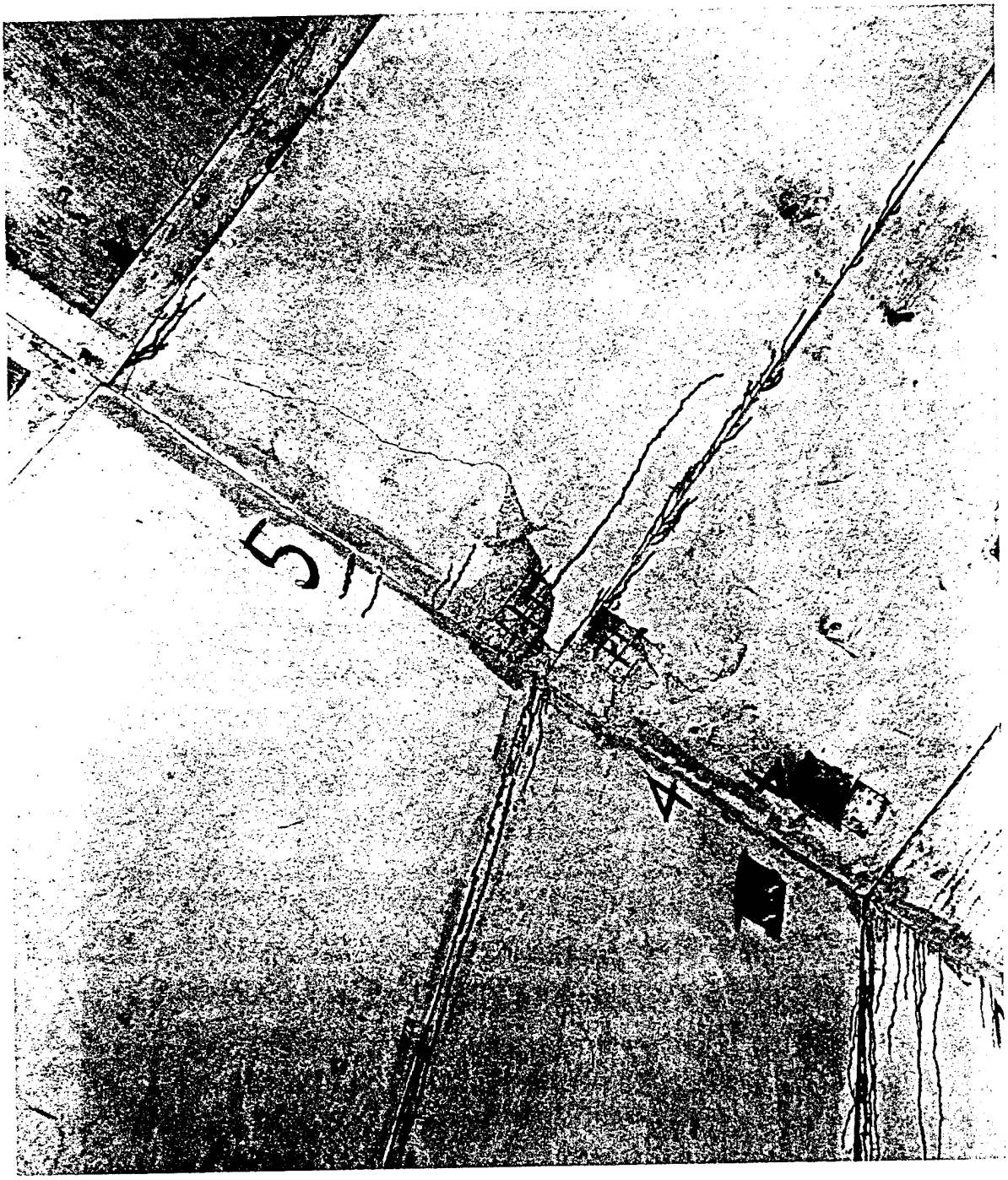


Fig. L.393 Interior Detail of Failure of Roof Section of Ribs-out Panels Fourth and Fifth from Right End of Structure, 3.2.4b

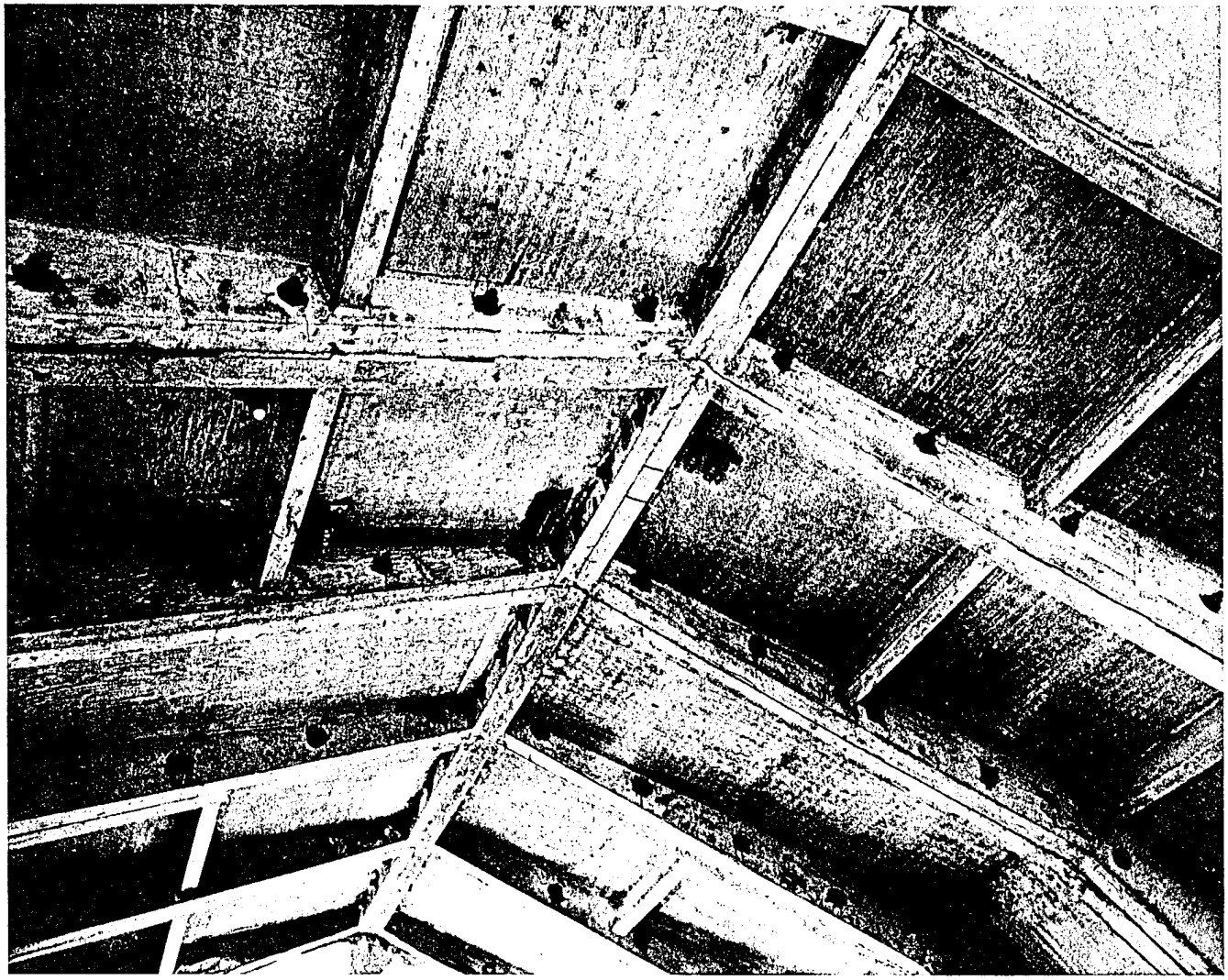


Fig. L.394 Interior View of Roof Section of Ribs-in Panels, Structure 3.2.4b

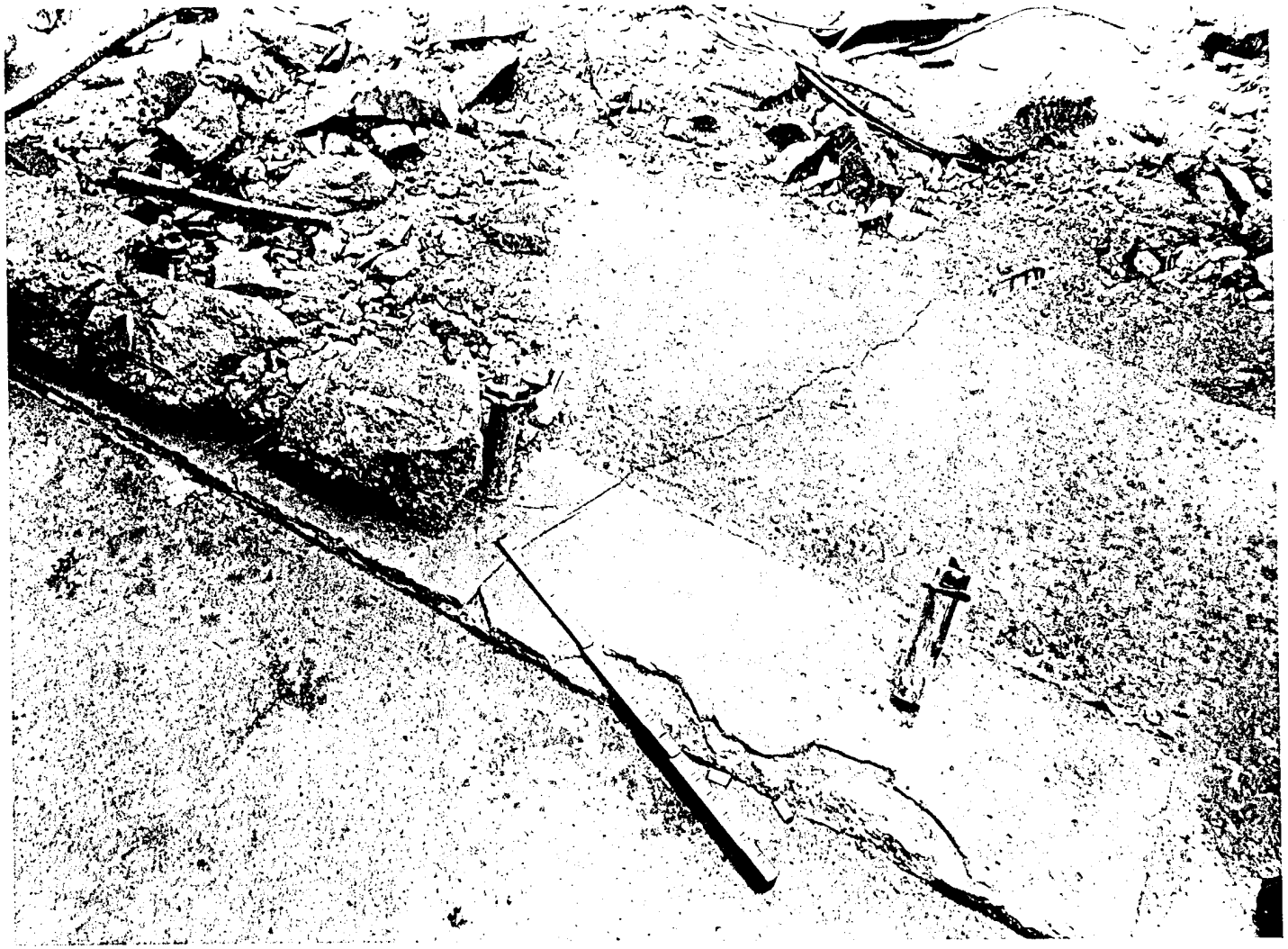


Fig. L.395 Detail of Right End Foundation Crack at Rear Third Point, Structure 3.2.4b



Fig. L.396 Detail of Right End Foundation Crack Showing Crack Width Diminishing with Depth, Structure 3.2.4b

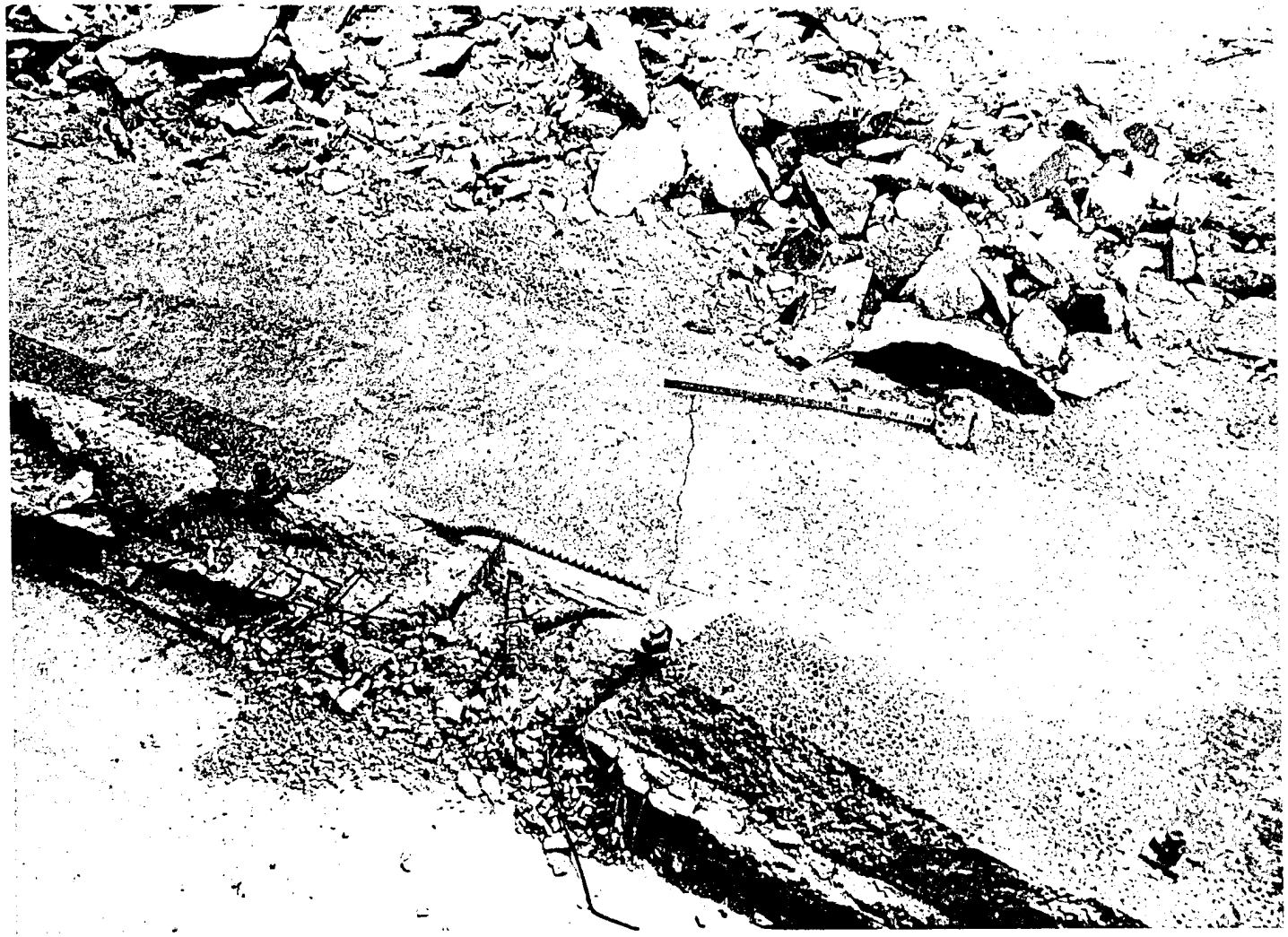


Fig. L.397 Detail of Left End Foundation Crack at Rear Third Point, Structure 3.2.4b

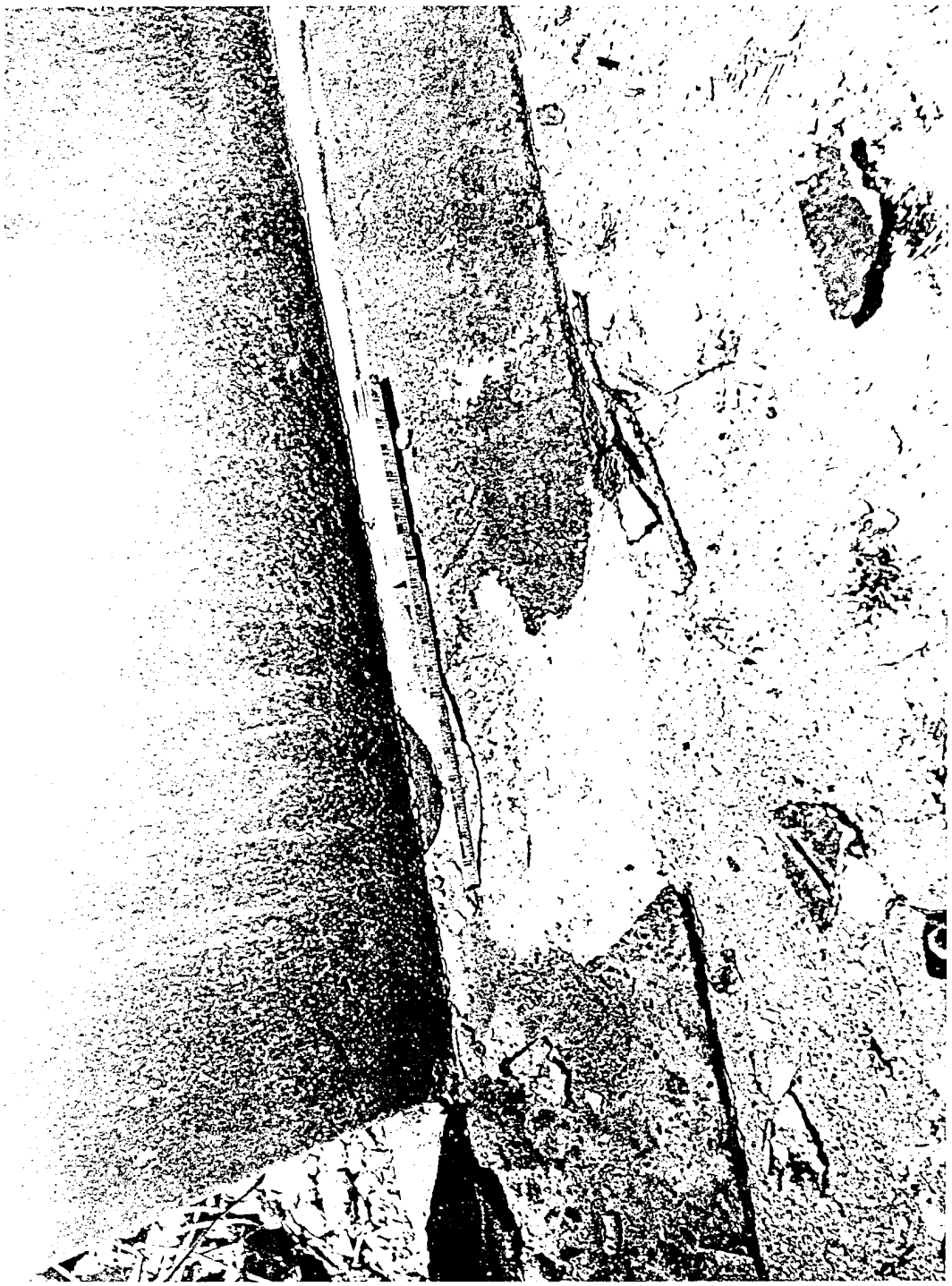


Fig. L.398 Detail of Spall in Front Foundation near Left Edge of Left Front-wall Panel, Structure 3.2.4b

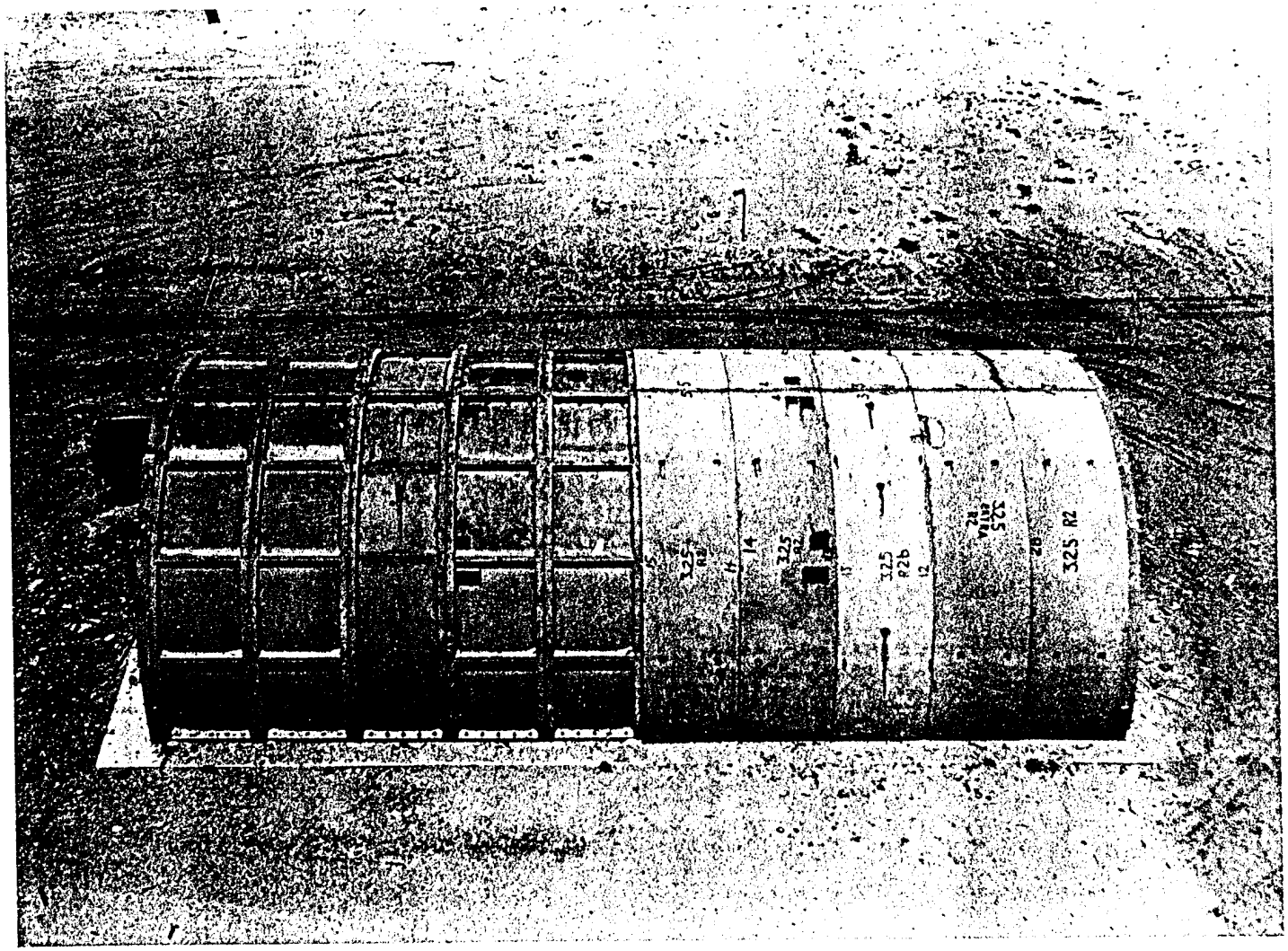


Fig. L.399 Postshot Aerial View from Front, Structure 3.2.5

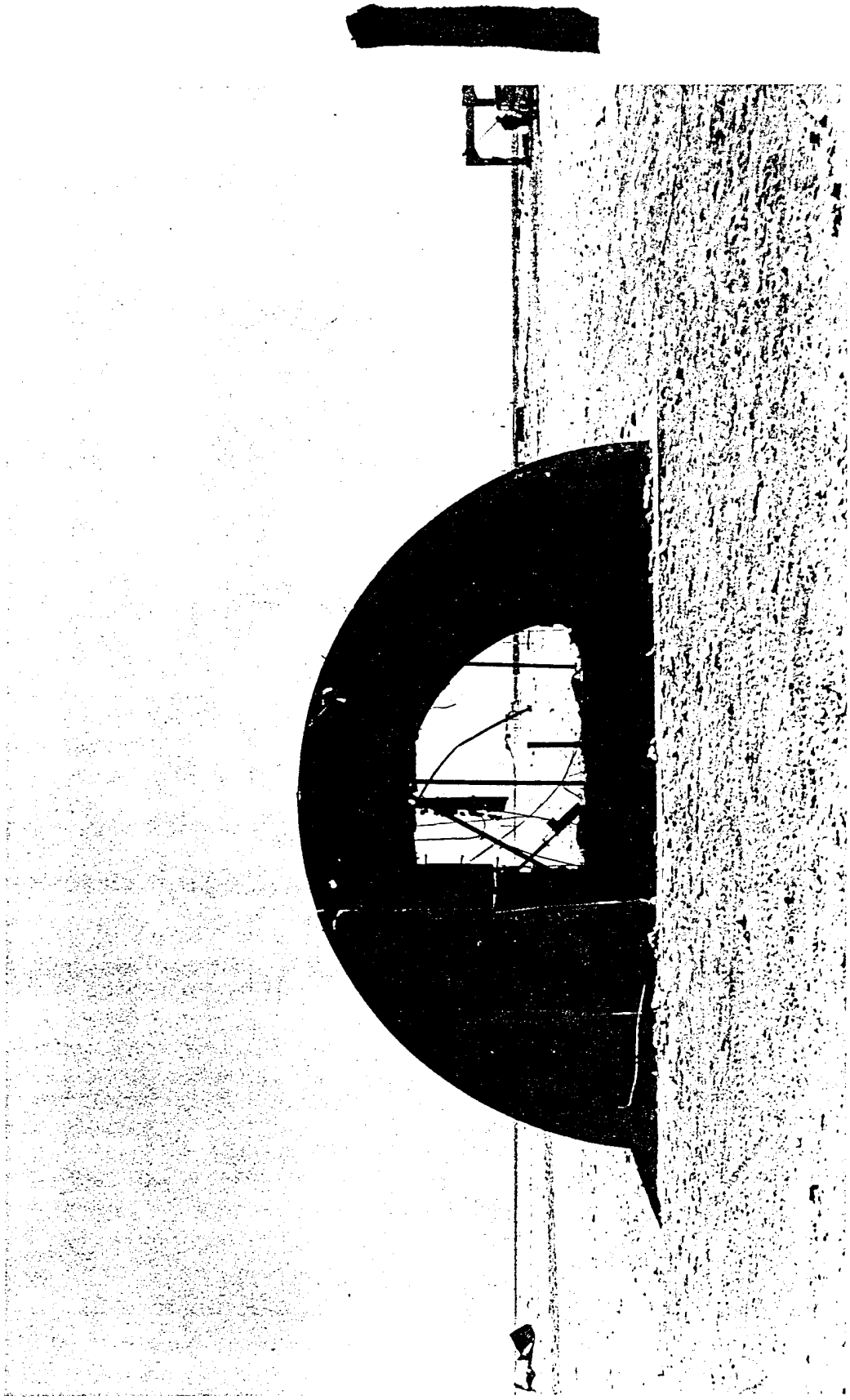


Fig. L.400 Right End Wall, Structure 3.2.5

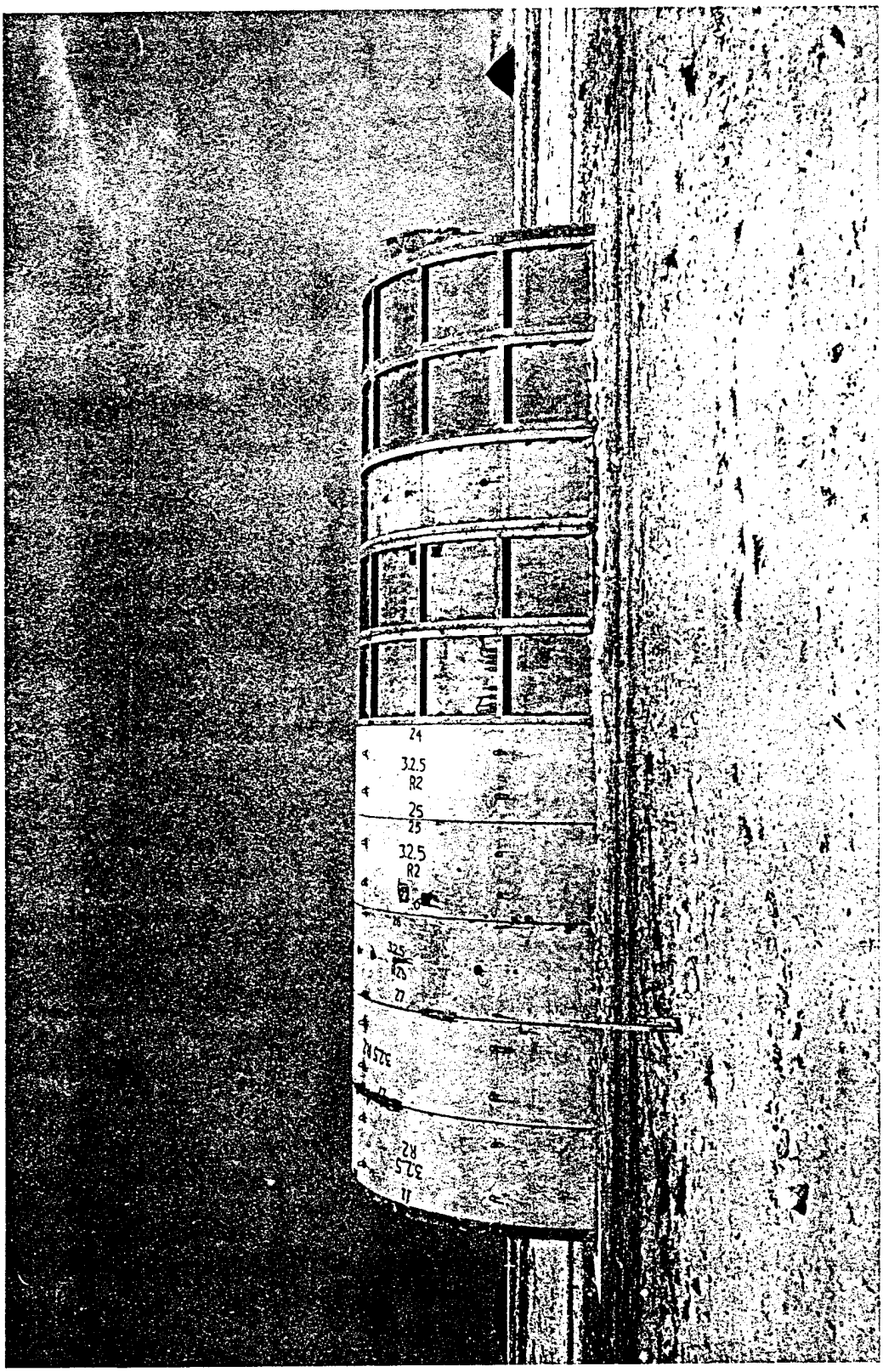


Fig. L.401 Rear Wall, Structure 3.2.5

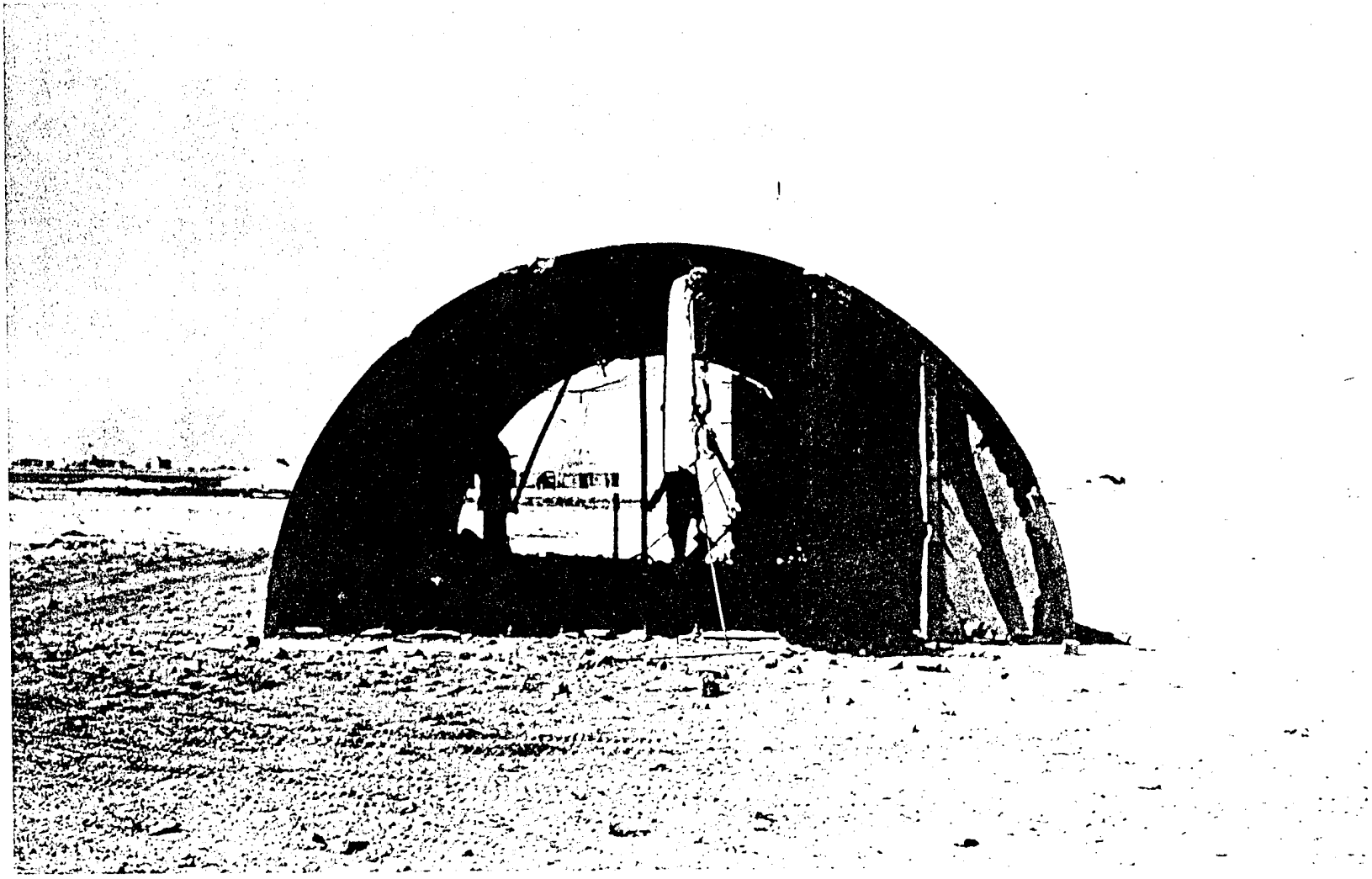


Fig. L.402 Left End Wall, Structure 3.2.5

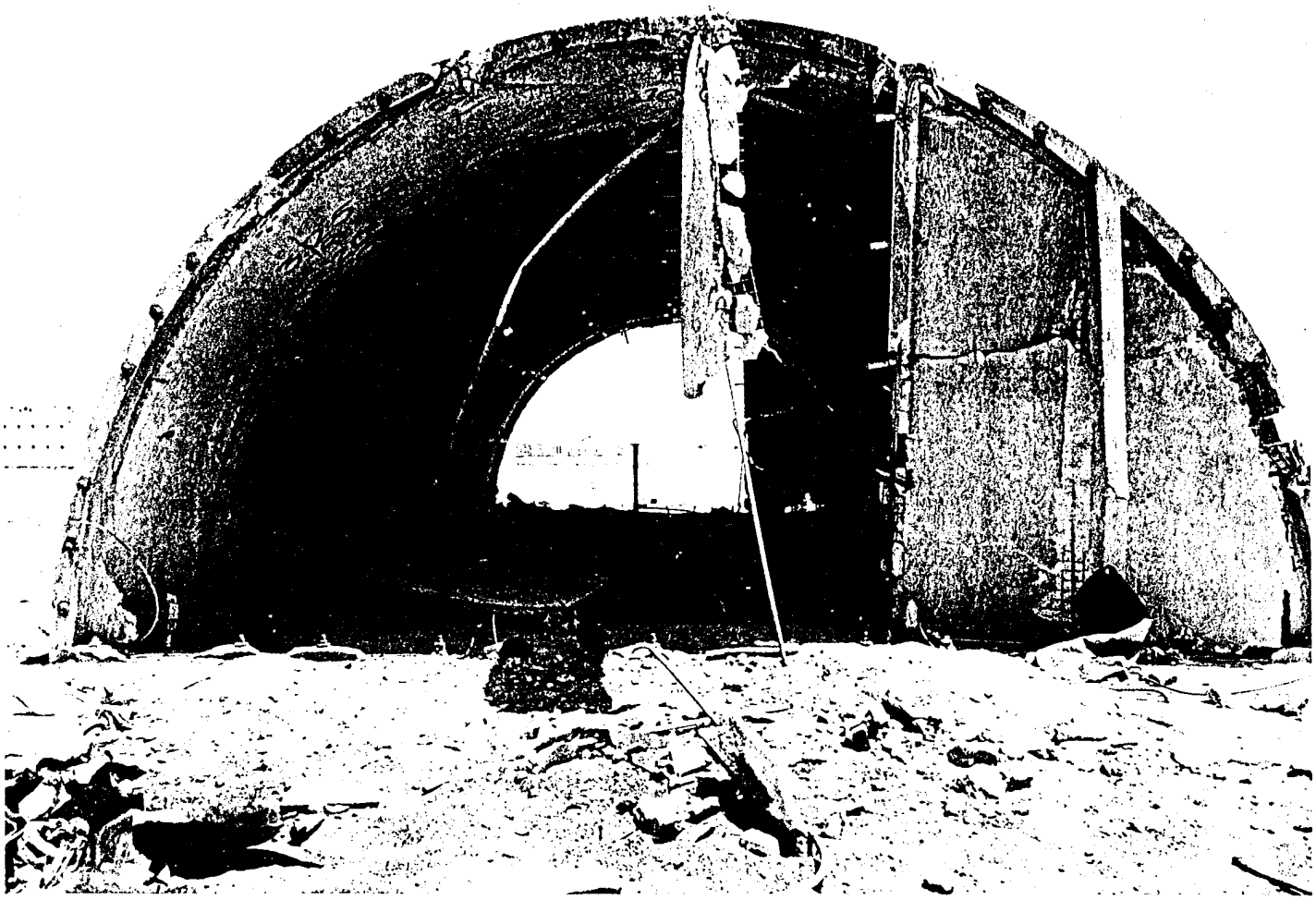


Fig. L.403 Close-up of Left Side, Structure 3.2.5. Note top half of center panel hanging by a single bar.

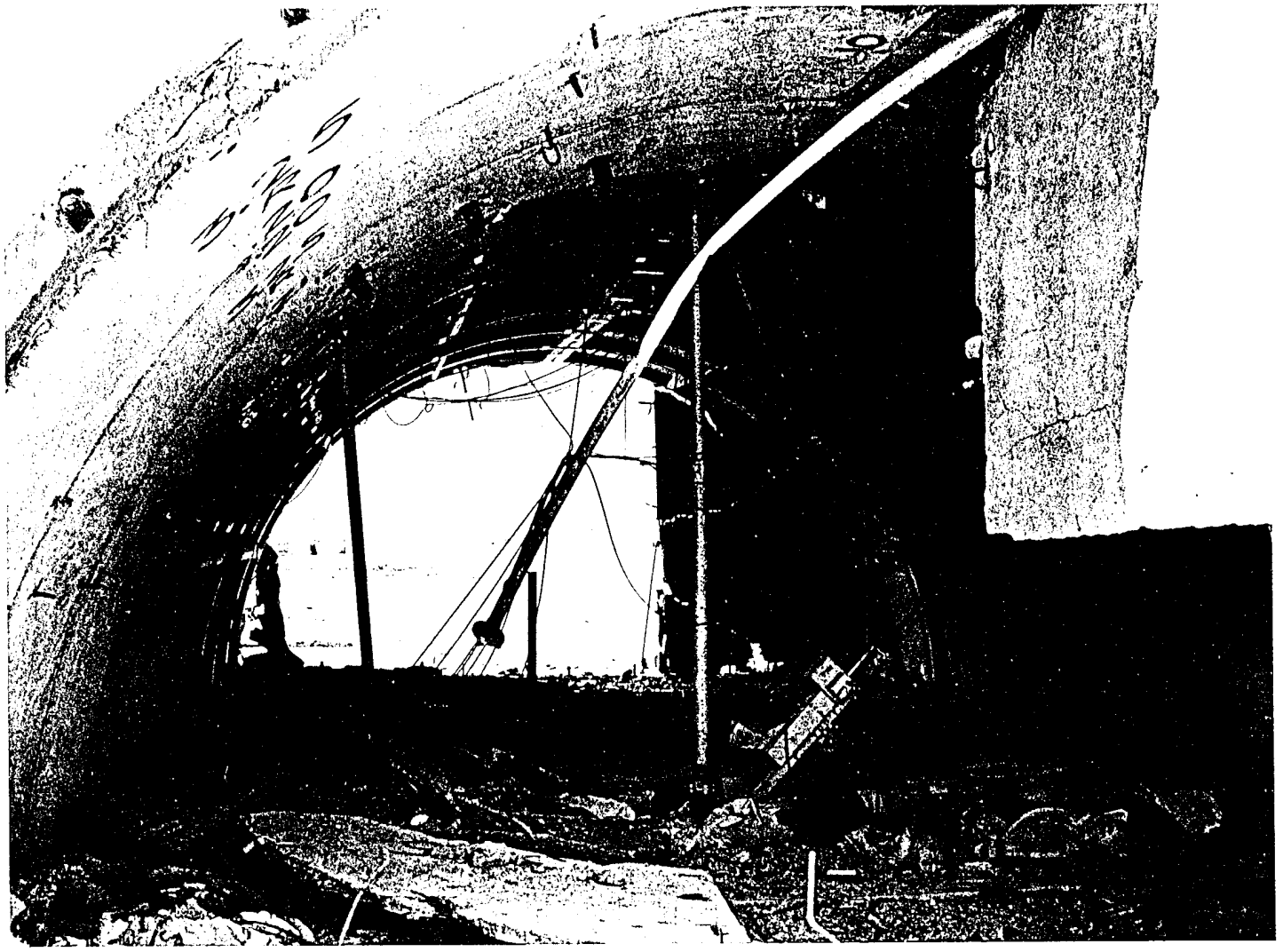


Fig. L.404 End-wall Panel Debris from Left End, Structure 3.2.5

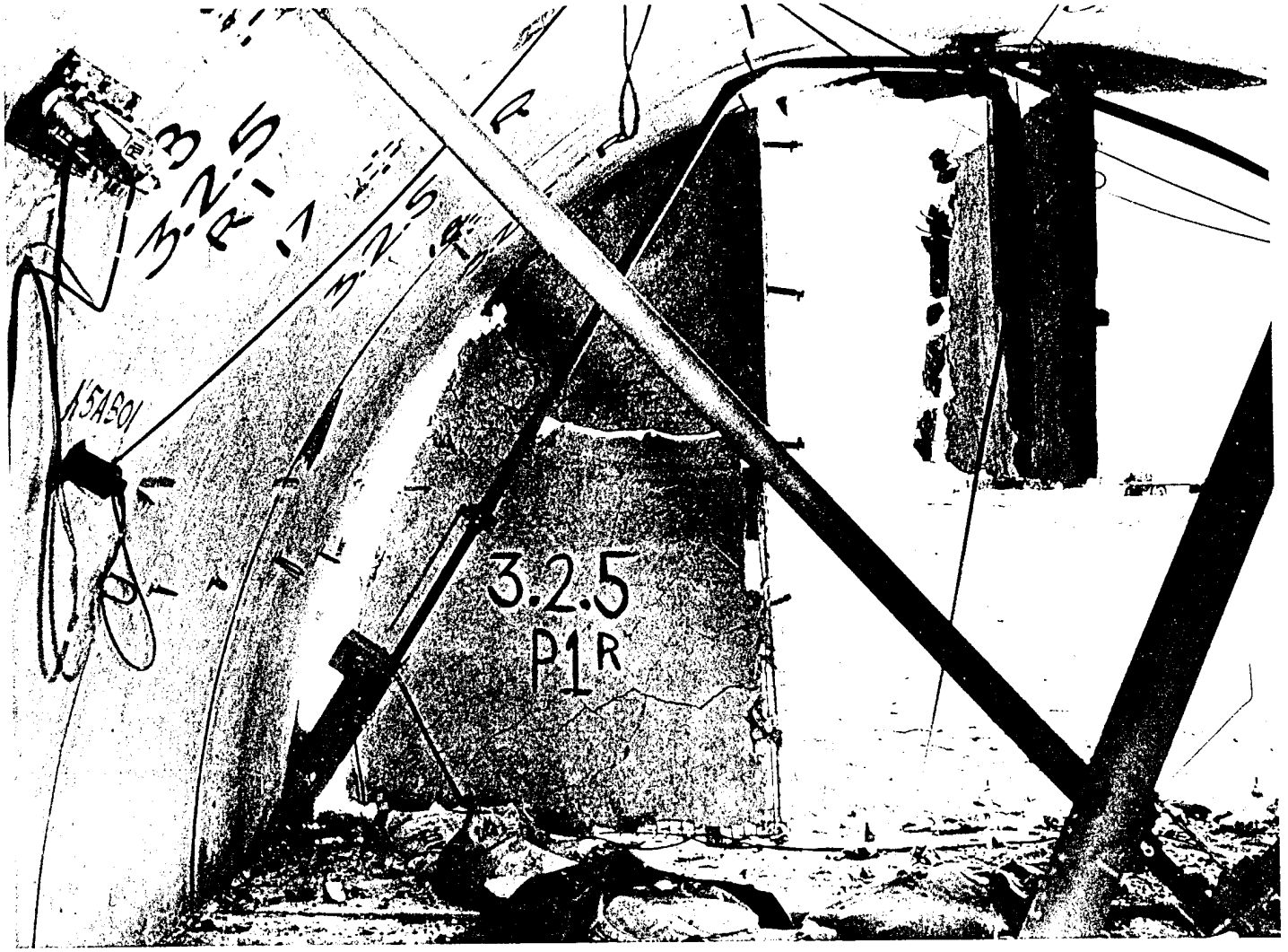


Fig. L.405 Interior View of Left End, Structure 3.2.5

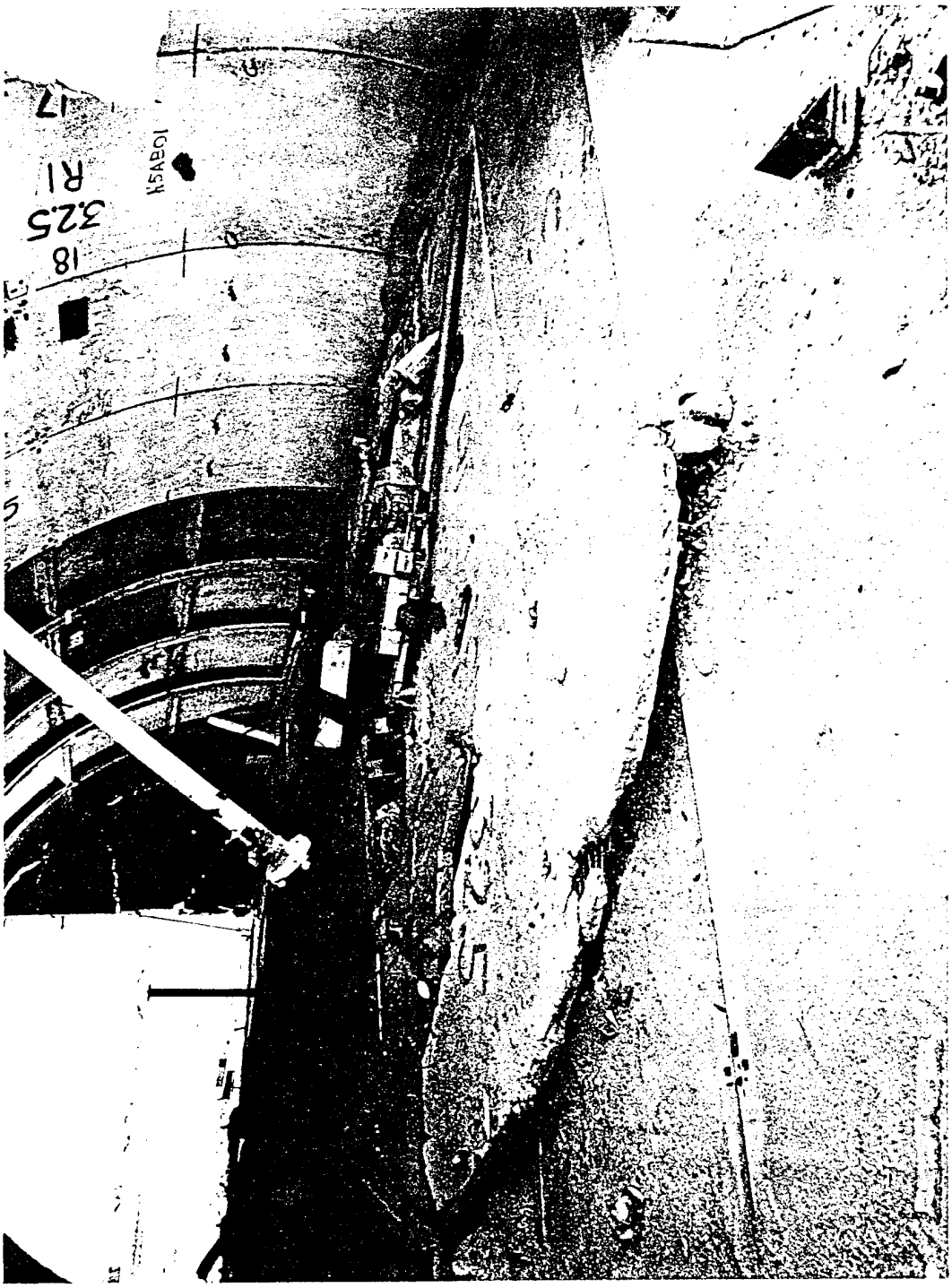


Fig. L.406 Top Half of Rear Panel on Left End Wall Lying inside Structure, 3.2.5

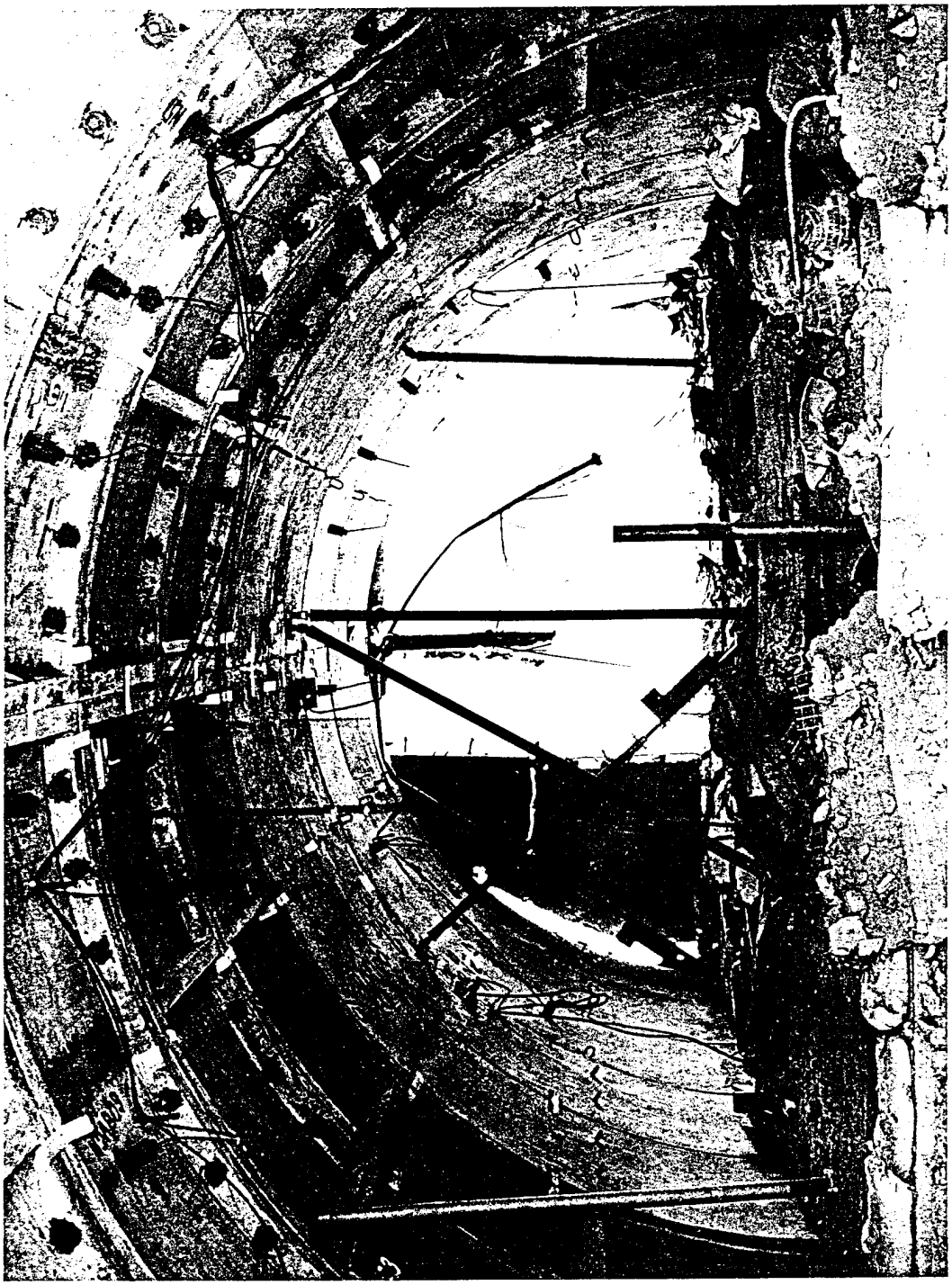


Fig. L.407 Interior View of End-wall Panel Debris from Right End, Structure 3.2.5

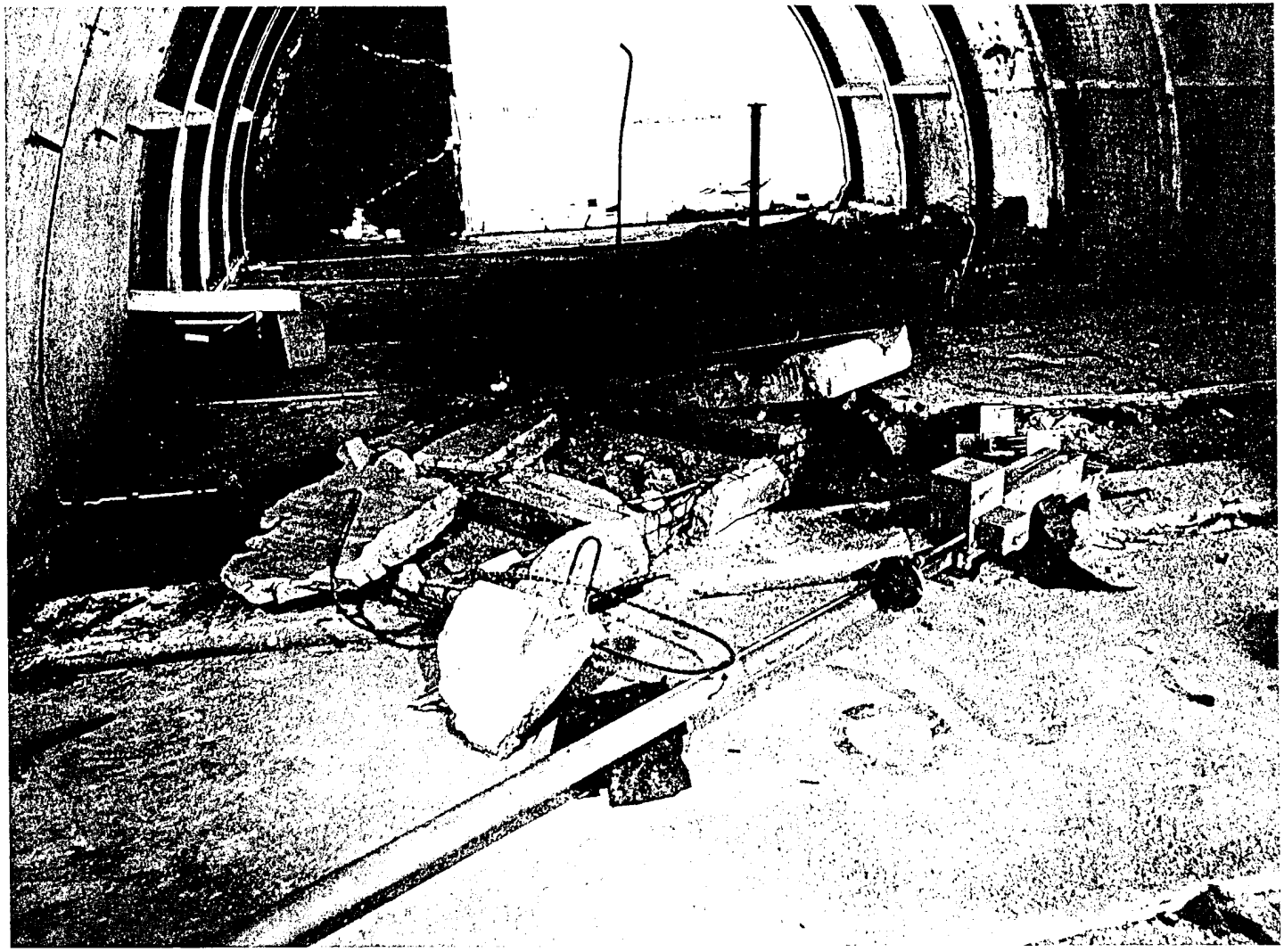


Fig. L.408 Fragment of Left Side Panel on Left and Section of Right End Panel with Door in Place on Right, Structure 3.2.5

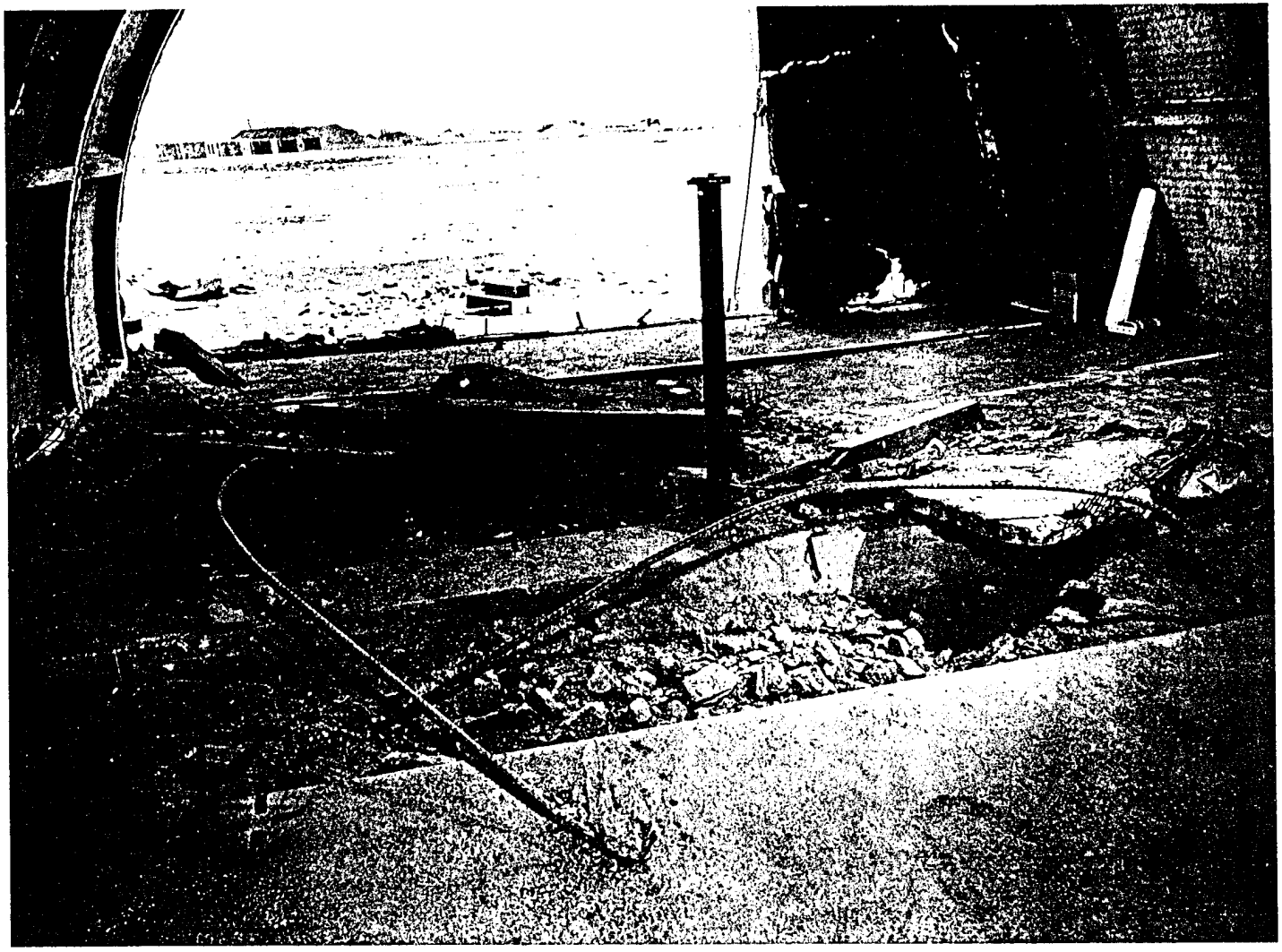


Fig. L.409 Right End-wall Panels Looking toward Right End, Structure 3.2.5

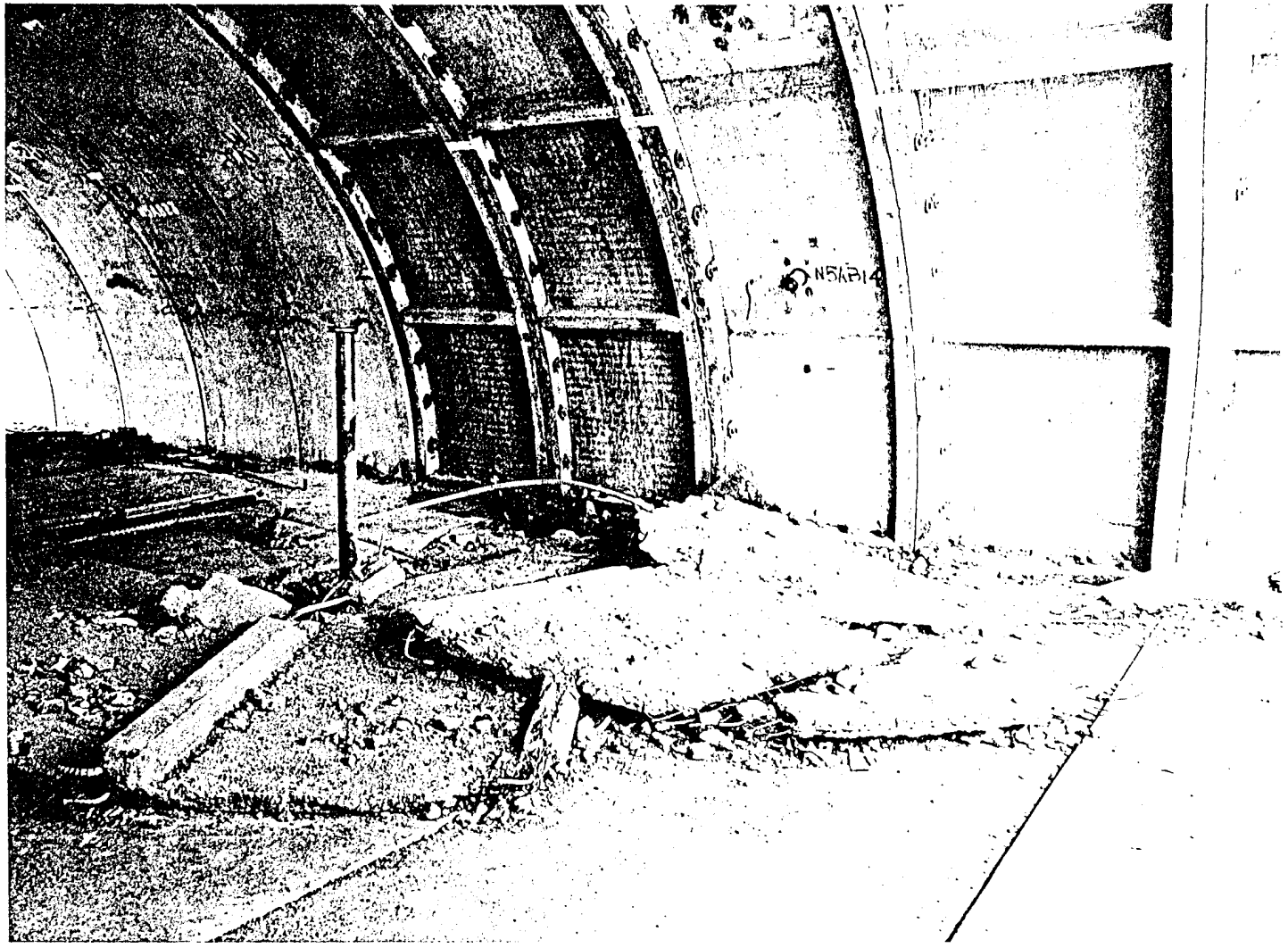


Fig. L.410 Right End-wall Panels from Right End, Structure 3.2.5

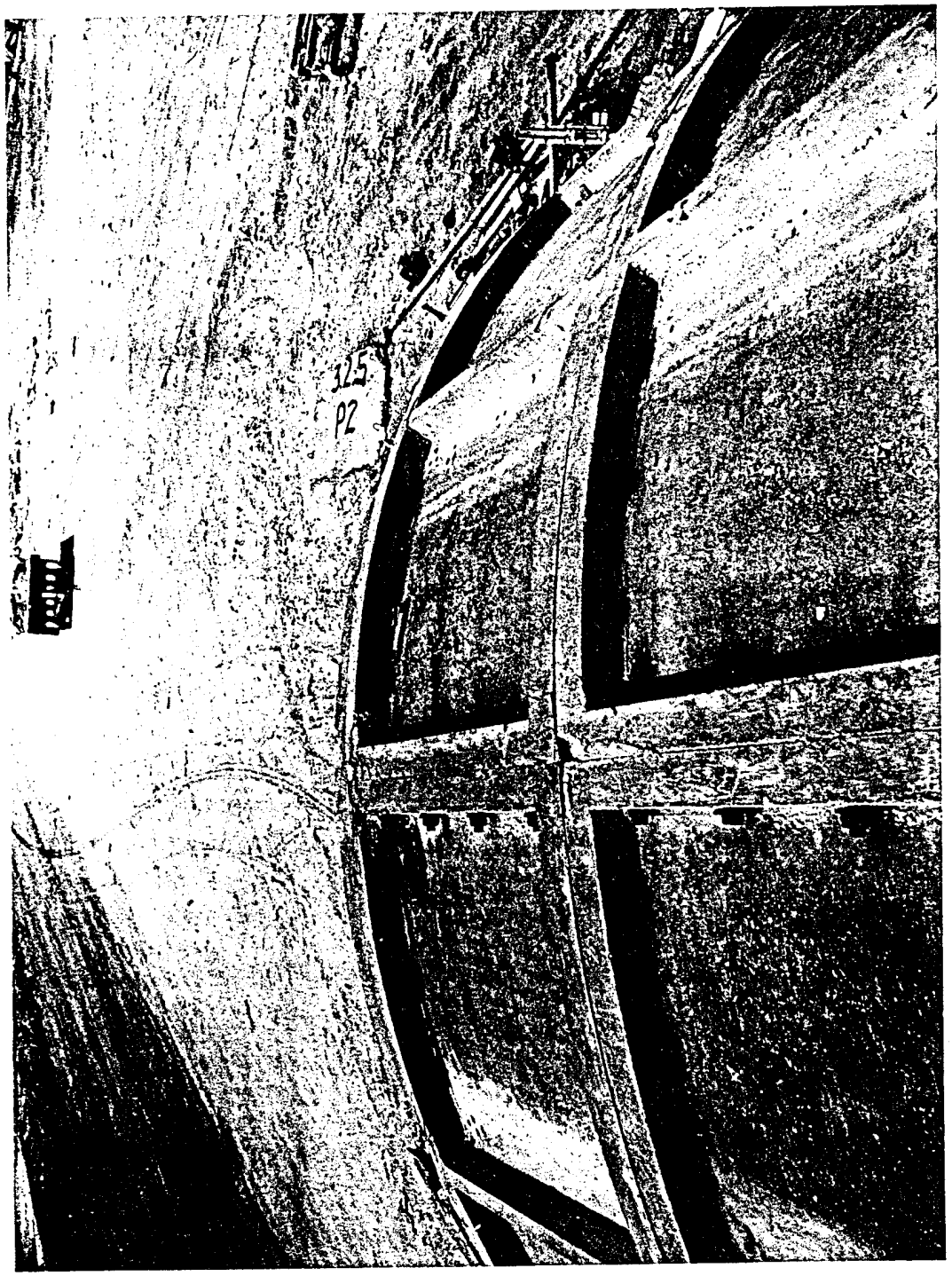


Fig. L.411 Cracking and Spalling on Ridge at Left End, Structure 3.2.5

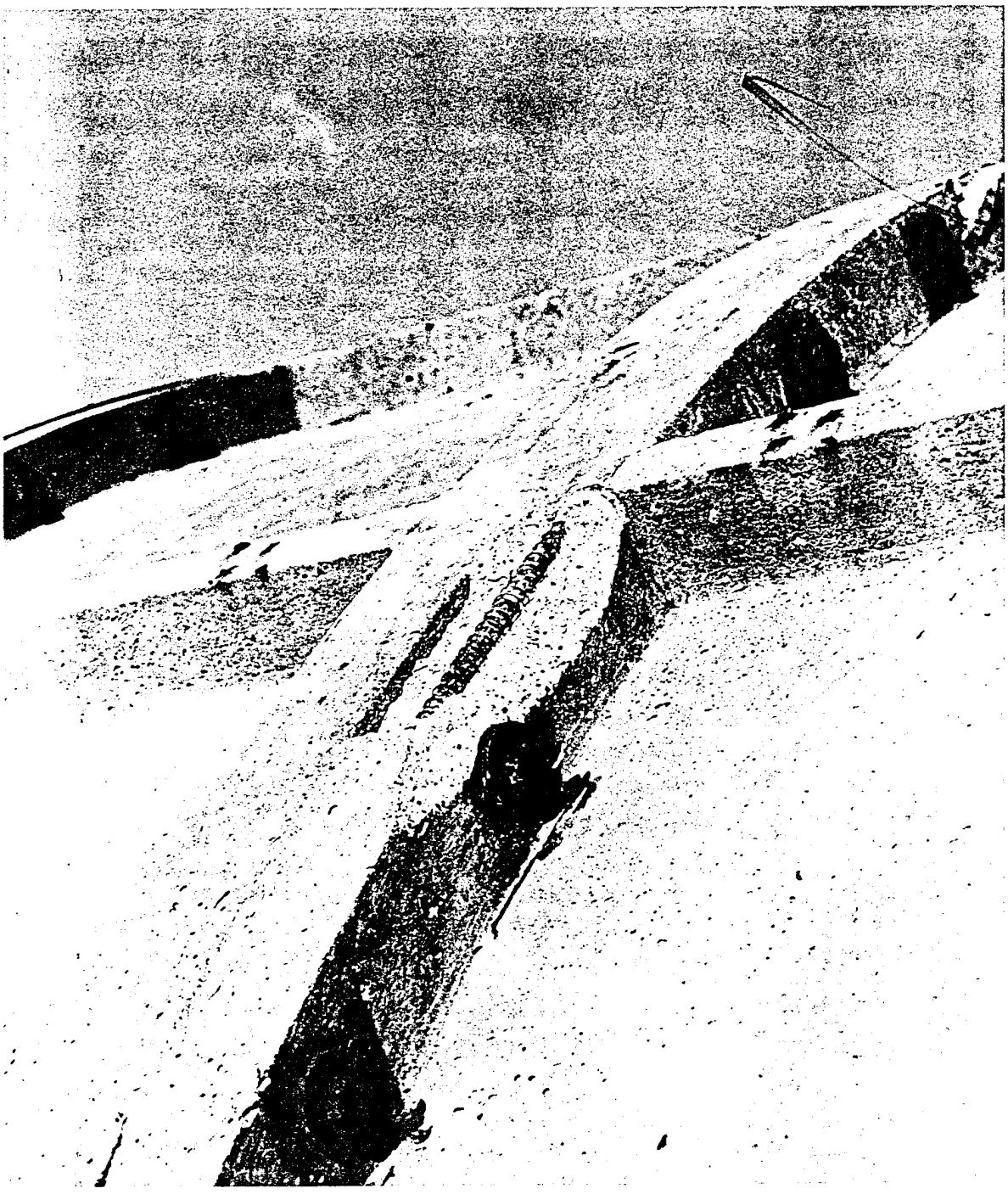


Fig. L.412 Spall on Left Rear Panel Rib, Structure 3.2.5

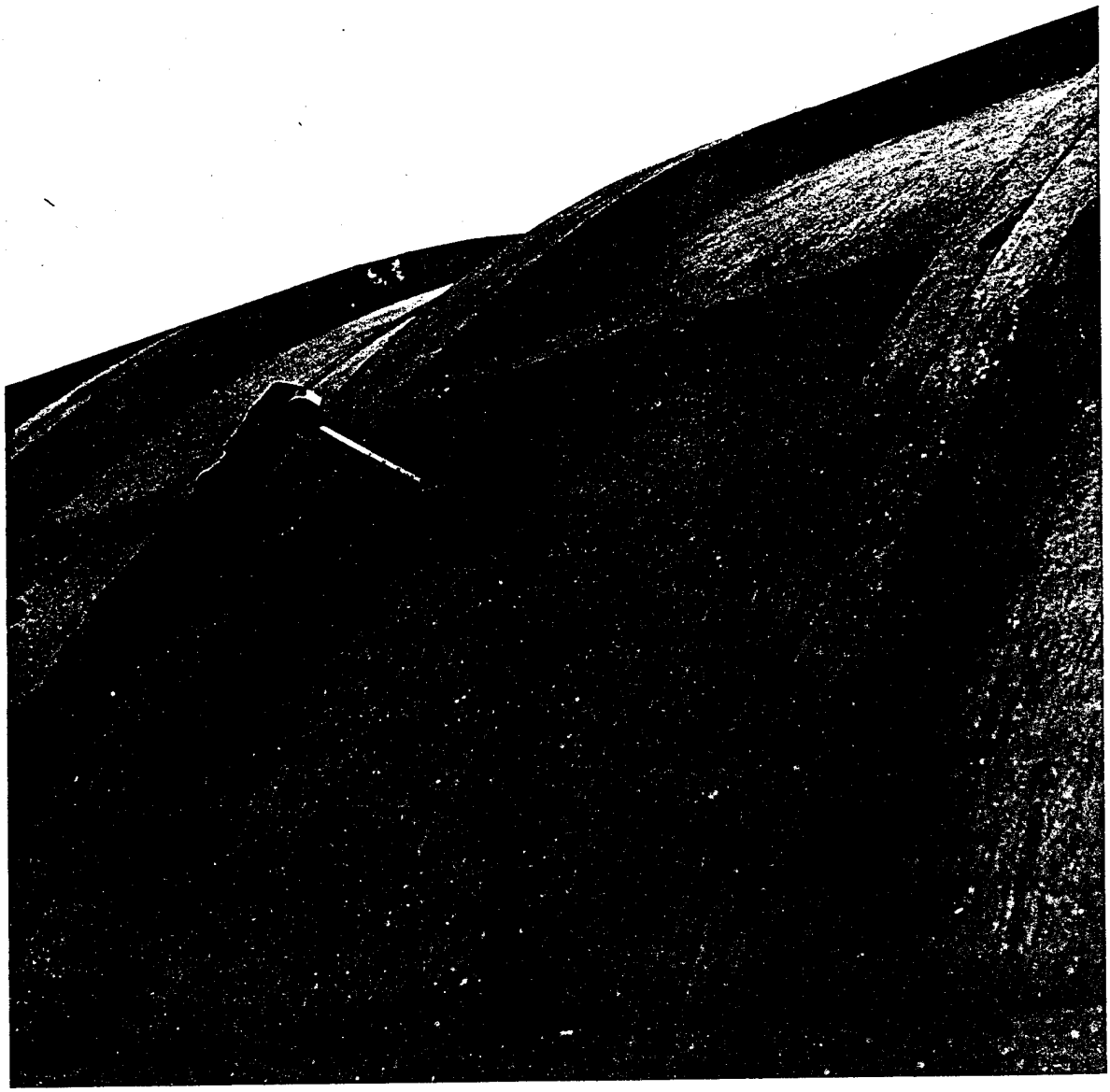


Fig. L.413 Typical Cracking on Ribs-out Front Panels, Structure 3.2.5

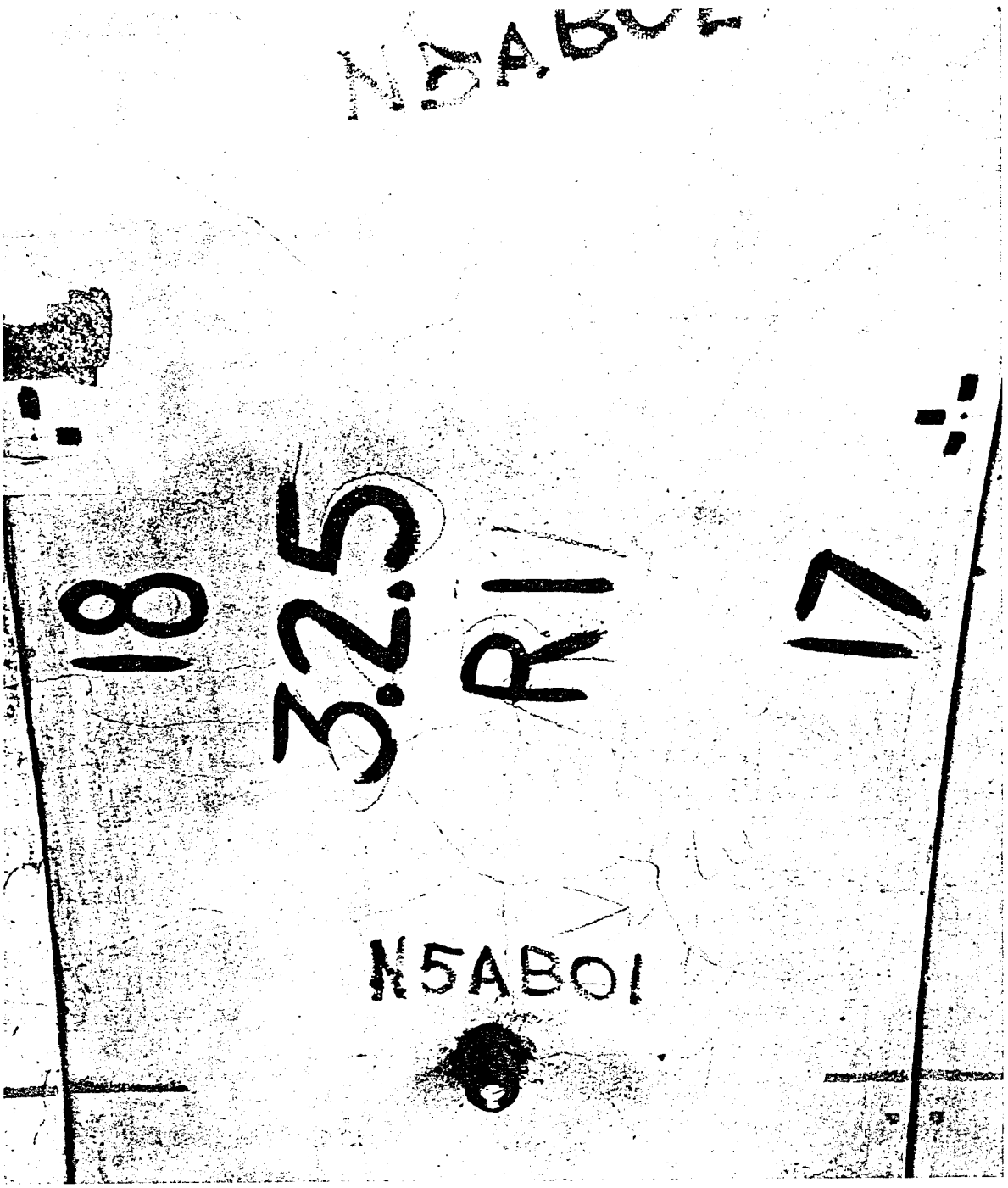


Fig. L.414 Interior of Ribs-out Front Panel 17-18, Showing Cracking in Skin, Structure 3.2.5. This panel has extra cross ribs omitted.

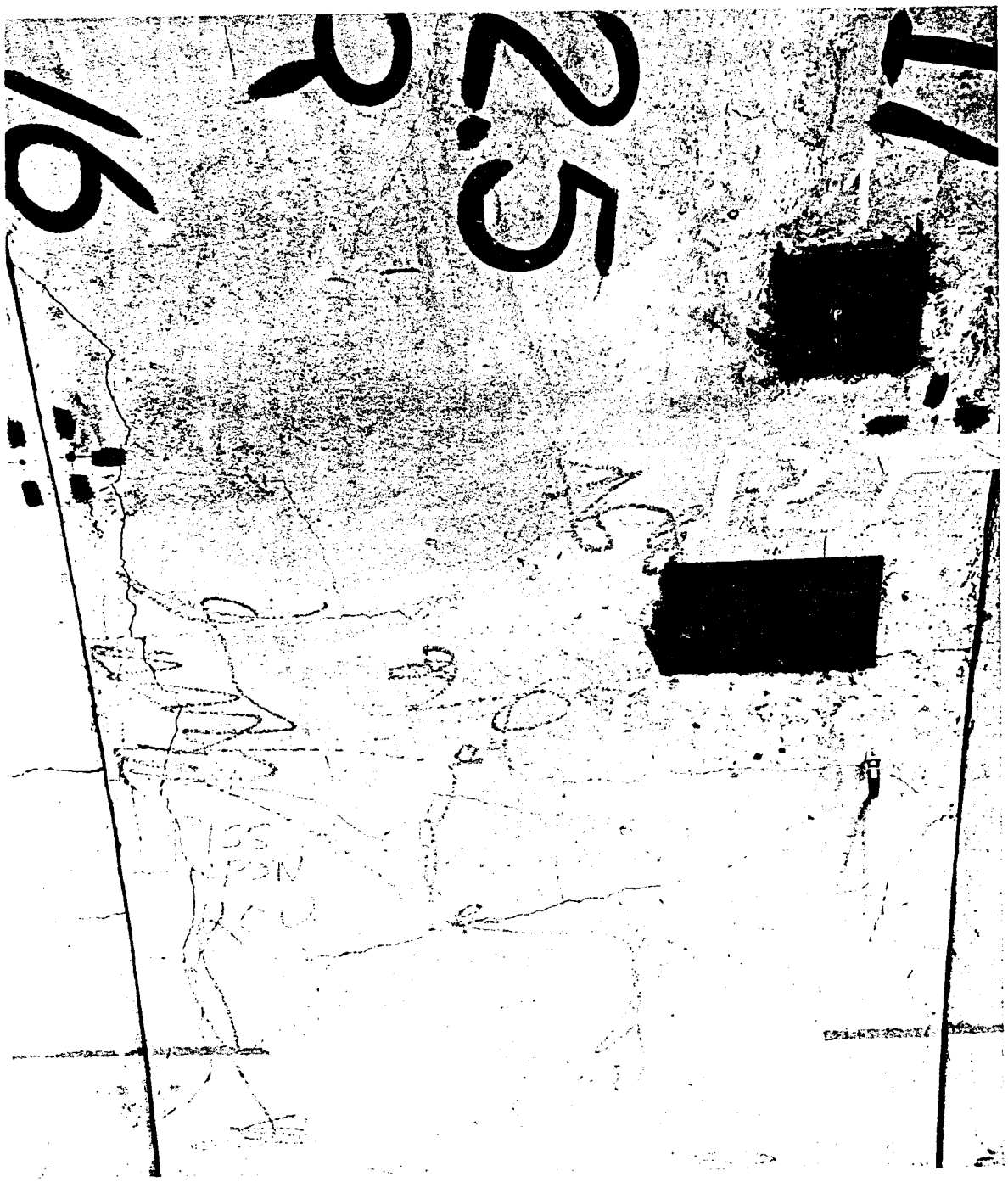


Fig. L.415 Interior of Ribs-out Front Panel 16-17, Showing Skin Cracking, Structure 3.2.5

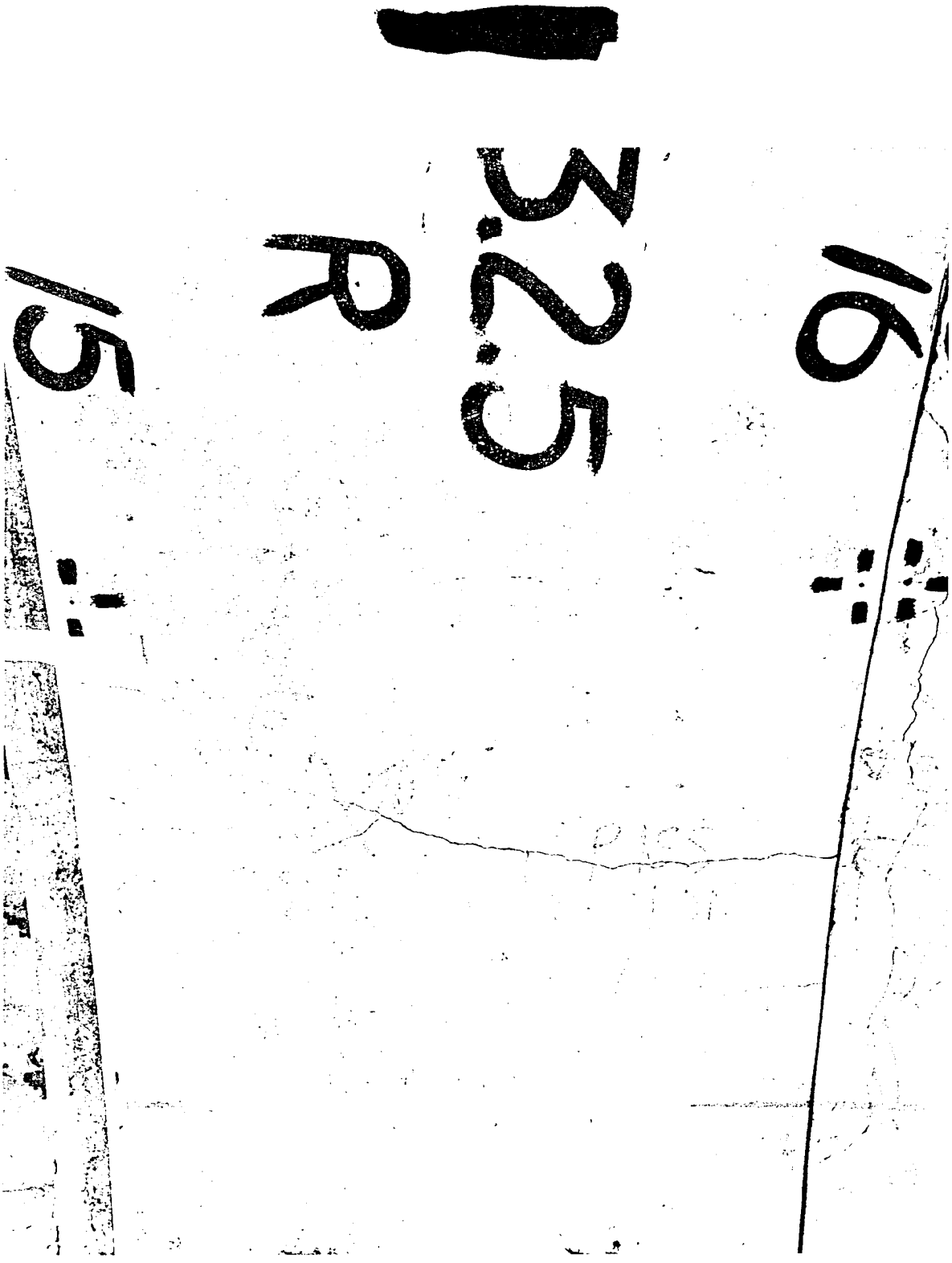


Fig. L.416 Interior of Front Center Panel 15-16 with Ribs Out, Structure 3.2.5

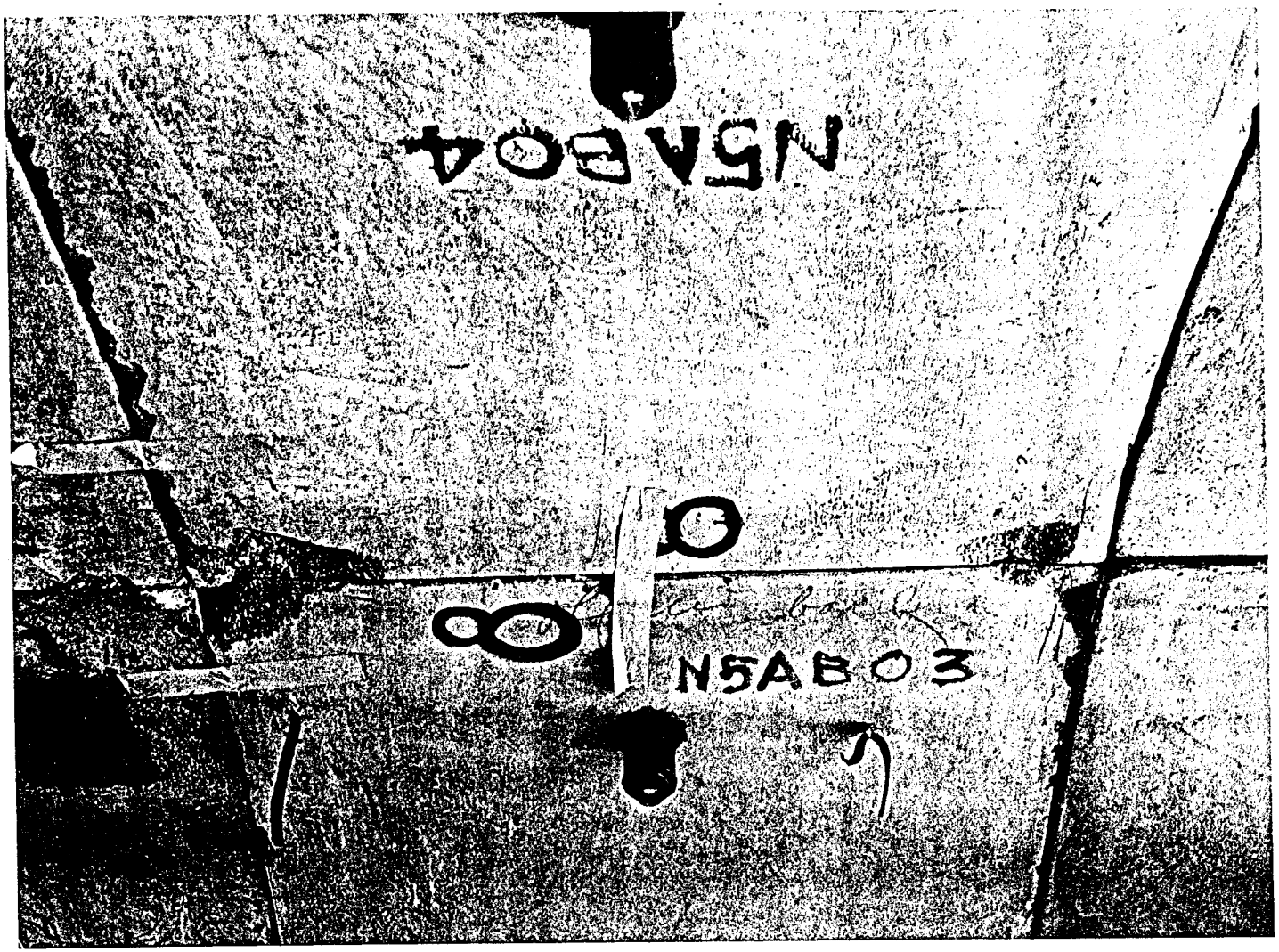


Fig. L.417 Spalling at Peak at Left Center of Arch, Structure 3.2.5



Fig. L.418 Close-up of Spalling on Interior of Ribs-out Panels (at Peak), Structure 3.2.5



Fig. L.419 Interior Close-up of Skin on Front Panel Damaged by Flying Fragment, Structure 3.2.5

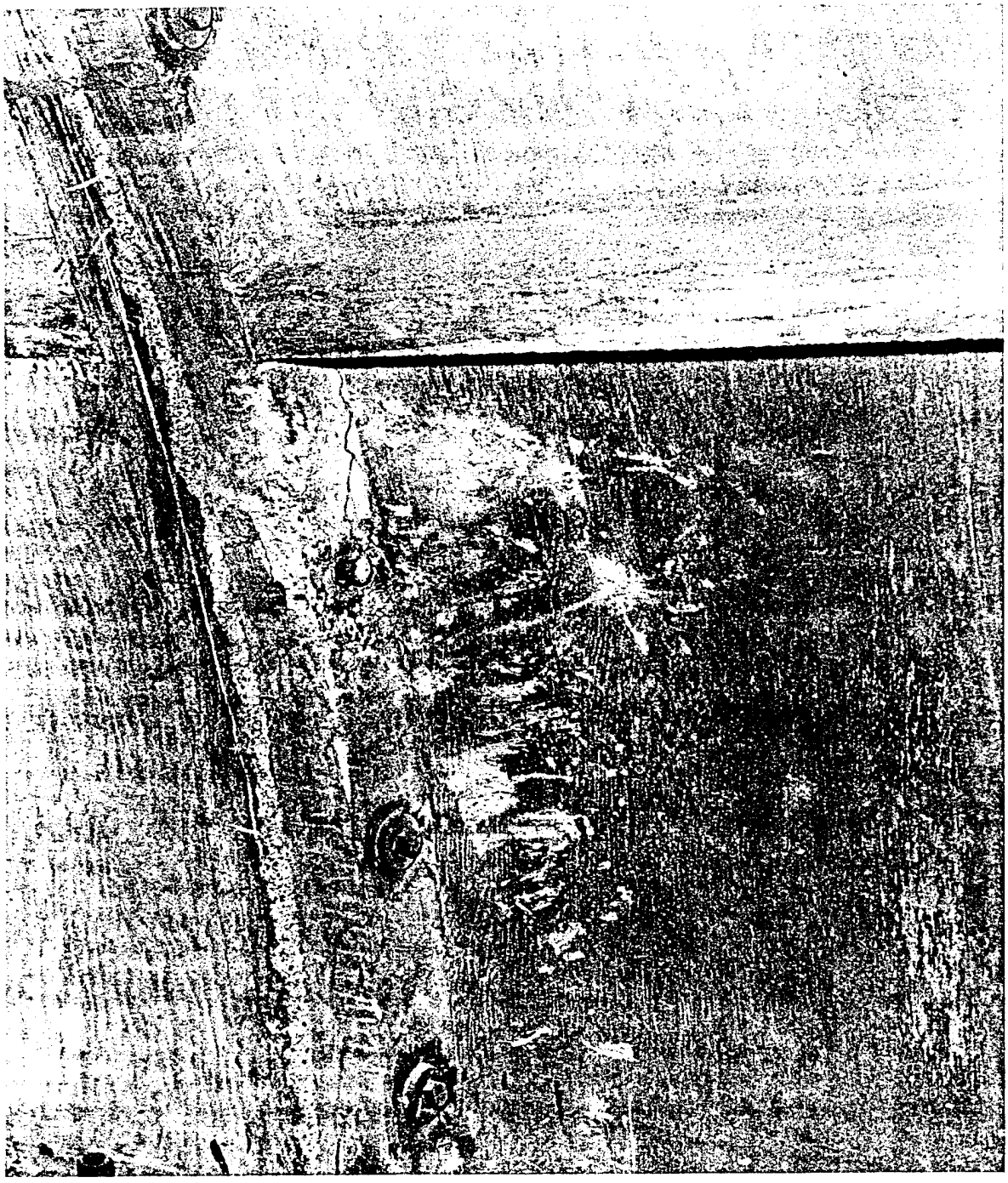


Fig. L.420 Damaged Interior of Rear Panel; Probably Hit by End Walls When They Failed, Structure 3.2.5



Fig. L.421 Exterior Shot of Rear Panel Damaged from Interior by Flying End Walls, Structure 3.2.5

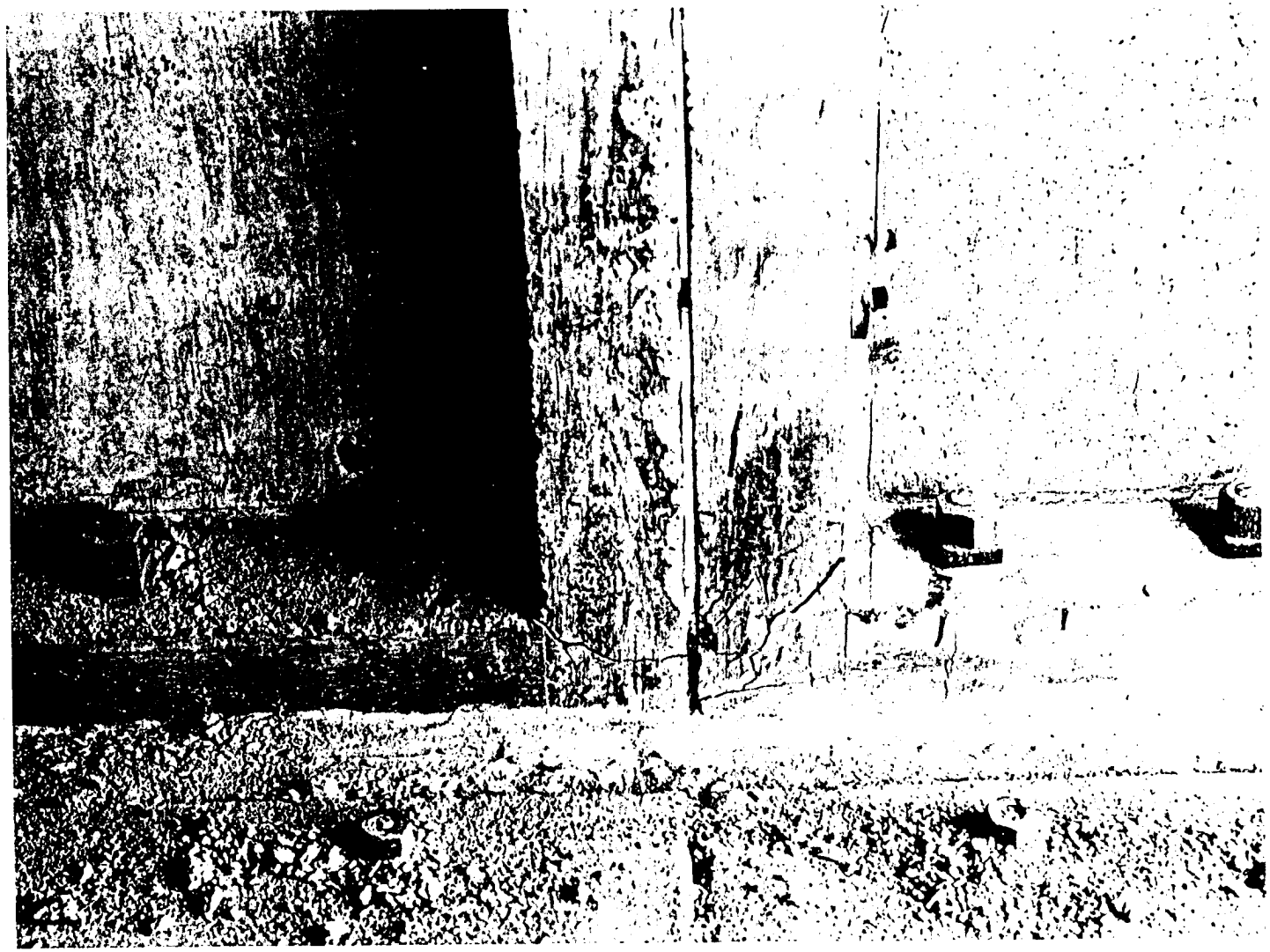


Fig. L.422 Interior Close-up of Base of Rear Panel Cracked in Rib and in Skin, Structure 3.2.5



Fig. L.423 Exterior Close-up of Cracking at Base of Front Panel, Structure 3.2.5



Fig. L.424 Front Panel on Right End Wall, Structure 3.2.5. Note separation of center rib from skin and failure of concrete around anchor bolts.

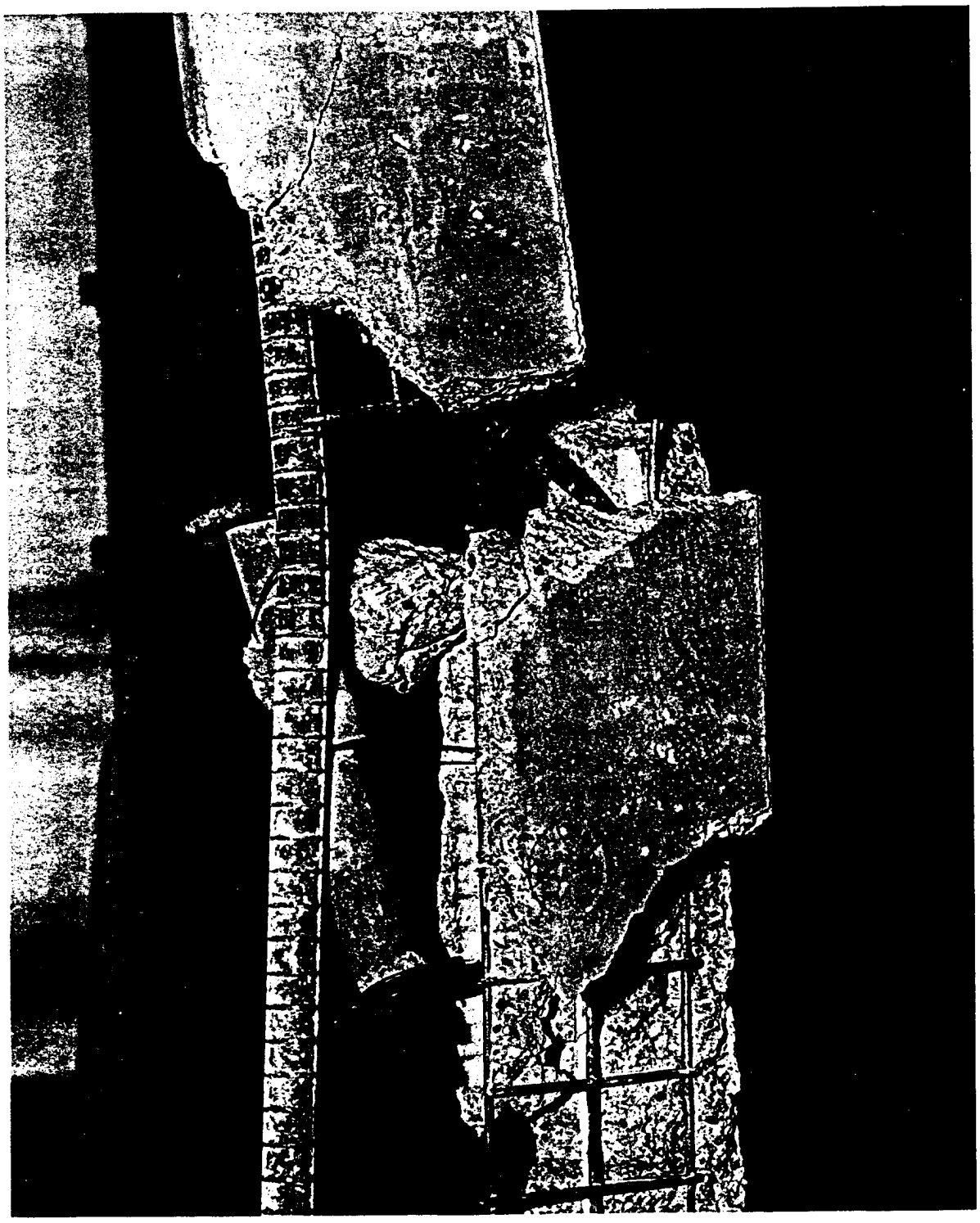


Fig. L.425 Close-up of Panel in Previous Photo Showing Heaviest Steel in Compression Face of Rib, Structure 3.2.5



Fig. L.426 Ribs of Rear Panel of Right End Wall in Place after Remainder of Panel Broke Loose at Junction of Skin and Rib, Structure 3.2.5



Fig. L.427 Close-up of Mesh Failure on Bottom Rib of Rear Panel of Right End Wall; Tension Failure, Structure 3.2.5.

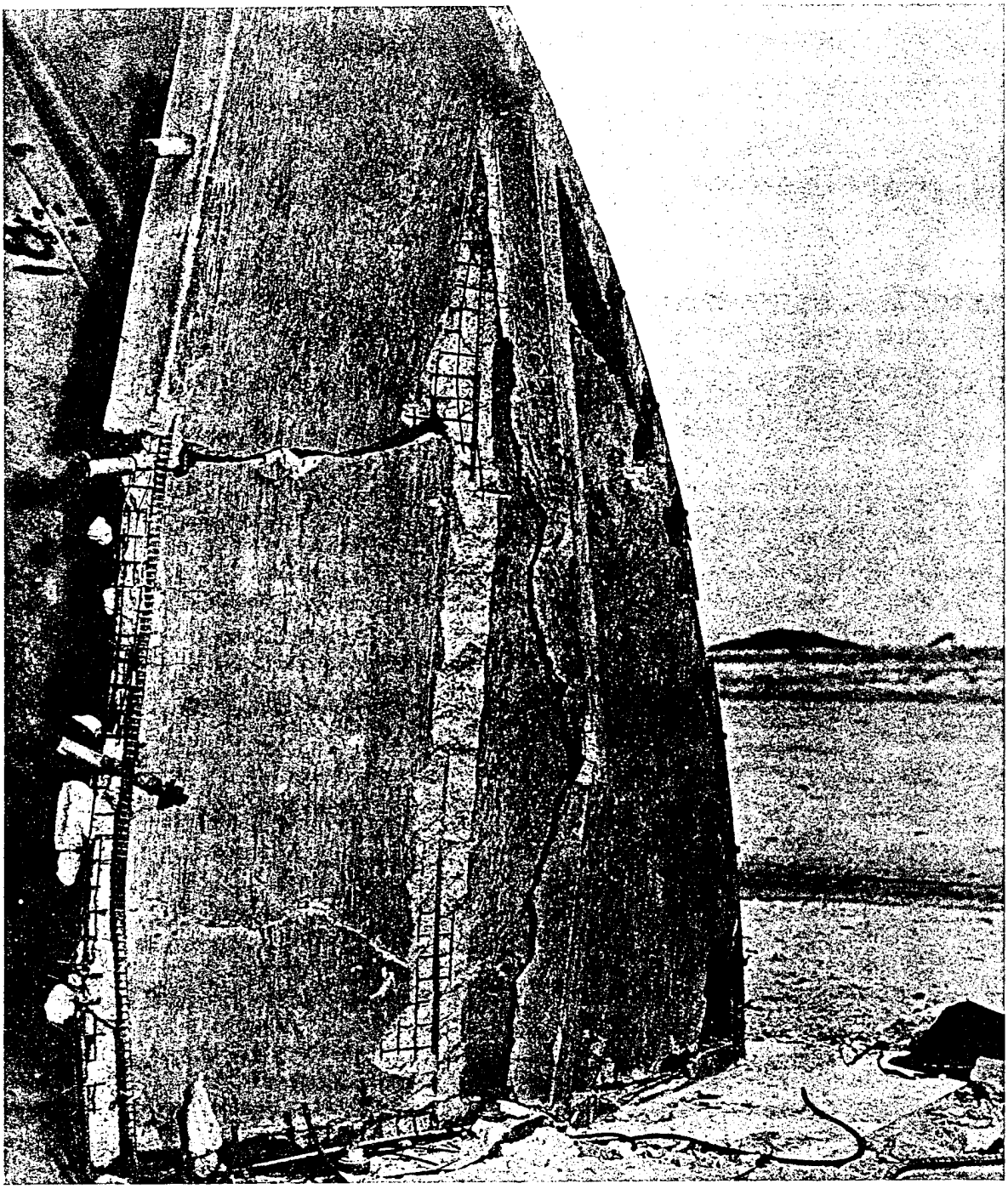


Fig. L.428 Front Panel of Left End Wall Nearly Severed All Around, Structure 3.2.5



Fig. L.429 Close-up of Mesh Tension Failure along Rib of Front Panel of Left End Wall, Structure 3.2.5

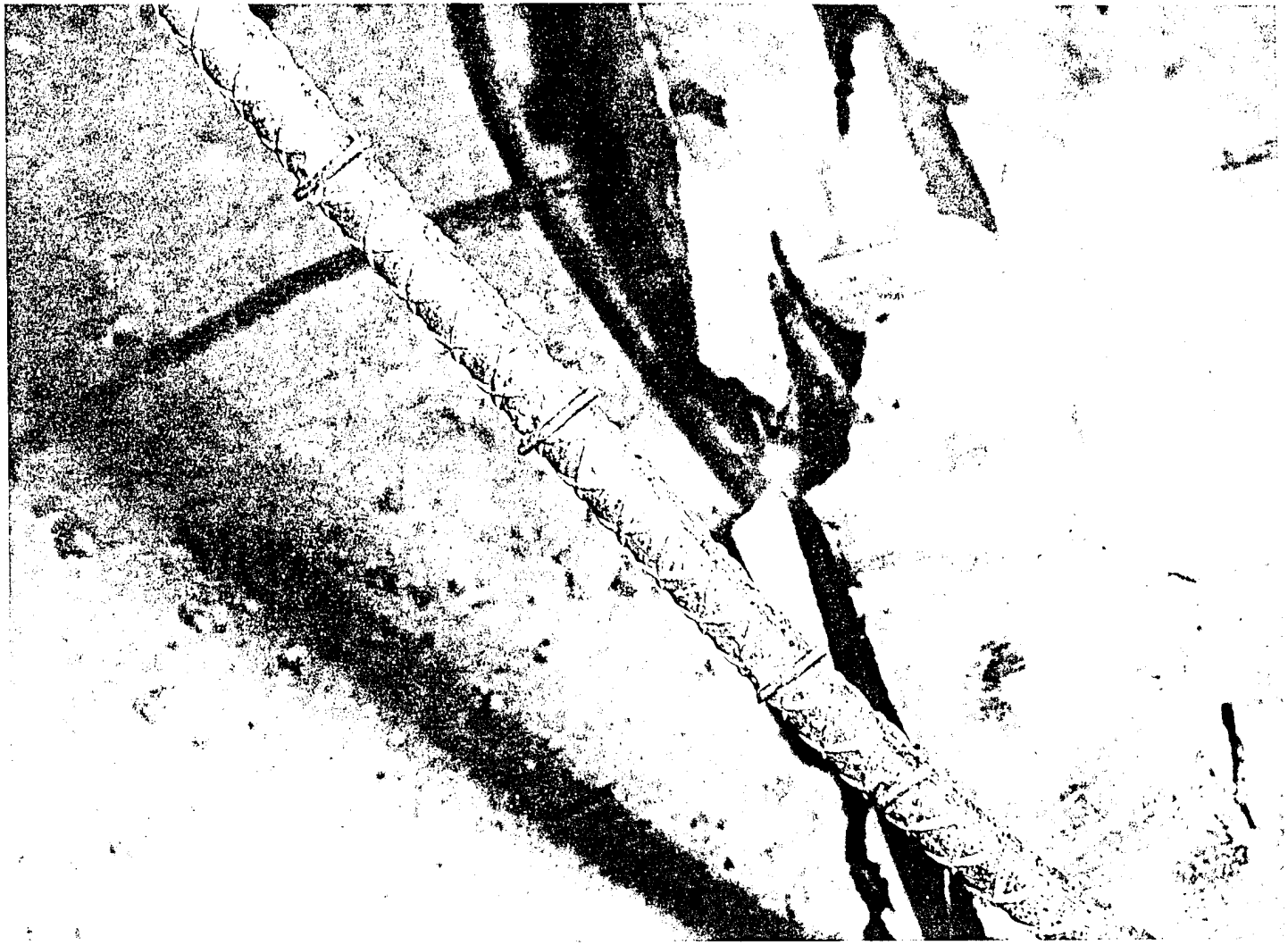


Fig. L.430 Tension Failure of Mesh where Tack Welded to ⅞-in. Bar in a Rib, Structure 3.2.5



Fig. L.431 Overhead View of Structure, 3.2.6. Note that cover has slipped down exposing panel ribs.

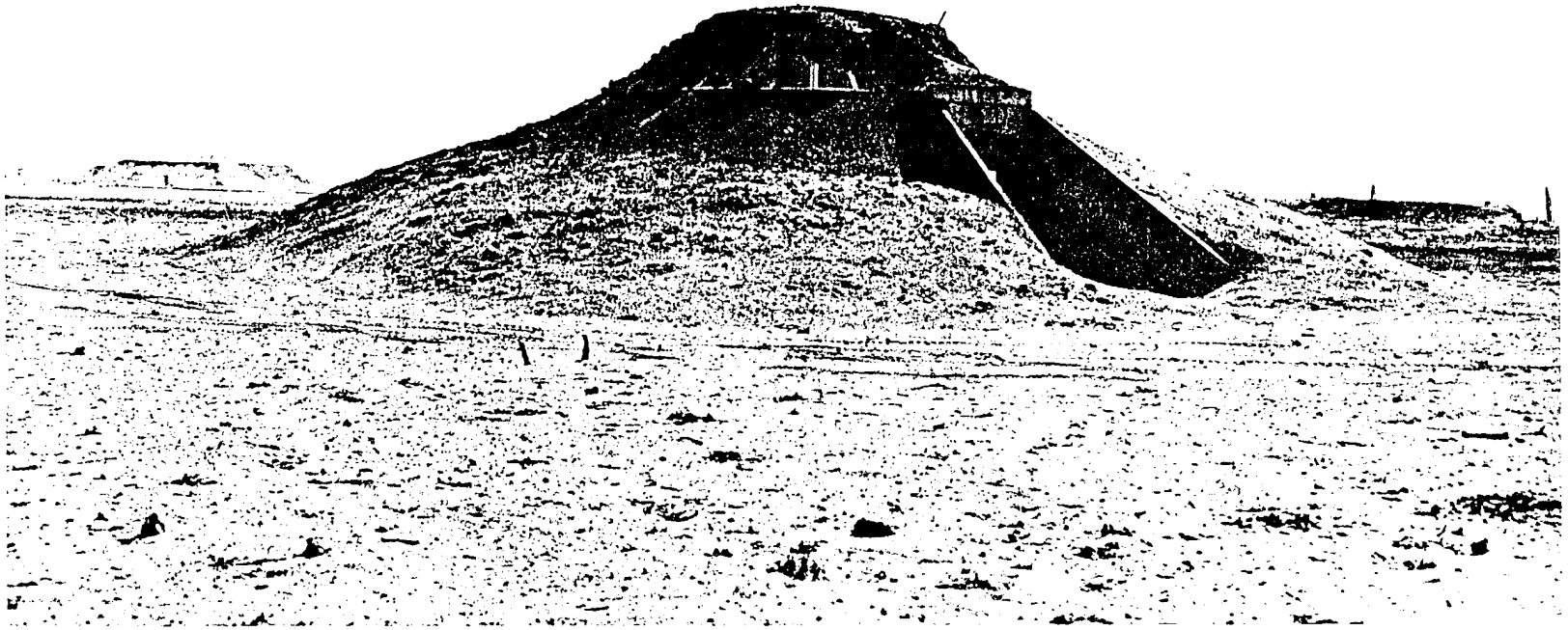


Fig. L.432 Structure 3.2.6, from Right Front

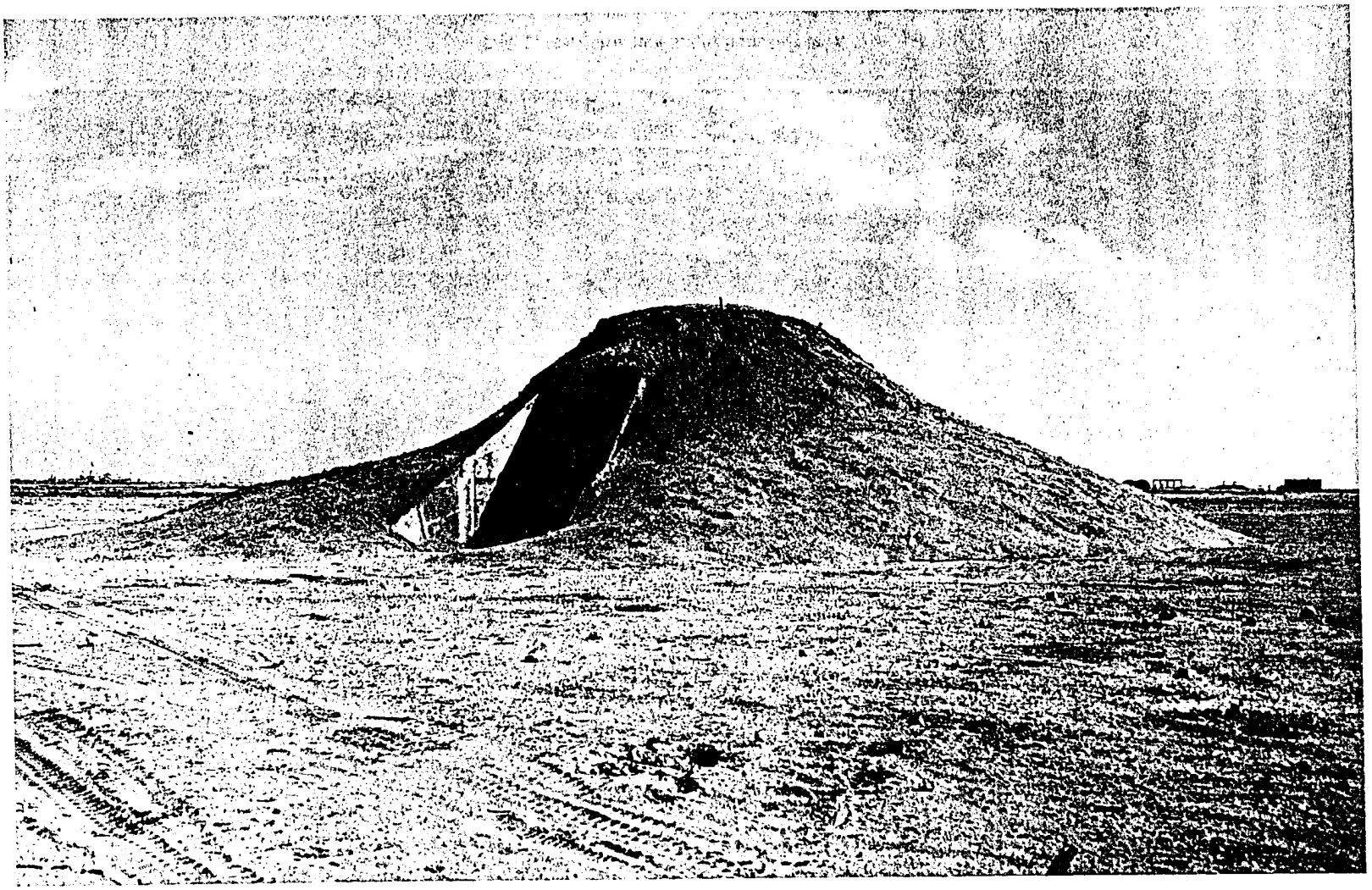


Fig. L.433 Structure 3.2.6, from Right Rear

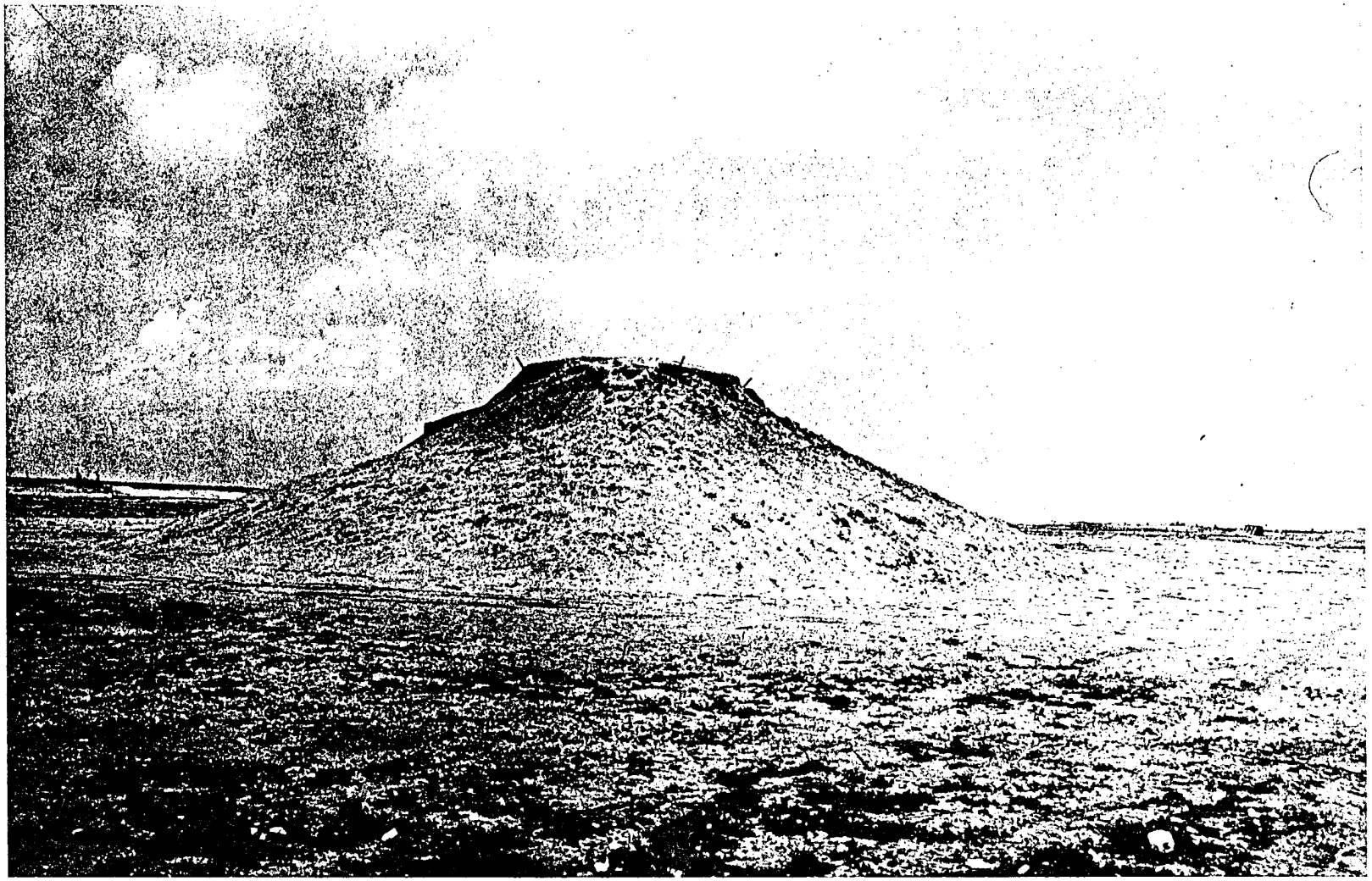


Fig. L.434 Structure 3.2.6, from Left Rear



Fig. L.435 Structure 3.2.6, from Left Front

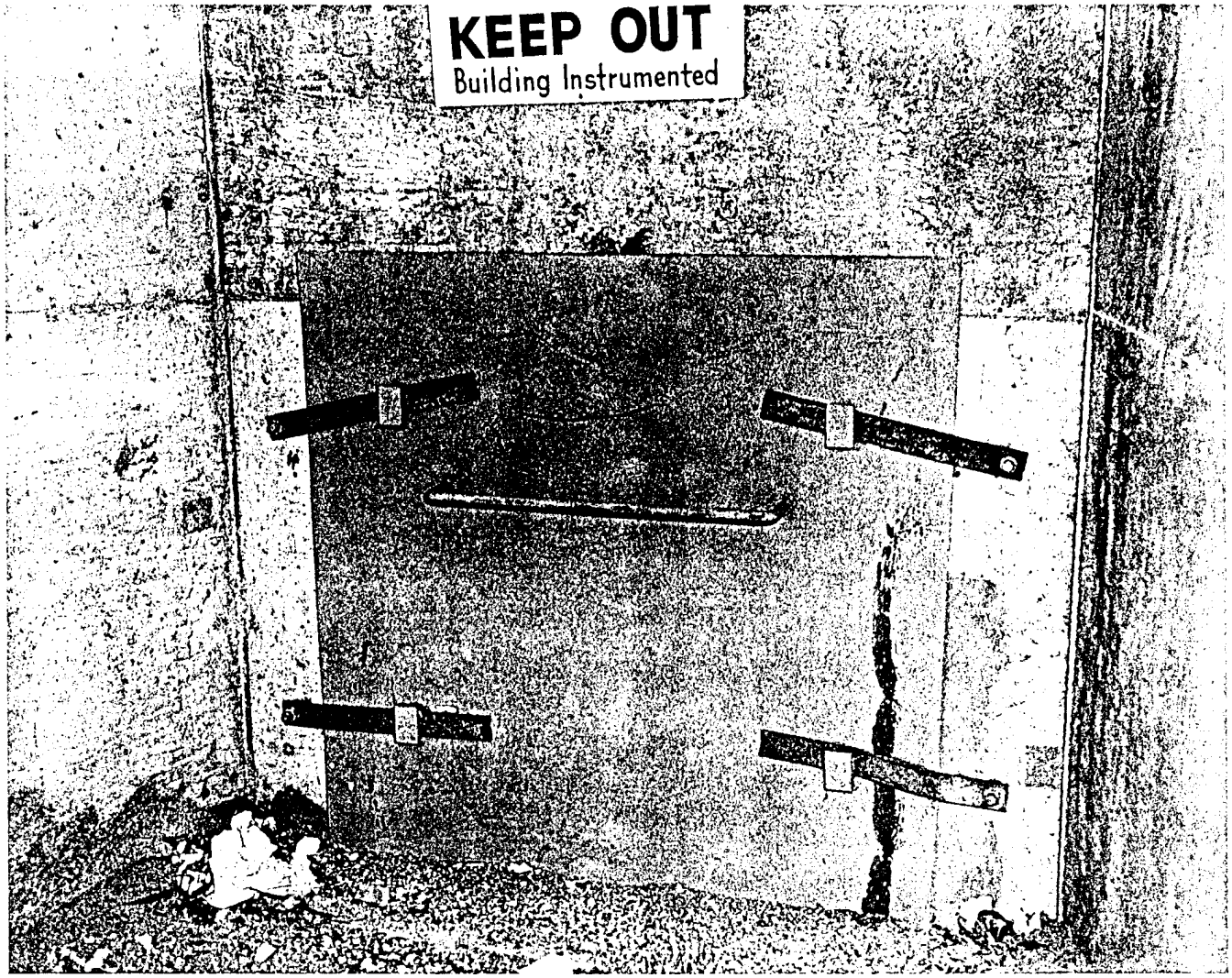


Fig. L.436 Entry Door Showing 2-in. Buckle in Rear Edge, Structure 3.2.6



Fig. L.437 Structure 3.2.6, Uncovered from the Right

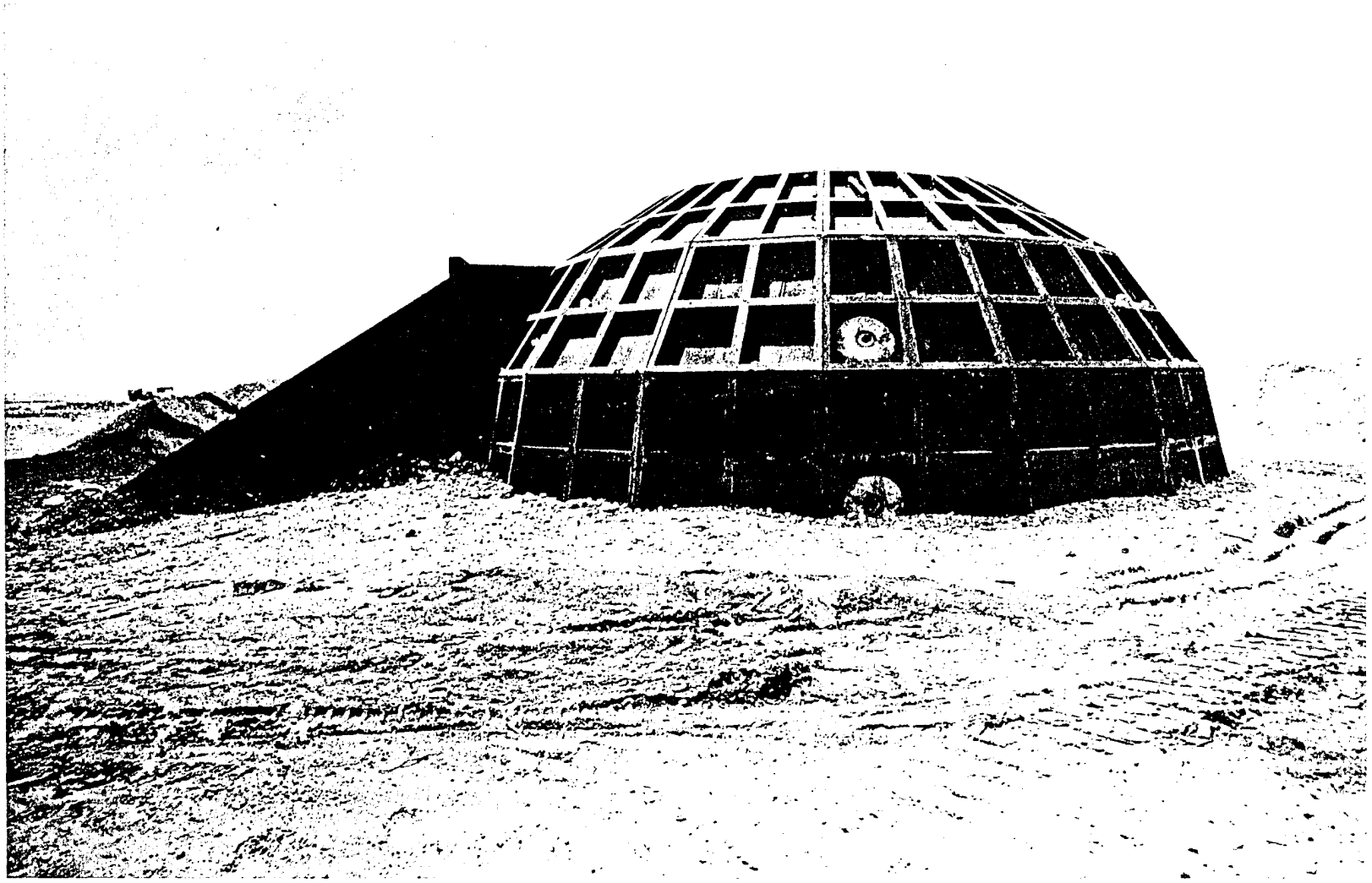


Fig. L.438 Structure 3.2.6, Uncovered from the Rear

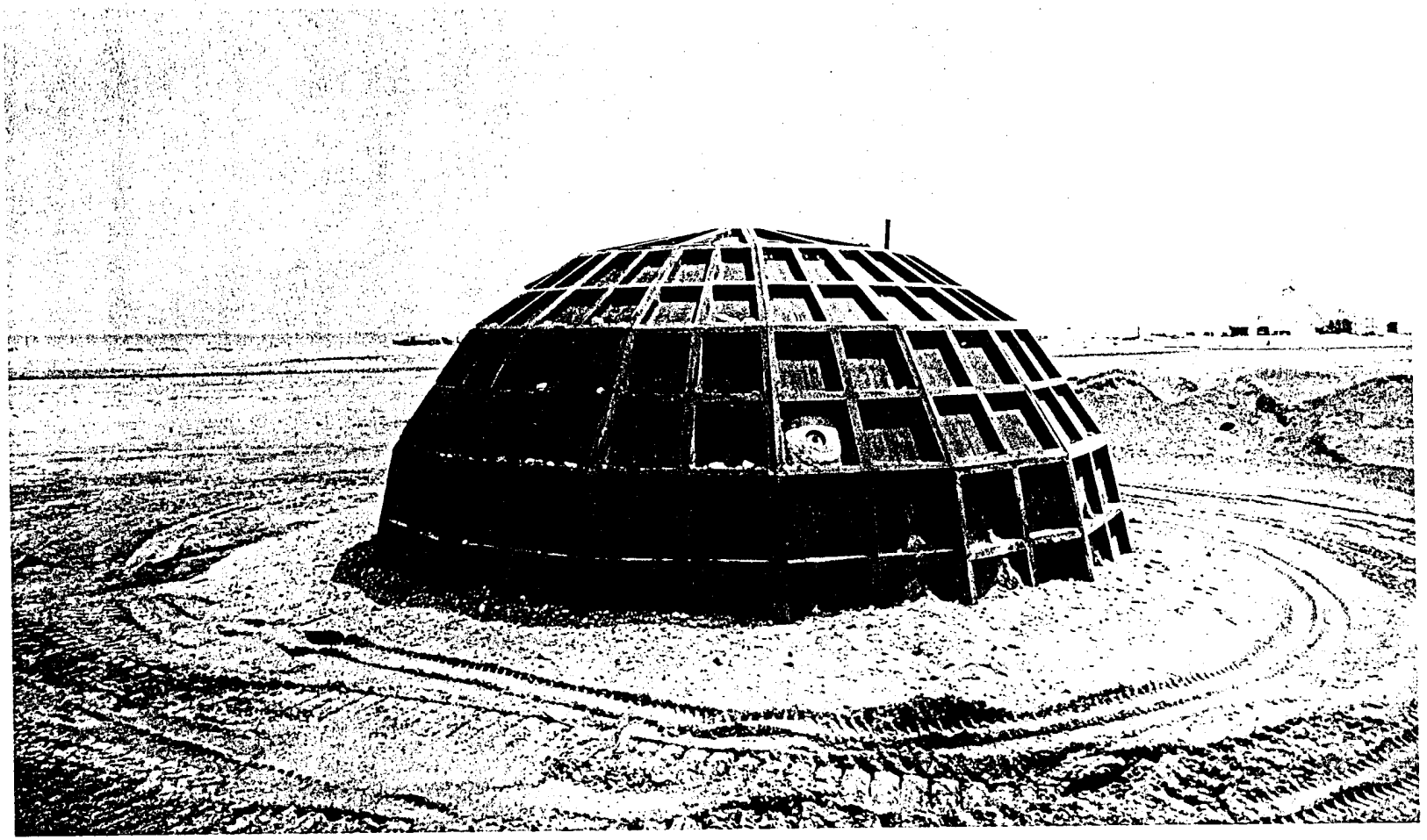


Fig. L.439 Structure 3.2.6, Uncovered from the Left

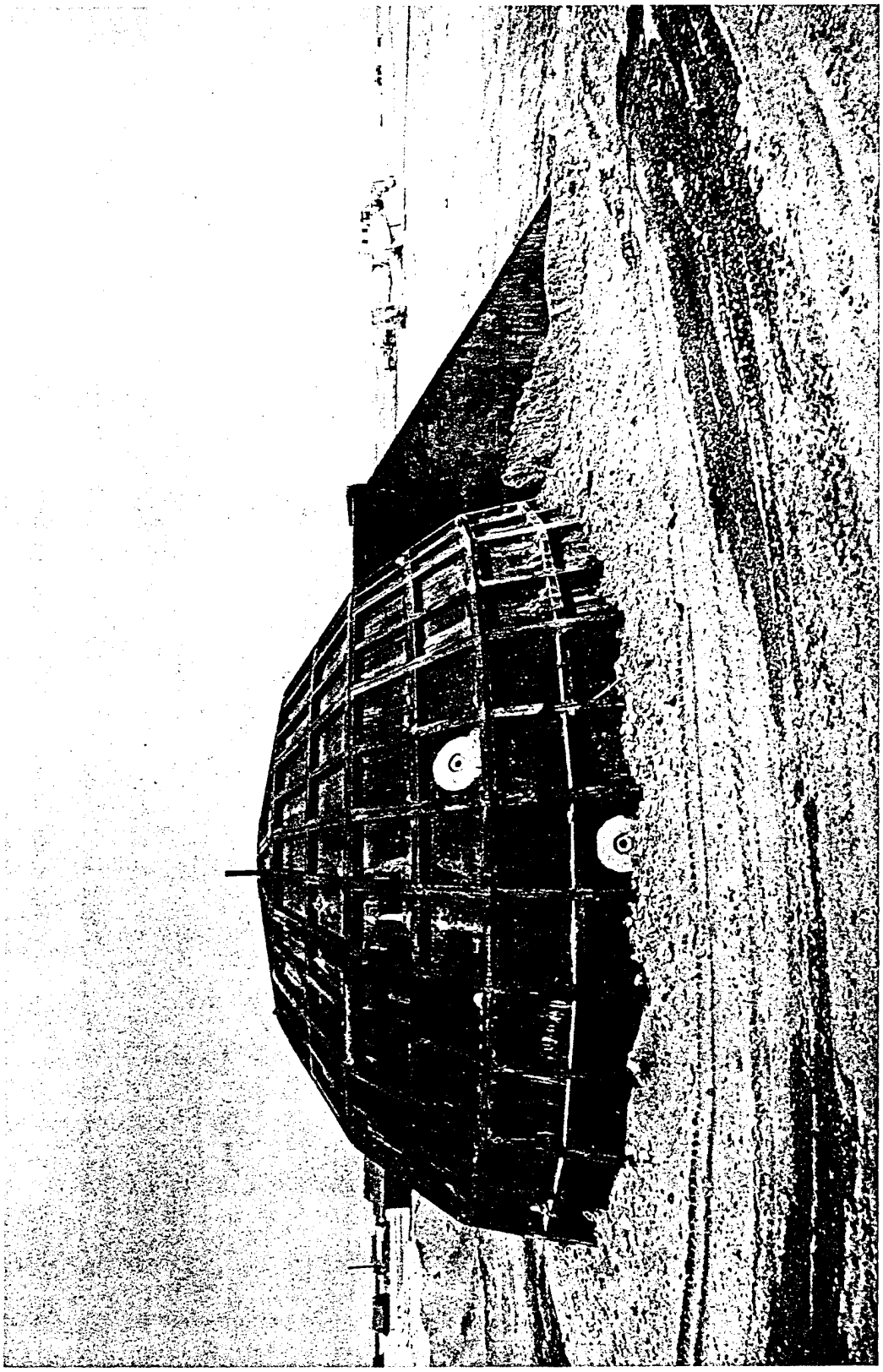


Fig. L.440 Structure 3.2.6, Uncovered from the Front

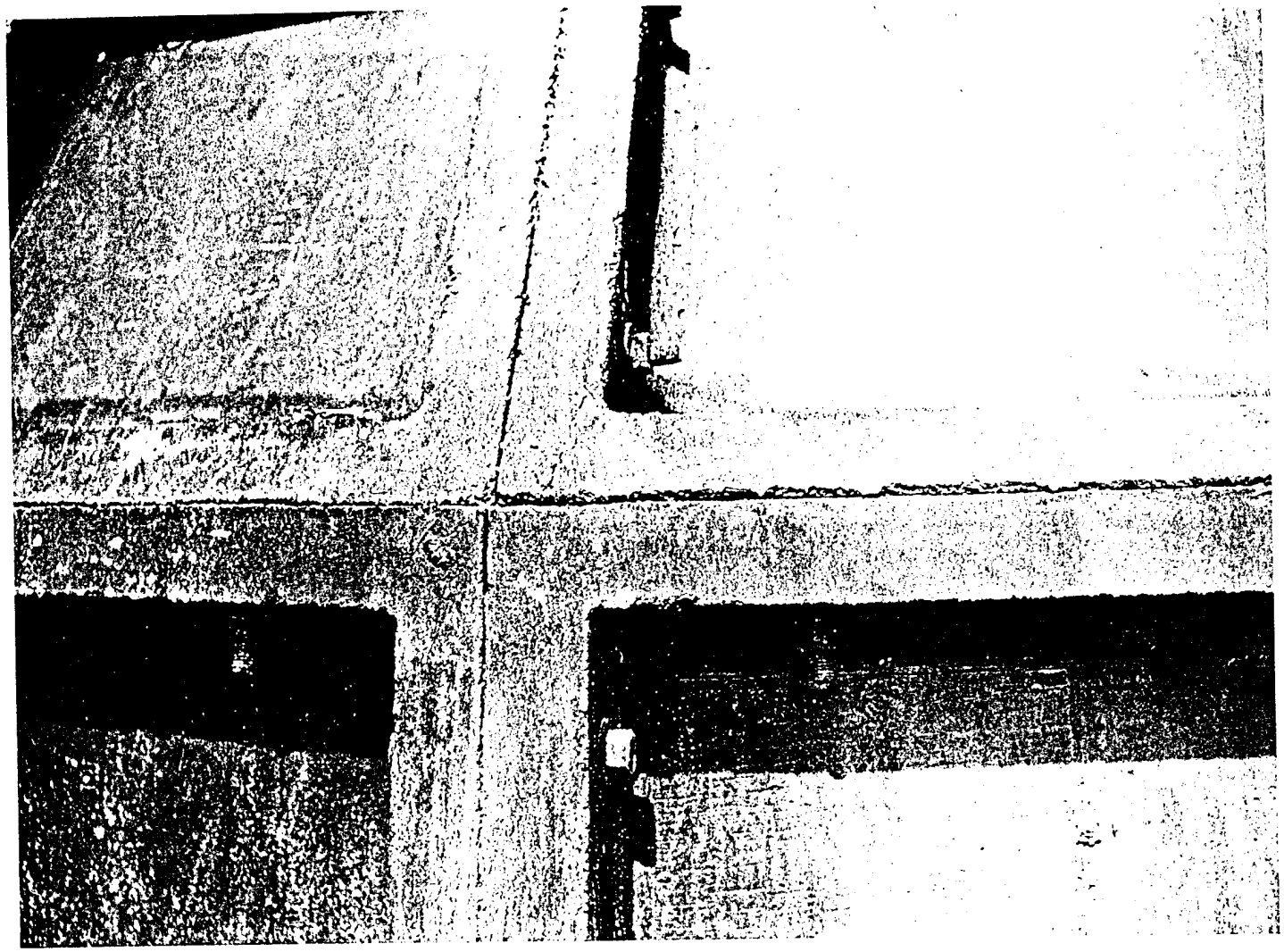


Fig. L.441 Detail of Typical Rib Intersection Crack, Structure 3.2.6

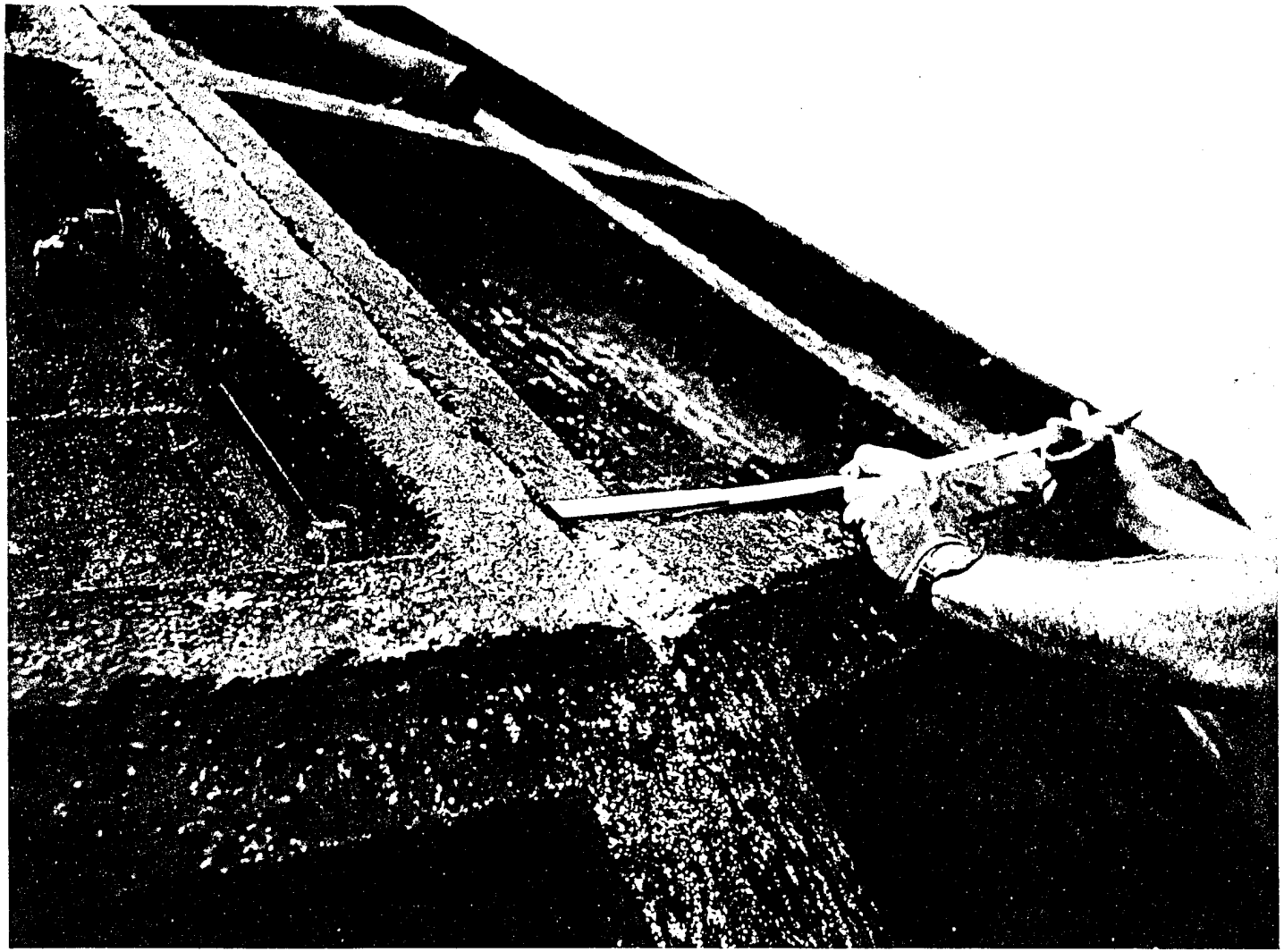


Fig. L.442 Detail of Typical Rib Intersection Spall, Structure 3.2.6

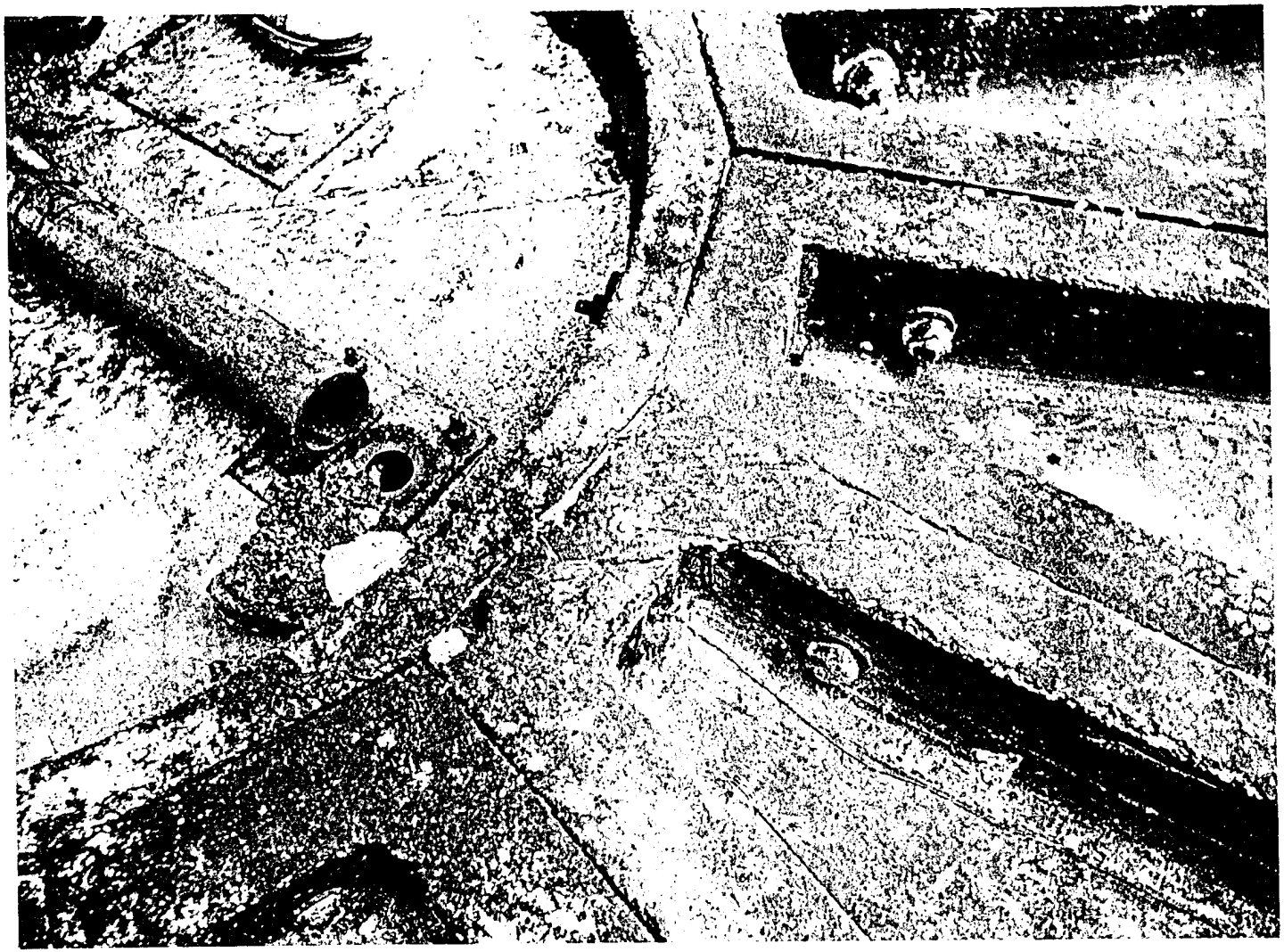


Fig. L.443 Detail of Top Panel Intersection, Structure 3.2.6. Hinged pipe at left center carried through earth cover to air-pressure gauge installed in the end of the pipe.

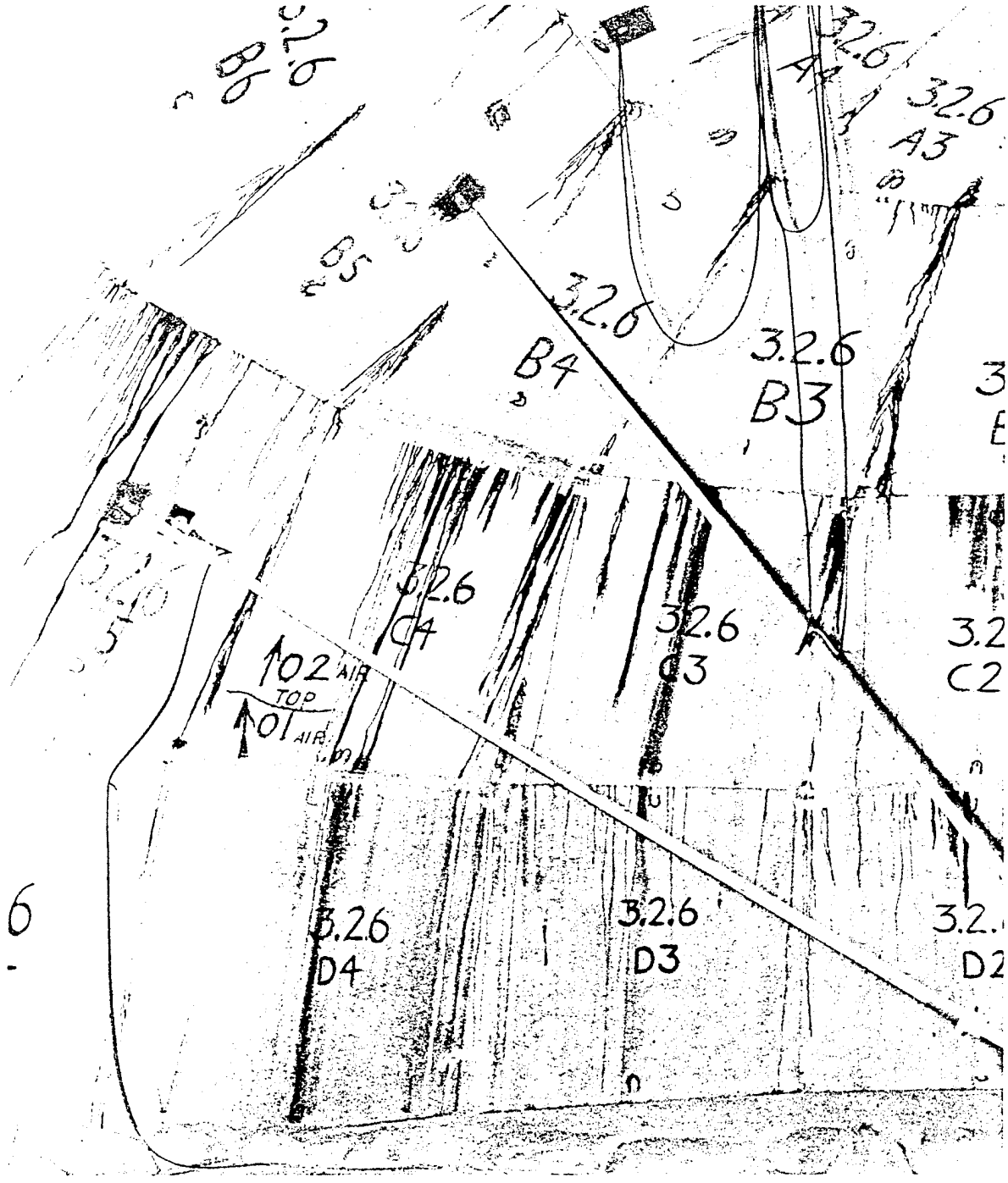


Fig. L.444 Interior View toward Front, Taken from the Right, Structure 3.2.6

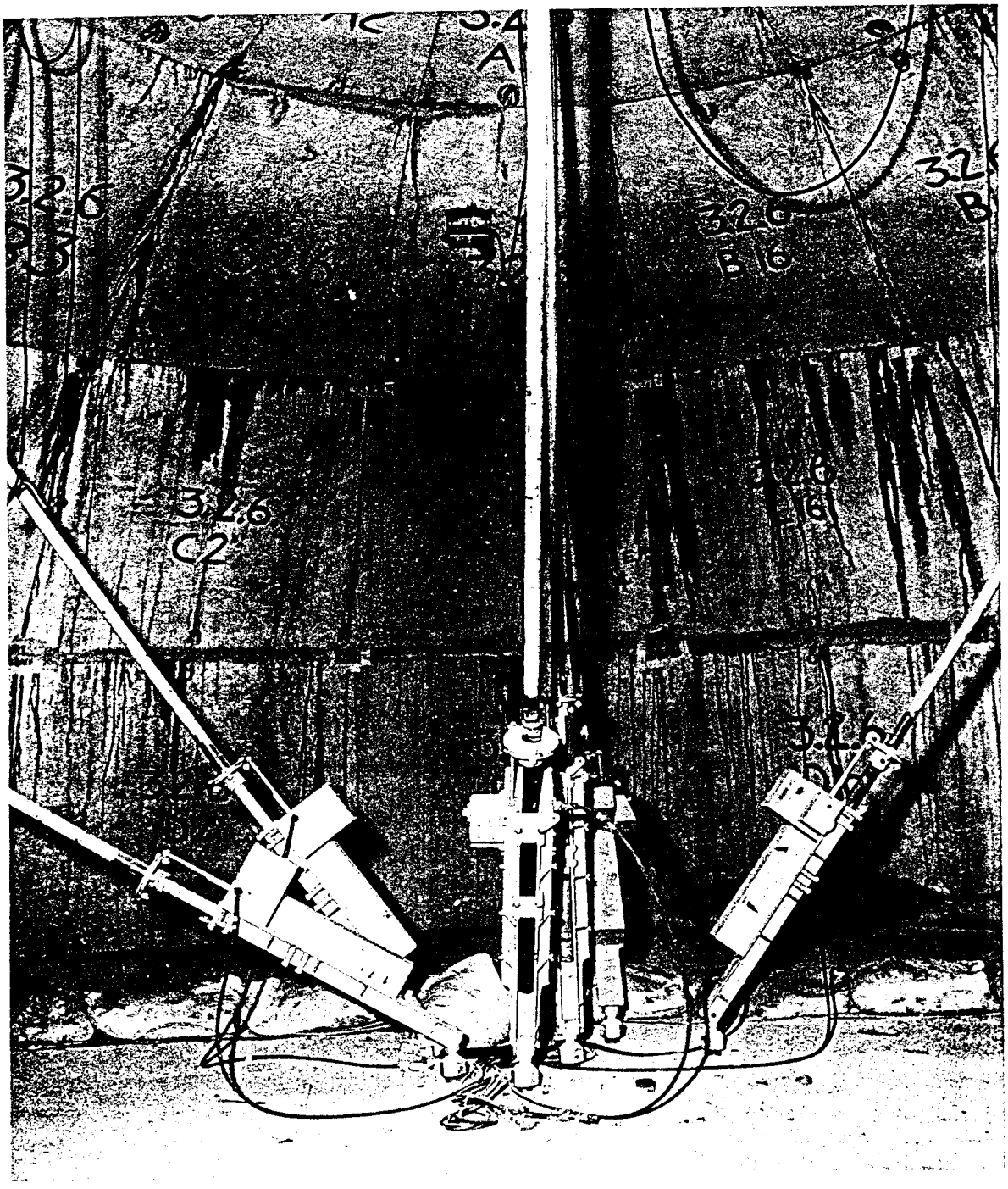


Fig. L.445 Interior View toward Left, Taken from the Right, Structure 3.2.6

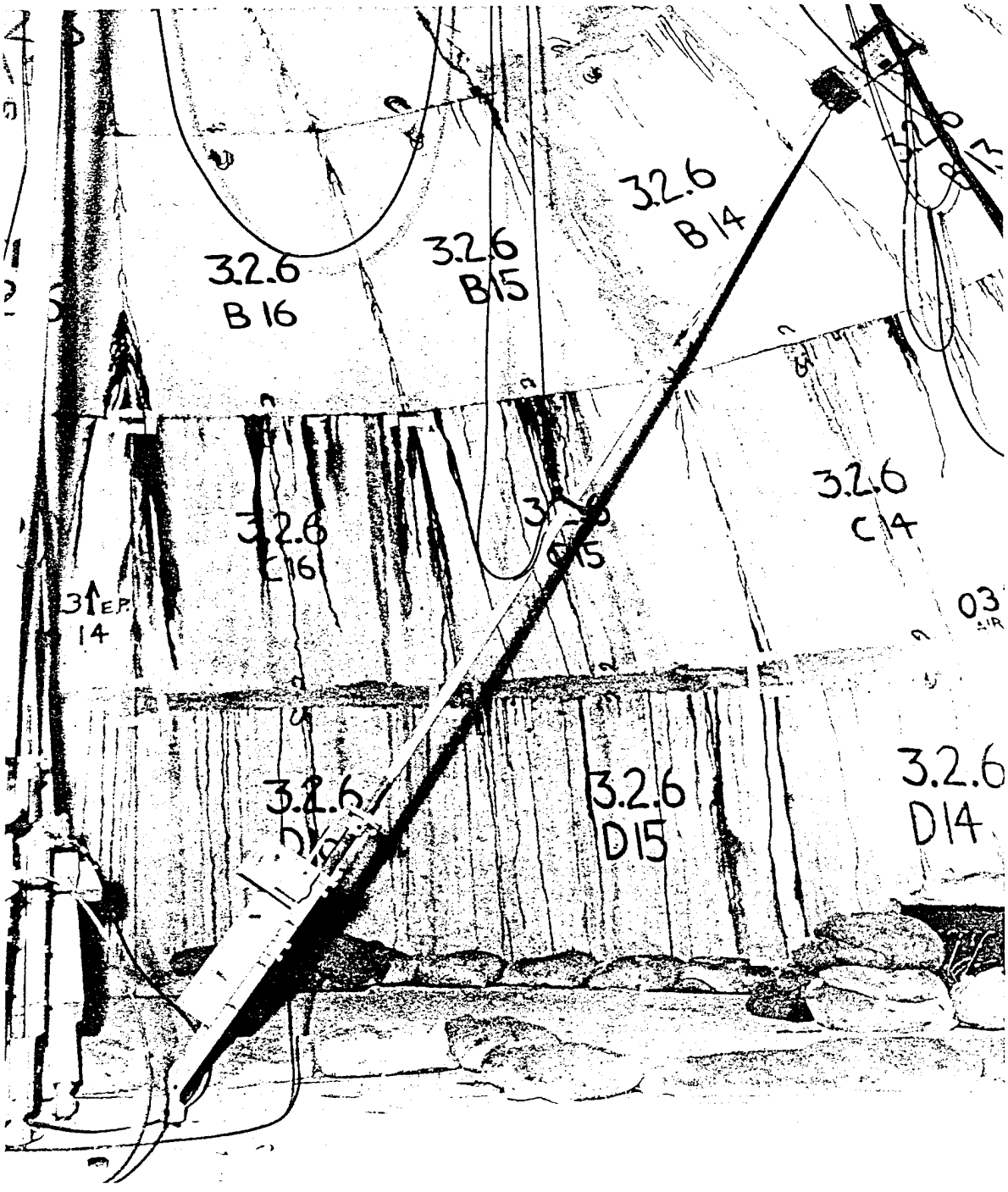


Fig. L.446 Interior View toward Rear, Taken from the Right, Structure 3.2.6

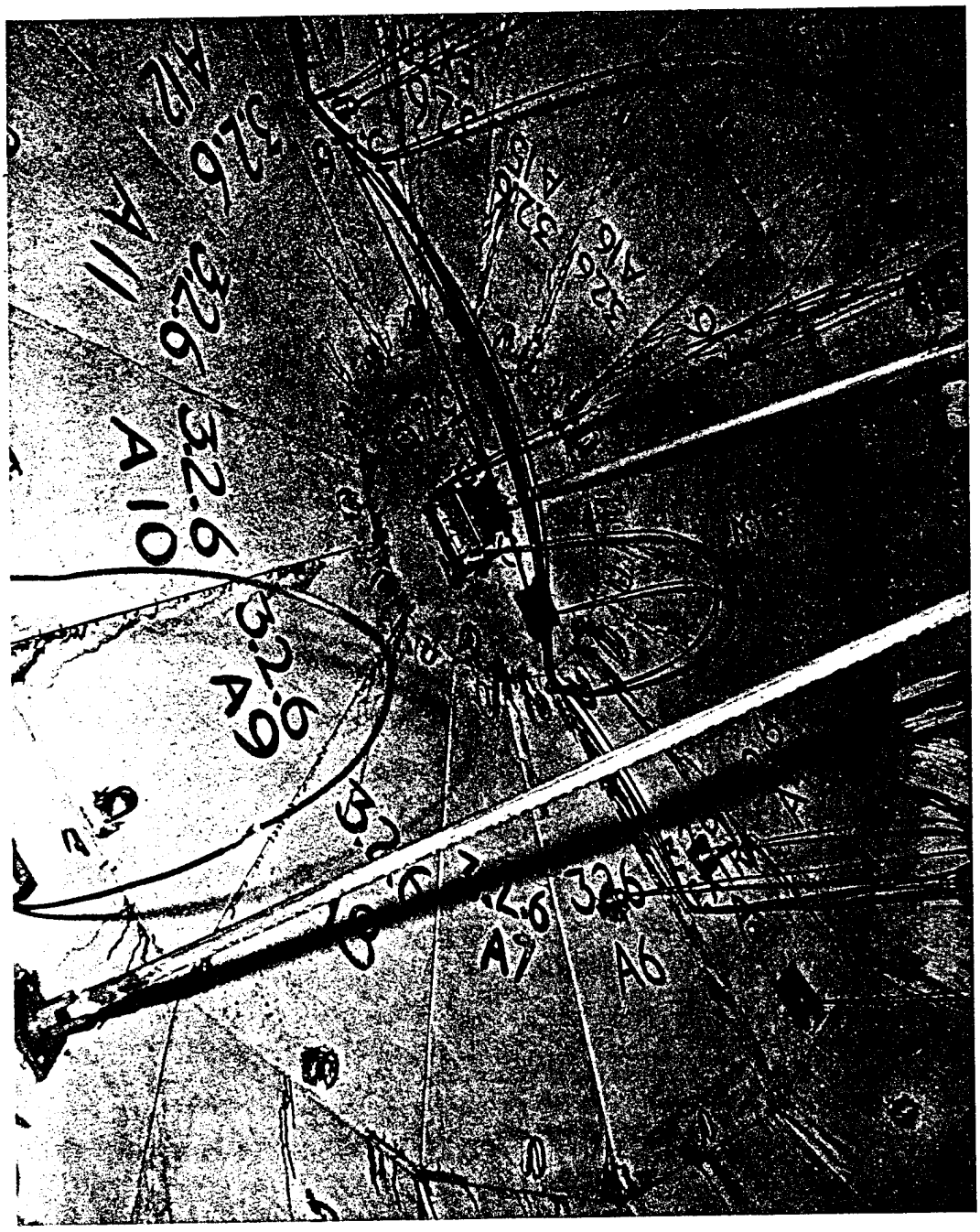


Fig. L.447 Interior View toward Top, Taken from the Right, Structure 3.2.6

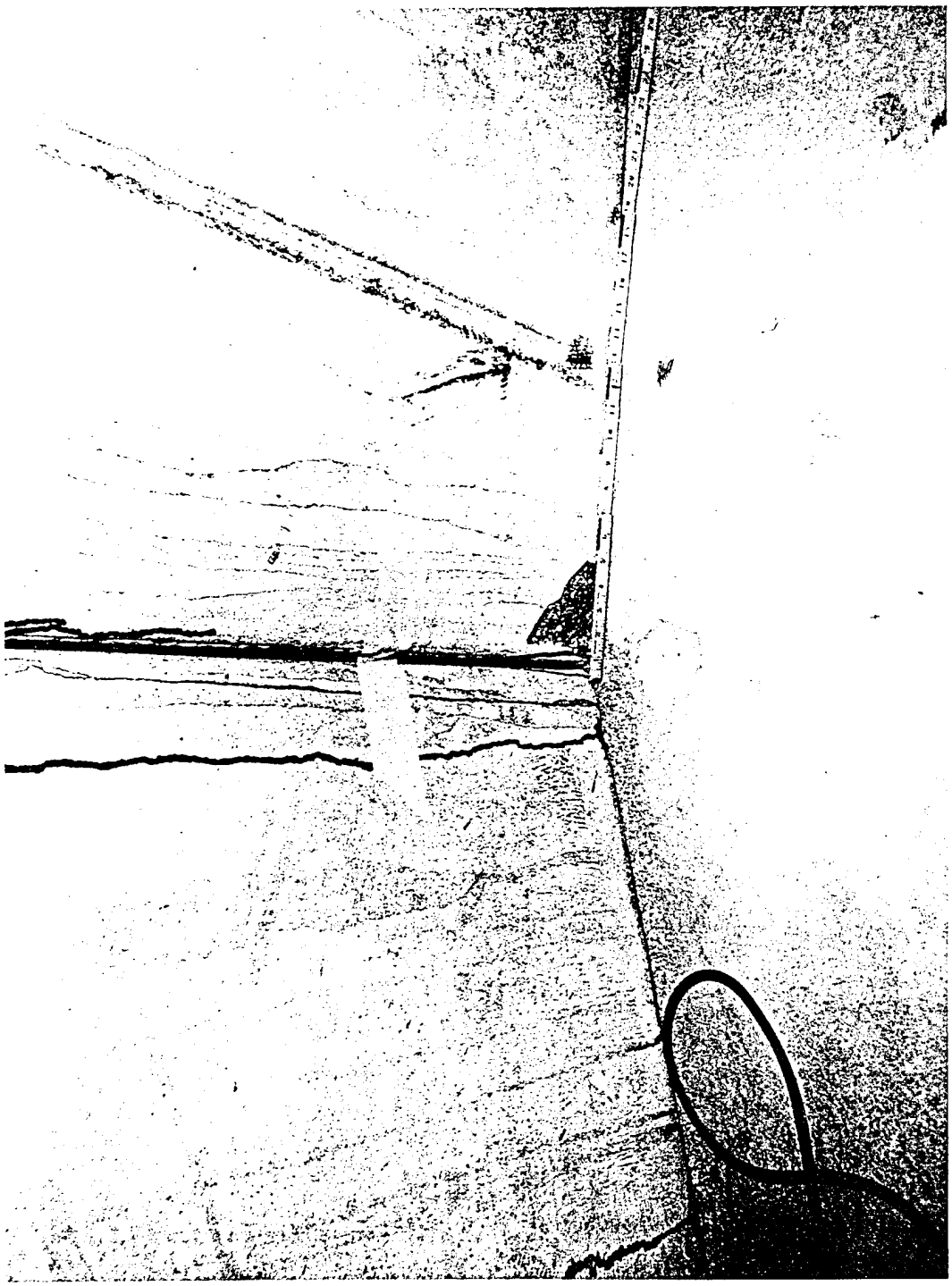


Fig. L.448 Typical Detail of Spall at Corners in Base of D Ring, Structure 3.2.6



Fig. L.449 Typical Detail of Spall and Cracks in Base of D Ring, Structure 3.2.6. Tape shows relative movement of panels.

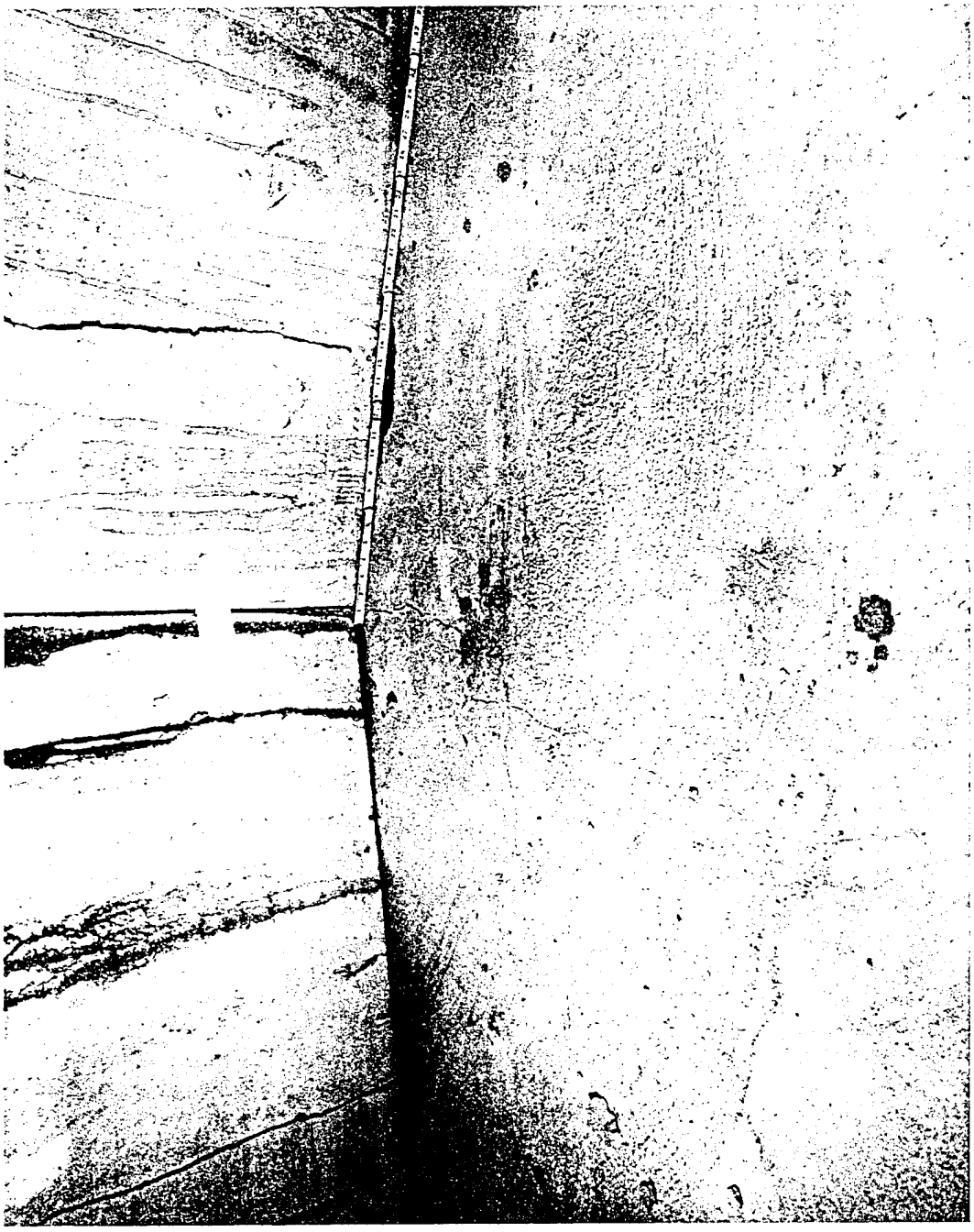


Fig. L.450 Radial Crack in Floor of Building on Side Opposite Wing Walls, Structure 3.2.6

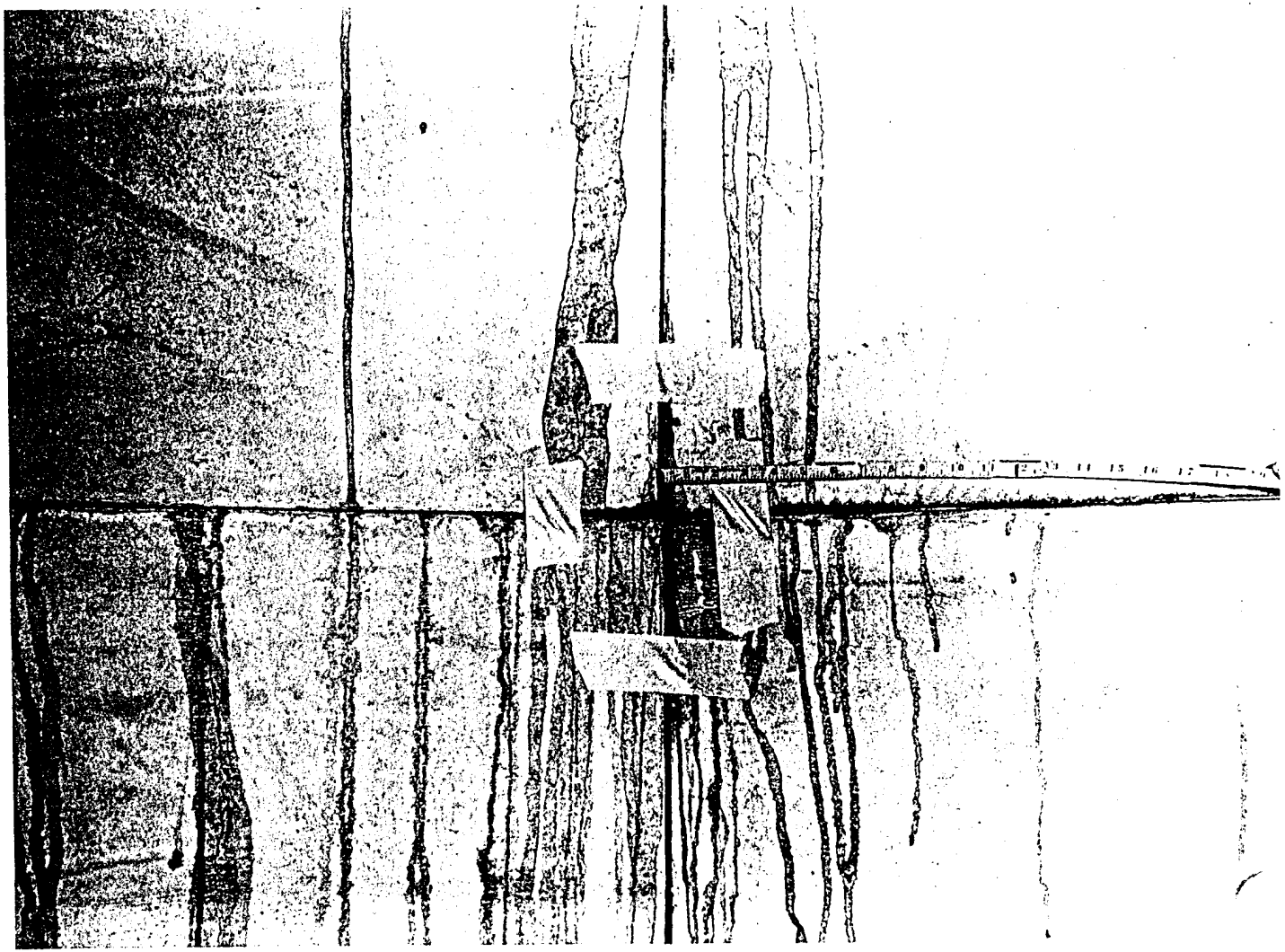


Fig. L.451 Typical Tape Buckling Showing Relative Movement of Panels, Structure 3.2.6

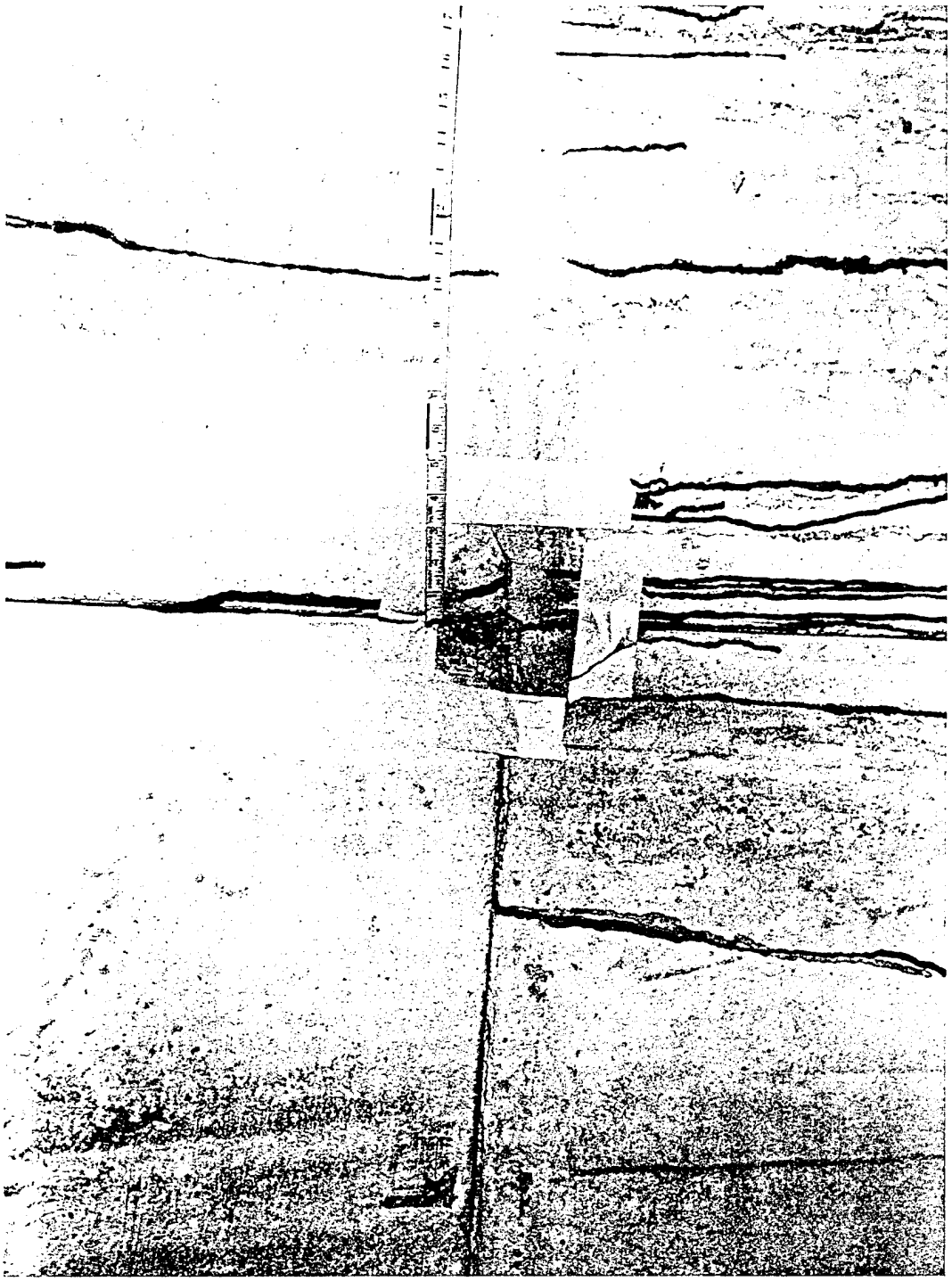


Fig. L.452 Typical Spall at Corner Intersection of D and C Ring Panels, Structure 3.2.6

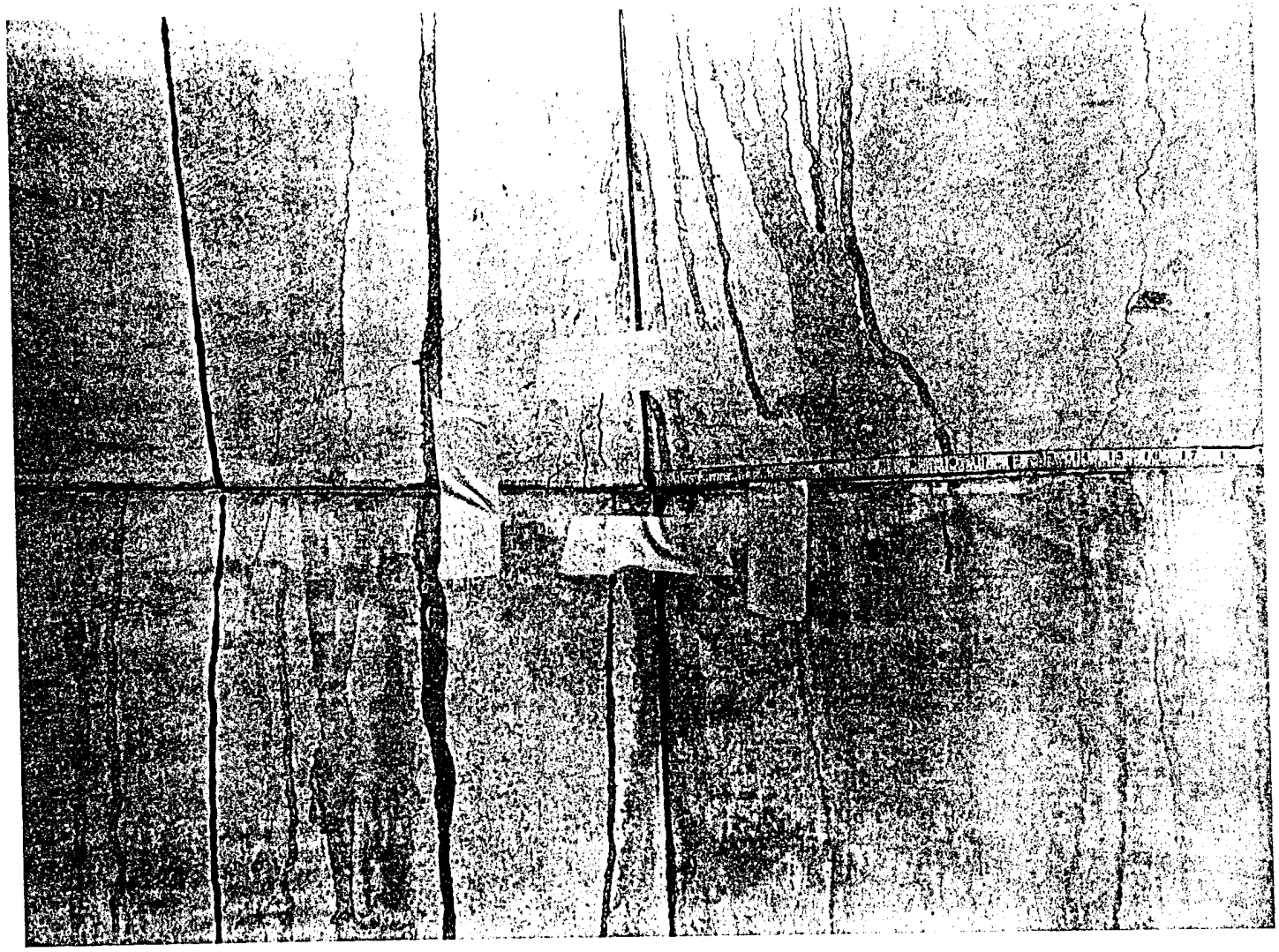


Fig. L.453 Typical Vertical Cracks at Corner Intersection of D and C Ring Panels near Front, Structure 3.2.6

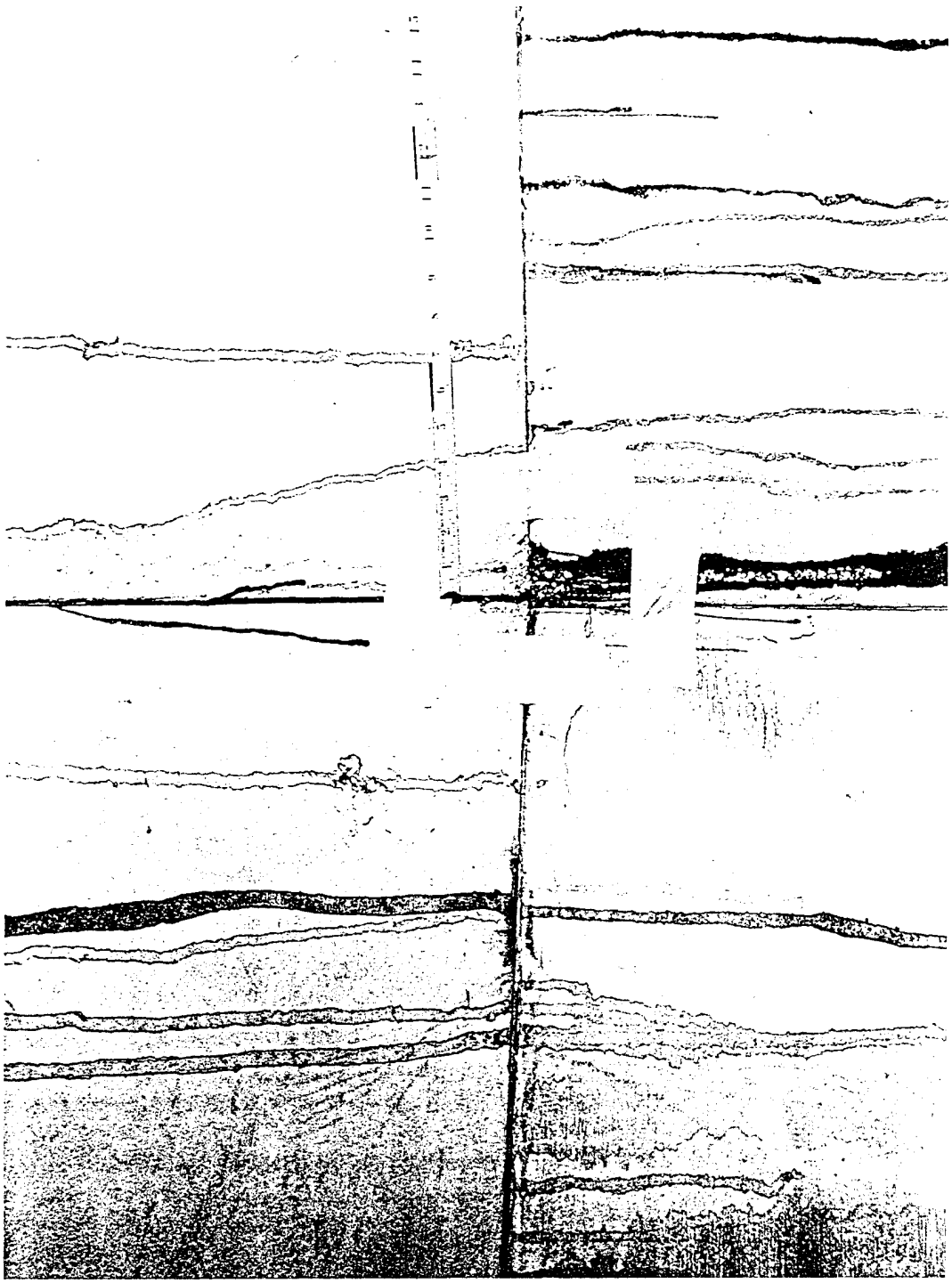


Fig. L.454 Typical Horizontal Cracks at Corner Intersection of D and C Ring Panels near Left, Structure 3.2.6

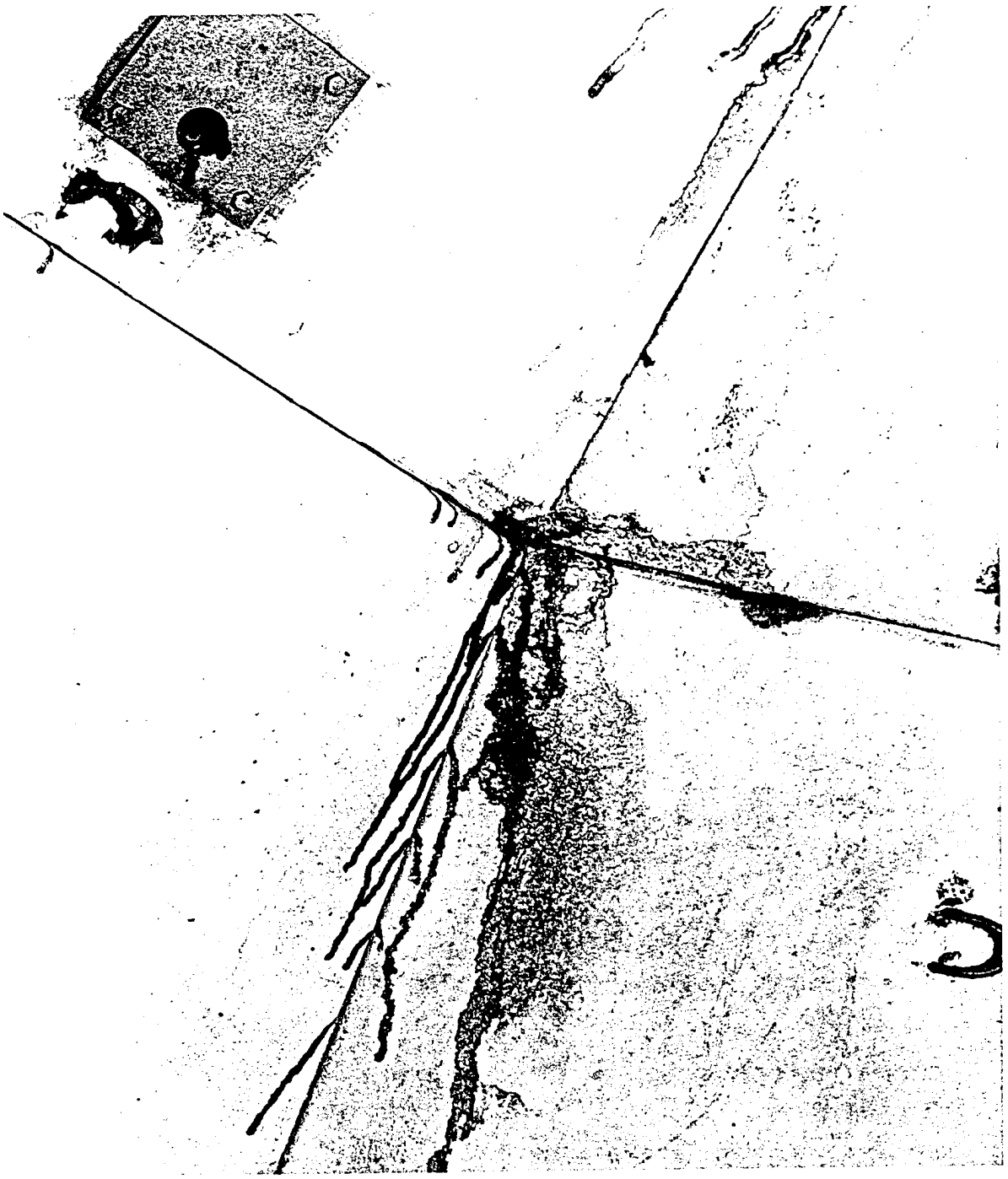


Fig. L.455 Spall at Corner Intersection of B and A Ring Panels near Front, Structure 3.2.6

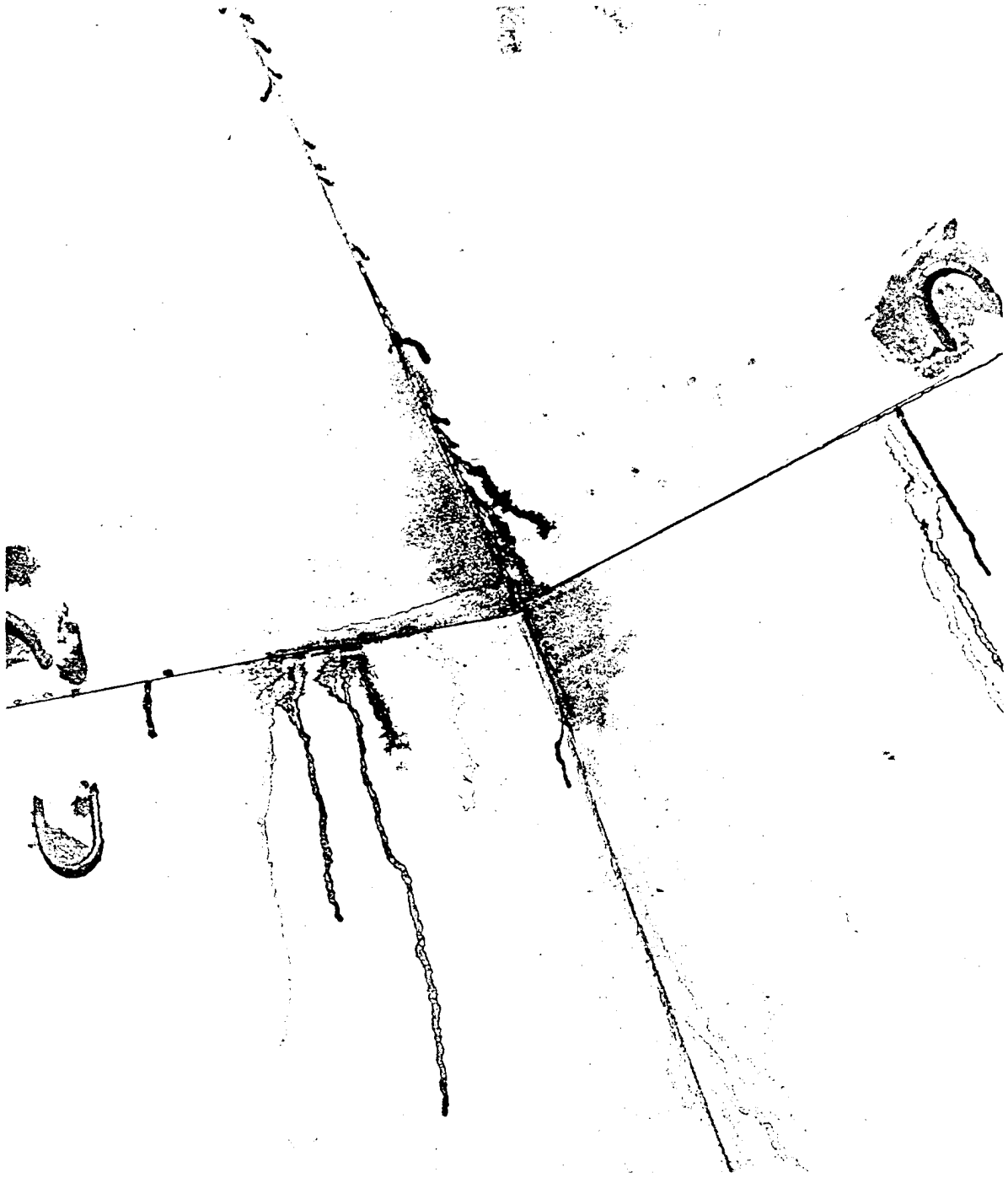


Fig. L.456 Horizontal Crack at Corner Intersection of B and A Panels, Structure 3.2.6

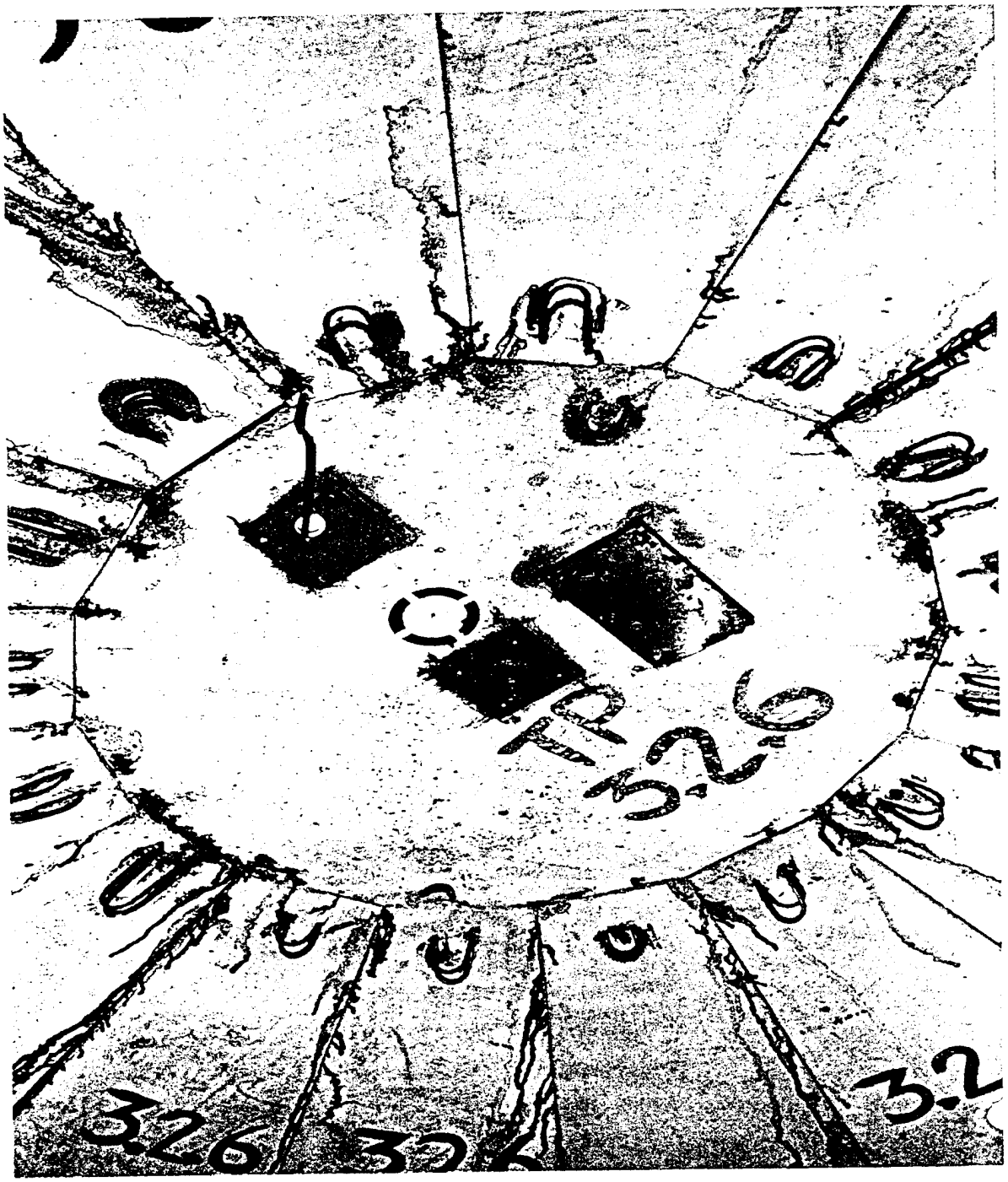


Fig. L.457 Interior View of Top Panel Intersection with the A Ring, Structure 3.2.6



Fig. L.458 Overhead View of Structure, 3.2.7a

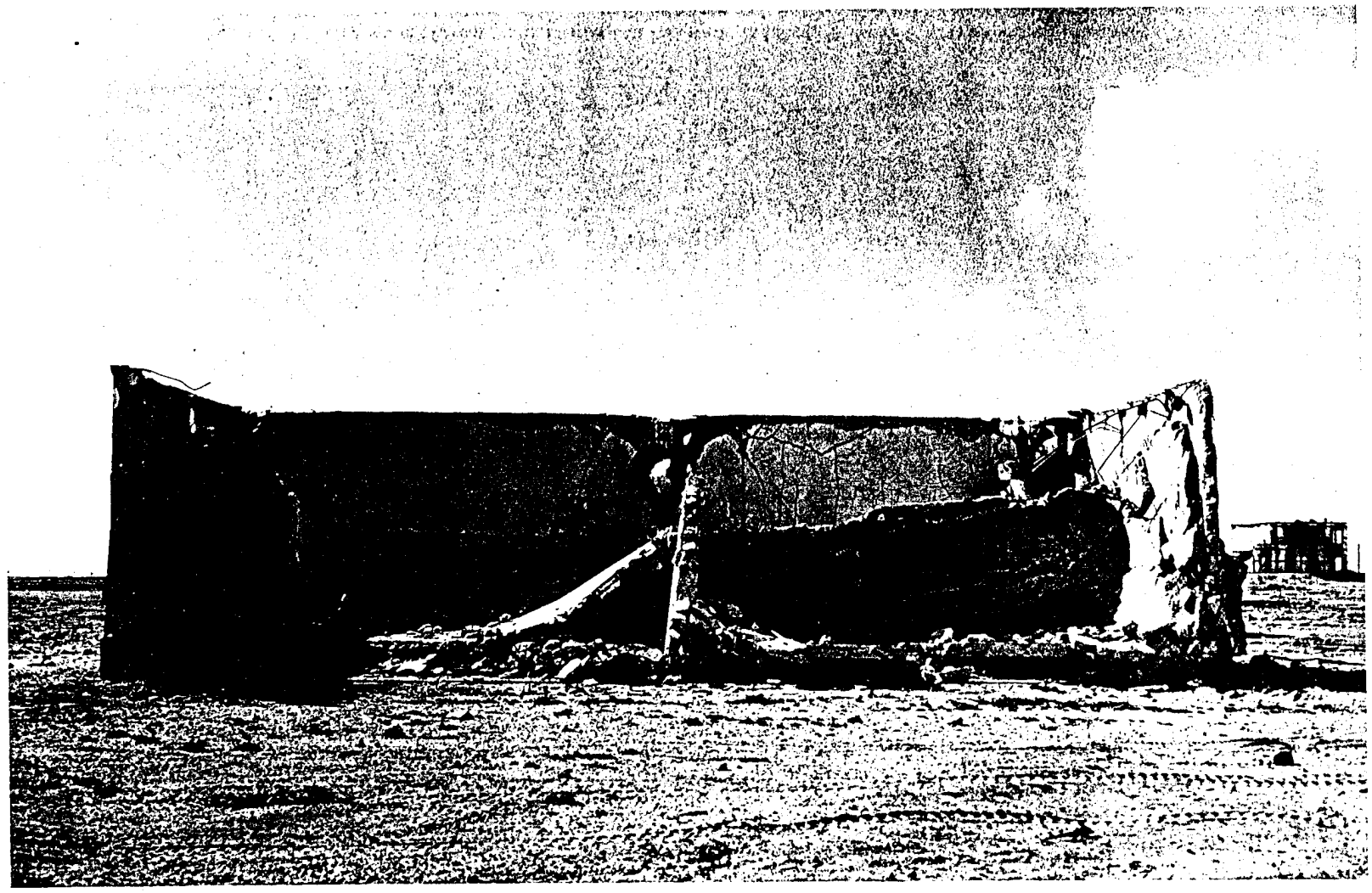


Fig. L.459 View of Structure from the Front, Structure 3.2.7a

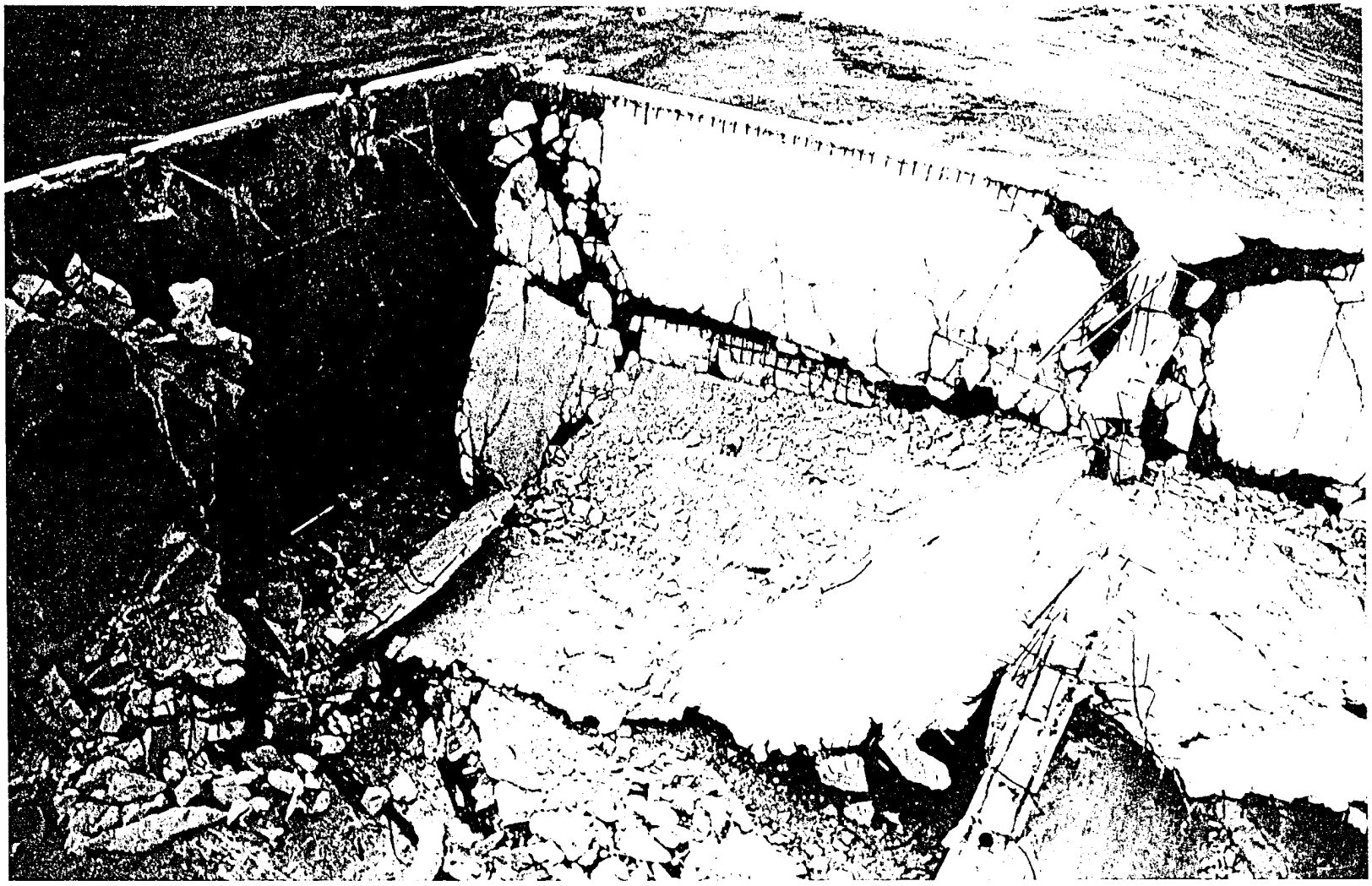


Fig. L.460 Left Section of Front Wall, Interior Left End Wall, and Roof, Structure 3.2.7a. Front wall lies partially under the roof.



Fig. L.461 Left Corner of Front Wall Showing Corner and Front-wall Failure, Structure 3.2.7a



Fig. L.462 Necked-down Steel Dowels in Front-wall Foundation, Structure 3.2.7a



Fig. L.463 Right Half of Front Wall, Structure 3.2.7a



Fig. L.464 Diagonal View of Right Half of Front Wall and Center Column, Structure 3.2.7a. Note deflection and compression spalls in front-wall slab. Note also the corner failure taking part of the end wall.



Fig. L.465 Diagonal View of Right Half of Front Wall, Structure 3.2.7a



Fig. L.466 Right Front-corner Failure, Structure 3.2.7a

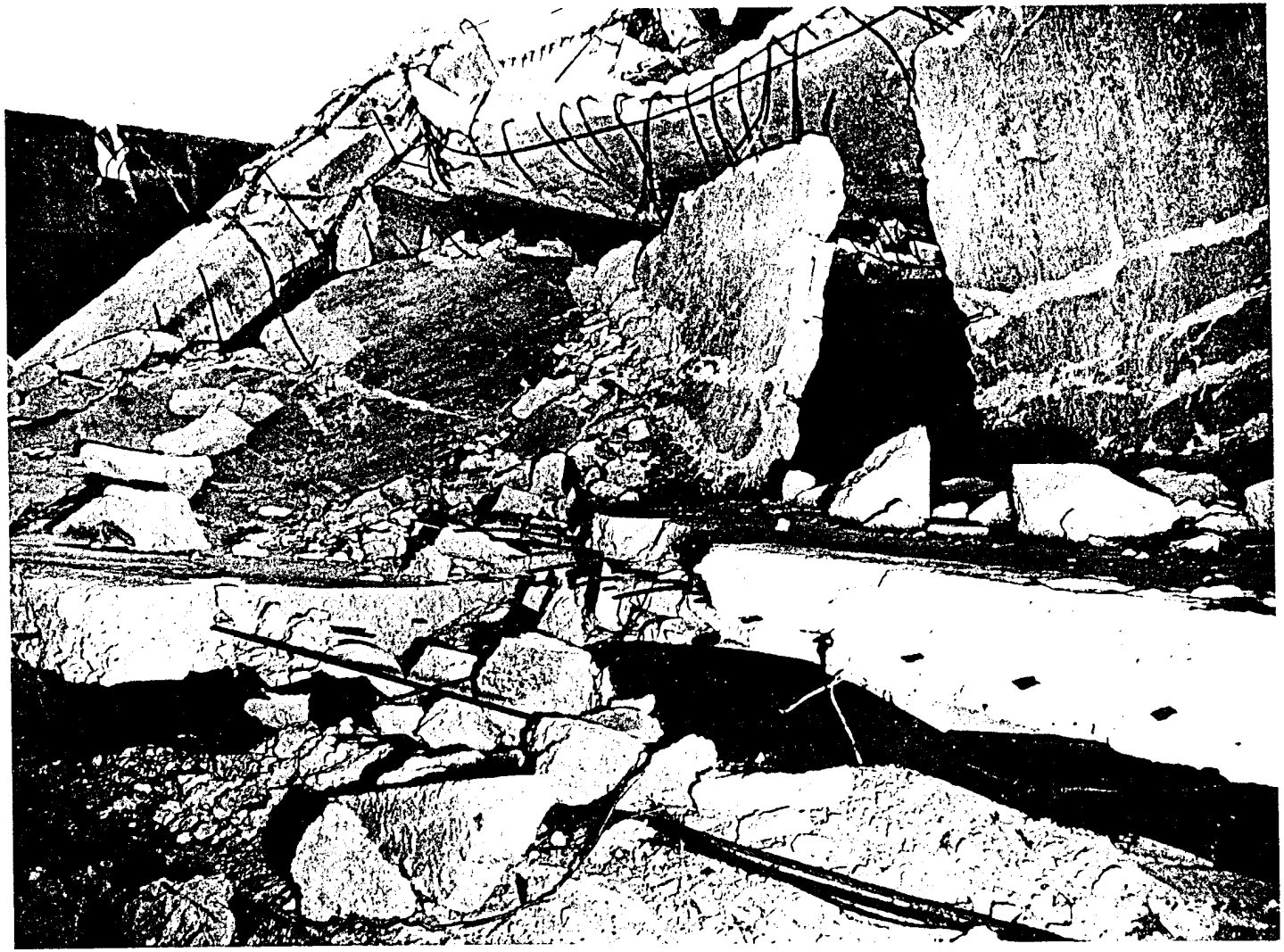


Fig. L.467 Steel Dowels to Foundation Were Necked Down Indicating Tension Failure, Structure 3.2.7a

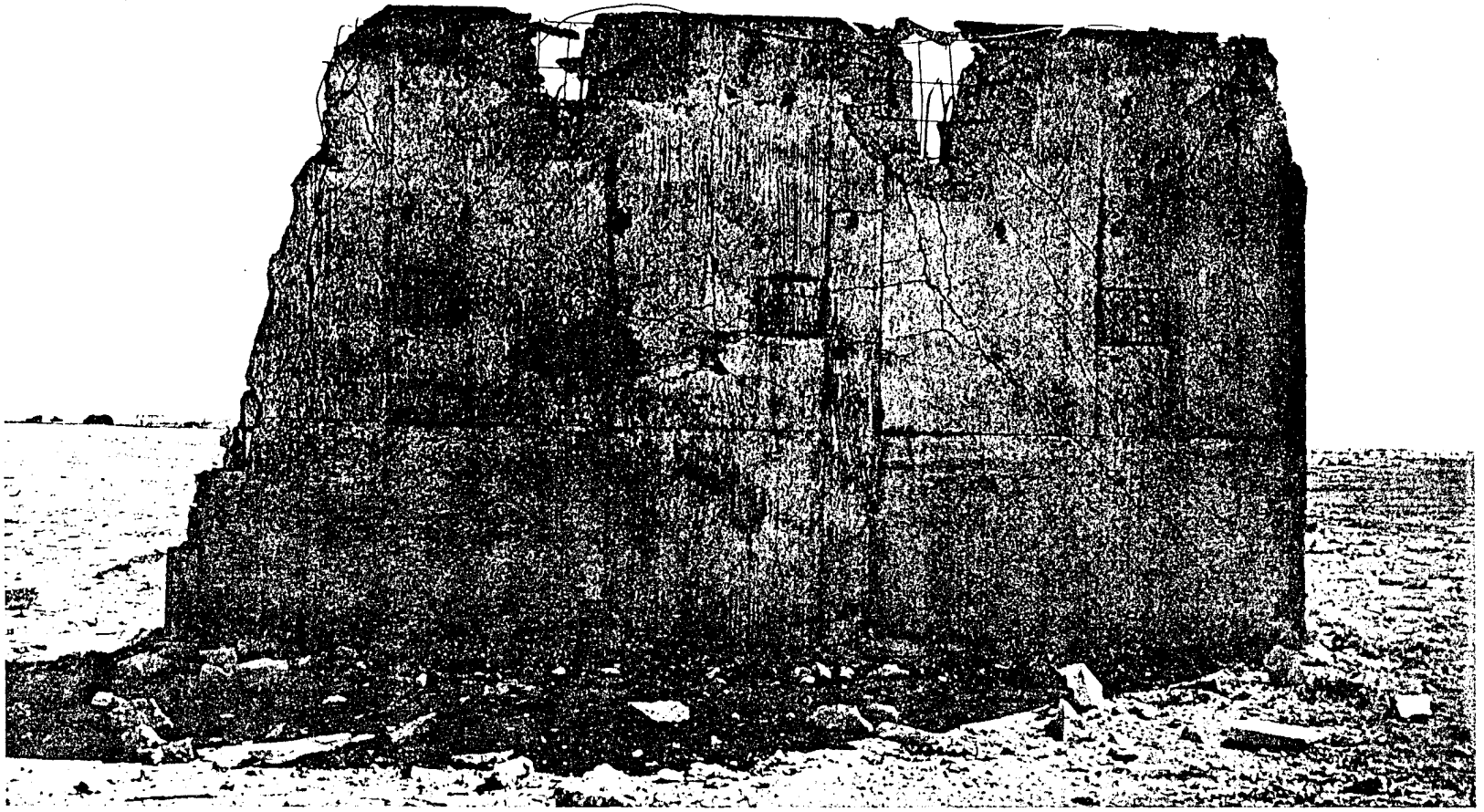


Fig. L.468 Right End Wall, Structure 3.2.7a. The two stringer haunches stayed with the roof, leaving the holes at top edge.

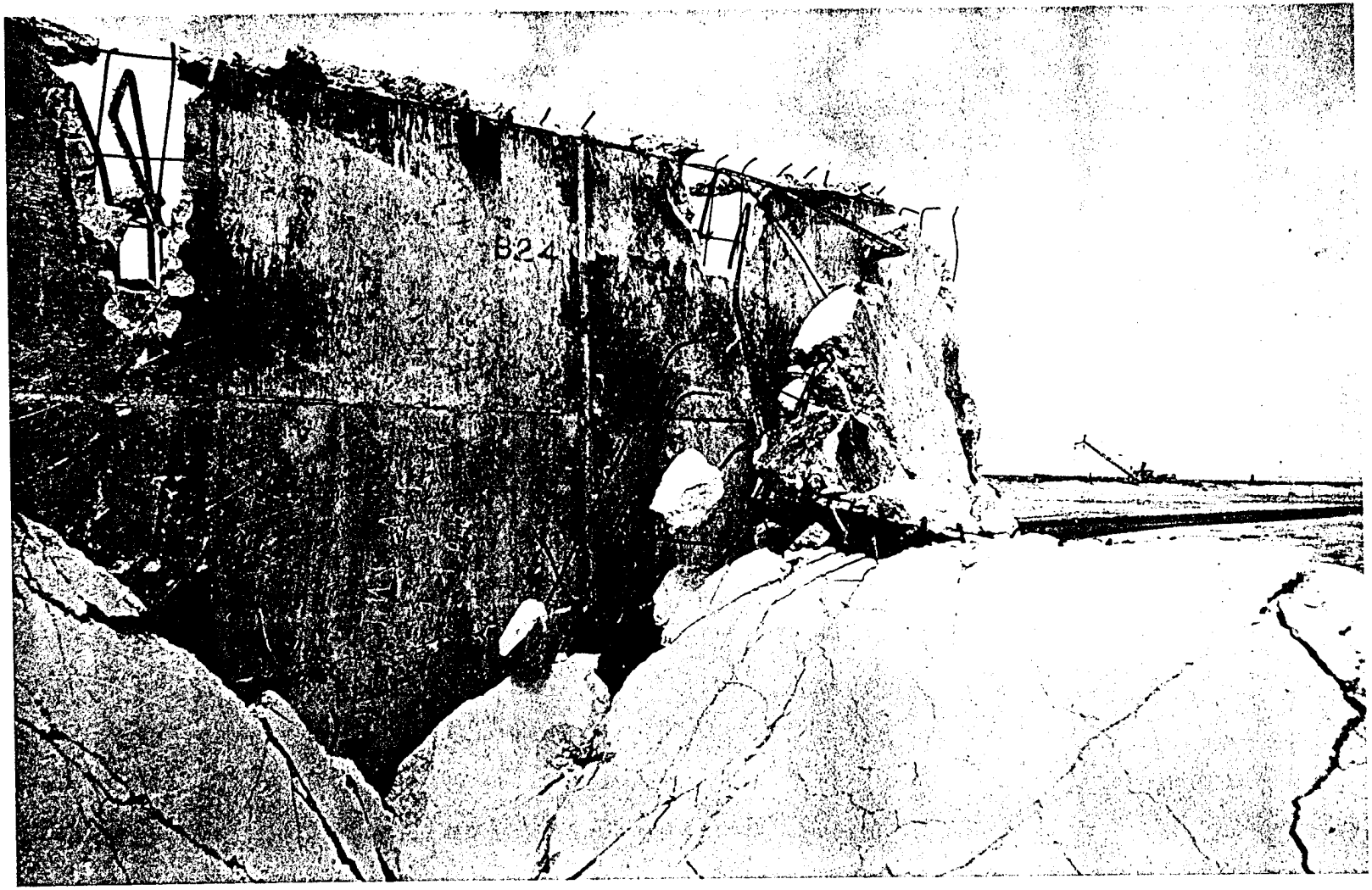


Fig. L.469 Interior View of Right End Wall, Structure 3.2.7a. Note top tension bars of stringers remained with the end walls.

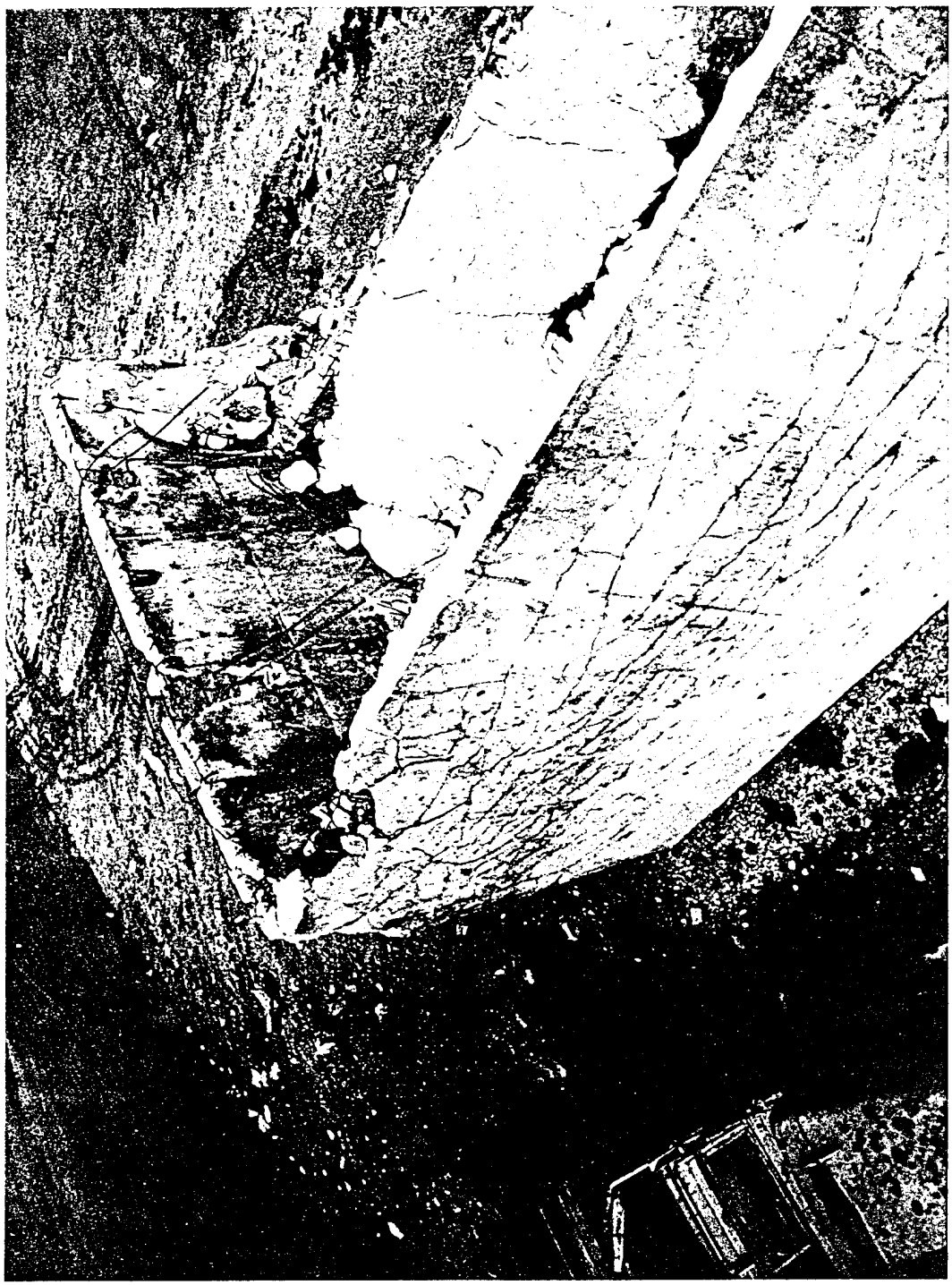


Fig. L.470 Overhead View of Right Rear Corner, Interior Right End, and Right Rear Face of Structure, 3.2.7a

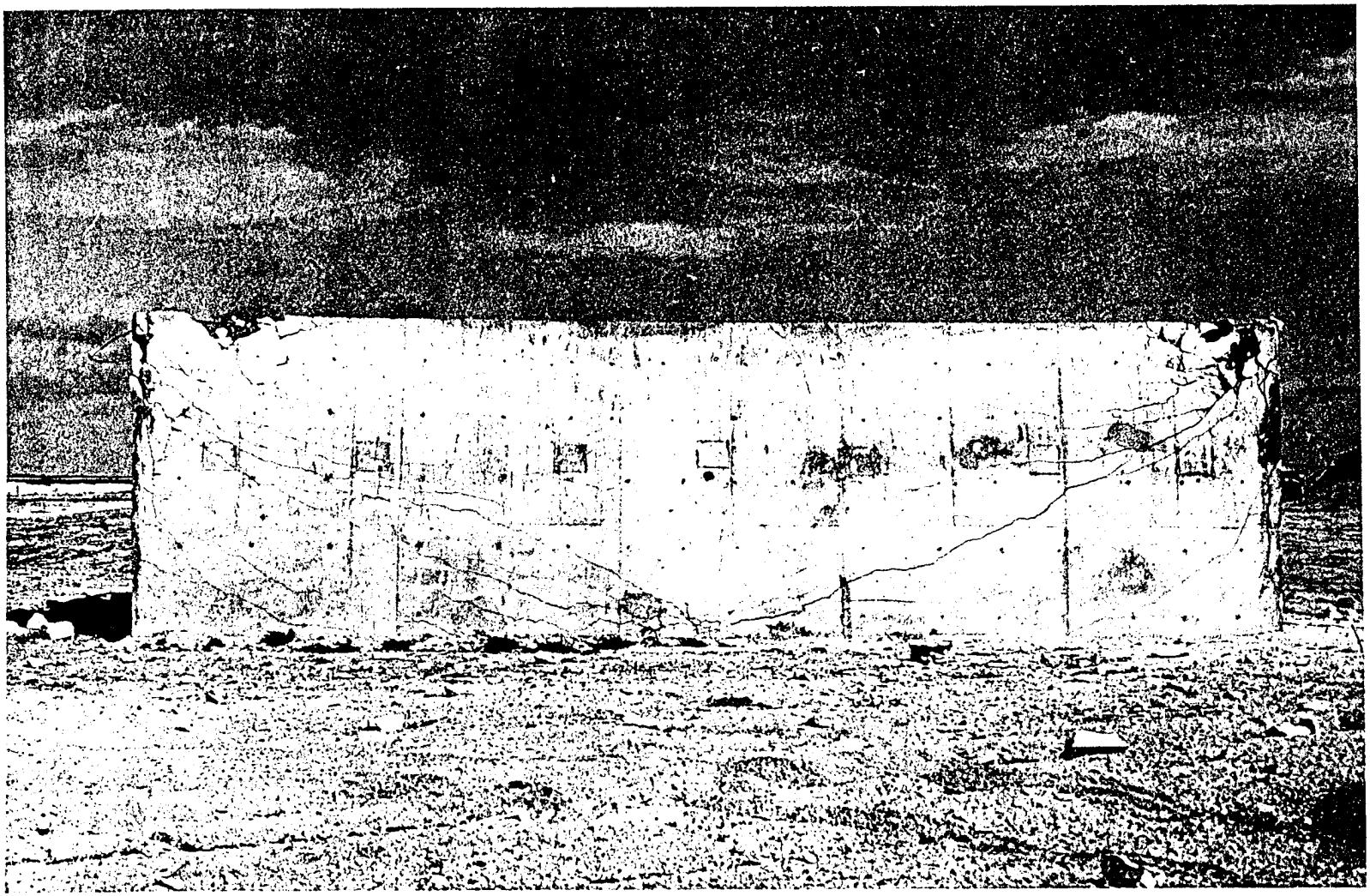


Fig. L.471 Rear Face of Structure, 3.2.7a

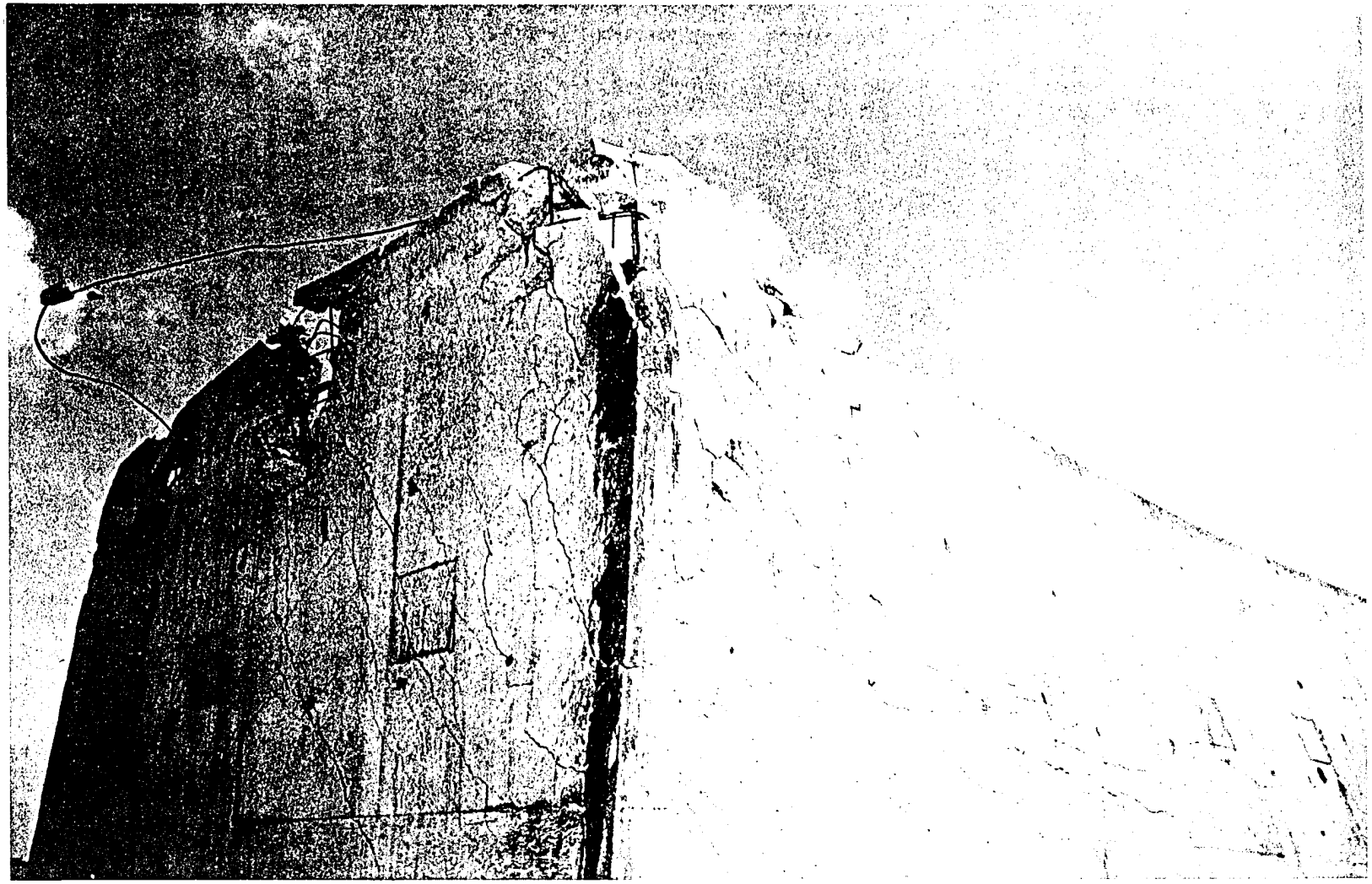


Fig. L.472 Right Rear-corner Failure at Roof Line, Structure 3.2.7a



Fig. L.473 Rear-column Failure at the Base Caused Rear-wall Cracks at Bottom Center, Structure 3.2.7a



Fig. L.474 Left Rear-corner Failure at the Roof Line, Structure 3.2.7a

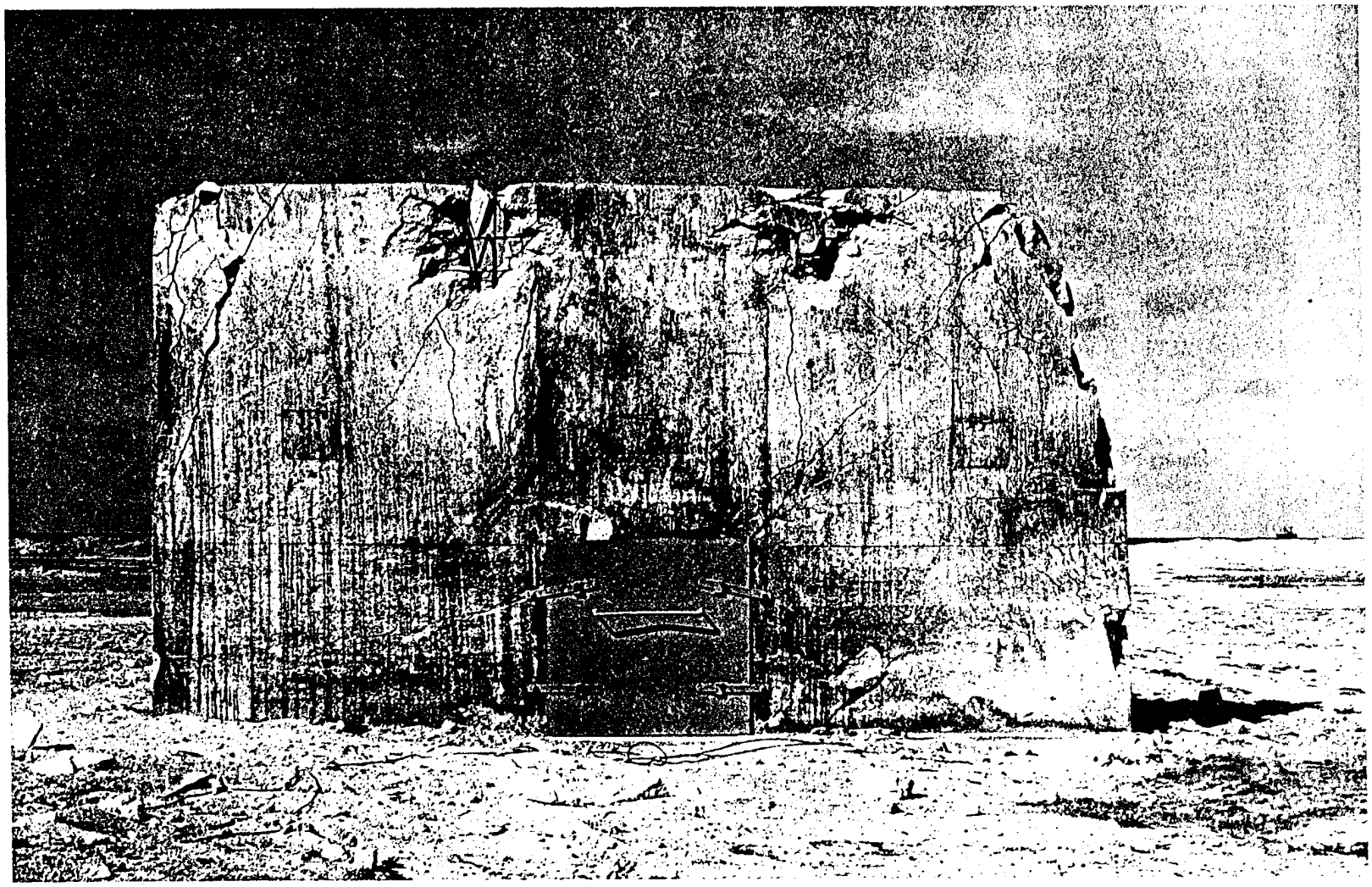


Fig. L.475 Left End Wall, Structure 3.2.7a

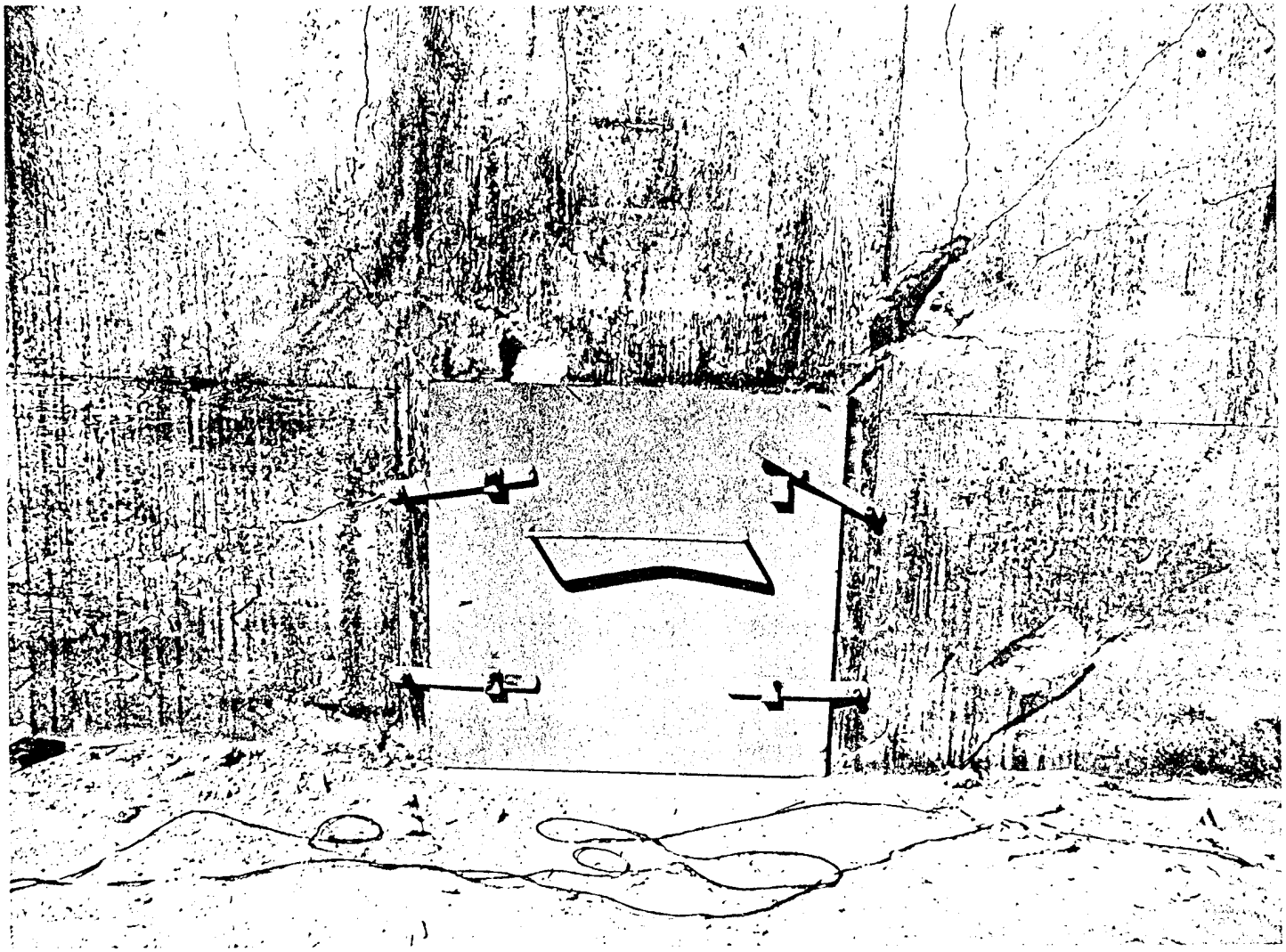


Fig. L.476 Door in Left End Wall, Structure 3.2.7a. Cracks indicate concentration of stresses at upper corners of door caused by change in section. Cracks at bottom of wall are shear failures.

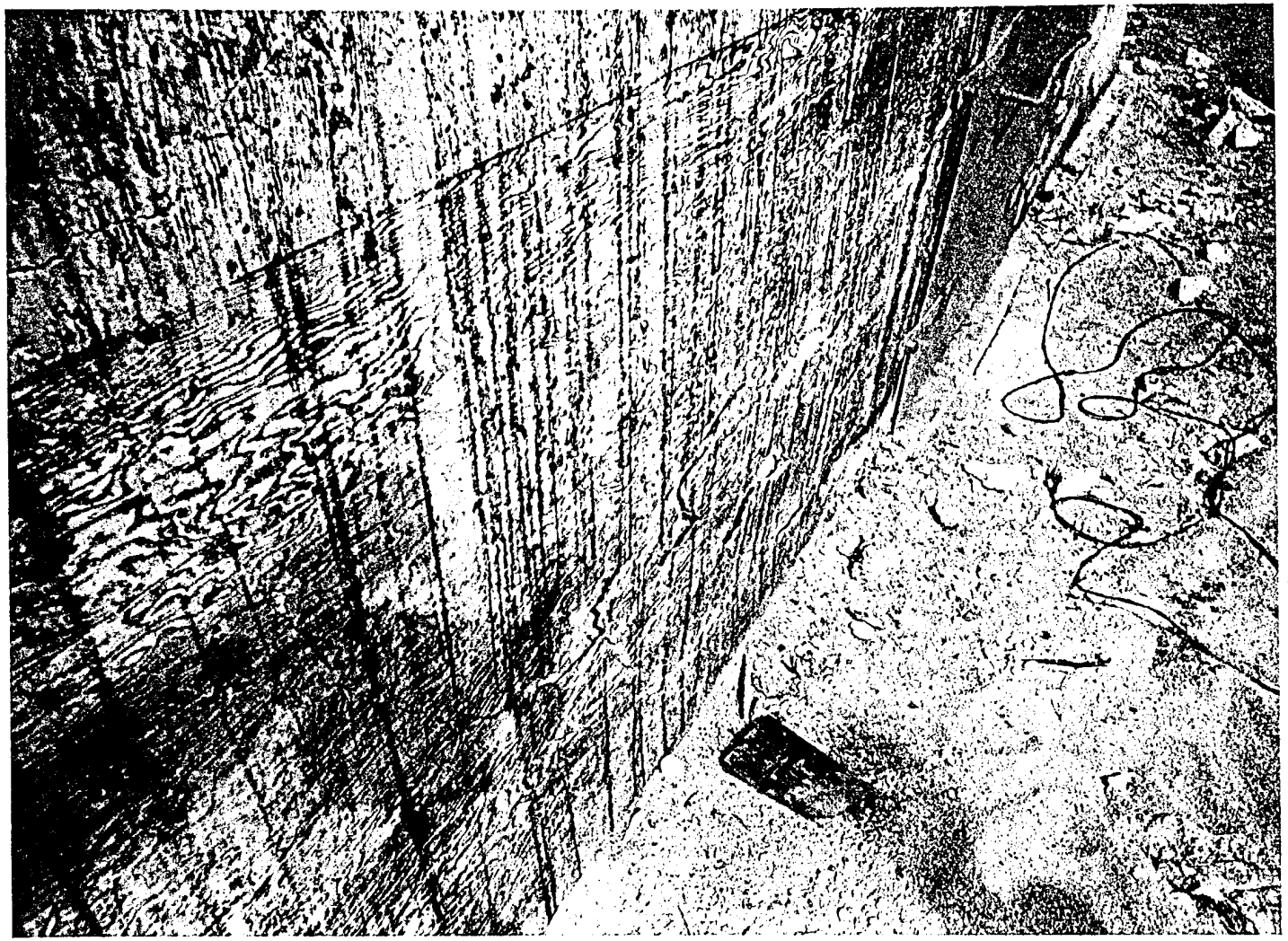


Fig. L.477 Shear Cracks to Rear of Door, Structure 3.2.7a. Similar cracks were present on interior face.

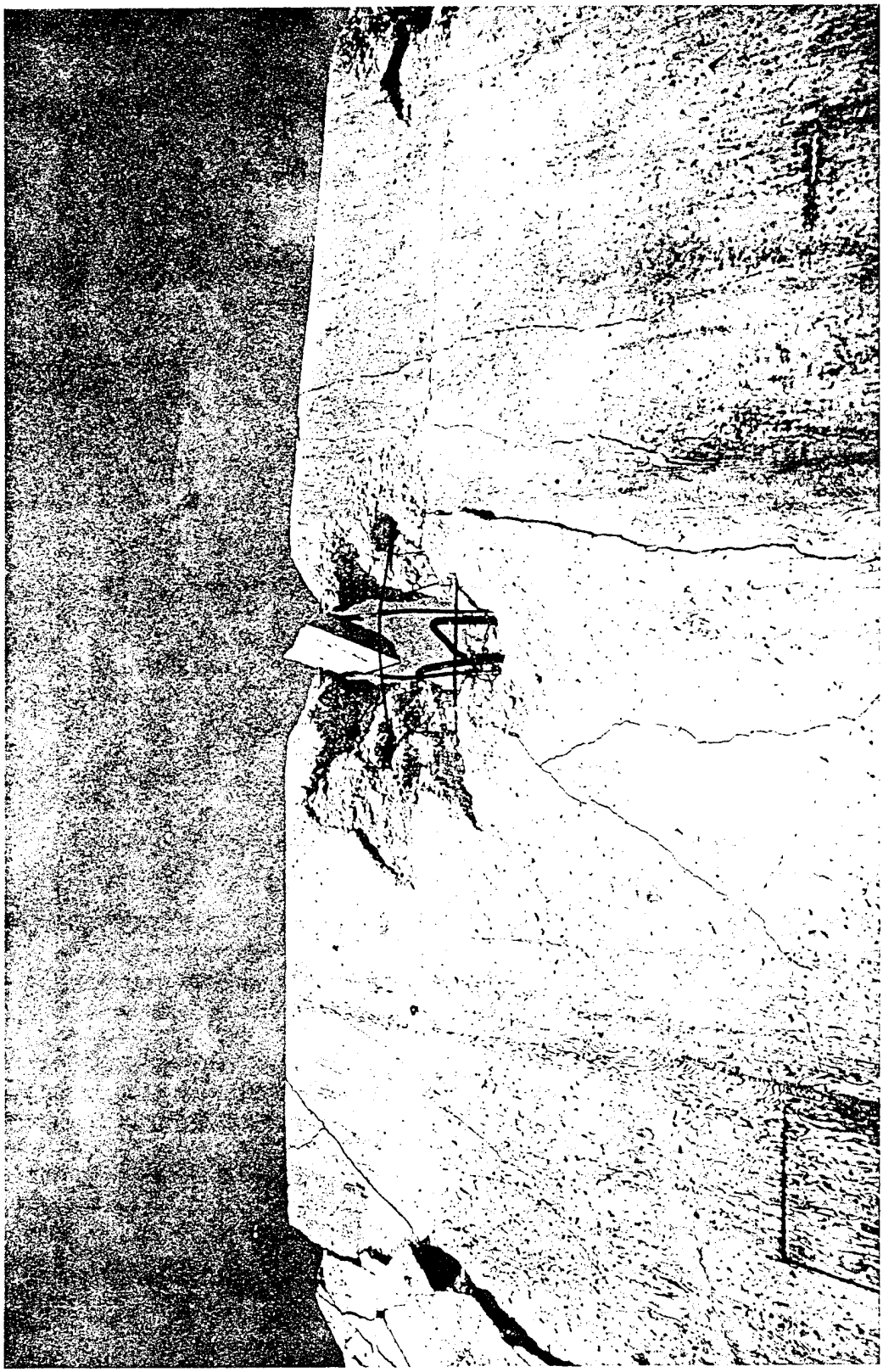


Fig. L.478 Detail View of Failure when Stringer Haunches Pulled Away, Structure 3.2.7a

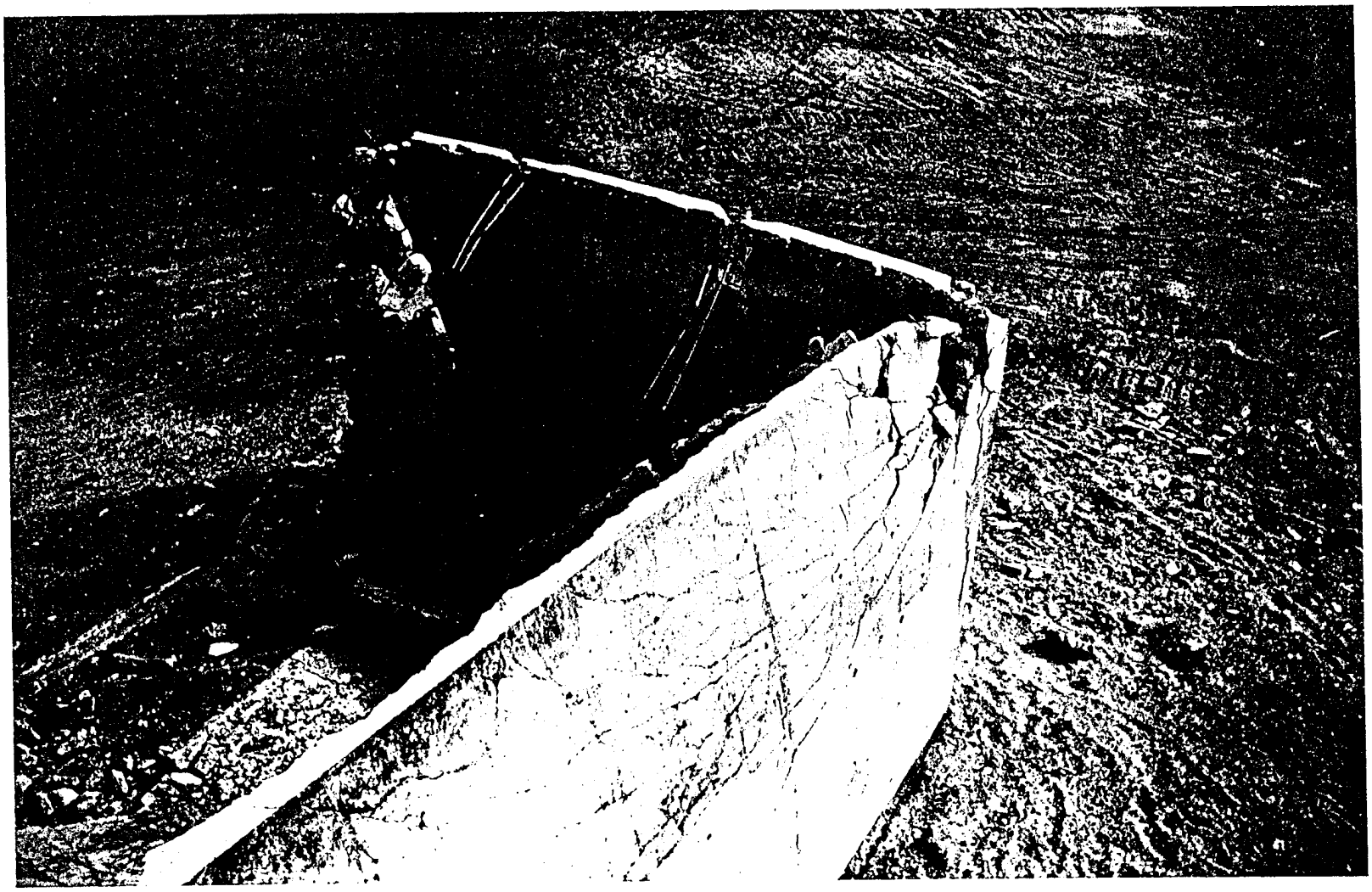


Fig. L.479 Interior View of Left End Wall, Structure 3.2.7a. Note stringer top tension steel remained with end wall.



Fig. L.480 Failure of Left Half of Roof, Structure 3.2.7a

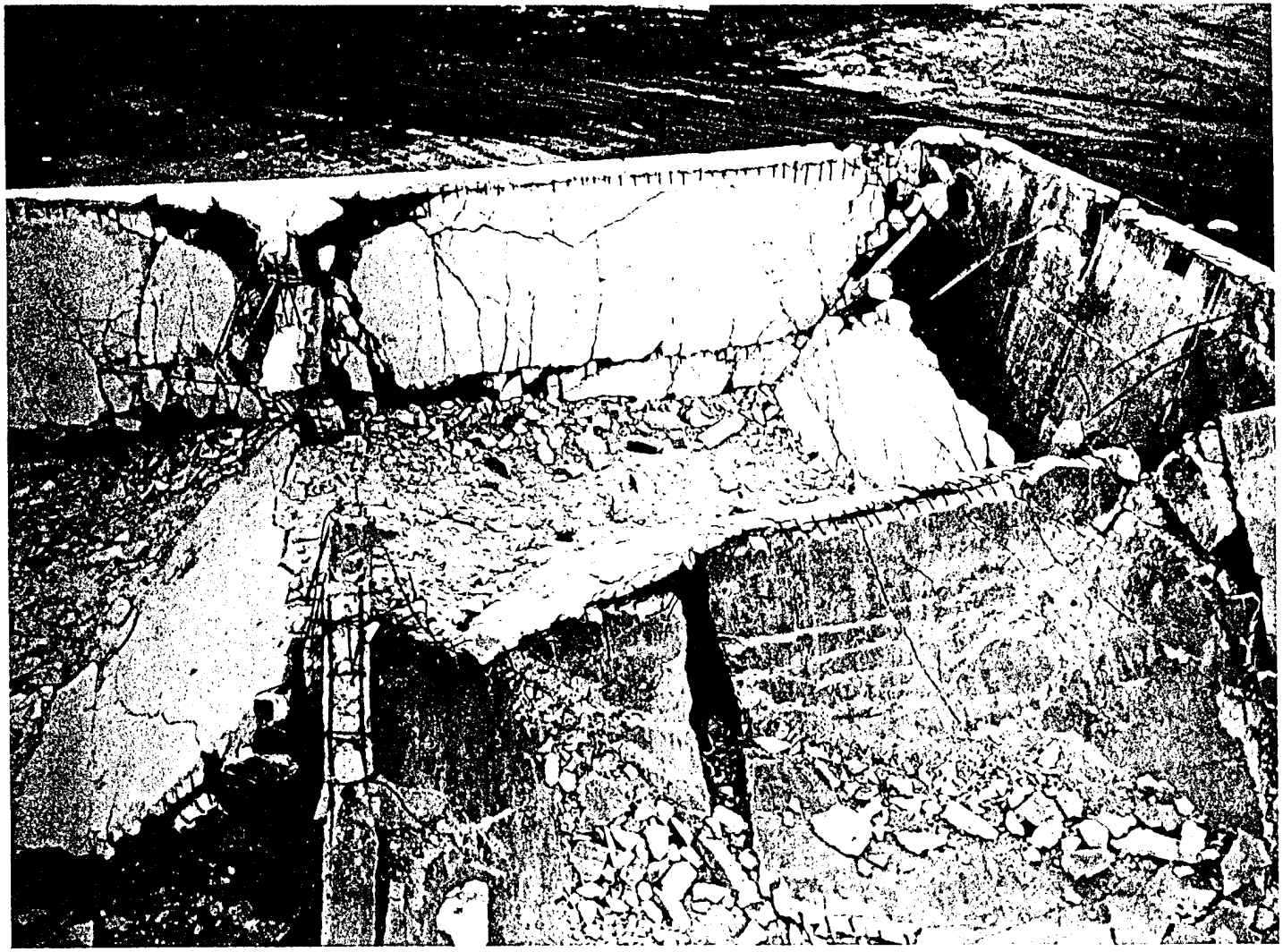


Fig. L.481 Failure of Right Half of Roof, Structure 3.2.7a



Fig. L.482 Diagonal Tension Failure of Girder near Rear Column, Structure 3.2.7a

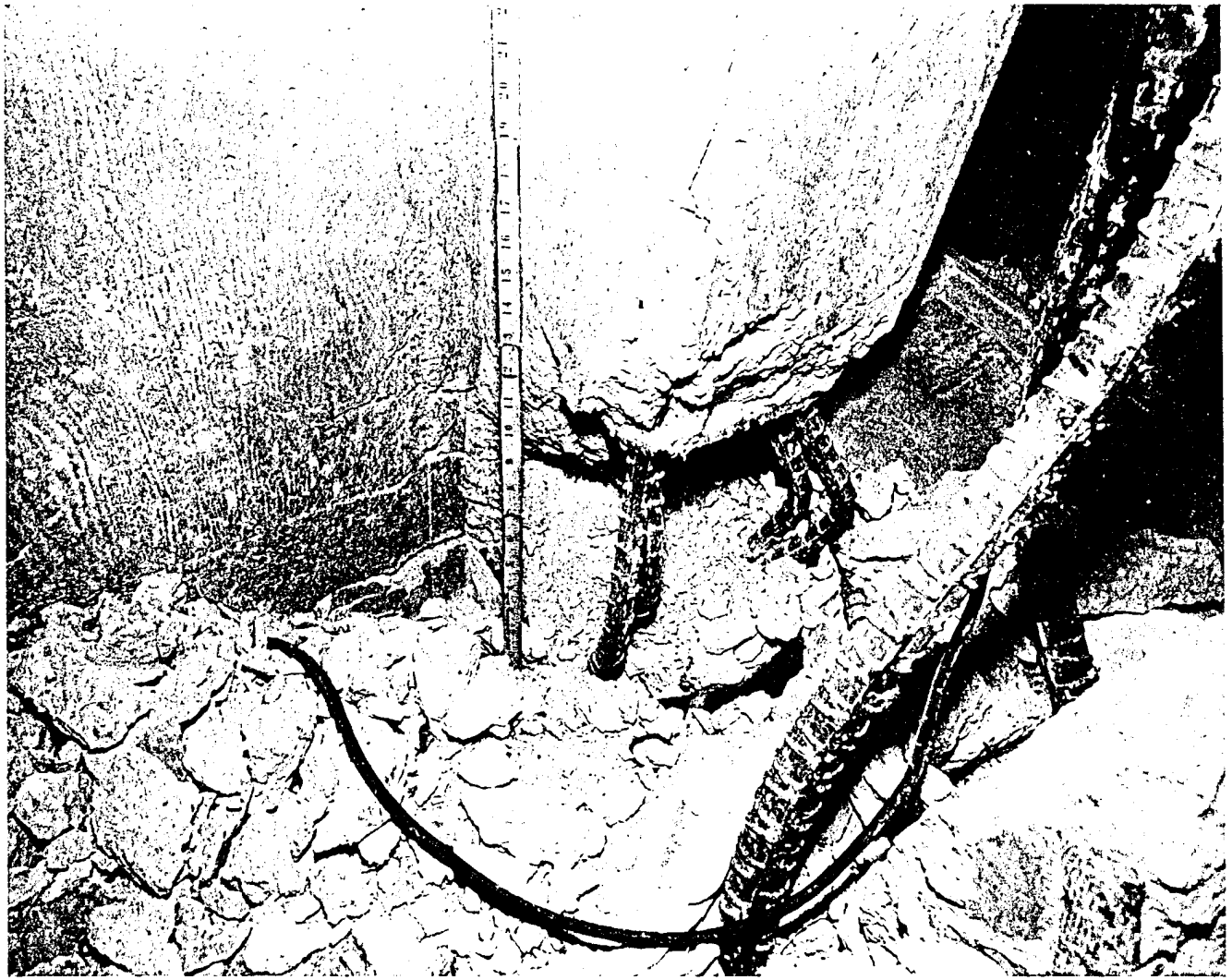


Fig. L.483 Movement Failure at Base of Rear Column, Structure 3.2.7a. Girder steel in right foreground.

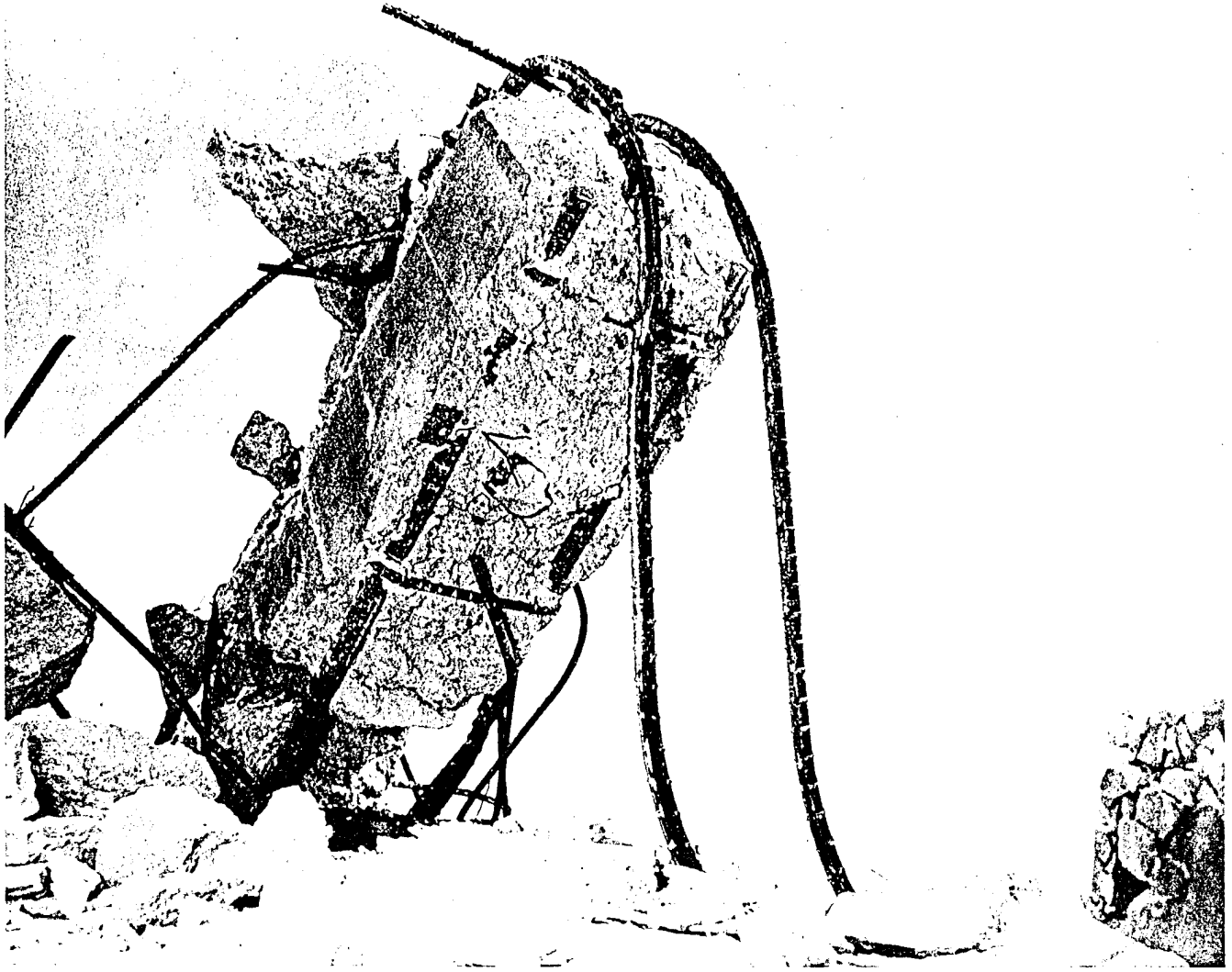


Fig. L.484 Tension Failure of Girder Haunch at Front-column Face, Structure 3.2.7a

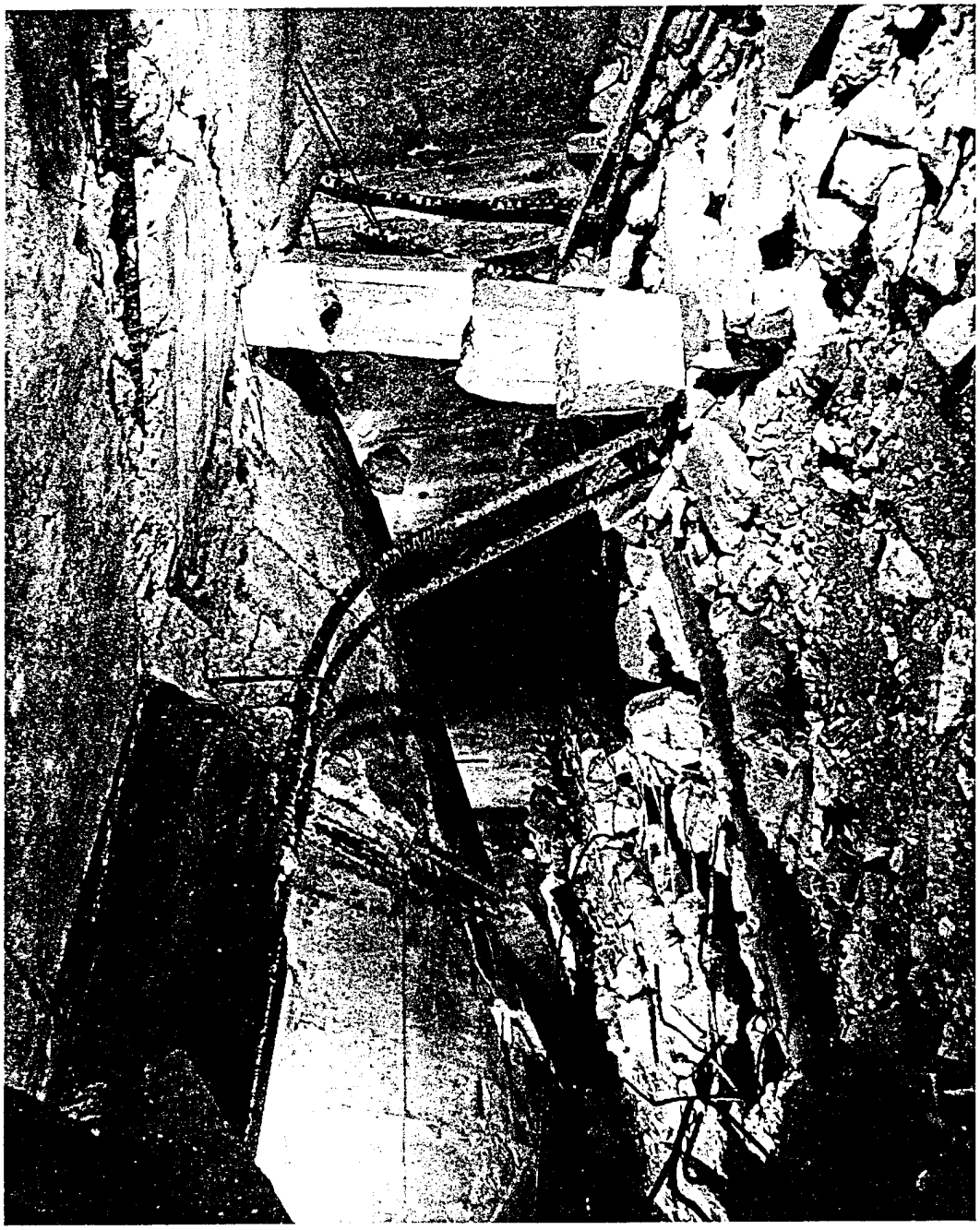


Fig. L.485 Girder Failure Showing Bare Untied Bottom Tension Steel, Structure 3.2.7a



Fig. L.486 Untied Bottom Tension Steel of Stringers Dropped Free on Initial Loading, Structure 3.2.7a



Fig. L.487 Untied Bottom Tension Steel of Stringers, Structure 3.2.7a



Fig. L.488 Interior View of Left Rear Corner Showing Roof to End-wall Bar Hooks Pulled Free, Structure 3.2.7a



Fig. L.489 Roof Failure along Front Longitudinal Stringer Line, Structure 3.2.7a

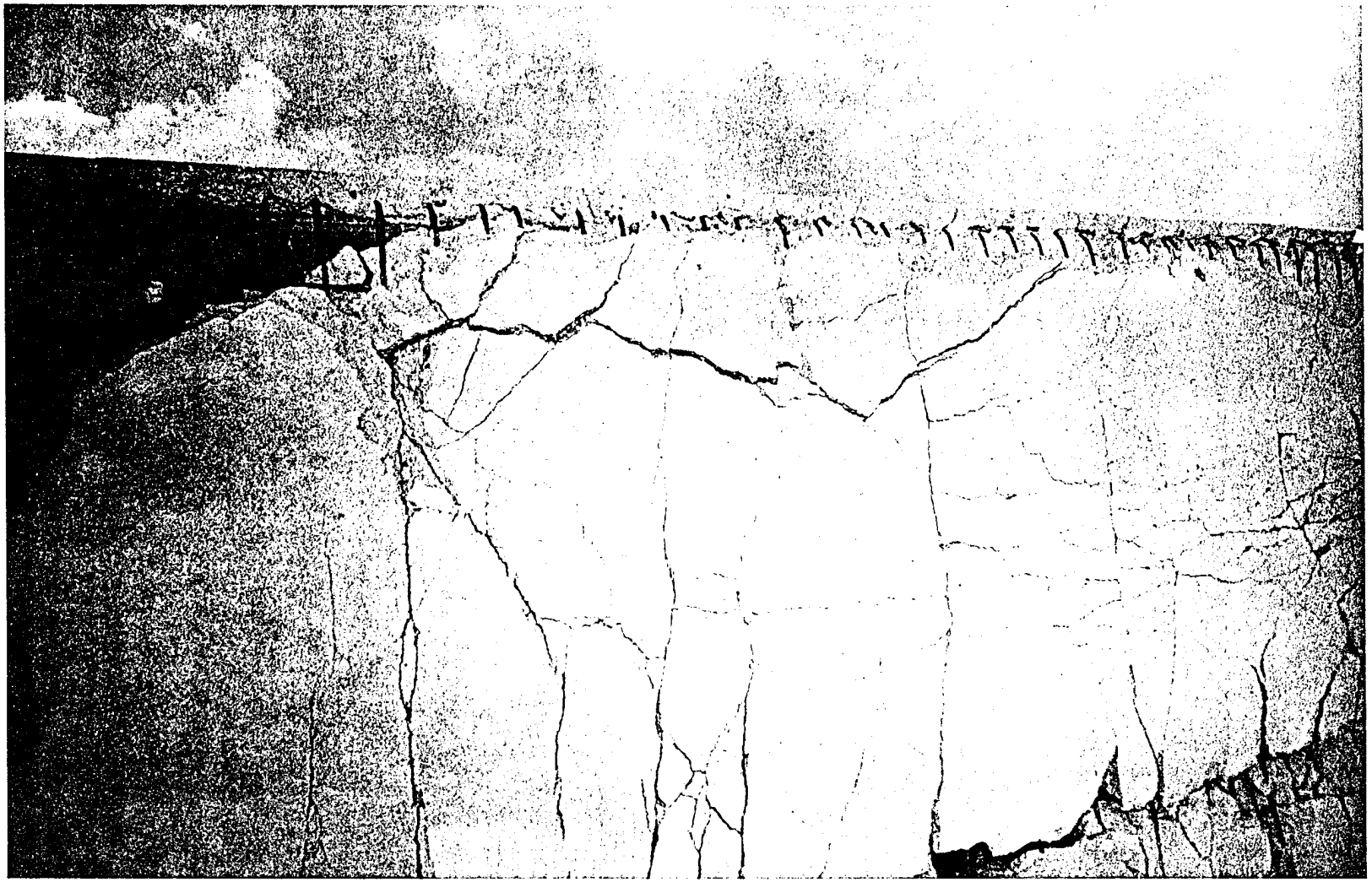


Fig. L.490 Failure of Roof to Rear Wall, Structure 3.2.7a. Bar hooks held. At bottom right, failure of roof along the rear longitudinal string line is shown.

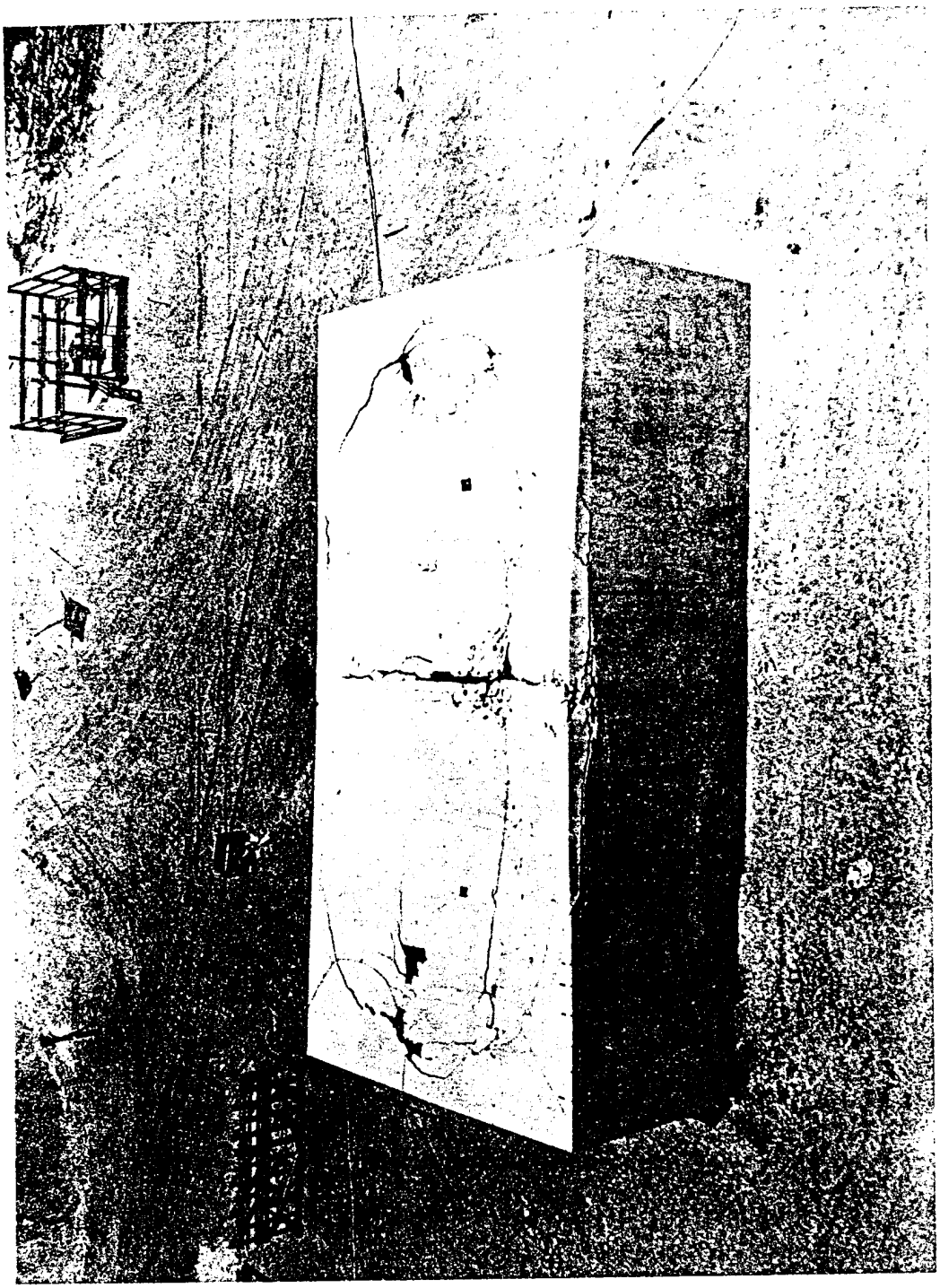


Fig. L.491 Aerial View of Structure after Blast, Structure 3.2.7b

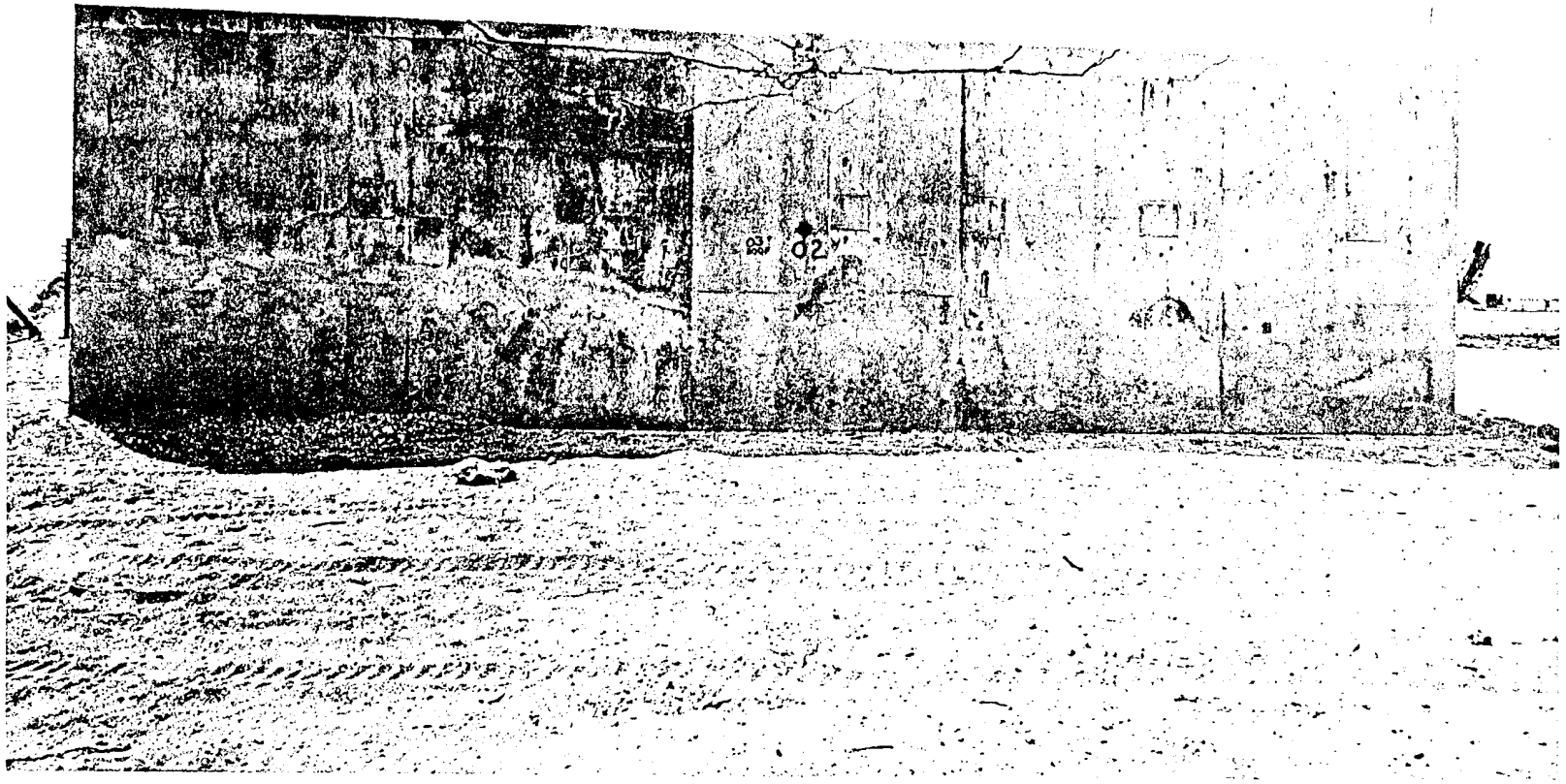


Fig. L.492 Front Wall after Blast, Structure 3.2.7b

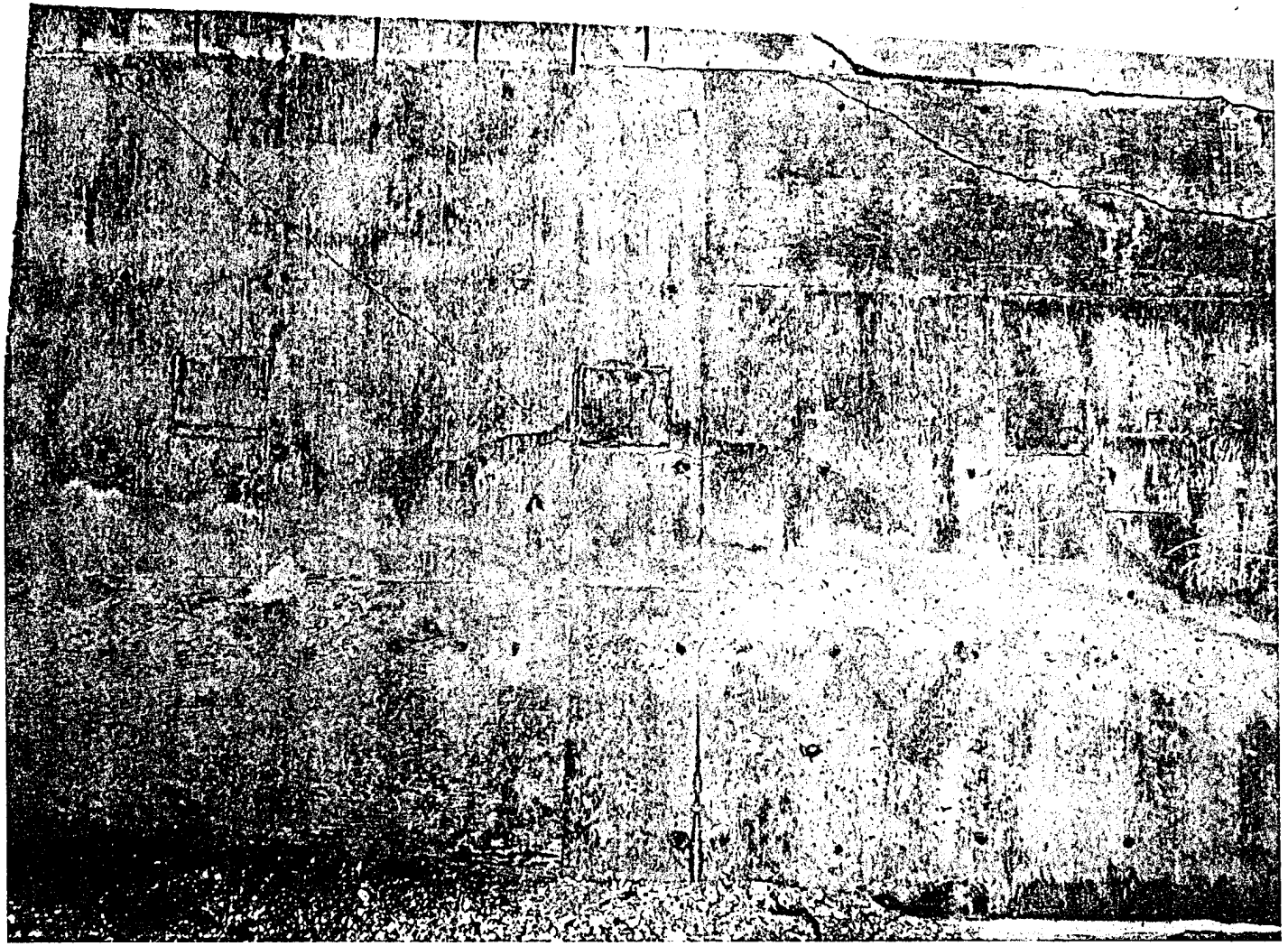


Fig. L.493 Left Half of Front Wall after Blast, Structure 3.2.7b

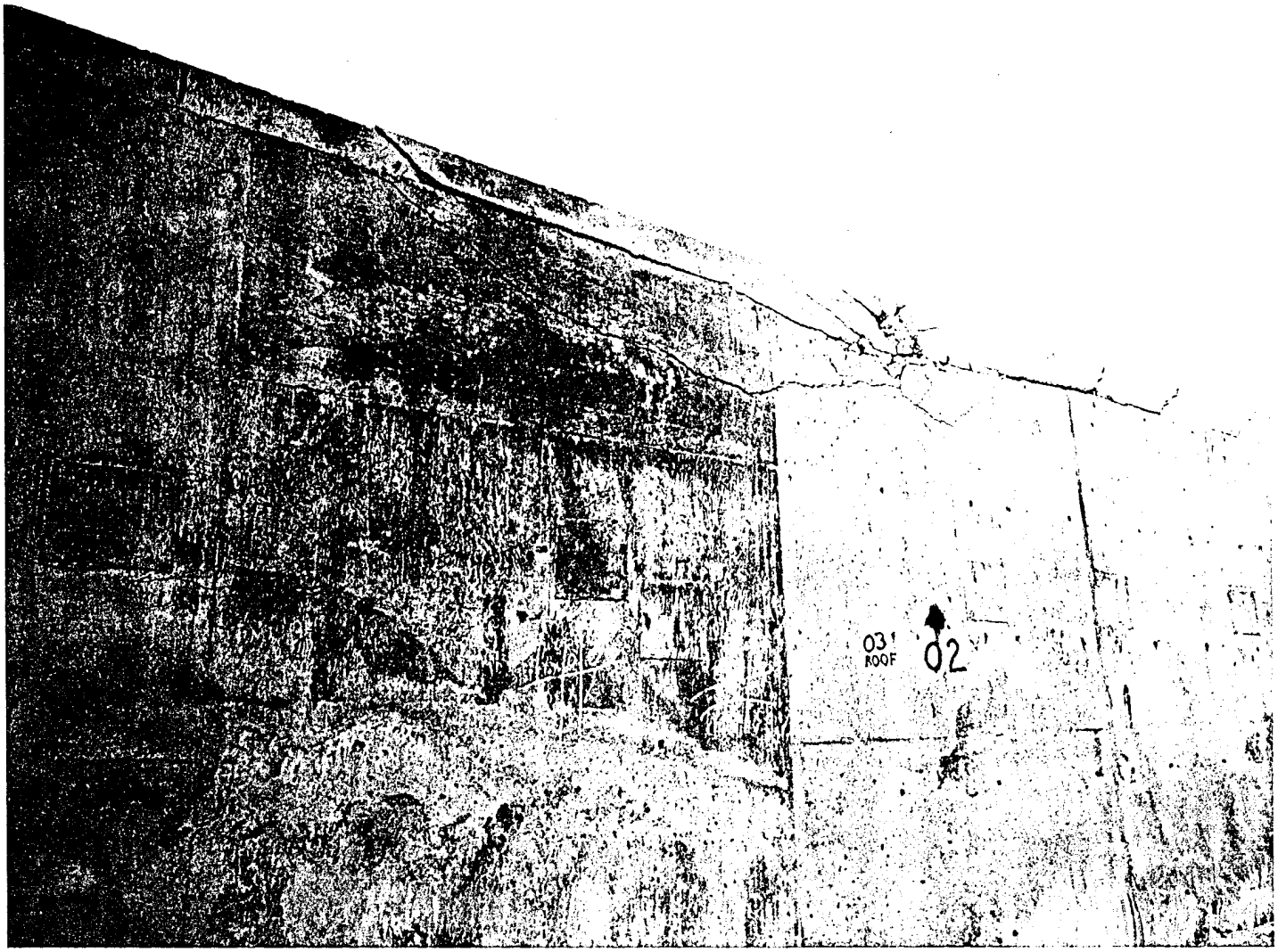


Fig. L.494 Center Portion of Front Wall after Blast, Structure 3.2.7b. Heavy cracking near roof line is clearly visible. Upper 6 in. of the wall bent inward as the main roof girder rotated at the haunch.

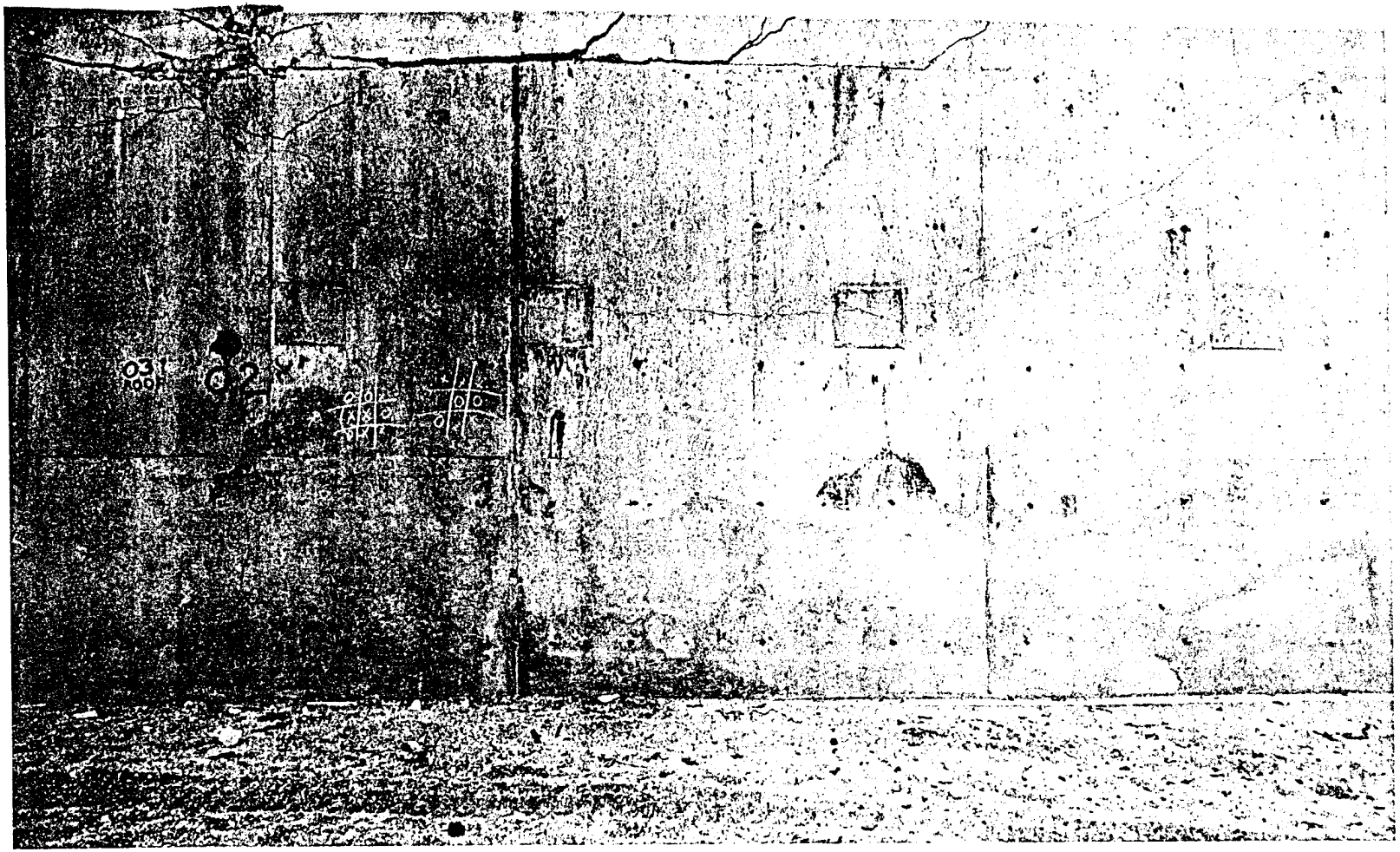


Fig. L.495 Right Half of Front Wall after Blast, Structure 3.2.7b

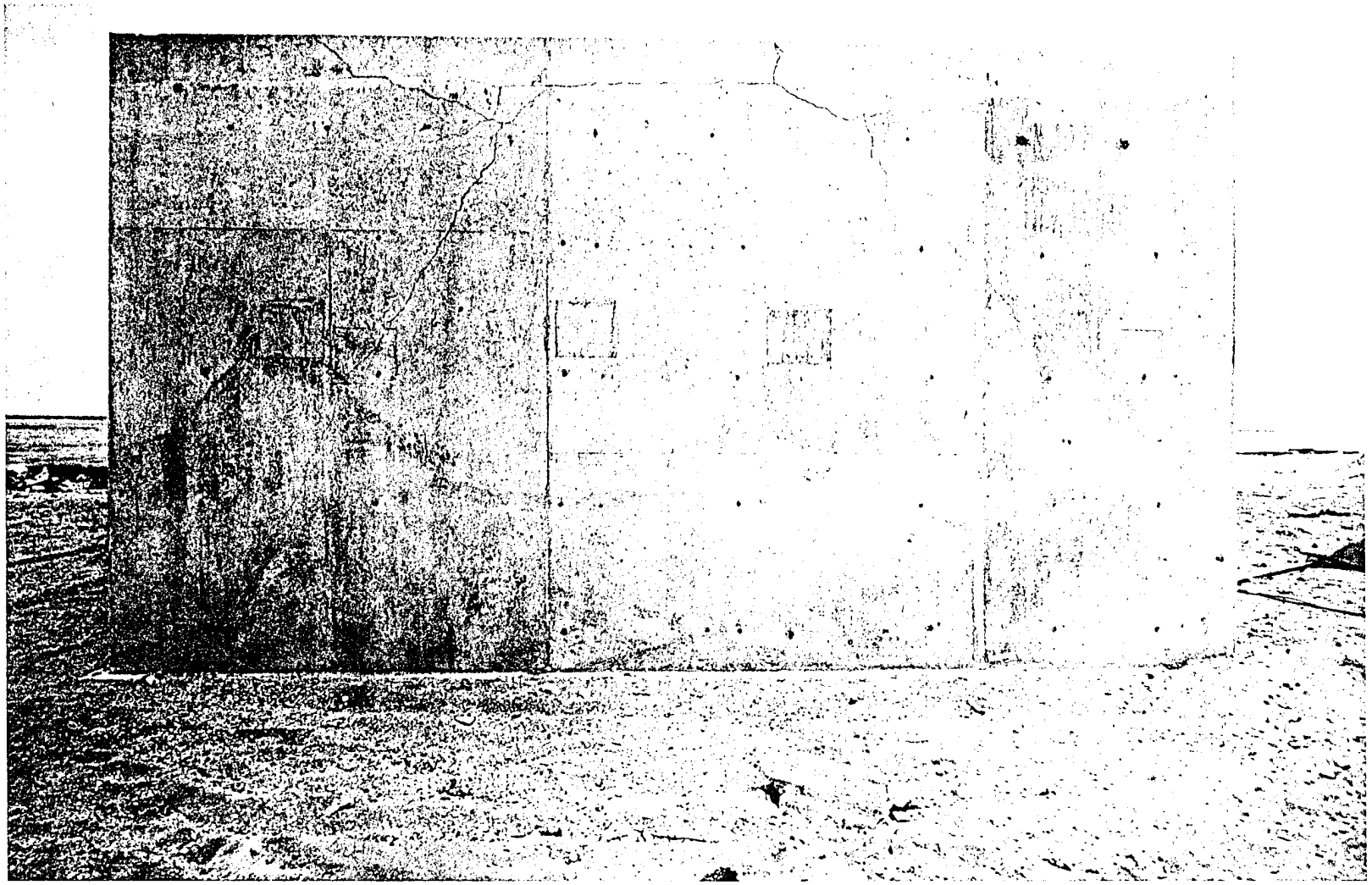


Fig. L.496 Right End Wall after Blast, Structure 3.2.7b. The two concentrations of cracking near the roof are located at the haunches of the longitudinal stringer beams.

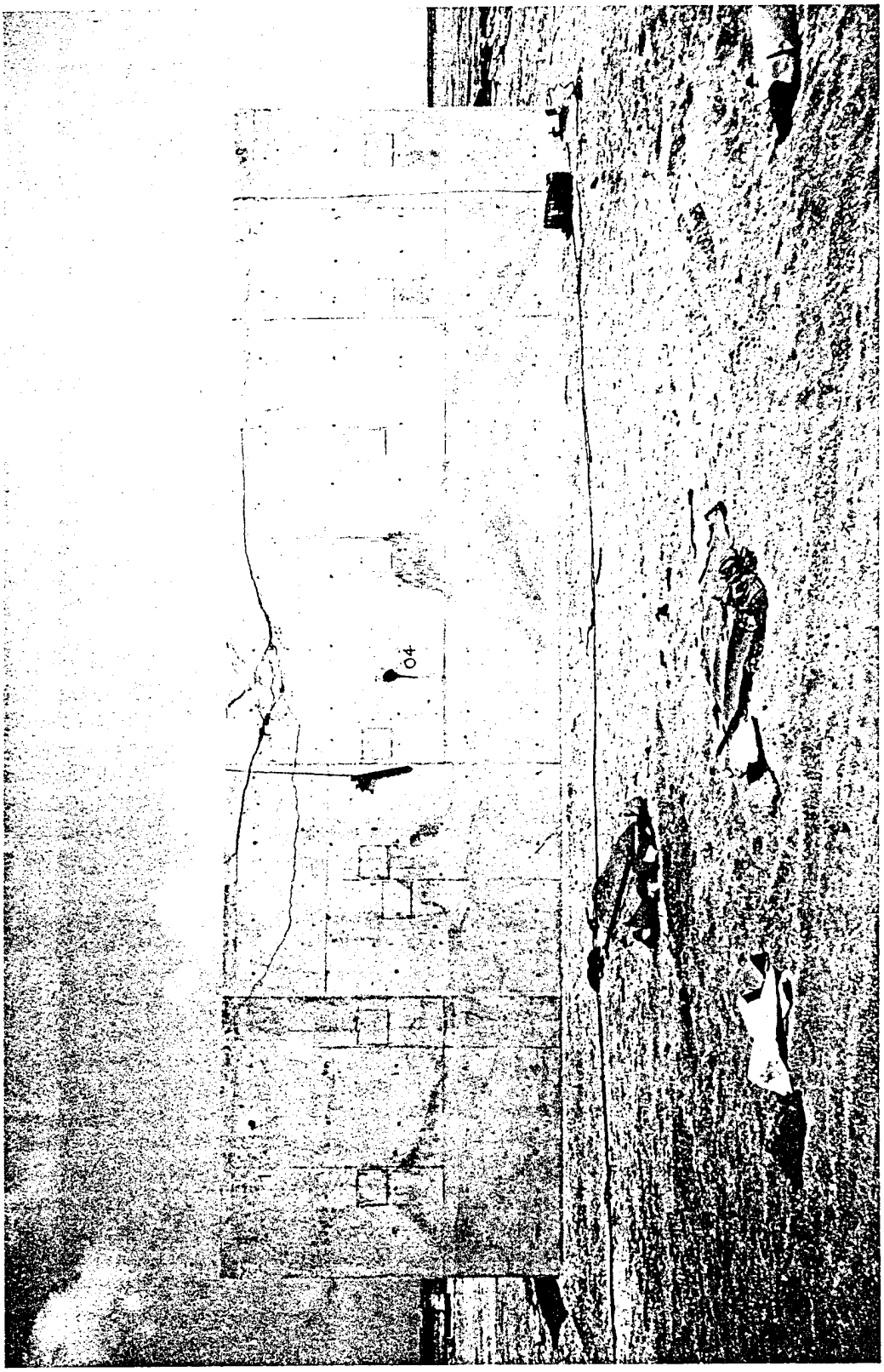


Fig. L.497 Rear Wall of Structure after Blast, Structure 3.2.7b

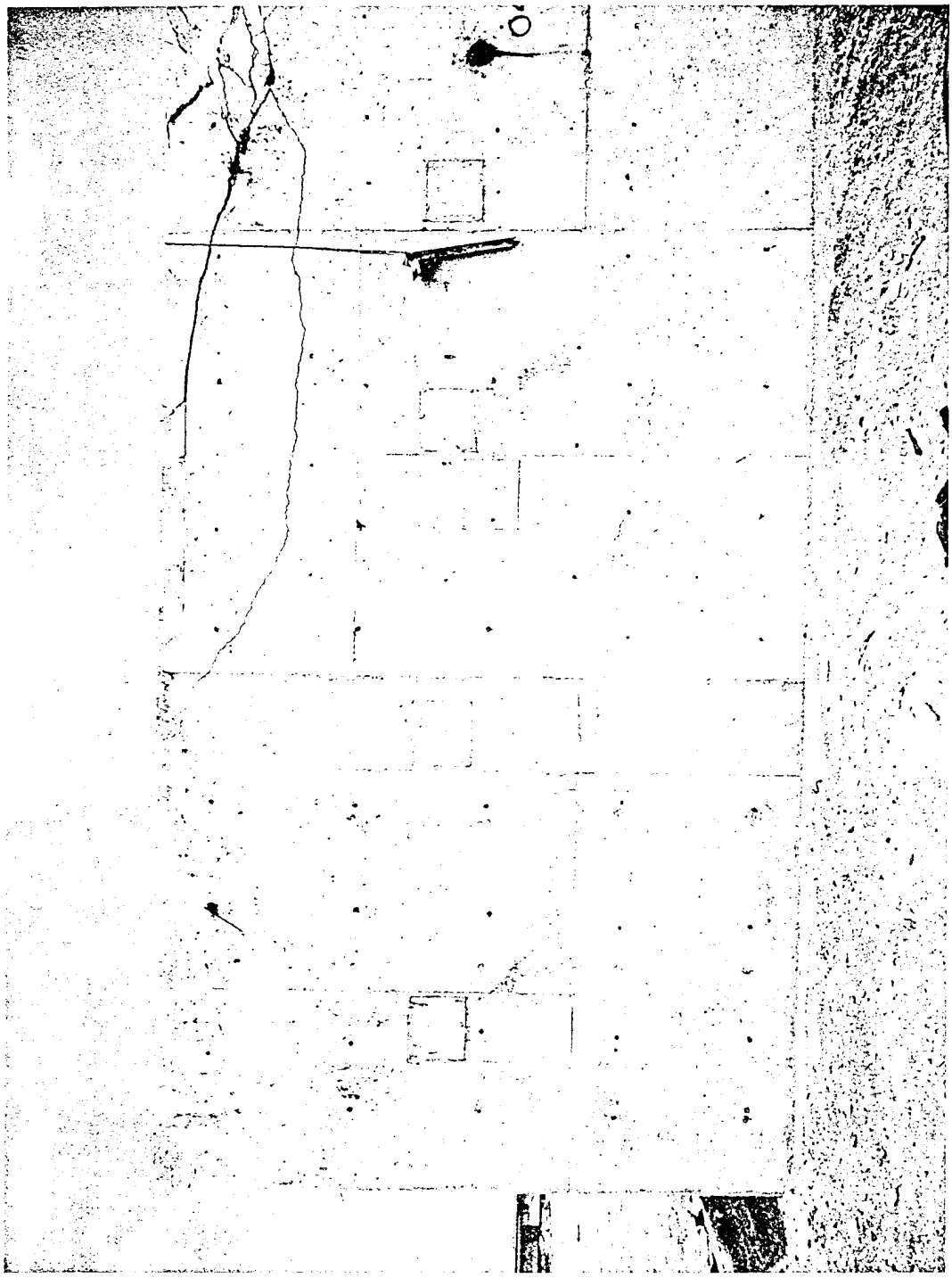


Fig. L.498 Right Half of Rear Wall after Blast, Structure 3.2.7b

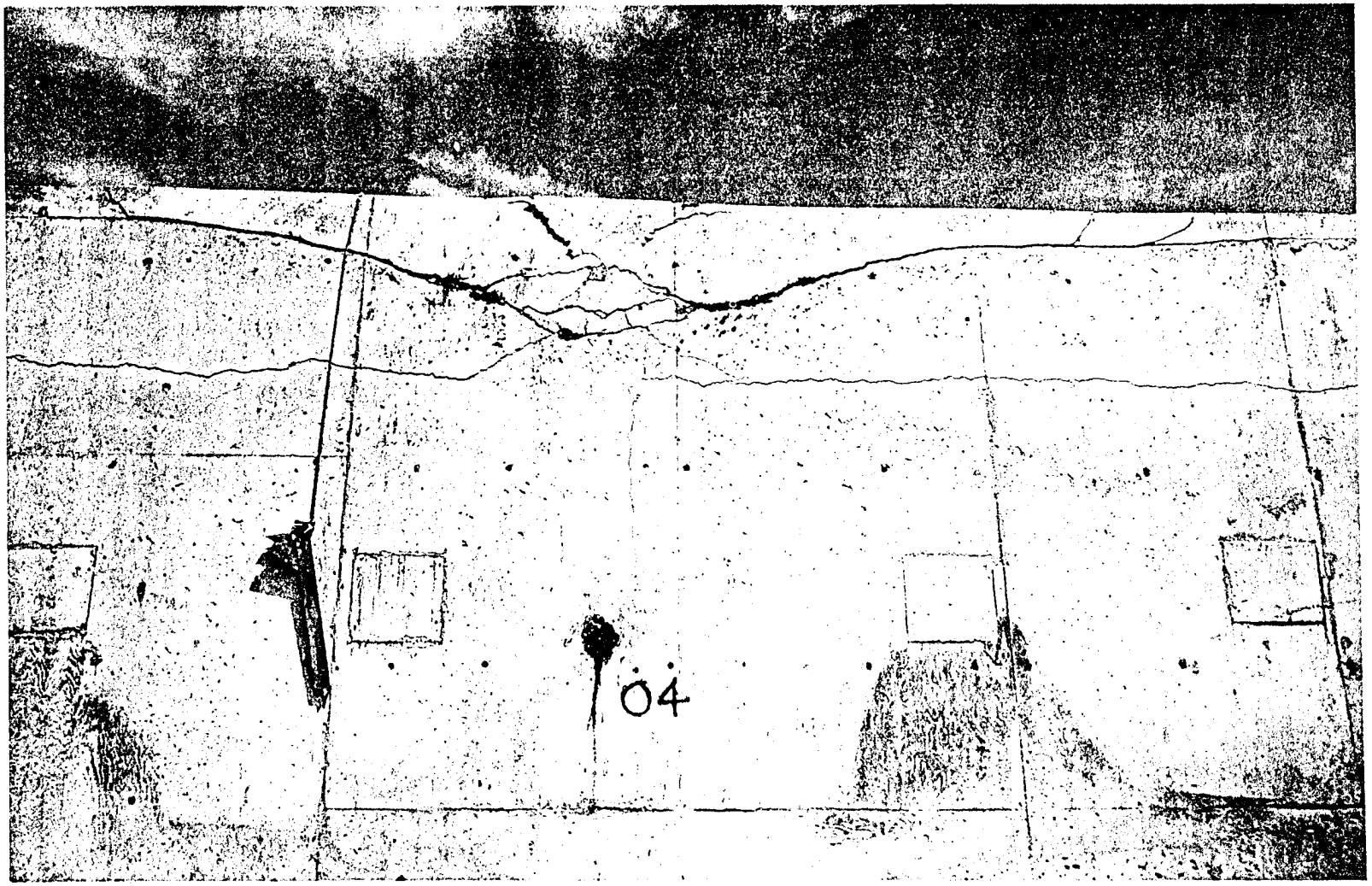


Fig. L.499 Center Portion of Rear Wall after Blast, Structure 3.2.7b. Heavy cracking occurred along the construction joint near the roof when the main transverse roof girder rotated at the haunch.

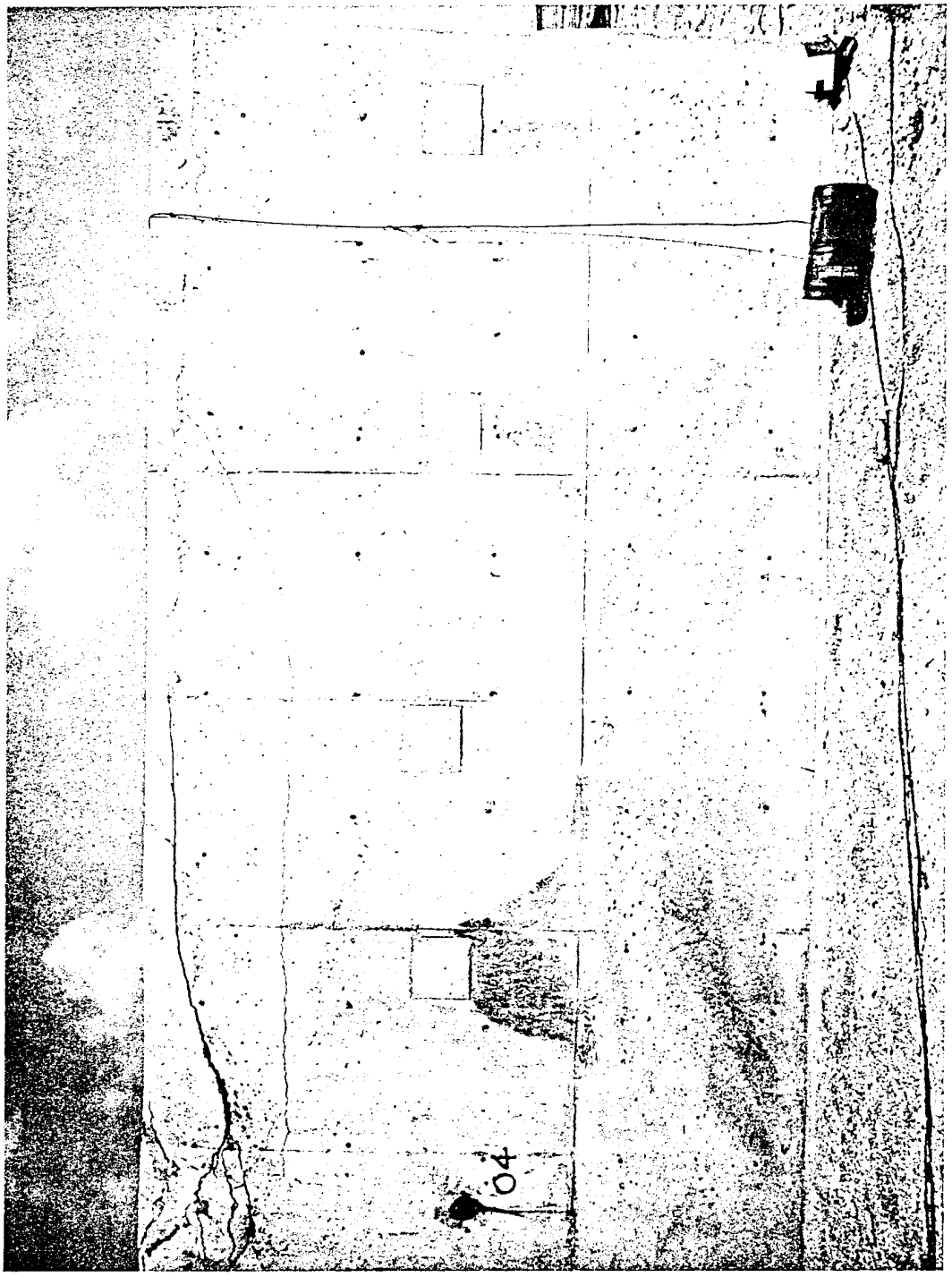


Fig. L.500 Left Half of Rear Wall after Blast, Structure 3.2.7b

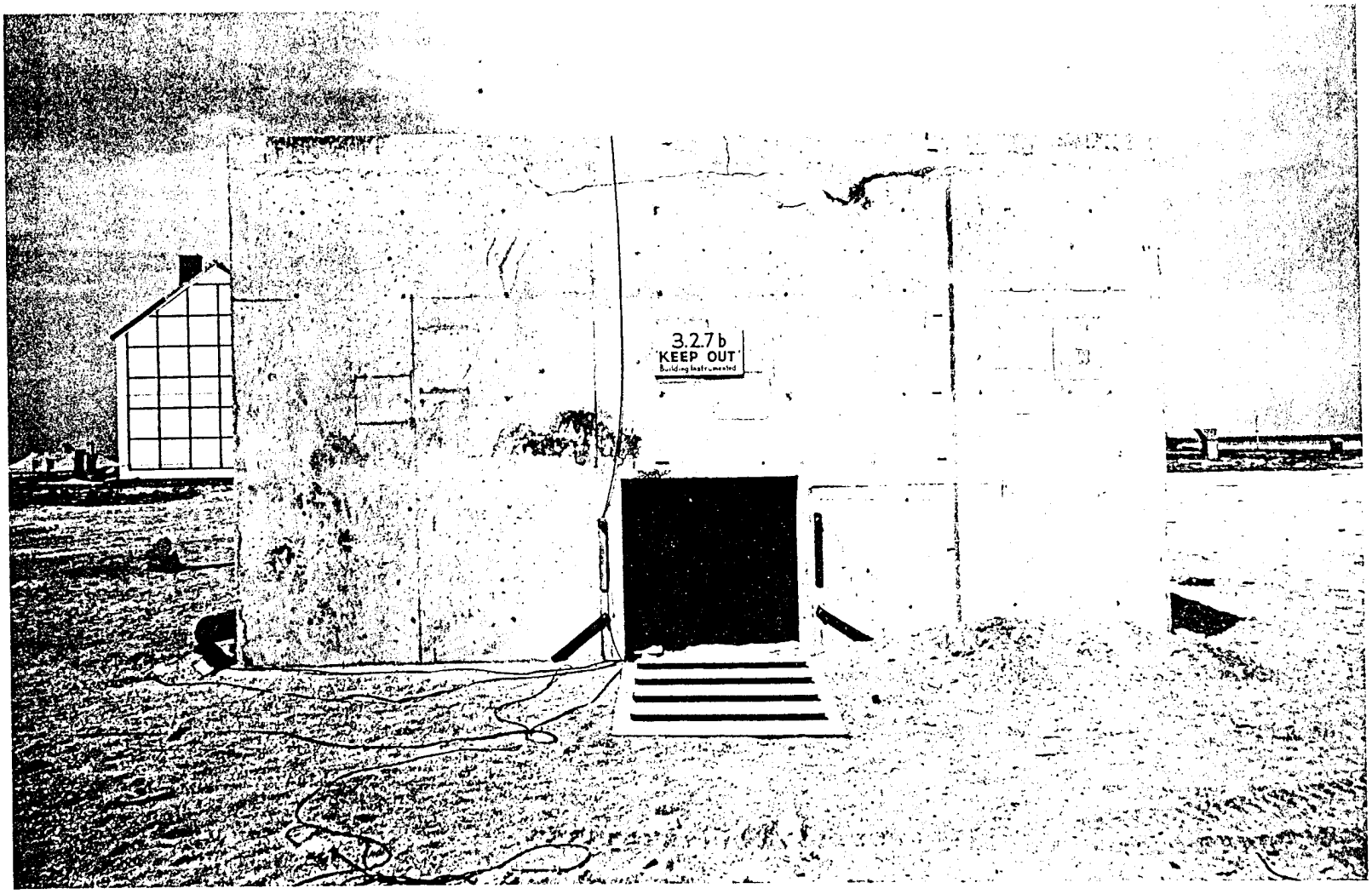


Fig. L.501 Left End Wall after Blast, Structure 3.2.7b. Door has been removed by hand; it suffered no damage and remained in place.

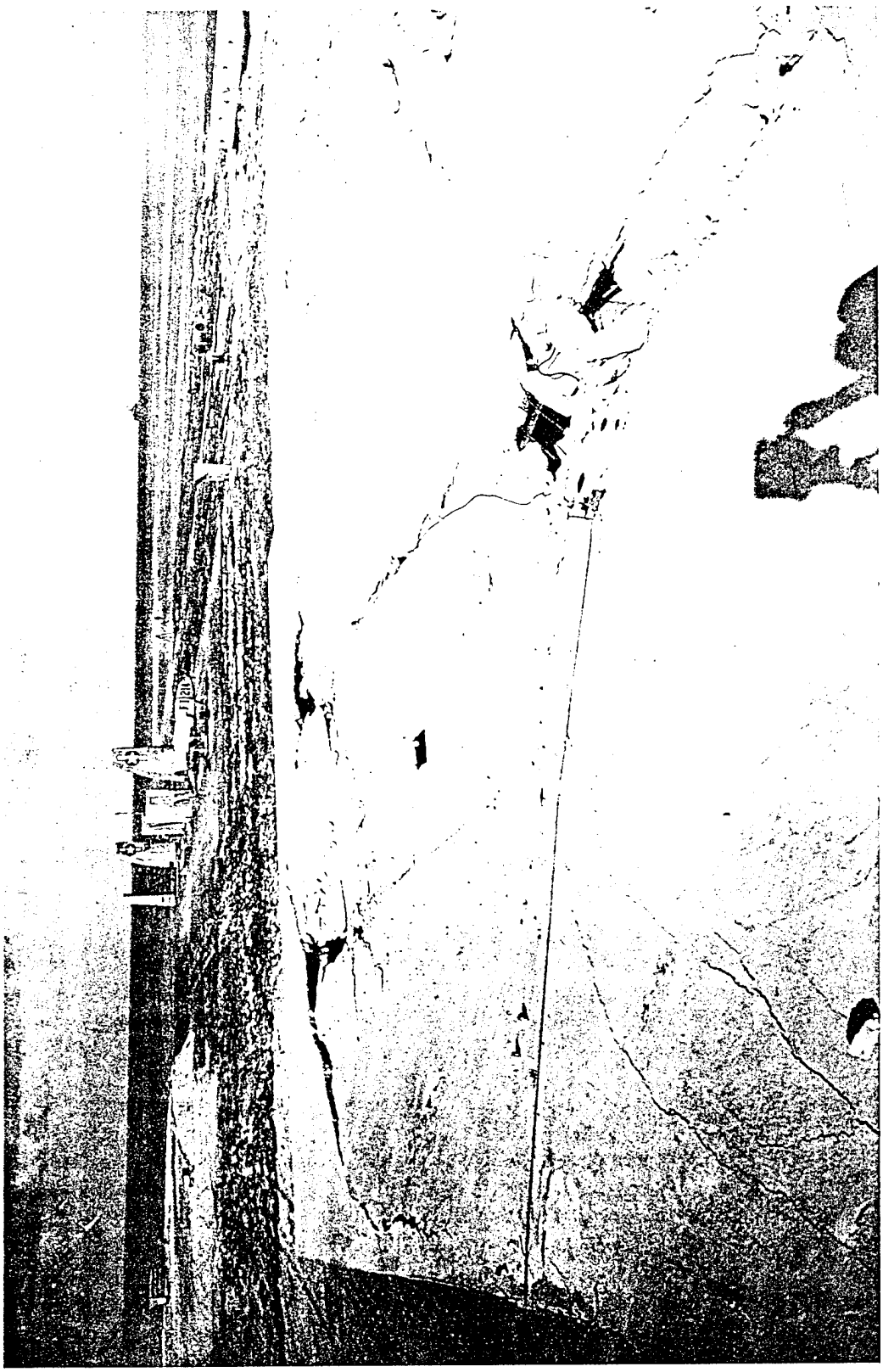


Fig. L.502 General Exterior View of Roof after Blast, Taken from Left End, Structure 3.2.7b

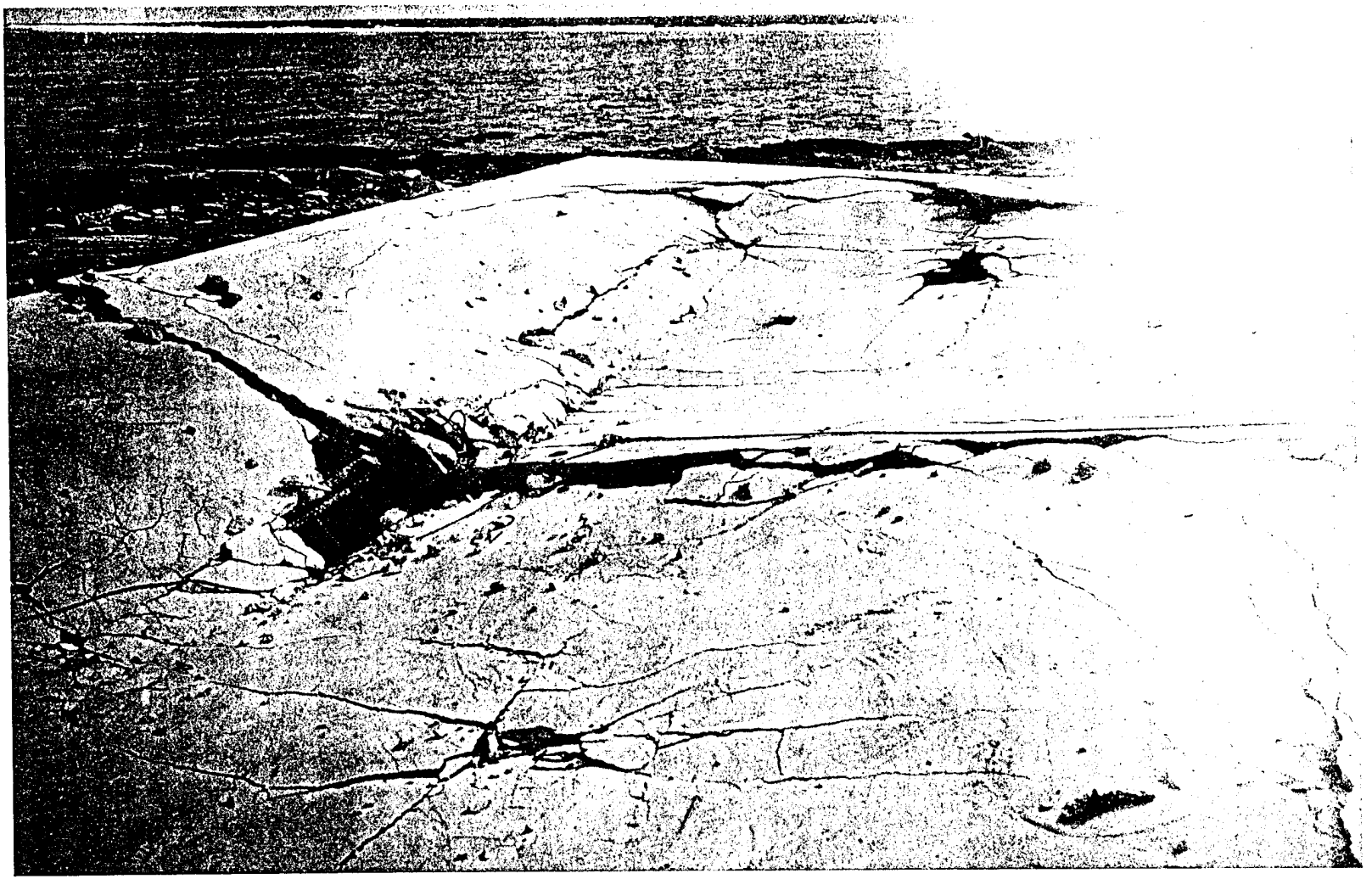


Fig. L.503 General Exterior View of Roof, Taken from Right End, Structure 3.2.7b. Note the extremely heavy deflection of the main transverse roof girder. Heaviest deflections along the longitudinal axis occurred at the line of the forward stringer beams.



Fig. L.504 View along Rear Edge of Roof, Structure 3.2.7b. Deflection pattern of rear wall can be seen; it is a maximum at the roof level.



Fig. L.505 Detail View of Cracks in Roof along Rear Edge on Left Half of Roof, Structure 3.2.7b



Fig. L.506 Cracks and Holes in Concrete Roof Slab at Left Rear Corner, Structure 3.2.7b. Note that the reinforcing steel is still holding up the roof.

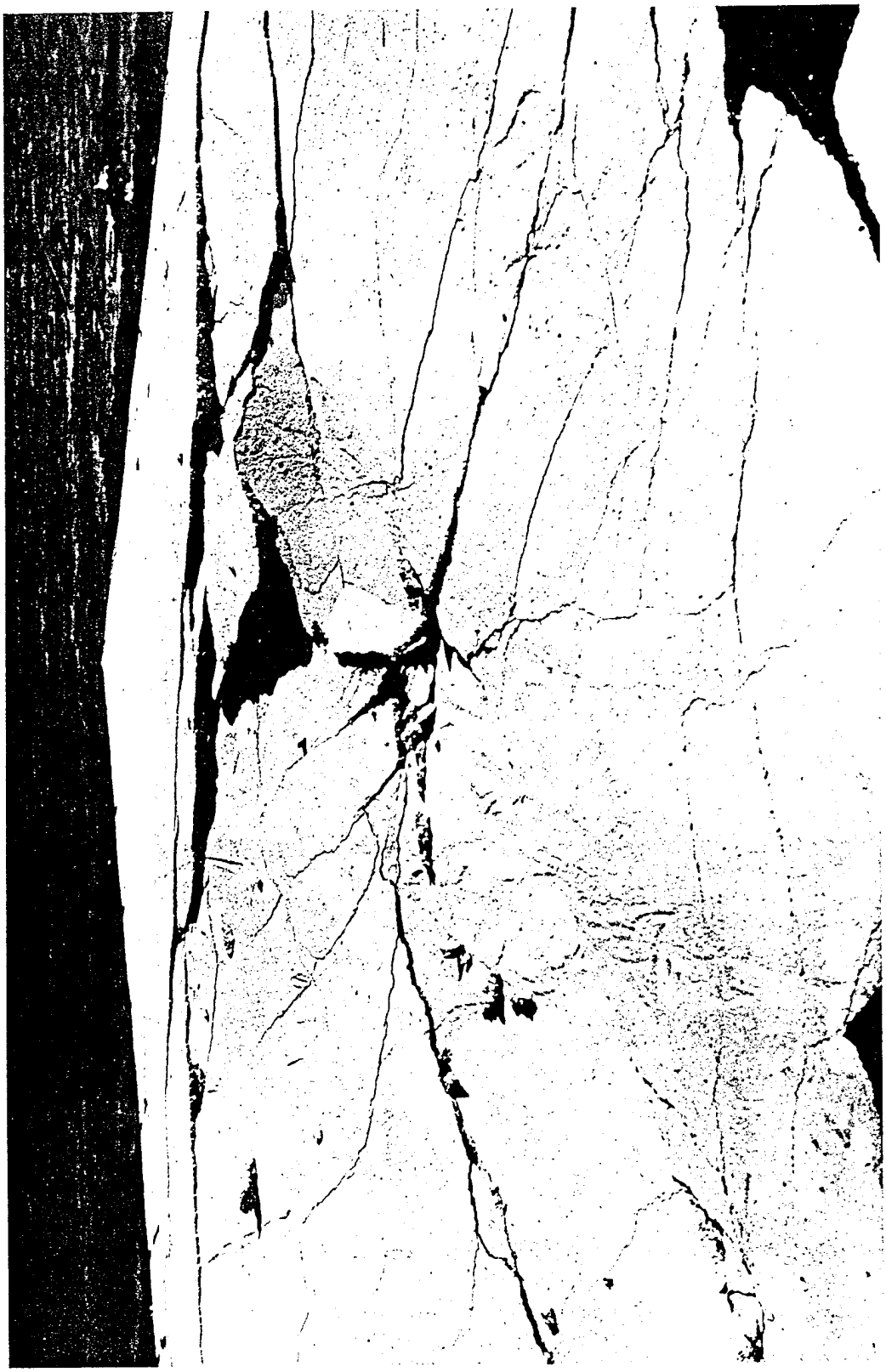


Fig. L. 507 Cracks and Fractures in Roof Slab at Front Corner, Structure 3.2.7b

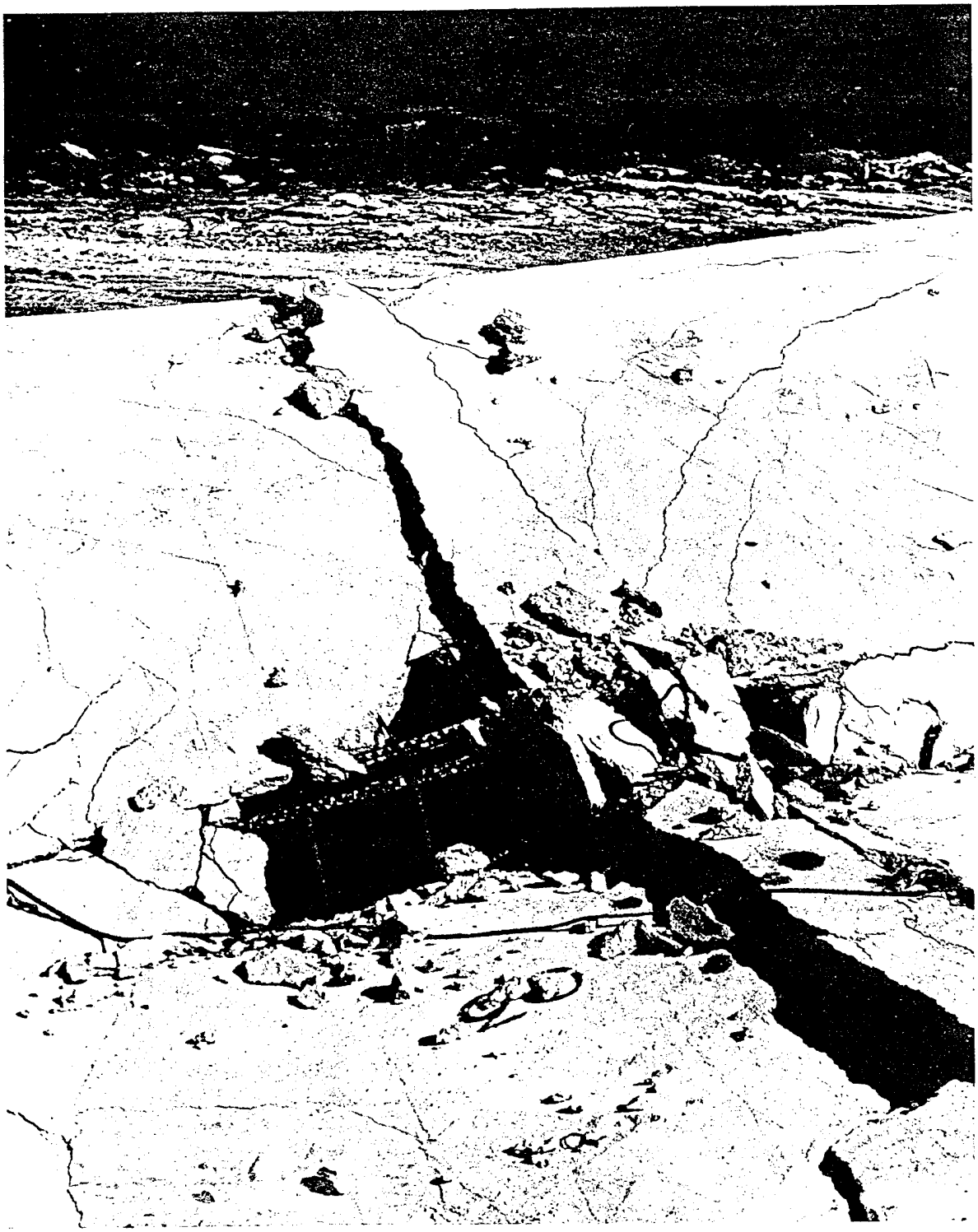


Fig. L.508 Detail View of Concrete Failure along Main Transverse Roof Girder, Structure 3.2.7b. Reinforcing steel has elongated but has not ruptured.

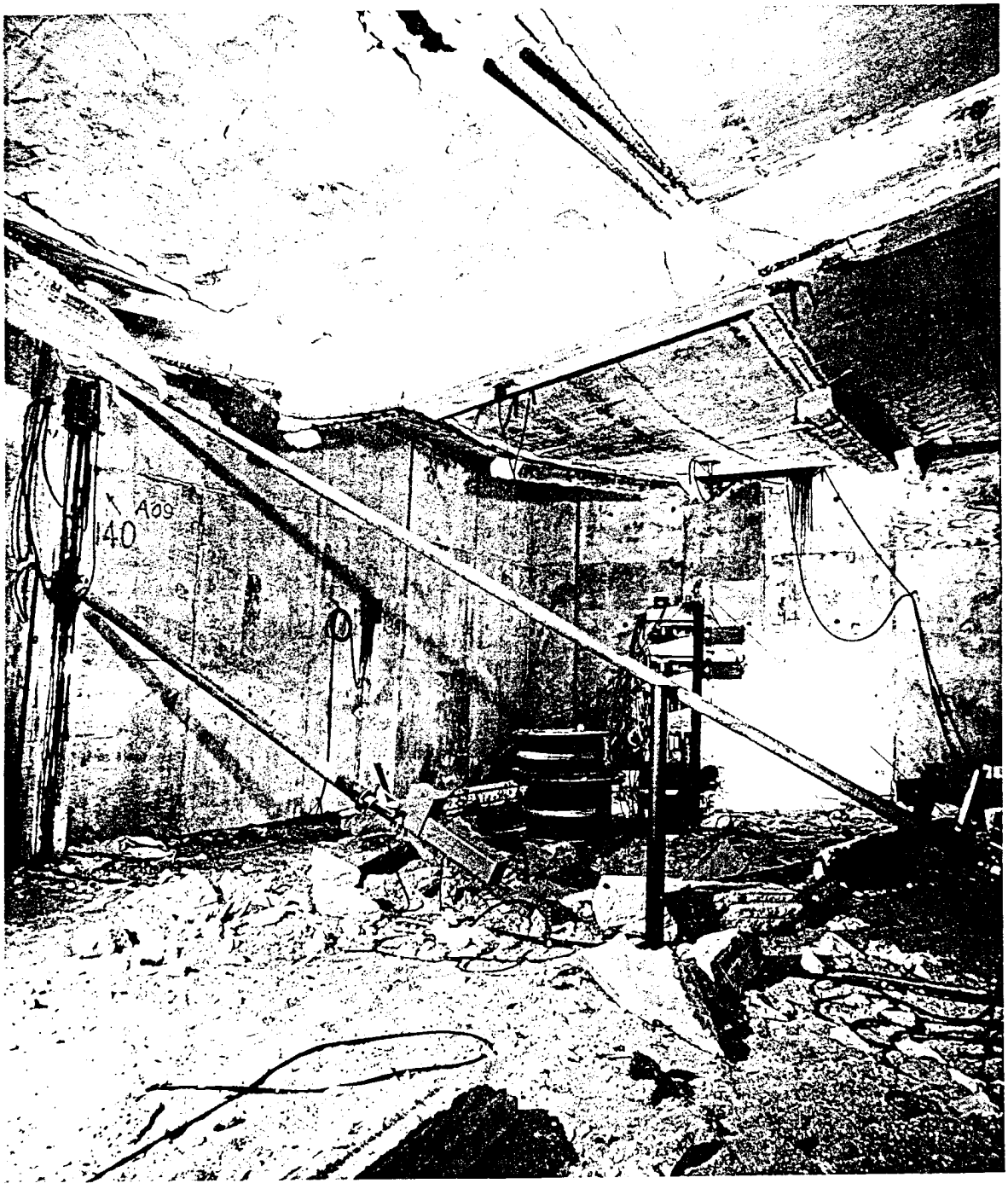


Fig. L.509 General Interior View Looking toward Left End of Structure, 3.2.7b. Deflection of the main transverse roof girder can be clearly seen. Note the lower sections of the small longitudinal stringer beams lying on the ground below the beams.

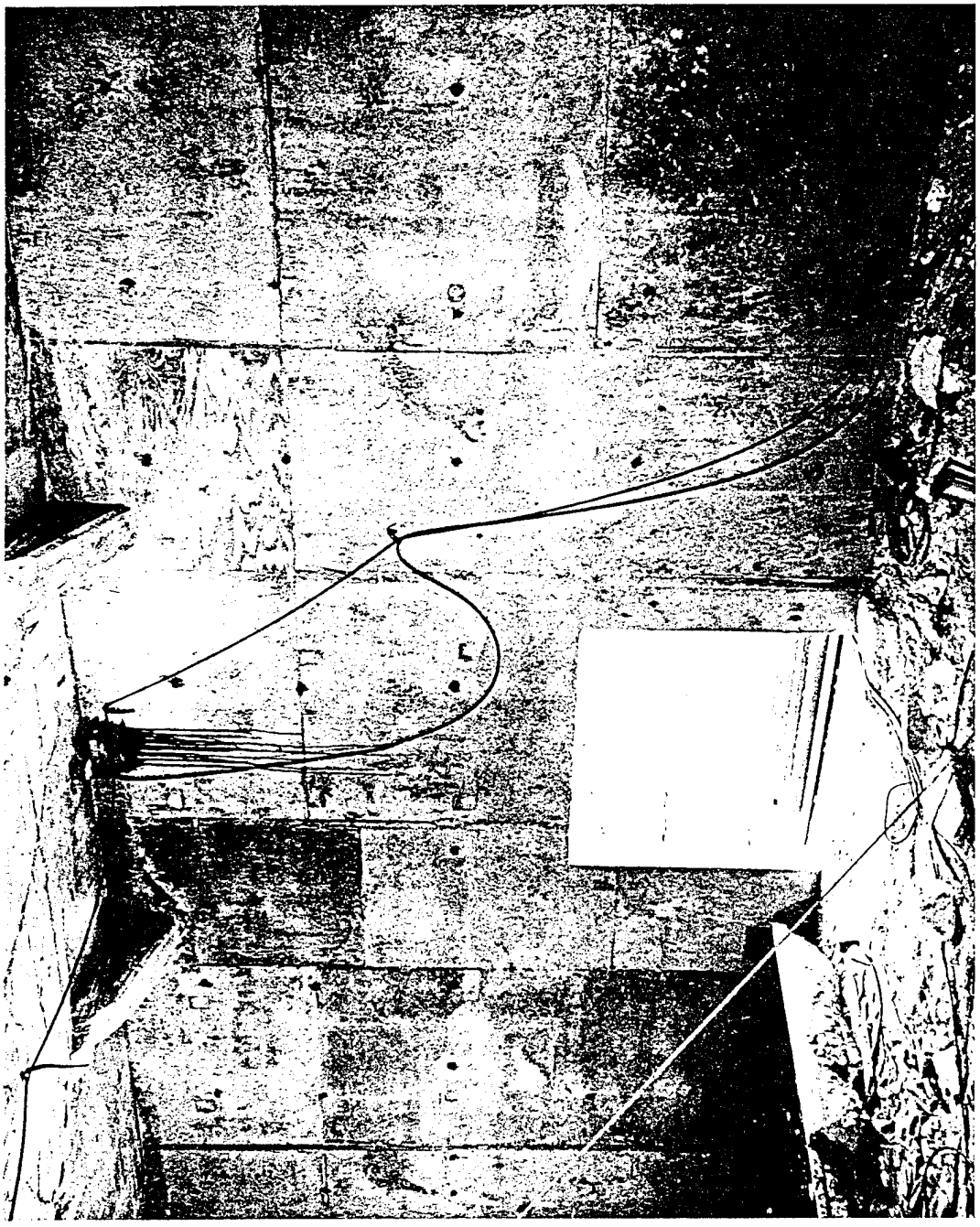


Fig. L.510 Interior View of Left End Wall, Structure 3.2.7b



Fig. L.511 Interior View of Left Half of Underside of Roof, Structure 3.2.7b. Note how longitudinal stringer beams failed.

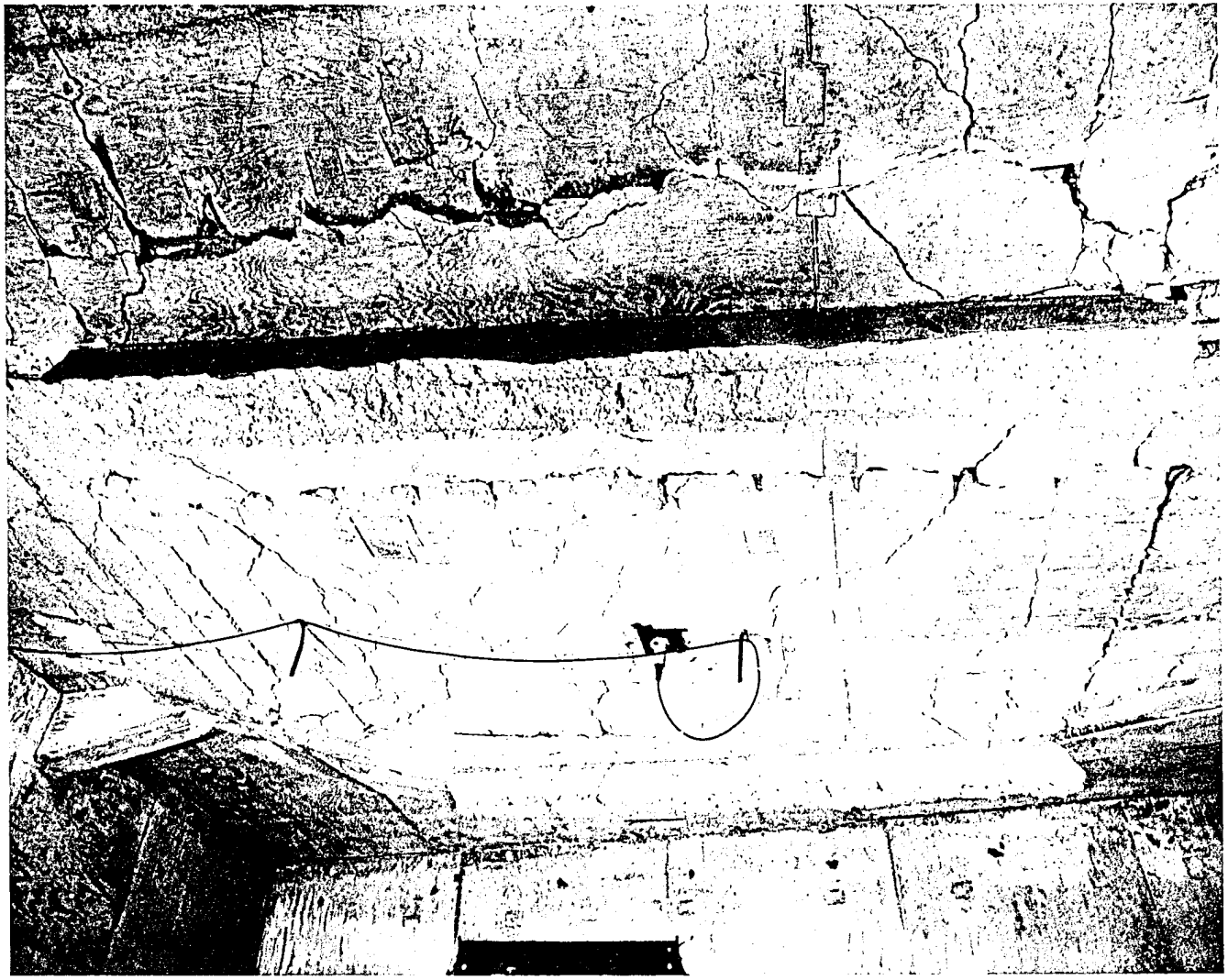


Fig. L.512 Detail View of Underside of Left Portion of Roof, Structure 3.2.7b. Note the uniform pattern of cracking in the roof slab proper.

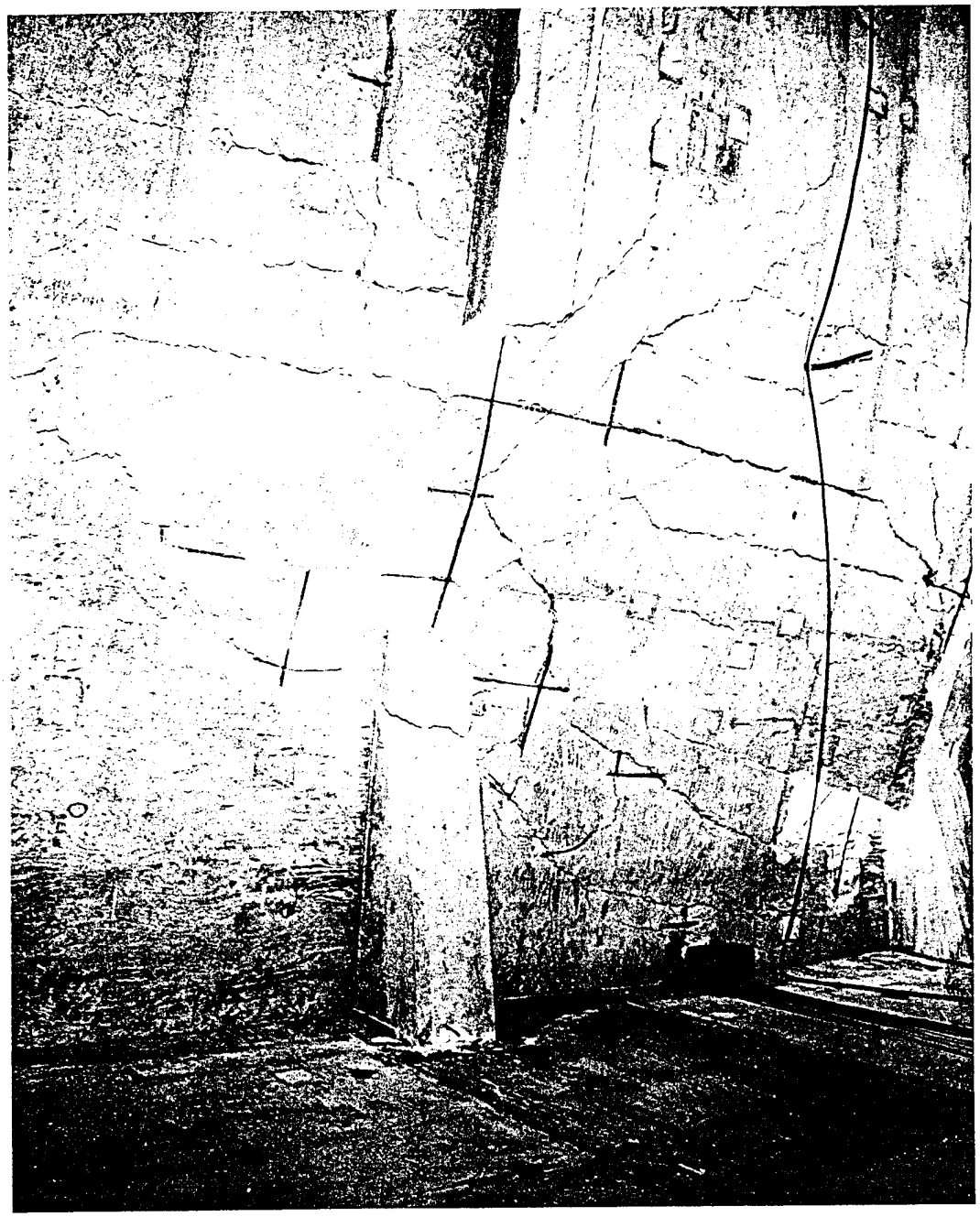


Fig. L.513 Detail View of Failure of Longitudinal Stringer Beam in Diagonal Tension, Structure 3.2.7b. There was only a 6-in. overlap of top and bottom steel at the haunch, with no stirrups.



Fig. L.514 Detail View of Failure of Same Stringer Beams as Shown in Preceding Photographs, Structure 3.2.7b. Note the clean break through the concrete at the haunch. There was no effective steel tie at this location.



Fig. L.515 Detail View of Lower Section of Front Stringer Beam in the Left Half of Roof, after This Part of Beam Was Severed from the Roof, Structure 3.2.7b

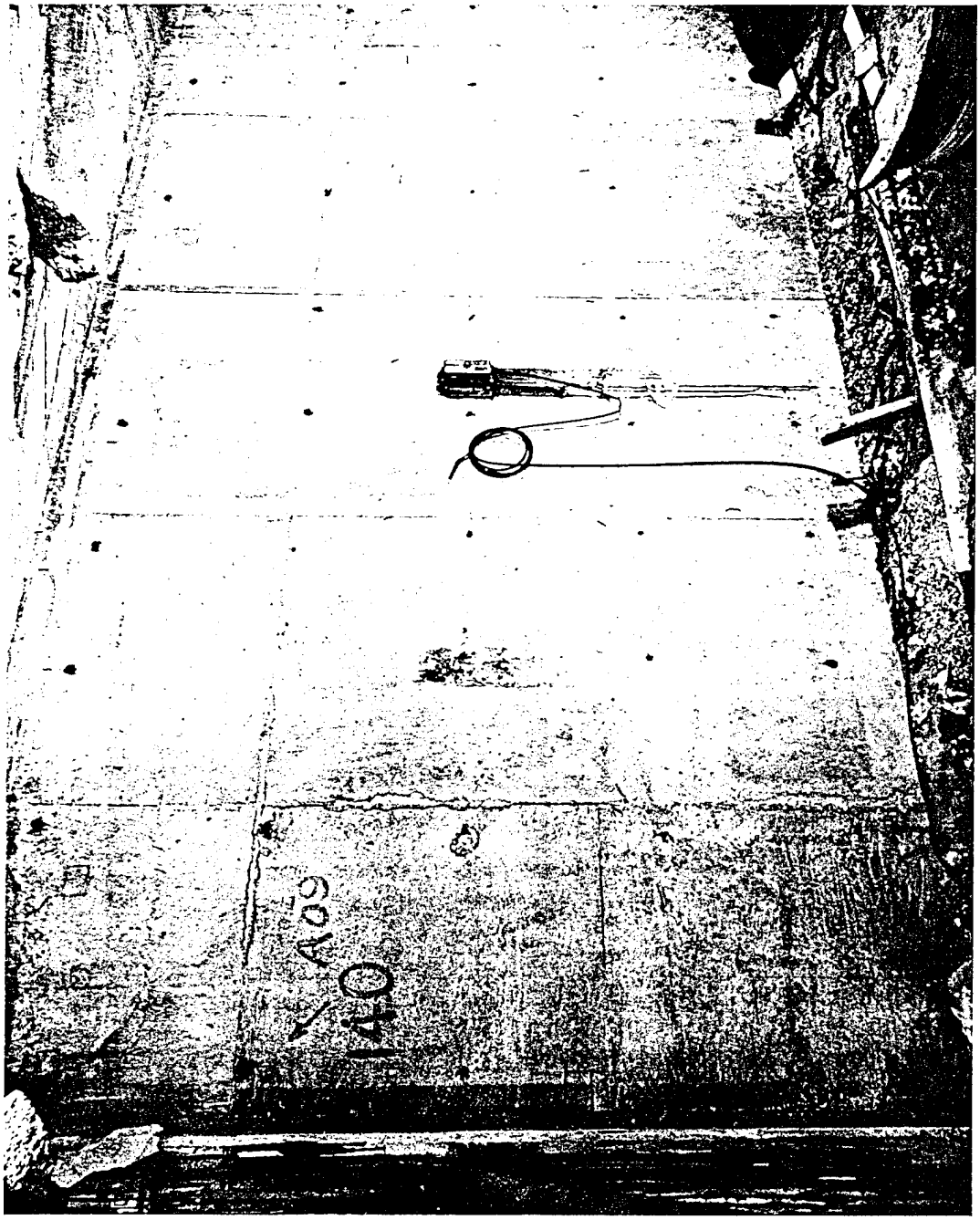


Fig. L.516 Interior View of Left Half of Front Wall, Structure 3.2.7b. The clean concrete break of a stringer beam can be seen overhead.

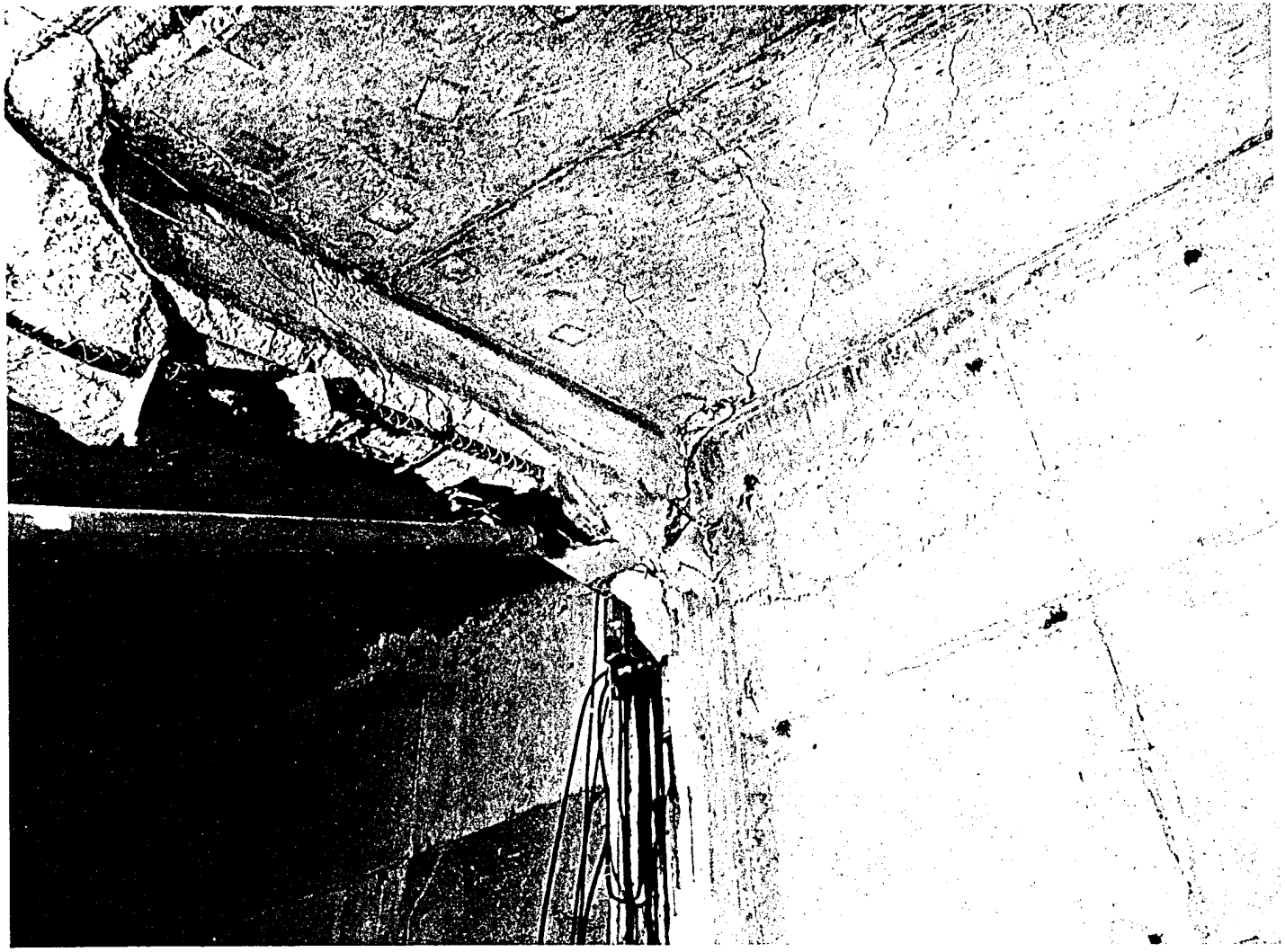


Fig. L.517 Detail View of Transverse Roof Girder at Front Wall, Structure 3.2.7b. Haunch failure and girder failure can be clearly seen.

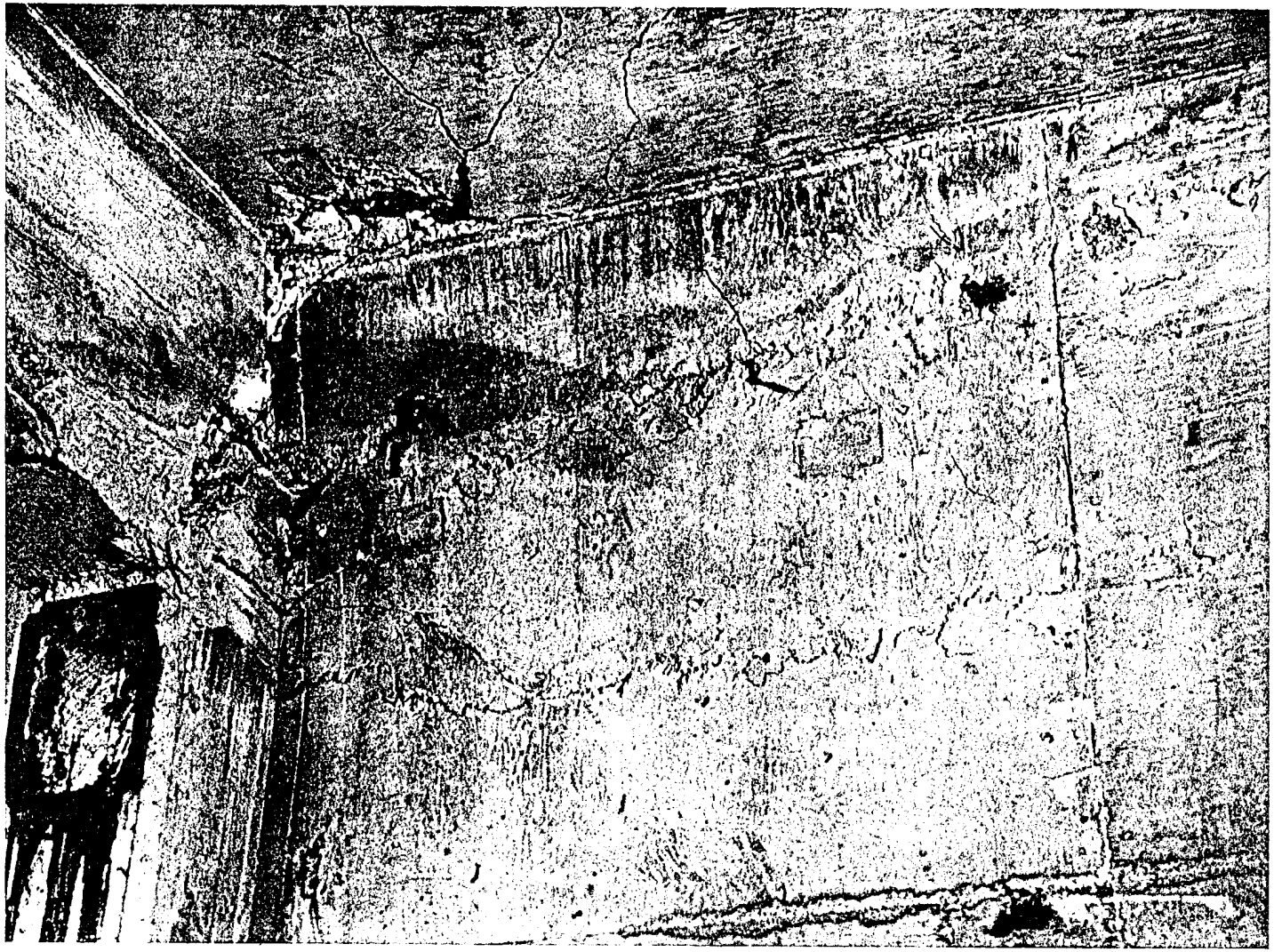


Fig. L.518 Detail View of Main Girder Haunch at the Front Wall, Structure 3.2.7b. Note how part of the wall has bent inward with the girder haunch when it rotated.

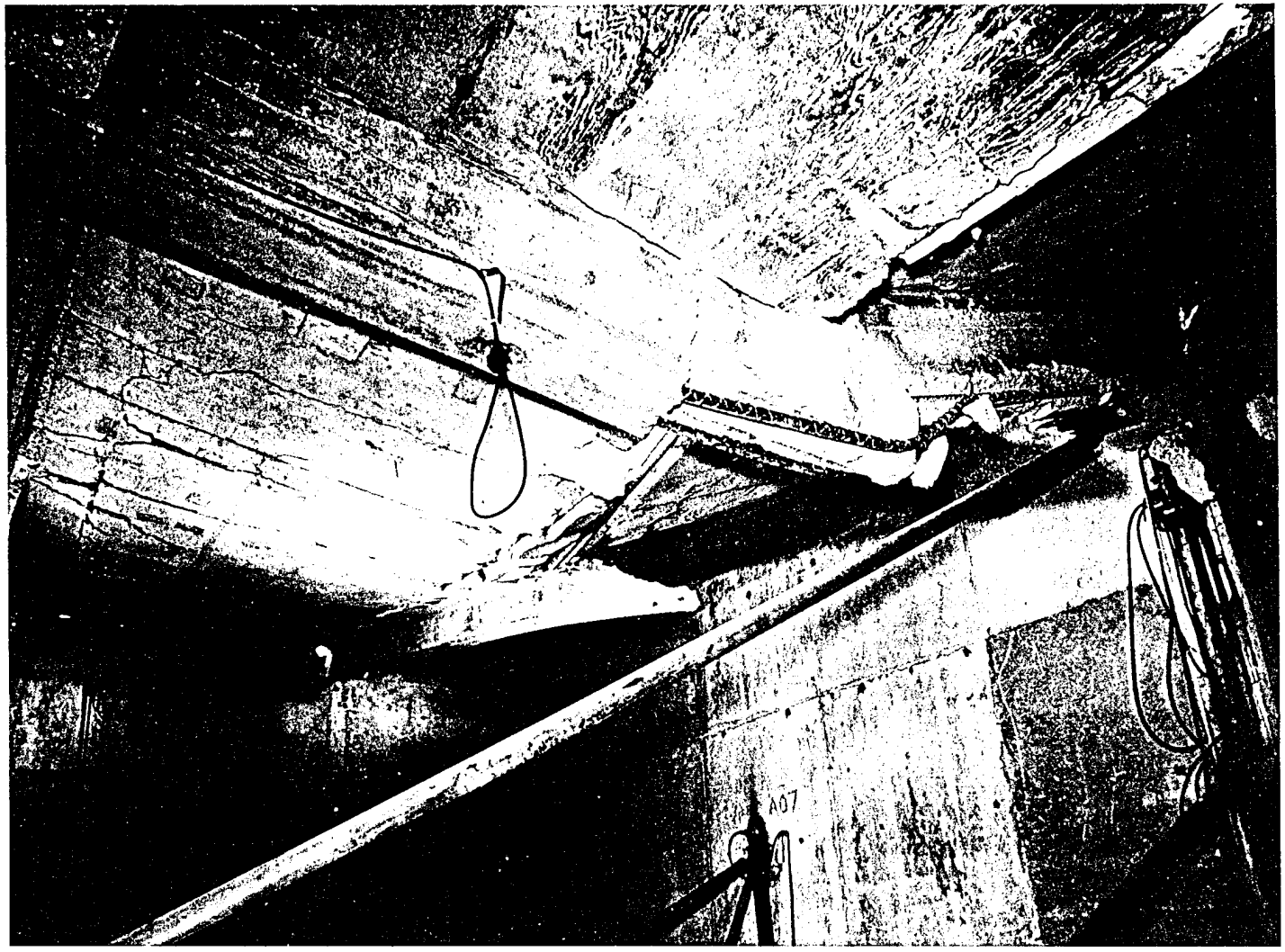


Fig. L.519 Detail View of Failure of Roof Girder, Structure 3.2.7b. Note the failure of the small stringer beam in the background. The sharp bend in the roof slab can be seen in the upper right-hand corner of this photograph.

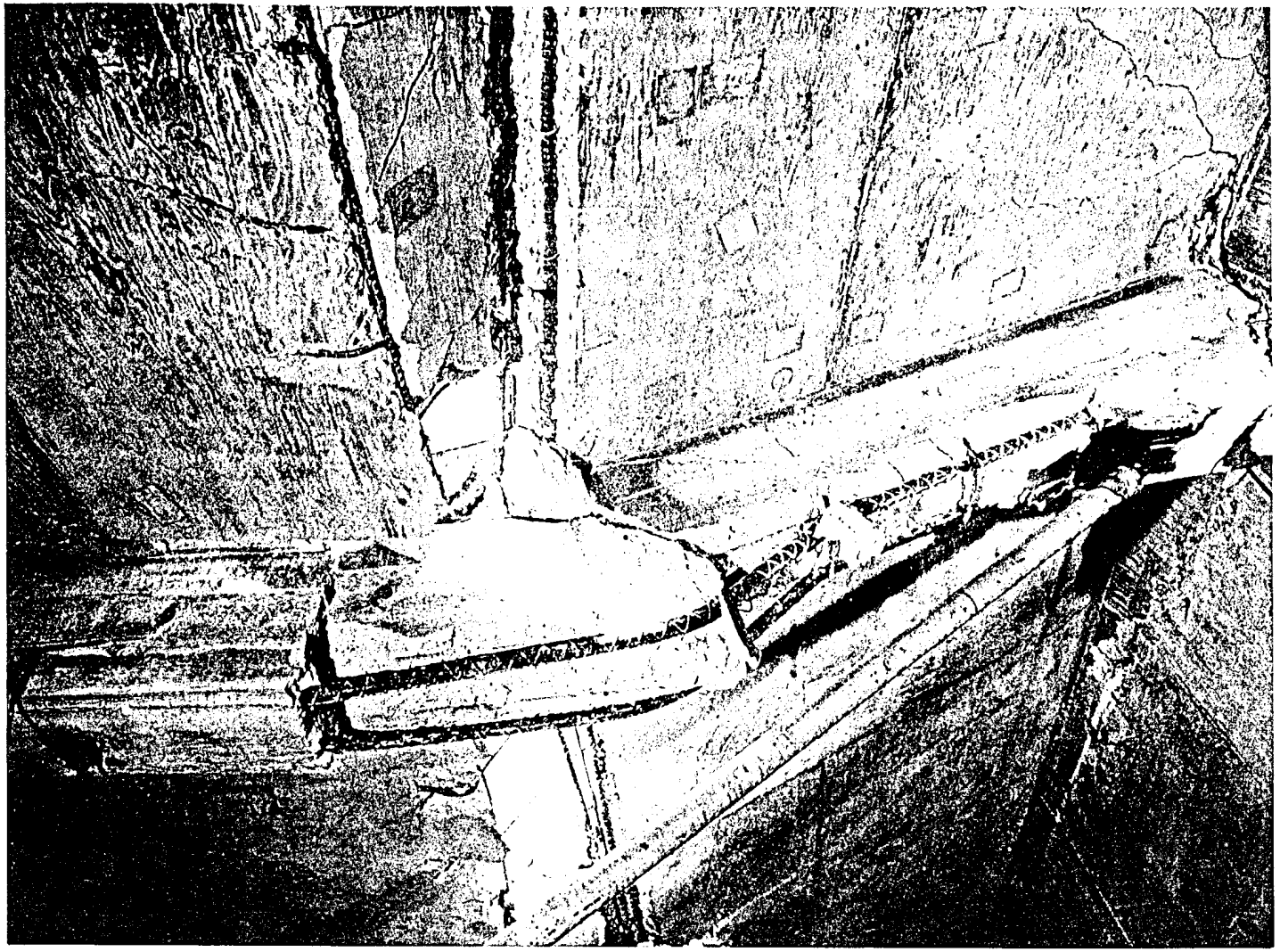


Fig. L. 520 Detail View of Portion of Roof Girder That Failed in Diagonal Tension and Then Telescoped Slightly Until the Steel Restrained Further Motion, Structure 3.2.7b

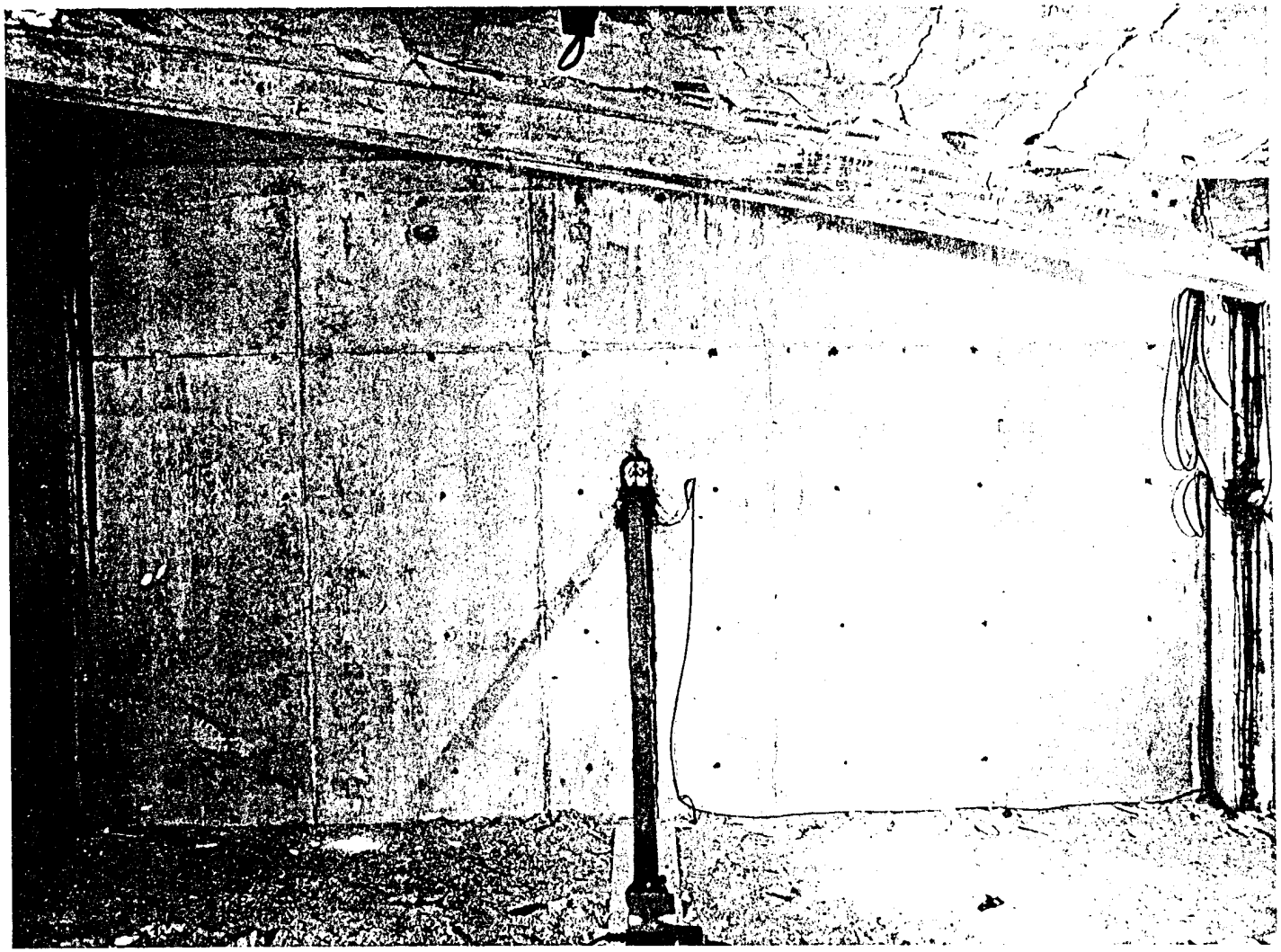


Fig. L.521 Interior View of Right Half of Front Wall, Structure 3.2.7b. Slope of roof toward center and stringer beam can also be seen.

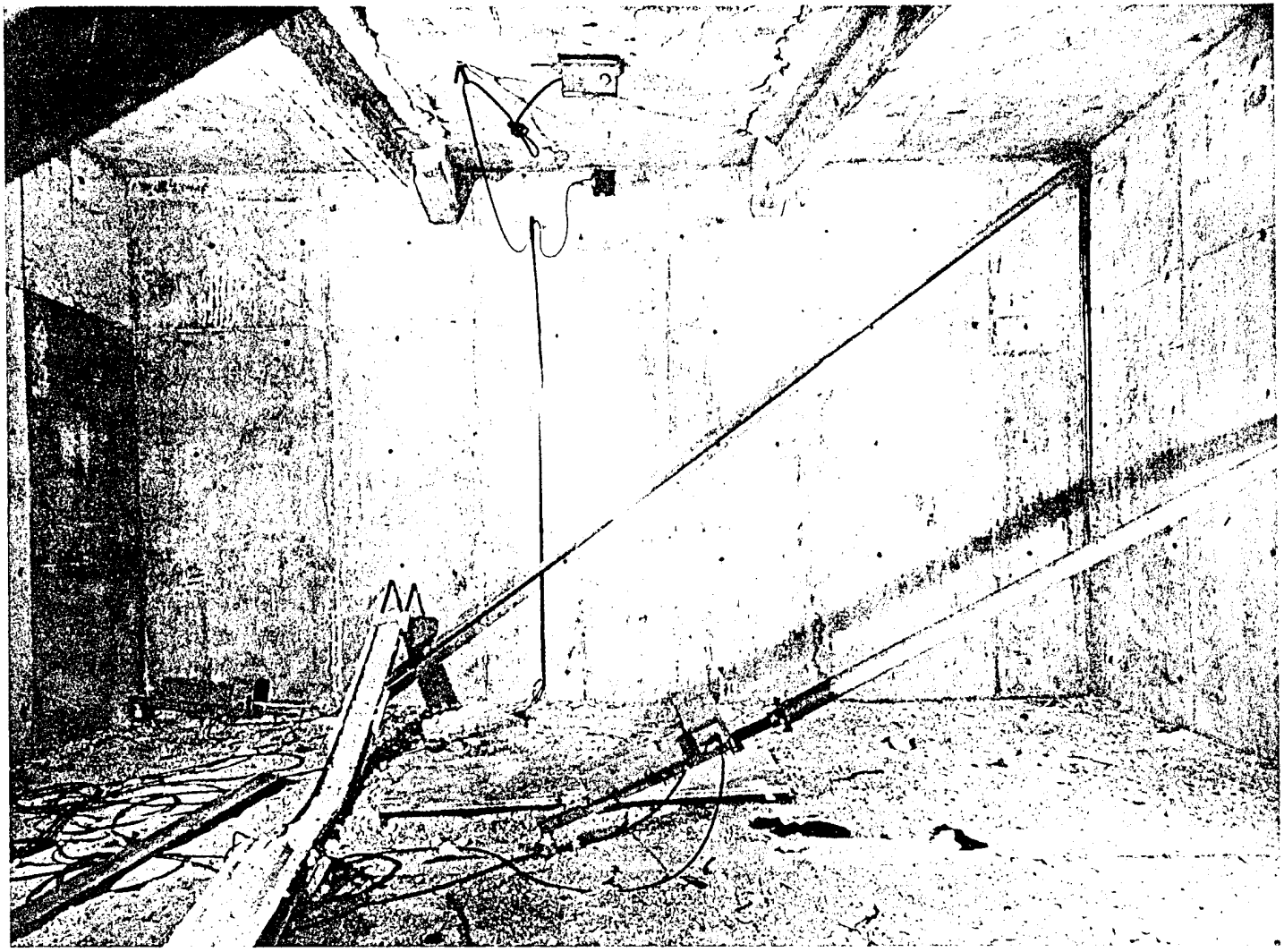


Fig. L.522 Interior View of Right End Wall, Structure 3.2.7b. Lower section of right rear stringer beam is shown lying on the ground.

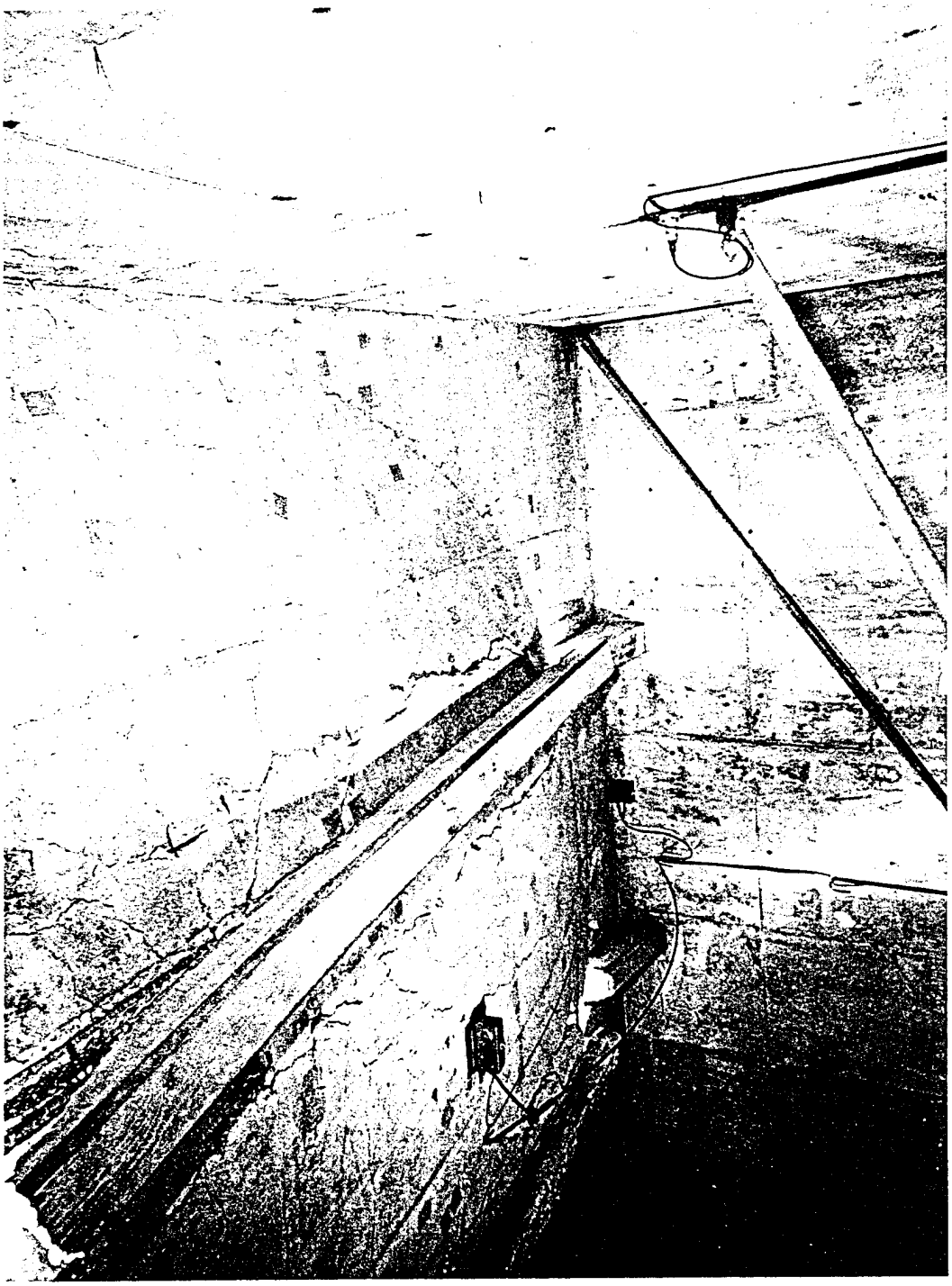


Fig. L. 523 Interior View of Front Right Corner, Structure 3.2.7b. Note the elliptical pattern of roof slab fracture; this is typical of entire roof.

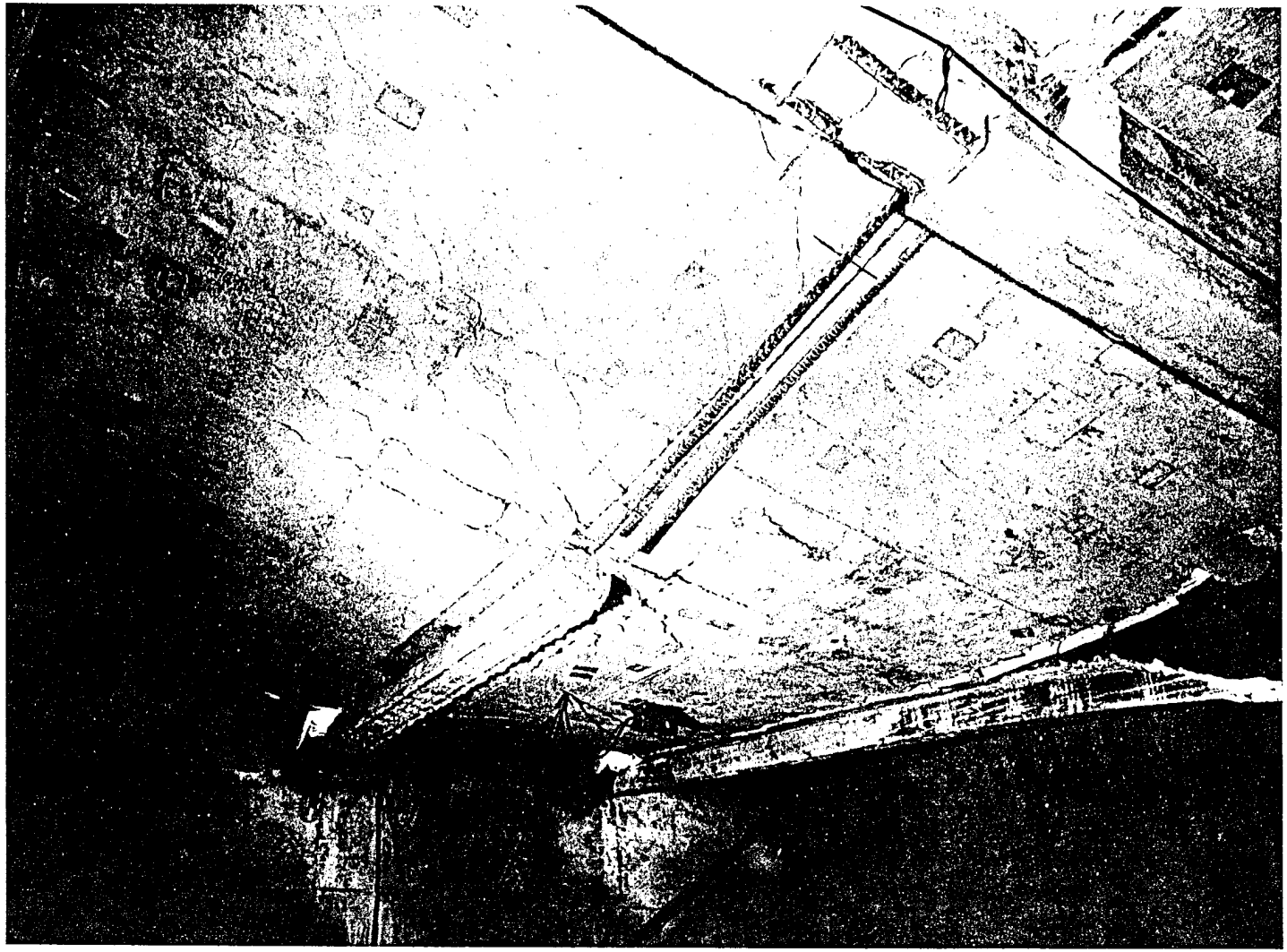


Fig. L.524 Detail View of Stringer Beams under Right Half of Roof, Structure 3.2.7b

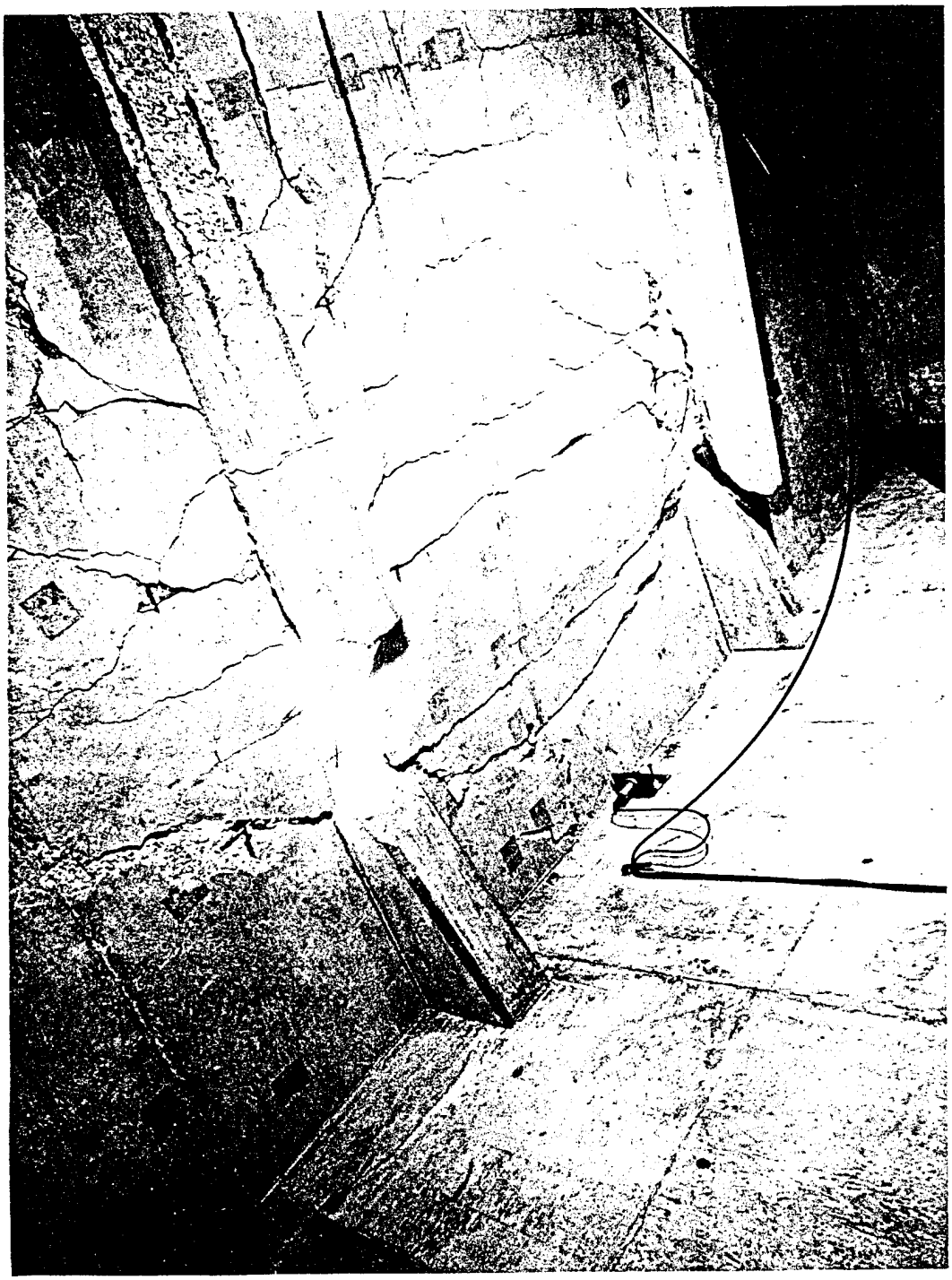


Fig. L.525 Detail View of Method of Failure of Stringer Beams under Right Half of Roof, Structure 3.2.7b.



Fig. L. 526 Detail View of Bottom Half of Right Rear Stringer Beam, Structure 3.2.7b

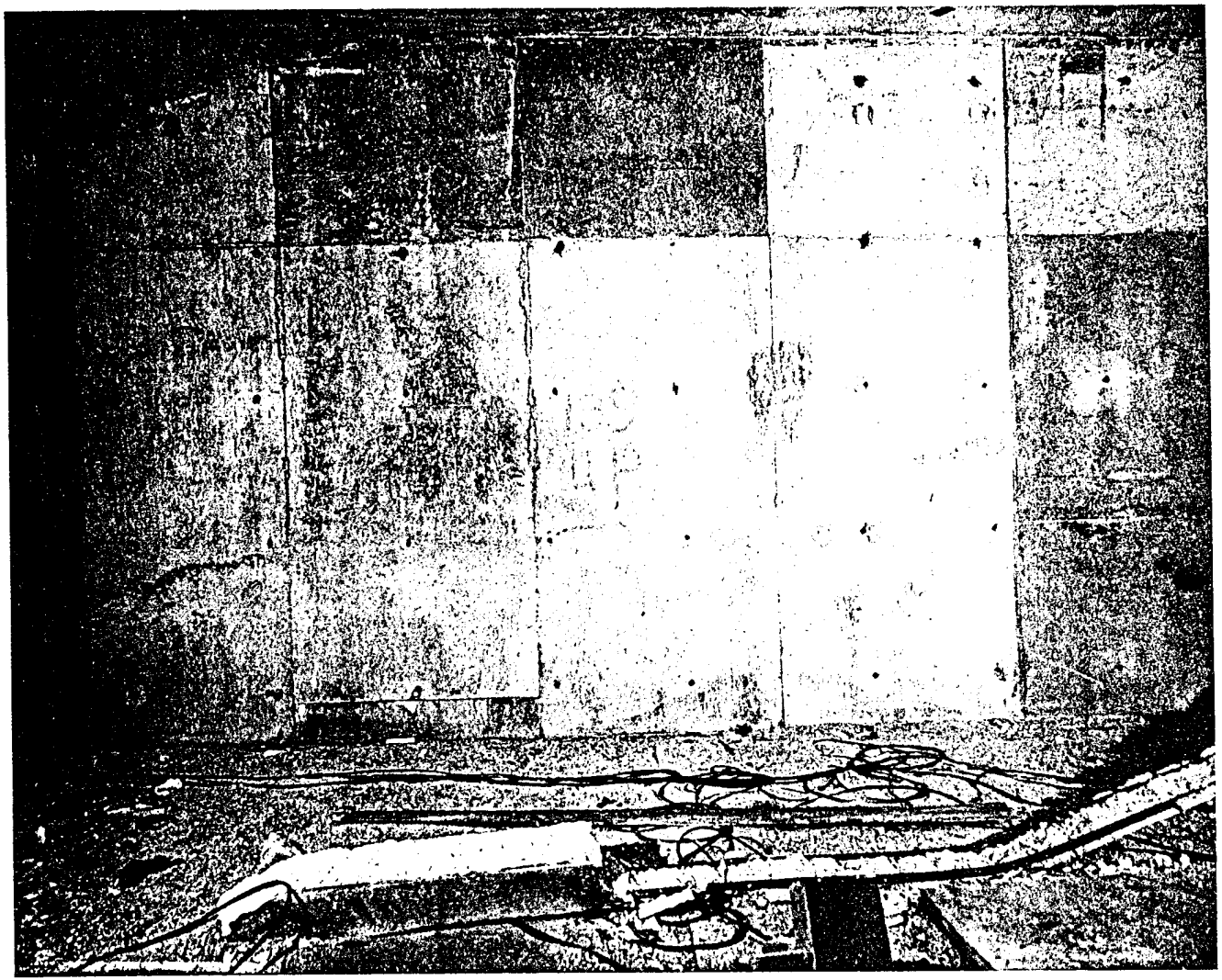


Fig. L.527 Interior View of Right Half of Rear Wall, Structure 3.2.7b

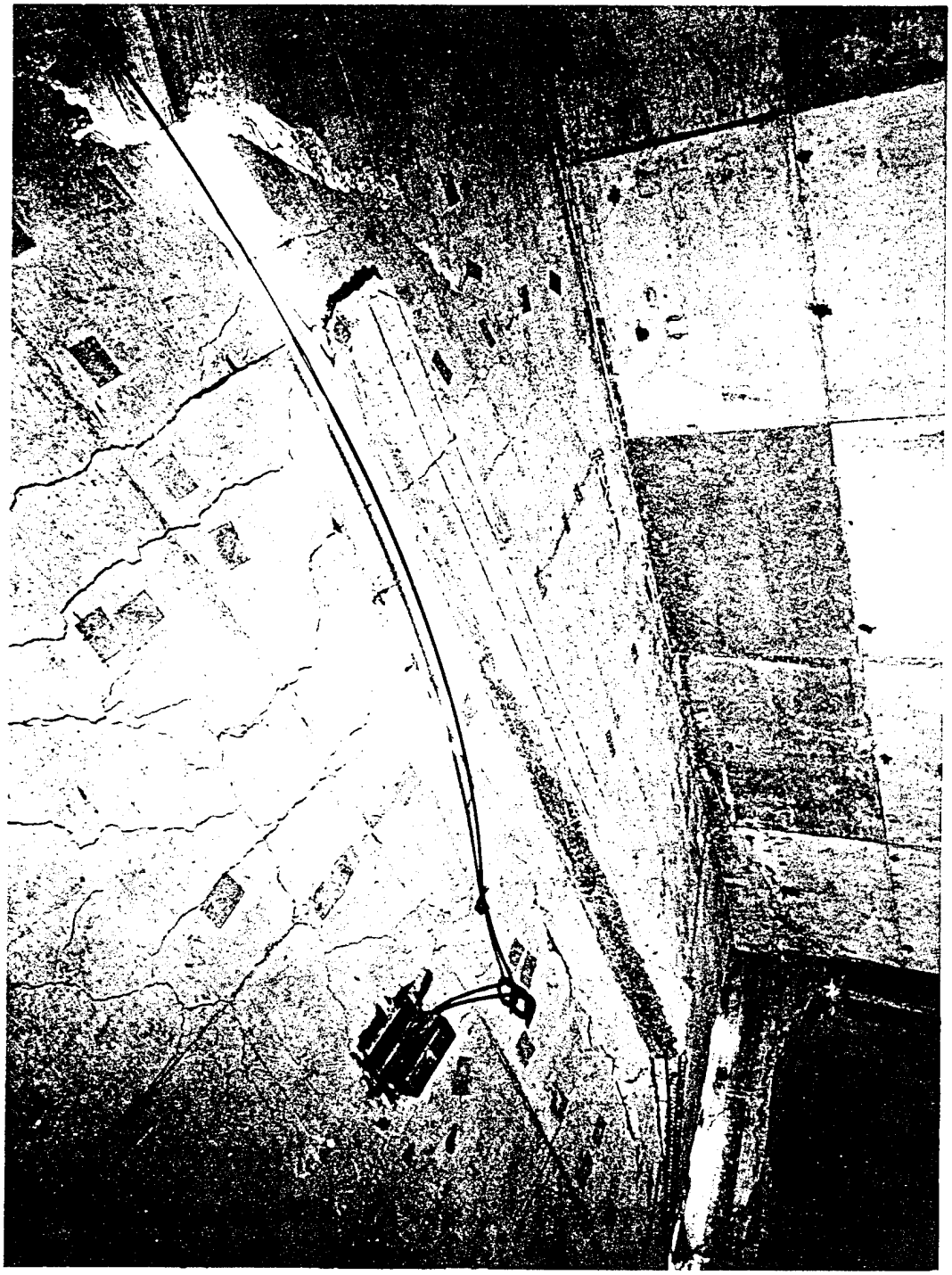


Fig. L.528 Interior View of Main Girder Haunch at Rear Wall, Structure 3.2.7b

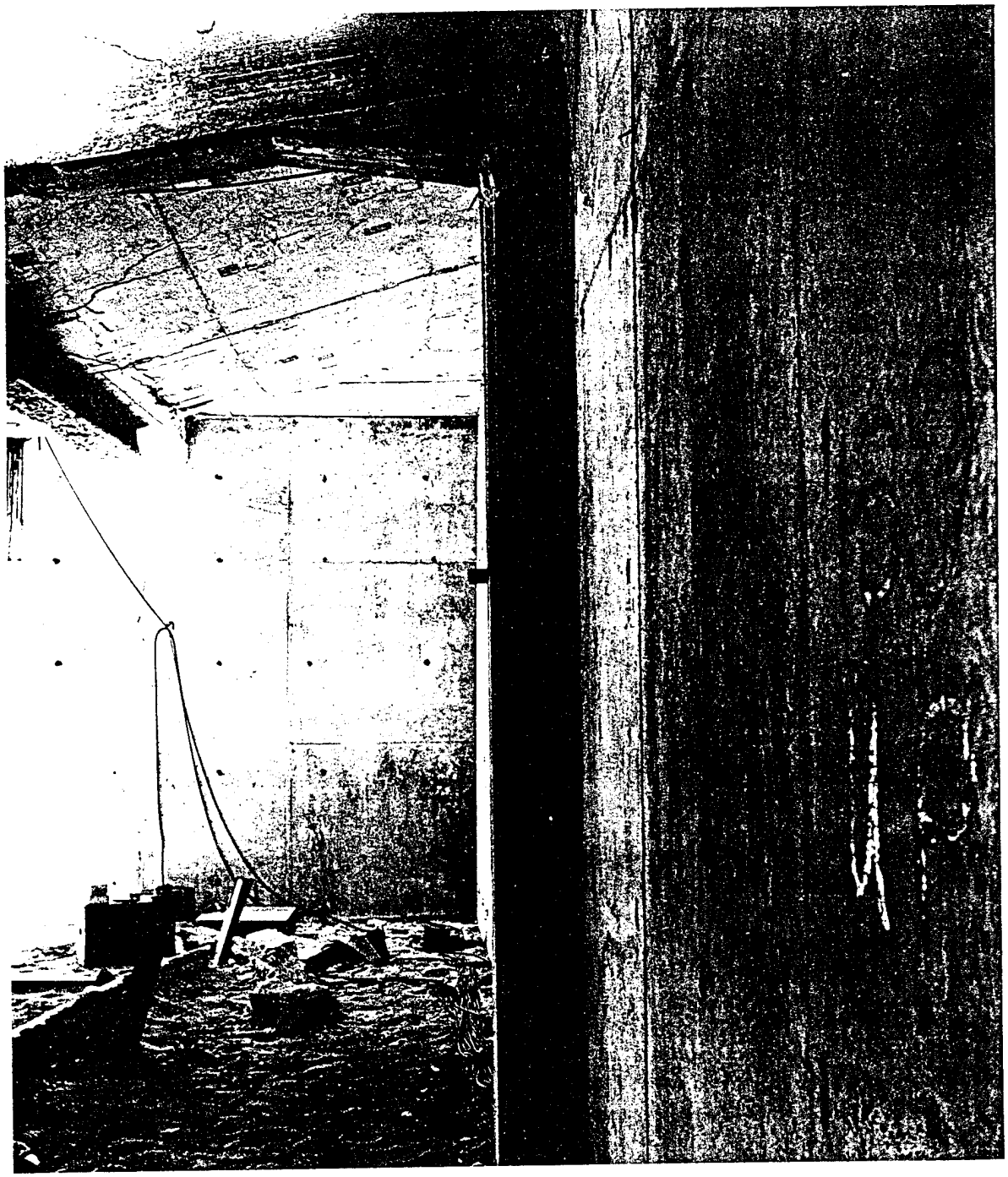


Fig. L.529 Side View of Rear Pilaster and Failure of Main Girder Haunch at Rear Wall, Structure 3.2.7b

UNCLASSIFIED

Fig. L. 530 Detail View of Main Girder Haunch at Rear Wall, Structure 3.2.7b. Part of wall bent in with the haunch as it rotated inward. Note the crushing of the concrete at the underside of the haunch.

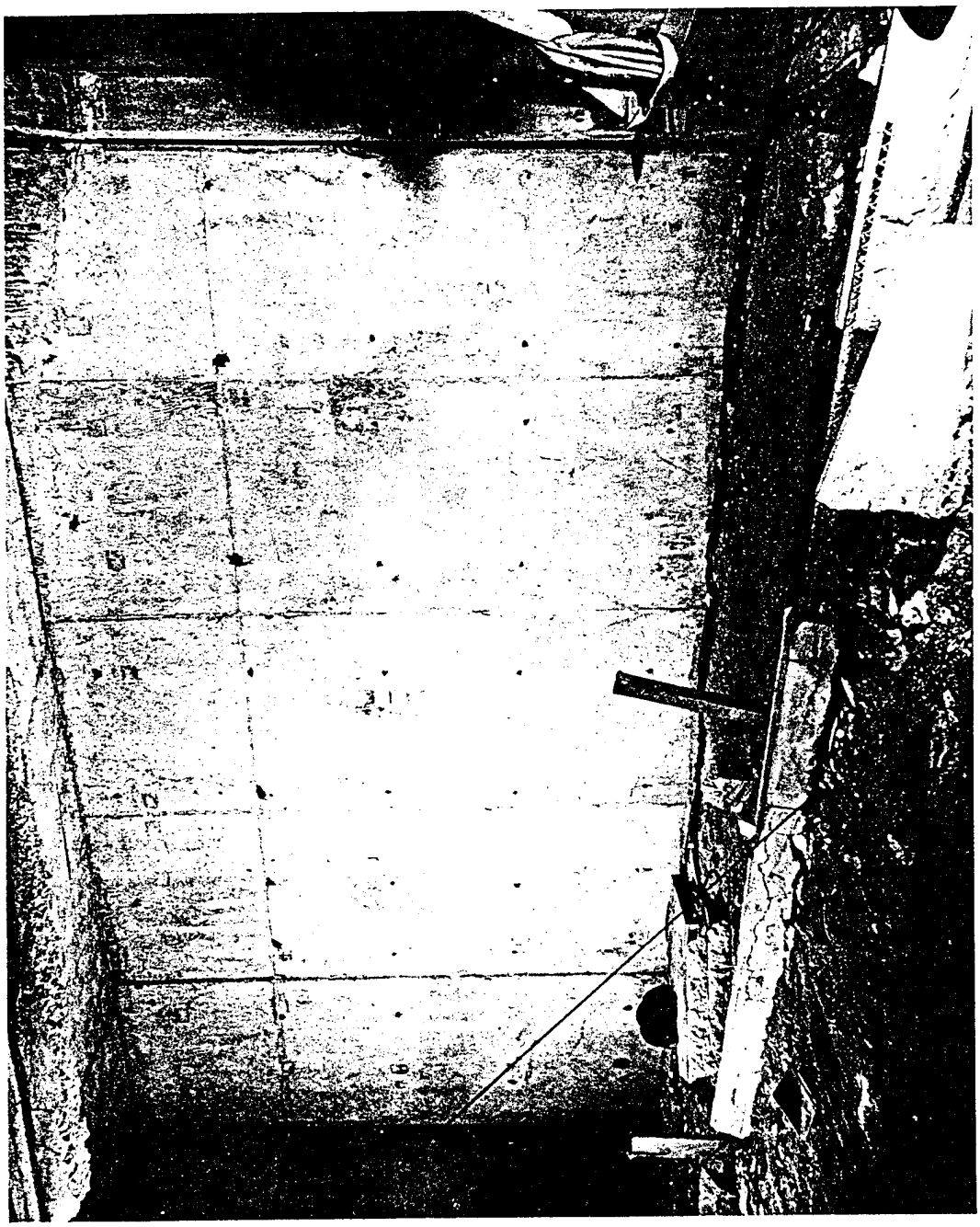


Fig. L. 531 Interior View of Left Half of Rear Wall, Structure 3.2.7b. Lower half of left rear stringer beam can be seen on ground.

UNCLASSIFIED

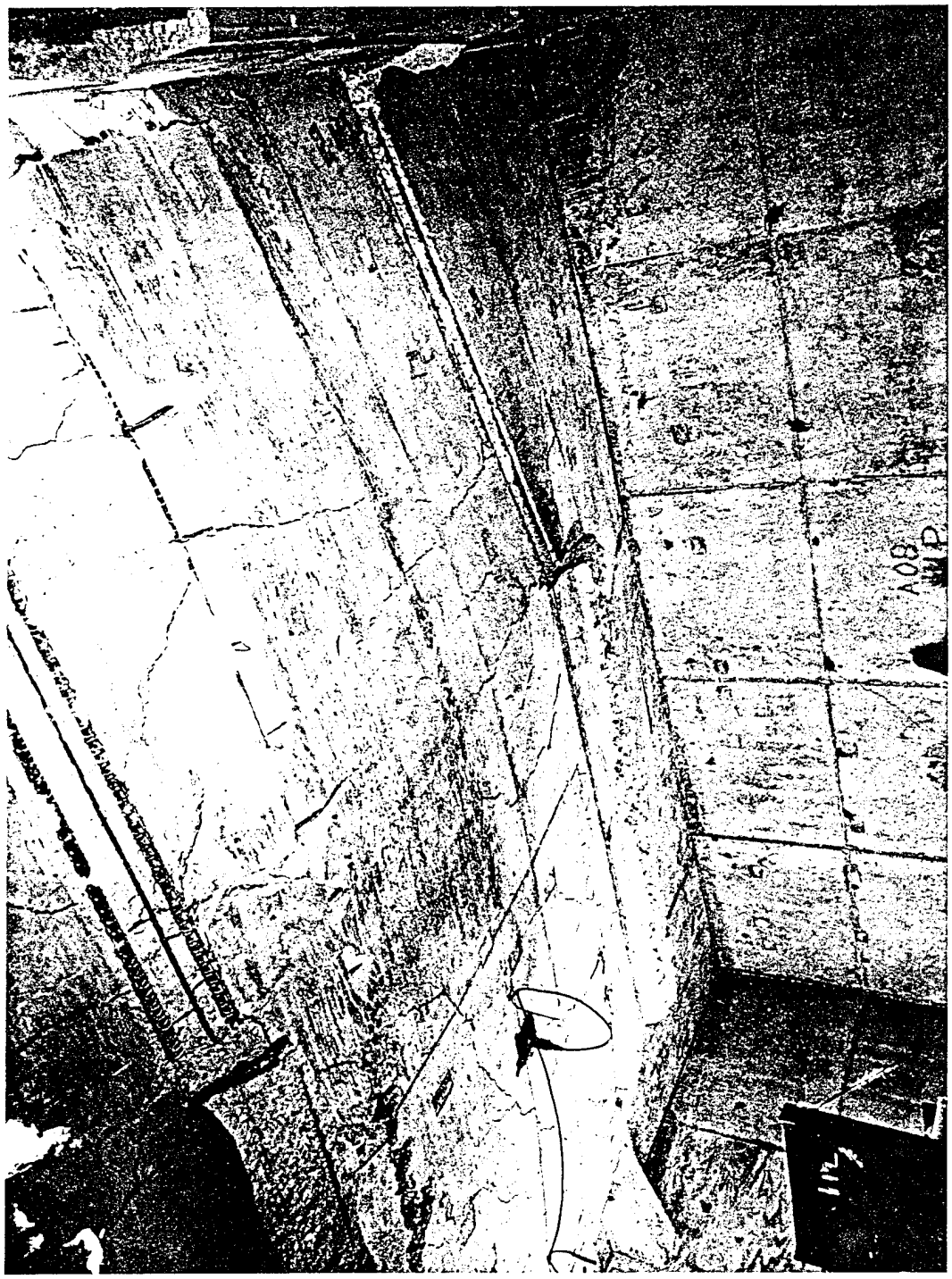
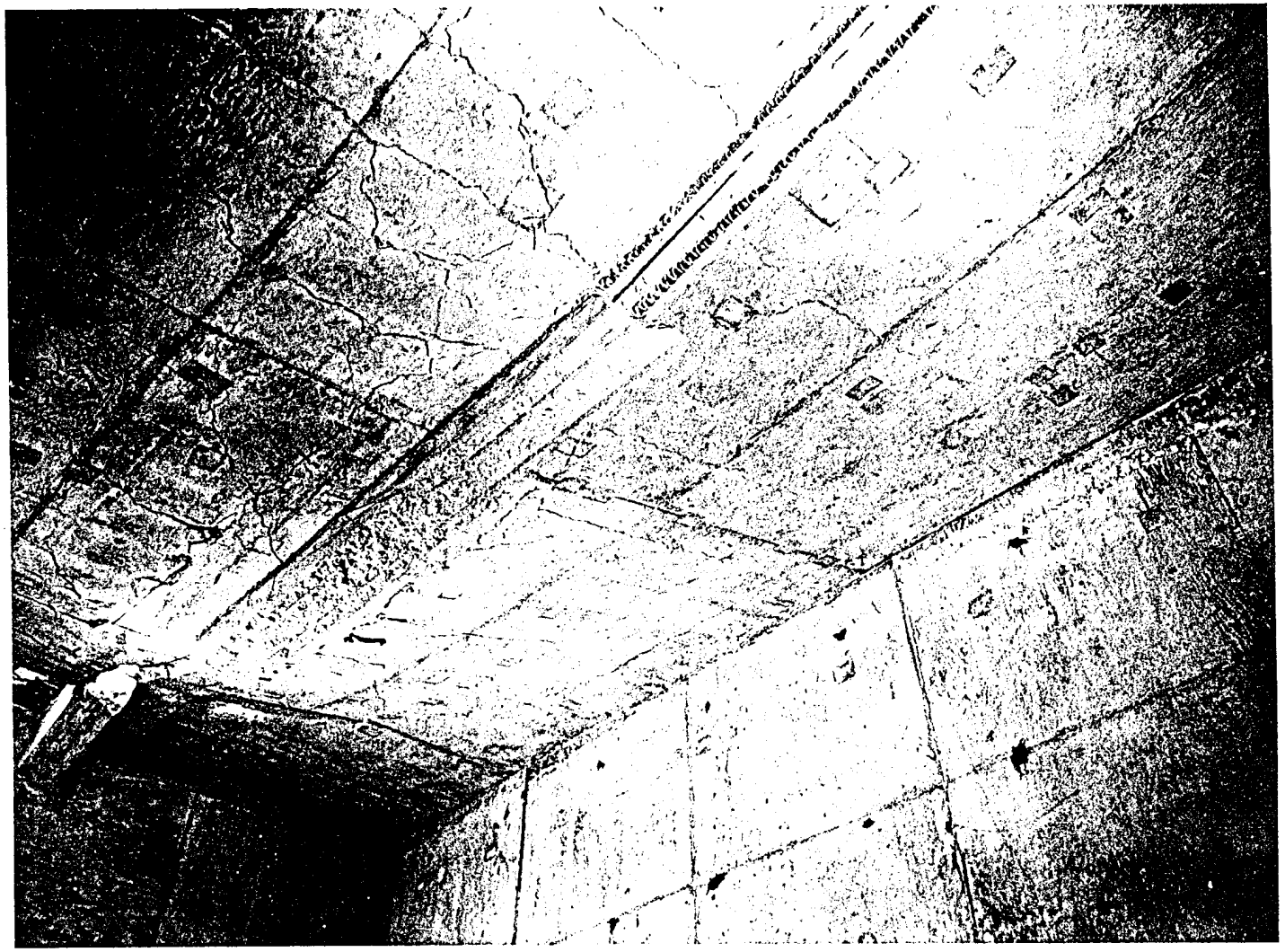


Fig. L.532 Interior View of Rear Left Corner, Showing General Dishing of the Roof Slab, Structure 3.2.7b

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Fig. L.533 Detail View of Crack Patterns in Underside of Roof, Structure 3.2.7b

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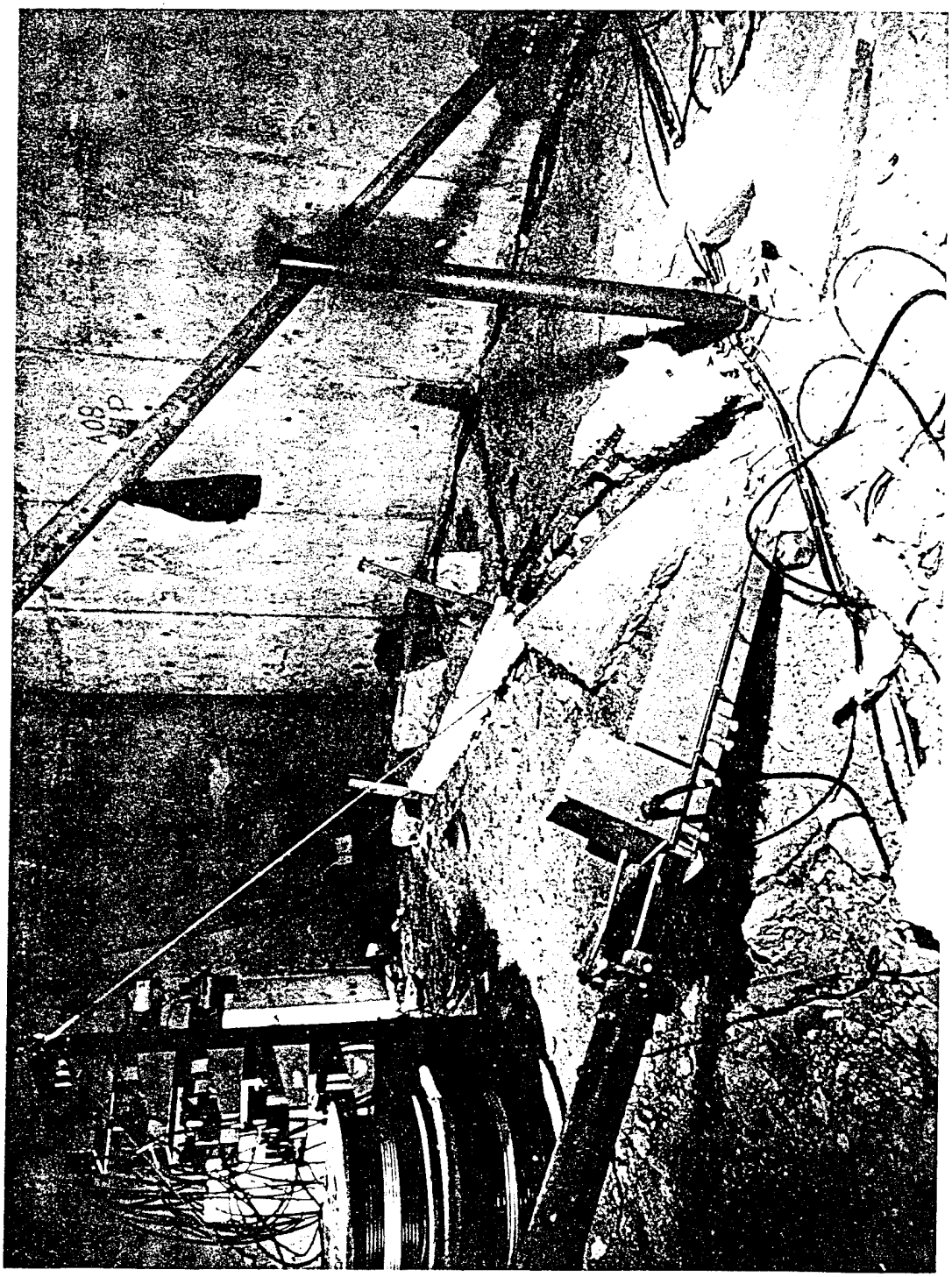


Fig. L. 534 Interior View at Ground Level of Left Rear Portion of Structure, 3.2.7b

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