

SPECIFICATION SECTION 05 90 02: SOLAR PHOTOVOLTAIC CANOPY STRUCTURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. The Contract and any design-build bridging documents.
- B. Section 26 00 00: General Electrical Specifications
- C. Section 48 14 00: Photovoltaic System Specifications
- D. Other relevant Judicial Council Specifications

NOTE: Where this specification and other specifications or bridging-documents are in conflict, the more stringent shall apply. Contractor shall identify conflicts and confirm recommended equipment or procedures with the Judicial Council.

1.2 CODES & REFERENCES

- A. The design and installation shall conform to all requirements as defined by the applicable codes, laws, rules, regulations, and standards of applicable code enforcing authorities (Latest Edition unless otherwise noted). The following are key standards that shall be followed. The Architect/Engineer of Record and Contractor shall ensure all applicable codes are followed:
 - 1. Aluminum Association (AA) (www.aluminum.org) - Aluminum Standards and Data
 - 2. ASTM International (ASTM) (www.astm.org), including:
 - a. A6, Standard Specification for General Requirements for Rolled Structural Steel Bars, Plates, Shapes, and Sheet Piling
 - b. A36, Standard Specification for Carbon Structural Steel
 - c. A123, Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products
 - d. A653, Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process
 - e. E3010, Standard Practice for Installation, Commissioning, Operation, and Maintenance Process (ICOMP) of Photovoltaic Arrays
 - 3. AISC Manual of Steel Construction
 - 4. AISI Specifications for the Design of Cold Formed Steel Members
 - 5. American National Standards Institute (ANSI)
 - 6. American Society of Civil Engineers (ASCE), Minimum Design Loads and Associated Criteria for Buildings and Other Structures (7-16)
 - 7. California Building Code (CBC), with State of California Amendments
 - 8. California Energy Commission Title 24 Building Energy Efficiency Requirements
 - 9. California Department of Forestry and Fire Protection, Office of the State Fire Marshal – Solar Photovoltaic Installation Guidelines
 - 10. Local and State Fire Code
 - 11. Institute of Electrical and Electronics Engineers (IEEE)
 - 12. National Electrical Manufacturers Association (NEMA)
 - 13. National Fire Protection Association (NFPA), National/CA Electrical Code
 - 14. Occupational Safety and Health Administration (CAL_OSHA)
 - 15. Research Council on Structural Connections (RCSC)

RFX Title: Solar Power Purchase Agreement Statewide

RFX Number: RFP_FS-2023-06-JP

16. Underwriters Laboratory (UL), including:
 - a. UL 2703 – Standard for Mounting Systems, Mounting Devices, Clamping/Retention Devices, and Ground Lugs for use with Flat-Plate Photovoltaic Modules.
17. Utility company standards and requirements
18. For projects under the Purview of the Division of the State Architect (DSA)
 - a. DSA IR-16-8 (most recent) Guidelines
 - b. DSA PL-07-02 (most recent) Guidelines
19. Judicial Council Judicial Council Specifications and Requirements
20. All other applicable Codes and Ordinances

1.3 GENERAL

- A. "Judicial Council" shall refer to Judicial Council of the State of California, owner of the site(s) where project will be located, regardless of system ownership, and include any representative of the site Judicial Council, such as independent engineers, consultants, or inspectors. "Contract" refers to the design-build and/or construction contract and any associated design-build bridging documents, inclusive of requirements outlined in the request for proposals (RFP). "Contractor" refers to the entity performing the work, inclusive of Engineer(s) and Architect(s) of Record for design-build contracts, post construction system operator, and financier.
- B. This is a design-build project and includes the construction of Structural Photovoltaic Shade Canopies (PV Canopies). The design and installation shall conform to all requirements as defined by the applicable codes, laws, rules, and standards as specified in the Contract.
- C. The Contractor shall include all items and all work reasonable inferred by these specifications and the Contract for compliance with all applicable structural codes. If the Contractor is in doubt as to the intent of any portion of these specifications and the Contract, or necessary information is omitted, the Contractor shall notify the Judicial Council in writing for clarifications or corrections to be provided by addendum.
- D. All design documents, cut sheets, and technical specifications shall be submitted, reviewed, and accepted by the Judicial Council per the guidelines specified in the Contract.
- E. General Specifications as described in Section 26 00 00: General Electrical Specifications, are referred to herein and shall apply to this specification. Section 26 00 00 shall be deemed to supersede this specification in the case of conflicts.

1.4 WORK INCLUDED

- A. The work shall include the design and construction of the structural systems for solar PV canopies, in conformity with plans, applicable codes and professionally recognized standards.
- B. The structural design shall be fully developed, including descriptions and calculations for all structural components. The site, plans, elevations, schedules, and detail drawings must be sufficiently developed to reflect the overall design per the Contract and as described in Section 48 14 00, Photovoltaic System Specifications. Clear-height of canopy above grade shall be clearly noted on the drawings for the low side of canopies at corners and at the minimum clear location between corners.
- C. Contractor shall provide all materials, labor, equipment, services, and incidentals necessary to install the structures at each Site as shown on the design drawings and as specified hereinafter.

RFX Title: Solar Power Purchase Agreement Statewide

RFX Number: RFP_FS-2023-06-JP

- D. Contractor shall provide temporary power and lighting as required for construction. Additionally, Contractor shall provide sufficient temporary facility lighting in place of removed existing lighting during construction phase until under canopy lighting is fully operational, unless an exception is provided by Judicial Council in writing.
- E. Contractor shall include any other structural work as might reasonably be implied as required, even though not specifically mentioned herein or shown on the drawings.
- F. Contractor shall be responsible for confirming location of all underground utilities and infrastructure with the use of Ground Penetrating Radar (GPR) or equivalent Judicial Council approved technology and Underground Service Alert (USA) prior to construction.
- G. Contractor shall be responsible for prompt removal and disposal of spoils from all related construction activities.

1.5 DESIGN PROCEDURE & REQUIREMENTS

- A. Engineering calculations, drawings and specifications shall be prepared and signed by a Structural Engineer, registered in the State of California, and regularly employed in the design of photovoltaic canopy systems. The Structural Engineer shall be the Engineer of Record as required by code-enforcing authorities. The Engineer of Record shall provide required statements and certifications.
- B. All structural system components shall be designed and constructed to withstand the environmental conditions of the site to which they will be exposed. The mounting systems shall be designed and installed to resist dead load, live load, corrosion, UV degradation, wind loads, and seismic loads appropriate to the geographic area over the expected life of the PV system. Design life shall be a minimum of 25 years.
- C. All canopies shall be designed to meet ADA requirements per the relevant AHJ(s). Contractor shall be responsible for the design and construction of all required ADA improvements to complete the project. All changes to the parking lot shall comply with ADA requirements.
- D. Fire lanes established to access any adjacent facility by the local fire department shall be maintained and comply with state, county, and local fire guidance. Contractor to support Judicial Council coordination with Office of the State Fire Marshall as needed. Changes to fire lanes are allowed, but only under approval by fire authorities having jurisdiction over the site and under coordination and approval by the agency project manager. Fire lanes are to be shown on submittal drawings and must be approved before Notice to Proceed.
- E. The Contractor shall work with the Judicial Council Project Manager to designate delivery truck routes through the site to ensure that the shaded carport structures have adequate clearance and are compatible with non-project related deliveries during and after construction.
- F. **GEOTECHNICAL STUDY AND ANALYSIS**
 - 1. A geotechnical analysis shall be provided and directed by the Contractor and performed by a licensed geotechnical engineering firm at the locations where the structures are to be installed. The results of the analysis shall be used when designing the foundations and structures for the project.
 - 2. At a minimum, the following should be included in the analysis:

RFX Title: Solar Power Purchase Agreement Statewide

RFX Number: RFP_FS-2023-06-JP

- a. Review available geotechnical information. This may include past geotechnical reports, soil and geologic maps/literature, photographs, groundwater reports, water well data, etc.
- b. Coordination and mobilization of the geotechnical services team for subsurface exploration of the site. This shall include coordinating local utilities to mark any existing underground utilities.
- c. Study the site to determine the presence of faults, ground fissures, and other potential geologic hazards that could affect the structural design and construction of the facility.
- d. Drilling or digging of exploratory borings and pits. The amount and depth shall be determined by the Engineer of Record.
- e. Performance of cone penetration tests where the potential of liquefaction exists. The amount and depth shall be determined by the Contractor.
- f. Laboratory testing of collected soil samples from the borings and test pits. An evaluation of the in-place moisture content and dry density, gradation, plasticity, consolidation characteristics, collapse potential, expansivity, shear strength, resistivity, chloride content, sodium sulfate content, and solubility potential (total salts) should be conducted.
- g. Analyze the corrosivity of the soil upon determination of a professional engineer. Include a recommendation for the type of cement to be used in concrete foundations. Also include recommendations for corrosion protection for underground steel, including rigid metal conduit (such as the need for polyvinyl chloride [PVC] coating).
- h. A detailed report shall be provided outlining the tasks performed and the results of the testing. Included in the report should be any recommendations for the foundation designs, structural support designs, corrosion protection, pile drive frequency, minimum pile size, and any geologic conditions that may prevent the development of the project. For ground mount systems, an opinion on the viability of driven piles as the PV racking supports should be provided.

1.6 PERMITS AND INSPECTIONS

- A. Contractor shall obtain all required permits and arrange for all required inspections, including utility company requirements, inspections, and sign-offs.
- B. Contractor shall not allow or cause any of the work to be covered or enclosed until it has been tested and/or inspected.
- C. Contractor shall obtain all required permits and arrange for all required inspections, including utility company requirements, inspections, and sign-offs.

PART 2 - PRODUCTS

2.1 SOLAR CANOPY STRUCTURES

- A. The PV Canopies shall consist of interconnected structural steel columns and beams, with purlins attached to cross beams. Solar modules shall be installed on purlins with mechanical fasteners. Canopies shall have a single row of columns along the long axis of the canopy. In parking areas, columns shall be located between parking stall spaces with beams cantilevered to either one or both sides of the column for both dual entry (aisle) and single entry (perimeter) parking structures.

RFX Title: Solar Power Purchase Agreement Statewide

RFX Number: RFP_FS-2023-06-JP

- B. Contractor shall be responsible for all design and coordination to achieve all AHJ permits for the canopy design.
- C. Modules shall be fastened to the canopy structure with through-bolted connections.
- D. COATINGS AND CORROSION CONTROL
 - 1. All structural members and racking installed outdoors shall be hot dipped galvanized steel.
 - a. All galvanized structural components shall be hot-dipped galvanized in compliance with ASTM 123.
 - b. All purlin framing members shall meet ASTM A653, minimum G90. If structure is in close proximity to a marine environment (within 5 miles), G120 or higher shall be used. per Engineer/Architect of Record's specification.
 - c. Field cuts of galvanized materials shall be kept to a minimum. All galvanized materials cut during construction shall be field coated with a long-lasting rust inhibiting coating, color matched and intended for coating hot-dipped galvanized metal in outdoor settings.
 - d. Painted portions of structures will be primed with rust inhibitive primer and then painted with 2 coats of paint or powder coated. All unpainted metal shall be resistant to corrosion for a minimum of 25 years.
 - 2. All canopy bolts, nuts and washers, unless otherwise noted, shall be hot dip galvanized or stainless steel.
 - 3. Particular attention shall be given to the prevention of corrosion at the connections between dissimilar metals.
- E. All structural members and panels shall be designed in accordance with the latest version, with addenda, of the American Iron and Steel Institute (AISI) publication, "Specification for the Design of Cold-Formed Steel Structural Members."
- F. Welding of the light gauge, cold-formed structural members shall be in accordance with the latest version of the "Structural Welding Code Sheet Steel" (AISC/AWS D1.3). All structural steel sections shall be designed in accordance with the latest version, with addenda, of the AISC "Specifications for the Design, Fabrication, and Erection of the Structural Steel for Buildings."
- G. Any steel canopy roof panel shall be coated steel conforming to ASTM A792, ASTM A653, or ASTM A611 with a minimum yield strength of 80 kilo pounds per square inch (KSI) or equal. The roof panels shall be factory pre-painted.
- H. Light-gauge steel beams and columns shall conform to ASTM A653, with a minimum yield strength of 55 KSI.
- I. Concrete shall be done in accordance with the latest edition of ACI 318 "Specifications for Structural Concrete for Buildings," and shall be 2,500 pounds per square inch (PSI) at 28 days. Reinforcing shall be new billet steel conforming to ASTM A615, grade 40.
- J. All steel framing fabrication shall be done by an approved fabricator and certified by an independent agency, for the type of fabrication required. Certification shall be as required by the local municipality. Welders holding a valid certification for the type of welding required shall perform all steel welding. Certification shall be as required by the local jurisdiction. The submittal shall include: Carport Drawings (stamped by an Engineer licensed in state); Carport

RFX Title: Solar Power Purchase Agreement Statewide

RFX Number: RFP_FS-2023-06-JP

Structural Calculations (stamped by an Engineer licensed in state; Standard Colors; and renderings as required for the compliance process approval.

- K. All framing material shall be drained or have provisions to prevent water pooling on or within the framing member (weep holes).
- L. Purlins shall be structurally connected to beams as detailed on the drawings with hot-dipped galvanized fasteners, unless otherwise specified by the Structural Engineer of Record. The number of purlins and purlin spacing shall be as shown on the drawings. Mounting holes for the racking system and solar module installation shall be pre-located and pre-drilled prior to finishing and coating operations. Should an approved substitution of modules dictate modification of purlin placement, Contractor shall provide stamped drawings for review detailing any modifications.
- M. Any fasteners used to secure modules shall include rated locking fasteners based on DIN-65151. Wedge-lock washers and pre-applied thread lock can be used to achieve this in a bolted joint, fasteners should be designed and installed by the structural engineer in accordance with standard DIN 65151.
- N. Threaded fasteners should include locking mechanisms to address both preload relaxation and joint slip. Spring/cupped washers such as Belleville washers shall be used to compensate for preload relaxation, as specified by the structural engineer.
- O. Under no circumstances shall split washers, nylon-insert nuts, double-nutting, star washers, and/or serrated flange nuts be used to provide fastener locking capability.
- P. FOUNDATIONS AND COLUMNS
 - 1. In parking areas, concrete column foundations shall extend a minimum height of 30 inches above grade for protection of structural steel from vehicle strikes.
 - 2. All column anchor bolts shall be torqued per Engineer of Record requirements and marked once torqued. Nuts shall then be double nutted or 'staked' (threading irreversibly altered) to protect from structural compromise and vandalism.
 - 3. All structural connections at the flanged base of columns shall be outfitted with metal pole skirts coated to match columns. Pole skirts shall have rounded corners. Alternatively, flange bases may be grouted at the approval of the Judicial Council.
- Q. CANOPY
 - 1. All canopies shall have a minimum clear height above grade of 12-feet at the lowest point of any structure. Contractor is responsible for determining grade elevations under canopies and ensuring clear-heights are achieved. Clear heights shall be identified on drawings, including at all low side corners and at the point of minimum clearance on the low side.
 - 2. All canopies to be co-planer and in alignment horizontally and vertically with adjacent arrays. Canopies shall be level horizontally along the long axis of the canopy. Slopes on the long axis of the canopy or stair-stepping between adjacent arrays shall not be allowed unless approved in writing by Judicial Council and only where substantial grade change exists below the canopy.
 - 3. Top of column heights shall be shown in design drawings.

RFX Title: Solar Power Purchase Agreement Statewide

RFX Number: RFP_FS-2023-06-JP

4. Canopies shall have a minimum tilt of five degrees (5°) and maximum tilt of ten degrees (10°), with tilt and aspect clearly shown drawings. All canopies on a project site shall have the same tilt, unless approved otherwise by Judicial Council.
5. Canopies placed in parking lots shall be clearly labeled with max clearance for vehicles at the low points. Labels shall be rated for long-term UV exposure with lifetime to match warranties specified for PV panels in Section 48 14 00. Minimum labeling along the long axis of the low-side of the canopy shall be one every 30 feet of canopy or 3 labels, whichever is greater. Labeling shall also include the exterior low-side corner of each canopy within a parking lot. Label should be easily visible from a vehicle.

R. ELECTRICAL CONDUITS

1. Electrical conduits extending from the canopy to grade (including any spares) are to be encased in the foundations, not mounted on the outside of finished concrete piers.
2. All electrical connections between separate structures shall be underground. Overhead “jumpers” between structures shall not be permitted. Structures are considered separate wherever a gap exists between structural crossmembers that is not spanned by purlins.

2.2 SPARE CONDUITS

1. EV Charging Spares: The following measures are required to accommodate future chargers while avoiding retrenching and or reworking electrical switchgear. The following factors shall be designed for and installed:
 - a. For canopies located in parking lots, 30% of covered parking spots shall include spare conduit(s) for EV charger communication wire and electrical conductors. Conduits shall originate at a utility box between the parking lot and the building or as otherwise approved by the Judicial Council to the termination location(s) at the parking spot to include both ADA and non-ADA stalls.
 - b. At the canopies, the spare conduit shall terminate in a flush grade-mounted pull box designated as “EV Charger Ready”. Spare conduit shall have a minimum of two sufficiently rated pull strings or wires inside conduit for future wire pull.
 - c. For the purposes of this RFP, the Contractor shall assume parking stalls to be served by double-service, Level 2 EV (208/240V) chargers, with each charger requiring one (1) forty (40)-amp circuit served by a forty (40)-amp two-pole breaker. The Contractor shall install at a minimum one (1), one-inch electrical conduit for every two circuits or a larger conduit able to serve the number of required circuit conductors.

B. Battery Energy Storage System (BESS) Spares

1. A BESS system may be included in the scope of this project. If included, Contractor shall design and install a complete and interconnected BESS system.
2. If BESS system is not included in the scope, Contractor shall install spare conduits for future BESS implementation. Spare conduits shall include (2) x 4" and (1) x 1.5" conduits from the main service to a pull box at the future BESS location indicated in the Bridging Documents. In the absence of a designated BESS location, Contractor shall work with Judicial Council during design to establish a BESS location and provide spare conduits to that location.

RFX Title: Solar Power Purchase Agreement Statewide

RFX Number: RFP_FS-2023-06-JP

3. At the BESS location, the spare conduit shall terminate in a flush grade-mounted traffic rated pull box, see Guide Specifications for pull box requirements. Spare conduit shall have a minimum of two sufficiently rated pull strings or wires inside each conduit for future wire pull.

C. Other Spares

1. A (2) x 1.5" (minimum) spare conduit for security camera cable or another data pathway shall be provided to each canopy. Conduit shall terminate in the main facility electrical interconnection point and be labeled "For Future Use – Security Video". Conduit shall have a minimum of two sufficiently rated pull strings or wires inside conduit for future wire pull.
2. Conduit at the canopies shall extend from grade inside of foundations and up column to the level of the structural cross-member. Conduit shall terminate in an 8" x 8" x 3" NEMA 4X junction box. Pathways to multiple canopies may be combined into a single 2" conduit.

- D. Additional spare conduits may be required as specified in the Bridging Documents.**

2.3 LIGHTING SYSTEMS

- A. Contractor shall review and confirm as-built lighting plans for sites with existing lighting. Where as-builts do not exist or are not accurate, Contractor shall develop as-built lighting plans for all sites with existing lighting, identifying existing fixtures, and existing light levels in target canopy areas.**
- B. Canopy lighting systems shall be designed to meet the Illuminating Engineering Society of North America (IESNA) requirements for parking lot areas, to meet or exceed minimum values and maximum uniformity ratios as listed in the IESNA criteria as well as comply with requirements listed in the Attachment O10 California Trial Court Facilities Standards.**
- C. Lighting shall meet all Title 24 requirements for installations in California.**
- D. All lighting sources shall be LED type.**
- E. Lighting control system shall be connected to the existing lighting controls in each area. If tie-in with existing circuits is not feasible, Contractor shall establish new circuit and controls. Contractor shall field verify that existing lighting circuit conductor, controls, and overcurrent protective device at the circuit point of supply are sufficiently rated for the final lighting load after removal of existing lighting and addition of new lighting. The Contractor shall notify the Judicial Council if existing conductors or infrastructure are found to be deficient, and connection of the new lighting to the new project panelboard shall be implemented by Contractor.**
- F. Lighting design on canopies shall insure cut-off light control to limit spill light or glare to adjoining areas as needed. Design and install custom shielding or other mitigation measures to avoid light pollution and glare to neighbors.**
- G. Lighting temperature or Kelvin Rating shall be consistent with Judicial Council Standards and approved during design phase. Contractor shall provide Judicial Council a submittal for fixtures and obtain written approval from Judicial Council of temperature rating prior to ordering fixtures.**
- H. Existing parking lot lighting poles and fixtures illuminating the proposed solar PV carport areas shall be removed, and lighting shall be restored by new light-emitting diode (LED) fixtures**

RFX Title: Solar Power Purchase Agreement Statewide

RFX Number: RFP_FS-2023-06-JP

mounted to the carport structure. The LED fixtures shall be FEMP-designated (100 lumens per watt or greater) and/or ENERGY STAR-rated and controlled through photocell and motion sensors if dimmed during off hours. The lighting layout shall achieve minimum Illuminating Engineering Society of North America (IESNA)-recommended foot-candle levels and uniformity for parking lots (ANSI/ASHRAE/IESNA Standard 90.1) and comply with the most recent version of the International Dark-Sky Association (IDA/IESNA lighting ordinance). Modify other existing lighting to coordinate with the new work and design, including reconnection of any existing downstream circuiting and controls to remain. Foundations of existing pole mount lighting are to be completely removed a minimum of 6-inches below grade, with grade restored to surrounding condition and demolished material removed and disposed of by Contractor. Light standards and fixtures shall be carefully removed and returned to the Judicial Council at Judicial Council's option. Contractor to confirm prior to demo.

- I. New design shall cover all areas of the parking lots (in the area of the work) to leave no dark spots and meet IESNA and requirements for all areas previously covered by light standards removed under this contract. Contractor shall install new pole mounted luminaires if canopy lighting does not provide sufficient lighting in all areas previously covered by removed or altered light standards. Existing fixtures may remain, if not in direct conflict with canopies or causing shading of new canopies.
- J. New array mounted light fixtures shall also provide illumination levels and distribution needed to support existing and proposed security camera systems. The proposed lighting layout and specification shall be part of the submittal package. The Contractor shall coordinate with Judicial Council security staff to select a final lighting layout.

PART 3 - EXECUTION

3.1 SITE PREPARATION AND INSPECTION

- A. Contractor shall direct, oversee and inspect all site work related to structural installation. Site preparation shall be in accordance with final drawings and specifications provided by manufacturer.

3.2 INSTALLATION

- A. Erect/stand structural steel with proper equipment and qualified installers.
- B. Actively cooperate with other trades and provide incidental welding, connections, etc. for securement of work of others to structural steel framing.
- C. Erect/stand temporary flooring, planking, and scaffolding necessary in connection with erection of structural steel or support of erection machinery. Use of temporary floors shall be as required by municipal or state laws and governing safety regulations. Hoist metal deck onto structural frame.
- D. After erection, clean connections and abrasions to shop coat and spot paint with same primer used in shop.
- E. Installation of the structural system and all components shall be in strict accordance with manufacturer's and Engineer of Record's recommendations.

RFX Title: Solar Power Purchase Agreement Statewide

RFX Number: RFP_FS-2023-06-JP

- F. Post installation, Contractor shall provide the materials and labor to grout the base of the column to produce a finished joint.

3.3 ERECTION TOLERANCES

- A. Erection tolerances for structural steel work shall be in accordance with latest AISC "Code of Standard Practice for Steel Buildings and Bridges".

3.4 BOLTING

- A. High strength steel bolts shall be used where indicated. Fabrication and erection shall be in strict accordance with the latest edition of "Specifications for Assembly of Structural Joints Using High-Strength Steel Bolts", as approved by the Research Council on Riveted and Bolted Structural Joints of the Engineering Foundation. Load indicator washer shall be used. Use beveled washers on sloping surfaces.

3.5 WELDING

- A. Welding and welded joints shall be in accordance with AWS standards. Work shall be performed by operators who have been qualified by test in accordance with AWS D1.1, "Structural Welding Code – Steel", to perform type of work required for this project.
- B. All methods, sequence, qualifications, and procedures including preheating, post heating, etc. shall be detailed in writing and submitted for review by the testing laboratory and results provided to Judicial Council. Provisions shall be made in detailing of lengths of members for dimensional changes as a result of shrinkage stresses so as to provide specified finished dimensions.
- C. Remove all runoff tabs, and bottom backing bars. Top backup bars to be removed or have continuous fillet weld to column.

3.6 ANCHOR BOLTS

- A. Provide at site, for others to install, all anchor bolts, bearing plates, and templates to be embedded in concrete.
- B. Provide necessary steel or wood templates and diagrams for setting and securing of such anchor bolts in concrete forms.
- C. Be jointly responsible with others for proper locating and installing bolts. Make good any deficiencies and errors.
- D. Setting of anchor bolts in hardened concrete necessitates drilled holes solidly grouted in place with epoxy grout. Submit materials and methods for review and approval.
- E. Nuts shall then be double nutted or 'staked' (threading irreversibly altered) to protect from structural compromise and vandalism.

END OF SPECIFICATION SECTION 05 90 02