117 Monitor Existing Structures

117.1 General

Monitor Existing Structures includes settlement, vibration, and groundwater monitoring of existing structures during construction as described in ***Standard Specifications, Section 108***. Monitor Existing Structures pay item numbers are lump sum; see the ***BOE Manual*** for additional information.

For Department (in-house) design projects, the Department PM should work with appropriate district staff to identify and determine the structures that are to be monitored.

For consultant design projects, the consultant PM is to provide to the Department PM a list of structures that warrant consideration for monitoring. The Department PM will work with appropriate district staff to make a final determination of the structures that are to be included.

117.2 Inspection and Settlement Monitoring

Inspection and settlement monitoring (pay item 108-1) is primarily used to mitigate the risk for damage occurring to an existing structure due to settlement of the foundation. Structures considered for settlement monitoring typically include buildings, bridges, retaining walls, and other facilities such as historic features or swimming pools. This pay item is typically not used for Department-owned structures but should be considered for existing bridges for bridge widening projects.

If a determination is made to monitor an existing structure, include pay item 108-1 in the Estimated Quantities (EQ) Report in the Summary of Lump Sum Items table.

117.2.1 Miscellaneous Structures

Activities that may cause harm to existing structures include the construction of foundations for mast arm signal poles, strain poles, cantilever signs, overhead truss signs, high mast lighting, and ITS poles.

Because the ***Standard Specifications, Section 108***, does not provide prescribed distances for Miscellaneous Structures, all structures that are to be monitored must be listed in a pay item note on the General Notes sheet; see ***FDM 117.5***.

117.2.2 Structures Other Than Miscellaneous Structures

Activities that may cause harm to existing structures include the excavation of deep foundations, extraction of existing piles, sheet piling and temporary casing installations, and pile driving operations associated with bridge or retaining wall construction.

MSE walls and bridges founded on short piles, shallow foundations, or timber pile foundations are vulnerable to these operations.

Structures that are to be monitored that are beyond the distances specified in the ***Standard Specifications***, ***Section 108***, must be listed in a pay item note on the General Notes sheet; see ***FDM 117.5***.

117.2.3 Roadway Compaction Operations

Activities that may cause harm to existing structures include embankment and asphalt vibratory compaction.

Do not include inspection and settlement monitoring (pay item 108-1) for roadway compaction operations when a note is included in the plans requiring non-vibratory compaction mode near any structure recommended for monitoring.

Structures that are to be monitored that are beyond the distances specified in the ***Standard Specifications***, ***Section 108***, must be listed in a pay item note on the General Notes sheet; see ***FDM 117.5***. It is typically not necessary to monitor structures beyond the distances specified in the ***Standard Specifications, Section 108***.

117.3 Vibration Monitoring

Vibration monitoring (pay item 108-2) is primarily used to mitigate the risk for interfering with the intended use of an existing structure. Structures considered for vibration monitoring typically include buildings in which sensitive business operations are conducted: e.g., eye surgery, medical treatments, rehabilitation operations, recording and broadcasting operations, places of worship, antique shops, or museums.

This pay item is not typically used for residential properties, storage facilities, retail and grocery stores, warehouse and distribution centers, or other similar structures where sensitive business operations are not conducted. This pay item should not typically be used for Department-owned structures.

Activities that may warrant vibration monitoring include pile driving, sheet pile and casing installation, and embankment and asphalt vibratory compaction.

Do not include vibration monitoring (pay item 108-2) for embankment and asphalt compaction operations when the risk of interfering with the intended use of a structure is mitigated by including a note in the plans that:

(1) Restricts hours of construction activities (to non-business hours).

(2) Requires non-vibratory compaction mode.

If a determination is made to monitor an existing structure, include pay item 108-2 in the EQ Report in the Summary of Lump Sum Items table. Because ***Standard Specifications, Section 108,*** does not provide prescribed distances for vibration monitoring, all structures that are to be monitored must be listed in a pay item note on the General Notes sheet; see ***FDM 117.5***.

117.4 Groundwater Monitoring

Dewatering operations have the potential for lowering the groundwater elevation in or above compressible soils supporting a structure which can cause that structure to settle. Groundwater monitoring for this purpose is not common and is to be used only when concurred with by the District Geotechnical Engineer.

If a determination is made to monitor an existing structure, include pay item 108-3 in the EQ Report in the Summary of Lump Sum Items table. Because ***Standard Specifications, Section 108,*** does not provide prescribed distances for Groundwater Monitoring, structures that are to be monitored must be listed in a pay item note on the General Notes sheet; see ***FDM 117.5***.

117.5 Pay Item Notes

The following are examples of pay item notes. Notes are included in the plans only when ***Standard Specifications, Section 108,*** does not provide prescribed distances, or when a structure is beyond the prescribed distances.

108-1 In addition to the requirements of ***Standard Specifications, Section 108***, provide Inspection and Settlement Monitoring for the following structures:

- Church located at 3750 County Road 220 during pile driving operations.
- Historic cemetery stone archway entrance located at Sta. 1327+60 Lt. during foundation construction for mast arm signal pole.
- Existing I-95 Bridge over NW 6th Ave, piers 1 through 6, during pile driving operations for bridge widening.

108-2 Provide Vibration Monitoring for the Walk-in Medical Clinic located at 3326 Byron Road during pile driving operations.

108-3 Provide Groundwater Monitoring for the commercial building located at Sta. 840+25 Rt. during dewatering operations.