

SECTION 02251 - NEEDLING & SHORING

PART 1 - GENERAL

- 1.1 RELATED DOCUMENTS: The General Conditions, any Supplementary General Conditions and Division 1, General Requirements, are hereby made a part of this Section as fully as if repeated herein.
- 1.2 DEFINITIONS
- A. Furnish all labor, materials, equipment and services necessary for and incidental to the execution and completion of needling and shoring of existing walls without producing damage to the existing building structures. Work shall be performed by a Specialty Sub-Contractor.
- B. Work consists of needling and shoring of existing structures adjacent to and above new construction and the restoration of those structures to the conditions existing prior to the removal of existing walls.
1. Supports include the facilities required to support and prevent movement of existing structures until removal of existing walls is complete.
 2. Needling and shoring includes the temporary construction, designed by the Professional Engineer, which directly transmits existing structure foundation loads to a lower bearing elevation, and which preserves the existing structures above.
 3. Restoration includes the reconstruction, by repair or replacement, of portions of structures removed or altered by needling, shoring and supporting operations.
- 1.3 REQUIREMENTS OF REGULATORY AGENCIES
- A. Materials and methods provided under this section shall conform to local codes and ordinances and shall be as directed and approved in writing by the local building officials.
- 1.4 PROFESSIONAL RESPONSIBILITY
- A. Needling and shoring for all existing structures shall be selected, designed and supervised by a Registered Professional Engineer(hereinafter referred to as the "Construction Engineer") approved by the A/E. Engineering fees shall be paid for by the Contractor.
- 1.5 SUBMITTALS
- A. Detailed drawings and calculations of proposed materials and methods of installation of needling and shoring.
- B. Certification: Signed and sealed by the Construction Engineer specializing in this type of design and certifying that the needling and shoring as designed and installed are in compliance with the requirements of the Contract Documents and all governing codes and will not produce damage to the existing building structures.
1. The Construction Engineer should schedule sufficient number of visits to the site to enable him to verify that the systems as installed meet the requirements of the Contract Documents.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Concrete (for needling and shoring): Compressive strength of 3,000 psi at the end of 28 days, with a minimum of 5.5 bags of cement per cubic yard of concrete. As specified in DIVISION 3.
- B. Reinforcement (for needling and shoring): As specified in DIVISION 3.
- C. Rolled steel shapes, plates and bars as specified in DIVISION 5.
- D. Wood columns, beams, and studs as specified in Division 6.
- E. Non-metallic Non-shrink Grout: Pre-mixed, non-metallic, non-corrosive, non-staining product containing selected silica sands, portland cement, shrinkage compensating agents, plasticizing and water reducing agents, complying with CRD C-588.
 - 1. Manufacturers:
 - a. Master Buildings - Masterflow
 - b. U.S. Grout Corp. - Five Star Grout
 - c. Upco Chem. Div., USM Corp. - Upcon
 - d. Castle Chemical Co. - Aguabar Imperial
 - e. Anti-Hydro Waterproofing Co. - A-H Hydraulic
 - f. Cement
- F. Supports: Props, shores, jacks, needles, braces, sheeting, cribbing, etc., shall be materials standard with and available to the Contractor, which are of proper size and are in good serviceable condition. Materials that are unsuitable for the intended purpose, or which are severely damaged, shall not be used.
- G. Materials and Techniques: Contractor's option, as approved; however, needling and shoring shall be accomplished in such a manner as not to produce settlement in the existing building structures.

PART 3 - EXECUTION

3.1 DETECTION OF MOVEMENT

- A. Inscribe or firmly affix bench marks on columns and walls to be needled and shored at locations as approved by the Construction Engineer. The method used is optional, but shall be capable of being read to an accuracy of 0.005 feet.
- B. Take readings daily during removal of existing walls, and installation of new beams and support operations under the existing structure.
- C. Stop work, notify the Construction Engineer and take immediate remedial action if movement of the existing structure occurs during progress of the work.
- D. Upon completion of needling and shoring of the existing structure, take daily readings of the measurement point for a period of 30 days, and report the results to the A/E.

3.2 PREPARATION

- A. Inspection: Examine the areas and conditions under which this work is to be installed, and notify the Construction Engineer in writing of conditions detrimental to the proper and timely completion of the work.
- B. Protection: During the progress of the work, the Contractor shall protect the occupants

and contents of the existing buildings from damage or injury. The Contractor shall confer with the Construction Engineer and make arrangements with the Owner for his removal or protection of any building contents and personnel which may be affected by this work, or which are especially vulnerable to damage or injury.

3.3 PROPPING, BRACING, NEEDLING, SHORING ETC

- A. All walls, piers, columns, beams and slabs shall be properly braced and supported as necessary to prevent any improper deflection or misalignment during the course of normal construction and abnormal loading.
- B. Props, jacks, needles, shores, bracing, sheeting, cribbing, etc., shall remain in place until such time as construction has sufficiently aged or has been permanently braced and is ready to withstand normal loading, abnormal loads have been removed, etc., and such removal has been approved by the A/E.
- C. All required cutting and drilling in connection with this work shall be performed by the Contractor, and the Contractor shall be fully responsible for any damage to the existing structure or new construction, or injury to persons due to any neglect in installing adequate braces and supports for existing structures.

3.4 OPTIONAL METHODS

- A. Contractor shall change methods of needling and shoring, as approved, to accommodate unforeseen conditions.
- B. Any suggestion that the Contractor may have to expedite work of this Section, to promote greater safety, or insure a more practical or efficient installation will be considered for approval.
- C. Contractor is responsible for all phases of work of this Section, regardless of the methods specified or used. He shall take all practical precautions to insure the complete safety and sufficiency of the work under this Section and of related or existing work.

3.5 RESPONSIBILITY FOR PERFORMANCE

- A. The responsibility for the performance of the needling and shoring methods and devices shall lie entirely with the Contractor.
- B. During the progress of the work, the Contractor shall protect the occupants and contents of the existing buildings from damage or injury.
- C. Contractor shall needle and shore the existing buildings sufficiently to prevent damage to the existing building structures. If damage occurs to the existing building structures, the Contractor shall at no additional cost to the Owner, repair the existing building structure to the satisfaction of the Owner.

3.6 DAMAGE

- A. Any damage to persons, property, structures, or contents, due to cracking, movement, failure of other conditions caused by inadequate support (needling and shoring) work, shall be made good by the Contractor without any additional cost to the Owner.

3.7 TESTING AND INSPECTION

- A. The Contractor shall employ an Inspection Agency approved by the A/E to inspect the

needling and shoring operation to assure compliance in all particulars to these specification requirements. The cost of all testing and inspections shall be borne by the Contractor.

- B. Final Report: The Inspection Agency shall prepare a written report that summarizes the work inspected during the course of the project. A discussion of all deviations from the contract documents and specifications, with their related impact on the final construction, shall be described in detail. The engineer of record shall review this final report, and recommend corrective measures (as deemed necessary) that must be made prior to final acceptance of the work. Prior to final payment, a written report certifying that the work meets the requirements of the contract documents, specifications, and all governing agencies shall be prepared, submitted, and approved by the A/E.

END OF SECTION 02251