

TECHNICAL SPECIFICATIONS

FOR

SSRL SHELTER NO. 140

SPEAR INJECTOR EQUIPMENT SHELTER

IS-586-140-00-RO

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DIVISION 1

GENERAL REQUIREMENTSSECTION 01100 -- SPECIAL CONDITIONS & STATEMENT OF WORKPART I -- GENERAL1.1 LOCATION

The work as outlined in these specifications shall be performed at the Stanford Linear Accelerator Center, 2575 Sand Hill Road, Menlo Park, CA (San Mateo County). The construction site is located southeast of SPEAR Ring and north of End Station A as shown on Dwg. ID-586-140-01-CO.

1.2 STATEMENT OF WORK

The work covered by this specification shall include, but not necessarily be limited to, the following:

1. Supply and erection of metal clad, pre-engineered building including siding, roofing, insulation, doors, trim, paint, and miscellaneous metals.
2. Interior gypsum board partitions including toilet room and janitor closet, with doors, hardware and painting; sheet vinyl floor covering in toilet.
3. Mechanical work including:
 - a. Interior plumbing work.
 - b. Fire sprinkler system.
 - c. Heating and ventilation system.

4. Electrical work including house power, lighting, cable trays, grounding and fire detection system with alarm and pull boxes.

1.3 WORKING HOURS

The Subcontractor will be permitted to work in the construction area during normal working hours, and before 7:30 AM, after 4:30 PM, or on holidays or weekends, when authorized by the University Representative.

1.4 COOPERATION WITH OTHER SUBCONTRACTORS AND SLAC PERSONNEL

- A Other Subcontractors and SLAC technicians may be working in the area within and adjacent to the Subcontractor's work area. The Subcontractor shall cooperate with the University in the scheduling of the work to avoid undue inconveniences to all parties.
- B The roof shielding blocks for the northern portion of the Ring (See Drawing C-1) are scheduled to be set in place (by others) after the shelter is erected with siding, roofing, and doors installed, but before the anticipated completion date of this Subcontract.

1.5 DISPOSAL OF WASTE MATERIAL AND EQUIPMENT

Waste material such as lumber, building materials, asphalt paving, concrete, and other debris shall be disposed of by the Subcontractor off the SLAC site.

1.6 UTILITIES

- A Domestic water is available near the work area (WSW of old Building 101) at no cost to the Subcontractor.
- B 120/208 Volt construction power is available near the work area (H-frame NNW of old Building 101) at no cost to the Subcontractor.

1.7 UTILITY OUTAGES

All required utility outages, including power, water, fire protection, sanitary sewer, air, etc., shall be scheduled 72 hours in advance with the University Representative. Certain electrical outages may require additional notice, and shall be scheduled and coordinated through the University Representative.

1.8 SAFETY REQUIREMENTS

A Flagmen, signs, barricades, fences, lights and similar precautions are the responsibility of and shall be provided by the Subcontractor to assure public safety and properly guard against personal injury or property damage.

B Mobile crane safety shall be in accordance with applicable sections of OSHA Construction Safety & Health Regulations, Part 1926, particularly, section 1926.550. However, the following is a list of certain aspects of the safety procedure that are highlighted. This list is to be used as a check before a mobile crane is placed in service. A copy shall be placed in the cab in full view of the operator.

1. The mobile crane operator must be qualified and demonstrate, to the satisfaction of his supervisor, his ability to safely operate the model of equipment which he is asked to operate.
2. The equipment is to be inspected daily and it shall be determined by the operator that it is safe to operate. Any irregularities found that could adversely affect its safe operation shall be reported to his supervisor and corrected prior to placing it in service.
3. The mobile crane boom angle indicating device shall be operable, properly calibrated and visible to the operator at all times.
4. The mobile crane's boom extension length must be known to the operator or physically measured by him, before the pick is made.
5. The weight of the mobile crane's pick must be accurately known by the operator before the pick is made.
6. The weight vs. reach chart shall be clearly written and shall be posted in the operator's cab, in clear view of the operator.

7. The mobile crane shall never be operated in a manner in which an outrigger (or if on rubber, a wheel) lifts or is about to lift off the ground.
8. The supervisor cannot overrule the mobile crane operator on an unsafe pick refusal. The Subcontractor shall require the operator to demonstrate to his supervisor why he considers the pick unsafe.
9. If the equipment is operated with disregard for any of the above, the Subcontractor shall immediately stop the unsafe operation. Thereafter, operation shall not be permitted to resume until the University's contract administrator is satisfied that the unsafe practice has been corrected.

C In addition, see GENERAL CONDITIONS, Safety & Health.

1.9 JOB OFFICE AND YARD

- A The Subcontractor shall provide a construction job office on site for his use. The office shall be weatherproof and furnished complete with telephone service paid for by the Subcontractor.
- B In addition, a standard desk and chair, complete with telephone, shall be provided for the exclusive use of the University Representatives.
- C A complete set of contract documents and shop drawings shall be maintained at the job office by the Subcontractor at all times.
- D Staging and parking area for the Subcontractor's use is shown on Drawing C-1. Subcontractor shall limit such activities to this area. Area shall be returned to its original condition upon completion of work.

1.10 TOILET FACILITIES

The Subcontractor shall provide and maintain chemical toilet(s) at the construction site in accordance with OSHA requirements.

1.11 PROTECTION OF EXISTING FACILITIES

- A Existing facilities, including materials, surfaces, paving, equipment, pipes, conduits and appurtenances not specified for disposal, which are damaged by any operations under this Subcontract, shall be replaced or repaired, neatly patched and refinished, all as may be necessary to restore the work to the original condition and to leave the work in a thoroughly complete, operable and finished condition.
- B All damage to existing buildings or equipment, as a result of the Subcontractor's activities, shall be repaired to the satisfaction of the University at the Subcontractor's expense.
- C Work and materials shall be protected against damage due to construction operations, weather, or other hazards. The Subcontractor shall provide suitable covering of all exposed trenches, excavations and equipment to protect the work from damage.
- D All areas used by the Subcontractor shall be restored to their original condition and the area left in a clean condition. All roads shall be kept clear of haul material and other debris.
- E Storm drains are to be used for clean water only.

1.12 MATERIALS ACCESS AND DELIVERY

- A Access to the work site for delivery of material and equipment shall be through the main entrance located at 2575 Sand Hill Road east of the intersection with Interstate Highway 280, and through Gate 17, and shall be arranged in advance with the University Representative.
- B Delivery of materials or equipment to the work site will be permitted during normal working hours, 7:30 AM to 4:30 PM, Monday through Friday, and at other times when authorized in advance by the University.
- C No material deliveries will be accepted by the University on behalf of Subcontractors. All deliveries shall be properly labeled or identified as follows:
--- (Subcontractor) ---
c/o SLAC Jobsite Office, near SSRL Building 120
2575 Sand Hill Road
Menlo Park, CA. 94025

1.13 DOSIMETER BADGES

Dosimeter badges that measure exposure to ionizing radiation will be issued by the University to the Subcontractor for all personnel working in the construction area. Although no personal radiation exposure above natural background radiation is anticipated, the badges are required for compliance with Department of Energy regulations and for site security. These badges will be issued to the Subcontractor's personnel at the Sector 17 Gate by the guard on duty. Radiation dosimeters are to be carried at all times while inside the Research Areas. Persons entering the area will be required to show their badge to the guard at the gate house. Subcontractor is responsible for maintaining a current list of badgeholders. A copy of the list shall be submitted to the University Representative whenever a change is made. The Subcontractor is responsible for insuring that all dosimeters are returned to the University upon completion of the work and prior to final payment.

1.14 VISIT TO CONSTRUCTION SITE

All prospective bidders should plan to visit the construction site prior to submission of bids to inspect the site for location, existing conditions, and accessibility of work to be accomplished. See Invitation for Bids for further information regarding a bidders conference. See General Conditions, "Site Investigation and Representations".

1.15 AS-BUILT DRAWINGS

At the beginning of the work, the University will furnish to the Subcontractor one set of prints for recording as-built conditions. As the work progresses, the Subcontractor shall record on these prints in red pencil the actual locations of all items where there is a variance with the drawings. Approval must be received from the University before any item is relocated. Upon the completion of the work, the Subcontractor shall forward these prints to the University.

1.16 FIELD SURVEYS

The Subcontractor shall furnish all construction surveys required for correct location and installation of all work, using control points furnished by the University as shown on the drawings.

1.17 SHOP DRAWINGS AND SUBMITTALS

Shop drawings and submittals shall be submitted to the University for review as required by the various sections of this specification and shall conform to the requirements of General Conditions. Submittals are required for specified items, as well as "or equal" items proposed by the Subcontractor.

1.18 MATERIALS AND SUBSTITUTIONS

- A In any section of these specifications or drawings where reference is made to any article, device, product, material, fixture, form or type of construction by name, make or catalog number, such reference shall be interpreted as establishing a standard of quality and not as limiting competition. An approved equal may be accepted whether specifically stated or not. If substitutions are offered, the list shall be accompanied by drawings and other data, giving adequate information to enable the University to determine the quality of the suggested materials to those specified, without recourse to other information.
- B This implies no right of the Subcontractor to use other materials or methods unless approved in writing by the University. The decision of the University shall govern as to what material is equivalent to that named, but the burden of proof shall be upon the Subcontractor.

1.19 TESTING, INSPECTION, AND APPROVALS

Except as otherwise specified herein, testing, inspection, approvals, and other actions by the University, other than changes issued in writing by the Contract Administrator, do not relieve the Subcontractor of any Subcontract requirement or otherwise change the Subcontract. Any approval of the work or of substitutions is based on representations made by the Subcontractor. The Subcontractor remains responsible for costs of correction of any work that is not in conformance with the Subcontract requirements, regardless of any testing, inspection, or approvals performed by the University. The Subcontractor expressly agrees that testing, inspection, and approvals performed by the University are for the benefit of the University and are not for the benefit of the Subcontractor; that any reliance by the Subcontractor on any such testing, inspection, and approvals is at the Subcontractor's risk; that the performance by the Subcontractor of work not in conformance with contract requirements constitutes a material cause of any resulting costs of correction, and that any unintentional failure on

the part of the University to discover or notify the Subcontractor of a deficiency constitutes an immaterial cause of any resulting costs of correction.

1.20 HISTORICAL AND SCIENTIFIC SPECIMENS

All articles of historical or scientific value, including but not limited to fossils and archaeological artifacts which may be uncovered by the Subcontractor during the progress of the work, shall become the property of the University. Such findings shall be reported immediately to the University Representative who will determine the method of removal, where necessary, and the final disposition thereof.

1.21 DRAWINGS AND WORKMANSHIP

The drawings are diagrammatic and indicate the general arrangement of the work. Drawings shall not be scaled for dimensions. All dimensions shall be verified in the field. Only quality workmanship will be accepted. Haphazard or poor construction practice will be cause for rejection of the work by the University.

1.22 DRAWING LIST

All work covered by this specification shall be in strict accordance with the following subcontract drawings:

<u>Number</u>	<u>Sheet</u>	<u>Title</u>
ID-586-140-01-C0	C-1	SSRL Shelter No. 140 SPEAR Injector Equipment Shelter Civil Site Plan
ID-586-140-10-C0	A-1	SSRL Shelter No. 140 SPEAR Injector Equipment Shelter Architectural Floor Plan
ID-586-140-11-C0	A-2	SSRL Shelter No. 140 SPEAR Injector Equipment Shelter Architectural Building Elevations

<u>Number</u>	<u>Sheet</u>	<u>Title</u>
ID-586-140-12-CO	A-3	SSRL Shelter No. 140 SPEAR Injector Equipment Shelter Architectural Building Sections
ID-586-140-41-CO	M-1	SSRL Shelter No. 140 SPEAR Injector Equipment Shelter Mechanical - Fire Protections Site Plan, Sections & Details
ID-586-140-42-CO	M-2	SSRL Shelter No. 140 SPEAR Injector Equipment Shelter Mechanical - Fire Protection Floor Plan, Sections & Details
ID-586-140-61-CO	M-3	SSRL Shelter No. 140 SPEAR Injector Equipment Shelter Mechanical - Ventilation Plan, Sections & Details
ID-586-140-70-CO	E-1	SSRL Shelter No. 140 SPEAR Injector Equipment Shelter Electrical - Plan, Single Line & Wiring Diagrams
ID-586-140-71-CO	E-2	SSRL Shelter No. 140 SPEAR Injector Equipment Shelter Electrical - Plan, Lighting, Power & Fire Alarm

DIVISION 5

METALSSECTION 05100 -- STRUCTURAL STEELPART I -- GENERAL5.1 SCOPE

This section covers minimum requirements for the fabrication and erection of structural steel including framing for doors and windows for a pre-engineered type building.

5.2 RELATED WORK SPECIFIED ELSEWHERE

- A Section 05500: Miscellaneous Metals.
- B Section 07400: Metal Siding, Roofing, Insulation & Trim.
- C Section 09900: Paint and Stain.

5.3 SHOP DRAWINGS AND CALCULATIONS

Submit fully detailed shop drawings and design calculations for structural steel framing, giving sizes, details of fabrication and construction, methods of assembly, and location of anchors, to the University for review. Drawings and calculations shall be approved and stamped by a registered civil or structural engineer. No work shall be fabricated or installed until the shop drawings have been reviewed and returned "approved" or "approved as corrected" to the Subcontractor.

5.4 GENERAL DESCRIPTION

The structure shall be of rigid frame clearspan construction, with dimensions as shown on the drawings. Design is based on building provided by American Buildings Company. Subcontractor may submit alternate manufacturer for approval, provided it meets all requirements of these specifications and dimensions as shown on the drawings. Clearances for overhead crane, 12' X 18' double door, etc., must be maintained.

5.5 APPLICABLE DOCUMENTS

Except as modified by the requirements specified herein and/or the details on the drawings, all work included in this section shall conform to the applicable provisions of the following codes and standards (latest edition):

1. American Institute of Steel Construction (AISC):
"Manual of Steel Construction," 8th Edition, including "Specification for the Design, Fabrication and Erection of Structural Steel for Buildings (11/1/78)".
2. American Iron & Steel Institute (AISI) Standards:
Specifications for the Design of Light Gage Cold-Formed Steel Structural Members.
3. American Welding Society (AWS):
"Code for Arc and Gas Welding in Building Construction," AWS Standard D1.0.
"Structural Welding Code," AWS Standard A5.1.
4. American Society for Testing and Materials (ASTM):
ASTM A325 - Standard Specifications for High-Strength Bolts for Structural Steel Joints.
ASTM A36 - Structural Steel.
ASTM A307 - Low-Carbon Steel Externally and Internally Threaded Standard Fasteners.
5. Metal Building Manufacturers Association:
"Recommended Design Practices Manual".
6. Uniform Building Code, 1985 Edition (UBC):
Structure shall be designed in accordance with the UBC with the following specific requirements:
 - a. Roof Load: ADDITIONAL 5 psf dead load above normal building roof dead load to account for piping, light fixtures, and cable trays; UBC Table No. 23-C for minimum roof live loads.

- b. Wind Loads: UBC Sect. 2311 using minimum wind stagnation pressure (q_s) of 15 psf.
- c. Seismic Loads: UBC Sect. 2312 with twice the minimum lateral base shear force (for Zone 4), given by the following formula in order to account for the proximity of the site to the San Andreas Fault:

$$V = ZIKCSW \times 2$$
- d. Crane Loads: Building frame shall be designed for a five (5) ton capacity pendant operated monorail crane. Design of building frame, accounting for future crane loads, is the responsibility of the Subcontractor.

UBC Table No. 23-B, Category No. 8 using 1.10 (10%) impact factor for pendant operated crane.

Crane data: maximum crane live load - 10,000 lb.
 maximum trolley weight - 2,000 lb.
 maximum crane rail weight - 100 PLF

5.6 FIELD MEASUREMENTS AND TEMPLATES

Subcontractor shall secure all field measurements required for proper and adequate fabrication and installation of the work. Exact measurements are the Subcontractor's responsibility. Subcontractor shall furnish any setting instructions required for all installation work.

PART II -- PRODUCTS

5.7 GENERAL

All materials shall be new and of the best commercial quality. Stock items shall be well manufactured by concerns specializing in the particular articles and subject to approval by the University. Material specifications shall be submitted to the University for approval prior to installation.

5.8 STEEL

1. All structural or built-up sections shall comply with the applicable requirements of AISC Standards. Standard structural sections shall conform to ASTM A36; built-up sections shall be 50 ksi (yield) steel minimum.

2. All light gage steel structural members shall comply with the AISI Specifications for the Design of Light Gage Cold-Formed Steel Structural Members of the "C" or "Z" shapes.

5.9 ANCHORS, BOLTS, AND FASTENINGS: ASTM A325

1. Machine bolts and nuts, other than those with self-locking screw threads, shall be the American National coarse-thread series. Self-locking threads shall be the manufacturer's approved standard types. Nuts of the self-locking type may be used in lieu of upsetting the bolt threads as hereinafter specified. Bolts and nuts shall be the regular hex head types.
2. Washers: Round washers shall conform to American Standard B27.2, Type B. Hardened washers shall be placed under all bolts and nuts bearing on steel and at other locations shown on drawings. Beveled washers shall be square, smooth and sloped so that contact surfaces of bolt head and nut are parallel. The diameter of the hole of square-beveled washers shall be 1/16" greater than the bolt size for bolts not larger than 1", and 1/8" greater than the bolt size for bolts larger than 1".

5.10 ELECTRODES

All arc-welding electrodes shall conform to AWS A5.1 for Steel Arc-Welding Electrodes. Electrodes shall be as recommended by their manufacturers for the positions and other conditions of actual use.

PART III -- EXECUTION5.11 INSPECTION AND TESTS

Materials are subject to inspection and tests in the mill, shop, and field, and will be conducted by a qualified person or testing laboratory paid by the University. Such inspection and tests, however, shall not relieve the Subcontractor of responsibility for furnishing satisfactory materials. The right is reserved to reject any material at any time before final acceptance, if the University finds material and/or workmanship that do not conform to specification requirements. Acceptance of any materials shall not prevent its rejection later if defects are discovered. Subcontractor shall remove and replace any installed materials which are rejected by the University at no additional cost to the University, and to the satisfaction of the University.

5.12 STORAGE OF MATERIALS

Steel materials, either plain or fabricated, shall be stored above the ground upon platforms, pallets, skids, or other supports. Materials shall be kept free from dirt, grease, and other foreign matter, and shall be protected from corrosion.

5.13 GENERAL REQUIREMENTS

- A All details shown are typical. Similar details apply to similar conditions.
- B Structural drawings shall be checked with the architectural drawings for dimensions, elevations, size, and locations of all installations. All dimensions shall be verified at the job site.
- C Built-in items shall be supplied in ample time for incorporation in the work.
- D Bearing plates and anchors: For items bearing on concrete, provide steel-bearing plates and anchors as indicated.
- E Shelter columns with base plates shall be anchored to the concrete foundations, which (foundations) are provided by others

prior to the erection of the shelter, using heavy-duty expansion anchors as called-out on the plans.

5.14 WELDED CONNECTIONS

- A Welded connections shall be in strict accordance with the most recent "Code for Arc and Gas Welding in Building Construction" and "Structural Welding Code" of the American Welding Society. All welding shall be done in the shop as far as practicable.
- B Fillet and butt welds shall be made with such a number of passes or beads as may be necessary to secure sound and thoroughly fused joints, but each deposit shall not exceed 1/8" of weld for each bead or pass. Preceding layers shall be thoroughly cleaned and wire-brushed to remove all scale and slag before succeeding layers are placed.
- C All welds exposed in the finished work shall be ground and dressed smooth.

5.15 BOLTED CONNECTIONS

Use hardened washers under high-strength (A325) bolt heads and nuts to give full grip when turned tight. Use beveled washers where bolts bear on sloping surfaces. Installation and bolt tightening procedures shall conform to AISC Specifications for Structural Joints Using ASTM A325 or A490 Bolts, using A325 bolts. Non-structural connections (girts, purlins) may be made using A307 bolts and regular washers under bolt heads and nuts.

5.16 HOLES IN STRUCTURAL MEMBERS

Wherever noted on the drawings or where directed, Subcontractor shall provide holes in structural members for the support of other materials, for the passage of pipes or for other reasons that may be necessary to the construction. Structural members shall not have holes unless so detailed or approved by the University.

5.17 PROVISIONS FOR OTHER WORK

Work under this Section includes any required cutting, punching, drilling, tapping, and welding for attachment of other work coming in contact with structural steel work where so indicated and/or required for the proper subsequent installation of other work, or where directions for the same are given prior to or with the approval of the Shop drawings. Include furnishing of templates for accurate location of items to be set under other sections.

5.18 FABRICATION

- A All steel work shall conform with the applicable requirements of the previously referenced "Codes and Standards." Workmanship shall be to the best standard practices of the trades and shall be done by mechanics skilled in the type of work required.
- B Steel members shall be pre-fabricated and pre-assembled in the factory or shop as far as practicable. Welds shall be expertly made and shall be ground and dressed smooth.

5.19 INSTALLATION

- A All anchors, bolts and washers, inserts, lag screws, etc., as required for the erection, installation and completion of the work shall be provided.
- B Installation shall be in strict accordance with approved drawings, true and horizontal or perpendicular as the case may be, level and square with angles and edges parallel with related lines of the building.
- C Shop-fabricated items, which might otherwise be subject to damage, shall be braced and carefully handled to prevent distortions or other damage.
- D All clips, seats, bolts, and other auxiliary devices required for the field erection of the pre-assembled units shall be removed after erection, and all holes shall be plug-welded and ground and dressed smooth as required to leave the structure in the finished form shown on the drawings.

- E Field welding shall conform to the requirements for shop fabrication.
- F Enlargement of holes or other cutting shall be made only upon approval of the University Representative. All burned holes shall be burned 1/4" undersize and finished to size by reaming.

5.20 CLEANING AND PAINTING

All steel materials furnished under this section shall be thoroughly cleaned of rust, mill scale, grease, and any other contaminant. All surfaces shall be cleaned per Steel Structures Painting Council. Immediately after cleaning, paint with one shop coat of rust-inhibitive primer as specified in Section 09900. After installation of steel, welds and damaged areas of the shop coat shall be touched up in the field with the same primer. Steel shall be clean and free of dirt, grease, and other foreign material after installation.

DIVISION 5

METALSSECTION 05500 -- MISCELLANEOUS METALSPART I -- GENERAL5.1 SCOPE

All miscellaneous metals necessary for a complete job, unless specifically noted otherwise in the specifications, shall be furnished and installed under this Section, including but not necessarily limited to the following:

1. Clip angles, anchors, bolts, plates, etc.
2. Pipe sleeves
3. Steel channel and angle frames
4. Steel plate
5. Structural shapes not included in Structural Steel Section, but shown on architectural drawings and/or required by job conditions
6. Angle thresholds, curb angles, plate-thresholds and similar items

5.2 RELATED WORK SPECIFIED ELSEWHERE

- A Section 05100: Structural Steel
- B Section 7400: Metal Siding, Roofing, Insulation,
& Trim

C Section 09900: Paint and Stain

5.3 SHOP DRAWINGS

A Shop drawings are required for all miscellaneous metals.

B Comply with DIVISION 1, General Requirements.

C All items shall be sized and detailed to fully develop the strength of the members involved.

PART II -- PRODUCTS

5.4 QUALITY ASSURANCE

A The following specifications shall be considered as extensions of these specifications in the determination of quality standards for material and workmanship.

- | | |
|---------------------------|-----------------------------------|
| 1. Galvanizing | ASTM A-123, zinc (hot galvanized) |
| 2. Steel Shapes and Plate | ASTM A-36 |
| 3. Misc. Bars & Flats | Mild Steel ASTM A-283 Grade D |
| 4. Welding | AWS |
| 5. Steel Tube | ASTM A-500 Grade B |

B Conform to requirements of the "Surface Preparation Specifications" of the Steel Structures Painting Council.

5.5 PAINTING

All exposed interior ferrous metals shall be shop painted using Tnemec 10-99 Primer (or approved equal) in accordance with the requirements of Section 09900, unless specifically specified otherwise herein. Coating shall not be closer than 4" to areas to be welded. These areas shall be coated after completion of welding. All damage to shop coat shall be touched up in the field with the same primer after installation. Exterior ferrous metals shall be painted in accordance with the requirements of Section 09900.

PART III -- EXECUTION5.6 WORKMANSHIP FOR STEEL - GENERAL

In addition to the requirements contained in the referenced specifications, comply with the following:

1. All work shall strictly conform to the approved shop drawings. Standard commercial products conforming to the requirements of the drawings and specifications may be subject to the approval of the University Representative; however, shop drawings are still required.
2. Bolting shall be done with proper sized bolts; nuts shall be drawn tight and end thread upset. Bolts and lags shall be standard size and proper washers shall be provided where necessary.
3. Screws shall be countersunk oval heads unless otherwise noted.
4. All welding exposed to the weather shall be continuous and watertight. Welding shall be done only by certified welding mechanics, and done to AWS Specification Standards. Where exposed to view or where people may come in contact with them, welds shall be ground smooth.
5. No welding or burning of galvanized surfaces will be permitted until the galvanizing has been removed to a distance of 4" all around by an approved method. Galvanized areas burnt off by welding or otherwise damaged during construction shall be treated with Galvalloy as manufactured by Metalloy Products Co.
6. Interior ferrous metals so indicated shall be galvanized. Fabricate into largest practical components before galvanizing.
7. Execute work in best possible manner using skilled metal workers only. Do only such work at site as cannot be performed reasonably at the shop. Cuts, bends, punching and drilling must be accurate, neat and properly located.
8. Furnish all necessary templates and patterns required by all trades. Supervise and be responsible for the proper location and installation of all miscellaneous metals furnished. Members shall be punched, drilled, etc., as required to accommodate the work of all trades, but shall be done in such a manner as not to render the strength of the members inadequate for their intended use.

9. Install all items specified herein, unless otherwise noted, true to line and plane, plumb, square and accurately fitted.

DIVISION 7

THERMAL AND MOISTURE PROTECTIONSECTION 07400 -- METAL SIDING, ROOFING, INSULATION AND TRIMPART I -- GENERAL7.1 SCOPE OF WORK

Provide all labor, materials and equipment to furnish and install all metal siding, roofing, insulation and wainscot complete, including but not necessarily limited to the following:

1. All exterior steel wall and roof panels, including accessories, clips, trim, closures and flashing.
2. Roof and wall insulation.
3. Caulking of panels where required.
4. Gutters and downspouts.

7.2 PRODUCT STORAGE AND HANDLING

1. Store panels above ground and cover to keep dry.
2. Handle panels carefully to prevent damage.

7.3 RELATED WORK SPECIFIED ELSEWHERE

- A Section 05100 - Structural Steel
- B Section 05500 - Miscellaneous Metals
- C Section 07600 - Flashing and Sheet Metal
- D Section 08100 - Hollow Metal Doors and Frames

7.4 SHOP DRAWINGS

Prepare shop and erection drawings based on the Subcontract documents clearly showing each piece to be erected in accordance with DIVISION 1, General Requirements. Submit to University for review.

PART II -- PRODUCTS7.5 MATERIALS

1. Metal roof decking shall be American Buildings Long Span Roof Panels or approved equal, not less than 24 gauge. Panels shall be galvanized to ASTM A-525 (G-90). Finish shall be factory-applied American Buildings "Light Stone" or equal, with color on exterior side only. Panels shall be full length to eliminate any unnecessary joints.
2. Metal siding shall be American Buildings Long Span Panel, or approved equal, not less than 24 gauge. Panels shall be galvanized to ASTM A-525 (G-90). Finish shall be factory-applied American Buildings "Light Stone" or equal, with color on exterior side only.
3. Wall and roof insulation shall be 2" thick and 3" thick, respectively, vinyl (white) faced flexible type for pre-engineered buildings and shall have a U.L. flame spread rating of 25 or less and smoke development rating of 50 or less and shall be Owens-Corning Fiberglas or other University approved equal.
4. Caulking shall be butyl type or other suitable compound recommended for the specific application.
5. Closures shall be preformed composition to match roof and wall panels, minimum 26 gauge galvanized steel, to insure complete weathertightness.
6. Flashing shall be minimum 26 gauge galvanized or as otherwise noted on the drawings.

7. Gutters and downspouts shall be factory finished to match roof and wall panels, manufacturer's standard, 24 gauge minimum.
8. Metal drips of 24 gauge galvanized steel shall be provided overhead of all exterior door openings.

PART III -- EXECUTION

7.6 ERECTION

Panels shall be erected using colored hex or round head cadmium plated self-tapping or drilling screws (TEKS or equal) with steel-backed neoprene washers under the head, and then caulked.

1. Laps occurring over purlins for roofs shall be 6" minimum. Joints shall be mechanically tight and caulked prior to panel installation. Side laps shall be as specified by manufacturer but shall not be less than one full rib, then caulked.
2. Fasteners shall be applied directly through field drilled holes in the sheets and the supporting structural member to insure perfectly matched holes and shall be installed between the supporting members. Spacing shall be as required by manufacturer but shall not exceed 24" on center.
3. Wall and roof panels shall be made rodent proof and weather proof by means of preformed composition closures and caulking of joints as required.
4. Provision shall be made between base angle of building and foundation slab to prevent weather and water incursion by using neoprene closure, mastic seal or another approved means.
5. Roof and wall insulation shall be installed between covering steel and structural members and stretched tight. Joints shall be secured as recommended by the manufacturer.
6. Gutters and downspouts shall be securely fastened, flashed, and caulked.
7. Touch-up any damaged areas of roof panels, wall panels, plus gutters and downspouts, with same paint as factory applied finish.

DIVISION 7

THERMAL AND MOISTURE PROTECTION

SECTION 07600 -- FLASHING AND SHEET METAL

PART I -- GENERAL

7.1 DESCRIPTION

Work Included: Provide flashing and sheet metal not specifically described in other sections of these Specifications but required to prevent penetration of water through the exterior shell of the building.

7.2 RELATED WORK SPECIFIED ELSEWHERE

- A Section 05500 - Miscellaneous Metals
- B Section 07900 - Sealants and Caulking

7.3 QUALITY ASSURANCE

All work shall conform to "Suggested Specifications for Architectural Sheet Metal Work" manual published by the Sheet Metal and Air Conditioning Contractor's National Association, as a minimum standard and to normal good practice in the area, except where in conflict with these specifications, which shall govern.