

PEER Preliminary Notes and Observations on the August 24, 2014, South Napa Earthquake

Appendix A

2014 South Napa Field Notes
Oregon State University Team



Pacific Earthquake Engineering Research Center

Report No. 2014/13

A 2014 South Napa Field Notes—Oregon State University Team⁺

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INTRODUCTION

The research team from Oregon State University traveled to Napa, California, to perform post-earthquake reconnaissance in the aftermath of the August 24, M6.0, South Napa Earthquake. The objective was to collect and synthesize structural and geotechnical performance data. It was observed that the Napa earthquake led to some damage; most notably, damage to older unreinforced masonry buildings, wood-frame structures, toppled chimneys, and non-structural and content damage. The following sections summarize the field notes collected by the Oregon State University (OSU) team. Note that the content of the report has had little to no post-processing. The main objective is to provide as captured information and not to provide detailed information and inferences on what was observed. Following ATC-20 terminology, we can classify the evaluations herein as “Rapid Evaluations.”

On Day 0 (August 24), the researcher team collected following: (a) intensity of shaking from USGS and the CESMD on ground motions from previous recent earthquakes in the area; (b) social media data (newspaper digital collections and tweets #napa, #napaquake); and (c) data from the City of Napa, including live press releases and list of tagged buildings.

The team travelled to Napa on Monday, August 25 and was on the field for three days from Day 2 to Day 5 (August 26–28). This report focuses on the reconnaissance work done on August 26, which was centered on downtown Napa. The research team from OSU started their reconnaissance at CA Clearinghouse, which was in Day 2 of operations (see Figure 1). Working with EERI/PEER, the OSU team and two EERI interns volunteered to aid in gathering data of damaged structures, working in the area surrounding the main historical center. A second team consisting of practicing engineers was focusing on structures within a few hundreds of feet around the N016 net quake station². Figure 2 shows the list of structures for which rapid evaluation was performed.

A total of 29 structures were evaluated on August 26 by the research team. A list of structures evaluated is shown in Table 1. Figures 3–81 summarizes the main observations for all these structures. Focus was placed on URM structures, but the list of evaluated structures includes two parking structures, one pedestrian bridge, one skywalk, and one retaining wall. In the interest of limiting the number of pages in this report, the original ATC–20 rapid evaluation forms are not shown.

⁺ Any observations, opinions, findings, and conclusions or recommendations expressed in this material are preliminary and are those of the authors, and do not necessarily reflect those of the Pacific Earthquake Engineering Research Center. The information, data and images contained in this report may not be published or presented without permission from the authors.

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² <http://strongmotioncenter.org/cgi-bin/CESMD/stationhtml.pl?stationID=NCN016&network=NCSN>, Accessed Sept. 11



Figure 1 CA Clearinghouse, Napa Caltrans Maintenance Station 3161 Jefferson Street Napa, CA 94558 - August 26, 2014.

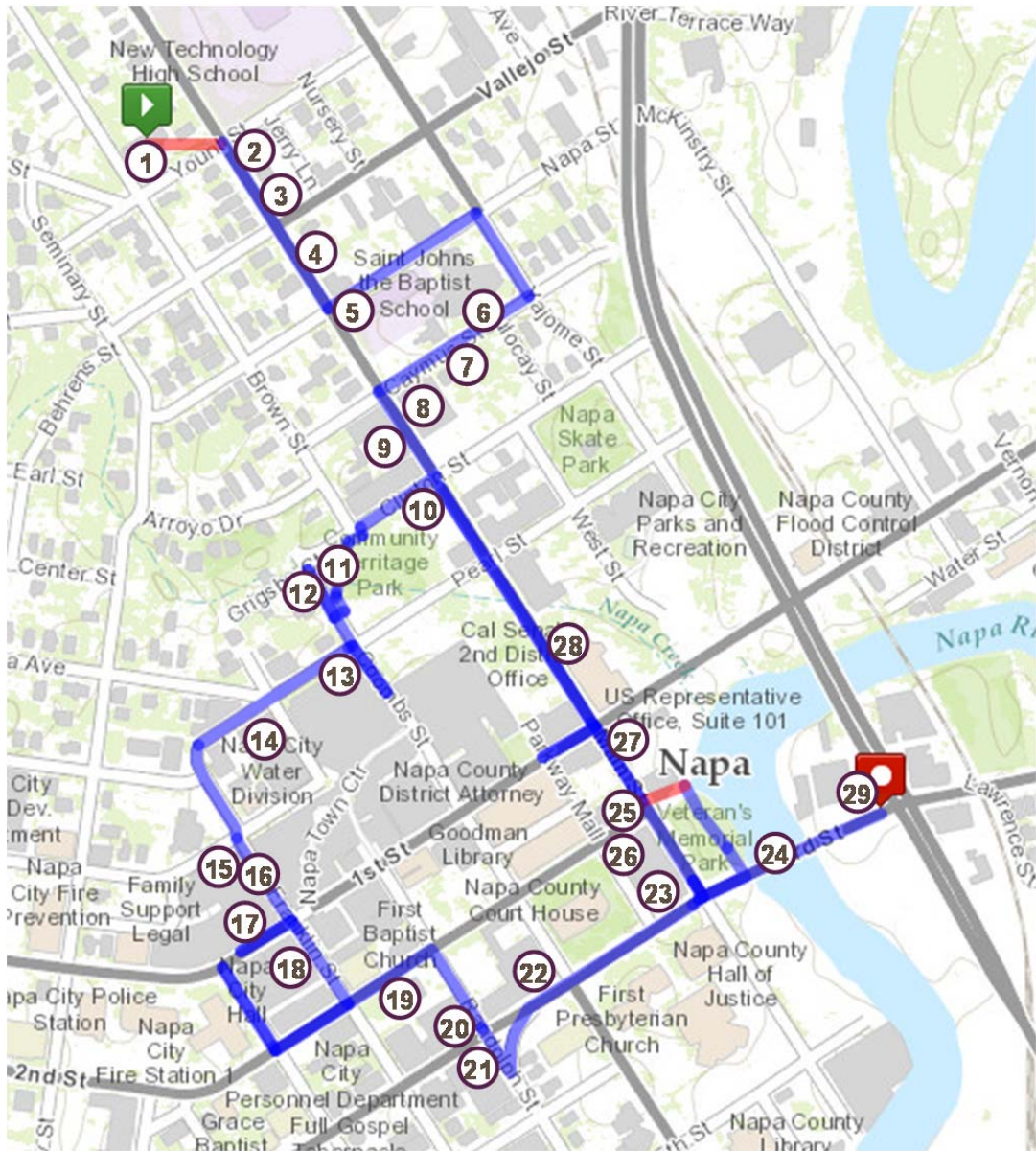


Figure 2 Location and sequence of analyzed structures.

EVALUATED STRUCTURES

Table 1 List of Structures Evaluated on August 26, 2014

No.	Address	Building Name	Description
1	1762 Brown St.	Lisbon Winery	Retrofitted URM building (stone masonry). Minor exterior damage, with stone block falling from wall. Building sustained interior damage to content, nonstructural partition walls, and water pipes, which caused inundation on second and first floor.
2	1660 Main St.	Jarvis Conservatory Annex	Wood-frame warehouse and auditorium. Stucco exterior walls damaged and detaching from main structure. Broken windows in direction of exterior cracking. Interior damage was not observed.
3	1606/1610 Main St.	Law Offices	Two buildings: 1610 Main St. has a first story URM and a wood wall with masonry veneer on second floor. Veneer collapsed out-of-plane. Significant damage to the masonry walls; 1606 Main St. is a URM building that had been retrofitted. Interior brace frame in front. No apparent steel brace frame on the east and south elevations. Masonry pier in-plane cracks and out-of-plane cracks visible. East wall collapsed between wall-to-floor tied URM wall.
4	1530/32 Main St.	Duplex Residence	Two chimneys damaged and collapsed. Garage shifted off foundation. Stucco cracks in exterior walls.
5	980 Napa St.	St. John the Baptist Catholic School	Private School. Some cracking on exterior facades. Interior tabique partition walls damaged. Fallen ceiling tiles and content. Broken glass debris.
6	981 Caymus St.	St. John the Baptist Catholic Church	Roof tile damage.
7	927 Caymus St.	Residence	Wood frame housing, with no visible damage. Chimney collapse.
8	1326 Main St.	Abandoned commercial building	Reinforced concrete building. Glazing and wall damage at corners.
9	1327 Main St.	Normar Fabrics	Glazing damage; visible crack in beam-column joint. It looks like the building is RC.
10	1245 Main St.	Vintner's Collection	Retrofitted URM building (stone masonry). Significant exterior damage, with stone blocks falling from wall and falling hazard from adjacent stones. In-plane shear cracking visible.
11	Clinton St. and Coombs St. over Napa Creek	Pedestrian Bridge	Bridge structural elements sustained no apparent damage. In the bearings, bolts had yielded and had residual deformations.
12	Coombs St. Retaining Wall (Napa Creek)	Retaining wall	Deformation of backfill notable. Settlement of adjacent roadway. Rotations of the wall were not observed.

No.	Address	Building Name	Description
13	Pearl St. Garage	Parking garage	Overall structure did not show signs of distress. However, flexural/shear cracks were visible in short columns. Minor cracks had been painted over, larger cracks seemed to be recent and a cause of the earthquake ground motion. Pending confirmation.
14	1300 Clay St.	AT&T Building	RC concrete building. Non-structural pre-fabricated concrete wall panel sheared off from supporting angles.
15	Clay St. Garage	Parking garage	Overall structure did not show signs of distress. However, flexural/shear cracks were visible in short columns. Minor cracks had been painted over, larger cracks seemed to be recent and a cause of the earthquake ground motion. Pending confirmation.
16	Clay St.	Skyway over Franklin St.	Pounding between skyway and parking garage. Damage on precast double-t girder.
17	1450 1st St.	Andaz Napa Hotel	Cracking of exterior wall cladding and falling hazard from ornamental fixtures.
18	935 Franklin St.	Charles Schwab Building	Failed wall-to-diaphragm connections. New construction (2008). Cornice cracked.
19	1351 2nd St/820 Randolph St.	Post Office	Steel framing with infill walls.
20	819 Randolph St.	Ace Hardware	Parapet ties yielded and parapet is bowing out.
21	1333 3 rd St.	First Presbyterian Church	Chimney damage.
22	801 Coombs St.	--	Plaster and glazing damage.
23	810-816 Brown St.	--	Unretrofitted URM building. Out-of-plane failure.
24	3 rd St. Bridge	--	Increased gap between abutment and bridge. No signs of pounding. Retaining wall under bridge with 1/2 to 1 inch permanent gap.
25	901 Main St.	Wells Fargo Building	Tall 1 story building that appears to be RC framing with infill or RC frame. Need conformation. Crack at end walls possibly enhanced by significant height between adjacent buildings.
26	840 Brown St.	Alexandria Building	Significant damage to signature URM retrofitted building. Smooth, straight dowels are visible.
27	942 Main St.	Napa Coffee Roasting Co.	Storefront glazing damage and cornice damage.
28	1040 Main St.	--	Retrofitted URM building with interior braced frames.
29	963 3 rd St.	--	Stone masonry URM building. Stone had fallen off. No other visible damage.

FIELD NOTES



No.	Address	Building Name	Photo Comments
1	1762 Brown St.	Lisbon Winery	Minor exterior damage, major interior damage due to water leak

Figure 3 Evaluated Structure No. 1.



No.	Address	Building Name	Photo Comments
1	1762 Brown St.	Lisbon Winery	Minor exterior damage, major interior damage due to water leak

Figure 4 Evaluated Structure No. 1.



No.	Address	Building Name	Photo Comments
1	1762 Brown St.	Lisbon Winery	Interior damage in a old bearing wall that is not supporting load.

Figure 5 Evaluated Structure No. 1.



No.	Address	Building Name	Photo Comments
1	1762 Brown St.	Lisbon Winery	Fallen stone and displaced stones adjacent to it.

Figure 6 Evaluated Structure No. 1.



No.	Address	Building Name	Photo Comments
2	1660 Main St.	Jarvis Conservatory Annex	Wood-frame warehouse/auditorium. Stucco exterior walls extensively damaged and detaching from main structure. No interior damage.

Figure 7 Evaluated Structure No. 2.



No.	Address	Building Name	Photo Comments
2	1660 Main St.	Jarvis Conservatory Annex	Visible exterior wall damage in stucco walls.

Figure 8 - Evaluated Structure No. 2.



No.	Address	Building Name	Photo Comments
2	1660 Main St.	Jarvis Conservatory Annex	Visible exterior wall damage in stucco walls.

Figure 9 Evaluated Structure No. 2.



No.	Address	Building Name	Photo Comments
2	1660 Main St.	Jarvis Conservatory Annex	No interior damage observed.

Figure 10 Evaluated Structure No. 2.



No.	Address	Building Name	Photo Comments
3	1606/1610 Main St.	Law Offices	1610 Main St. has a first story URM and a extension (wood shear wall) with masonry veneer on second floor. Veneer collapsed out-of-plane.

Figure 11 Evaluated Structure No. 3: Star indicates 1610 Main St.



No.	Address	Building Name	Photo Comments
3	1606/1610 Main St.	Law Offices	1606 Main St. is a URM building that had been retrofitted. Interior brace frame in front. No apparent steel brace frame on the back or side walls.

Figure 12 Evaluated Structure No. 3: Star indicates buildings on 1606 Main St.



No.	Address	Building Name	Photo Comments
3	1606/1610 Main St.	Law Offices	Different masonry type construction visible on both floor levels. In-plane cracks, and out-of-plane cracks visible.

Figure 13 Evaluated Structure No. 3.



No.	Address	Building Name	Photo Comments
3	1606/1610 Main St.	Law Offices	Significant damage to the masonry walls.

Figure 14 Evaluated Structure No. 3.



No.	Address	Building Name	Photo Comments
3	1606/1610 Main St.	Law Offices	Wall-to-floor ties performed well. Out-of-plane movements between floors.

Figure 15 Evaluated Structure No. 3.



No.	Address	Building Name	Photo Comments
3	1606/1610 Main St.	Law Offices	Back wall collapse (out-of-plane) between two levels of wall-to-floor ties.

Figure 16 Evaluated Structure No. 3.



No.	Address	Building Name	Photos Comments
4	1530/32 Main St.	Duplex Residence	Two chimneys damaged and collapsed. Garage shifted off foundation. Stucco cracks in exterior walls.

Figure 17 Evaluated Structure No. 4.



No.	Address	Building Name	Photo Comments
5	980 Napa St.	St. John the Baptist Catholic School	Private School. Some cracking on exterior facades. Interior tabique partition walls damaged. Fallen ceiling tiles and content. Broken glass debris.

Figure 18 Evaluated Structure No. 5.



No.	Address	Building Name	Photo Comments
5	980 Napa St.	St. John the Baptist Catholic School	Some cracking on exterior facades.

Figure 19 Evaluated Structure No. 5.



No.	Address	Building Name	Photo Comments
5	980 Napa St.	St. John the Baptist Catholic School	Some cracking on exterior facades. Interior tabique partition walls damaged.

Figure 20 Evaluated Structure No. 5.



No.	Address	Building Name	Photo Comments
5	980 Napa St.	St. John the Baptist Catholic School	Fallen ceiling tiles and content. Broken glass debris.

Figure 21 Evaluated Structure No. 5.



No.	Address	Building Name	Photo Comments
5	980 Napa St.	St. John the Baptist Catholic School	Fallen ceiling tiles. Cracked plaster.

Figure 22 Evaluated Structure No. 5.



No.	Address	Building Name	Photo Comments
6	981 Caymus St.	St. John the Baptist Catholic Church	Roof tile damage.

Figure 23 Evaluated Structure No. 6.



No.	Address	Building Name	Photo Comments
7	927 Caymus St.	Residence	Wood frame housing, with no visible damage. Chimney collapse.

Figure 24 Evaluated Structure No. 7.



No.	Address	Building Name	Photo Comments
8	1326 Main St.	Abandoned commercial building	Reinforced concrete building. Glazing and corner wall/wall damage.

Figure 25 Evaluated Structure No. 8.



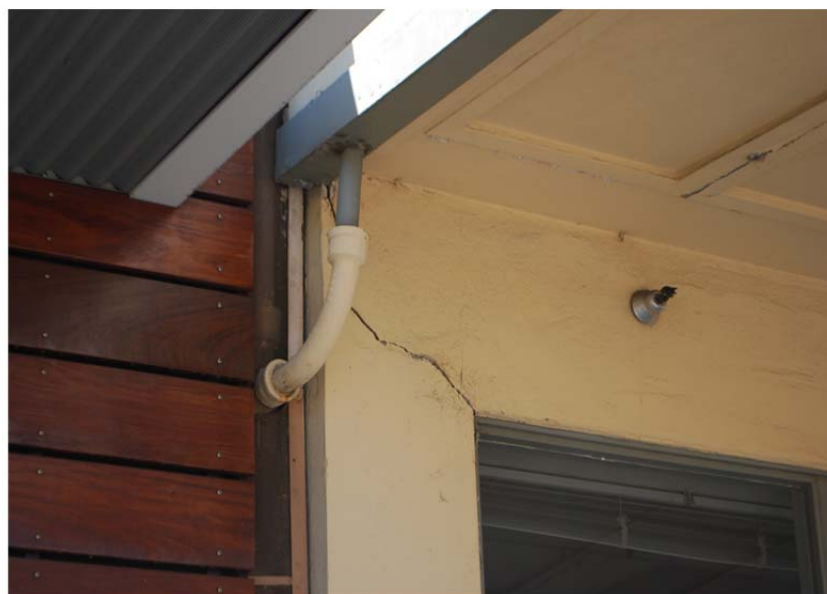
No.	Address	Building Name	Photo Comments
8	1326 Main St.	Abandoned commercial building	Corner wall damage.

Figure 26 Evaluated Structure No. 8.



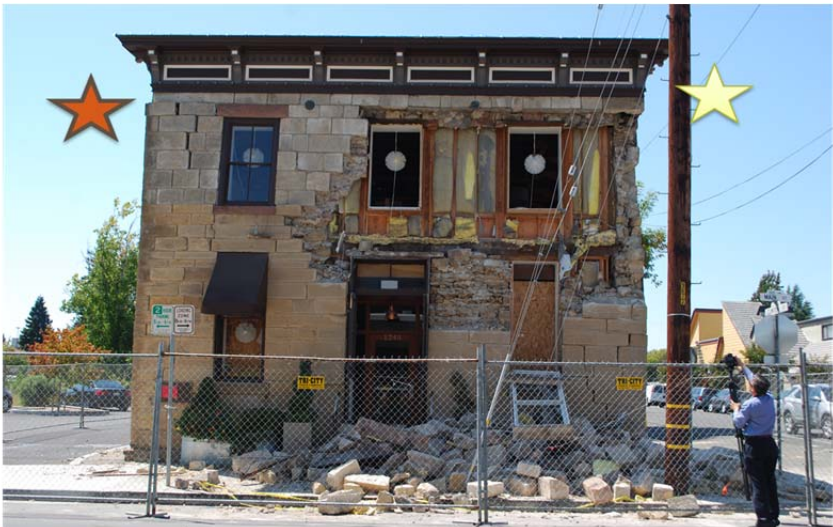
No.	Address	Building Name	Photo Comments
9	1327 Main St.	Normar Fabrics	Glazing damage; visible crack in beam-column joint. It looks like the building is RC.

Figure 27 Evaluated Structure No. 9.



No.	Address	Building Name	Photo Comments
9	1327 Main St.	Normar Fabrics	Visible crack in beam-column joint.

Figure 28 Evaluated Structure No. 9.



No.	Address	Building Name	Photo Comments
10	1245 Main St.	Vintner's Collection	Retrofitted URM building (stone masonry). Significant exterior damage, with stone blocks falling from wall and falling hazard from adjacent stones. In-plane shear cracking visible.

Figure 29 Evaluated Structure No. 10.



No.	Address	Building Name	Photo Comments
10	1245 Main St.	Vintner's Collection	Significant exterior damage, with stone blocks falling from wall and falling hazard from adjacent stones.

Figure 30 Evaluated Structure No. 10.



No.	Address	Building Name	Photo Comments
10	1245 Main St.	Vintner's Collection	In-plane shear cracking visible.

Figure 31 Evaluated Structure No. 10.



No.	Address	Building Name	Photo Comments
10	1245 Main St.	Vintner's Collection	In-plane shear cracking visible.

Figure 32 Evaluated Structure No. 10.



No.	Address	Building Name	Photo Comments
10	1245 Main St.	Vintner's Collection	Significant exterior damage, with stone blocks falling from wall and falling hazard from adjacent stones.

Figure 33 Evaluated Structure No. 10.



No.	Address	Building Name	Photo Comments
11	Clinton St. and Coombs St. over Napa Creek	Pedestrian Bridge	Bridge structural elements sustained no apparent damage. In the bearings, bolts had yielded and had residual deformations.

Figure 34 Evaluated Structure No. 11.



No.	Address	Building Name	Photo Comments
11	Clinton St. and Coombs St. over Napa Creek	Pedestrian Bridge	Bridge structural elements sustained no apparent damage.

Figure 35 Evaluated Structure No. 11.



No.	Address	Building Name	Photo Comments
11	Clinton St. and Coombs St. over Napa Creek	Pedestrian Bridge	In the bearings, bolts had yielded and had residual deformations.

Figure 36 Evaluated Structure No. 11.



No.	Address	Building Name	Photo Comments
12	Coombs St. Retaining Wall (Napa Creek)	Retaining wall	Deformation of backfill visible. Settlement of adjacent roadway. No notable rotations of the wall were observed.

Figure 37 Evaluated Structure No. 12.



No.	Address	Building Name	Photo Comments
12	Coombs St. Retaining Wall (Napa Creek)	Retaining wall	Deformation of backfill notable.

Figure 38 Evaluated Structure No. 12.



No.	Address	Building Name	Photo Comments
13	Pearl St. Garage	Parking garage	Overall structure did not show signs of distress. However, flexural/shear cracks were visible in short columns. Minor cracks had been painted over, larger cracks seemed to be recent and a cause of the earthquake ground motion. Pending confirmation.

Figure 39 Evaluated Structure No. 13.



No.	Address	Building Name	Photo Comments
13	Pearl St. Garage	Parking garage	Flexural cracks were visible in short columns. Minor cracks were painted over indicating that these were not due to the earthquake. However, larger cracks seemed to be recent and maybe due to earthquake motion. Pending confirmation.

Figure 40 Evaluated Structure No. 13.



No.	Address	Building Name	Photo Comments
13	Pearl St. Garage	Parking garage	Shear cracks were visible in this short column. Large cracks seemed to be recent and caused by ground motion. Pending confirmation.

Figure 41 Evaluated Structure No. 13.



No.	Address	Building Name	Photo Comments
13	Pearl St. Garage	Parking garage	Visible cracks in beam end. It is unlikely that the damage is due to the earthquakes. However, this is pending confirmation.

Figure 42 Evaluated Structure No. 13.



No.	Address	Building Name	Photo Comments
14	1300 Clay St.	AT&T Building	RC concrete building. Non-structural pre-fabricated concrete wall panel sheared off from supporting angles.

Figure 43 Evaluated Structure No. 14.



No.	Address	Building Name	Photo Comments
14	1300 Clay St.	AT&T Building	A/C units had shifter off supports.

Figure 44 Evaluated Structure No. 14.



No.	Address	Building Name	Photo Comments
14	1300 Clay St.	AT&T Building	Non-structural pre-fabricated concrete wall panel sheared off from supporting angles.

Figure 45 Evaluated Structure No. 14.



No.	Address	Building Name	Photo Comments
15	Clay St. Garage	Parking garage	Overall structure did not show signs of distress. However, flexural/shear cracks were visible in short columns. Minor cracks had been painted over, larger cracks seemed to be recent and a cause of the earthquake ground motion. Pending confirmation.

Figure 46 Evaluated Structure No. 15.



No.	Address	Building Name	Photo Comments
16	Clay St.	Skyway over Franklin St.	Pounding between skyway and parking garage. Damage on precast double-t girder.

Figure 47 Evaluated Structure No. 16.



No.	Address	Building Name	Photo Comments
16	Clay St.	Skyway over Franklin St.	Damage on precast double-t girder.

Figure 48 Evaluated Structure No. 16.



No.	Address	Building Name	Photo Comments
16	Clay St.	Skyway over Franklin St.	Damage on precast double-t girder.

Figure 49 Evaluated Structure No. 16.



No.	Address	Building Name	Photo Comments
17	1450 1st St.	Andaz Napa Hotel	Cracking of exterior wall cladding and falling hazard from ornamental fixtures.

Figure 50 Evaluated Structure No. 17.



No.	Address	Building Name	Photo Comments
17	1450 1st St.	Andaz Napa Hotel	Cracking of exterior wall cladding and falling hazard from ornamental fixtures.

Figure 51 Evaluated Structure No. 17.



No.	Address	Building Name	Photo Comments
18	935 Franklin St.	Charles Schwab Building	Failed wall-to-diaphragm connections. Cornice cracked.

Figure 52 Evaluated Structure No. 18.



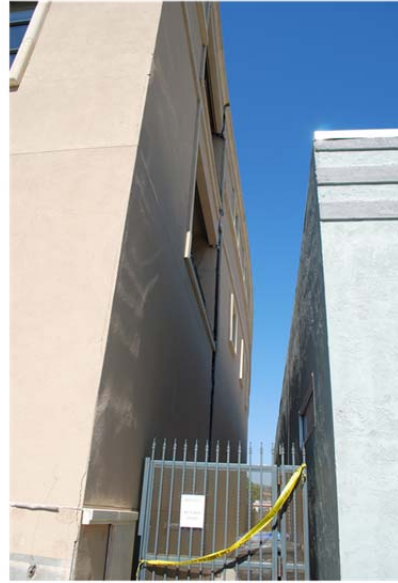
No.	Address	Building Name	Photo Comments
18	935 Franklin St.	Charles Schwab Building	Failed wall-to-diaphragm connections. Cornice cracked.

Figure 53 Evaluated Structure No. 18.



No.	Address	Building Name	Photo Comments
18	935 Franklin St.	Charles Schwab Building	Cornice cracked.

Figure 54 Evaluated Structure No. 18.



No.	Address	Building Name	Photo Comments
18	935 Franklin St.	Charles Schwab Building	Failed wall-to-diaphragm connections.

Figure 55 Evaluated Structure No. 18.



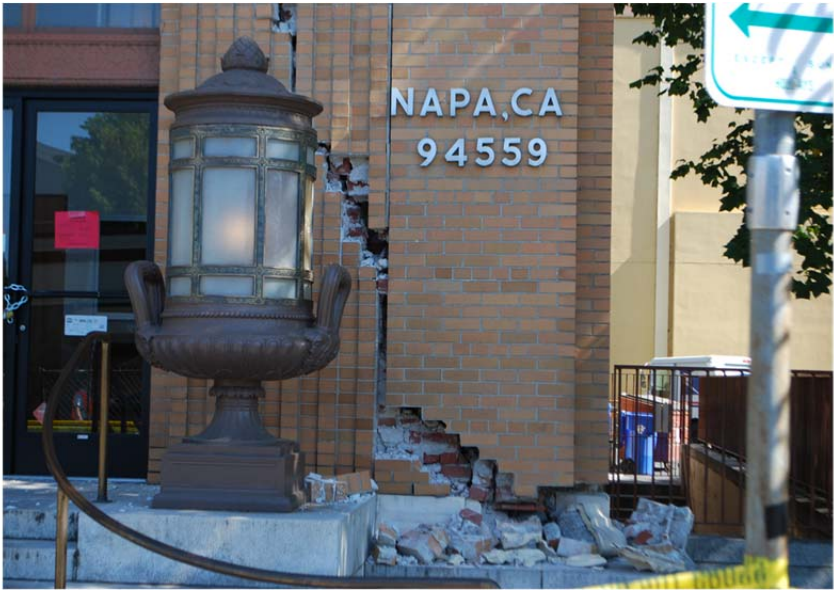
No.	Address	Building Name	Photo Comments
18	935 Franklin St.	Charles Schwab Building	Failed wall-to-diaphragm connections.

Figure 56 Evaluated Structure No. 18.



No.	Address	Building Name	Photo Comments
19	820 Randolph St.	Post Office	Steel framing with infills.

Figure 57 Evaluated Structure No. 19.



No.	Address	Building Name	Photo Comments
19	820 Randolph St.	Post Office	Steel framing with masonry infill. Shear cracking.

Figure 58 Evaluated Structure No. 19.



No.	Address	Building Name	Photo Comments
19	820 Randolph St.	Post Office	Stepped shear/diagonal cracks.

Figure 59 Evaluated Structure No. 19.



No.	Address	Building Name	Photo Comments
20	819 Randolph St.	Ace Hardware	Parapet ties yielded and stepped cracking in masonry walls.

Figure 60 Evaluated Structure No. 20.



No.	Address	Building Name	Photo Comments
20	819 Randolph St.	Ace Hardware	Parapet ties yielded and parapet is bowing out.

Figure 61 Evaluated Structure No. 20.



No.	Address	Building Name	Photo Comments
21	1333 3 rd St.	First Presbyterian Church	Chimney damage.

Figure 62 Evaluated Structure No. 21.



No.	Address	Building Name	Photo Comments
21	1333 3 rd St.	First Presbyterian Church	Chimney damage.

Figure 63 Evaluated Structure No. 21.



No.	Address	Building Name	Photo Comments
22	801 Coombs St.	--	Plaster and glazing damage.

Figure 64 Evaluated Structure No. 22.



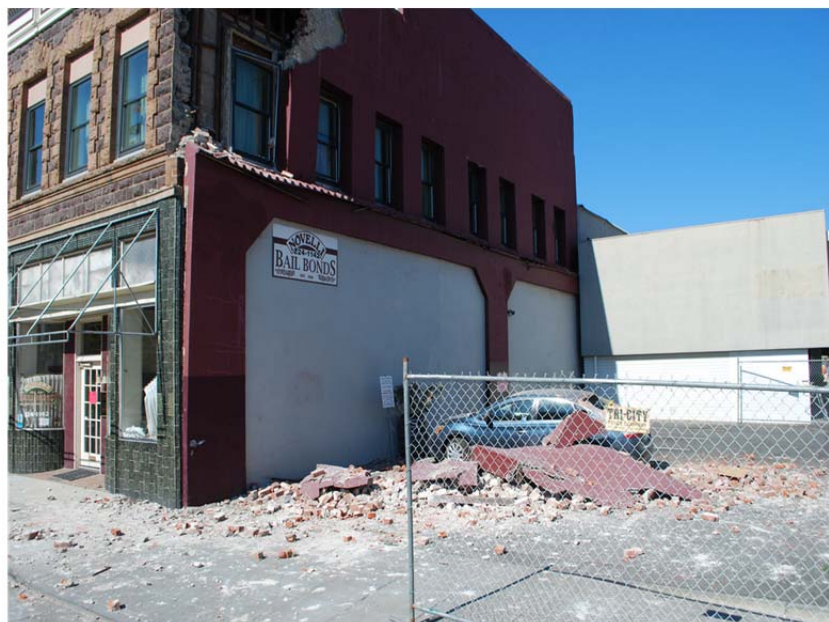
No.	Address	Building Name	Photo Comments
22	801 Coombs St.		Plaster and glazing damage.

Figure 65 Evaluated Structure No. 22.



No.	Address	Building Name	Photo Comments
23	810-816 Brown St.	--	Unretrofitted URM building. Out-of-plane failure.

Figure 66 Evaluated Structure No. 23.



No.	Address	Building Name	Photo Comments
23	810-816 Brown St.	--	Out-of-plane failure.

Figure 67 Evaluated Structure No. 23.



No.	Address	Building Name	Photo Comments
24	3 rd St. Bridge	--	Increased gap between abutment and bridge. No signs of pounding. Retaining wall under bridge with 1/2 to 1 inch (?) permanent gap. Confirmation needed.

Figure 68 Evaluated Structure No. 24.



No.	Address	Building Name	Photo Comments
24	3 rd St. Bridge	--	Retaining wall under bridge with 1/2 to 1 inch permanent gap.

Figure 69 Evaluated Structure No. 24.



No.	Address	Building Name	Photo Comments
25	901 Main St.	Wells Fargo Building	Tall 1 story building that appears to be RC framing with infill or RC frame. Need conformation.

Figure 70 Evaluated Structure No. 25.



No.	Address	Building Name	Photo Comments
25	901 Main St.	Wells Fargo Building	Crack at end walls possibly enhanced by significant height between adjacent buildings.

Figure 71 Evaluated Structure No. 25.



No.	Address	Building Name	Photo Comments
26	840 Brown St.	Alexandria Building	Significant damage to signature URM retrofitted building. Smooth, straight dowels are visible.

Figure 72 Evaluated Structure No. 26.



No.	Address	Building Name	Photo Comments
26	840 Brown St.	Alexandria Building	Smooth, straight dowels are visible. Two-wythe wall with brick veneer on the outside.

Figure 73 Evaluated Structure No. 26.



No.	Address	Building Name	Photo Comments
27	942 Main St.	--	Storefront glazing damage and cornice damage.

Figure 74 Evaluated Structure No. 27.



No.	Address	Building Name	Photo Comments
28	1040 Main St.	--	Retrofitted URM building with interior braced frames.

Figure 75 Evaluated Structure No. 28.



No.	Address	Building Name	Photo Comments
28	1040 Main St.	--	Retrofitted URM building with interior braced frames.

Figure 76 Evaluated Structure No. 28.



No.	Address	Building Name	Photo Comments
28	1040 Main St.	--	Retrofitted URM building with interior braced frames.

Figure 77 Evaluated Structure No. 28.



No.	Address	Building Name	Photo Comments
29	963 3 rd St.	--	Stone masonry URM building. Stone had fallen off. No other visible damage.

Figure 78 Evaluated Structure No. 29.



No.	Address	Building Name	Photo Comments
29	963 3 rd St.	--	Stone masonry URM building. Stone had fallen off. No other visible damage.

Figure 79 Evaluated Structure No. 29.



No.	Address	Building Name	Photo Comments
29	963 3 rd St.	--	Stone masonry URM building. Stone had fallen off. No other visible damage.

Figure 80 Evaluated Structure No. 29.



No.	Address	Building Name	Photo Comments
29	963 3 rd St.	--	Stone masonry URM building. Stone had fallen off. No other visible damage.

Figure 81 Evaluated Structure No. 29.