THE WATTS TOWERS
CONSERVATION REPORT

for efforts on

THE HOUSE FACADE

April 1995

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

CONSERVATION OF THE HOUSE FACADE
WATTS TOWERS CONSERVATION PROGRAM
APRIL 1995

This is a report on the conservation work performed by the Cultural Affairs Department, City of Los Angeles, between January 1986 and December 1994 on the House Facade sculpture on the site of the Towers of Simon Rodia State Historic Park, 1765 East 107th Street.

HISTORY OF THE SCULPTURE

House and chimney.
The sculptured House Facade was added to the house sometime after 1929 and before 1939, as shown in a sketch of the house and sculptures published in a 1940 *book by Joseph Seewerker. When Rodia bought the property, c1921, the house was on the site. Figure 1 (c1929) shows the house and original chimney from the northeast and *Figure 2 (c1939) shows the chimney, to the left of the partly finished West Tower. A tall spire was added to the original chimney by Rodia between 1939 and 1947, making this Chimney sculpture the last of the seventeen major works started by the artist. Figure 3 (c1946) shows the completed Chimney with its tall spire above Rodia's house. Figure 4 shows the south, front of Rodia's house. Although the house was burned in 1955, apparently by vandals, the existing brick and mortar foundation (where visible) indicates the house dimensions were approximately 19 feet from east to west along 107th street and 38 feet from north to south. An aerial photo from the UCLA Geography Department taken in March 1950 and a 1954 photograph of the north side of the dwelling (Figure 6) indicate that the roof of the house was extended to the rear by Rodia sometime after 1929. Please refer to the final conservation report on the Chimney sculpture for more information on that sculpture.

House front steps.
The front porch steps were probably built c1929-1939. A 1950 photograph (Figure 5) shows a planter in the front step which was later modified by Rodia a year before he stopped work at the site (c1953) by filling in the planter and covering the previous opening with tiles.
*Nuestro Pueblo, Los Angeles City of Romance. (Boston: Houghton, Loughlin Co.). Article `Glass Towers and Demon Rum'. 1940.

CONSERVATION PROGRAM SUMMARY

Background
Mortar cracking failures have been evident in the House Facade and posts along the outside of the house on the east side since 1958. See Figures 8 through 13. Failures were caused by loss of support from adjacent walls when the house burned to the ground, vandalism, inadequate end connections and reinforcements in the facade and posts, and environmental influences-wind, earthquakes and dynamic forces from trucks, trains, Red Cars (public transit through the early 1960s immediately to the north and to the west), aircraft, and trucks. In late 1985 the Cultural Affairs Department took over responsibility for the site.

Preliminary Phases- photography, emergency stabilization and inspection.

Formal "Baseline" photography of the House Facade took place in 1988. A detailed inspection in 1989 identified exposed, rusted steel throughout the facade; loose mortar; major structural failures in the horizontal beams across the entire top of the facade; 117 significant cracks in the mortar and 139 broken ornaments and 8 missing ornaments.

Emergency conservation in 1990 consisted of filling large cracks with foam backer-rod and covering with silicone sealant.

Materials Test Program
Following the inspection, 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 protect them from further deterioration (see Appendix, Watts Towers Materials Tests Report).

Engineering analyses of failed areas were performed to provide guidance in the design of repairs and for replacements of structurally inadeguate reinforcements. A staff of assistants was trained to perform the work under technical supervision of contract conservation and engineering consultants. The selected materials and processes were then applied to the sculpture and instructions were incorporated into the controlling document, The Watts Towers Conservation Handbook.

Program Scope
This document is a report on the final conservation effort which consisted of: replacing damaged and/or inadequate vertical and horizontal reinforcements at both ends and the top and bottom of the facade and at several intermediate locations; reinforcing existing footings or adding new footings under vertical supports; adding steel connectors for the four main Canopy beam ends and welding the connectors to a new horizontal support across the top of the facade; filling all cracks; and cleaning and consolidating ornaments.

A summary of treatments which were applied is shown in the Appendix "Watts Towers - House Facade Conservation". This summary is a printout of only a small portion of the computer data file "HOUCONS". Identified in the summary for each treatment are:

a) the elevation code - A is 0 to 4 feet, B is 4 to 8 feet, C is 8 to 12 feet.
b) the side of the member receiving treatment (View direction),
c) the initial problem found during inspection in 1989,

d) the treatment date,
e) the conservation materials used, and
f) the treatment process used on the member.

The results of the baseline photography, emergency stabilization and inspection operations, and reports and records are on file in the Watts Towers conservation office trailer.

Cost estimate

The estimated cost for conservation of the House Facade sculpture was $75,000. Included in the cost were: baseline photography $ 1,800, inspection $ 1,800, emergency stabilization $ 1,000, and design and application of conservation processes or structural conservation $70,000.

Structural Conservation (See Figure 14 and subsequent). Conservation materials treatments consisted of removing and replacing the main vertical and horizontal structural wall supports with redesigned steel members of adequate strength with deeper foundations and footings to resist wind and earthquake forces; cleaning and rebonding broken ornament pieces; rebonding loosened or detached ornaments to the mortar coverings; filling cracks around ornaments; rebonding mortar-to-mortar; adding pigment-based coloring to mortar repairs; and applying consolidants to ornament surfaces. Cleaning was normally accomplished using distilled water. Glazed tile cleaning was performed using Brasso. Rebonding ornaments to the original mortar was done with either Jahn mortar or cement mortar. Rebonding mortar-to-mortar (where cement mortar was not used) was accomplished with Sikadur 23 epoxy. Various pigments were used to match repair mortar color with the originals and then the surface was covered with Siline for waterproofing. The consolidant used for shells was Acryloid B-72.

Small crack-filling around ornaments and in other, non-structural areas was accomplished using Jahn restoration mortar purchased from Cathedral Stone Company, Washington, D.C. Please see "Watts Towers Materials Tests Report" and "Watts Towers House Conservation" tables in the Appendix.

Large crack filling and foundation work was accomplished using either Portland cement mortar or Jahn mortar.

CONSERVATION OF THE HOUSE FACADE

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 and in attachments to the Canopy intersection with the facade. 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:

Cleaning with water/cotton swabs - 591 tiles; 50 glass & 56 pottery.

Cleaning and consolidation with B-72 - 0 shells.

Cleaning with Brasso - 591 tiles; 50 glass; and 56 pottery.

Rebonding mortar-to-mortar with Sikadur 23 - 48 places

Rebonding mortar-to-mortar with cement mortar - 64 places

Rebonding mortar-to-mortar with Jahn mortar - 136 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.
- Inspection of House and Chimney.

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

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.
June - Reinstalled Heart atop junction of North & South Walls.
August - Modified sand sieve sizes for cement to match State specification.

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.
- 6.8 Northridge earthquake and aftershocks.
February- Northridge earthquake aftershocks.
Propped up Canopy from earthquake damage.
July - Began Northridge earthquake repairs.
- Increased staff members and daily schedule.
October - Completed House conservation except steps.

November/December
- Review of House & Canopy conservation work.

Inspection Information
June 30, 1989 WATTS TOWERS CONSERVATION
HOUSE FACADE INSPECTION RESULTS
Reference: a) Computer data file HOUINSP May 1989 - June 1989
b) Inspection sheets
c) Microfiche records

The information presented below is based on inspections made by the inspection staff from May 30, 1989 to June 26, 1989.

Information is presented in 5 sections; 1. Rusted/exposed wire, mesh and rebars; 2. Loose parts; 3. Broken/missing major & minor

load carrying members; 4. Cracks; and 5. Broken/missing ornaments. The enclosed charts resulted from a computer-generated search of the HOUINSP data base.

SECTION 1. RUSTED/EXPOSED WIRE, MESH AND REBARS

Inspection revealed some exposed, rusted wire, mesh or rebars in 6 of the 14 4' by 4' areas.

SECTION 2. LOOSE PARTS

See SECTION 5. BROKEN/MISSING ORNAMENTS for graphical computer-generated analyses of House ornamentation.

Inspection revealed loose mortar in 3 of the 14 4' by 4' areas, particularly at the junction of the facade with the horizontal beam near the Canopy in panel 04 at the B level.

SECTION 3. BROKEN/MISSING MAJOR & MINOR LOAD CARRYING MEMBERS
Inspection revealed major failures in the top horizontal beams of the facade.

SECTION 4. CRACKS

Inspection revealed 117 cracks in the 14 4' by 4' areas. The numbers and depths of the cracks and their distribution throughout the sculpture are shown in graphical analysis Figure 1.

Depth of Cracks

Sixteen (16) cracks, 14 per cent, of the 117 were greater than 25.4 mm deep, with the deepest measuring 60, 70 and 94 mm deep. The depths of up to 3 cracks (depth1, depth2, depth3) and the number of cracks in the various areas of the sculptures are displayed in Figure 1.

SECTION 5. BROKEN/MISSING ORNAMENTS
Inspection revealed broken ornaments in 11 of the 14 4' by 4' areas and missing ornaments in 6 areas. The numbers and types of ornaments and their distribution throughout the sculpture are shown in Figure 2. House Inspection.

Summary	Ornaments			
	Tiles	Glass	Shells	Pottery
Broken	102	29	0	0
Missing	3	5	0	0

PHOTOGRAPHS AND SKETCHES.

Figure 1. Photograph c1929. Watts Towers site from southeast on 107th St. House in left center of photo. Photographer unknown.

Figure 2. Artist sketch c1939 of house and Watts Towers site from southeast on 107th Street. House south elevation in lower left. Published in book 1940 and April 28, 1939 in Los Angeles Times.

Figure 3. Photograph c1950 of house and Watts Towers site from southwest on 107th Street. House south elevation in lower left. Photo by J. Reed. Arts and Architecture July 1951.

Figure 4. South facade of house. Sketch of probable configuration c1945 to 1954 developed from photographs. Cyprus trees omitted for clarity. Prepared 1993 by Arloa P. Goldstone.

Figure 5. House front porch with planter for cyprus trees c1950 top photo c1950 and lower photo (1993) after removing and covering planter c1953.

Figure 6. Photograph c1954 north elevation of house showing added rear section. Photo acquired in 1994. Photographer Pete Teti.

Figure 7. Footings for Rodia's house c1993.

Figure 8. Inside (north) elevation of facade. January 3, 1994.

Figure 9. Inside (north) facade portion showing deteriorated and burned wooden panel above door from 1955 fire, damaged door frame, window frame. January 3, 1994.

Figure 10. Post hole at east end inside (north) of facade after removal of deteriorated post before installing new steel channel reinforcement and footing. January 12, 1994.

Figure 11. Facade front steps showing quake-induced crack (center on top of step) after Northridge earthquake. January 18, 1994.

Figure 12. View looking down on top of facade showing damaged top beam and overhead (top left center of photo). January 19, 1994.

Figure 13. View looking down on top of facade showing damaged top beam and overheads (left-to-right). January 19, 1994.

Figure 14. Removal of portion of facade top beam outside (south) before conservation. February 8, 1994.

Figure 15. Conservation underway on vertical reinforcement and reinstallation of original covering on post at east end inside (north) of facade. February 23, 1994.

Figure 16. Inside (north) facade during conservation. Posts on both sides of door opening replaced with vertical steel channels wrapped with mesh (right) and placed in new footings. February 23, 1994.

Figure 17. Inside (north) facade horizontal steel channel

replacement for damaged top beam. Note top beam welded to new vertical channels on both sides of door opening. February 23, 1994.

Figure 18. View of newly reinstalled original coverings over new channel reinforcement and footings for east post inside (north) facade. March 8, 1994.

Figure 19. Inside (north) facade showing conservation work in progress. April 5, 1994.

Figure 20. Wooden frame of door inside (north) before treatment. June 1, 1994.

Figure 21. Post 08 east of house foundation showing vertical cracks and damage at top near connection to overhead. July 5, 1994.

Figure 22. Post 08 east of house foundation after removal of failed reinforcement. July 5, 1994.

Figure 23. House facade and window outside (south) near west end of facade during crack-filling with Jahn M-90 mortar. July 5, 1994.

Figure 24. Post 04 east of house foundation during conservation after removal and replacement of failed reinforcement and installation in adequate foundation. August 10, 1994.

Figure 25. Post 08 (center of photo) after conservation. The entire original covering has been installed over a new reinforcement cemented into a new footing and foundation. August 16, 1994.

Figure 26. Portion of south side of facade after conservation. September 10, 1994.

Figure 27. Upper portion of south side of facade after conservation. September 10, 1994.

Figure 28. Lower portion of south side of facade after conservation. September 10, 1994.

Figure 29. South side of facade portion west of the doorway after conservation. October 7, 1994.

APPENDIX enclosed after page 9.

* Watts Towers Materials Tests Report - listing of conservation materials tested and start dates of tests.
* Watts Towers House Conservation - Preliminary listing of separate treatments; listing the original Rodia materials; problems found during inspection and the conservation materials and techniques used; locations by direction and by elevation.

Recuerdo. de Bro. SAM. Radia
Diciembre. 1936 Watts Calif.

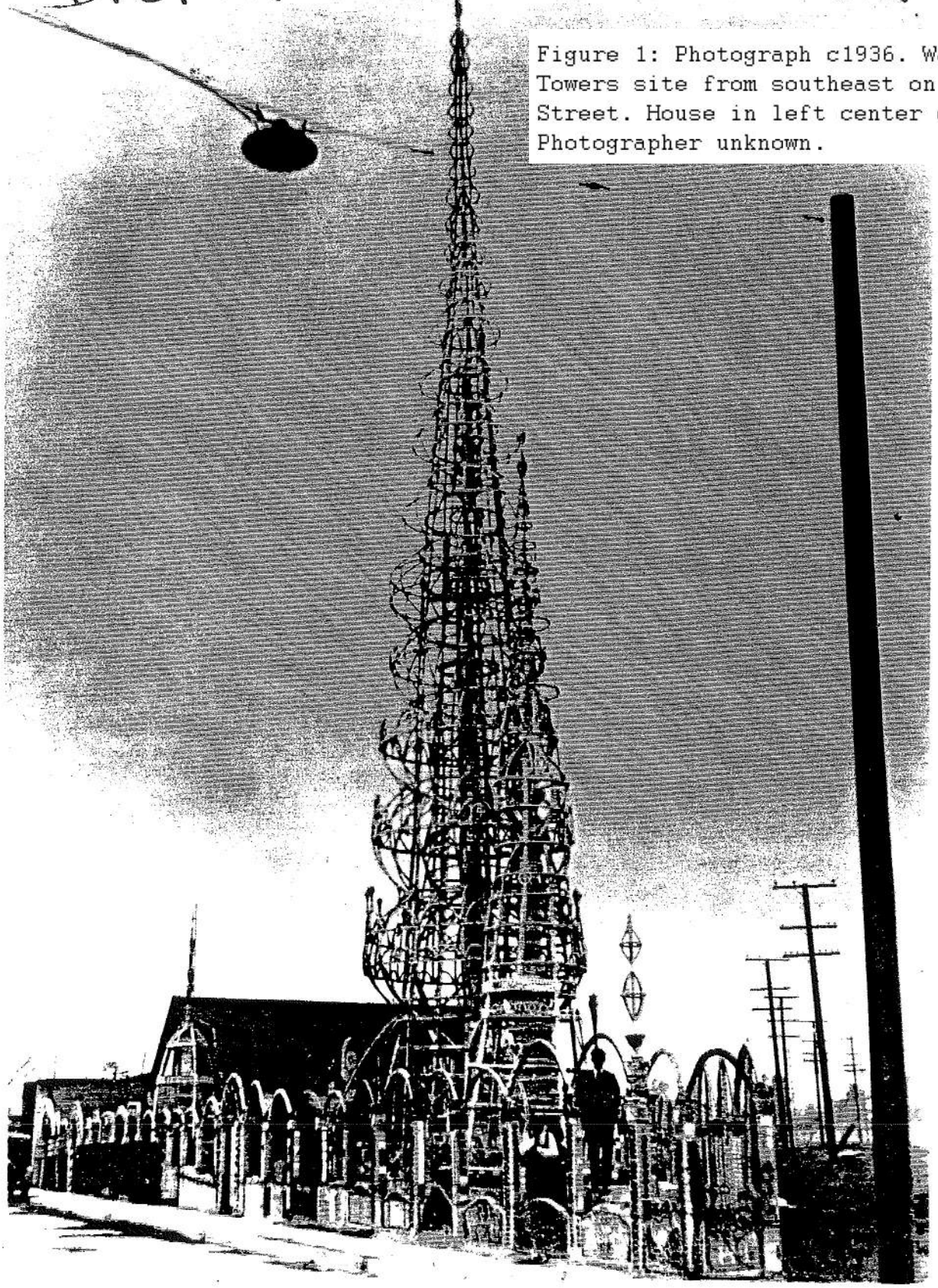


Figure 1: Photograph c1936. Watts Towers site from southeast on 107th Street. House in left center of photo. Photographer unknown.

GLASS TOWERS AND DEMON 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 facetious observer might say that the cure came from bottles.

'Twenty years ago,' Simon explains himself, 'I am all time *borracho* — what you say dronk. My head, she is all time big like — like lard 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. Seventeen years ago he began to build a tile wall around the lot. It was his own wall; no architect stood 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 2. Artist sketch c1939 of house and Watts Towers site from southeast on 107th Street. House south elevation in lower left. Published in book 1940 and April 28, 1939 in Los Angeles Times.

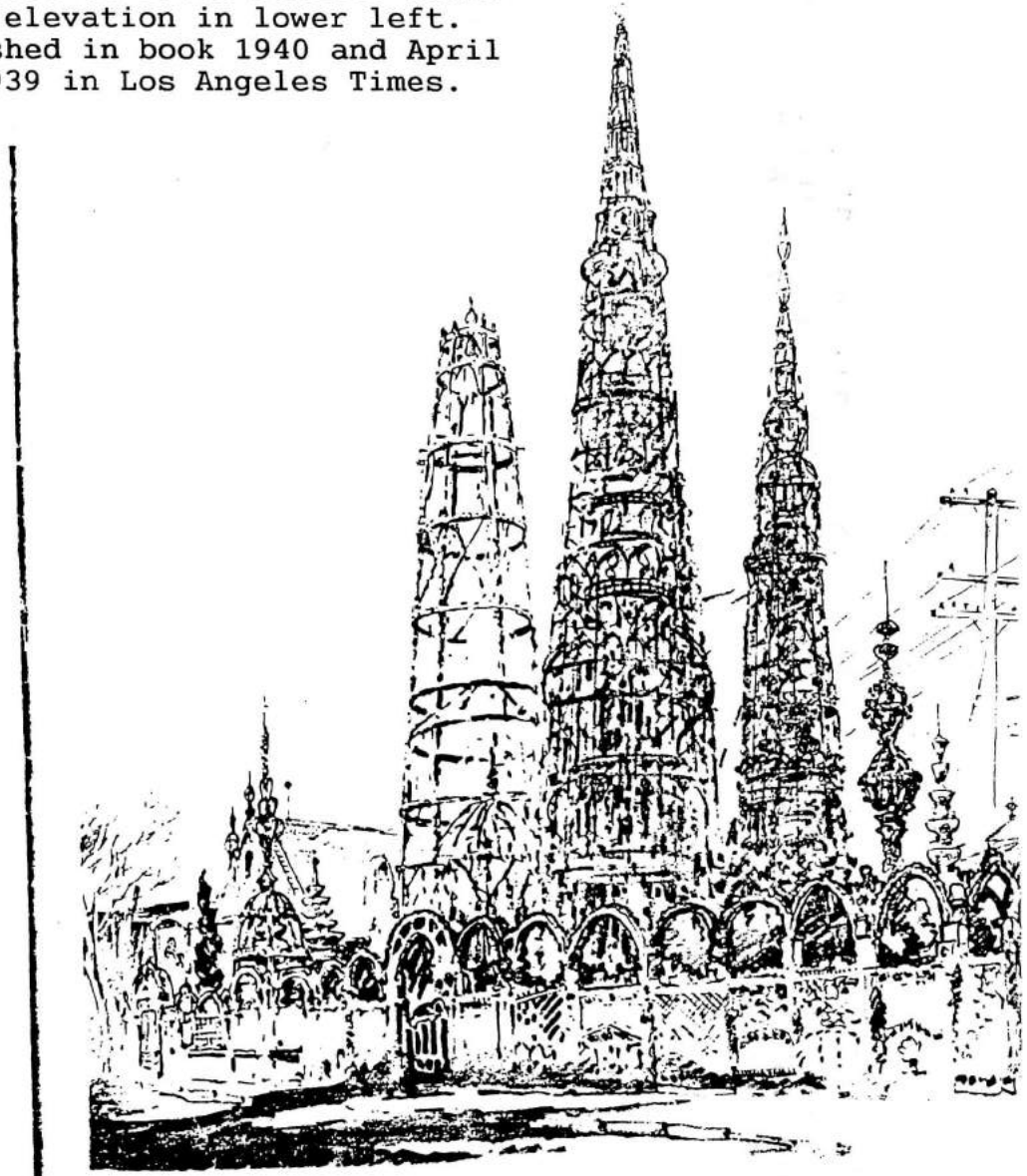
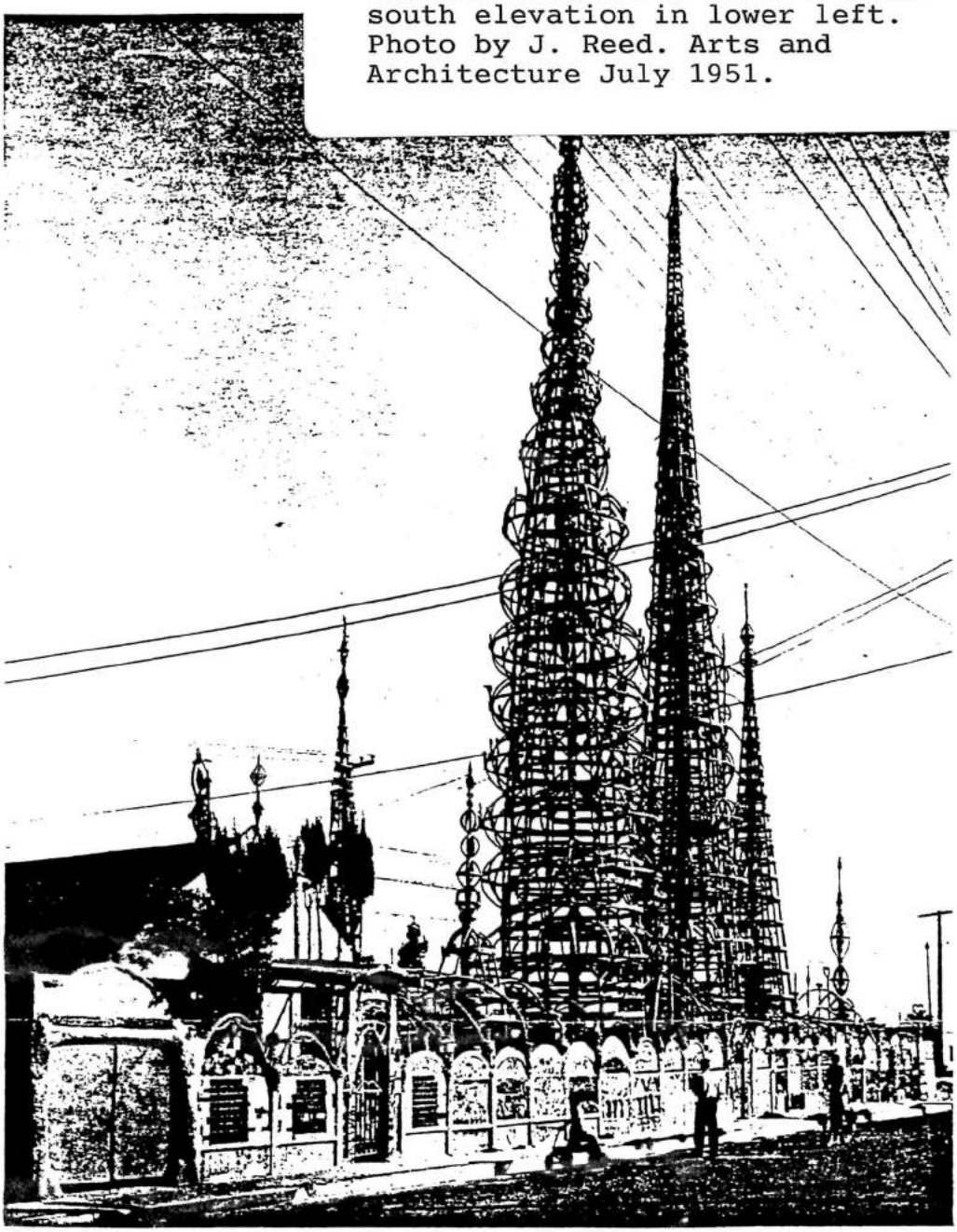


Figure 3. Photograph c1950 of house and Watts Towers site from southwest on 107th Street. House south elevation in lower left. Photo by J. Reed. Arts and Architecture July 1951.



SAM OF WATTS "I had in my mind to do something big and I did."

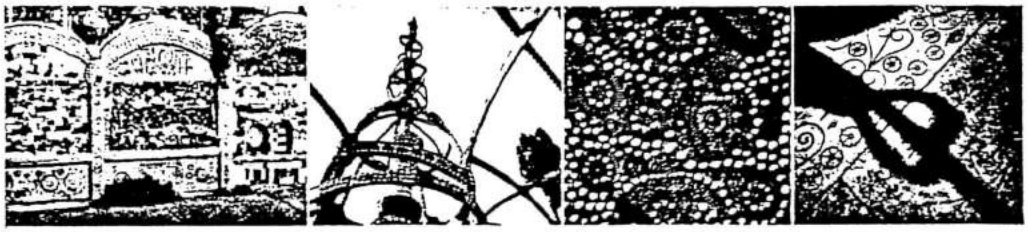
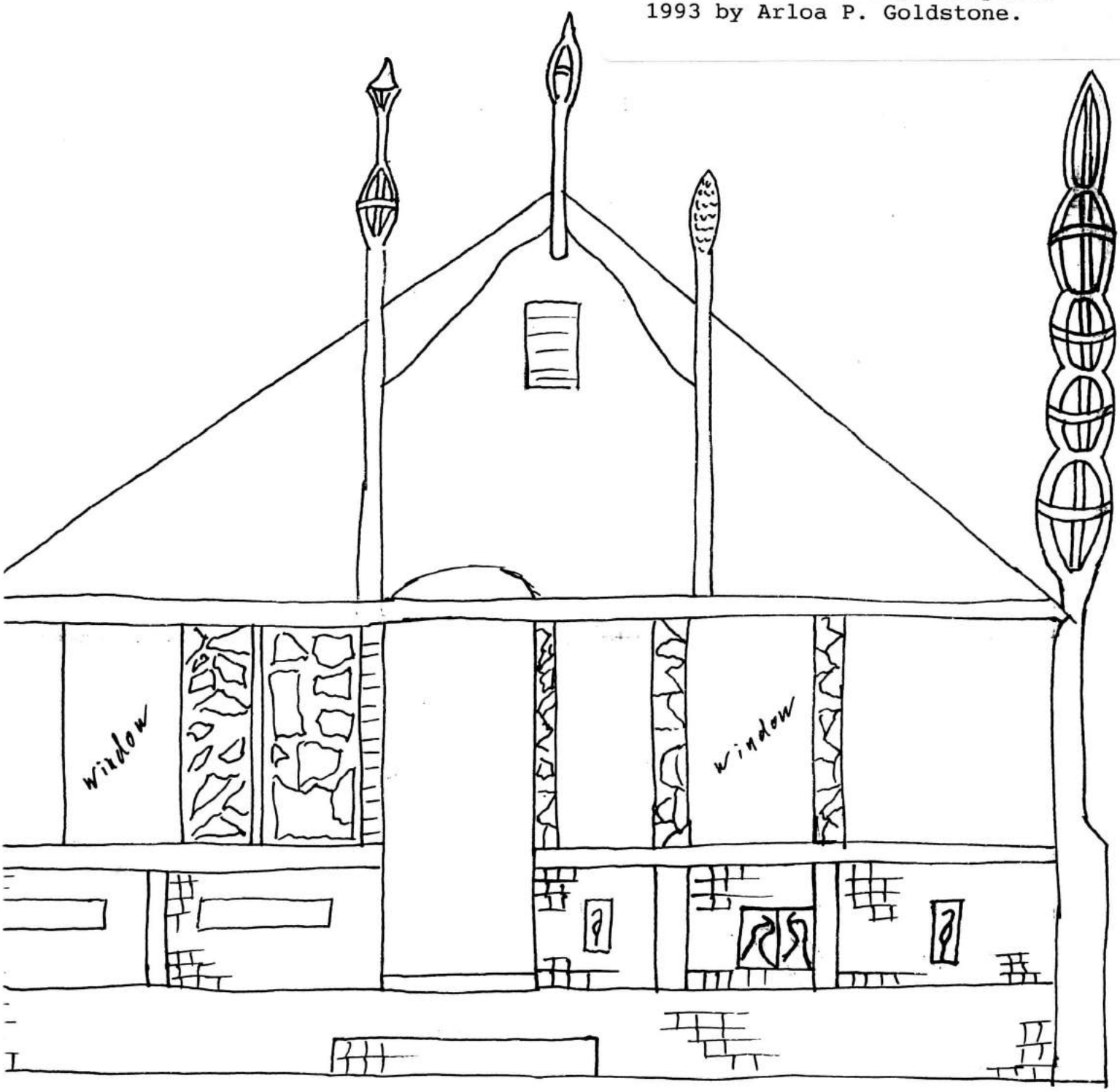


Figure 4. South facade of house. Sketch of probable configuration c1945 to 1954 developed from photographs. Cyprus trees omitted for clarity. Prepared 1993 by Arloa P. Goldstone.



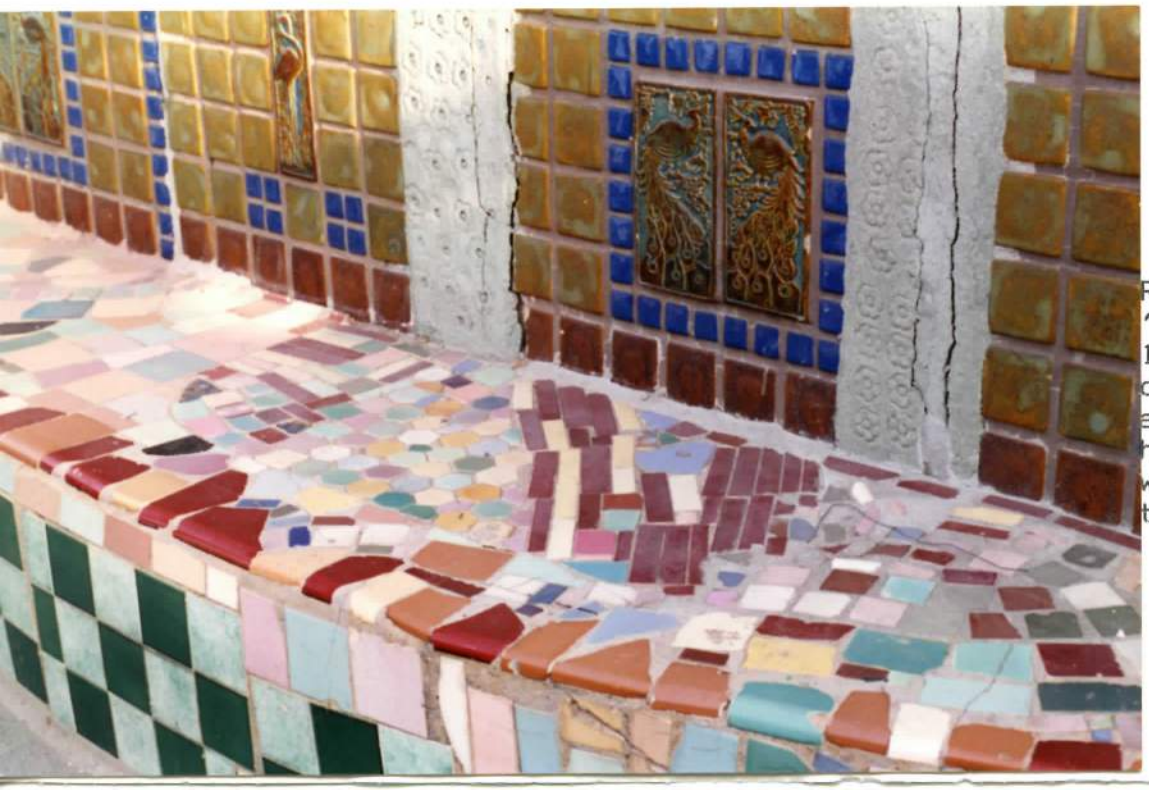
SOUTH FACADE

Not to scale
APG '93 Nov.

Possible Configuration 1945 - 1954

Figure 5. House front porch with planter for cyprus trees c1950 top photo c1950 and lower photo (1993) after removing and covering planter c1953.

Rodia's House front 'porch step' with planter, lower right, showing Italian Cypress tree trunks rising up along house facade. "A" Tower on front left.



Rodia's front 'porch step' Sept 1992 showing curved outline of area where planter had been covered with mortar and tiles.

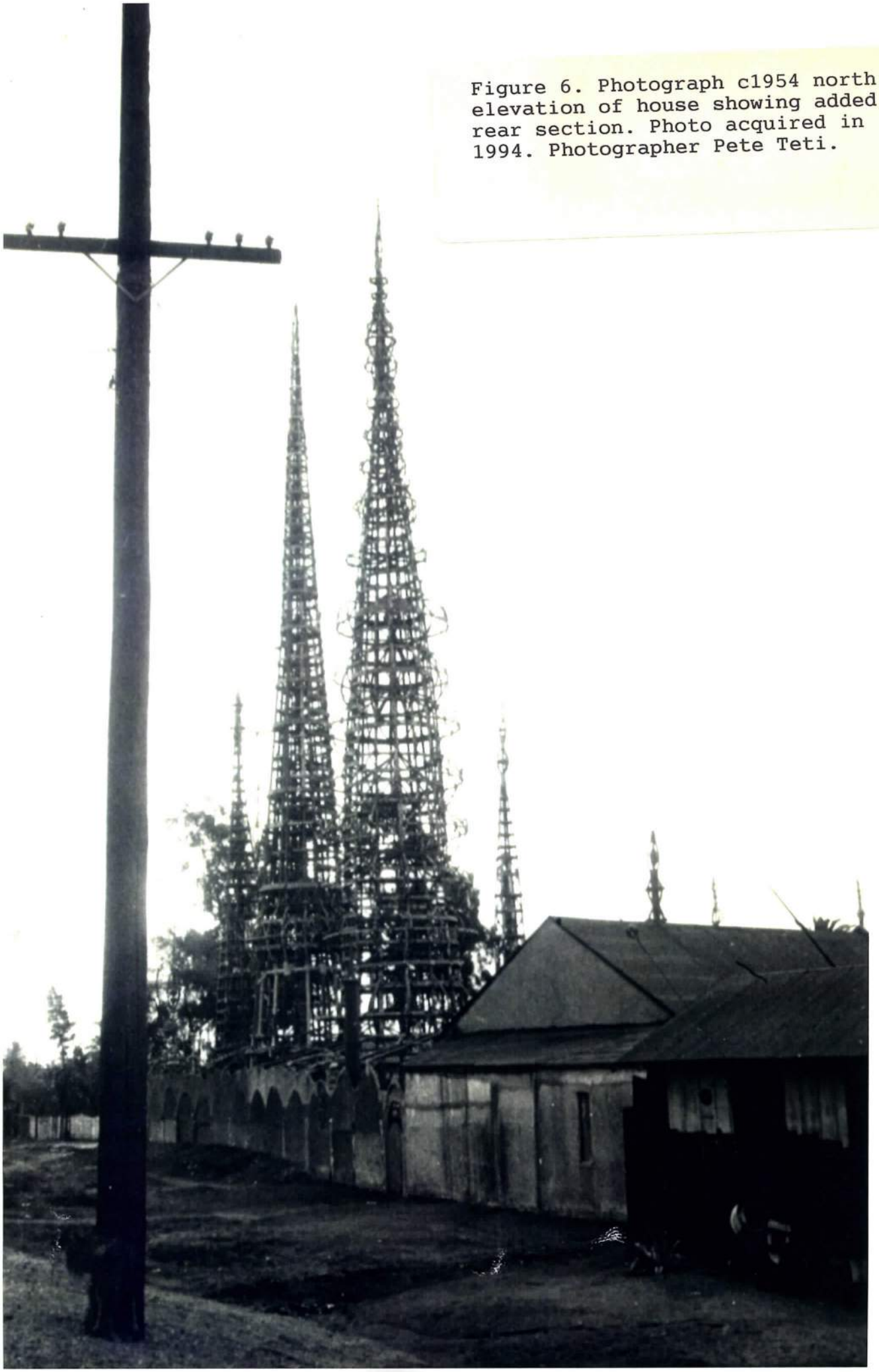


Figure 6. Photograph c1954 north elevation of house showing added rear section. Photo acquired in 1994. Photographer Pete Teti.

Figure 7. Footings for Rodia's house

Figure 8. Inside (north) elevation of facade. January 3, 1994.

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Figure 10. Post hole at east end inside (north) of facade after removal of deteriorated post before installing new steel channel reinforcement and footing. January 12, 1994.

Figure 11. Facade front steps showing quake-induced crack (center on top of step) after Northridge earthquake. January 18, 1994.

Figure 12. View looking down on top of facade note damaged top beam and overhead (top left ctr of photo). January 19, 1994.

Figure 13. View looking down on top of facade showing damaged top beam and overheads (left-to-right). January 19, 1994.

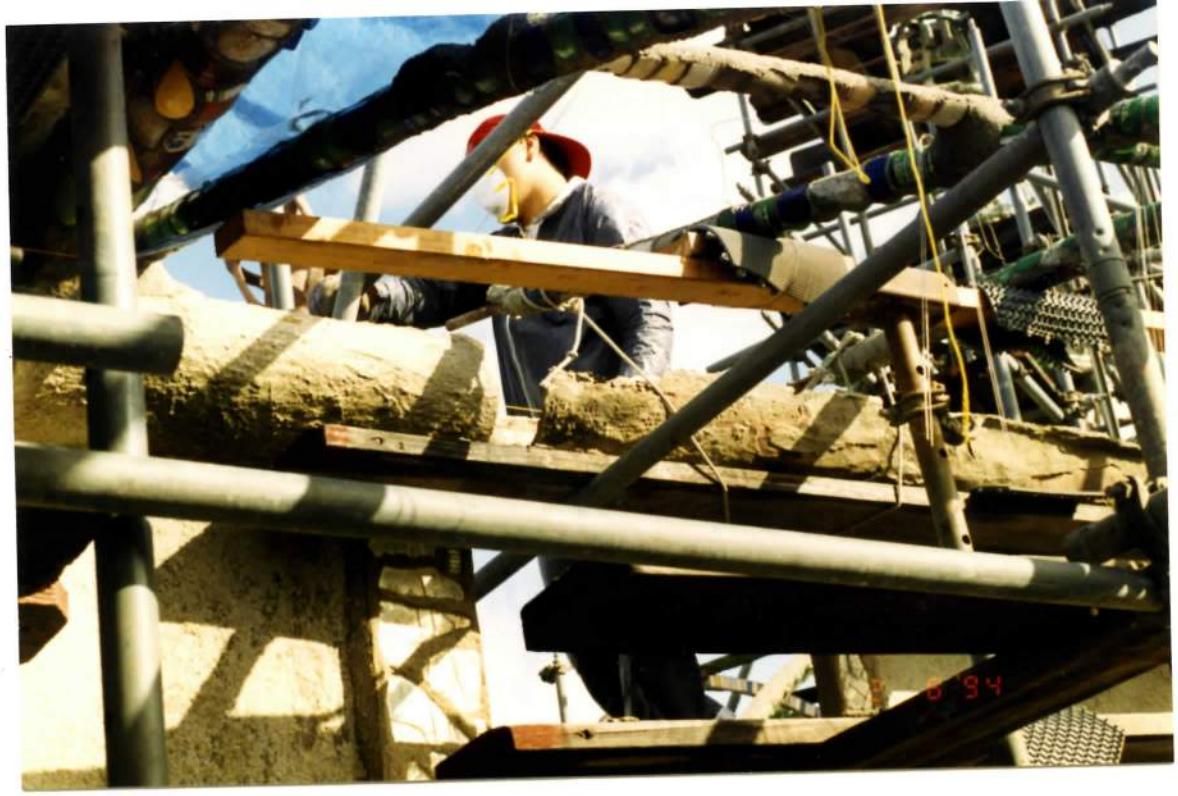

Figure 14. Removal of portion of facade top beam outside (south) before conservation. February 8, 1994.

Figure 15. Conservation underway on vertical reinforcement and reinstallation of original covering on post at east end inside (north) of facade. February 23, 1994.

Figure 16. Inside (north) facade during conservation. Posts on both sides of door opening replaced with vertical steel channels wrapped with mesh (right) and placed in new footings. February 23, 1994.

Figure 17. Inside (north) facade horizontal steel channel replacement for damaged top beam. Note top beam welded to new vertical channels on both sides of door opening. February 23, 1994.

Figure 18. View of reinstalled coverings over new reinforcement for east post inside (north) facade. Mar 8, 1994.

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Figure 20. Wooden frame of door inside (north) before treatment. June 1, 1994.

Figure 21. Post 08 east of house foundation showing vertical cracks and damage at top near connection to overhead. July 5, 1994.

Figure 22. Post 08 east of house foundation after removal of failed reinforcement. July 5, 1994.

Figure 23. House facade outside (south) west end of facade during crack-filling with Jahn mortar. July 5, 1994.

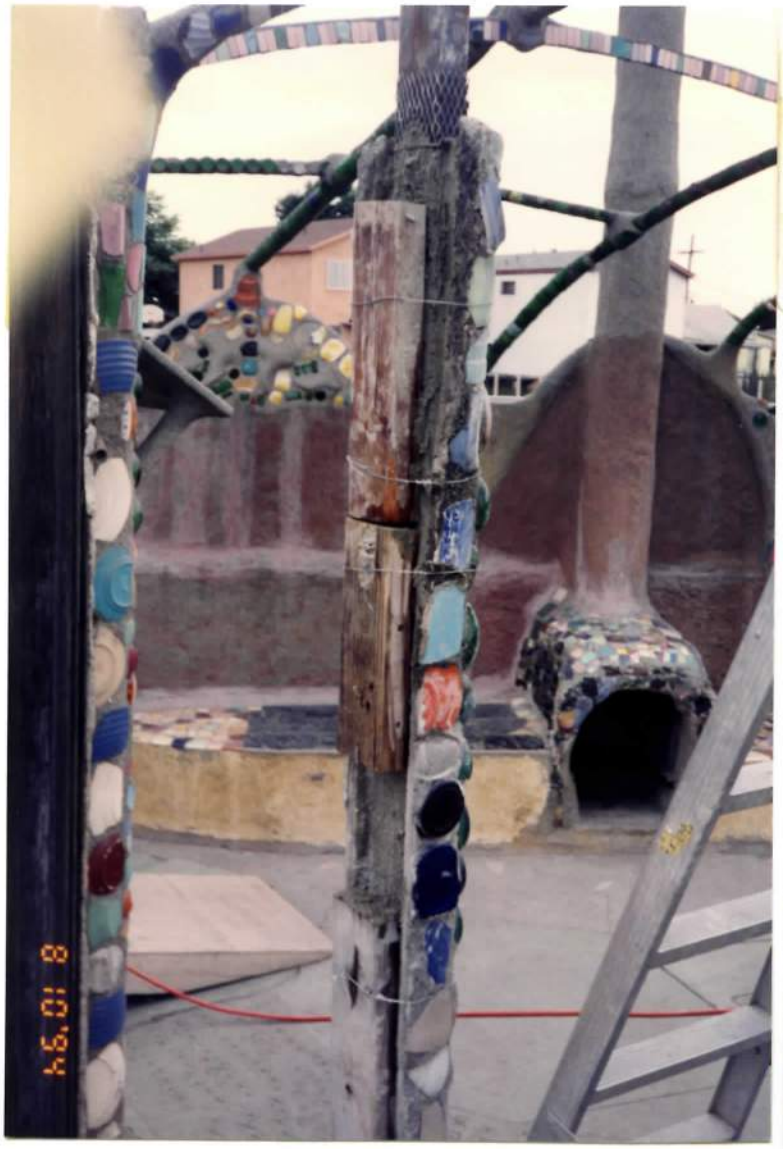

Figure 24. Post 04 east of house foundation during conservation after removal and replacement of failed reinforcement and installation in adequate foundation. August 10, 1994.

Figure 25. Post 08 (center of photo) after conservation. Note that the entire original covering has been installed over a new reinforcement cemented into a new footing and foundation. August 16, 1994.

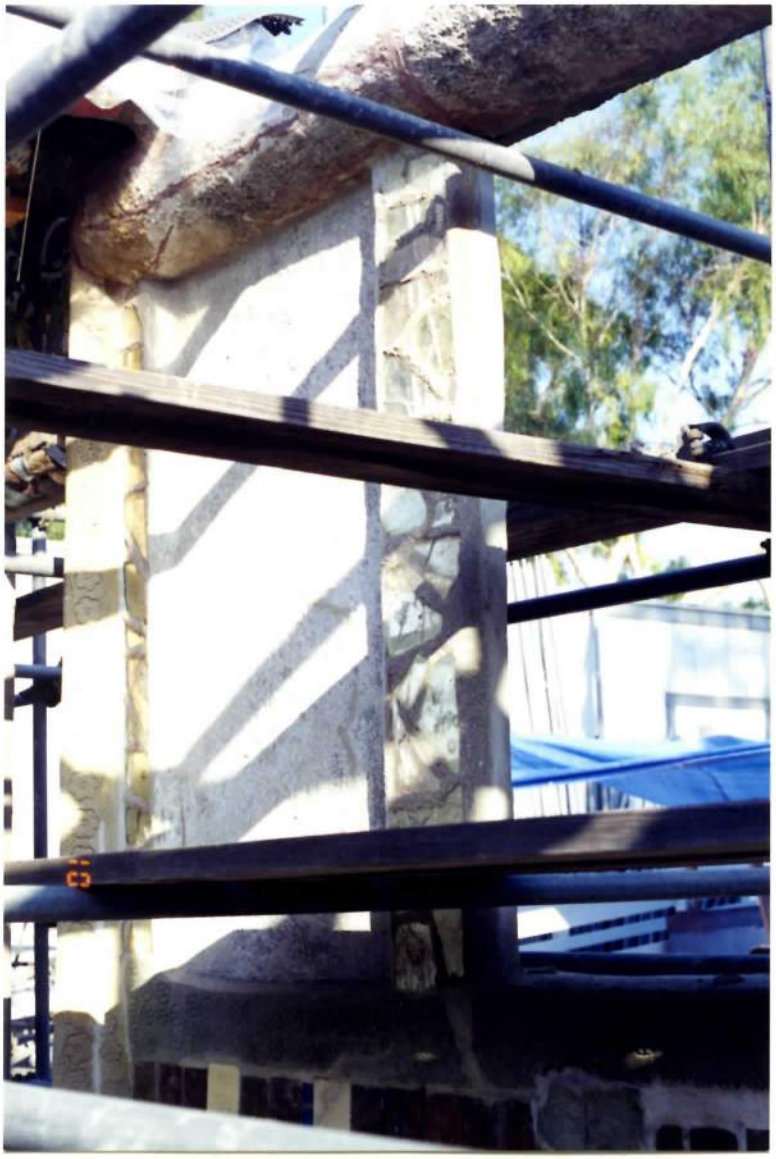

Figure 26. Portion of south side of facade after conservation. September 10, 1994.

Figure 27. Upper portion of south side of facade after conservation. September 10, 1994.

Figure 28. Lower portion of south side of facade after conservation. September 10, 1994.

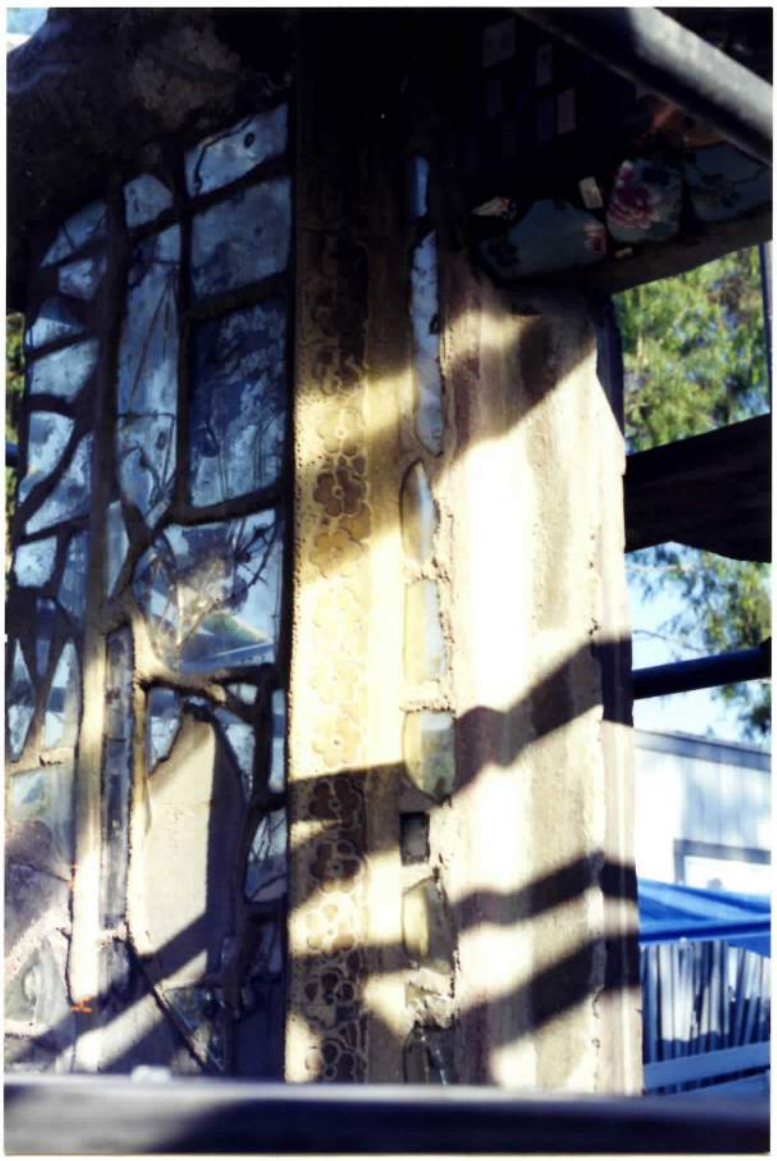

Figure 29. South side of facade west of the doorway after conservation. October 7, 1994.

PRODUCT NAME	DATE INITIATED	OPERATION/PROCESS	TOWERS LOCATION	PRODUCT TYPE	MATERIAL TREATED
HXTAL NYL-1 EPOXY ADHESIVE	5/04/89	ADHESION/ORNAMENTS	NWA A 17 I F		GLASS
DC 3145 SILICONE	7/07/89	CRACK-FILLING	SWA B 15 O		MORTAR
DC 3145 SILICONE (PIGMENTED)	7/07/89	CRACK-FILLING	SWA A 28 O		MORTAR
DC 3145 SILICONE	7/07/89	CRACK-FILLING	SWA A 24 O		MORTAR
DC 3145 SILICONE	10/06/89	CRACK-FILLING	SWA B 15 I	CRACK-FILLER	MORTAR/TILE
DC 3145 SILICONE	10/06/89	CRACK-FILLING	SWA A 29 O	CRACK-FILLER	MORTAR
ACRYLOID B-72 IN ACETONE(60%)	9/26/89	ADHESION/ORNAMENTS	SWA B 15 I	CONSOLIDANT	CERAMIC TILE
ACRYLOID B-72 IN ACETONE	9/26/89	ADHESION/ORNAMENTS	SWA B 15 I	CONSOLIDANT	CERAMIC TILE
ACRYLOID B-72 IN XYLENEX 5%	7/27/89	ADHESION/ORNAMENTS	CTO A NWW??	CONSOLIDANT	ABALONE SHELL
ACRYLOID B-72 IN XYLENE 5%	7/27/89	CONSOLIDATION	SWA B 24 I	CONSOLIDANT	SEA SHELL
ACRYLOID B-72 IN XYLENE 10%	7/27/89	CONSOLIDATION	SWA B 24 I	CONSOLIDANT	SEA SHELL
ACRYLOID B-72 IN XYLENE 5%	8/29/89	CONSOLIDATION	SHI C 01 NW	CONSOLIDANT	SEA SHELL
ACRYLOID B-72 IN XYLENE 5%	8/29/89	CONSOLIDATION 3 SMPL	SHI C 01 SW	CONSOLIDANT	SEA SHELL
ACRYLOID B-72 IN XYLENE 5%	7/27/89	CONSOLIDATION	NWA A 18 I	CONSOLIDANT	ABALONE SHELL
ACRYLOID B-72 IN XYLENE 5%	7/27/89	CONSOLIDATION	CTO A NNW	CONSOLIDANT	ABALONE SHELL
CHEMTRETE BSM 40D	7/27/89	CONSOLIDATION	SWA B 24 I	H2O PROOFING AGT	SEA SHELL
CHEMTRETE BSM 40D	7/27/89	CONSOLIDATION	NWA A 18 I	H2O PROOFING AGT	ABALONE SHELL
CHEMTRETE BSM 40D	7/27/89	CONSOLIDATION	CTO A NNN	H2O PROOFING AGT	ABALONE SHELL
CHEMTRETE BSM 40D	8/22/89	CONSOLIDATION	SWA B 24 O	H2O PROOFING AGT	SEA SHELL
CHEMTRETE BSM 40D	8/22/89	WATERPROOFING AGENT	SWA A 12 O	H2O PROOFING AGT	BATCHELDER TILE
CHEMTRETE BSM 40D	8/22/89	WATERPROOFING AGENT	SWA A 11 O	H2O PROOFING AGT	MORTAR,SHELLS
CONSERVARE H PROSOCO	7/27/89	CONSOLIDATION	CTO A NNE O	CONSOLIDANT	SANDSTONE
CONSERVARE H PROSOCO	9/22/89	CONSOLIDATION	CTO A SSE O	CONSOLIDANT	ROCK
CONSERVARE H PROSOCO	9/22/89	CONSOLIDATION	CTO B SSS O	CONSOLIDANT	ROCK
CONSERVARE OH PROSOCO	7/27/89	CONSOLIDATION	CTO A NNE O	CONSOLIDANT	STONE(ROCK)BRN
CONSERVARE OH PROSOCO	9/22/89	CONSOLIDATION	NWA B 17 I	CONSOLIDANT	ROCK(GYPSUM?)

PRODUCT NAME	DATE INITIATED	OPERATION/PROCESS	TOWERS LOCATION	PRODUCT TYPE	MATERIAL TREATED
GE DF 104/ACRYLOID B-72 MIX	8/22/89	CONSOLIDATION	SWA A 10 O	CONSOLIDANT/H2O PROOF	MORTAR AROUND SHELLS
GE DF 104/ACRYLOID B-72 MIX	7/27/89	CONSOLIDATION	CTO A NNN O	CONSOLIDANT/H2O PROOF	STONE(ROCK)WHT
GE DF 104/ACRYLOID B-72 MIX	9/22/89	CONSOLIDATION	NWA B 17 I	CONSOLIDANT/H2O PROOF	ROCK(GYPSUM)
GE DF 104/ACRYLOID B-72 MIX	9/22/89	CONSOLIDATION REPAIR	CTO B SSW	CONSOLIDANT/H2O PROOF	ROCK
GE DF 104/ACRYLOID B-72 MIX	9/22/89	CONSOL/WATERPR AGENT	CTO A SSE O	CONSOLIDANT/H2O PROOF	ROCK
GE DF 104/ACRYLOID B-72 MIX	9/22/89	CONSOLIDATION	CTO B NNN O	CONSOLIDANT/H2O PROOF	ROCK
GE DF 104/ACRYLOID B-72 MIX	9/22/89	CONSOLIDATION	CTO B NNW O	CONSOLIDANT/H2O PROOF	ROCK
GE DF 104/ACRYLOID B-72 MIX	7/27/89	CONSOLIDATION 2 SMPL	SWA B 24 I	CONSOLIDANT/H2O PROOF	SEA SHELL
GE DF 104/ACRYLOID B-72 MIX	7/27/89	CONSOLIDATION	NWA A 18 I	CONSOLIDANT/H2O PROOF	ABALONE SHELL
GE DF 104/ACRYLOID B-72 MIX	7/27/89	CONSOLIDATION	CTO A NNN	CONSOLIDANT/H2O PROOF	ABALONE SHELL
GE DF 104/ACRYLOID B-72 MIX	7/27/89	CONSOLIDATION	CTO NNW	CONSOLIDANT/H2O PROOF	ABALONE SHELL
GE DF 104/ACRYLOID B-72 MIX	8/22/89	CONSOLIDATION	SHI A N O	CONSOLIDANT/H2O PROOF	ABALONE SHELL
GE DF 104/ACRYLOID B-72 MIX	8/22/89	CONSOLIDATION	SWA A 05 I	CONSOLIDANT/H2O PROOF	MUSSEL SHELL
GE DF 104/ACRYLOID B-72 MIX	8/22/89	CONSOLIDATION	SWA B 24 O	CONSOLIDANT/H2O PROOF	SEA SHELL
GE DF 104/ACRYLOID B-72 MIX	8/22/89	CONSOLIDATION	SHI A N 03	CONSOLIDANT/H2O PROOF	SEA SHELL
GE DF 104/ACRYLOID B-72 MIX	8/22/89	CONSOLIDATION	SWA A 10 O	CONSOLIDANT/H2O PROOF	SEA SHELLS
GE DF 104/ACRYLOID B-72 MIX	8/22/89	CONSOLIDATION	SWA A 12 O	CONSOLIDANT/H2O PROOF	BATCHELDER TILE
GE DF 104/ACRYLOID B-72 MIX	8/22/89	CONSOLIDATION	SWA A 12 O	CONSOLIDANT/H2O PROOF	LINOLEUM
GE DF 104/ACRYLOID B-72 MIX	8/22/89	CONSOLIDATION	SHI A N 03	CONSOLIDANT/H2O PROOF	LINOLEUM
GE DF 104/ACRYLOID B-72 MIX	8/22/89	CONSOLIDATION	SWA A 12 O	CONSOLIDANT/H2O PROOF	GLAZED CERAMIC TILE
GE 167 SILICONE	9/26/89	CRACK-FILLING	SWA B 14 I	CRACK-FILLER	MORTAR GREY
GE 167 SILICONE	9/26/89	CRACK-FILLING	SWA A 14 O	CRACK-FILLER	MORTAR

PRODUCT NAME	DATE INITIATED	OPERATION/PROCESS	TOWERS LOCATION	PRODUCT TYPE	MATERIAL TREATED
GE 167 SILICONE	9/26/89	CRACK-FILLING	SWA A 13 O	CRACK-FILLER	MORTAR YELLOW
GE 167 SILICONE	9/26/89	CRACK-FILLING	SWA A 09 O	CRACK-FILLER	MORTAR GREY
GE 167 SILICONE	9/26/89	CRACK-FILLING	SWA B 16 I	CRACK-FILLER	MORTAR GREY
GE 167 SILICONE	9/26/89	CRACK-FILLING	SWA A 09 O	CRACK-FILLER	MORTAR GREY
DC 738 W/PIGMENTS/		CRACK-FILLING		CRACK-FILLER	MORTAR
DC 738 W/PIGMENTS/	9/12/89	CRACK-FILLING	SWA B 07 I	CRACK-FILLER	MORTAR
DC 738 W/PIGMENTS/	9/12/89	CRACK-FILLING	SWA B 07 I	CRACK-FILLER	MORTAR
DC 738 W/PIGMENTS/		CRACK-FILLING		CRACK-FILLER	MORTAR
DC 738 W/PIGMENTS/		CRACK-FILLING		CRACK-FILLER	MORTAR
DC 738 W/PIGMENTS/	9/12/89	CRACK-FILLING	SWA A 14 O	CRACK-FILLER	MORTAR
DC 738 W/30% SAND,W/PIGMENTS	9/12/89	CRACK-FILLING	SWA A 17 O	CRACK-FILLER	MORTAR
DC 738 W/PIGMENT,30% SAND	9/12/89	CRACK-FILLING	SWA A 13 O	CRACK-FILLER	MORTAR
DC 738 W/SAND & PIGMENTS	10/06/89	CRACK-FILLING	HOU A 05 O	CRACK-FILLER	MORTAR/TILE
DC 739 W/PIGMENTS/	9/12/89	CRACK-FILLING	SWA B 15 I	CRACK-FILLER	MORTAR
DC 739 W/PIGMENTS/	9/12/89	CRACK-FILLING	SWA B 16 O	CRACK-FILLER	MORTAR
DC 739 W/PIGMENTS/30% SAND	9/12/89	CRACK-FILLING	SWA B 17 O	CRACK-FILLER	MORTAR
DC 739 W/PIGMENTS	9/12/89	CRACK-FILLING	SWA B 16 I	CRACK-FILLER	MORTAR
DC 739 W/PIGMENTS	9/12/89	CRACK-FILLING	SWA B 16 I	CRACK-FILLER	MORTAR
DC 739 W/PIGMENTS	9/12/89	CRACK-FILLING	SWA B 16 I	CRACK-FILLER	MORTAR
DC 739 W/PIGMENTS	9/12/89	CRACK-FILLING	GAZ A NNW I	CRACK-FILLER	MORTAR
B-48N ADHESIVE	9/01/89	ADHESIVE	SCULPTURE CON		ORNAMENTS
HXTAL NYL-1 EPOXY ADHESIVE					
ABLEBOND EPOXY UV-CURING PRODUCTS					
DC 737	9/01/89	ADHESIVE/FILL	SCULPTURE CON		ORNAMENTS/MORTAR
GE 160					
GE 161					
GE 162	10/24/89	ADHESION	SHI C 01 NW-1	ADHESIVE/ SILICONE	ORNAMENTS
TRIMETHOXY SILANE					
WESTTECH EPOXY W/MICROBALLOONS	9/01/89	ADHESIVE/FILL	SCULPTURE CON		MORTAR/ORNAMENTS
GE SILPRUF	9/01/89	FILL MATERIAL	SCULPTURE CON		MORTAR

PRODUCT NAME	DATE INITIATED	OPERATION/PROCESS	TOWERS LOCATION	PRODUCT TYPE	MATERIAL TREATED
DC 737	10/24/89	DECORATION ADHESION	SHI C 01 NW-1	SILICONE ADHESIVE	ORNAMENTS/MORTAR
SIKATOP 122	10/24/89	MORTAR REPLACEMENT	SHI S B 04	MORTAR, COMMERCIAL	MORTAR
BRASSO	2/27/90	CLEANING AGENT	GAZ A WSW O	METAL POLISH	TILE
BRASSO	2/27/90	CLEANING AGENT	GAZ A WSW O	METAL POLISH	TILE #1
BRASSO	2/27/90	CLEANING AGENT	GAZ A WSW O	METAL POLISH	TILE #5
NOXON	2/27/90	CLEANING AGENT/POLIS	GAZ A WSW O	METAL CLEANER	TILE #6
NOXON	2/27/90	CLEANING AGENT/POLIS	GAZ A WWS O	METAL CLEANER	TILE #7
NOXON	2/27/90	CLEANING AGENT	GAZ A WWS O	METAL CLEANER	TILE #4
MAGNESIUM TRISILICATE	2/27/90	CLEANING POULTICE	GAZ A WWS O		TILES #Mg
DC-738 SILICONE 50% SAND	3/20/90	CRACK-FILLING	PATIO FLOOR	CRACK-FILLER	CEMENT FLOOR CRACK
MONSANTO BUTVAR B-90	7/03/90	WOOD CONSOLIDANT	CHI A WWW O	WOOD CONSOLIDANT	WOOD
SIKADUR 31 HI MOD GEL EPOXY	8/06/90	ADHESIVE	SHI C 01 EEE	EPOXY	MORTAR FRAGMENTS
WHITE PORTLAND CEMENT TYPE I	10/02/90	CEMENT-COLOR	WATTS TOWERS	BONDING	SHIP BASE
GRAY PORTLAND CEMENT TYPE I	10/15/90	CEMENT-COLOR	WATTS TOWERS	BONDING	SHIP BASE
WHITE/GRAY CEMENT TYPE I MIX	10/16/90	CEMENT-COLOR	WATTS TOWERS	BONDING	SHIP BASE
JAHN M30	11/27/90	CRACK-FILLING	NWA A 09 I	INJECTION MORTAR	MORTAR POST 09
JAHN M30	12/05/90	STR. CRACK-FILLING	NWA A 09 I	INJECTION MORTAR	MORTAR POST 09
JAHN M30	12/05/90	STR. CRACK-FILLING	CHI B NNN	INJECTION MORTAR	TOP/N EDGES FPLACE
PIGMENTS/SILINE	5/29/91	PIGMENT/SEAL JAHNM70	SHI B S03	PIGMENTS/SEALANT	JAHN MORTAR M70 18A
PIGMENTS/SILINE	5/29/91	PIGMENT/SEAL JAHNM70	SHI A 04	PIGMENTS/SEALANT	JAHN MORTAR M70 18A
PIGMENTS/SILINE	5/29/91	PIGMENT/SEAL JAHNM70	SHI B S 03	PIGMENTS/SEALANT	JAHN MORTAR M70 18A
MD CAULK (TUB & TILE)	1/22/92	SEAL HOLES IN SHELLS	ATO B SW HORI	CAULK/SEALER AGAINST	SEA SHELL HOLE
GE RTV SILICONE #169	3/18/92	SEAL HOLES IN SHELLS	ATO B N O HOR		SEA SHELL HOLES
PLIACRE EPOXY RESIN PUTTY	6/29/93	FILL FOR TILES	BTO B WEST SI	EPOXY PUTTY	TILES
GRIP FLEX ACRYLIC SIGN PAINT	6/29/93	INPAINT TILE FILL	BTO B WEST SI	PAINT/GLAZE	TILES

ELEV. CODE	VIEW DIR.	ASPECT	ELEV FEET	DATE #1	MATERIALS USED	TECHNIQUE	DATE #2	MATERIALS USED	TECHNIQUE
A	01	O	4	1/03/94	GRINDER	CUT/DETACH POST	1/05/94	GRINDER	READY AREA FOR FOOTING
A	01	O	4	1/03/94	WOOD	MAKE BRACES	2/02/94	GRINDER/WELDER STEEL	WELD STEEL SUPPORTS
A	01	O	4	3/08/94	CEMENT MORTAR, WOODEN	POUR 4 POSTS	7/18/94	GRINDER, JAHN M90 MORTAR	OPEN CRACKS, FILL W/MORTAR
A	01	O	4	7/26/94	GRINDER, JAHN M90 MORTAR	OPEN & FILL CRACKS			
A	02	O	4	1/25/94	TOOLS	PANEL 02	7/13/94	GRINDER, JAHN M90 MORTAR	OPEN & FILL CRACKS
A	02	O	4	10/15/94	BRASSO, DIST WATER, ETHANOL	CLEAN ORNAMENTS	10/19/94	ETHANOL	REMOVE RESIDUE,
A	03	O	4	10/19/94	ETHANOL	CLEAN ORNAMENTS			
A	04	O	4	7/13/94	GRINDER, JAHN M90 MORTAR	OPEN & FILL CRACKS			
A	05	O	4	5/26/94	JAHN M90 MORTAR,SHARP	ADD INCISION,	10/21/94	BRASSO, DIST WATER, ETHANOL	CLEAN ORNAMENTS
A	06	O	4						
A	06	I	4	5/17/94	MESH, CEMENT MORTAR	WRAP MESH, APPLY	7/11/94	GRINDER, JAHN M90 MORTAR	OPEN,FILL CRACKS,REBOND
A	07	O	4	1/05/94	GRINDER	GRIND OUT POST FOR	1/18/94	SCAFFOLD PARTS	ERECT SCAFFOLDING
A	07	O	4	7/05/94	GRINDER, JAHN M90 MORTAR	OPEN, FILL CRACKS			
B	01	O	8	1/11/94	GRINDER	PREPARE 3" X 1/4" X	1/31/94	GRINDER	GRIND MORTAR COATS
B	01	O	8	2/09/94	WIRE	BUILD FRAME FOR TOP	1/25/94	WOOD/PLASTIC	SHORE WALL/COVER
B	01	O	8	7/18/94	GRINDER, JAHN M90 MORTAR	OPEN & FILL CRACKS			
B	01	I	8	5/19/94	MESH, CEMENT MORTAR,	GRIND, WRAP AND APPLY	7/27/94	GRINDER, JAHN M90 MORTAR	OPEN CRACKS, FILL WITH
B	02	O	8	2/01/94	STEEL CHANNELS/STEEL	WRAP MESH AROUND	2/09/94	GRINDER	CUR SPACERS FOR
B	03	O	8	7/18/94	GRINDER, JAHN M90 MORTAR	OPEN CRACK/FILL	7/26/94	GRINDER, JAHN M90 MORTAR	OPEN & FILL CRACKS
B	03	O	8	7/27/94	JAHN M90 MORTAR	RESTORE CONTOUR TO	10/14/94	BRASSO, JAHN M90 MORTAR	CLEAN ORNAMENT/FILL
B	04	O	8	4/11/94	CEMENT MORTAR, WOOD	MAKE FORM, POUR CEMENT	4/18/94	CEMENT MORTAR, MESH,	WELD REPAIR,WRAP,

ELEV. CODE	VIEW DIR.	ASPECT	ELEV FEET	DATE #1	MATERIALS USED	TECHNIQUE	DATE #2	MATERIALS USED	TECHNIQUE
B	04	O	8	7/25/94	JAHN M70-18A & M90 MORTARS	OPEN & FILL CRACKS	10/25/94	BRASSO, ETHANOL,DIST	CLEAN ORNAMENTS
B	05	O	8	4/12/94	CEMENT MORTAR, WOOD	MAKE FORM, POUR CEMENT	5/31/94	JAHN M90 MORTAR,ACETONE	OPEN/CLEAN CRACKS,FILL
B	05	O	8	7/13/94	JAHN M70-18A MORTAR	FILL CRACKS	7/18/94	GRINDER, JAHN M70-18A MORTAR	OPEN & FILL CRACKS
B	06	O	8	7/11/94	JAHN M90 MORTAR;	OPEN CRACKS/FILL	7/18/94	JAHN M90 MORTAR	REMOVE,REBOND FRAGMENT
B	07	O	8	7/06/94	JAHN M90 MORTAR;	OPEN CRACKS/FILL			
C	P04	O	8	7/25/94	GRINDER	CUT/DETACH POST	7/26/94	GRINDER	GRIND INNER SURFACES
C	P04	O	8	7/27/94	GRINDER	GRIND INNER SURFACE OF	8/01/94	GRINDER	GRIND INNER SURFACES
C	P04	O	8	8/02/94	WOOD, GRINDER	PREPARE FRAME TO	8/08/94	CEMENT MORTAR	REBOND FRAGMENTS
C	P04	O	8	8/09/94	GRINDER, CEMENT MORTAR	GRIND INNER SURFACE,	8/10/94	CEMENT MORTAR, SIKADU	REBOND FRAGMENTS,JOI
C	P04	O	8	8/15/94	CEMENT MORTAR	REBOND FRAGMENTS	8/16/94	CEMENT MORTAR	APPLY LAST COAT
C	P08	O	8	7/06/94	B-72,SIKADUR 23,ACETONE	CLEAN,REBOND ORNAMENTS,F	8/09/94	CEMENT MORTAR	REBOND FRAGMENTS
C	P08	O	8	8/10/94	GRINDER, WIRE, CEMENT	GROOVE CONNECTOR/RE	8/15/94	CEMENT MORTAR	REBOND FRAGMENTS,FIL
C	P08	O	8	8/16/94	CEMENT MORTAR	REBOND FRAGMENTS	8/18/94	CEMENT MORTAR	REBOND ORNAMENTS/FRA
C	P08	O	8	8/22/94	CEMENT MORTAR, WIRE	RETIE, REBOND OHD	8/23/94	CEMENT MORTAR	REBOND FRAGMENTS
C	P08	O	8	8/24/94	CEMENT MORTAR, WIRE	REBOND FRAGMENTS	8/17/94	CEMENT MORTAR	REBOND FRAGMENTS