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**PART 1 GENERAL****1.1 RELATED DOCUMENTS**

- A. The drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

**1.2 SUMMARY**

- A. Section Includes: Seismic Monitoring Equipment as required by San Francisco Department of Building Inspection Administrative Bulletin 058 (AB-058).
- B. Provide all labor, tools, materials, equipment, appliances, services and related work as indicated on the Drawings, specified in this Section.

**1.3 REFERENCE STANDARDS**

- A. San Francisco Department of Building Inspection Administrative Bulletin 058 (AB-058).

**1.4 DEFINITIONS**

- A. Seismic monitoring equipment is required as defined in AB-058 for all new buildings in San Francisco over six stories in height with an aggregate floor area of 60,000 square feet or more, and every new building over 10 stories in height regardless of floor area.

**1.5 SUBMITTALS**

- A. Submit the following in accordance with Division 1.
  - 1. Manufacturer's specifications and installation instructions for the recording system prior to the start of any work.
  - 2. A detailed information package which outlines how the system works
  - 3. A complete set of user operating instructions

**PART 2 PRODUCTS**

- A. The accelerometers (accelerographs) shall comply with all requirements and recommendations contained in the State of California, System Requirements for Integrated Tri-Axial Accelerographs, revision date October 4, 2007. This document may be found at the following website:  
<http://www.conservation.ca.gov/cgs/smip/Documents/SystemRqmts-TriaxialAccelerograph.pdf>
- B. The following units have met the CGS/DGS Triaxial Accelerograph System Requirements and are currently in use by the California Strong Motion Instrumentation Program (CSMIP), California Geological Survey.
  - 1. ETNA Strong Motion Accelerograph by Kinemetrics, Inc of Pasadena, California.
  - 2. 130-SM Strong Motion Accelerograph by Refraction Technology, Inc of Plano, Texas.
- C. Refer also to Appendix A from AB-058 for additional equipment specifications. This Appendix is attached to this specification for reference.

**PART 3 EXECUTION****3.1 LOCATIONS**

- A. Three accelerometers shall be installed in the building at the following floor levels:
  - 1. Level 61 (Room 61-12)
  - 2. Level 31 (Room 31-12)
  - 3. Level P1 (Room P1-71)
- B. The preferred locations for the accelerometers are in small, seldom-used rooms or closets near a column or structural wall. Adequate space shall be provided to mount the accelerometers and to contain an approved protective enclosure. The protective enclosure shall be securely fastened to the floor, ceiling, or structural wall.

**3.2 INSTALLATION REQUIREMENTS**

- A. Each accelerometer shall be located so that access is maintained at all times. Access shall be unobstructed by room contents.
- B. All accelerometers shall be installed with the same orientation relative to the building, with the orientation chosen such that the reference or long dimension of the instrument is aligned with a major axis of the building. The orientation shall be clearly and permanently marked on the floor near the location of each instrument.
- C. The accelerometers' triggering threshold shall be set to 1% of the acceleration of gravity nominal.
- D. Auxiliary devices shall be secured to the floor, ceiling, or structural wall or to the enclosure.

**3.3 SIGNAGE REQUIREMENTS**

- A. A sign stating "Maintain Clear Access to this Instrument" shall be posted in a conspicuous location near each instrument.
- B. Signage shall also include the phone numbers of the local building contact and the Department of Building Inspection.

**3.4 ELECTRICAL REQUIREMENTS**

- A. Each accelerometer requires AC power.
- B. A dial-up telephone line is required at the base level accelerometer.
- C. The accelerometers shall be interconnected for common start and common timing.
- D. Refer also to Appendix A from AB-058 for cabling and equipment specifications. This Appendix is attached to this specification for reference.

**END OF SECTION**

**APPENDIX A  
CABLING, COMMUNICATIONS  
AND EQUIPMENT SPECIFICATIONS**

**Cabling**

- a) *Communication: A continuous 4-pair communications cable (plenum-rated Category 5 such as Belden 1624P or approved equal) is required between the instruments.*
- b) *Interconnection: A continuous 4-pair interconnection cable (plenum-rated RS485 cable similar to Belden 9844 or approved equal) is required between the instruments. (Conduit is only required where the cable is likely to be damaged.)*
- c) *Alternate communication and interconnection methods using dedicated building cabling between the instruments may be approved after review.*

**Communications**

*A four-port AC-powered telephone switch (such as ComSwitch 7500 or approved equal) is to be installed at the base-level instrument (with the default port connected to that instrument), to allow communication with all three instruments via one phone line. The other telephone switch ports are to be connected to the other instruments via the communication cable. Alternate methods of communication between the instruments may be approved after review.*

**Equipment Specifications**

The minimum performance requirements for the accelerographs are as follows:

The instruments should be comprised of either a central-recording system with simultaneous sampling of the sensors or of three interconnected individual accelerographs located as required above. In either case, the system shall be digital recording, of a type *approved and in use by the CGS or USGS strong motion programs*, and meet the following criteria:

1. Sampling rate: 200sps.  
Full scale recording capability: >3 g.
2. Rms noise of system shall be less than 40 micro-g measured over a 0-80 Hz band.
3. If separate accelerographs are used, they must have common triggering and common timing, with timing to better than 2 milli-seconds.
4. The accelerograph system *may* extract peak accelerations and velocities in real time, and transmit these together with event time and location, by e-mail to the building owner or his agent.
5. Owners are encouraged to employ more than the minimum three instruments.
6. Instruments meeting the referenced System Requirements will be monitored to assure correct operation by CSMIP at the owner's request.