

**SECTION 04 05 19
MASONRY ANCHORAGE AND REINFORCING**

PART 1 - GENERAL

1.01 SUMMARY

- A. This Section includes anchors and fastening systems for masonry.

1.02 SUBMITTALS

- A. Product Data: For each product specified in Part 2 - Products.
- B. Samples:
1. Anchors and Fasteners: For each type to be incorporated in the Work.
- C. Show Drawings (Delegated Design): Showing detailed installation layout of helical façade stabilization anchors. Shop Drawings shall bear the seal of a qualified professional engineer.
- D. Pre-construction Test Reports:
1. Anchorage Pull-out Test Reports.
- E. Certificates
1. ICC-ES (Evaluation Service) Report s, for each adhesive or capsule anchor specified.

1.03 QUALITY ASSURANCE

- A. Qualifications:
1. Manufacturer Qualifications: Company with minimum 10 years of experience in manufacturing of specified products and systems.
 2. Applicator Qualifications: Company with minimum of 5 years experience in application of specified products and systems on projects of similar size and scope and is acceptable to product manufacturer.

1.04 TESTS AND INSPECTIONS

- A. Testing:
1. Performance Models: Construct performance models of anchorage into existing substrate material. Individual models shall be constructed for each anchor and substrate material configuration required for the Work, at locations determined by Architect.
 2. Pre-construction Testing:
 - a. Perform tensile proof load pull-out tests (herein referred to as "pull-out tests") on each anchorage performance model.
 - 1) Arrange for Architect to be present at testing, provide five (5) business days' notice.
 - 2) Testing: Three (3) of each type and size of drilled-in anchor shall be proof loaded by the independent testing laboratory.
 - 1) Strength Design Testing (LRFD): Test in accordance with values indicated in manufacturer's design manual.
 - 2) Allowable Stress Design Testing (ASD): Test in accordance with manufacturer's allowable stress recommendations, multiplied by a factor of safety of 1.5.
 - b. Testing: Three (3) of each type and size of drilled-in anchor shall be proof loaded by the independent testing laboratory.
 - 1) Strength Design Testing (LRFD): Test in accordance with values indicated in manufacturer's design manual.
 - 2) Allowable Stress Design Testing (ASD): Test in accordance with manufacturer's allowable stress recommendations, multiplied by a factor of safety of 1.5.
 3. Construction Pull-out Testing:
 - a. Testing: 10% of each type and size of drilled-in anchor shall be proof loaded by the independent testing laboratory hired by the contractor. Adhesive anchors and capsule anchors shall not be torque tested unless otherwise directed by the Engineer. If any of the tested anchors fail to achieve the specified torque or proof load within the limits as defined on the Drawings, all anchors of the same diameter and type as the failed anchor shall be tested, unless otherwise instructed by the Engineer.
 - 1) Tension testing should be performed in accordance with ASTM E488.
 - 2) Retest as necessary until satisfactory results are obtained.
 - b. Test Reports: Reports shall include date of test, location, products used, test method, and test results stating whether anchorage complies, or does not comply with the manufacturer's listed allowable load capacity.

- c. Acceptance: Obtain Architect or Engineer's written acceptance of test results before proceeding with installation Work.
 - d. Anchor type, diameter and minimum embedment shall be as shown on the Drawings or approved Shop Drawings.
- B. Special Inspection:
1. Periodic special inspection must be performed where required in accordance with related ICC-ES Report (ICC-ESR), per table below.
 2. ICC-ES Report (ICC-ESR) numbers listed are for reference only. Verify ICC-ESR with anchor manufacturer.

Manufacturer	Product	ICC-ES Report
ITW Red Head	Trubolt+ Anchor	ICC-ESR 2427
Hilti	HIT-HY 270 Injection Adhesive (CMU)	ICC-ESR 4143
Hilti	HIT-HY 270 Injection Adhesive (Brick)	ICC-ESR 4144
Hilti	HIT-HY 200 Injection Adhesive (Concrete)	ICC-ESR 3187
Hilti	Kwik Bolt Tension Zone (KB-TZ)	ICC-ESR 1917
Powers Fastener	AC100+ Gold (Concrete)	ICC-ESR 2582
Powers Fastener	AC100+ Gold (CMU/Brick)	ICC-ESR 3200
Powers Fastener	Power Stud+ SD4 Expansion Anchor	ICC-ESR 2502
Simpson Strong-Tie	AT Anchoring Adhesive	ICC-ESR 1958
Simpson Strong-Tie	AT-XP Anchoring Adhesive (Concrete)	ICC-ESR 0263

PART 2 - PRODUCTS

2.01 GENERAL

2.02 REFERENCE STANDARDS

- A. ASTM F593 - Standard Specification for Stainless Steel Bolts, Hex Cap Screws, and Studs; 2022.
- B. ASTM F594 - Standard Specification for Stainless Steel Nuts; 2024.
- C. Product Source Limitation: Where products are intended to be installed as a system (warranted or otherwise) use only compatible products from the same manufacturer without exception, unless authorized in writing by Architect and, for warranted systems, approved in advance by manufacturer.
- D. Components of anchoring systems shall be stainless steel conforming to ASTM A276, ASTM A 493 or ASTM F593 with chemical composition of either AISI 304 or AISI 316, as indicated on Drawings.
 1. Stainless steel wedges shall be of the same material grade as the bolts or superior.
 2. Stainless steel nuts shall conform to ASTM F594 and be of the same material grade as the bolts or superior. Nuts shall be furnished with the bolt and meet the dimensional requirements of ANSI to conform to the bolt.
 3. Washers shall conform to ASTM A 240 and be also of the same material grade as the bolts.
- E. Where low temperature limits are listed for products, the listed value refers to minimum air and surface temperature at time of application and for a period required by manufacturer.

2.03 ADHESIVE ANCHORAGE SYSTEMS

A. Anchorage Adhesive

1. For Concrete Substrates:
2. HIT-HY 200 Injection Adhesive Low temperature limit: 14° F
3. AC100+ Gold

LOW TEMPERATURE LIMIT: 14° F

AT-XP ANCHORING ADHESIVE

4.01 LOW TEMPERATURE LIMIT: 14° F FOR CMU SUBSTRATES:

1. HIT-HY 270 Injection Adhesive with Screen tube Low temperature limit: 23° F
2. AC100+ Gold

LOW TEMPERATURE LIMIT: 14° F

AT-XP ANCHORING ADHESIVE

6.01 LOW TEMPERATURE LIMIT: 14° F FOR BRICK SUBSTRATES:

1. HIT-HY 270 Injection Adhesive with Screen tube Low temperature limit: 41° F
2. AC100+ Gold
 - a. Lower temperature limit: 14° F

3. Hilti
 4. Powers Fasteners Simpson Strong-Tie
 5. Hilti
 6. Powers Fasteners Simpson Strong-Tie
 7. Hilti
 8. Powers Fasteners
 9. AT Anchoring Adhesive Simpson Strong-Tie
 - a. Low temperature limit: 0° F
- B. Anchor Rod w/ Nut and Washer
1. a. For Concrete Substrates:
 - a. HIT TZ-R Anchor Rod Stainless steel
 2. Chisel Pointed Rod Stainless steel
 3. Threaded Rod Stainless steel

4. Hilti
 5. Powers Fasteners Simpson Strong-Tie
 - a. Note: Provide nut and washer per Manufacturer's recommendation.
- C. Threaded Rod w/ Nut and Washer
1. a. For CMU / Brick Substrates:
 - a. HAS-R 316 Anchor Rod Stainless steel

- b. Hilti
 - c. Note: Provide nut and washer per Manufacturer's recommendation.
- D. Threaded Rod
- 1. HAS-R Anchor Rod Stainless steel
 - 2. Chisel Pointed Rod Stainless steel
 - 3. Threaded Rod Stainless steel

4. Hilti
5. Powers Fasteners Simpson Strong-Tie

6.02 HORIZONTAL JOINT REINFORCEMENT

- A. Horizontal Joint Reinforcement (Truss Type / 2 side rods)
 1. Horizontal Joint Reinforcement (Truss Type / 2 side rods)
 2. #120 Truss Mesh
 - a. Stainless Steel, 9 Gauge wire

3. Hohmann & Barnard
 4. Or Equal
 5. Prefabricated Corner Truss
 6. Prefabricated Corner to match Horizontal Joint Reinforcement, 32" each direction
 7. Or Equal
- B. Horizontal Joint Reinforcement (Truss Type / 3 side rods)
1. 130 Truss Tri-Mesh
 - a. Stainless steel wire: 9 gauge side rods, 9 gauge cross rods

1) Hohmann & Barnard

6.03 VENEER ANCHORING SYSTEMS

- A. Veneer Anchor (To Masonry/Concrete)
 - 1. Tie: HB-345-SV
 - a. 12-gauge; stainless steel
 - b. Pencil Rod: Pencil Rod
 - c. 9-gauge; stainless steel

2. Hohmann & Barnard Hohmann & Barnard
 - a. Expansion Anchor:

- 1) HB-BL-523 Brass Expansion Anchor
- 2) Components:
 - (a) Internal Bolt: Type 304 Stainless Steel
 - (b) Washer: Type 18-8 Stainless Steel
 - (c) Knurled Expansion Sleeve: Brass 260 Alloy
- 3) Expander Cone: Brass 260 Alloy

HOHMANN & BARNARD

- A. Expansion Joint Stabilizing Anchor
- B. Slip-Set Stabilizer Stainless steel Hohmann & Barnard

7.02 FAÇADE STABILIZATION ANCHORS: HELICAL TYPE

- A. Helical Facade Stabilization Anchor (Friction Secured)
 - 1. Spira-Lok Helical Wall Tie System Stainless Steel
 - 2. DryFix Mechanical Pinning and Remedial Tying System Stainless Steel

7.03 FASTENERS

- A. Hammer Drive Anchor
 - 1) HMMH SS 304 Metal Anchor Stainless steel Hilti Powers
 - 2) ZamacNailin Stainless steel

7.04 ZINC SS NAILON PIN DRIVE ANCHOR STAINLESS STEEL SIMPSON STRONG-TIE

- A. Blok-Lok Helifix

7.05 STEEL REINFORCING BARS

- A. Deformed Reinforcing Bar (Epoxy Coated)
 - 1. Epoxy Coated, ASTM A 775, Grade 60, unless otherwise indicated
- B. Reinforcing Bar Inline Splice Coupler
 - 1. Bar Lock Mechanical Coupler System Plain Steel
 - 2. Lenton Lock Shear Bolt Splicing System Plain Steel
 - 3. Dayton Superior Erico
- C. Reinforcing Bar Lapped Splice Coupler
 - 1. Lenton Quick Wedge Mechanical Lap Splicing System Plain Steel
 - 2. Double Barrel Zap Screwlok Coupler Plain Steel

- 1) Erico
- 2) BarSplice Products

PART 3 - EXECUTION

8.01 GENERAL

- A. Install anchors of type and diameter indicated, at locations shown on the Drawings.
- B. Where length of anchor is not indicated on the Drawings, follow manufacturer's recommendations and obtain approval in writing from A/E prior to proceeding.

8.02 POST INSTALLED ANCHORS

- A. Anchor capacity used in design shall be based on the technical data published by Manufacturer or such other method as approved by the Structural Engineer of Record. Substitution requests for alternate products must be approved in writing by the Structural Engineer of Record prior to use. Contractor shall provide calculations demonstrating that the substituted product is capable of achieving the performance values of the specified product including an ICC-ES Report showing compliance with the relevant building code, seismic use, load resistance, installation category, in- service temperature, installation temperature, etc.
- B. Adhesive anchors installed in a horizontally or upwardly inclined orientation into concrete and supporting a sustained tension load shall be installed by a certified adhesive anchor installer. Installer shall be certified through the ACI/CRSI Adhesive Anchor Installer Certification Program or approved equal.
- C. Contractor shall arrange an anchor manufacturer's representative to provide on-site anchor installation training for all of their anchoring products specified. Contractor shall submit documented confirmation that all of the contractor's personnel installing anchors have received the required training prior to the commencement of work.
- D. Anchor capacity is dependent upon spacing between adjacent anchors and proximity of anchors to edge of concrete. Install anchors in accordance with spacing and edge clearances indicated in the manufacturer's design manual.

END OF SECTION 04 05 19