

**FACADE INVESTIGATION
VISITOR CENTER
FLOYD BENNETT FIELD**

TONETTI ASSOCIATES

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Mr. Eugene Goldberg
National Park Service
755 Parfet Street
P.O. Box 25287
Denver, CO 80225

January 30, 1984

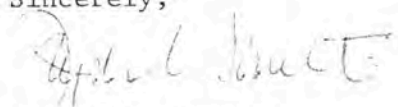
Dear Mr. Goldberg:

The following is our report on the conditions of the exterior shell of the William Ryan Visitor's Building at Floyd Bennett Field, Gateway National Recreation Area. We trust that this report will serve as a documentation of the conditions at present and as a tool for evaluating future repairs and restoration.

The entire facade was reviewed from scaffold, probes were made to establish concealed conditions, and lines were run to verify displacement, so that we are confident that the problems have been revealed. Specific problem areas are located in the elevation drawings and photographs. We have prepared recommendations for repairs according to material types and included an estimate of construction costs. We have also made a short list of items which require immediate attention for safety. Included are alternate methods of repair for these safety items, if funds for the full-scale job are not available.

Please advise if you have any questions.

Sincerely,



Joseph L. Tonetti

JLT:cv

LEGEND TO THE DRAWINGS

A	-	area of test
B	-	bituminous material surface
C	-	crack
C1	-	structural crack caused by a rust build-up on the flange of the structural steel column located on the interior
C2	-	structural crack
(C2)	-	structural crack located on the interior face of the wall
C3	-	cracks due to rusted steel lintel
C4	-	structural cracks along the interior steel column where the brick is only 2" thick
D	-	stone displacement
D1	-	deformation
D2	-	wall that moved in
D3	-	wall that moved out
E	-	defective enclosure
F	-	defective flashing
J	-	defective joints (open, eroded)
K	-	caulked
P	-	deteriorated precast stone (peeling, chipped, porous)
P1	-	spalling of the stone due to steel lintel rust
P2	-	missing cast stone
R	-	rust due to existing fixtures
R1	-	rusted steel lintel
R2	-	heavily rusted steel lintel
R3	-	rusted steel window
S	-	surface material defective
T1	-	missing granite treads



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GENERAL DETERIORATION CONDITIONS

These conditions are generalized over large areas, or are not visible in the elevations, and so are not noted on the drawings.

1. Approximately 30 to 35% of the masonry joints throughout all four facades are deteriorated, cracked or eroded. The parapet joints are about 65 to 75% defective.

2. The coping stone units capping parapet appear to be in good condition. Several of these units are slightly displaced, some are deteriorated and all joints between the units are defective.

Several cast stone units of the cornice (water table) and other different stone mouldings of the entablament are chipped, displaced or cracked and some sections are missing. The majority of the cross joints in these stones are defective.

Some stones of the precast quoin corner are deteriorated and cracked, and the joints are defective.

3. The brick chimney located on the main roof level has severely eroded and defective mortar joints. The precast concrete cap stone is totally deteriorated.
4. The stairway skylight located at the south side of the Control Tower has cracked glass and defective sealant material.
5. Some panes of glass in the Control Tower are broken and the glazing compound is completely dried out.
6. The recently installed cap flashing appears to be only surface mounted and is not properly sealed.

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EMERGENCY WORK

These recommendations are ordered to give first priority to those items which endanger personal safety and second to those problems which will lead to further rapid and serious deterioration.

1. SAFETY PROBLEMS

1.1 Parapet Wall and Entablature Above West Main Entry:

The parapet wall is seriously deformed, coping stones are visably displaced and elements of the cast stone entablature are spalled and chipped. Some elements have recently fallen. This section which is approximately sixty feet long plus the two return sections of five feet are seriously weak.

A sidewalk bridge spanning the main entrance and stairs should be erected to protect individuals. Then working from pipe staging the parapet should be taken down and rebuilt as described in paragraph 2.1 of the Work Required section. The construction estimate is \$69,000. for rebuilding, plus \$8,000. for sidewalk bridge and \$2,800. for pipe staging.

If the funds are not immediately available for the full repair, as a temporary measure the sidewalk bridge should be erected and the parapet and loose section of the entablature removed. The exposed brickwork should then be temporarily flashed to prevent further water damage.

1.2 If visitors are going to continue to use the building prior to complete renovations, temporary wood treads laid over the granite ones and hand rail should be constructed. The existing treads are displaced and are a liability especially without railings. One stair for primary access would cost approximately \$2,000.

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2. SIGNIFICANT STRUCTURAL PROBLEMS

If money does not become available for the complete renovation of the facade within the next three to four years the following problems should be addressed to prevent more major problems.

2.1 All vertical structural cracks throughout the facade should be repaired. This includes resolving the underlying problems of the steel columns and piping as detailed in paragraph 1.2 of the Work Required section. If these are allowed to remain open the deterioration of the steel, masonry and interior finishes will be extremely destructive.

2.2 All heavily corroded lintels described in paragraph 1.1 should be replaced. The continued cracking of the surrounding brick and mortar increases the problems of replacement and increases resulting deterioration on the interior.

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WORK REQUIRED

This outline is organized according to material types, steel, masonry, and cast stone. The locations where this work is required can be seen on the elevation drawings and further detailed in the photographs.

1. DETERIORATED STEEL MEMBERS

1.1 Window and Door Lintels:

Severely deteriorated lintels should be replaced with new galvanized steel angles. This will require removal of surrounding brick, which must be reused or matched in kind. Lightly rusted lintels (all lintels not noted as severely deteriorated) should be scraped to bare metal, primed and painted with appropriate rust inhibitive paint. All joints between the pair of angles which have been caulked should be raked clean and left open, as well as the joint on the outer edge of the lintel.

1.2 Steel Columns:

At the four corners of the building the steel columns have rusted, expanded and cracked the surrounding brick. A sufficient amount of brick will have to be removed from basement to cornice to reveal the column behind. The pre-cast quoins should be reinforced and left in place. The columns would then be scraped clean, primed and painted with highest quality paint. New brick matching the existing should be keyed and reset in full mortar bed.

The joint between the existing quoins and new brickwork should be treated as an expansion joint. It should be filled with backer rod and pressure sealed with polysulfide sealant pigmented to match mortar.

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If, after the removal of the masonry, the deterioration of the corner columns is discovered to be advanced, a decision will be made to the advisability of reinforcing the columns with steel plates.

It should be noted that at the corners of the portico section, similar cracks appear though no columns are shown on the structural drawing in these locations. These cracks are assumed to be the result of foundation settlement or more probably the result of inadequate expansion joints. Their repair is covered in the masonry section.

1.3 Steel Frame Windows, Control Tower and Skylights:

The existing steel frame windows are in various stages of rusting, which has caused them to seal improperly. This leakage and interior condensation has caused deterioration of the plaster and other interior finishes. Approximately 15% require more extensive repairs including replacement of sections, new hardware or welding.

Various options are available for their renovation or replacement. The existing windows can be repaired, cleaned, painted and weatherstripped with an additional window added on the interior. The existing windows can be replaced with steel units to match or with wood double hung sash as are shown on the Contract Documents, or even with aluminum thermal broken sash. Our recommendation is to preserve, repair and renovate the existing and add secondary windows on the interior. Replacing the existing with new steel frame would not solve the long term problems of thermal transfer and condensation inherent in a steel sash. We are not convinced that wood windows were ever installed and believe that steel units were substituted

during the construction process. This could most likely be verified in photos. The aluminum window profiles would conflict with the historic nature of the building.

The three large windows under the control tower are deteriorated to the point where they must be replaced. The steel framing of the Control Tower glazing is in good enough condition to scrape, clean and paint though the flashing of the observation deck must be replaced. The skylights over the access stairs to the Control Tower should be replaced in kind. As a minor repair item the broken glazing in the north skylight should be replaced.

2. DETERIORATED MASONRY

2.1 Parapet Wall:

The existing parapet wall presents numerous problems. The interior surface has been coated with bituminous asphalt over approximately 75% of its area which has lead to deterioration of the covered mortar joints and contributed to the wall deformation. The west section over the portico has been severely displaced by frost action and is eminently dangerous to people below. Approximately 65% of the mortar joints on the parapet exterior require repointing. The precast stone coping is in various stages of deterioration. Approximately ten units (4'-0" long each) must be replaced, another fifty are displaced. The entire parapet was not constructed with expansion joints, thru-wall flashing under coping units, or flashing above the roof spandrel. This has caused moderate displacement and structural cracks throughout, in addition to the more serious problems described above. Lastly, the counter flashing which

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was installed with the recent roofing was not cut adequately into the masonry.

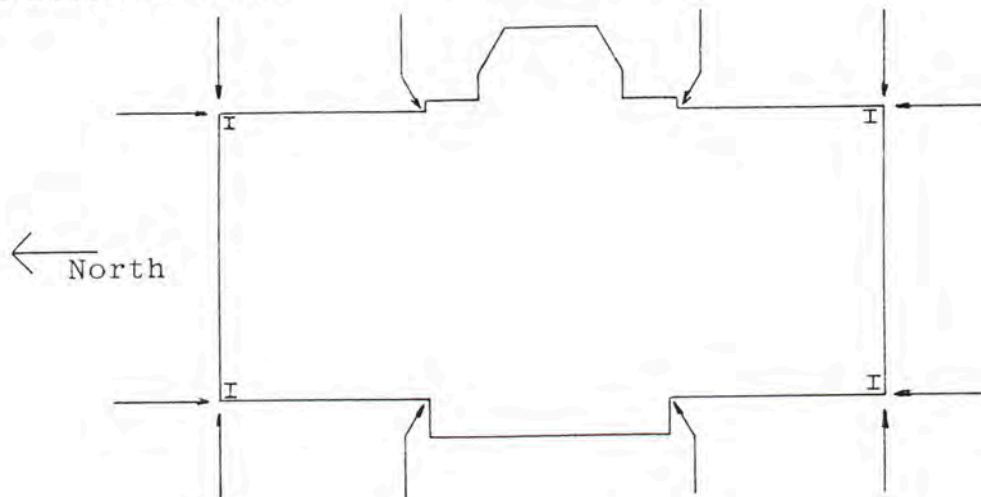
For these reasons, we are recommending that the entire parapet wall be dismantled and properly rebuilt with new masonry. This would entail tying the inner two wythes to the roof slab, creating a cavity and then connecting outer wythe to the inner with flexible ladder reinforcing. Vertical control joints should be constructed at each corner of the parapet. The precast "World Medallion" and the coping units which are reusable would be cleaned and reset. Additional units would be cast to match originals and then placed in sequence so that the subtle variations would not be so easily noticed. Proper thru-wall and counter flashing would be installed. It should be noted that the brick and mortar of the parapet is of another color than the remainder of the building so that the juxtaposition of old and new work would not be so evident.

2.2 Structural Cracks:

Cracks by steel columns are addressed in Section 1. Other cracks are caused by roof drains within 2" of the brick surface, lack of expansion joints, and miscellaneous rusted conduit and other abandoned electrical equipment. The four roof drains which have caused structural cracks should be rerouted towards the interior of the building, the broken and displaced brick removed, and replaced with brick to match. The abandoned electrical equipment should be removed and damaged brick replaced. A total of eight expansion joints should be cut on the East and West facade, as shown in the sketch below.

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± Steel Columns



2.3 Mortar Masonry Joint:

Approximately 30% of the brick joints are open, eroded or deteriorated on the North, South and West, and 35% on the East. The majority of these joints are on the upper sections of the facade. The reason for the deterioration on the upper areas may be due to increased exposure to weather or to higher moisture content because of proximity to the parapet. These should be routed out to a depth of approximately 3/4" and repointed with an appropriate mortar. The existing mortar was found to be of good quality and medium porosity. We would also recommend that areas which were repointed in recent years with mortar which did not match the existing be cleaned and repointed.

The chimney, which does not show on the elevations, also needs to be completely repointed.

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3. EAST STONE

3.1 Coping and Entablature:

Cast stone is used as ornamental elements throughout the building facade. It has deteriorated in some areas and mortar has eroded between units. The coping units replacement has been mentioned in the masonry section with the parapet wall. The joints between the units should be filled with mortar to within 3/4" of surface then filled with backer rod and sealed. The unit should be tied to parapet below in stainless steel or teflon anchors.

The cornice is composed of dentils and a string course of moulding. These elements have deteriorated in certain areas and units have also been displaced as noted on drawings. The severely deteriorated units should be recast to match in color, texture, and contours. This is approximately 5% of the total linear footage. They should be doweled to substrate and set in portland cement with epoxy bonding agent. An additional approximately 35% of the units are deteriorated but can be repaired. All units should be tested for soundness, any evidence of loose or spalled cement, and removed back to sound substrate. Those which are judged repairable shall be patch with mortar and exposed marble aggregate to match existing surfaces. We would recommend that a continuous cap flashing be considered to protect the exposed ledge of the cornices. The flashing would be set in a reglet in the parapet wall and, following the contour of the top cornice, extend to the outer edge of the moulding. This flashing would protect the cornice joints and aid in water run-off. The cornice units which have been displaced but are otherwise intact should be removed and reset as described above.

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In the West elevation above the main entry, the cast stone of the entire entablature is in obviously weak condition and should be removed and replaced with new units. On the East elevations the bronze letters in the frieze should be removed, cleaned and resecured through the cast stone to the masonry substrate. The decision about leaving the name "Naval Air Station" is an open question.

3.2 Quoins:

Approximately four quoins per corner must be replaced as described in the entablature section. 50% of the mortar joints must be repointed. The repointing should be done with a lime mortar and a portland cement additive pigmented to match existing. The expansion joint between the quoins and the brick is also described in that section.

3.3 Stairs:

The existing stairs have granite tread, brick substrate, and cast stone veneer on the cheek walls. The granite and cast stone has been displaced by movement of the brick to varying degrees on the different stairs. The brick, which was visible from our probes and areas where the cast stone has fallen off, had deteriorated to the point where it should be replaced. Our assumption is that the deterioration is typical of all the stairs and we recommend removing the treads and cast stone pieces, providing a poured in place concrete substrate and reinstalling the reuseable pieces. New cast stone pieces would have to be provided in specific areas at each stairs. The rails are missing as well and should be replaced with replicas of those on the Contract Documents or shown in old photos.

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3.4 Base:

On East elevation the cast stone of the base from the ground level to the terrace has become displaced and deteriorated. It is a general condition which requires the removal of the material, a review of the substrate and anchors and replacement of lintels. On the remainder of the elevations this stone requires removal and replacement in specific areas as noted on drawings.

3.5 Miscellaneous Pieces:

The cast stone door enframements require patching and re-pointing. These are noted on drawings. Approximately 25% of the balusters have eroded to the point where they should be replaced. The railing is in adequate condition. The precast cap stones of the chimney should be replaced.

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COST ESTIMATE

1. STEEL

1.1 Lintels:

Replaced \$ 102,000.

Refurbished 6,300.

1.2 Columns 60,000.

1.3 A) Steel Windows:

Refurbished 32,700.

Replaced 16,000.

B) Tower 2,600.

C) Skylight 2,700.

2. MASONRY

2.1 Rebuilding of Parapet Wall 210,000.
(includes recommended emergency work)

2.2 Structural Cracks 56,000.
(includes roof drain relocation)

2.3 Masonry Repointing 36,000.

3. CAST STONE

3.1 Coping Stone and Entablature 40,000.

3.2 Quoins 24,000.

3.3 Stairs 240,000.

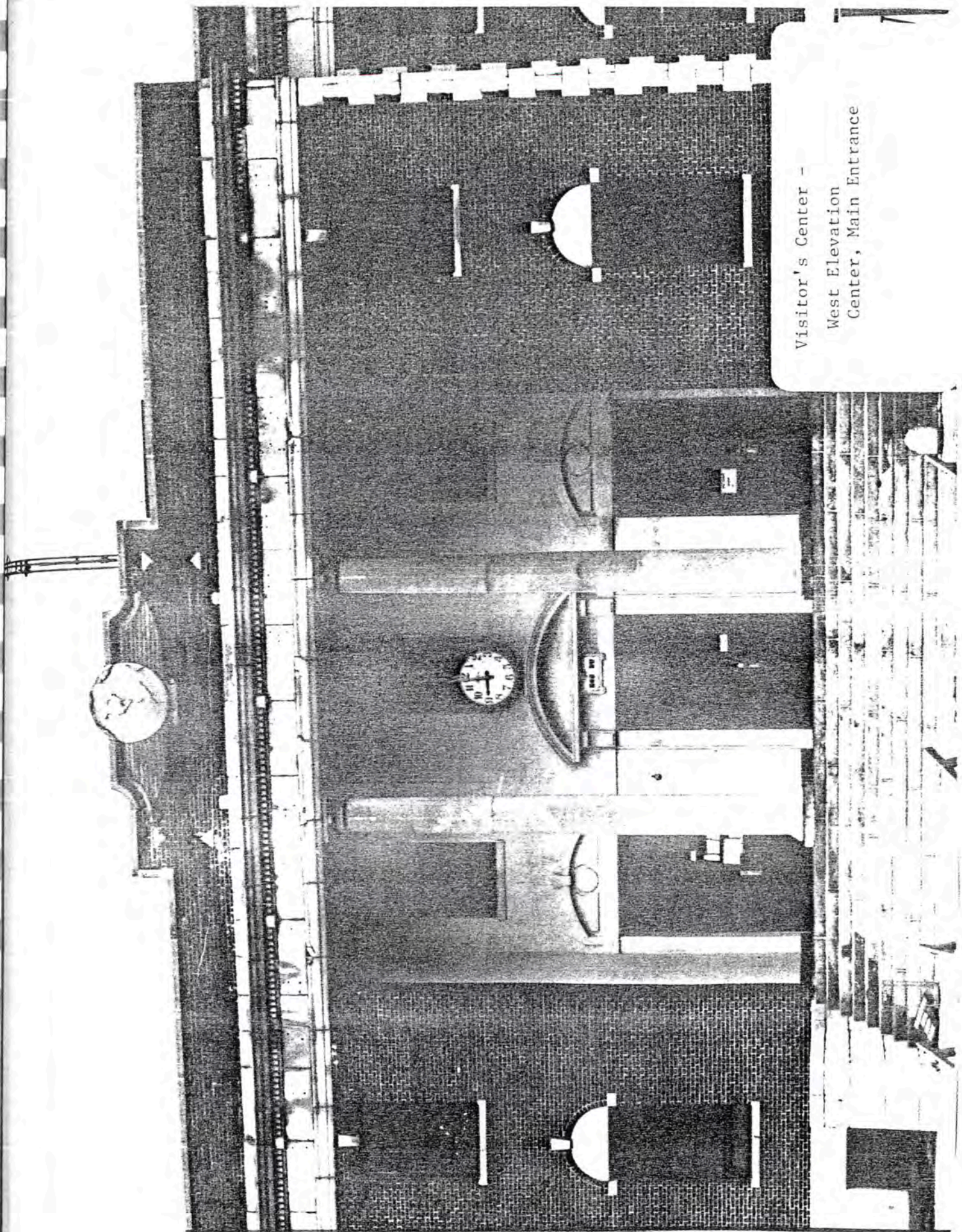
3.4 Base 57,000.

3.5 Miscellaneous:

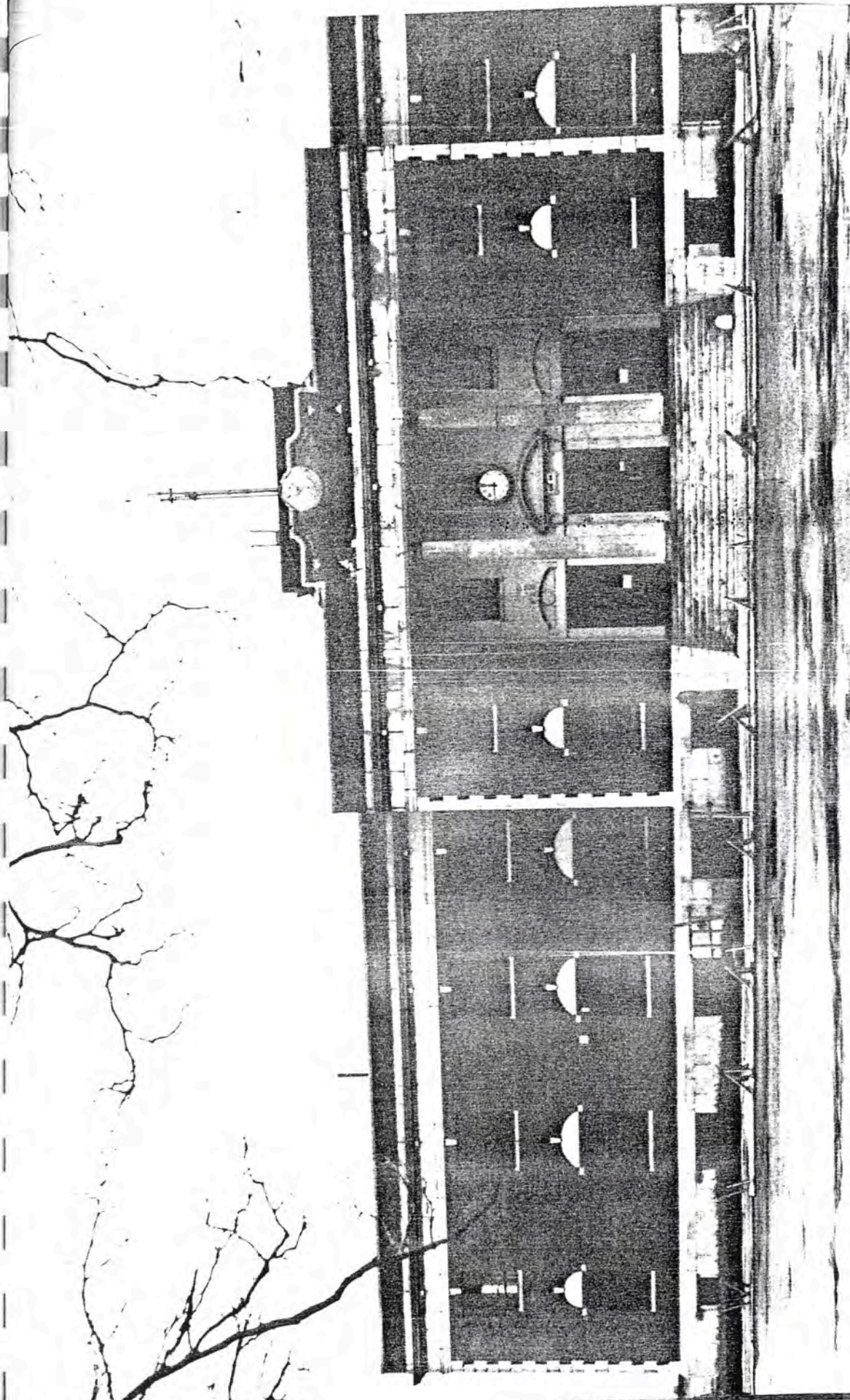
Balusters 4,000.

Door Enframements 5,000.

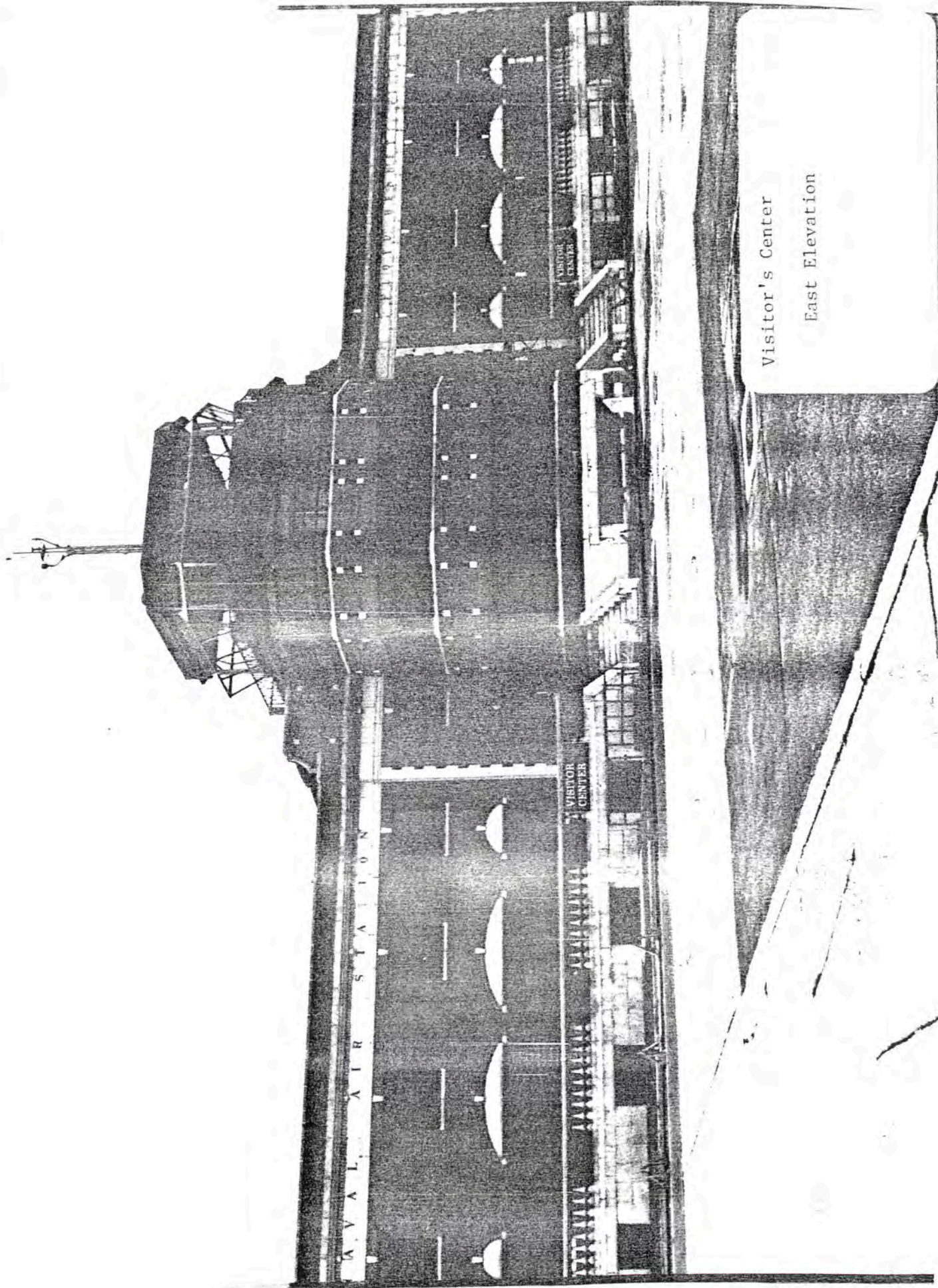
TOTAL: \$ 894,300.



Visitor's Center -
West Elevation
Center, Main Entrance

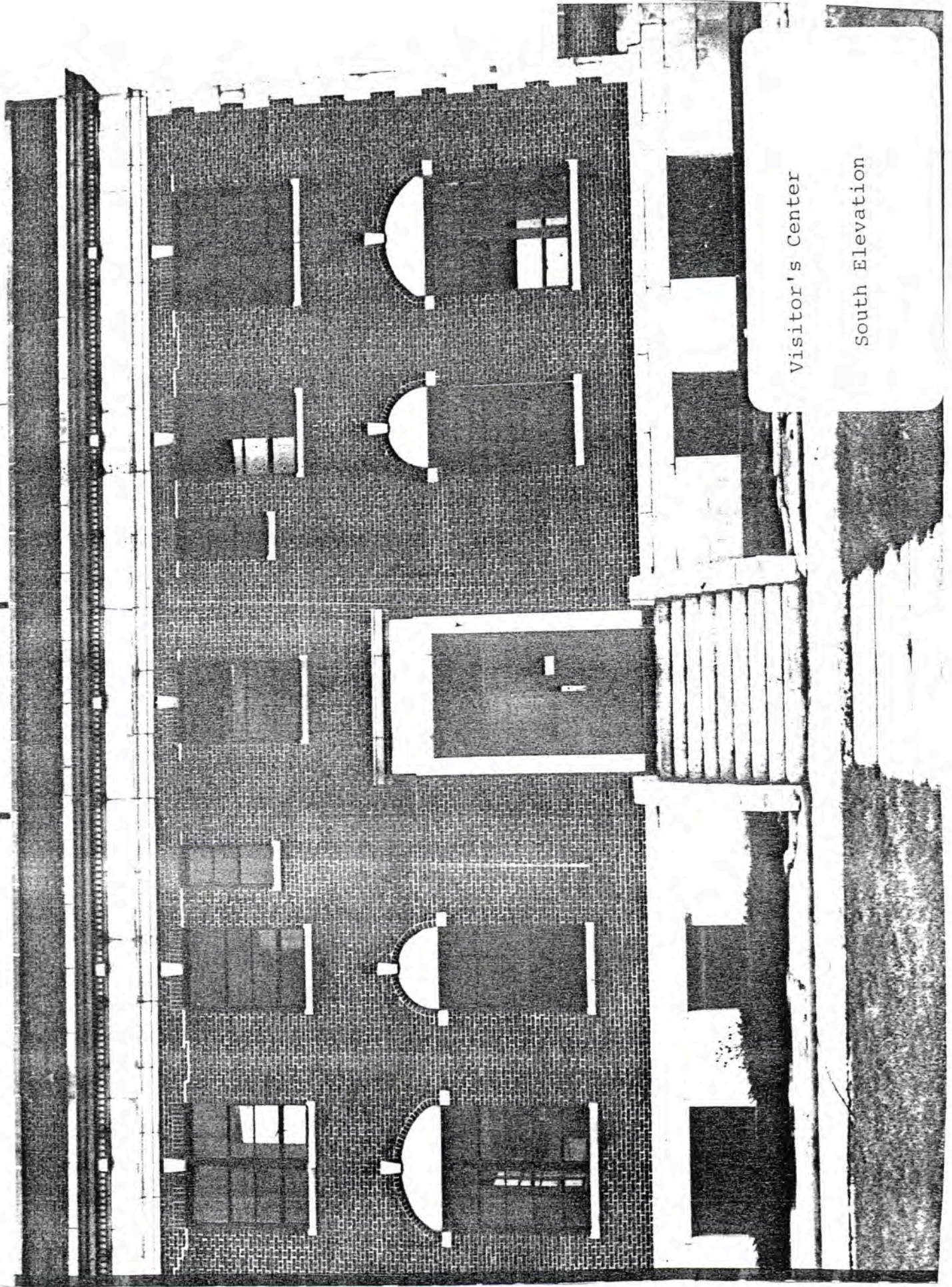


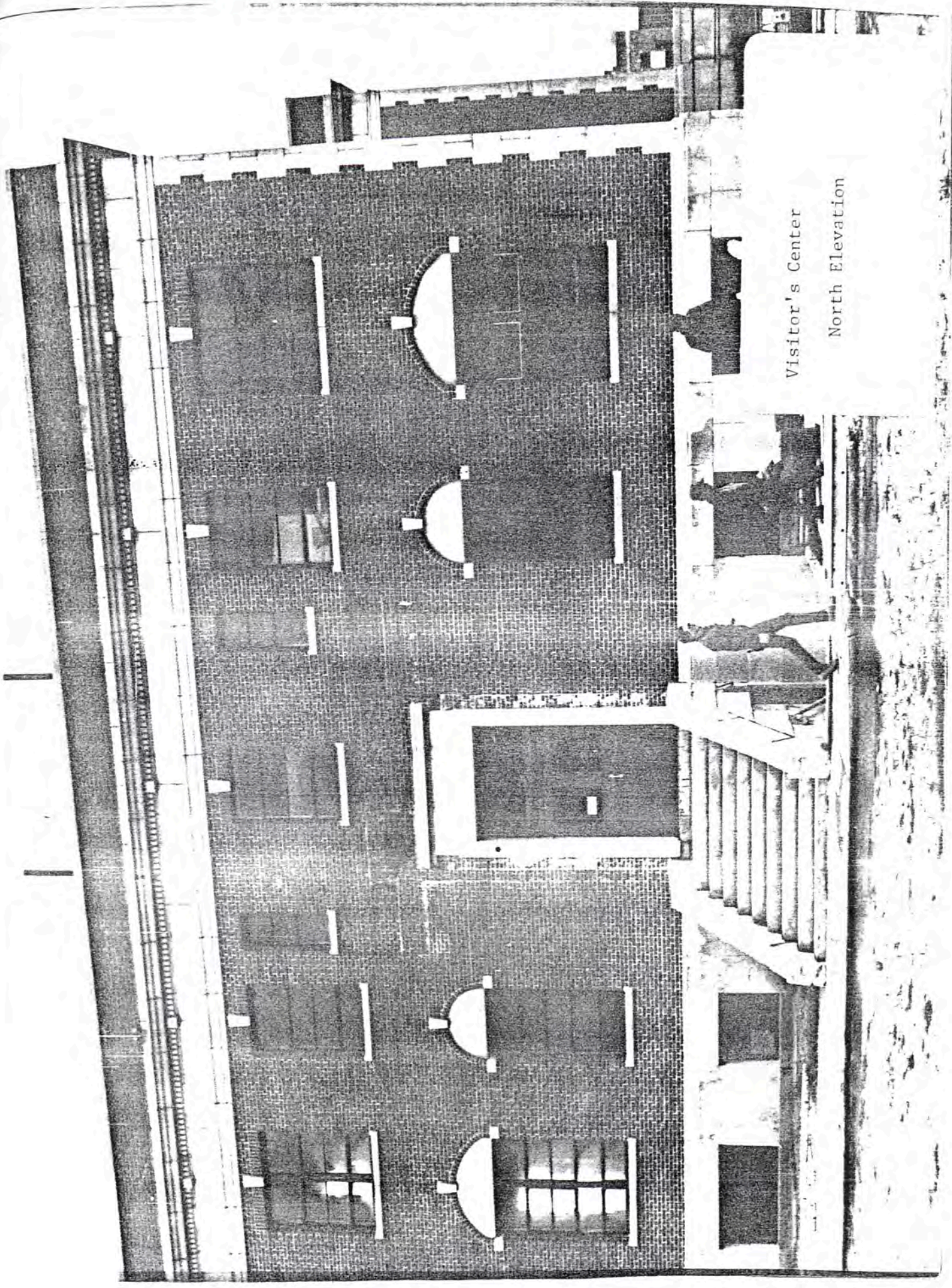
Visitor's Center
Center & northerly
end.
West Elevation



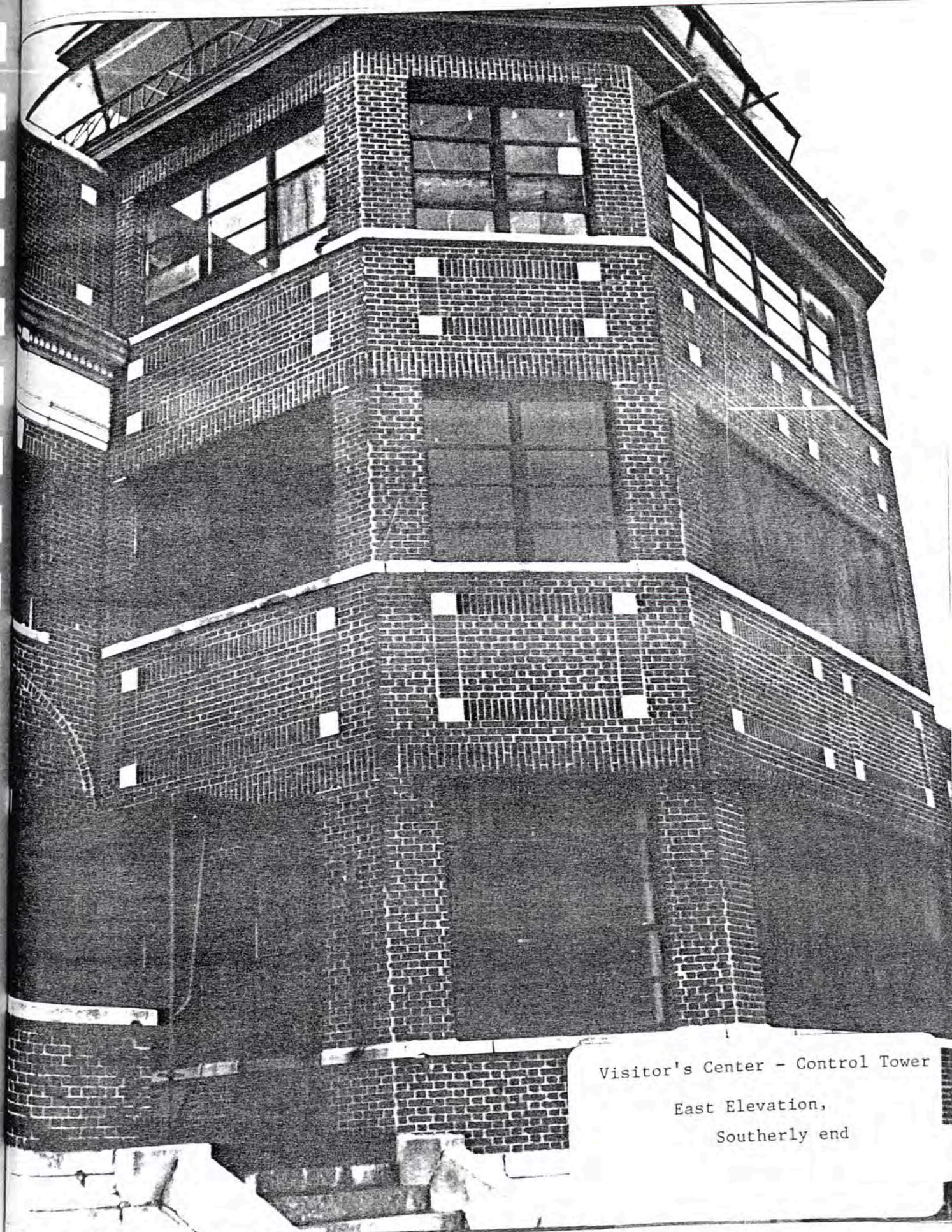
Visitor's Center
East Elevation

Visitor's Center
South Elevation



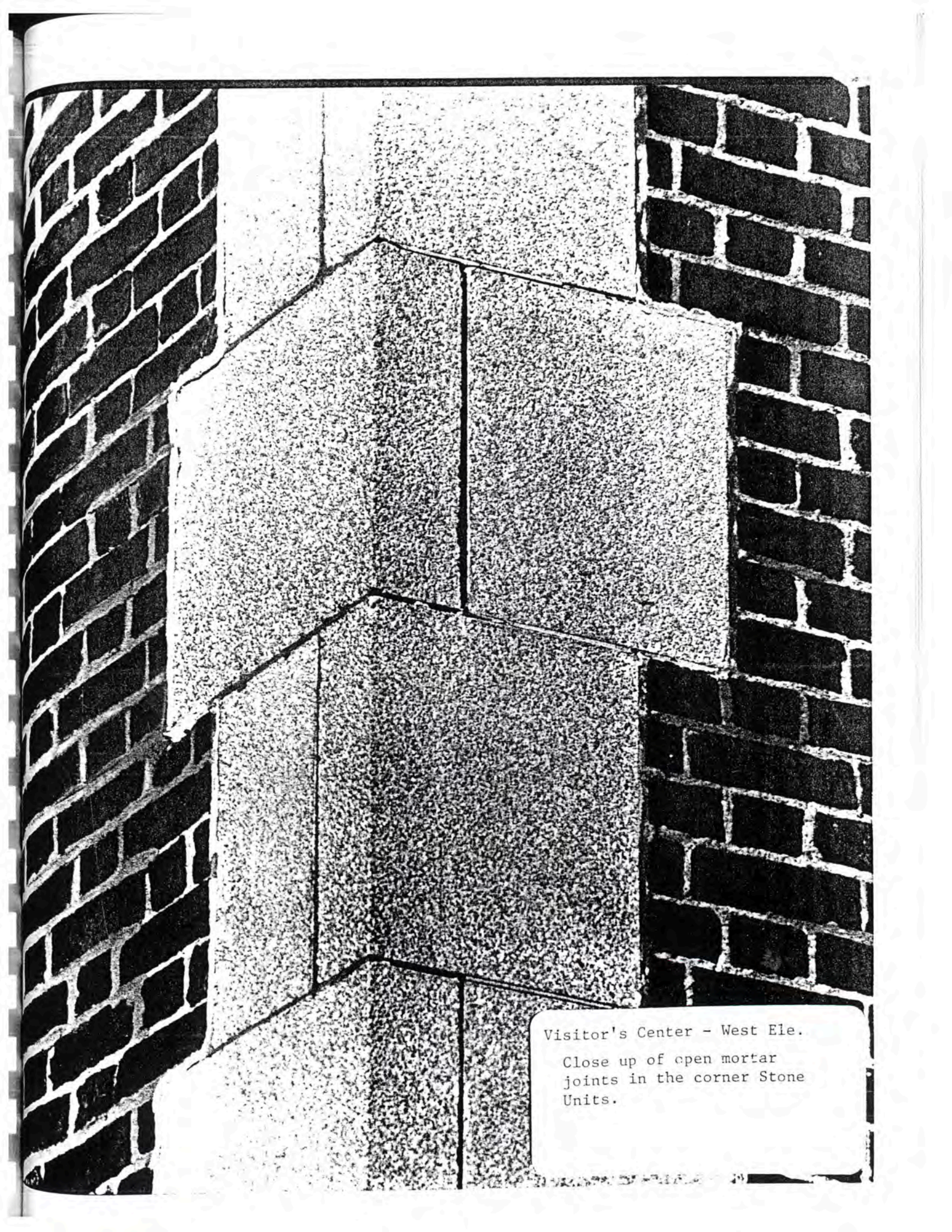


Visitor's Center
North Elevation



Visitor's Center - Control Tower

East Elevation,
Southerly end

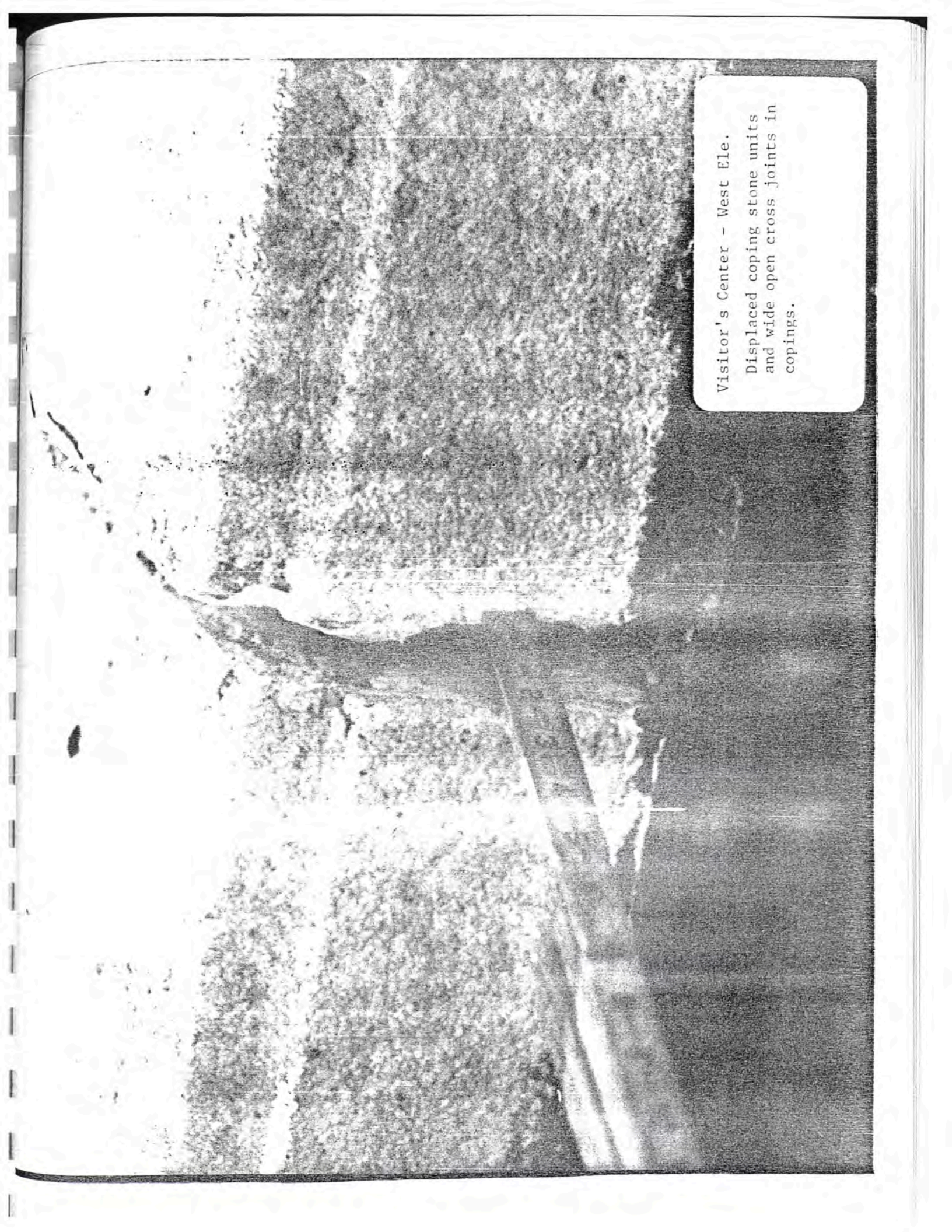


Visitor's Center - West Ele.

Close up of open mortar
joints in the corner Stone
Units.

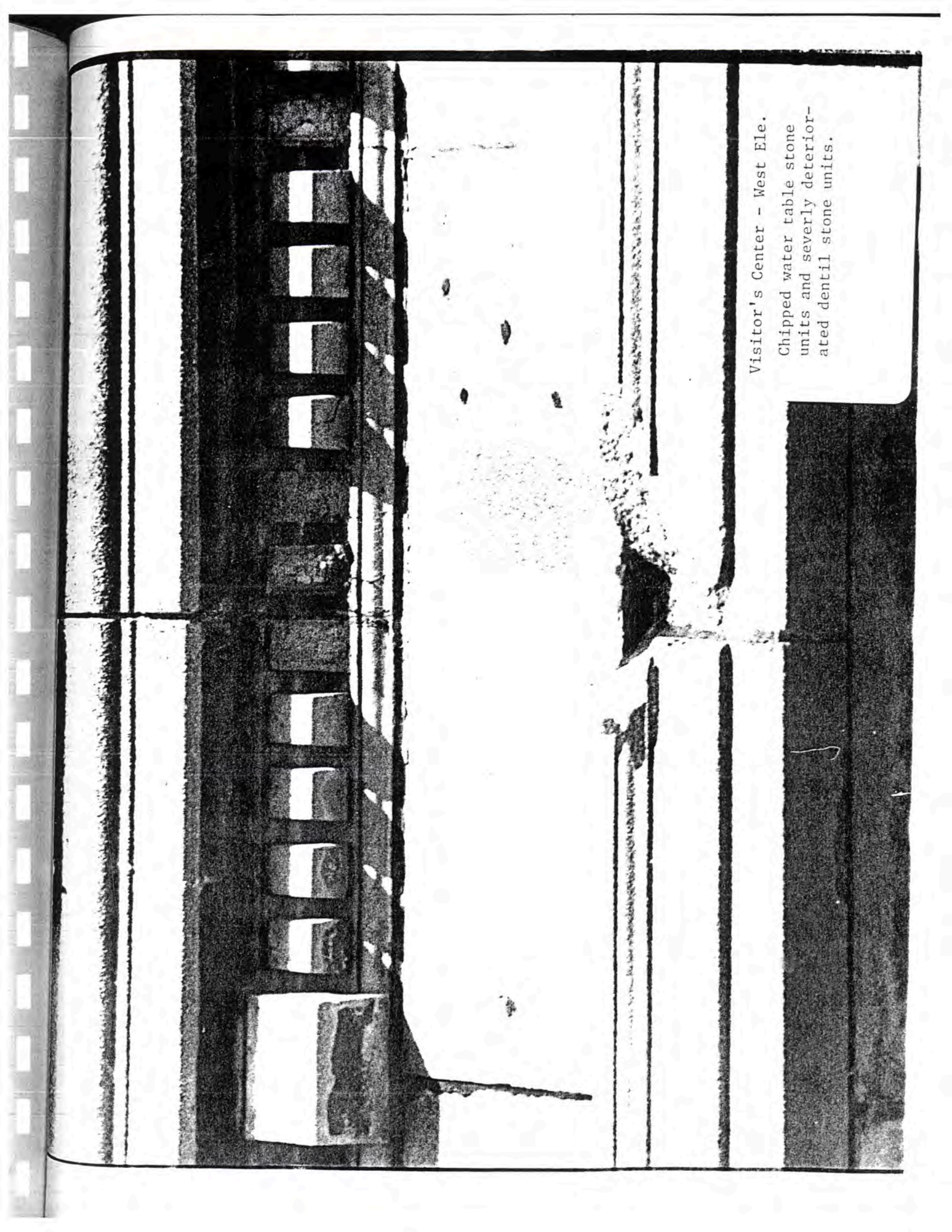


Visitor's Center - South Ele.
Deterioration of stone door
enframement and masonry joints
above.



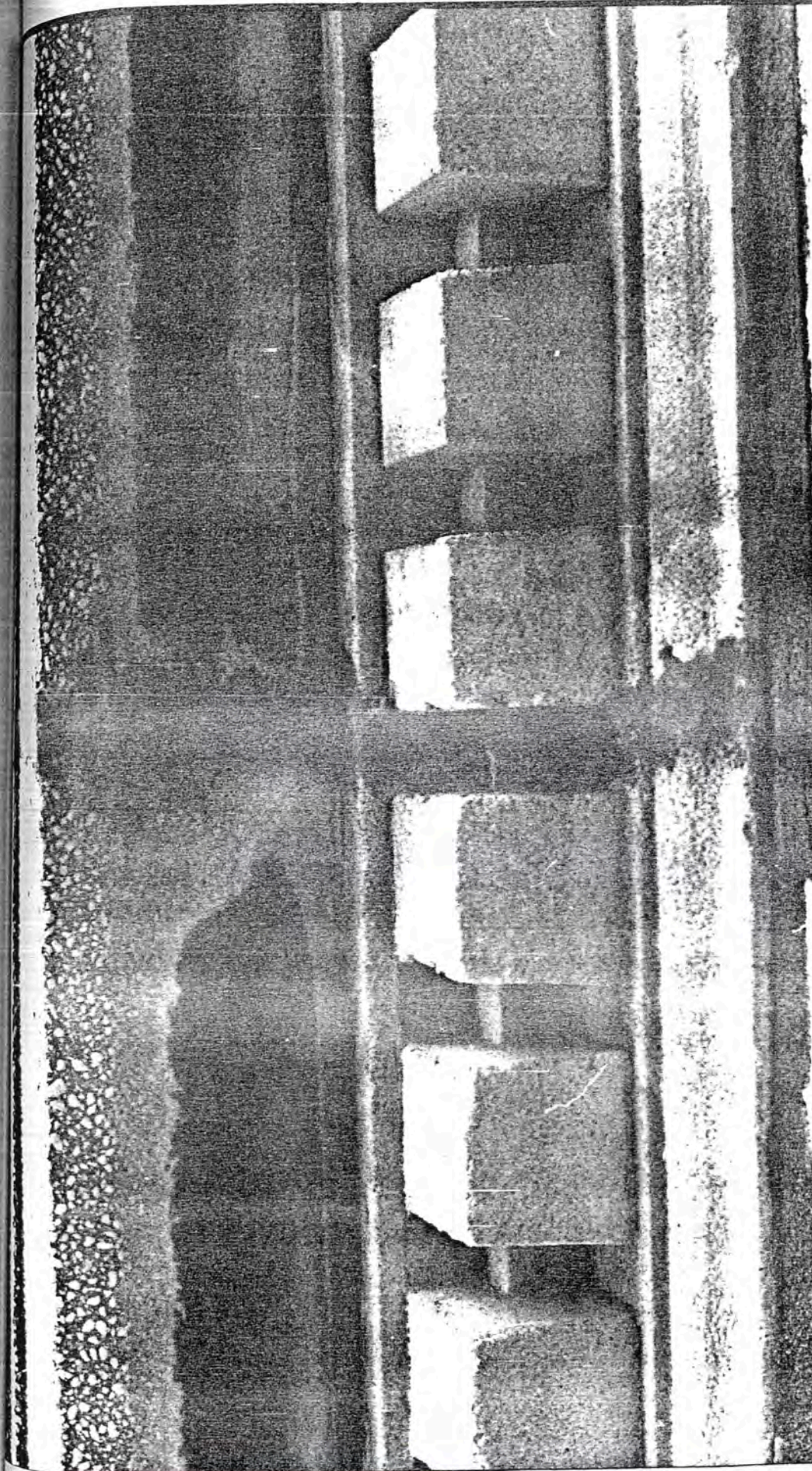
Visitor's Center - West Ele.

Displaced coping stone units
and wide open cross joints in
copings.



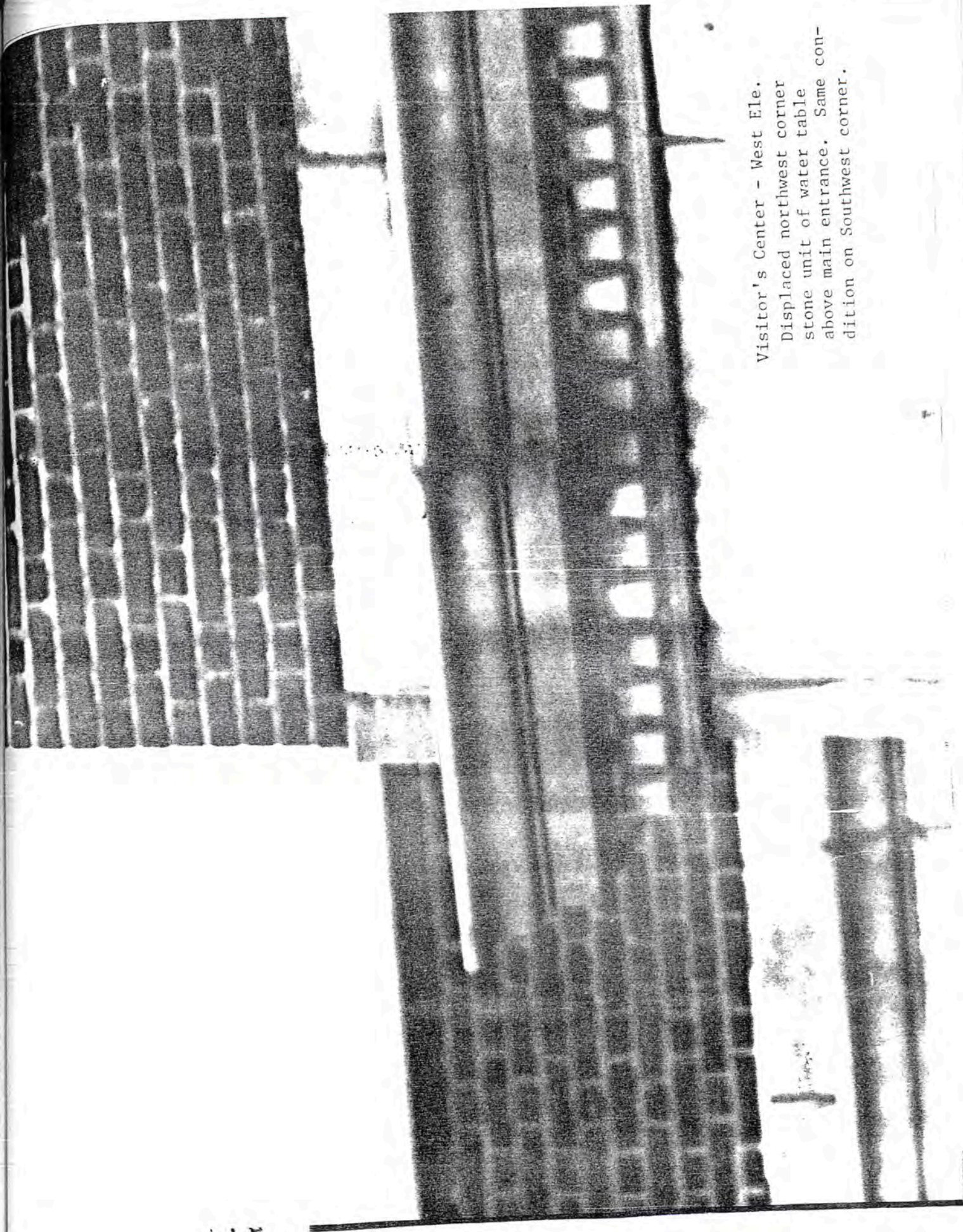
Visitor's Center - West Ele.

Chipped water table stone
units and severely deterior-
ated dentil stone units.

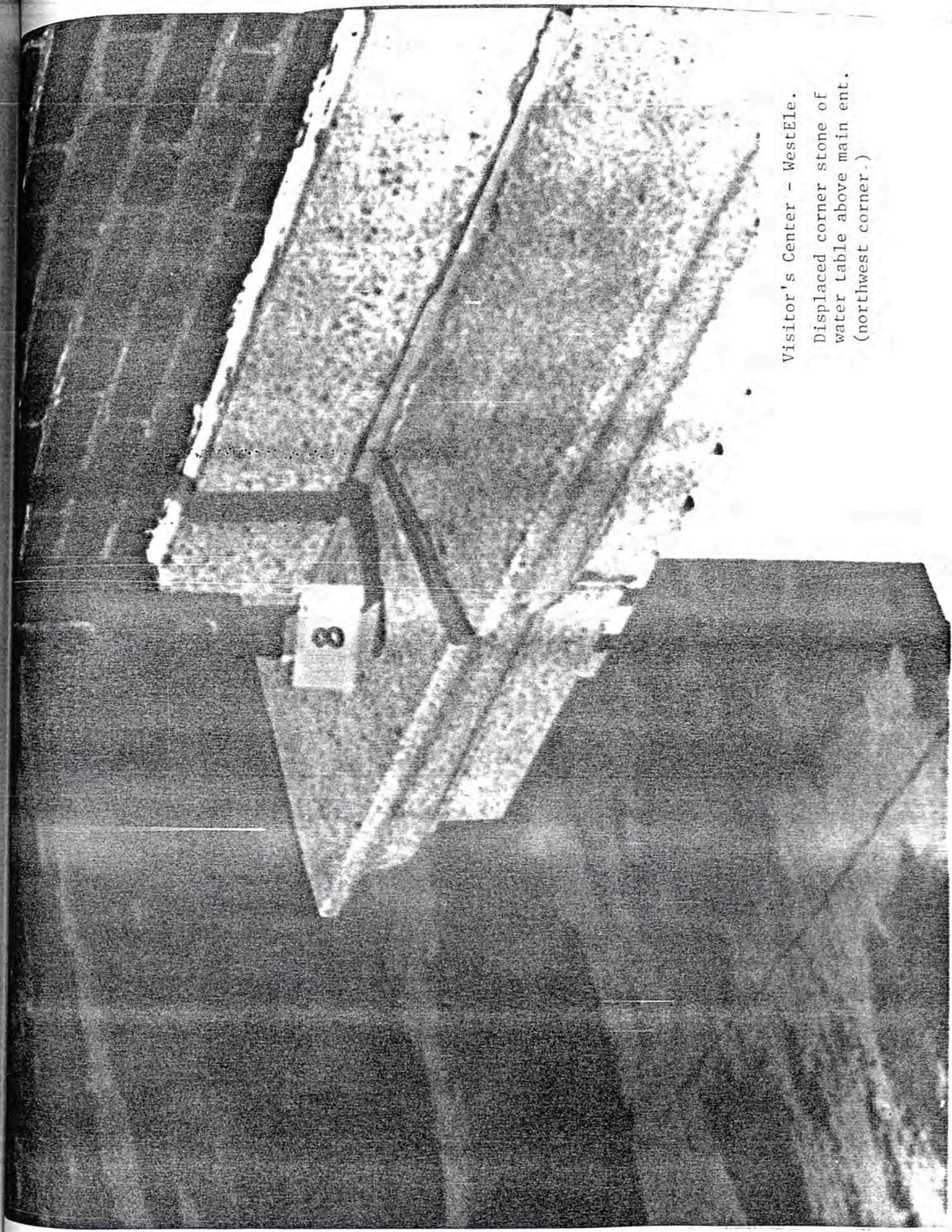


Visitor's Center - West Ele.

Water table below parapet wall.
Notice defective cross joints.

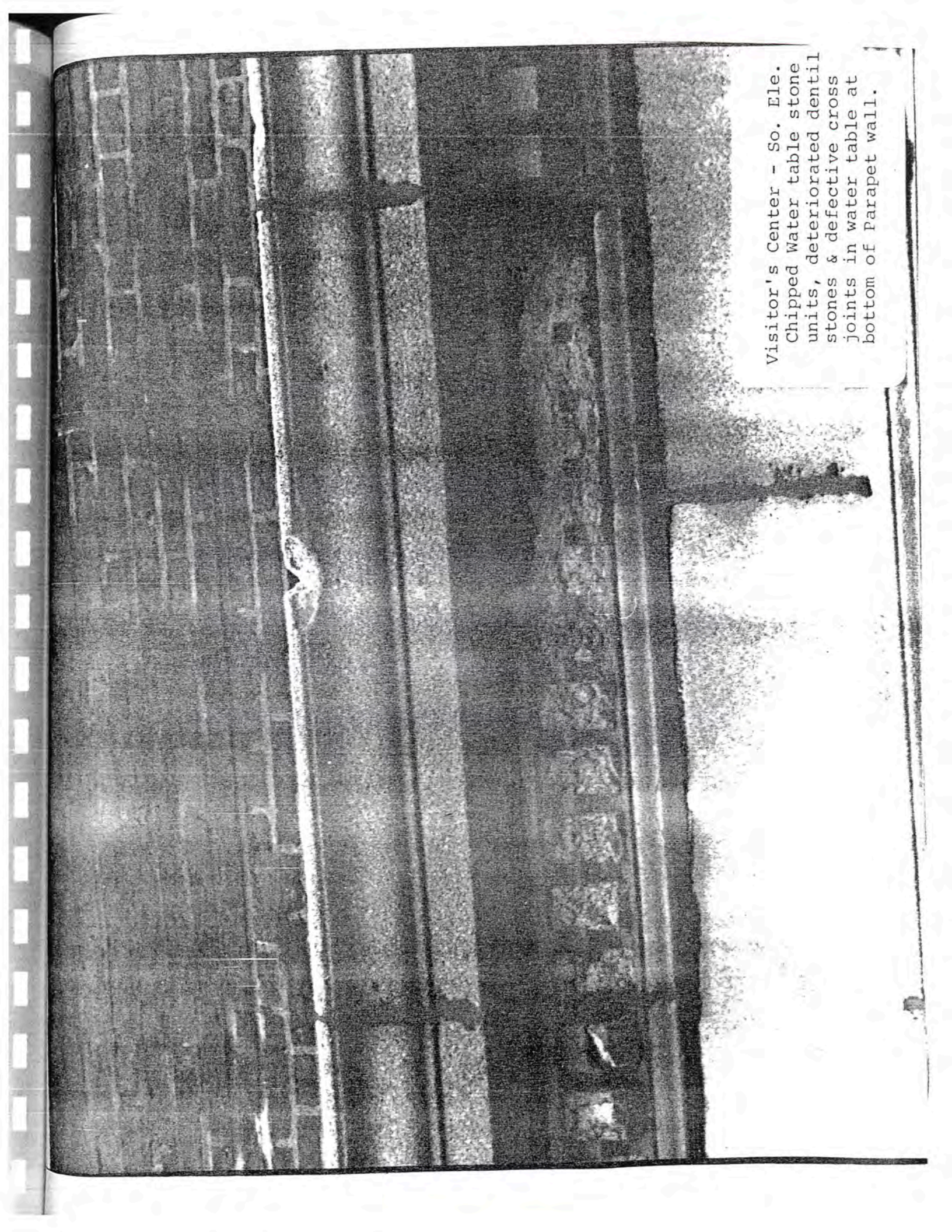


Visitor's Center - West Ele.
Displaced northwest corner
stone unit of water table
above main entrance. Same con-
dition on Southwest corner.



Visitor's Center - WestEle.

Displaced corner stone of
water table above main ent.
(northwest corner.)

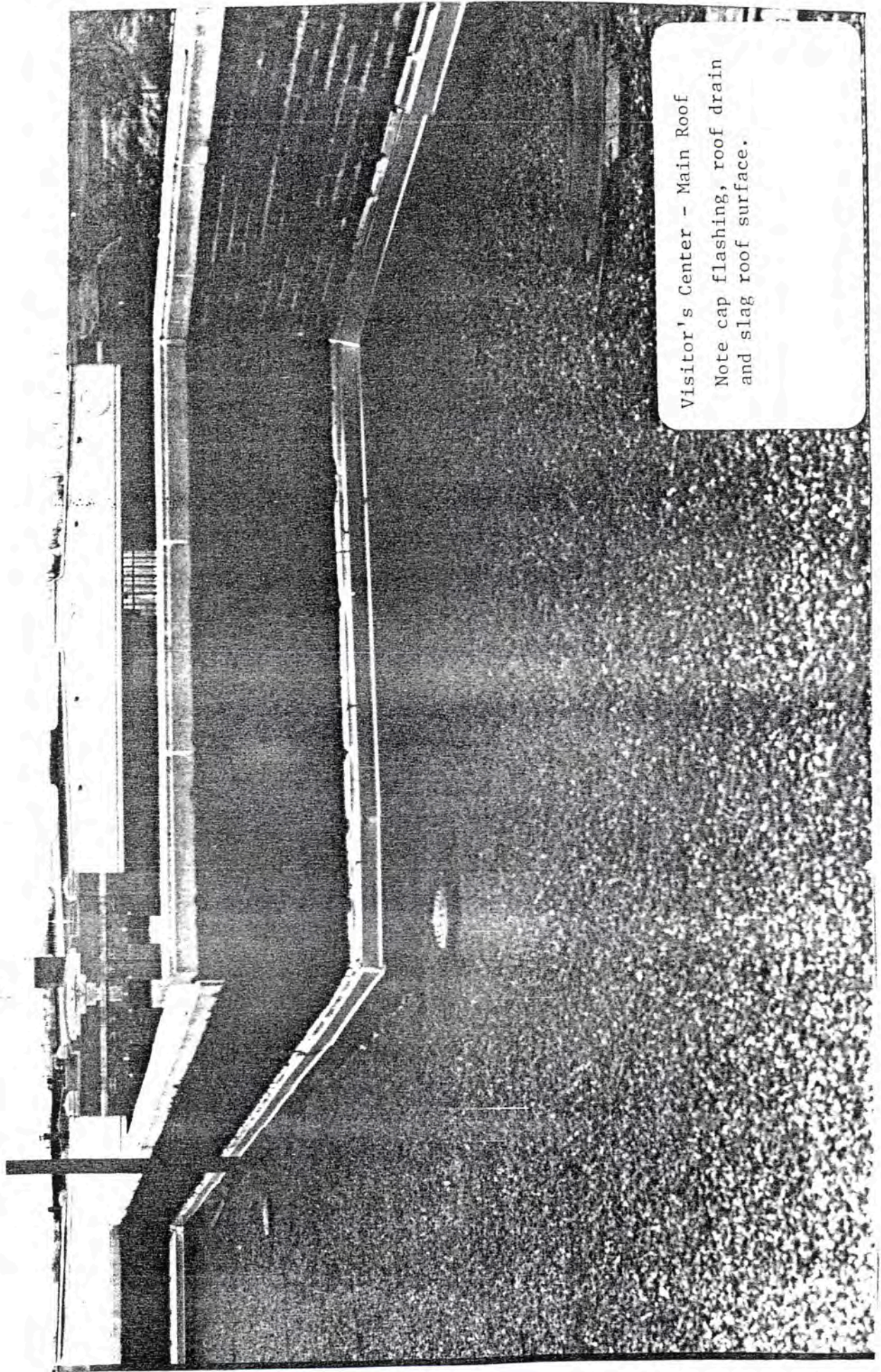


Visitor's Center - So. Ele.
Chipped water table stone
units, deteriorated dentil
stones & defective cross
joints in water table at
bottom of parapet wall.



Visitor's Center, North Ele.

Deteriorated dentil stone units,
defective water table cross
joints & displaced corner stone
unit.

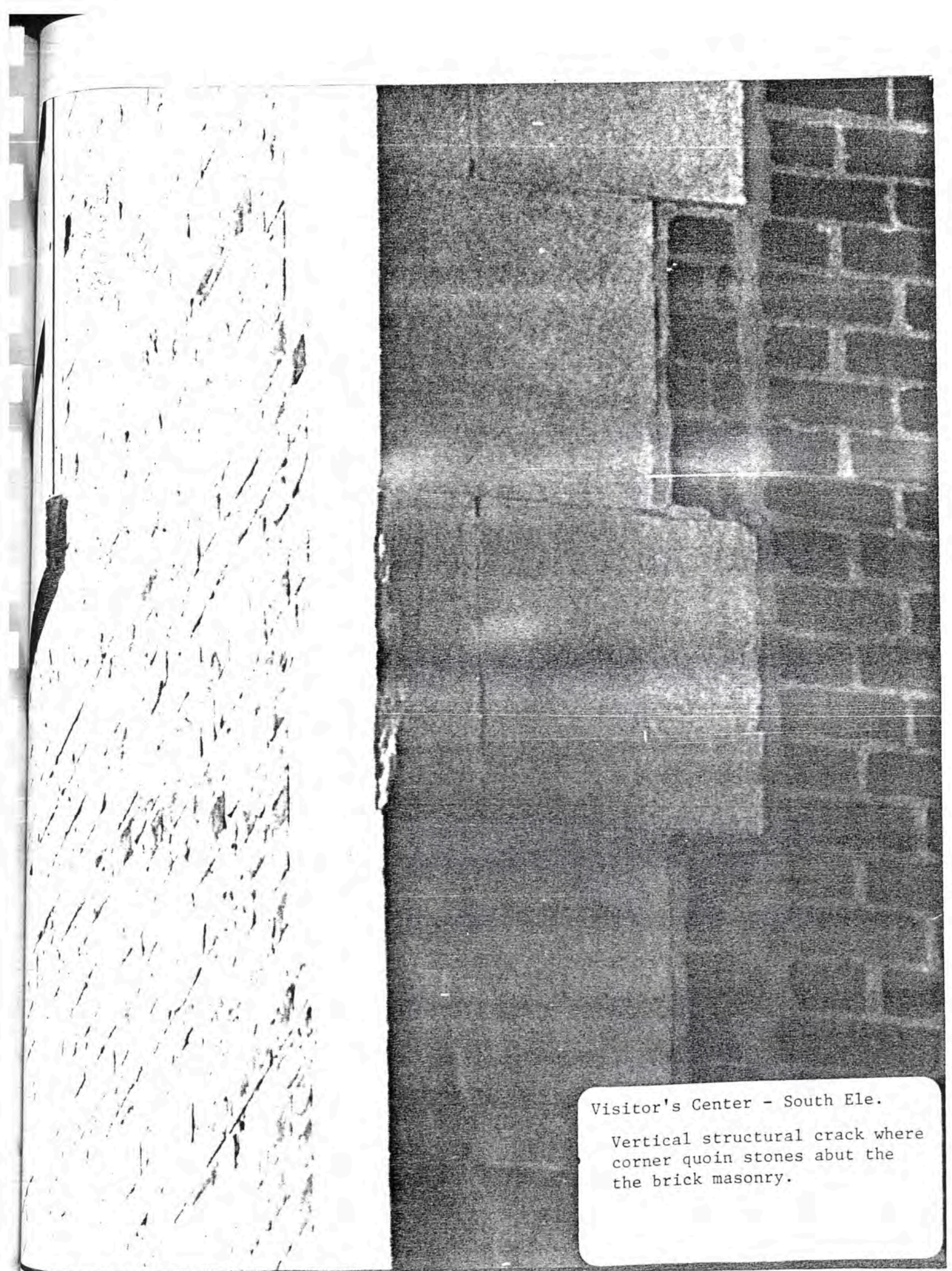


Visitor's Center - Main Roof
Note cap flashing, roof drain
and slag roof surface.

4

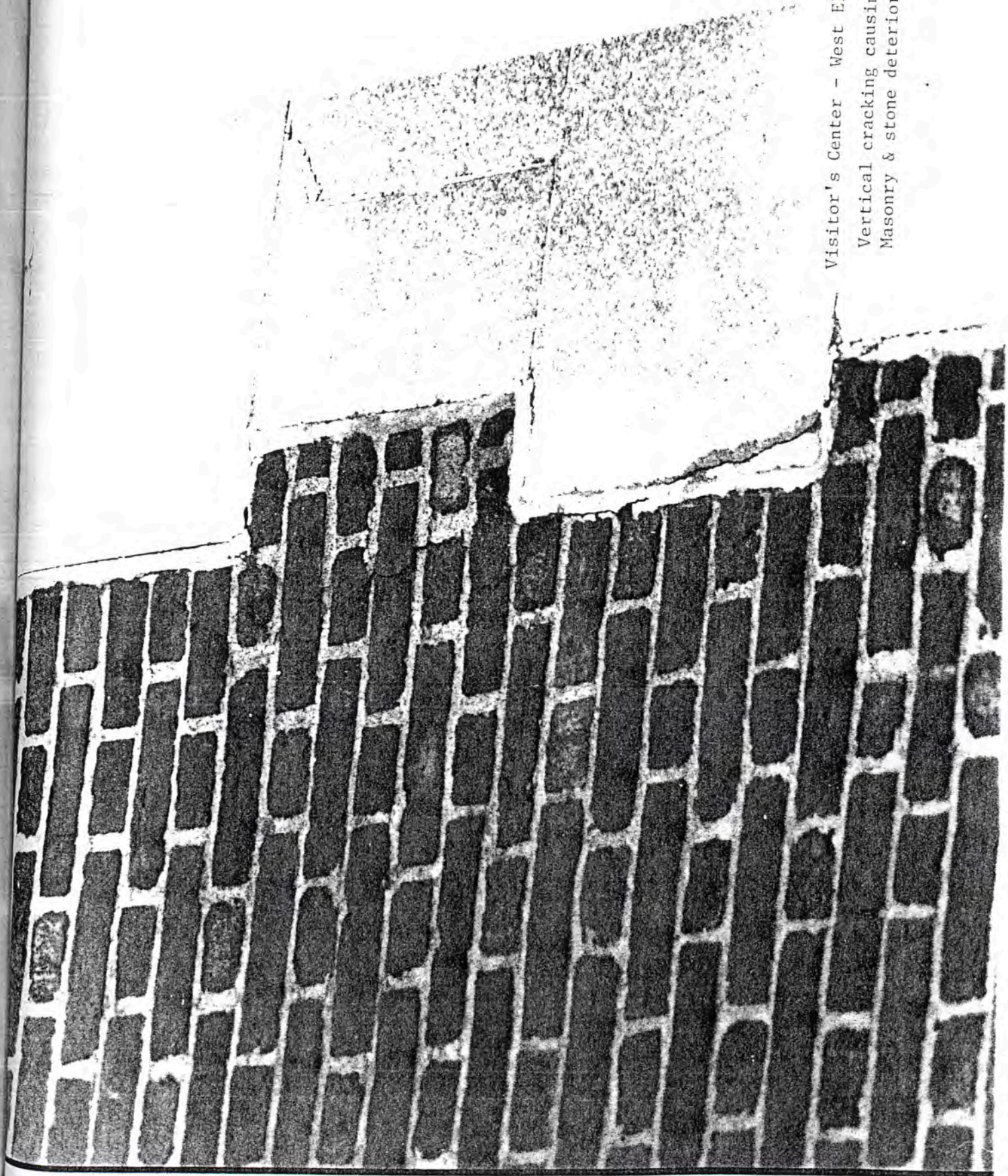
Visitor's Center - Chimney

Note eroded mortar joints,
severely deteriorated cap
stone.



Visitor's Center - South Ele.

Vertical structural crack where
corner quoin stones abut the
the brick masonry.

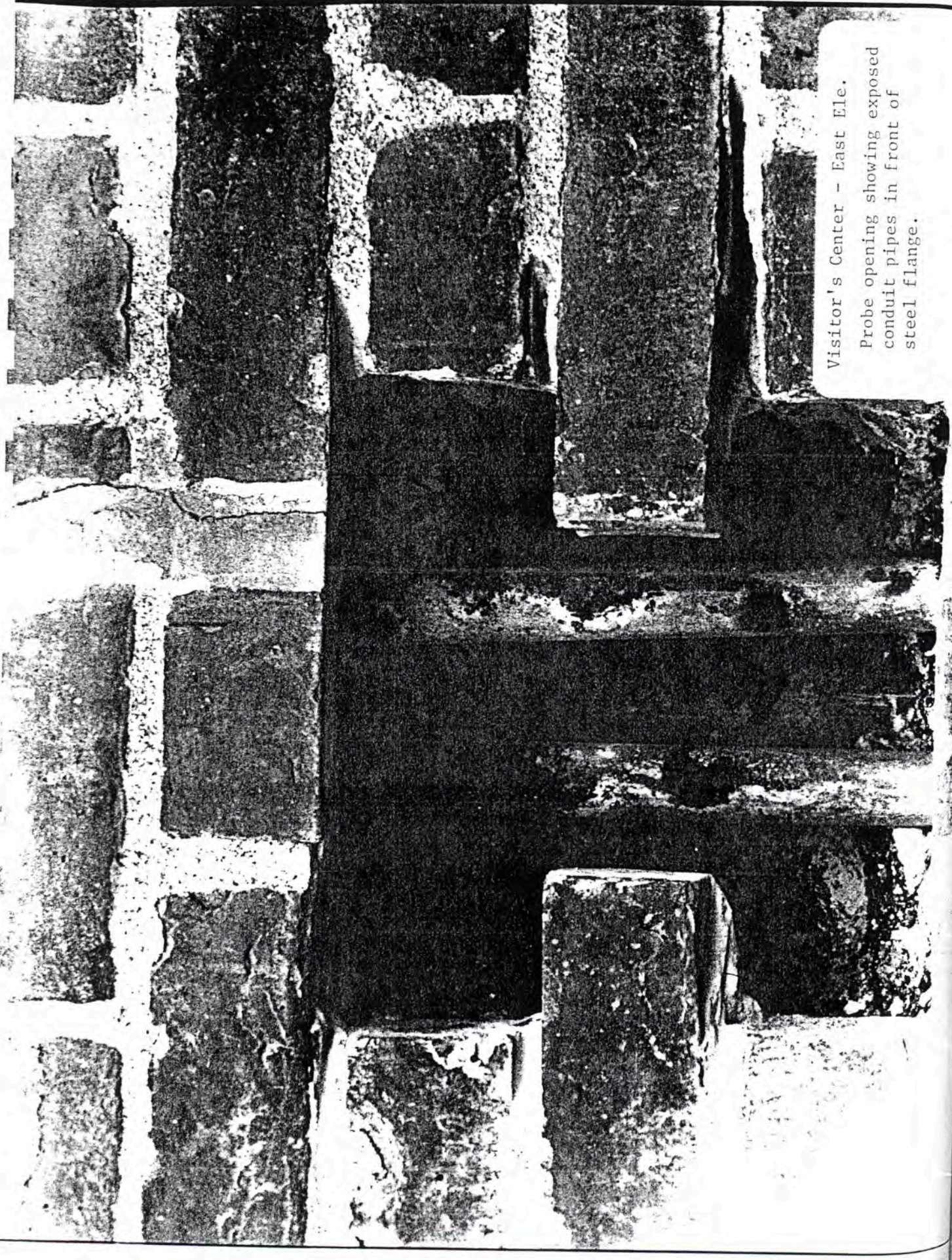


Visitor's Center - West Ele.
Vertical cracking causing
Masonry & stone deterioration.



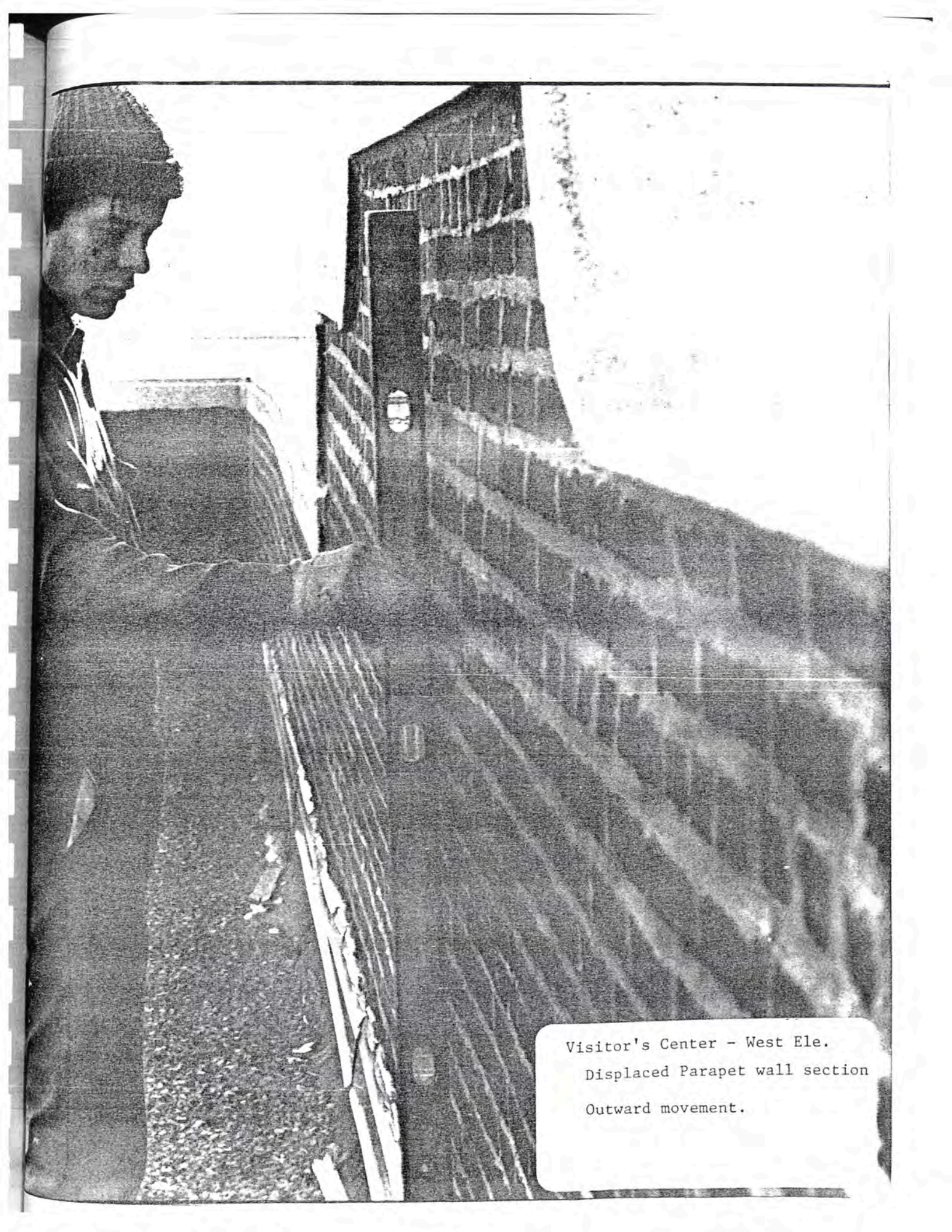
Visitor's Center - East Ele.

Probe opening - area of pre-cast corner stone unit - exposed steel column shows heavy rust buildup. (southerly end)



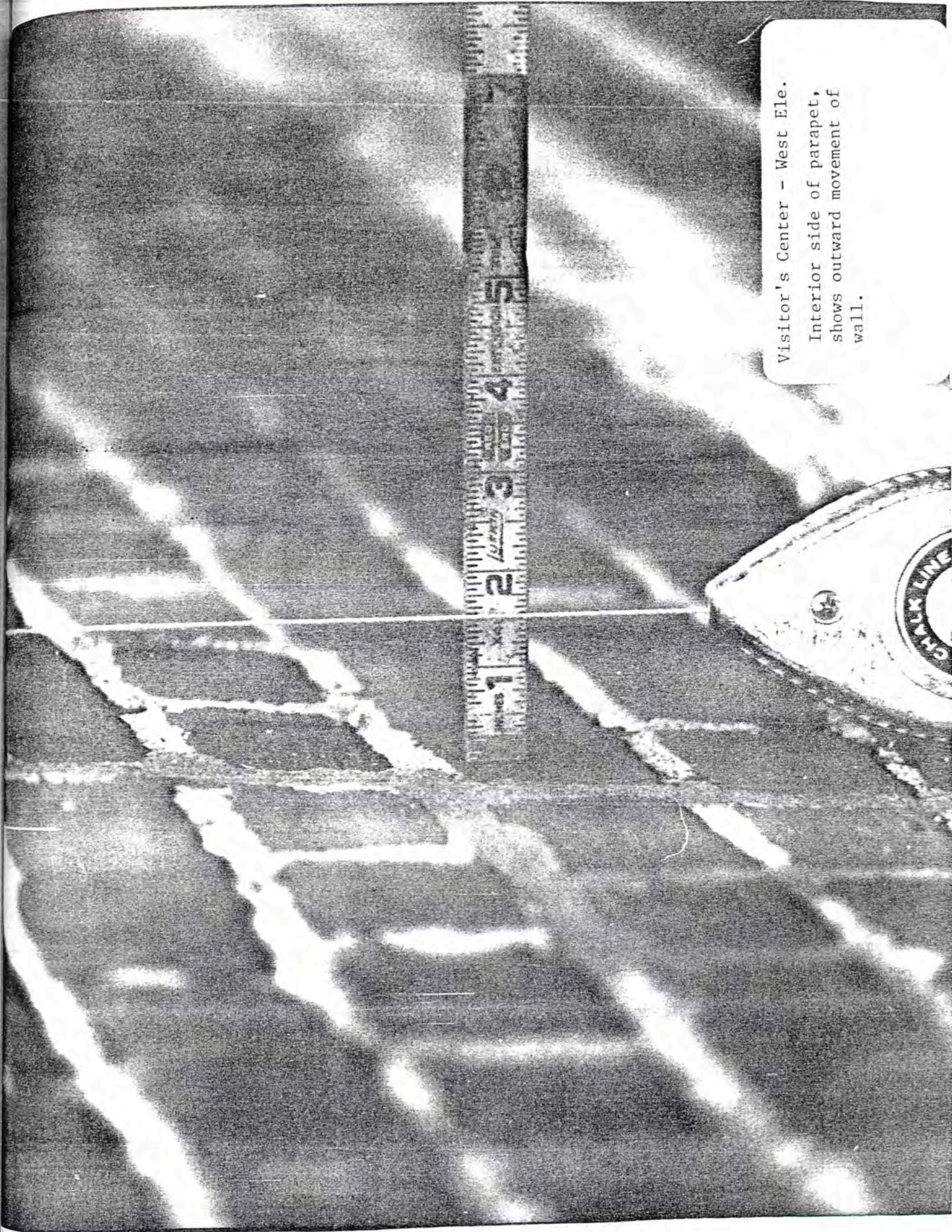
Visitor's Center - East Ele.

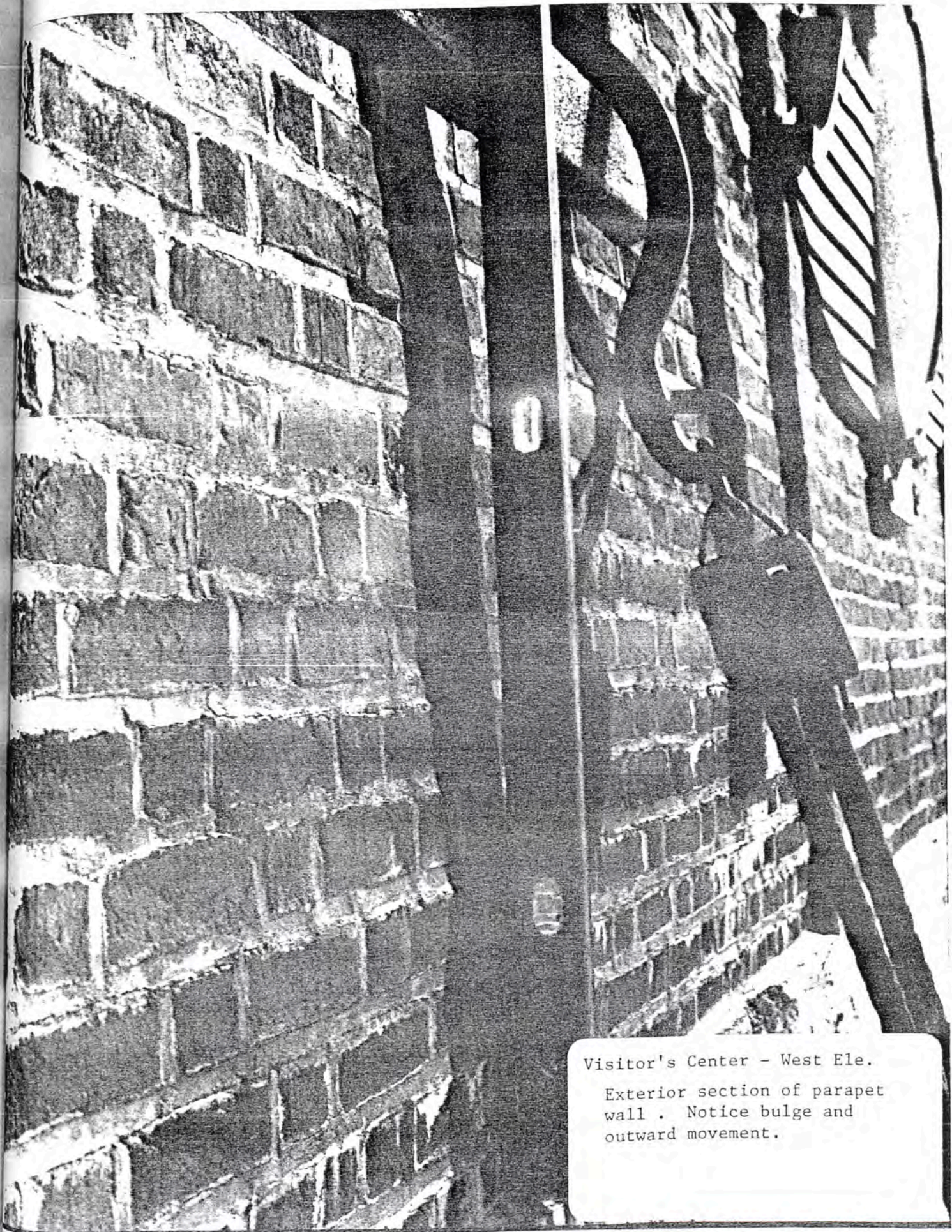
Probe opening showing exposed
conduit pipes in front of
steel flange.



Visitor's Center - West Ele.
Displaced Parapet wall section
Outward movement.

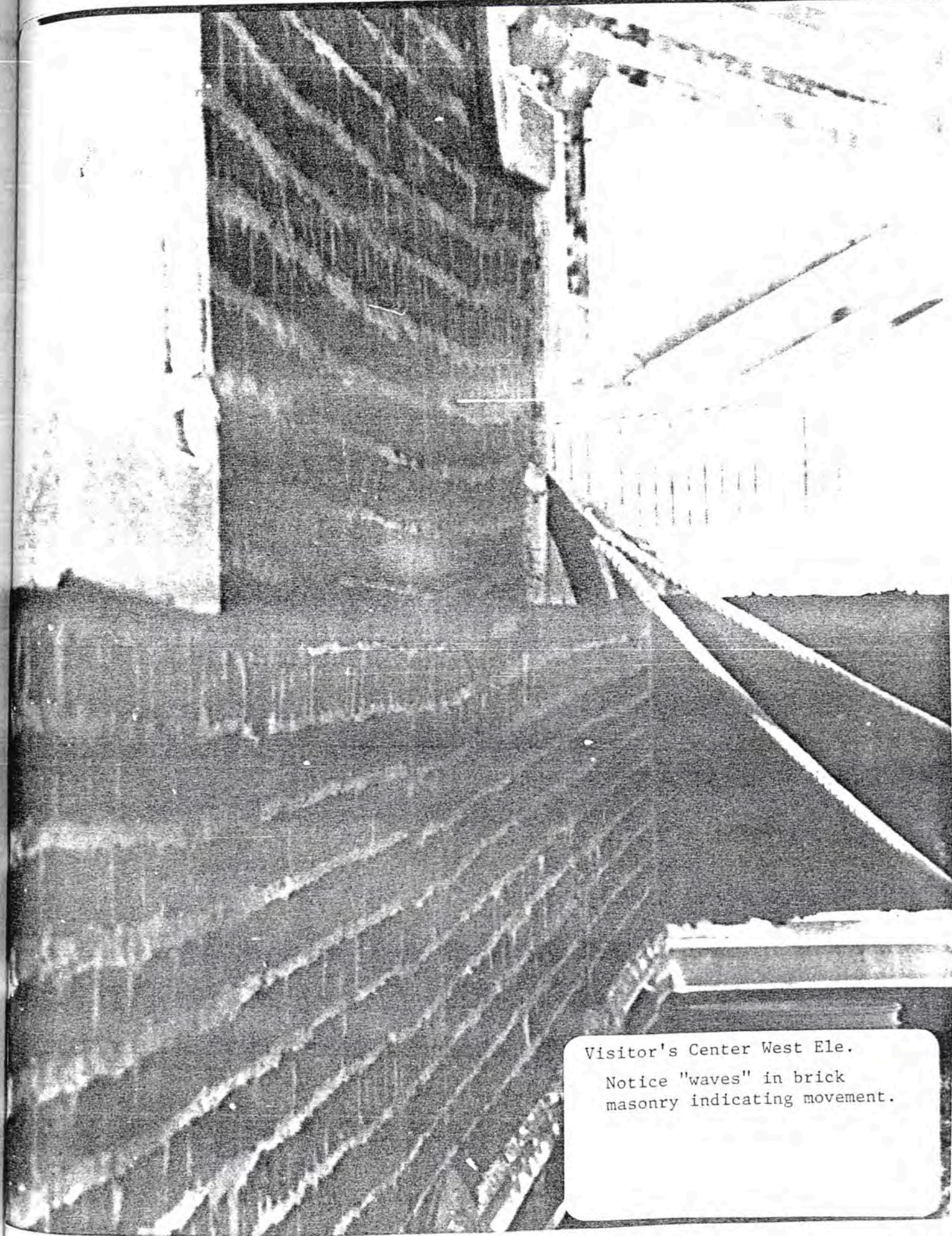
Visitor's Center - West Ele.
Interior side of parapet,
shows outward movement of
wall.





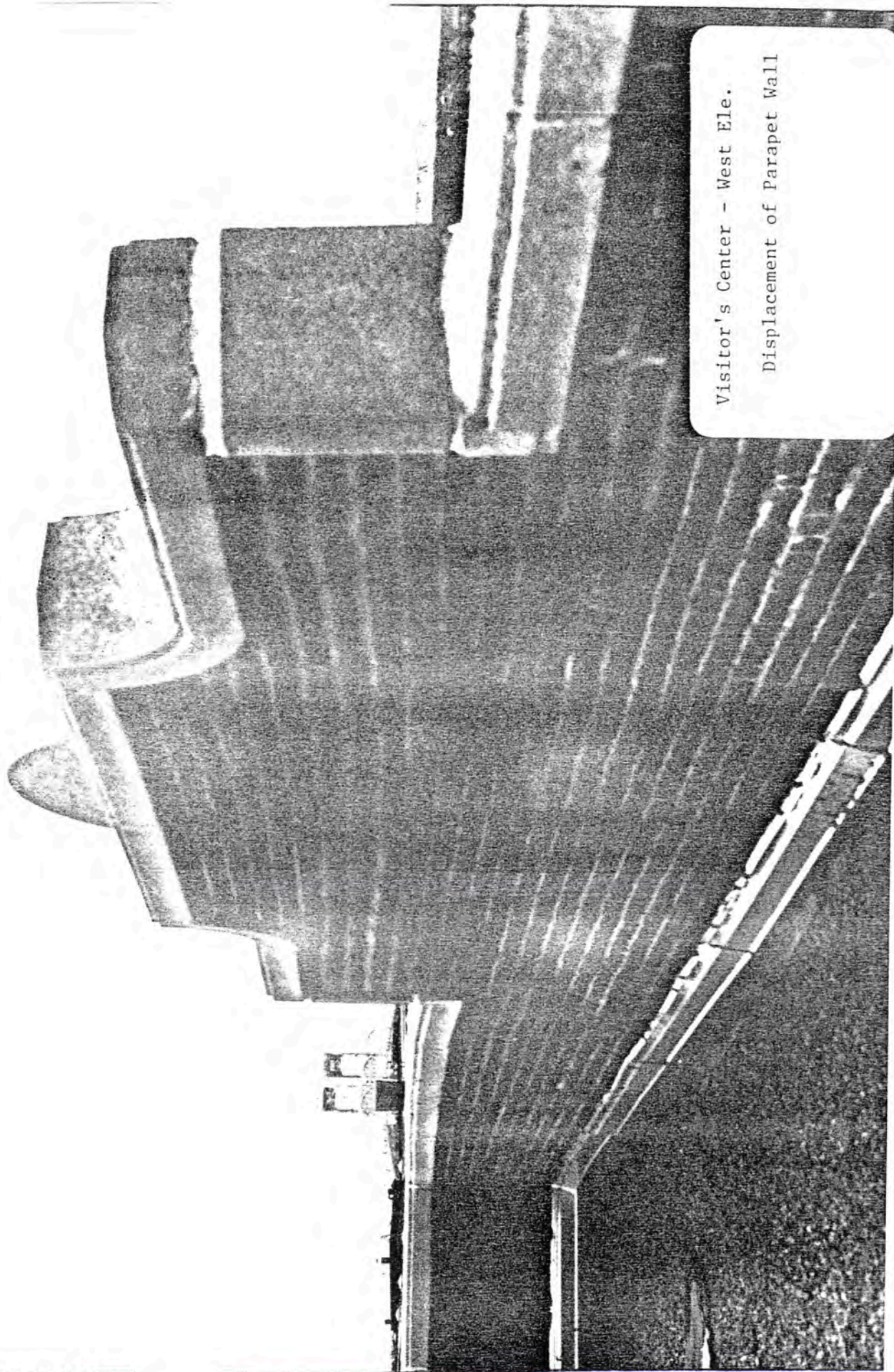
Visitor's Center - West Ele.

Exterior section of parapet wall . Notice bulge and outward movement.



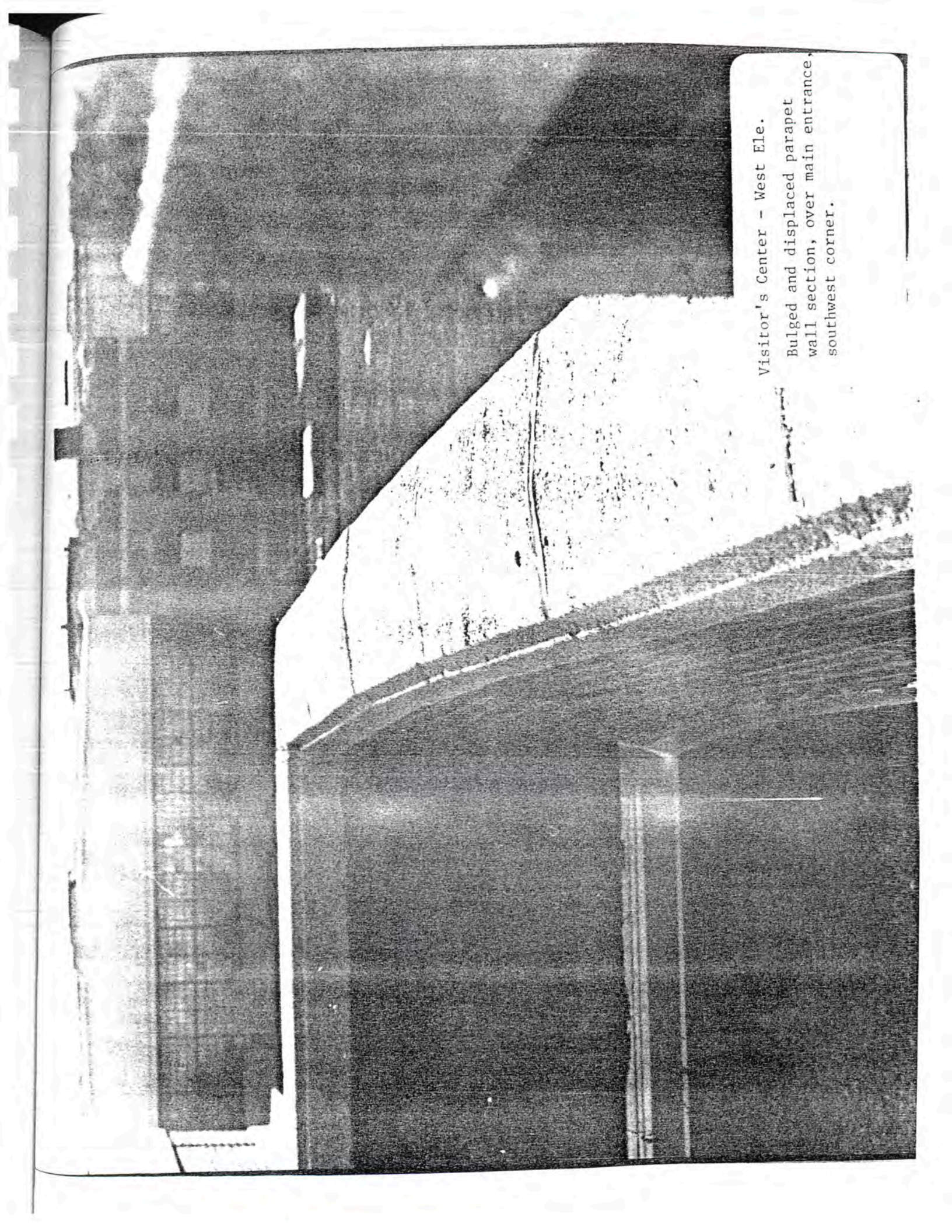
Visitor's Center West Ele.

Notice "waves" in brick
masonry indicating movement.

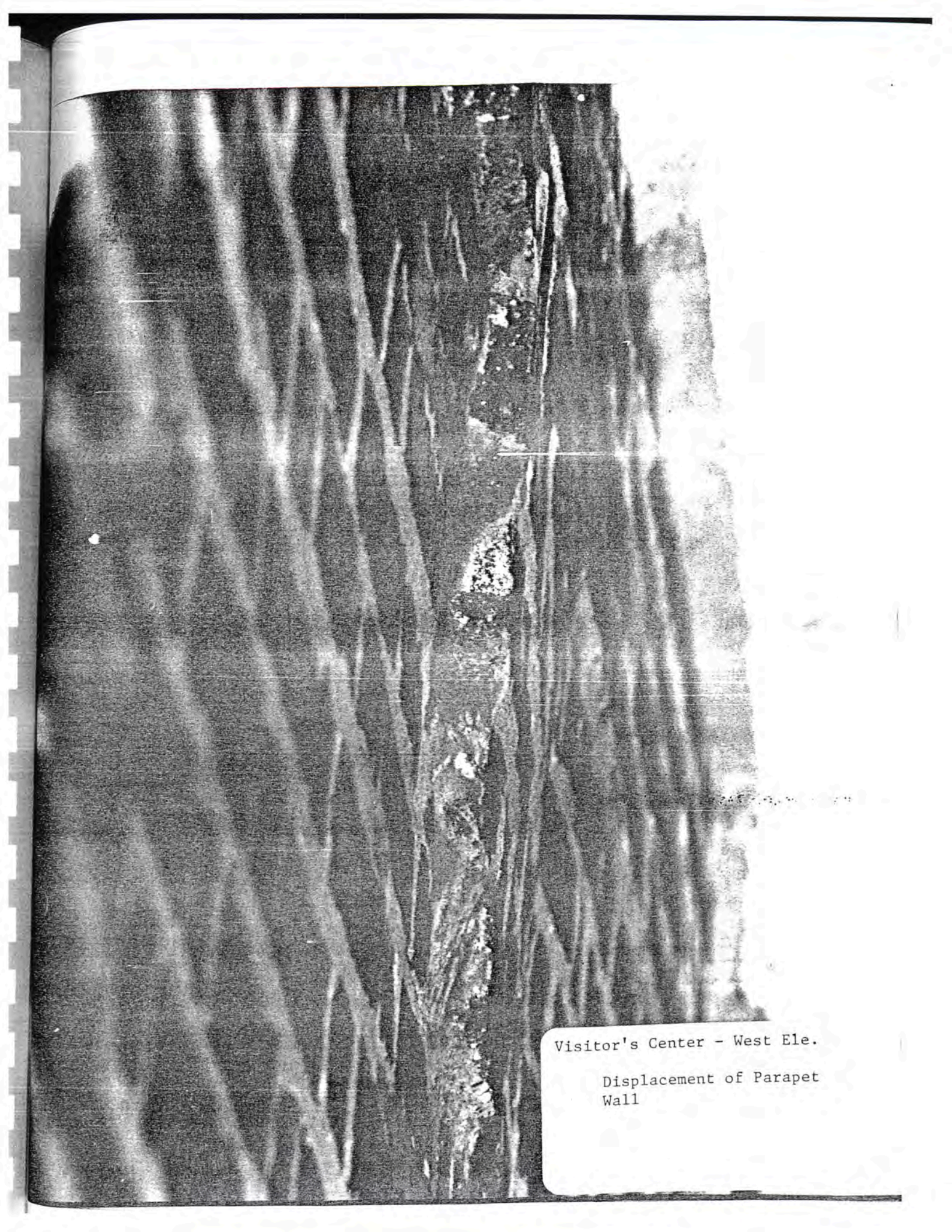


Visitor's Center - West Ele.

Displacement of Parapet Wall

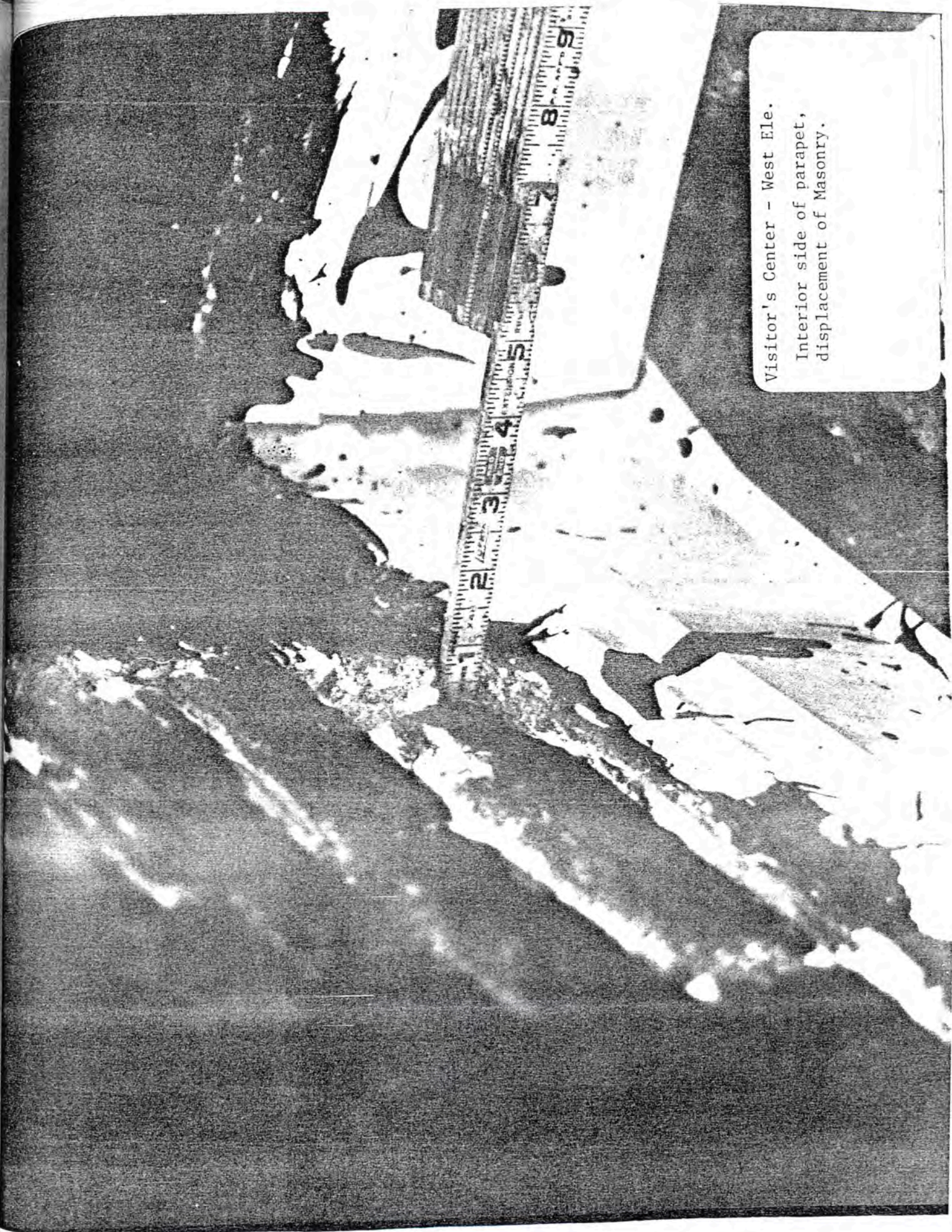
A black and white photograph showing a close-up of a building's exterior wall. The wall is light-colored and appears to be made of concrete or masonry. There is a prominent bulge or protrusion on the left side of the frame. To the right of the bulge, there is a section of the wall that is displaced or offset, creating a stepped appearance. The top of the wall features a parapet. The overall image has a grainy, high-contrast quality typical of older black and white photography.

Visitor's Center - West Ele.
Bulged and displaced parapet
wall section, over main entrance,
southwest corner.



Visitor's Center - West Ele.

Displacement of Parapet
Wall



Visitor's Center - West Ele.
Interior side of parapet,
displacement of Masonry.

2

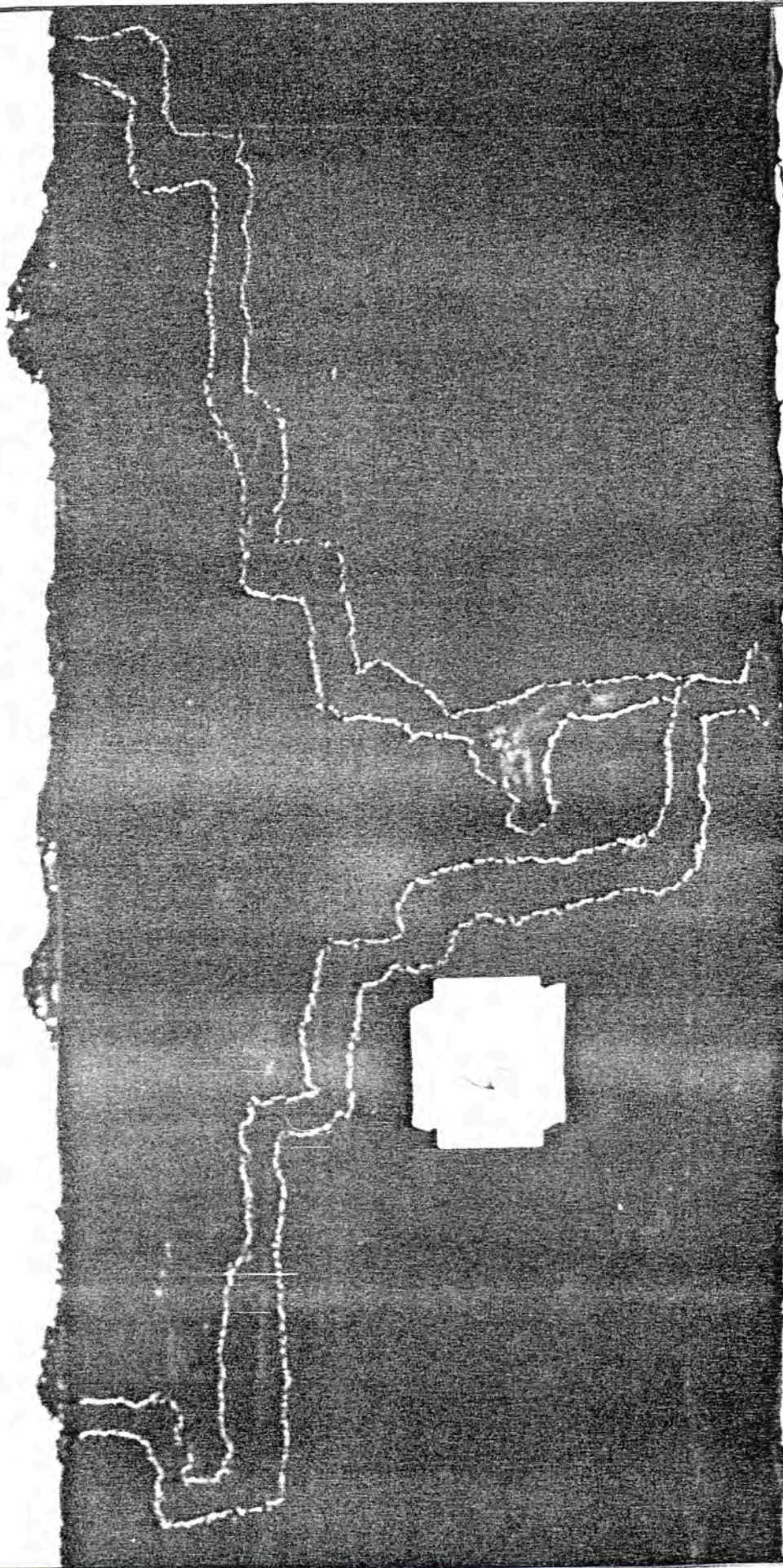
Visitor's Center - West Ele.

Interior side of parapet.
Brick deterioration, structural
cracks and displacement.

Visitor's Center - West Ele.

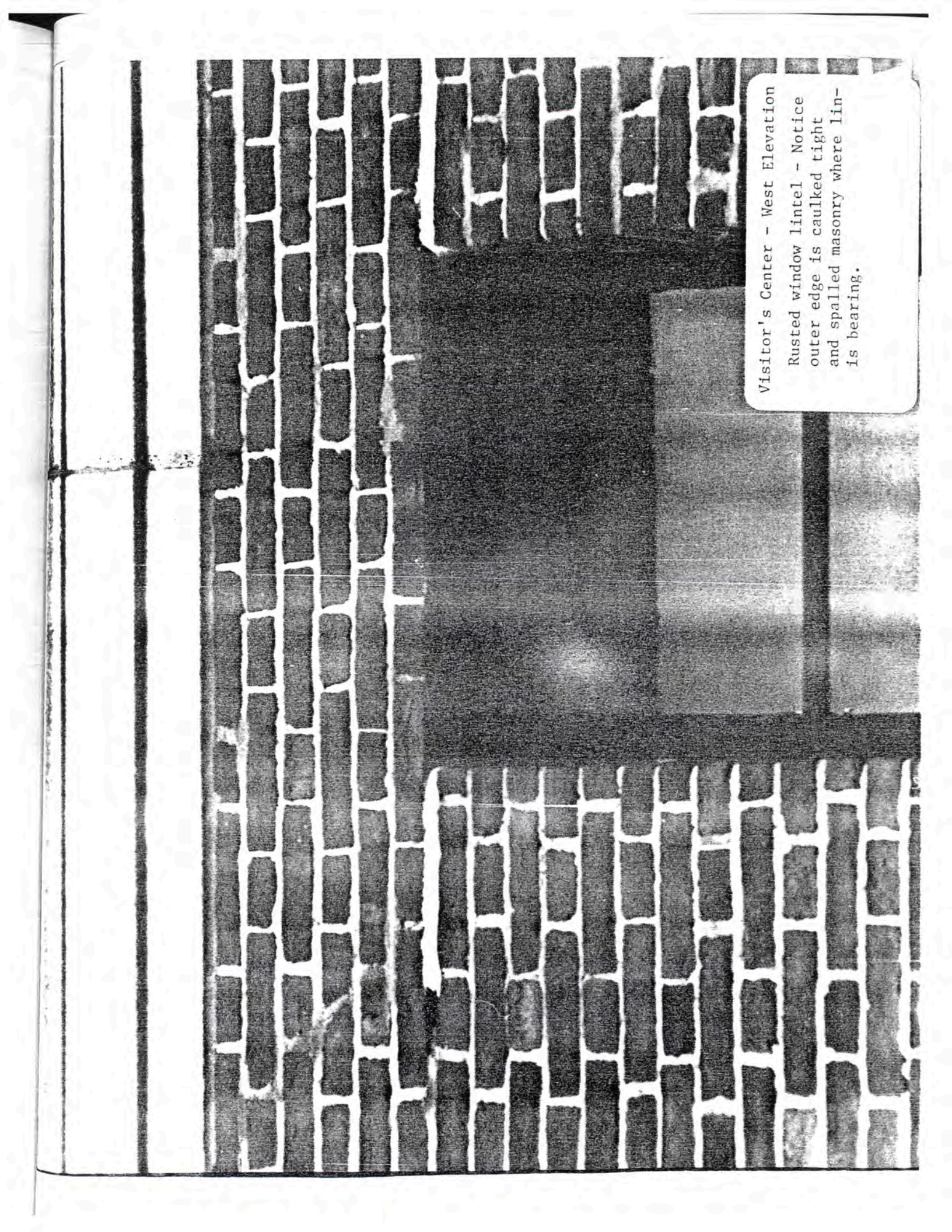
Parapet interior - displaced
brick masonry covered with
black asphaltic material.
Notice horizontal crack.

10



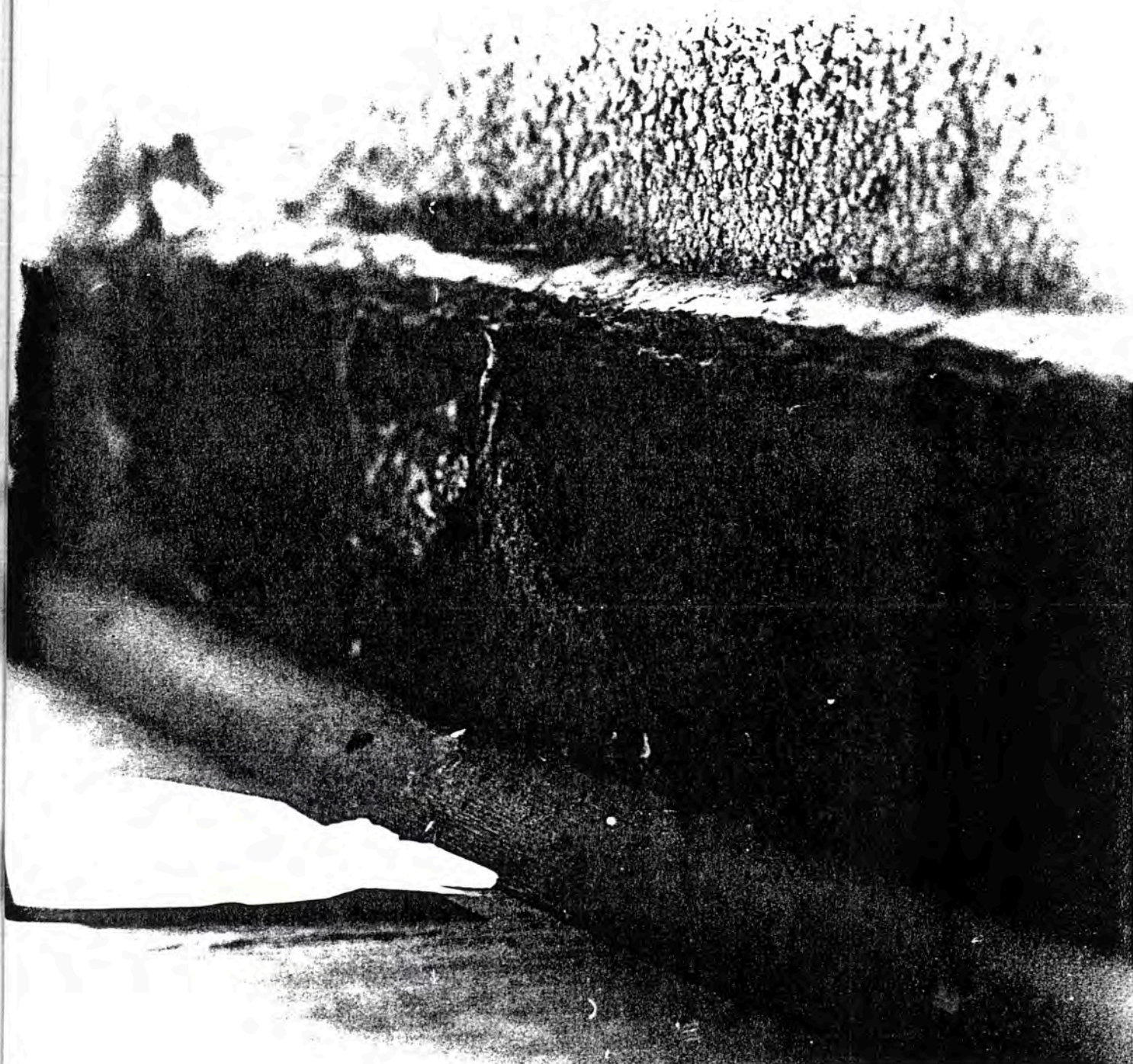
Visitor's Center - West Ele.
Interior side of Parapet.
Extensive step cracking is
visible.





Visitor's Center - West Elevation

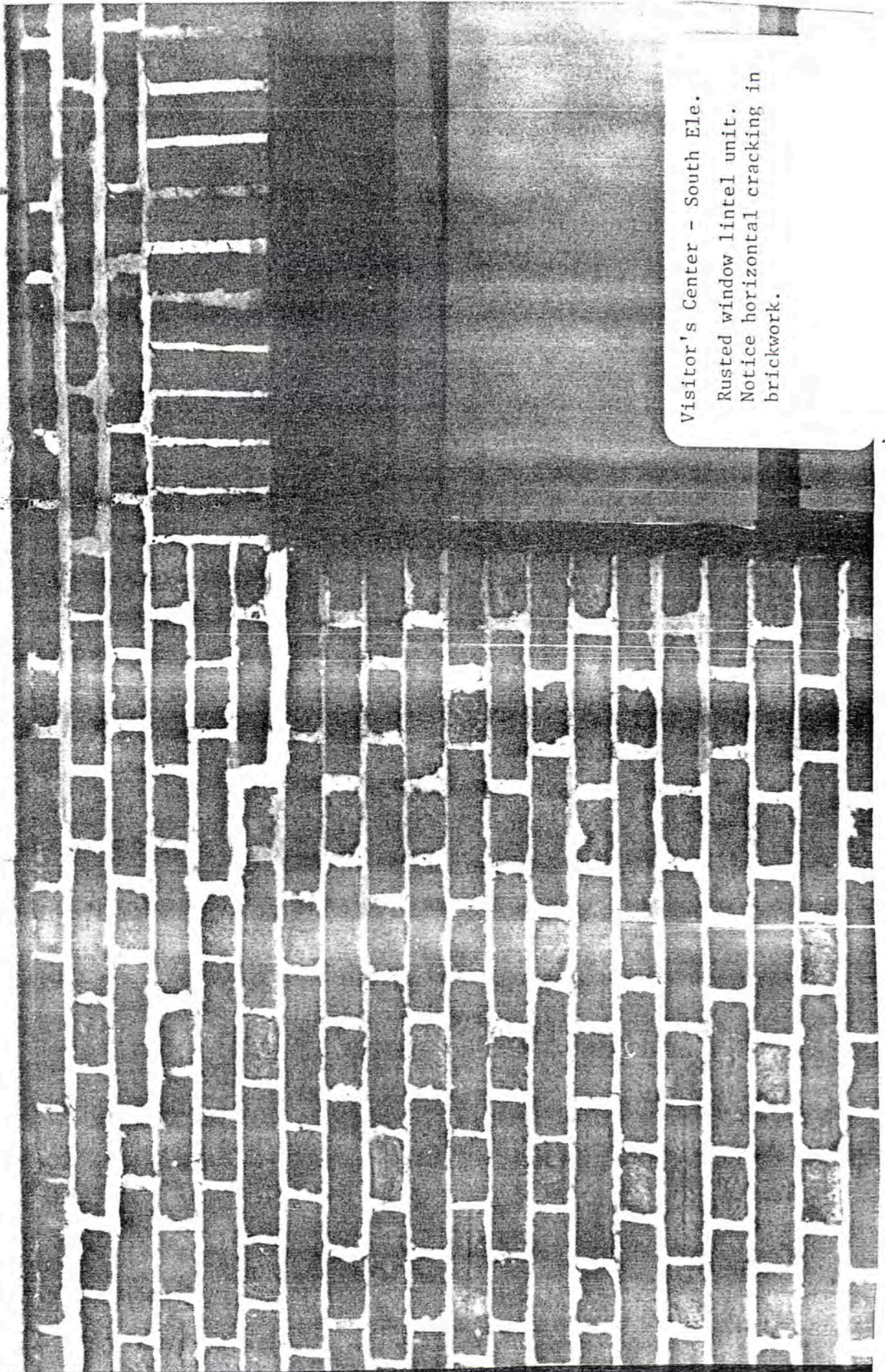
Rusted window lintel - Notice
outer edge is caulked tight
and spalled masonry where lin-
tel is bearing.



Visitor's Center - East Ele.

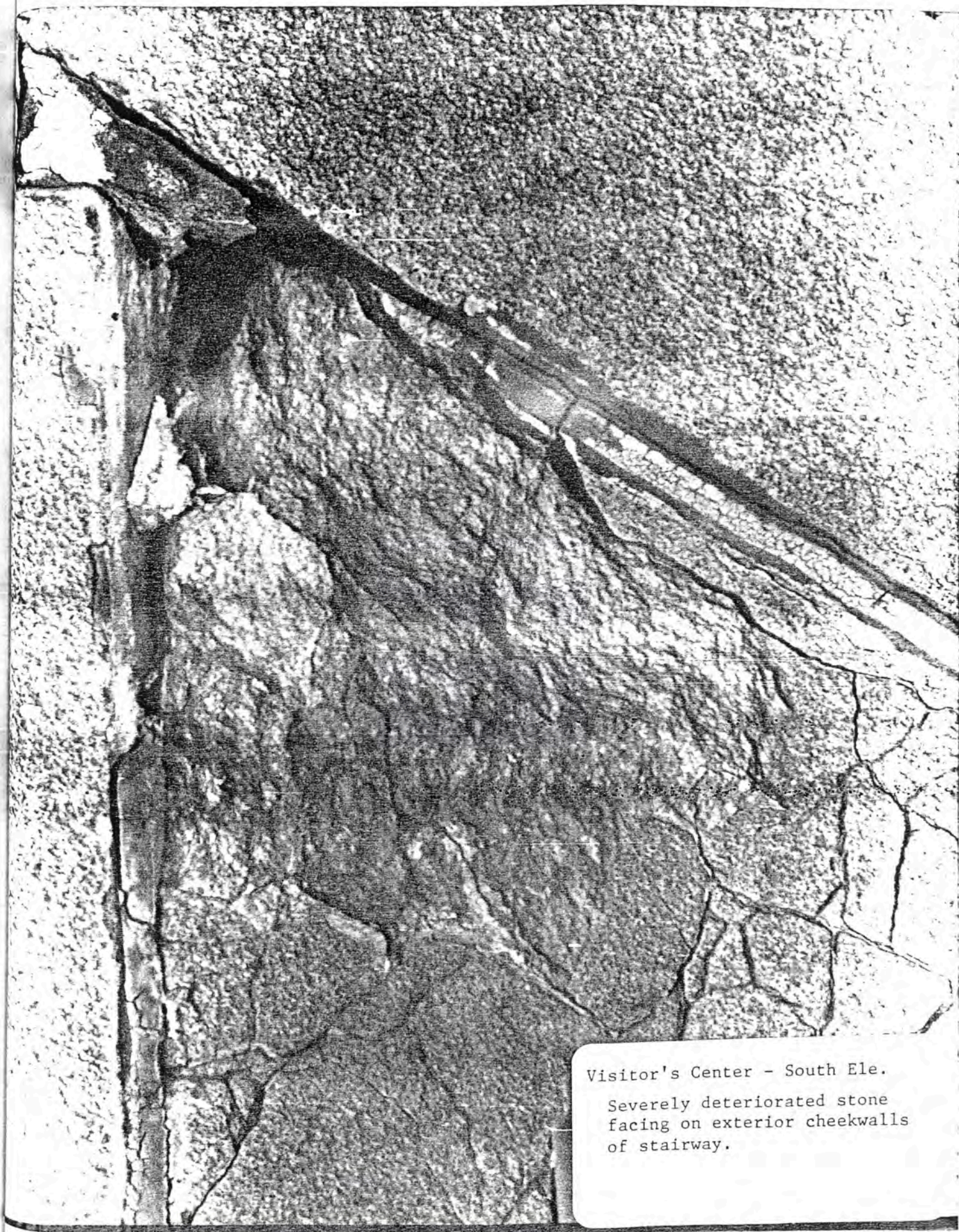
Rust Buildup on Steel Lintel.
This condition is typical
throughout the building.

Visitor's Center - South Ele.
Rusted window lintel unit.
Notice horizontal cracking in
brickwork.

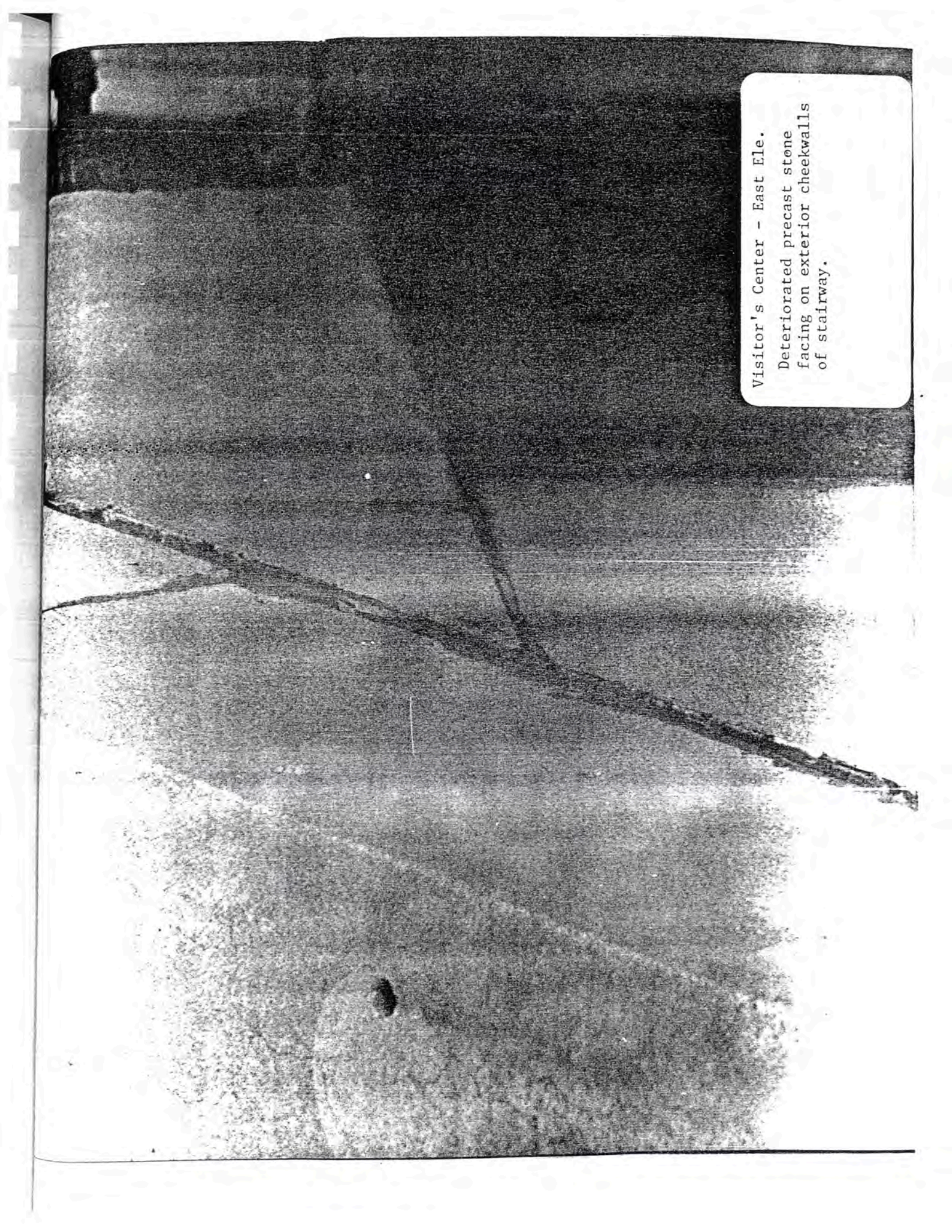




Visitor's Center - West Ele.
Close up of stone deterioration,
and displacement, Main Ent.
Stairway.

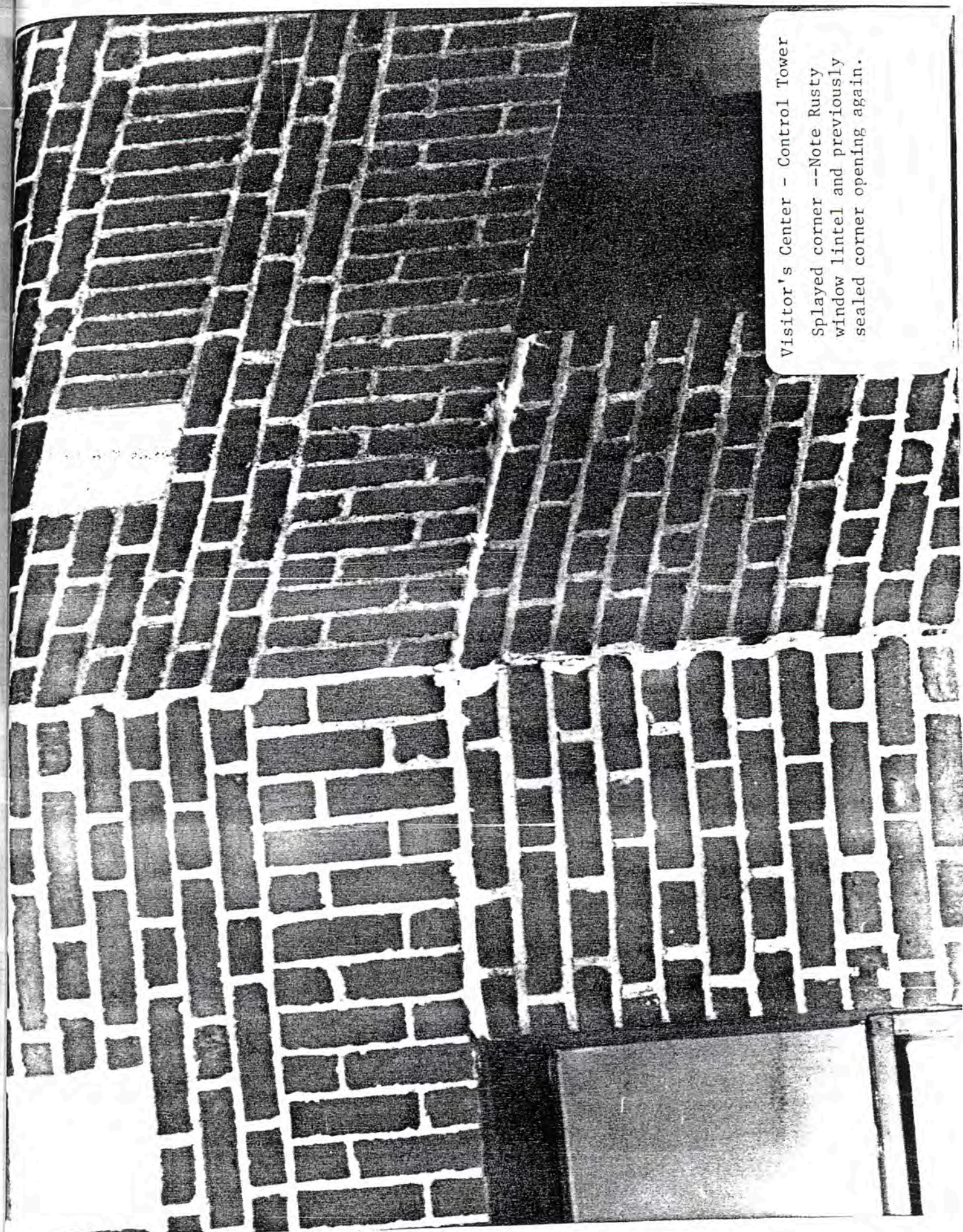


Visitor's Center - South Ele.
Severely deteriorated stone
facing on exterior cheekwalls
of stairway.



Visitor's Center - East Ele.

Deteriorated precast stone
facing on exterior cheekwalls
of stairway.



Visitor's Center - Control Tower

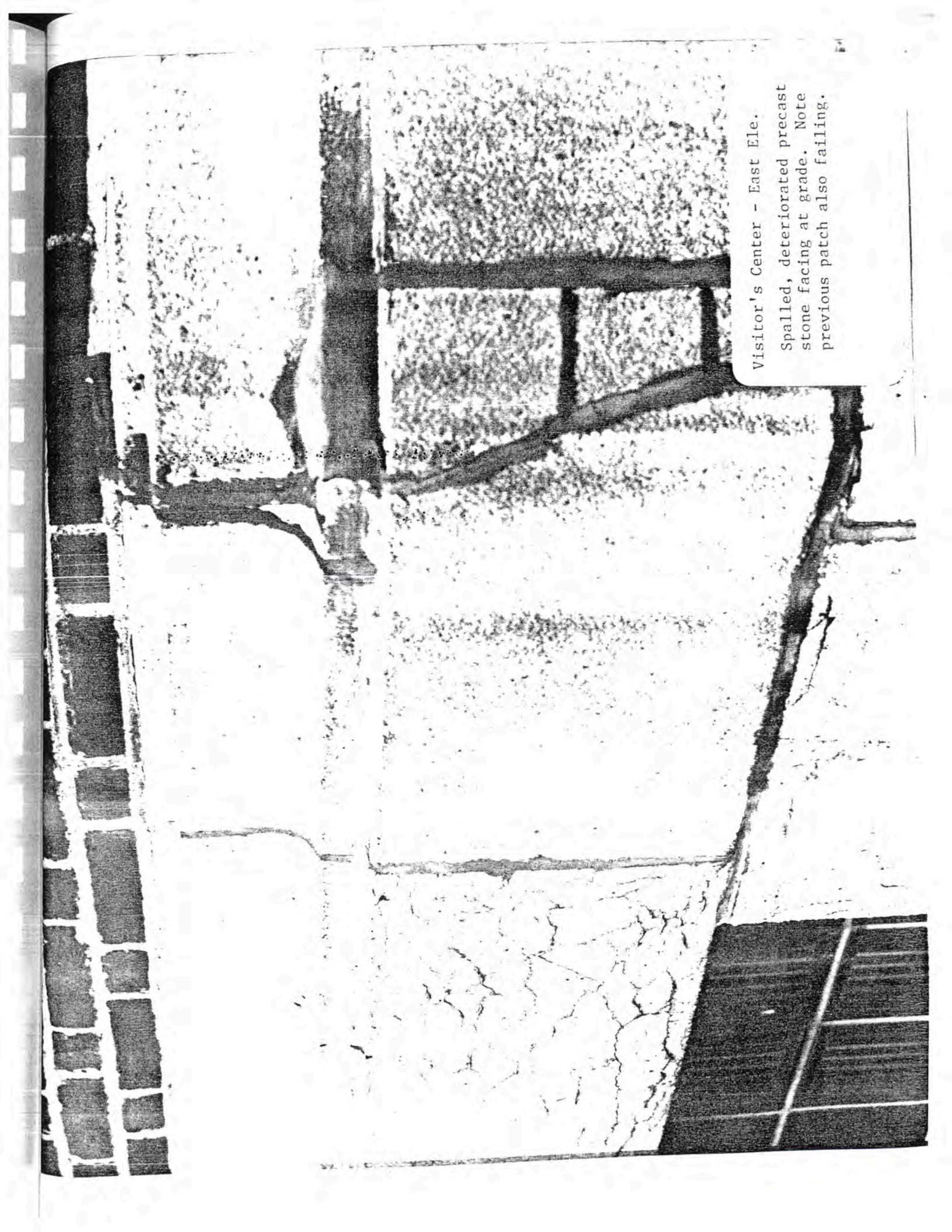
Splayed corner --Note Rusty
window lintel and previously
sealed corner opening again.

125

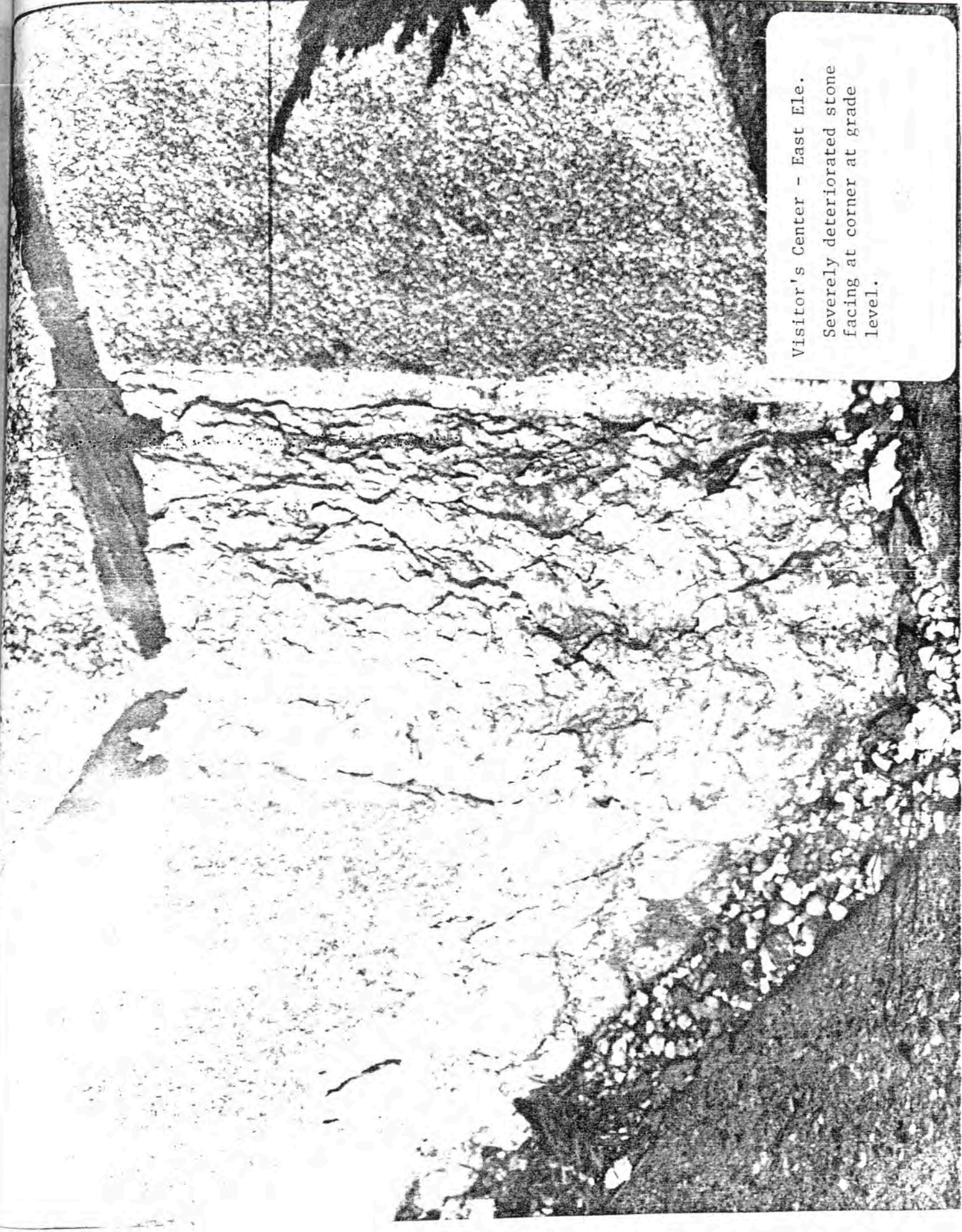
Visitor's Center - South Ele.
Deteriorated stone units &
mortar joints in the environs
of 1st fl., easterly end.



Visitor's Center - East Elevation
Deteriorated and eroded stone
facing at grade level.

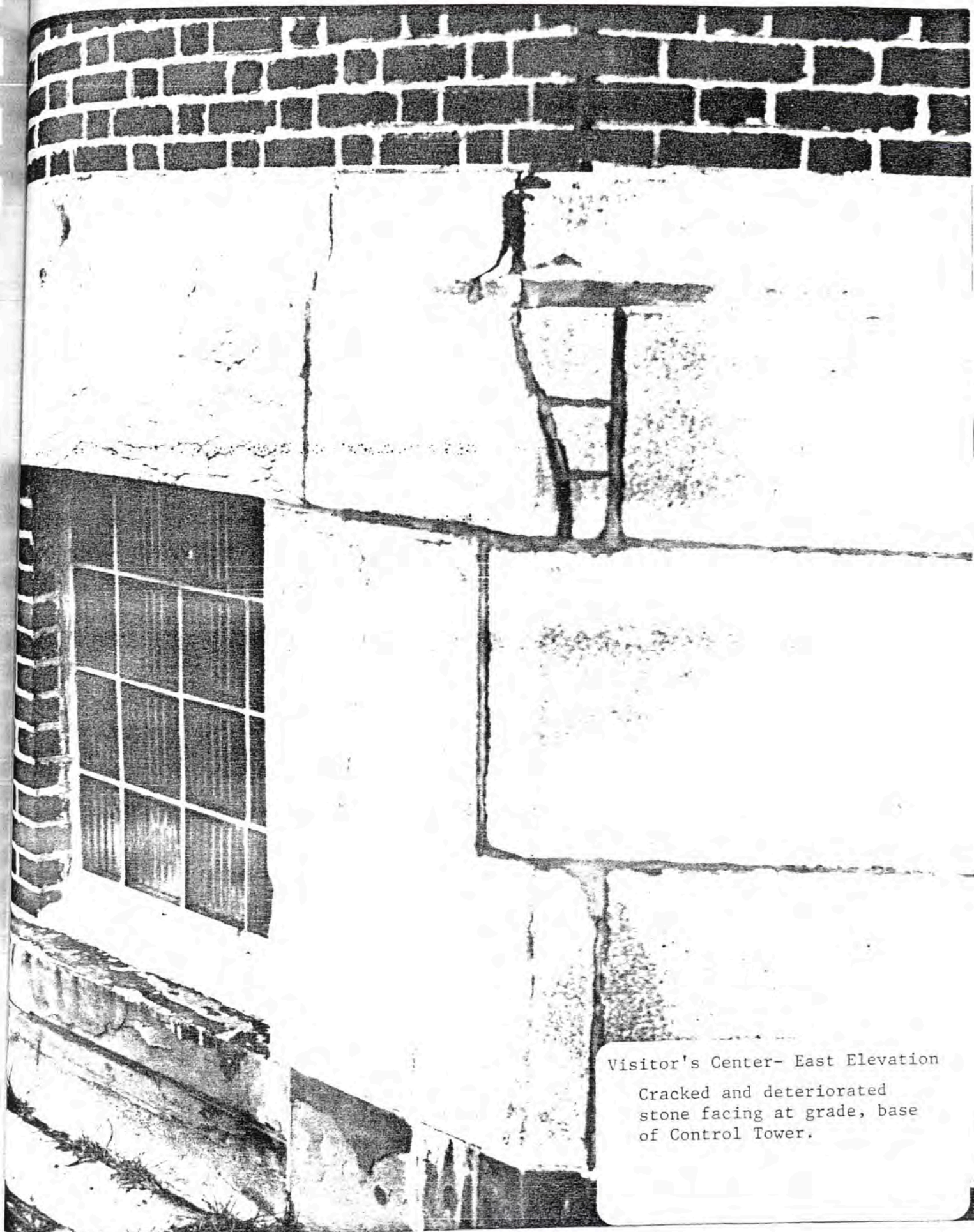


Visitor's Center - East Ele.
Spalled, deteriorated precast
stone facing at grade. Note
previous patch also failing.



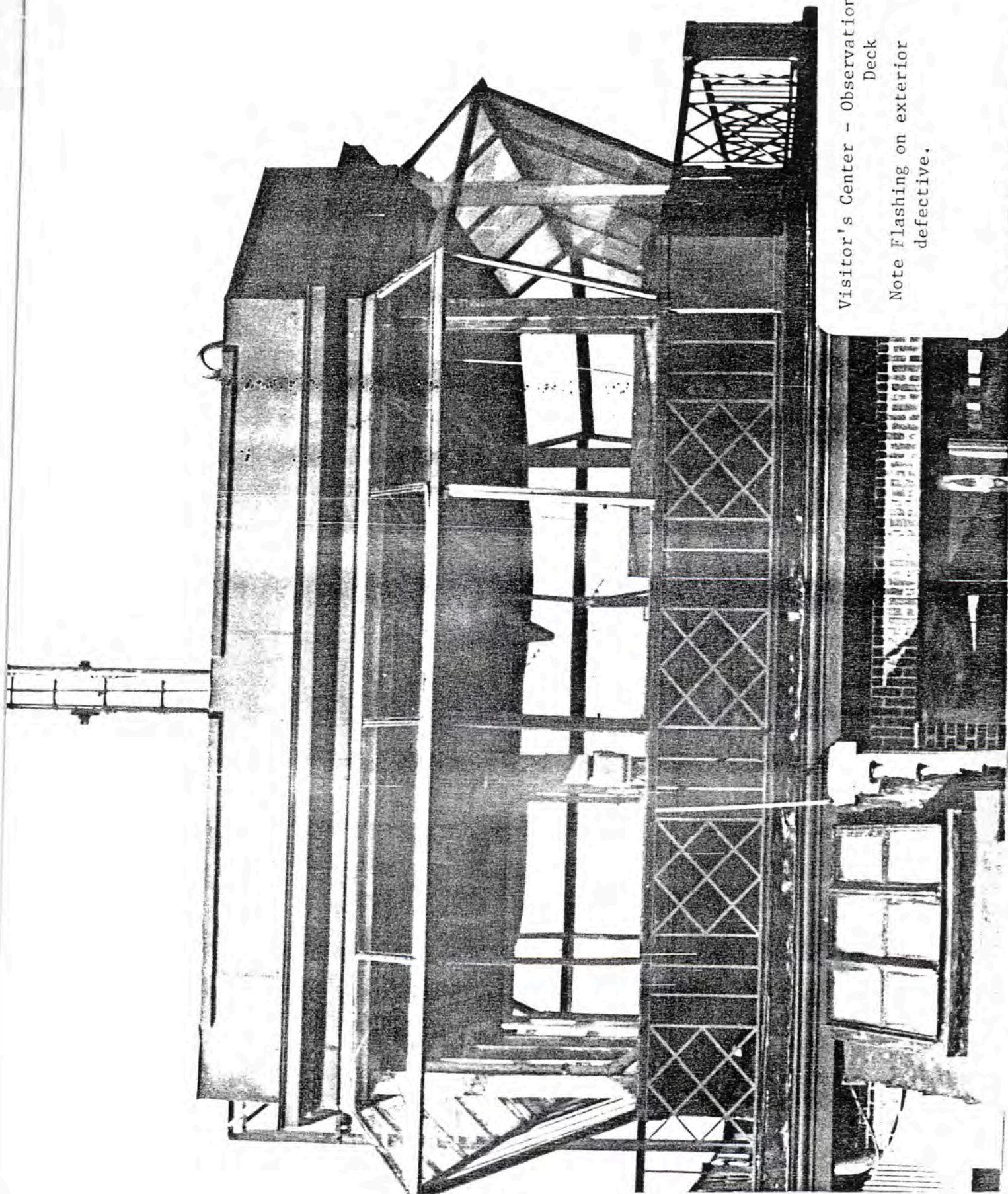
Visitor's Center - East Ele.

Severely deteriorated stone
facing at corner at grade
level.

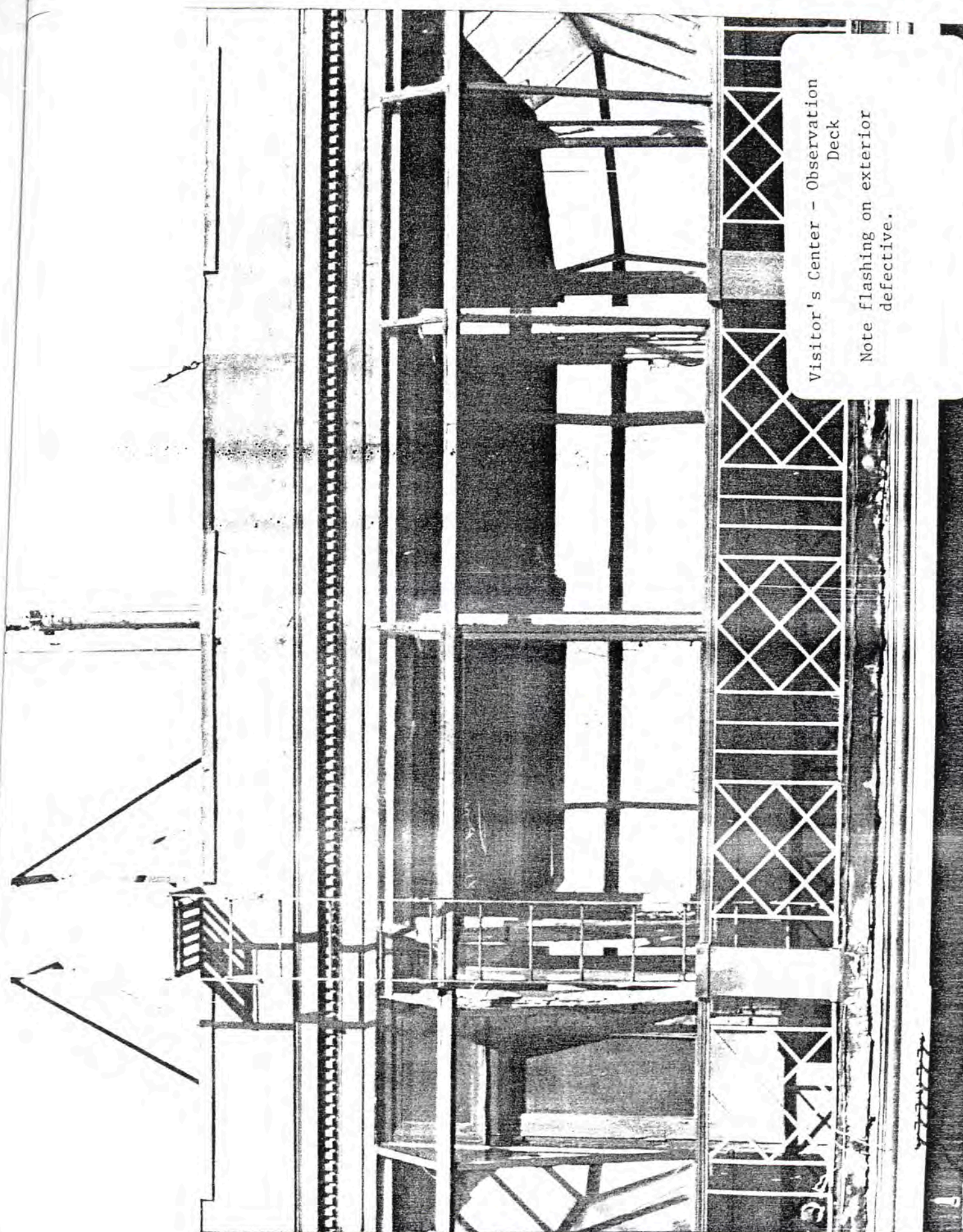


Visitor's Center- East Elevation

Cracked and deteriorated
stone facing at grade, base
of Control Tower.

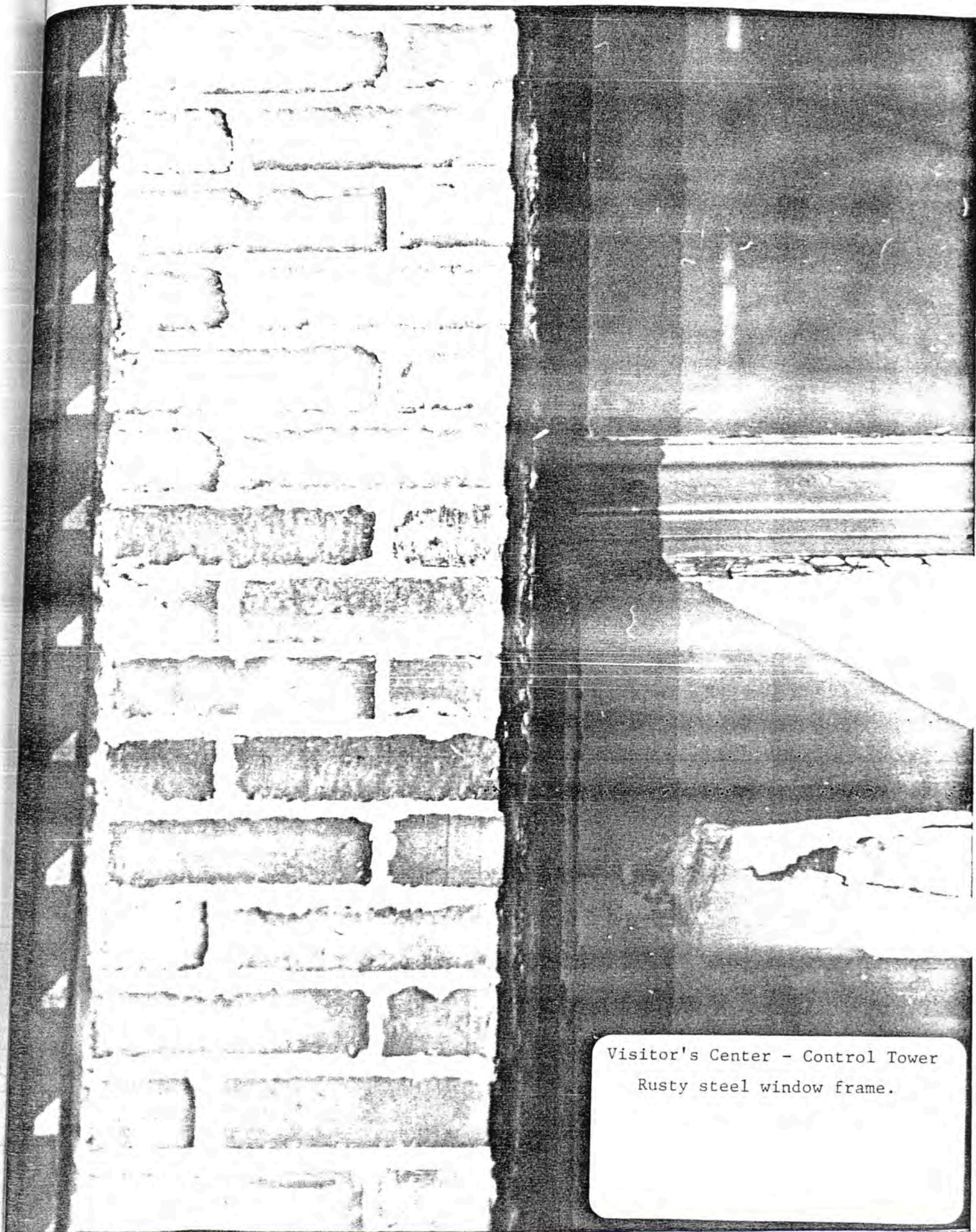


Visitor's Center - Observation
Deck
Note Flashing on exterior
defective.



Visitor's Center - Observation
Deck

Note flashing on exterior
defective.



Visitor's Center - Control Tower
Rusty steel window frame.