

# GENERAL NOTES

CALC. BY AEP	OHIO	11A
DATE 08/00	LAK - 615 - 2.82	199
CHKD. BY PDB	FHWA REGION 5	
DATE 8/00		

## ITEM SPECIAL - STRUCTURAL SURVEY AND MONITORING OF VIBRATIONS

### 1.0 Description

This work consists of conducting a survey of the condition of structures and the monitoring of ground vibrations. The survey work is to be conducted before and after all construction work is performed which could cause undesirable ground vibrations. Ground vibrations shall be monitored at the appropriate times during the duration of this project.

### 2.0 Personnel Qualifications

A Professional Engineer, registered in the State of Ohio, shall be engaged by the Contractor to be in charge of conducting a structural survey and in charge of monitoring vibrations. The engineer in charge of performing the required work under this item is herein referred to as the Monitoring Foreman. The Monitoring Foreman and/or his team of experts shall have collectively worked on two similar projects or shall have collectively accrued not less than two years of successful experience in performing the type of work specified by this note. The monitoring foreman and/or his team of experts shall have expertise in (1) conducting structural surveys by video methods, (2) monitoring vibrations with a seismograph or with other appropriate instrumentation, and (3) assessing sites for potential damage that may occur as a result of the proposed construction. Documentation of this experience shall be furnished at the preconstruction meeting.

2.1 The requirement for the Monitoring Foreman to be an engineer can be waived provided that the Monitoring Foreman's experience or the collective experience of the monitoring team shows substantial expertise in performing the required work.

### 3.0 Structural Survey

The structural survey shall include but not be limited to the following:

3.1 Documentation of, the integrity of existing building materials and the general overall condition of the structures recorded by written text, photographs, and VHS video cassette recording.

3.2 The establishment of locations and elevations of reference points, chosen by the Monitoring Foreman, for documentation of measurements.

3.3 A detailed on-site inspection conducted in the presence of the Project Engineer, the Contractor, property owners, property tenants if appropriate, representatives of any involved utility companies, and the City of Mentor representative.

3.4 Documentation of all structural deficiencies with regard to location, size, type, etc.

3.5 Following is a list of home owners to be monitored for vibrations during construction..

1. Pcl 17WD (Davis) 7680 Center Street Mentor, Ohio
2. Pcl 43WD (Davis-Daniels) 7597 Center Street, Mentor, Ohio.
3. Pcl 15WD (Chevako) 7692 Center Street, Mentor, Ohio
4. Pcl 32WD (Langdon) 7641 Center Street, Mentor, Oh.
5. Pcl 42WD (Jewish Center) 7599 Center Street, Mentor, Ohio

### 4.0 Monitoring of Vibrations

The monitoring of vibrations shall include but not be limited to the following:

4.1 Determination and documentation of existing levels of vibrations

4.2 Monitoring of all construction operations that significantly contribute to the production of vibrations with a special effort made to document the vibration associated with blasting and/or pile installation procedures.

4.3 The development of criteria for controlling construction activities so that the Monitoring Foreman's allowable predetermined vibration levels are not exceeded during construction.

### 5.0 Water Quality

When appropriate, water samples shall be collected from wells, streams or project runoff areas to document before and after construction site conditions regarding the quality of water available in the vicinity of the project.

### 6.0 Ground Vibration

Vibration monitoring guidelines can be found in FHWA's May 1985 manual entitled "Rock Blasting" and in various other reports.

The peak particle velocity (PPV) of ground vibrations is generally used to monitor the effect of vibrations on structures. When monitoring vibrations consideration must be given to (1) the type of structure being evaluated and (2) the frequency of the vibrations (low frequency 40 Hz). Generally allowable ground vibration peak particle velocities range from 13mm/second (0.5 inches per second) to 50mm/second (2.0 inches per second) depending on the type of structure under consideration. When an allowable PPV is exceeded, the vibration producing operation shall be suspended and alternative construction procedures should be evaluated. The Director shall be consulted whenever the measured magnitude of the vibration level is considered potentially capable of producing structural damage.

### 7.0 Method of Measurement

The final twenty percent of the payment for this work shall not be made until the Project Engineer has received and approved three copies of the Monitoring Foreman's final report. The final report shall be typed and contain all measurements, conclusions, and recommendations which resulted from performing the above required work. Included with the reports shall be one copy of all pictures and video recordings. Interim reports shall be furnished to the Project Engineer during construction thereby keeping the Project Engineer informed of the Monitoring Foreman's progress and findings. The original tapes shall remain in the exclusive possession of the Monitoring Foreman for a period of not less than 10 years.

### 8.0 Method of Payment

Payment for this item will be made at the contract lump sum price for Item Special - "Structural Survey and Monitoring of Vibrations".