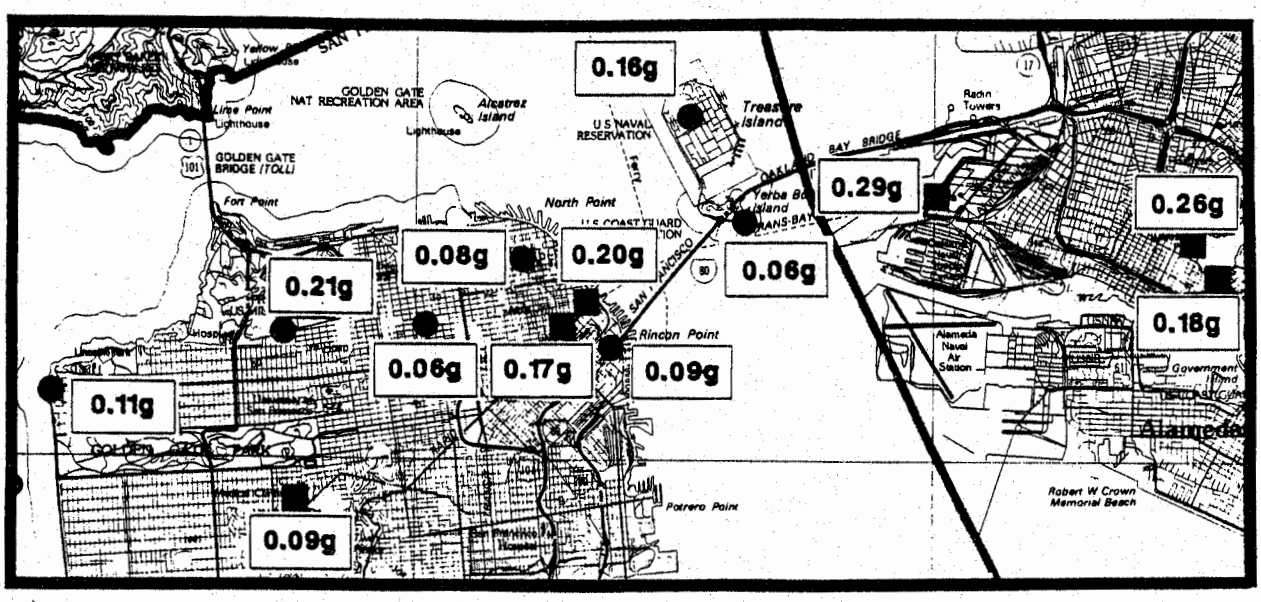
CSMIP STRONG-MOTION RECORDS FROM THE SANTA CRUZ MOUNTAINS (LOMA PRIETA), CALIFORNIA EARTHQUAKE OF 17 OCTOBER 1989



CALIFORNIA DEPARTMENT OF CONSERVATION
Division of Mines and Geology

CALIFORNIA DEPARTMENT OF CONSERVATION
DIVISION OF MINES AND GEOLOGY
OFFICE OF STRONG MOTION STUDIES
REPORT OSMS 89-06

1989

THE RESOURCES AGENCY
GORDON K. VAN VLECK
SECRETARY FOR RESOURCES

STATE OF CALIFORNIA
GEORGE DEUKMEJIAN
GOVERNOR

DEPARTMENT OF CONSERVATION
RANDALL M. WARD
DIRECTOR

DIVISION OF MINES AND GEOLOGY
JAMES F. DAVIS
STATE GEOLOGIST

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CSMIP STRONG-MOTION RECORDS

FROM THE

SANTA CRUZ MOUNTAINS (LOMA PRIETA), CALIFORNIA

EARTHQUAKE OF 17 OCTOBER 1989

A. Shakal, M. Huang

M. Reichle, C. Ventura, T. Cao,

R. Sherburne, M. Savage, R. Darragh and C. Petersen

Report No. OSMS 89-06

California Strong Motion Instrumentation Program

California Department of Conservation

Division of Mines and Geology

Office of Strong Motion Studies

630 Bercut Drive, Sacramento, California 95814

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CSMIP STRONG-MOTION RECORDS FROM THE SANTA CRUZ (LOMA PRIETA), CALIFORNIA EARTHQUAKE OF 17 OCTOBER 1989

Introduction

Strong-motion records were recovered from 93 stations of the California Strong Motion Instrumentation Program (CSMIP) after the earthquake of October 17, 1989 which occurred in the Santa Cruz Mountains. The epicenter was approximately 16 km east of Santa Cruz and 33 km southwest of San Jose. The 93 stations from which CSMIP recovered data include 53 ground-response stations and 40 extensively-instrumented structures. The most distant stations were approximately 175 km from the earthquake (Santa Rosa and Bodega Bay); 25 records were obtained within 40 km of the epicenter. The 40 extensively-instrumented structures include 33 buildings, two dams, two freeway overpasses, a wharf, a tunnel and a rapid-transit structure. This report includes all CSMIP data from this earthquake and supersedes the quick reports distributed on October 17 and 25 (CDMG, 1989 a,b).

The estimated earthquake location and magnitude are:

Epicenter: 37.037N, 121.883W. Depth: 18 km (USGS)
Origin Time: 00:04:02, 18 Oct 1989 GMT. (5:04 pm, 17 Oct 1987 PDT)
Magnitude: 7.0 ML (BRK); 7.1 MS (NEIS).

Damage was extensive in the coastal area west of the San Andreas fault, from Santa Cruz to Watsonville. Damage was also severe in localized areas in the San Francisco Bay area. A collection of damage studies by various individuals and institutions is being prepared by the Earthquake Engineering Research Institute.

Highlights of CSMIP Strong-Motion Data

A total of 125 records were recovered from the 93 CSMIP stations which recorded this event. These 125 records contain data from a total of 690 strong-motion sensors. The data set is important because of the unique structures and sites which recorded the shaking during this event. Some highlights of particular interest include:

- The closest CSMIP station is Corralitos, located very close to the San Andreas fault near the center of the aftershock zone, which recorded 65% g. This is the first record from the nearfield of a magnitude 7 event, and provides important data on the shape of attenuation curves at close-in distances. Three other close-in stations, Santa Cruz, Capitola and Watsonville, recorded the shaking in the heavily damaged coastal zone. Peak horizontal accelerations ranged from 40% g at Watsonville to 54% g at Capitola. All four of these stations recorded high vertical accelerations, ranging from 40% g at Santa Cruz to 60% g at Capitola. The stations also had long duration records, with strong shaking lasting as much as 10 seconds.

- Ten CSMIP stations recorded the motion in the City of San Francisco. They recorded peak horizontal accelerations ranging from 9% g at Rincon Hill in eastern San Francisco to 21% g at the Presidio (about 2.5 km or 1.5 miles southwest of the heavily damaged Marina district). A station at the airport recorded 33% g. East of San Francisco, Yerba Buena Island and Treasure Island form a rock/soil station pair. These stations, which recorded 6% and 16% g, respectively, also indicate the level of ground shaking that occurred at the west end of the damaged (eastern) section of the Bay Bridge. Observations of liquefaction on Treasure Island, not far from the instrument site, also make the data important for study.

- In Oakland, two stations recorded the motion at locations approximately 2 km (1.5 miles) east and west of the collapsed section of the I-880 freeway. The two stations, an office building in the Lake Merritt district and the Oakland wharf, recorded peak accelerations at base sensors of 26% and 29% g, respectively, suggesting a similar level of shaking at the freeway. Another record was recovered from a station approximately 2 km to the north by the USGS (Maley et al., 1989), and the peak value in that record is also 26% g. The geologic conditions at the three stations and the freeway are similar except for near the surface. The wharf record is also important because the wharf is the closest station to the east end of the damaged Bay Bridge (approximately 1 km or 0.6 mi), and the 29% g recorded may approximate the level of shaking at the bridge.

- Records were obtained at a total of 40 extensively-instrumented structures. Significant records were also obtained from many of these structures in the 1984 Morgan Hill earthquake (Shakal et al., 1984).

- Important building records include the first recorded response of an unreinforced masonry (URM) building, a class of buildings very important in assessing California's earthquake hazard. The in-plane motion at the top of one of the brick walls was 42% g, while the motion at the ground level was 25% g. The record from a horizontal sensor at the center of the roof diaphragm shows high frequency peaks near 1 g superimposed on a longer period motion of approximately 50% g.

- Another important building record was obtained in a 4-story building in Watsonville in which nearly 1.25 g was recorded at the roof, and about 40% g was recorded at the ground floor. The vertical motion at the ground floor was about 60% g. Four vertical sensors at the base allow studies of building rocking response.

- A 13-story steel-frame building in San Jose shows long duration of motion; the peak value is similar to that in the 1984 Morgan Hill and 1986 Mt. Lewis earthquakes. The duration of shaking is again very long, near 100 seconds. For comparison, two nearby buildings of differing construction continued to respond for only about 25 seconds in this earthquake. (Note that this record shows certain unusual features in some traces, an unusual response of the galvanometers in the recorders; this is not thought to arise from effects of the shaking, nor to materially affect the reliability of the records; the records can still be digitized.)

- Important lifeline structures include the Sierra Point Overpass on Hwy 101 near Candlestick Park. The bridge deck was seismically isolated by Caltrans in 1985 as part of an upgrade project. The motion at the base of the columns was 9% g; at the top of the columns, the peak motion below the isolators was 41% g; the peak motion on the bridge deck, above the isolators, was 33% g, with a reduction in high frequency components.

- San Juan Bautista overpass - This is the third set of significant records obtained from this bridge since it was instrumented in 1978. The first set of records was obtained from the 1979 Coyote Lake earthquake before the bridge was seismically retrofitted with cable restrainers. Since the retrofit, another record was obtained from the 1984 Morgan Hill earthquake. In this earthquake, the motion at the base of the columns was 15% g; the motion on the deck was 94% g, dominated by high frequency motion.

- BART Elevated Section - These are the first records from an elevated rapid-transit structure. The instrumentation includes a freefield site 30 m from the structure and sensors on an extension of the pile-cap at the base of the columns.

- Oakland Wharf - These are the first records of the earthquake shaking of a wharf structure during an earthquake; although this wharf section was not damaged, a nearby wharf structure underwent failure of the batter piles, and a section to the southwest had extensive liquefaction of the ground around the structure.

- Caldecott tunnel, on Highway 24 in the Berkeley Hills - the first records from a tunnel; motion was of low amplitude but still shows significant differences between the motion near the portal and deep within the tunnel.

- The earthquake shaking was recorded at two dams. Lexington Dam, near the northern end of the aftershock zone, recorded accelerations of 45% g. Another dam, Lower Crystal Springs Dam on the San Francisco peninsula, recorded a lower value of 10% g on the crest.

- Gilroy Array - This earthquake generated another suite of strong motion records from the Gilroy Array, an east-west alignment of stations extending across the Calaveras fault near Gilroy (Figure 1). This array is a cooperative effort of the CDMG Strong Motion Instrumentation Program (SMIP) and the USGS Branch of Engineering Seismology and Geology, and is currently instrumented and maintained by SMIP. In addition to the original stations #1 through #6, CDMG has added station #7 and the Gavilan College station. This array, extending from rock on the east across the alluvial Santa Clara Valley to rock on the west, also provided significant records in the 1979 Coyote Lake and the 1984 Morgan Hill earthquakes.

- Another cooperative array, the APEEL array, was originally designed and installed by the NOAA Seismological Field Survey (Morrill, 1972). The array is an east-west alignment of stations extending from the San Francisco peninsula across the San Francisco Bay to Hayward. The records obtained by CSMIP and the USGS from this array will be very useful for studying the effects of soil conditions on strong ground motion because several stations are located on bay mud.

In addition to those stations noted above, several other CSMIP stations are cooperative. These include the stations at Lawrence Berkeley Laboratory, the UC Berkeley Memorial Stadium, and at the Caldecott Tunnel.

Additional Strong-Motion Data

Several agencies in addition to CSMIP have strong-motion instruments in the San Francisco Bay area. The U.S. Geological Survey maintains instruments of its own and of other agencies in this area. Maley and others (1989) prepared a report on data from 38 stations of this group. In addition to the above networks, private building owners in the City of San Francisco have instruments in their buildings, as required by the City code.

Order of Data - How to Use This Report

Three tables are included in this report to make cross-referencing stations and records as convenient as possible. The CSMIP strong-motion stations that recorded this earthquake are shown on the station map in Figure 1. Each station is identified by a nearby three-digit code on the map. This identification code and the corresponding station name are cross-referenced in Table 1, which appears on the page opposing the station map for convenience. Once the station name is known, Table 2, which lists the stations in alphabetical order, can be used to obtain station parameters such as coordinates and site geology. In addition, the number of the page where the record from the station appears is also given, provided the station was triggered. Finally, Table 3 list earthquake and station dependent information, such as epicentral distance, component orientations, and peak acceleration values. The page number where the accelerogram appears is again listed.

To make accessing the data from the stations more convenient, three station areas have been defined, as shown in Figure 1. **Area 1** is the epicentral and southern area extending from San Jose to the south; **Area 2** covers the San Francisco peninsula and the area north to Santa Rosa; finally, **Area 3** covers the east bay area, including Hayward, Oakland and north to Napa. In Table 3, the stations are listed in order of increasing epicentral distance within each of the three areas. The records are presented in this order.

The accelerograph records section of this report has two main groupings based on station type: ground response and structural response. The structural response section is further separated into building stations and lifeline stations. The first grouping contains the records from the ground response stations, two records per page.

The second grouping contains building response records. For most buildings the presentation includes a picture of the building, a brief description of the structural system, and a schematic of the sensor layout. (For distant stations with low amplitude records, the sensor layout is not included.) By convention, the orientation of sensors in buildings is given by reference directions parallel to the principal building dimensions; the relationship of these directions to true geographic directions is given on the sensor layout and the building record. The introductory pages are followed by one to six

pages of records, depending on the number of recording instruments associated with the building and the duration of the structural response. Many buildings have ground-response stations nearby to provide reference ground motion information. For convenience, a copy of each reference-station record is included in both the ground-response and structural response sections.

The third grouping contains copies of records from instrumented lifeline structures, including two freeway overpasses, two dams, a wharf, a tunnel and a rapid-transit structure. The presentation for lifeline structures follows the format used for building records; a schematic of the sensor layout at the station is again presented for all significant records.

Acknowledgements

The California Strong Motion Program extends its appreciation to the individuals and organizations which have permitted and cooperated in the installation of seismic strong-motion equipment on their property. CSMIP also extends its appreciation to the members of the Strong Motion Instrumentation Advisory Committee and its subcommittees.

The records presented in this report were made possible through the efforts of many CSMIP technicians, both present and past, who installed and maintained the stations over the years. Record recovery following this earthquake was performed by S. Rider, R. Meneely, K. Wampole, J. Anderson, M. Malone, R. Land, M. Morgan, W. Stephan, R. Payne, R. Zimmerman, E. Jacobson and K. Breitwieser. Mark Delisle assisted in verifying station information and map preparation. C. Young, D. Eddy and S. Rowley assisted in the preparation of this report. The efforts of all those involved made the timely publication of these data possible.

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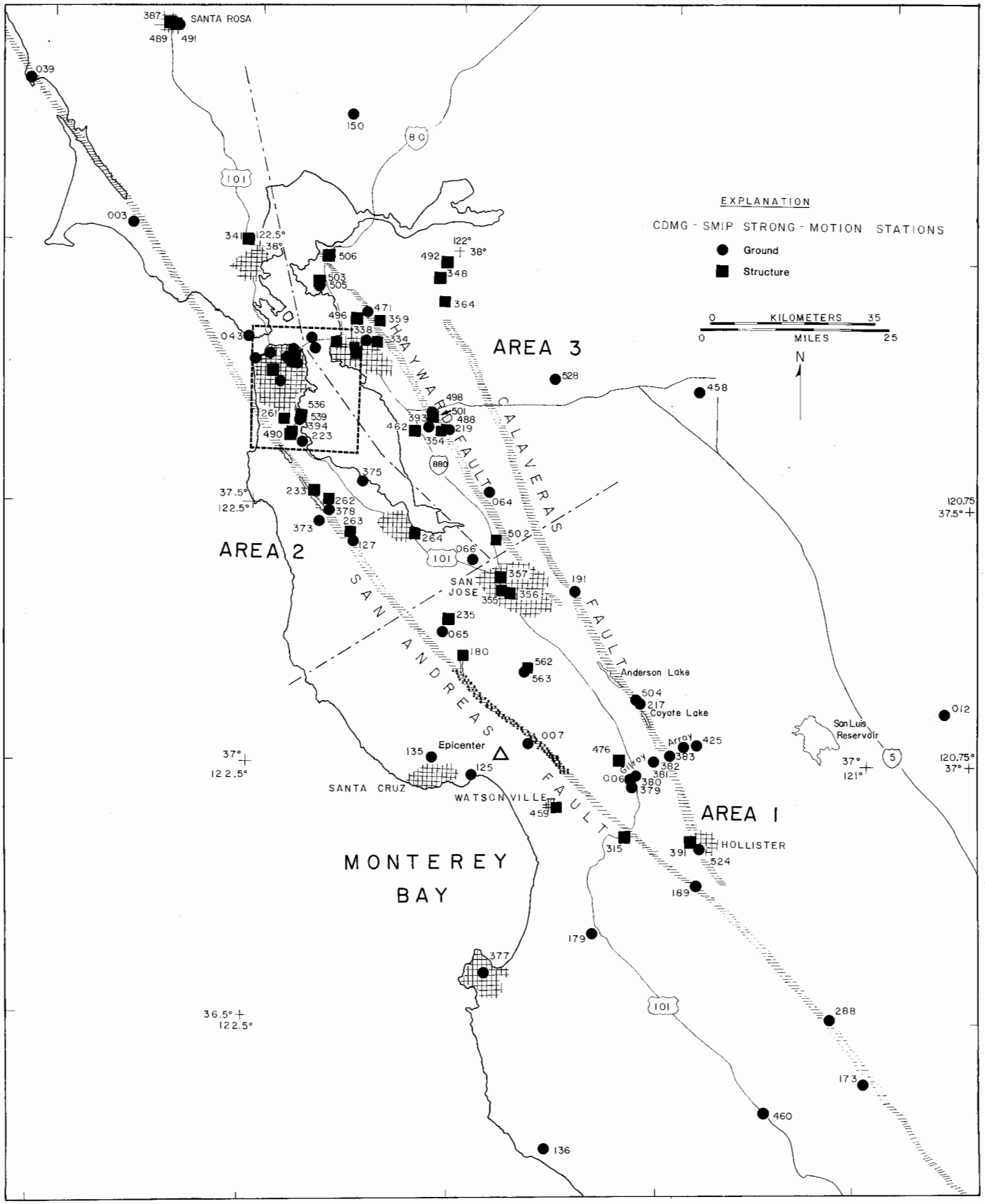

Figure 1. CSMIP stations that recorded the October 17, 1989 earthquake in the Santa Cruz mountains. The 3-digit codes correspond to the last 3 digits of the station numbers in Table 1. The map has been divided into three areas for more convenient reference to the stations.

TABLE 1
Station-Code Reference Table

Code	Station Name
003	Olema - Point Reyes
006	Gilroy - Gavilan College
007	Corralitos
012	Los Banos
039	Bodega Head
043	Point Bonita
064	Fremont - Mission San Jose
065	Saratoga
066	Agnew
117	Treasure Island
125	Capitola
127	Woodside
130	San Francisco - Diamond Heights
131	San Francisco - Pacific Heights
132	San Francisco - Cliff House
133	San Francisco - Telegraph Hill
135	Santa Cruz - UCSC
136	Big Sur
150	Napa
151	San Francisco - Rincon Hill
163	Yerba Buena Island
173	Bitterwater
179	Salinas
180	Lexington Dam
189	Sago South - Hollister
191	Halls Valley
217	Coyote Lake Dam - Abutment
219	Hayward - CSUH Stadium Grounds
222	San Francisco - Presidio
223	San Francisco - Intl. Airport
224	Oakland - 2-story Office Bldg.
233	Lower Crystal Springs Dam
235	Saratoga - 1-story School Gym
261	So. San Francisco - 4-story Hospital
262	Belmont - 2-story Office Bldg.
263	Redwood City - 3-story School Bldg.
264	Palo Alto - 2-story Office Bldg.
288	San Benito
315	San Juan Batista - 101/156 Overpass
334	Piedmont - 3-story School Bldg.
338	Piedmont - Piedmont Jr. High Grounds
341	San Rafael - 3-story Office Bldg.
348	Pleasant Hill - 3-story Commer Bldg.
354	Hayward - 13-story CSUH Admin. Bldg.
355	San Jose - 10-story Commercial Bldg.
356	San Jose - 10-story Residential Bldg.
357	San Jose - 13-story Gov. Office Bldg.
359	Oakland - Caldecott Tunnel
364	Walnut Creek - 10-story Commer. Bldg.
373	Upper Crystal Springs Res. - Skyline
375	Foster City - Redwood Shores
377	Monterey - City Hall
378	Upper Crystal Springs Res. - Pulgas
379	Gilroy #1 - Gavilan College, Water Tank
380	Gilroy #2 - Hwy 101 Motel
381	Gilroy #3 - Sewage Plant
382	Gilroy #4 - San Ysidro School
383	Gilroy #6 - San Ysidro
387	Santa Rosa - 5-story Commercial Bldg.
391	Hollister - 1-story Warehouse
393	Hayward - Muir School
394	San Bruno - 9-story Gov. Office Bldg.
425	Gilroy #7 - Mantelli Ranch
458	Tracy - Sewage Plant
459	Watsonville - 4-story Commercial Bldg.
460	Greenfield
462	Hayward - 6-story Office Bldg.
471	Berkeley - LBL
472	Oakland - Outer Harbor Wharf
476	Gilroy - 2-story Historic Commercial Bldg.
479	San Francisco - 6-story UCSF Bldg.
480	San Francisco - 18-story Commercial Bldg.
483	Oakland - 24-story Residential Bldg.
488	Hayward - 4-story CSUH Science Bldg.
489	Santa Rosa - 14-story Residential Bldg.
490	San Bruno - 6-story Office Bldg.
491	Santa Rosa - Hendley St. & Tupper
492	Concord - 8-story Residential Bldg.
496	Berkeley - 2-story Hospital
498	Hayward - BART Station Parking Lot
501	Hayward - BART Elevated Section
502	Milpitas - 2-story Industrial Bldg.
503	Richmond - 3-story Government Office Bldg.
504	Coyote Lake Dam - Downstream
505	Richmond - City Hall Lot
506	Richmond - 3-story Office Bldg.
524	Hollister - South St. & Pine
528	Livermore - Fagundes Ranch
532	San Francisco - 47-story Office Bldg.
536	So. San Francisco - Sierra Pt. Overpass
539	So. San Francisco - Sierra Point
562	San Jose - 3-story Office Bldg.
563	San Jose - Santa Teresa Hills

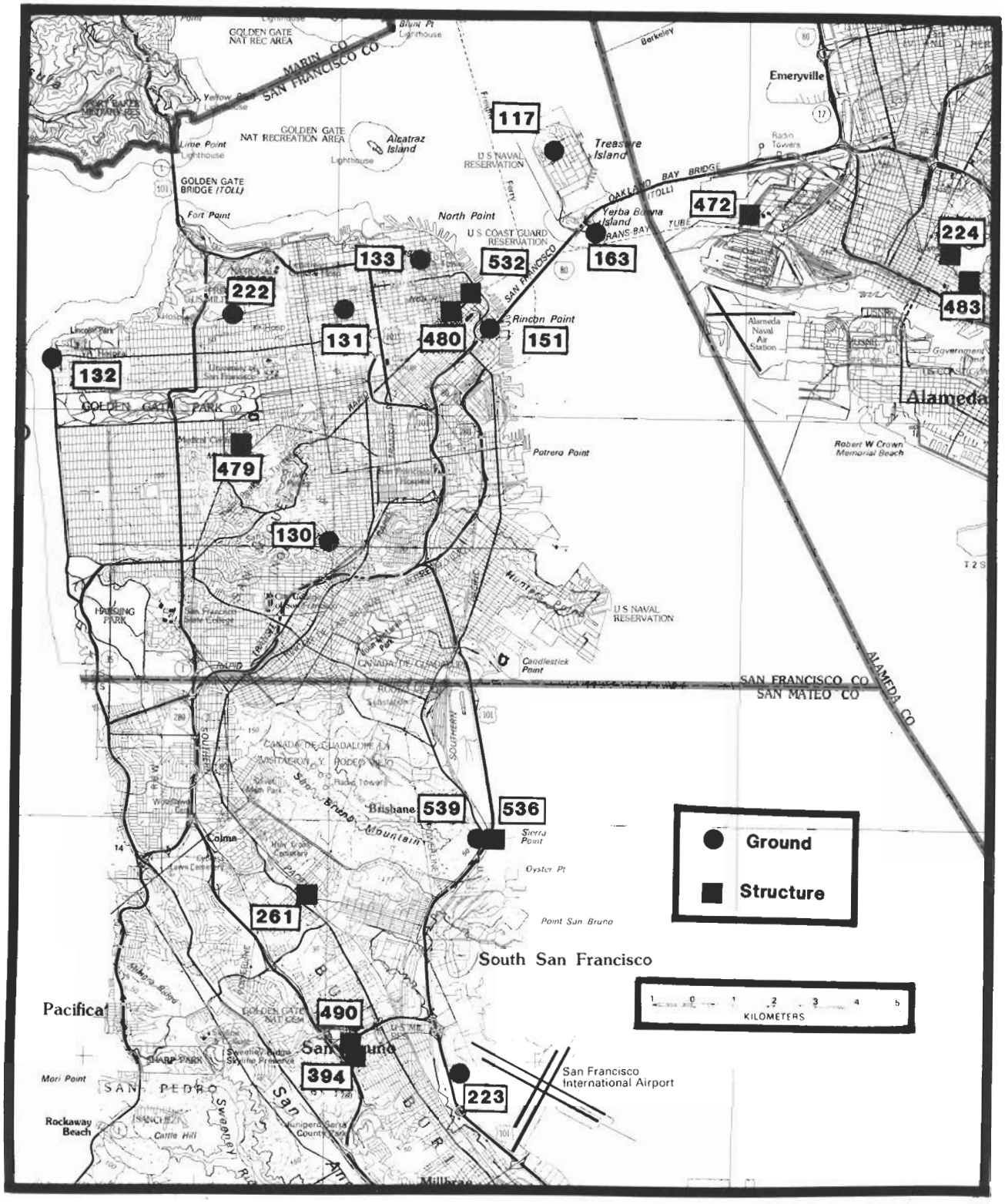

Figure 2. Inset section of Figure 1 of San Francisco area. Three-digit code identifies stations as follows:

117	Treasure Island	261	So. SF - 4-story Hospital
130	SF - Diamond Heights	394	San Bruno - 9-story Gov. Bldg.
131	SF - Pacific Heights	472	Oakland- 24-story Residential Bldg.
132	SF - Cliff House	479	SF - 6-story UCSF Bldg.
133	SF - Telegraph Hill	480	SF - 18-story Commercial Bldg.
151	SF - Rincon Hill	483	Oakland- 24-story Residential Bldg.
163	Yerba Buena Island	490	San Bruno - 6-story Office Bldg.
222	SF - Presidio	532	SF - 47-story Office Bldg.
223	SF - International Airport	536	So. SF - Sierra Pt. Overpass
224	Oakland - 2-story Office Bldg.	539	So. SF - Sierra Point

TABLE 2

CSMIP Strong-Motion Stations - Loma Prieta Earthquake

Station Name	N. Lat.	W.Long.	Sta. No.	Code	Site Geology	Record on Page*
Agnew Agnews State Hospital	37.239	121.952	57066	066	Alluvium	37
Antioch 510 G Street	38.015	121.813	67070	070	Alluvium	NT
Antioch Contra Loma Park	37.972	121.829	57426	426	Alluvium	NT
Belmont 2-story Office Bldg.	37.512	122.308	58262	262	Sandstone	97
Berkeley Lawrence Berkeley Lab	37.876	122.249	58471	471	Thin alluvium on shale, siltstone	50
Berkeley 2-story Hospital	37.855	122.256	58496	496	Alluvium	148
Berkeley UCB Memorial Stadium Grounds	37.87	122.25	58000	000	Fault gouge	50
Big Sur Pfeiffer State Park	36.255	121.782	47136	136	Alluvium	34
Bitterwater	36.395	120.982	46173	173	Alluvium	36
Bodega Head Doran Beach	38.311	123.052	69039	039	Alluvium	44
Briones Dam	37.914	122.208	58183	183	Sandstone	NT#
Capitola Fire Station	36.974	121.952	47125	125	Alluvium	25
Concord 8-story Residental Bldg.	37.979	122.032	58492	492	Alluvium	159
Corralitos Eureka Canyon Road	37.046	121.803	57007	007	Landslide deposits	25
Coyote Lake Dam Downstream	37.124	121.551	57504	504	Alluvium	31
Coyote Lake Dam-Abutment (San Martin-Coyote Creek)	37.118	121.550	57217	217	Fill over carbonate rock	31
El Cerrito 2-Story Commercial Bldg.	37.899	122.298	58188	188	Alluvium	NT#
Foster City - Redwood Shores (APEEL 1; USGS No. 1001)	37.55	122.23	58375	375	Aluv,210m; serpentine	39
Fremont Mission San Jose	37.530	121.919	57064	064	Alluvium	46
Gilroy 2-story Historic Comm. Bldg.	37.009	121.569	57476	476		63
Gilroy #1 - Gavilan Coll., Water Tank (USGS No. 1408)	36.973	121.572	47379	379	Franciscan sandstone	28
Gilroy #2 - Hwy 101/Bolsa Rd. Motel (USGS No. 1409)	36.982	121.556	47380	380	Alluvium	28
Gilroy #3 Sewage Plant (USGS No. 1410)	36.987	121.536	47381	381	Alluvium	29
Gilroy #4 - San Ysidro School (USGS No. 1411)	37.005	121.522	57382	382	Alluvium	29
Gilroy #6 - San Ysidro (USGS No. 1413)	37.026	121.484	57383	383	Silty clay over sandstone	30
Gilroy #7 Mantelli Ranch	37.033	121.434	57425	425	Alluvium over sandstone	30
Gilroy Gavilan Coll., Phys. Sci. Bldg.	36.973	121.568	47006	006	Terrace deposit over sandstone	27
Greenfield	36.321	121.243	47460	460	Alluvium	35

TABLE 2 (Continued)

Station Name	N. Lat.	W.Long.	Sta. No.	Code	Site Geology	Record on Page*
Halls Valley Grant Park	37.338	121.714	57191	191	Alluvium	32
Hayward BART Station Parking Lot	37.670	122.086	58498	498	Alluvium	47
Hayward BART Elevated Section	37.671	122.087	58501	501		171
Hayward 6-story Office Bldg.	37.635	122.104	58462	462	Alluvium	129
Hayward 13-story CSUH Admin. Bldg.	37.655	122.056	58354	354	Franciscan meta-volcanic rock	133
Hayward - Pt. Eden Way (APEEL 1E; USGS No. 1180)	37.623	122.130	58376	376	Clay, more than 100m	NR1
Hayward 4-story CSUH Science Bldg.	37.657	122.053	58488	488	Weathered metavolcanic rock	137
Hayward - CSUH Stadium Grounds (APEEL 3E; USGS No. 1219)	37.657	122.061	58219	219	Franciscan greenstone	46
Hayward - Muir School (APEEL 2E; USGS No. 1121)	37.657	122.082	58393	393	Alluvium	47
Hollister South & Pine	36.848	121.397	47524	524	Alluvium	32
Hollister 1-story Warehouse	36.851	121.398	47391	391	Alluvium	59
Lexington Dam	37.202	121.949	57180	180	Slate and sandstone	175
Livermore Fagundes Ranch	37.753	121.772	57528	528	Alluvium	48
Los Banos	37.106	120.825	56012	012	Alluvium	36
Lower Crystal Springs Dam	37.529	122.361	58233	233	Franciscan greywacke	178
Mendota	36.755	120.382	56073	073	Alluvium	NT
Merced	37.289	120.455	56071	071	Alluvium	NT
Milpitas 2-story Industrial Bldg.	37.430	121.897	57502	502	Alluvium	125
Modesto	37.666	121.036	57011	011	Alluvium	NT
Monterey City Hall	36.597	121.897	47377	377	Granite	34
Napa Napa College	38.270	122.276	68150	150	Alluvium	52
Oakland Outer Harbor Wharf	37.816	122.314	58472	472	Bay mud	181
Oakland Caldecott Tunnel, Hwy 24	37.857	122.214	58359	359	Sandstone, shale, mudstone	184
Oakland	37.742	122.148	58225	225		NT#
Oakland	37.809	122.27	58337	337		NT#
Oakland 2-story Office Bldg.	37.806	122.267	58224	224	Alluvium	143
Oakland 24-story Residental Bldg.	37.798	122.257	58483	483		139
Olema Point Reyes	38.043	122.797	68003	003	Alluvium	44
Palo Alto 2-story Office Bldg.	37.453	122.112	58264	264	Alluvium	93
Palo Alto 5-story Office Bldg.	37.424	122.101	58484	484		NR2

TABLE 2 (Continued)

Station Name	N. Lat.	W.Long.	Sta. No.	Code	Site Geology	Record on Page*
Palo Alto Fabian Way and San Antonio Rd.	37.423	122.100	58485	485		NR2
Piedmont 3-story School Office Bldg.	37.823	122.233	58334	334	Serpentinite	146
Piedmont Jr. High School Grounds	37.823	122.233	58338	338	Weathered serpentinite	51
Pleasant Hill 3-story Commercial Bldg.	37.946	122.060	58348	348	Alluvium,2m; sandstone	157
Point Bonita	37.82	122.52	58043	043	Broken rock and soil 2m;sandstone	43
Priest Valley	36.191	120.708	46174	174		NT
Redwood City 3-story School Office Bldg.	37.448	122.265	58263	263	Greenstone	96
Richmond City Hall Parking Lot	37.935	122.342	58505	505	Alluvium	51
Richmond 3-story Government Office Bldg.	37.938	122.342	58503	503		150
Richmond 3-story Office Bldg.	37.978	122.329	58506	506		153
SAGO - South, Hollister	36.753	121.396	47189	189	Granite	33
Salinas	36.671	121.642	47179	179	Alluvium	33
San Benito	36.519	121.084	47288	288	Alluvium	35
San Bruno 6-story Office Bldg.	37.628	122.424	58490	490		103
San Bruno 9-story Government Office Bldg.	37.627	122.424	58394	394	Alluvium	99
San Francisco Cliff House	37.78	122.51	58132	132	Franciscan sandstone,shale	43
San Francisco 18-story Commercial Bldg.	37.792	122.400	58480	480	Fill over bay mud	112
San Francisco 47-story Office Bldg.	37.796	122.396	58532	532	Fill	115
San Francisco 6-story UCSF Bldg.	37.762	122.459	58479	479		110
San Francisco Diamond Heights	37.74	122.43	58130	130	Franciscan chert	40
San Francisco International Airport	37.622	122.398	58223	223	Deep alluvium	39
San Francisco Pacific Heights	37.79	122.43	58131	131	Franciscan sandstone,shale	42
San Francisco Presidio	37.792	122.457	58222	222	Serpentine	42
San Francisco Rincon Hill	37.79	122.39	58151	151	Franciscan sandstone,shale	41
San Francisco Telegraph Hill	37.80	122.41	58133	133	Franciscan shale,sandstone	41
San Jose 10-story Commercial Bldg.	37.338	121.893	57355	355	Alluvium	79
San Jose 13-story Government Office Bldg.	37.353	121.903	57357	357	Alluvium	83
San Jose 3-story Office Bldg.	37.212	121.803	57562	562		67
San Jose Santa Teresa Hills	37.210	121.803	57563	563	Alluvium over serpentine	27
San Jose 10-story Residential Bldg.	37.338	121.888	57356	356	Alluvium	75

TABLE 2 (Continued)

Station Name	N. Lat.	W.Long.	Sta. No.	Code	Site Geology	Record on Page*
San Juan Bautista Fire Station	36.846	121.536	47126	126	Alluvium	NR3
San Juan Bautista Hwy 101/156 Overpass	36.862	121.578	47315	315	Alluvium	163
San Rafael 3-Story Office Bldg.	38.196	122.819	68341	341	Franciscan sandstone & silts	119
San Rafael Sewage Plant	37.960	122.499	58096	096	Fill, 3m bay mud,45m	NR3
San Ramon Kodak Bldg.	37.729	121.928	57187	187	Alluvium	NR3
Santa Cruz UCSC/Lick Obs. Elect. Lab.	37.001	122.060	58135	135	Limestone	26
Santa Rosa 5-story Commercial Bldg.	38.439	122.711	68387	387		124
Santa Rosa 14-story Residental Bldg.	38.437	122.707	68489	489		121
Santa Rosa Hendley and Tupper	38.437	122.707	68491	491		45
Saratoga Aloha Ave.	37.255	122.031	58065	065	Alluvium	26
Saratoga 1-story Gymnasium	37.262	122.009	58235	235	Alluvium	71
So. San Francisco 4-story Hospital	37.660	122.439	58261	261	Fill over sandstone	107
So. San Francisco Sierra Point	37.674	122.388	58539	539		40
So. San Francisco Sierra Pt. Overpass	37.674	122.388	58536	536		167
Stockton Univ. of Pacific	37.981	121.311	57062	062	Deep alluvium	NT
Tracy Sewage Plant	37.766	121.421	57458	458	Alluvium	48
Treasure Island Naval Base Fire Station	37.825	122.373	58117	117	Fill	49
Upper Crystal Springs Res. Pulgas Temple (APEEL 7; USGS No. 1160)	37.49	122.31	58378	378	Sandstone	38
Upper Crystal Springs Res. Skyline Blvd. (APEEL 10; USGS 1107)	37.465	122.343	58373	373	Sandstone	38
Vacaville	38.348	121.963	67068	068	Sandstone	NT
Walnut Creek 10-Story Commercial Bldg.	37.907	122.065	58364	364	Marine sedimentary rock	154
Watsonville	36.909	121.756	47459	459	Fill over alluvium	55
Woodside Fire Station	37.429	122.258	58127	127	Conglomerte	37
Yerba Buena Island	37.81	122.36	58163	163	Franciscan Sandstone	49

Footnote:
NT - Instrument not triggered, though operational
NT# - Instrument not triggered, probable instrument malfunction
NR1 - No record because of vandalism at the site.
NR2 - Instruments removed during seismic-upgrade construction work.
NR3 - Instruments removed at request of the building owner.

TABLE 3 - CSMIP Strong Motion Data - Loma Prieta Earthquake

Station Name	No.	Structure Type,Size*	Epicenter Dist.**	Trigger Time#	Comp.	Max. Acceleration Grnd. (g)	Struct. (g)	Pg.
---------- MAP AREA 1 ----------								
Corralitos Eureka Canyon Rd.	57007	Instr. Shltr. F	7 [1]	20.4	90	0.50		25
					Up	0.47		
					360	0.64		
Capitola Fire Station Capitola Ave.	47125	1-story bldg.	9 [14]	----	90	0.47		25
					Up	0.60		
					360	0.54		
Santa Cruz UCSC/Lick Obs. Elect. Lab.	58135	1-story bldg.	16 [16]	----	90	0.44		26
					Up	0.40		
					360	0.47		
Watsonville 4-story Commercial Bldg.	47459	4-story concrete bldg. (13 sensors)	18 [7]	21.6	45	0.28	0.81	55
					Up	0.66	----	
					135	0.39	1.24	
Lexington Dam Lexington Reservoir (near Los Gatos)	57180	Earth dam (9 sensors)	19 [5]	21.2	90	0.41	0.40	175
					Up	0.15	0.22	
					360	0.45	0.45	
San Jose Santa Teresa Hills Bernal & Harry Rds	57563	Instr. Shltr. H	21 [10]	18.3	225	0.28		27
					Up	0.22		
					315	0.27		
San Jose 3-Story Office Bldg.	57562	3-story steel bldg. (10 sensors)	21 [10]	18.6	315	0.20	0.58	67
					Up	0.14	----	
					45	0.20	0.67	
Saratoga 1-story Gymnasium	58235	1-story concrete gym (11 sensors)	27 [9]	----	270	0.33	0.87	71
					Up	0.27	----	
					360	0.26	0.77	
Saratoga Aloha Ave.	58065	1-story bldg.	27 [9]	----	90	0.34		26
					Up	0.41		
					360	0.53		
Gilroy 2-story Historic Commercial Bldg.	57476	2-story masonry bldg. (6 sensors)	28 [16]	23.4	250	0.25	0.55	63
					Up	0.15	----	
					160	0.28	0.99	
Gilroy Gavilan College Physical Sciences Bldg.	47006	1-story bldg.	29 [15]	----	67	0.37		27
					Up	0.20		
					337	0.33		

TABLE 3 - Strong Motion Data - Area 1 (Continued)

Station Name	No.	Structure Type,Size*	Epicenter Dist.**	Trigger Time#	Comp.	Max. Acceleration Grnd. (g)	Struct. (g)	Pg.
Gilroy #1	47379	Instr.	29	23.9	90	0.50		28
Gavilan College		Shltr. H	[15]		Up	0.22		
Water Tank					360	0.43		
Gilroy #2	47380	Instr.	30	23.8	90	0.33		28
Hwy 101/Bolsa Rd		Shltr. F	[16]		Up	0.31		
Motel					360	0.37		
Gilroy #3	47381	Instr.	31	23.9	90	0.37		29
Gilroy Sewage		Shltr. H	[18]		Up	0.38		
Plant					360	0.55		
Gilroy #4	57382	1-story	32	24.1	90	0.22		29
San Ysidro School		bldg.	[20]		Up	0.17		
					360	0.42		
Gilroy #6	57383	Instr.	35	26.0	90	0.17		30
San Ysidro		Shltr. A	[24]		Up	0.10		
Microwave Site					360	0.13		
Gilroy #7	57425	Instr.	40	----	90	0.33		30
Mantelli Ranch		Shltr. F	[28]		Up	0.12		
Jamison Rd.					360	0.23		
Coyote Lake Dam	57217	Instr.	31	24.6	285	0.49		31
Southwest Abutment		Shltr. A	[21]		Up	0.08		
					195	0.15		
Coyote Lake Dam	57504	Instr.	31	24.5	285	0.19		31
Downstream		Shltr. H	[21]		Up	0.10		
					195	0.17		
San Juan Bautista	47315	Bridge	33	----	336	0.15	0.94	163
Hwy 101/156 Overpass		(12 sensors)	[19]		Up	0.10	0.27	
					66	0.14	0.61	
San Jose	57356	10-story	33	----	150	0.10	0.37	75
10-story		concrete	[20]		Up	0.09	----	
Residential Bldg.		(13 sensors)			60	0.13	0.24	
San Jose	57355	10-story	33	----	330	0.09	0.26	79
10-story		concrete	[20]		Up	0.09	----	
Commercial Bldg.		(13 sensors)			240	0.11	0.38	
San Jose	57357	13-story	35	----	337	0.11	0.35	83
13-story		steel bldg.	[21]		Up	0.10	----	
Government Office Bldg.		(22 sensors)			67	0.10	0.36	

TABLE 3 - Strong Motion Data - Area 1 (Continued)

Station Name	No.	Structure Type,Size*	Epicenter Dist.**	Trigger Time#	Comp.	Max. Acceleration Grnd. (g)	Max. Acceleration Struct. (g)	Pg.
Halls Valley Grant Park Old Ranch Hdqtrs	57191	Instr. Shltr. A	37 [31]	24.9	90 Up 360	0.11 0.06 0.13		32
Salinas John & Work St.	47179	1-story bldg.	46 [34]	25.9	250 Up 160	0.12 0.11 0.09		33
Hollister South & Pine	47524	Instr. Shltr. H	48 [33]	27.5	90 Up 360	0.18 0.20 0.38		32
Hollister 1-story Warehouse	47391	1-story tilt-up warehouse (13 sensors)	48 [33]		65 Up 335	(Record not yet recoverable)		59
Monterey City Hall	47377	1-story bldg.	49 [44]	27.6	90 Up 360	0.07 0.03 0.07		34
SAGO South Hollister Cienega Rd.	47189	Instr. Shltr. A	54 [39]	30.2	351 Up 261	0.07 0.06 0.07		33
Big Sur Pfeiffer State Park	47136	1-story bldg.	87 [79]	33.7	90 Up 360	0.05 0.03 0.06		34
San Benito	47288	Instr. Shltr. A	92 [77]	46.8	90 Up 360	0.05 0.02 0.05		35
Los Banos	56012	Instr. Shltr. A	94 [83]	39.3	90 Up 360	0.05 0.01 0.05		36
Greenfield Police Station	47460	1-story bldg.	98 [85]	36.1	90 Up 360	0.08 0.06 0.08		35
Bitterwater Coalinga Rd.	46173	Instr. Shltr. A	107 [93]	45.8	90 Up 360	0.06 0.03 0.07		36

TABLE 3 - Strong Motion Data - Area 2

Station Name	No.	Structure Type,Size*	Epicenter Dist.**	Trigger Time#	Comp.	Max. Acceleration Grnd. (g)	Max. Acceleration Struct. (g)	Pg.
---------- MAP AREA 2 ----------								
Agnew Agnews State Hospital	57066	1-story bldg.	40 [25]	24.2	90 Up 360	0.16 0.10 0.17		37
Palo Alto 2-Story Office Bldg.	58264	2-story masonry bldg. (7 sensors)	50 [32]	----	37 Up 127	0.20 0.09 0.21	0.38 ---- 0.55	93
Woodside Fire Station	58127	1-story bldg.	55 [36]	----	90 Up 360	0.08 0.05 0.08		37
Redwood City 3-story School Office Bldg.	58263	3-story concrete (6 sensors)	57 [38]	----	217 Up 307	0.05 0.04 0.09	0.19 ---- 0.17	96
Upper Crystal Springs Reservoir Skyline Blvd. (APEEL 10)	58373	Instr. Shltr. A	63 [44]	----	90 Up 360	0.09 0.04 0.10		38
Upper Crystal Springs Reservoir Pulgas Water Temple (APEEL 7)	58378	Instr. Shltr. A	63 [44]	30.7	90 Up 360	0.09 0.06 0.16		38
Foster City Redwood Shores (APEEL 1)	58375	Instr. Shltr. A	63 [44]	29.2	90 Up 360	0.29 0.11 0.26		39
Belmont 2-story Office Bldg.	58262	2-story concrete (7 sensors)	65 [46]	----	345 Up 75	0.10 0.04 0.11	0.20 ---- 0.19	97
Lower Crystal Springs Dam	58233	Concrete gravity Dam (15 sensors)	69 [50]	25.0	332 Up 242	0.06 0.03 0.09	---- 0.03 0.07	178
San Francisco International Airport Svc. Bldg. near Hwy 101	58223	1-story bldg.	79 [60]	34.1	90 Up 360	0.33 0.05 0.24		39
San Bruno 9-Story Government Office Bldg.	58394	9-story concrete (16 sensors)	81 [62]	----	65 Up 335	0.11 0.14 0.16	0.32 ---- 0.36	99

TABLE 3 - Strong Motion Data - Area 2 (Continued)

Station Name	Station No.	Structure Type,Size*	Epicenter Dist.**	Trigger Time#	Comp.	Max. Acceleration Grnd. (g)	Max. Acceleration Struct. (g)	Pg.
San Bruno 6-Story Office Bldg.	58490	6-story concrete (13 sensors)	81 [62]	31.6	335 Up 245	0.14 0.12 0.12	0.25 ---- 0.46	103
So. San Francisco Sierra Point	58539	Instr. Shltr. H	84 [65]	----	205 Up 115	0.11 0.05 0.06		40
So. San Francisco Sierra Pt. Overpass Highway 101	58536	Isolated-deck bridge (13 sensors)	84 [65]		25 Up 115	0.09 0.03 0.05	0.41 0.11 0.22	167
So.San Francisco 4-story Hospital	58261	4-story steel bldg. (11 sensors)	85 [66]	----	41 Up 311	0.14 0.08 0.15	0.57 ---- 0.68	107
San Francisco Diamond Heights Digby St. Fire Station	58130	2-story bldg.	92 [73]	----	90 Up 360	0.12 0.05 0.10		40
San Francisco Rincon Hill Fremont & Harrison	58151	Instr. Shltr. A	95 [76]	35.7	90 Up 360	0.09 0.03 0.08		41
San Francisco 6-Story UCSF Bldg.	58479	6-story concrete (13 sensors)	95 [76]	35.0	345 Up 75	0.09 0.04 0.07	0.28 ---- 0.19	110
San Francisco 18-Story Commercial Bldg.	58480	18-story steel/concrete (13 sensors)	95 [77]	33.1	350 Up RefN	0.17 0.04 0.14	0.27 ---- 0.27	112
San Francisco 47-Story Office Bldg.	58532	47-story steel bldg. (18 sensors)	96 [77]	33.9	RefN Up	0.13 0.08 0.20	0.48 ---- 0.39	115
San Francisco Pacific Heights Calif. St. Fire Sta.	58131	2-story bldg.	97 [78]	----	360 Up 270	0.05 0.03 0.06		42
San Francisco Telegraph Hill Stockton St. Fire Sta.	58133	2-story bldg.	97 [78]	46.6	90 Up 360	0.08 0.03 0.06		41
San Francisco Presidio Arguello Dr. Vista Pt.	58222	Instr. Shltr. H	98 [79]	36.1	90 Up 360	0.21 0.06 0.10		42

TABLE 3 - Strong Motion Data - Area 2 (Continued)

Station Name	No.	Structure Type,Size*	Epicenter Dist.**	Trigger Time#	Comp.	Max. Acceleration Grnd. (g)	Struct. (g)	Pg.
San Francisco Cliff House	58132	2-story bldg.	99 [80]	----	90 Up 360	0.11 0.06 0.08		43
Point Bonita	58043	Instr. Shltr. A	104 [85]	39.1	297 Up 207	0.07 0.03 0.07		43
San Rafael 3-Story Office Bldg.	68341	3-story steel/ concrete (16 sensors)	124 [105]	----	20 Up 290	0.04 0.03 0.04	0.10 ---- 0.13	119
Olema Point Reyes Ranger Station	68003	Instr. Shltr. H	138 [119]	42.5	90 Up 360	0.11 0.06 0.16		44
Santa Rosa Hendley & Tupper	68491	Instr. Shltr. H	171 [153]	12.9	69 Up 339	0.05 0.03 0.04		45
Santa Rosa 14-Story Residental Bldg.	68489	14-story concrete bldg. (16 sensors)	171 [153]	12.1	340 Up 70	0.04 0.02 0.05	0.21 ---- 0.21	121
Santa Rosa 5-Story Commercial Bldg.	68387	5-story concrete bldg. (16 sensors)	172 [153]	----	330 Up 60	0.06 0.03 0.06	0.11 ---- 0.13	124
Bodega Head Doran Beach	69039	1-story bldg.	175 [156]	----	180 Up 90	0.04 0.02 0.04		44
---------- MAP AREA 3 ----------								
Milpitas 2-story Industrial Bldg.	57502	2-story tilt-up bldg. (13 sensors)	43 [29]	25.0	335 Up 245	0.10 0.08 0.14	0.34 ---- 0.58	125
Fremont Mission San Jose Fire Station	57064	1-story bldg.	55 [39]	28.6	90 Up 360	0.11 0.09 0.13		46
Hayward 6-story Office Bldg.	58462	6-story concrete bldg. (13 sensors)	69 [51]	29.5	335 Up 65	0.10 0.05 0.12	0.24 ---- 0.45	129
Hayward 13-story CSUH Admin. Bldg.	58354	13-story steel/concrete (16 sensors)	70 [53]	----	320 Up 50	0.08 0.05 0.09	0.21 ---- 0.24	133

TABLE 3 - Strong Motion Data - Area 3 (Continued)

Station Name	No.	Structure Type,Size*	Epicenter Dist.**	Trigger Time#	Comp.	Max. Acceleration Grnd. (g)	Struct. (g)	Pg.
Hayward	58488	4-story	70	32.8	335	0.05	0.18	137
4-story CSUH		concrete bldg.	[53]		Up	0.03	----	
Science Bldg.		(16 sensors)			65	0.04	0.08	
Hayward	58219	Instr.	71	32.8	90	0.08		46
CSUH Stadium Grounds		Shltr. A	[53]		Up	0.05		
(APEEL 3E)					360	0.08		
Hayward	58393	1-story	71	----	90	0.14		47
Muir School (APEEL 2E)		bldg.	[53]		Up	0.10		
(USGS #1121)					360	0.18		
Hayward	58498	Instr.	73	----	310	0.16		47
BART Station		Shltr. H	[55]		Up	0.08		
Parking Lot					220	0.16		
Hayward - BART	58501	Single-deck	73	31.3	310	0.15	0.26	171
Elevated Section		elevated rapid	[55]		Up	0.05	----	
		transit structure			220	0.15	0.60	
		(16 sensors)						
Livermore	57528	Instr.	80	35.6	92	0.04		48
Fagundes Ranch		Shltr. H	[67]		Up	0.02		
No. Livermore Ave.					2	0.04		
Tracy	57458	1-story	91	40.3	90	0.06		48
Sewage Plant		bldg.	[83]		Up	0.02		
Generator Bldg.					360	0.06		
Oakland	58483	24-story	91	35.1	305	0.18	0.38	139
24-story bldg.		concrete bldg.	[72]		Up	0.04	0.14	
Residential Bldg.		(16 sensors)			35	0.14	0.25	
Oakland	58224	2-story	92	----	200	0.20	0.26	143
2-story Office Bldg.		masonry/steel	[73]		Up	0.16	----	
		(10 sensors)			290	0.26	0.69	
Piedmont	58334	3-story	93	----	315	0.08	0.18	146
3-story School Bldg.		concrete bldg.	[74]		Up	0.04	----	
Piedmont Jr. High		(11 sensors)			45	0.07	0.15	
Piedmont	58338	Instr.	93	----	45	0.08		51
Piedmont Jr. High		Shltr. H	[74]		Up	0.03		
Grounds					315	0.07		
Oakland	58472	Concrete	95	35.0	35	0.29	0.45	181
Outer Harbor Wharf		wharf	[76]		Up	0.07	----	
14th Street		(12 sensors)			125	0.27	0.32	

TABLE 3 - Strong Motion Data - Area 3 (Continued)

Station Name	No.	Structure Type,Size*	Epicenter Dist.**	Trigger Time#	Comp.	Max. Acceleration Grnd. (g)	Max. Acceleration Struct. (g)	Pg.
Yerba Buena Island	58163	Instr. Shltr. F	95 [77]	----	90 Up 360	0.06 0.03 0.03		49
Treasure Island Naval Base Fire Station	58117	1-story bldg.	98 [79]	----	90 Up 360	0.16 0.02 0.11		49
Oakland Caldecott Tunnel Hwy 24	58359	3100-ft tunnel (24 sensors)	96 [77]	37.0	251 Up 161	---- ---- ----	0.06 0.03 0.06	184
Berkeley 2-story Hospital	58496	2-story steel bldg. (12 sensors)	97 [78]	36.5	345 Up 255	0.11 0.04 0.12	0.28 ---- 0.30	148
Walnut Creek 10-story Commercial Bldg.	58364	10-story concrete bldg. (16 sensors)	98 [81]	----	167 Up 77	0.10 0.05 0.05	0.21 ---- 0.25	154
Berkeley Lawrence Berkeley Lab (LBL #01) Cyclotron Rd.	58471	Instr. Shltr. H	99 [80]	38.4	90 Up 360	0.12 0.04 0.05		50
Berkeley UCB Memorial Stadium Grounds	58000	Instr. Shltr. D	98 [80]	----	135 Up 225	0.13 0.03 0.07		50
Pleasant Hill 3-Story Commercial Bldg.	58348	3-story concrete bldg. (12 sensors)	102 [85]	----	360 Up 270	0.08 0.03 0.13	0.13 ---- 0.23	157
Concord 8-story Residential Bldg.	58492	8-story masonry bldg. (13 sensors)	105 [89]	40.1	150 Up 240	0.06 0.03 0.06	0.14 ---- 0.24	159
Richmond City Hall Parking Lot	58505	Instr. Shltr. H	108 [89]	38.4	280 Up 190	0.11 0.04 0.13		51
Richmond 3-Story Government Office Bldg. City Hall	58503	3-story concrete bldg. (13 sensors)	108 [89]	37.9	10 Up 280	0.12 0.04 0.09	0.24 ---- 0.20	150

TABLE 3 - Strong Motion Data - Area 3 (Continued)

Station Name	No.	Structure Type,Size*	Epicenter Dist.**	Trigger Time#	Comp.	Max. Acceleration Grnd. (g)	Max. Acceleration Struct. (g)	Pg.
Richmond	58506	3-story	112	36.9	360	0.10	0.32	153
3-Story Office Bldg.		steel bldg.	[93]		Up	0.07	----	
		(12 sensors)			270	0.12	0.29	
Napa	68150	1-story	141	----	90	0.03		52
Napa College		bldg.	[123]		Up	0.02		
					360	0.03		

Footnotes:

* - Instrument shelter types:
Instr. shltr. A - small prefabricated metal or wood frame building
Instr. shltr. D - small metal box
Instr. shltr. F - small, 1-story building
Instr. shltr. H - small fiberglass shelter

** - Distance given (in km) relative to the presently estimated epicenter at 37.037N, 121.883W (USGS). Braketed number is the distance to the nearest point on the fault inferred from the aftershock distribution.

\# - Accelerograph trigger time, when present, in seconds after 00:04 GMT on 18 October 1989.

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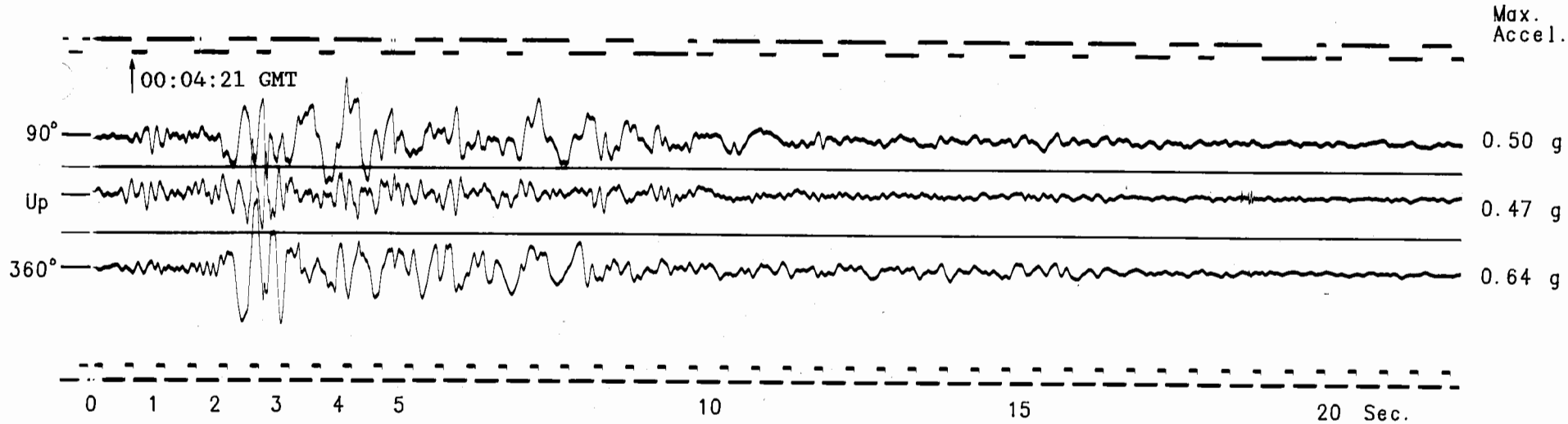
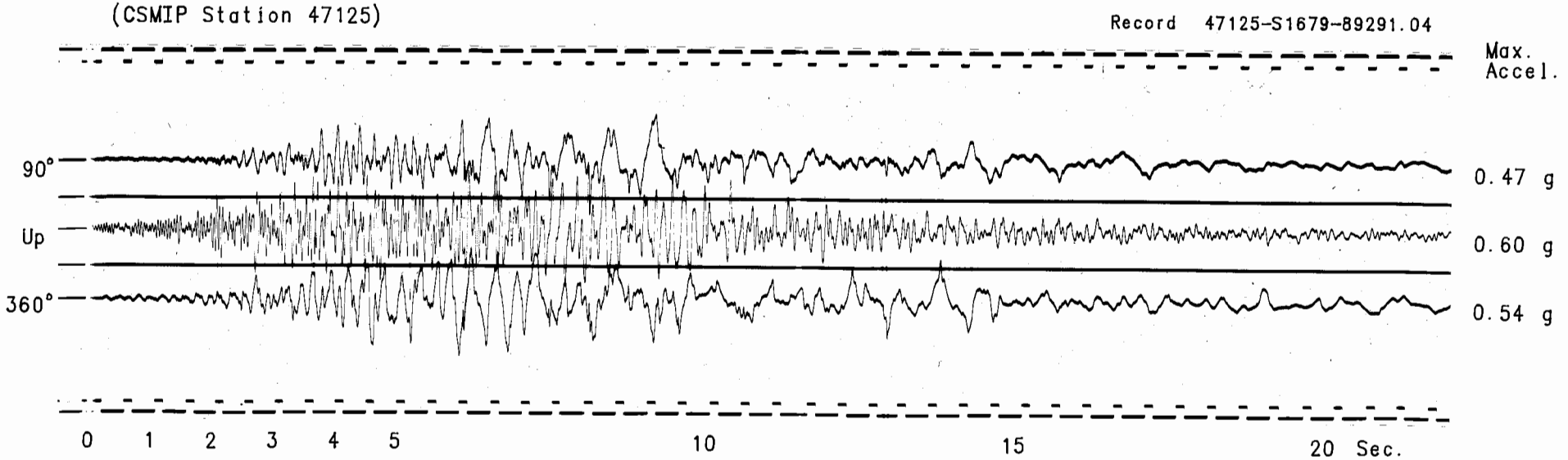
Corralitos - Eureka Canyon Rd.
(CSMIP Station 57007)

Record 57007-S4809-89292.01



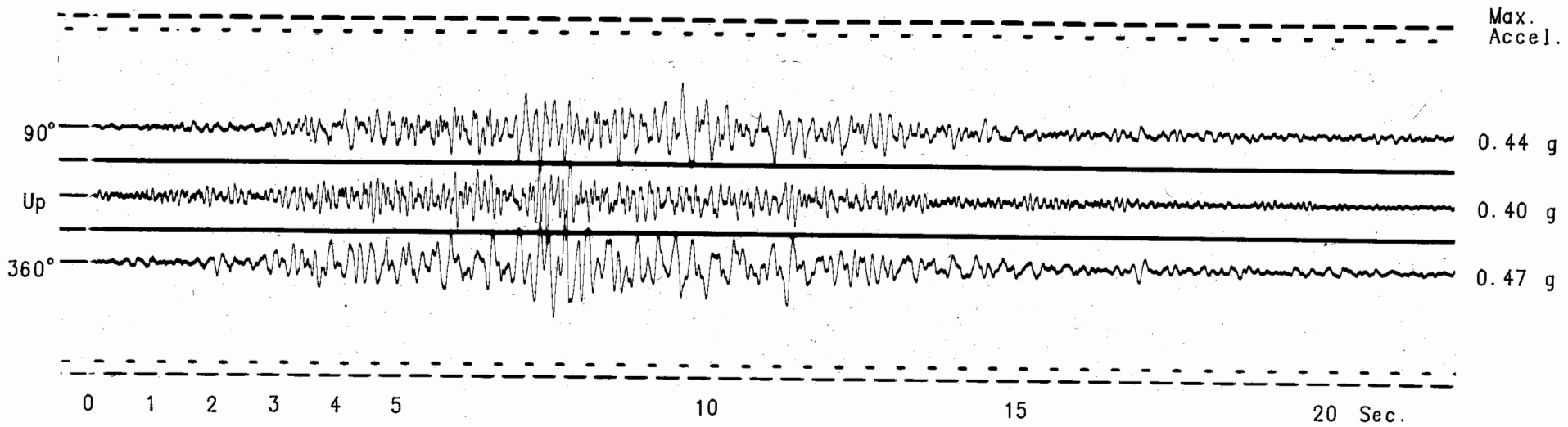
Capitola - Fire Station
(CSMIP Station 47125)

Record 47125-S1679-89291.04



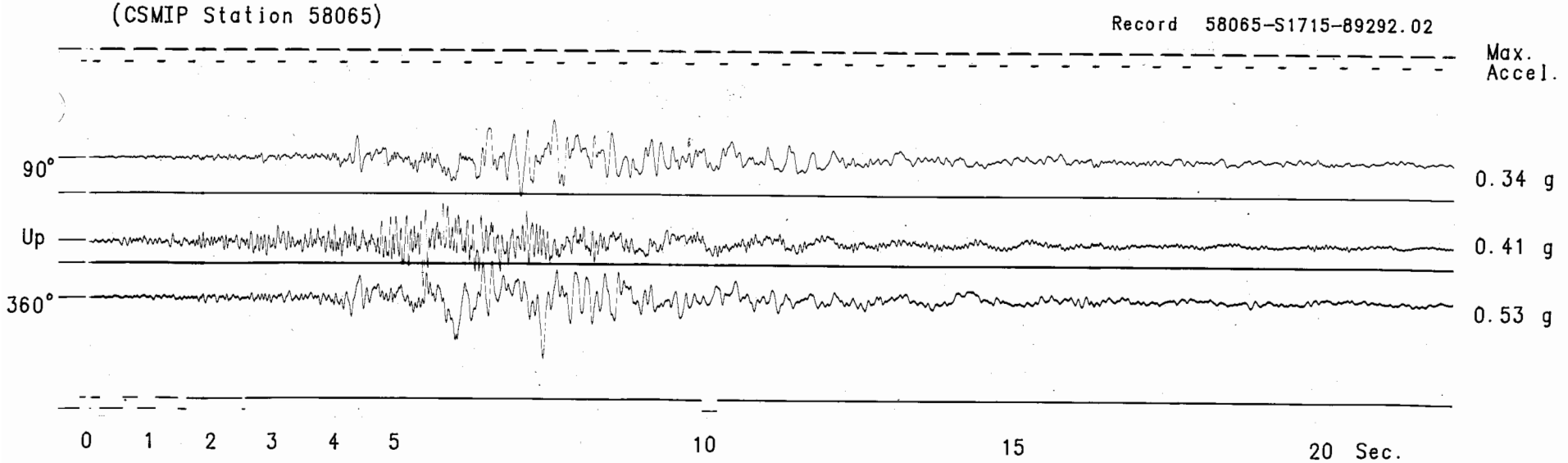
Santa Cruz - UCSC/Lick Lab.
(CSMIP Station 58135)

Record 58135-S1682-89292.04

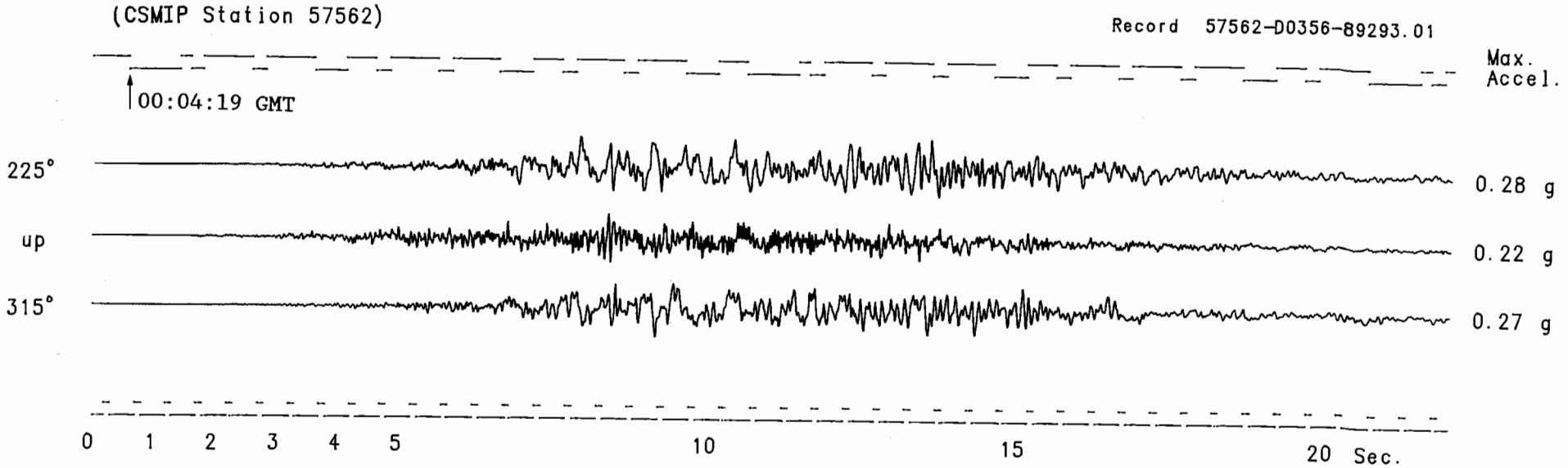


Saratoga - Aloha Ave.
(CSMIP Station 58065)

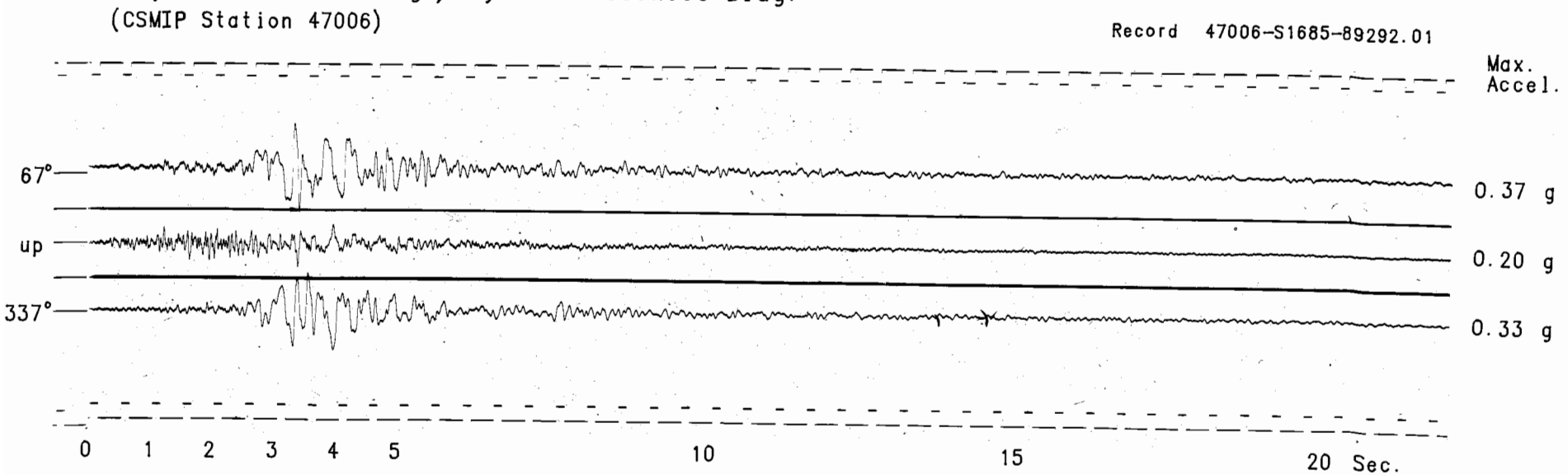
Record 58065-S1715-89292.02



San Jose – Santa Teresa Hills
(CSMIP Station 57562)

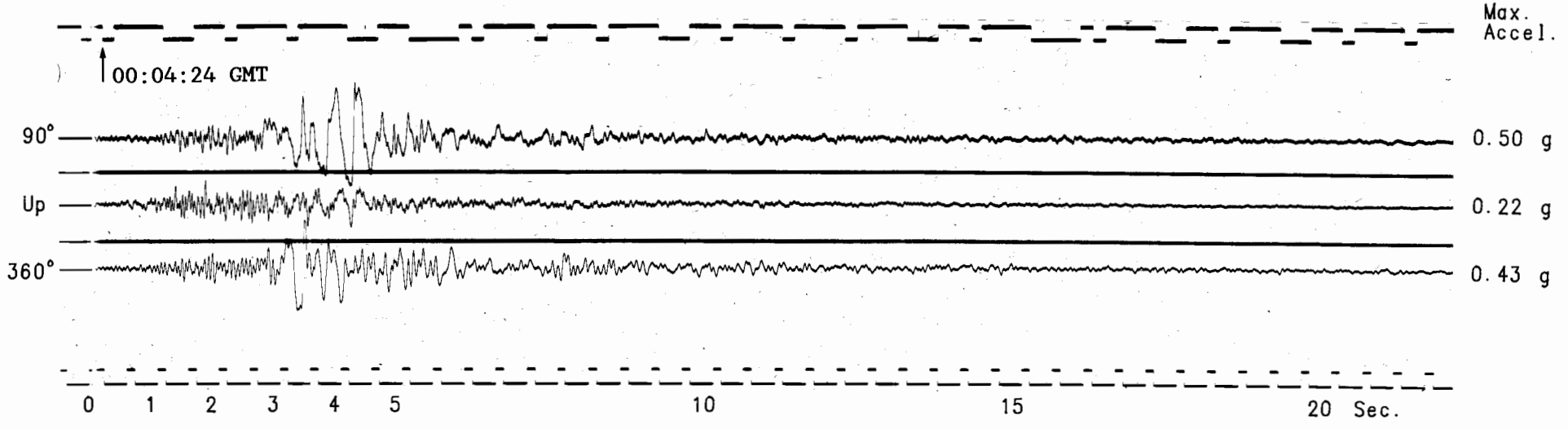


Gilroy – Gavilan College, Physical Sciences Bldg.
(CSMIP Station 47006)



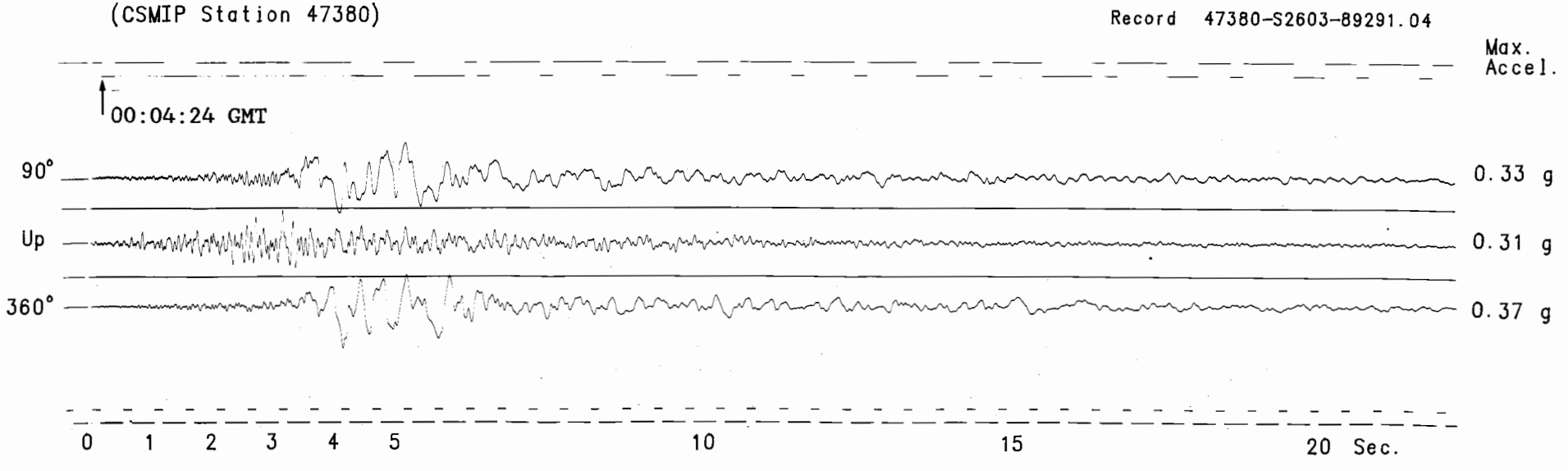
Gilroy #1 – Gavilan College, Water Tank
(CSMIP Station 47379)

Record 47379-S2602-89291.01



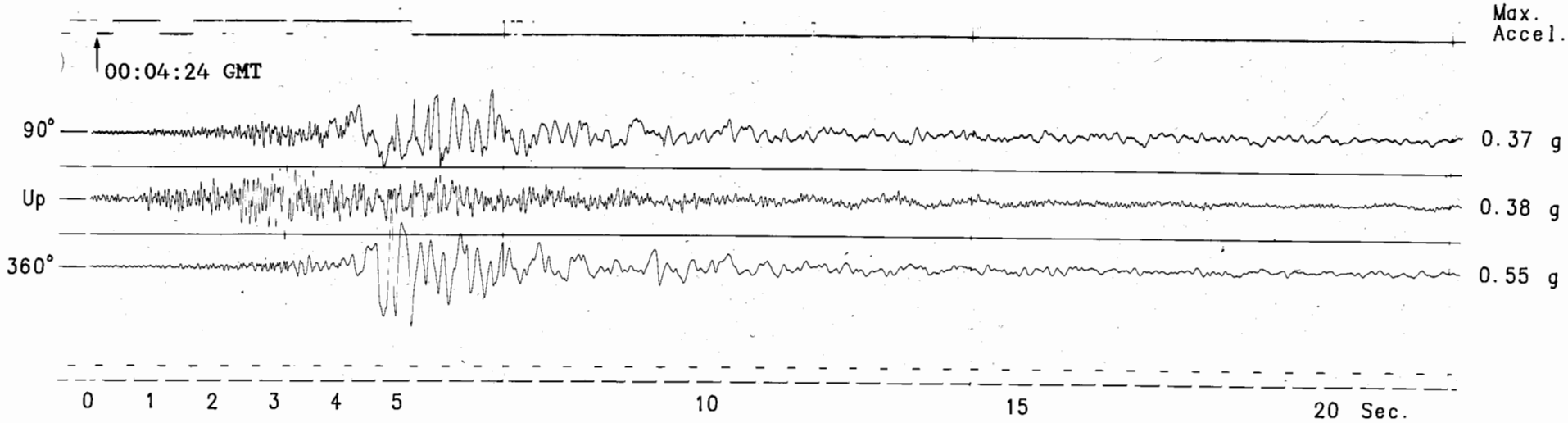
Gilroy #2 – Hwy 101/Bolsa Rd. Motel
(CSMIP Station 47380)

Record 47380-S2603-89291.04



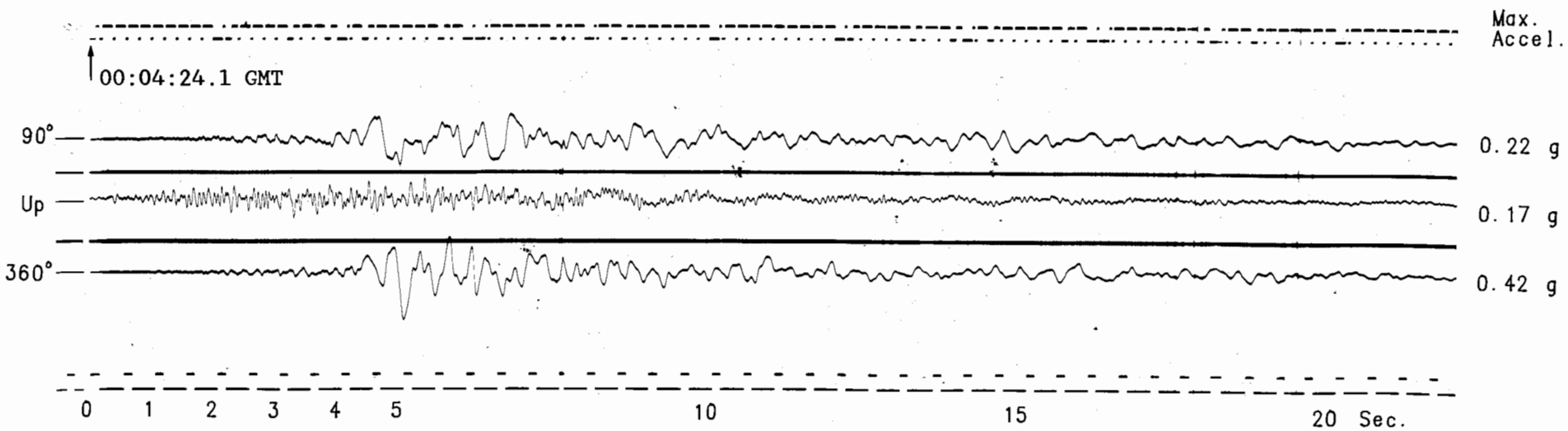
Gilroy #3 - Gilroy Sewage Plant
(CSMIP Station 47381)

Record 47381-S2757-89291.01



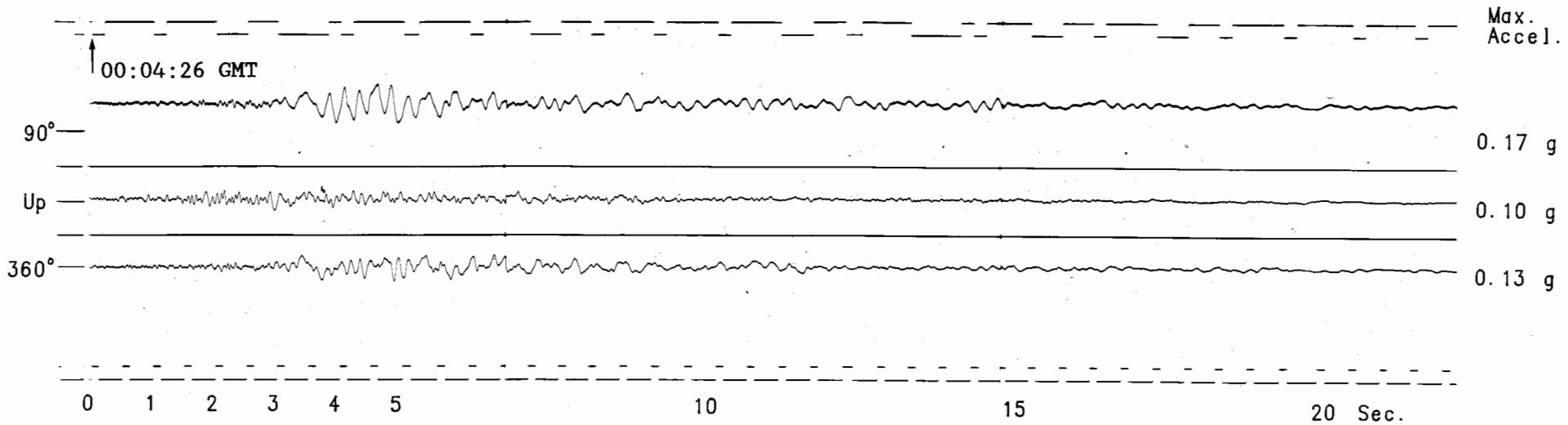
Gilroy #4 - San Ysidro School
(CSMIP Station 57382)

Record 57382-S3501-89293.01



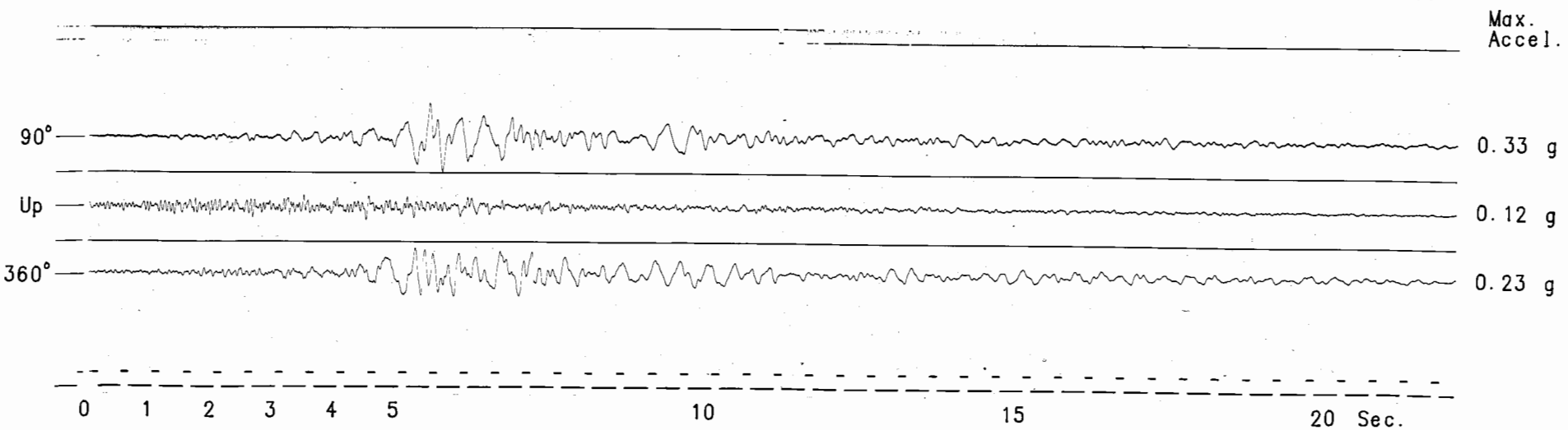
Gilroy #6 - San Ysidro
(CSMIP Station 57383)

Record 57383-S2606-89293.01



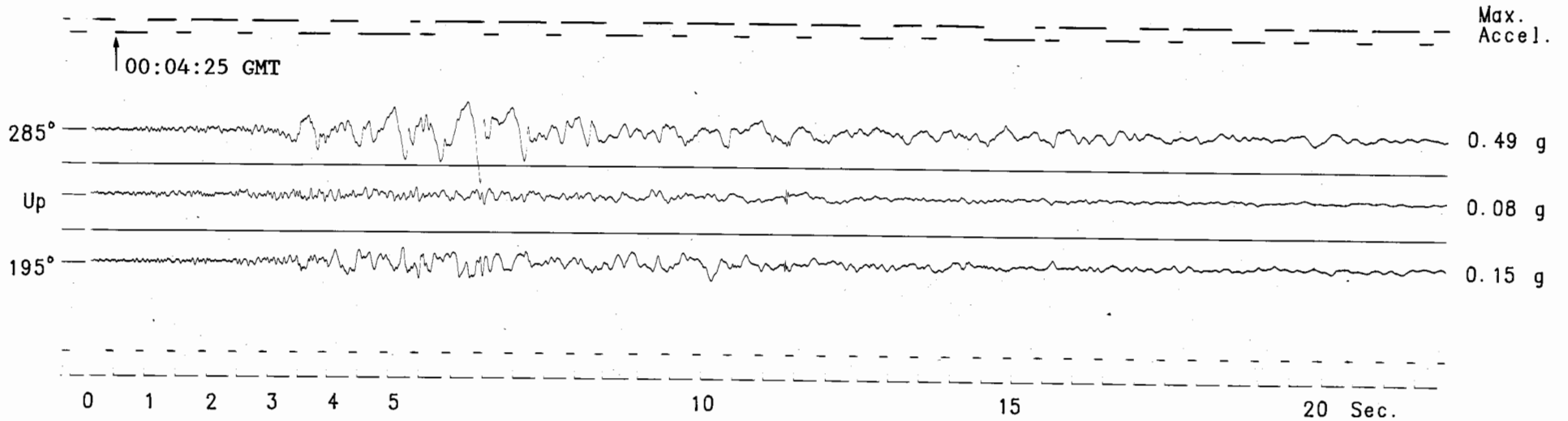
Gilroy #7 - Mantelli Ranch
(CSMIP Station 57425)

Record 57425-S2762-89293.01



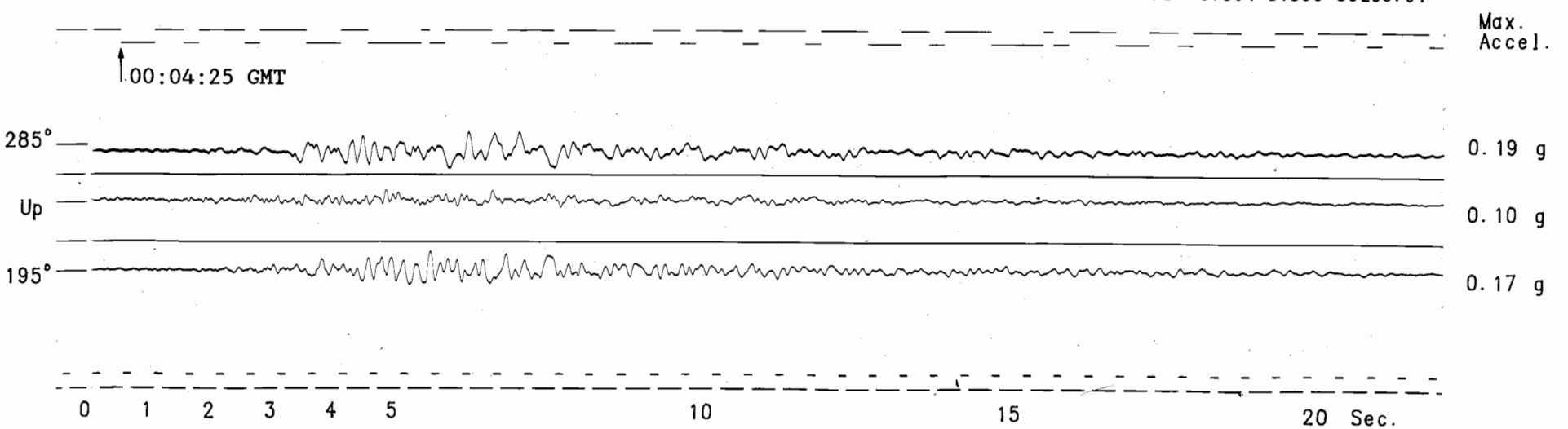
Coyote Lake Dam - Southwest Abutment
(CSMIP Station 57217)

Record 57217-S2569-89293.02



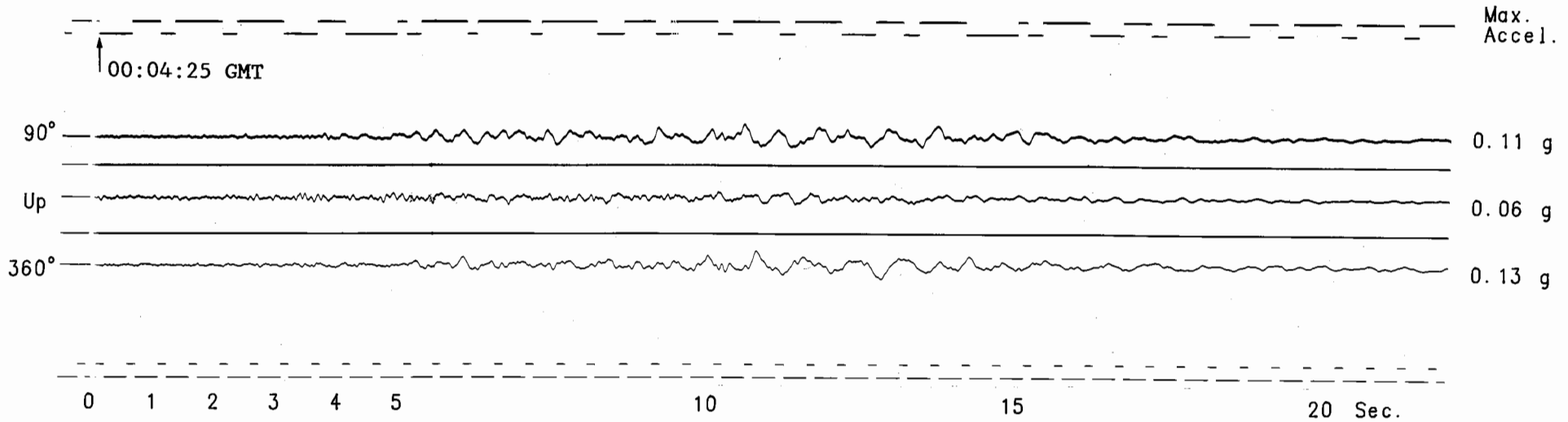
Coyote Lake Dam - Downstream
(CSMIP Station 57504)

Record 57504-S1830-89293.01



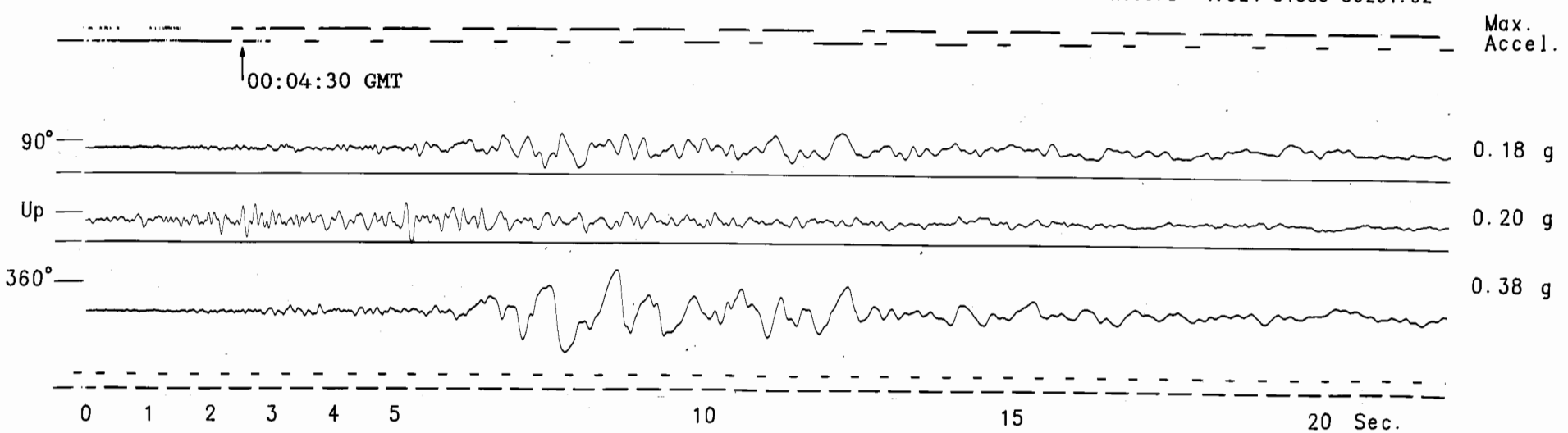
Halls Valley - Grant Park
(CSMIP Station 57191)

Record 57191-S2496-89293.02



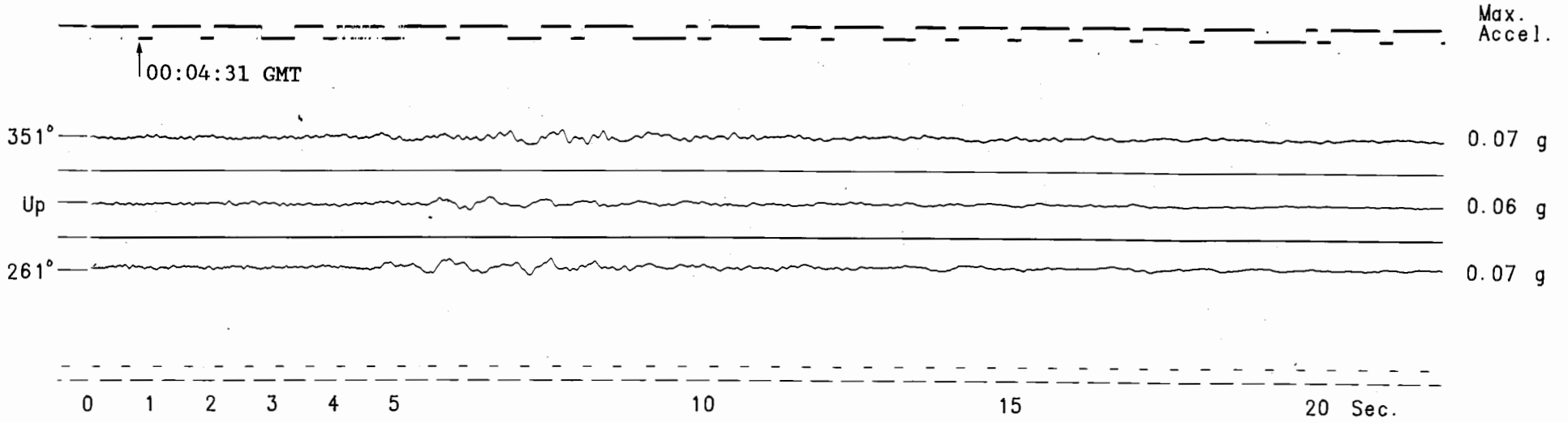
Hollister - South Street and Pine Drive
(CSMIP Station 47524)

Record 47524-S1585-89291.02



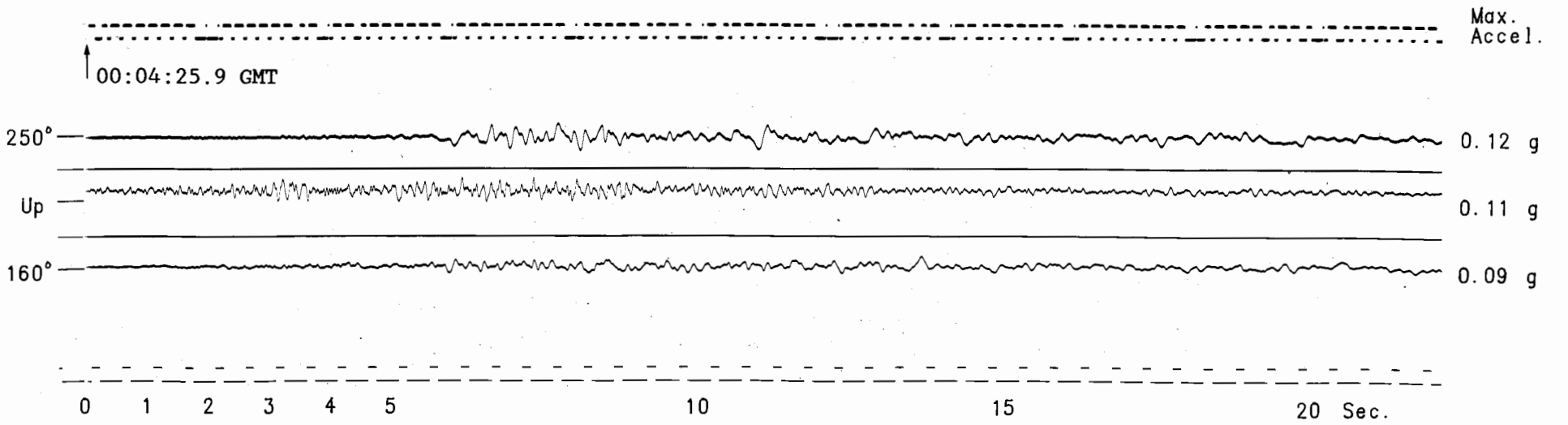
Sago South - Hollister, Cienega Rd.
(CSMIP Station 47189)

Record 47189-S1858-89291.01



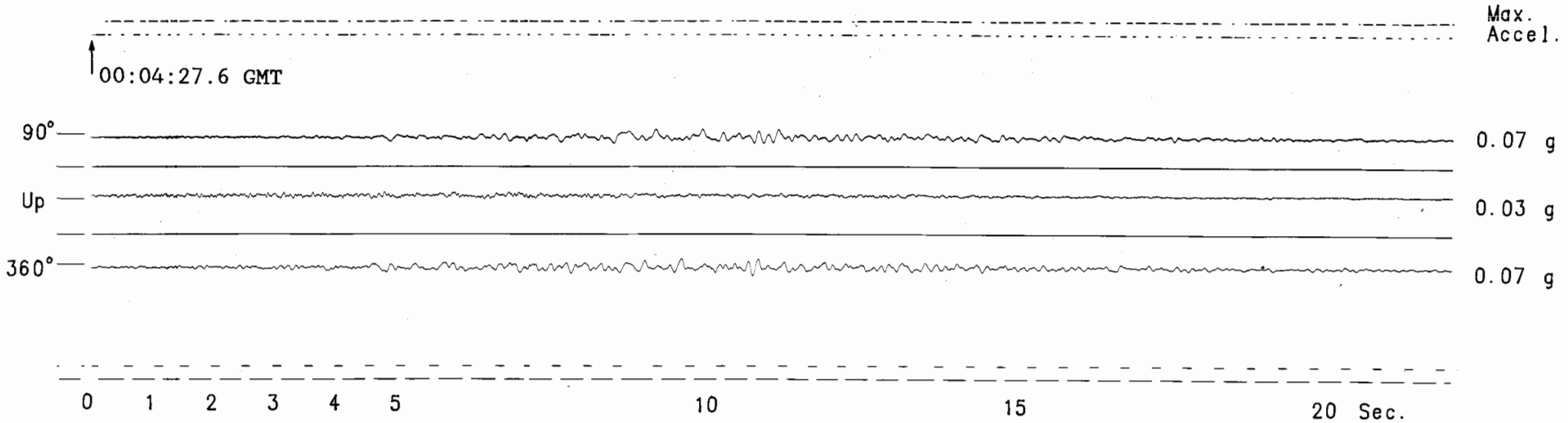
Salinas - John and Work St.
(CSMIP Station 47179)

Record 47179-S1591-89292.01



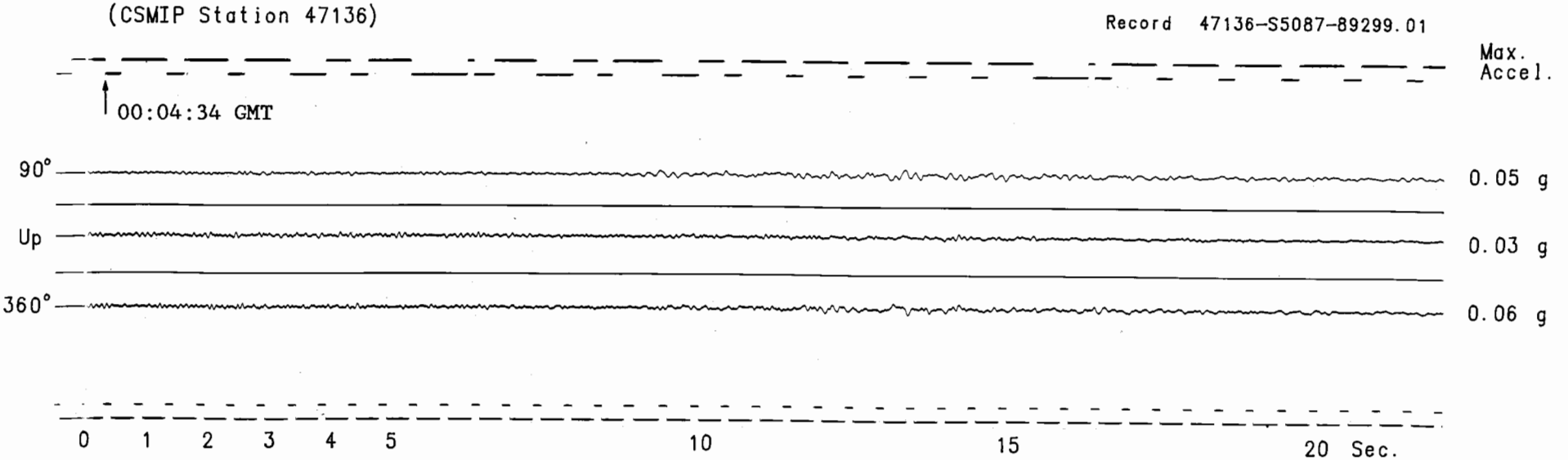
Monterey - City Hall
(CSMIP Station 47377)

Record 47377-S1584-89292.01



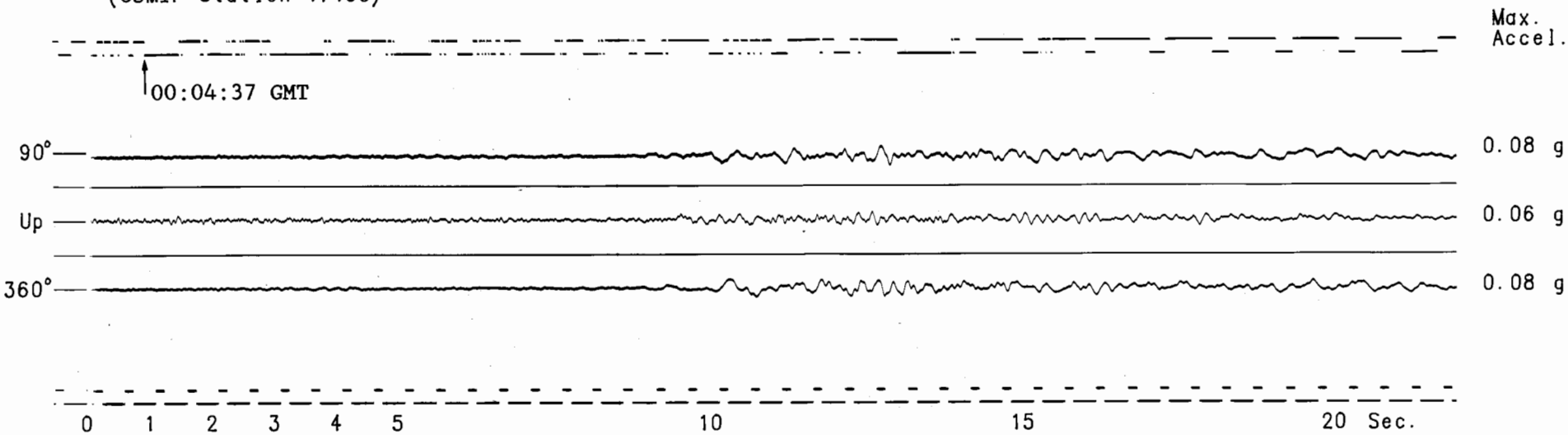
Big Sur - Pfeiffer State Park
(CSMIP Station 47136)

Record 47136-S5087-89299.01



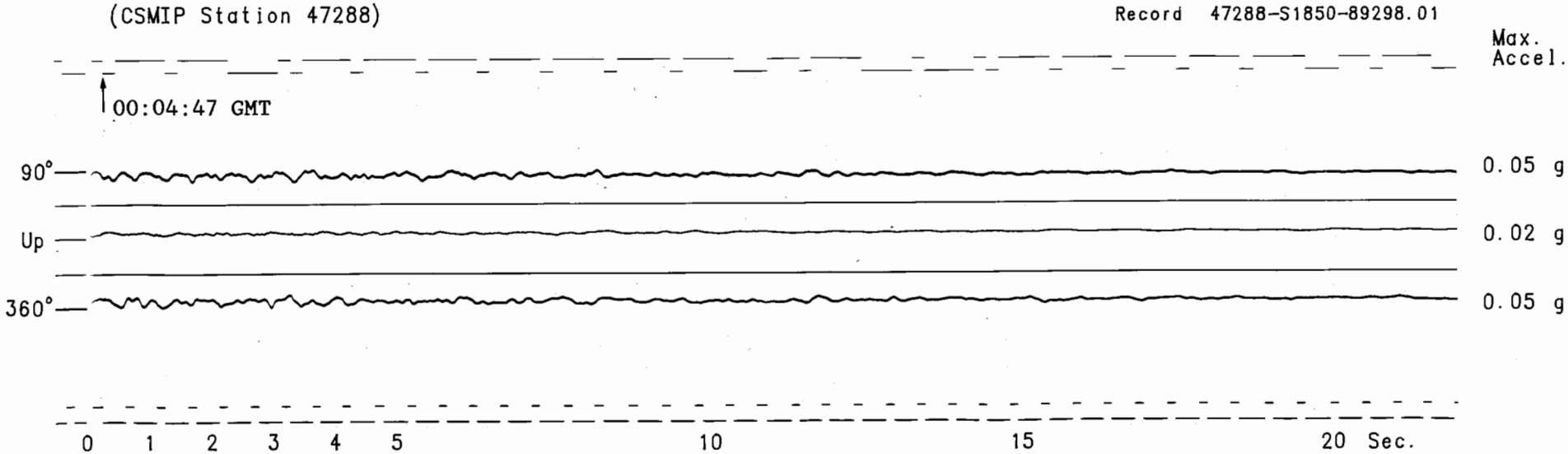
Greenfield – Police Station
(CSMIP Station 47460)

Record 47460-S4385-89299.01



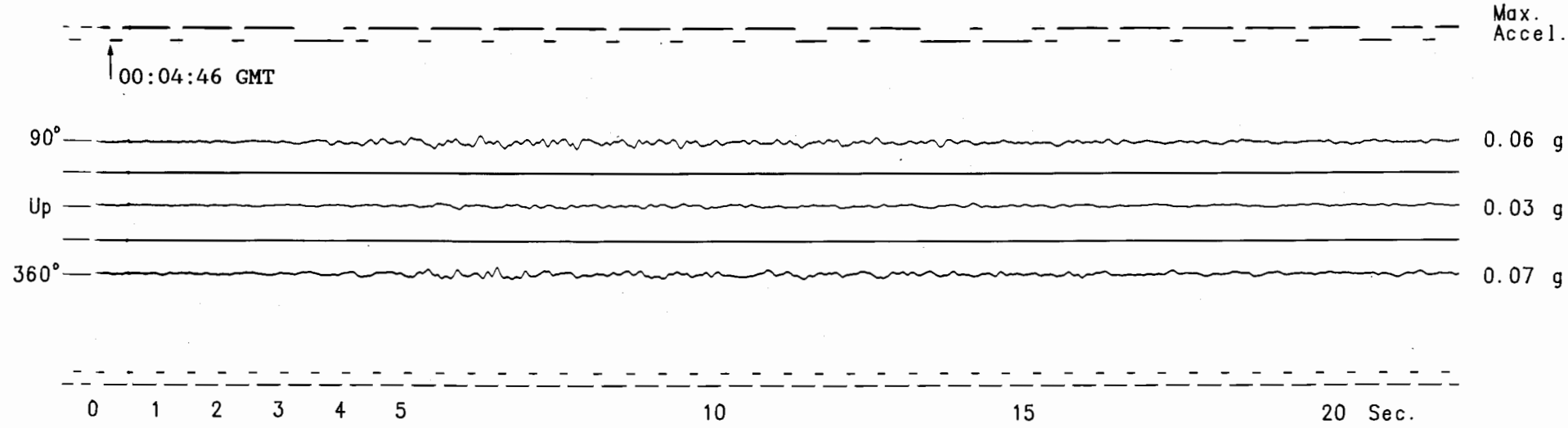
San Benito
(CSMIP Station 47288)

Record 47288-S1850-89298.01



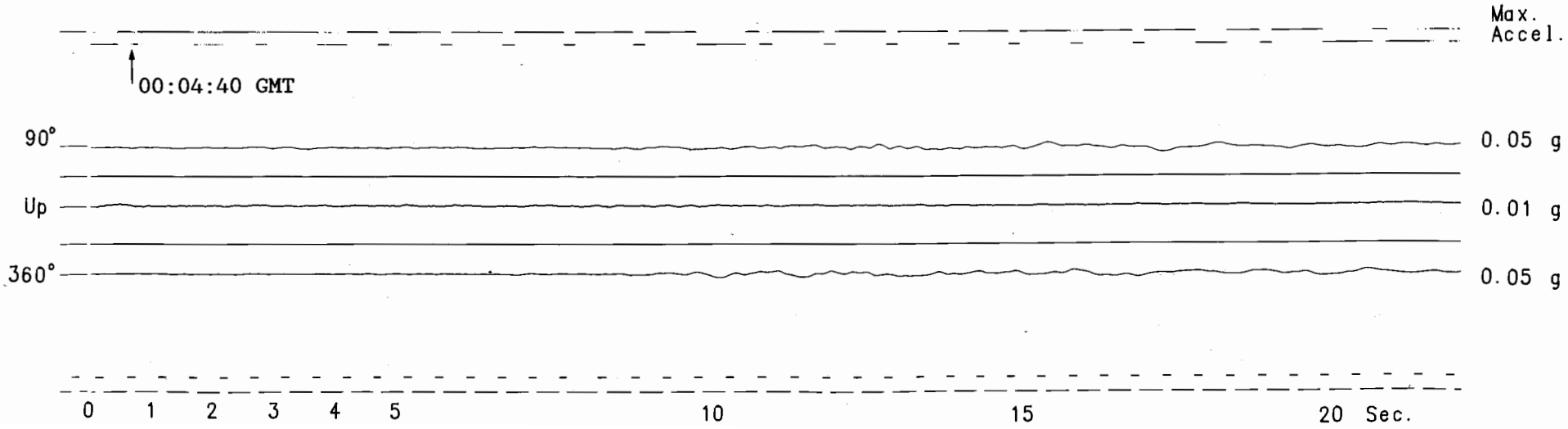
Bitterwater - Coalinga Rd.
(CSMIP Station 46173)

Record 46173-S2495-89298.01



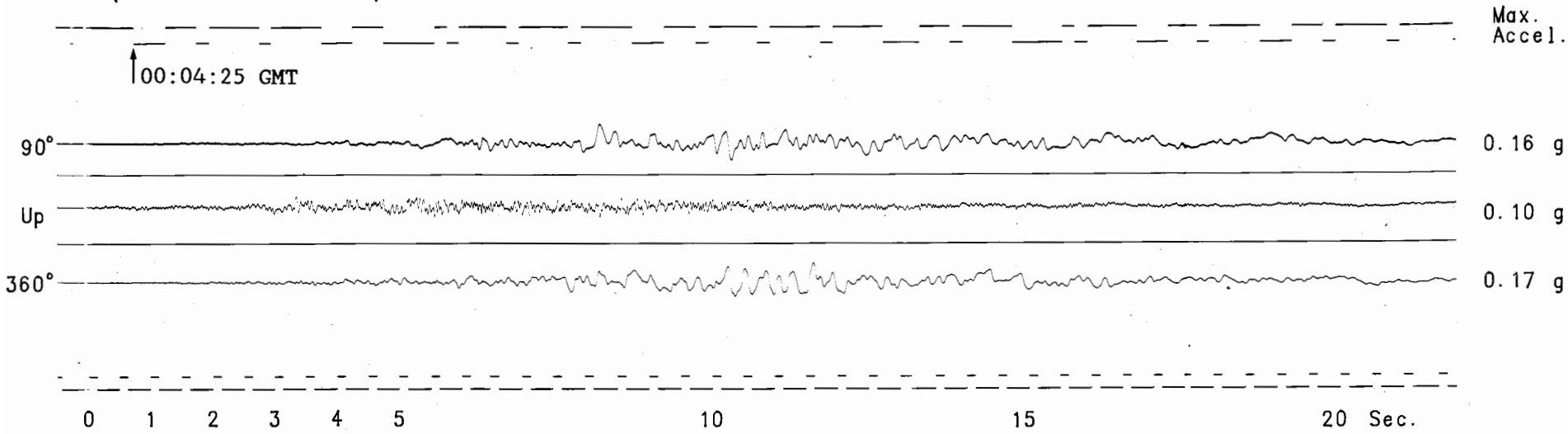
Los Banos
(CSMIP Station 56012)

Record 56012-S2780-89291.01



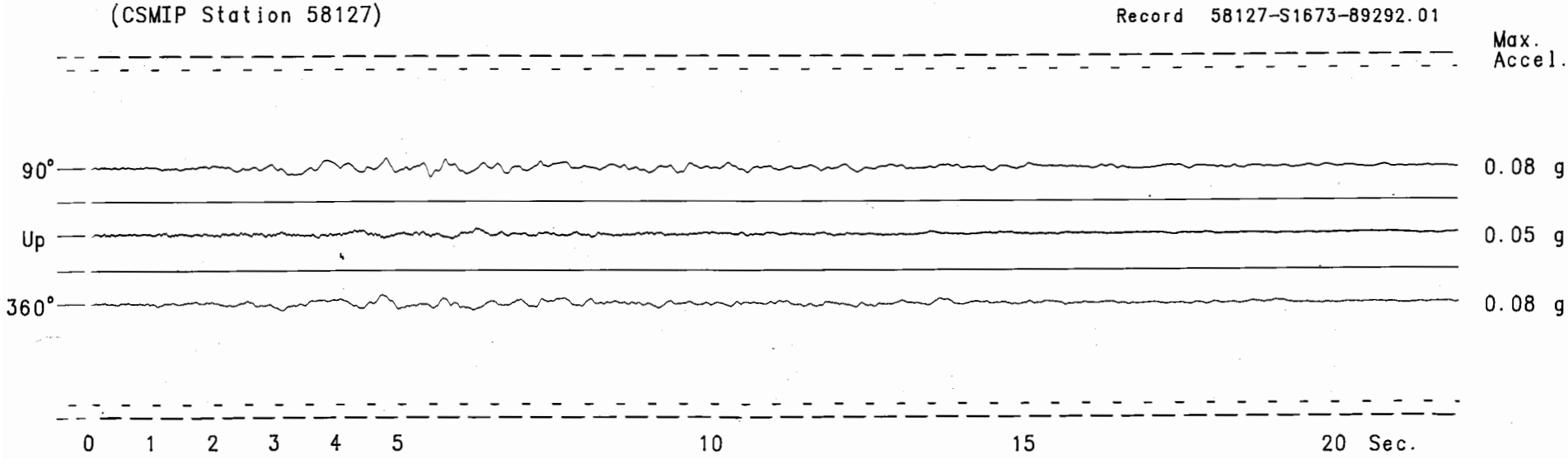
Agnew - Agnews State Hospital
(CSMIP Station 57066)

Record 57066-S1589-89292.02



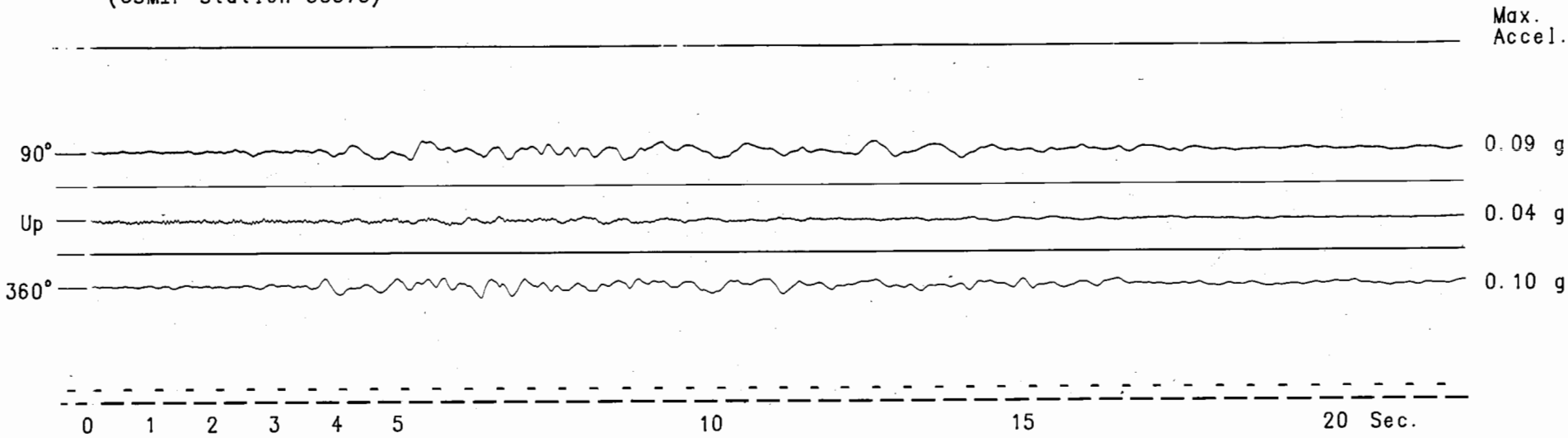
Woodside - Fire Station
(CSMIP Station 58127)

Record 58127-S1673-89292.01



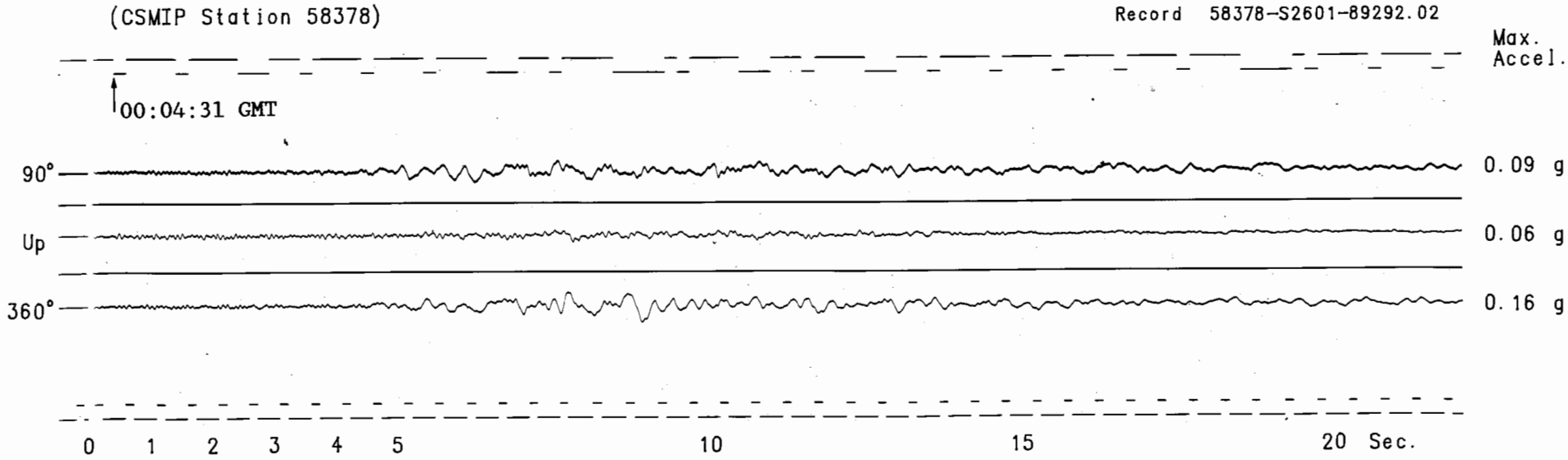
Upper Crystal Springs Reservoir - Skyline Blvd.
(CSMIP Station 58373)

Record 58373-S2758-89293.01



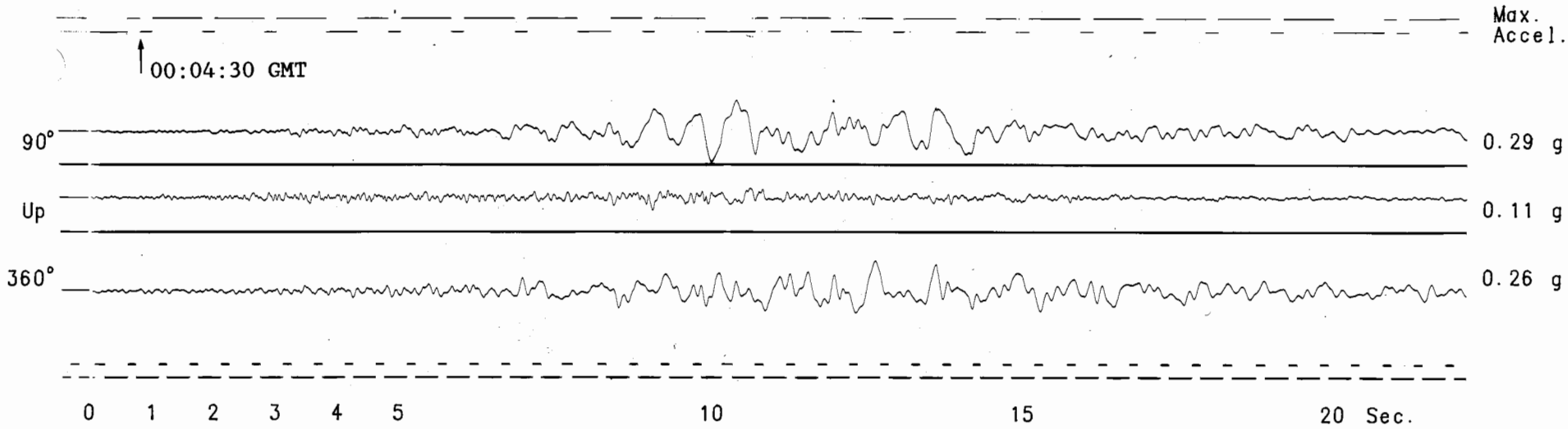
Upper Crystal Springs Reservoir - Pulgas Water Temple
(CSMIP Station 58378)

Record 58378-S2601-89292.02



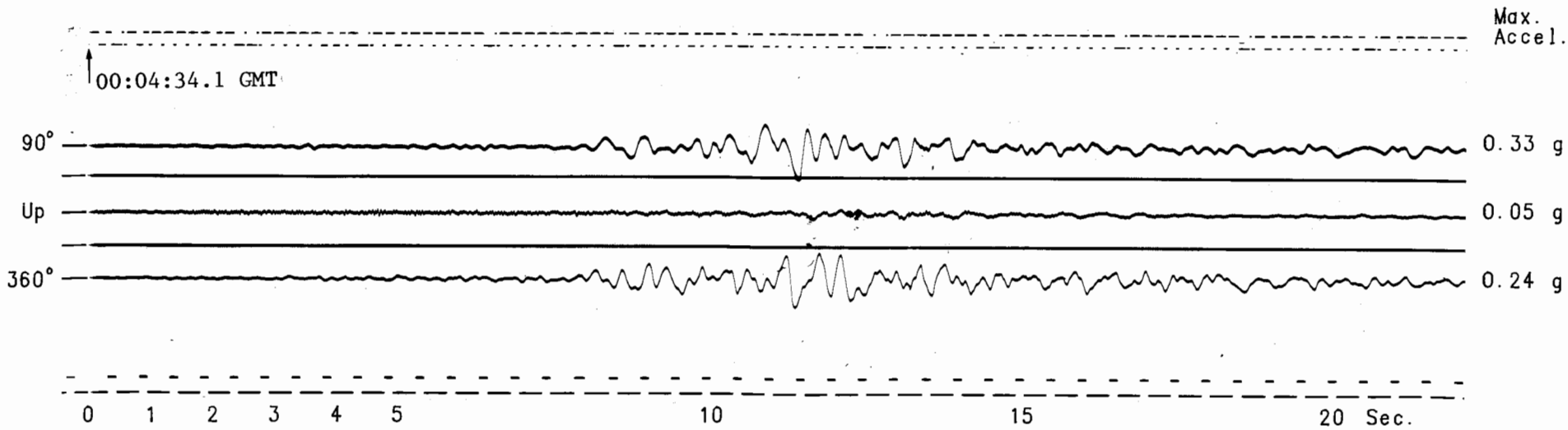
Foster City - Redwood Shores
(CSMIP Station 58375)

Record 58375-S1819-89291.02



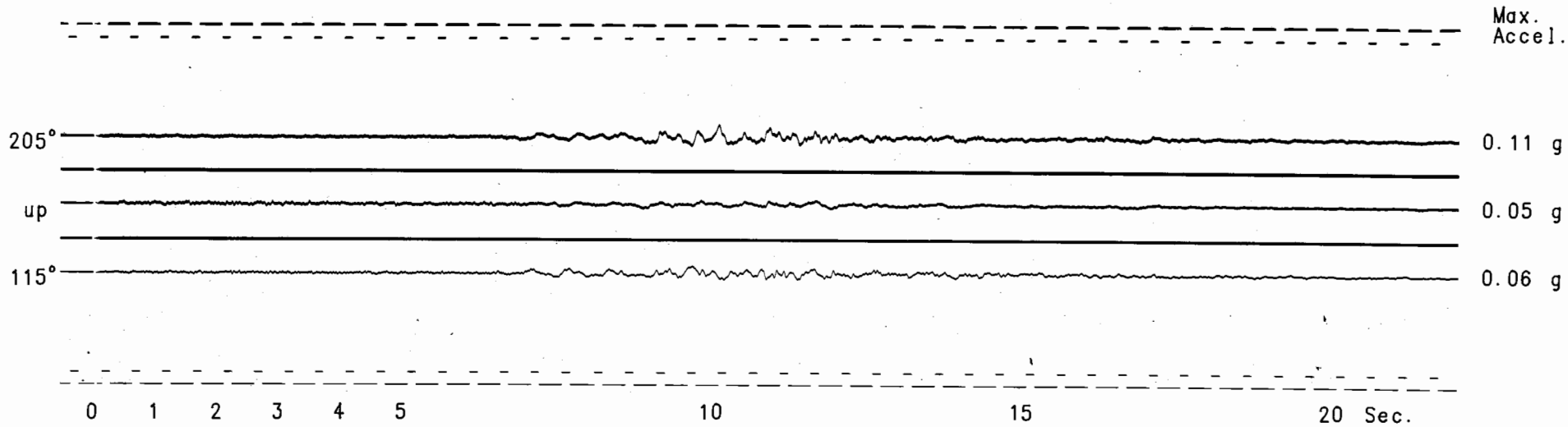
San Francisco International Airport - Service Bldg. near Hwy. 101
(CSMIP Station 58223)

Record 58223-S1846-89291.02



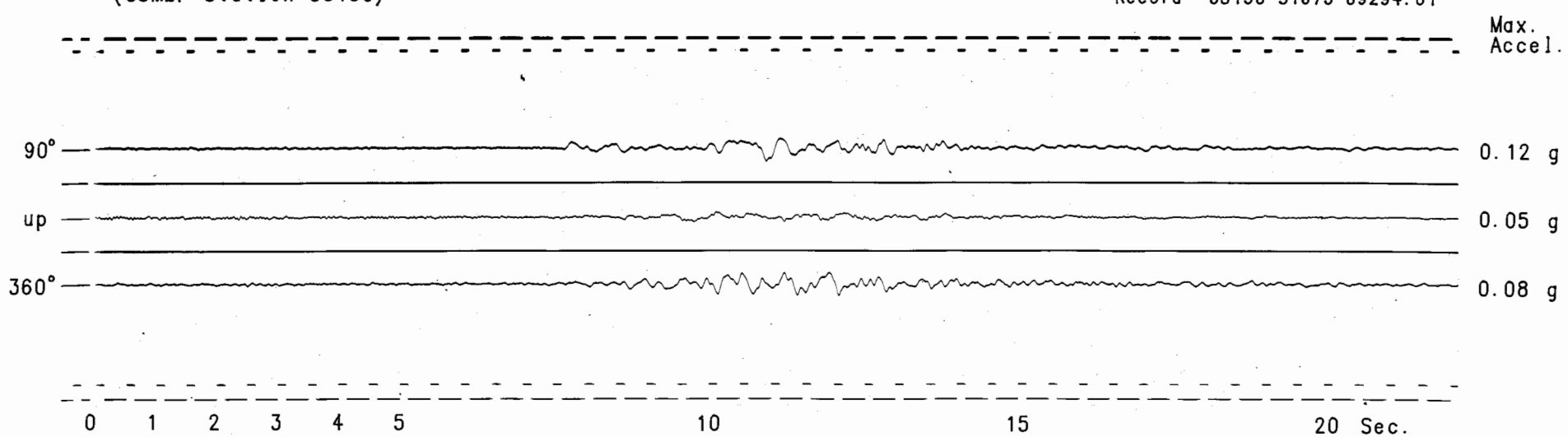
So. San Francisco - Sierra Pt.
(CSMIP Station 58539)

Record 58539-S5946-89294.01



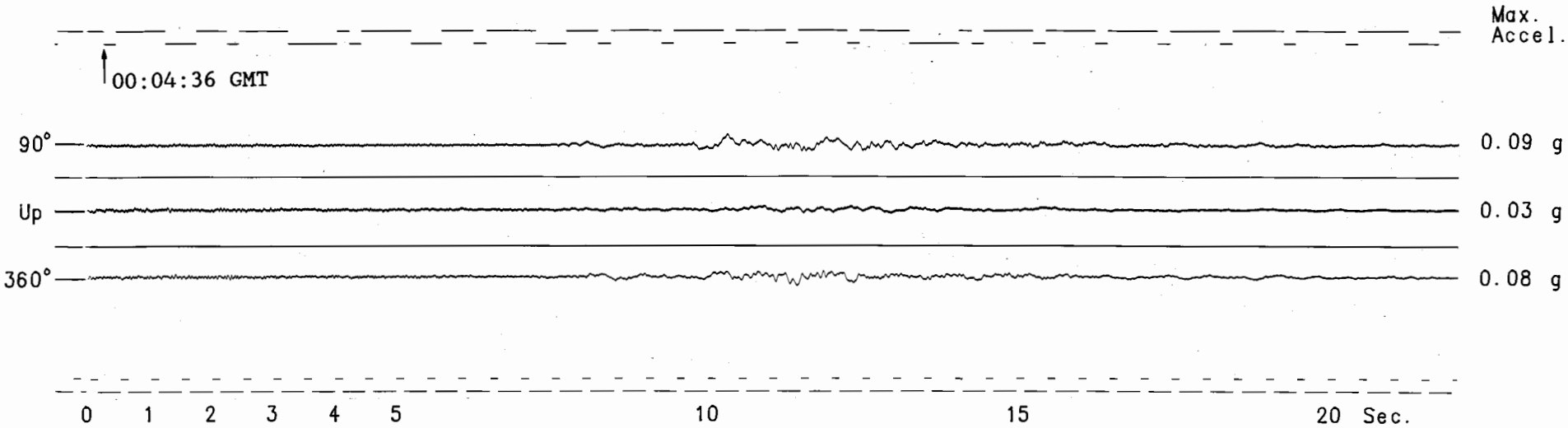
San Francisco - Diamond Heights
(CSMIP Station 58130)

Record 58130-S1675-89294.01



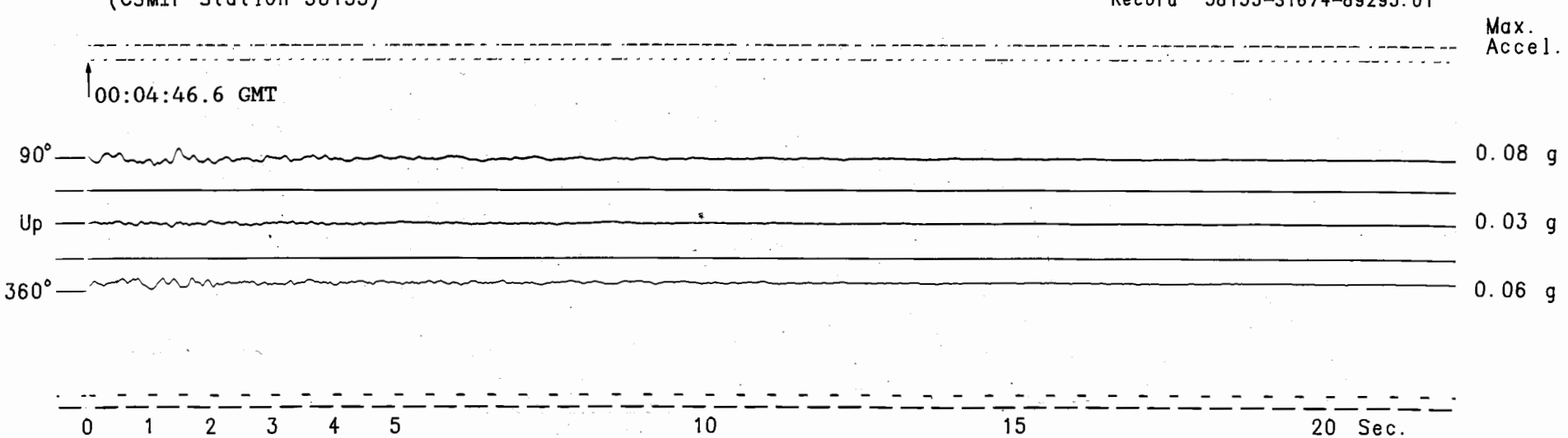
San Francisco - Rincon Hill
(CSMIP Station 58151)

Record 58151-S1708-89293.01



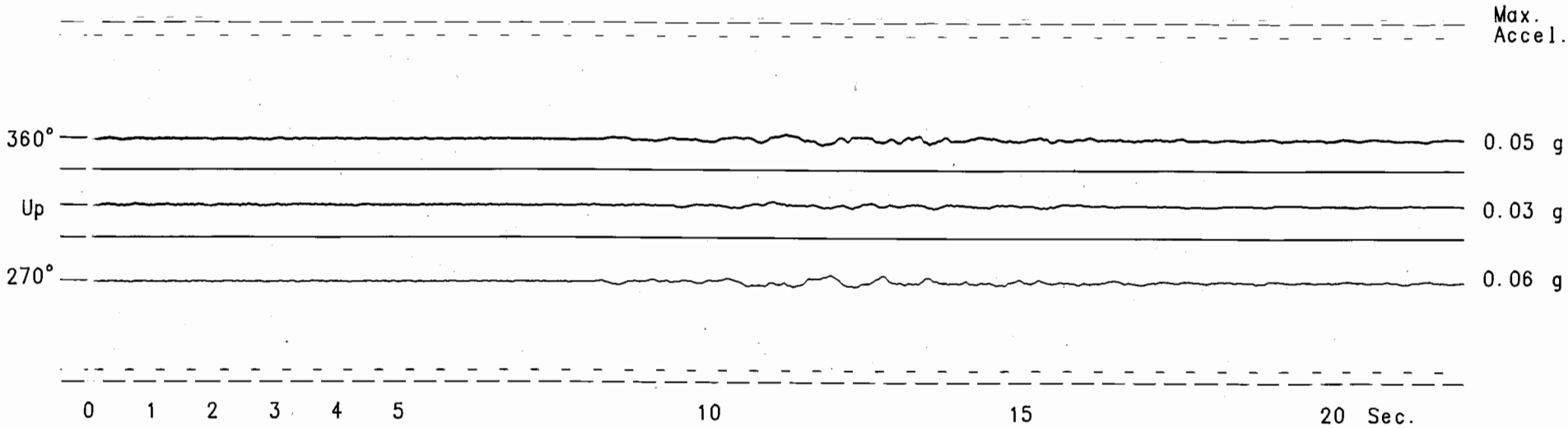
San Francisco - Telegraph Hill
(CSMIP Station 58133)

Record 58133-S1674-89293.01



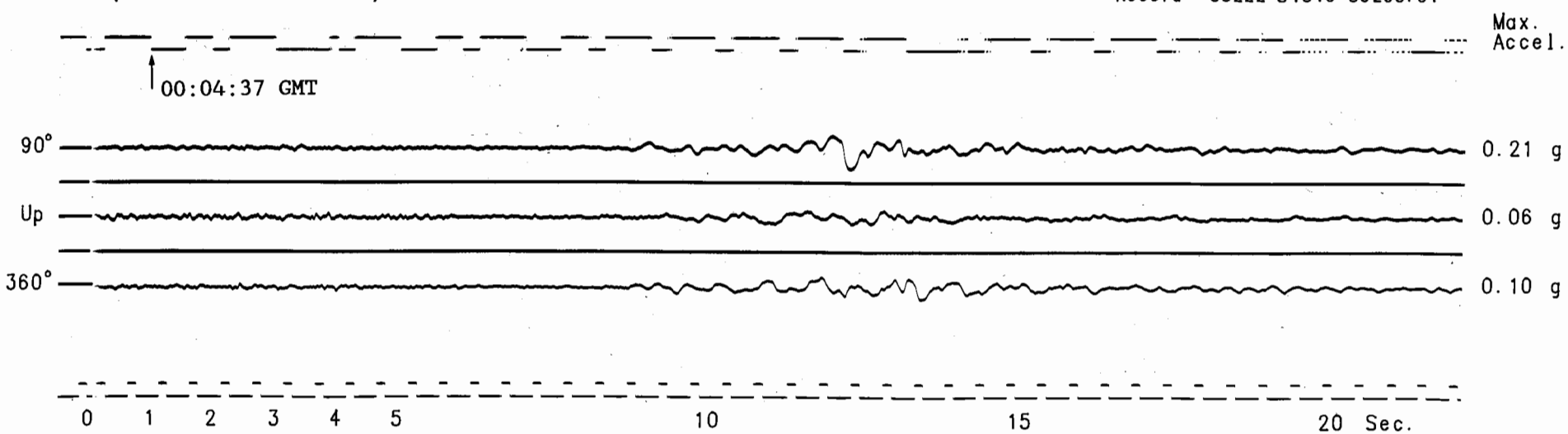
San Francisco - Pacific Heights
(CSMIP Station 58131)

Record 58131-S1683-89293.01



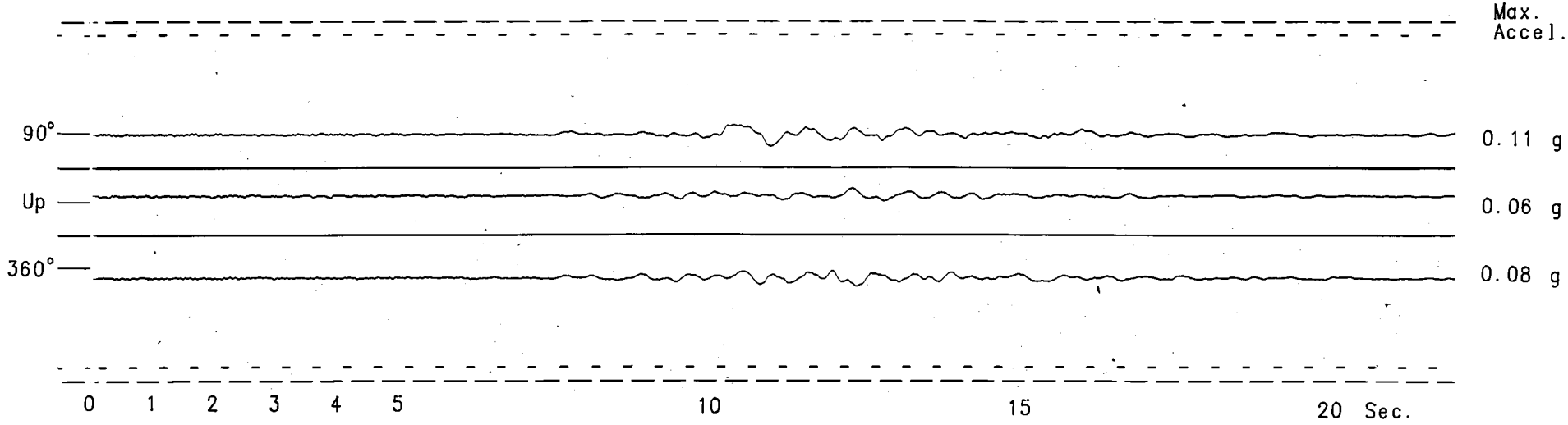
San Francisco - Presidio
(CSMIP Station 58222)

Record 58222-S4810-89293.01



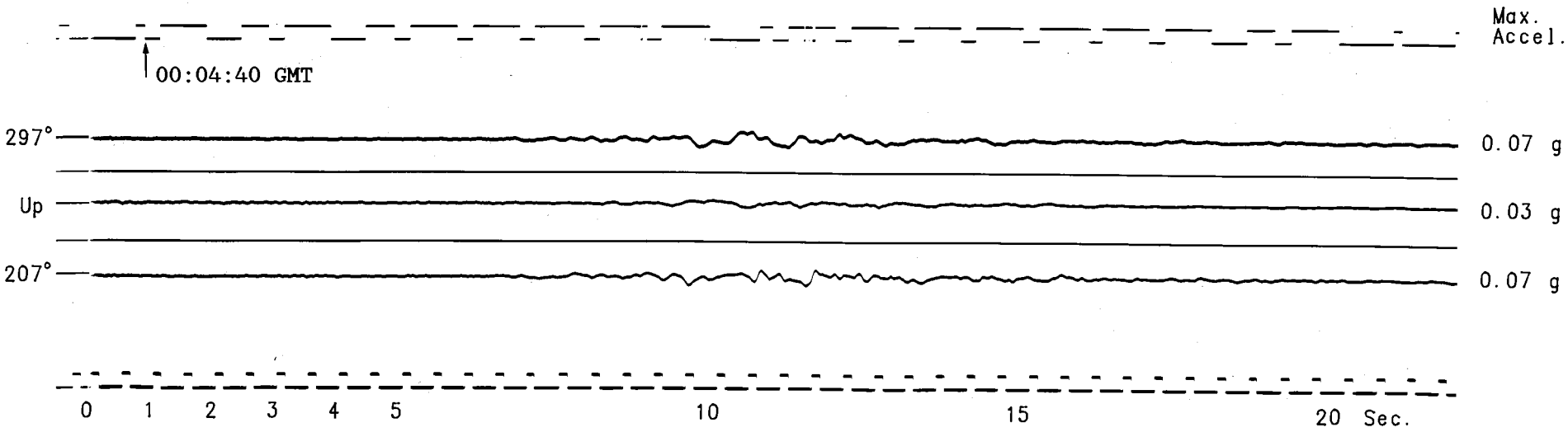
San Francisco - Cliff House
(CSMIP Station 58132)

Record 58132-S1609-89294.01



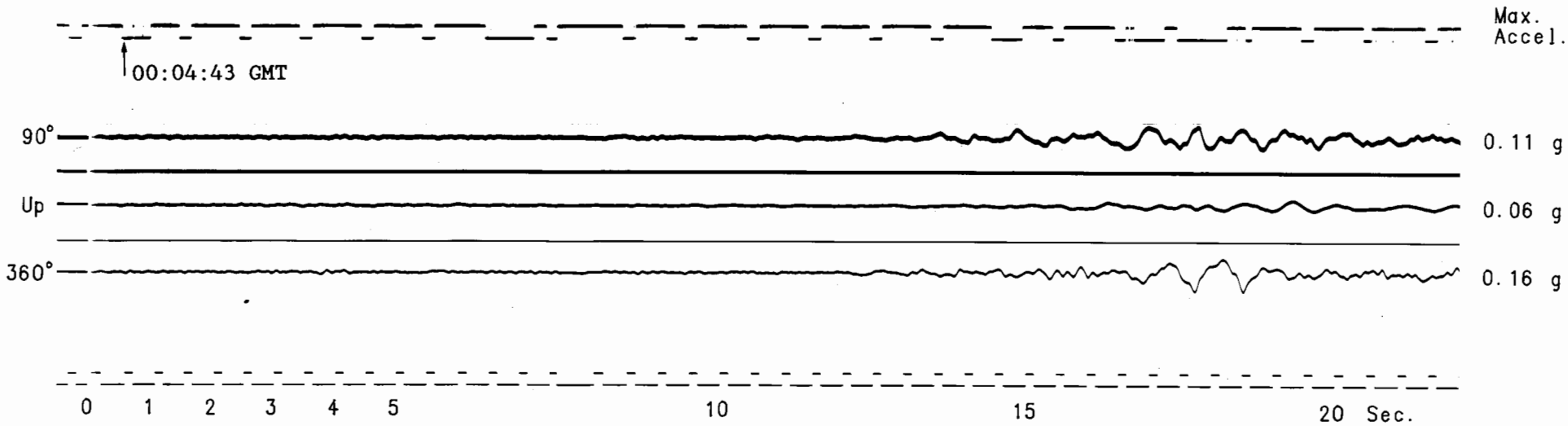
Point Bonita
(CSMIP Station 58043)

Record 58043-S4807-89297.01



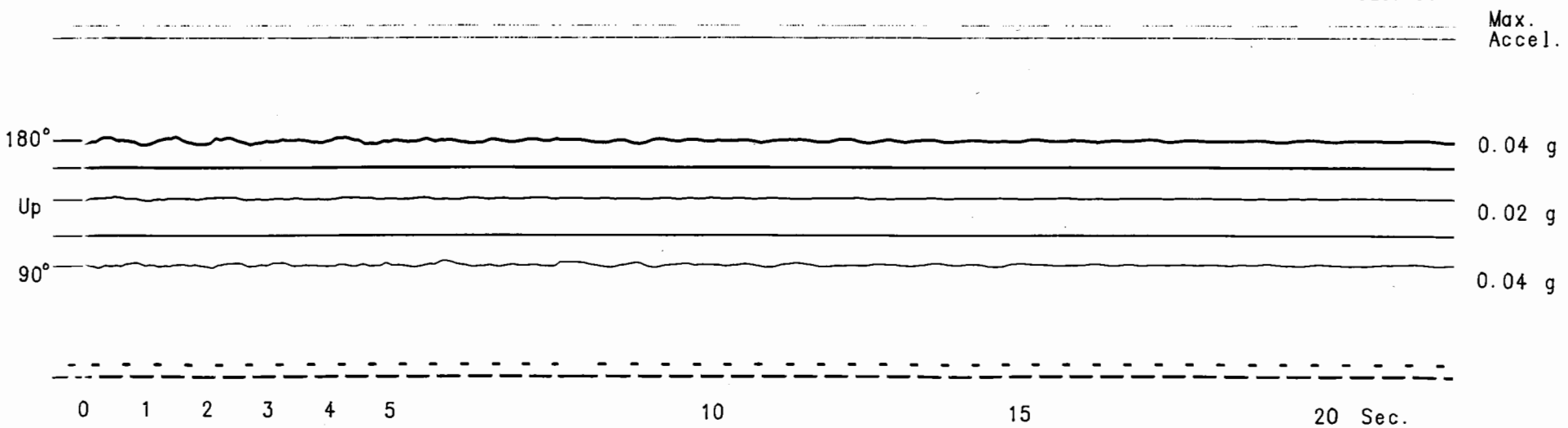
Olema - Point Reyes Ranger Station
(CSMIP Station 68003)

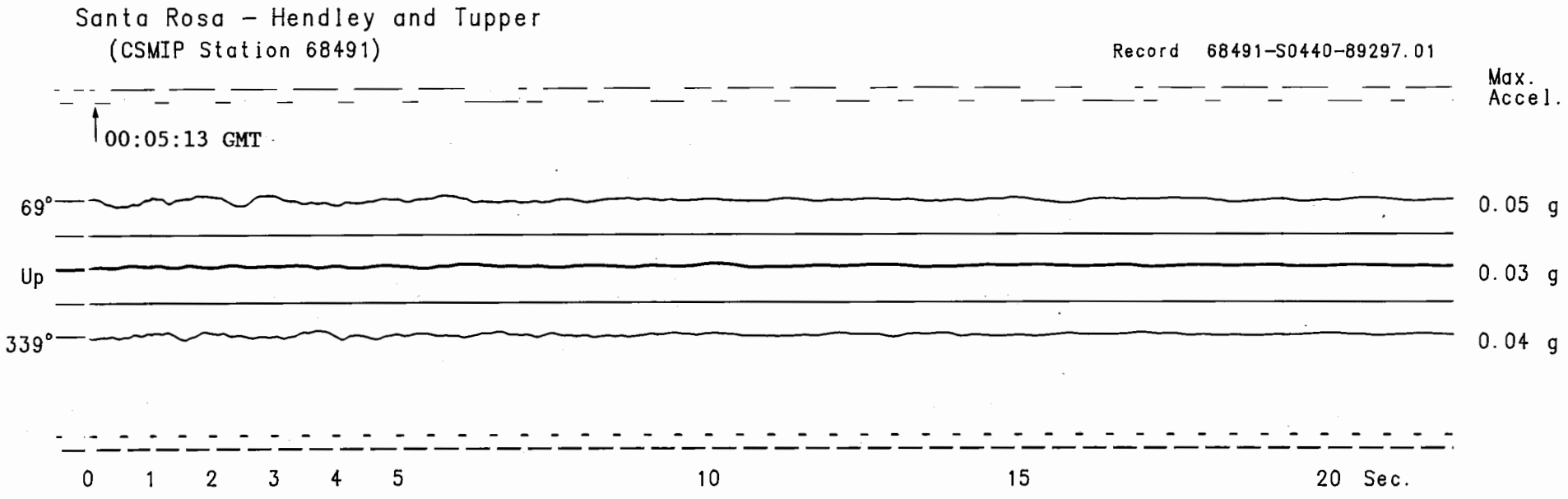
Record 68003-S1816-89297.01



Bodega Head - Doran Beach
(CSMIP Station 69039)

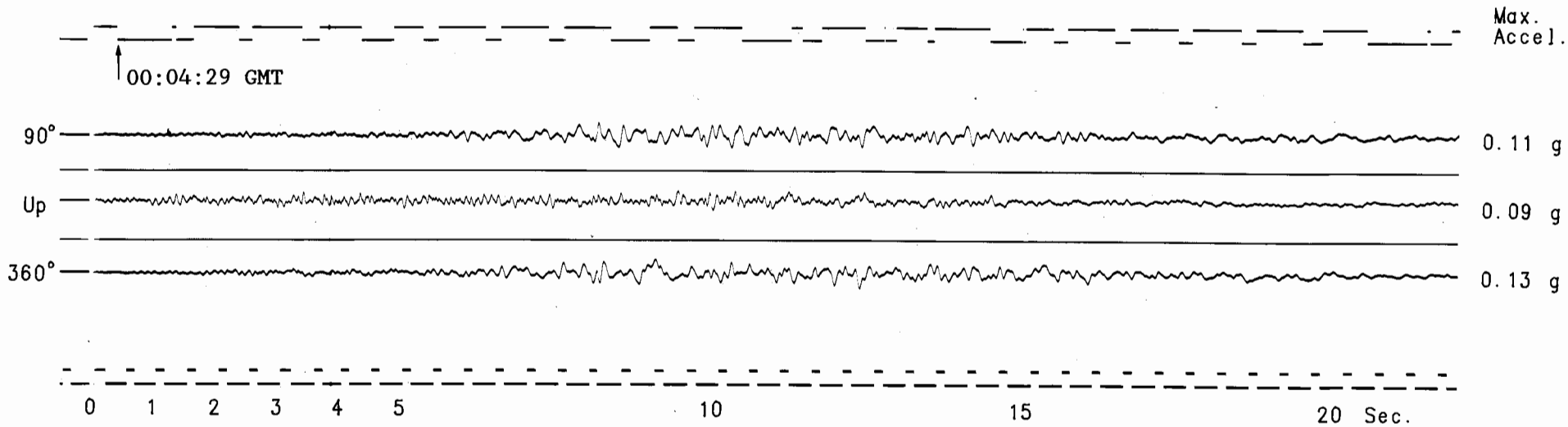
Record 69039-S1876-89297.01




Santa Rosa - Hendley and Tupper
(CSMIP Station 68491)
Record 68491-S0440-89297.01
Max. Accel.
00:05:13 GMT
69°
0.05 g
Up
0.03 g
339°
0.04 g
0
1
2
3
4
5
10
15
20
Sec.

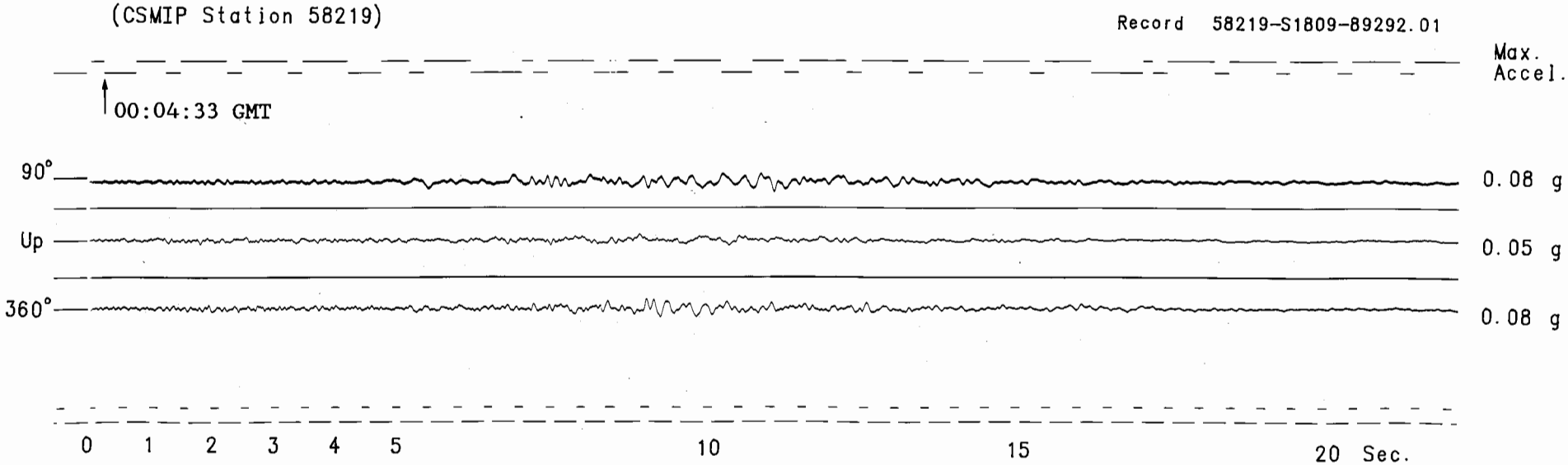
Fremont - Mission San Jose
(CSMIP Station 57064)

Record 57064-S1818-89292.02



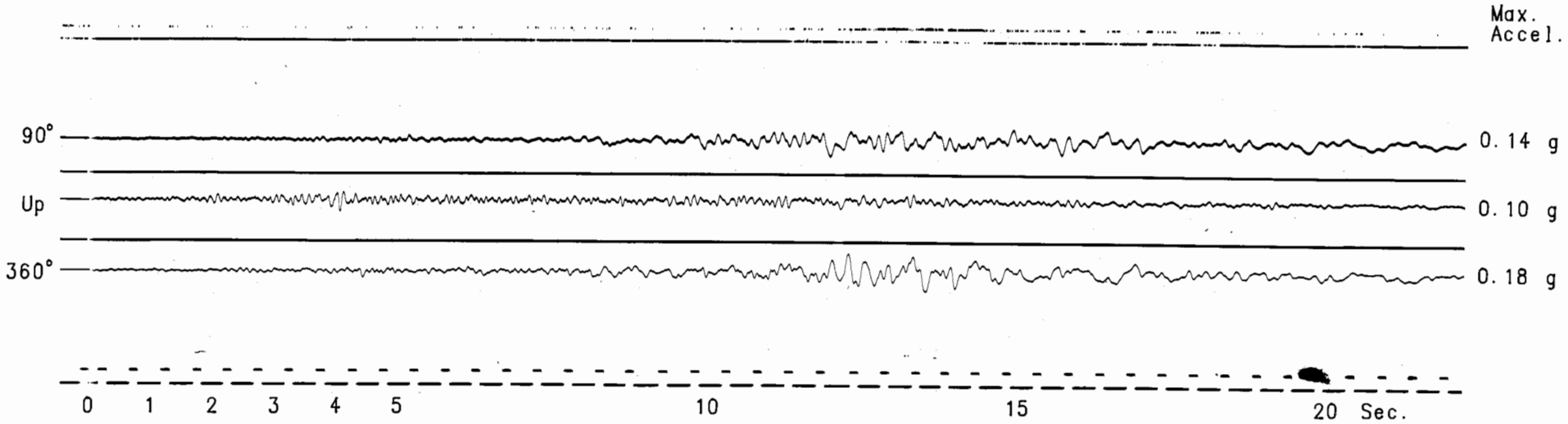
Hayward - CSUH Stadium Grounds
(CSMIP Station 58219)

Record 58219-S1809-89292.01



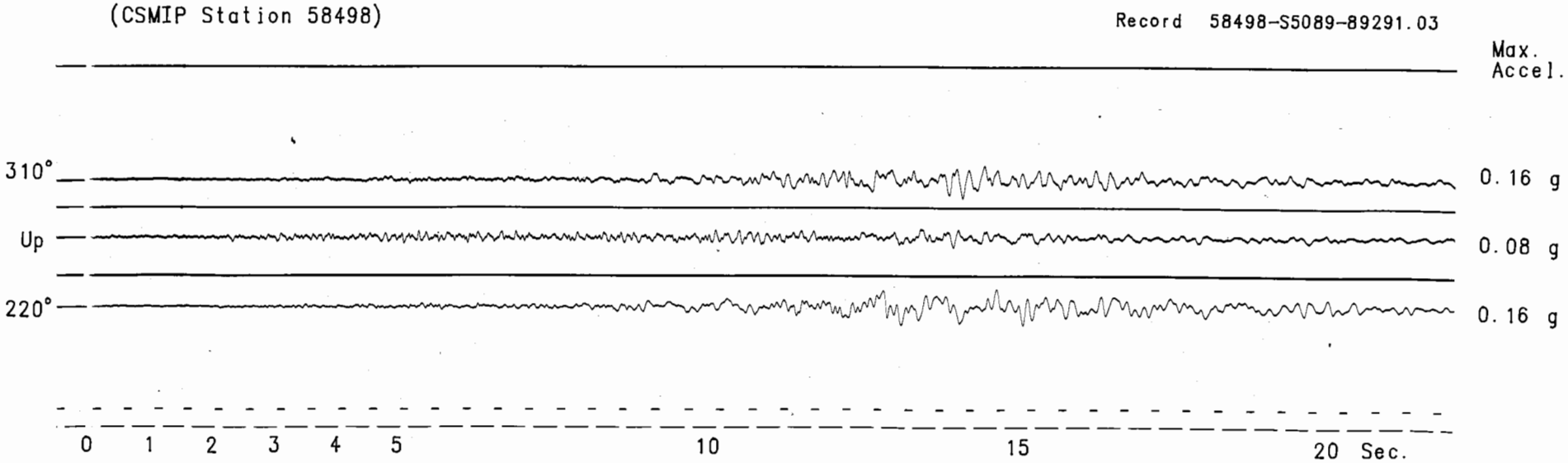
Hayward - Muir School
(CSMIP Station 58393)

Record 58393-S1847-89291.02



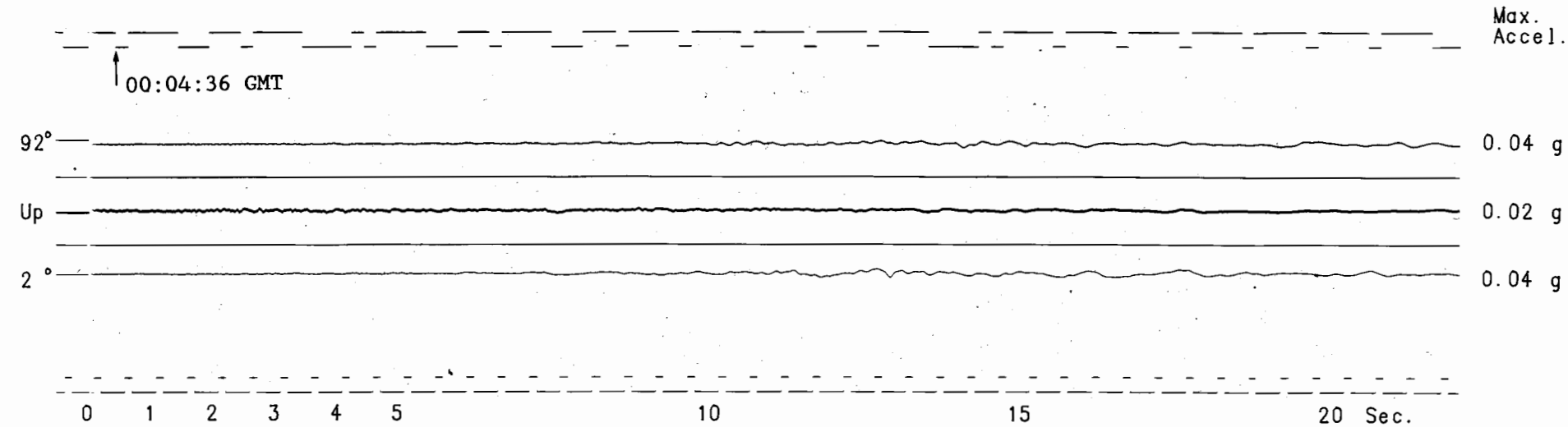
Hayward - BART Station
(CSMIP Station 58498)

Record 58498-S5089-89291.03



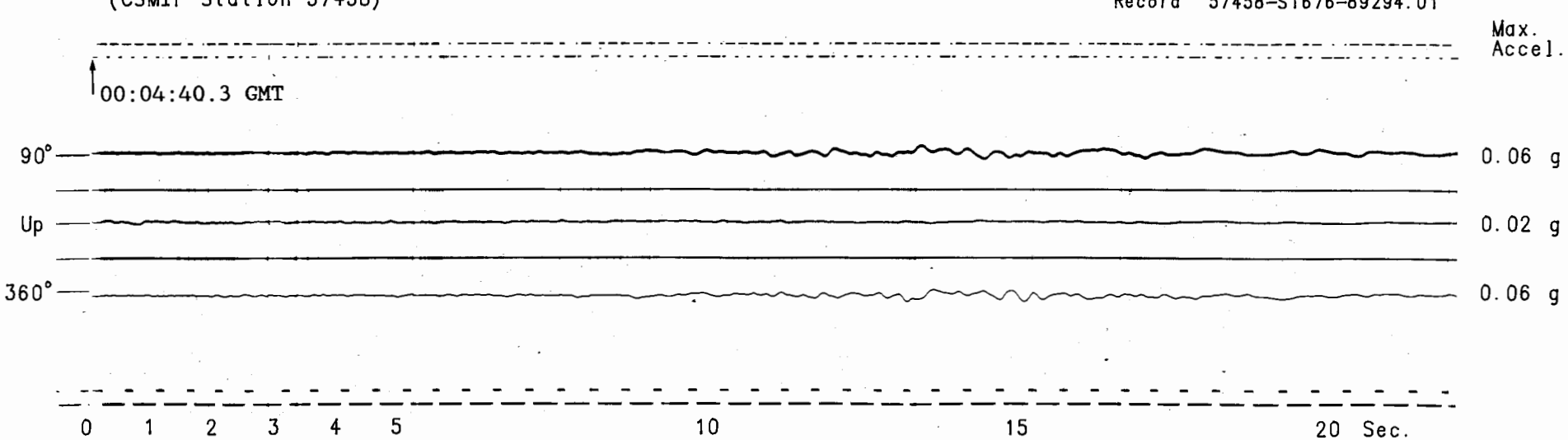
Livermore - Fagundes Ranch
(CSMIP Station 57528)

Record 57528-S2524-89294.01



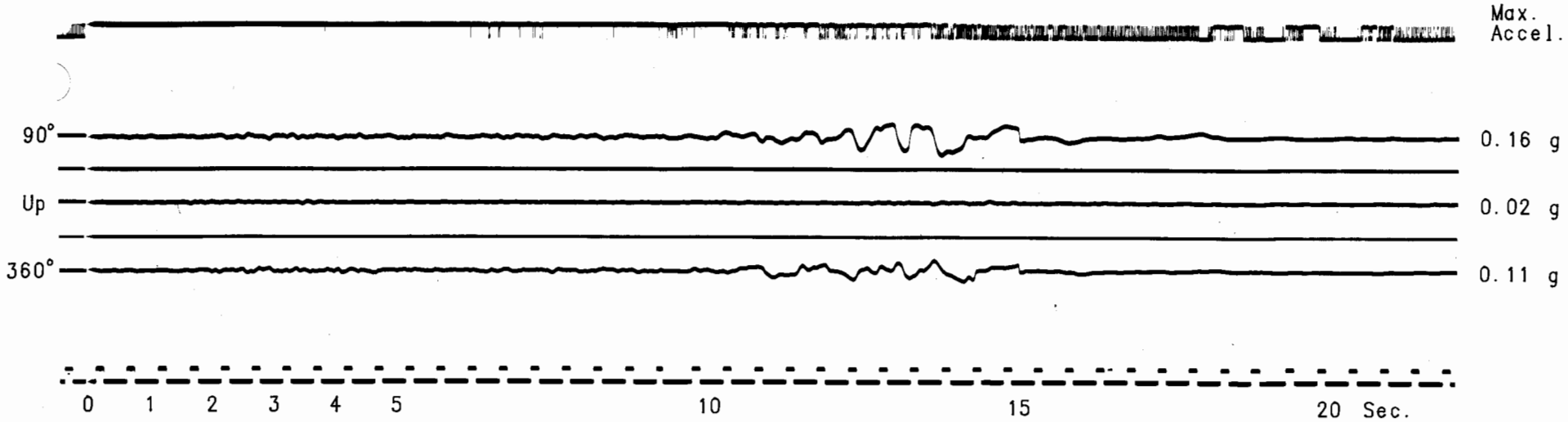
Tracy - Sewage Plant Generator Bldg.
(CSMIP Station 57458)

Record 57458-S1676-89294.01



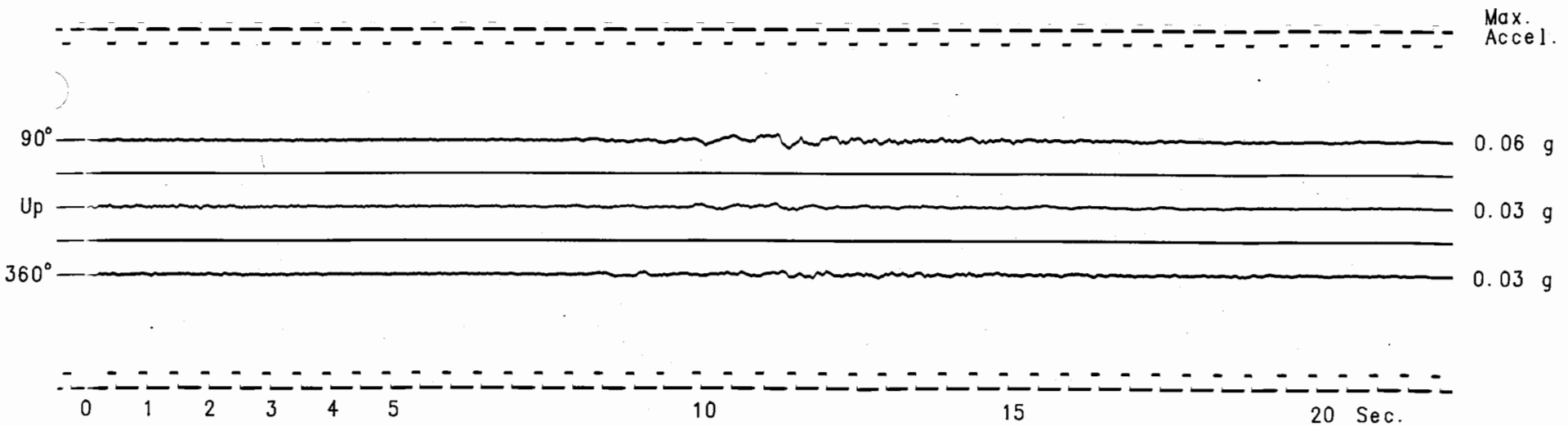
Treasure Island
(CSMIP Station 58117)

Record 58117-S2598-89296.01



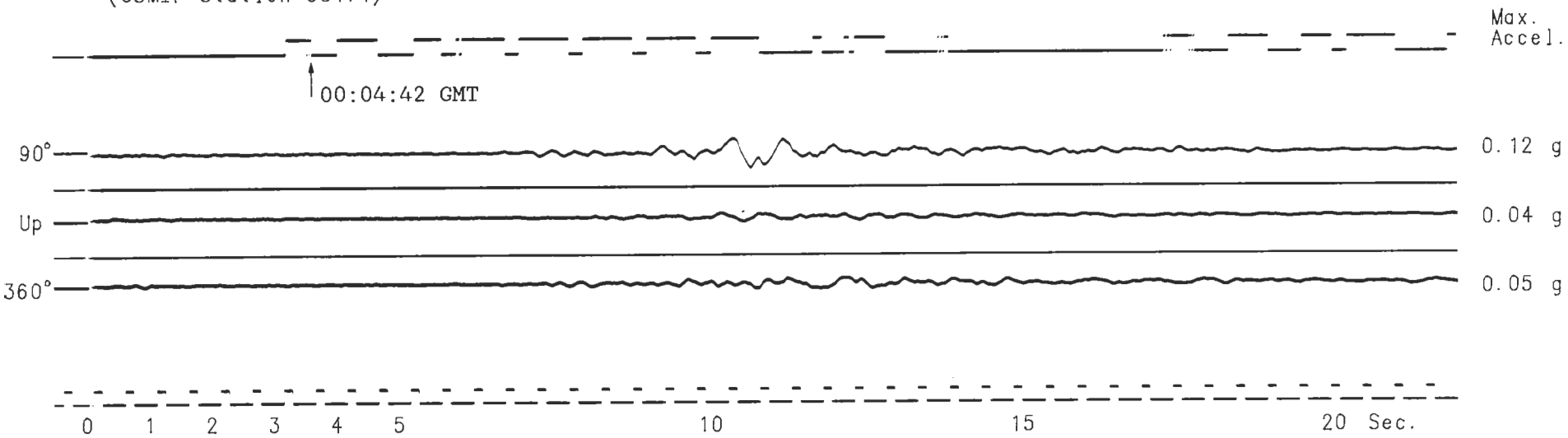
Yerba Buena Island
(CSMIP Station 58163)

Record 58163-S1720-89296.01



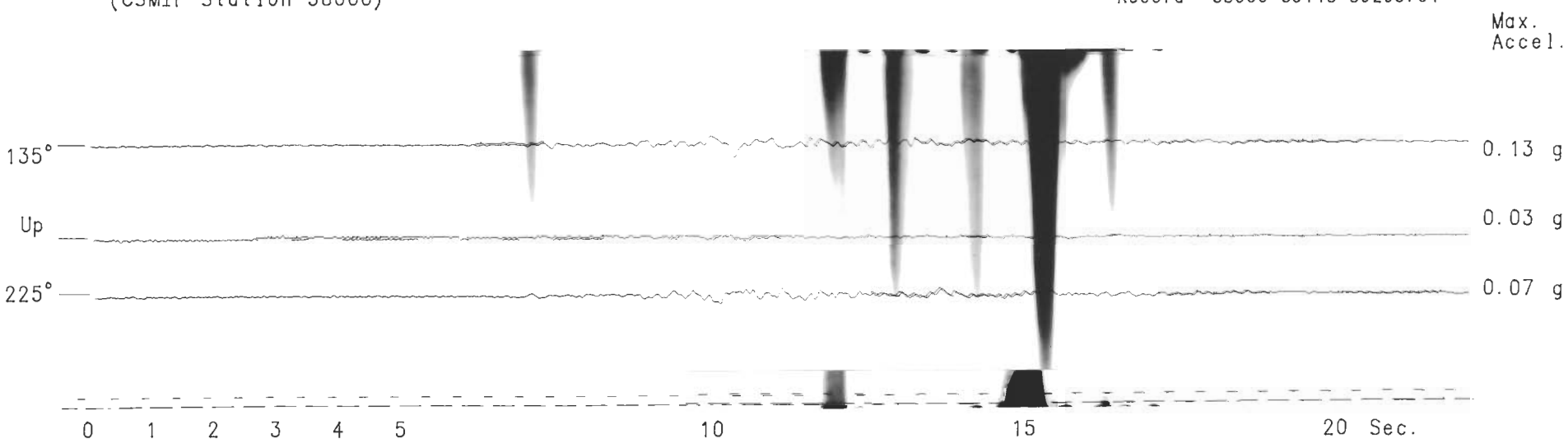
Berkeley - Lawrence Berkeley Lab
(CSMIP Station 58471)

Record 58471-S5150-89297.01



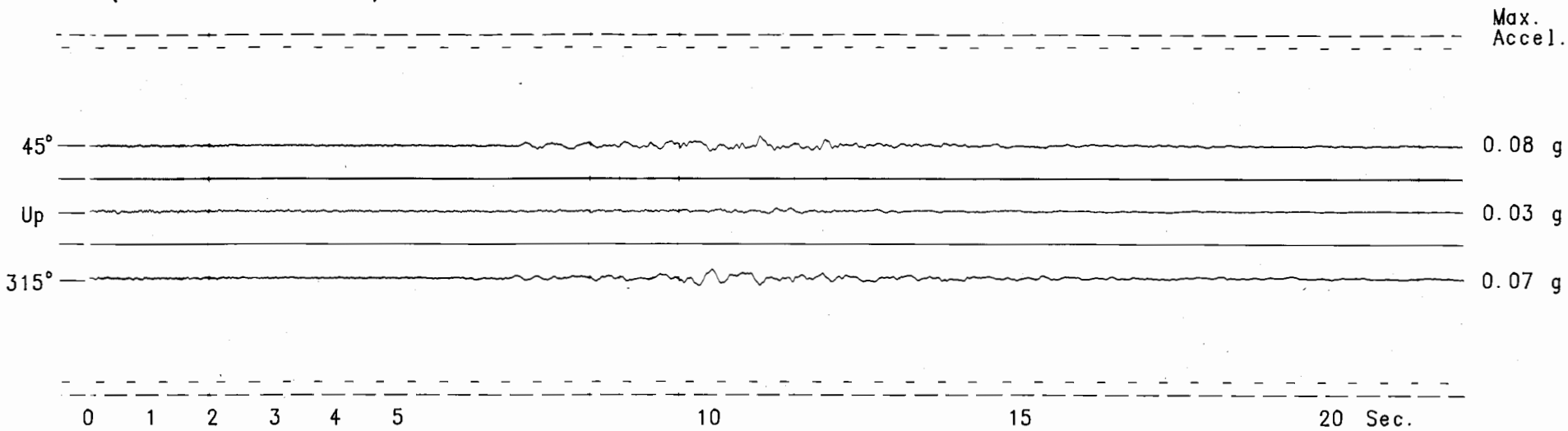
Berkeley - UCB, Memorial Stadium Grounds
(CSMIP Station 58000)

Record 58000-C0148-89293.01



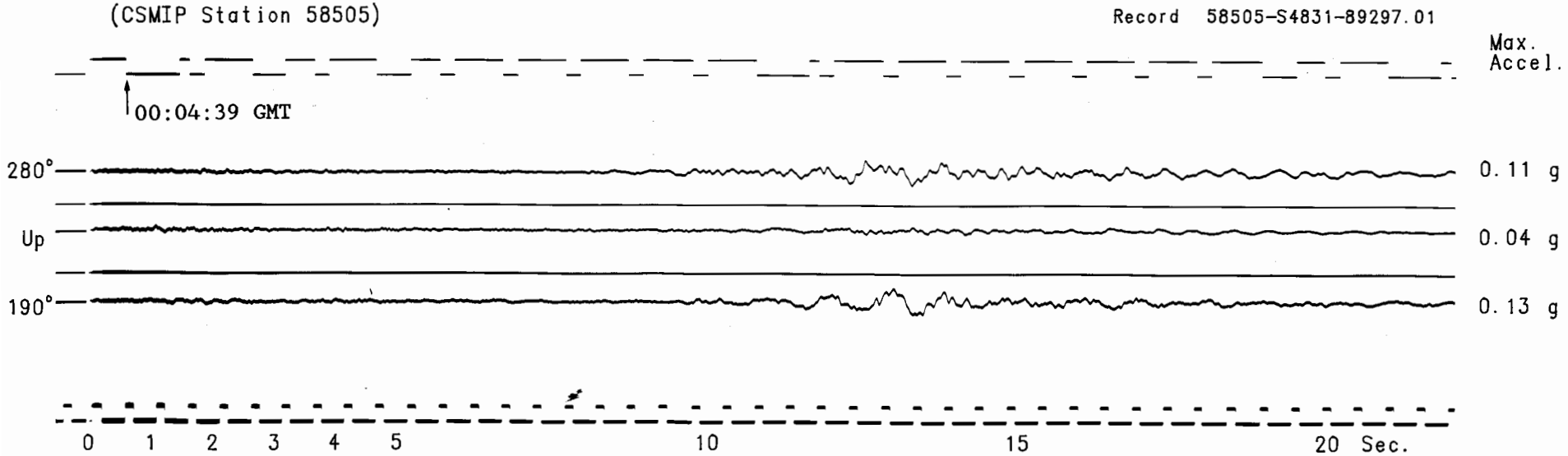
Piedmont - Piedmont Jr. High School Grounds
(CSMIP Station 58338)

Record 58338-S2791-89293.01



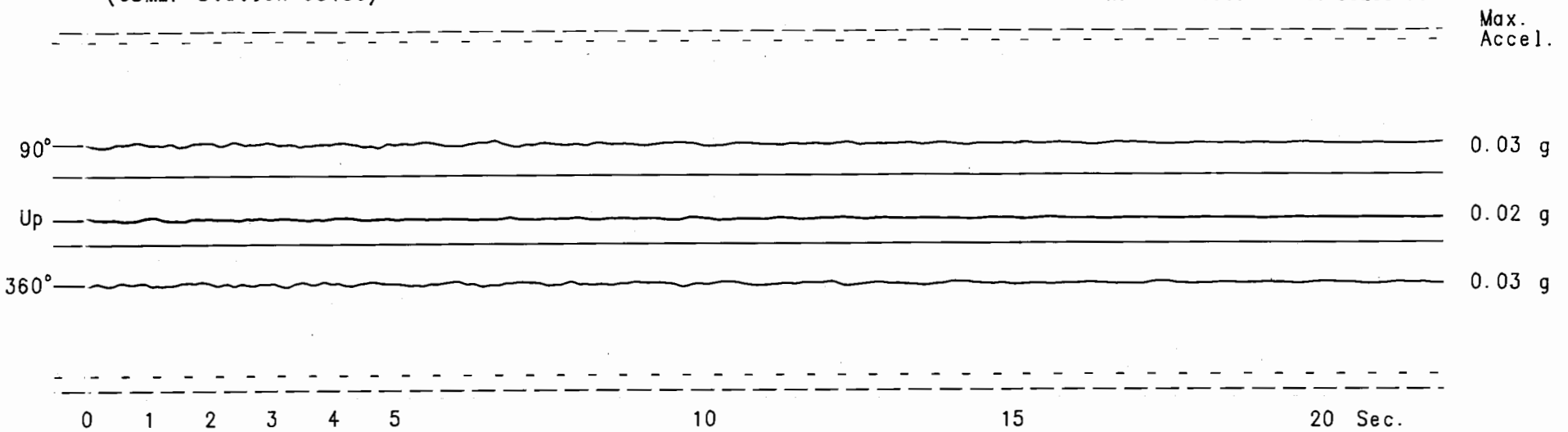
Richmond - City Hall Parking Lot
(CSMIP Station 58505)

Record 58505-S4831-89297.01



Napa – Napa College
(CSMIP Station 68150)

Record 68150-S1681-89298.01



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Watsonville - 4-story Commercial Bldg.

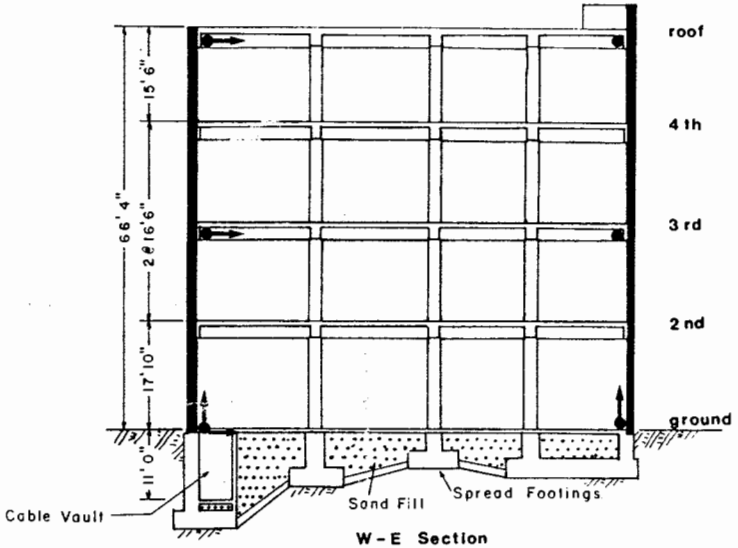
No. of Stories above/below ground: 4/0
Plan Shape: Rectangular
Base Dimensions: 75' x 71'
Typical Floor Dimensions: Same as base
Design Date: 1948 & 1955
Construction Date: 1948 & 1955
Note: 4th story was added in 1955

Vertical Load Carrying System:
Composite concrete/steel beams, girders and columns; concrete slabs.
Lateral Force Resisting System:
Concrete shear walls.
Foundation Type:
Spread footings.

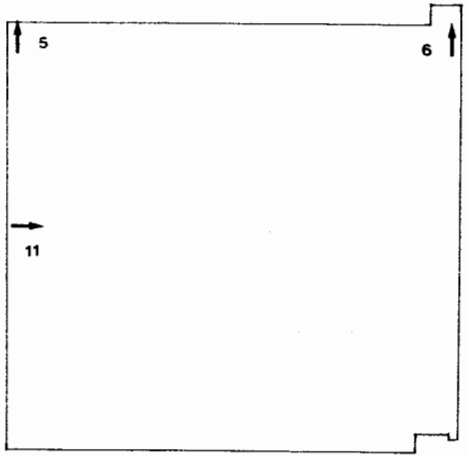
Watsonville - 4-story Commercial Bldg.

(CSMIP Station No. 47459)

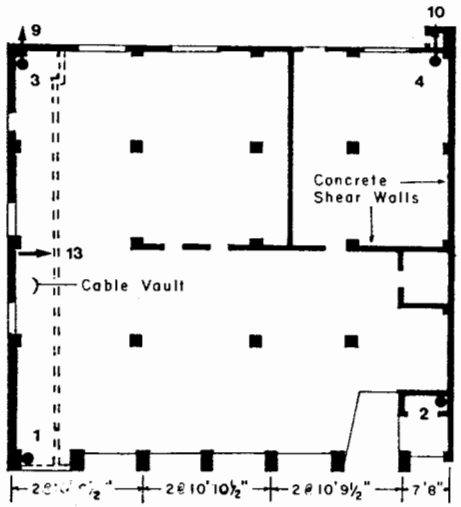
SENSOR LOCATIONS



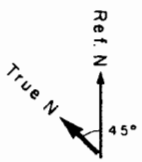
W-E Section

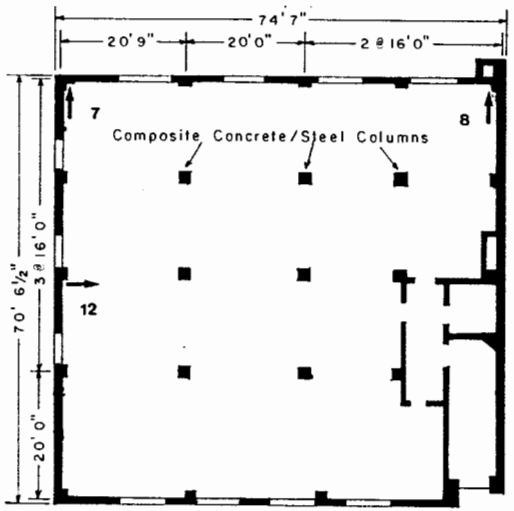


Roof Plan



Ground Floor Plan

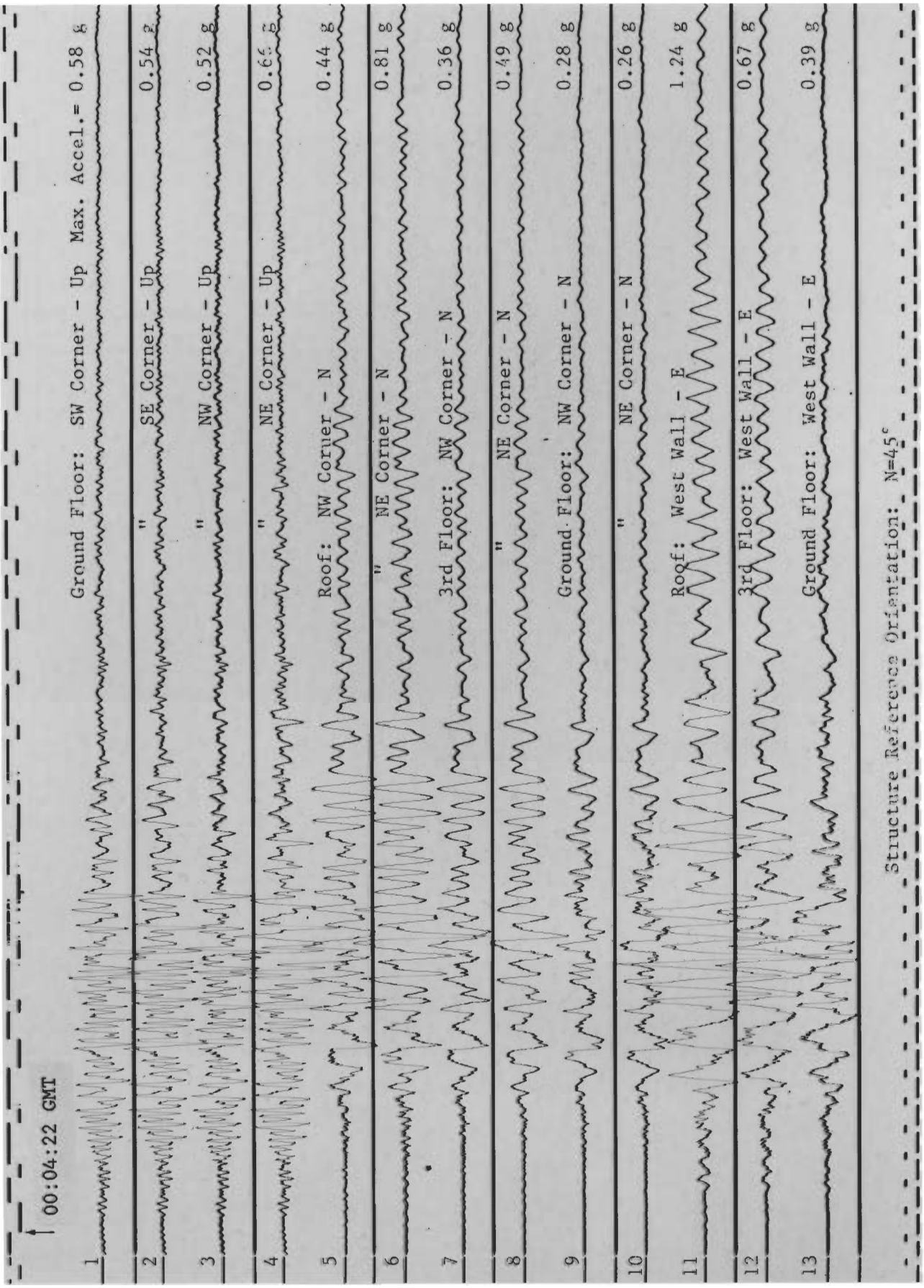




3rd Floor Plan

Watsonville - 4-story Commercial Bldg.
(CSMIP Station 47459)

Record 47459-C0215-89291.01



Hollister - 1-story Warehouse

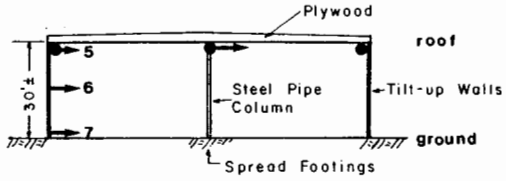
No. of Stories above/below ground: 1/0
Plan Shape: Rectangular
Base Dimensions: 300' x 100'
Typical Floor Dimensions: Same as base
Design Date: 1979
Construction Date: 1979

Vertical Load Carrying System:
Glulam Beams, wood joists, interior steel columns, and perimeter tilt-up concrete walls.
Lateral Force Resisting System:
Concrete tilt-up shear walls on perimeter; plywood roof diaphragm.
Foundation Type:
Spread footings.

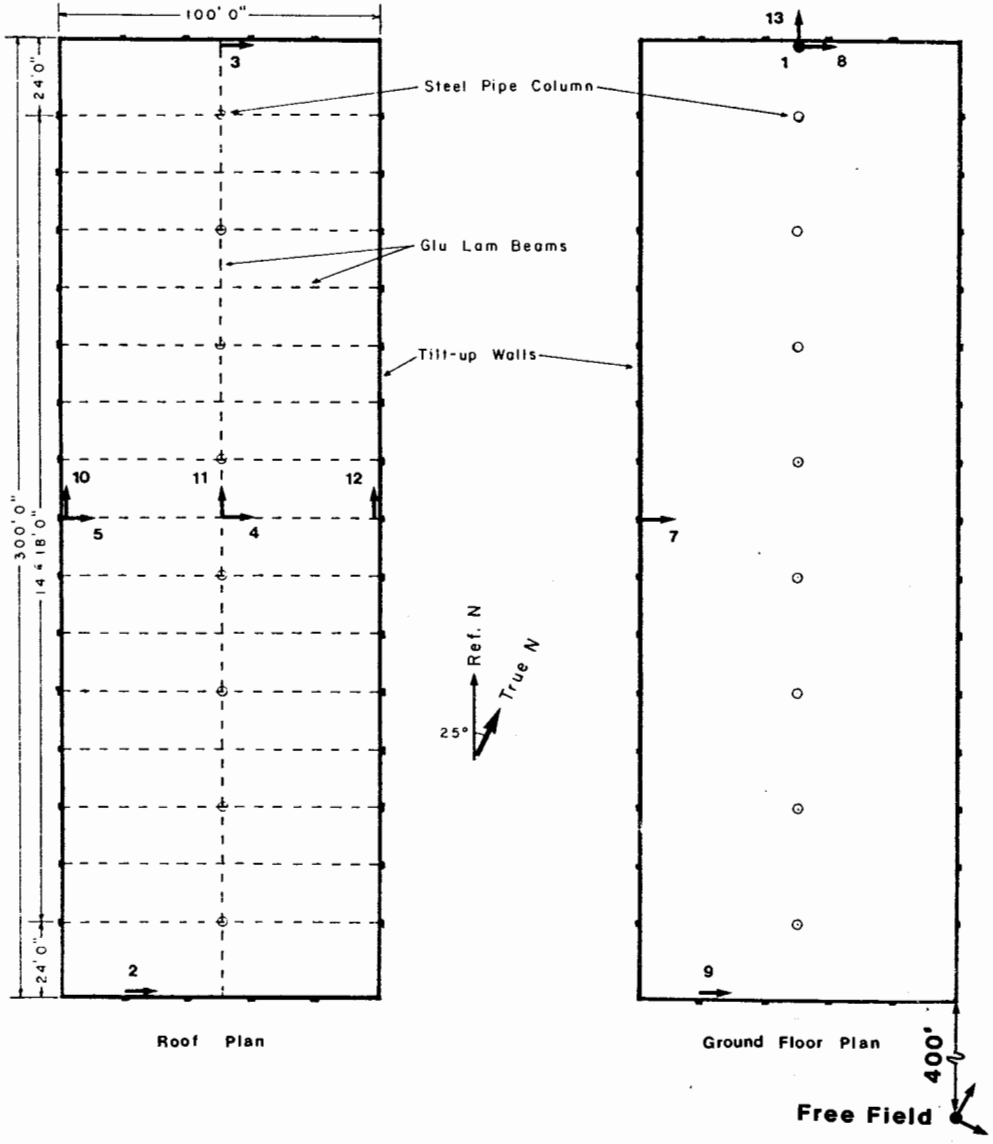
Hollister – 1-story Warehouse

(CSMIP Station No. 47391)

SENSOR LOCATIONS



W – E Section at Center



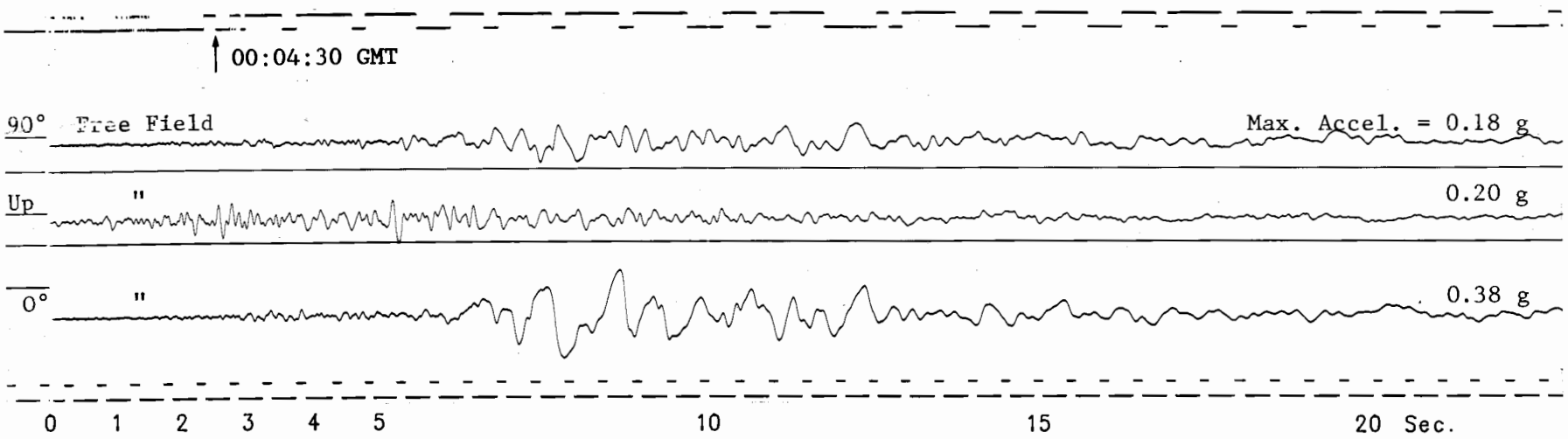
Roof Plan

Ground Floor Plan

Sensors 4, 11 Mounted on Glu Lam Beam
Sensor 13 Mounted on Floor Slab
Other Sensors Mounted on Wall

Hollister - South Street and Pine Drive
(CSMIP Station 47524)

Record 47524-S1585-89291.02



The record for channels 1 to 13 could not be recovered yet at this time due to damage of building contents.

Gilroy - 2-story Historic Commercial Bldg.

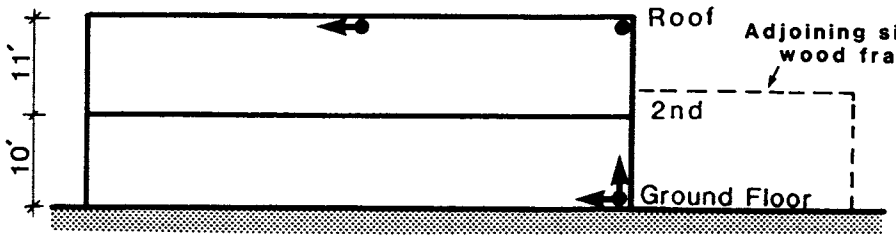
No. of Stories above/below ground: 2/0
Plan Shape: Rectangular
Base Dimensions: 40' x 60'
Typical Floor Dimensions: Same as base
Design Date: 1916
Construction Date: 1916

Vertical Load Carrying System:
Unreinforced masonry (brick) walls; wood beams, joists, sheathing, and columns.
Lateral Force Resisting System:
Unreinforced masonry (brick) walls; 2nd floor diaphragm - diagonal sheathing; roof diaphragm - straight sheathing.
Foundation Type:
Spread footings.

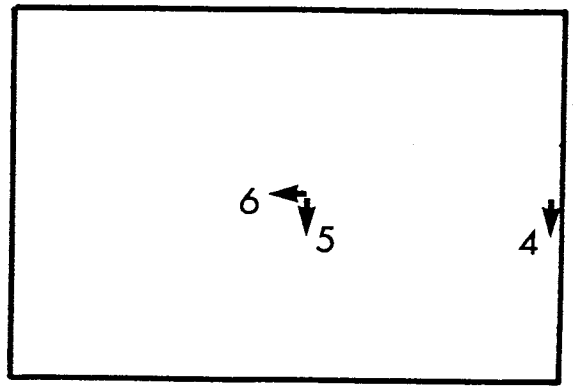
Gilroy - 2-story Historic Commercial Bldg.

(CSMIP Station No. 57476)

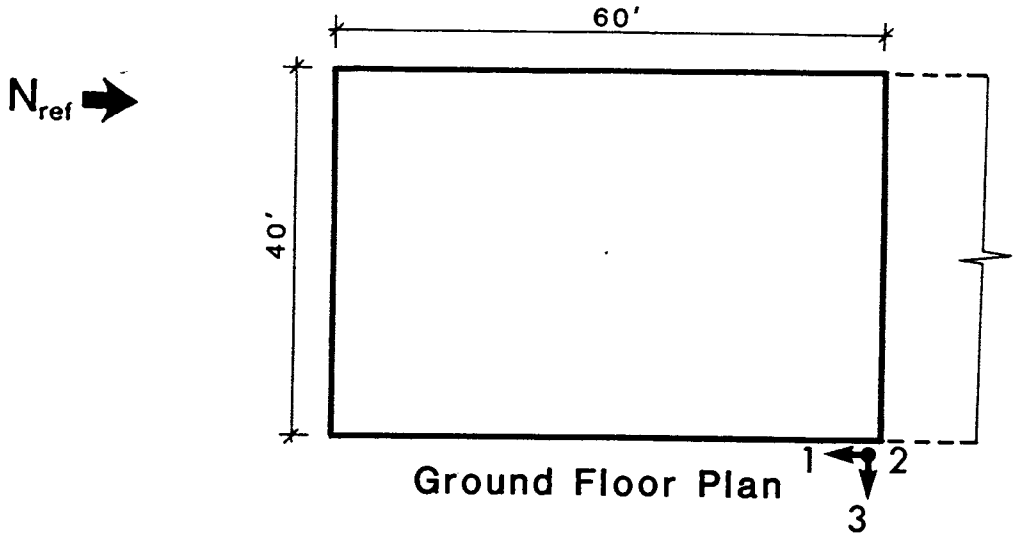
SENSOR LOCATIONS



S/N Elevation



Roof Plan

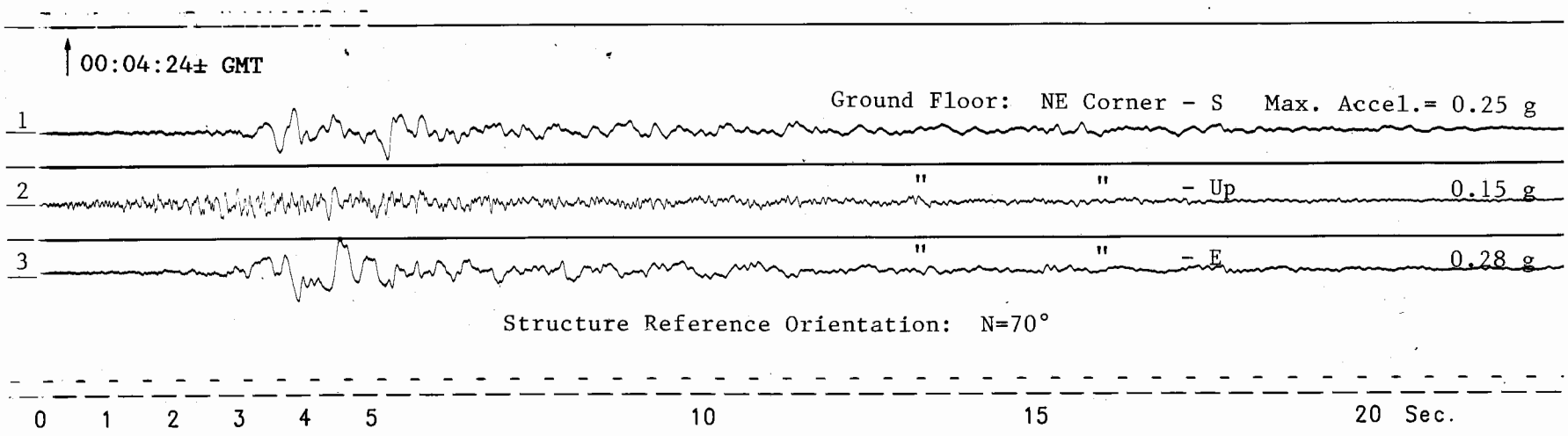


Ground Floor Plan

Structure Reference
Orientation: N= 70 °

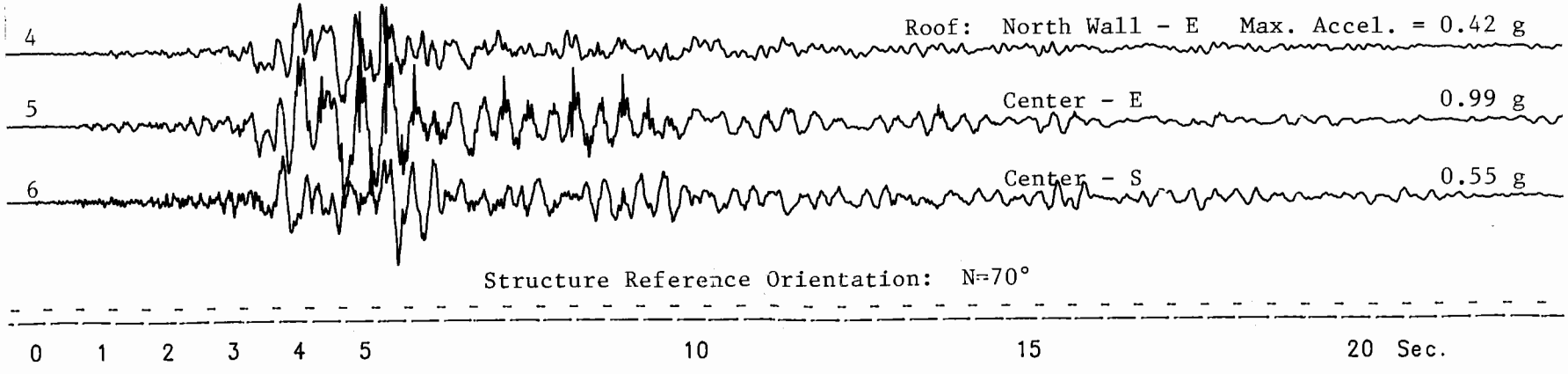
Gilroy - 2-story Historic Commercial Bldg.
(CSMIP Station 57476)

Record 57476-S4814-89292.01

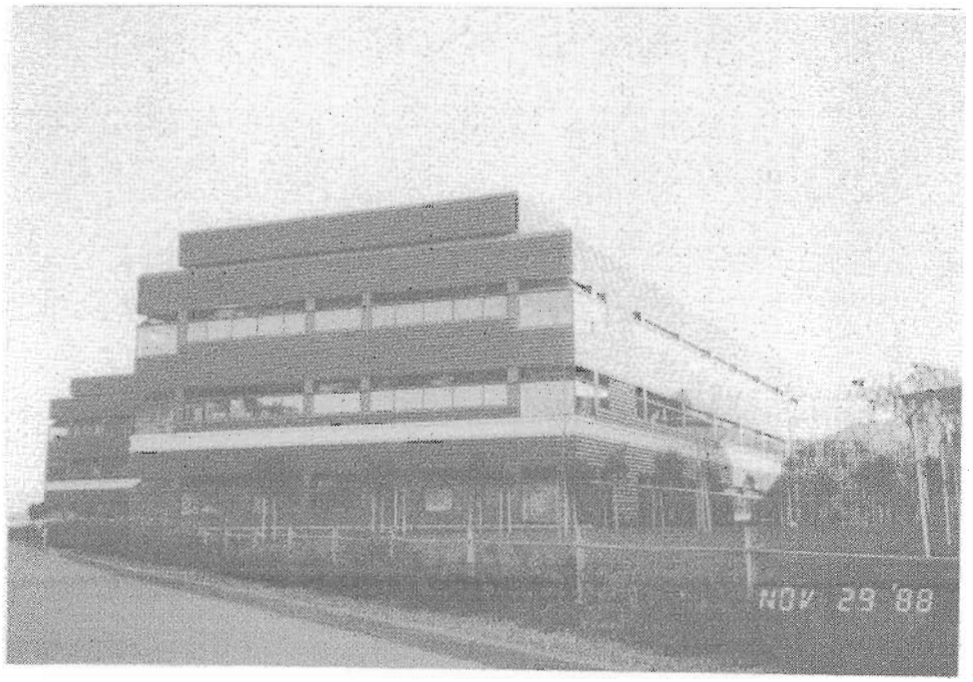


Gilroy - 2-story Historic Commercial Bldg.
(CSMIP Station 57476)

Record 57476-D0266-89292.01



San Jose - 3-story Office Bldg.



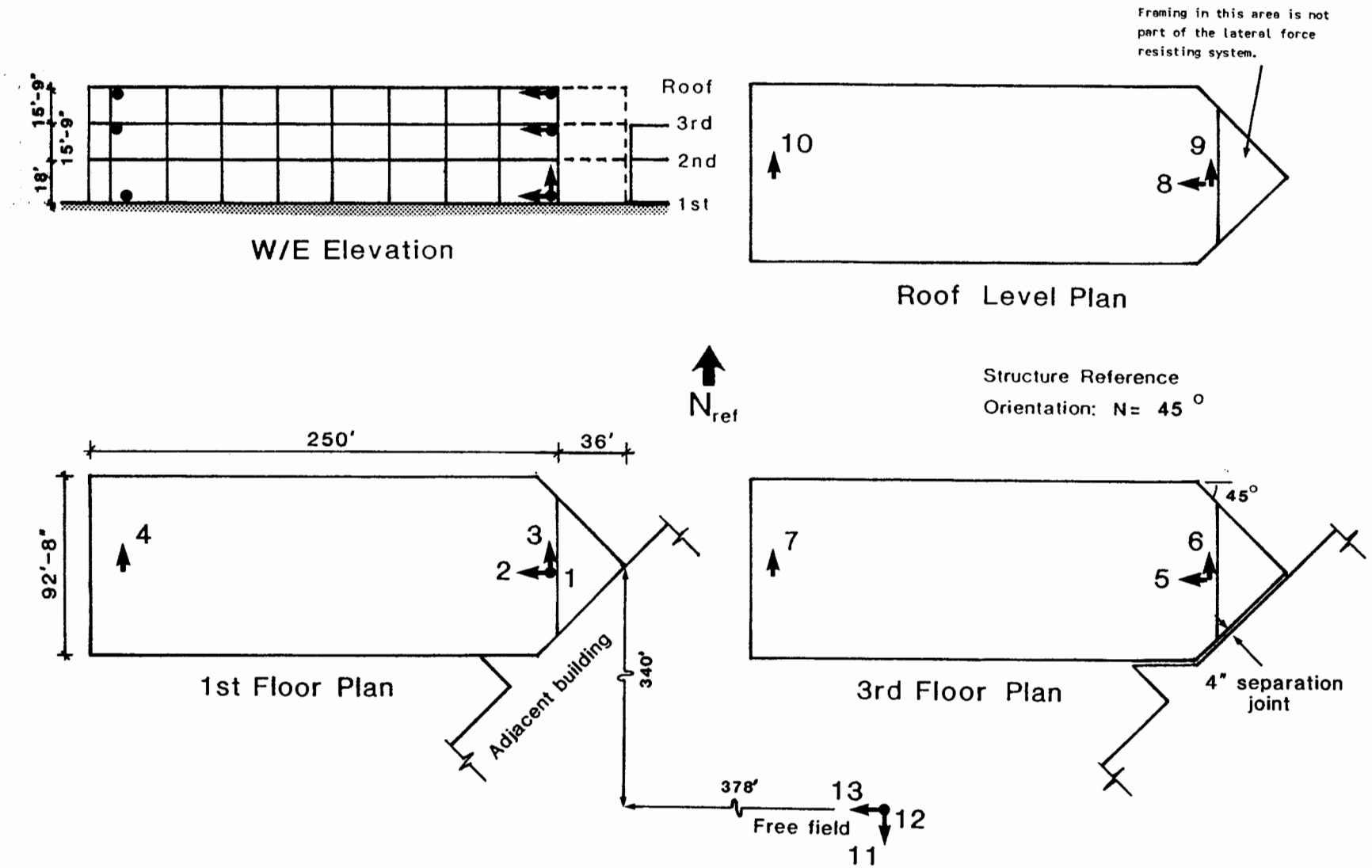
No. of Stories above/below ground: 3/0
Plan Shape: Rectangular
Base Dimensions: 250' x 93'
Typical Floor Dimensions: Same as base
Design Date: 1983
Construction Date: 1984

Vertical Load Carrying System:
Concrete slab on steel deck supported by steel frame.
Lateral Force Resisting System:
Moment-resistant steel frame with exterior cladding.
Foundation Type:
Spread footings.

San Jose - 3-story Office Bldg.

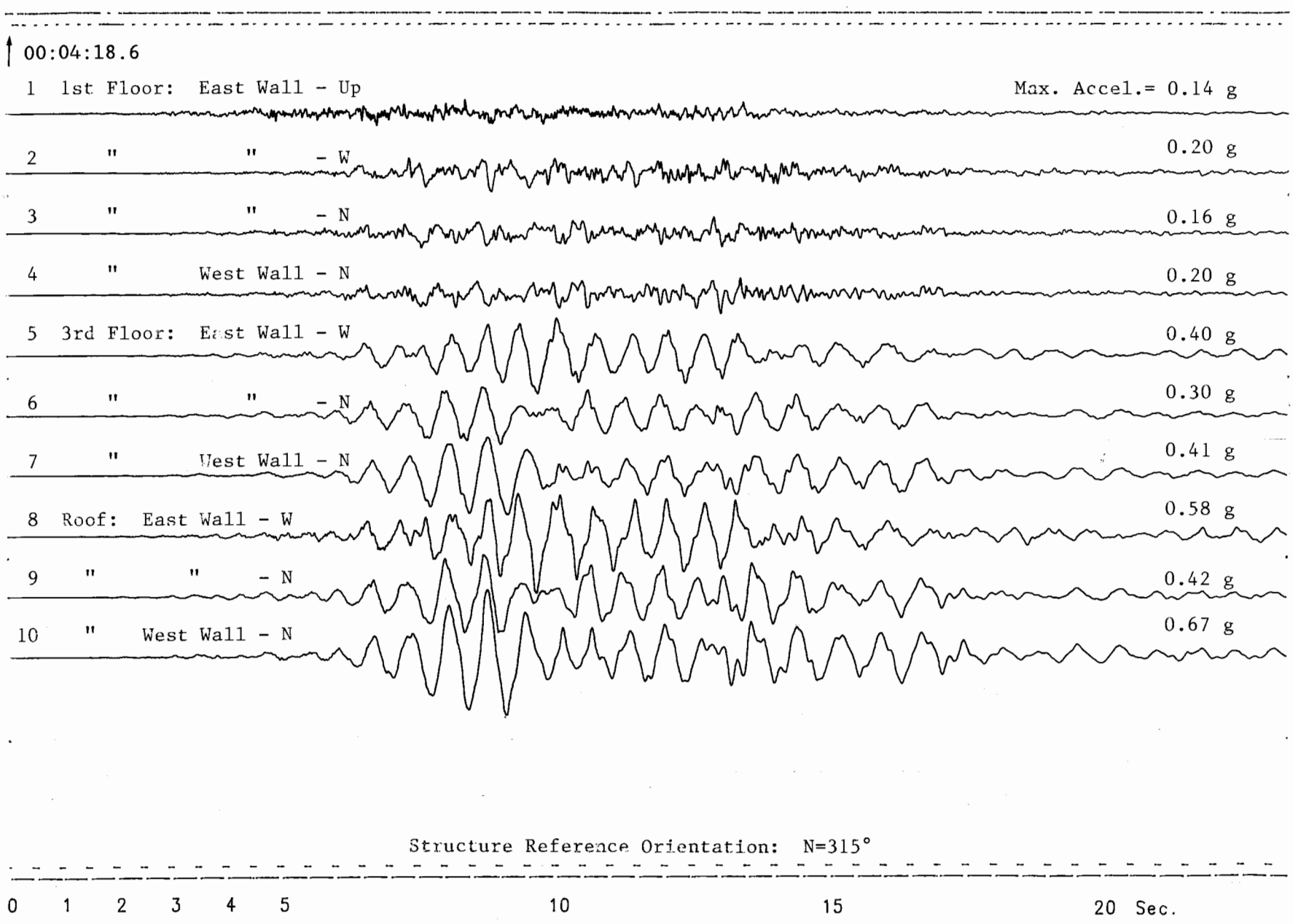
(CSMIP Station No. 57562)

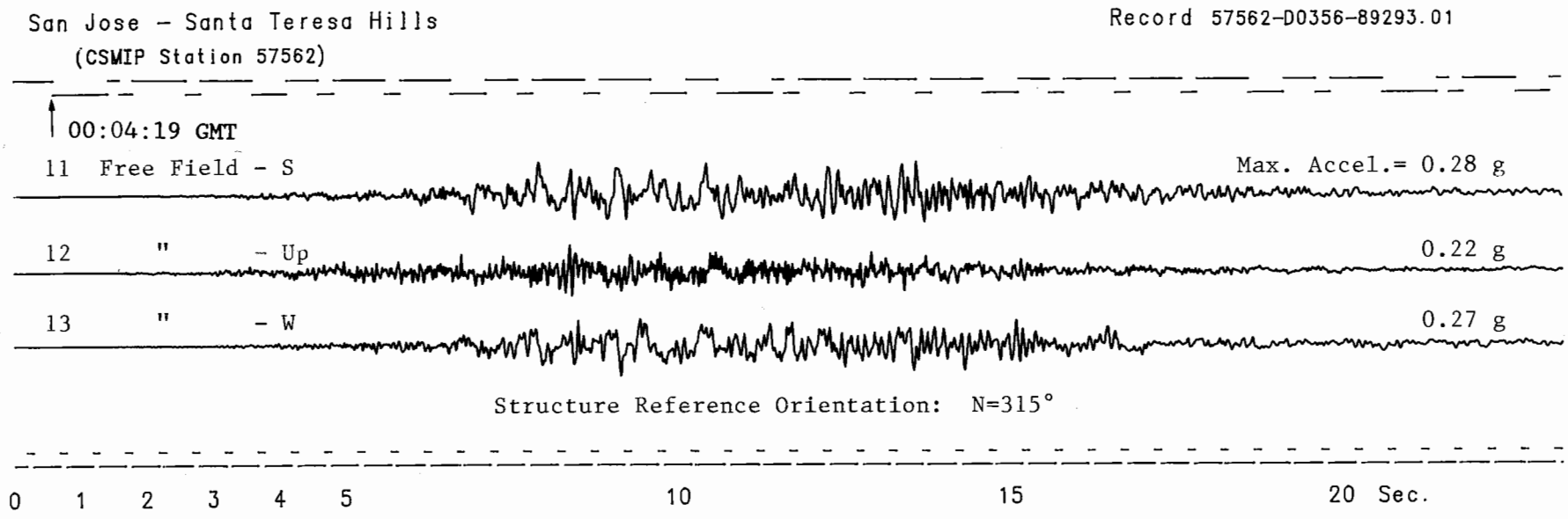
SENSOR LOCATIONS



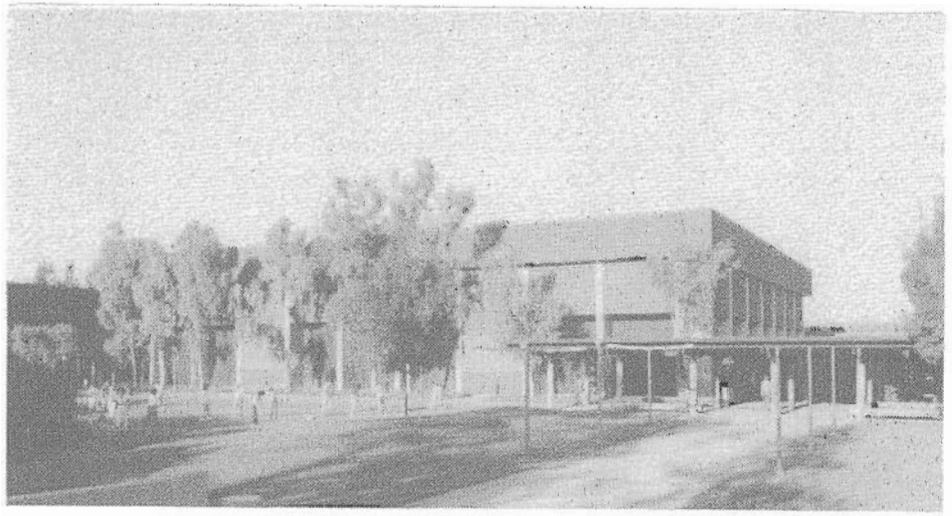
San Jose - 3-story Office Bldg.
(CSMIP Station 57562)

Record 57562-CD106-89293.05




San Jose – Santa Teresa Hills
(CSMIP Station 57562)
Record 57562-D0356-89293.01
00:04:19 GMT
11 Free Field - S
Max. Accel.= 0.28 g
12 " - Up
0.22 g
13 " - W
0.27 g
Structure Reference Orientation: N=315°
0 1 2 3 4 5 10 15 20 Sec.

Saratoga - 1-story School Gym



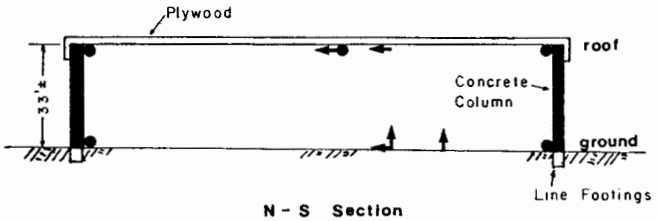
No. of Stories above/below ground: 1/0
Plan Shape: Rectangular
Base Dimensions: 154' x 122'
Typical Floor Dimensions: Same as base
Design Date: 1971

Vertical Load Carrying System:
3/8" plywood over tongue & groove sheathing; steel trusses on concrete columns.
Lateral Force Resisting System:
Isolated perimeter concrete shear walls and columns.
Foundation Type:
Spread footings.

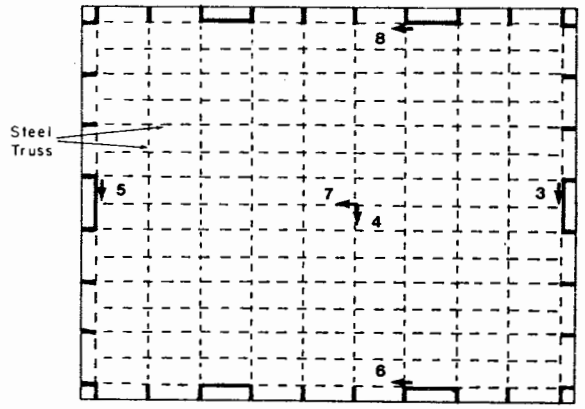
Saratoga - 1-story School Gym

(CSMIP Station No. 58235)

SENSOR LOCATIONS

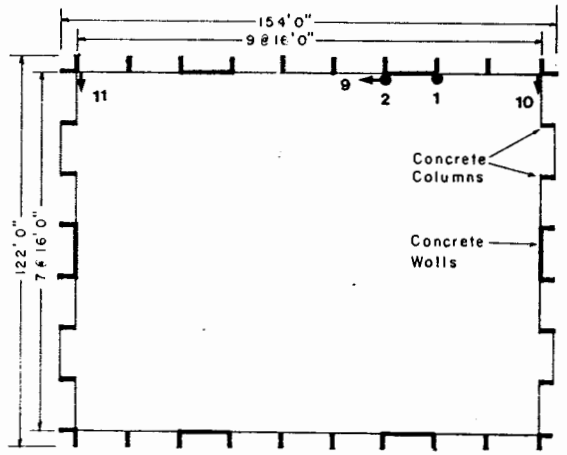


N - S Section



Roof Plan

Ref. N
True N

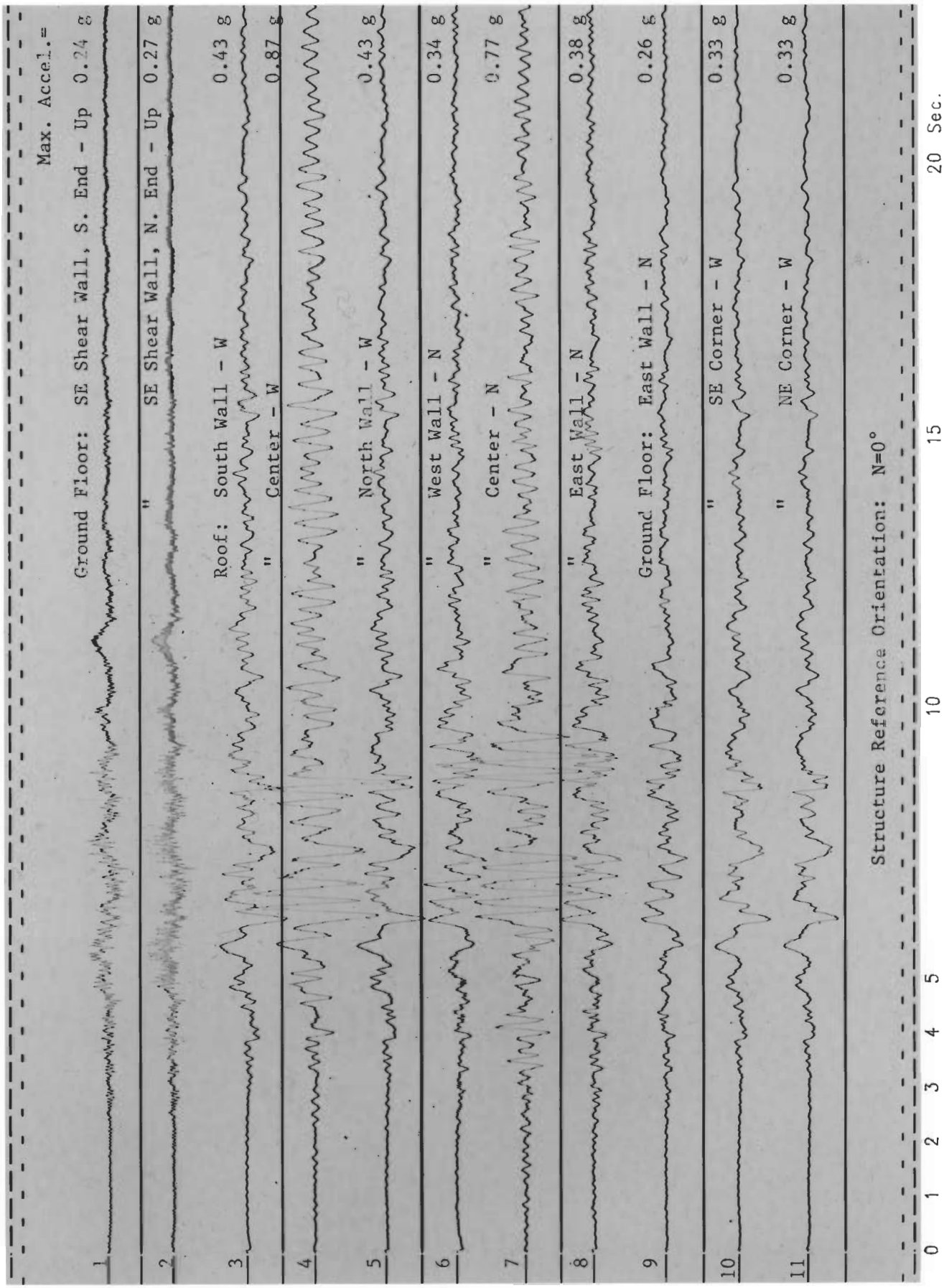


Ground Floor Plan

Sensors 4,7 Mounted on Steel Truss
Sensors 10,11 Mounted on Conrete Column
Other Sensors Mounted on Concrete Wall

Saratoga - 1-story School Gym
(CSMIP Station 58235)

Record 58235-C0184-89292.04



San Jose - 10-story Residential Bldg.

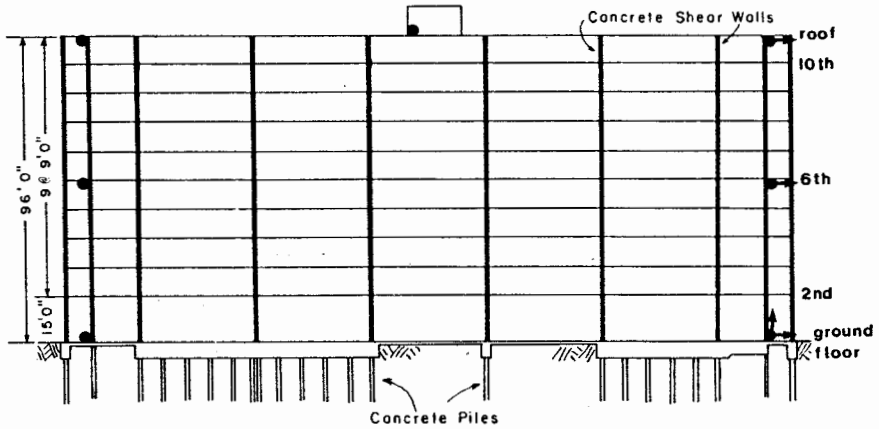
No. of Stories above/below ground: 10/0
Plan Shape: Rectangular
Base Dimensions: 210' x 64'
Typical Floor Dimensions: Same as base
Design Date: 1971
Construction Date: 1971-72

Vertical Load Carrying System:
One-way post-tensioned flat slabs on reinforced concrete bearing walls.
Lateral Force Resisting System:
Concrete shear walls at regular intervals in transverse direction, and along interior corridors in longitudinal direction.
Foundation Type:
Precast-prestressed concrete piles under all walls.

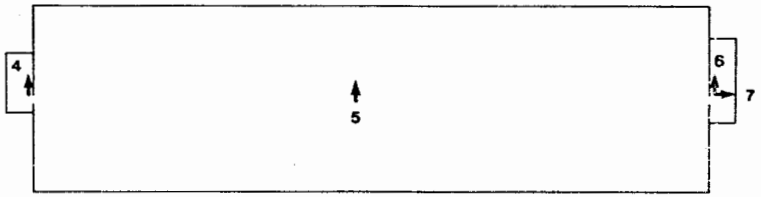
San Jose - 10-story Residential Bldg.

(CSMIP Station No. 57356)

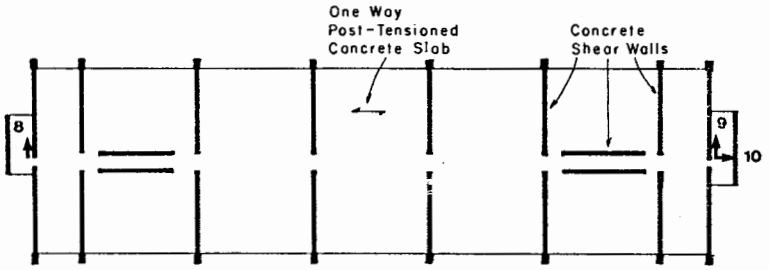
SENSOR LOCATIONS



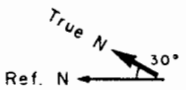
N-S Section

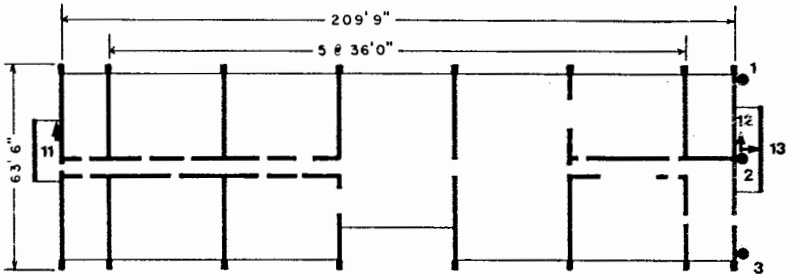


Roof Plan



6th Floor Plan

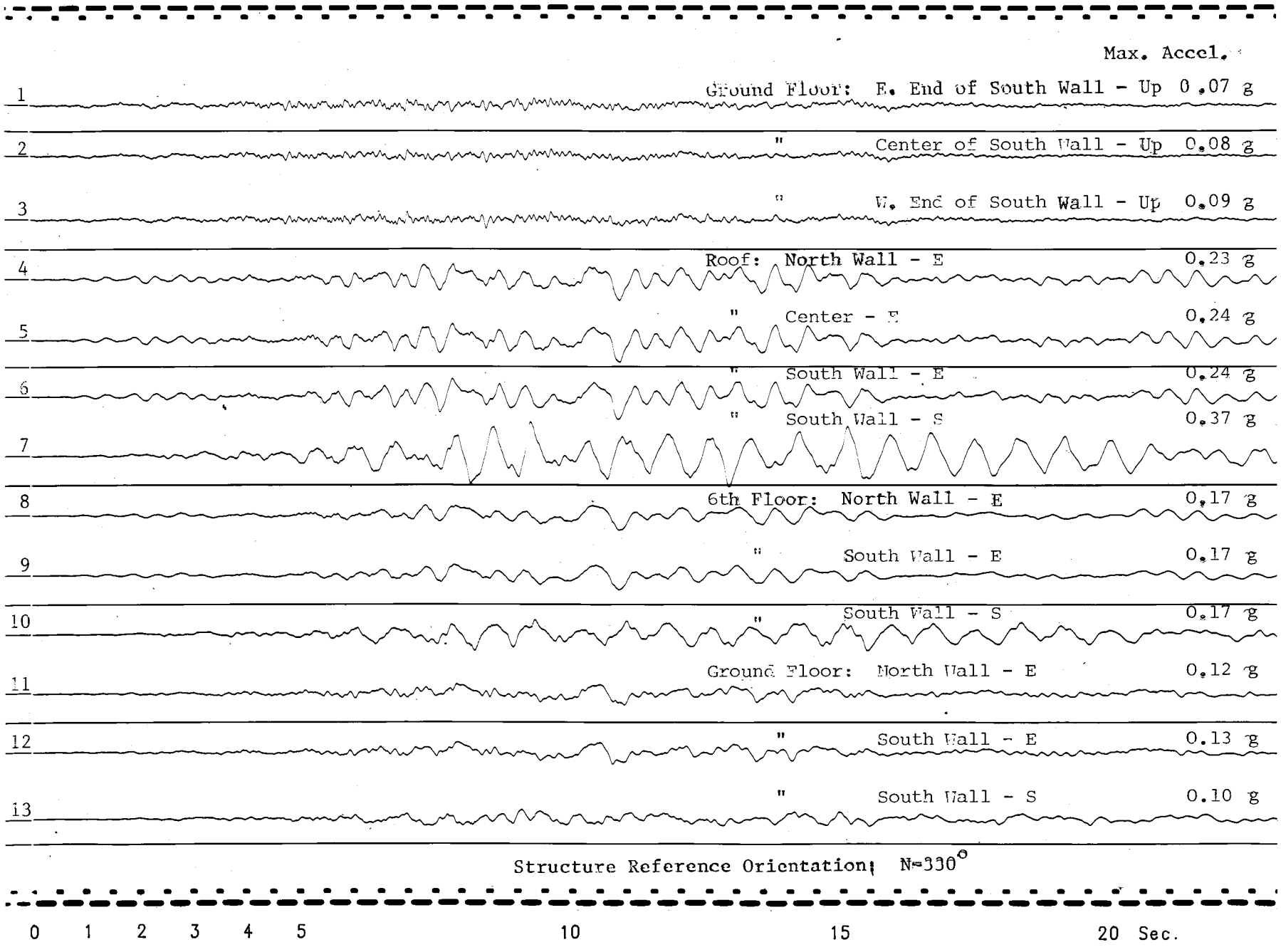




Ground Floor Plan

San Jose - 10-story Residential Bldg.
(CSMIP Station 57356)

Record 57356-C0189-89292.03



San Jose - 10-story Commercial Bldg.

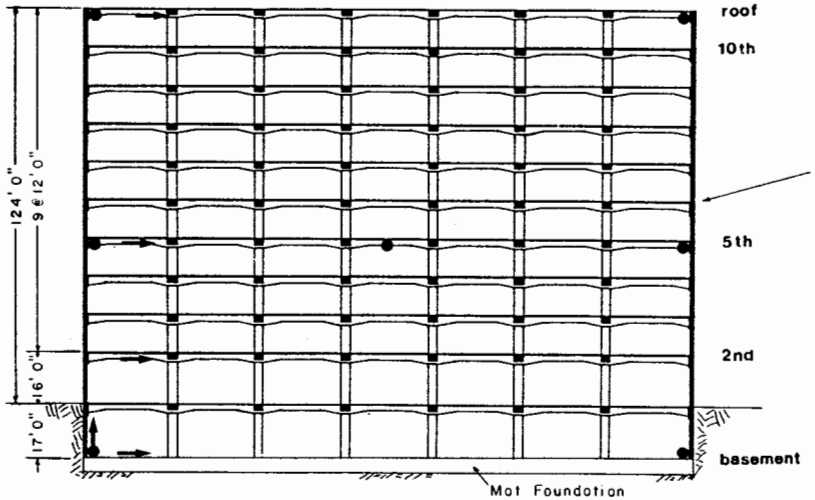
No. of Stories above/below ground: 10/1
Plan Shape: Rectangular
Base Dimensions: 190' x 96'
Typical Floor Dimensions: 190' x 82'
Design Date: 1964
Construction Date: 1967

Vertical Load Carrying System:
Concrete floor slabs supported by concrete pan joists and concrete frames.
Lateral Force Resisting System:
End concrete shear walls in transverse direction; moment-resistant concrete frame in longitudinal direction.
Foundation Type:
Mat foundation.

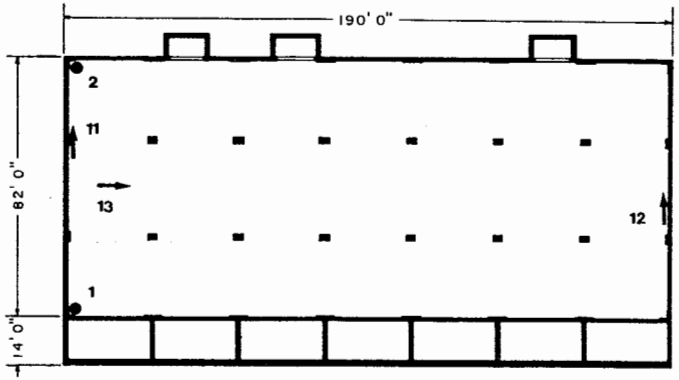
San Jose - 10-story Commercial Bldg.

(CSMIP Station No. 57355)

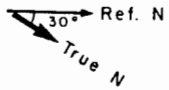
SENSOR LOCATIONS

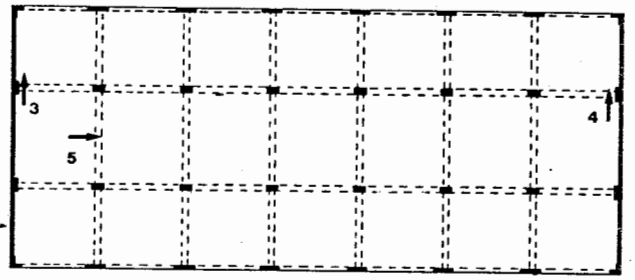


S - N Section

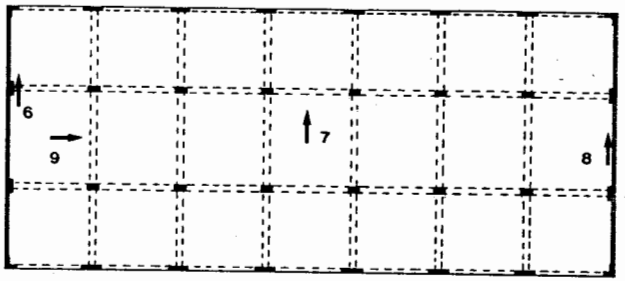


Basement Plan

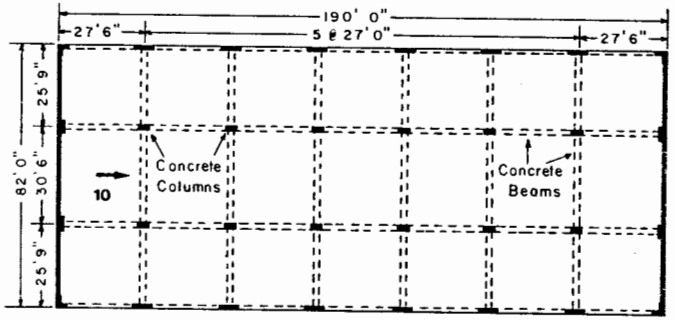




Roof Plan



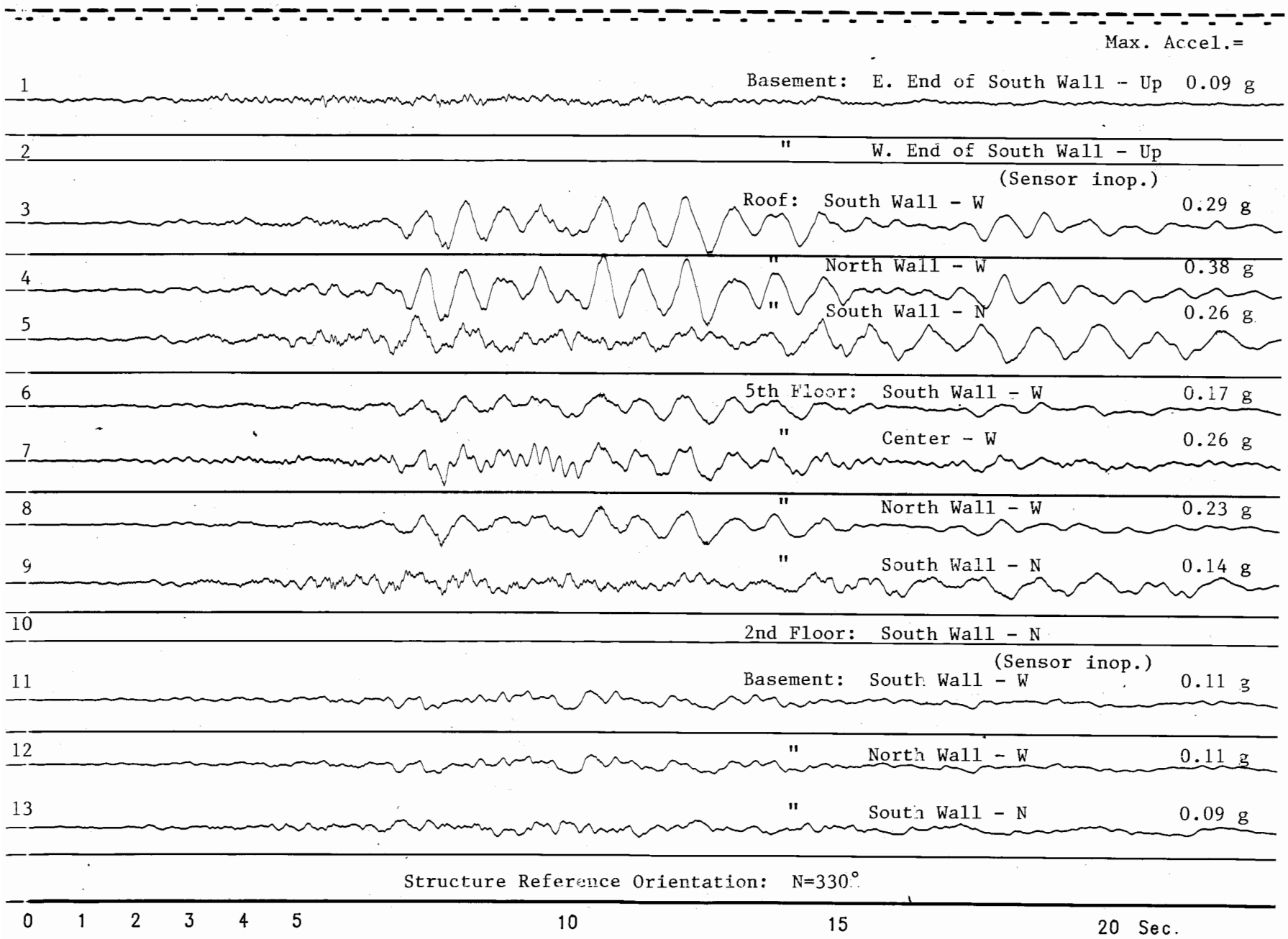
5th Floor Plan

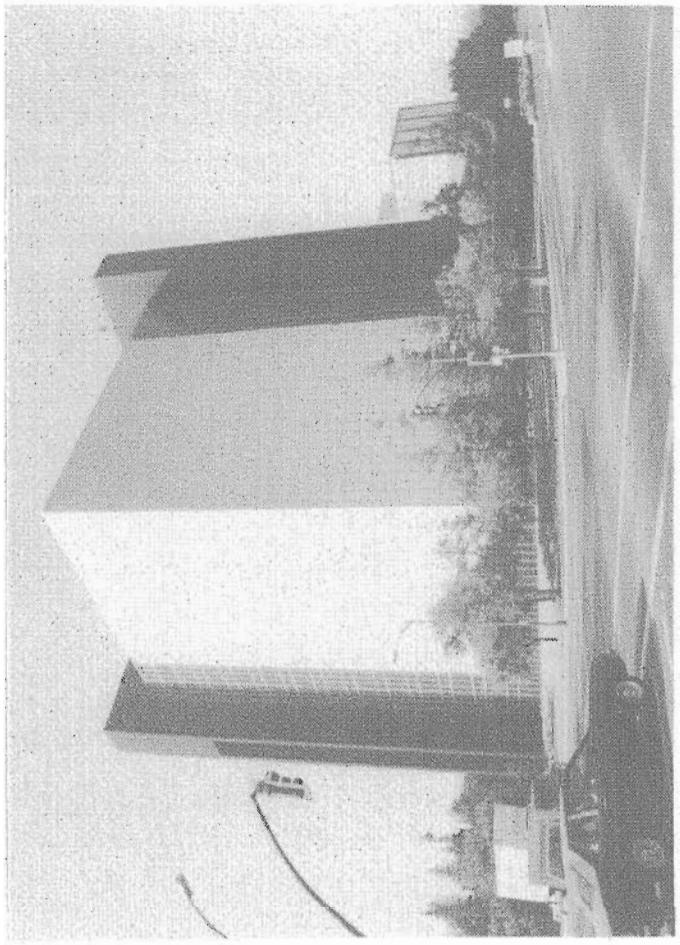


2nd Floor Plan

San Jose - 10-story Commercial Bldg.
(CSMIP Station 57355)

Record 57355-C0112-89292.03



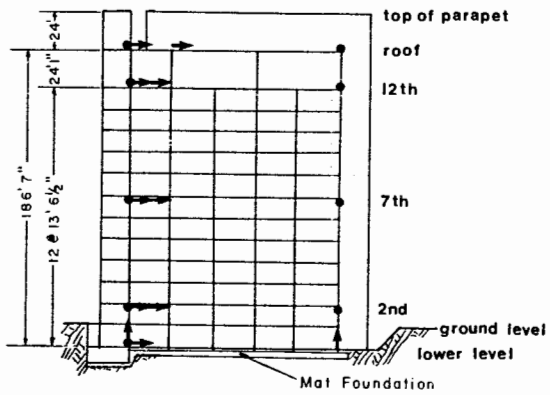


San Jose - 13-story Government Office Bldg.

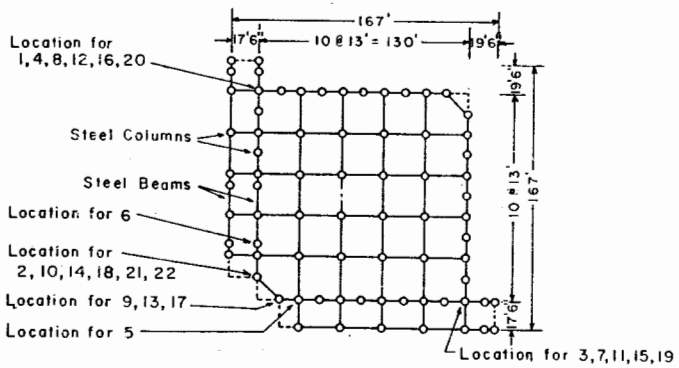
San Jose - 13-story Government Office Bldg.

(CSMIP Station No. 57357)

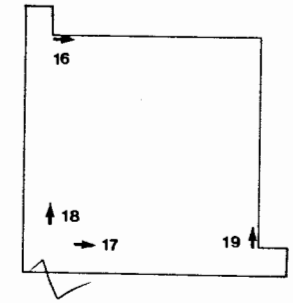
SENSOR LOCATIONS



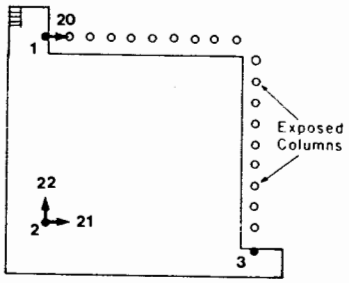
E-W Section



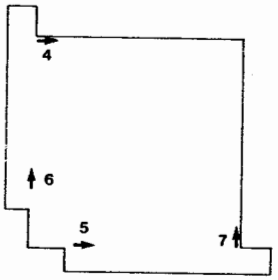
Typical Floor Plan



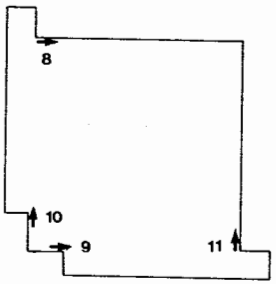
2nd Floor Plan



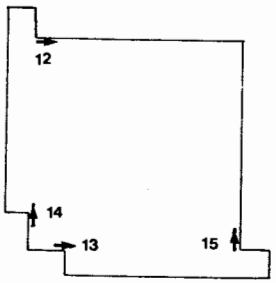
Lower Level Plan



Roof Plan



12th Floor Plan



7th Floor Plan

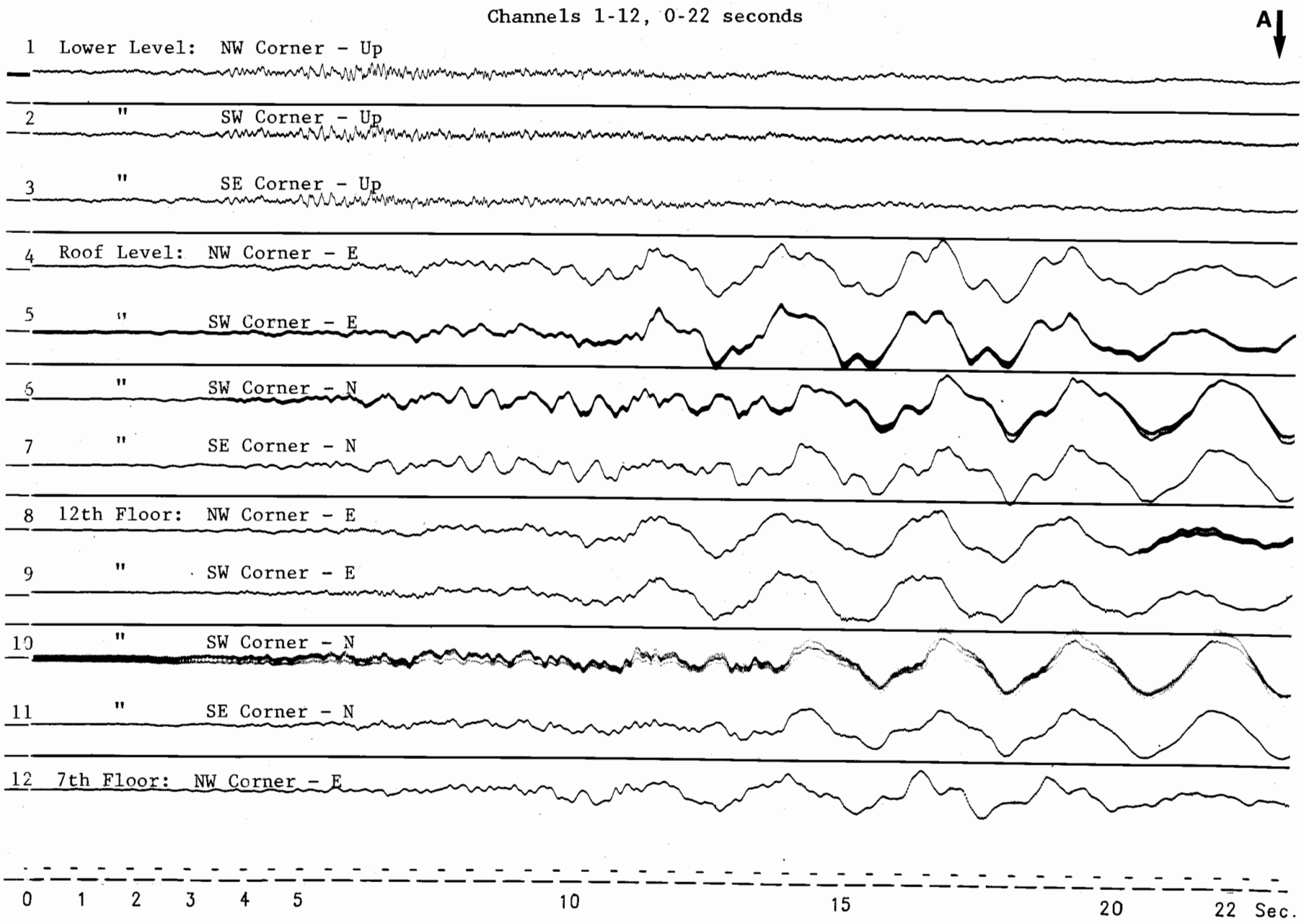
San Jose - 13-story Government Office Bldg.

No. of Stories above/below ground: 13/0
Plan Shape: Rectangular
Base Dimensions: 173′ x 167′
Typical Floor Dimensions: 167′ x 167′
Design Date: 1972
Construction Date: 1975-76

Vertical Load Carrying System:
3.5″ concrete slab on metal deck; steel columns, beams and joists.
Lateral Force Resisting System:
Moment-resistant steel frame.
Foundation Type:
Mat foundation.

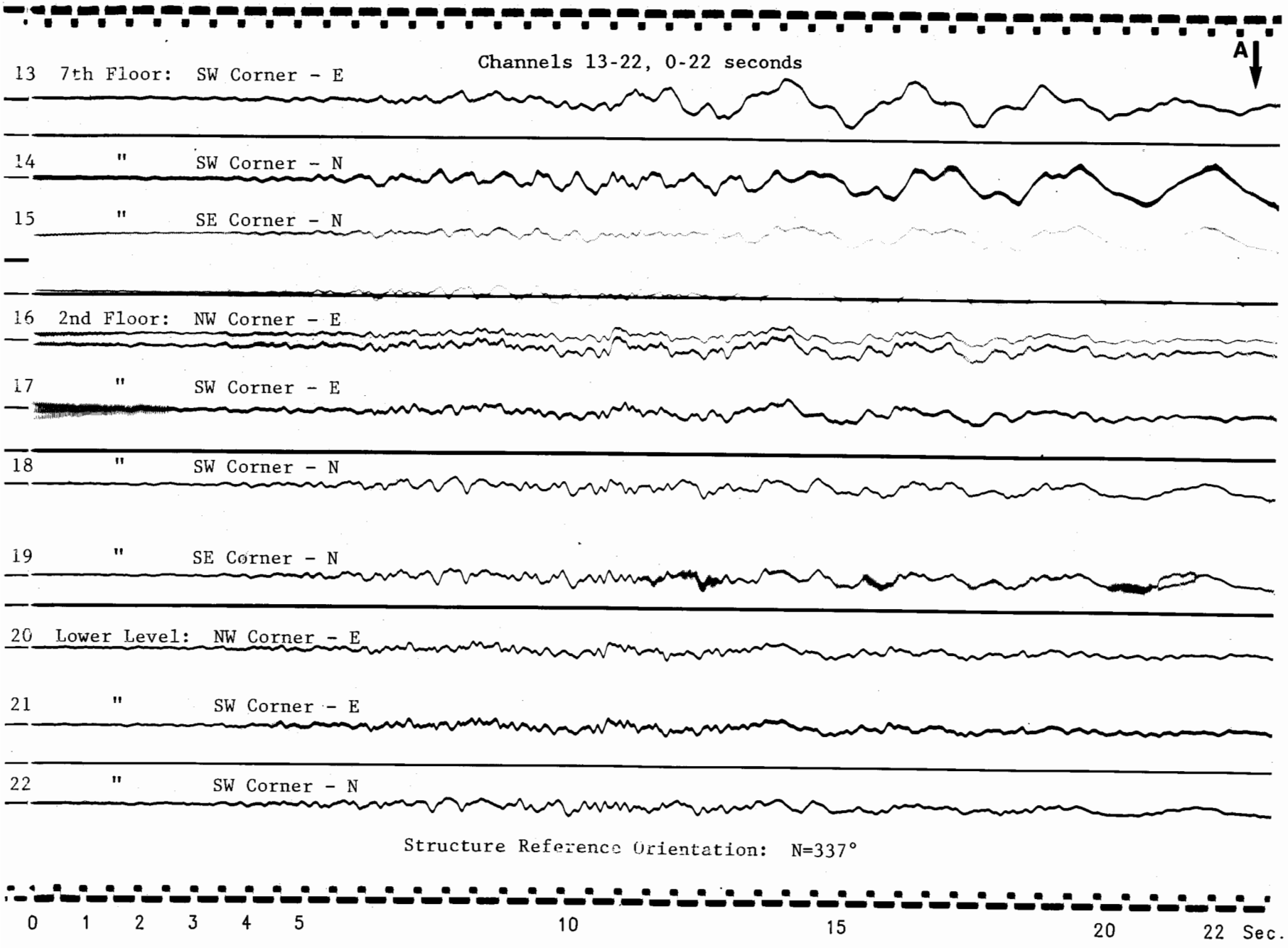
San Jose - 13-story Government Office Bldg.
(CSMIP Station 57357)

Record 57357-C0185-89291.03



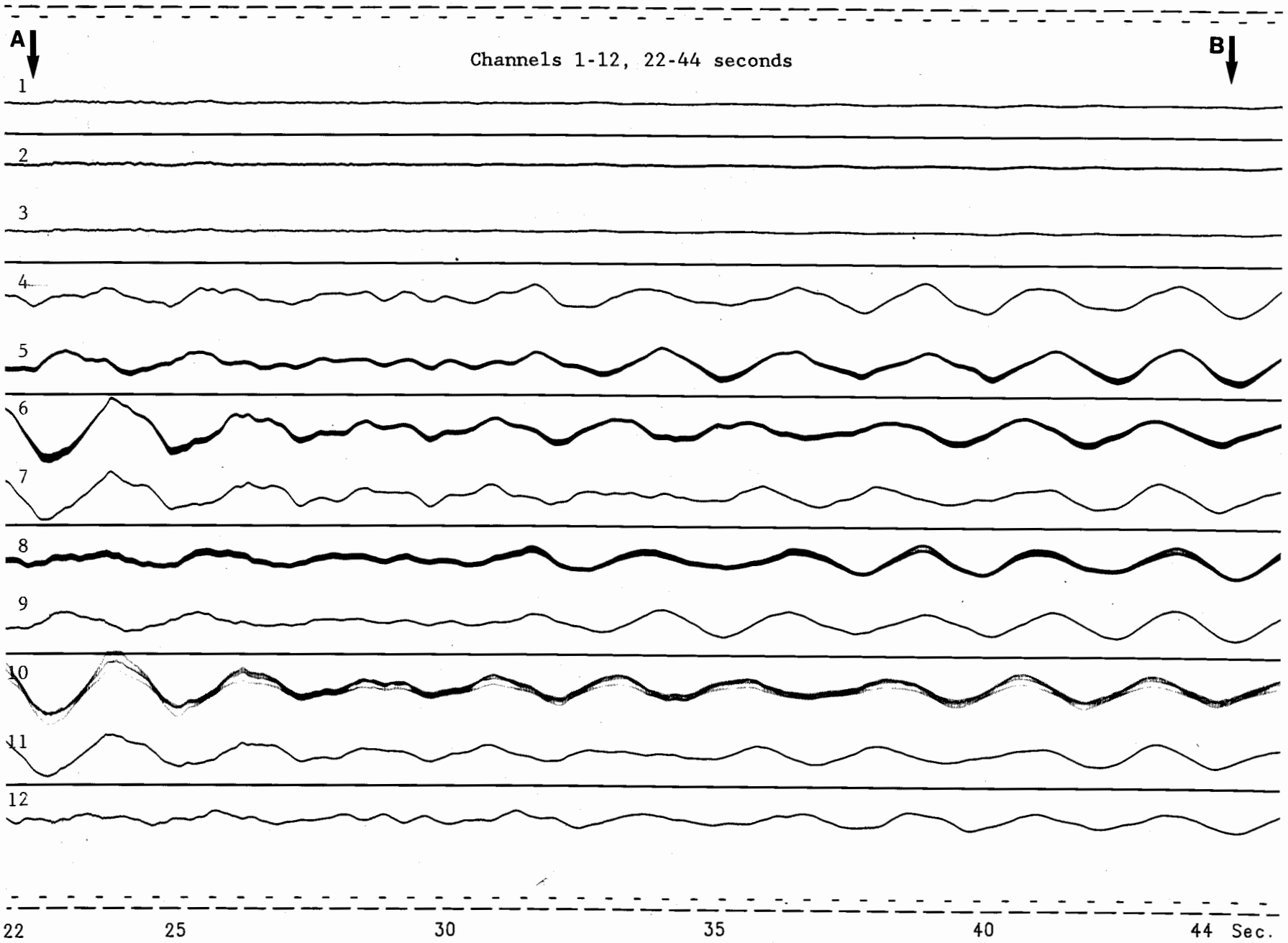
San Jose - 13-story Government Office Bldg.
(CSMIP Station 57357)

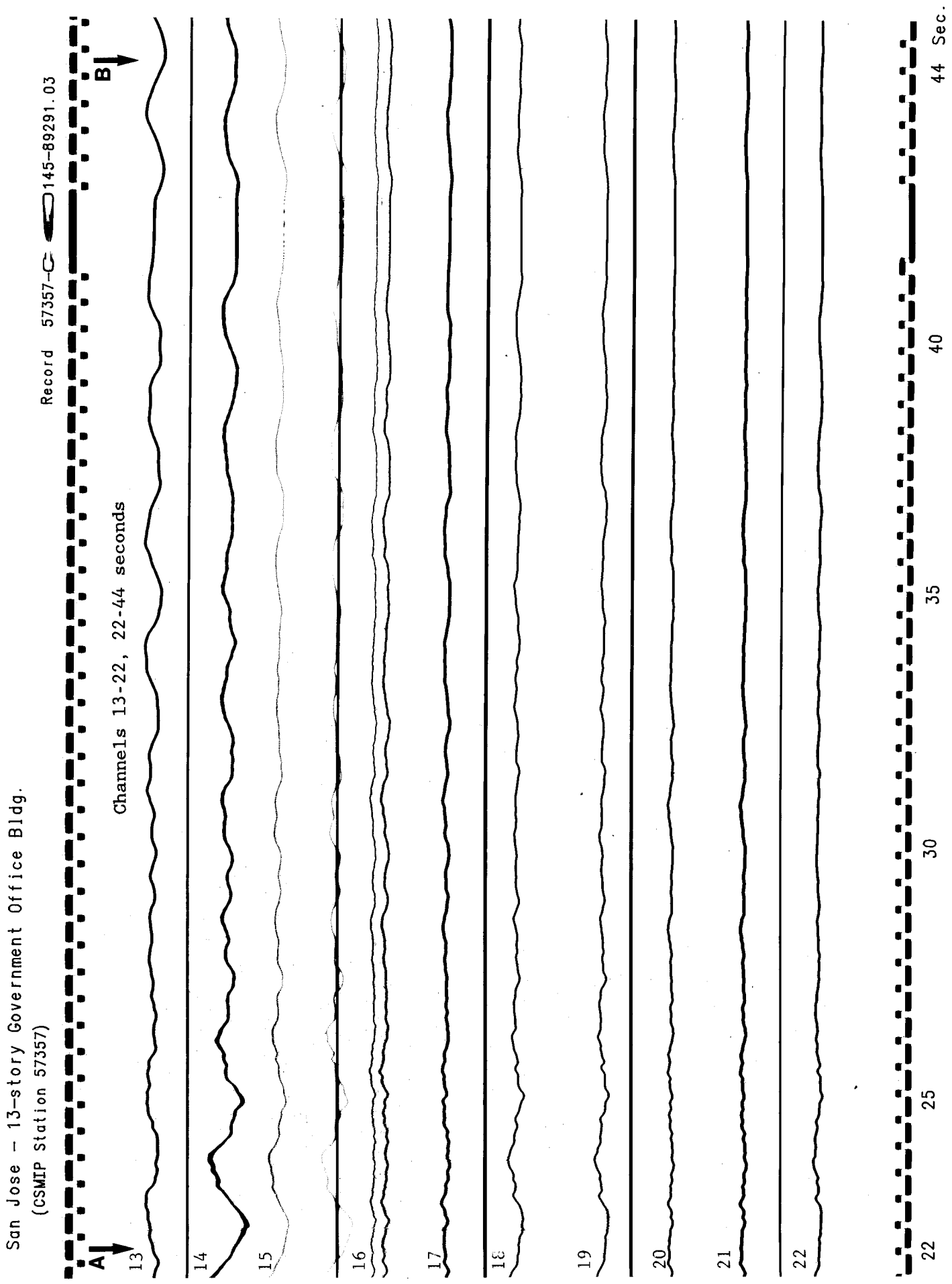
Record 57357-C0145-89291.03



San Jose - 13-story Government Office Bldg.
(CSMIP Station 57357)

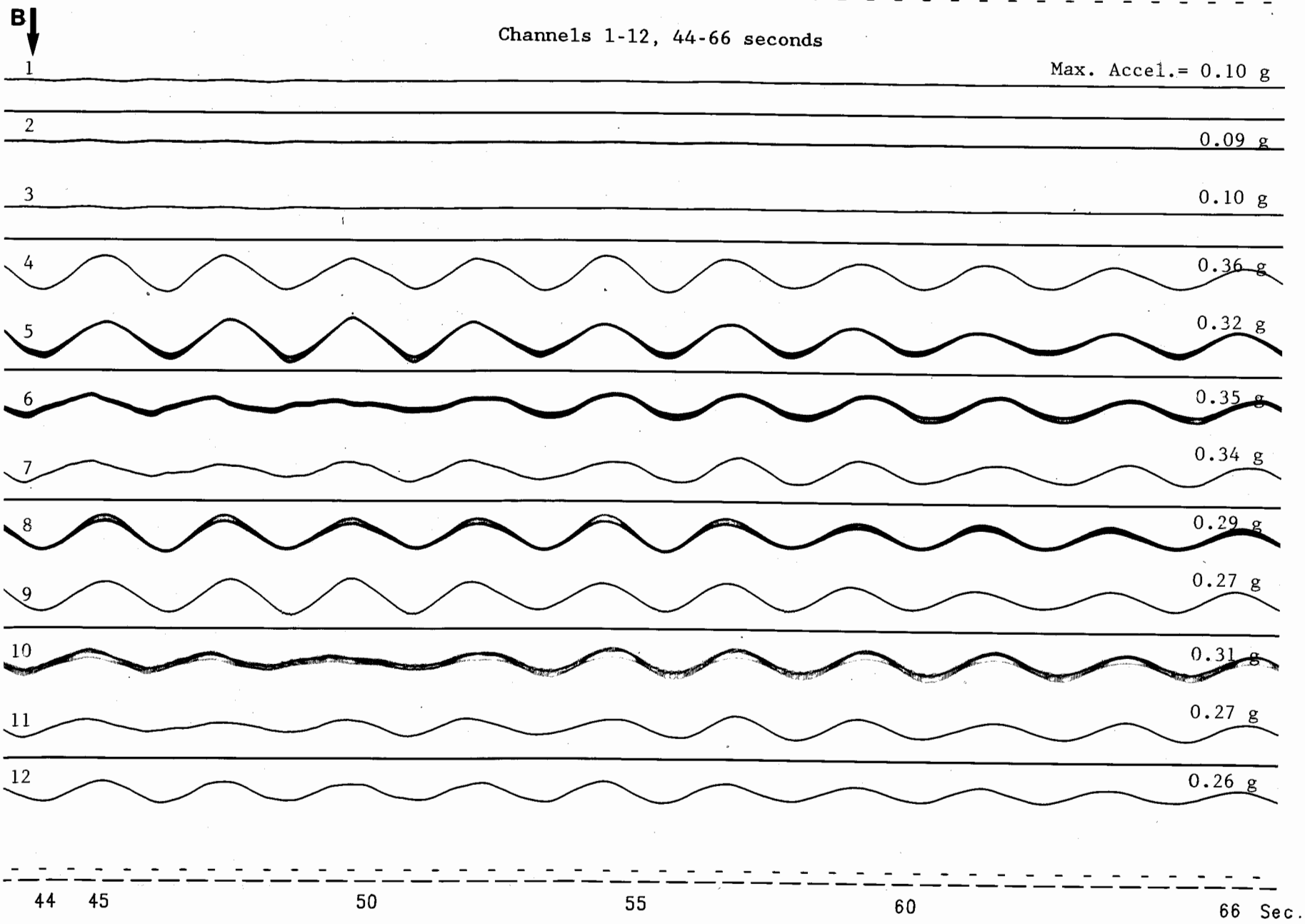
Record 57357-C0185-89291.03




San Jose – 13-story Government Office Bldg.
(CSMIP Station 57357)
Record 57357-C 145-89291.03
Channels 13-22, 22-44 seconds
A
B
13
14
15
16
17
18
19
20
21
22
22
25
30
35
40
44 Sec.

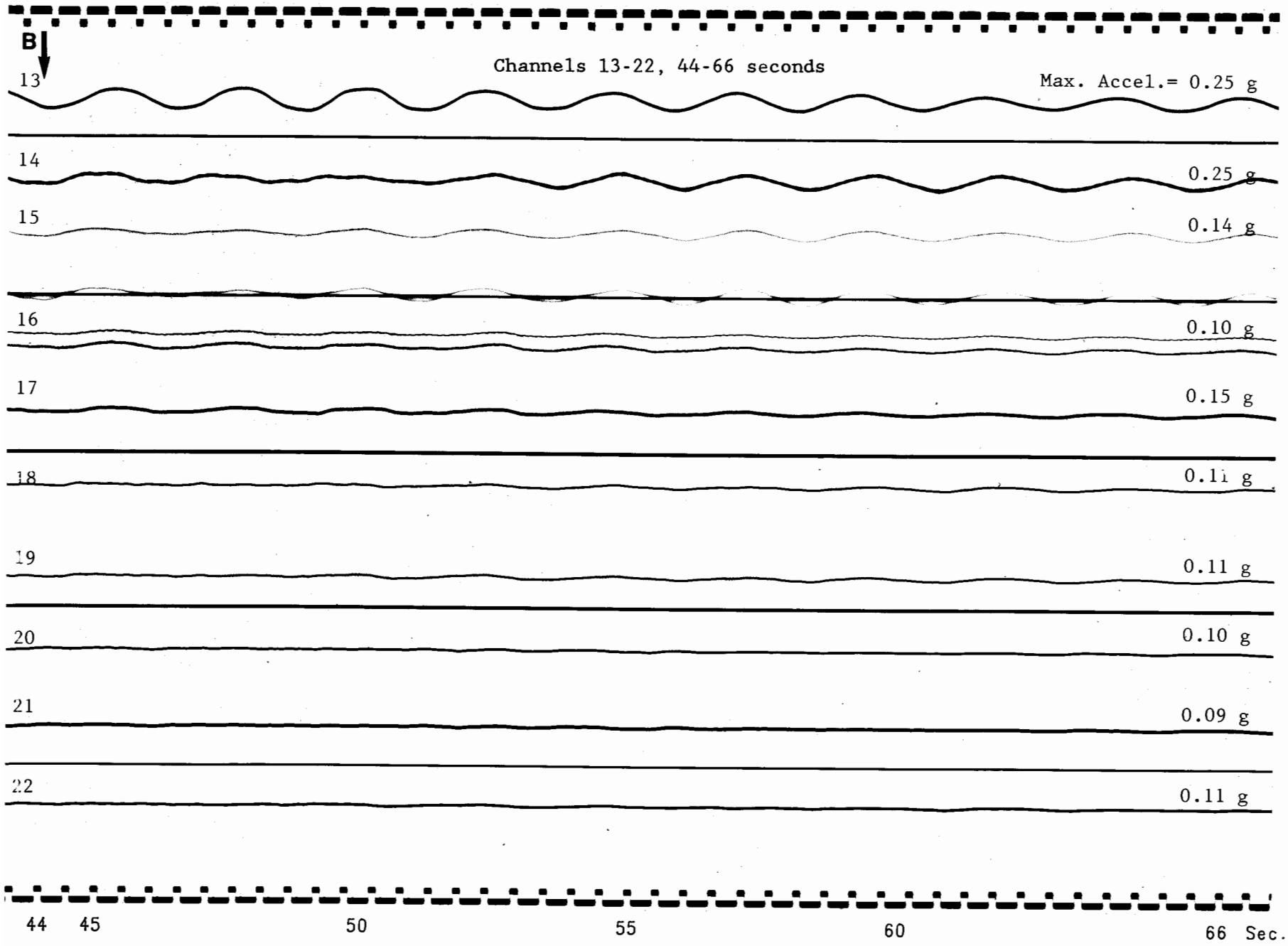
San Jose - 13-story Government Office Bldg.
(CSMIP Station 57357)

Record 57357-C0185-89291.03



San Jose - 13-story Government Office Bldg.
(CSMIP Station 57357)

Record 57357-C0145-89291.03



Palo Alto - 2-story Office Bldg.

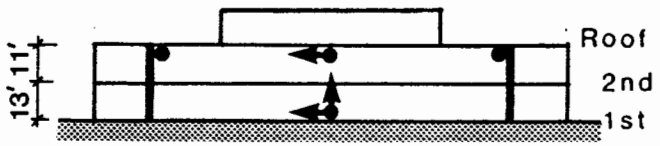
No. of Stories above/below ground: 2/0
Plan Shape: Rectangular
Dimensions: 155' x 83'
Typical Floor Dimensions: Same as base
Design Date: 1973
Construction Date: 1974

Vertical Load Carrying System:
Floor: 1.5" light weight concrete over 3/4" plywood; Roof: plywood over 36" truss joists; interior steel tube columns; exterior glulam columns.
Lateral Force Resisting System:
Two-way grouted brick walls at north and south ends.
Foundation Type:
Spread footings.

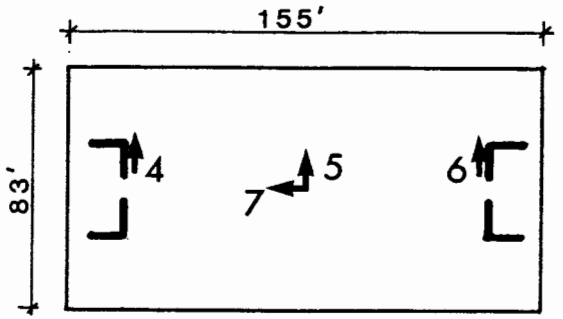
Palo Alto - 2-story Office Bldg.

(CSMIP Station No. 58264)

SENSOR LOCATIONS

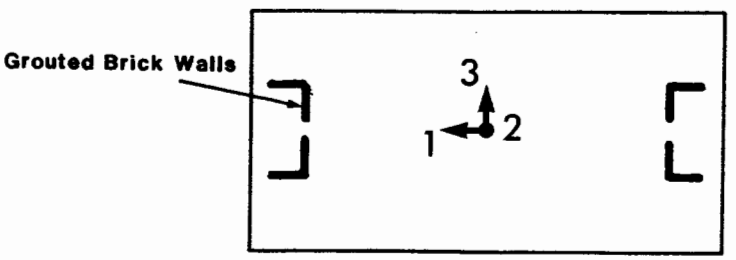


N/S Elevation



Roof Plan

N_{ref}

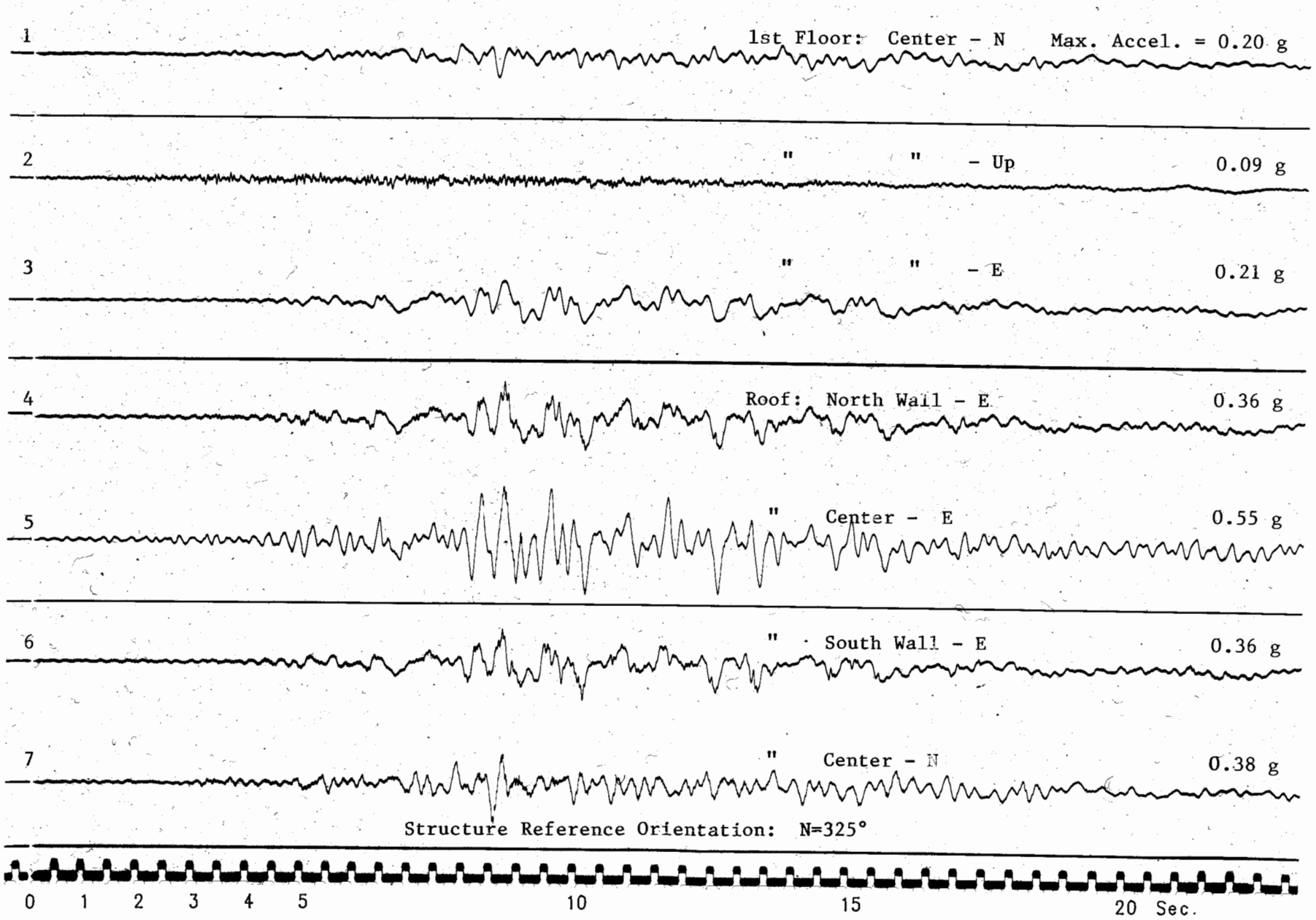


1st Floor Plan

Structure Reference
Orientation: N= 325°

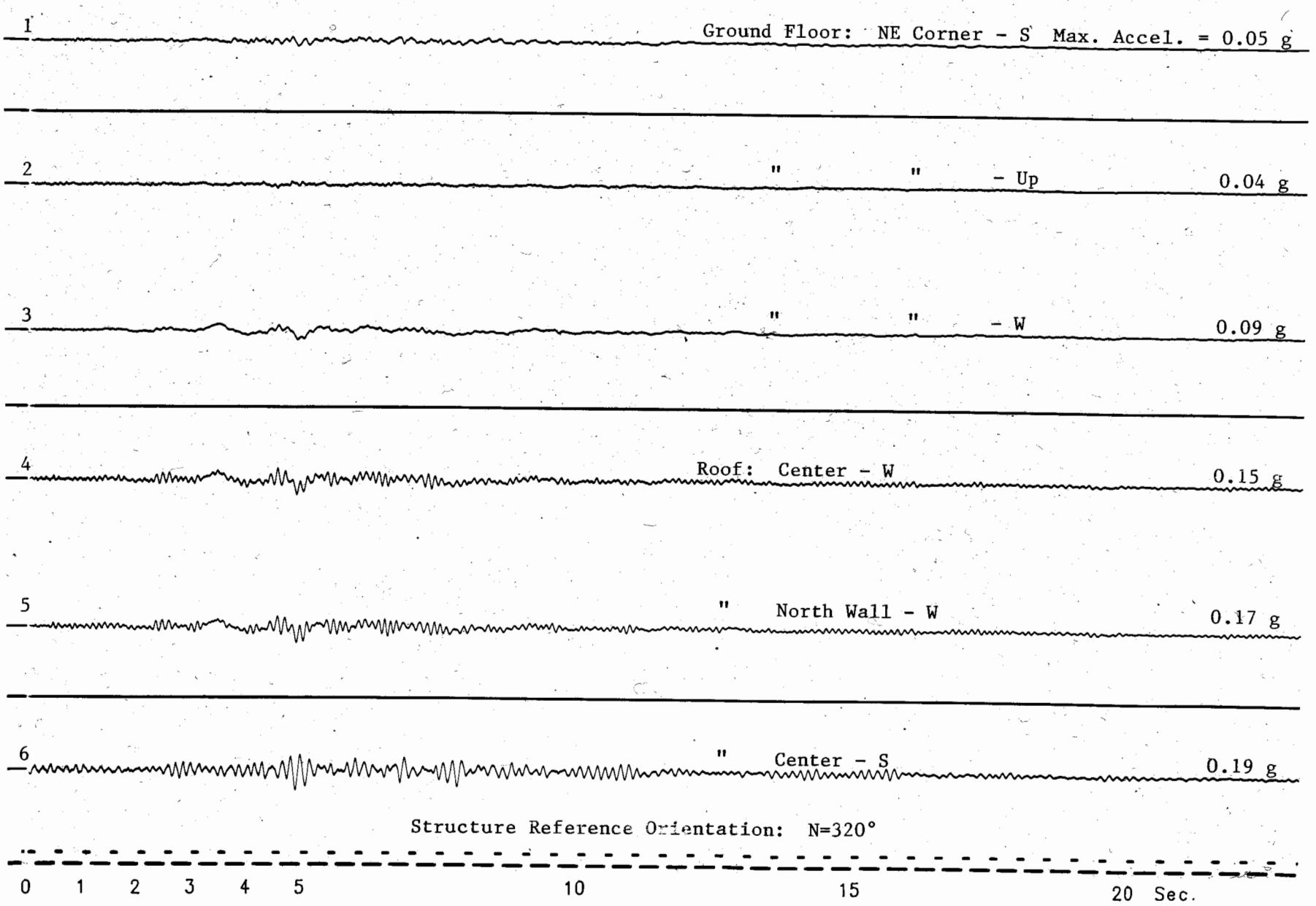
Palo Alto - 2-story Office Bldg.
(CSMIP Station 58264)

Record 58264-C0123-89292.02



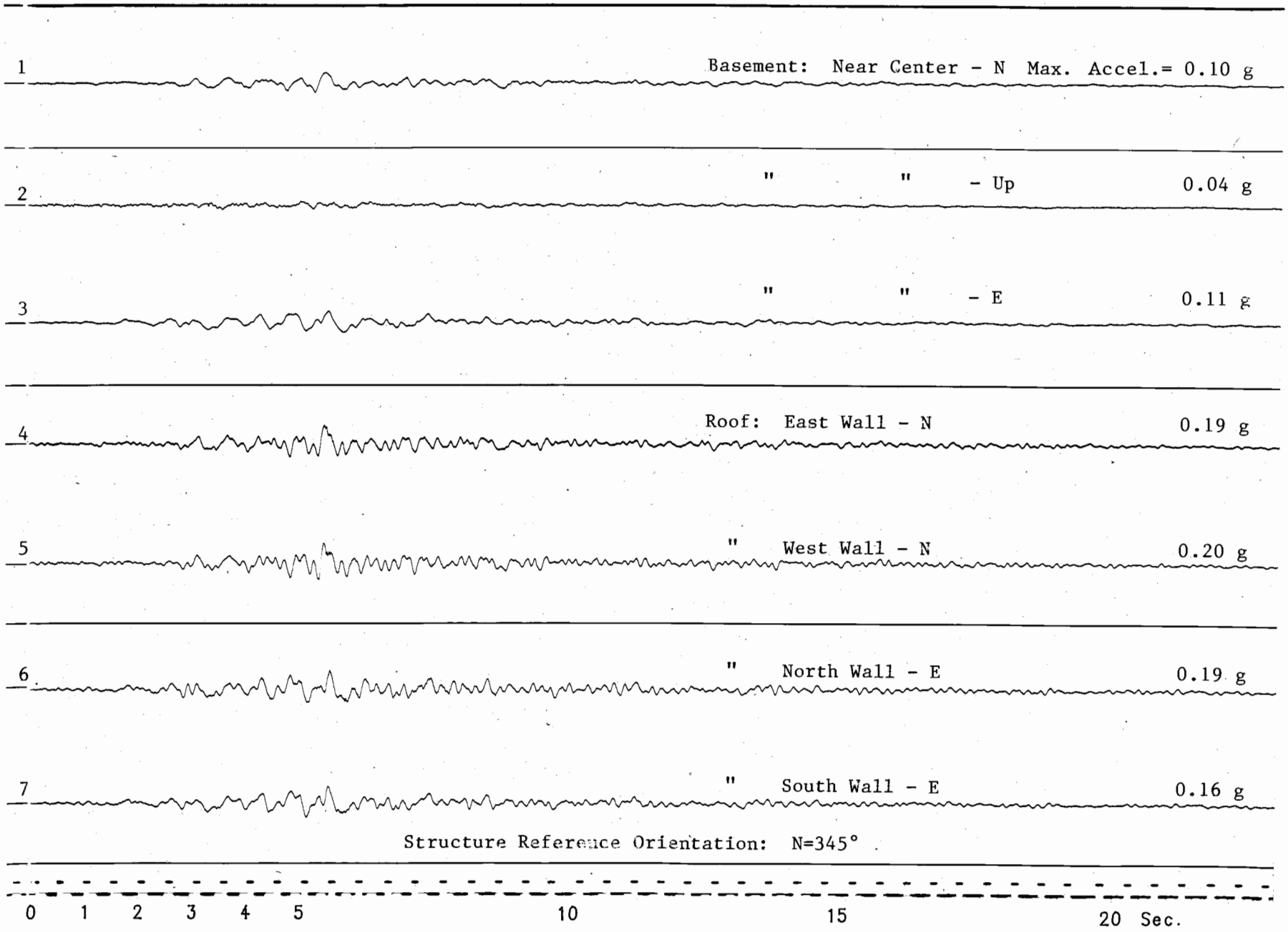
Redwood City - 3-story School Office Bldg. (concrete shear walls)
(CSMIP Station 58263)

Record 58263-C0110-89292.01



Belmont - 2-story Office Bldg. (concrete shear walls)
(CSMIP Station 58262)

Record 58262-CO122-89292.01



San Bruno - 9-story Government Office Bldg.

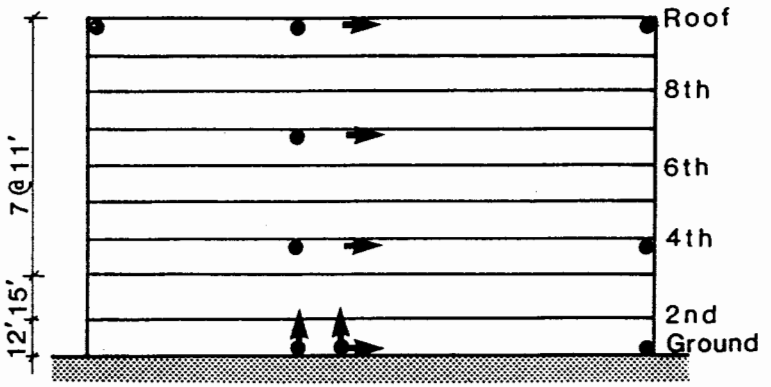
No. of Stories above/below ground: 9/0
Plan Shape: Rectangular
Base Dimensions: 192' x 84'
Typical Floor Dimensions: Same as base
Design Date: 1972
Construction Date: 1972

Vertical Load Carrying System:
8" and 9" post-tensioned light-weight concrete flat slabs; concrete columns.
Lateral Force Resisting System:
Center core concrete shear walls.
Foundation Type:
Mat foundation.

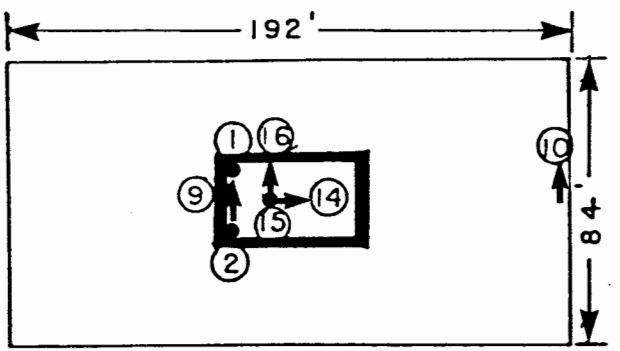
San Bruno - 9-story Government Office Bldg.

(CSMIP Station No. 58394)

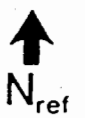
SENSOR LOCATIONS

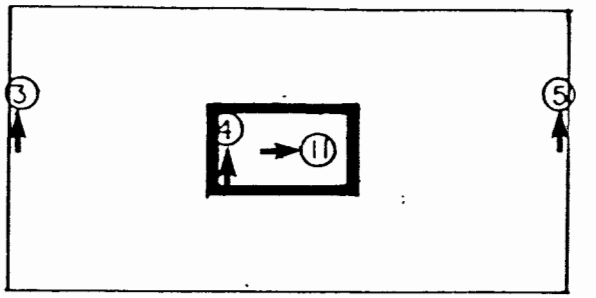


W/E Elevation

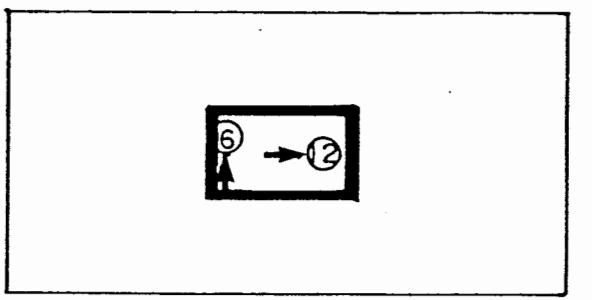


GROUND

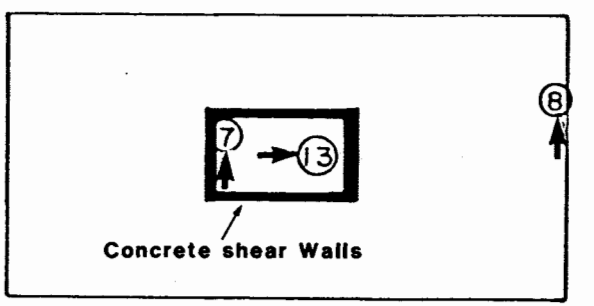




ROOF



7TH FLOOR

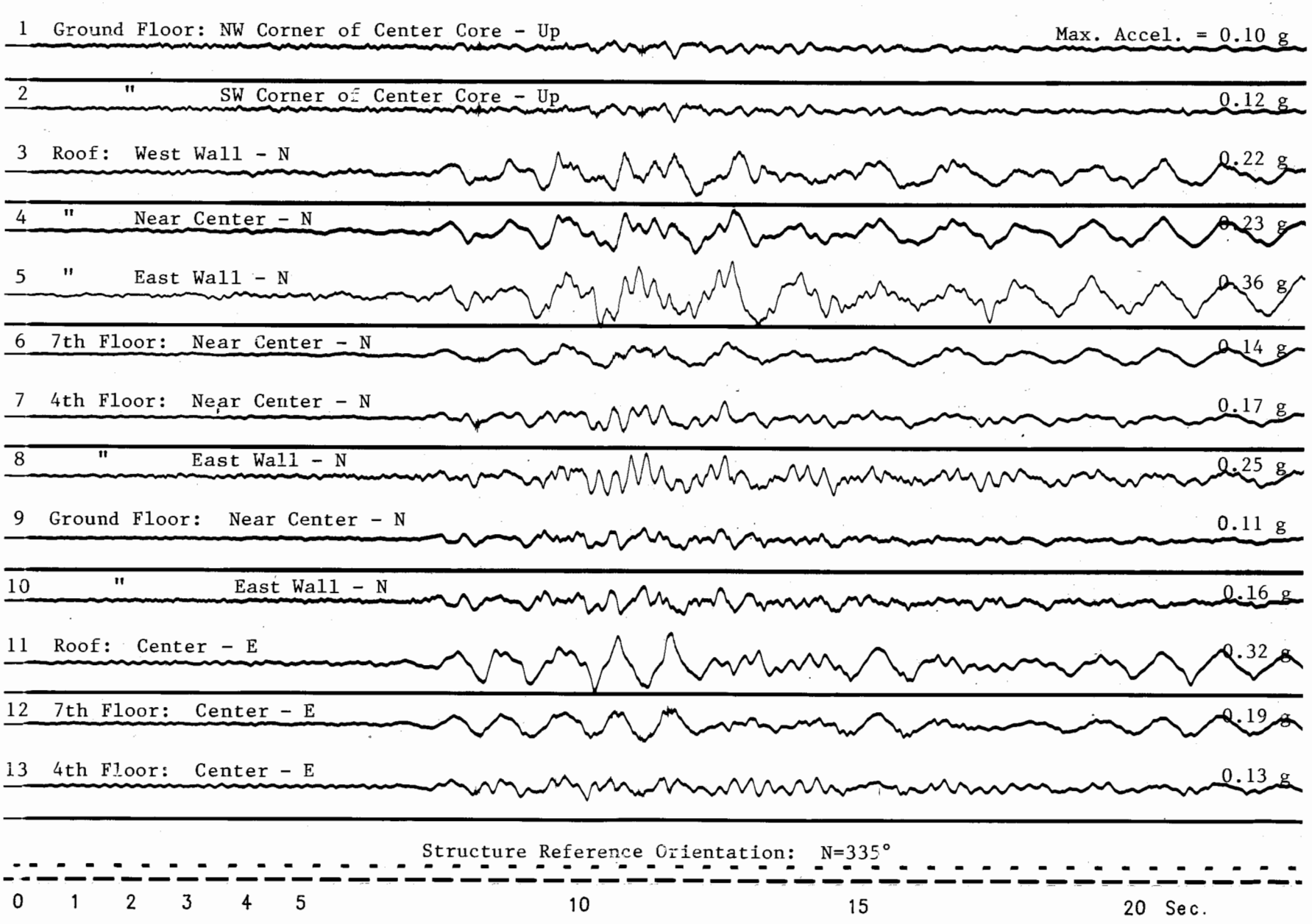


4TH FLOOR

Structure Reference
Orientation: N= 335°

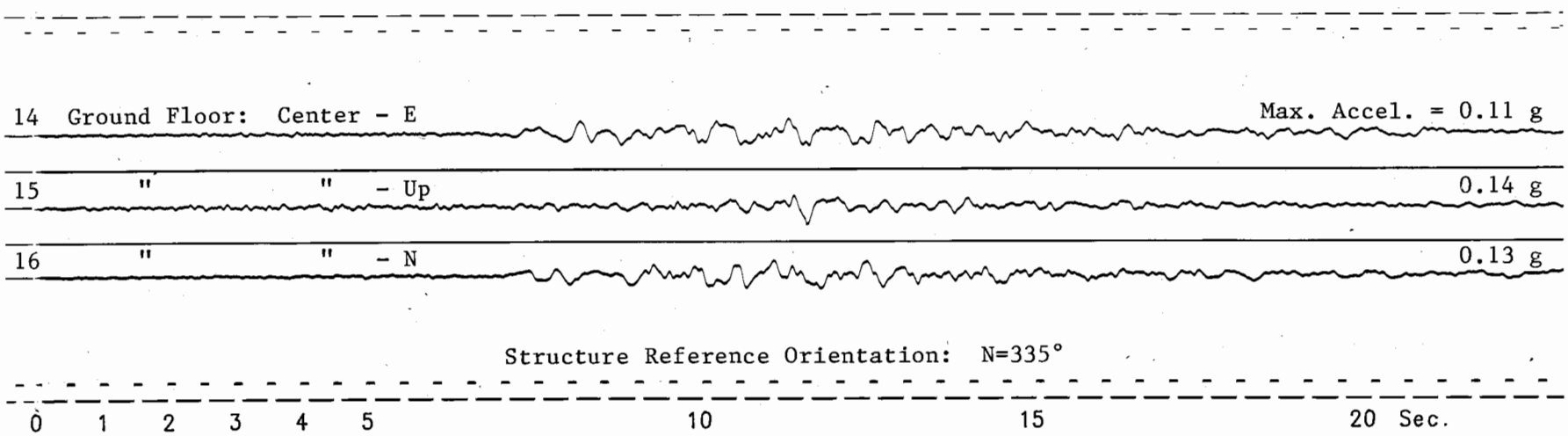
San Bruno - 9-story Government Office Bldg.
(CSMIP Station 58394)

Record 58394-C0216-89293.02



San Bruno – 9-story Government Office Bldg.
(CSMIP Station 58394)

Record 58394-S1220-89293.02



San Bruno - 6-story Office Bldg.

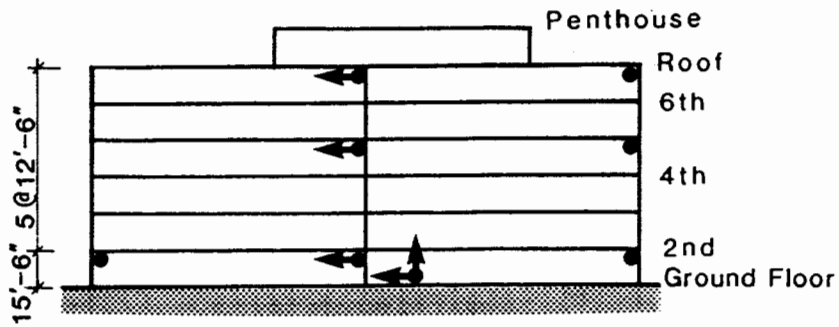
No. of Stories above/below ground: 6/0
Plan Shape: Rectangular
Base Dimensions: 90' x 200'
Typical Floor Dimensions: Same as base
Design Date: 1977
Construction Date: 1978

Vertical Load Carrying System:
Concrete slabs supported by concrete beams and columns.
Lateral Force Resisting System:
Moment-resistant concrete frame (exterior and one interior frame); concrete roof and floor diaphragms.
Foundation Type:
Spread footings.

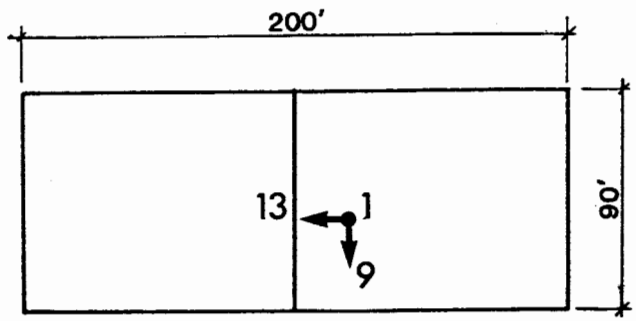
San Bruno - 6-story Office Bldg.

(CSMIP Station No. 58490)

SENSOR LOCATIONS

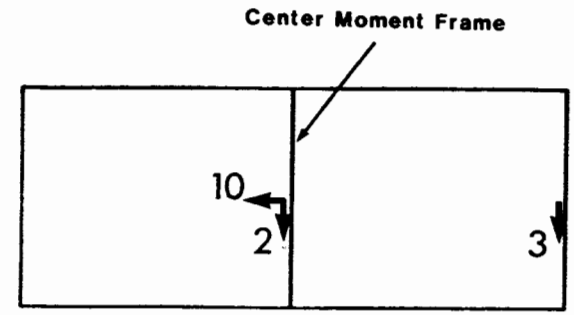


S/N Elevation

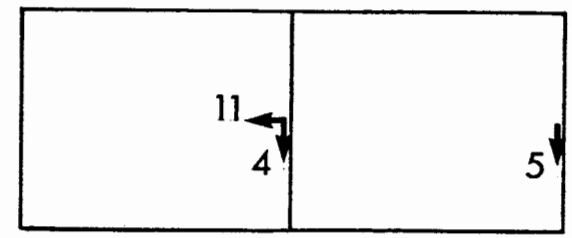


Ground Level Plan

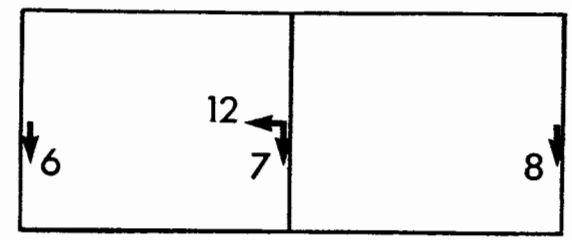
N_{ref}



Roof Plan



5th Floor Plan

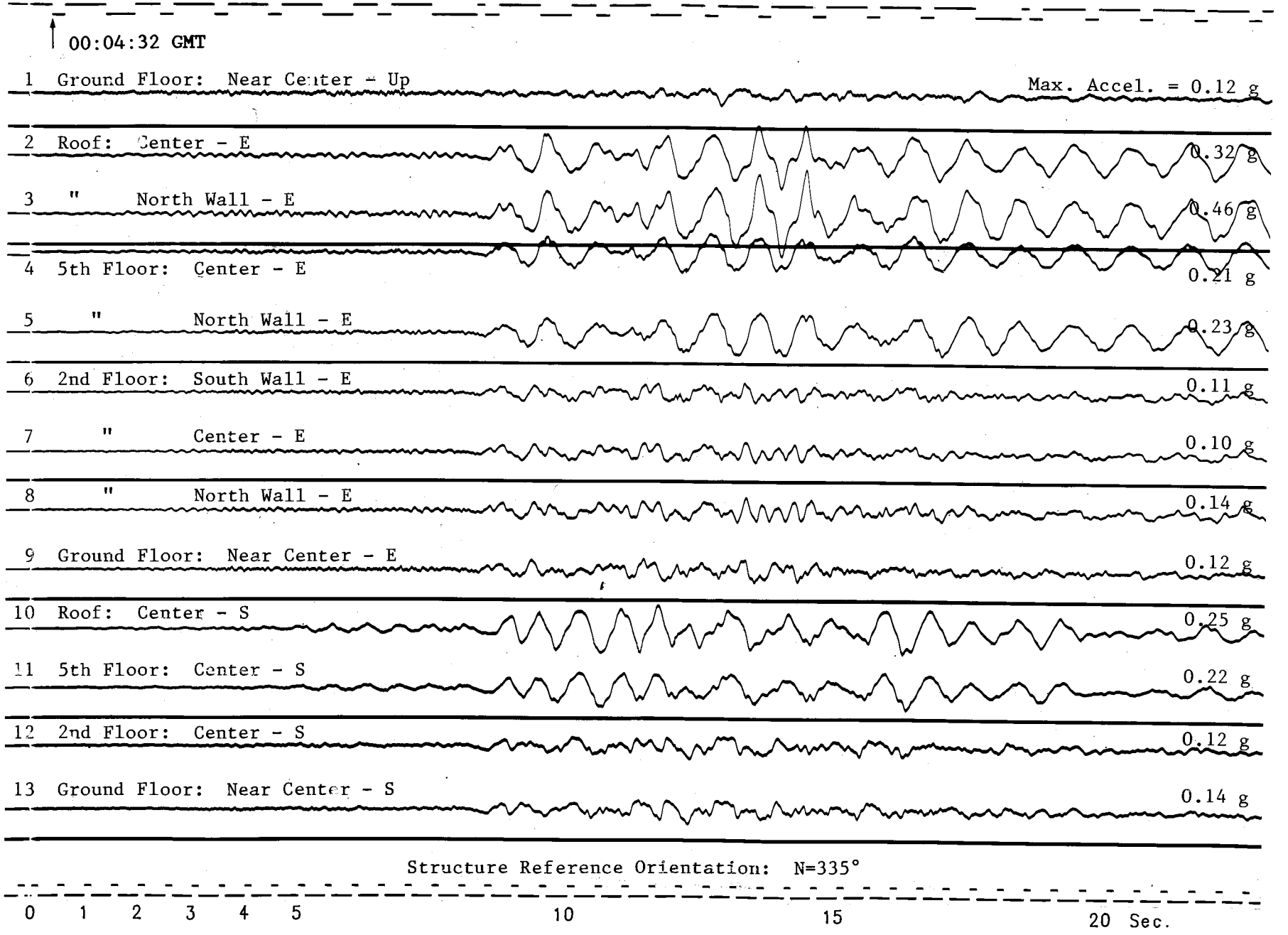


2nd Floor Plan

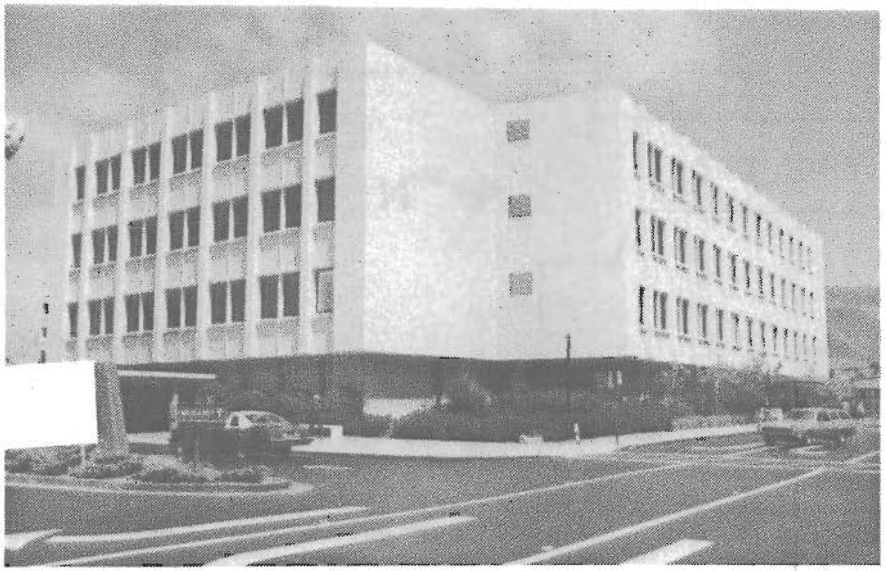
Structure Reference
Orientation: N= 335°

San Bruno - 6-story Office Bldg.
(CSMIP Station 58490)

Record 58490-C0272-89293.02



South San Francisco - 4-story Hospital



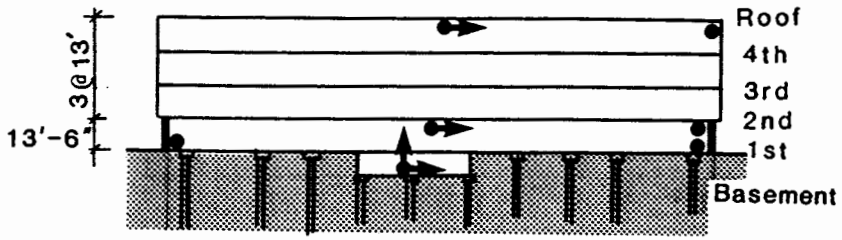
No. of Stories above/below ground: 4/0
Plan Shape: Rectangular
Base Dimensions: 219' x 144'
Typical Floor Dimensions: 219' x 117'
Design Date: 1972
Construction Date: 1973-75

Vertical Load Carrying System:
3.5" light-weight concrete fill over metal deck supported by steel frame.
Lateral Force Resisting System:
Concrete shear walls at first floor; moment-resistant steel frame.
Foundation Type:
Piles (50-70' deep); 8" concrete slab on grade.

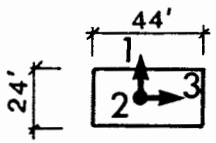
So. San Francisco - 4-story Hospital

(CSMIP Station No. 58261)

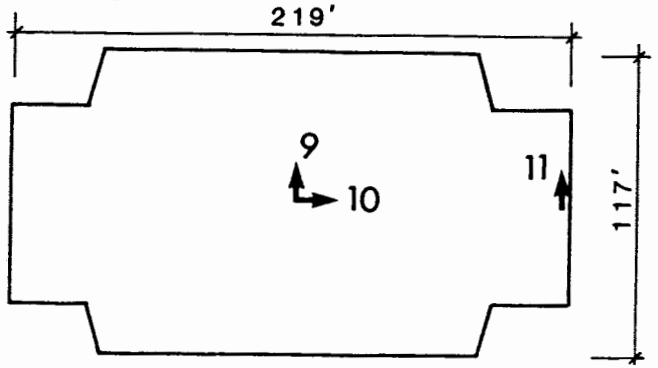
SENSOR LOCATIONS



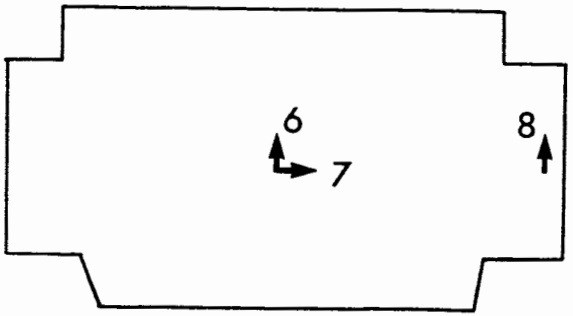
S/N Elevation



Basement Plan

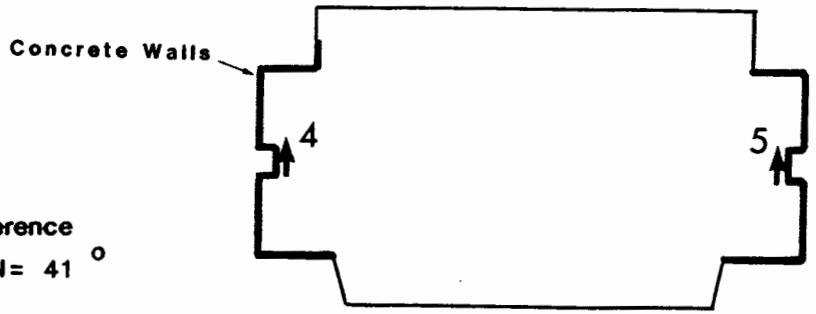


Roof Plan



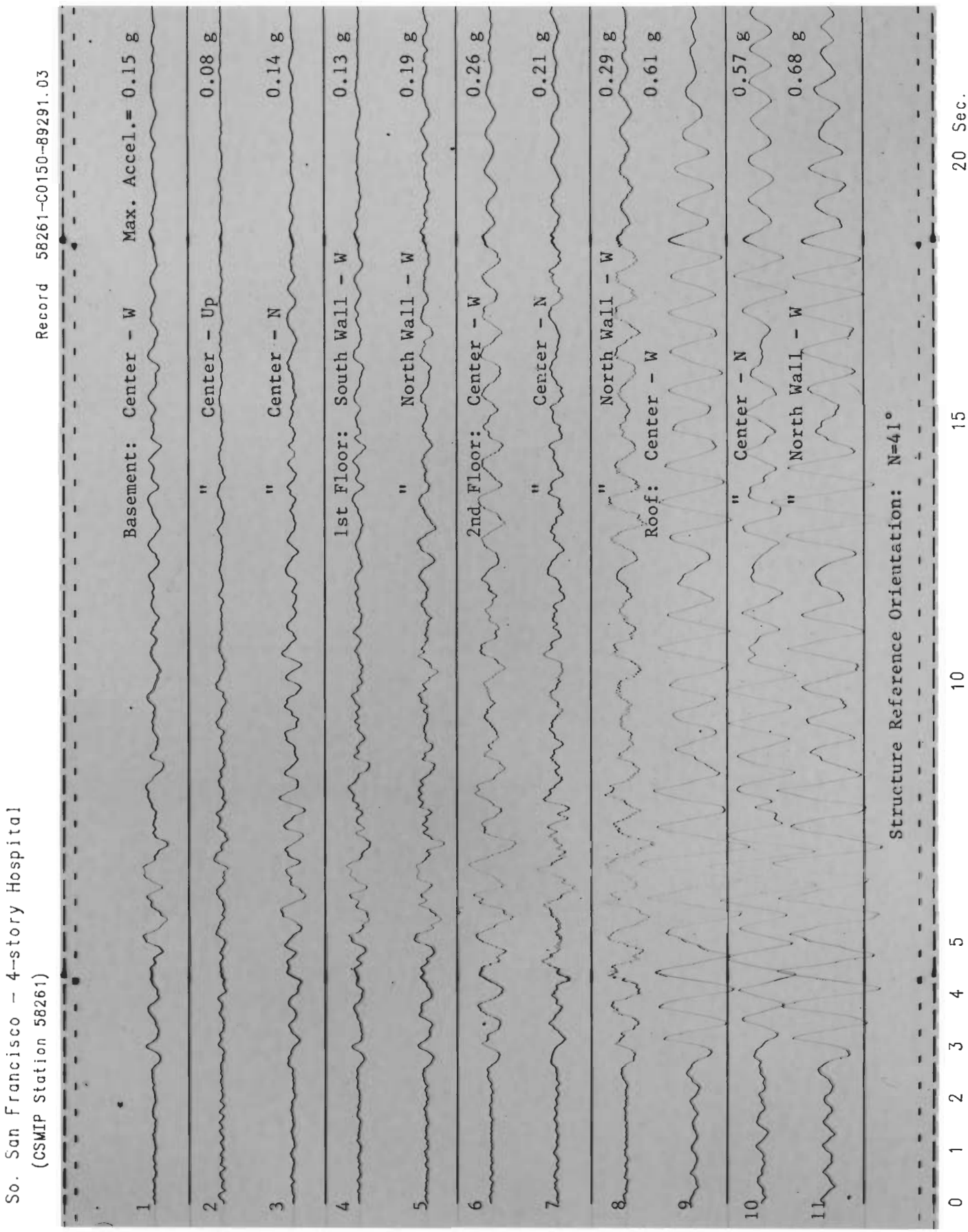
2nd Floor Plan

N_{ref}



1st Floor Plan

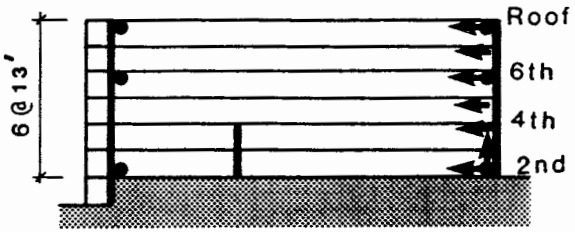
Structure Reference
Orientation: N= 41 °


So. San Francisco – 4-story Hospital
(CSMIP Station 58261)
Record 58261-C0150-89291.03
Basement: Center – W Max. Accel.= 0.15 g
" Center – Up 0.08 g
" Center – N 0.14 g
1st Floor: South Wall – W 0.13 g
" North Wall – W 0.19 g
2nd Floor: Center – W 0.26 g
" Center – N 0.21 g
" North Wall – W 0.29 g
Roof: Center – W 0.61 g
" Center – N 0.57 g
" North Wall – W 0.68 g
Structure Reference Orientation: N=41°
0 1 2 3 4 5 10 15 20 Sec.

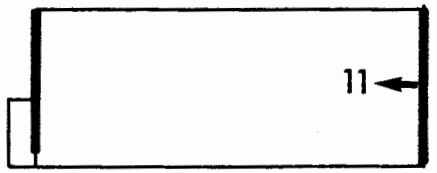
San Francisco - 6-story School Bldg.

(CSMIP Station No. 58479)

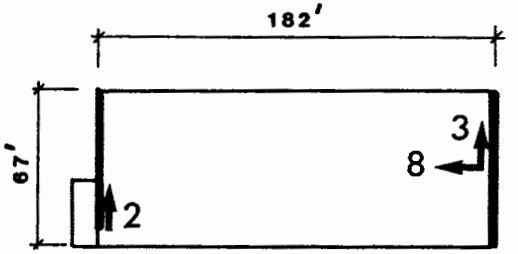
SENSOR LOCATIONS



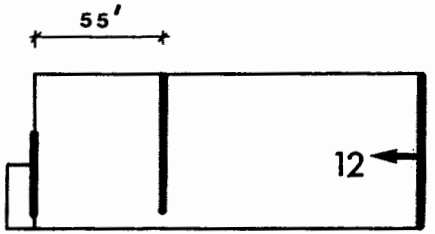
N/S Elevation



5th Floor Plan

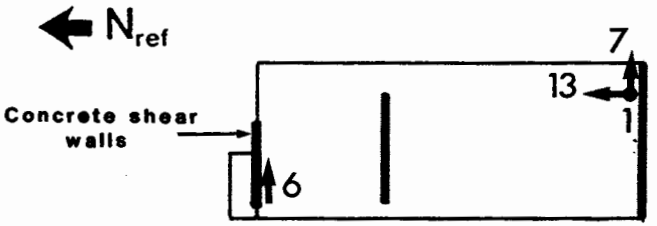


Roof Plan

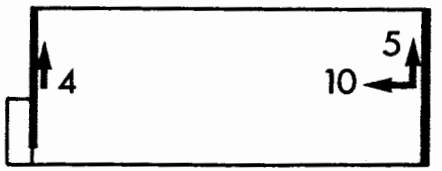


4th Floor Plan

7th Floor Plan



2nd Floor Plan

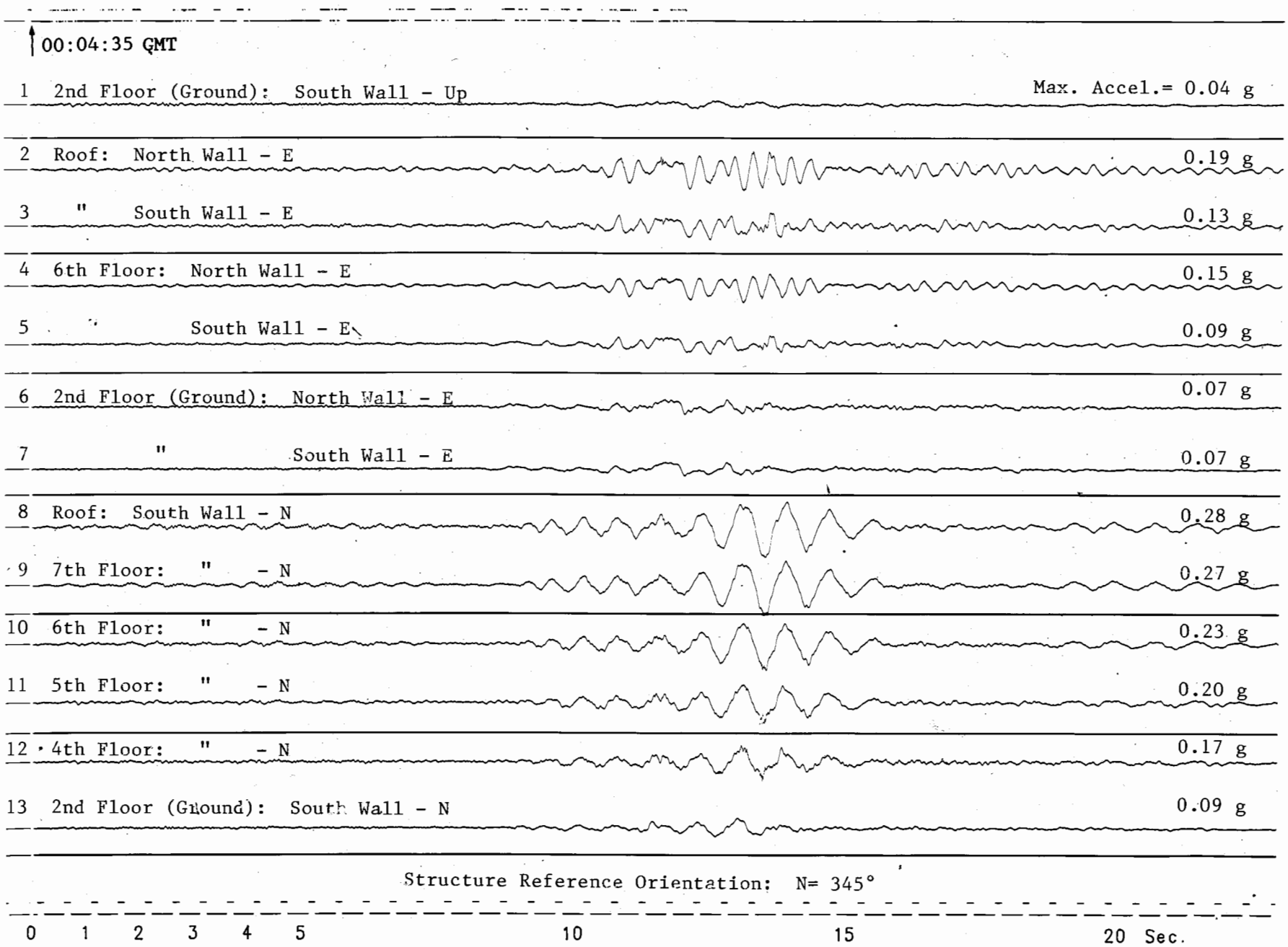


6th Floor Plan

Structure Reference
Orientation: N= 345°

San Francisco - 6-story School Bldg.
(CSMIP Station 58479)

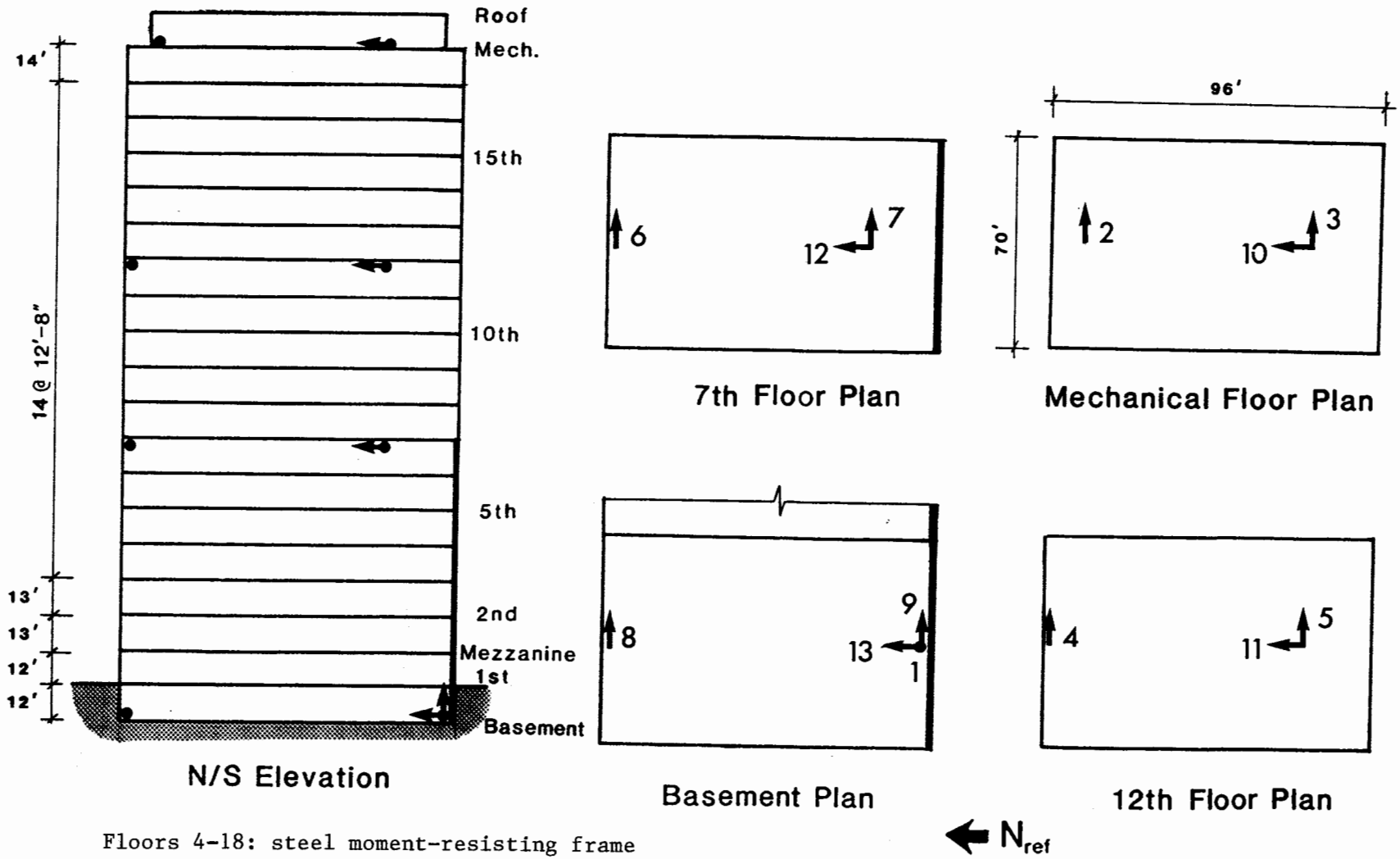
Record 58479-C0242-89294.01



San Francisco - 18-story Commercial Bldg.

(CSMIP Station No.58480)

SENSOR LOCATIONS

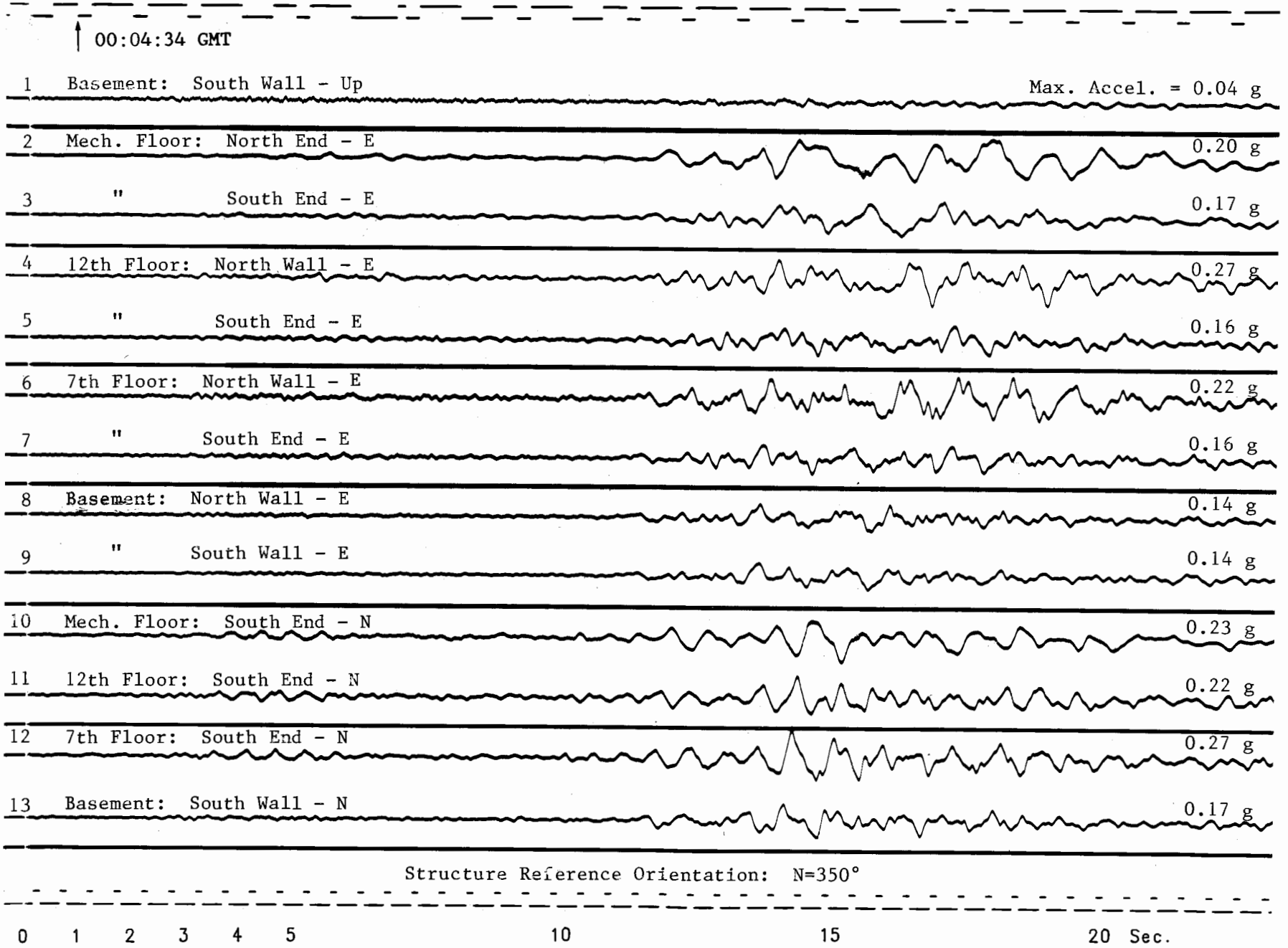


Floors 4-18: steel moment-resisting frame
Floors 1-3: concrete shear walls
Design Date: 1964

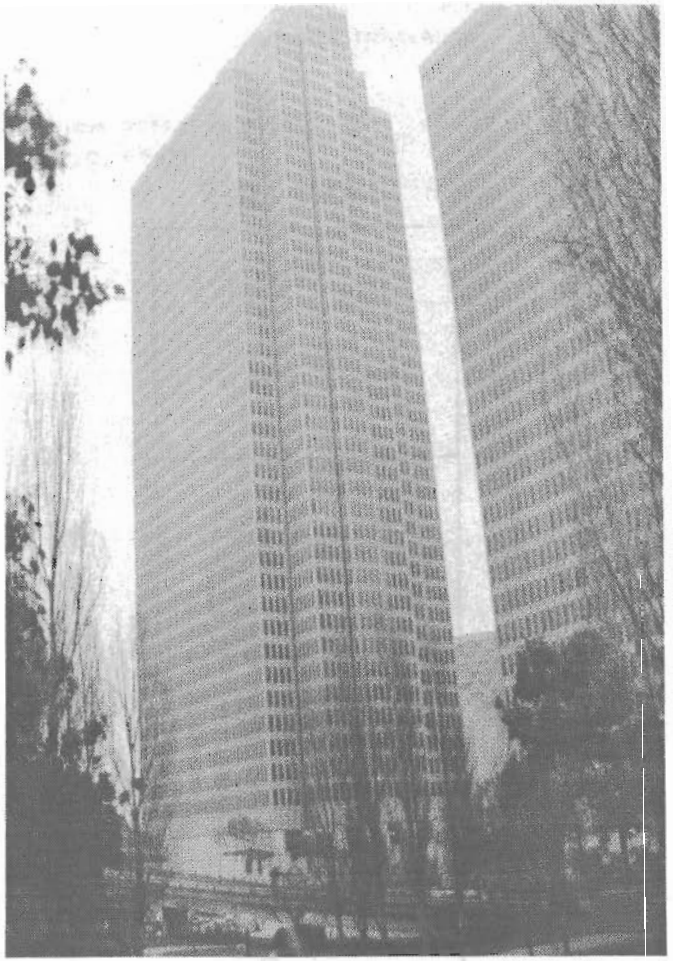
Structure Reference
Orientation: N= 350°

San Francisco - 18-story Commercial Bldg.
(CSMIP Station 58480)

Record 58480-C0243-89296.01



San Francisco - 47-story Office Bldg.



No. of Stories above/below ground: 47/2
Plan Shape: Rectangular
Base Dimensions: 300' x 210'
Typical Floor Dimensions: 180' x 122'
Design Date: 1978
Construction Date: 1978-79

Note: There is a 3-story concrete building adjacent to the high-rise tower and both are separated by a 2" seismic joint.

Vertical Load Carrying System:
2.5" concrete over 3" metal decking supported by steel frames.

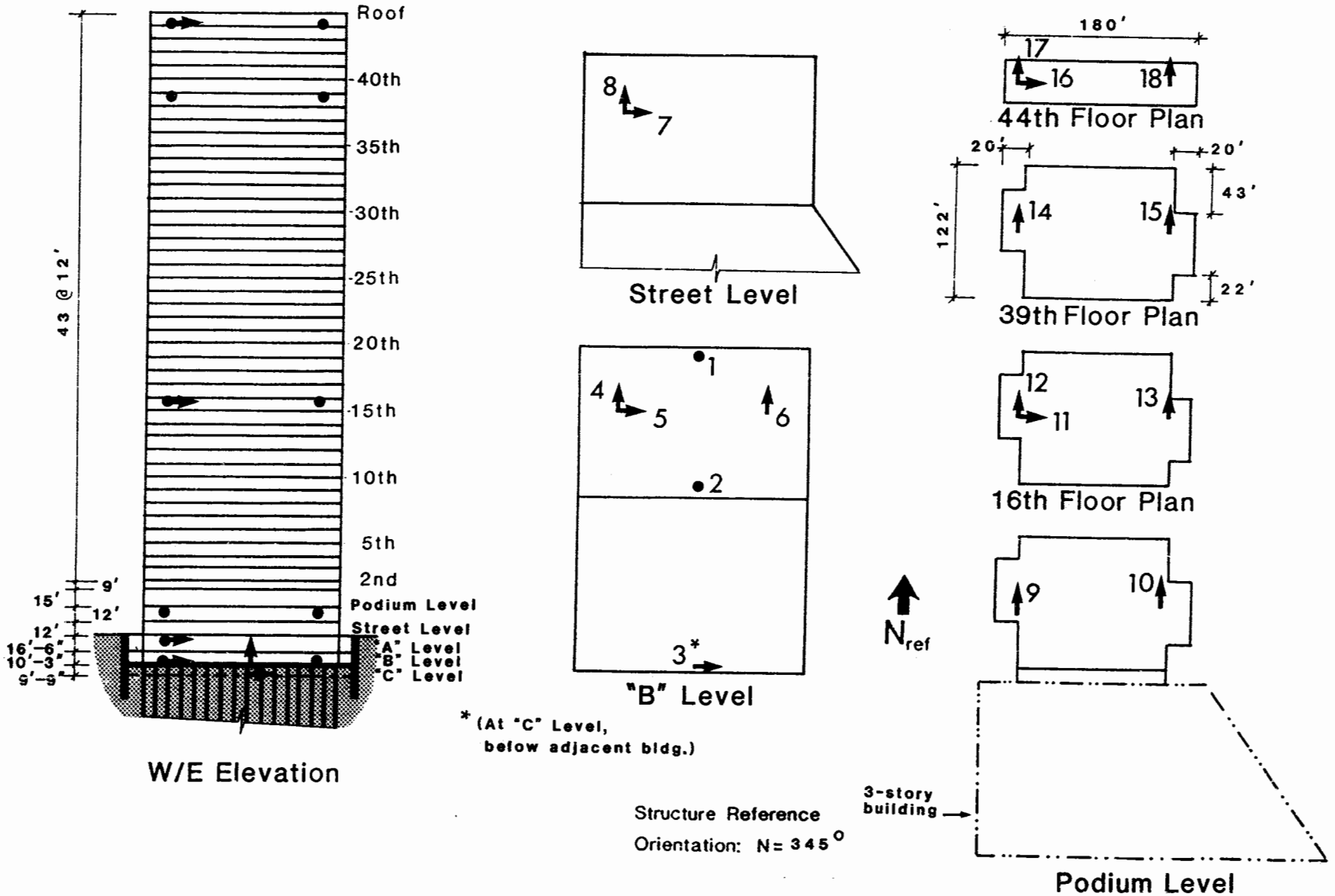
Lateral Force Resisting System:
Moment-resisting steel frames in both directions; the frame is eccentrically braced at two center bays in the transverse direction.

Foundation Type:
5' reinforced concrete mat supported by composite concrete and steel piles (150 - 200' long)

San Francisco - 47-story Office Bldg.

(CSMIP Station No. 58532)

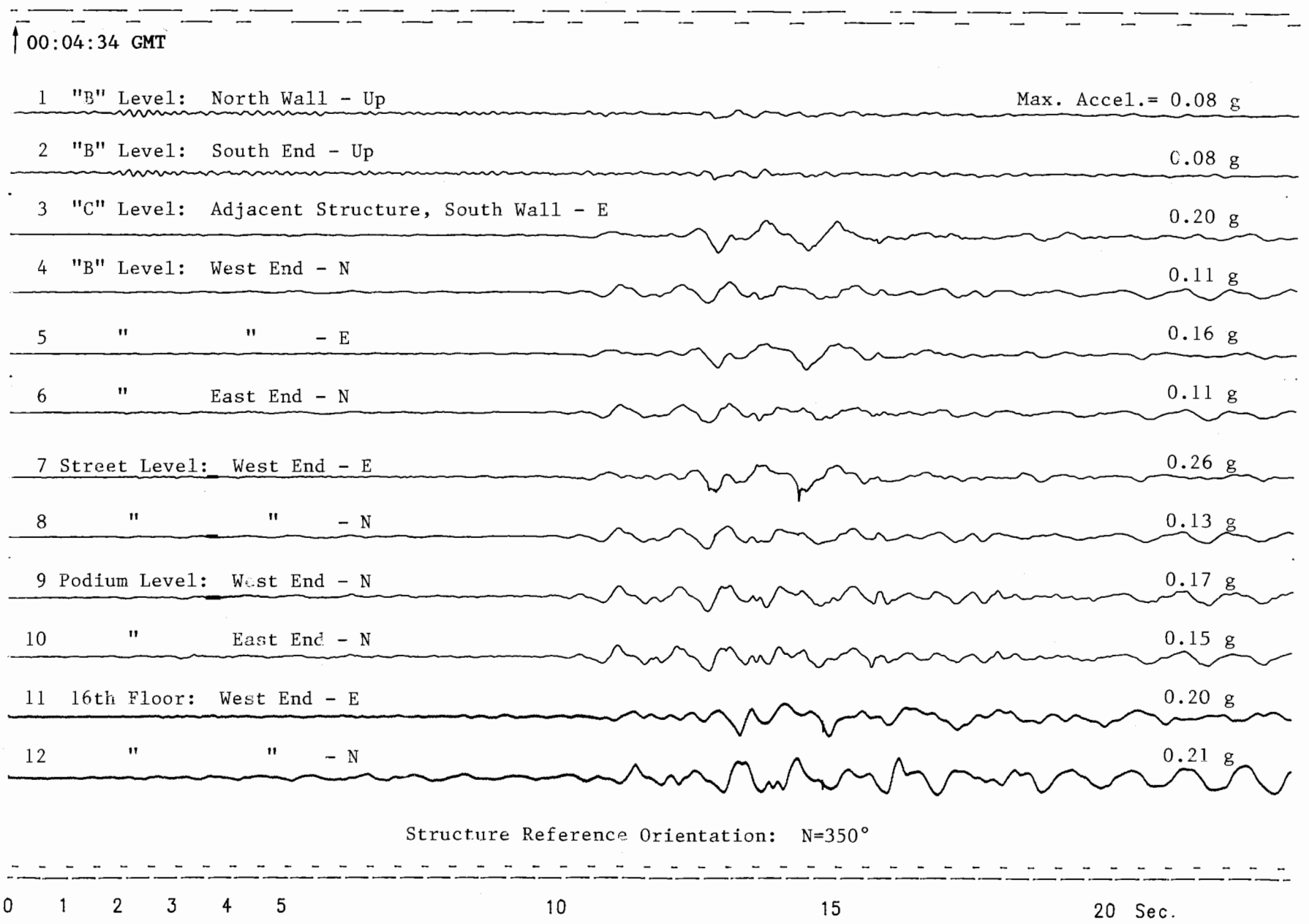
SENSOR LOCATIONS



Structure Reference Orientation: N = 345°

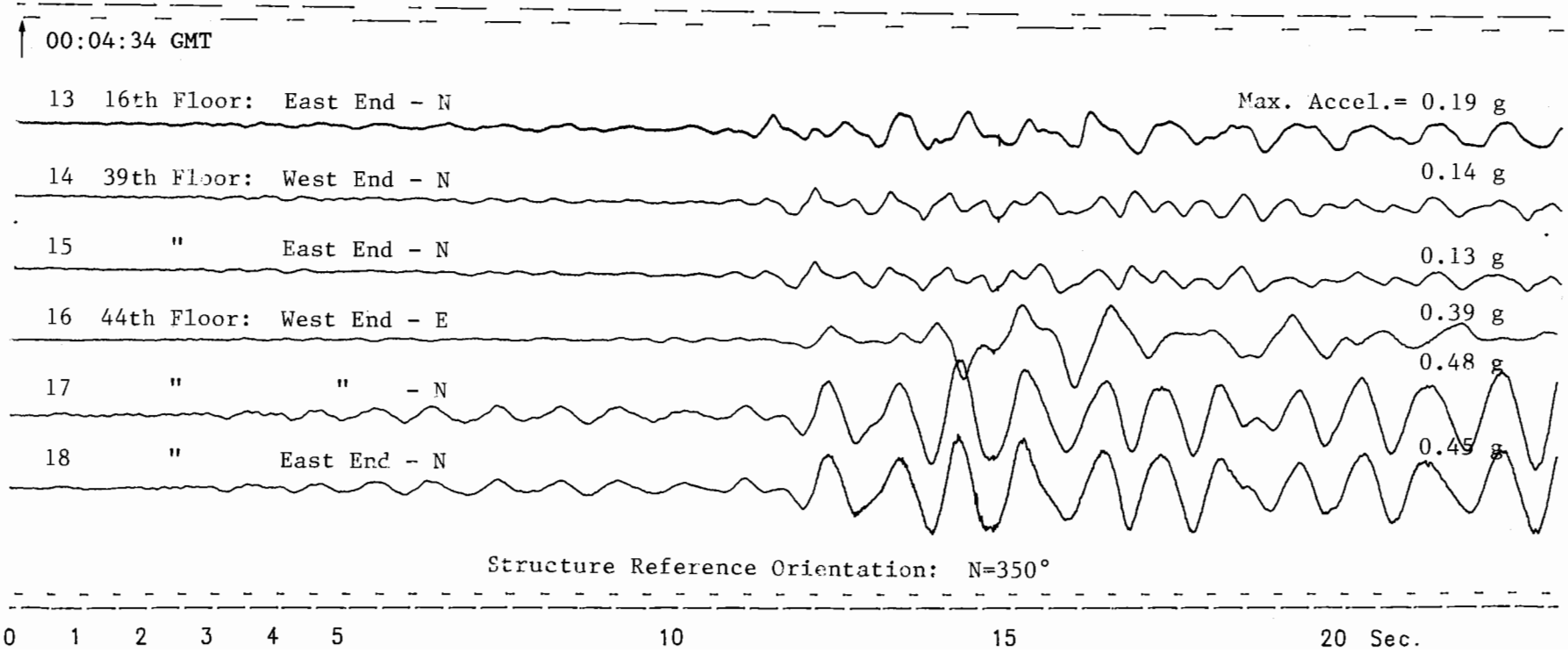
San Francisco - 47-story Office Bldg.
(CSMIP Station 58532)

Record 58532-CD103-89293.02



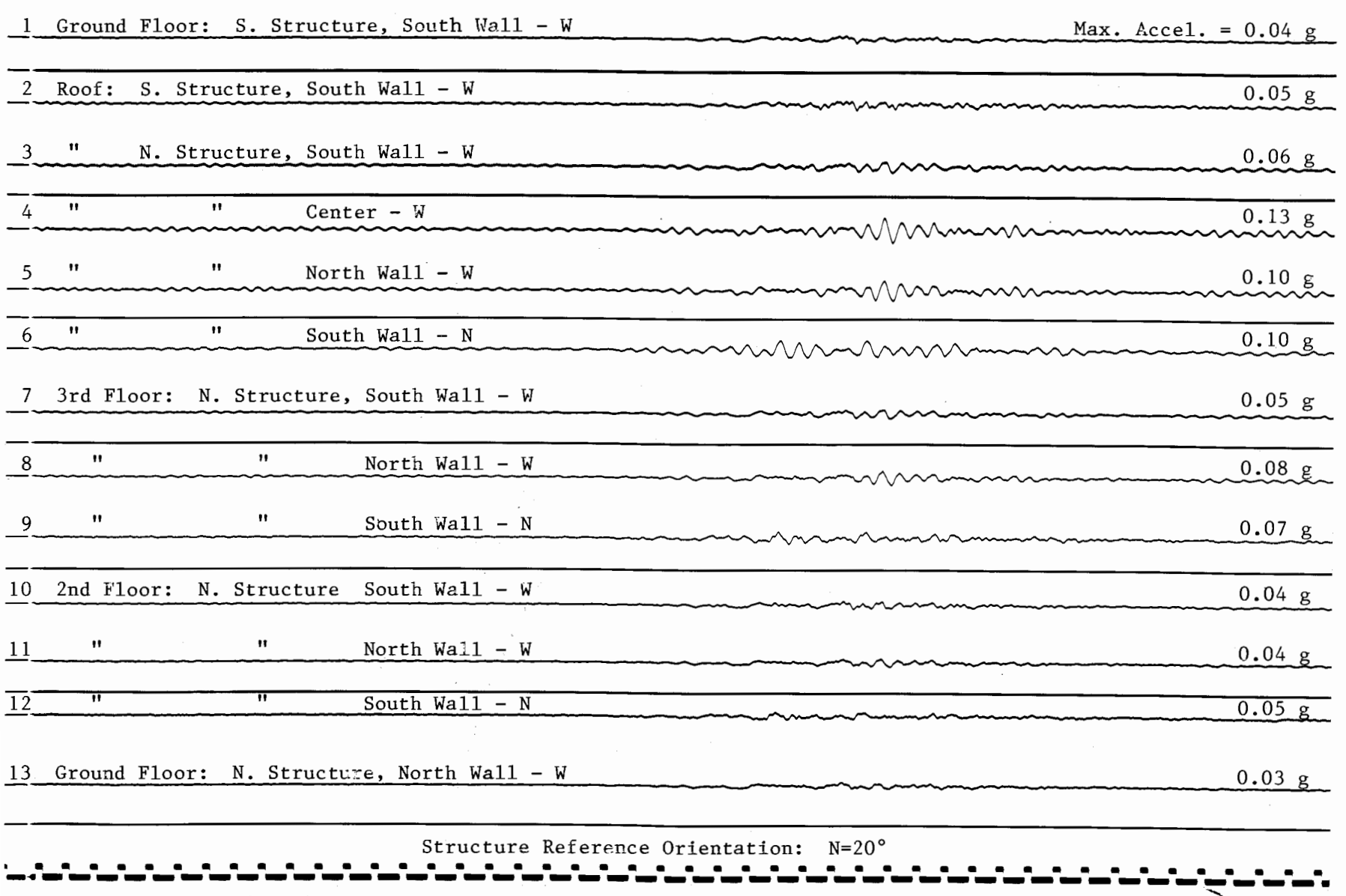
San Francisco – 47-story Office Bldg.
(CSMIP Station 58532)

Record 58532-CD103-89293.02



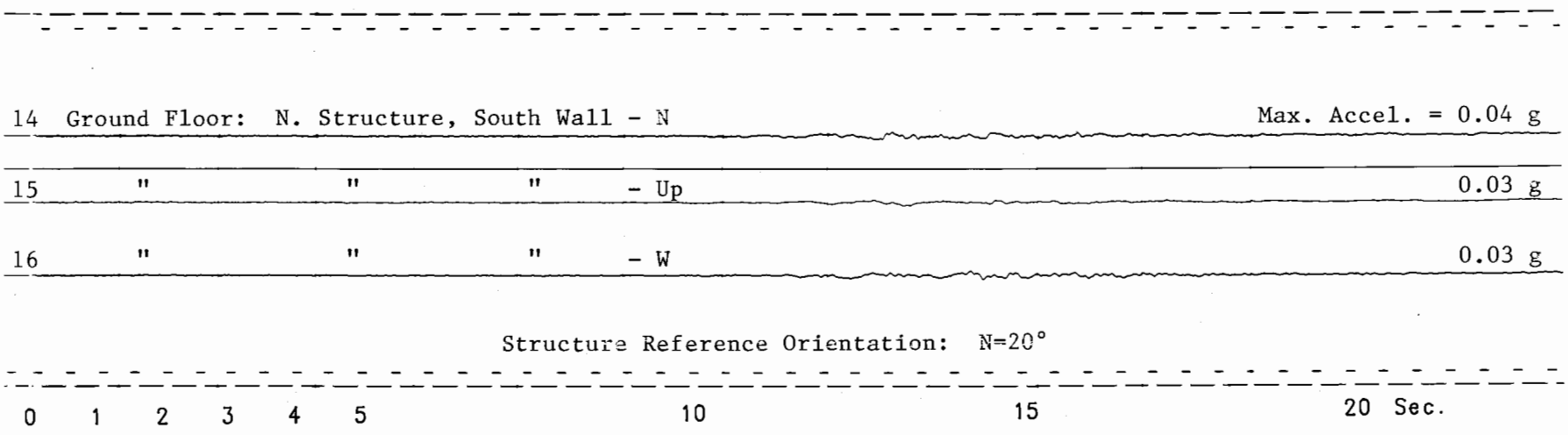
San Rafael - 3-story Office Bldg. (concrete shear wall and steel frame)
(CSMIP Station 68341)

Record 68341-C0141-89297.01



San Rafael - 3-story Office Bldg.
(CSMIP Station 68341)

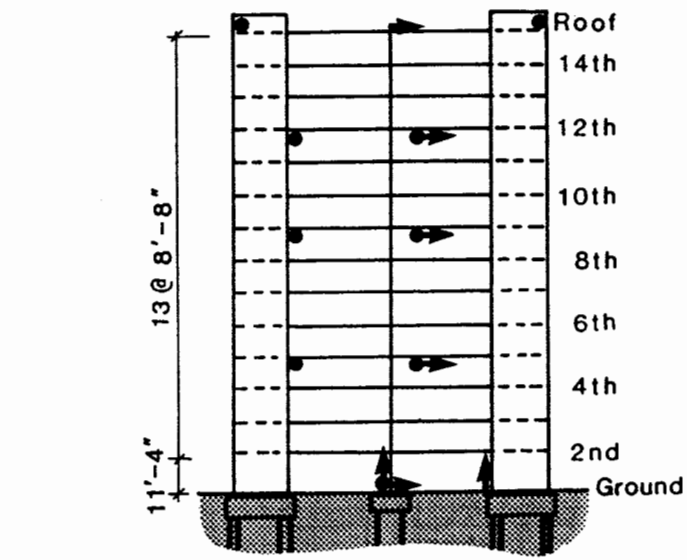
Record 68341-S2793-89297.01



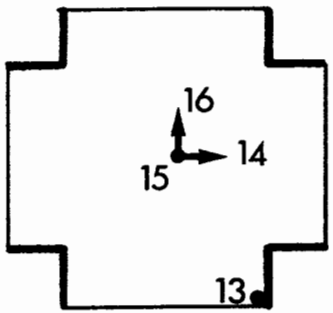
Santa Rosa - 14-story Residential Bldg.

(CSMIP Station No. 68489)

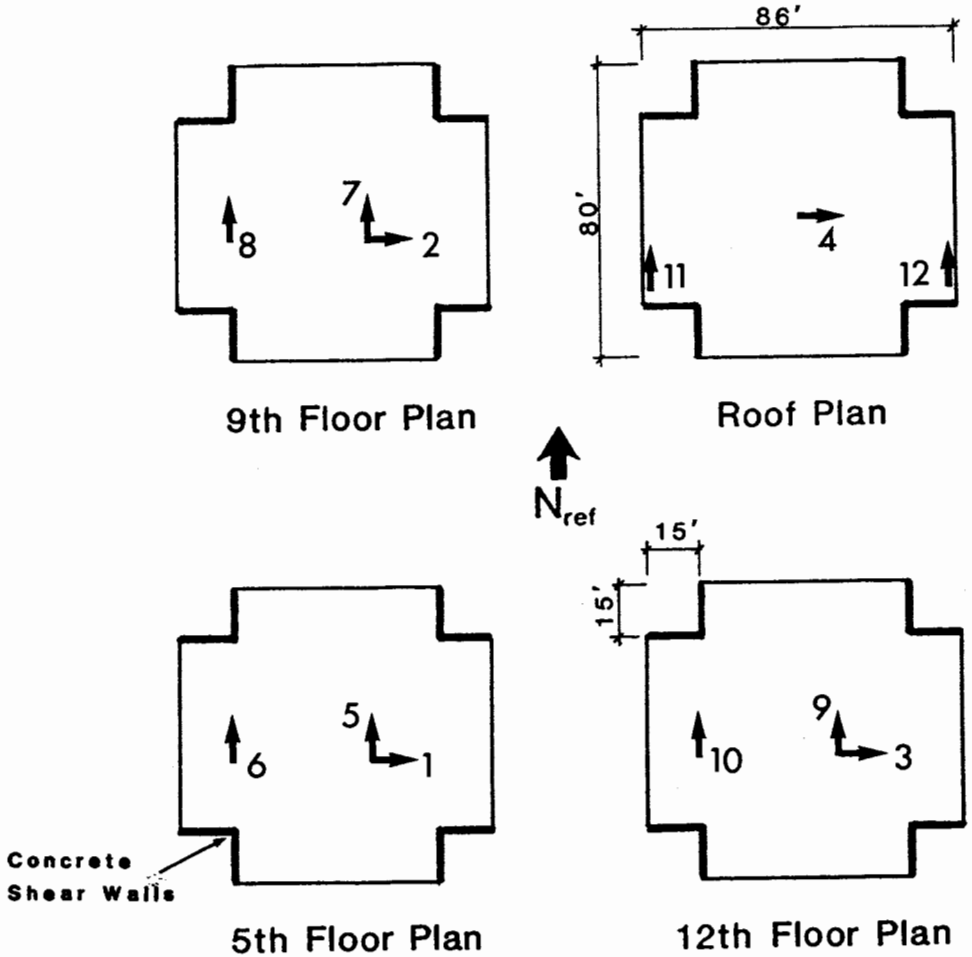
SENSOR LOCATIONS



W/E Elevation



Ground Level Plan

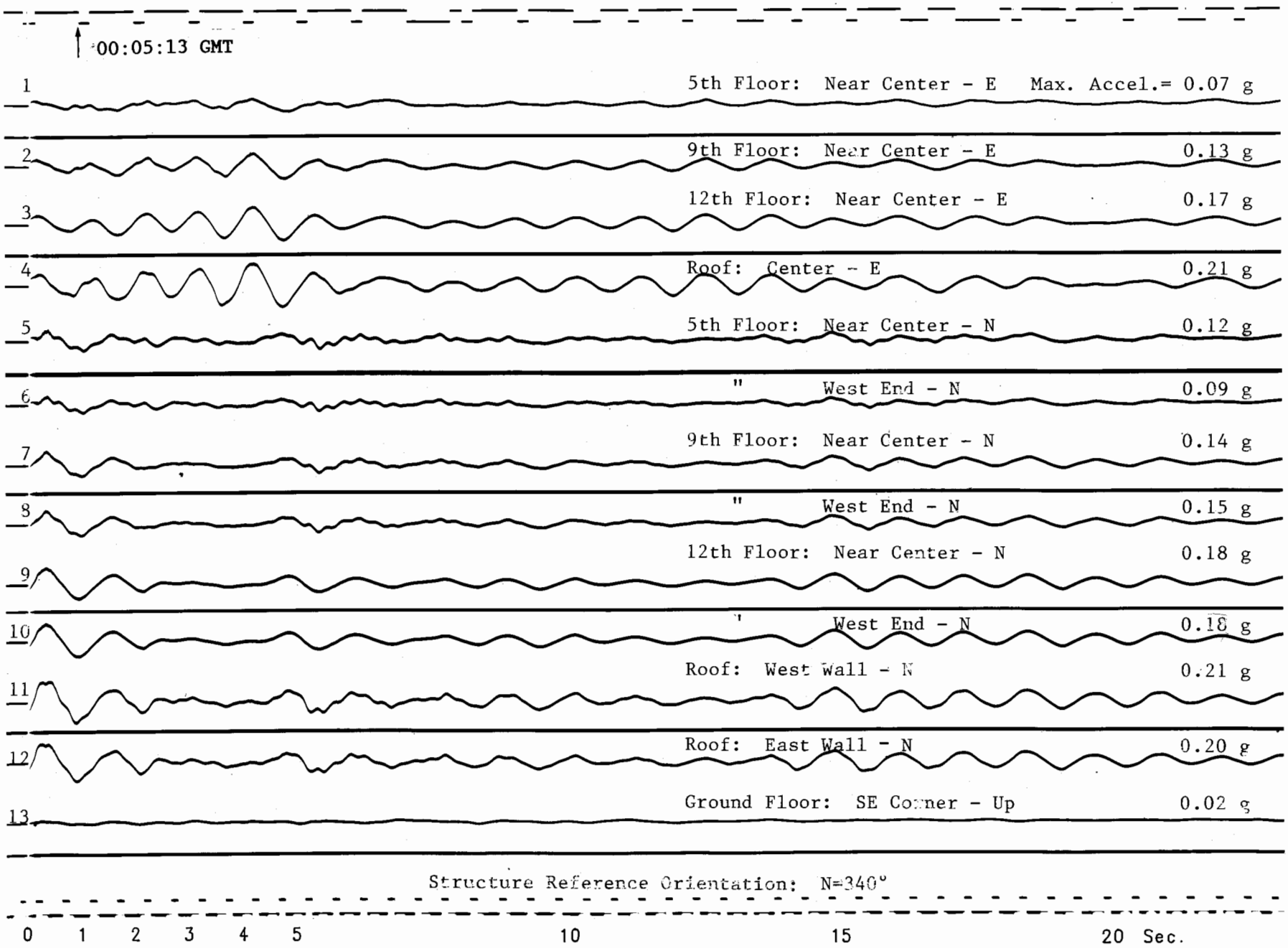


Concrete moment-resisting frame
with corner shear walls.
Design Date: 1970

Structure Reference
Orientation: N= 340°

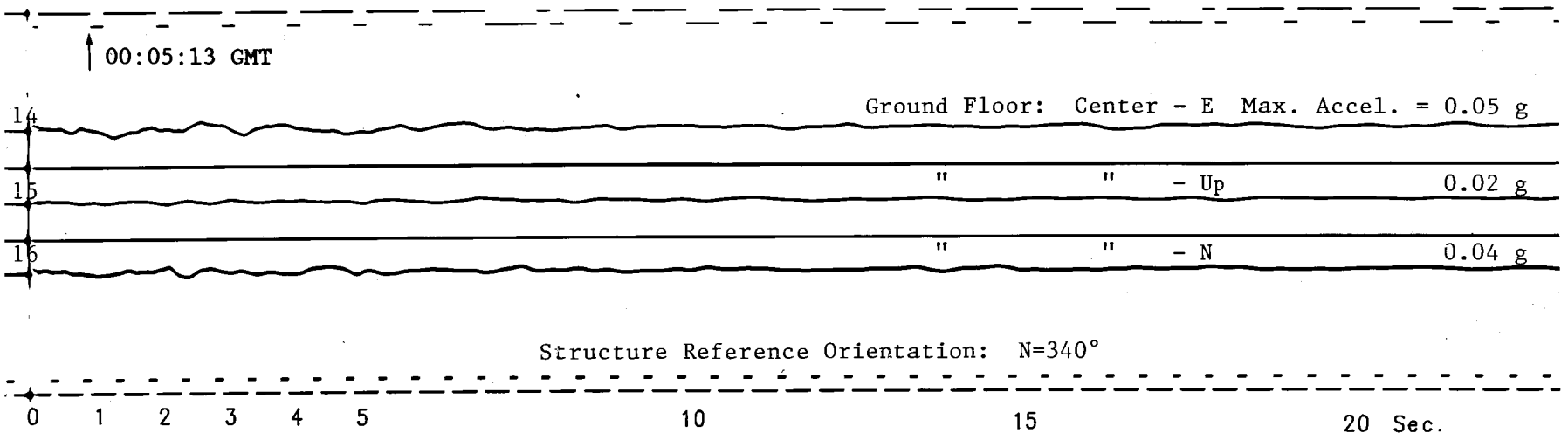
Santa Rosa - 14-story Residential Bldg.
(CSMIP Station 68489)

Record 68489-C0279-89297.01



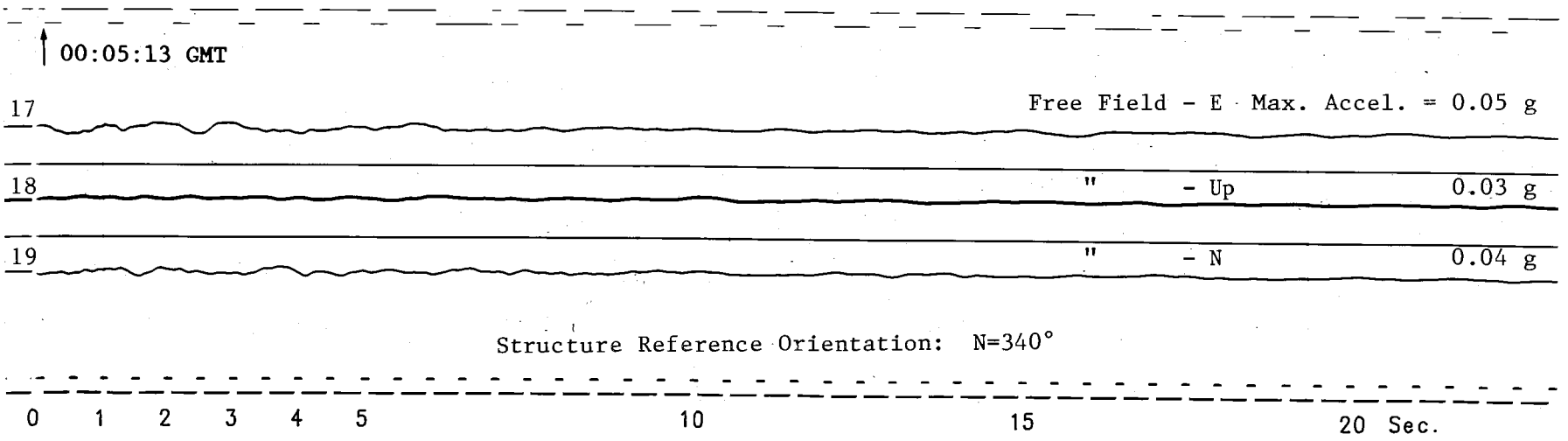
Santa Rosa - 14-story Residential Bldg.
(CSMIP Station 68489)

Record 68489-S0439-89297.01

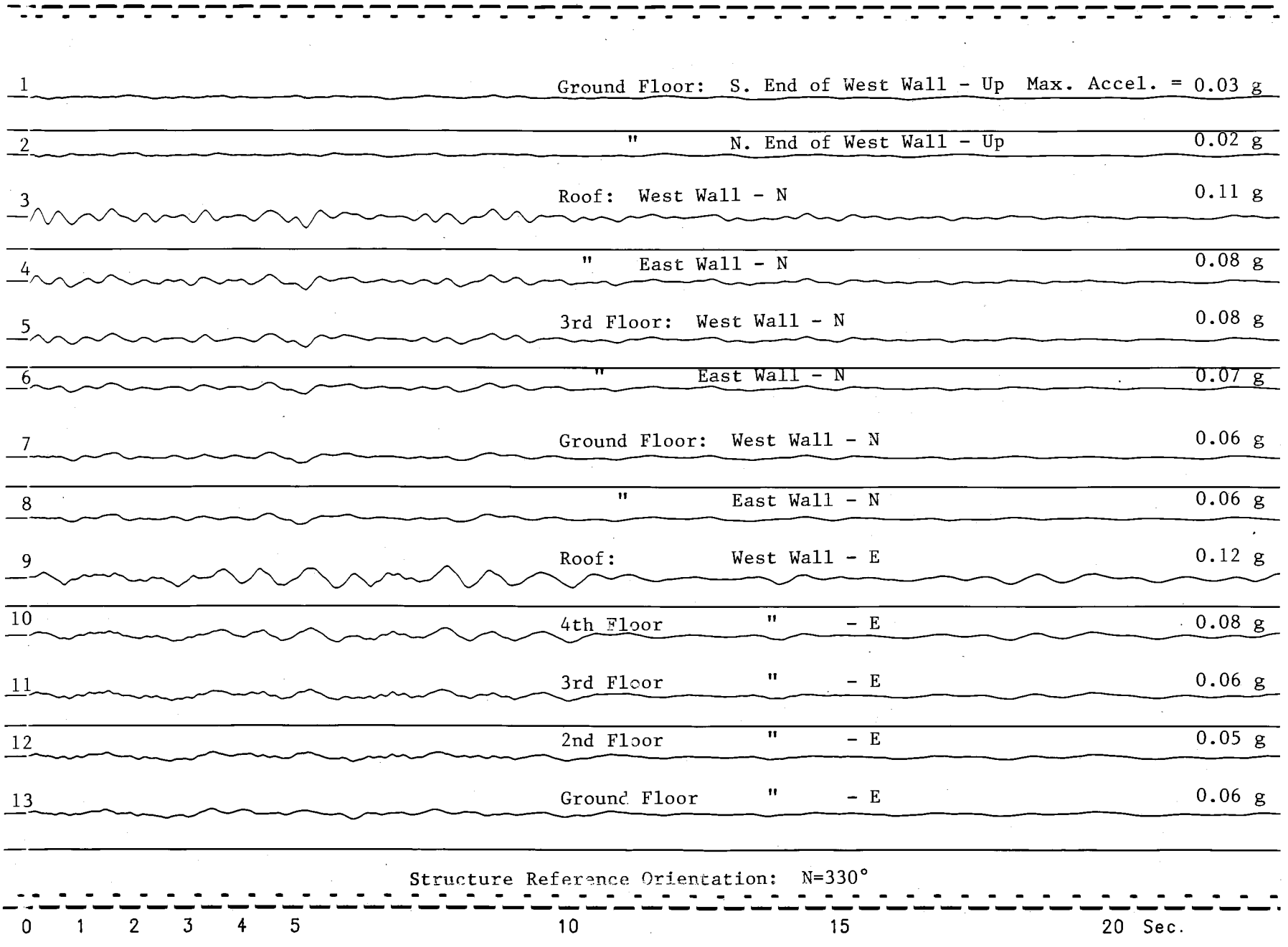


Santa Rosa - Hendley and Tupper
(CSMIP Station 68491)

Record 68491-S0440-89297.01



Santa Rosa - 5-story Commercial Bldg. (NS: concrete shear wall; EW: concrete frame)
(CSMIP Station 68387) Record 68387-C0199-89297.01



Milpitas - 2-story Industrial Bldg.

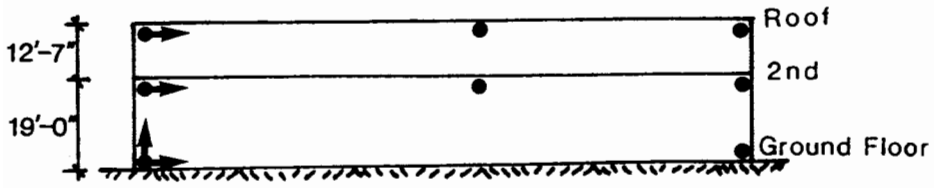
No. of Stories above/below ground: 2/0
Plan Shape: Rectangular
Base Dimensions: 168' x 120'
Typical Floor Dimensions: Same as base
Design Date: 1984
Construction Date: 1985

Vertical Load Carrying System:
Glulam Beams (roof); steel beams and joists (2nd); interior steel tube columns, and perimeter tilt-up concrete walls.
Lateral Force Resisting System:
Concrete tilt-up shear walls on perimeter; concrete floor on metal deck (2nd); plywood roof diaphragms.
Foundation Type:
Spread footings.

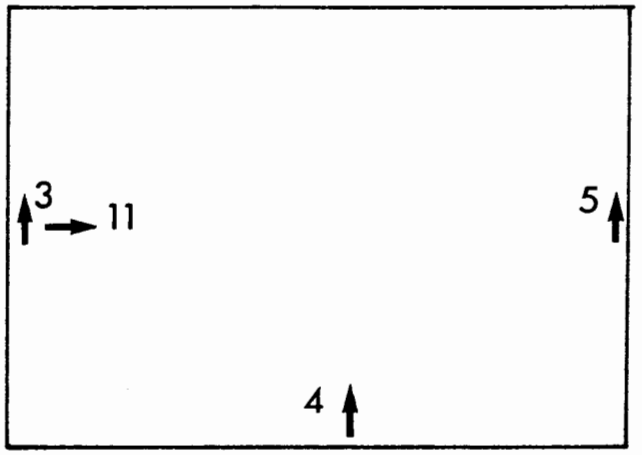
SENSOR LOCATIONS

Milpitas – 2-story Industrial Bldg.

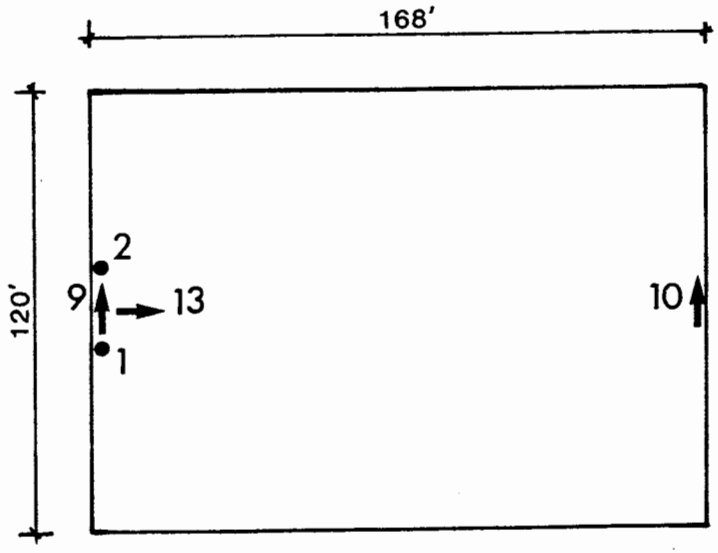
(CSMIP Station No. 57502)



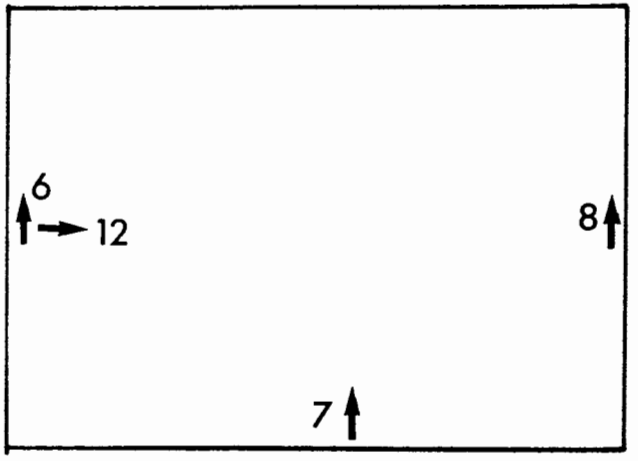
E/W Elevation



Roof Plan

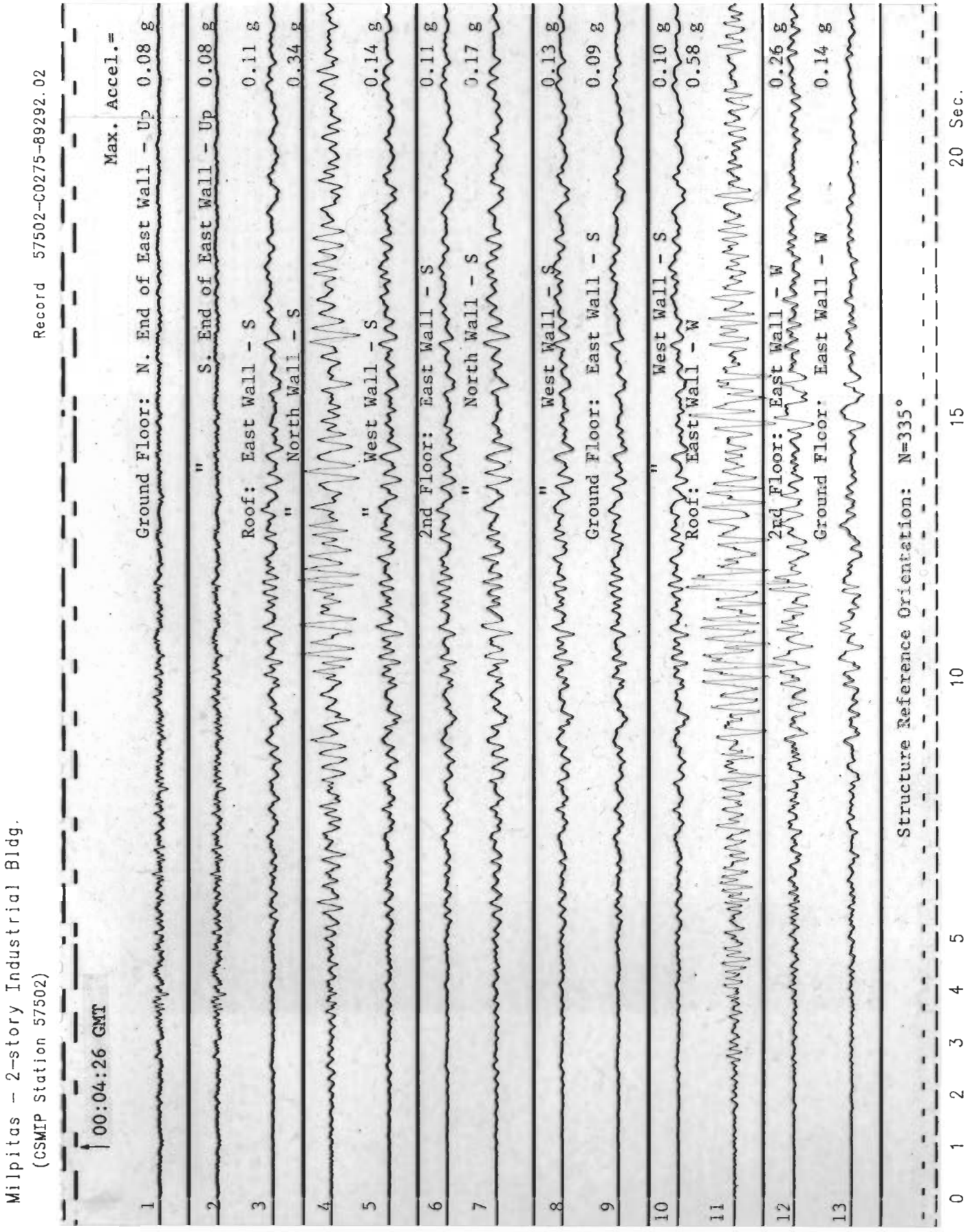


Ground Floor Plan



2nd Floor Plan

Structure Reference
Orientation: N= 335°


Milpitas – 2-story Industrial Bldg.
(CSMIP Station 57502)
Record 57502-C0275-89292.02
00:04:26 GMT
Max. Accel.=
1 Ground Floor: N. End of East Wall – Up 0.08 g
2 " S. End of East Wall – Up 0.08 g
3 Roof: East Wall – S 0.11 g
4 " North Wall – S 0.34 g
5 " West Wall – S 0.14 g
6 2nd Floor: East Wall – S 0.11 g
7 " North Wall – S 0.17 g
8 " West Wall – S 0.13 g
9 Ground Floor: East Wall – S 0.09 g
10 " West Wall – S 0.10 g
11 Roof: East Wall – W 0.58 g
12 2nd Floor: East Wall – W 0.26 g
13 Ground Floor: East Wall – W 0.14 g
Structure Reference Orientation: N=335°
0 1 2 3 4 5 10 15 20 Sec.

Hayward - 6-story Office Bldg.

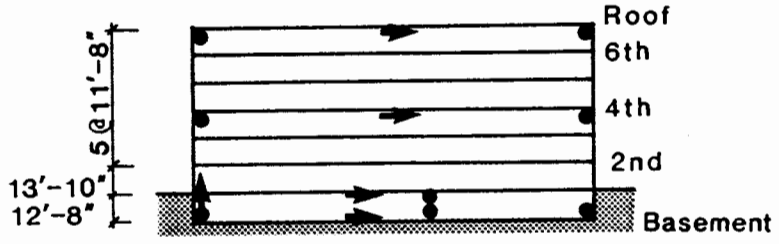
No. of Stories above/below ground: 6/1
Plan Shape: Rectangular
Base Dimensions: 218' x 92'
Typical Floor Dimensions: 218' x 92'
Design Date: 1966
Construction Date: 1967

Vertical Load Carrying System:
Concrete waffle floors with 4" slabs and 10" deep two way joists; concrete columns.
Lateral Force Resisting System:
Concrete shear walls.
Foundation Type:
Spread footings under columns; combined footings under shear walls.

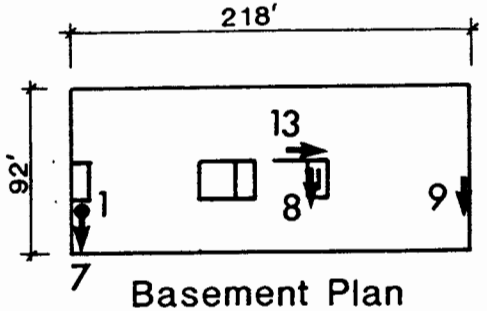
Hayward - 6-story Office Bldg.

(CSMIP Station No. 58462)

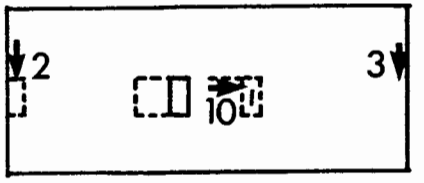
SENSOR LOCATIONS



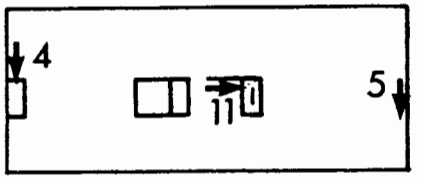
S/N Elevation



Basement Plan

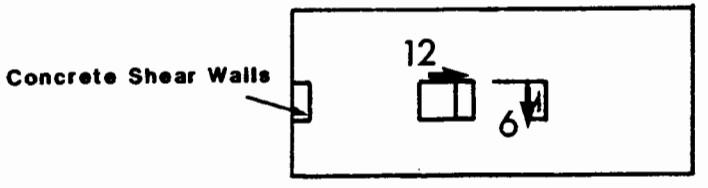


Roof Plan



4th Floor Plan

N_{ref}

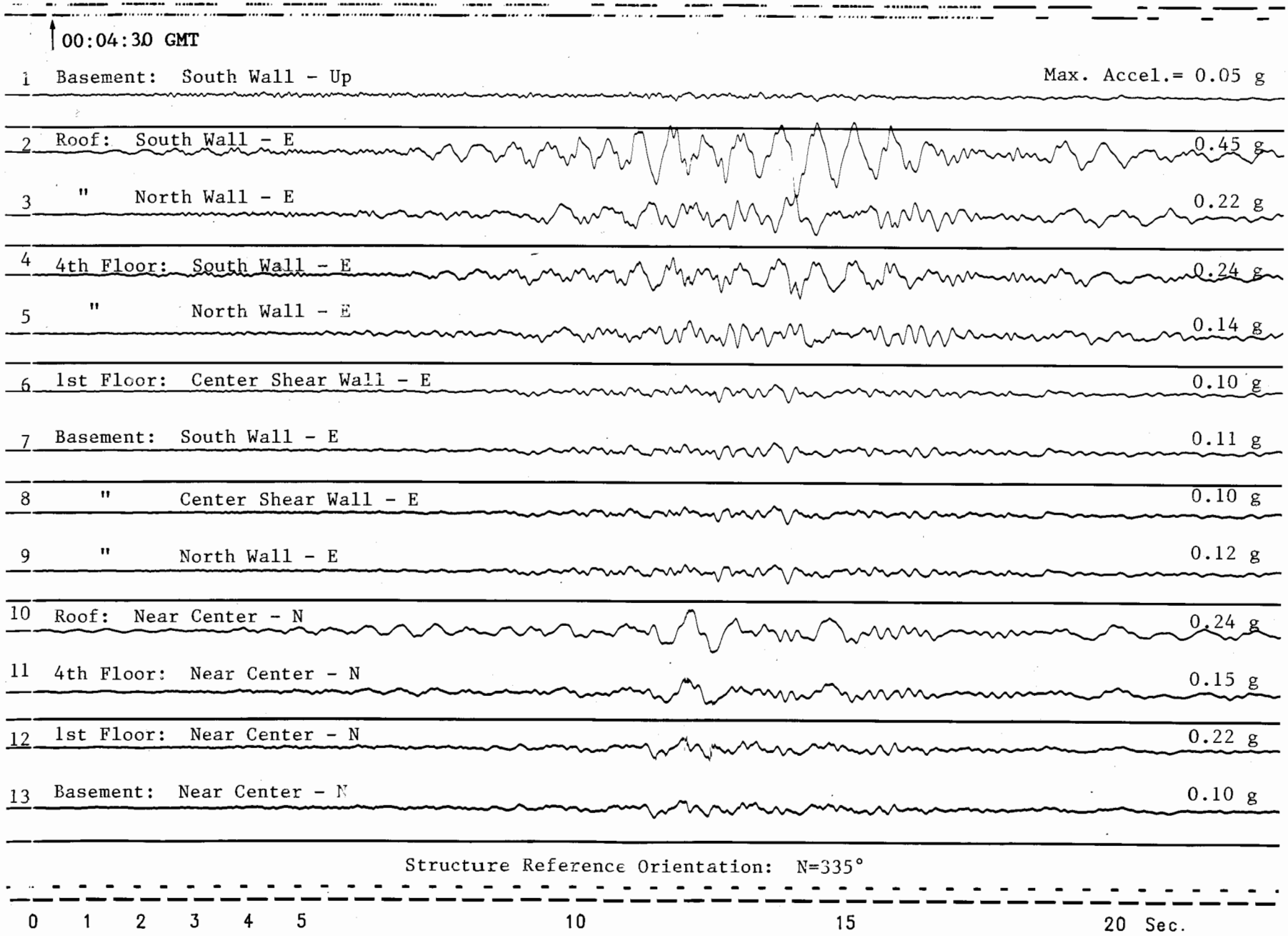


1st Floor Plan

Structure Reference
Orientation: N= 335°

Hayward - 6-story Office Bldg.
(CSMIP Station 58462)

Record 58462-C0217-89293.02



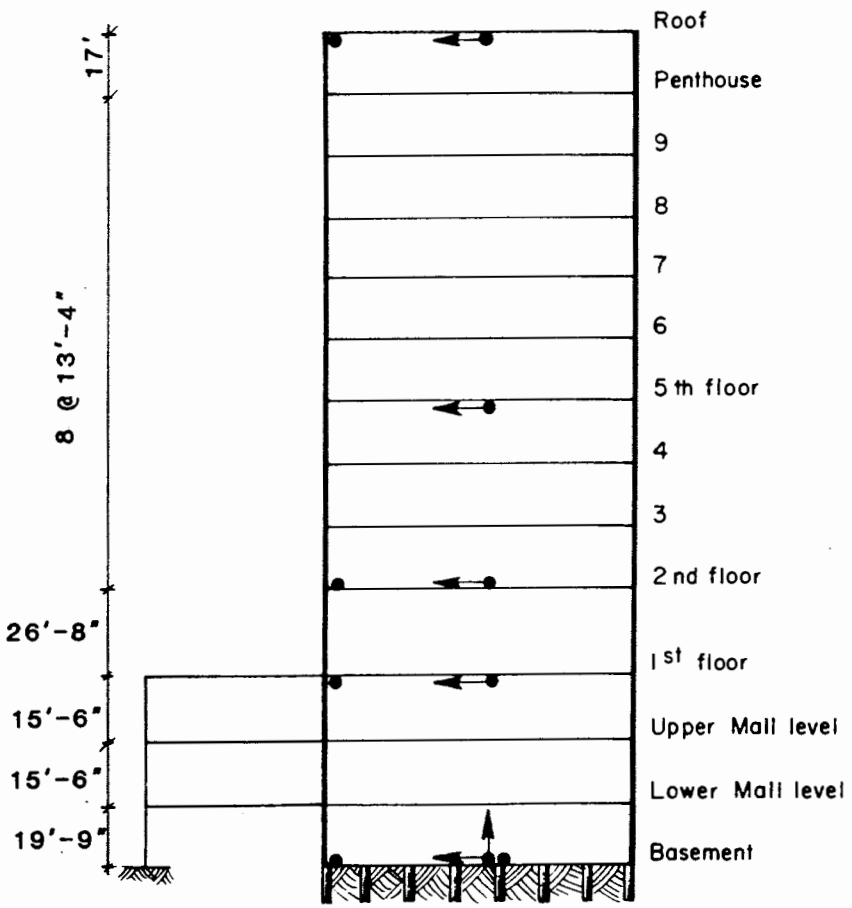
Hayward - 13-story School Office Bldg.

No. of Stories above/below ground: 13/0
Plan Shape: Rectangular
Base Dimensions: 122' x 125'
Typical Floor Dimensions: 113' x 113'
Design Date: 1969
Construction Date: 1969-71

Vertical Load Carrying System:
2.5" light-weight concrete slab over metal deck supported by steel beams and columns.
Lateral Force Resisting System:
Interior core moment steel frame and exterior perimeter concrete moment frame; concrete shear walls around elevator to 2nd floor.
Foundation Type:
Bearing piles with 18" concrete slab on grade.

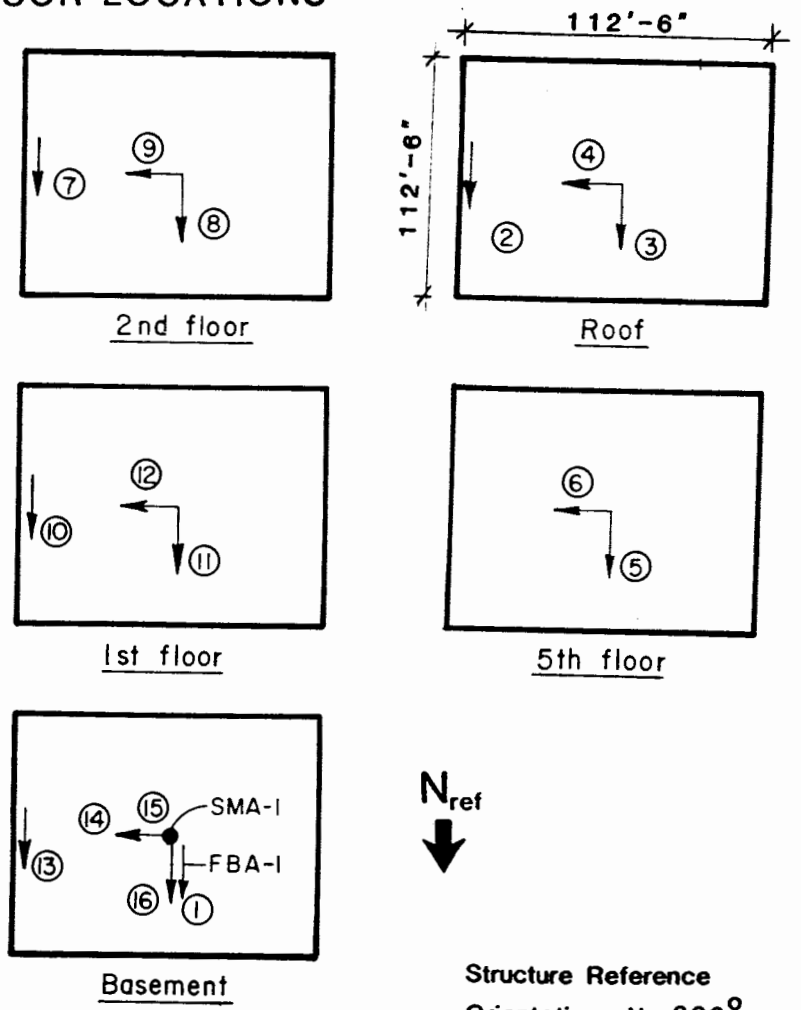
Hayward - 13-story School Office Bldg.

(CSMIP Station No. 58354)



E/W Elevation

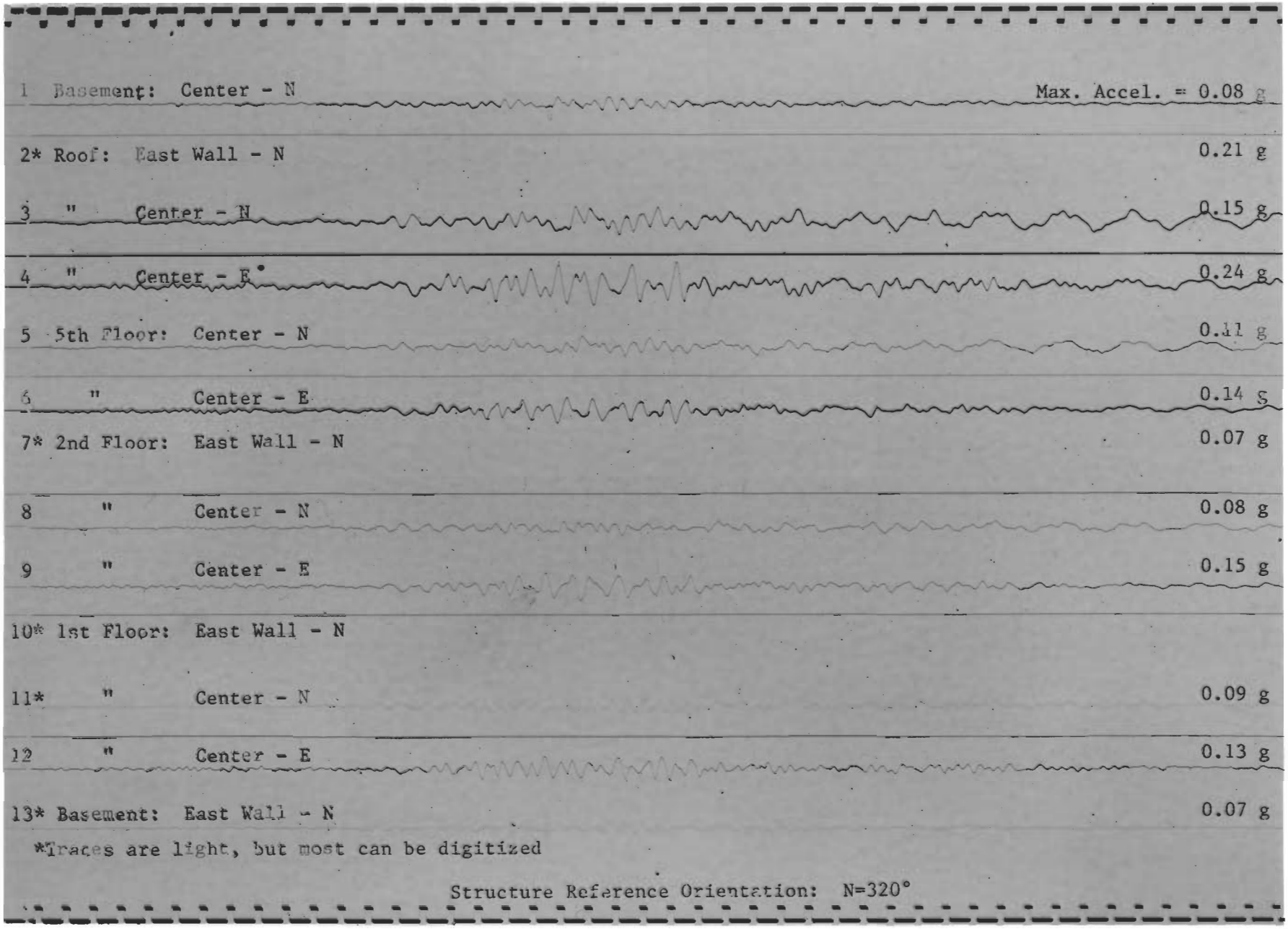
SENSOR LOCATIONS



Structure Reference Orientation: N= 320°

Hayward – 13-story School Office Bldg.
(CSMIP Station 58354)

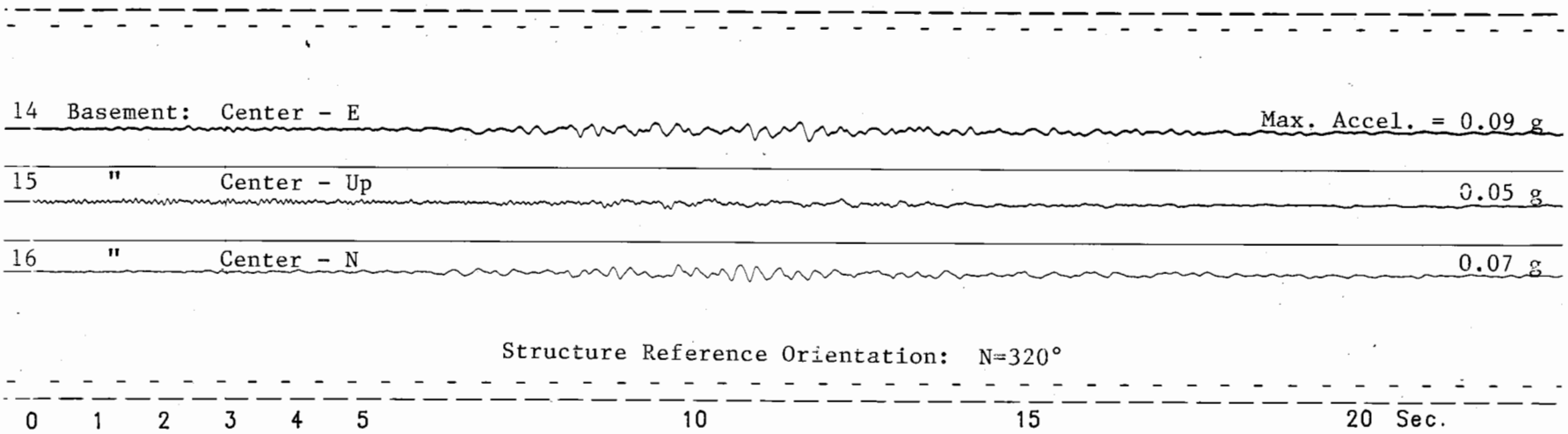
Record 58354-C0188-89291.02



0 1 2 3 4 5 10 15 20 Sec.

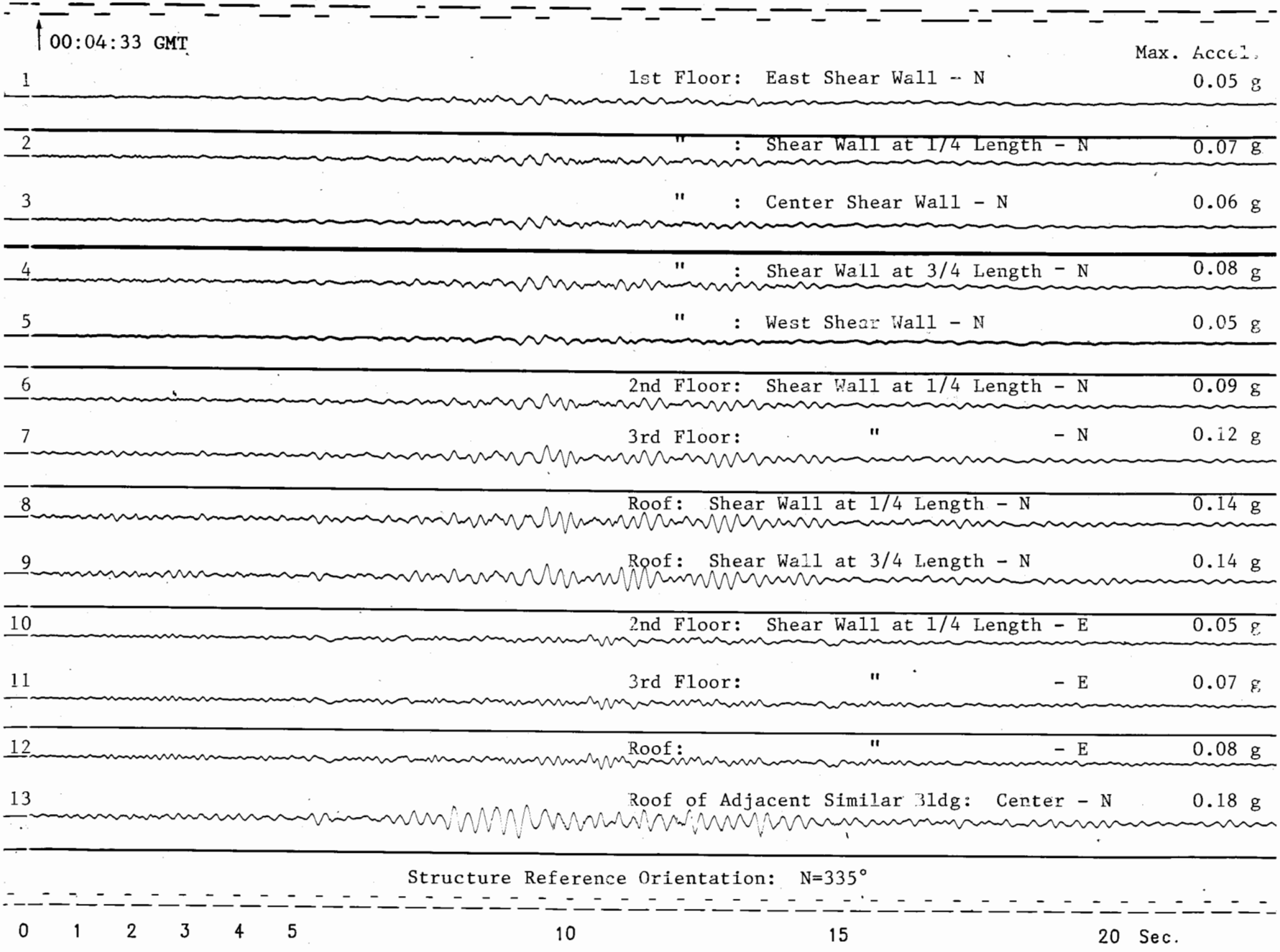
Hayward – 13-story School Office Bldg.
(CSMIP Station 58354)

Record 58354-S3489-89292.02



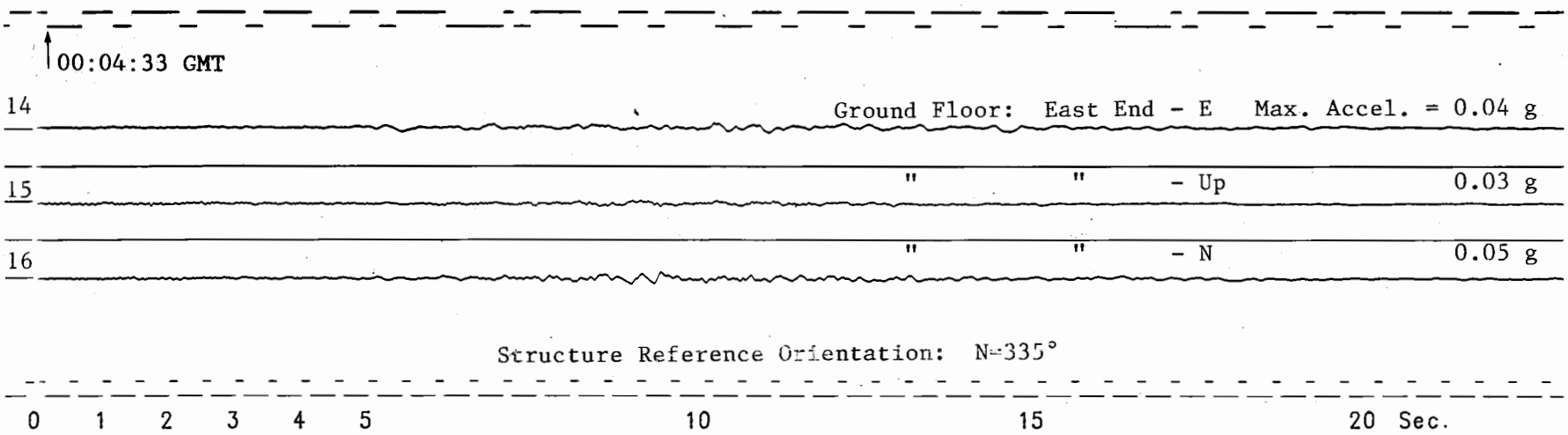
Hayward – 4-story School Bldg. (concrete shear walls)
(CSMIP Station 58488)

Record 58488-C0248-89292.01



Hayward – 4-story School Bldg.
(CSMIP Station 58488)

Record 58488-S3508-89292.01



Oakland -24-story Residential Bldg.

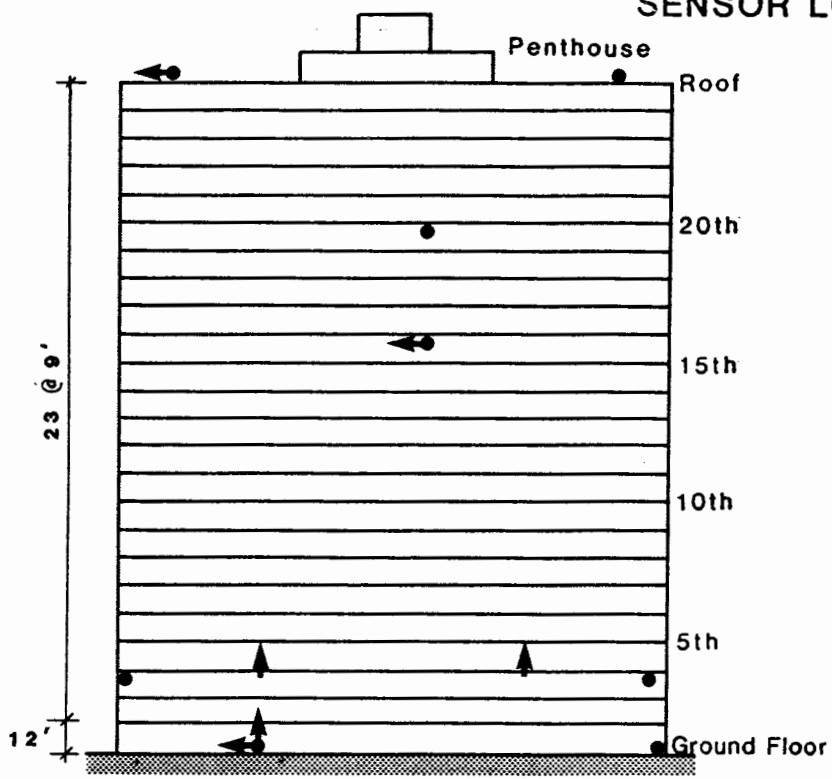
No. of Stories above/below ground: 24/0
Plan Shape: Trapezoidal
Base Dimensions: 211' x 197' (Flrs 1-3)
Typical Floor Dimensions: 211' x 78'
Design Date: 1964

Vertical Load Carrying System:
Concrete floor and roof slabs supported by concrete columns.
Lateral Force Resisting System:
Multiple concrete shear walls in both directions.
Foundation Type:
Mat foundation.

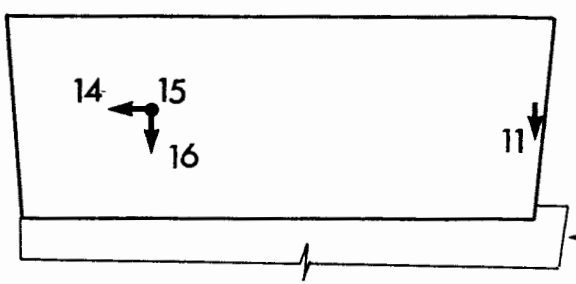
Oakland - 24-story Residential Bldg.

(CSMIP Station No.58483)

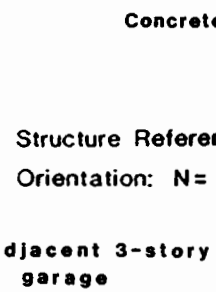
SENSOR LOCATIONS

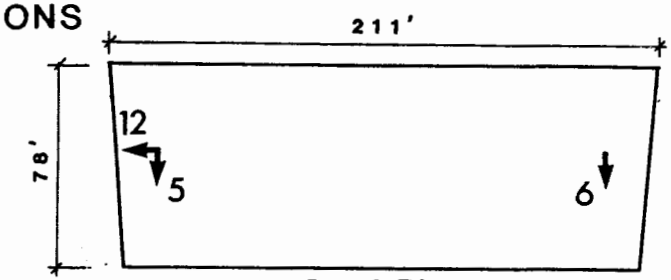


W/E Elevation

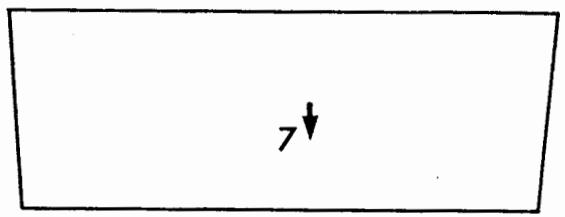


Ground Level Plan



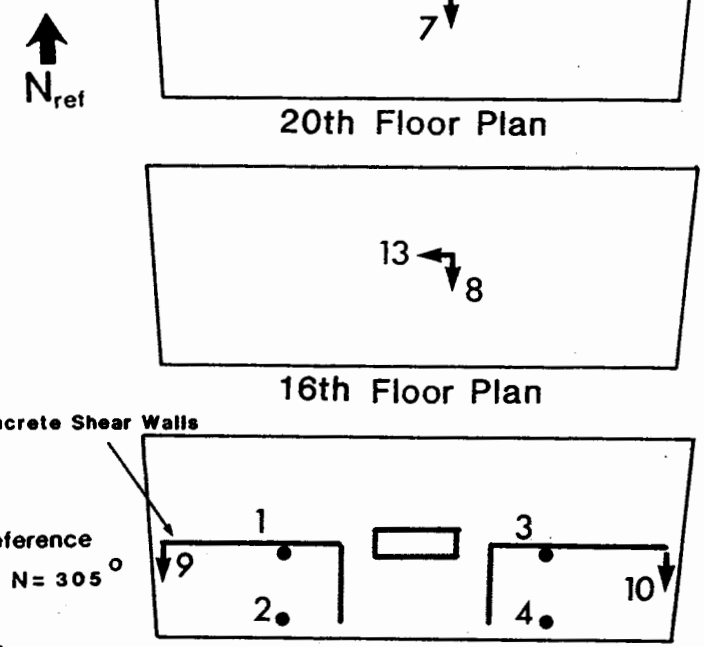


Roof Plan



20th Floor Plan

16th Floor Plan

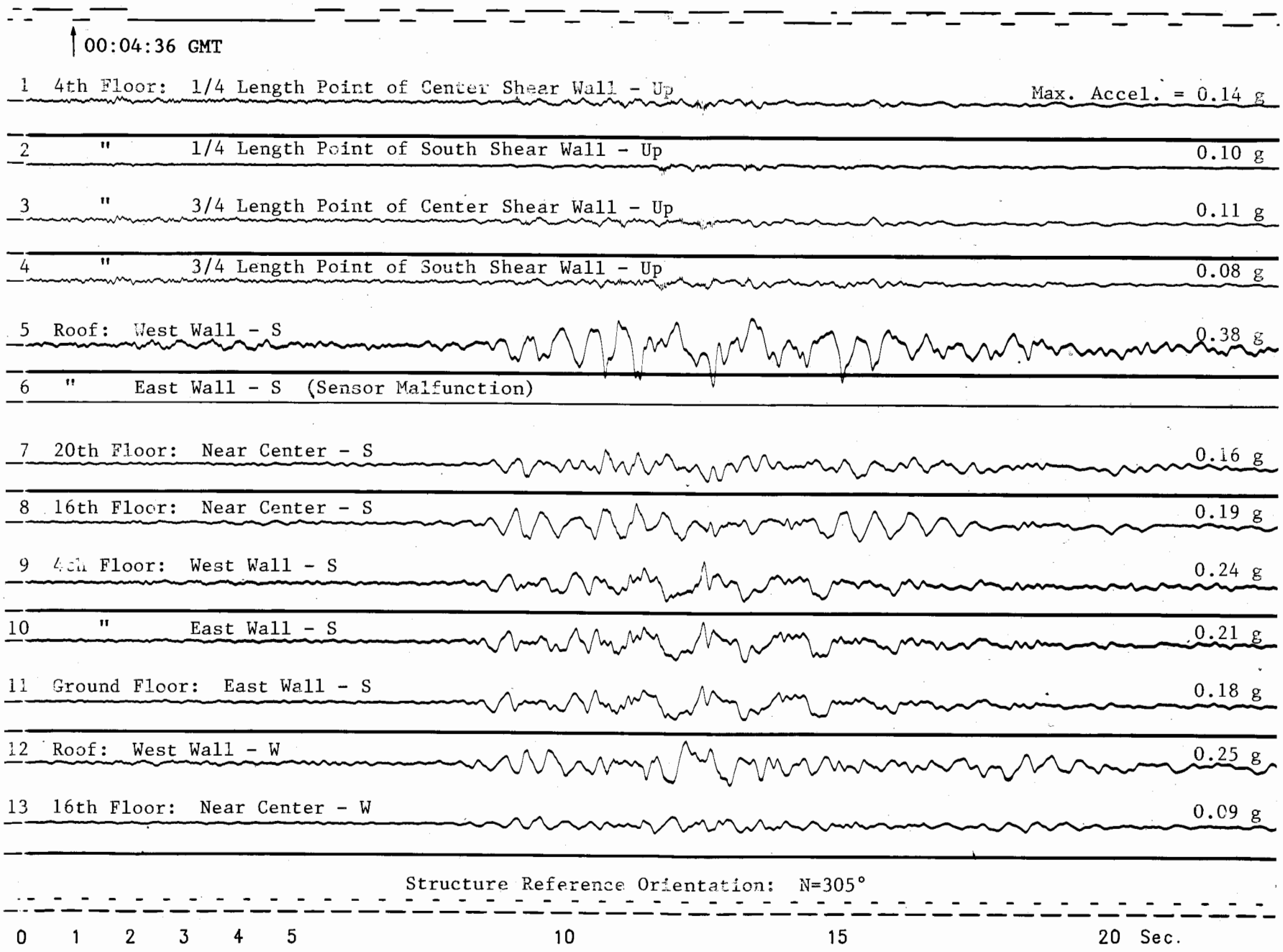


4th Floor Plan

N_{ref}

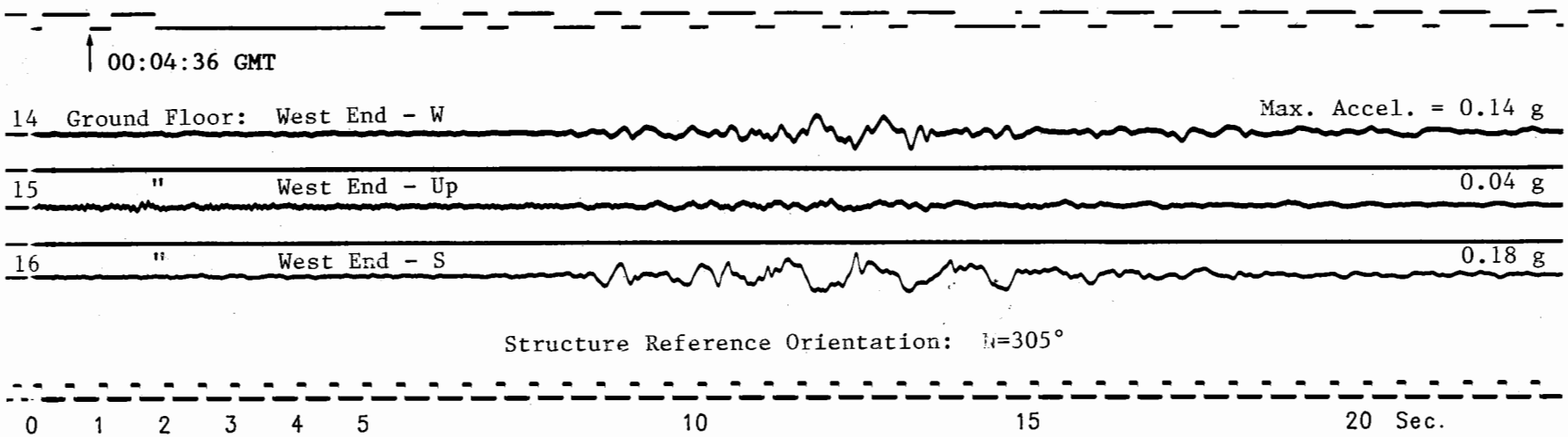
Oakland - 24-story Residential Bldg.
(CSMIP Station 58483)

Record 58483-C0244-89292.01



Oakland - 24-story Residential Bldg.
(CSWIP Station 58483)

Record 58483-S5082-89292.01



Oakland - 2-story Office Bldg.

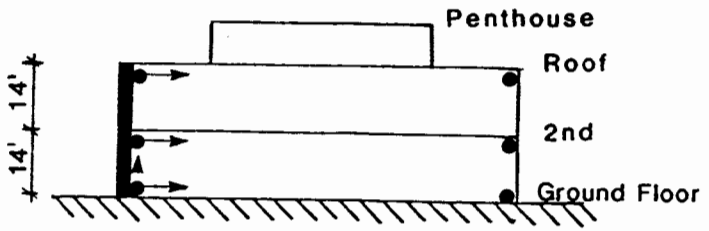
No. of Stories above/below ground: 2/0
Plan Shape: Rectangular
Base Dimensions: 163' x 153'
Typical Floor Dimensions: Same as base
Design Date: 1964
Construction Date: 1965

Vertical Load Carrying System:
2.5" concrete fill on 3" metal decks supported by rigid steel frame.
Lateral Force Resisting System:
Reinforced concrete block shear walls on two adjacent exterior faces; welded rigid steel frame.
Foundation Type:
Spread footings.

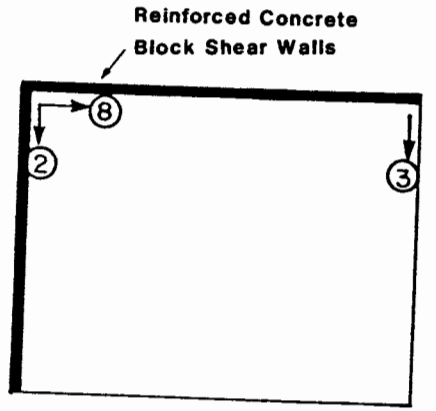
Oakland - 2-story Office Bldg.

(CSMIP Station No. 58224)

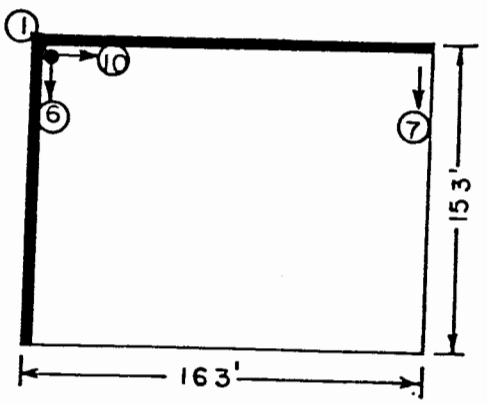
SENSOR LOCATIONS



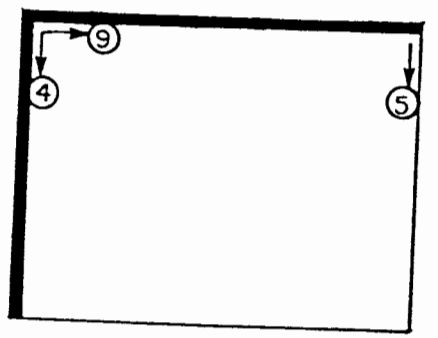
N/S Elevation



Roof Plan



Ground Level Plan

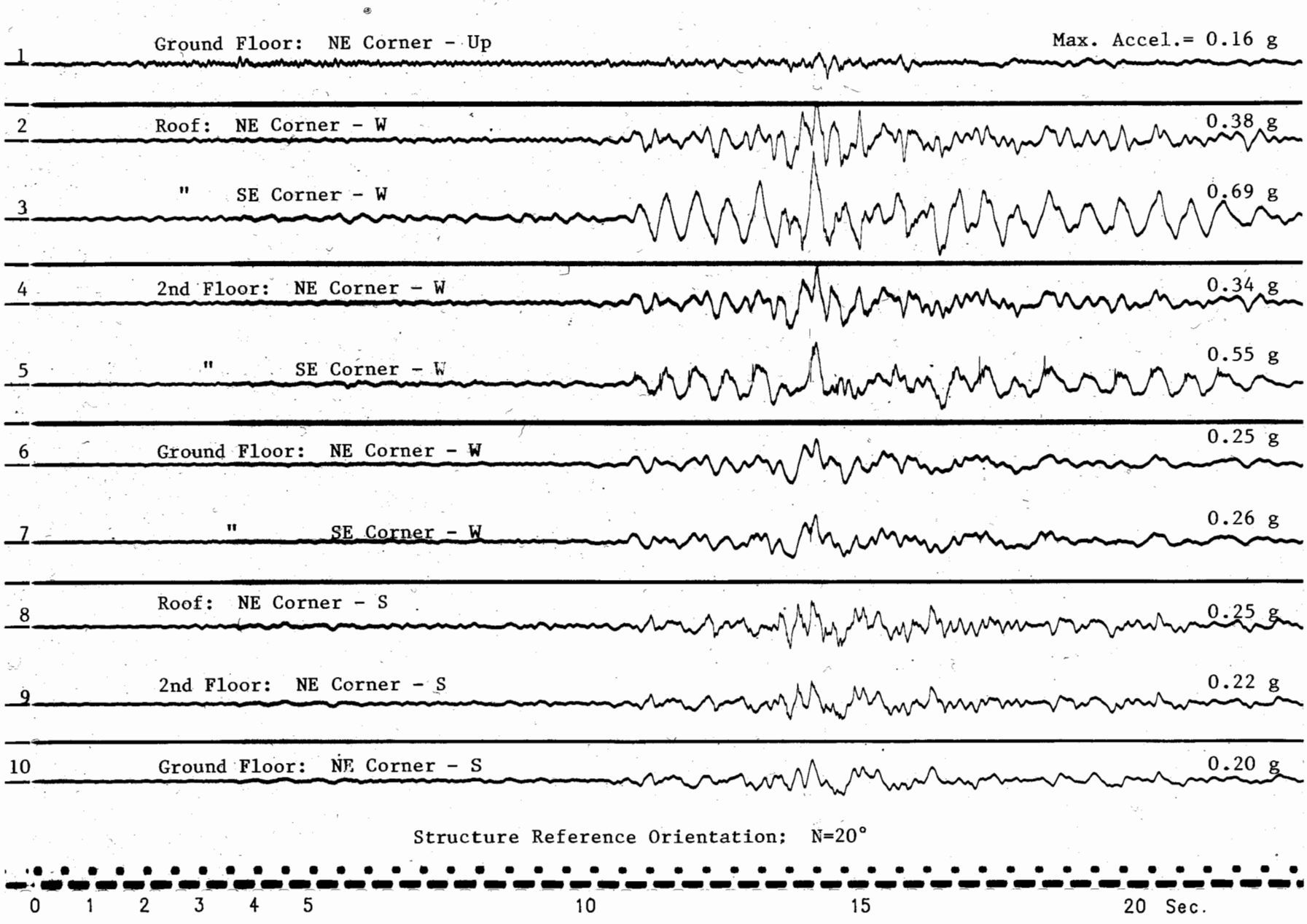


2nd Floor Plan

Structure Reference
Orientation: N= 20°

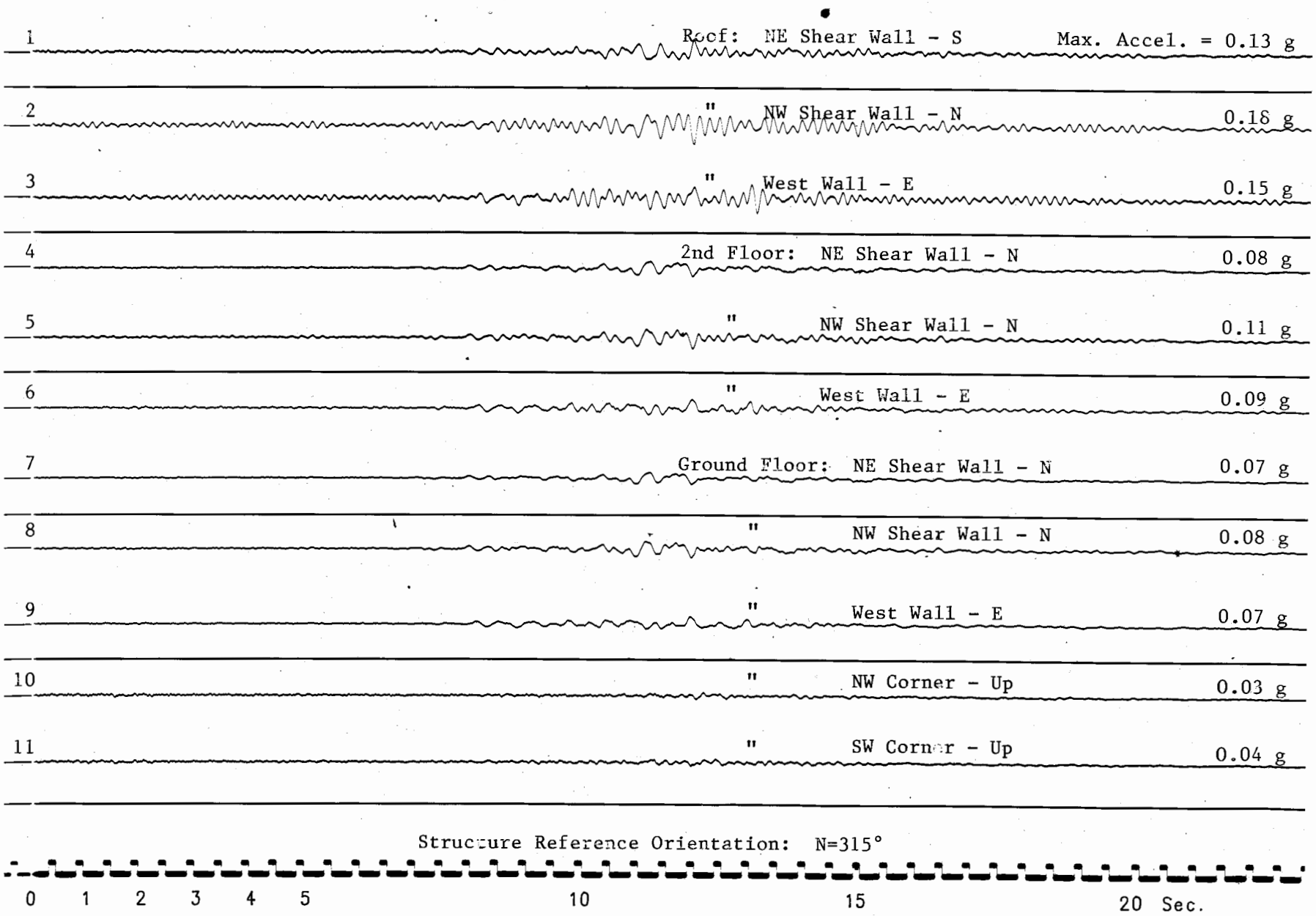
Oakland - 2-story Office Bldg.
(CSMIP Station 58224)

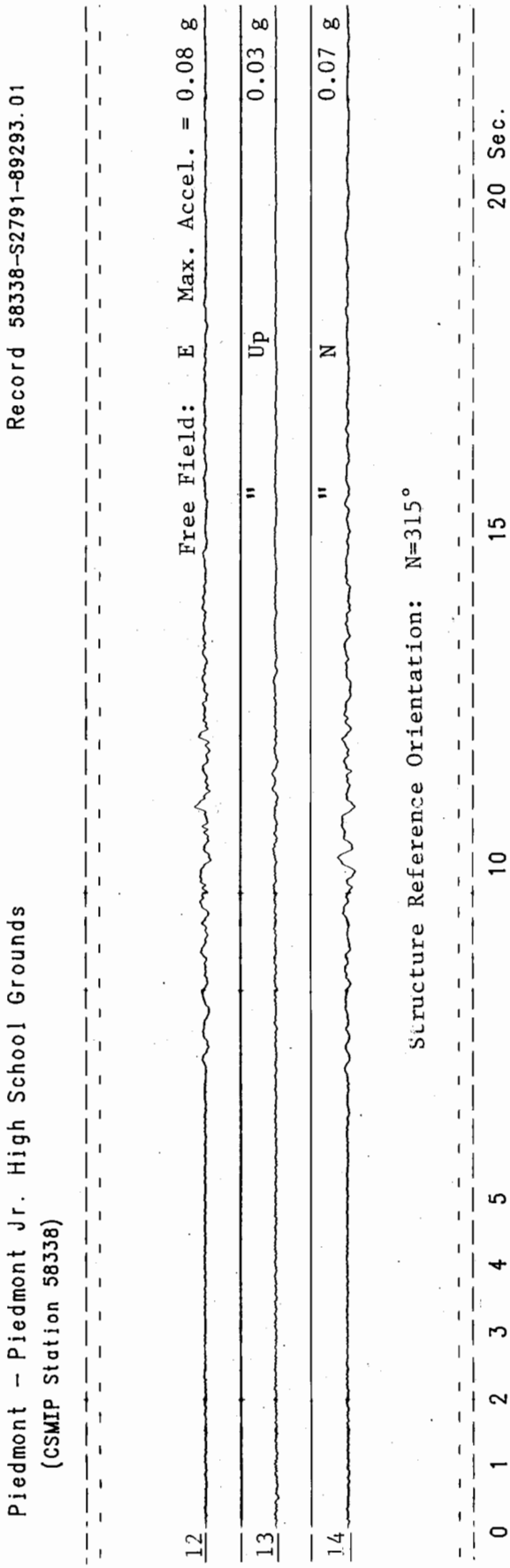
Record 58224-C0120-89293.02



Piedmont - 3-story School Bldg. (concrete shear walls)
(CSMIP Station 58334)

Record 58334-C0163-89293.01

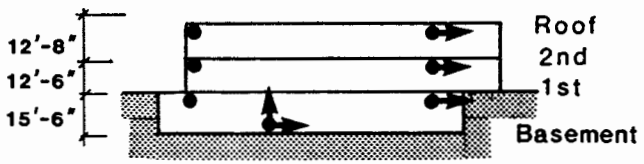



Piedmont - Piedmont Jr. High School Grounds
(CSMIP Station 58338)
Record 58338-S2791-89293.01
12
Free Field: E Max. Accel. = 0.08 g
13
" Up 0.03 g
14
" N 0.07 g
Structure Reference Orientation: N=315°
0 1 2 3 4 5 10 15 20 Sec.

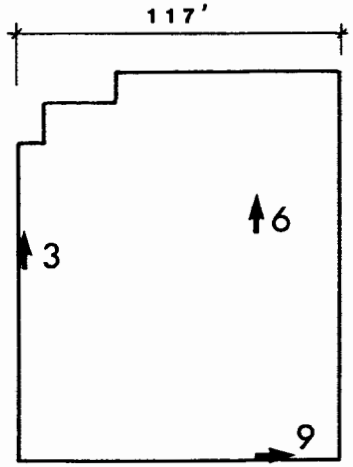
Berkeley - 2-story Hospital

(CSMIP Station No. 58496)

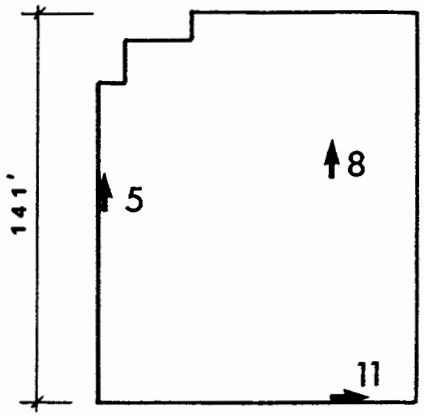
SENSOR LOCATIONS



S/N Elevation

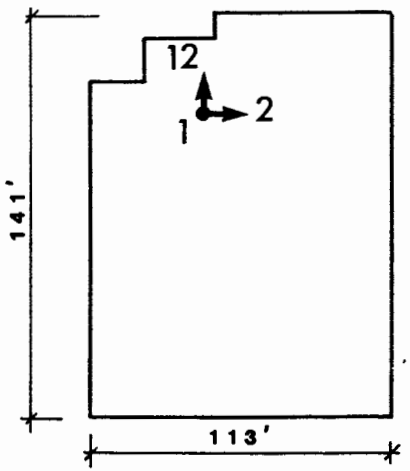


1st Floor Plan

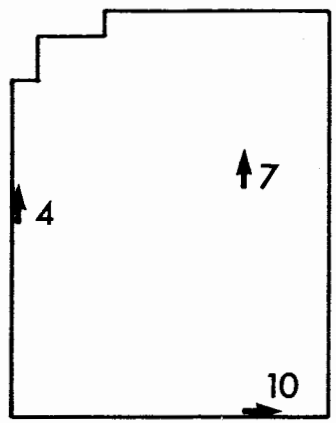


Roof Plan

N_{ref}



Basement Plan



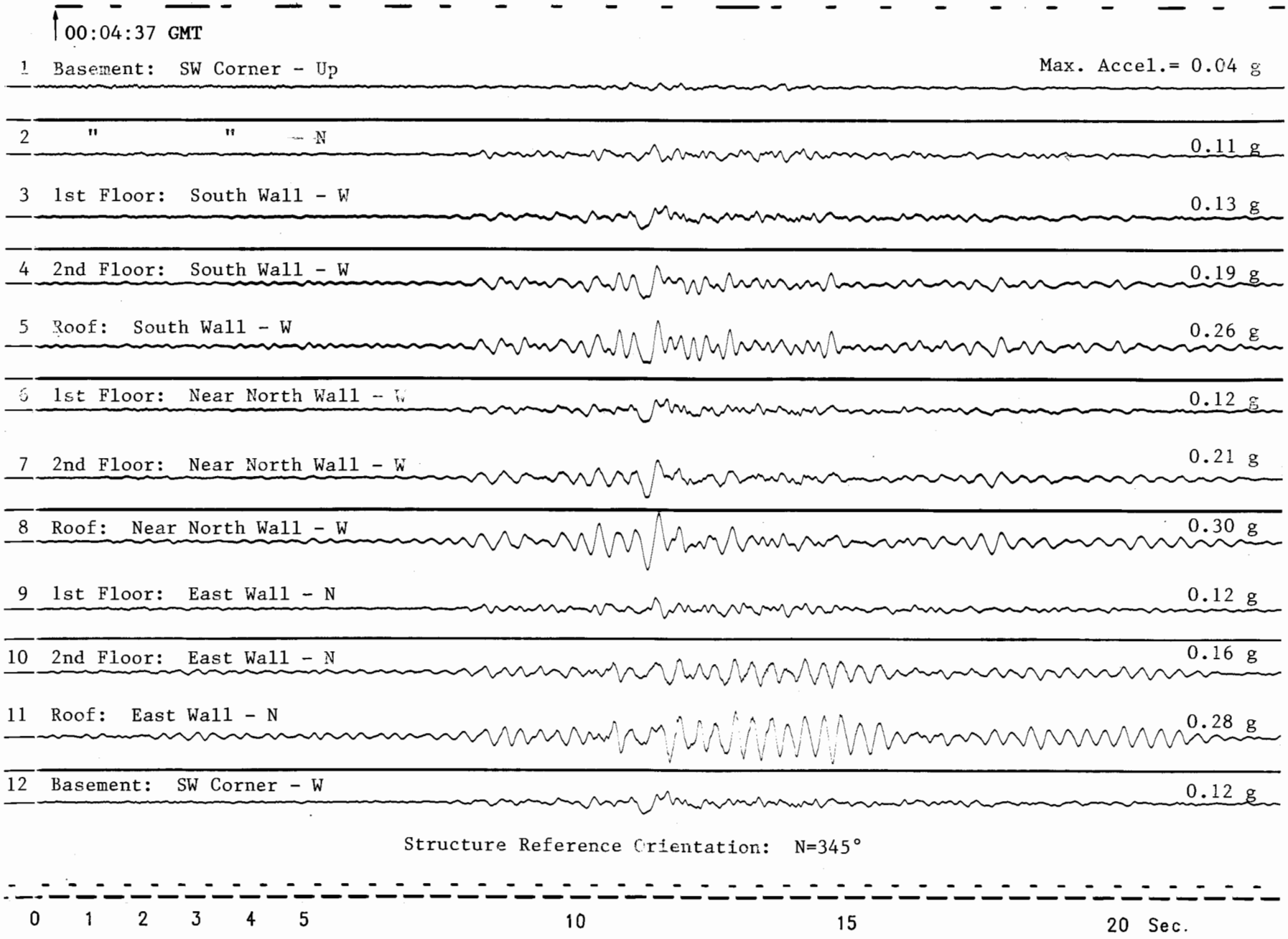
2nd Floor Plan

Structure Reference
Orientation: N = 345°

Eccentrically braced steel frame
at first and second stories.
Design Date: 1984

Berkeley - 2-story Hospital
(CSMIP Station 58496)

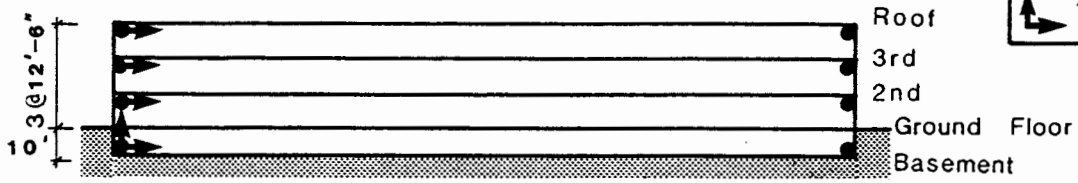
Record 58496-C0180-89293.01



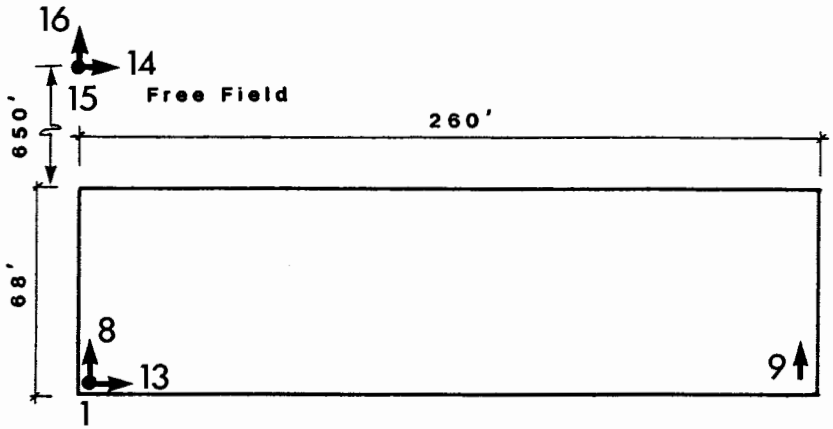
Richmond - 3-story Government Office Bldg.

(CSMIP Station No. 58503)

SENSOR LOCATIONS



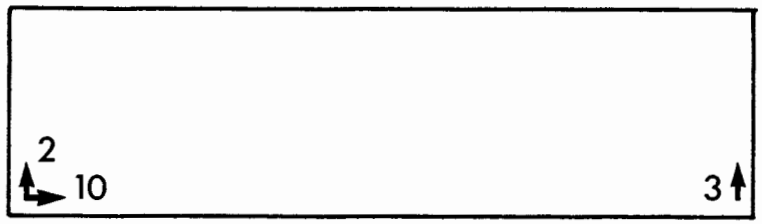
W/E Elevation



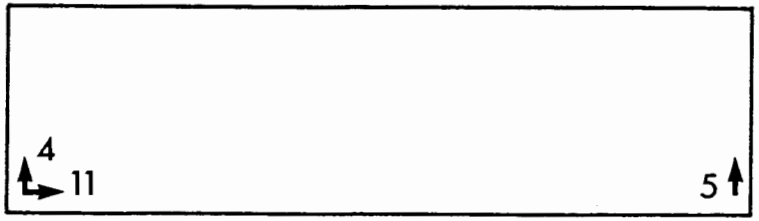
Basement Plan

Structure Reference
Orientation: N= 10°

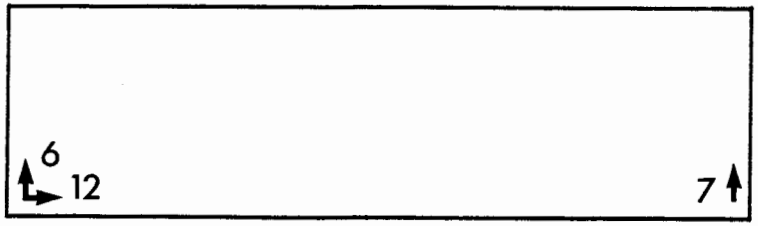
N_{ref}



Roof Plan



3rd Floor Plan

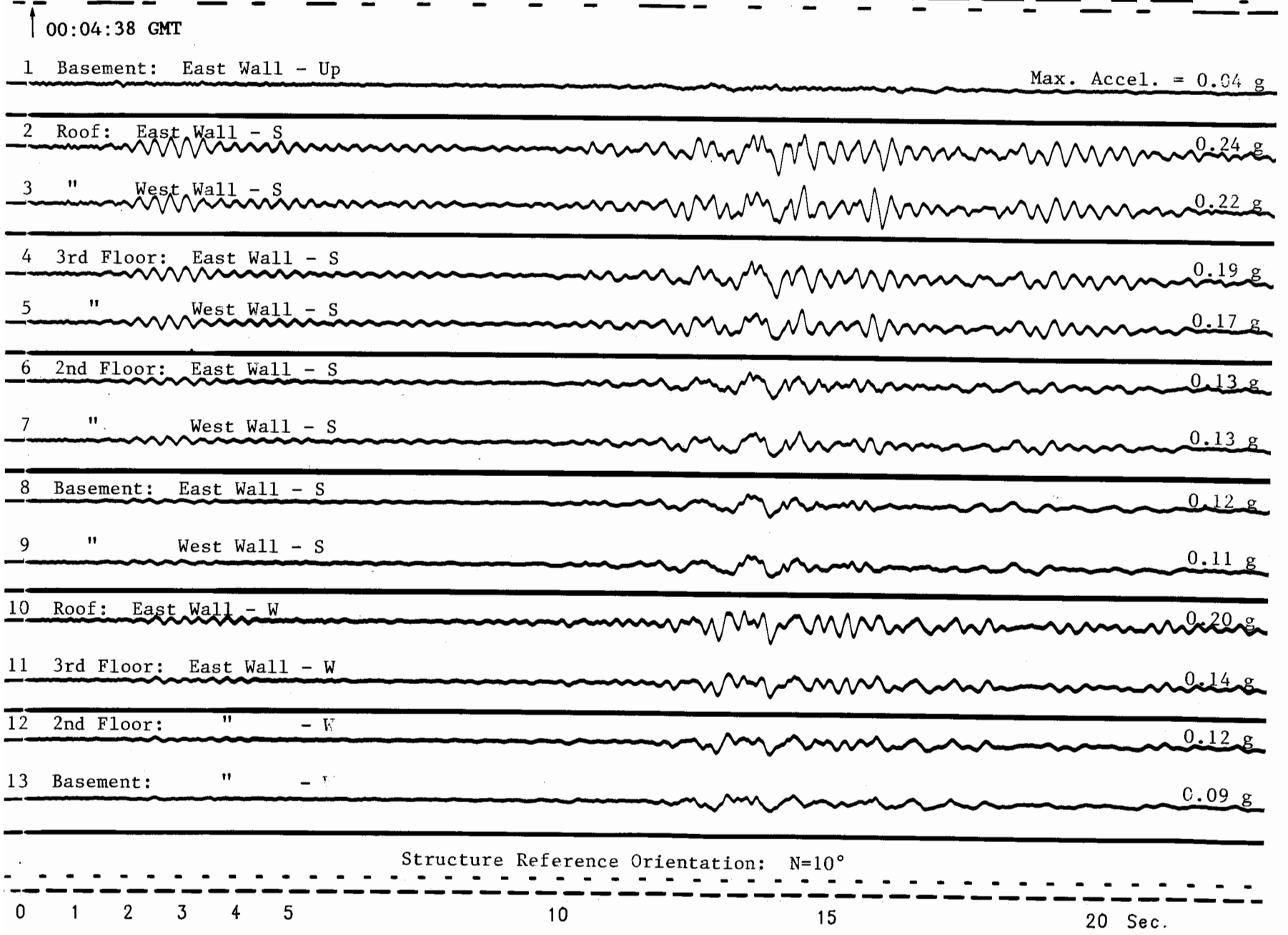


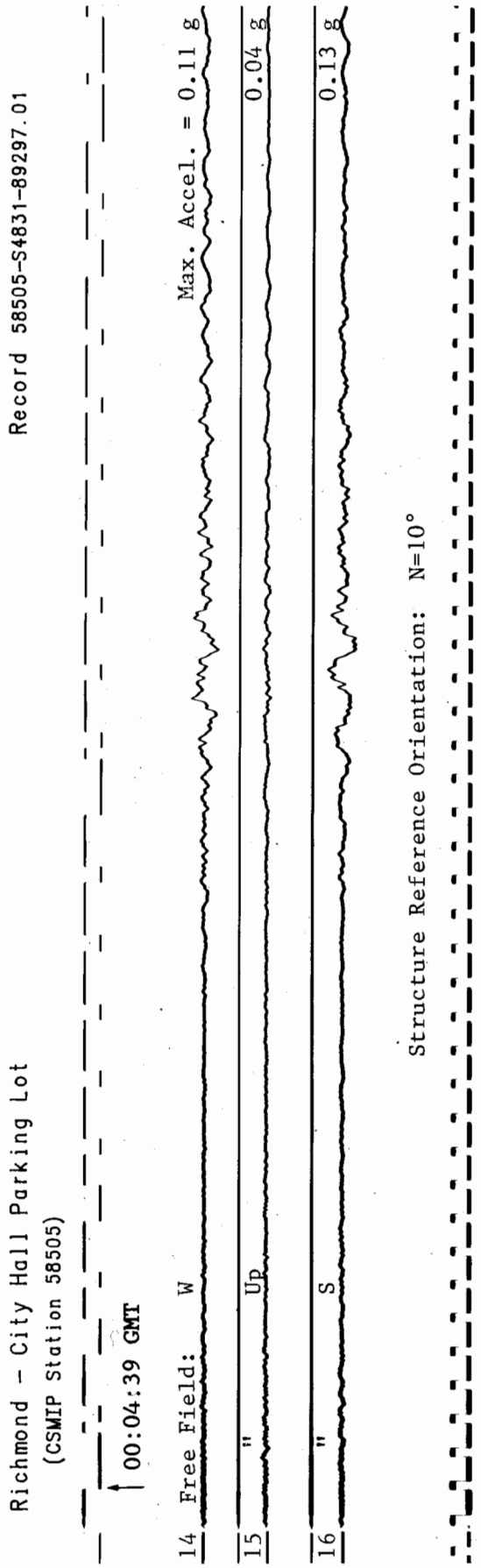
2nd Floor Plan

Concrete moment-resisting frame and
concrete shear walls.
Design Date: 1948

Richmond - 3-story Government Office Bldg.
(CSMIP Station 58503)

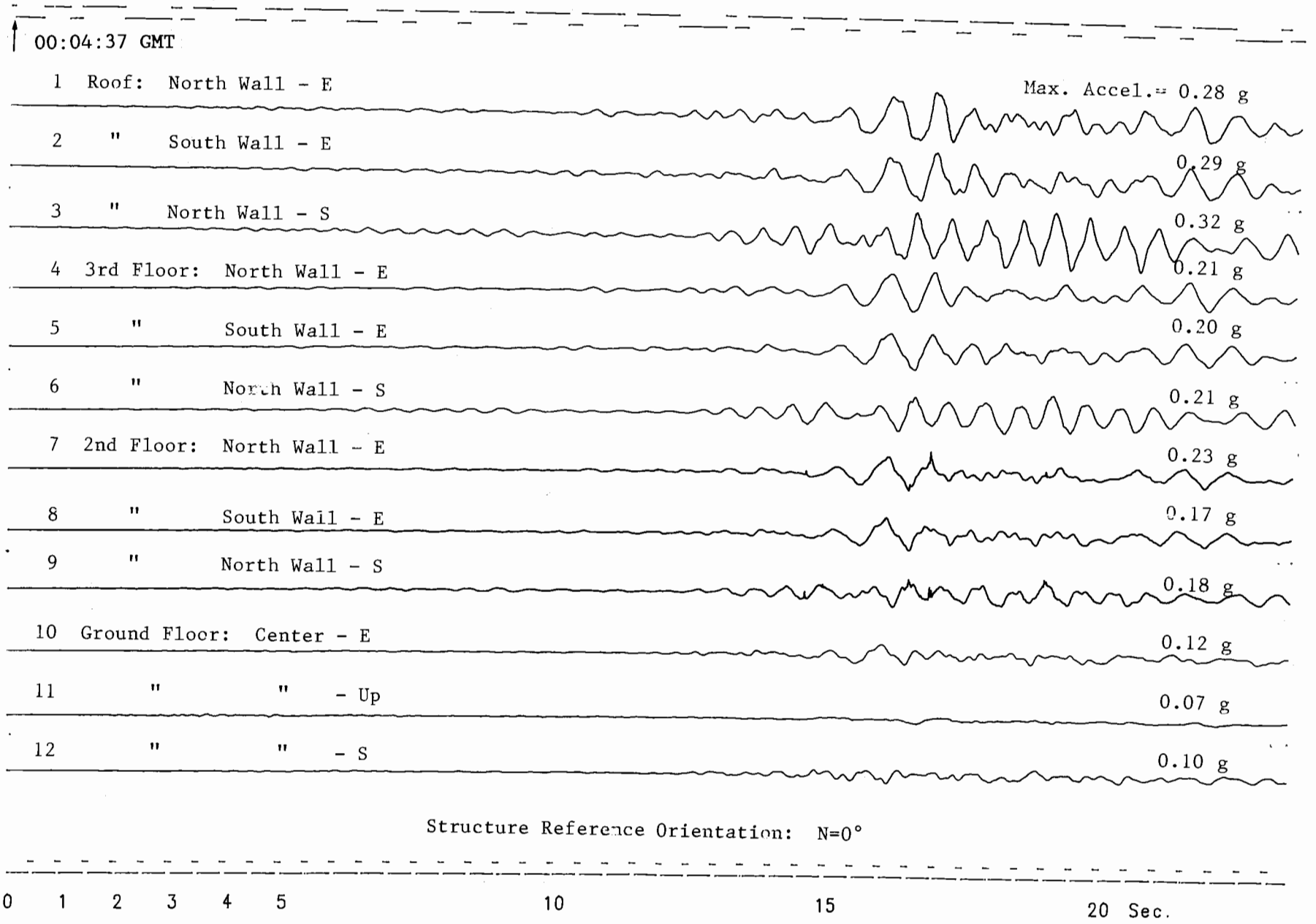
Record 58503-C0276-89297.01




Richmond - City Hall Parking Lot
(CSMIP Station 58505)
Record 58505-S4831-89297.01
00:04:39 GMT
14 Free Field: W
Max. Accel. = 0.11 g
15 " Up
0.04 g
16 " S
0.13 g
Structure Reference Orientation: N=10°
0 1 2 3 4 5 10 15 20 Sec.

Richmond - 3-story Office Bldg. **(perimeter moment-resisting steel frame)**
(CSMIP Station 58506)

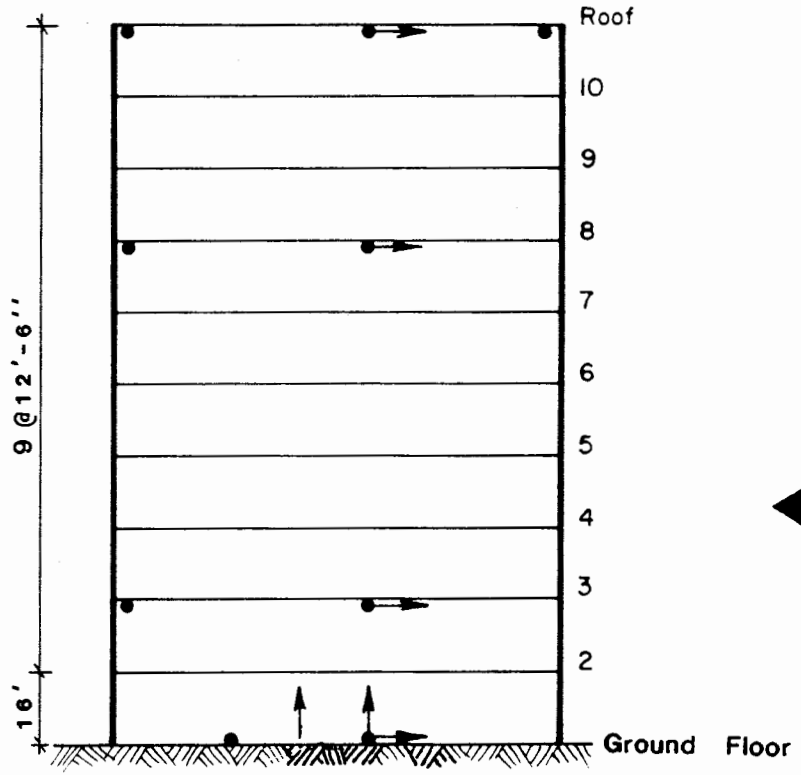
Record 58506-CD101-89297.04



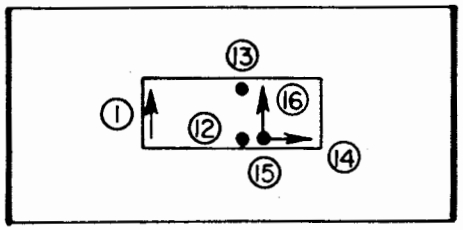
Walnut Creek - 10-story Commercial Bldg.

(CSMIP Station No. 58364)

SENSOR LOCATIONS

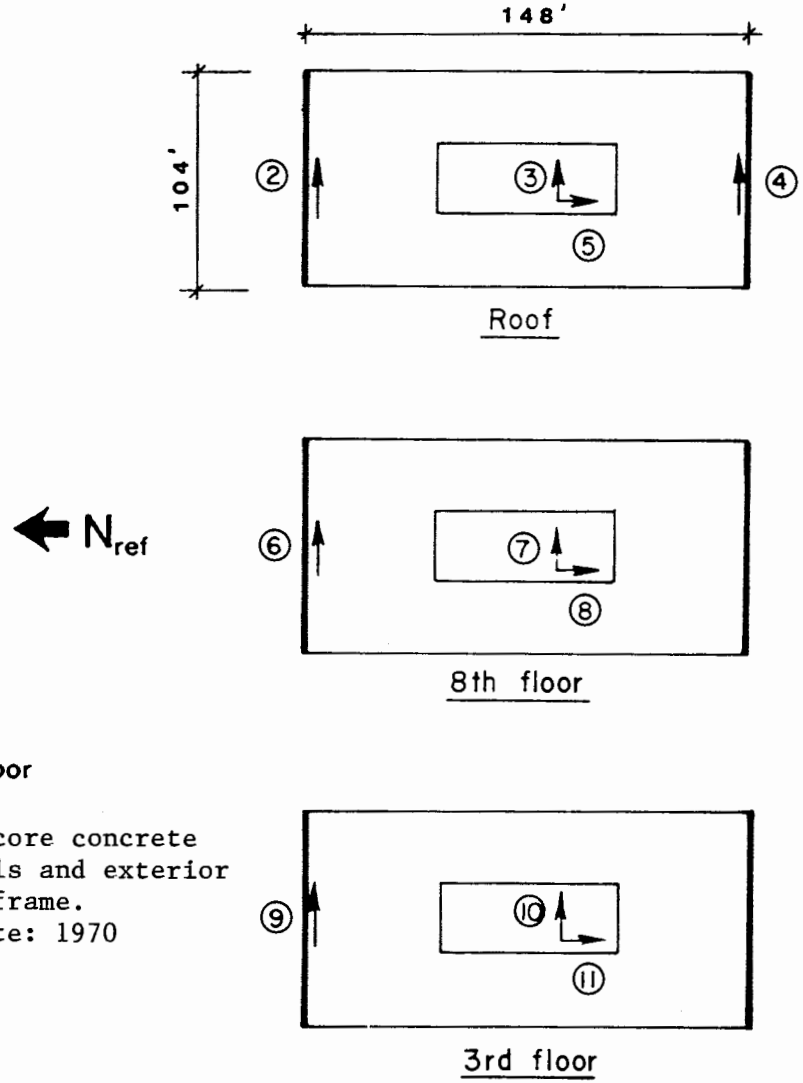


N/S Elevation



Ground Floor Plan

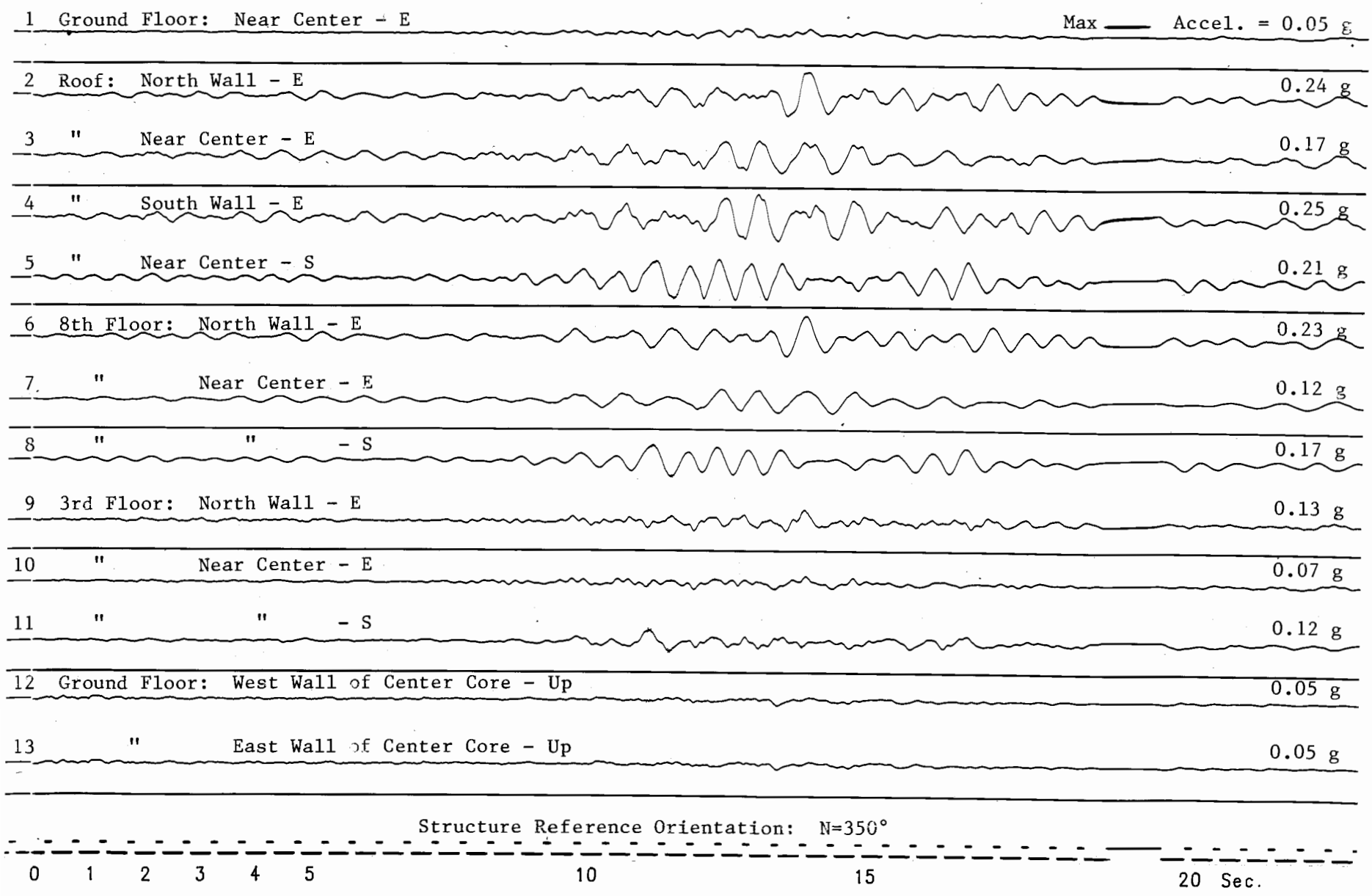
Interior core concrete shear walls and exterior concrete frame.
Design Date: 1970



Structure Reference Orientation: N= 350°

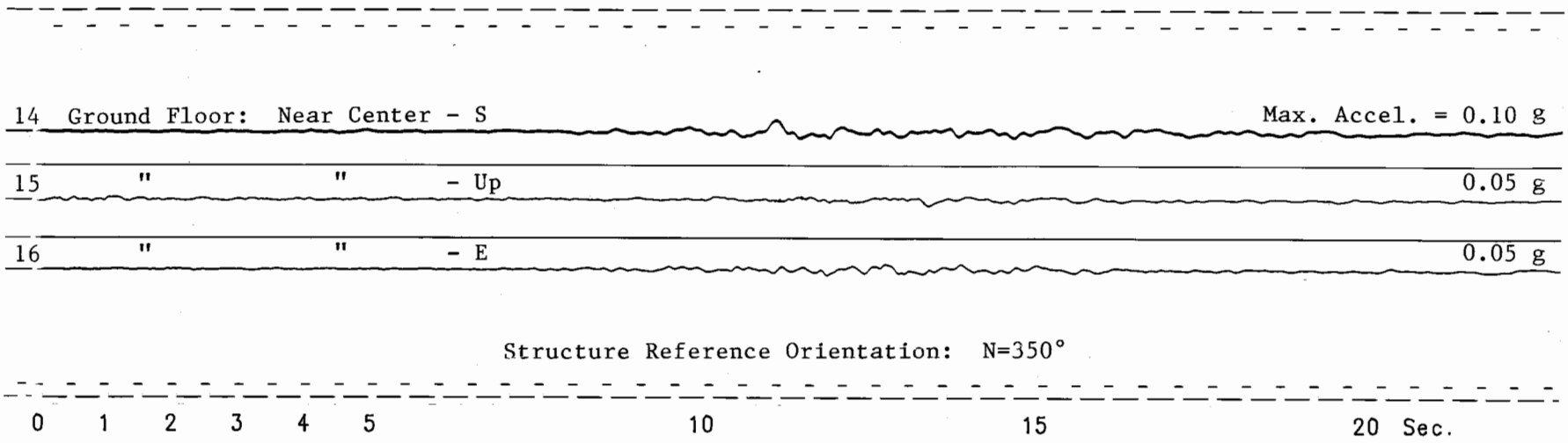
Walnut Creek – 10-story Commercial Bldg.
(CSMIP Station 58364)

Record 58364 ——◄C0194-89298.01



Walnut Creek - 10-story Commercial Bldg.
(CSMIP Station 58364)

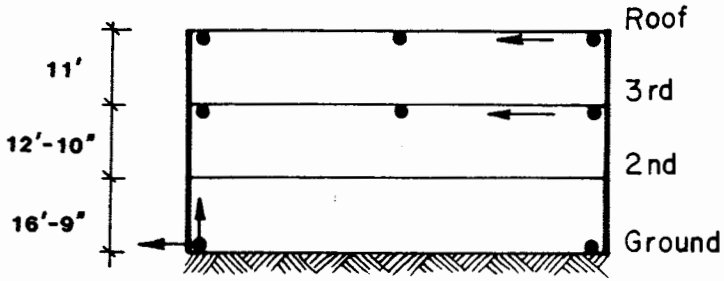
Record 58364-S3490-89298.01



Pleasant Hill - 3-story Commercial Bldg.

(CSMIP Station No. 58348)

SENSOR LOCATIONS

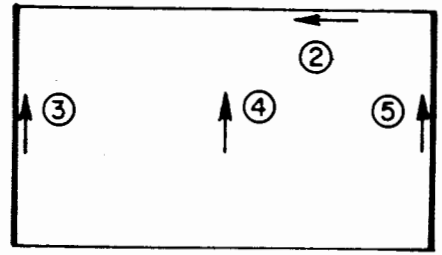


N/S Elevation

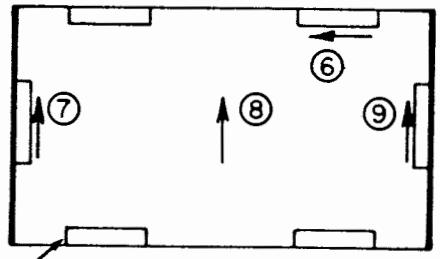
Plywood diaphragms, concrete shear walls at first and second stories, concrete columns at third story.
Design Date: 1972

N_{ref}

Structure Reference
Orientation: N= 0°

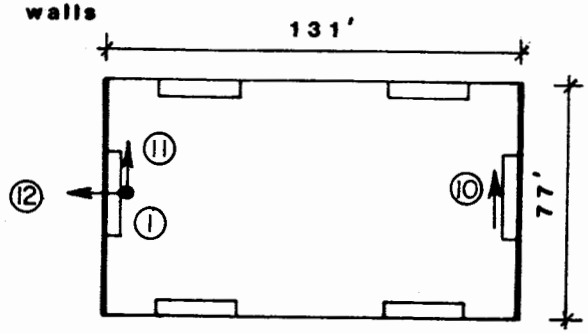


Roof



3rd floor

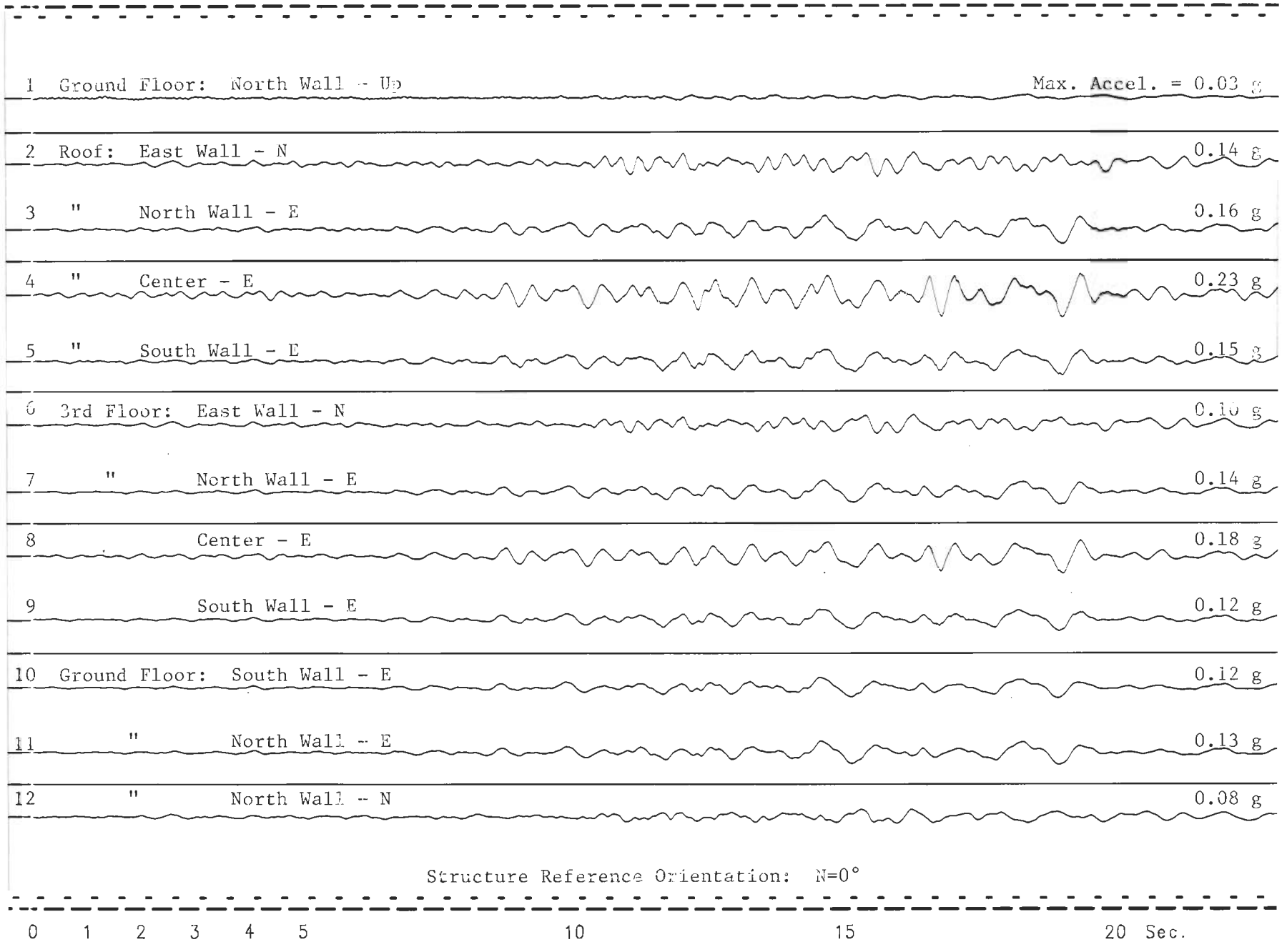
Concrete shear walls



Ground

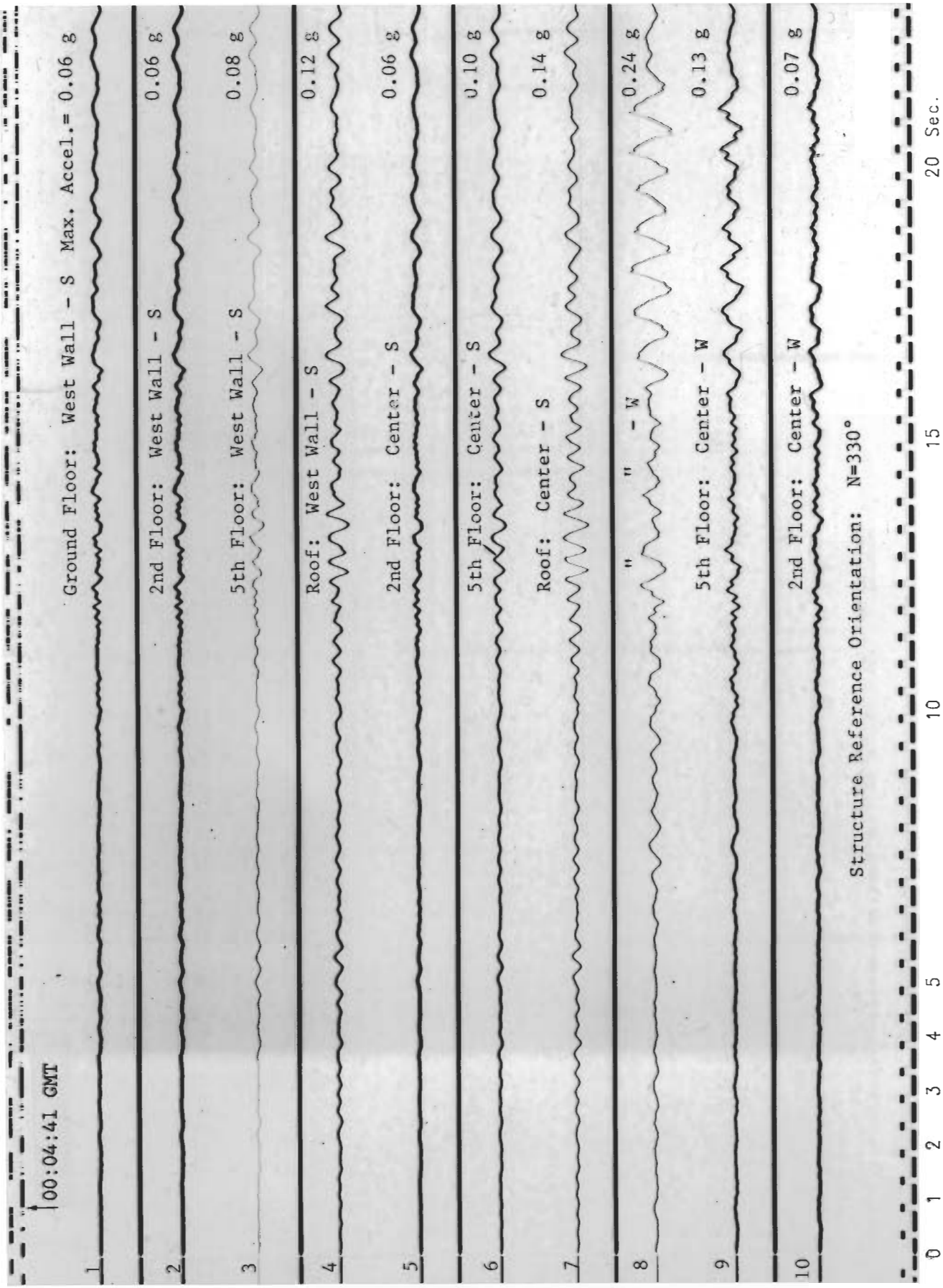
Pleasant Hill – 3-story Commercial Bldg.
(CSMIP Station 58348)

Record 58348-C0179-89298.01



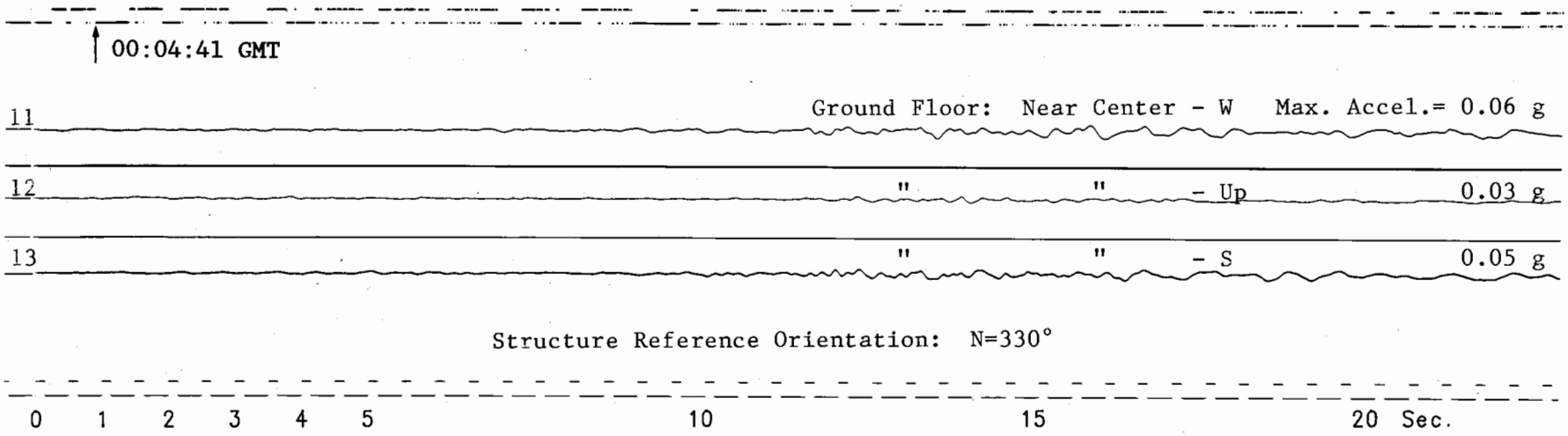
Concord – 8-story Residential Bldg. (reinforced masonry shear walls)
(CSMIP Station 58492)

Record 58492-C0212-89298.01



Concord – 8-story Residential Bldg.
(CSMIP Station 58492)

Record 58492-S2264-89298.01



INDEX TO STRUCTURAL RESPONSE RECORDS

LIFELINE STRUCTURES

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Hayward - BART Elevated Section	171
Lexington Dam	175
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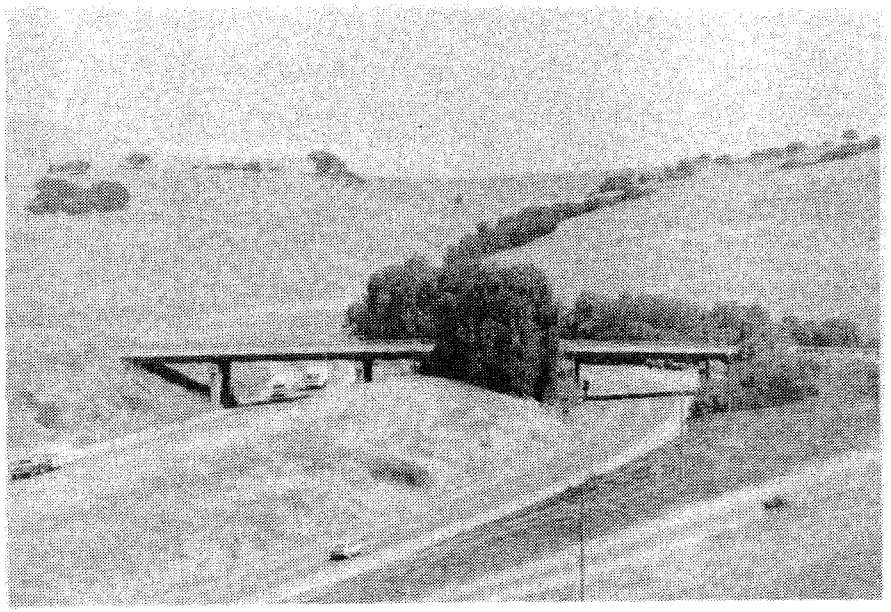
Oakland - Outer Harbor Wharf	181
Oakland - Caldecott Tunnel	184

San Juan Bautista - 101/156 Overpass



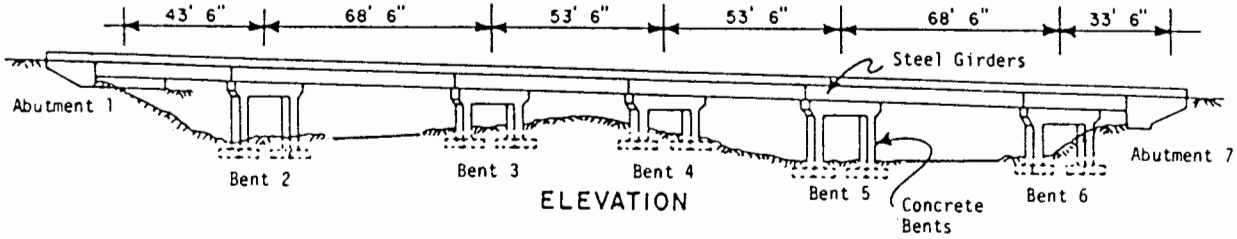
Number of Spans: 6
Length: 326'
Width: 32'
Plan Shape: Skew
Design date: 1956
Construction Date: 1958

Note: This bridge was seismically retrofitted with steel restrainers.

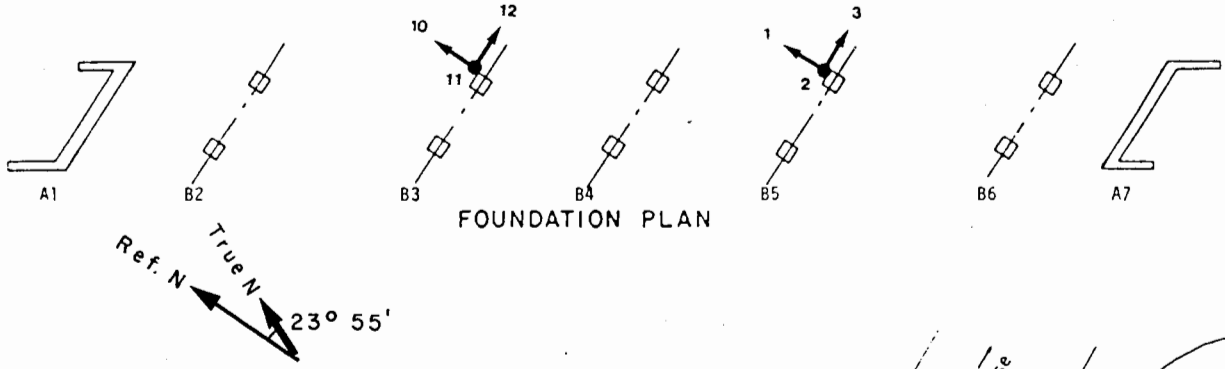
Superstructure Type:
Welded steel girders supported on rocker bearings.
Substructure Type:
Two-column reinforced concrete bents; seat type abutments with integral wingwalls.
Foundation Type:
Spread footings.

SENSOR LOCATIONS

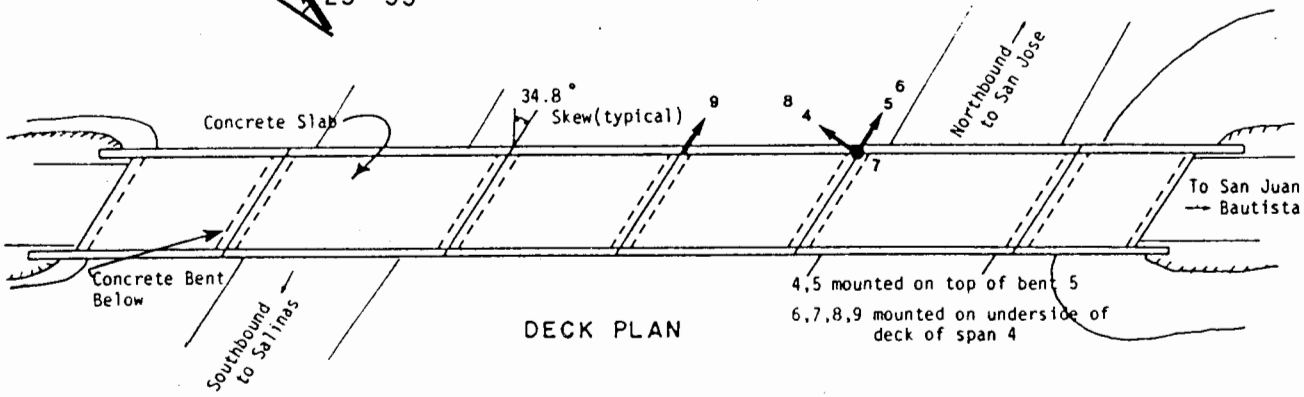
San Juan Bautista-101/156 Overpass
CSMIP Station No. 47315



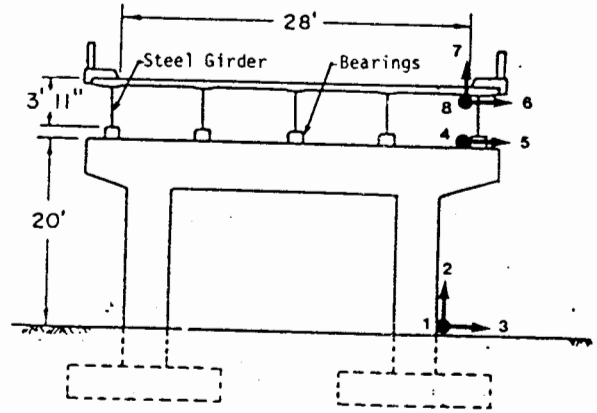
ELEVATION



FOUNDATION PLAN



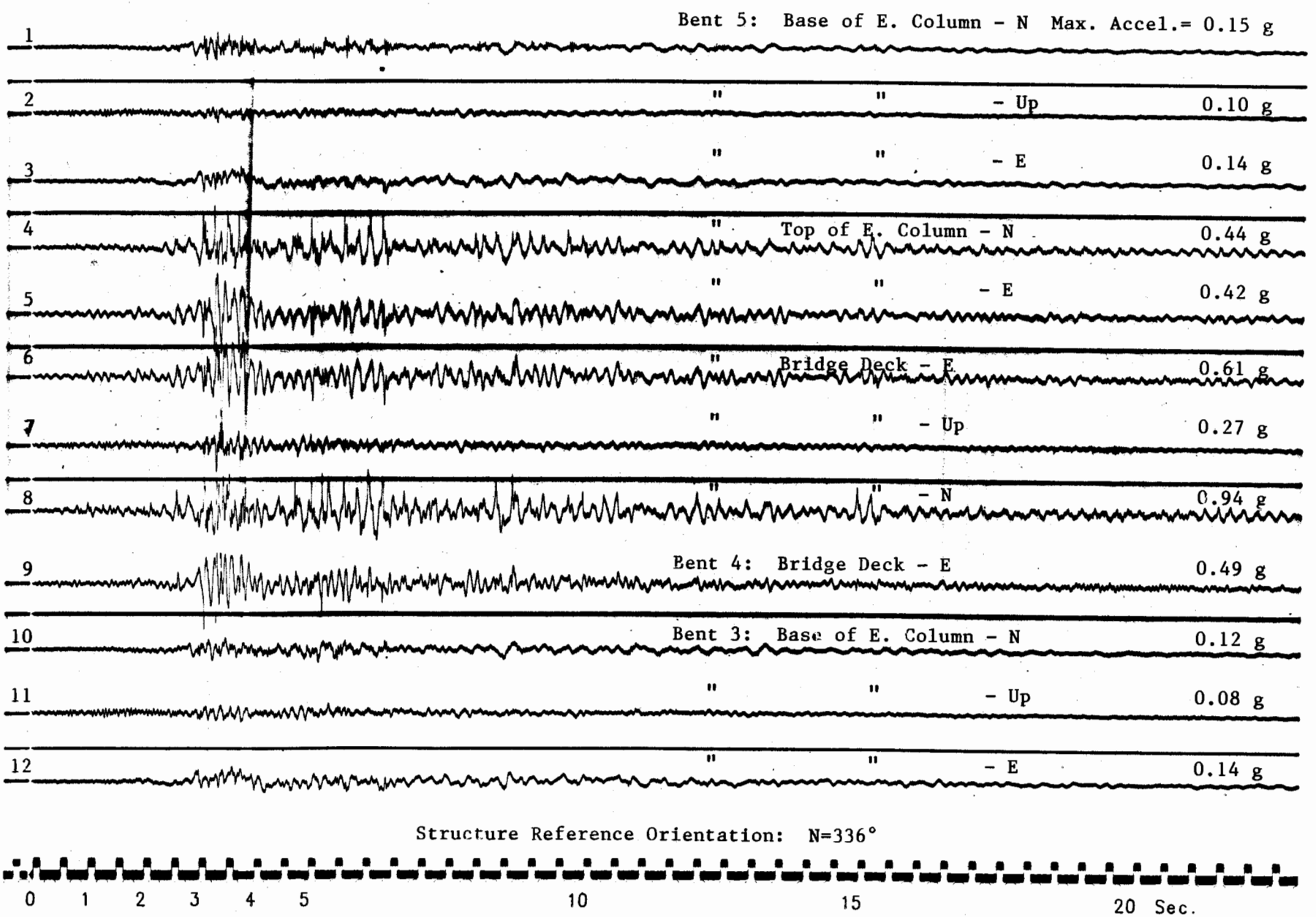
DECK PLAN



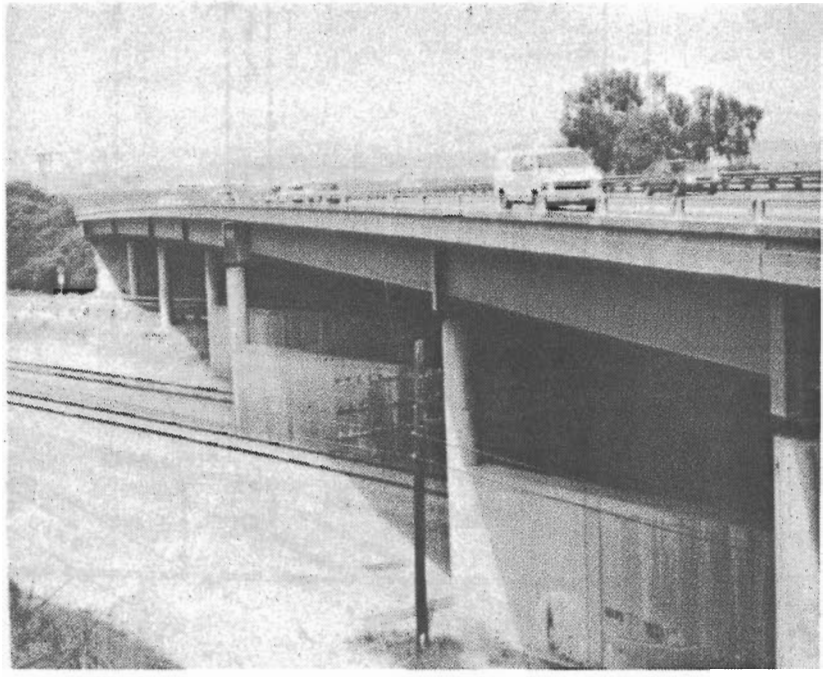
W.-E Section of Bent 5

San Juan Bautista - 101/156 Overpass
(CSMIP Station 47315)

Record 47315-C0139-89291.01



South San Francisco - Sierra Point Overpass



Number of Spans: 10
Length: 616' at centerline
Width: 117'
Plan Shape: Skew
Design Date: 1955
Construction Date: 1957

Note: In 1984-85, this bridge was retrofitted by isolating the superstructure from the columns and the abutments. Only two columns were instrumented.

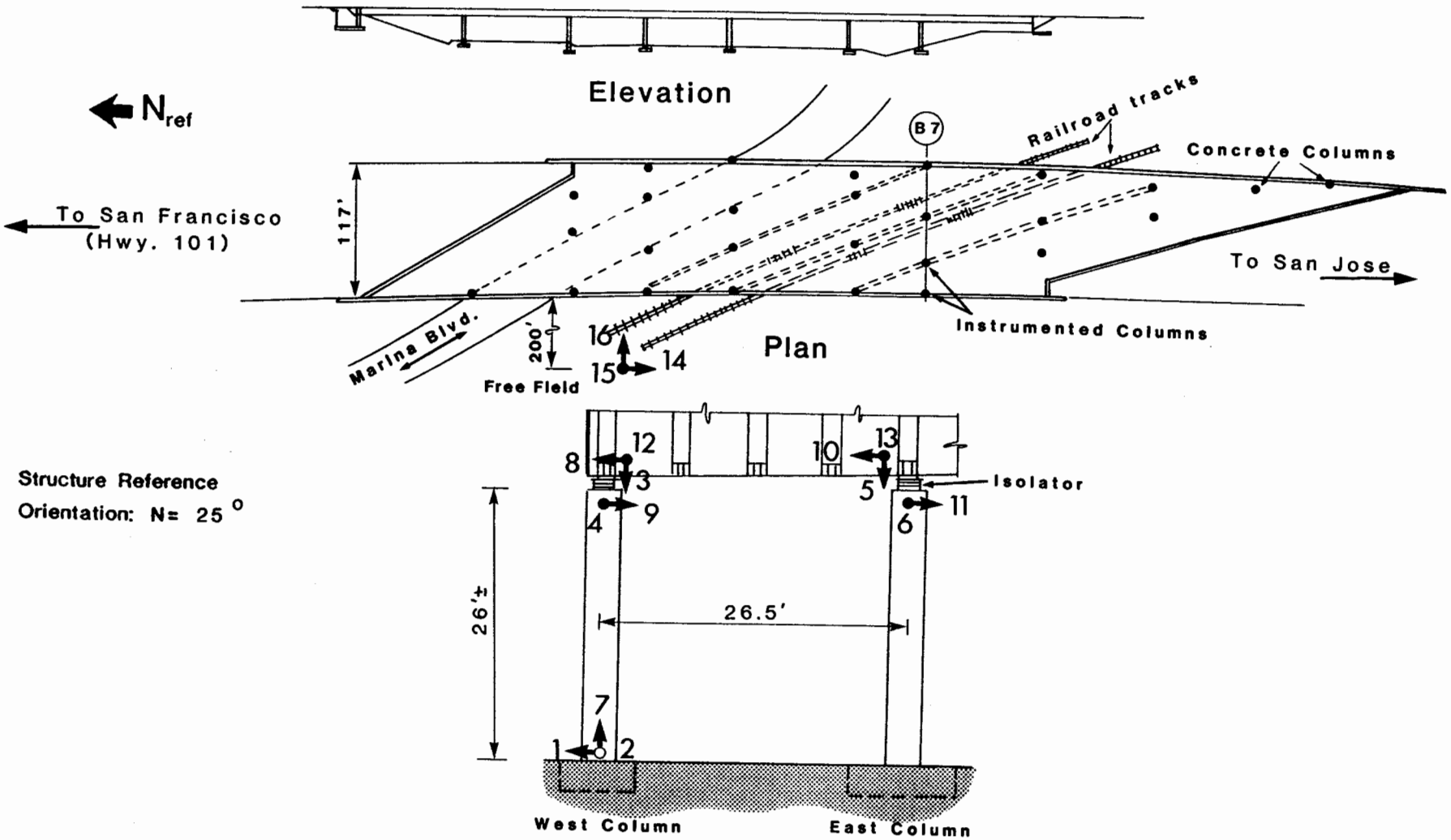
Superstructure Type:
Concrete deck slab on steel girders supported on spherical steel pin type bearings. The bearings were replaced with lead-rubber isolators in the retrofit.

Substructure Type:
Total of 27 concrete columns, 3 feet in diameter and 11 to 30 feet high. 4-column bents, reducing to 2 or 3-columns at the abutments due to the skew.
Spread footings.

South San Francisco – Sierra Point Overpass

(CSMIP Station No. 58536)

SENSOR LOCATIONS

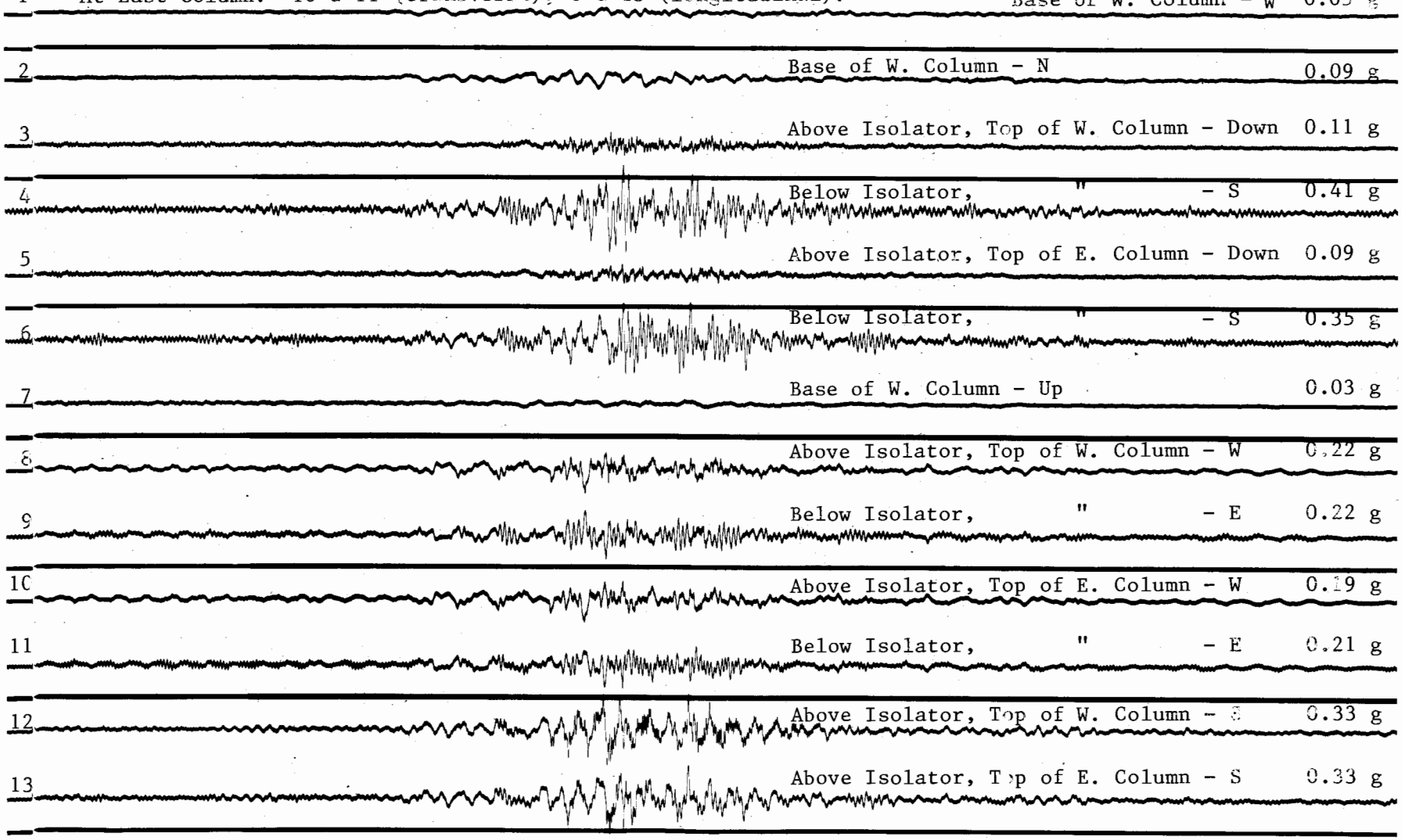


W/E Section of Column Line B7

So. San Francisco – Sierra Pt. Overpass
(CSMIP Station 58536)

Record 58536-C0285-89294.01

Across-isolator pairs:
At West Column: 8 & 9 (transverse); 4 & 12 (longitudinal).
At East Column: 10 & 11 (transverse); 6 & 13 (longitudinal).

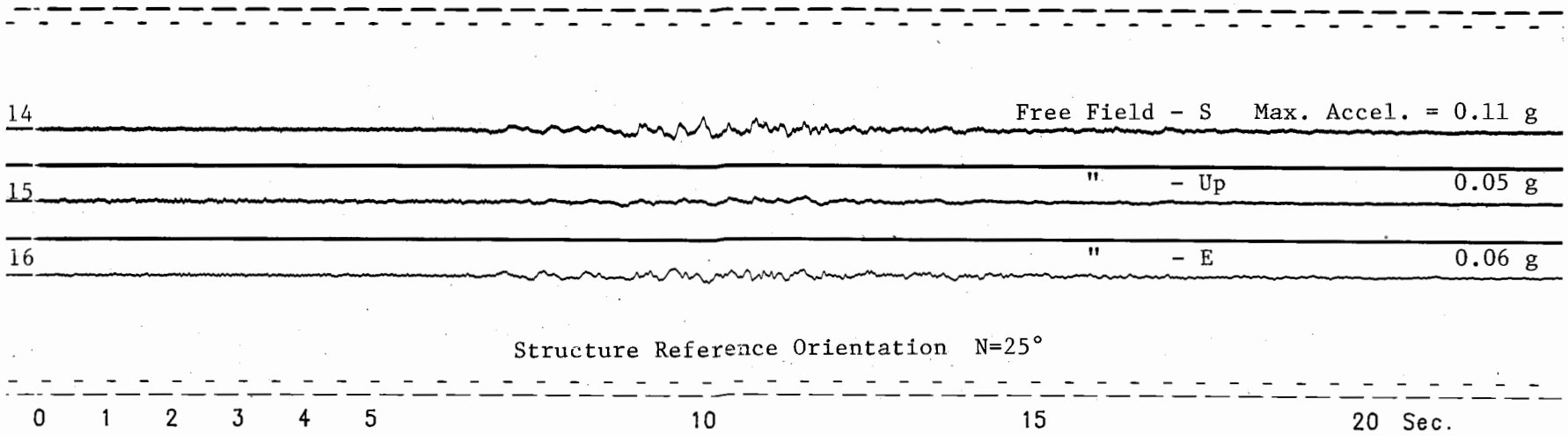


Structure Reference Orientation: N=25°

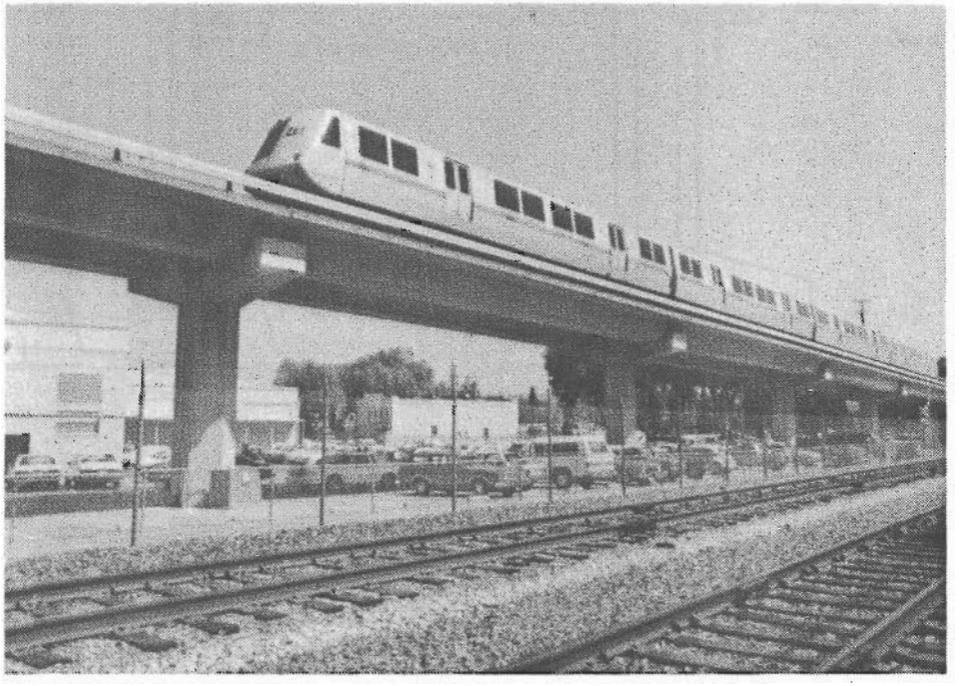
0 1 2 3 4 5 10 15 20 Sec.

So. San Francisco – Sierra Pt.
(CSMIP Station 58539)

Record 58539-S5946-89294.01



Hayward - BART Elevated Section

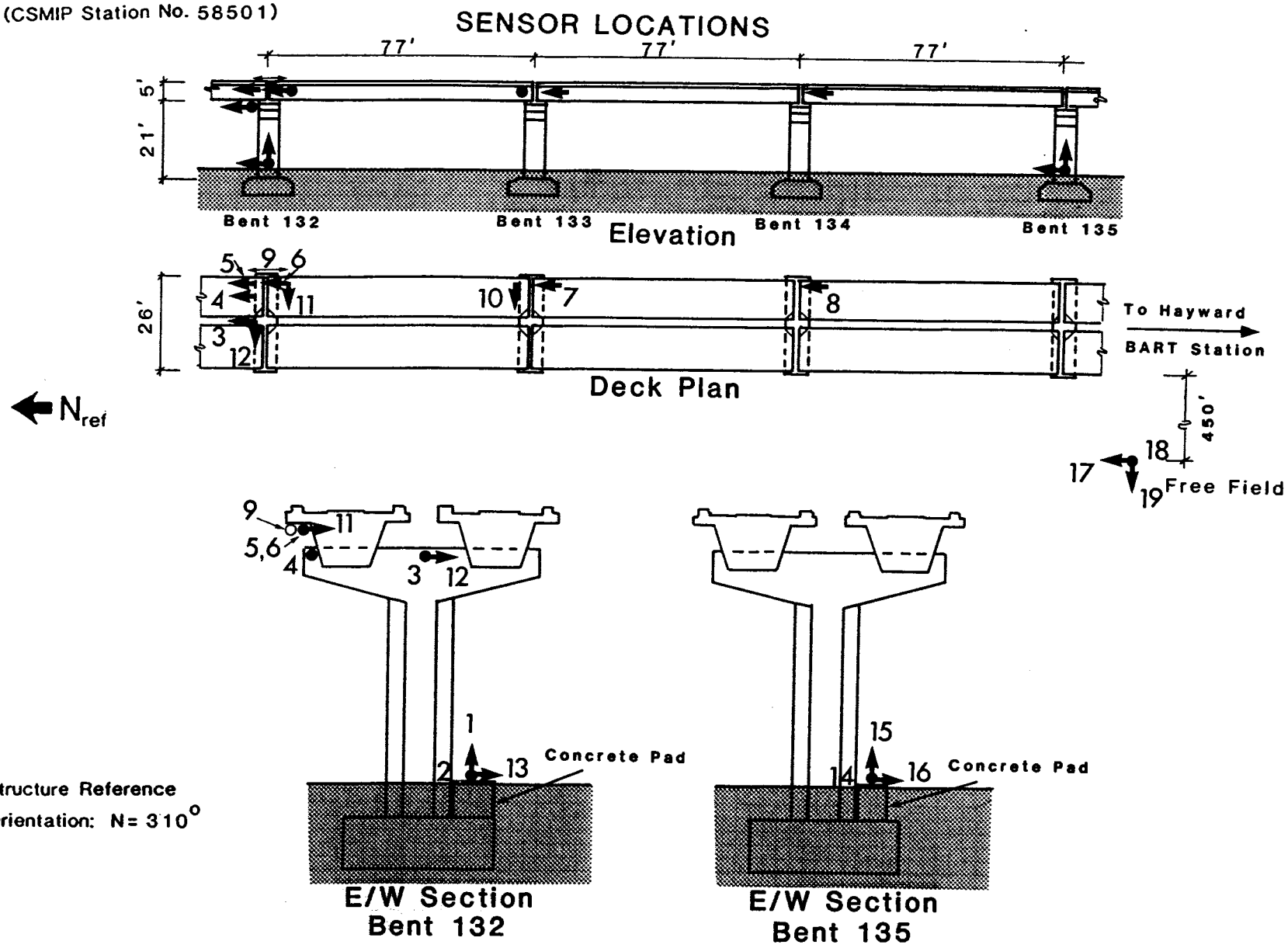


Number of Spans Instrumented: 3
Span Length: 77'
Width: 26'
Plan Shape: Rectangular
Design Date: 1965
Construction Date: 1967

Superstructure Type:
Double tracks supported on separate girders (simply supported prestressed concrete box girders).
Substructure Type:
Single-column reinforced concrete bents; beams and columns are spirally reinforced.
Foundation Type:
60 ton pile foundation.

Hayward - BART Elevated Section

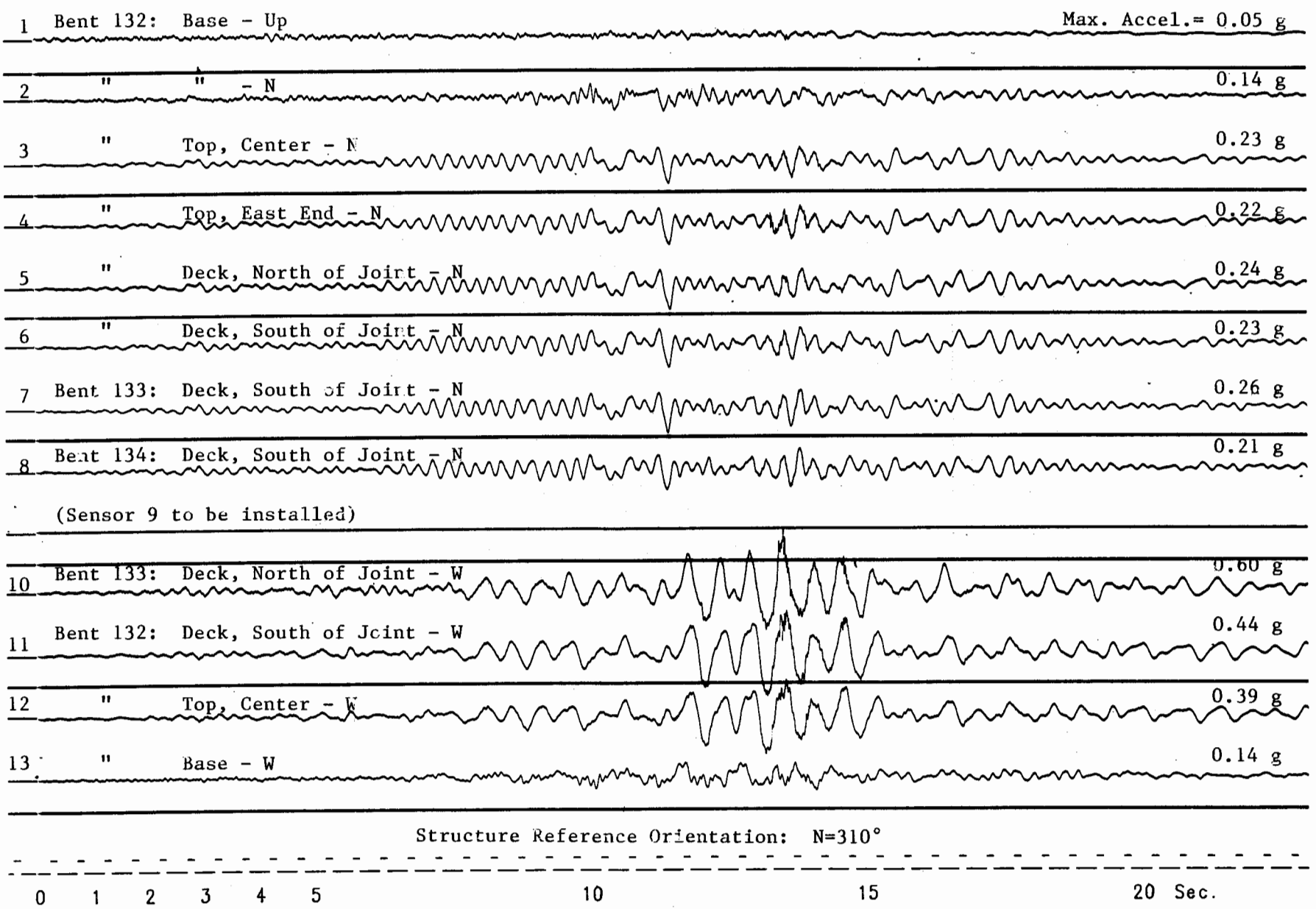
(CSMIP Station No. 58501)



Structure Reference
Orientation: N= 310°

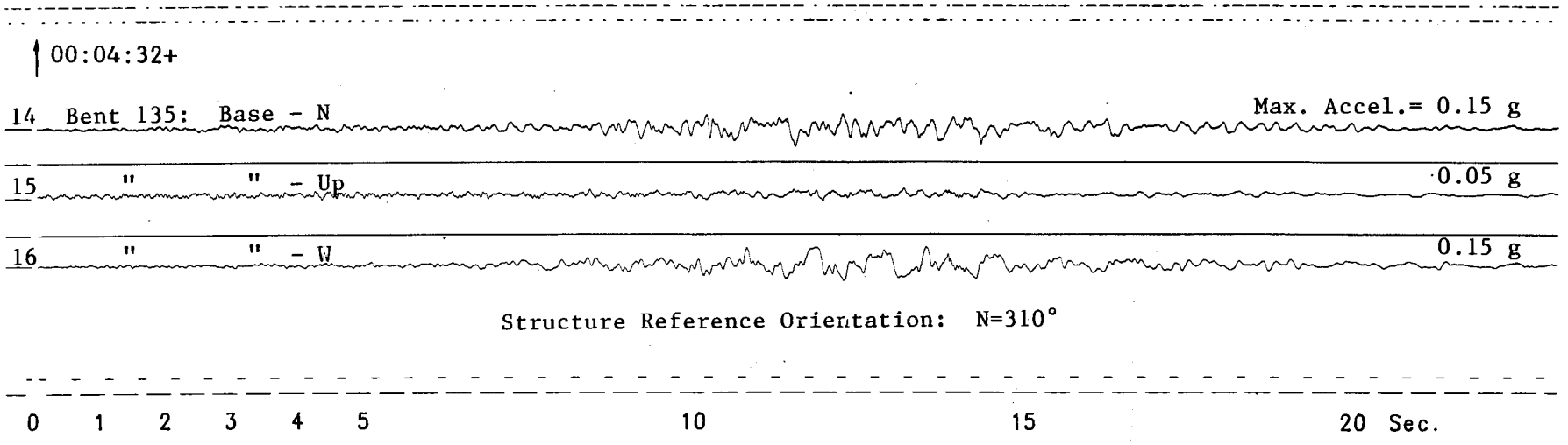
Hayward - BART Elevated Section
(CSMIP Station 58501)

Record 58501-C0274-89291.02



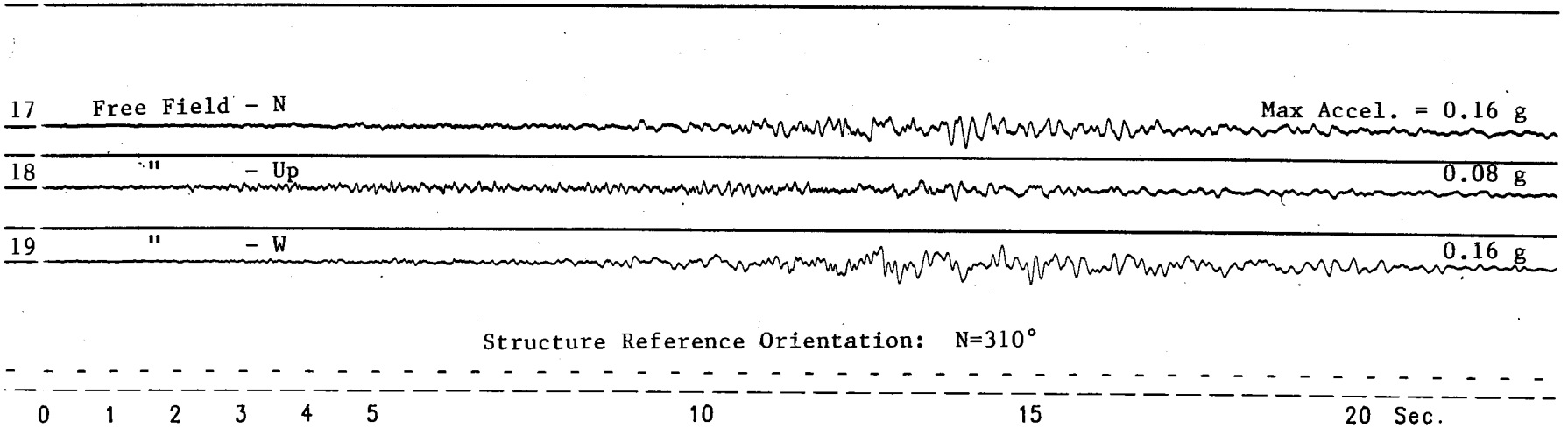
Hayward - BART Elevated Section
(CSWIP Station 58501)

Record 58501-S1694-89291.02



Hayward - BART Station
(CSWIP Station 58498)

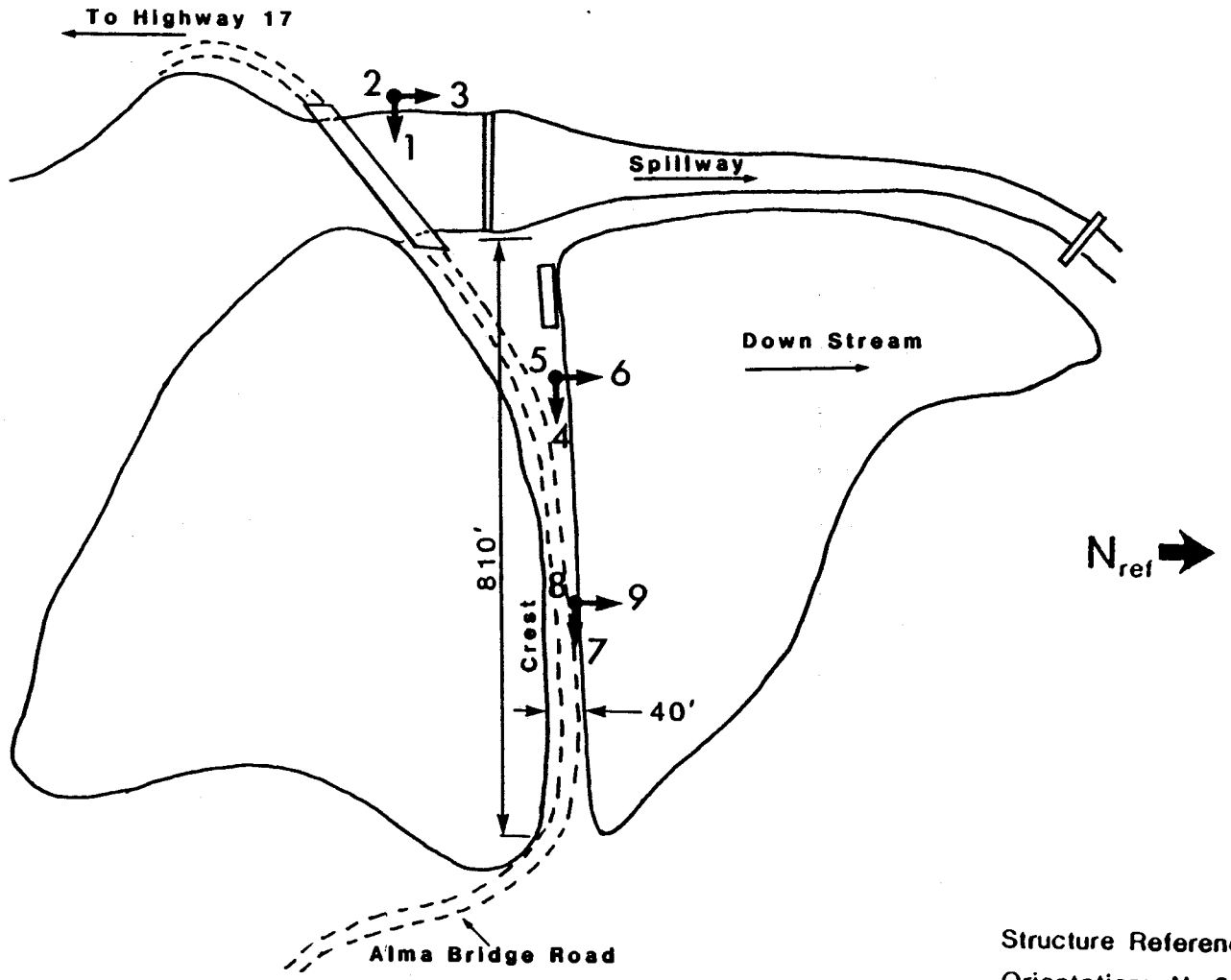
Record 58498-S5089-89291.03



Lexington Dam

(CSMIP Station No. 57180)

SENSOR LOCATIONS



Earth Dam

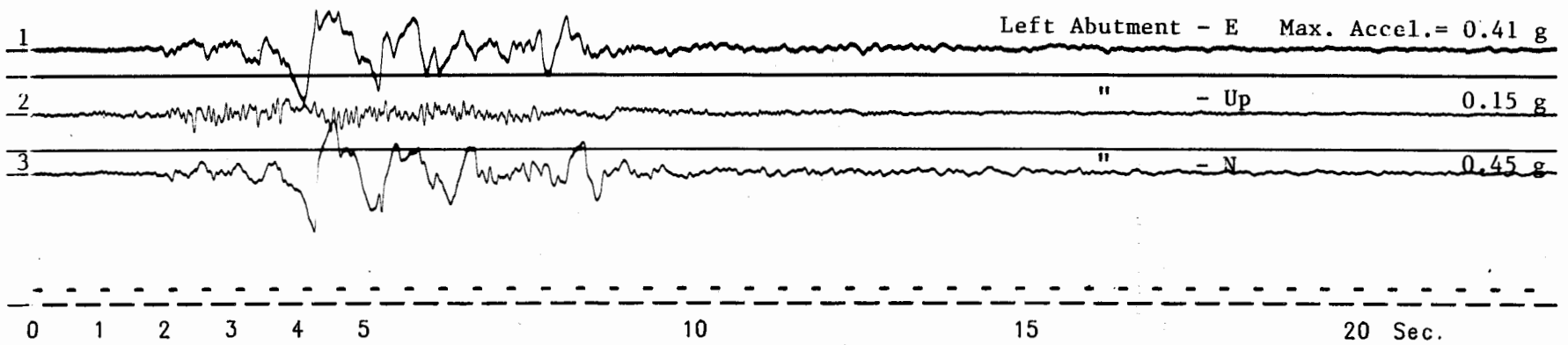
Maximum Height = 205'

Construction Date: 1953

Structure Reference Orientation: N=0°

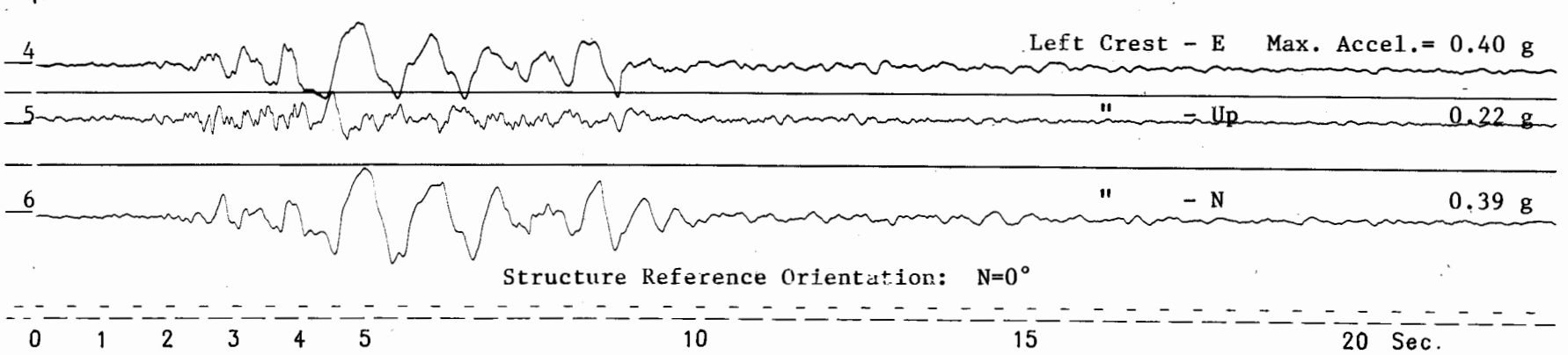
Lexington Dam
(CSMIP Station 57180)

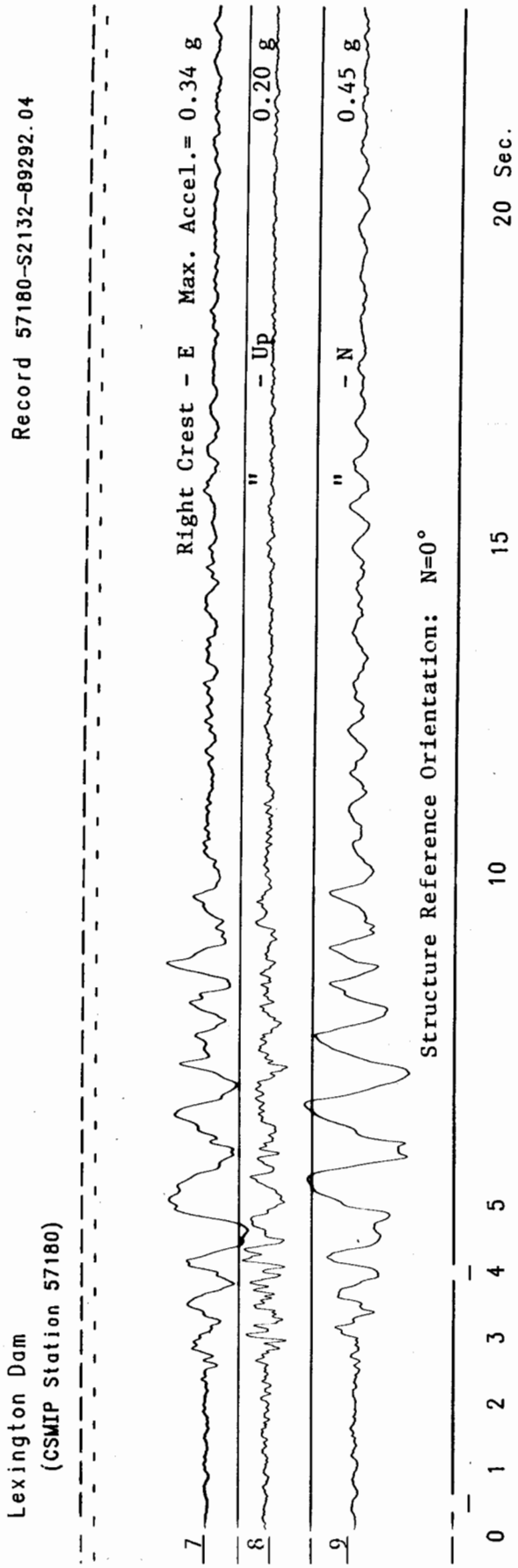
Record 57180-S2130-89292.02



Lexington Dam
(CSMIP Station 57180)

Record 57180-S2131-89292.03

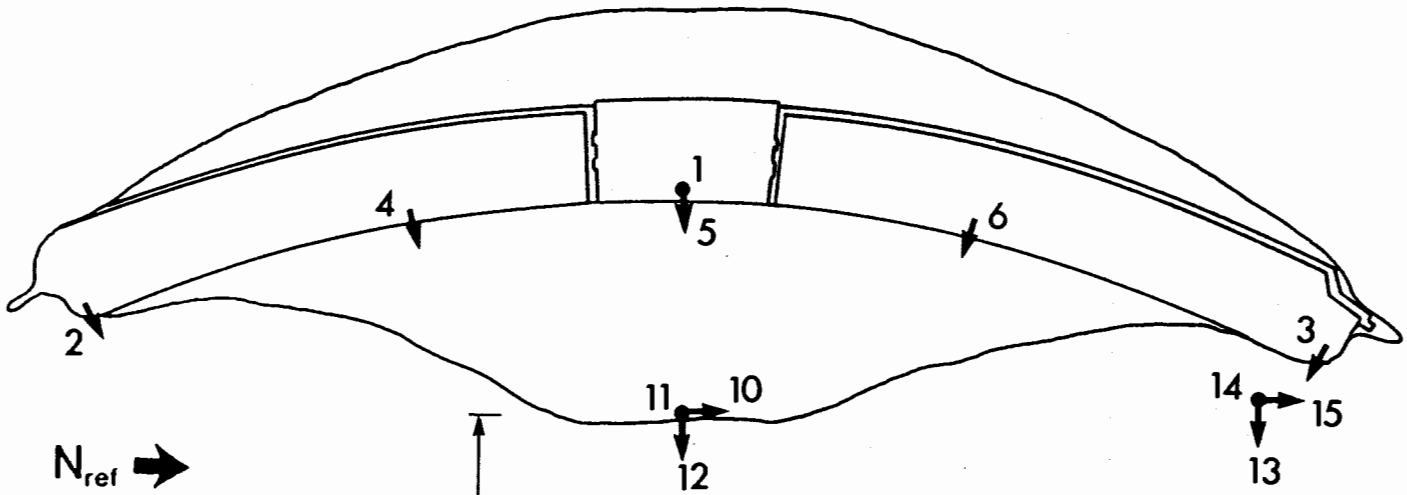


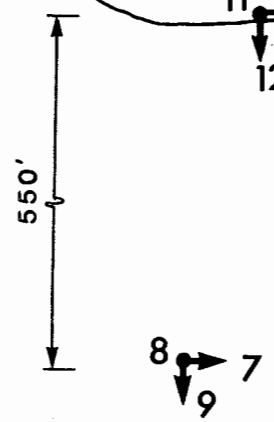

Lexington Dam
(CSMIP Station 57180)
Record 57180-S2132-89292.04
7
Right Crest - E Max. Accel.= 0.34 g
8
" - Up 0.20 g
9
" - N 0.45 g
Structure Reference Orientation: N=0°
0 1 2 3 4 5 10 15 20 Sec.

Lower Crystal Springs Dam

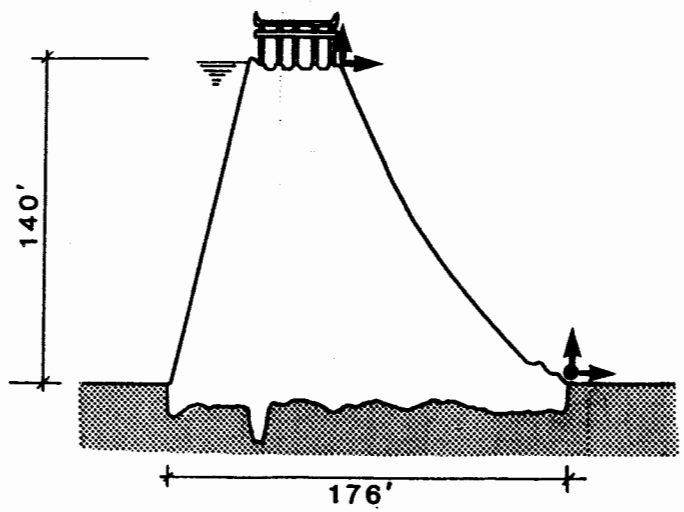
(CSMIP Station No. 58233)

SENSOR LOCATIONS





Plan



W/E Section

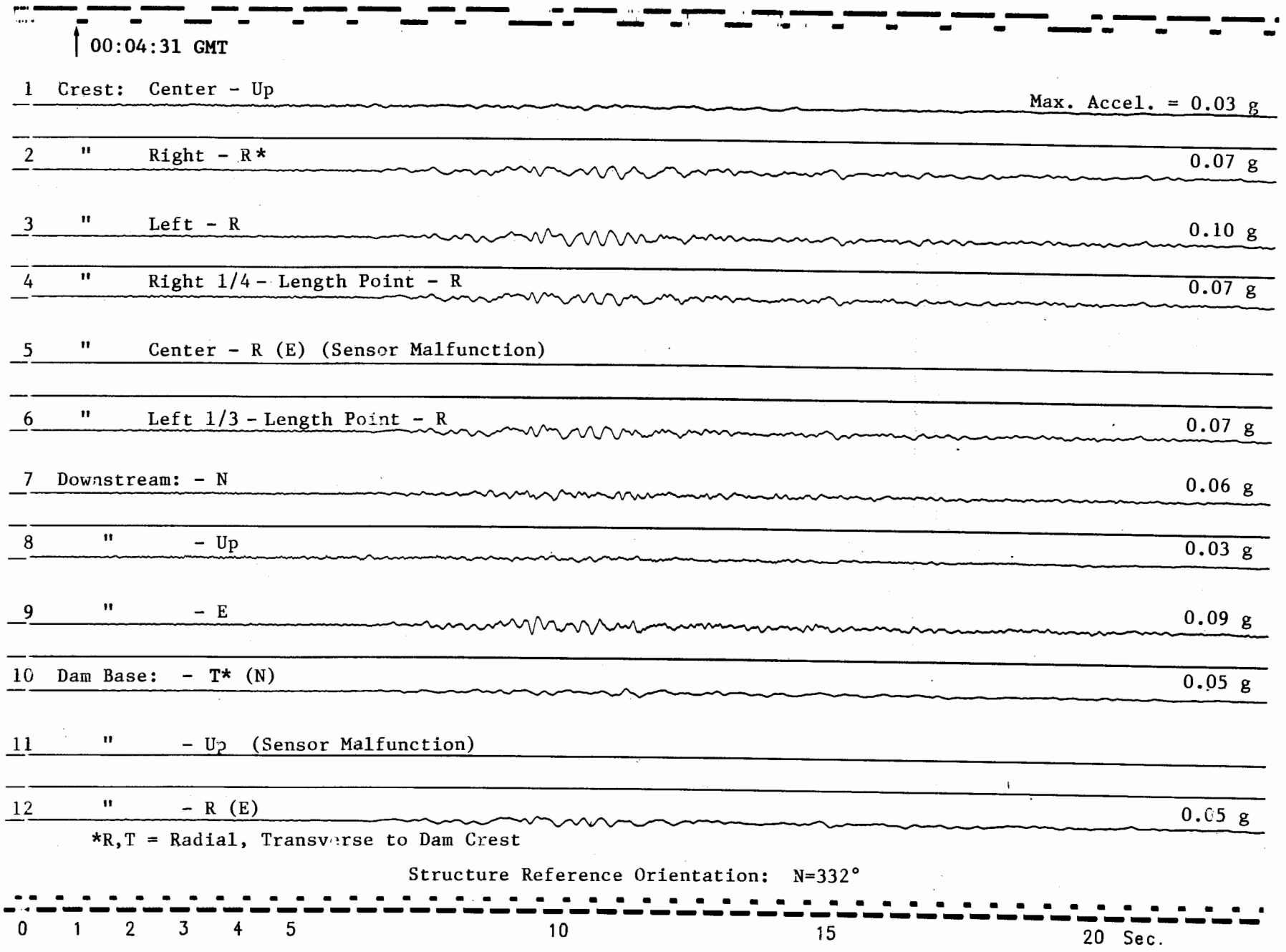
Structure Reference
Orientation: N= 332°

Concrete Gravity Dam

Construction Date: 1888

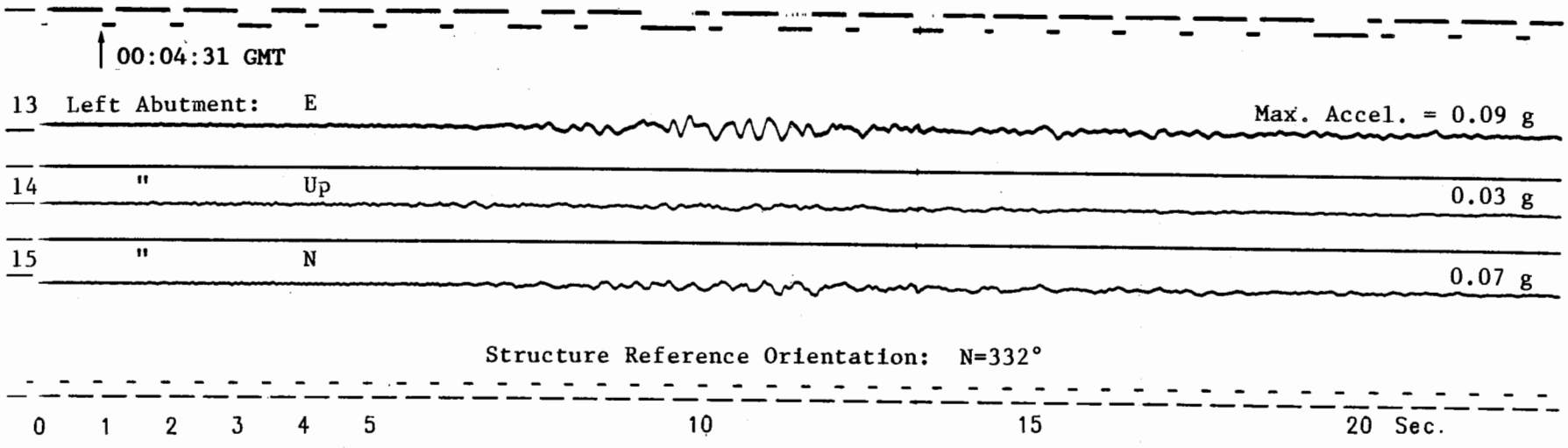
Lower Crystal Springs Dam
(CSMIP Station 58233)

Record 58233-C0143-89293.01



Lower Crystal Springs Dam
(CSWIP Station 58233)

Record 58233-S1686-89293.01



Oakland - Outer Harbor Wharf

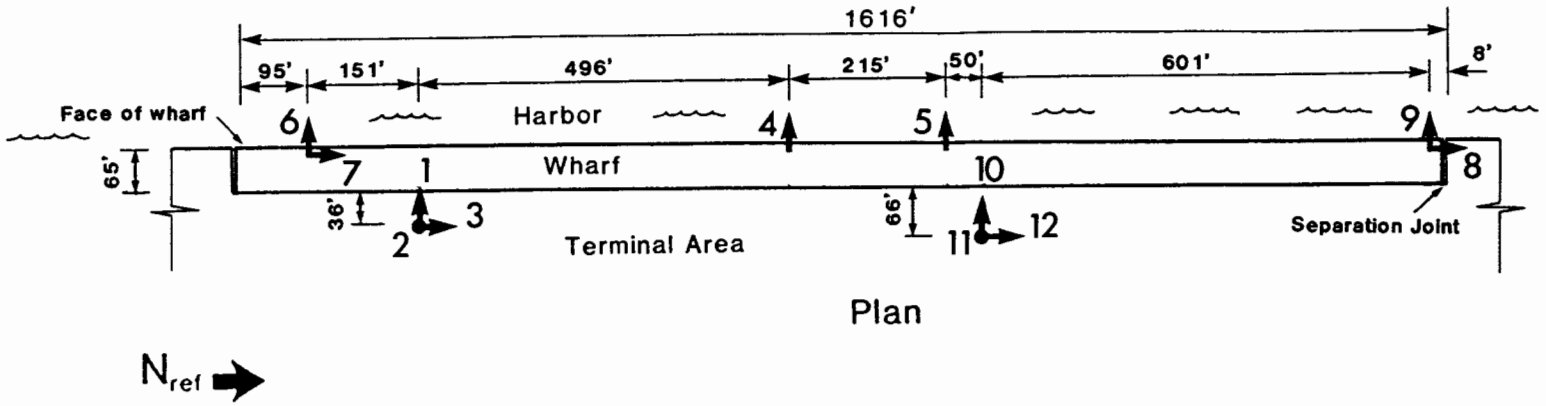
Length: 1616'
Width: 65'
Plan Shape: Rectangular
Design Date: 1975

Structure System:
20" reinforced concrete deck supported by prestressed concrete piles (vertical, and batter piles, 60-90 feet long)

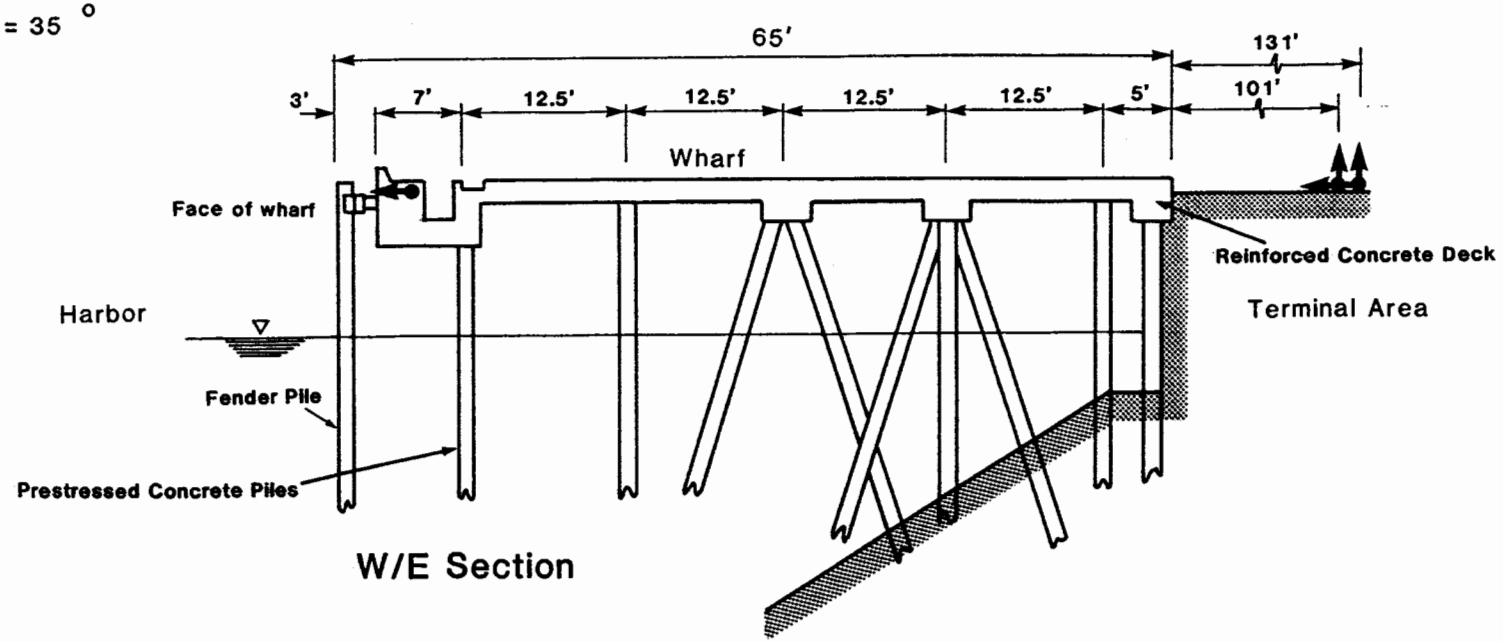
Oakland – Outer Harbor Wharf

(CSMIP Station No. 58472)

SENSOR LOCATIONS

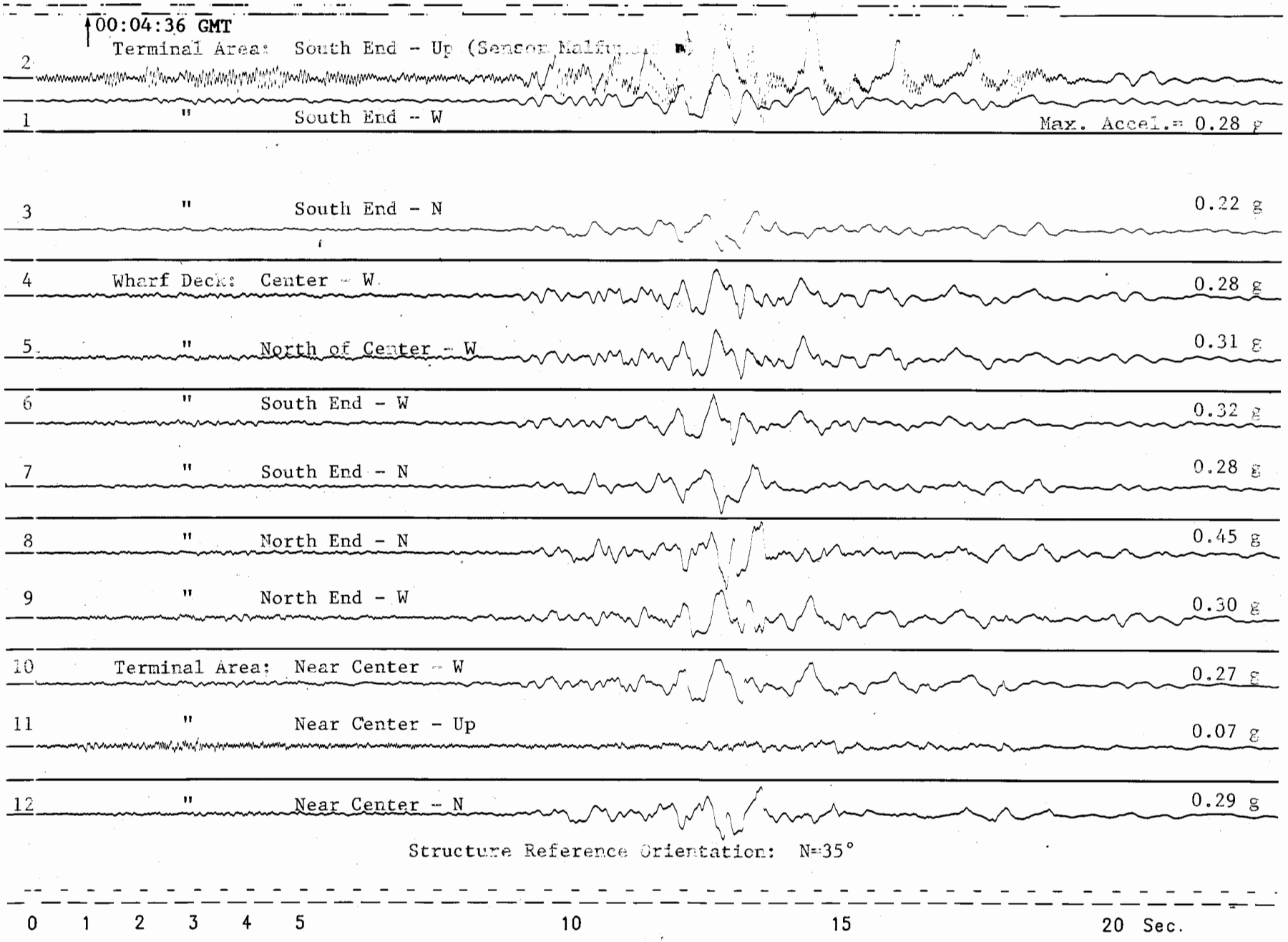


Structure Reference
Orientation: N= 35 °



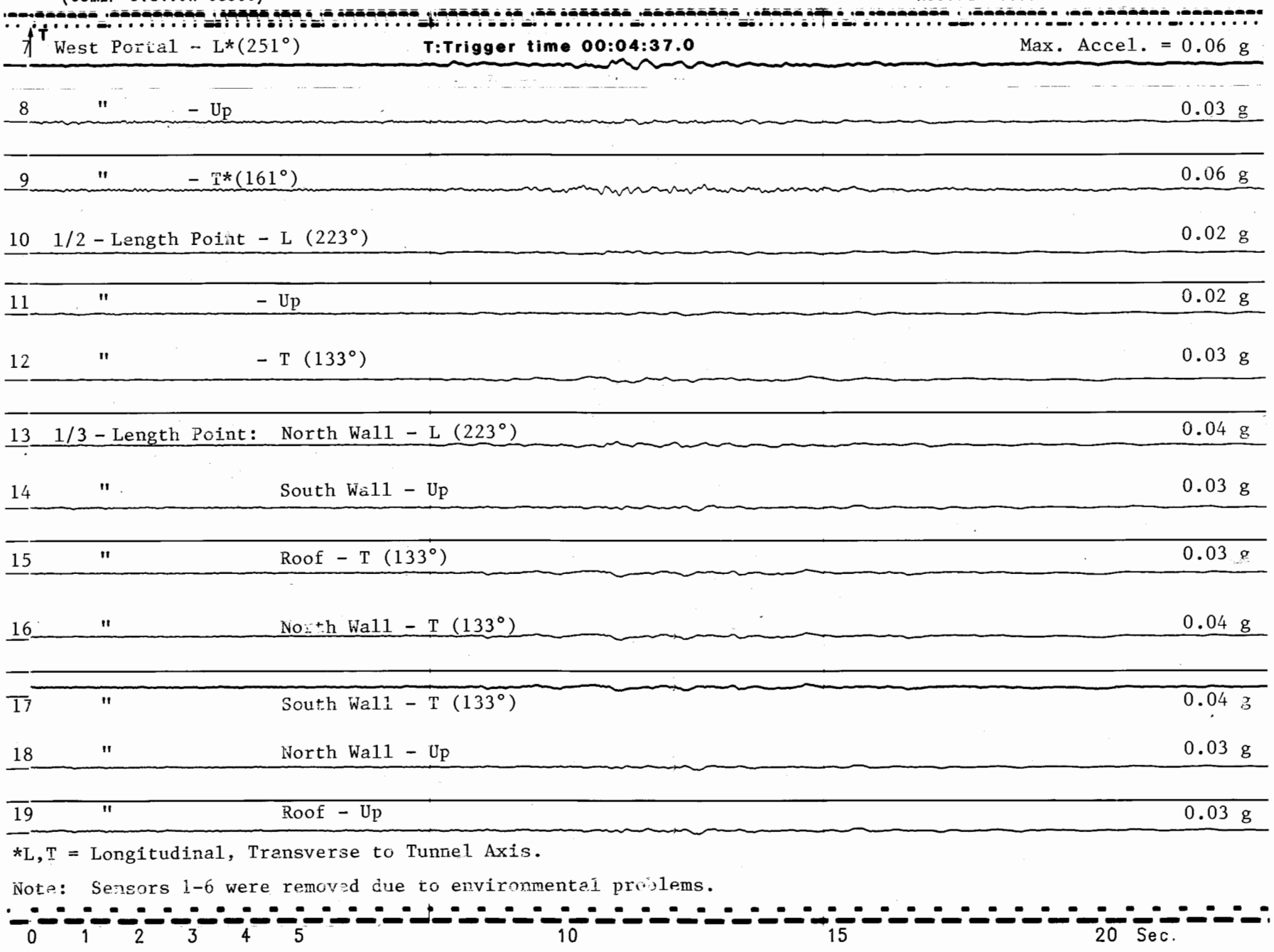
Oakland - Outer Harbor Wharf
(CSMIP Station 58472)

Record 58472-C0221-89293.05



Oakland - Caldecott Tunnel (Hwy 24, North Tunnel, 3100 feet long)

(CSMIP Station 58359) Record 58359-C0162-89297.01



*L,T = Longitudinal, Transverse to Tunnel Axis.

Note: Sensors 1-6 were removed due to environmental problems.

List of CSMIP Reports and Data Tapes

LIST OF CSMIP REPORTS AND DATA TAPES

California Department of Conservation
Division of Mines and Geology
Office of Strong Motion Studies
California Strong Motion Instrumentation Program (CSMIP)

AVAILABLE REPORTS:

Title	Number
I. Earthquake Data Reports:	
CSMIP Strong-Motion Records from the Superstition Hills, Imperial County, California Earthquakes of 23 and 24 November 1987	OSMS 87-06
CSMIP Strong-Motion Records from the Whittier, California Earthquake of 1 October 1987	OSMS 87-05
CSMIP Strong-Motion Records from the Chalfant Valley, California Earthquakes of July and August 1986	OSMS 86-06
CSMIP Strong-Motion Records from the Palm Springs, California Earthquake of 8 July 1986	OSMS 86-05
Selected Accelerograms from the Redlands, California Earthquake of October 2, 1985	OSMS 85-02
CSMIP Strong-Motion Records from the Bishop, California Earthquake of 23 November 1984	OSMS 84-12
CDMG Strong-Motion Records from the Morgan Hill, California Earthquake of 24 April 1984	OSMS 84-7
Preliminary Summary of CDMG Strong-Motion Records from the 2 May 1983 Coalinga, California Earthquake	OSMS 83-5.2
Strong-Motion Records from the Mammoth Lakes, California Earthquake of 6 January 1983	OSMS 83-1.1
Strong-Motion Records Recovered from the Mammoth Lakes, California Earthquake of 30 September 1981	OSMS 81-10.1
Strong-Motion Records Recovered from the Westmorland, California Earthquake of 25 April 1981	OSMS 81-5.1
Strong-Motion Records Recovered from the Trindad-Offshore, California Earthquake of 8 November 1980	OSMS 80-11.1
Strong-Motion Records from the Livermore Earthquakes of 24 and 26 January 1980	PR 28
Strong-Motion Records from the Mammoth Lakes Earthquakes of May 1980	PR 27
Compilation of Strong-Motion Records and Preliminary Data from the Imperial Valley Earthquake of 15 October 1979	PR 26

Title	Number
Compilation of Strong-Motion Records from the Coyote Lake Earthquake of 6 August 1979	PR 25
Compilation of Strong-Motion Records Recovered from the Bishop, California Earthquake of 4 October 1978	OSMS 78-7.1
Compilation of Strong-Motion Records Recovered from the Santa Barbara Earthquake of 13 August 1978	PR 22
Catalog of Strong Motion Accelerograph Records Recovered by Office of Strong Motion Studies before January 1, 1982	SR 154
Catalog of Strong Motion Accelerograph Records Recovered by Office of Strong Motion Studies During 1982	SR 154A
II. Processed Data Reports:	
Processed Strong-Motion Data from the Whittier, California Earthquake of 1 October 1987; Part I Ground-Response Records	OSMS 89-03
The Cerro Prieto, Baja California Earthquake of February 6, 1987 and Processed Strong-Motion Data	OSMS 87-04
Processed Strong Motion Data from the Palm Springs Earthquake of 8 July 1986; Part I Ground-Response Records	OSMS 87-01
Processed Strong Motion Data from the San Salvador Earthquake of October 10, 1986	OSMS 86-07
Processed Data from the Strong-Motion Record Obtained at a Base-Isolated Building in Rancho Cucamonga, California during the Redlands Earthquake of 2 October 1985	OSMS 86-01
Processed Data from Strong-Motion Records of the Morgan Hill Earthquake of 24 April 1984: Part I Ground-Response Records	OSMS 85-04
Processed Data from Strong-Motion Records of the Morgan Hill Earthquake of 24 April 1984: Part II Structural-Response Records	OSMS 85-05
Processed Data from the Strong-Motion Records of the Imperial Valley Earthquake of 15 October 1979.	SP 65
Processed Data from the San Juan Bautista 101/156 Separation Bridge and the San Juan Bautista Freefield Records from the Coyote Lake Earthquake 6 August 1979	SP 64
Processed Data from the Gilroy Array and Coyote Creek Records, Coyote Lake, California, Earthquake 6 August 1979	PR 24
Processed Data from the Strong-Motion Records of the Santa Barbara Earthquake of 13 August 1978. (in three volumes)	SR 144
III. Other Reports:	
Standard Tape Format of CSMIP Strong-Motion Data Tapes	OSMS 85-03

AVAILABLE STRONG-MOTION DATA TAPES:

Tape Name	Description
SANTBARB78	Santa Barbara earthquake of 13 August 1978.
IMPERIAL79	Imperial Valley earthquake of 15 October 1979 (County Services Bldg. and other CSMIP stations).
COYOTE79A	Coyote Lake earthquake of 6 August 1979, Gilroy Array stations.
COYOTE79B	Coyote Lake earthquake of 6 August 1979, San Juan Bautista overpass and nearest free-field station.
COYOTE79C	Coyote Lake earthquake of 6 August 1979, Halls Valley station.
MAMMOTH80A	Mammoth Lakes earthquakes of 25 May 1980 at 09:34 and 09:49 PDT.
MAMMOTH80B	Mammoth Lakes earthquakes of 25 May 1980 at 12:45 and 13:36 PDT.
MAMMOTH80C	Mammoth Lakes earthquakes of 26 May 1980 at 11:58 PDT and 27 May 1980 at 07:51 PDT.
WESTMOR81	Westmorland earthquake of 26 April 1981.
COALINGA83	Coalinga earthquake of 2 May 1983, 16:43 PDT; Vol. 2 and 3 data for 47 records.
COALINGA83-IA	Coalinga earthquake of 2 May 1983, Vol. 1 data for first 22 records.
COALINGA83-IB	Coalinga earthquake of 2 May 1983, Vol. 1 data for remaining 25 records.
COALINGA83AS	Vol. 2 and 3 data for eight aftershocks of the Coalinga 2 May 1983 earthquake. The aftershocks occurred between 8 May and 11 September 1983, and were of magnitude (ML) 4.3 - 6.0.
COALINGA83AS-I	Vol. 1 data for the Coalinga aftershock records included on the tape COALINGA83AS.
RIODEL8083	Processed data from the Highway 101 Overpass at Rio Dell for the earthquakes of: 8 Nov 1980 (6.9ML Trinidad-Offshore); 16 Dec 1982 (4.4ML Rio Dell) and 24 Aug 1983 (5.5ML Cape Mendicino Offshore).
MAMMOTH83	Mammoth Lakes earthquakes of 7 Jan 1983 at 01:38 and 03:24 GMT.
MORGANHILL84-IG	Morgan Hill earthquake of 24 April 1984; Vol. 1 data from 19 ground-response stations.
MORGANHILL84-G	Morgan Hill earthquake of 24 April 1984; Vol. 2 and 3 data from 19 ground-response stations.
MORGANHILL84-IS	Morgan Hill earthquake of 24 April 1984; Vol. 1 data from 7 buildings and one bridge.
MORGANHILL84-S	Morgan Hill earthquake of 24 April 1984; Vol. 2 and 3 data from 7 buildings and one bridge.

Tape Name	Description
REDLANDS85	Redlands earthquake of 2 October 1985; data from the Law & Justice Building at Rancho Cucamonga.
HOLLISTER86	Hollister earthquake of 26 January 1986.
MTLEWIS86	Mt. Lewis earthquake of 31 March 1986.
SANSALVADOR86	San Salvador earthquake of October 10, 1986.
PALMSPRINGS86-IG	Palm Springs earthquake of 8 July 1986; Vol. 1 data from 18 ground-response stations.
PALMSPRINGS86-G	Palm Springs earthquake of 8 July 1986; Vol. 2 and 3 data from 18 ground-response stations.
CERROPRIETO87	Cerro Preito, Baja California earthquake of February 6, 1987
WHITTIER87-IG	Whittier earthquake of 1 October 1987; Vol. 1 data from 36 ground-response stations.
WHITTIER87-G	Whittier earthquake of 1 October 1987; Vol. 2 and 3 data from 36 ground-response stations.
WHITTIER87-IB1	Whittier earthquake of 1 October 1987; Vol. 1 data from first 10 of the 18 buildings.
WHITTIER87-IB2	Whittier earthquake of 1 October 1987; Vol. 1 data from last 8 of the 18 buildings.
WHITTIER87-IIB	Whittier earthquake of 1 October 1987; Vol. 2 data from all 18 buildings.
WHITTIER87-IIIB	Whittier earthquake of 1 October 1987; Vol. 3 data from all 18 buildings.
WHITTIER87-L	Whittier earthquake of 1 October 1987; Vol. 1, 2 and 3 data from 3 lifeline structures (1 bridge and 2 dams).

Footnotes:

Each tape contains Vol. 1, 2 and 3 data unless otherwise specified.

Vol. 1 data - uncorrected accelerations,
Vol. 2 data - instrument and baseline-corrected acceleration, velocity, and displacement.
Vol. 3 data - Response and Fourier amplitude spectra.

The magnetic tapes are provided at cost. Included with each tape is a copy of either the processed data report (if available) or the plots of the data.

The Vol. 2 and 3 data are also available on floppy disks for use in personal computers. Requests for the reports, data tapes, data disks and/or for additional information should be addressed to:

Office of Strong Motion Studies
California Division of Mines and Geology
630 Bercut Drive
Sacramento, CA 95814

Phone: (916) 322-3105

PROCESSED ACCELEROGRAMS ON CSMIP DATA TAPES:

Tape: SANTBARB78

Santa Barbara Earthquake of 13 Aug 1978, 15:54 PDT, ML=5.1(CIT)

UCSB Goleta Free Field
Santa Barbara - Freitas Building
Santa Barbara - UCSB North Hall
Ventura - Holiday Inn

Tape: IMPERIAL79

Imperial Valley Earthquake of 15 Oct 1979, 16:17 PDT, ML=6.6(CIT)

Niland
Westmorland
Westmorland, aftershock record
El Centro - Imperial County Services Building and Free Field
El Centro - Highway 8/Meloland Road Overpass

Tape: COYOTE79A

Coyote Lake Earthquake of 6 Aug 1979, 10:05 PDT, ML=5.9(BRK)

Gilroy #1, #2, #3, #4, #6
Coyote Lake Dam (San Martin)

Tape: COYOTE79B

Coyote Lake Earthquake of 6 Aug 1979, 10:05 PDT, ML=5.9(BRK)

San Juan Bautista - Fire Station
San Juan Bautista - Highway 101/156 Overpass

Tape: COYOTE79C

Coyote Lake Earthquake of 6 Aug 1979, 10:05 PDT, ML=5.9(BRK)

Halls Valley

Tape: MAMMOTH80A

Mammoth Lakes Earthquake of 25 May 1980, 09:34 PDT, ML=6.1(BRK),6.4(CIT)

Convict Creek
Mammoth Lakes - High School Gym
Long Valley Dam

Aftershock at 25 May 1980, 09:36 PDT, ML=unknown

Mammoth Lakes - High School Gym, 10 channels

Mammoth Lakes Earthquake of 25 May 1980, 09:49 PDT, ML=6.0(BRK),5.8(CIT)

Convict Creek
Mammoth Lakes - High School Gym
Long Valley Dam - Upper Left Abutment

Tape: MAMMOTH80B

Mammoth Lakes Earthquake of 25 May 1980, 12:45 PDT, ML=6.1(BRK),6.5(CIT)

Convict Creek	Long Valley Dam

Mammoth Lakes Earthquake of 25 May 1980, 13:36 PDT, ML=5.7(BRK),5.5(CIT)

Convict Creek	Long Valley Dam

Aftershock approx 58 seconds after 25 May 1980, 13:36 Event, ML=unknown

Convict Creek

Tape: MAMMOTH80C

Mammoth Lakes Earthquake of 26 May 1980, 11:58 PDT, ML=5.7(BRK),4.9(CIT)

Convict Creek	Long Valley Dam

Mammoth Lakes Earthquake of 27 May 1980, 07:51 PDT, ML=6.2(BRK),6.3(CIT)

Convict Creek	Long Valley Dam
Bishop - Paradise Lodge	Benton

Tape: WESTMOR81

Westmorland Earthquake of 26 Apr 1981, 05:09 PDT, ML=5.7(CIT),6.3(BRK)

Westmorland	Niland

Tape: RIODEL8083

Records obtained at Rio Dell - Highway 101/Painter Street Overpass from the following three earthquakes:

Trinidad Offshore Earthquake of 8 Nov 1980, 02:27 PST, ML=6.9(BRK)

Rio Dell Earthquake of 15 Dec 1982, 22:53 PST, ML=4.4(BRK)

Cape Mendocino Offshore Earthquake of 24 Aug 1983, 06:36 PDT, ML=5.5(BRK)

Tape: MAMMOTH83

Records obtained at Convick Creek from the following two earthquakes:

Mammoth Lakes Earthquake of 6 Jan 1983, 17:38 PST, ML=5.2(BRK)

Mammoth Lakes Earthquake of 6 Jan 1983, 19:24 PST, ML=5.4(BRK)

Tapes: COALINGA83, COLINGA83-IA, COLINGA83-IB *

Coalinga Earthquake of 2 May 1983, 16:42 PDT, ML=6.5(BRK)

Cantua Creek School
Slack Canyon
Parkfield - Vineyard Canyon 1E, 2E, 1W, 2W, 3W, 4W, 5W, 6W
Parkfield - Gold Hill 2E, 3E, 1W, 2W, 3W, 4W, 5W, 6W
Parkfield - Stone Corral 1E, 2E, 3E, 4E
Parkfield - Cholame 1E, 2E, 3E, 2WA, 3W, 4W, 4AW, 5W, 6W, 8W, 12W
Parkfield - Fault Zone 1, 2, 3, 4, 6, 7, 8, 9, 10, 11, 12, 14, 15, 16

* Vol. 1 data are on tapes COALINGA83-IA and COLALINGA83-IB; Vol. 2 and 3 data are on tape on tape COALINGA83.

Tapes: COALINGA83AS, COLINGA83AS-I **

Records from 8 aftershocks of the Coalinga Earthquake of 2 May 1983

Event #2: 8 May 1983, 19:49 PDT, ML=5.1(BRK)

Coalinga - Sulphur Baths
Coalinga - CHP
Anticline Ridge - Palmer Ave.
Oil Fields - Skunk Hollow
Harris Ranch

Event #3: 10 June 1983, 20:10 PDT, ML=5.1(BRK)
Event #4: 9 July 1983, 00:41 PDT, ML=5.3(BRK)
Event #5: 21 July 1983, 19:40 PDT, ML=6.0(BRK)
Event #6: 21 July 1983, 20:43 PDT, ML=5.0(BRK)
Event #7: 25 July 1983, 15:31 PDT, ML=5.1(BRK)
Event #8: 9 Sept 1983, 02:16 PDT, ML=5.3(BRK)
Event #9: 11 Sept 1983, 04:48 PDT, ML=4.3(BRK)

For each of events #3 through #9:

Coalinga - Sulphur Baths
Coalinga - CHP

** Vol. 1 data are on tape COALINGA83AS-I; Vol. 2 and 3 data are on tape COALINGA83AS.

Tapes: MORGANHILL84-G, MORGANHILL84-IG ***

Morgan Hill Earthquake of 24 Apr 1984, 13:15 PST, ML=6.2(BRK)
Ground-response records

Halls Valley
Coyote Lake Dam (San Martin)
Gilroy #1, #2, #3, #4, #6, #7
Gilroy - Gavilan College
Corralitos
Capitolas
Santa Cruz
San Juan Bautista - Fire Station
Los Banos
Agnews - State Hospital
Redwood City - APEEL #1
San Francisco - International Airport
Fremont - Mission San Jose
Hayward - APEEL #1E

Tapes: MORGANHILL84-S, MORGANHILL84-IS ***

Morgan Hill Earthquake of 24 Apr 1984, 13:15 PST, ML=6.2(BRK)
Structural-response records

San Jose-Town Park Towers
San Jose-Great Western Savings Bldg.
San Jose-Santa Clara Co. Bldg.
Saratoga - West Valley College Gym
Watsonville - Telephone Bldg.
Hollister - Glorietta Warehouse
South San Francisco - Kaiser Medical Center
San Juan Bautista - Highway 101/156 Overpass

*** Vol. 1 data are on tapes MORGANHILL84-IG and MORGANHILL84-IS; Vol. 2 and 3 data are on tapes MORGANHILL84-G and MORGANHILL84-S.

Tape: REDLANDS85

Redlands Earthquake of 2 Oct 1985, 16:44 PDT, ML=4.8(CIT)

Rancho Cucamonga - Law & Justice Building (base-isolated) and FF

Tape: HOLLISTER86

Hollister Earthquake of 26 January 1986, 11:21 PST, ML=5.5(BRK)

SAGO South - Tunnel
SAGO South - Surface
Hollister - Glorietta Warehouse

Tape: MTLEWIS86

Mt. Lewis Earthquake of 31 March 1986, 03:56 PST, ML=5.8(BRK)

Halls Valley
San Jose - Santa Clara County Bldg.
San Jose - Town Park Towers
San Jose-Great Western Savings Bldg.

Tape: SANSALVADOR86

San Salvador Earthquake of 10 October 1986, 17:49 GMT, MS=5.4(CIG)

Natl Geographical Inst. (IGN)
Geotech. Investigation Center (CIG)
Inst. Urban Construction (IVU)
Hotel Sheraton (HSH)
Hotel Camino Real (HCR) - Basement, 2nd Floor, Roof
Centro Americana University (UCA)

Tapes: PALMSPRINGS86-G, PALMSPRINGS86-IG ****

Palm Springs Earthquake of 8 July 1986, 02:20 PDT, ML=5.6(CIT)
Ground-response records

Desert Hot Springs
Palm Springs - Airport
Silent Valley - Poppet Flat
San Jacinto - Soboba
San Jacinto - Valley Cemetery
Hemet - Stetson Ave Fire Station
Winchester - Page Bros. Ranch
Winchester - Hidden Valley Farms
Winchester - Bergman Ranch
Murrieta Hot Springs - Collins Ranch
Landers - Fire Station
Joshua Tree - Fire Station
Indio - Coachella Canal
Temecula - CDF Fire Station
Puerta La Cruz
Riverside - Airport
Hesperia
Rancho Cucamonga-Law & Justice Center FF

**** Vol. 1 data are on tape PALMSPRINGS86-IG; Vol. 2 and 3 data are on tape PALMSPRINGS86-G.

Tape: CERROPRIETO87

Cerro Prieto, Baja California earthquake of 6 February 1987,
19:45 PST, ML=5.4 (CICESE)

Cerro Prieto

Tape: WHITTIER87-IG, -G #

Whittier Earthquake of 1 October 1987, 07:42 PDT, ML=5.9 (CIT)
Ground-response records

Tarzana - Cedar Hill Nursery
San Marino - Southwestern Academy
Altadena - Eaton Canyon Park
Mt. Wilson - Caltech Seismic Station
Los Angeles-Hollywood Storage Bldg. FF
Long Beach - Rancho Los Cerritos
Century City - LA Country Club South
Long Beach - Recreation Park
Pacoima - Kagel Canyon
Sylmar - Olive View Medical Center FF
Featherly Park - Park Maint. Bldg.
Rancho Cucamonga-Law & Justice Cntr FF
Hemet - Stetson Ave Fire Station
Newhall - LA County Fire Station
Leona Valley #5 - Ritter Ranch
Malibu - Point Dume School
Lake Hughes #1 - Fire Station #78
Moorpark-Ventura Co. Fire Dept. Garage
Alhambra - Fremont School
Los Angeles - Obregon Park
Downey - County Maint. Bldg.
Los Angeles - 116th St. School
Inglewood - Union Oil Yard
Los Angeles - Baldwin Hills
Century City - LA Country Club North
Long Beach - Harbor Admin. Bldg. FF
Arleta - Nordhoff Ave Fire Station
Pomona - 4th & Locust FF
Huntington Beach - Lake St. Fire Stat
Riverside - Airport
Vasquez Rocks Park
Lancaster - Medical Office Bldg. FF
Leona Valley #6
Castaic - Hasley Canyon
Castaic - Old Ridge Route
Rosamond - Godde Ranch

Vol. 1 data are on tape WHITTIER87-IG; Vol. 2 and 3 data are on Tape WHITTIER87-G.

Tape: WHITTIER87-IB1, -IB2, -IIB, IIIB ##

Whittier Earthquake of 1 October 1987, 07:42 PDT, ML=5.9 (CIT)
Building records

Los Angeles-CSULA Admin. Building
Los Angeles-Hollywood Storage Bldg. & FF
Burbank-California Fed. Savings Bldg.
N. Hollywood - Sheraton Universal Hotel
Long Beach - CSULB Eng. Bldg. 1
Los Angeles-UCLA Math-Science Bldg.
Long Beach - Harbor Admin. Bldg. & FF
Sherman Oaks - Union Bank Bldg.
Sylmar - Olive View Medical Center & FF
Pomona - First Federal Savings Bldg. & FF
Rancho Cucamonga - Law & Justice Center & FF
San Bernardino - Sunwest Office Bldg.
Los Angeles - Sears Warehouse
Burbank - Pacific Manor
Los Angeles-Century City Bullock's
Long Beach - City Hall
Van Nuys - Holiday Inn
Lancaster-Medical Office Bldg. & F

Vol. 1 data are on tapes WHITTIER87-IB1 and -IB2; Vol. 2 are on WHITTIER87-IIB; Vol. 3 data are on Tape WHITTIER87-IIIB.

Tape: WHITTIER87-L

Whittier Earthquake of 1 October 1987, 07:42 PDT, ML=5.9 (CIT)
Lifeline structure records

Los Angeles - Vincent Thomas Bridge
Puddingstone Dam
Cogswell Dam