

TECHNICAL SPECIFICATION
FOR
CONCRETE SHIELDING BLOCKS
SPEAR INJECTOR PROJECT
PS-439-320-03-R0

Prepared by Mark N. Obergfell Plant Engineering
Mark N. Obergfell

Reviewed by Hugh E. Vassar Plant Engineering
Hugh E. Vassar

Approved by John M. Voss Stanford Synchrotron
John M. Voss Radiation Laboratory

Plant Engineering Department
Stanford Linear Accelerator Center
Stanford University
Stanford, California

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TECHNICAL SPECIFICATION
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SPEAR INJECTOR PROJECT

PART 1 - GENERAL

1.1 DESCRIPTION

- A. Work included: Provide all labor, materials, equipment, services, and transportation necessary to detail, fabricate, and deliver shielding blocks as shown on the Drawings, and as specified herein.
- B. Work not included:
1. Unloading at site. University will furnish necessary labor and equipment to off-load the blocks at the delivery site. The Seller shall give the University at least five days advance notice of each separate delivery date and time. One (1) hour shall be allowed per truck load for unloading at the site.
 2. Installation at site.

1.2 QUALITY ASSURANCE

- A. Use adequate numbers of skilled workers who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work.
- B. Seller shall provide a certificate of conformance, certifying that each block has been manufactured in strict accordance with the requirements of this specification and the drawings.
- C. See Section 3.2 below.

1.3 SUBMITTALS

- A. Prior to commencing fabrication of the blocks, submit data and drawings as specified below:
1. Concrete mix design (in accordance with ASTM C-94) data by a established testing laboratory or registered engineer within seven (7) calendar days after receipt of order showing: proportions of materials per cubic yard; brand and type of cement; source and properties of aggregates (gradation etc. in accordance with ASTM C-33); compressive strength at 28 days; and certification that materials are in compliance with specification requirements.
 2. Description of forms to be used, and methods of placing, consolidating, and curing concrete.
 3. Shop drawings of reinforcing steel and all embedded metal items, including anchors and lifting devices, showing sizes, member dimensions and cross-sections (including cutting and bending dimensions for reinforcing steel), and details.

- B. Submittals shall be made in sufficient time to allow University review and Seller's resubmittal, if necessary, without delaying the work. Any review by the University shall not relieve the Seller from responsibility for errors or omissions.
- C. One reproducible copy of data and drawings shall be submitted after final approval and delivery of blocks to denote "as-built" condition. Final payment will not be made until this information is received and approved by the University.

1.4 APPLICABLE DOCUMENTS

The following documents are hereby made a part of this specification. Materials and fabrication shall conform to applicable portions of the latest editions and revisions of the codes and standards.

A. Drawings

<u>Number</u>	<u>Sheet</u>	<u>Title</u>
ID-439-320-03-C0	S-3	SPEAR Injector Project Shielding Roof Structural Plan
ID-439-320-04-C0	S-4	SPEAR Injector Project Shielding Roof Structural Sections and Details

B. Codes and Standards

1. ACI - American Concrete Institute
ACI 318-83 Building Code Requirements for Reinforced Concrete
2. AISC - American Institute of Steel Construction
"Specification for the Design, Fabrication and Erection of Structural Steel for Buildings"
3. ASTM - American Society for Testing and Materials
 - A-36 Standard Specification for Structural Steel
 - A-615 Standard Specification for Deformed and Plain Billet-Steel Bars for Concrete Reinforcement
 - C-33 Standard Specification for Concrete Aggregates
 - C-39 Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens
 - C-94 Standard Specification for Ready-Mixed Concrete
 - C-494 Standard Specification for Chemical Admixtures
4. AWS - American Welding Society
D1.1 Structural Welding Code

PART 2 - PRODUCTS

2.1 CONCRETE

Concrete shall have a minimum compressive strength at 28 days of 4000 psi. Tests shall be made each day concrete is placed in accordance with ASTM C94, Section 16. Results of strength tests shall be submitted to the University within five calendar days after cylinders are tested (in accordance with ASTM C-39). The University may, at its option, perform slump, strength and other tests on concrete as placed. Maximum size of aggregate shall be 3/4".

2.2 REINFORCING STEEL

Reinforcing steel shall be Grade 60 in accordance with ASTM A-615.

2.4 ADMIXTURES

Chemical admixtures, if used, shall be in accordance with ASTM C-494. Use of admixtures shall be approved by the University prior to use.

2.4 FORMWORK

Forms shall be of steel construction. Forms shall be designed and constructed to permit placing and consolidation of concrete without deformation of the forms and to accurately hold embedded metalwork in position. Templates, jigs or other items as required shall be used to accurately position embedded items within the tolerances shown on the drawings. Forms shall produce a surface finish equivalent to a steel troweled finish.

2.5 EMBEDDED ITEMS

Steel plates and angles shall be in accordance with ASTM A-36. Concrete anchors shall be Nelson Studs, or approved equal, and shall be installed in accordance with the manufacturer's recommendations. Lifting inserts shall be Burke Rapid-Lift, 4 TON Spread Anchors #79-117 with sealing cover, or approved equal, installed in accordance with the manufacturer's recommendations. All welding shall be in accordance with AWS D1.1. Outside surfaces and flame cut ends of corner angles shall be ground smooth. Surfaces to be embedded in concrete shall be free of heavy rust, oil, grease, and other foreign substances which would prevent bond with the concrete.

PART 3 - EXECUTION

3.1 FABRICATION

- A. General:
1. Fabricate the work of this Section to the sizes and shapes indicated.
 2. Provide finished units which are straight, true to size and shape, and within the specified casting tolerances.
 3. Warped, cracked, broken, spalled, stained, and otherwise defective units will not be acceptable. All imperfections shall be repaired to the satisfaction of the University using materials and methods as directed.
 4. Place and secure in the forms all anchors, clips, studs, bolts, inserts, lifting devices and other devices required for handling and installing the blocks.
 5. It shall be the responsibility of the Seller to provide all additional inserts and reinforcing, if necessary, to permit placing and consolidating concrete, and for handling of the blocks before attaining design strength.
- B. Furnish and place reinforcing as detailed. Securely tie and anchor against displacement. Provide bends and hooks as detailed. Laps shall be 32 diameters minimum or as shown on the drawings. Clean all bars free of dirt, scale, rust etc., just prior to placing concrete. Forms shall be cleaned of all debris and other deleterious substances, and coated with form release oil as necessary to insure the proper release of forms without damaging the concrete.
- C. Concrete shall be placed and consolidated by vibration in a manner to ensure freedom from rock pockets and segregated materials and to ensure close and intimate contact with all form surfaces and embedded materials. Maximum slump of concrete at time of placement shall be 4" unless approved plasticizing admixtures are used. The exposed surface of the concrete shall receive a light broom finish.
- D. Concrete shall be cured by steam, water, membrane or other method approved by the University, provided that curing shall develop the specified strength and shall not have an adverse effect on the durability of concrete. If membrane curing is used, it shall permit the identification markings as indicated on the drawings.

3.2 SHOP INSPECTION

- A. Seller shall inspect each block prior to shipment. Dimensions shall be checked to ensure that they are within the tolerances noted on the drawings. The surfaces of each block shall be checked by laying a straightedge, at least 10 feet long, on each mating surface, and the surface checked to ensure that it is within tolerance. The Seller shall certify that each block shipped meets the dimensional and surface tolerances.

- B. The University, at its option, from time to time at the fabrication site may select groups of three blocks at random to test the proper mating of contact surfaces, and tolerances. It is anticipated that these tests will occur only twice during the fabrication period, but the University reserves the right to perform additional tests at no extra cost to the University. The Seller shall provide all space, labor, and equipment required to test the blocks. Blocks which will not mate properly during testing will be rejected by the University and shall be repaired or replaced at no additional cost. The Seller remains responsible for costs of correction of any work that is not in conformance with the purchase order requirements, regardless of any testing, inspection, or approvals performed by the University. Final acceptance will be upon delivery and installation at the SLAC site.

END OF SPECIFICATION

