HCAI/CSMIP

HOSPITAL INSTRUMENTATION

Annual Report

July 1, 2025 through June 30, 2026

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California Strong Motion Instrumentation Program
California Department of Conservation
California Geological Survey

715 P Street, MS 1901
Sacramento, California 95814

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I. INTRODUCTION

The California Geological Survey's Strong Motion Instrumentation Program (CSMIP) performs installation, maintenance, and data recovery for strong motion instrumentation in hospitals through an interagency agreement with the Department of Health Care Access and Information (HCAI). Funding strong motion instrumentation of hospitals through the interagency agreement is in lieu of normal building-permit fee funding referenced in Chapter 8 of the Public Resources Code.

Hospital buildings have been instrumented under twelve Interagency Agreements. The first eleven agreements extended from July 1989 through June 2023, each covering a period of three fiscal years. The twelfth contract was approved by the Department of General Services (DGS) on September 5, 2023. This Report covers activities performed between July 1, 2025 and June 30, 2026 (FY25-26).

The code requirements regarding the instrumentation of hospitals were updated in 2019. Previously, the code stipulated that HCAI was responsible for subsidizing the maintenance of instrumentation installed at hospitals. With the updated requirements, however, the code requires hospital owners to pay for maintenance. When a maintenance issue is identified, CSMIP reports it to HCAI, then either HCAI authorizes CSMIP to perform the work, or advises the hospital owner that they are responsible for maintenance. If CSMIP performs maintenance on instrumentation that the hospital owner has responsibility for, the hospital owner can be billed to recover the cost of the work performed.

The Hospital Building Safety Board (HBSB) Instrumentation Committee has recommended seven one-story wood-framed hospitals for instrumentation, with funding to be provided by HCAI. CSMIP visited one of these hospitals, Monterey Park Hospital, on April 14, 2026 and June 10, 2026 to mark sensor locations in preparation for equipment installation. In addition, there was progress on owner-funded hospital instrumentation projects as CSMIP certified the completion of installation of two hospitals and continued to provide technical guidance and assistance to the general contractors and structural engineers on other instrumentation projects currently underway.

In addition to new instrumentation projects under the CGS/HCAI agreement, CSMIP upgraded the recording systems at 9 instrumented hospitals and free-field stations at no charge for equipment to HCAI. The instrumentation at these stations was upgraded from obsolete recording

systems to modern higher resolution recorders capable of real-time data streaming. The funding for purchasing recording systems for these upgrades was provided by CGS through its Statewide Seismic Hazard Mitigation Upgrade Project. HCAI paid only for the labor cost of these upgrades. So far, CSMIP has upgraded 62 hospitals and free-field stations as part of the Statewide Seismic Hazard Mitigation project.

II. HOSPITAL INSTRUMENTATION STATUS

Hospital buildings with instrumentation installations completed or underway are listed in Tables 1, 2, and 3. Like the other hospitals recently instrumented by the CSMIP, the new stations will have near-real-time data communication capability to allow the recorded motion to be automatically transmitted to the CSMIP servers after an earthquake where it will be automatically processed and made available for use in post-earthquake response by the HCAI and the hospital owners.

1) Type 1 - HCAI-Funded Regular Instrumentation of Hospitals (Table 1)

The Hospital Building Safety Board (HBSB) Instrumentation Committee has recommended seven one-story wood-framed hospitals for instrumentation, with funding to be provided by HCAI. CSMIP worked with HCAI to prepare preliminary sensor layouts and coordinate with representatives of five of these seven hospitals.

The sensor layout was finalized for the Monterey Park Hospital, and a project kick-off meeting was held on May 22, 2025 with a hospital representative. CSMIP visited this hospital on April 14, 2026 and June 10, 2026 to mark sensor locations in preparation for equipment installation. Due to cable path and sensor location access issues discovered during the visits, it was determined that adjustments to the sensor layout may be required. CSMIP plans to meet again with the hospital representative to discuss these issues and develop potential solutions before a third site visit is scheduled.

2) Types 2 and 3 - Owner-Funded Instrumentation of Hospitals with CSMIP Guidance and Assistance (Tables 2 and 3)

In addition to the hospital instrumentation funded under the HCAI/CSMIP contract discussed above, a significant component of CSMIP hospital instrumentation work involves detailed technical guidance and assistance with hospital instrumentation projects for which the owner absorbs the capital cost of instrumentation under HCAI regulations. These may be in new hospitals (Type 2), or in existing hospitals being retrofitted (Type 3). Eleven CSMIP-assisted hospital instrumentation projects are currently underway or have been recently completed.

Background on Instrumentation Guidance

CSMIP guidance and assistance in the instrumentation of hospitals includes the following steps:

1. **Development or review of the proposed sensor locations to ensure sensor coverage is sufficient to characterize the building's seismic response.** CSMIP performs design work in-house, or reviews plans and specifications submitted by the design structural engineer of record (SE). In either case, an instrumentation planning meeting or conference call among

the SE, architect of record, HCAI and CSMIP staff is held to discuss and develop consensus on sensor locations and quantity.

2. **Establishment of the specific locations of all sensors, based on detailed study of the architectural plans by the design architect or SE.** Sensor locations need to avoid conflict with other non-structural components and sensors need to be accessible after they are installed.
3. **Development of the comprehensive, detailed design of the system, called the Technical Specifications Letter (TSL), by CSMIP staff.**

   The TSL is provided to the owner, HCAI, and the contractor, and is included in the plans. It specifies acceptable instruments and approved installation practices as well as details for the locations and interconnection of the components. The final instrumentation plans are approved by HCAI.
4. **Sensor marking field visit by CSMIP staff with representatives of the owner, construction contractor, and HCAI Inspector of Record.** During this visit the actual sensor locations are approved and physically marked on the structural members. During the subsequent work by the contractor, CSMIP staff approves the submittals, and assists with problems and issues as they arise.
5. **Acceptance field testing of the completed instrumentation system, some months or years later, by CSMIP staff.** If problems are found in the installation or operation, the contractor is called back in for repairs, followed by a repeat of tests. Once the installed system is accepted, HCAI is notified, and CSMIP is supported by HCAI to take on long-term maintenance of the instrumentation, as well as data recovery and processing.
6. CSMIP staff prepare sensor location diagram, building descriptions and station photo for the building, which are made available at the Center for Engineering Strong Motion Data (CESMD) after the instrumentation is completed.

Type 2 Instrumentation Projects

Type 2 Instrumentation Projects are hospital buildings that have base-isolation and/or energy dissipation devices or use an Alternate Method of Compliance (AMOC) in their design. These are required to have owner-paid instrumentation installed during construction per the California Building Code and HCAI regulations. The following progress on Type 2 projects occurred during FY25-26.

1. **Loma Linda University Medical Center Replacement Hospital:** Installation of relative displacement sensors completed on September 9, 2025.

2. **Cedars-Sinai Medical Center Replacement Hospital in Marina Del Rey**: Coordinated with contractor on minor location adjustments of select sensors on January 5, 2026.

3. **Scripps Hospital Tower II in La Jolla**: Coordinated with equipment manufacturer to resolve communication issue. CSMIP certified completion of installation on April 29, 2026.

4. **UC Irvine Medical Center New Hospital**: CSMIP certified completion of installation on November 18, 2025.

5. **UC Davis Health New Hospital in Sacramento**: Coordinated with contractor and design team on minor location adjustments of select sensors on October 20, 2025.

6. **Kaiser Replacement Hospital in San Jose**: Coordinated with the contractor on location of sensors within BIM model on January 16, 2026. Minor location adjustments of select sensors were required. On June 2, 2026, updated instrumentation plans were submitted by the design team to CSMIP for review.

7. **Sutter Santa Clara Hospital**: An instrumentation planning meeting that included the design team and HCAI and CSMIP personnel was held on June 18, 2026.

Type 3 Instrumentation Projects

Type 3 Instrumentation Project buildings are retrofitted under the Voluntary Seismic Improvement (VSI) regulations of the hospital building design code. Because of an AMOC design used in their retrofit, these buildings are required to be instrumented at the owner's expense.

There is only one Type 3 hospital instrumentation project currently underway.

Building 2 at the Salinas Valley Health Medical Center is a steel moment frame building constructed in 1973. The retrofit of this structure will include the addition of exterior steel truss framing with viscous dampers. An instrumentation planning meeting that included the design team, HCAI, and CSMIP personnel was held on June 22, 2026. During the meeting a preliminary sensor layout for the structure was developed.

Table 1

Regular Hospital Buildings (Type 1)
Instrumented under HCAI/CSMIP Hospital Instrumentation Project

(HCAI Funded - HBSB Instrumentation Committee Recommended)

Hospital Name	CSMIP Sta. No.	HCAI Approval No.	Year Built	No. of Stories	No. of Sensors	Completion Date
Instrumentation Completed or Underway						
1. Fortuna – Providence Redwood Memorial Hospital						
	89nnn	--	1955	1/0	24	FY TBD
	Wood shear wall					
	[**STATUS:** Hospital representative provided plans to HCAI; Preliminary sensor layout completed]					
2. Healdsburg – Healdsburg Hospital						
	68nnn	--	1972	1/0	12	FY TBD
	Wood shear wall					
	[**STATUS:** Hospital representative provided plans to HCAI; Preliminary sensor layout completed]					
3. Santa Rosa – Providence Santa Rosa Memorial Hospital						
	68nnn	--	1961	1/0	16	FY TBD
	Wood shear wall					
	[**STATUS**: Hospital representative provided plans to HCAI; Preliminary sensor layout completed]					
4. Hollister – Hazel Hawkins Memorial Hospital						
	47nnn	--	1960	1/0	9	FY TBD
	Wood shear wall					
	[**STATUS**: Hospital representative provided plans to HCAI; Preliminary sensor layout completed]					
5. Ojai – Community Memorial Hospital						
	25nnn	--	1960	1/0	TBD	FY TBD
	Wood shear wall					
	[**STATUS**: HCAI to establish contact with hospital representative]					
6. Monterey Park – Monterey Park Hospital						
	24776	--	1971	1/1	14+FF	FY 26-27
	Wood shear wall					
	[**STATUS**: Sensor layout finalized; Kick-off meeting held with hospital representative on 5/22/25; Sensor locations marked 4/14/2026 and 6/10/2026]					
7. San Bernardino – Community Hospital						
	23nnn	--	1969	1/0	TBD	FY TBD
	Wood shear wall					
	[**STATUS**: HCAI to establish contact with hospital representative]					

Table 2

New Hospital Buildings (Type 2) – Assisted Instrumentation Base-Isolated or Alternate Method of Compliance

(Owner-Funded with CSMIP Assistance and Guidance)

Hospital Name	CSMIP Sta. No.	HCAI Approval No.	Year Built	No. of Stories	No. of Sensors	Completion Date

Instrumentation Completed or Underway

1. Loma Linda – University Medical Center Replacement Hospital

23001 I 150010-36 ca 2021 16/2 42+FF 9/9/2025

Steel BRB and SidePlate moment frames isolated with triple pendulum bearings and viscous dampers.

[**STATUS:** TSL completed 4/26/17; Sensor locations marked 9/6/2018, 4/11/2019 and 1/30/2020; Accelerometers installed 10/21/2020; Relative Displacement sensors installed 9/9/2025]

Reference free-field station: Loma Linda – Barton & Anderson, CSMIP Sta. 23702

2. Los Angeles - Hollywood Presbyterian Medical Center Acute Care Services Replacement Building

24758 I 17002-19-02 ca 2026 4/1 16 FY 26-27

Steel moment frames with SidePlate connections

[**STATUS:** TSL completed 10/26/17; Sensor locations marked 5/6/2020]

(Pre-existing reference FF station: Los Angeles – Vermont & Fountain, CSMIP Sta. 24642)

3. Marina Del Rey – Cedars-Sinai Medical Center Replacement Hospital

14756 I 180008-19-00 ca 2026 9/0 24+FF FY 26-27

Steel moment frames with SidePlate connections.

[**STATUS:** TSL completed 7/16/21; Sensor locations marked 4/3/2024; Installation of sensors underway]

(To include a reference free-field station)

4. La Jolla – Scripps Hospital Tower II

03754 I 190018-37-00 ca 2026 8/1 18 4/29/2026

Steel moment frames with bolted SidePlate connections

[**STATUS:** TSL completed 2/8/22; Sensor locations marked 6/28/2023; Installation completed 4/29/2026]

(Pre-existing reference FF station: La Jolla – I5 & Genesee**,** CSMIP Sta. 03539)

5. San Diego – Sharp Metropolitan Medical Center New Tower

03755 I 210010-37-01 ca 2030 7/0 18+FF FY 29-30

Steel moment frames with bolted SidePlate connections.

[**STATUS:** TSL completed 5/31/22]

(To include a reference free-field station)

6. Irvine – UC Irvine Medical Center New Hospital

13751 I 210005-30-03 ca 2026 7/0 15+FF 11/18/2025

Steel buckling restrained braced frames

[**STATUS:** TSL completed 3/9/23; Sensor locations marked 11/30/2023; Installation completed 11/18/2025]

Reference free-field station: Irvine – UCI Medical Center Grounds, CSMIP Sta. 13772

Table 2 (continued)

New Hospital Buildings (Type 2) – Assisted Instrumentation Base-Isolated or Alternate Method of Compliance

(Owner-Funded with CSMIP Assistance and Guidance)

Hospital Name	CSMIP Sta. No.	HCAI Approval No.	Year Built	No. of Stories	No. of Sensors	Completion Date
7. Sacramento – UC Davis Health New Hospital						
	67759	I 210013-34-05	ca 2030	14/1	47+FF	FY 29-30
	Steel moment frames with SidePlate connections. [**STATUS:** Kickoff meeting with design team held 1/30/23; TSL completed 6/19/24; Updated TSL completed 11/19/24; Meeting with design/construction team regarding sensor location adjustments held 10/20/25] (To include a reference free-field station)					
8. Torrance – Harbor UCLA Medical Center						
	14757	I 230003-19-03	ca 2028	9/1	23+FF	FY 27-28
	Steel moment frames with SidePlate connections. [**STATUS:** Instrumentation planning meeting held 11/14/23; TSL completed 3/21/24; Updated TSL completed 8/20/24] (To include a reference free-field station)					
9. San Jose – Kaiser Replacement Hospital						
	57nnn	I 230010-43	ca 2028	6/1	28+FF	FY 27-28
	Steel moment frames with SidePlate connections. [**STATUS:** Instrumentation planning meeting held 8/16/24; TSL completed 10/4/24; Updated TSL completed 1/30/25; Meeting with design/construction team to confirm sensor locations in BIM model held 1/16/26] (To include a reference free-field station)					
10. Santa Clara – Sutter Santa Clara Hospital						
	57nnn	H 252167-43-00	ca 2031	8/0	27+FF	FY 30-31
	Steel moment frames with SidePlate connections. [**STATUS:** Instrumentation planning meeting held 6/18/26] (To include a reference free-field station)					

Table 3

Existing Hospital Buildings (Type 3) – Assisted Instrumentation Voluntary Seismic Improvement (VSI) Projects

(Owner-Funded with CSMIP Assistance and Guidance)

Hospital Name	CSMIP Sta. No.	HCAI Approval No.	Year Design	No. of Stories	No. of Sensors	Installation Date
1. Salinas – Salinas Valley Health Medical Center (Building 2)						
	47nnn	H 261434-27-00	ca 1973	1/partial	12+FF	FY 28-29
	Steel moment frames (retrofit: add exterior steel truss framing with viscous dampers)					
	[**STATUS:** Instrumentation planning meeting held 6/22/26]					
	(To include a reference free-field station)					

III. HOSPITAL INSTRUMENTATION MAINTENANCE

In this section, the previously instrumented hospital buildings for which ongoing maintenance was performed throughout FY25-26 are listed. During FY25-26, CSMIP performed periodic maintenance of the strong-motion instrumentation installed in the 87 previously instrumented hospital buildings, 67 of which have an associated free-field instrument. With the addition of two newly instrumented hospital buildings, a total of 89 buildings will be maintained during the next fiscal year (FY26-27).

The 87 hospital buildings instrumented as of the beginning of FY25-26 (buildings with an associated reference free-field station are indicated by an *), are listed alphabetically by city below:

1. Alameda - Alameda Hospital *
2. Bakersfield - Kern County Hospital *
3. Berkeley - Alta Bates Hospital
4. Burlingame - Mills Peninsula Hospital *
5. Castro Valley - Sutter Eden Medical Center *
6. Colton - Arrowhead Regional Medical Center (base-isolated) *
7. Crescent City - Sutter Coast Hospital *
8. Downey - Kaiser Hospital Tower Expansion *
9. Downey - PIH Health Medical Center (VSI) *
10. El Centro - El Centro Regional Medical Center *
11. Encino - Encino Hospital (VSI) *
12. Escondido - Palomar West Medical Center, Central Plant
13. Escondido - Palomar West Medical Center, Main Tower *
14. Eureka - St. Joseph Hospital *
15. Fairfield - North Bay Medical Center *
16. Fremont - Kaiser Hospital *
17. Fremont - Washington Hospital (base isolated) *
18. Gilroy - St. Louise Hospital *
19. Greenbrae - Marin General Hospital Replacement Building *
20. Hemet - Hemet Valley Medical Center *
21. Indio - JFK Memorial Hospital *
22. Irvine - Kaiser Sand Canyon Hospital *
23. King City - Mee Hospital *
24. La Jolla - Scripps Memorial Hospital (VSI) *
25. La Jolla - UCSD Hospital *
26. La Jolla - UCSD Jacobs Medical Center
27. Lancaster - Antelope Valley Hospital *
28. Loma Linda - University Hospital (base isolated) *
29. Long Beach - Miller Children's Hospital *
30. Los Angeles - Children's Hospital
31. Los Angeles - Good Samaritan Hospital
32. Los Angeles - Hollywood Presbyterian Medical Center, Doctor's Tower (VSI)
33. Los Angeles - Hollywood Presbyterian Medical Center, South Wing (VSI) *
34. Los Angeles - LAC+USC Hospital D&T (base-isolated) *
35. Los Angeles - LAC+USC Hospital Inpatient Bldg

36. Los Angeles - LAC+USC Hospital Outpatient Bldg
37. Los Angeles - MLK Hospital (base-isolated) *
38. Los Angeles - USC Hospital (base-isolated)
39. Los Angeles - USC Hospital Addition
40. Mammoth Lakes - Mammoth Hospital *
41. Moreno Valley - Riverside County Hospital *
42. Murrieta - Rancho Springs Medical Center *
43. Newport Beach - Hoag Hospital West Tower *
44. Newport Beach - Hoag Hospital East Tower (base-isolated)
45. Novato - Community Hospital *
46. Oakland - Kaiser Hospital
47. Ontario - Kaiser Hospital *
48. Oxnard - St. John's Medical Center *
49. Palm Springs - Desert Hospital
50. Palmdale - Palmdale Regional Medical Center *
51. Palo Alto - Lucile Packard Children's Hospital Stanford *
52. Redlands - Community Hospital (VSI) *
53. Riverside - Community Hospital (VSI) *
54. Salinas - Natividad Medical Center *
55. San Bernardino - Community Hospital *
56. San Bernardino - St. Bernardine Hospital (VSI) *
57. San Diego - Sharp Memorial Hospital (VSI) *
58. San Diego - UCSD Medical Center *
59. San Francisco - CPMC Cathedral Hill Hospital
60. San Francisco - General Hospital (base-isolated) *
61. San Francisco - Kaiser Hospital
62. San Francisco - St. Luke's Hospital
63. San Francisco - UCSF Hospital *
64. San Francisco - UCSF Mission Bay Hospital *
65. San Jose - O'Connor Hospital *
66. San Jose - Santa Clara Valley Hospital Bed Bldg 1
67. San Jose - Santa Clara Valley Hospital Bldg K
68. San Pedro - Providence LCOM Medical Center Bldg 1T (VSI) *
69. San Pedro - Providence LCOM Medical Center Bldg 2 (VSI)
70. San Rafael - Marin General Hospital West Wing *
71. Santa Ana - Orange County Global Med Center (VSI) *
72. Santa Barbara - Cottage Hospital *
73. Santa Clara - Kaiser Hospital *
74. Santa Maria - Marian Hospital *
75. Santa Monica - St. John's Hospital (base-isolated) *
76. Santa Rosa - Kaiser Hospital *
77. Simi Valley - Simi Valley Hospital *
78. Stanford - 7-story Hospital (base-isolated) *
79. Stanford - University Hospital *
80. Sylmar - Olive View Hospital *
81. Templeton - Twin Cities Hospital *
82. Torrance - Providence LCOM Medical Center (VSI)*
83. Valencia - Mayo Hospital *

84. Ventura - Community Memorial Hospital *
85. Ventura - Ventura County Hospital *
86. Walnut Creek - Kaiser Hospital
87. Whittier - Presbyterian Intercommunity Hospital *

In addition to periodic maintenance, CSMIP upgraded the recorders, without charge to HCAI for equipment, at the following 9 hospitals and free-field stations in FY 25-26.

1. Berkeley – Alta Bates Hospital
2. Fairfield – North Bay Medical Center
3. King City – Mee Hospital
4. Los Angeles – USC Hospital Addition
5. San Francisco – UCSF Med Center FF
6. Santa Barbara - Cottage Hospital
7. Santa Maria - Marian Hospital
8. Santa Maria - Marian Hospital FF
9. Walnut Creek – Kaiser Hospital

The instrumentation at these stations was upgraded from obsolete recording systems to modern higher resolution recorders capable of real-time data streaming. The upgrade of one of these hospitals (Berkeley – Alta Bates Hospital) also included new cabling and sensors. The funding for these upgrades was provided by CSMIP through its Statewide Seismic Hazard Mitigation BCP Upgrade Project. A total of 62 hospital and free-field stations have now been upgraded as part of this project, without charge for equipment to HCAI.

CSMIP also performs monitoring and data recovery for the code-type instrumentation systems (three tri-axial accelerographs) in the following four hospitals without charge to HCAI:

1. Los Angeles – White Memorial Hospital (7-story)
2. Pasadena – Huntington Memorial Hospital (7-story)
3. Downey – Kaiser Hospital (6-story)
4. Los Angeles – Kaiser LAMC Sunset Hospital (7-story)

IV. STRONG-MOTION RECORDS FROM HOSPITALS

From July 1, 2025, to June 30, 2026, a total of 13 earthquakes with magnitude 3.0 or larger were recorded at 20 instrumented hospitals. General information about each earthquake, and the maximum accelerations recorded at the hospital buildings (base and superstructure) and at their reference free-field stations (ground), are listed below.

Station 12759: Indio – JFK Memorial Hospital (1-story wood shear wall)

Earthquae	Magnitude	Date	Epicentral Ditance (km)	Max. orizontal Acceleration (%g)		
				Ground*	Base	Structure
Indio	4.9	01/20/2026	21.7	4.1	3.5	9.4

* Station 12904

Station 23416: Ontario – Kaiser Hospital (5-story buckling-restrained steel braced frame)

Earthquae	Magnitude	Date	Epicentral Ditance (km)	Max. orizontal Acceleration (%g)		
				Ground*	Base	Structure
Riatto	4.4	07/31/2025	22.0	--	0.9	2.9

* Station 23417

Station 23548: Redlands – Community Hospital (2-story concrete shear wall)

Earthquae	Magnitude	Date	Epicentral Ditance (km)	Max. orizontal Acceleration (%g)		
				Ground*	Base	Structure
Riatto	4.4	07/31/2025	23.0	1.4	1.2	1.6
Redlans	3.3	04/27/2026	3.9	--	1.1	3.1
Loma Lina	3.2	05/09/2026	4.2	--	0.9	2.8

* Station 23547

Station 23634: San Bernardino – Community Hospital (5-story steel moment frame)

Earthquae	Magnitude	Date	Epicentral Ditance (km)	Max. orizontal Acceleration (%g)		
				Ground*	Base	Structure
Riatto	4.4	7/31/2025	8.7	4.4	5.4	12.8

* Station 23656

Station 23788: Colton – San Bernardino Co. Medical Center (3-story, isolated, concentrically braced steel frame)

Earthquae	Magnitude	Date	Epicentral Ditance (km)	Max. Hrizontal Acceleration (%g)		
				Ground	Base	Structure
Riatto	4.4	7/31/2025	10.1	11.0	10.6	8.9

Station 36695: Templeton –Twin Cities Hospital (1-story wood shear wall)

Earthquak	Magnitude	Date	Epicentral Ditance (km)	Max. Hrizontal Acceleration (%g)		
				Ground*	Base	Structure
Atascadero	3.5	09/14/2025	13.1	2.9	2.7	3.5
Templeton	4.1	11/18/2025	6.7	35.6	21.2	14.7
Templeton	3.5	12/12/2025	6.8	8.3	6.9	8.8

* Station 36712

Station 58199: Walnut Creek – Kaiser Hospital (3-story steel moment frame)

Earthquake	Magnitude	Date	Epicentral Distance (km)	Max. Horizontal Acceleration (%g)		
				Ground	Base	Structure

Berkeley	4.3	09/22/2025	17.5	No FF	1.8	6.2
San Ramo	4.0	12/20/2025	18.9	No FF	0.4	1.6
San Ramo	3.9	12/21/2025	19.0	No FF	0.6	1.9
San Ramo	4.2	02/02/2025	18.2	No FF	0.8	3.4

Station 58396: Alameda – Alameda Hospital (3-story steel moment frame)

Earthquae	Magnitude	Date	Epicentral Ditance (km)	Max. orizontal Acceleration (%g)		
				Ground*	Base	Structure
Berkeley	4.3	09/22/2025	11.1	2.4	2.8	3.5
San Ramo	4.2	02/02/2026	27.3	--	0.5	1.8
Boulder Creek	4.6	04/02/2026	72.9	0.7	0.6	8.2

* Station 58398

Station 58572: San Francisco – University Hospital (6-story, buckling-restrained steel braced frame)

Earthquae	Magnitude	Date	Epicentral Ditance (km)	Max. orizontal Acceleration (%g)		
				Ground*	Base	Structure
Berkeley	4.3	09/22/2025	16.1	4.3	2.6	16.8

* Station 58579

Station 58574: San Francisco – General Hospital (7-story base isolated)

Earthquae	Magnitude	Date	Epicentral Ditance (km)	Max. orizontal Acceleration (%g)		
				Ground*	Base	Structure
Berkeley	4.3	09/22/2025	17.9	--	2.8	5.2

* Station 58575

Station 58590: Oakland – Kaiser Hospital (12-story steel buckling-restrained braced frame)

Earthquae	Magnitude	Date	Epicentral Ditance (km)	Max. Hrizontal Acceleration (%g)		
				Ground	Base	Structure
Berkeley	4.3	09/22/2025	4.4	No FF	3.1	8.3

Station 58640: San Francisco –Cathedral Hill Hospital (12-story steel moment frame)

Earthquae	Magnitude	Date	Epicentral Ditance (km)	Max. Hrizontal Acceleration (%g)		
				Groun	Base	Structure
Berkeley	4.3	09/22/2025	17.1	No FF	2.5	8.3

Station 68032: Fairfield–NorthBay Medical Center (3-story steel EBF and moment frames)

Earthquae	Magnitude	Date	Epicentral Ditance (km)	Max. orizontal Acceleration (%g)		
				Ground*	Base	Structure
Berkeley	4.3	09/22/2025	47.8	--	0.4	1.6

* Station 68045

Station 58494: Castro Valley – Sutter Eden Medical Center (6-story concrete shear wall, concentrically braced steel frame)

Earthquak	Magnitude	Date	Epicentral Ditance (km)	Max. orizontal Acceleration (%g)		
				Ground*	Base	Structure
San Ramon	4.0	12/20/2025	13.1	--	0.9	3.5

* Station 58493

Station 12299: Palm Springs – Desert Hospital (4-story steel moment frame)

Earthquake	Magnitude		Epicentral Distance (km)	Max. Horizontal Acceleration (%g)

		Date		Ground	Base	Structure
Indio	4.9	01/20/2026	35.0	No FF	1.8	2.9

Station 57301: Fremont – Kaiser Hospital (2-story steel moment frame)

Earthquae	Magnitude	Date	Epicentral Ditance (km)	Max. orizontal Acceleration (%g)		
				Ground*	Base	Structure
Boulder Creek	4.6	04/02/2026	50.0	0.6	0.8	1.7

* Station 57311

Station 57495: San Jose –Kaiser Hospital (4-story steel moment frame)

Earthquae	Magnitude	Date	Epicentral Ditance (km)	Max. Hrizontal Acceleration (%g)		
				Ground	Base	Structure
Boulder Creek	4.6	04/02/2026	27.0	No FF	0.7	2.9

Station 58604: Palo Alto –LP Children's Hospital (6-story steel moment frame and buckling restrained braced frame)

Earthquae	Magnitude	Date	Epicentral Ditance (km)	Max. orizontal Acceleration (%g)		
				Ground*	Base	Structure
Boulder Creek	4.6	04/02/2026	36.0	1.7	0.7	2.3

* Station 58086

Station 23001: Loma Linda –University Hospital (16-story steel moment frame and buckling restrained braced frame with base isolation)

Earthquak	Magnitude	Date	Epicentral Ditance (km)	Max. orizontal Acceleration (%g)		
				Ground*	Base	Structure
Redlands	3.3	04/27/2026	7.0	--	1.8	2.9

* Station 23702

Station 68669: Santa Rosa –Kaiser Hospital (4-story steel moment frame)

Earthquak	Magnitude	Date	Epicentral Distnce (km)	Max. orizontal Acceleration (%g)		
				Ground*	Base	Structure
Redwood Valley	5.6	06/24/2026	108.2	--	0.2	0.4

* Station 68676

The strong-motion records are made available rapidly after an earthquake by the CSMIP Strong-motion Automated Recovery and Analysis (SARA) system and posted in the Internet Quick Reports at the web site of the Center for Engineering Strong Motion Data (CESMD), at **https://www.strongmotioncenter.org**.

The largest earthquake recorded by an instrumented hospital during FY25–26 was the M5.6 Redwood Vally earthquake on June 24, 2026. This event was recorded only at the 4-story Kaiser Hospital in Santa Rosa, located 108 km from the source, and produced a peak floor acceleration of 0.4% g. Acceleration records from each instrumented level of the building are shown in Figure 1.

The largest acceleration recorded inside a hospital during FY25–26 was from the M4.1 Templeton earthquake on November 18, 2025, at the 1-story Twin Cities Hospital in Templeton

(Station 36695), which is located only 6.7 km from the epicenter. This event caused a peak floor acceleration of approximately 21% g at the base of the building in the east–west direction. The roof sensor in this direction was not operational during the event; however, the base and roof sensors in the north–south direction both recorded a peak floor acceleration of approximately 14% g. These spikes in the acceleration records, at both the base and roof levels of the building, are shown in Figure 2. It is noteworthy that the ground station near this building (Station 36712) recorded a peak ground acceleration of 35.6% g. It should also be noted that in the three events recorded by Twin Cities Hospital during FY25–26, multiple sensors were not operational. These issues were addressed in April of 2026, and the non-operational sensors were either replaced or reinstalled as required.

The M4.3 Berkeley earthquake on September 22, 2025, was recorded by seven hospital stations, with epicentral distances ranging from 4 to 50 km. Six of the seven hospitals were located within 20 km of the source and recorded peak base accelerations of approximately 3% g. Station 68032 was located 48 km from the source and recorded a peak base acceleration of 0.4% g. One of the channels at University Hospital in San Francisco (Station 58572) recorded a peak floor acceleration of 16.8% g, which is much larger than the acceleration at the base level (2.6% g). This spike in the acceleration record, shown in Figure 3 (channel 8), could be caused by a local impact or potentially a sensor malfunction. To rule out sensor malfunction, we reviewed the records from all four earthquakes recorded by this station over the last decade, including another Berkeley earthquake with similar magnitude and distance. No other channel 8 records include similar spikes. We will continue to monitor this station and if the spike is repeated in future events, we will inspect the sensor to ensure it's not malfunctioning.

One notable observation is the large acceleration recorded at the penthouse roof of Alameda Hospital (Station 58639) during the M4.6 Boulder Creek earthquake on April 2, 2026. As shown in Figure 4, while the base acceleration in the north–south direction is 0.6% g, Channel 12 at the elevator roof recorded a much larger acceleration, with a peak of approximately 8.2% g. This observation warrants further investigation.

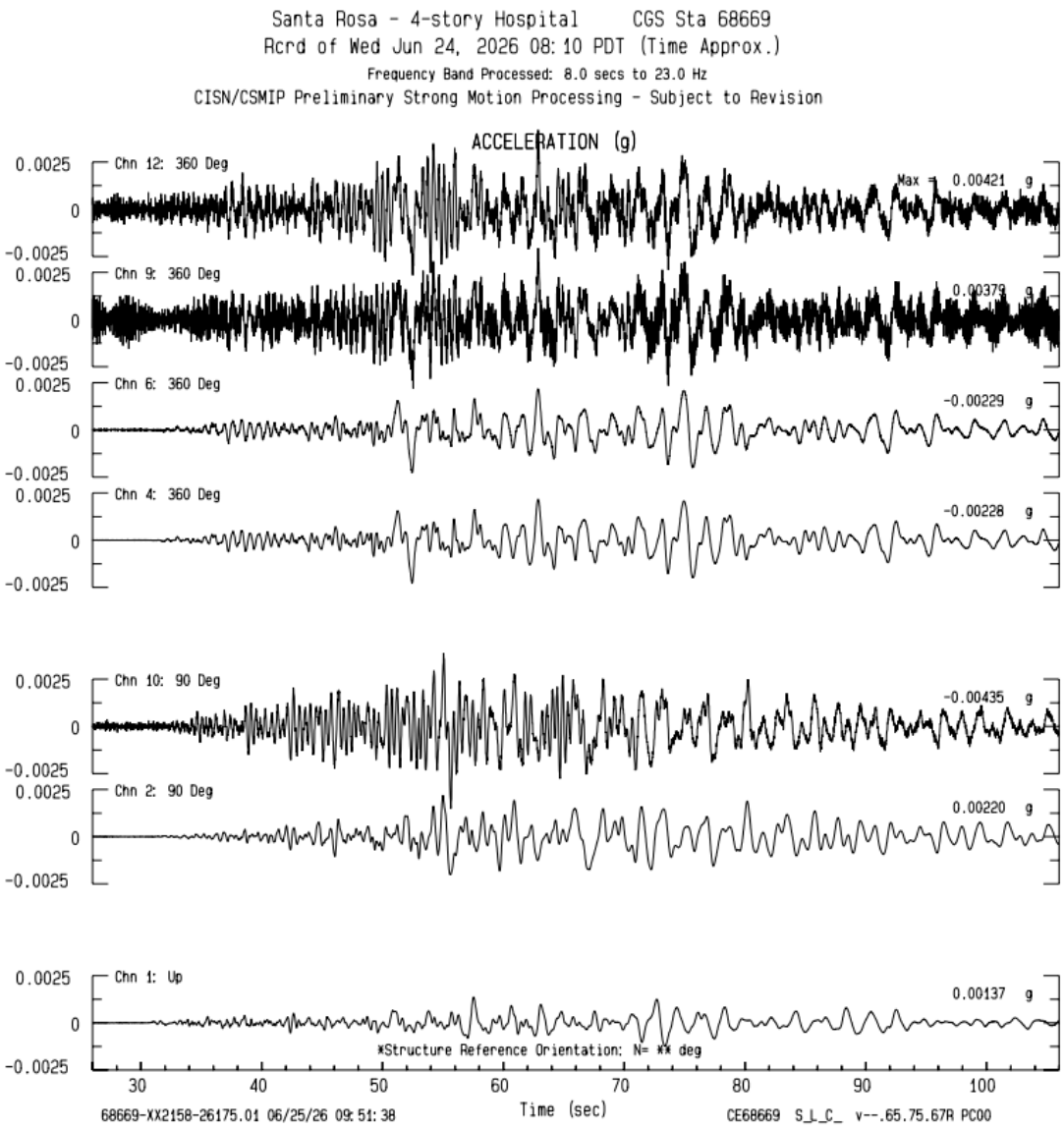


Figure 1. Accelerations recorded at the Santa Rosa Kaiser Hospital (Station 68669) during the M5.6 Redwood Valley earthquake of June 24, 2026.

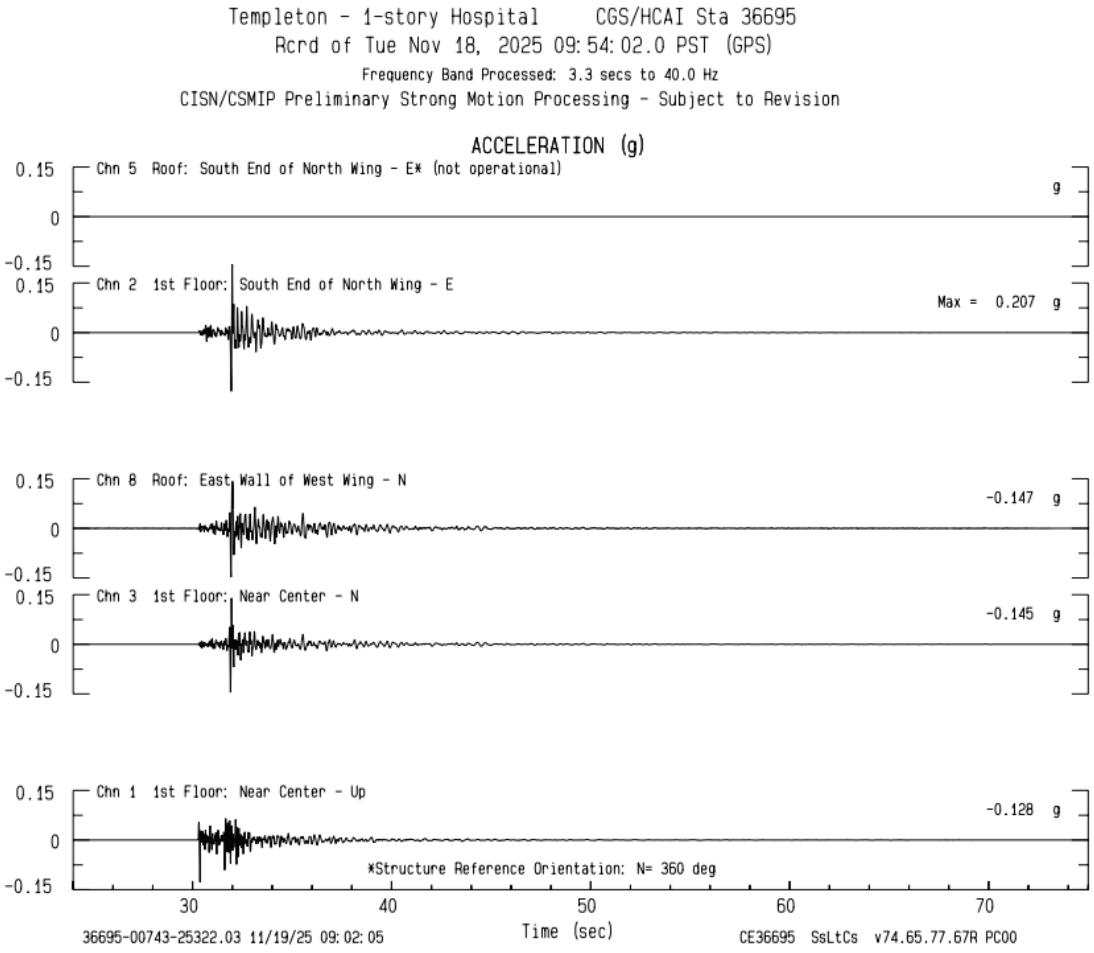


Figure 2. Accelerations recorded at the Templeton Twin Cities Hospital (Station 36695) during the M4.1 Templeton earthquake of November 18, 2025.

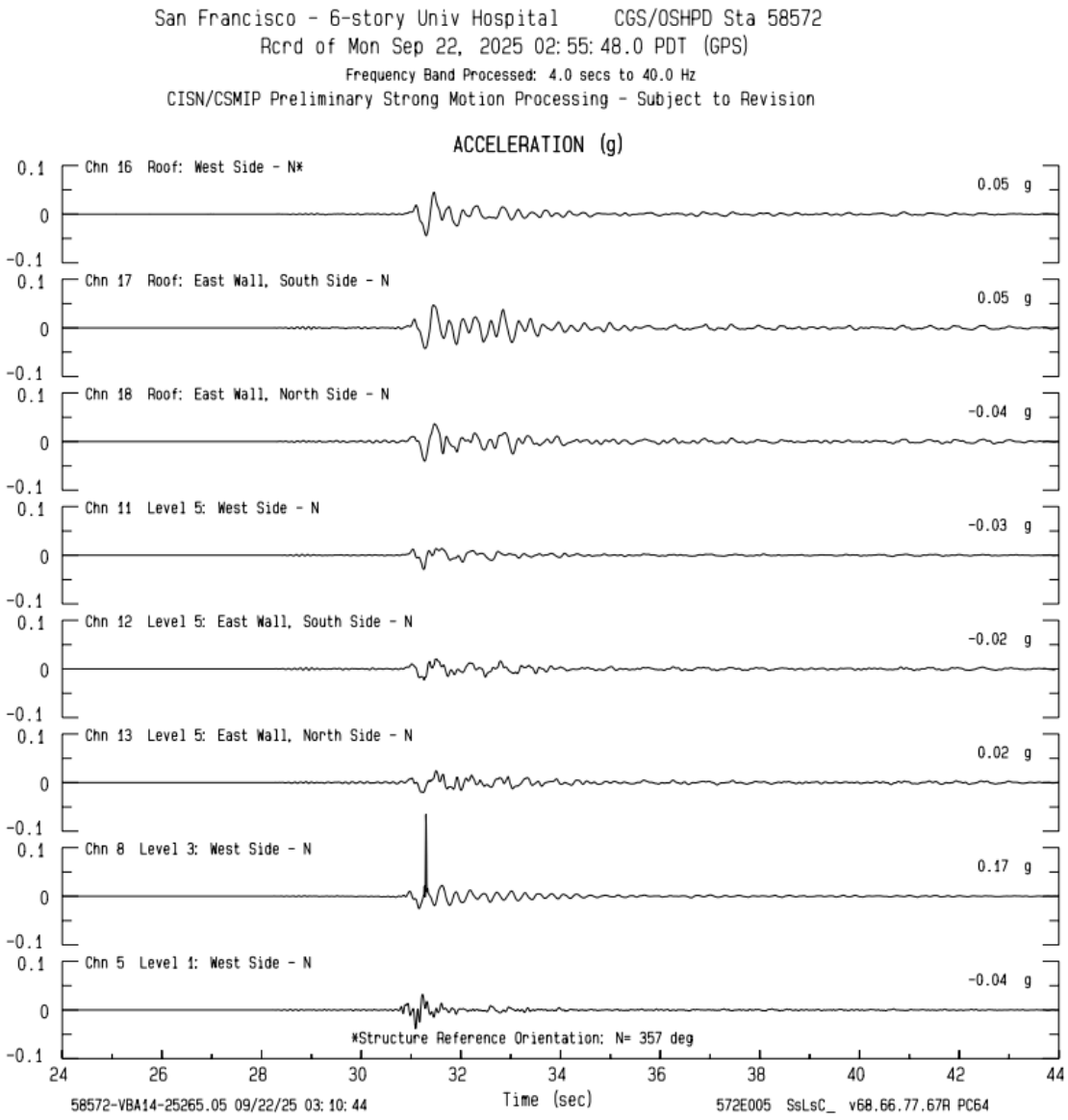


Figure 3. Accelerations recorded at the San Francisco University Hospital (Station 58572) during the M4.3 Berkeley earthquake of September 22, 2025.

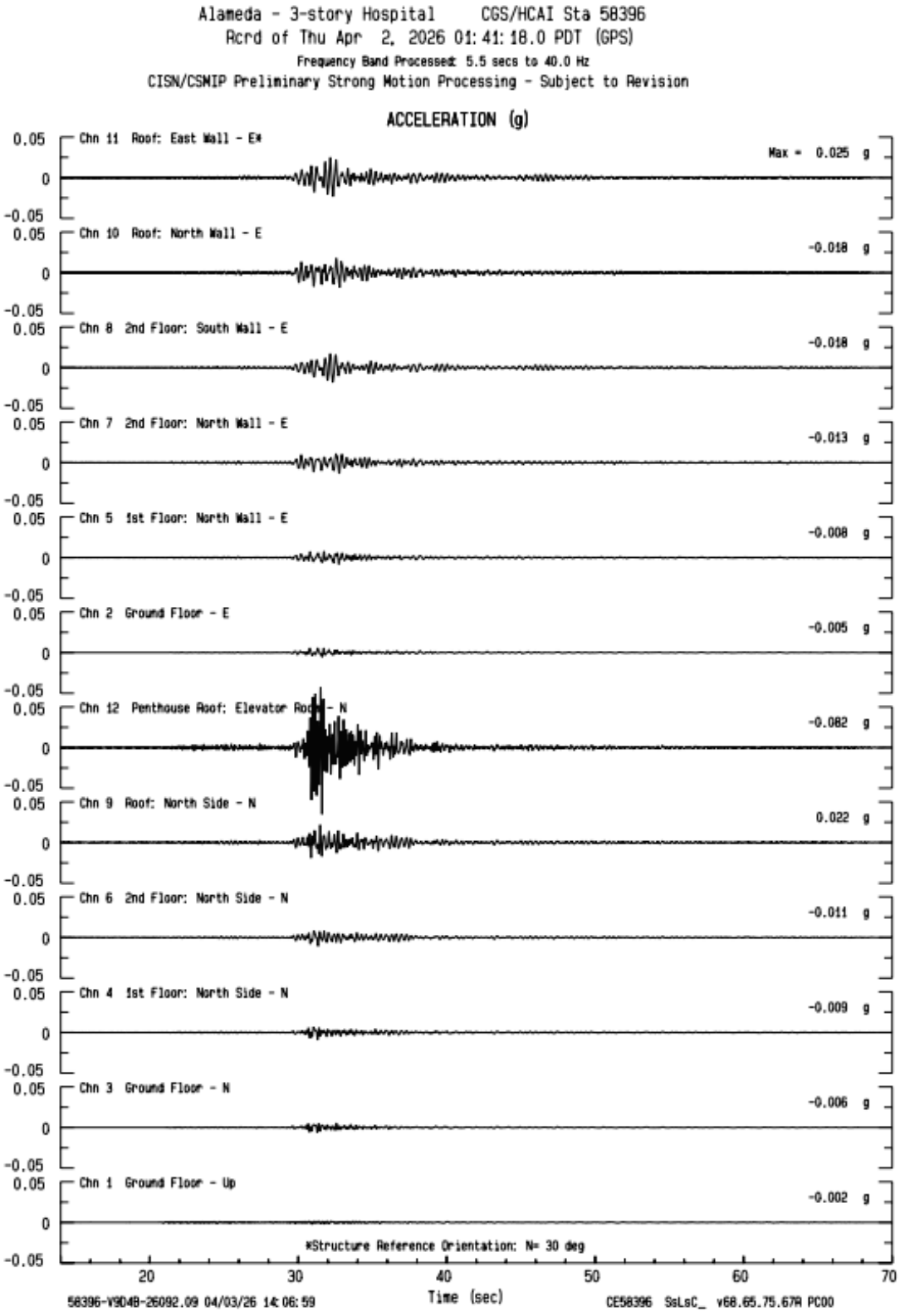


Figure 4. Accelerations recorded at the Alameda Hospital (Station 58396) during the M4.6 Boulder Creek earthquake of April 2, 2026.

Although all earthquake events recorded by the hospitals in FY 25-26 were weak, modal identification can be employed to identify any permanent change in natural frequency to the buildings. As an illustrative example, Figure 5 shows the existing instrumentation layout of the Desert Hospital in Palm Springs (Station 12299). Earthquake data from the M4.9 Indio earthquake of January 1, 2026, which occurred 35 km from the building, were used. The baseline modal properties were identified from 30 seconds of pre-event ambient data and compared with the properties identified from 36 seconds of earthquake data, and 5 minutes of ambient data collected on September 15, 2026.

The first NS and EW mode shapes and their corresponding natural frequencies are shown in Figure 6. As seen in this figure, while there is a significant drop in the natural frequencies in both directions during the event due to the reduced contribution of nonstructural elements to the lateral stiffness of the building, both modes return to their initial values after the earthquake, confirming that there was no permanent change in natural frequency. The small differences between the pre- and post-event natural frequencies are associated with measurement uncertainties (the pre-event data are only 30 seconds long), as well as inherent variability due to environmental factors.

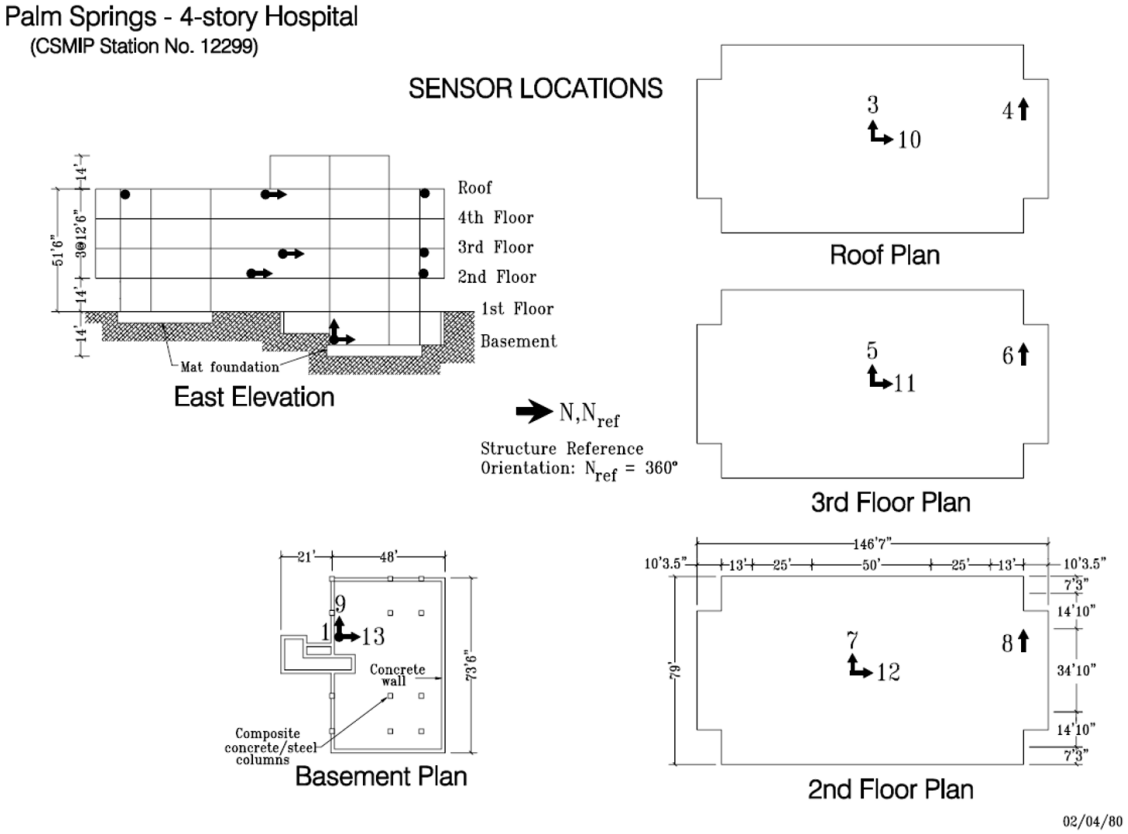


Figure 5. Instrumentation layout of Desert Hospital in Palm Springs.

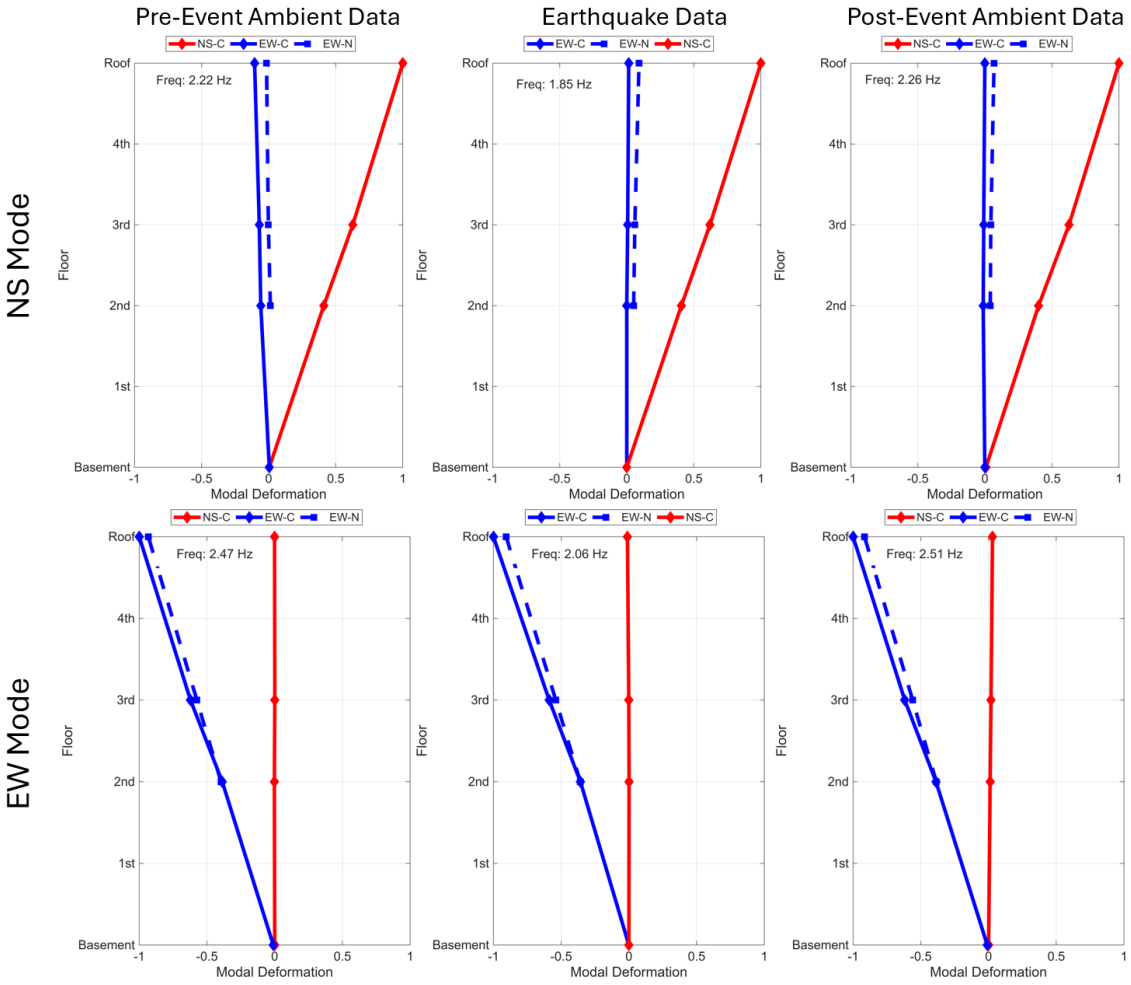


Figure 6. Identified mode shapes and natural frequencies of Desert Hospital from pre-event ambient, earthquake, and post-event ambient data.

V. REAL TIME STRONG MOTION DATA STREAM

In response to the HCAI request, CSMIP started a pilot project on streaming data in real time to the HCAI Earthworm system. Currently, data from Santa Rosa Kaiser Hospital and Lancaster Antelope Valley Hospital are being streamed in real time.

VI. FISCAL REPORT

The current contract was executed on September 5, 2023. A summary of the budget and expenditures is provided below:

Total amount of Agreement (September 5, 2023 – June 30, 2026)		$1,470,963.00
1)	Budgeted for FY23-24	$490,321.00
	Expended in FY23-24	($192,995.32)
	Remaining amount from FY23-24	$297,325.68
2)	Budgeted for FY24-25	$490,321.00
	Expended in FY24-25	($172,088.95)
	Remaining amount from FY24-25	$318,232.05
3)	Budgeted for FY25-26	$490,321.00
	Expended in FY25-26	($433,675.77)
	Remaining amount from FY25-26	$56,645.23

The contract ended with a balance of $672,202.96. This remaining balance is attributable to three key factors:

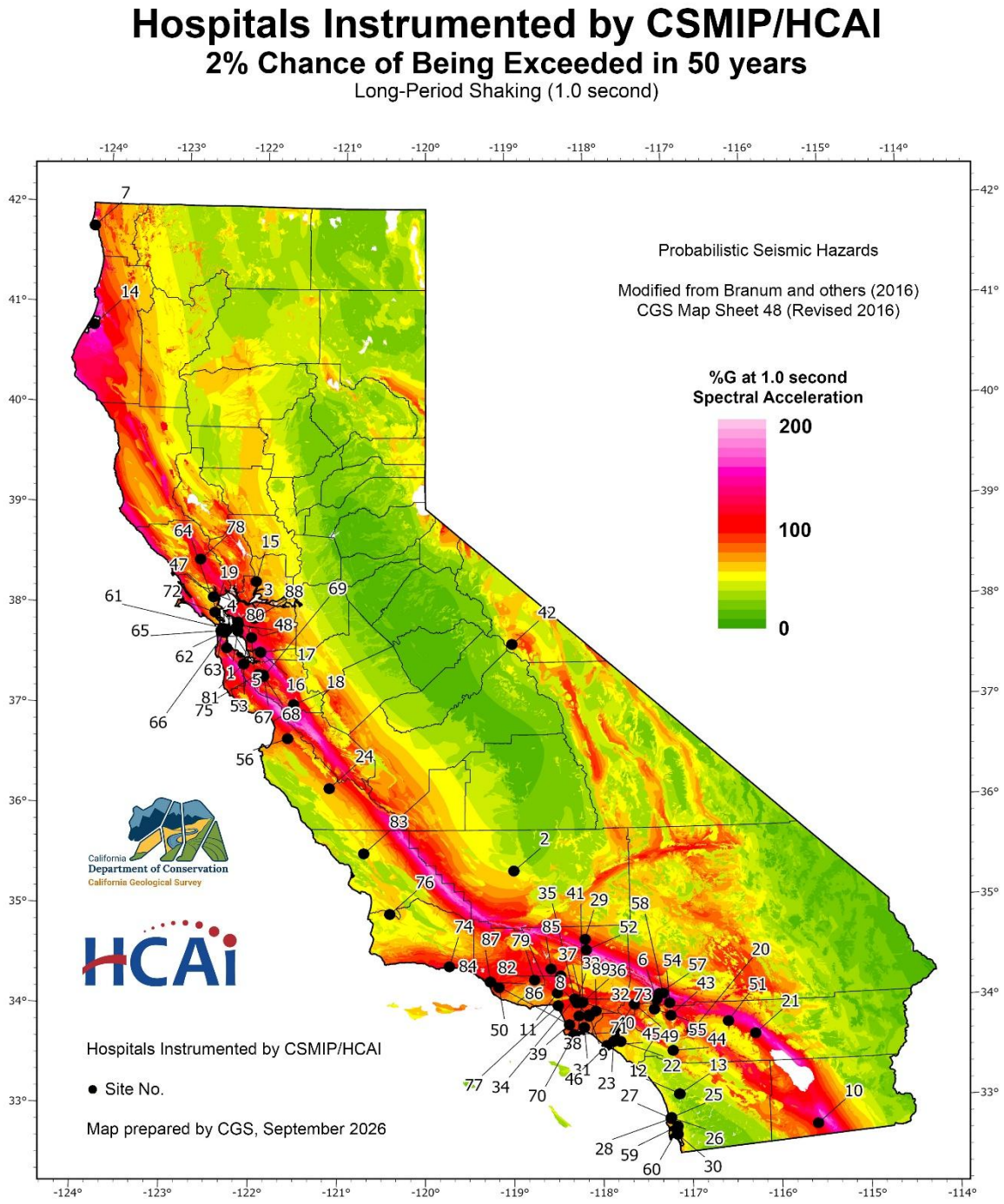
HCAI-Funded Projects: Instrumenting single-story wood-framed hospitals was a priority for this contract. However, HCAI and CGS faced coordination challenges with representatives from the seven HBSB-recommended candidate hospitals and it delayed progress. Consequently, the team advanced only one project during this period, leaving the remaining allocated budget unspent.

Owner-Funded Projects: Progress on owner-funded instrumentation depends heavily on external schedules. Unpredictable start dates, project completions, and fluctuating construction timelines limited the rate of budget utilization.

Maintenance Savings: Hospital instrumentation maintenance costs were significantly lower due to CSMIP's ongoing upgrade initiative. Because CGS funded the new recording systems through the Statewide Seismic Hazard Mitigation Upgrade Project, with HCAI covering only labor, the deployment of modern equipment reduced the need for costly repairs on obsolete systems.

Appendix A

89 hospital buildings have been instrumented in the HCAI/CSMIP project through the end of FY25-26. The locations of the 89 hospital buildings are shown on a probabilistic seismic Hazard map below.



Appendix B

The hospital buildings and information about their structural systems are listed in the table below. The number of strong-motion recorders at each building and the communication speed are also shown in the table as these will determine how quickly data can be recovered for application after earthquakes. Note that the recovery speeds of 5 hospitals, shown in red in the table, increased in FY 25-26 from Low (L) or Medium (M) to High (H) as a result of the instrumentation upgrade described in Section III of this report.

BUILDINGS INSTRUMENTED BY CSMIP/HCAI 10/1/2026

Site No. on Map	CSMIP Sta. No.	Station Name	No. of Stories	No. of Sensors	No. of Rcrdrs	Recov. Speed	FEMA-310 Bldg Type	SMIAC Bldg Type
1	58396	Alameda - Alameda Hospital	3/0	12+FF	1	M	S1L	K1
2	34234	Bakersfield - Kern County Hospital	4/1	12+FF	1	H	C2M	H2b
3	58496	Berkeley - Alta Bates Hospital	2/1	12	1	H	S2L	I1c
4	58390	Burlingame - Mills Peninsula Hospital (isolated)	6/0	27+FF	1	M	IM	Q2
5	58494	Castro Valley - Sutter Eden Medical Center	6/1	19+FF	1	H	S2M	I2a
6	23788	Colton - San Bernardino Co. Med. Center (isolated)	6/0,4/0,2/0	27+FF	2	H	IM	Q2
7	99261	Crescent City - Sutter Hospital	1/0	10+FF	1	H	S2L	I1c
8	14689	Downey - Kaiser Hospital Tower Expansion	6/partial	16+FF	1	M	S1M	J2b
9	14646	Downey - PIH Health Hospital (VSI)	4/1	12+FF	1	M	C2M	G2b
10	01699	El Centro - Community Hospital	1/0	12+FF	1	H	S2L	I1b
11	24648	Encino - Encino Hospital (VSI)	4/1	12+FF	1	H	RM2M	F2a
12	13476	Escondido - PMC West Hospital Central Plant	2/0	6	1	H	C2L	H1f
13	13473	Escondido - PMC West Hospital (Main Tower)	11/1	12+FF	1	H	S1H	K3a
14	89770	Eureka - St. Joseph Hospital	4/1	11+FF	1	H	C2M	G2d
15	68032	Fairfield - NorthBay Medical Center	3/0	12+FF	1	H	S2L	I1d
16	57301	Fremont - Kaiser Hospital	2/0	15+FF	1	H	S1L	K1
17	57643	Fremont - Washington Hospital (isolated)	3/1	24+FF	1	M	IL	Q1
18	57200	Gilroy - St. Louise Hospital	2/0	10+FF	1	H	S1L	K1
19	58M15	Greenbrae - Marin General Hospital Replacement Building	4/1	16+FF	1	H	S1M	J2b
20	12267	Hemet - Valley Hospital	4/1	17+FF	1	H	C2M	G2d
21	12759	Indio - JFK Hospital	1/0	8+FF	1	H	W1	A1
22	13439	Irvine - Kaiser Sand Canyon Hospital	6/partial	15+FF	1	M	S2M	I2b
23	13571	Irvine - UCI Medical Center	7/0	15+FF	1	H	S2M	I2b
24	47231	King City - Mee Hospital	2/0	10+FF	1	L	S2L	I1c
25	03754	La Jolla - Scripps Hospital Tower II	8/1	18	1	H	S1H	J3b
26	03538	La Jolla - Scripps Memorial Hospital	7/1	12+FF	1	M	S1M	J2b
27	03233	La Jolla - UCSD Hospital	2/0	16+FF	1	H	S1L	J1b
28	03593	La Jolla - UCSD Jacobs Medical Center	10/2	24	1	H	S1H	K3a
29	24609	Lancaster - Antelope Valley Hospital	5/0	12+FF	1	H	S1M	K2
30	23001	Loma Linda - University Hospital	16/2	42+FF	3	H	IH	Q3
31	14735	Long Beach - Miller Children's Hospital	4/0	15+FF	1	H	S1M	J2b
32	24397	Los Angeles - Childrens Hospital	7/1	12	1	H	S1M	K2
33	24713	Los Angeles - Good Samaritan Hospital	8/1	15	1	H	S2H	I3b
34	24662	Los Angeles - Hollywood Presbyterian MC S. Wing (VSI)	4/1	12+FF	1	M	C2M	H2b
35	24682	Los Angeles - Hollywood Presbyterian MC Drs Tower (VSI)	10/2	15	1	M	S1H	J3b
36	24250	Los Angeles - LAC+USC Hospital D&T Bldg (isolated)	6/0	20+FF	1	H	IM	Q2
37	24248	Los Angeles - LAC+USC Hospital IP Bldg	9/0	12	1	H	S2H	I3b
38	24249	Los Angeles - LAC+USC Hospital OP Bldg	8/partial	12	1	H	S2H	I3b
39	14724	Los Angeles - MLK Hospital (isolated)	5/1	21+FF	2	H	IM	Q2
40	24605	Los Angeles - USC Hospital (isolated)	7/1	24	1	H	IH	Q3
41	24260	Los Angeles - USC Hospital Addition	9/1	12	1	H	S2H	I3b
42	54331	Mammoth Lakes - Mammoth Hospital	1/0	10+FF	1	H	S2L	I1b
43	13213	Moreno Valley - Riverside County Hospital	3/1	12+FF	1	H	S1L	K1
44	13601	Murrieta - Rancho Springs Medical Center	2/0	9+FF	1	M	C1L	L1
45	13291	Newport Beach - Hoag Hospital East Tower (isolated)	7/1	27	1	H	IM	Q3
46	13589	Newport Beach - Hoag Hospital West Tower	11/0	18+FF	1	H	C2H	H3a
47	68430	Novato - Community Hospital	2/0	12+FF	1	M	S2L	I1b
48	58590	Oakland - Kaiser Hospital	12/1	18	1	M	S2H	I3b
49	23416	Ontario - Kaiser Hospital	5/partial	18+FF	1	H	S2M	I2b
50	25949	Oxnard - St. Johns Hospital	4/1	16+FF	1	H	S1M	K2
51	12299	Palm Springs - Desert Hospital	4/1	13	1	H	S1M	K2

Appendix B

BUILDINGS INSTRUMENTED BY CSMIP/HCAI 10/1/2026

Site No. on Map	CSMIP Sta. No.	Station Name	No. of Stories	No. of Sensors	No. of Rcrdrs	Recov. Speed	FEMA-310 Bldg Type	SMIAC Bldg Type
52	24457	Palmdale - Palmdale Regional Hospital	5/0	16+FF	1	M	C2M	H2d
53	58604	Palo Alto - Lucile Packard Childrens Hospital Stanford	6/2	21	2	M	S2M	J2a
54	23548	Redlands - Community Hospital (VSI)	2/1	9+FF	1	M	C2L	H1c
55	13633	Riverside - Community Hospital (VSI)	6/1	12+FF	1	M	C2M	G2e
56	47796	Salinas - Natividad Medical Center	3/0	15+FF	1	H	S2L	I1b
57	23634	San Bernardino - Community Hospital	5/0	12+FF	1	H	S1M	K2
58	23697	San Bernardino - St. Bernardine Medical Center	6/0	12+FF	1	H	S1M	J2a
59	03546	San Diego - Sharp Memorial Hospital (VSI)	8/1	15+FF	1	M	C2H	H3b
60	03743	San Diego - UCSD Hospital	11/1	12+FF	1	H	C1H	M3
61	58640	San Francisco - CPMC Cathedral Hill Hospital	12/2	24	1	H	S1H	K3a
62	58574	San Francisco - General Hospital (isolated)	7/2	24+FF	2	M	IM	Q2
63	58718	San Francisco - Kaiser Hospital	6/0	18	1	H	C2M	H2d
64	58649	San Francisco - St. Luke's Hospital	6/1	16	1	M	S2M	I2b
65	58257	San Francisco - UCSF Hospital	15/1	16+FF	1	H	U	U
66	58572	San Francisco - UCSF Mission Bay Hospital	6/0	18+FF	1	M	S2M	I2b
67	57594	San Jose - O'Connor Hospital	5/0	16+FF	1	H	S2M	I2c
68	57495	San Jose - Santa Clara Valley Hospital (Bldg K)	4/1	15	1	M	S1M	K2
69	57537	San Jose - Santa Clara Valley Hospital (Bed Bldg 1)	7/1	20+FF	1	M	S1M	K2
70	14535	San Pedro - Providence LCOM Hosp (Bldg 1T) (VSI)	5/partial	12+FF	1	H	S2M	I2d
71	14536	San Pedro - Providence LCOM Hosp (Bldg 02) (VSI)	4/1	12	1	H	C2M	H2d
72	58755	San Rafael - Marin General Hospital	5/1	12+FF	1	H	S1M	J2b
73	13611	Santa Ana - Orange County Global Medical Center (VSI)	1/0	6+FF	1	M	S2L	I1a
74	25777	Santa Barbara - Cottage Hospital	3/1	9+FF	1	H	C2L	H1e
75	57251	Santa Clara - Kaiser Hospital	3/1	18+FF	1	H	S2L	I1b
76	26470	Santa Maria - Marian Hospital	4/partial	12+FF	1	H	S2M	I2c
77	24202	Santa Monica - St. John's Hospital (isolated)	5/1	24+FF	1	H	IM	Q2
78	68669	Santa Rosa - Kaiser Hospital	4/1	13+FF	1	H	S1M	K2
79	24104	Simi Valley - Simi Valley Hospital	2/1	12+FF	1	H	S1L	K1
80	58623	Stanford - 7-story Hospital (isolated)	7/1	34+FF	1	M	IM	Q2
81	58055	Stanford - University Hospital	3/1	12+FF	1	H	S1L	K1
82	24514	Sylmar - Olive View Medical Center	6/0	13+FF	1	L	UM	R
83	36695	Templeton - Twin Cities Hospital	1/0	9+FF	1	H	W1	A1
84	14529	Torrance - Providence LCOM Hospital (VSI)	4/2	21+FF	2	M	C2M	H2d
85	24344	Valencia - Mayo Hospital	2/partial	12+FF	1	M	S1L	K1
86	25594	Ventura - Community Memorial Hospital	6/1	24+GA	2	M	S2M	I2b
87	25744	Ventura - County Hospital	4/1	12+FF	3	H	C2M	H2b
88	58199	Walnut Creek - Kaiser Hospital	3/1	16	1	H	S1L	K1
89	14737	Whittier - Presbyterian Intercommunity Hospital	4/1	18+FF	1	H	S1M	J2b