

SECTION 1

GENERAL REQUIREMENTS

1. **SCOPE OF WORK:** The work to be performed under the provisions of these documents and the contract based thereon includes furnishing all labor, equipment, materials, tools, supervision and other services required for foundation repair, including design layout and installation of the Foundation Supportworks™ Push Pier System, exterior slab removal, soil excavation, and backfilling. **Work does not include...**

2. **MEASUREMENTS AND LAYOUTS:** The drawings are copies of the original blueprints for the intended buildings requiring underpinning. Current elevation readings and calculated line loads are recorded and provided to cover the layout and design of the work needed and are not scaled for exact measurements. Where specific detail and dimension for work not show on the Drawings, the Contractor shall take measurements and make layouts as required for proper installation of work.

3. **DISPOSAL:** All debris and refuse generated by the construction work and all equipment and materials which have to be removed, and are not required in the work, shall be removed from the jobsite by the Contractor and legally disposed of by the Contractor.

4. **CONTRACTOR'S SUBMITTALS:** The Contractor shall furnish to the _____ or _____'s Agent four copies of all submittal data. If the Contractor desires more than one copy returned he should furnish extra copies.
 - 4.1 The Contractor shall certify in writing that he has reviewed, checked and approved the submittal data and that it is in conformance with the requirements on the Contract Documents before he submits it to the _____ or _____'s Agent.

 - 4.2 Approval must be obtained from the _____ or _____'s Agent of any items requiring submittals before delivery of said item to the job site or commencing work on or with any such item.

 - 4.3 A warranty of the work and against further appreciable structural settlement shall be provided for a period of no less than 10 years from the date of completion (see Section 2, Subsection 11).

 - 4.4 Items requiring submittals are as follows:

<u>Submittal</u>	<u>Specification Section</u>
Underpinning/Pier System	2

- 4.5** If the Contractor wishes to use an “or equal” item in lieu of any item shown on the Drawings or designated in the Specifications, he shall submit data for approval.
- 5. QUALIFICATIONS OF CONTRACTOR:** The Contractor shall be a qualified Contractor with a 10-year (minimum) history of successful performance in the type of work and project scheduled (no exceptions) and found acceptable to the _____ or _____’s Agent. Work history to be local contractor’s own and not any contractor affiliates, dealers, manufacturer, etc. The Contractor shall be a manufacturer-trained and certified installer of Foundation Supportworks™ Push Piers, which are manufactured by Foundation Supportworks, Inc. in Omaha, Nebraska.
- 5.1 Labor and Workmanship:** All labor for the installation of material and equipment furnished under this Contract shall be done by experienced personnel. All workmanship shall be first class and in compliance with the specific requirements of the Drawings and Specifications.
- 5.2 Insurance:** Contractor shall carry a minimum of \$2 million in general liability and a minimum of \$2 million in umbrella insurance coverage. A copy of a current insurance certificate shall be included with the Contractor’s submittal information.
- 6. QUALIFICATIONS OF MANUFACTURER:** Products used in the work of this specification shall be produced by Foundation Supportworks, Inc.
- 7. SAFETY:** All equipment, methodologies, assessments, controls, enforcement, signage, etc. as necessary for site work, traffic ability, construction, and personal safety shall be, and shall remain for the project duration, the sole responsibility of the Contractor. Project duration refers to the length of time, from start to finish, necessary for the specialty Contractor to complete their portion of the project. Specialty Contractors are not responsible for on-site safety items or precautions following successful completion of the work and sign-off by the _____ or _____’s Agent.

End of Section 1

SECTION 2

FOUNDATION REPAIRS – UNDERPINNING and LEVELING SYSTEM

1. **SCOPE OF WORK:** The work performed under this Section consists of designing the layout and installation of an underpinning pier system to stabilize and level the existing foundations of the _____ building. The building in question has current elevation readings for the main foundation and interior center walls.
2. **REPAIR METHODS:** Underpinning the foundation shall be performed using Foundation Supportworks™ Push Piers.
3. **SETTLEMENT:** Relative settlements for the building are shown on the Drawing. These settlements were measured as accurately as possible under the existing conditions. The Contractor shall expose the foundation at the proposed pier locations and notify the _____ or _____'s Agent if settlement varies from the trend or magnitude of movement shown on the Drawing. Contractor shall also notify the _____ or _____'s Agent if the exposed foundations are significantly damaged to warrant additional consultation by the project structural engineer.
4. **SOIL BEARING:** No soil testing has been performed. The Contractor shall determine system pressures and capacities as required for the successful installation, lift and re-leveling, and long-term performance of the proposed system.
5. **SYSTEM DESIGN:**
 - 5.1. **General** – The Contractor and/or the Manufacturer shall design the proposed system based on the existing, exposed conditions at the site as determined by the Contractor. Spacing requirements for the pier system have been determined by the Project Structural Engineer (see Section 2, Subsection 5.6, below). The pier system (combined bracket and pier sections) shall have an allowable capacity of at least 30 kips (30,000 pounds).
 - 5.2. **Typical Specifications** – Provide typical specifications, schematics, and installation procedures for the proposed system.

Calculations and/or test performance data showing the capacities of the proposed system in the working position shall be submitted for review by _____ or _____'s Engineer or representative. All tests shall consist of testing the pile in the actual working position with no substitution of any of the pile components.

Currently there are no established criteria that set minimum design and testing standards for hydraulically-driven, steel-component push pier systems. Therefore, because of the similar design methodologies and loading conditions, the push pier system shall be designed and/or tested in general accordance with the applicable sections of AC308, Acceptance Criteria for Helical Foundation Systems and Devices, by the ICC Evaluation Service, Inc.

Applicable sections are those that pertain to the design and/or testing of foundation support piers in a Side Load condition.

The Contractor shall provide test results from an International Code Council (ICC)-accredited lab or a letter signed and sealed by a licensed engineer employed by the manufacturer, either stating that the design and/or testing was completed in general accordance with AC358.

5.3. Materials – All steel components that are to remain, as a permanent part of the structure, including the pier sections and foundation support bracket, must be of new material. Bars, angles, and plates must meet the requirements of ASTM A36, A53, and A572. The bracket bearing plate must have a minimum bearing surface against the bottom of the footing of at least 60 square inches.

Pier sections shall consist of round mechanical steel tube with an ultimate tensile strength of at least 55,000 psi and a yield tensile strength of at least 50,000 psi. Pier sections shall have an outside diameter of at least 2.875 inches and a nominal wall thickness of at least 0.165 inch. See Section 5.5 below for corrosion protection.

5.4. Weldments – All welded connections shall conform to the requirements of the American Welding Society, “Structural Welding Code AWS D1.1”, and applicable revisions.

5.5. Cathodic Protection - All pier system components shall be galvanized for corrosion protection (**Optional – not typically done for brackets**). At a minimum, thin-walled pier sections shall be hot-dip galvanized for corrosion protection. Triple-Coated In-Line Galvanizing, consisting of hot-dip galvanizing, a conversion coat and a clear coat, is preferred.

5.6. Pier Spacing – Pier spacing shall not exceed four (4) feet, center to center. The pier spacing is based on the ability of the footing/foundation wall to span between piers.

6. UTILITIES: Contractor shall contact a one-call utility locate service to have public utilities located prior to initiating work at the site. Private utilities and drainage systems, if present within the work area, shall be located by the owner. The Contractor is not responsible for removing and replacing such systems, unless specifically addressed in the contract.

7. EXCAVATION:

7.1. Hand or machine excavate immediately adjacent to the building foundation at each pier location to expose the footing or the bottom of the grade beam to an appropriate working width and depth. After installation is complete, replace soil in exposed areas in 6” lifts and mechanically compact into place.

7.2. Where pier installation is required through pavement or slabs, saw cut access openings to provide for neat removal and appearance. Contractor is not responsible for replacement of concrete unless specifically addressed in the contract.

7.3. Uniformly grade disturbed areas to ready the area for seed and straw, or landscaping by others. Contractor is not responsible for removing and replacing landscaping unless specifically addressed in the contract.

8. POSITIONING OF FOUNDATION SUPPORT BRACKET: The exposed footing surfaces should be cleaned of all soil. A chipping hammer shall be used to smooth and prepare the bottom and vertical face of the footing to provide for the proper fit of the bracket and to bring the concrete surfaces in full contact with the bracket. Spread footings are typically “notched” to allow bracket placement as close as possible beneath the structural load of the foundation wall. The bottom and vertical faces, to the extent possible, should be at right angles to each other and the bracket positioned as close to vertical as possible. Foundation Supportworks™ Push Pier brackets have been designed with either a vertical orientation or an angle of two (2) degrees from vertical. The brackets may be used interchangeably, selection depending upon structure details and ease of installation.

9. PIER INSTALLATION:

9.1. Foundation Supportworks™ Push Piers – Attach hydraulic assemblies and drive equipment necessary for the advancement of the piers. All hydraulically-driven piers are to be installed individually, using the maximum weight of the structure and surrounding soil to advance the pier, until the maximum operating pressure of the hydraulic cylinder is reached, the pressure meets the safe-rated capacity of the pier, or until lift of the structure is achieved, whichever comes first. Installation of more than one hydraulically driven pier at a time is not allowed unless the piers are separated by at least three pier spacings, but no less than 18 feet. Installed capacity should be measured by multiplying the hydraulic fluid pressure times the effective area of the drive cylinder(s). The Contractor shall have calibrated gauges on their pumps and provide the _____ or _____'s Representative with technical documentation that verifies the drive cylinder's effective area and the hydraulic pump's rated capacity.

9.2. Pier sections shall be coupled so as to form a continuous pier column. Hydraulically driven piers shall have a coupler that extends a minimum of three inches into each section and are integral with the pier section.

9.3. The completed piers shall be filled with concrete following installation and prior to lifting. The concrete shall be a sand mix to prevent material segregation and allow flow down the pier center. The concrete mix design shall have a compressive strength of at least 2,500 psi. **(Optional)**

10. LIFTING AND LEVELING:

10.1. The lifting and holding operation is completed by simultaneously lifting at each pier location using hydraulic rams connected by hydraulic lines and then to a pump with a pressure gauge. Lifting shall be controlled at each pier location by opening and closing valves located at each pier.

10.2. Contractor shall continuously monitor the structure's elevations to ensure that no pier rises more than ¼" vertically ahead of the adjacent piers.

10.3. Contractor shall use calibrated pressure gauge(s), to determine the force applied to each pier and monitor any change in force required to lift the building's weight. The contractor shall be experienced in lifting structures (see Section 1, Subsection 5). The Contractor shall determine system pressures and capacities as required for the successful installation, lift and re-leveling, and long-term performance of the proposed system.

11. GUARANTEE: The work performed under this section shall be guaranteed for a minimum of ten (10) years against all defects in material and workmanship. If appreciable movement occurs in the foundation for any reason other than earthquake, severe wind, extreme change in water table, or any other Act of God or similar manmade condition, the Contractor shall correct any defect in workmanship and materials that may have occurred in order to stabilize the structure and bring it back to the required position.

End of Section 2