SECTION 04051 — MASONRY HELICAL ANCHORS

PART 1 — GENERAL

1.01 SECTION INCLUDES

A. Requirements pertaining to post-installed helical anchor work including, but not limited to, furnishing and installing helical anchors and providing all equipment, labor, services, and access to complete the work. This Section pertains to all other Sections of these Specifications that require post-installed or helical anchors, unless specified otherwise.

1.02 RELATED DOCUMENTS

A. Division 1: General Requirements
B. Division 4: Masonry

1.03 REFERENCES

A. ANSI B212.15 — Cutting Tools — Carbide-Tipped Masonry Drills and Blanks for Carbide-Tipped Masonry Drills
B. ASTM A193 — Standard Specification for Alloy-Steel and Stainless-Steel Bolting Materials for High-Temperature Service
C. ASTM E3121 — Standard Test Methods for Field Testing of Anchors in Concrete or Masonry
D. ACI 530/530.1-13 — Building Code Requirements and Specification for Masonry Structures
E. TMS 402/602-16 — Building Code Requirements and Specification for Masonry Structures

1.04 SUBMITTALS AND SUBSTITUTIONS

A. Submittals shall be in accordance with the General Conditions of the Contract Documents, Division 1: General Requirements. To create a product submittal, click Product Submittal Generator.

1. Submit product data for proprietary products and materials listed under Part 2 — Products of this Section, which includes:
   i. General Product Information
   ii. Technical Performance Data
   iii. Material Safety Data Sheets (MSDS)
   iv. Manufacturer’s Published Installation Instructions (MPII)
v. Results of pre-construction, site-specific field testing program when required by the Contract Documents or Project exiting conditions

B. Substitutions shall be in accordance with Conditions of the Contract and Division 1 Substitution Procedures Section. To create a product substitution, click **Substitution**.

1. The Contractor shall submit technical performance data and calculations that are prepared and sealed by a registered Design Professional demonstrating that the product substitution is capable of achieving performance values equal to, or better than, the specified product using appropriate design procedure and/or standard(s) as required by the Contract Documents and applicable Building Code.
2. Calculations shall specify the diameter and embedment depth required of the substituted product as well as the diameter of drill bits and drilling procedures required to drill holes for the installation.
3. The Contractor shall submit results of a pre-construction, site-specific field testing program for helical anchors proposed as substitutes when such field testing is required by the Contract Documents or Project existing conditions.
4. Substitution requests must be accompanied by all Submittal information required of the specified product for which the substitution is proposed.
5. Any increase in costs for such substitution shall be the sole responsibility of the Contractor.

### 1.05 QUALITY ASSURANCE

A. Installer Qualifications: Installers shall be trained by a qualified helical anchor product manufacturer’s representative to ensure proper installation.
B. The Installer shall be experienced with the installation of helical anchors similar to the type specified, and into the base material required for the Project, or shall otherwise be acceptable to the Owner.
C. Installers shall provide a list of at least three past, successful Projects involving helical anchor installation when requested by the Owner or registered Design Professional of Record.

### 1.06 DELIVERY, STORAGE, AND HANDLING

A. Deliver products to jobsite undamaged and in product manufacturer’s or distributor’s original packaging, complete with installation instructions.
B. Protect and handle materials in accordance with product manufacturer’s recommendations to prevent product damage, degradation, or deterioration.
1.07 PROJECT CONDITIONS

A. Contractor shall notify the registered Design Professional of inadequate, deteriorated, poor-quality, and/or inappropriate base material conditions prior to commencing the work.

B. The anchor or fastener steel type must provide suitable corrosion resistance for the anticipated service environment following proper installation. Steel shall be Type 304 or 316 stainless steel as required by the Contract Documents.

C. Pre-Construction, Site-Specific Field Testing Program
   1. Pre-construction, site-specific field testing of helical anchors may be specified or required when base materials are of unknown quality or poor existing condition to determine specific installation parameters — e.g., drill bit diameter, hole drilling procedures — to optimize helical anchor performance.
   2. Results of the pre-construction, site-specific, field testing program shall be documented in a written field test report. The field test report shall include, but not be limited to, the following information: maximum tension performance, tension performance — axial deflection relationship, helical anchor embedment depth, drill bit size, and rotohammer settings for each test and base material tested.
   3. Pre-construction, site-specific field testing shall conform to ASTM E3121 to the greatest extent possible and shall be conducted by qualified field technicians using calibrated test equipment.

PART 2 — PRODUCTS

2.01 MASONRY ANCHORS

A. Helical Anchors
   1. Stainless-steel, post-installed helical anchors shall be Simpson Strong-Tie Heli-Tie™ helical wall tie anchors for use in masonry or concrete base materials and suitable to support and resist structural demand loading by means of tension, compression or a combination of both. Heli-Tie helical wall tie anchors shall be installed using the manufacturer’s proprietary setting tool as recommended by the Simpson Strong-Tie Company.
   2. Material: Type 304 or 316 stainless steel as specified for the Project conditions.
   3. Anchor performance shall meet the performance criteria specified in the Contract Documents.

B. Drill Bits
   1. Carbide-tipped and conforming to ANSI B212.15. Drill bit diameter shall be as specified in the Contract Documents.
PART 3 — EXECUTION

3.01 EXAMINATION

A. Examine supporting base materials and environmental conditions. Do not begin installation until base materials have been properly prepared.
B. Unless otherwise specified, do not drill holes or commence helical anchor installations in concrete or masonry until the concrete, mortar, or grout base materials have achieved their full design strength.
C. Install products only if environmental conditions are in compliance with manufacturer’s recommendations for installation conditions.

3.02 INSTALLATION

A. Installations shall conform to the Manufacturer’s Published Installation Instructions (MPII) or to alternative procedures specified in the Contract Documents. Installation procedures specified in the Contract Documents shall govern when such procedures conflict with procedures in the MPII.
B. Drill holes for helical anchors accurately and squarely, without excessive drill bit wobble, at locations and spacings specified in the Contract Documents. Drill holes perpendicular to base material, unless otherwise specified. Drill holes with rotohammer setting set as recommended in the MPII or otherwise specified in the Contract Documents.
C. Clean drilled holes in accordance with manufacturer’s recommendations when so specified or as appropriate for job conditions.
D. Install helical anchors into holes previously drilled in base materials using carbide-tipped drill bits of the diameter recommended in the MPII or specified in the Contract Documents. Use the drill bit diameter specified in the Contract Documents when such drill bit diameter conflicts with what is recommended in the MPII.
F. Drill holes continuously through all facing and backup base materials to be anchored together and to the specified embedment depth using appropriate drill bits.
G. Position correct end of helical anchors in the manufacturer’s installation tool set in an SDS-plus rotohammer and drive the helical anchor into the pilot hole with the SDS-plus rotohammer in hammer mode. Drive the helical anchor into the base material until the helical anchor is countersunk beyond the facing base-material surface as specified or to the depth permitted by the installation tool. Install pertinent patch or repair material to match the existing finish surface material.
H. Where the helical anchor manufacturer recommends use of special tools for installation of anchors, such tools shall be used, unless otherwise specifically permitted by the registered Design Professional of Record.
I. Identify position of bed joint reinforcement, reinforcing steel and/or other embedded items prior to drilling holes for anchors. Exercise care in drilling
to avoid damaging existing reinforcing or embedded items. Notify the registered Design Professional of Record if reinforcing steel or other embedded items are encountered during hole-drilling procedures.

3.03 FIELD QUALITY CONTROL

A. Special Inspection
   1. When Special Inspection is required under the Contract, the Contractor shall notify the Owner’s selected Special Inspection Agency of the helical anchor Installer’s intent to commence work, providing at least 72 hours advance notice.
   2. The Contractor shall provide the Special Inspector with safe access to the work and a representative from the Contractor shall accompany the Special Inspector at all time during Special Inspection, unless otherwise agreed between the Contractor, Owner, and Special Inspection Agency.

3.04 FIELD TESTING

A. Helical anchor installations shall be tested during construction by qualified field technicians acceptable to the Owner and registered Design Professional of Record using properly calibrated, manufacturer-recommended, proprietary testing equipment when such field testing is specified under the Contract.
B. Frequency of helical anchor testing shall be in accordance with the Contract Documents.

END OF SECTION