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RESEARCH REPORT: RR 26170
(CSI # 13440)

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GENERAL APPROVAL – 130-MC Multi-Channel Accelerographs, 130-GPS Receiver/Clock, 130-GPS-Extender/Repeater, and 147A High resolution Accelerometer.

DETAILS

The strong motion building structural monitoring systems consist of the following components:

- a) 130-MC Multi-channel Accelerographs with 12- and 18-channels and 24-Bit A/D Resolution.
- b) 130-GPS Receiver/Clock is to provide an accurate time for a long period using GPS for time, frequency and position reference.
- c) 130-GPS Extender/Repeater is to supply the power and extend the cable length between the 130-MC and the 130-GPS to distances more than 75 feet.
- d) 147A High Resolution Accelerometer is a force balance accelerometer that converts acceleration signals into voltage signals to measure various low and ultra-low frequency motion. 147A accelerometer is available either in uniaxial or triaxial configuration.

130-MC Multi-Channel Accelerograph, 130-GPS, 130-GPS Extender/Repeater and 147A Accelerometer, as manufactured by Trimble, Inc., are approved strong motion recorders when complying with the following:

A. Instrument Package Requirements:

1. Maintenance and servicing of the instrument shall be in accordance with information Bulletin P/BC 2017- 048, and Section 1613.10 of the 2017 Los Angeles City Building Code.

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2. These instruments shall meet all specifications contained in Information Bulletin P/BC 2017-048 including power supplied by battery with a trickle charger.
3. Electrical equipment including power supply shall be listed by a City of Los Angeles recognized electrical testing laboratory or approved by the department.

B. Site Installation Requirements:

1. Location:

Strong Motion Recorder are to be located as required by the Department. It is desirable to locate the upper instruments at a point that will give representative vibration patterns for the building as a whole (i.e. - not adjacent to an extremely stiff shear wall, or on cantilever projections where torsional effects are excessive). Each instrument shall be located in an area that is protected from shock other than due to earthquake and from handling by unauthorized persons. The instrument shall be accessible for servicing by an accelerograph maintenance agency approved by the City of Los Angeles.

2. Space Requirements:

- i. The minimum space required for the installation is 2'W x 2.5' H x 2' D.
- ii. A minimum clear space of 1'-0" shall be provided around the 130-MC Multi-channel Accelerographs.
- iii. Space access shall be arranged so that the instrument may be easily serviced by Los Angeles City approved accelerograph maintenance agency.
- iv. The instruments, batteries, and trickle charger shall be protected by being located in a locked closet with no other use, or covered with a cage that is locked in place.

3. Attachment:

Each strong motion recorder must be securely anchored to the mounting structure or wall. If triaxial accelerometers are installed on a wall, it should be attached to the wall using an L-shaped (or 90 degree) aluminum bracket.

4. Orientation of Instrument:

The strong motion recorder are recommended to be aligned with the principal axis of the building.

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5. Electrical Inter-Connection:

- Strong Motion Recorder sites - multiple Strong Motion Recorders shall be electrically inter-connected with wire assembly installed in rigid metal conduit of ½" minimum diameter with the approval from a Los Angeles City licensed accelerograph maintenance agency.
- All interconnecting conductors to remote sensors and the GPS unit, shall be listed and installed in Rigid Metal Conduit (RMC), Intermediate Metal Conduit (IMC) or Electrical Metallic Tubing (EMT) in accordance with the requirements of California Electrical Code (CEC).
- An electrical permit is required for said installations.

6. Electrical Outlets:

A 110 Volt electrical outlet shall be provided adjacent to each instrument for trickle charger and servicing needs.

7. Qualified Installers:

The strong motion recorder shall only be installed, maintained and used by qualified and trained personnel.

C. Certification:

The manufacturer shall submit a written certification to Chief of Engineering Bureau, 201 N. Figueroa Street, Room 1030, Los Angeles, California, 90012, stating that the required instruments are properly installed and operational prior to the issuance of the Certificate of Occupancy.

DISCUSSION

The report is in compliance with the 2017 Los Angeles City Building Code.

The Systems 130-MC-12A and 130-MC-18A have been demonstrated to show that it exceed the minimum specifications for strong motion recorder as outlined in Information Bulletin P/BC 2017-48 and Section 1613.10 of the 2017 Los Angeles Building Code.

This general approval of an equivalent alternate to the Code is only valid where an engineer and/or inspector of this Department has determined that all conditions of this approval have been met in the project in which it is to be used.

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Addressee to whom this Research Report is issued is responsible for providing copies of it, complete with any attachments indicated, to architects, engineers and builders using items approved herein in design or construction which must be approved by Department of Building and Safety Engineers and Inspectors.

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