ITEM 11552.17 M - Temporary Bracing System

DESCRIPTION

This work shall consist of providing design engineering, labor, materials, tools and equipment to construct, maintain and remove a temporary bracing system. The system shall be designed to prevent lateral movement of the existing bridge which carries West Alley Road over Cross Island Parkway (BIN # 2-23186-0) during staged excavation needed to construct the adjacent new bridge which will carry West Alley Road over new Ramp "ES". Also included in this item is providing a system of survey targets and periodic survey to verify that no vertical and/or horizontal movement of the existing West Alley/Cross Island Parkway bridge occurs and providing labor and other services to adjust the bracing system by jacking to restore the existing bridge to the original horizontal location which existed prior to excavation, if necessary.

MATERIALS

The steel shapes and plates used to fabricate the temporary bracing system may be used steel in good condition or new steel. Welding and bolting shall conform to the provisions of Section 564.

Timber shall be free from any defects which might impair its strength or functional use. Timber used for blocking shall be white oak unless otherwise designed and approved in the submitted calculations and working drawings .

Concrete shall conform to Section 555.

All reinforcement bars shall conform to Section 556.

CONSTRUCTION DETAILS

General

The bracing system shall be installed in stages as shown in the Contract Documents. The rakers shall be preloaded by jacking prior to excavating adjacent to the existing structure and shall be installed with gauges capable of indicating the imposed raker loads. Jacks used for preloading and readjusting raker loads shall have a rated capacity which is not less than one and one half times the maximum raker load. The rakers, wales and dead men (footings) designed for the temporary bracing shall be designed with an adequate safety factor against failure based upon AASHTO Standard Specifications for Bridges. It is likely that the pressure on the far side of the existing bridge is earth pressure at rest or greater and that the rakers may need to be designed to support that load or greater in order to hold the existing bridge and prevent movement as is required by this specification. If horizontal motion of the existing bridge is detected that can be corrected by adjustments to the bracing system raker loads, then the raker loads shall be immediately adjusted when movement is detected. If vertical motion of the existing bridge is detected or if horizontal motion is detected which cannot be corrected by adjusting the rakers, any excavation which is underway shall be stopped and the Engineer shall be notified immediately. Excavation shall not proceed until a means to correct the movement and/or settlement of the existing bridge is developed by the Contractor and approved by the Engineer.

Survey targets shall be installed as indicated in the Contract Drawing or as per the Contractor's previously approved written procedure prior to commencing excavation adjacent to the existing bridge. As excavation progresses the Contractor shall monitor the survey targets periodically as necessary to detect any significant horizontal or vertica1 movement. As a minimum, the Contractor shall check for movement of the existing bridge at five intervals as

excavation of each stage progresses. These interval shall be when the excavation is open to 20%, 40%, 60% , 80% and 100% of the final depth. After full excavation depth is reached the existing bridge shall be surveyed to check for motion daily in the first week after reaching full depth and not less than once per week thereafter. Additional survey after backfilling shall be as required to verify that the existing bridge does not move due to consolidation or the long term effects such as shrinkage of the lightweight foam concrete backfill.

The Contractor may, at his option, design the temporary bracing to be removed in stages as work progresses, or to remain and be cut off below subgrade level. The working drawings shall show the Contractor's intent for this item.

Lightweight foam concrete fill has been specified to backfill the area between the new and existing bridges in **Item 17203.0309 M - Lightweight Concrete Fill (TYPE B)**. The Contractor may, at his option suggest the use of an alternate material for backfill, provided he designs the temporary bracing system accordingly and will provide the alternate backfill for the same price as the specified fill item.

Working Drawings

The Contractor shall furnish calculations and working drawings prepared, stamped and signed by a New York State Licensed Professional Engineer for the proposed temporary bracing system. Three legible standard sized (560 mm x 910 mm nominal, 530 mm x 850 mm working area) prints of each drawings, together with three copies of all design computations shall be submitted to the Engineer for approval.

The Engineer shall be allowed the longest of the following time durations to examine design computations and working drawings:

1. Fifteen working days
2. Two working days for each drawing submitted
3. One working day for every four (4) design computation sheets, Two sided sheets shall be Considered to be two sheets

Review time shall be calculated based upon date of receipt at the design office performing the review.

METHOD OF MEASUREMENT

Measurement shall be by lump sum payment.

11552-5 BASIS OF PAYMENT

The lump sum price bid for this item shall include the cost of all labor, materials, tools, equipment, transport, fabrication, design, adjustment, maintenance and survey necessary to brace the existing bridge to prevent horizontal and/or vertical movement during excavation.

Work related to bracing and monitoring the existing bridge which is not specifically included payment under another item shall be deemed to have been included for payment herein.