

THE WATTS TOWERS  
PRELIMINARY CONSERVATION REPORT

for efforts on

THE CENTER TOWER

MAY 1997

prepared by N.J. Bud Goldstone  
under contract C89122  
for the Cultural Affairs Department, City of Los Angeles

CONSERVATION OF THE CENTER TOWER  
WATTS TOWERS CONSERVATION PROGRAM  
PRELIMINARY REPORT

This is a report on the conservation work performed by the Cultural Affairs Department, City of Los Angeles between January 1986 and May 1997 on the Center Tower, one of 17 sculptures in the Towers of Simon Rodia State Historic Park at 1765 East 107th Street. Summary information is also included on repairs by Rodia, the state of California and others. The Watts Towers are a City Cultural Heritage Monument #15, a state of California Historic Landmark No. 993 (August 3, 1990) and a National Historic Landmark (December 14, 1990). The Center Tower as it appears in 1996 is shown in \*Figure 1.

#### HISTORY

The Center Tower was begun in the early 1920s and is shown in its full height of 97 foot 10 inches west of the 55 foot tall East Tower as it appeared in 1929 in \*Figure 2 and 3. At that time, this tower consisted of a center column and sixteen full-height supporting columns joined by bands and radial members and nine large rings encircling the sculpture.

Damage to the Center Tower from the March 10, 1933 Long Beach, California earthquake caused Rodia to modify his plans for his tall towers and other sculptures. Among those sculptures with major changes were the East and Center Towers, the Ship of Marco Polo and the "A" Tower. For the Center Tower, he was forced to increase the size of the large base and add eight vertical external columns with bands connecting the columns, and nine (9) large rings encircling the sculpture (Figure 2 and 3). The modifications may be seen in a 1939 sketch, 10 years later. The sketch, \*Figure 4, shows the more elaborate structure with twenty-four (24) vertical columns. All but one of the nine large rings were removed between 1947 and 1952.

There is no evidence of redesign of the Center Tower after the 7.5 magnitude Kern (Tehachapi) earthquake on July 21, 1952 but Rodia did make some changes in other sculptures at that time. Damage to the Tower was caused by the 5.9 Whittier Narrows quake October 1, 1987, and to a larger degree on January 17, 1994 by the 6.7 Northridge earthquake and after shocks and the January 1995 rain and flood disaster.

#### CONSERVATION PROGRAM SUMMARY

##### BACKGROUND

In 1977, the Center Tower was in poor condition. Mortar around several of the columns near the base was cracked through to metal pipe reinforcements (Figure aa). Horizontal bands encircling the columns had broken (Figure 5). Pieces of mortar and ornaments had become dislodged, particularly after rain storms, and fallen to break on the patio floor. Rodia had made modifications to the tall towers, including the East Tower until he left the site in 1954, and subsequent owners made repairs between 1959 and 1979. Extensive repairs were made to this tower and the two other tall towers from early 1979 to June 1985 by the California Office of the State Architect (OSA) under a repair plan developed by the California Department of Parks and Recreation (DPR) with assistance from the City Municipal Arts Department (now Cultural

Affairs) and the Committee for Simon Rodia's Towers in Watts (CSRTW) which had owned the site and given it to the City in 1975.

#### RODIA'S MODIFICATIONS AND REPAIRS, AND REPAIRS BY OTHERS TO 1979

After the 1933 Long Beach quake, Rodia performed extensive modifications to the tall towers, walls and smaller sculptures. In so doing he often covered already-ornamented surfaces with mortar and added ornaments to the new surfaces. This was found to be true on the Center and East Tower inner supporting columns.

#### OSA REPAIRS

In a program between May 1979 and July 1985, the OSA performed 78 repairs on the East Tower, 166 repairs on the Center Tower and 160 on the West Tower. Color photographs using a Kodak Instamatic camera were taken by the crew members numbering about 300 on the East Tower, 1,000 on the Center Tower and 1,600 on the West Tower. Please refer to OSA records and photographs and the summary report, "A Listing of Repair Photographs Taken by the State of California of the Rodia Towers", by N.J. Goldstone, July 7, 1986.

#### CULTURAL AFFAIRS DEPARTMENT CONSERVATION

In 1986, the Cultural Affairs Department was given responsibility for maintenance of all of the sculptures.

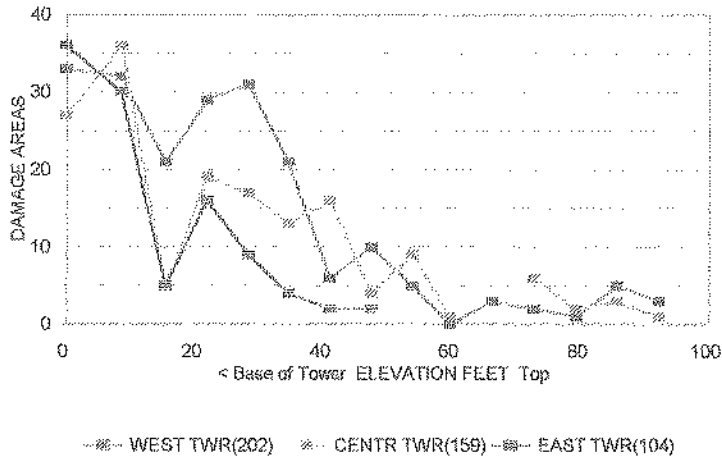
##### Preliminary Phases

In 1987, cracks were noticed in one of the Center Tower columns near the base and in three of the 14 East Tower columns, also near the base. Appearance of cracks so soon after completion by the State caused the Cultural Affairs Department management concern about the deterioration of the other tall towers. Between 1988 and 1993, an environmental test program was performed on East and Center tower columns and one Gazebo arched support to determine crack growth under temperature and stresses caused by wind and vibrations. The results indicated persistent growth in the width and length of cracks. Emergency stabilization was performed in 1988 - nylon netting was wrapped around ornaments within reach, to hold them in place and large cracks were cleaned of debris and filled with urethane foam rods before being sealed with silicone. Additional crack filling was performed from the ground in 1990, 1992 and 1993. In December 1992, large cracks in the Center and East Tower were filled with mortar by workers operating for several hours at a time from a 70-foot cherry picker.

The graphs below show the number of damaged areas identified on each of the 3 tallest towers after the Northridge earthquake of January 17, 1994 and those on the Center Tower at different elevations.

# WATTS TOWERS DAMAGE ANALYSIS

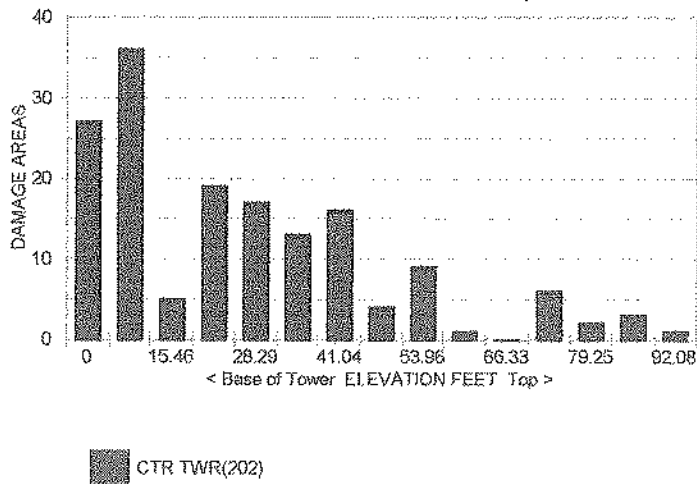
March to June 1995 inspections.



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# WATTS TOWERS DAMAGE ANALYSIS

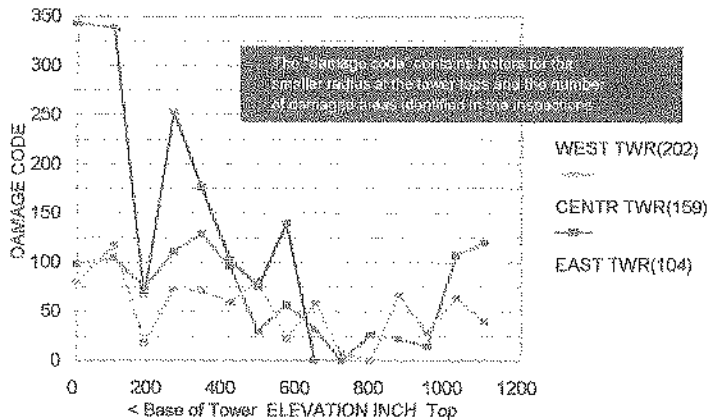
March to June 1995 inspections.



The graph below was constructed to give consideration to the size of the sculptures at each elevation. The larger areas of sculpture are nearer the base of each tower. The number of damage areas were related to the diameters of the towers at that elevation.

# WATTS TOWERS DAMAGE ANALYSIS

March to June 1995 inspections.



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## Materials Test Program

Following the inspection of the 14 smaller sculptures, a test program was established to select suitable conservation materials and techniques for replacing damaged reinforcements, preserving the remaining ornaments, restoring the bonds between the mortar and ornaments and mortar and steel reinforcements, and cleaning and consolidating the ornament surfaces and protecting them from further deterioration (see Appendix, Towers Materials Tests). Engineering analyses and x-rays of the columns, joints between columns and bands, and other failed areas provided guidance for the design of repairs.

## Archival Material

Historic records, photographs and aerial surveys from 1926 to 1951, and the 1952 film, "The Towers", were used to determine the evolution of the Center Tower structure.

## Program Scope

On an allocated basis, the conservation of the Center Tower cost about \$ TBD. Estimated costs were: baseline photography \$29,300; inspection in 1995 \$10,000; emergency stabilization \$TBD; scaffolding \$63,400 and, finally, application of conservation processes or structural conservation \$TBD. This final effort included TBD hours of labor by Cultural Affairs staff and TBD hours by contract conservators and an engineer over a TBD -month period. The processes were: ornament cleaning and rebonding to the mortar and/or reattaching broken ornament pieces; surface consolidation of ornaments; narrow crack filling and sealing; and treatment of broken, major load-carrying members. The results of the baseline photography, emergency stabilization and inspection operations have been documented previously, and reports and records are on file in the Watts Towers conservation office trailer.

Structural Conservation (See Figures 6 through 50). Conservation materials treatments consisted of cleaning, rebonding broken ornament pieces together, rebonding loosened or detached

ornaments to the mortar coverings, filling cracks around ornaments, rebonding mortar-to-mortar, and applying consolidants to ornament surfaces. Cleaning was normally accomplished using water. Glazed tile cleaning was performed using Brasso. Cleaning and removing rust and grease from steel was done with Duro naval jelly and acetone. ZRC was used as a coating where new and old steel were in contact. Rebonding glass-to-glass was accomplished using Dow Corning DC 3145 silicone. Rebonding ornaments to the original mortar was done with either General Electric GE 738 or 739 or GE 162 RTV. Rebonding mortar-to-mortar (where cement mortar was not used) was accomplished with GE 162 RTV or Sikadur 23 or 31 epoxies. The consolidant used for shells was a mixture of GE DF 104 and Acryloid B-72 (Bologna cocktail).

Small crack-filling around ornaments and in other, non-structural areas was performed using DC 738 or 739 and 50 percent sand and suitable pigments. Please see "Towers Materials Tests" and "Center Tower Conservation" tables in the Appendix.

Large crack filling was accomplished using Portland cement mortar or Jahn repair mortar.

Major member conservation on the Center Tower included a) replacements of reinforcements in portions of TBD large vertical columns and TBD horizontal bands which were broken and where steel reinforcements were weakened by excessive corrosion; b) replacements of reinforcements in portions of TBD vertical arcs which were similarly weakened; c) extensive removal of mortar covering, cleaning of TBD steel reinforcements, rewinding of wire mesh around the pipe or angle or other reinforcement, application of new cement, and reinstallation or replacement of mortar coverings; d) removal of mortar coverings from both ends of TBD vertical arcs, rejoining and reinforcing the end connections to the column with a new steel band, and restoring or replacing the mortar coverings.

#### CONSERVATION OF THE CENTER TOWER

The local, commercial sand used to mix the cement mortar was a 1:2:3 mix of #12, #16 and #60 to match that originally specified by the State of California. Major conservation efforts included repairs and replacement of steel reinforcements in vertical and horizontal members. Whenever possible, the original mortar covers were carefully removed, ground from the inside into a thin shell of mortar containing the original ornaments, cleaned inside and out and reinstalled over new mortar and the new structural steel reinforcements.

Conservation Applications: as of May 1997

Cleaning with water/cotton swabs - 2,267 tiles; 1,173 glass & 1,000 pottery.

Cleaning and consolidation with B-72 - 88 shells.

Cleaning with Brasso - 731 tiles.

Rebonding mortar-to-mortar with Sikadur 23 - 660 places

Rebonding mortar-to-mortar with cement mortar - 448 places

Rebonding mortar-to-mortar with Jahn mortar - 317 places

#### CHRONOLOGY OF WATTS TOWERS CONSERVATION

1954 to 1959 No repairs after Rodia left.

1960 to 1971 Crack-filling with cement and waterproofing.

1987

July - Cultural Affairs Department computer and software acquired/installed.

October - 6.1 and 5.5 Whittier earthquakes.

- Scaffolding erected on Gazebo for photography.

October to December - Baseline photographs taken.

December - Microfiche viewer/printer acquired/installed.

1988

January - 6 foot, chainlink security fence erected.

March - Scaffold erected, emergency stabilization started.

April - Start of staff training for inspection.

July - Microfiche delivered.

December - Survey of 6 tallest sculptures completed.

1989

April and May - Filled large cracks with urethane foam.

May - Start of conservation materials selection test program.

- Start inspection of North Wall.

August - Start cleaning and consolidating sea shells and abalone shells.

- Complete inspection of North Wall.

September - Inspection of all sculptures completed.

- Emergency stabilization completed.

1990

January to

March - Evaluation of conservation materials from test program.

March - Began replacement & strengthening of Chimney foundation.

July - Reinstalled Heart atop junction of North & South Walls. See photographs 10-12.

August - Modified sand sieve sizes for cement to match State specification.

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1991

February - Removed scaffold from Ship of Marco Polo.  
- Began conservation work on Garden Spire.

March - Began conservation work at D & E levels of "A" Tower.

June 28 - 5.8 Sierra Madre earthquake.

1992

January - Heavy rains/winds.

February - Garden Spire scaffold removed.

April - Review of "A" Tower by GCI & LACMA Representatives.  
- Civil unrest & riots.

1993

August - Began Chimney & spire conservation.

September - 'B' Tower completed.

1994

January - Removed Chimney scaffolding.  
- Began House Facade conservation.  
- 6.7 Northridge earthquake and aftershocks.  
- Began North wall temporary stabilization.

February - Northridge earthquake aftershocks.  
Propped up Canopy from earthquake damage.

July - Began Northridge earthquake repairs.  
- Increased staff members.  
- Survey of tall towers. No movement indicated.

August - Increased work days to 5 from 2 1/2 per week.

October - Completed House conservation except steps.  
- Tall tower scaffold started.

November/December

December 23 - Program stopped for lack of funds.

- Scaffold erected on 3 tallest towers.

1995

January - Rains and flooding.



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- March - Program start up. (3/13).
- North wall repairs re-started.
- Rain & flood damage report submitted.

1996 to be added

1997 to be added

#### INSPECTION SUMMARY OF DATA

Enclosed is the draft Tall Towers Inspection Report #5, the fifth and last in a series of draft reports which document in photographs and captions the results of Northridge earthquake inspections. Four hundred and sixty four (464) areas of damage to the three tallest towers are shown in the reports. This report covers inspections conducted June 2, June 7 and 9, 1995.

This 58 page report contains 98 photographs of damage areas with clarifying notes of the most visible damage observed in the West, Center and East towers. Tall Towers Inspection Report #1, released April 7, contains 86 photographs of specific damage areas and Tall Towers Inspection Report #2, released April 26, contains 118 photographs, Tall Towers Inspection Report #3 released May 16, contains 102 photographs and Tall Towers Inspection Report #4 released May 30 contains 60 photographs. This report covers inspections conducted June 2, 7 and 9, 1995. . The inspections are designed to document the extent of damage to these sculptures and to assist in developing long-lasting repairs for the damage.

#### CENTER TOWER PHOTOGRAPHS

##### 1ST INSPECTION - MARCH 17, 1995.

Photograph #03. Center Tower spire. The tube on the north (right) is a stainless steel replacement. The tube ends of the other 1/2 inch diameter by 30 inch long tubes #02, #03 & #04 are split. The four solid 5/16 inch square bars are rusted at the top, but are otherwise in good condition down to the 91 foot level. At the 91 foot level the joints between the top ring and verticals #02 and #04 are cracking.

Center Tower. Cracks in the spire and joints between the upper and lower spire at the 86 foot 6 inch level.

Photograph #12. Center Tower. Horizontal cracks in the center column and in vertical column 02 between the 80 foot and 86 foot levels.

Photograph #13. Center Tower. Cracks in Column 02 (see finger) between the 80 foot and 83 foot levels.

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Photograph #17. Center Tower. Cracks in Band 22 at the 74 foot level and a vertical crack in the column above and a crack in column 02 at the 75 foot 6 inch level.

Tower Crack in column 04 with rain damage at the 74 foot level.

Photograph #18. Center Tower. Major cracking in column 02 between bands 24 and 25 above the 75 foot 6 inch level.

Photograph #20. Center Tower. Cracks and a loose covering inside at the 76 foot level.

Photograph #21. Center Tower. Cracks in column 08 between the 74 foot and 77 foot levels.

Photograph #22. Center Tower. Cracks in the center column below the 77 foot level and in column 06 between 75 and 76 foot levels.

Photograph #24. Center Tower. Cracks in the center column on the North, inside between the 61 foot 6 inch and 64 foot 6 inch levels.

2ND INSPECTION - MARCH 22, 1995.

Photograph 001. Center Tower. East side. Crack in column 03 between the 54 foot to 59 foot level.

Photograph 02. Center Tower. South side. Series of cracks in intermediate column 05 (MC05) between the 56 foot 6 inch and 57 foot level.

Photograph 02 & 03. Center Tower. South side. Series of cracks in intermediate column 05 (MC05) between the 56 foot 6 inch and 57 foot level.

Photograph 04. Center Tower. West side. Cracks in column 07 at the 56 foot 6 inch level.

Photograph 05. Center Tower. South south west side. Cracks in band 11 at joint with column 06 at the 56 foot 6 inch level.

Photograph 06. Center Tower. Crack at center column junction...

Photograph 07. Center Tower. North side. Cracks in column 01 junction between the 56 foot 6 inch and 59 foot 6 inch levels.

Photograph 15. Center Tower. North side. Scaffold plank has caused cracks in column 01 between 47 and 54 foot levels.

Photograph 16. Center Tower. East side. Cracks in exterior column 03 between the 52 foot and 55 foot levels.

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Photograph 17. Center Tower. South west side. Cracks in exterior column 06 inside, between the 48 foot and 56 foot levels.

Photograph 18. Center Tower.

Photograph 19. Center Tower. East side. Major crack in center column and ornament at 52 foot level.

3RD INSPECTION - MARCH 24, 1995.

Photograph 006. Center Tower. Cracks through repairs in the minor arc between the "hearts" connecting the East and Center towers, on the east side at 18 foot level. Scaffold level 02. 3/24/95

Photograph 007. Center Tower. Cracks in external column 04 and joint with outer band on the south south east at 21 foot level. Scaffold level 02. 3/24/95

Photograph 008. Center Tower. Cracks on inner band 04 between inner columns 06 and 07, west south west at 20 foot level. Scaffold level 02. 3/24/95

Photograph 009. Center Tower. Cracks on intermediate column 06 on the north west 22 foot level. Scaffold level 02. 3/24/95

Photograph 010. Center Tower. Cracks in the south west radial to the center column on the west side at the 22 foot level. Scaffold level 02. 3/24/95

4TH INSPECTION - APRIL 4, 1995.

Photograph 012A. Center Tower. Cracks in external column 01 between bands 07 and 08 at the 44 foot level on the north. Scaffold level 06. 4/4/95

Photograph 013. Center Tower. Cracks in joint between band 08 and external column 02 at the 45 foot 6 inch level on the north north east. Scaffold level 06. 4/4/95

Photograph 014. Center Tower. Major cracks in external column 03 above and below the band at the 45 foot 6 inch level on the east. Scaffold level 06. 4/4/95

Photograph 015. Center Tower. Vertical crack in internal column 02 at the 45 foot 6 inch level on the east. Scaffold level 06. 4/4/95

Photograph 016. Center Tower. Cracks in center column junction with radials at the 45 foot level on the south south east. Scaffold level 06. 4/4/95

Photograph 017. Center Tower. Cracks in joint between band 08 and external column 05 at the 45 foot 6 inch level on the south. Scaffold level 06. 4/4/95

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Photograph 018. Center Tower. Cracks in external column 06 below band 08 at the 45 foot 6 inch level on the south south west. Scaffold level 06. 4/4/95

Photograph 019. Center Tower. Major crack across inner ring at the 45 foot 6 inch level on the south south west. Scaffold level 06. 4/4/95

Photograph 020. Center Tower. Vertical crack in external column 06 at the 45 foot 6 inch level on the south south west. Scaffold level 06. 4/4/95

Photograph 021a. Center Tower. Major cracks through repairs in intermediate column 07 under band 08 at the 45 foot 6 inch level on the west. Scaffold level 06. 4/4/95

Photograph 021b. Center Tower. Major cracks through repairs in intermediate column 07 under band 08 at the 45 foot 6 inch level on the west. Scaffold level 06. 4/4/95

Photograph 022. Center Tower. Cracks through repair in internal column 04 at the 45 foot 6 inch level on the west. Scaffold level 06. 4/4/95

Photograph 023. Center Tower. Major cracks in external column 07 and band 08 at the 45 foot 6 inch level on the west north west. Scaffold level 06. 4/4/95

Photograph 024. Center Tower. Cracks in external column 08 between band 07 and 08 at the 45 foot 6 inch level on the north north west. Scaffold level 06. 4/4/95

Photograph 025. Center Tower. Major vertical cracks in intermediate column 08 above and below band 08 at the 45 foot 6 inch level on the north north west. Scaffold level 06. 4/4/95

Photograph 026. Center Tower. Cracks through repairs in intermediate column 04 at the 45 foot 6 inch level on the north north west. Scaffold level 06. 4/4/95

5TH INSPECTION - APRIL 7, 1995.

Photograph 005. Center Tower. Vertical cracks in external column 01 between external bands 7 and 8 on north side at 38 foot 6 inch level. Scaffold level 05. Roll 119C shot 14 of 37. 4/7/95

Photograph 006. Center Tower. Cracks in intermediate column 02 and radial 02 on north north east side at the 38 foot 6 inch level. Scaffold level 05. Roll 119C shot 15 of 37. 4/7/95

Photograph 007. Center Tower. Cracks in external column 03, intermediate column 02 and minor band on the north north east at 38 foot 6 inch level. Scaffold level 05. Roll 119C shot 16 of 37. 4/7/95

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Photograph 008. Center Tower. Major cracks in repairs on intermediate column 03 on the east at 38 foot 6 inch to 40 foot level. Scaffold level 05. Roll 119C shot 17 of 37. 4/7/95

Photograph 009. Center Tower. Crack and rusted wires in repair of joints in radial with internal & intermediate columns 04 at the 38 foot 6 inch level on the south east side. Scaffold level 05. Roll 119C shot 18 of 37. 4/7/95

Photograph 010. Center Tower. Cracks in repairs in external column 05 between the 38 foot 6 inch and 42 foot levels on the south. Scaffold level 05. Roll 119C shot 19 of 37. 4/7/95

Photograph 012. Center Tower. Cracks in bands and external column 06 and intermediate column 05 on the south south west at 38 foot 6 inch level. Scaffold level 05. Roll 119C shot 20 of 37. 4/7/95

Photograph 012A. Center Tower. Cracks in bands and external column 06 and intermediate column 05 on the south south west at 38 foot 6 inch level. Scaffold level 05. Roll 119C shot 21 of 37. 4/7/95

Photograph 013. Center Tower. Vertical cracks in repairs of internal and intermediate column 06 and radial on west side at 38 foot 6 inch level. Scaffold level 05. Roll 119C shot 22 of 37. 4/7/95

Photograph 014. Center Tower. Cracks in repairs of intermediate and external column 07 on west side at the 38 foot 6 inch level. Scaffold level 05. Roll 119C shot 23 of 37. 4/7/95

Photograph 015. Center Tower. Cracks in repairs of external and intermediate column 08 joints on the north north west at 38 foot 6 inch level. Scaffold level 05. Roll 119C shot 24 of 37. 4/7/95

Photograph 016. Center Tower. Cracks in repairs of external and intermediate column 08 joints on the north north west at 38 foot 6 inch level. Scaffold level 05. Roll 119C shot 25 of 37. 4/7/95

Photograph 017. Center Tower. Cracks in intermediate column 03 and related bands at the 38 foot 6 inch to 40 foot level on the east side. Scaffold level 05. Roll 119C shot 26 of 37. 4/7/95

8TH INSPECTION APRIL 19. 18 photographs.

Photograph 010. Center Tower. Crack in joint and spalls to external column 01 down to band 06 at 33 foot level on north side at scaffold level 04. Roll 122C shot 01 of 37. 4/19/95.

Photograph 011. Center Tower. Cracks in joint of intermediate column 01 with intermediate band at 33 foot level on north side at scaffold level 04. Roll 122C shot 02 of 37. 4/19/95.

Photograph 012. Center Tower. Cracks external column 02 and the spoke to band 06 on the north north east side at the 33 foot level. Scaffold level 04. Roll 122C shot 03 of 37. 4/19/95

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Photograph 013. Center Tower. Cracks in external column 03 and loop arc on the north east side at the 33 foot level. Scaffold level 04. Roll 122C shot 04 of 37. 4/19/95

Photograph 014. Center Tower. Moisture seepage and discoloration on intermediate column 03 near band 06 on the east side at the 33 foot level. Scaffold level 04. Roll 122C shot 05 of 37. 4/19/95

Photograph 015. Center Tower. Crack in external column 04 down to band 06 and in the radial on the south east side at 33 foot level. Scaffold level 04. Roll 122C shot 06 of 37. 4/19/95

Photograph 016. Center Tower. Cracks in intermediate column 04 on the south side at the 33 foot level. Scaffold level 04. Roll 122C shot 07 of 37. 4/19/95

Photograph 017. Center Tower. Cracks in joint of band with internal column 03 on east side at 33 foot level. Scaffold level 04. Roll 122C shot 08 of 37. 4/19/95

Photograph 018. Center Tower. Major crack in external column 05 on the south south west side at the 33 foot level. Scaffold level 04. Roll 122C shot 09 of 37. 4/19/95

9TH INSPECTION APRIL 21.

Photograph 019. Center Tower. Cracks on top of band between internal bands 05 and 07 at 33 foot level on south side at scaffold level 04. Roll 122C shot 12 of 37. 4/21/95.

Photograph 020. Center Tower. Cracks in external column 06 between 31 and 32 foot level on south south west side at scaffold level 04. Roll 122C shot 13 of 37. 4/21/95.

Photograph 021. Center Tower. Major cracks in joints and inner ring between internal column 07 and 08 on the west side at the 33 foot level. Scaffold level 04. Roll 122C shot 14 of 37. 4/21/95

Photograph 022. Center Tower. Crack in spoke to inner ring on the west side at the 33 foot level. Scaffold level 04. Roll 122C shot 15 of 37. 4/21/95

Photograph 023. Center Tower. Major crack on external column 07 and under band 05 on the west side at the 33 foot level. Scaffold level 04. Roll 122C shot 16 of 37. 4/21/95

Photograph 024. Center Tower. Crack and deep spall in intermediate column 06 on the west north west side at 33 foot level. Scaffold level 04. Roll 122C shot 17 of 37. 4/21/95

Photograph 025. Center Tower. Crack and deep spall in intermediate column 08 and joint with intermediate band on the north west side at 33 foot level. Scaffold level 04. Roll 122C shot 18 of 37. 4/21/95

Photograph 026. Center Tower. Major cracks in repair on intermediate column 07 on north west side at 33 foot level. Scaffold level 04. Roll 122C shot 19 of 37. 4/21/95

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10TH INSPECTION APRIL 28. 30 photographs, page 10 to 24.

Photograph 018. Hearts ETO to CTO. North side at the 24 foot level. Scaffold level 03. Roll 124C shot 25 of 37. 4/28/95

Photograph 019. Center Tower. Major crack in external column 01 25 to 26 foot level on north side at scaffold level 03. Roll 124C shot 26 of 37. 4/28/95.

Photograph 020. Center Tower. Major cracks in outer ring at 22 foot level on north side at scaffold level 03. Roll 124C shot 27 of 37. 4/28/95.

Photograph 021. Center Tower. Cracks and spall in band 05 and external column 03 on the north east side at the 26 to 27 foot level. Scaffold level 03. Roll 124C shot 28 of 37. 4/28/95

Photograph 022. Center Tower. Cracks in inner band on the east side at the 26 foot level. Scaffold level 03. Roll 124C shot 29 of 37. 4/28/95

Photograph 023. Center Tower. Major crack on internal column 03 and joint with inner band on the south east side at the 23 foot level. Scaffold level 03. Roll 124C shot 30 of 37. 4/28/95

Photograph 024. Center Tower. Major crack in joint of internal column 04 and inner ring on the south side at 22 foot level. Scaffold level 03. Roll 124C shot 31 of 37. 4/28/95

Photograph 025. Center Tower. Crack in internal column 04 and joint with radial 04 on the south side at 22 foot level. Scaffold level 03. Roll 124C shot 32 of 37. 4/28/95

Photograph 026. Center Tower. Ornament damage on inner column 04 on south side at 27 foot level. Scaffold level 03. Roll 124C shot 33 of 37. 4/28/95

Photograph 027. Center Tower. Ornament damage on inner column 04 on south side at 27 foot level. Scaffold level 03. Roll 124C shot 34 of 37. 4/28/95

Photograph 028. Center Tower. Rust and exposed wire in inter-mediate column 05 and minor band under band 05 on the south west side at 26 foot level. Scaffold level 03. Roll 124C shot 35 of 37. 4/28/95.

Photograph 029. Center Tower. Cracks in mortar joint and rust in intermediate column 05 on south west at 22 foot level. Scaffold level 03. Roll 124C shot 36 of 37. 4/28/95.

Photograph 030. Center Tower. Major crack in outer ring on south west side at 22 foot level. Scaffold level 03. Roll 124C shot 37 of 37. 4/28/95.

11TH INSPECTION MAY 3. 36 photographs, page 25 to 42.

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Photograph 001. Center Tower. Vertical crack in column and separation at joint of internal column 07 with ring joint at 24 foot level on west side at scaffold level 03. Roll 125C shot 01 of 37. 5/3/95.

Photograph 002. Center Tower. Outer ring and crown cracks on both sides at 22 foot level on west side at scaffold level 03. Roll 125C shot 02 of 37. 5/3/95.

Photograph 003. Center Tower. Cracks in joint of radial with internal column 08 and spalling at center column on the north west side at the 24 foot level. Scaffold level 03. Roll 125C shot 03 of 37. 5/3/95.

Photograph 004. Center Tower. Two major cracks in outer ring on the north west side at the 22 foot level. Scaffold level 03. Roll 125C shot 04 of 37. 5/3/95.

Photograph 005. Center Tower. Vertical crack in internal column 08 and intersection of column with 3rd band from bottom on the north west side at the 26 foot level. Scaffold level 03. Roll 125C shot 05 of 37. 5/3/95.

Photograph 006. Center Tower. Serial cracking and spalls in center column 03 on the north west side at 28 foot level. Scaffold level 03. Roll 125C shot 06 of 37. 5/3/95.

12TH INSPECTION MAY 5. 18 photographs, page 43 to 51. None.

13TH INSPECTION MAY 12. 18 photographs, page 52 to 60. None.

13TH INSPECTION (CONTINUED) MAY 12, 1995. 14 photographs, page 7 to 13.

Photograph 021. Center Tower. Major crack along intermediate column 01 and gaps around ornaments on the north side at the 8 foot level. Scaffold level 00. Roll 127C shot 01 of 37. 5/12/95.

Photograph 022. Center Tower. Crack in repair of external column 02 on the north north east side at the 4 to 8 foot level. Scaffold level 00. Roll 127C shot 02 of 37. 5/12/95.

Photograph 023. Center Tower. Crack in repair of external column 02 on the north north east side at the 4 to 8 foot level. Scaffold level 00. Roll 127C shot 03 of 37. 5/12/95.

Photograph 024. Center Tower. Crack in repair of external column 02 on the north north east side at the 4 to 8 foot level. Scaffold level 00. Roll 127C shot 04 of 37. 5/12/95.

Photograph 025. Center Tower. Base rock delamination and gaps on the north north east side at 6 foot level. Scaffold level 00. Roll 127C shot 05 of 37. 5/12/95.

Photograph 026. Center Tower. Major cracks in intermediate column 02 and band 01 in repairs - rebar gone on the north east side 8 foot level. Scaffold level 00. Roll 127C shot 06 of 37. 5/12/95.



Photograph 027. Center Tower. Crack under joint of internal column 02 and intermediate band 01 on the north north east side at the 8 foot level. Scaffold level 00. Roll 127C shot 07 of 37. 5/12/95.

Photograph 028. Center Tower. Cracks in mortar on the base on the north north east side at the 8 foot level. Scaffold level 00. Roll 127C shot 08 of 37. 5/12/95.

Photograph 029. Center Tower. Cracks and separations in external column 03 on east side at 8 foot level. Scaffold level 00. Roll 127C shot 09 of 37. 5/12/95.

Photograph 030. Center Tower. Rust on exposed rebar and mortar separation on north north east side at 8 foot level. Scaffold level 00. Roll 127C shot 10 of 37. 5/12/95.

Photograph 031. Center Tower. Cracks in temporary repairs on intermediate column 03 and internal band on the east side at the 8 foot level. Scaffold level 00. Roll 127C shot 11 of 37. 5/12/95.

Photograph 032. Center Tower. Serial cracks in base and pinnacles on the east side at the 8 foot level. Scaffold level 00. Roll 127C shot 12 of 37. 5/12/95.

Photograph 033. Center Tower. Major cracks in internal column 05 and base on the south side at the 8 foot level. Scaffold level 00. Roll 127C shot 13 of 37. 5/12/95.

Photograph 034. Center Tower. Major crack in internal column 05 above internal band 01 the 8 foot level. Scaffold level 00. Roll 127C shot 14 of 37. 5/12/95.

14TH INSPECTION MAY 26, 1995. 46 photographs, page 14 to 36.

Photograph 001. Center Tower. Crack in base and internal column 04 on the south south east side at the 4 to 8 foot level. Scaffold level 00. Roll 127C shot 15 of 37. 5/26/95.

Photograph 002. Center Tower. Cracks and delamination of slate stone in base on the south side at the 5 foot level. Scaffold level 00. Roll 127C shot 16 of 37. 5/26/95.

Photograph 003. Center Tower. Cracks extending past 2 bands in repair of internal column 05 on the south side from the 8 to 12 foot level. Scaffold level 00. Roll 127C shot 17 of 37. 5/26/95.

Photograph 004. Center Tower. Crack and spalling underneath band 01 on the south side at the 8 foot level. Scaffold level 00. Roll 127C shot 18 of 37. 5/26/95.

Photograph 005. Center Tower. Crack and mortar separation in external column 06 and joint with base on the south side at 4 foot level. Scaffold level 00. Roll 127C shot 19 of 37. 5/26/95.

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Photograph 006. Center Tower. Cracks(5) in repair mortar of intermediate column 06 and base on the south side at 6 foot level. Scaffold level 00. Roll 127C shot 20 of 37. 5/26/95.

Photograph 007. Center Tower. Crack in Jahn repair mortar in lower base and external column 06 on the south south west side at the 4 foot level. Scaffold level 00. Roll 127C shot 21 of 37. 5/26/95.

Photograph 008. Center Tower. Cracks along rim of base and in intermediate column 06 on the south west side at the 4 foot level. Scaffold level 00. Roll 127C shot 22 of 37. 5/26/95.

Photograph 009. Center Tower. Vertical cracks and separations in intermediate column 06 and base joint on west side at 5 foot level. Scaffold level 00. Roll 127C shot 23 of 37. 5/26/95.

Photograph 010. Center Tower. Crack in repair mortar on band 01 west side at 9 foot level. Scaffold level 00. Roll 127C shot 24 of 37. 5/26/95.

Photograph 011. Center Tower. Cracks propagating from external column 08 into base on both sides on the west side at the 4 to 8 foot level. Scaffold level 00. Roll 127C shot 25 of 37. 5/26/95.

Photograph 012. Center Tower. Cracks propagating from external column 08 into base on both sides on the west side at the 4 to 8 foot level. Scaffold level 00. Roll 127C shot 26 of 37. 5/26/95.

Photograph 013. Center Tower. Cracks propagating from external column 08 into base on both sides on the west side at the 4 to 8 foot level. Scaffold level 00. Roll 127C shot 27 of 37. 5/26/95.

16TH INSPECTION JUNE 7, 1995. 36 photographs, page 25 to 42.

Photograph 001. Center Tower. Cracks in external column 01 and band 01 at 10 foot 6 inch level on north side at scaffold level 01. Roll 133C shot 02 of 37. 6/7/95.

Photograph 002. Center Tower. Cracks in Temporary repairs in internal column 01 and band 04 at 10 foot 6 inch level on north side at scaffold level 01. Roll 133C shot 03 of 37. 6/7/95.

Photograph 003. Center Tower. Cracks in joint and along intermediate band 02 on the north side at the 10 foot 6 inch level. Scaffold level 01. Roll 133C shot 04 of 37. 6/7/95.

Photograph 004. Center Tower. Cracks in repairs in joint on the north side at the 10 foot 6 inch level. Scaffold level 01. Roll 133C shot 05 of 37. 6/7/95.

Photograph 005. Center Tower. Cracks in Jahn repair mortar on external column 02 and band 01 joint on the north east side at the 9 foot level. Scaffold level 01. Roll 133C shot 06 of 37. 6/7/95.

Photograph 006. Center Tower. Cracks in Jahn repair mortar on external column 02 and band 01 joint on the north east side at the 9 foot level. Scaffold level 01. Roll 133C shot 07 of 37. 6/7/95.

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Photograph 007. Center Tower. Cracks in joint of internal column 02 and band 03 on the north side at the 10 foot 6 inch level. Scaffold level 01. Roll 133C shot 08 of 37. 6/7/95.

Photograph 008. Center Tower. No rebar remains. Cracks in temp. repair of IC 02 and bands 02 & 03 north east side 10 foot 2 inch level. Scaffold level 01. Roll 133C shot 09 of 37. 6/7/95.

Photograph 009. Center Tower. No rebar remains. Cracks in temp. repair of IC 02 and bands 02 & 03 north east side 10 foot 2 inch level. Scaffold level 01. Roll 133C shot 10 of 37. 6/7/95.

Photograph 010. Center Tower. Spall and cracks in joint of radial arc 01 to internal column 02 on north east side at 10 foot 6 inch level. Scaffold level 01. Roll 133C shot 11 of 37. 6/7/95.

Photograph 011. Center Tower. Major crack in intermediate column 03 and in band 03 at 10 foot 6 inch level on east side. Scaffold level 01. Roll 133C shot 12 of 37. 6/7/95.

Photograph 012. Center Tower. Major crack in intermediate column 03 and in band 03 at 10 foot 6 inch level on east side. Scaffold level 01. Roll 133C shot 13 of 37. 6/7/95.

Photograph 013. Center Tower. Major crack in intermediate column 03 and in band 03 at 10 foot 6 inch level on east side. Scaffold level 01. Roll 133C shot 14 of 37. 6/7/95.

Photograph 014. Center Tower. Major failure in external column 04 joint with intermediate band 01 at 10 foot 6 inch level on south east side. Scaffold level 01. Roll 133C shot 15 of 37. 6/7/95.

Photograph 015. Center Tower. Cracks along internal band 03 and column 04 on the south east side at 10 foot 6 inch level. Scaffold level 01. Roll 133C shot 16 of 37. 6/7/95.

Photograph 016. Center Tower. Cracks in Jahn repair mortar on intermediate band 02 on the south east side at the 10 foot 6 inch level. Scaffold level 01. Roll 133C shot 17 of 37. 6/7/95.

Photograph 017. Center Tower. Major failure in external column 04 joint with intermediate band 01 at 10 foot 6 inch level on south east side. Scaffold level 01. Roll 133C shot 18 of 37. 6/7/95.

Photograph 018. Center Tower. Large spall and major failure in intermediate column 03 on east side at the 10 foot 6 inch level. Scaffold level 01. Roll 133C shot 19 of 37. 6/7/95.

Photograph 019. Center Tower. Large spall and major failure in intermediate column 04 on south east side at the 11 foot level. Scaffold level 01. Roll 133C shot 20 of 37. 6/7/95.

Photograph 020. Center Tower. Major crack along intermediate band 03 at 10 foot 6 inch level on south side at Scaffold level 01. Roll 133C shot 21 of 37. 6/7/95.

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Photograph 021. Center Tower. Major failure joint of ext. column 05 with band 01 and o'head to south wall on south side 9 foot 6 inch level. Scaffold level 01. Roll 133C shot 22 of 37. 6/7/95.

Photograph 022. Center Tower. Cracks in external band 01 on the south side at the 9 foot level. Scaffold level 01. Roll 133C shot 23 of 37. 6/7/95.

Photograph 023. Center Tower. Cracks in repair of intermediate band 03 and joint with internal column 05 on south side 10 foot 6 inch level. Scaffold level 01. Roll 133C shot 24 of 37. 6/7/95.

Photograph 024. Center Tower. Crack along intermediate column 05 and joint with internal band 02 on the south side 11 to 12 foot 6 inch level. Scaffold level 01. Roll 133C shot 25 of 37. 6/7/95.

Photograph 025. Center Tower. Rust exposed on intermediate column 05 and joint with internal band 02 south side 11 to 12 foot 6 inch level. Scaffold level 01. Roll 133C shot 26 of 37. 6/7/95.

Photograph 026. Center Tower. Major failure in internal column 06 on south west side 11 to 12 foot level. Scaffold level 01. Roll 133C shot 27 of 37. 6/7/95.

Photograph 027. Center Tower. Cracks on intermediate band 03 on south west side at 11 foot 6 inch level. Scaffold level 01. Roll 133C shot 28 of 37. 6/7/95.

Photograph 028. Center Tower. Major failure in temporary repair on external column 06 on the west side at 12 foot level. Scaffold level 01. Roll 133C shot 29 of 37. 6/7/95.

Photograph 029. Center Tower. Major vertical and horizontal cracks in intermediate column 06 on west side 11 to 12 foot level. Scaffold level 01. Roll 133C shot 30 of 37. 6/7/95.

Photograph 030. Center Tower. Crack in joint of internal column 06 with band 03 on west side 14 foot 6 inch level. Scaffold level 01. Roll 133C shot 31 of 37. 6/7/95.

Photograph 031. Center Tower. Vertical crack in internal column 07 on the north west side at 13 foot level. Scaffold level 01. Roll 133C shot 32 of 37. 6/7/95.

Photograph 032. Center Tower. Major failure in intermediate column 07 and joint with band 01 on north west side at 8 foot level. Scaffold level 01. Roll 133C shot 33 of 37. 6/7/95.

Photograph 033. Center Tower. Cracks in center column along ornaments on north west side at 14 foot level. Scaffold level 01. Roll 133C shot 34 of 37. 6/7/95.

Photograph 034. Center Tower. Crack along intermediate band 02 and joint with connector on the north west side at 10 foot level. Scaffold level 01. Roll 133C shot 35 of 37. 6/7/95.

Photograph 035. Center Tower to East Tower connector 01. Major failure in joint on west side at 11 foot level. Scaffold level 01. Roll 133C shot 36 of 37. 6/7/95.

Photograph 036. Center Tower to South Wall Overhead connector. Major cracks in connector on south side at 11 foot 6 inch level. Scaffold level 01. Roll 133C shot 37 of 37. 6/7/95.

X-RAY RESULTS

(Abstracted from 11/6/90 report) November 6, 1990

SUBJECT: REINFORCEMENTS IN SHIP SPIRE & CENTER TOWER COLUMNS  
FINDINGS FROM OCTOBER 25, 1990 X-RAYS.

- Reference: a) 11/18/89 GOALS OF X-RAY PROGRAM
- b) AFEs with Davis Quality Lab for X-rays
- c) Set of 16 x-rays 10/25/90
- d) Lotus 1-2-3 File "X-RAYCALC.WK1"

SUMMARY

X-rays have shown: the sizes and shapes of reinforcements and joints in the East and Center Tower, in South Wall posts and in horizontal bands and vertical, arched supports of the Ship; cracks and voids in the mortar; wire and wire mesh wrappings around the reinforcements and joints; and evidence of rusting in the steel reinforcements.

BACKGROUND

Mortar cracking failures have recurred in the East Tower many times since 1959. Recent cracks have appeared in the lower vertical columns of the Center and West Towers. In December 1989, and February 1990, x-rays were taken of the East Tower vertical columns and joints and the Ship spire column, horizontal bands and vertical arcs. In May 1990, x-rays were taken of reinforcements in the Ship Spire horizontal bands and vertical arcs and South Wall posts. See January 9, March 5, and May 25, 1990 reports.

In a further effort to resolve the cause of the failures and determine the extent of steel and mortar damage, X-rays were taken of the Ship Spire reinforcements at 20 feet elevation and of six damaged Center Tower vertical columns above the tower base. A total of 16 x-rays were taken on October 25 by Davis Quality Laboratory technicians, as listed below.

LOCATION #	X-RAY #	APPROX. ELEVATION	BASELINE
SHIP BOWL 07	1,2,3,4	BELOW/ABOVE	SHIP BOWL
CENTER TOWER			
MC01 Column	5 & 6	4'6"	CTO B NNN O
EC02 Column	7 & 8	4'6"	CTO B ENE O

LOCATION # X-RAY # APPROX. ELEVATION BASELINE  
SCULPTURE

CENTER TOWER

MC02 Column	11 & 12	4'6"	CTO B EEE O
MC03 Column	17 & 18	4'6"	CTO B EES O
EC08 Column	23 & 24	4'6"	CTO B NWN O
EC06 Column	27 & 28	4'6"	CTO B SWS O

RESULTS

Sculpture	X-ray No.	Results of analysis
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SHIP OF  
MARCO POLO  
TEXT DELETED

LOCATION # X-RAY # APPROX. ELEVATION BASELINE SCULPTURE

CENTER TOWER

MC01 Column	5 & 6	An oval shaped pipe contains an internal rebar, 0.392 inch in diameter. The oval is approx. 2.813 inch o.d. in the south view and 1.636 in the west view. The pipe thickness is about 0.125 inch.
EC02 Column	7 & 8	A "T"- or angle-section, legs of .462 and .744 inch in skewed views. rough edges, poor bond to mortar.
MC02 Column	11 & 12	Pipe in good condition, 2.290 inch o.d. by 0.112 inch wall. Cracks & voids in mortar. Bond varies from good to poor.
MC03 Column	17 & 18	Poor pipe condition 1 place; crack along pipe; poor bond, voids, cracks. Pipe o.d. 2.438 inch, wall 0.125 inch.

FIGURES ENCLOSED

Figure 1. Center Tower, tallest in photo. View from north. Shows 10 large, outer rings and bands supported by 16 vertical columns. East Tower on left, Gazebo & Rodia house on right. c1929.

Figure 2. Center Tower, tallest in photo. View from southeast. Shows large, outer rings and bands supported by 16 vertical columns. Wall, house, 'A' Tower, on left and East Tower & Ship mast on right. c1929.

Figure 3. Center Tower, tallest in sketch. View from southeast. Shows 8 more support columns than in 1929. L to R vertical columns. Wall, house, 'A' Tower, on left and East Tower & Ship mast on right. Story is typical of Rodia "quotes". c1939.

Figure 4. Center Tower, right of West Tower, tallest in photo. View from southwest. Shows large, outer rings and bands. Published March 1947.

Figure 5. Center Tower, right of tallest, West Tower. View from southwest. Shows large outer rings and bands. Published in July 1951.

Figure 6. Center Tower column crack near ground. January 1992.

Figure 7. Center Tower column crack near ground. January 1992.

Figure 8. Center Tower column crack near ground. January 1992.

Figure 9. Center Tower column crack at joint. January 1992.

Figure 10. Center Tower cracks 8 feet above patio. January 1992.

Figure 11. Center Tower column cracks above & below joint, 9 feet above patio. January 1992.

Figure 12. Center Tower pipe with cover removed. February 1992.

Figure 13. Center Tower ornaments covered by prior repair. February 1992.

Figure 14. Center Tower crack opened to disclose ornaments covered by prior repair. January 1993.

CONSERVATION OF THE CENTER TOWER  
WATTS TOWERS CONSERVATION PROGRAM  
FIGURES ENCLOSED continued

Figure 15. Center Tower crack opened to disclose ornaments covered by prior repair. January 1993.

Figure 16. Center Tower column (right center) near base. Cracks above have caused water intrusion. Before temporary repairs. 1/11/93 photo.

Figure 17. Center Tower column near base. See cracks in mortar (lower center) and between rocks in base. Before temporary repairs. 1/11/93 photo.

Figure 18. Center Tower base showing crack through rocks Before temporary repairs. 1/11/93 photo.

Figure 19 (10.) Center Tower showing some of nine support columns wrapped with plastic to impede rain water intrusion into large cracks in mortar. 1/11/93 photo.

Figure 20 (11.) Center Tower showing some of nine support columns wrapped with plastic to impede rain water intrusion into large cracks in mortar. 1/11/93 photo.

Figure 21 (12.) Center Tower showing some of nine support columns wrapped with plastic to impede rain water intrusion into large cracks in mortar. 1/11/93 photo.

Figure 22 (13.) Center Tower showing some of nine support columns wrapped with plastic to impede rain water intrusion into large cracks in mortar. 1/11/93 photo.

Figure 23 -(Photograph 31.) Center Tower crack through 1985 State repair of main vertical support column. November 18, 1992.

Figure 24 -(Photograph 32.) Center Tower cracks through 1985 State repairs to main vertical support column near base. November 18, 1992.

Figure 25 -(Photograph 33.) Center Tower cracks through 1985 State repairs to main vertical support column near base. November 18, 1992.

Figure 26 -(Photograph 34.) Center Tower cracks through test area in main vertical support column near base. November 18, 1992.

Figure 27 -(Photograph 35.) Center Tower cracks through 1985 State repairs to main vertical support. November 18, 1992.

Figure 28 -(Photograph 36.) Center Tower cracks through 1985 State repairs to main vertical support. November 18, 1992.



CONSERVATION OF THE CENTER TOWER  
WATTS TOWERS CONSERVATION PROGRAM  
FIGURES ENCLOSED continued

Figure 29 -(Photograph 37.) Center Tower cracks through 1985 State repairs to main vertical support. November 18, 1992.

Figure 30 -(Photograph 38.) Boom approaching Center Tower from south side on 107th Street. December 16, 1992.

Figure 31 -(Photograph 39.) Center Tower crack in joint inside surface before repair from boom bucket. December 16, 1992.

Figure 32 -(Photograph 40.) Extensive crack in Center Tower vertical column before repair from boom bucket. December 16, 1992.

Figure 33 -(Photograph 41.) Repair in progress in Center Tower vertical column. December 16, 1992

Figure 34 -(Photograph 44.) Crack near top of vertical column of connecting structure between East & Center towers. 50 foot elevation. December 16, 1992

Figure 35 -(Photograph 45.) Crack in Center Tower vertical column and horizontal band before repair from boom bucket. December 16, 1992

Figure 36 -(Photograph 46.) Crack in Center Tower vertical column before repair from boom bucket. December 16, 1992

Figure 37 -(Photograph 47.) Crack in Center Tower vertical column before repair from boom bucket. December 16, 1992

Figure 38 -(Photograph 48.) Crack in Center Tower vertical column before repair from boom bucket. 55 foot elevation. December 16, 1992

Figure 39 (01.) Center Tower. State of CA repair mortar c1983 which separated from original, Rodia work. Piece shows impression of ornaments which had been covered by repair erroneously. 12/30/92 photo.

Figure 40 (02.) Center Tower. State of CA repair mortar c1983 which separated from original, Rodia work. Piece shows impression of ornaments which had been covered by repair erroneously. 1/5/93 photo.

Figures 41 through 49. Center Tower. June 1994. Vertical cracks in repairs and in support columns. B level.

CONSERVATION OF THE CENTER TOWER  
WATTS TOWERS CONSERVATION PROGRAM

APPENDIX

Towers Materials Tests - listing of conservation materials tested and start dates of tests.

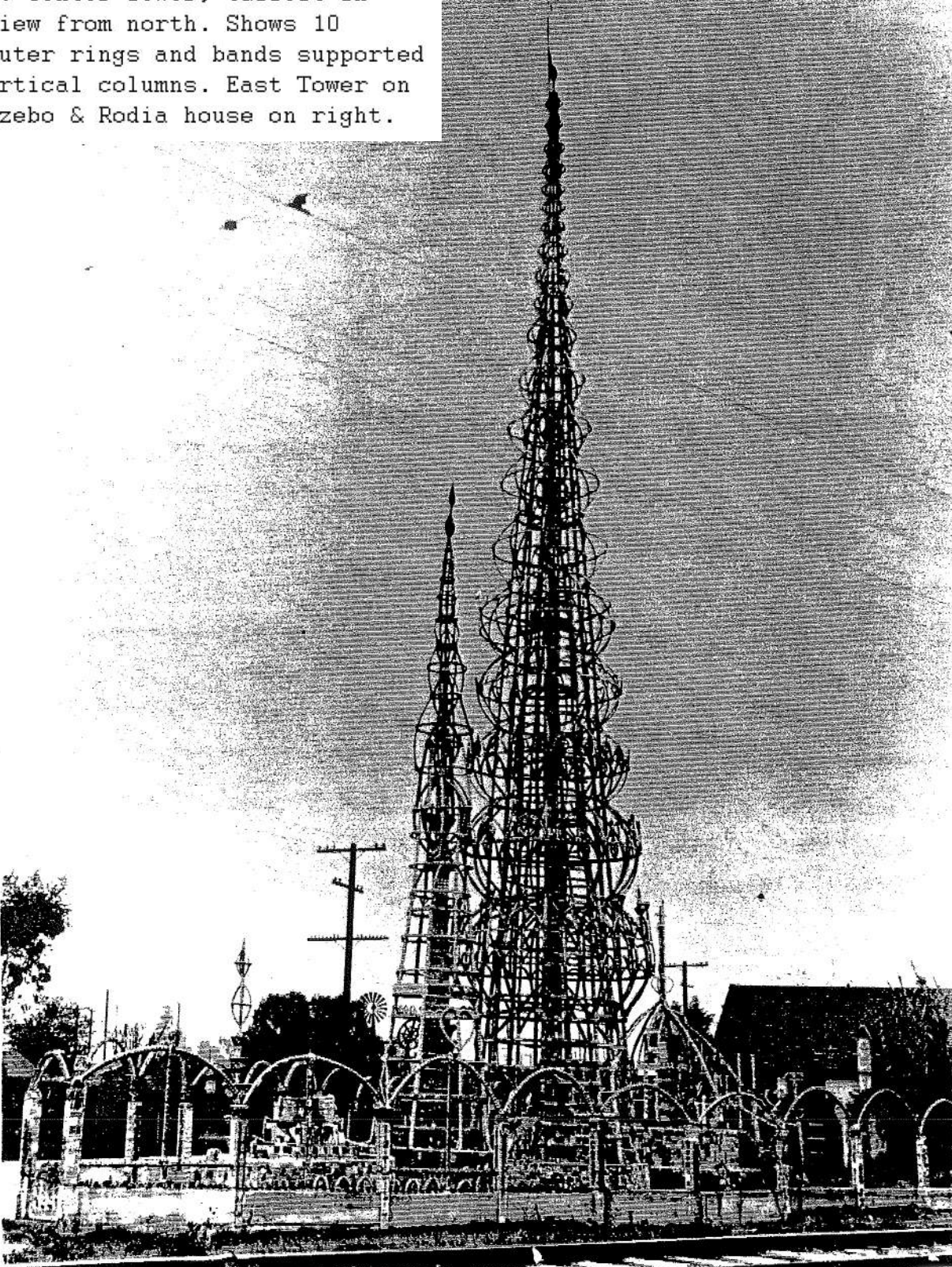
Center Tower Conservation - Materials and techniques list 1., by elevation and photographic baseline reference location.

Center Conservation - Materials and techniques list 2., by date and photographic baseline reference location.

HNO. Sām Rodia

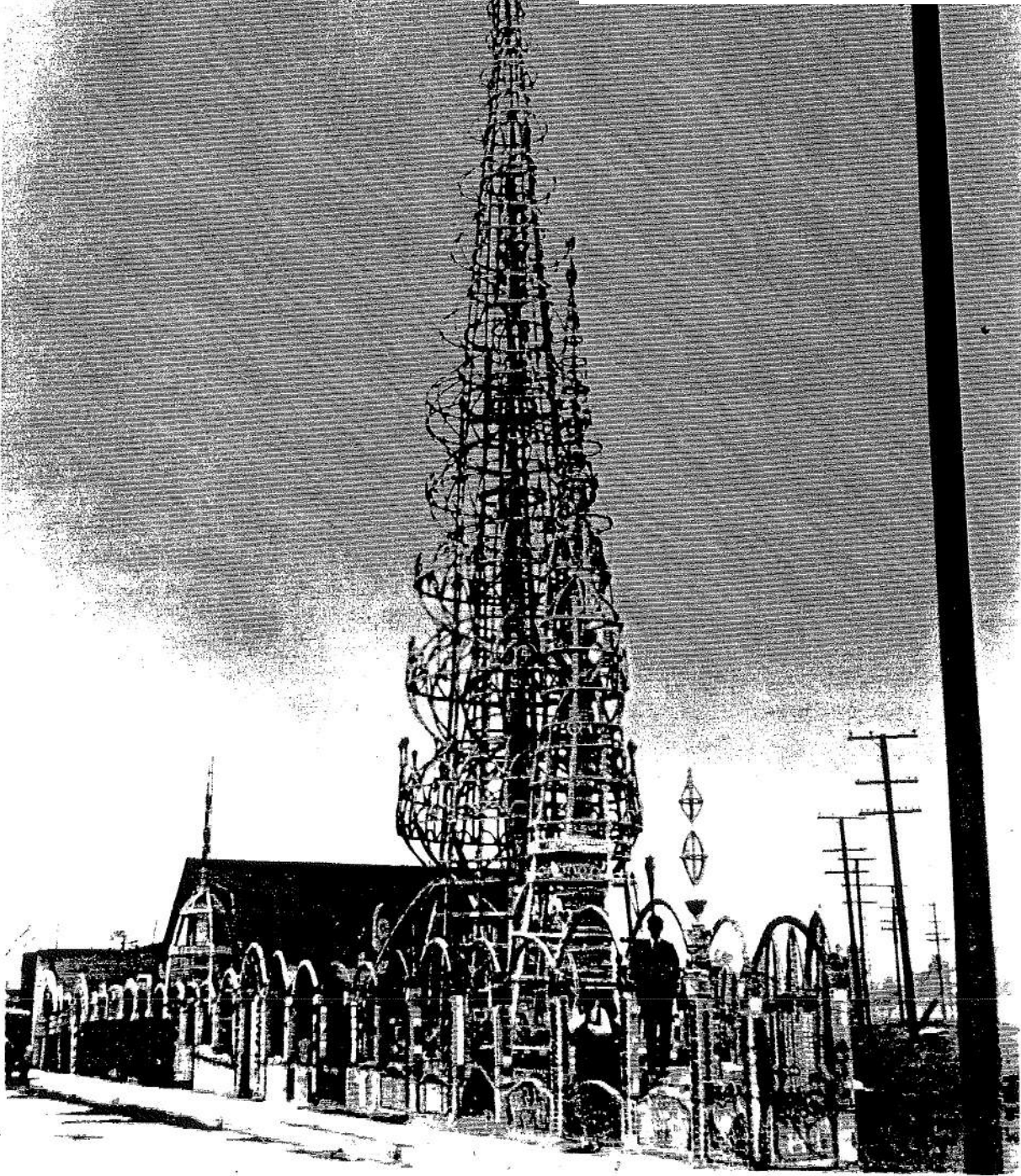
Watts. 1938

Figure 1: Center Tower, tallest in photo. View from north. Shows 10 large, outer rings and bands supported by 16 vertical columns. East Tower on left, Gazebo & Rodia house on right. c.1938



The photo was taken by James Watt  
Recuerdo de BRO. SAM. RODIA  
Diciembre. 1936 Watts' Calif.

Figure 2: Center Towerm tallest in photo. View from southeast. Shows large, outer rings and bands supported by 16 vertical columns. Wall, house 'A' Tower, on left and East Tower & Ship mast on right. c.1936



## GLASS TOWERS AND DEATH RUM

SIMON RODILLA is happy, nowadays. By accident, he discovered the joy of creative work and the remedy for his great trouble. The two were really one, and a famous observer might say that the cure came from bottles.

'Twenty years ago,' Simon explains himself, 'I am all time *borracho* --- what you say drunk. My head, she is all time big like --- like hard can! She is big so she will hold the great aching from my drink. Then, one day, I am forget to drink! Like this!'

Simon is a tile-setter and a bachelor. For many years he has owned a home at 1765 East 107th Street, Watts. Seven teen years ago he began to build a tile wall around the lot. It was his own wall; no architect good by to specify size and lines; Simon could let his fancy direct his hand.

'It is plenty fun! So I build my wall so much I am forget to drink. Then I am think of towers and not to drink. So ---'

Today, three huge towers and many smaller ones stand about his home. Built of tile, glass, empty bottles, they shimmer like peacock feathers and are visible for miles. Simon draws humorous parallels between the bottles of today and those of yesterday. Now, the empty flasks of other drinkers supply his materials. He, sober and happy, builds no dreams from bottles that are full.

Figure 3. Center Tower, tallest in sketch. View from southeast. Shows 8 more support columns than in 1929. L to R vertical columns. Wall, house, 'A' Tower, on left and East Tower & Ship mast on right. Story is typical of Rodia "guites". c1939.

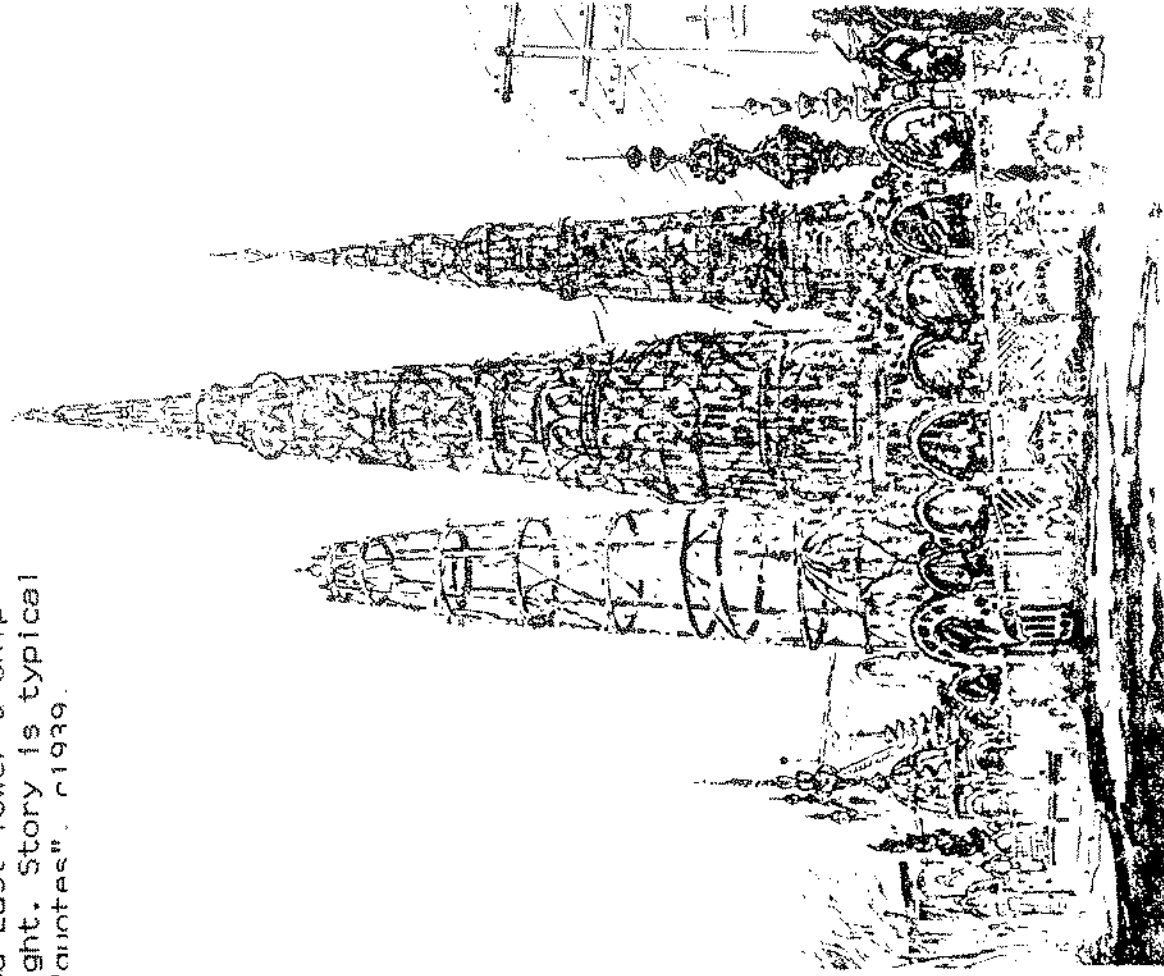
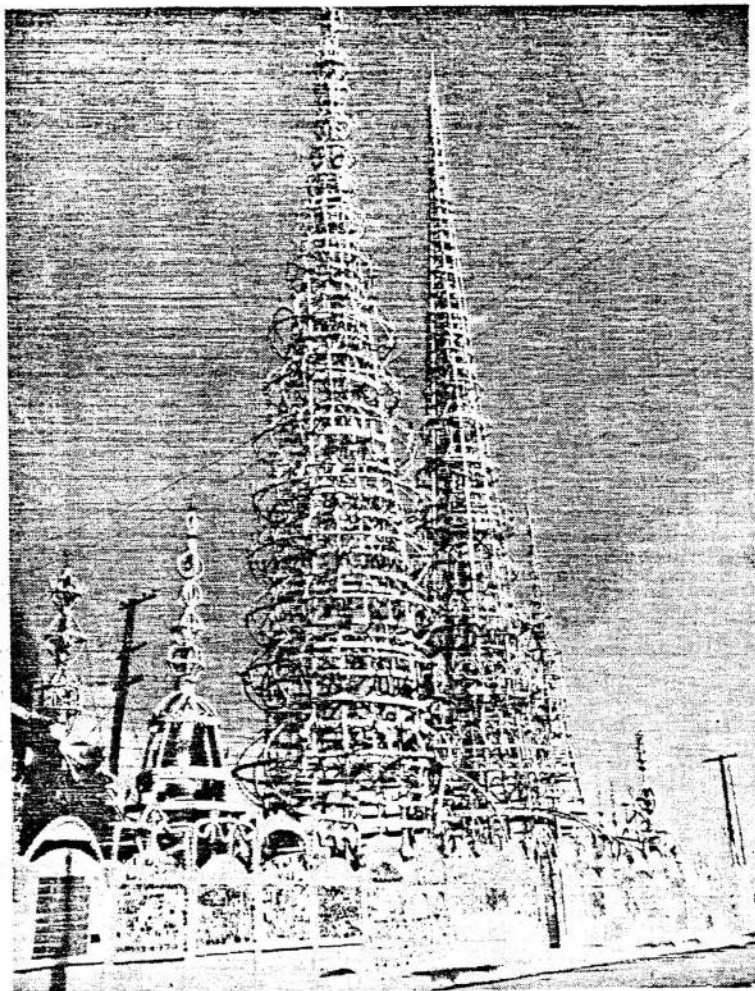


Figure 4: Center Tower, right of West Tower, tallest in photo. View from southeast. Shows large, outer rings and bands. Published March 1947

## DREAM TOWERS



It was all by chance one day in taking a walk, I encountered a bit of old Russia, the ornateness of Switzerland, and the romanticism of Italy.

Yes, hidden away in the little town of Watts are the most unique bit of achievement accomplished by one man who for 22 long years has been laboring patiently to build an edifice for the enjoyment of you and I.

From a distance one wonders what in the world are these towers? Perhaps they are an electrical tower? Then perhaps it is something to do with oil wells? Wrong again!

They are dream towers fashioned by an artist whose sense of symmetry, and color blending against the blue skies of California form an unforgettable picture in the mind.

Who made them? Why? Was it because of a woman? These are some of the questions which crowd into the mind. It is easily answered. All you have to do is to go to 1765 E. 107th Street.

There you will meet a small wiry man called Samuel Rodilla. He will answer some of the questions for you, and others you will have to deduce for yourselves.

According to Mr. Rodilla's story for the reason of building these unusual towers was all due to the fact he was once an excessive drinker. One day he decided to stop wasting his life and money. He looked about his house to find it littered with all types of bottles. Then and there he decided to make use of them. He did!

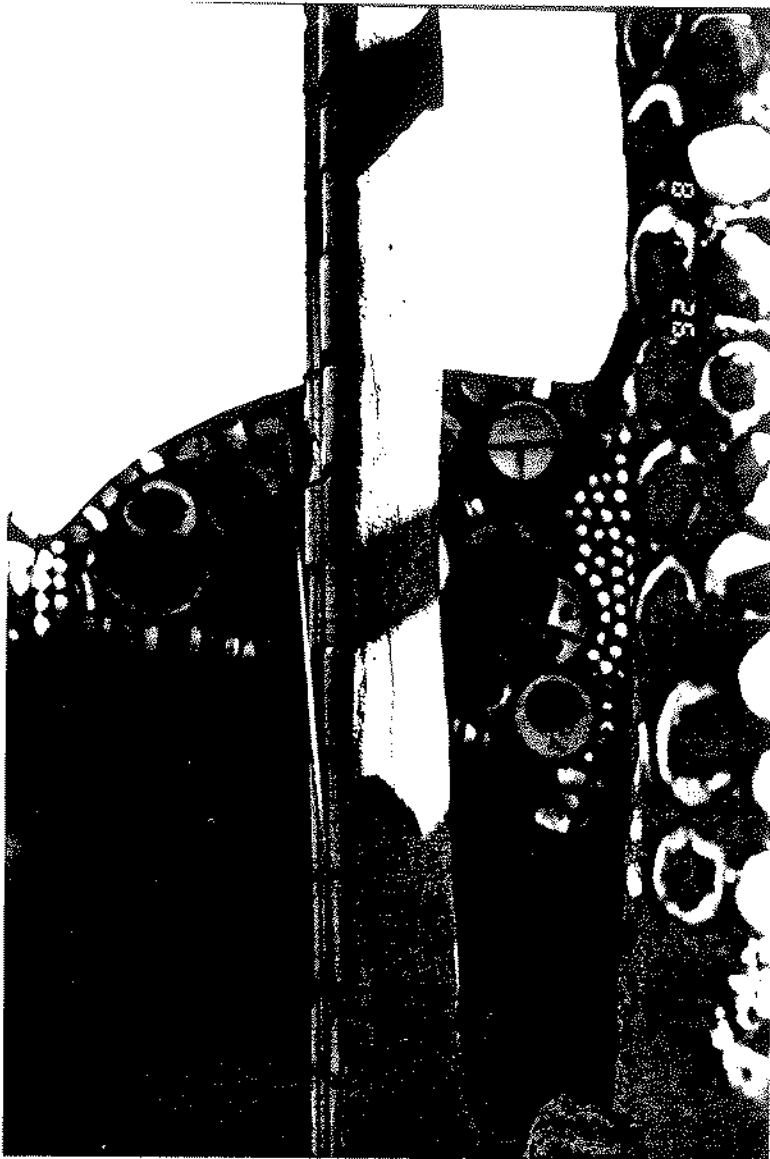


Figure 6. Center Tower column crack near ground. January 1992.



Figure 7. Center Tower column crack near ground. January 1992.

Figure 8. Center Tower column crack near ground. January 1992.

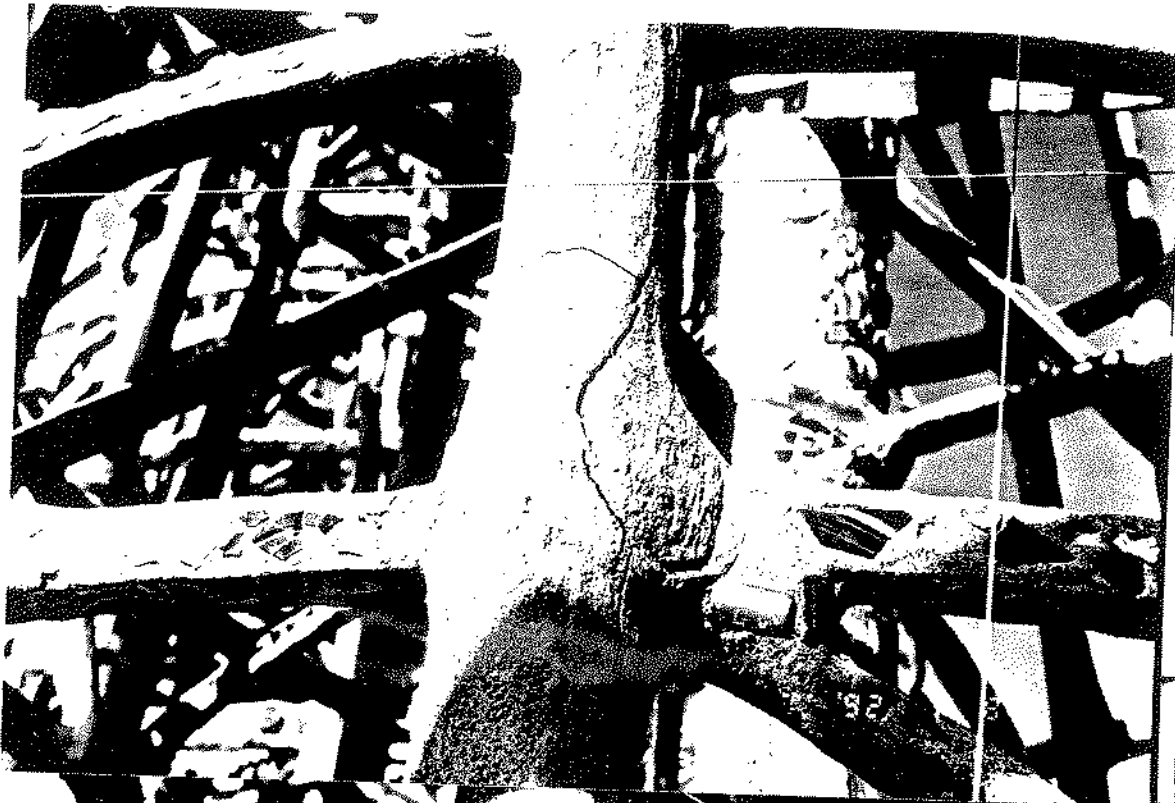


Figure 9. Center Tower column crack at joint. January 1992.



Figure 10. Center Tower cracks 8 feet above patio in joint. January 1992.



Figure 11. Center Tower column cracks above & below joint, 9 feet above patio. January 1992.





Figure 12. Center Tower pipe with cover removed. February 1992.



Figure 13. Center Tower ornaments covered by prior repair. February 1992.



Figure 14. Center Tower crack opened to disclose ornaments covered by prior repair. January 1993.



Figure 15. Center Tower crack opened to disclose ornaments covered by prior repair. January 1993.



Figure 16. Center Tower column (right center) near base. Cracks above have caused water intrusion. Before temporary repairs. 1/11/93 photo.

*TOP LEFT*

Figure 17. Center Tower column near base. See cracks in mortar (lower center) and between rocks in base. Before temporary repairs. 1/11/93 photo.

*TOP RIGHT*

Figure 18. Center Tower base showing crack through rocks. Before temporary repairs. 1/11/93 photo.

*LOW LEFT*



Figure 10. Center Tower showing some of nine support columns wrapped with plastic to impede rain water intrusion into large cracks in mortar. 1/11/93 photo.

Figure 19.

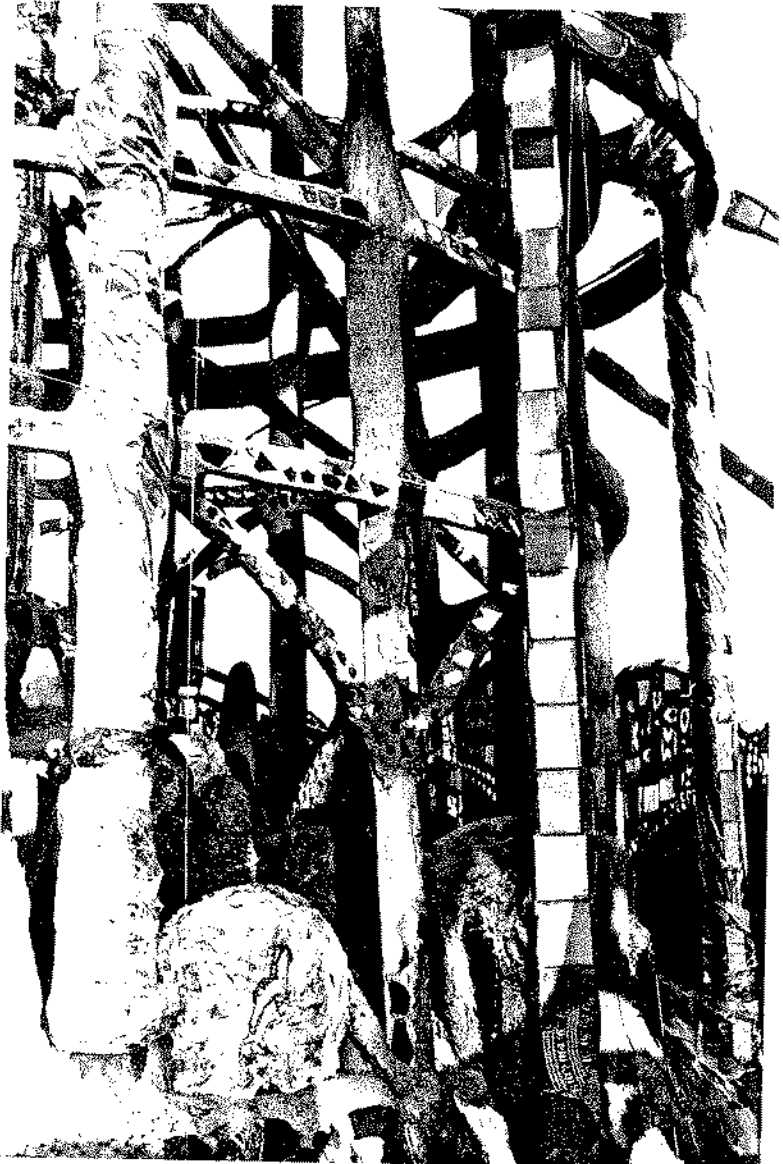


Figure 11. Center Tower showing some of nine support columns wrapped with plastic to impede rain water intrusion into large cracks in mortar. 1/11/93 photo.

Figure 20.



Figure 12. Center Tower showing some of nine support columns wrapped with plastic to impede rain water intrusion into large cracks in mortar. 1/11/93 photo.

Figure 21.

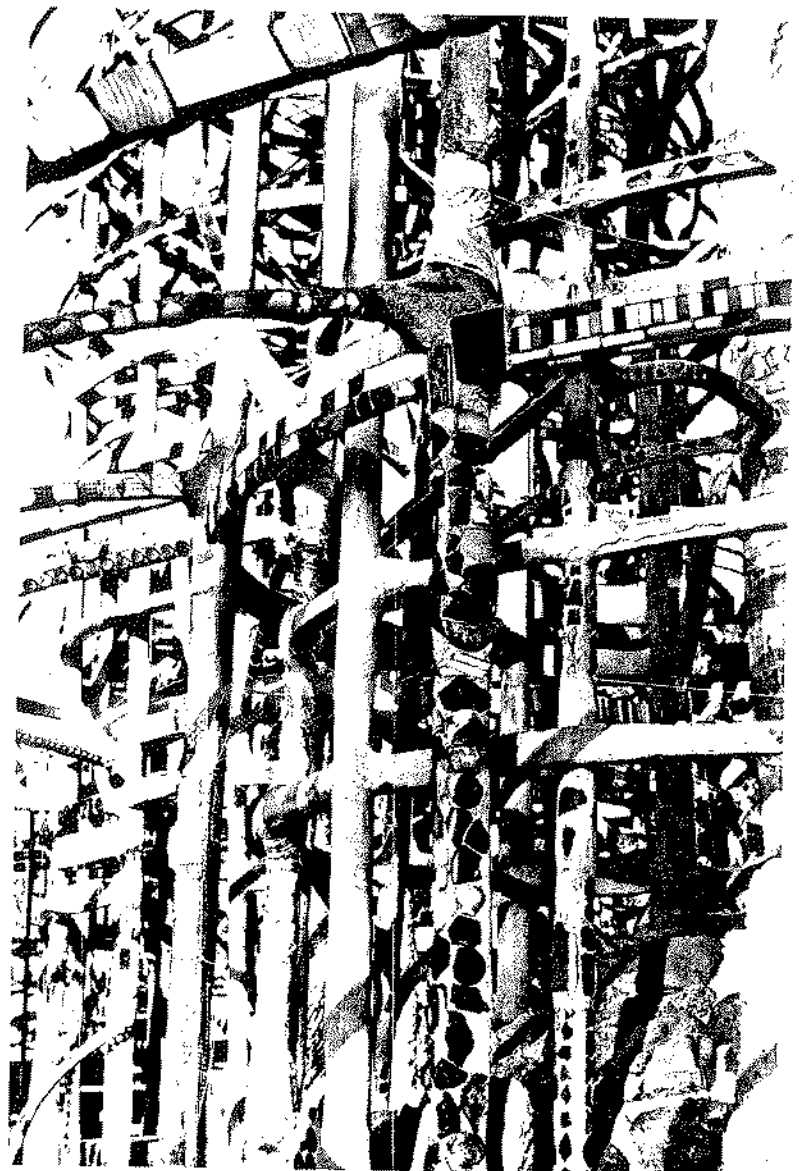


Figure 13. Center Tower showing some of nine support columns wrapped with plastic to impede rain water intrusion into large cracks in mortar. 1/11/93 photo.

Figure 22.

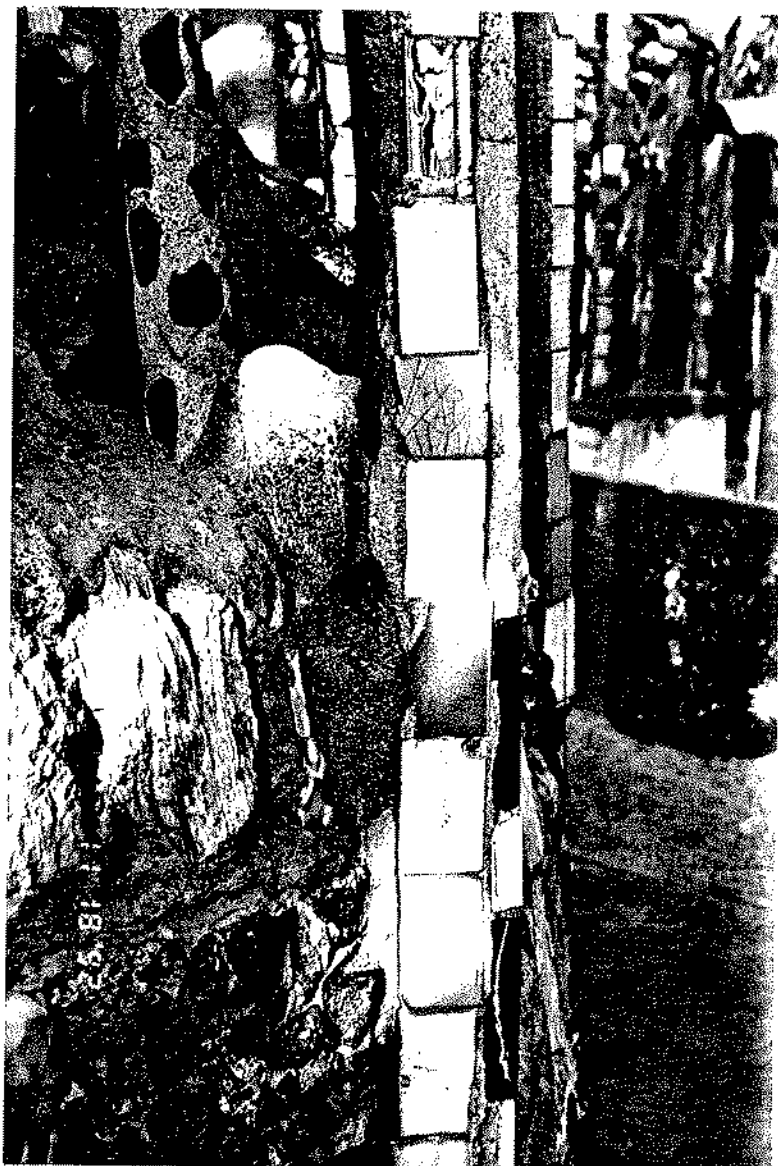
Photograph 31. Center Tower crack through 1985 State repair of main vertical support column. November 18, 1992.

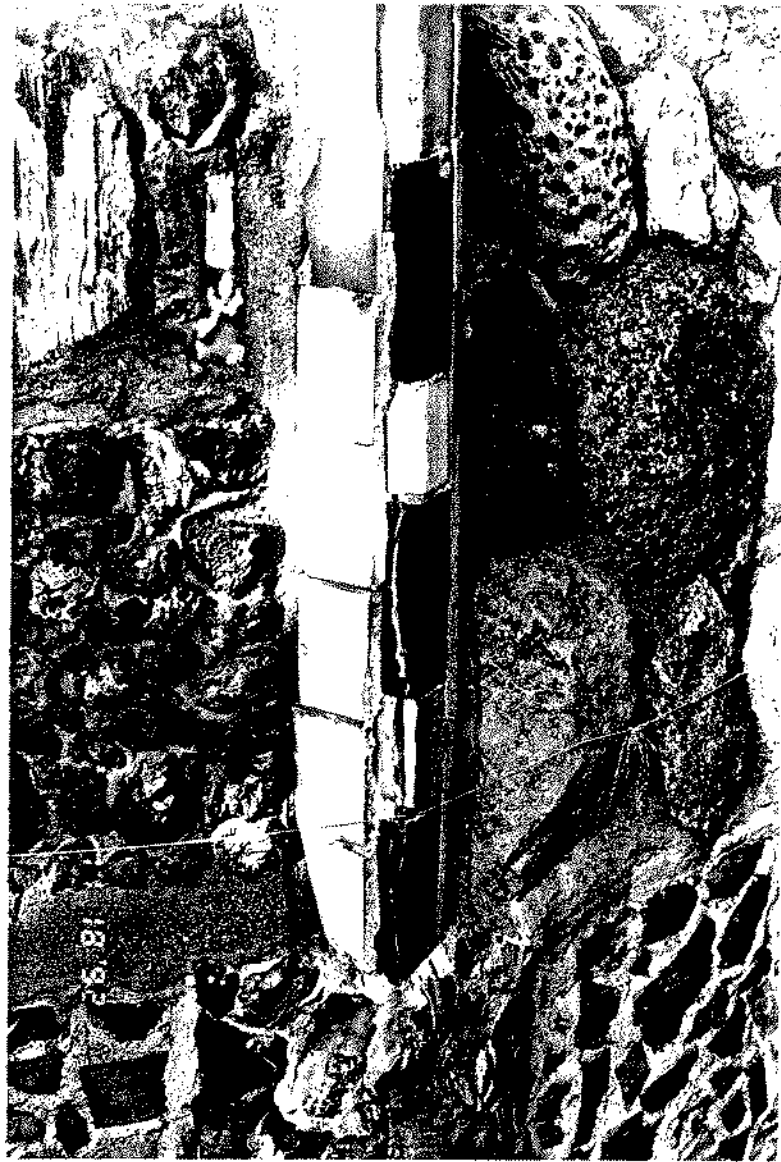
Figure 23.



Photograph 32. Center Tower cracks through 1985 State repairs to main vertical support column near base. November 18, 1992.

Figure 24.





Photograph 33. Center Tower cracks through 1985 State repairs to main vertical support column near base. November 18, 1992.

Figure 25.

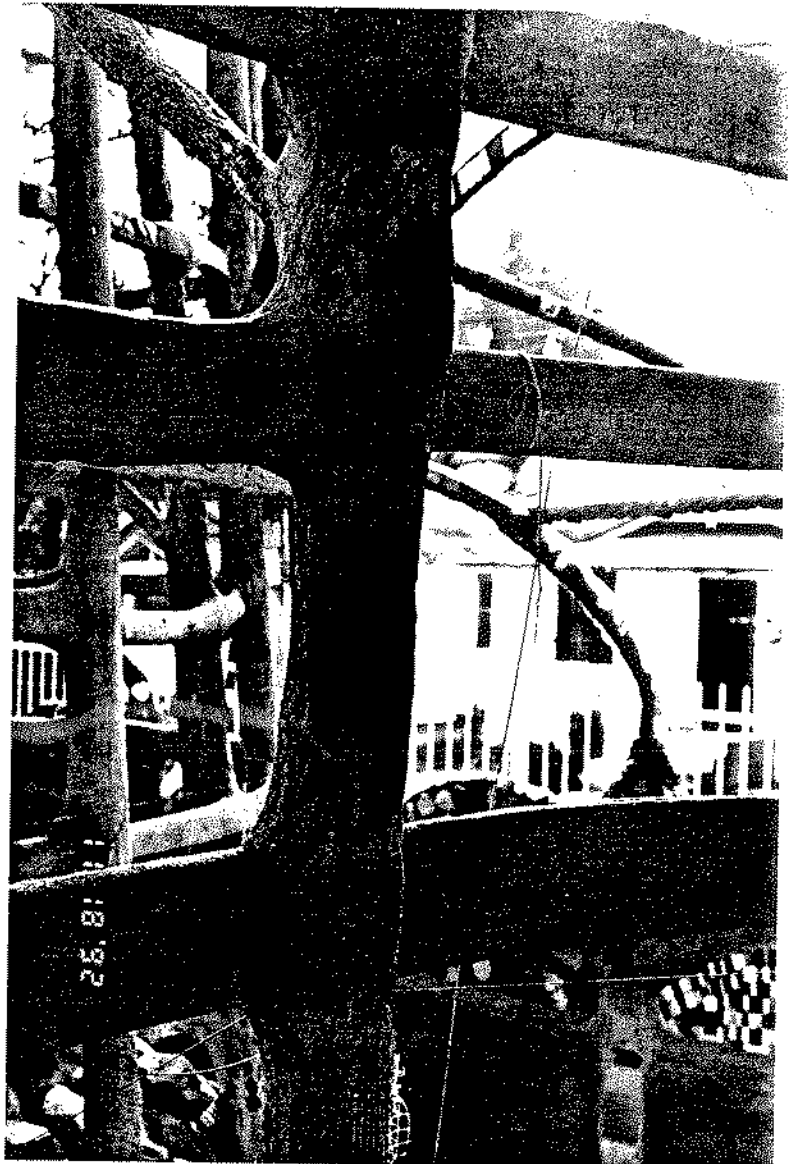
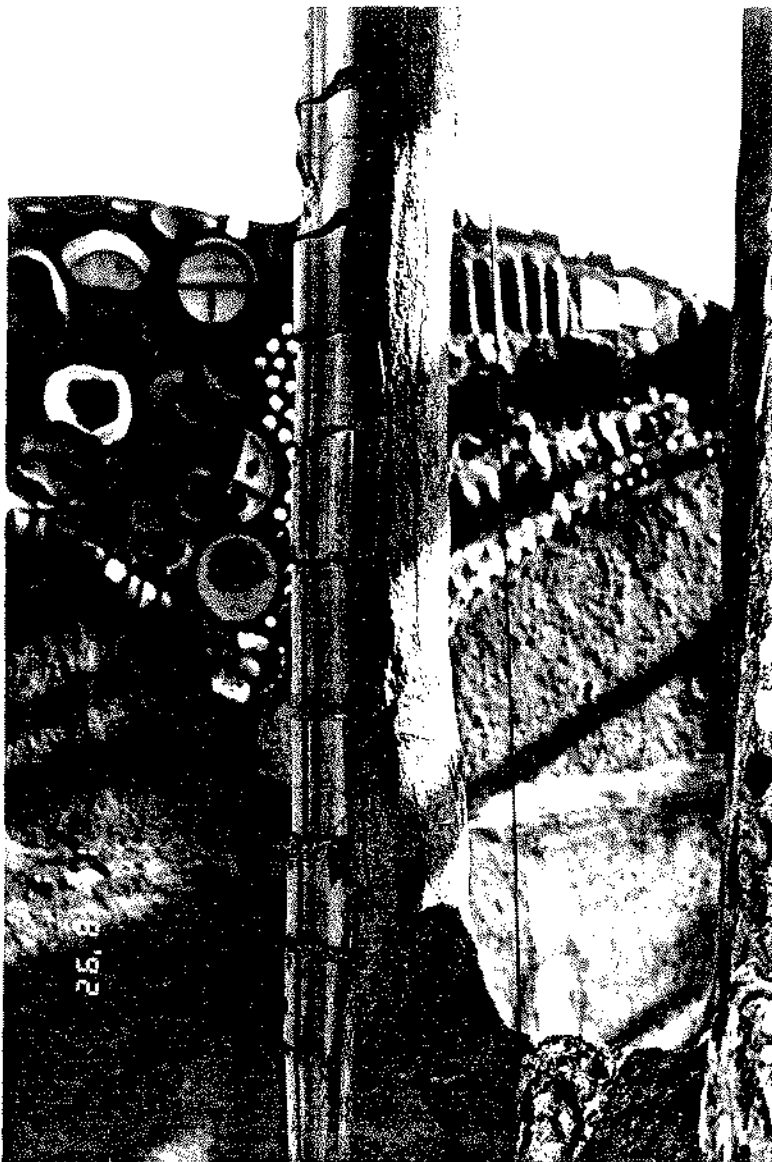


Photograph 34. Center Tower cracks through test area in main vertical support column near base. November 18, 1992.

Figure 26.

Photograph 35. Center Tower cracks through 1985 State repairs to main vertical support. November 18, 1992.

Figure 27.



Photograph 36. Center Tower cracks through 1985 State repairs to main vertical support. November 18, 1992.

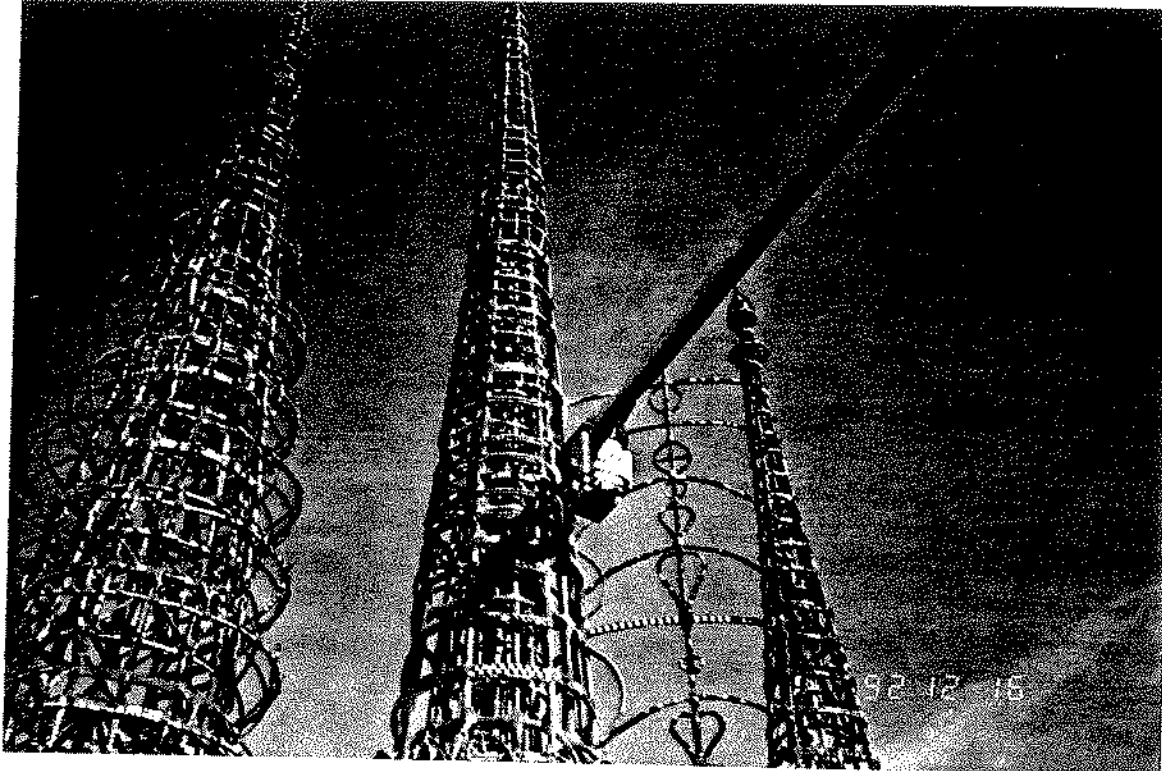
Figure 28.



Photograph 37. Center  
Tower cracks through  
1985 State repairs to  
main vertical support.  
November 18, 1992.

Figure 29.





Photograph 38. Boom approaching Center Tower from south side on 107th Street. December 16, 1992.

Figure 30.



Photograph 39. Center Tower crack in joint inside surface before repair from boom bucket. December 16, 1992.

Figure 31.

Photograph 40. Extensive crack in Center Tower vertical column before repair from boom bucket. December 16, 1992.

Figure 32.



Photograph 41. Repair in progress in Center Tower vertical column. December 16, 1992

Figure 33.

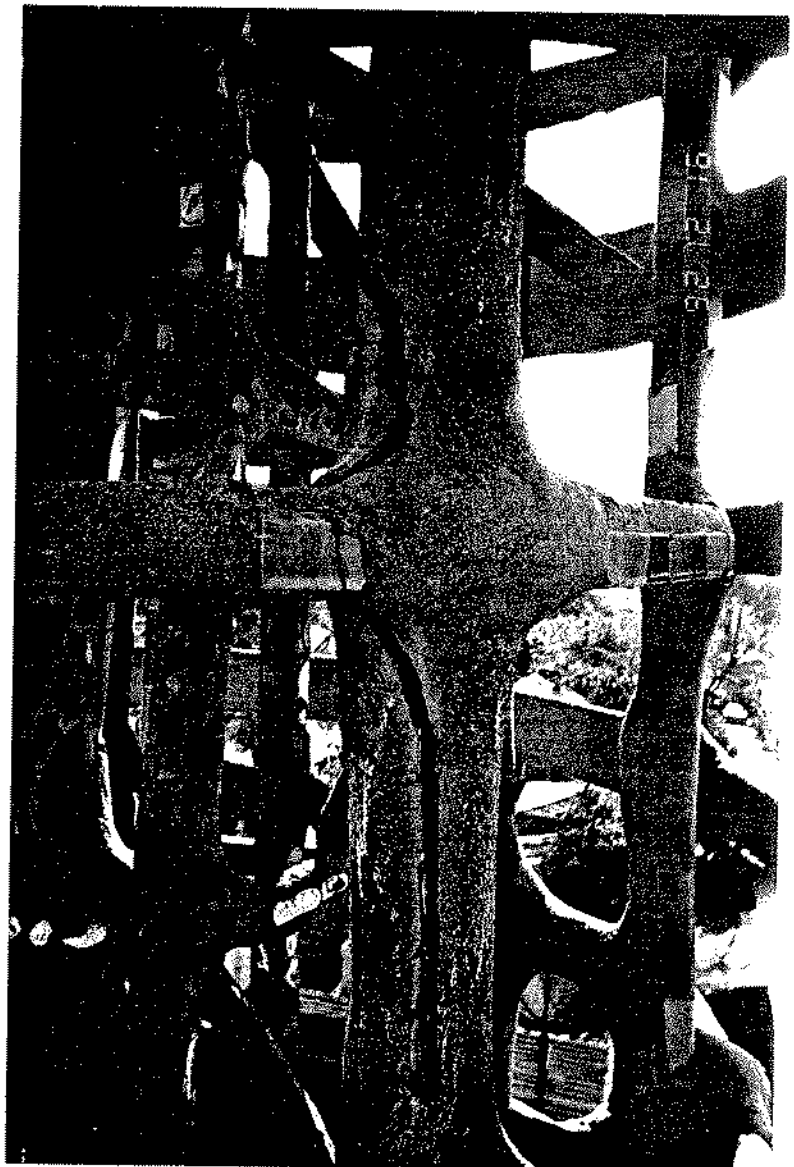
Photograph 44. Crack near top of vertical column of connecting structure between East & Center towers. 50 foot elevation. December 16, 1992

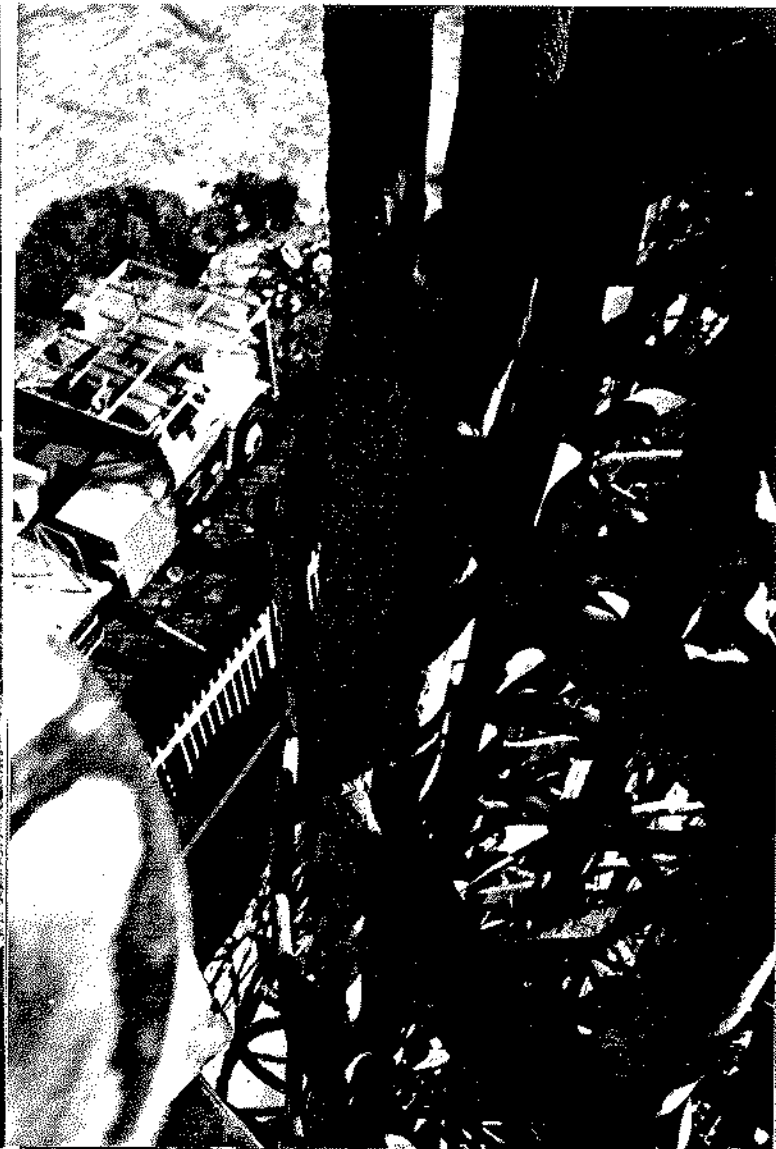
Figure 34.



Photograph 45. Crack in Center Tower vertical column and horizontal band before repair from boom bucket. December 16, 1992

Figure 35.





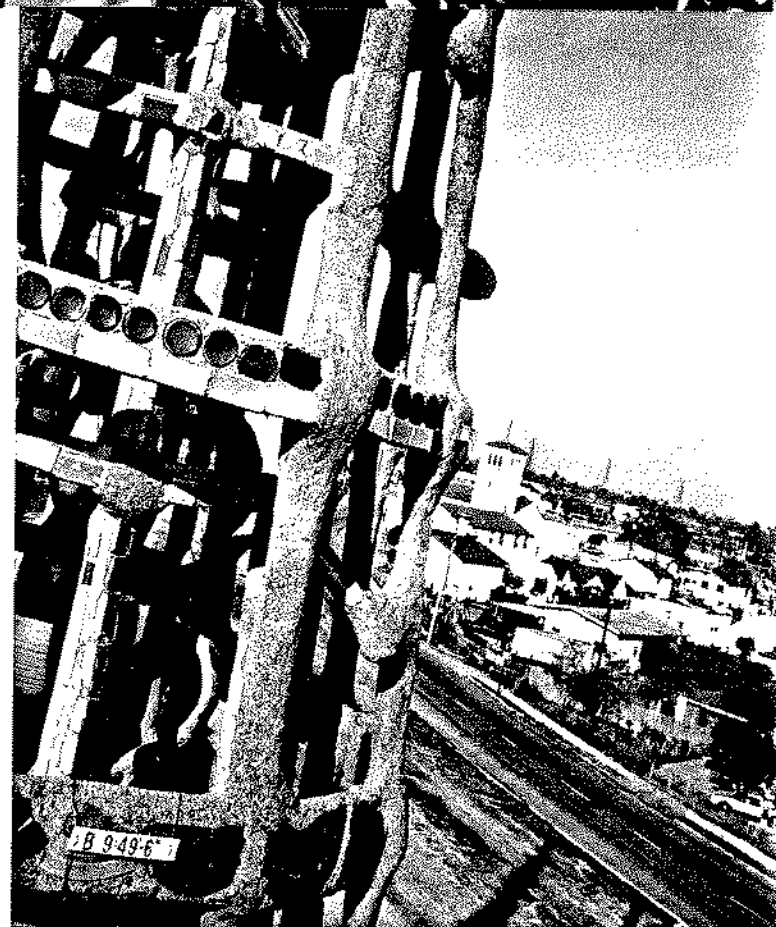
Photograph 46. Crack in Center Tower vertical column before repair from boom bucket. December 16, 1992  
Figure 36.

Photograph 47. Crack in Center Tower vertical column before repair from boom bucket. December 16, 1992

Figure 37.

Photograph 48. Crack in Center Tower vertical column before repair from boom bucket. 55 foot elevation. December 16, 1992.

Figure 38.



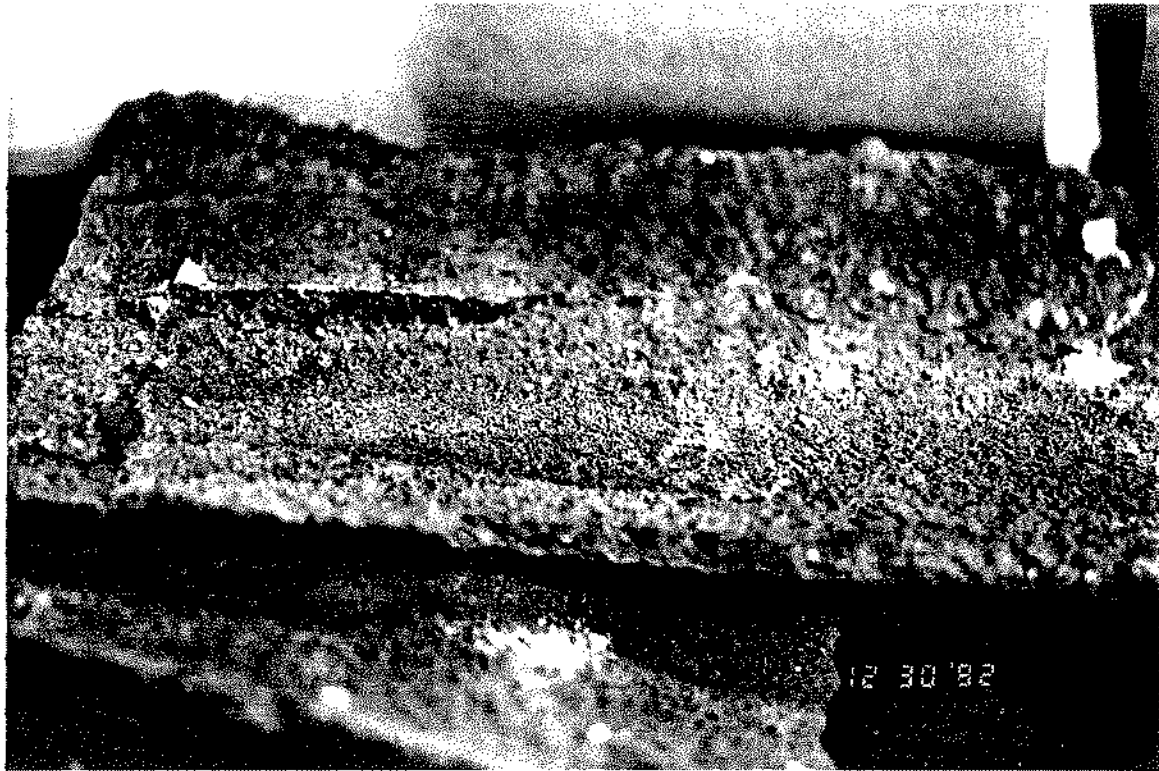
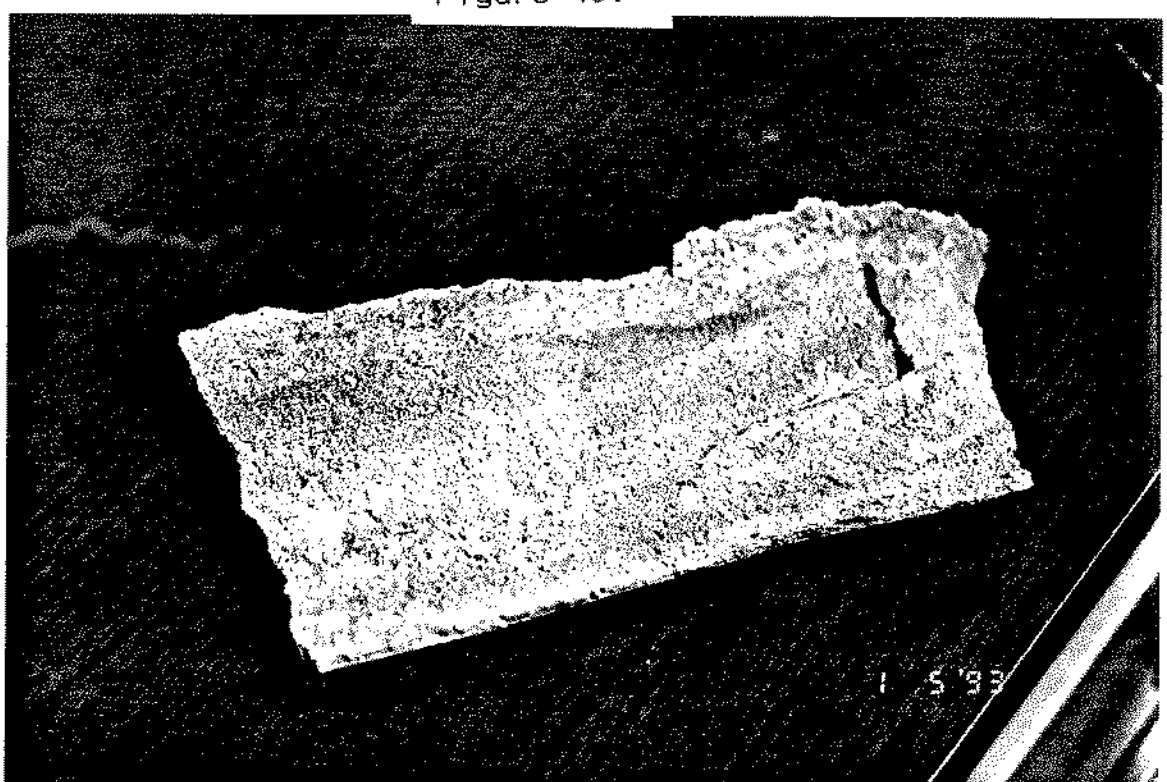


Figure 01. Center Tower. State of CA repair mortar c1983 which separated from original, Rodia work. Piece shows impression of ornaments which had been covered by repair erroneously. 12/30/92 photo.

Figure 39.

Figure 02. Center Tower. State of CA repair mortar c1983 which separated from original, Rodia work. Piece shows impression of ornaments which had been covered by repair erroneously. 1/5/93 photo. Figure 40.



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ELEV CODE	VIEW SEQ	ASPECT	ELEV (FEET)	DATE	MATERIALS TECH. #1	TECHNIQUE #1	LOCATION #1	PLACES #1	CRACKS FILL#1	SHELLS #1	TILES #1	GLASS #1	POTTERY #1
A	NNN	O	4	4/25/90	XYLENE,DF104/ B-72	CLEAN/CONSOLI DATE SHELLS	LOWER BASE	23		23			
A	NNE	O	4	4/25/90	XYLENE,DF194/ B-72	CLEAN/CONSOLI DATE SHELLS	BASE	2		2			
A	NNE	O	4	1/11/93	JAHN M90	OPEN/FILL CRACK-15" BY 1" WIDE	EC01	1	1				
A	NNE	O	4	1/11/93	JAHN M70-11A	OPEN/FILL CRACK-25" BY 1" WIDE	EC01 COLUMN	1	1				
A	WWN	O	4	4/25/90	XYLENE,DF104/ B-72	CLEAN/CONSOLI DATE SHELLS	BASE	30		30			
A	NNW	O	4	4/25/90	XYLENE,DF104/ B-72	CLEAN/CONSOLI DATE SHELLS	BASE	19		19			
B	NNE	O	8	1/12/93	JAHN M90 MORTAR	REMOVE/ATTACH TILES,FILL CRACK	EC02	20	1		19		
B	EEE	O	8	1/14/92	GRINDER, CHISEL,	CUT & REMOVE MORTAR	MC02	1					
B	EEE	O	8	1/21/92	GRINDER, CHISEL,	CUT & REMOVE MORTAR	MC02	14			7		
B	EEK	O	8	1/22/92	GRINDER, CHISEL,	CUT & REMOVE MORTAR	MC02 JOINT	2					
B	EEE	O	8	1/28/92	STEEL & GRINDER	PREPARE SPACERS FOR BAND-MAJV	MAJVMC02 & B01/02	2					
B	EEE	O	8	2/18/92	MESH, WIRE	TIE NEW MESH AROUND MC02 & B2	MC02 & B02	2					
B	EEE	O	8	2/20/92	CEMENT MORTAR	APPLY 1ST COAT, REBOND TILE	MINOR V03	2	1		1		
B	EEE	O	8	2/21/92	CEMENT MORTAR	REBOND FRAGS, APPLY MORTAR	MINOR V03,MAJHO	2	1				
B	EEE	O	8	3/09/92	CEMENT MORTAR	REBOND FRAGS, APPLY MORTAR	MC02,MJHO 1,02	2	2				

WIDTH 2

# 1

VIEW	DATE #2	MATERIALS		LOCATION #2	PLACES TECH.#2	CRACKS FILL #2	SHELLS #2	TILES #2	GLASS #2	POTTERY #2
		TECH. #2	TECHNIQUE #2							
NNN	8/11/94	CALCULATIONS	MEASURE	ENTIRE	1					
			MEMBERS FOR	SCULPTURE						
			WEIGHT EST							
NNE	1/11/93	JAHN M70-11A	OPEN/FILL	MC01	1	1				
		RED MORTAR	CRACK							
NNE										
NNE										
WWN										
NNW										
NNE										
EEE	1/14/92	GRINDER, CHISEL,	REMOVE RUST 2 1/2" (2")	MC02	1					
EEE	1/21/92	GRINDER, CHISEL,	REMOVE RUST, RUSTED WIRE & MESH	MC02	1					
EEE	1/27/92	ACETONE, SIKADUR 23	CLEAN, REBOND TILES; REMOVE RUST	MC02 &	9			7		
EEE	2/04/92	STEEL MESH	ADD MESH TO MC02	MC02	1					
EEE	2/19/92	CEMENT MORTAR	APPLY 1ST COAT ON MC02	MC02	1					
EEE	2/20/92	CEMENT MORTAR	REBOND 3 FRAGMENTS	MINOR V 03	3	3				
EEE	2/24/92	CEMENT MORTAR	REBOND TILES, APPLY MORTAR	MC02, MH02	4			3		
EEE	3/10/92	CEMENT MORTAR	REBOND TILES	MC02, MAJH01	7			7		



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REPAIRS TO FEBRUARY 1996

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ELEV CODE	VIEW SEQ	ASPECT	ELEV (FEET)	DATE #1	MATERIALS TECH. #1	TECHNIQUE #1	LOCATION #1	PLACES #1	CRACKS FILL#1	SHELLS #1	TILES #1	GLASS #1	POTTERY #1
B	EEE	0	8	3/11/92	CEMENT MORTAR	REBOND TILE, APPLY MORTAR	MC02	2				1	
B	SEE	0	8	1/19/93	JAHN M90 MORTAR	OPEN, FILL MINOR CRACKS	MC04	2	2				
B	SEE	0	8	1/27/93	CHISEL/HAMMER	OPEN CRACKS, REMOVE POOR REPAIR	MB02 & MC03	3					
B	SWS	0	8	1/21/93	JAHN M90 MORTAR	CLEAN, FILL CRACKS	MC08	3	3				
B	SWS	0	8	2/01/93	GRINDER	DETACH 6 FT OF MORTAR FRAGMENTS	EC06	2					
B	SWS	0	8	2/10/93	MESH, JAHN M90 MORTAR	DERUST, WRAP W/MESH, APPLY M90 MORTAR	EC06 71" X 8"	5	2				
B	SWS	0	8	2/17/93	JAHN M90 MORTAR	GRIND FRAGS, REATTAC H TO MEMBER	EC06	6	6				
B	WWW	0	8	1/21/93	JAHN M90 MORTAR	CLEAN/FILL CRACKS	EC07, EBAND01	4	4				
B	WWN	0	8	2/09/93	GRINDER, CHISEL,	REMOVE MORTAR/ORNAME REINFORCE NTS	EC06	25			24		
B	NNW	0	8	3/01/93	JAHN M90 MORTAR	CLEAN/FILL CRACK, ATTACH TILE	EC08	4	1			1	
C	NNN	0	12	2/01/93	JAHN M90 MORTAR	FILL CRACKS/GAP- REATTACH	IC01	4	4				
C	NNE	0	12	1/19/93	JAHN M90 MORTAR	CLEAN/REATTAC H FRAGMENTS	EC02	8	1		7		
C	NNE	0	12	1/25/93	B72 & ACETONE	BOND TILE/FRAGMENT S	EC02 TO EB01	4	1				
C	NNE	0	12	1/27/93	JAHN M90 MORTAR	FILL GAPS/CRACKS; A TTACH FRAGS	EC02 & JT W/EB01	6	6				

VIEW	DATE #2	MATERIALS		LOCATION #2	PLACES TECH.#2	CRACKS FILL #2	SHELLS #2	TILES #2	GLASS #2	POTTERY #2
		TECH. #2	TECHNIQUE #2							
EEE	3/16/92	CEMENT MORTAR	REBOND TILES, APPLY MORTAR	MC02, MAJH 01	3	1		2		
SEE	1/20/93	JAHN M90 MORTAR	OPEN, CLEAN, F ILL CRACK - TEMP!	MC04 & B01 JOINT	1					
SEE	2/23/93	JAHN M90 MORTAR	FILL CRACKS- TEMPORARY	MC03	3	3				
SWS	2/02/93	GRINDER	REMOVE RUST IN ANGLE, 2 4FT-LONG	EC06 ANGLE	2					
SWS	2/01/93	GRINDER	OPEN CRACKS/ STEEL REBAR	GOOD ANGLE EC06	3					
SWS	2/16/93	JAHN M90 MORTAR	REMOVE, CLEAN , REATTACH FRAGS	EC06	4	3				
SWS	2/22/93	JAHN M90 MORTAR	APPLY MORTAR COATS	EC06	2					
WWW	1/22/93	JAHN M90 MORTAR	CLEAN/FILL CRACKS	EC07	2	2				
WWN										
NNW										
NNN										
NNE	1/20/93	JAHN M90 MORTAR	OPEN CRACK, CLEAN, REBOND FRAGS	EC02	2					
NNE	1/26/93	GRINDER, CHISE L	OPEN MAJOR CRACKS/CLEAN CRUMBLING	MC01 & IC01/IB02	2					
NNE	2/22/93	JAHN M90 MORTAR	DETACH SPALL AREA, APPLY	MAJH03/MC 01	2	2				

ELEV	VIEW	ELEV	MATERIALS	LOCATION	PLACES	CRACKS	SHELLS	TILES	GLASS	POTTERY
CODE	SEQ	ASPECT	(FEET)	DATE #1	TECH. #1	TECHNIQUE #1	#1	#1	#1	#1
-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
C	NNE	0	12	1/15/92	GRINDER, CHISEL,	REMOVE CRACKED MORTAR	MC02	1		
C	NNE	0	12	2/25/92	CEMENT MORTAR	APPLY 1ST COAT OVER JOINT	MC02, BAND 1/2	2		
C	EEE	0	12	12/12/95	GRINDER, CHISEL	OPEN MORTAR WINDOW TO CHECK FAILURE	EB04, EB01	3	0	
C	SEE	0	12	2/01/93	JAHN M90 MORTAR	CLEAN/FILL CRACK/REBOND FRAGMENT	MB02	3	3	
C	SSS	0	12	1/29/96	CEMENT MORTAR	APPLY CEMENT MORTAR TO SHAPE MEMBER	MB01 BET MC05-MC04	2	0	
D	SSS	0	16	1/19/96	GRINDER, CHISEL AND	CUT/REMOVE REPAIR MORTAR OVER	MC04	3	0	
D	SSS	0	16	1/25/96	SIKADUR23,SPA TULE	BOND TILE/TILE FRAG. WITH	MC04	17	8	17
E	SSS	0	20	1/19/96	SIKADUR23;SPA TULE	BOND TILE FRAGMENTS W/ SIKADUR 23	MC04	72	36	72
F	WVN	0	24	12/16/92	JAHN M70 MORTAR	CLEAN/TEMP FILL MAJOR CRACKS	EC07 JT W/EB06/MB	2	2	
F	WVN	0	24	12/16/92	JAHN M70 MORTAR	CLEAN/TEMP FILL CRACKS OF MC04	MB02 RT MC04	3	3	
F	NNW	0	24	12/16/92	JAHN M70 MORTAR	CLEAN/TEMP FILL CRACK	MC08 BETW MB04	2	2	
I	WSW	0	36	3/02/93	JAHN M90 MORTAR	CLEAN/TEMP FILL CRACKS	BAND06 JYS	2	2	
J	EEE	0	40	3/02/93	JAHN M90 MORTAR	CLEAN/TEMP FILL CRACKS	EC05 BAND 07	1	1	
J	EEE	0	40	3/02/93	JAHN M90 MORTAR	CLEAN/TEMP FILL CRACKS	SPOKE TO CENTER	1	1	
J	SSS	0	40	3/02/93	JAHN M90 MORTAR	CLEAN/TEMP FILL CRACKS	INSIDE EC04/IB08	1	1	
K	WSW	0	44	3/02/93	JAHN M90 MORTAR	CLEAN/TEMP FILL CRACKS	EC04 & B33-44'	5	5	

VIEW	DATE #2	MATERIALS		LOCATION #2	PLACES TECH.#2	CRACKS FILL #2	SHELLS #2	TILES #2	GLASS #2	POTTERY #2
		TECH. #2	TECHNIQUE #2							
NNE	1/15/92	GRINDER, CHISEL,	REMOVE RUSTED MESH & WIRE	MC02	1					
NNE	2/26/92	CEMENT MORTAR	APPLY 2ND COAT OF CEMENT	MC02 & B01/ B02	2					
EEE										
SEE	12/14/95	WOOD, STEEL PIPE;SCAFOLD	TEMPORARY PROP-UP TO REPLACE	EC04, EB01	4	0				
SSS	1/30/96	CEMENT MORTAR	APPLY CEMENT MORTA R TO SHAPE	MC04 BEF MB01/MB02	3	0				
SSS	1/23/96	GRINDER, CHISE L AND HAMMER	CUT/REMOVE REPAIR OVER ORNAMMENTS	MC04	3	0				
SSS										
SSS	1/24/96	GRINDER, CHISEL	GRIND OFF INNER MORTAR TO	MC04	37	0				
WWN	12/16/92	JAHN M70 MORTAR	CLEAN/TEMP FILL CRACKS	EC07 BETW EB06	2					
WWN										
NNW	12/16/92	JAHN M70 MORTAR	CLEAN/TEMP FILL CRACKS	EC07 JT WITH EB06	1	1				
WSW										
EEE	3/02/93	JAHN M90 MORTAR	CLEAN/TEMP FILL CRACKS	VARIOUS	7	7				
EEE	3/02/93	JAHN M90 MORTAR	CLEAN/TEMP FILL CRACKS	B06	1	1				
SSS	3/02/93	JAHN M90 MORTAR	CLEAN/TEMP FILL CRACKS	EC06	3	3				

WSW

ELEV CODE	VIEW SEQ	ASPECT	ELEV (FEET)	DATE #1	MATERIALS TECH. #1	TECHNIQUE #1	LOCATION #1	PLACES #1	CRACKS FILL#1	SHELLS #1	TILES #1	GLASS #1	POTTERY #1
L	SSS	0	48	3/02/93	JAHN M90 MORTAR	CLEAN/TEMP FILL CRACKS	EC05 & EB05	1	1				
M	WWW	0	52	12/06/95	GRINDER, METAL LATH#3.4; CEMENT	CLEAN RUST MATERIALS; ATT ACH NEW MESH	EC01, EB09	2	0				
M	WWW	0	52	12/06/95	GRINDER, METAL	CLEAN RUST MATERIALS; ATT ACH NEW MESH	EC07, EB09	4	0				
N	EEE	0	56	10/03/95	GRINDER, CHISEL AND	CUT OPEN MAJOR CRACKS TO LOOK	EC03, B011-B012	4	0				
N	EEE	0	56	10/10/95	GRINDER	CUT TWO RUSTED STEEL ANGLES	EC03, BET.	4					
N	EEE	0	56	10/16/95	2" STEEL CHANNEL,	WELD NEW STEEL SUPPORTS IN	EC03, BET.	8	0				
N	SSS	0	56	1/25/96	GRINDER, CHISEL	CUT/REMOVE MORTAR CHECK STEEL FAILURE	EC05, BET EB11/EB12	2					
N	WSW	0	56	1/26/96	GRINDER, CHISEL	CUT/REMOVE MORTAR CHECK STEEL FAILURE	EC05 BET EB09/EB10	2	0				
O	NNN	0	60	11/01/95	GRINDER, CHISEL AND	CUT/REMOVE REPAIR MORTAR;	EC01, EC08	2	0				
O	NNN	0	60	11/03/95	GRINDER, CHISEL AND	CUT/OPEN CRACKS TO CHECK STEEL	EC01	2	0				
O	EEE	0	60	10/25/95	CEMENT MORTAR	APPLY AND BUILD JOINTS W/ CEMENT	EC04 & EB24	5	0				
O	SSS	0	60	1/18/96	GRINDER, CHISEL	OPEN REAR PORTION OF MEMBER BET.	EC05 BET EB13/EB10	3	0				
P	EEK	0	64	1/26/96	1.5 STEEL ANGLE, 1/8" ROD	WELD STEEL REINFORCEMENT W/ 1/8" ROD	EC03 BET EB17/EB14	7	0				
Q	NNN	0	68	1/17/96	GRINDER, CHISEL,	CUT OPEN BACK OF MEMBER TO	EC02 BET EB17/EB14	2	0				
Q	EEE	0	68	1/10/96	GRINDER, CHISEL & HAMMER	CUT OPEN BACK OF MEMBER TO	EC03 BET. EB18	2	0				

VIEW	DATE #2	MATERIALS		LOCATION #2	PLACES TECH.#2	CRACKS FILL #2	SHELLS #2	TILES #2	GLASS #2	POTTERY #2
		TECH. #2	TECHNIQUE #2							
SSS	3/02/93	JAHN M90 MORTAR	CLEAN/TEMP FILL CRACKS	B09: 49'6"	2	2				
WWW	12/06/95	CEMENT MORTAR	APPLY 2ND CEMENT MORTAR	EC01&EB09	2	0				
WWW										
EEE	10/04/95	GRINDER, WHEEL CUTTING	CUT REMOVE MORTAR & STEEL INNER	EC03;EB11 AND	3	0				
EEE	10/16/95	1/4" STEEL GUSSETS;METAL	WRAP NEW STEEL W/ MESH AND	EC03	3	0				
EEE										
SSS										
WSW										
NNN	11/02/95	METAL LATH 3.4; WIRE	WRAP W/MESH AND WIRE TIES	EC01, RADIAL 01	2	0				
NNN	11/21/95	CEMENT MORTAR	APPLY CEMENT MORTA R TO SHAPE	EC01	1	0				
EEE										
SSS	1/19/96	CEMENT MORTAR,	APPLY CEMENT MORTA R TO SHAPE	EC05 BEP EB13/EB11	3	0				
EEE										
NNN										
EEE	1/17/96	GRINDER, CHISEL&HAMMER	CUT/REMOVE TWO MORTAR FRAG.	EC03	2	0				

ELEV	VIEW	ELEV	MATERIALS	LOCATION	PLACES	CRACKS	SHELLS	TILES	GLASS	POTTERY
CODE	SEQ	ASPECT	(FEET)	DATE #1	TECH. #1	TECHNIQUE #1	#1	#1	#1	#1
---	---	---	---	---	---	---	---	---	---	---
Q	EEE	0	68	1/18/96	GRINDER, CHISEL&HAMMER	CUT OPEN BACK OF MEMBER TO	EC03	2	0	
Q	SSS	0	68	1/10/96	GRINDER, CEMENT MORTAR	OPEN CRACKS, CLEAN	EC04/05 BET	3	2	
Q	SSS	0	68	1/11/96	MESH, WIRE AND CEMENT	WRAPP SECTION WITH MESH;APPLY	EC06 BET EB18/EB20	2	0	
Q	WWW	0	68	1/17/96	GRINDER,CHISE L AND HAMMER	CUT&REMOVE REPAIR MORTAR TO	EC07 BET EB18/EB20	1	0	
S	NNN	0	76	1/09/96	CEMENT MORTAR	APPLY CEMENT MORTAR TO SHAPE MEMBER	EC01/04 BET	2	0	
S	EEE	0	76	8/20/95	GRINDER	CUT AND REMOVE RUSTED STEEL	EC04\B:22 -74'&	2	0	
S	EEE	0	76	1/23/96	BRASSO, DIST. H2O; JAHN M90	ORNAMENT CLEAN	EB29,EB28 :83,EB27:	35	4	8 2 21
S	SSS	0	76	11/06/95	CEMENT MORTAR	APPLY AND BUILD JOINTS BET MEMBERS	EC04,EC05 ;EB03;EC0	7	0	
S	SSS	0	76	11/13/95	CEMENT MORTAR, WIRE	BOND ORNAMENTS WITH CEMENT	EC05, EC04,	5	0	2 3
S	SSS	0	76	1/09/96	CEMENT MORTAR	APPLY LAST COAT CEMENT MORTAR;SHAPE	EC03/04 BET	2	0	
S	WWW	0	76	7/25/95	GRINDER/CHISE LS AND HAMMER	CUT/DETACH MORTAR; CLEAN RUST	EC08	4		
S	WWW	0	76	8/09/95	STEEL BRUSHES	CLEAN WELDS DUST	EC08	4		
T	NNN	0	80	5/30/95	CEMENT MORTAR	FILL CRACKS W/CEMENT MORTAR	EC02	2	2	
T	NNN	0	80	1/10/96	CEMENT MORTAR	APPLY LAST COAT OF CEMENT	EC02/01/0 4 EB25/26	2	0	
T	EEE	0	80	9/26/95	2" STEEL CHAN., METAL	PREPARED STEEL SECTIONS;	EC04, EB24	2	0	

VIEW	DATE	MATERIALS		LOCATION	PLACES	CRACKS	SHELLS	TILES	GLASS	POTTERY
		TECH. #2	TECHNIQUE #2							
EEE	1/22/96	GRINDER, CHISEL&HAMMER	CUT/REMOVE FOUR MORTAR FRAG. TO CHK	EC03	4	0				
SSS	1/11/96	CEMENT MORTAR, MESH&W	OPEN 3 LARGE CRACKS AND FILL	EC06 BET EB18/EB20	3	0				
SSS										
WWW	1/18/96	GRINDER, MESH, WIRE, CEMENT	CLEAN RUST, WRAP WITH	EC07 BET EB18/EB20	4	0				
NNN										
EEE	11/20/95	CEMENT MORTAR, WIRE	BOND ORNAMENTS WITH CEMENT	EC02, EB023, ECO	7	0			1	6
EEE										
SSS	11/15/95	CEMENT MORTAR, WIRE	APPLY & BOND W/ CEMENT	EC04, EC05 BET. B22/	8				6	
SSS	1/08/96	CEMENT MORTAR	APPLY CEMENT MORTA R TO SHAPE	EC05/06/0 7/8	4	0				
SSS										
WWW	7/25/95	SIKADUR 23/ACETONE	BOND MORTAR/MORTA R; CLEAN	EC08	4	3				
WWW	8/16/95	CEMENT MORTAR	REBOND 3 LG. MORTAR/C EMENT	EC08	3	3				
NNN	5/22/95	MAKITA GRINDER	OPEN CRACKS RELATED TO MEMBER	EC02 BTWN EB25	2	0				
NNN	1/29/96	BRASSO, DIST. H20,	ORNAMENT CLEAN W/ BRASSO, SOFT	EC02, EC08 BET EB27	36	9	6	9	12	
EEE	9/27/95	2" STEEL CHAN., METAL	PREPARED STEEL SECTION;	EC04, EB25	2	0				



ELEV	VIEW	ELEV	MATERIALS	LOCATION	PLACES	CRACKS	SHELLS	TILES	GLASS	POTTERY		
CODE	SEQ	ASPECT	(FEET)	DATE #1	TECH. #1	TECHNIQUE #1	#1	#1	#1	#1		
-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----		
T	EEE	O	80	9/28/95	2" STEEL CHAN., METAL	PREPARED STEEL SECTIONS;	EC04, EB26	2	0			
T	EEE	O	80	10/04/95	2" STEEL CHAN., METAL	PREPARED STEEL SECTIONS;	EC04, EB24	5	0			
T	EEE	O	80	10/11/95	CEMENT MORTAR	APPLY CEMENT MORTAR ON NEW ANGLE	EC04, EB24	2	0			
T	EEE	O	80	10/13/95	CEMENT MORTAR	APPLY CEMENT MORTAR ON NEW ANGLE	EC04, EB26	2	0			
T	EEE	O	80	10/16/95	CEMENT MORTAR, WIRE	APPLY AND REBOND MORTAR W/CEME	EC04 BET. EB22	3	0	1		
T	EEE	O	80	10/17/95	METAL LATH, WIRE	WRAPP SECTION OF BAND WITH	EB25	2	0			
T	EEE	O	80	10/24/95	CEMENT MORTAR	APPLY AND BOND ORNAMENTS W/	EC04, EB24	5	0	4		
T	EEE	O	80	11/09/95	CEMENT MORTAR	APPLY CEMENT MORTAR IN LAYERS TO	EC04, EC05 BET. EB23/	6	0	2	1	2
T	SSS	O	80	10/18/95	METAL LATH, WIRE; GRINDER	WRAP W/MESH NEW STEEL; CUT OFF	EB22, EC05	5	0			
T	SSS	O	80	1/30/96	BRASSO, DIST. H2O, ETHANOL	ORNAMENT CLEAN W/ BRASSO, ETHANO	EC04, EC06	27	0	7	16	
T	WWW	O	80	7/18/95	GRINDER, CHISE L & HAMMER	CUT & DETACH PREV. REPAIRS	EC08 BTWN EB23	3	0			
T	WWW	O	80	11/14/95	GRINDER, CHISEL & HAMMER	CUT/DETACH REPAIR MORTAR CHECK	EC06, EC07	2	0			
T	WWW	O	80	11/16/95	GRINDER, CHISEL; WOOD	CUT REPAIR MORTAR; PROP UP MEMBERS	EC06	2	0			
T	WWW	O	80	11/28/95	CEMENT MORTAR, WIRE	APPLY & BOND POTTERY W/ CEMENT MORTAR	EC06 & EC07	5	0		3	



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ELEV CODE	VIEW SEQ	ASPECT	ELEV (FEET)	DATE #1	MATERIALS TECH. #1	TECHNIQUE #1	LOCATION #1	PLACES #1	CRACKS FILL#1	SHELLS #1	TILES #1	GLASS #1	POTTERY #1
T	WWW	0	80	11/30/95	CEMNET MORTAR,	WRAPP MESH AROUND STEEL REINFORCEMEN	EC06&EC07	10	0				9
T	WWW	0	80	12/08/95	CEMENT MORTAR, WIRE	BOND ORNAMENTS&APP LY CEMENT	EC06&EC07	15	0				14
U	NNN	0	84	5/31/95	CEMENT MORTAR	FILL CRACKS W/CEMENT MORTAR	EC02	2	2				
U	NNN	0	84	6/19/95	CEMENT MORTAR	REBOND ORNAMENTS W/CEMENT	EC02	3	0				3
U	EEE	0	84	6/06/95	GRINDER; CEMENT MORTAR	REMOVED LOOSE MORTAR; APPLY CEMENT	EC04	2	2				
U	SSS	0	84	6/07/95	GRINDER; CEMENT MORTAR	REMOVED LOOSE MORTAR; APPLY CEMENT	CC	2	2				
U	SSS	0	84	1/17/96	BRASSO, DISTIL LATED	ORNAMENTS CLEANING WITH BRASSO, B	EB28/EB29	33	0		9	18	6
U	WWW	0	84	6/13/95	GRINDER; CEMENT MORTAR	CUT & DETACH/APPLY CEMENT MORTAR	EC08	1	1				
U	WWW	0	84	6/20/95	CEMENT MORTAR	FILL CRACKS W/ CEMENT MORTAR	EC06	5	5				
V	NNN	0	88	1/16/96	BRASSO, DISTIL LATED	ORNAMENT CLEANING WITH BRASSO, B	EC02, EC08	63	0		1	57	5
V	SSS	0	88	1/10/96	BRASSO, DISTIL LATED	ORNAMENTS CLEANING WITH BRASSO,	EC04, EC06	61	0		4	57	
X	NNN	0	96	1/10/96	BRASSO, DISTIL LATE	ORNAMENTS CLEANING WITH BRASSO,	SPA01/SPA 04	42				42	
X	SSS	0	96	1/16/96	BRASSO, DISTIL LATE H2O,	ORNAMNETS CLEANING WITH BRASSO,	SPA02/SPA 03	40				40	

VIEW	DATE #2	MATERIALS TECH. #2	TECHNIQUE #2	LOCATION #2	PLACES TECH.#2	CRACKS FILL #2	SHELLS #2	TILES #2	GLASS #2	POTTERY #2
EEE	10/03/95	2" STEEL CHAN., METAL	WRAPP STEEL SECTIONS W/ MESH, WIRE	EC04, EC05,06,0	5	0				
EEE	10/05/95	2" STEEL CHAN., METAL	WRAPP STEEL SECTIONS W/ MESH, WIRE	EC08, EB26	2	0				
EEE	10/12/95	CEMENT MORTAR	APPLY CEMENT MORTAR ON	EC04, EB25	2	0				
EEE										
EEE	10/17/95	CEMENT MORTAR	APPLY 1ST CEMENT MORTAR ON	EB24 JOINT	2	0				
EEE	10/19/95	CEMENT MORTAR, WIRE	APPLY CEMENT TO SHAPE, BOND	EC02	4	4				
EEE	11/07/95	CEMENT MORTAR	APPLY & BOND ORNAMENTS W/ CEMENT	EC04, EC05	7					2
EEE	1/10/96	CEMENT MORTAR	APPLY LAST COAT CEMENT MORTAR TO	EC03 BET EB25/26	2	0				
SSS	10/18/95	CEMENT MORTAR, WIRE	BOND TILE W/ CEMENT MORTAR	EB22, EC05	2	0		2		
SSS										
WWW	10/18/95	CEMENT MORTAR	APPLY CEMENT MORTAR, SHAPE	EC08	1	0				
WWW	11/15/95	GRINDER, CHISEL;	CUT REPAIR MORTAR & PREPARED	EC06, EC07	4	0				
WWW	11/22/95	CEMENT MORTAR	APPLY CEMENT MORTAR TO SHAPE	EC06, EC07	4	0				
WWW	11/29/95	CEMENT MORTAR & WIRE	APPLY & BOND POTTERY WITH CEMENT	EC07, EC06	5	0				4