Safety Anchor Post
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SECTION 031500
CONCRETE ACCESSORIES

PART 1 - GENERAL

1. SUMMARY

A. Section Includes:

1. Anchors for embedment in cast-in-place concrete.

B. Related Work

1. Section 031000 "Concrete Forming and Accessories"
2. Section 032000 "Concrete Reinforcing"
3. Section 033000 "Cast-In-Place Concrete"
4. Section 055000 "Miscellaneous Metals"
5. [**Section 095113 "Acoustical Panel Ceilings**] [**Section 095123 "Acoustic Tile Ceilings"**] [**Section 095133 "Acoustical Metal Pan Ceilings"**] [**Section 095423 Linear Metal Ceilings"**] [**Section 095423 "Suspended Decorative Grids"**] for primary suspension systems to be supported by embedded anchors provided in this Section.
6. Section 112400 "Façade Maintenance Equipment" for support of façade maintenance equipment.
7. Section 220529 "Hangers and Supports for Plumbing Piping and Equipment" for Linear suspension systems to be supported by embedded anchors provided in this Section.
8. Section 220529 "Hangers and Supports for HVAC Piping and Equipment for suspension systems to be supported by embedded anchors provided in this Section.
9. Section 260529 "Hangers and Supports for Electrical Systems Specification for suspension systems to be supported by embedded anchors provided in this Section.
10. [**Section 270529 "Hangers and Supports for Communications Systems"**] and [**Section 270526 "Cable Trays for Communications Systems"**] for suspension systems to be supported by embedded anchors provided in this Section.

C. References:

1. American National Standards Institute (ANSI): ANSI/ASSP Z359.18 - 2017 - Safety Requirements for Anchorage Connectors for Active Fall Protection Systems.
2. American National Standards Institute (ANSI): ANSI/ASSP Z359.14 - 2021 – SRL Class 2

3. Occupational Safety and Health Administration (OSHA): 29 CFR 1910.28 Duty to Have Fall Protection and Falling Object Protection.
4. Occupational Safety and Health Administration (OSHA): 29 CFR 1926.500 - Scope, Application, and Definitions Applicable to this Subpart.
5. Occupational Safety and Health Administration (OSHA): 29 CFR 1926.501 - Duty to Have Fall Protection.
6. Occupational Safety and Health Administration (OSHA): 29 CFR 1926.502 - Fall Protection Systems Criteria and Practices.
7. Occupational Safety and Health Administration (OSHA): 29 CFR 1926.503 - Training Requirements.

D. SUBMITTALS

1. Submit under provisions of Section 01 30 00 - Administrative Requirements.
2. Product Data: Manufacturer's data sheets on each product to be used, including:
   a. Preparation instructions and recommendations.
   b. Storage and handling requirements and recommendations.
   c. Installation methods.

3. Shop Drawings: Drawings showing plans, elevations, sections and details of components. Show member sizes and part identification, fasteners, anchors, fittings and evidence of compliance with structural performance requirements.

4. Manufacturer's Certificates:
   a. Certify that Railings and Base Castings are made in USA. Provide steel mill and foundry certificates for verification prior to shipment.
   b. Manufacturer must be American Welding Society Welding Certified for Welding Standards AWS D1.1 and AWS D1.3. Third party qualification documentation required prior to shipment.

2. MANUFACTURERS

A. Acceptable Manufacturer: Safety Anchor Posts System, 9630 Bruceville Rd. #160, Elk Grove, CA 95757. Phone: (800) 377-1632, www.safetyanchorpost.com, info@safetyanchorpost.com

B. Substitutions: Not permitted.

C. Requests for substitutions will be considered in accordance with provisions of Section 01 60 00 - Product Requirements.

3. FALL ARREST ANCHOR SYSTEM

A. Overhead Fall Protection: Provide Safety Anchoring Post System overhead fall arrest anchoring systems.
   1. Product: SAPS Swivel D-Ring.
      a. System in accordance with OSHA Standards - 29 CFR 1926.501 (b)(1-15).
      b. Fall arrest Load: 5,000 lbs. (2,268 kg), minimum, in any direction to all components in accordance with OSHA Regulation 29 CFR 1926.502.

   2. Accessories:
      a. Whisker Set Plug

   3. Finish: Steel surfaces.
      a. Hot Dip Zinc Galvanized.
      b. Factory finished powder coat paint.
      c. Hot Dip Zinc Galvanized and factory finished powder coat paint.
      d. Color: None.
      e. Color: Safety Yellow.

f. Color: _____.
g. Color: Specified by Architect.

4. PREINSTALLATION MEETINGS

A. Pre-installation Conference: Conduct conference at [**Project site**] <**Insert location**>.

1. Require representatives of each entity directly concerned with concrete anchors to attend Review the following:

a. Special inspection and testing and inspecting agency procedures for field quality control.
b. Anchor rod and anchorage device installation tolerances.
c. Forms and form-removal limitations.
d. Shoring and reshoring procedures.

5. ACTION SUBMITTALS

A. Product Data: For each of the following.

1. Anchors.

B. Sustainable Design Submittals:

1. Product Data: For recycled content, indicating postconsumer and preconsumer recycled content and cost.

2. Environmental Product Declaration (EPD): For each product.

C. Concrete Design Mixtures: For each concrete mixture, include the following:

1. Mixture identification.
2. Minimum 28-day compressive strength.
3. Durability exposure class.
4. Maximum w/cm.
5. Calculated equilibrium unit weight, for lightweight concrete.
6. Slump limit.
7. Air content.
8. Nominal maximum aggregate size.
9. Steel-fiber reinforcement content.
10. Synthetic micro-fiber content.
11. Indicate amounts of mixing water to be withheld for later addition at Project site if permitted.

D. Shop Drawings:

1. Anchorage Layout: Indicate proposed anchorage layout required.

a. Location of anchors is subject to approval of the Engineer.

E. Concrete Schedule: For each location of each Class of concrete indicated in "Concrete Mixtures" Article, including the following:

F.

1. Concrete class designation.
2. Location within project.

3. Exposure class designation.
4. Formed surface finish designation and final finish.
5. Final finish for floors.
6. Curing process.
7. Floor treatment, if any.

6. EXECUTION

A. EXAMINATION
1. For cast-in-place anchors ensure location of inserts are correct prior to placing substrate.
2. Do not begin installation until substrates have been properly prepared.
3. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

B. PREPARATION
1. Clean surfaces thoroughly prior to installation.
2. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.
3. When using post installed anchors In Post Tension slabs deck they should be scanned first to avoid damaging any existing strands.

C. INSTALLATION
1. Install in accordance with manufacturer's instructions, approved submittals and in proper relationship with adjacent construction.
2. Tie spider anchors to rebar mat to hold location. Do not wet set anchors.

D. PROTECTION
1. Protect installed products until completion of project.
2. Touch-up, repair or replace damaged products before Substantial Completion.

7. INFORMATIONAL SUBMITTAL

A. Qualification Data: For the following:

1. Installer: Include copies of applicable ACI certificates.
2. Ready-mixed concrete manufacturer.
3. Testing agency: Include copies of applicable ACI certificates.

B. Research Reports:

1. For concrete admixtures in accordance with ICC's Acceptance Criteria AC198.

8. QUALITY ASSURANCE

A. Installer Qualifications: A qualified installer who employs Project personnel qualified as an ACI-certified Flatwork Technician and Finisher and a supervisor who is a certified ACI Flatwork Concrete Finisher/Technician or an ACI Concrete Flatwork Technician [**with experience installing and finishing concrete, incorporating permeability-reducing admixtures**].

B. Laboratory Testing Agency Qualifications: A testing agency qualified in accordance with ASTM C1077 and ASTM E329 for testing concrete and concrete aggregates for use in construction and employing an ACI-certified Concrete Quality Control Technical Manager.

1. Personnel performing laboratory tests to be an ACI-certified Concrete Strength Testing Technician and Concrete Laboratory Testing Technician, Grade I. Testing agency laboratory supervisor to be an ACI-certified Concrete Laboratory Testing Technician, Grade II.

C. Field Quality-Control Testing Agency Qualifications: An independent agency, [**acceptable to authorities having jurisdiction,**] qualified in accordance with ASTM C1077 and ASTM E329 for testing layout concrete and concrete aggregates for use in construction.

1. Personnel conducting field tests to be qualified as an ACI Concrete Field-Testing Technician, Grade 1, in accordance with ACI CPP 610.1 or an equivalent certification program.

9. DELIVERY, STORAGE, AND HANDLING

A. Comply with ASTM C94/C94M and ACI 301 (ACI 301M).

B. Keep anchor thread boxes free of excessive moisture, chemicals or other degrading elements.

PART 2 - PRODUCTS

1. PERFORMANCE CRITERIA

A. Each embedded anchor capable of providing up to 5,000 lbs. of pull resistance when installed in concrete slabs with min. 5000 psi concrete per ICC-ES ESR 4788.

1. For steel anchors: with 6,000 lbs. tensile strength and 9,100 lb. shear strength based on 4,000 psi normal weight concrete with a 6-inch edge distance
2. For stainless Steel Anchors: with 6,000 lbs. tensile strength and 6,750 lbs. shear strength based on 4,000 psi normal weight concrete with a 6-inch edge distance.
3. Minimum breaking strength of 5,000 lbs. (22.2kN) in accordance with OSHA-1910.140c(4) safety standards for personal fall protection systems

B. Reference Standards

1. ASTM E3121 "Standard Test Methods for Field Testing of Anchors in Concrete or Masonry"

2. ICC-ES Evaluation Report, ESR-4788, which references approval in the following Building Codes:

a. 2021, 2018, 2015, 2012 and 2009 International Building Code IBC and International Residential Code IRC
b. 2014 City of New York Building Code (NYCBC)
c. 2020 City of Los Angeles Building Code (LABC) and 2020 City of Los Angeles Residential Code (LARC).
d. 2019 Chicago Building Code (Title 14B).

e. 2020 Florida Building Code-Building, and 2020 Florida Building Code-Residential per ESR-4788 to be incompliance with the High Velocity Hurricane Zone provisions
f. 2019 California Building Code, and 2019 California Residential Code; California Office of Statewide Health and Planning and Development OSHPD and Division of State Architect DSA and California Residential Code CRC

3. ACI 318 Chapter 17 cast-in-place anchor, including minimum concrete thickness and cover.

2. CONCRETE, GENERAL

A. ACI Publications: Comply with ACI 301 (ACI 301M) unless modified by requirements in the Contract Documents.

PART 3 - EXECUTION

1. EXAMINATION

A. Verification of Conditions:

1. Before placing concrete, verify that installation of concrete forms, accessories, and reinforcement, and embedded items is complete and that required inspections have been performed.
2. Do not proceed until unsatisfactory conditions have been corrected.

2. PREPARATION

A. Provide reasonable auxiliary services to accommodate field testing and inspections, acceptable to testing agency, including the following:

1. Daily access to the Work.
2. Incidental labor and facilities necessary to facilitate tests and inspections.
3. Secure space for storage, initial curing, and field curing of test samples, including source of water and continuous electrical power at Project site during site curing period for test samples.
4. Security and protection for test samples and for testing and inspection equipment at Project site.

B. Inspect anchors for damage, including but not limited to corrosion, deformation, pits, burrs, cracking, rust fatigue and alteration. Do not use anchors with sings of damage and fail inspection.

1. Prior to use of anchor threads, confirm with Project Engineer, that concrete strength will be sufficient for intended application.

3. INSTALLATION OF EMBEDDED ANCHORS

A. General: Place and secure anchorage devices and other embedded items required for adjoining Work that is attached to or supported by cast-in-place concrete.

1. Use setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.
2. Accurately locate and install anchor rods to elevations required and complying with

tolerances in Section 7.5 of ANSI/AISC 303.

B. Install embedded items complying with anchorage manufacturer's current published installation instructions.

C. CLT3 Anchor with Concrete Overlay:
   1. Locate anchor locations on CLT panels.
   2. Install CLT3 with (8) 4” long #10 wood screws in supplied holes with a minimum thread embedment of 2 ¾”.
   3. Use whisker set plugs for ease of locating anchors after pouring concrete. Set top of plug at top of slab to ensure easy removal.
   4. Pour over with 4,000 psi concrete, min. concrete must reach full design strength before installing handrail assembly. Minimum concrete depth is 3 3/4”

D. SAPS Spider Anchor:
   1. Locate anchor locations on formwork deck.
   2. Place spider anchor in desired location and tie to rebar to ensure anchor does not move during the pour.
   3. Use whisker set plugs for ease of locating anchors after pouring concrete. Set top of plug at top of slab to ensure easy removal.
   4. Pour over with 4,000 psi concrete, min. concrete must reach full design strength before installing handrail assembly. Minimum concrete depth is 6”
   5. Do not wet set anchors

E. Thin Slab Metal Deck Anchor:
   1. Locate anchor locations on metal deck, center must land in valley of corrugation
   2. Install anchor with flared coil anchor in valley of corrugation. Anchor plate must sit on top metal gap without a gap below.
   3. Install (2) ¼” TEK screws in provided holes and fasten to metal deck
   4. Use whisker set plugs for ease of locating anchors after pouring concrete. Set top of plug at top of slab to ensure easy removal.
   5. Pour over with 4,000 psi concrete, min. concrete must reach full design strength before installing handrail assembly. Minimum concrete depth from top of metal deck is 2”.

F. SAPS Dualie Anchor:
   1. Locate anchor locations on formwork deck.
   2. Install plug in bottom of anchor and place in desired location and tie to rebar to ensure anchor does not move during the pour.
   3. Use whisker set plugs on top of anchor for ease of locating anchors after pouring concrete. Set top of plug at top of slab to ensure easy removal.
   4. Pour over with 4,000 psi concrete, min. concrete must reach full design strength before installing and using fall arrest d-rings or handrail systems. Minimum concrete depth is 5”
   5. Do not wet set anchors

G. 3/8”Øx4” Titen HD Anchor:
   1. Install per manufactures recommendations with a minimum embed of 3 ½” and 6” minimum concrete depth.

4. FIELD QUALITY CONTROL

A. Testing Agency: Owner will engage a qualified testing and inspecting agency to perform tests and inspections and to submit reports.

   1. Testing agency to be responsible for providing curing container for composite samples on Site and verifying that field-cured composite samples are cured in accordance with

ASTM C31/C31M.

2. Anchor Testing: Field Test Anchors in accordance with ASTM E3121/3121M "Standard Test Methods for Field Testing of Anchors in Concrete or Masonry".
3. Testing agency to immediately report to Architect, Contractor, and concrete manufacturer any failure of Work to comply with Contract Documents.
4. Testing agency to report results of tests and inspections, in writing, to Owner, Architect, Contractor, and concrete manufacturer within 48 hours of inspections and tests.

5. Owner's independent special inspector shall make periodic inspections during installation of anchors to verify:

    a. Concrete type,
    b. Concrete compressive strength,
    c. Spacing,
    d. Edge distances,
    e. Concrete thickness
    f. Concrete cover,
    g. Engagement with lock plate, snug tight against the formwork and
    h. Adherence to the manufacturer's published installation instructions.

B. Inspections: In accordance with Section 1705.1.1 and Table 1705.3 of [**2018**] [**and 2021**] [**IBC**] <**insert local building code**>.

1. Headed bolts and studs.
2. Verification of use of required design mixture.
3. Concrete placement, including conveying and depositing.
4. Curing procedures and maintenance of curing temperature.
5. Verification of concrete strength before removal of shores and forms from beams and slabs.
6. Batch Plant Inspections: On a random basis, as determined by Architect.

END OF SECTION 031501