



## Iowa Department of Transportation

### SPECIAL PROVISIONS FOR VIBRATION MONITORING

Pottawattamie County  
BRF-006-1(113)--38-78

Effective Date  
February 16, 2010

**THE STANDARD SPECIFICATIONS, SERIES 2009, ARE AMENDED BY THE FOLLOWING ADDITIONS. THESE ARE SPECIAL PROVISIONS AND THEY SHALL PREVAIL OVER THOSE PUBLISHED IN THE STANDARD SPECIFICATIONS.**

#### **090044.01 DESCRIPTION**

This specification identifies the Contractor's responsibilities for protecting the historic properties listed below from possible vibration damage during construction activities, and vibration and crack monitoring of those properties. The Contractor may perform a pre-construction and post-construction condition survey which may include a photographic component. The Contractor shall determine the method of the survey to satisfy their need and is responsible for arranging with the property owners and tenants the rights-of-entry to their property in order to engage in condition surveys, vibration monitoring, and crack monitoring.

At a minimum, the following properties shall be protected per the requirements in this special provision. Additional properties may be protected and monitored as deemed necessary by the Contractor.

Our Savior's Scandinavian Evangelical Lutheran Church  
829 Ave A  
Owner: Charles V Svoboda  
Mailing address: C/O Patti Wiggins, 825 Timbercrest Dr, Council Bluffs, IA 51503

Omaha & Council Bluffs Street Railway Substation  
1311 Ave A  
Owner: City of Council Bluffs  
Mailing address: 209 Pearl St, Council Bluffs, IA

Groneweg & Schentgen Co Wholesale Grocers Warehouse  
825 W Broadway  
Owner: J Hughes Consulting Inc  
Mailing address: 15779 State Orchard Rd, Council Bluffs, IA 51503

Cottage  
816 1<sup>st</sup> Ave  
Owner: Karleen K Risner  
Mailing address: 210 Greenwood St, Council Bluffs, IA 51503

Chicago & North Western Railroad Freight Depot  
1104 2<sup>nd</sup> Ave  
Owner: B-D Land Co LLC  
Mailing address: 5296 Clay St, Omaha, NE 68152

Indian Creek Channel District  
Consists of concrete channel from Council Lane to 16<sup>th</sup> Ave, and 7 railroad bridges between

#### **090044.02 PRECONSTRUCTION SURVEY**

The Contractor may commission a preconstruction condition survey of the buildings/structures on the properties listed above, and additional properties as deemed necessary by the Contractor. If deemed necessary and desirable by the Contractor, the Contractor may install devices capable of indicating whether cracks continue to open or spread, such as crack monitoring gauges, at locations identified in the precondition survey. The following is a list of companies supplying crack monitoring equipment:

- Tell-Tale Crack Monitors, RST Instruments Ltd., 800.665.5599, [www.rstinstruments.com](http://www.rstinstruments.com)
- Crack Monitoring Equipment, Geotest Instrument Corp., 866.430.7645, [www.crackgauge.com](http://www.crackgauge.com)
- Avongard Crack Monitor, Avongard Products U.S.A, 800.244.7241, [www.avongard.com](http://www.avongard.com)
- Or approved equal

#### **090044.03 CONSTRUCTION.**

Construction activities near the properties listed above, and additional properties identified by the contractor, shall not create vibrations in excess of the Peak Particle Velocity (PPV) of 0.1 inch per second at frequencies below 10Hz. At other locations, vibration shall not exceed 0.2 inch per second at frequencies below 10Hz. The alarm threshold shall be set at 80% of the PPV, which is 0.08 and 0.16 inch per second, respectively, at frequencies below 10 Hz. The Contractor shall demonstrate that they have installed equipment that will measure, log (date/time stamp), and communicate continuously during construction activities that this threshold has not been exceeded.

Such equipment shall include an audio/visual alarm to alert the Contractor if the threshold has been reached or exceeded. The Contractor shall immediately cease work if the threshold is reached or exceeded (vibration event) and notify the Engineer immediately. The shut down shall remain in effect until the cause of the vibration event is identified and alternate equipment or methods approved by the Engineer are in place.

There will be no compensation for delays as the result of reaching or exceeding the maximum PPV threshold. There will be no compensation for adjustment of construction activities or equipment to reduce vibration levels to less than the maximum PPV threshold.

The Contractor shall monitor all crack monitoring devices daily and immediately notify the Engineer of any changes. Test drills of the alarm may be performed to ensure it is working.

The Contractor shall provide to the Engineer a Monitoring Plan at least 30 calendar days prior to commencing work. The plan shall describe the following:

- Construction methods and equipment that will be used to minimize vibration.

- Experience level of personnel and their ability to properly install and operate the vibration monitoring equipment.
- Alternative construction methods and equipment in case of a vibration event.
- Site communication methods and equipment to ensure immediate shut down of construction activities if the maximum PPV threshold is reached.
- Daily activity logging to ensure timely shut down and identification of cause.

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**090044.04 METHOD OF MEASUREMENT.**

The item Vibration Monitoring will be measured as a lump sum unit of work.

**090044.05 BASIS OF PAYMENT.**

Vibration Monitoring will be paid for at the contract lump sum price. This price shall be full payment for preconstruction surveys; installation, monitoring, and removal of crack monitoring gauges; furnishing, installation, monitoring, and removal of vibration monitoring equipment; notification of vibration events; post-construction surveys; and reports; and all labor, equipment, and materials necessary to complete the work as described.