DETAIL SPECIFICATION OF Earthquake Onsite Early Warning and Security System

Earthquake Master Detector & Sub Master

1. Applications:

1. Early Warning through Indoor and outdoor siren.
2. SMS or email alert warnings to designated group.
3. Coded system access only to authorized personnel.
4. Test alarm function
5. Close gas and water valves
6. Shut off electricity
7. Park elevators and escalators
8. Open safety and security gates automatically
9. Activate power generators
10. Switch on emergency lights
11. Switch signals for bridges and tunnels
12. Create redundant net works

2. Conditions:

a. System Capable of working on Power supply of 12/24/110/230V
b. The product should have been accepted and installed in India in any government establishment.
c. The product capable to generate SMS or Email alerts.
d. System should be capable to integrate with Building Management System (BMS) as per applications stated under Para above as **Applications.**
e. The product should be capable to trigger on the primary wave of the earthquake (8 threshold level 0.015g -0.4g) and triggering on different threshold levels, certified by any Reputed Government scientific institution of India.
f. The product should have proven record of triggering of early warning of earthquake at any place of installation.
g. The product must have sensor test facility 24x7, in case of a sensor problem via LED and RELAY to BMS.
h. The product should have proven test reports from two or more different reputed scientific institutions or universities.

3. Specifications of System Sensors:

1. Electronic sensor (3-Axis), Analysis method- 3 Analog devices sensors, installed in the system in 3 directions (X,Y and Z axis) making 3 axis capable of analyzing the acceleration of the ground motion from all directions.
2. Operating Range: DC - 40 Hz
3. Lowest Threshold for monitoring the system: 0.3 m/s2
4. Sensitivity: 1V/g $\pm$ 4%
5. Nonlinearity: < 2.5%
6. Cross Sensitivity : <3%
7. Noise: ~0.01m/s2

4. Features/Componenets of Master Detector:

i. Providing and fixing of Battery back up to avoid voltage fluctuations/power failure for 10 indoor Alarms.
ii. Relay controlled connections for Sirens.
iii. Relay connection for the commissioning of indoor/ public warning sirens.
iv. Relay connector for gas valve up to 16A.
v. Relay connection for 3 indicators (status, alarm, error) to the building control.
vi. Single relay for 8 thresholds for building control.
vii. Indication of the system status via LED.
viii. Sabotage contact in every device.
ix. Master System Installed in Protected Weatherproof case.

5. Earthquake detector Sub Master:

Sub Master connecting to Master system via bus cable, compulsory for redundant configuration capable of running on power supply of 12/24/110/230V supported by:

1. Battery back up to avoids voltage fluctuations/ power failure.
2. Relay connections for Sirens.
3. Relay connection for the commissioning of indoor/ public warning sirens.
4. Relay connector for gas valve up to 16A.
5. Relay connection for 3 indicators (status, alarm, error) to the building control.
6. Single relay for 8 thresholds for building control.
7. Capable of Indication of the system status via LED.
8. SubMaster System Installed in Protected Weatherproof case.
9. Capable of displaying on the system helping user's as guide.

6. Indoor Siren

i. Optic and Acoustic Alarms Red color.
ii. Power supply 12V DC, 250 mA
iii. Housing of the Alarms - Koli Carbonates.
iv. Capacity Volume of alarms - 110 $\pm$ 5 dB.
v. Terminal block for housing of connection
vi. Siren connected in parallel

7. Public Siren compatible to Earthquake Onsite Early warning System and security system

8. General

Sound Pressure Level: >/= 115dB@30m Omni directional
Siren-Speaker-Horns: Long Live Aluminum Directional Horn Assembly
Single-Horn-Power: 125W max.
Total Driver Power used: 900W
Power Supply: Capable of working on Mains 220 V or Solar or Single Battery
Standby Power back: To be provided by the bidder capable for 4 weeks without charging
Operational temperature: -25°C up to +80°C

8a. Siren Head

1. Speaker Horn mounting on steel pole from 4.5“ to 6“ without any flange on Horn, or flange on pole, or any holes in mounting pole
2. Capable of replacing Direct-Single-Horn any time.
3. Single Speaker Horn- Driver max power 125W
4. Siren-Speaker-Horns : Long Live Aluminum Directional Horn Assembly
5. Lightning protection: Siren-Speaker-Array capable to have fully ground potential.
6. All Speaker cable should be inside the pole or covered by metal structure for lightening protection.
7. Total Number of Horn-Assembly: max 6
8. Total Number of Driver used: max 6
9. Total Weight Horn-Assembly: max 72kg
10. Single-Horn-Mounting must be possible (for directional coverage)
11. Twin-Horn-Mounting must achieve omni directional coverage
12. Speaker-Horn-Array must be easy extendable by minimum 50%

9. Electronics

i. Simple Single-Electronic-Module assembled on metal base plate.
ii. ONEFour-Channel Digital Amplifier (4x125W on 11Ohm), efficiency >90%
iii. Each Amplifier should support 4Siren Driver with independent Amp-Channel
iv. Nominal Amplifier Operation Voltage - 12V DC
v. Direct 220VAC- Mains Operation without Battery should be possible with optional alternatives too.
vi. System Operation Voltage = 12V DC
vii. One 12V65Ah maintenance free *VRLA-AGM*-Type Battery must be sufficient for supply 30 minutes full/continuous operation.
viii. Local Control with basic siren features should be possible.
ix. Local Control with secured setup-functions.
x. Local Control Alarm Activation with password only.
xi. Automatic Log-file for last 30days operations with date and time.
xii. Remote Idle(off)- function should be possible.
xiii. Individual Amplifier Power measurements should be possible.
xiv. Remote communication should be possible by a common interface module for integration of any remote control like Radio VHF/UHF digital or analog , GPRS/#G/LTE , WiFi/Wi MAX ,IP/Ethernet must be possible

10. Radio Communication/Control

1. Communication over VHF/UHF- Analogue Radio-Chanel
2. Two-way communication using semi-duplex
3. Secured DATA-Packages against hacking
4. Secured DATA-Packages against false-alarm
5. Live P.A over the same Chanel as DATA
6. For long distance a Chain communication (Storing and forwarding) should be possible

11. Cable

I. Bus –Cat.7 4x2x0.5 mm2
II. IY(St)Y 2x2x0.80 mm2 and 15 V cable for siren
III. Main Volatge 110/230V : NYM 3x1.50 mm2

12. Installation including cabling and other Services like

- Training of technical staff in the earthquake early warning.
- Training in earthquake.
- Training in behavioral measures.
- General Advice in earthquake.