Indian Valley Campus Pool/Shower Roofing

College of Marin, Novato, CA

Addendum No. 1,  
5/19/014

ROOF PLAN & DRAWINGS:

Item #1 Delete ROOF PLAN and 2 detail pages.

Item #2 ROOF PLAN and 1 detail page. Attachment 1.

Specifications:

Item #3 Delete Part 1 (page 70) - Part 9 (Page 100)

Item #4 Add Attachment 2 – Technical Specifications
1. Part 1 – Section 06100 Rough Carpentry
2. Part 2 – Section 07220 Roof Deck and Insulation
3. Part 3 – Section 07311 Asphalt Shingle Roofing
4. Part 4 – Section 07410 Metal Roof Panels
5. Part 5 – Section 07550 Modified Bitumen Roofing
6. Part 6 – Section 07600 Sheet Metal and Flashing

Item #5 Bid Proposal Form Add additional contingency of $5,000.00 for unforeseen existing/original roof weather damage, replace 4" X 8' 3/8 plywood, 8' length of 2"x6" T&G (Plunge cut out old material and install new DF, straight planks)

Questions:

#1 Pool hours of use?
Answer: Monday – Saturday 7 am to 9 pm.
#2. Does the work area need to be separated from pool area?
Answer: Yes. People will be on the pool deck in bare feet. Construction debris to be monitored at all times and removed from pedestrian accessible areas immediately.

#3 Will the boiler flue height remain the same after new roof is installed?
Answer: No. Flues (2) with PVC coming through them to be removed under this contract. PVC will be shortened by District’s original installer. Deck to be infilled under this contract. Current hole diameter in deck is approximately 18” in diameter. Add blocking and ½” plywood.

#4 Contract duration?
Answer: 60 days.

#5 Are the acrylic windows to be resealed?
Answer: Yes. Remove existing sealant and apply new polyurethane sealant. Minimum 3/4” thick bead at wood/acrylic junction.

#6 Gutter dimensions to remain the same?
Answer: match existing dimensions and profile.

#7 Fascia below window to remain?
Answer: Remove existing fascia, install waterproof membrane and reinstall fascia. Apply sealant to all new nail holes.

#8 Vandal proof vent caps to remain?
Answer: Yes.

#9 Can handicap spaces be used?
Answer: No.

#10 What is existing roof assembly?
Answer: From previous tear offs we have seen:
T&G wood deck
Building paper slip sheet
3/8” plywood deck.
2.5” wood fiber
Aluminum foil radiant barrier
1”x4” wood battens
Asbestos felt
Wood shakes

#11 Is there conduit under roofs?
Answer: Assume there is conduit and junction boxes buried in the insulation. Electrical plan from project attached. Contractor will be responsible for working around existing insulation. Attachment: 3

#12 Engineering estimate for project is between $250,000.00 - $275,000.00
To be completed by bidder and submitted with bid.

ITEM 5

Governing Board
Marin Community College District

Dear Members of the Governing Board:

The undersigned, doing business under the name of ________________________________
_______________________________________________, having carefully examined the location of the proposed work, the local conditions of the place where the work is to be done, the Notice Inviting Bids, the General Conditions, the Instructions to Bidders, the Plans and Specifications, and all other Contract Documents for the proposed Indian Valley Campus Pool/Shower Roofing Project #14-0430, ("Project"), and having accurately completed the Bidder’s Questionnaire, proposes to perform all work and activities in accordance with the Contract Documents, including all of its component parts, and to furnish all required labor, materials, equipment, transportation and services required for the construction of the Project in strict conformity with the Contract Documents, including the Plans and Specifications as follows:

BASE BID TO INCLUDE $5,000.00 ALLOWANCE.

BASE BID:
For the sum of: ________________________________________________________________________

__________________________________________________________________________________

Dollars ( $ ________________________ )

Alternate #1 METAL ROOF

Add/Subtract ________________________________ Dollars ($ ________________________ )

ADDITIVE/DEDUCTIVE ALTERNATE [If applicable]:

Additive/Deductive Alternate #2 REPLACE 4"x 8' 3/8" plywood __________________________

Add/Subtract ________________________________ Dollars ($ ________________________ )

Additive/Deductive Alternate #3 8' length of 2"x6" T&G (Plunge cut out old material and install new DF, straight planks) __________________________________________.

Add/Subtract ________________________________ Dollars ($ ________________________ )

The undersigned has checked carefully all the above figures and understands that the District is not responsible for any errors or omissions on the part of the undersigned in making this bid.

Enclosed find certified or cashier’s check No._________________________ of the ________________________________ Bank for ________________________________ Dollars ($__________________) or Bidder’s Bond of the ________________________________ surety company in an amount of not less than ten percent (10%) of the entire bid. The undersigned further agrees, on the acceptance of this proposal, to execute the Contract and provide the required bonds and insurance, and that in case of default in executing these documents within the time fixed by the Contract Documents, the proceeds of the check or bond, accompanying this bid, shall be forfeited and shall become the property of the District.

Contractor agrees to commence the work within the time specified in the Notice to Proceed. It is understood that this bid is based upon completing the work within the number of calendar days specified in the Contract Documents.
**Bid Questions and Clarification:** Marin Community College District
**Proposal** Indian Valley Campus Pool/Shower Roofing Project #14-0430  Proposals due 3:00 p.m. Tuesday, May 27, 2014. **Acknowledge receipt of these bid clarifications below and attach and return with bid.**

Name of Company:

______________________________________________________________

Signature of Individual authorized to sign for company:

Name Printed: __________________________________________________

Date: ____________________________________________________________

END
PART 1 - GENERAL

1.01 SUMMARY
A. This section specifies rough carpentry, including all framing, sheathing, and underlayment.

1.02 RELATED SECTIONS
A. NA

1.03 QUALITY ASSURANCE
A. Furnish materials complying with the following:
      a. Graded in accordance with the latest edition of "Standard Grading Rules No. 17," WCLIB, or "Western Grading Rules," WWPA. Lumber grades specified below are taken from " Standard Grading Rules, No. 17." Equal grades from "Western Grading Rules" are acceptable. Furnish lumber bearing a recognized grading bureau mark or a "Certificate of Grade" may be substituted. Where a grade for Douglas Fir (DF) species is indicated, other species, if approved by the COR, may be supplied on an equal stress grade basis.
   2. Pressure Treatment.
      a. Waterborne, conforming to AWPA C2, AWPA P5.
   3. Plywood.
      a. Graded in accordance with APA PS 1-95. Furnish panels identifiable by a grade trademark of a recognized grading association. Index numbers listed (i.e. 24/0) may be larger but not smaller than shown.
   4. All materials and construction techniques shall meet applicable Local codes or the requirements herein, whichever is stricter.
PART 2 - PRODUCTS

2.01 MATERIALS

A. Lumber.
   1. Furnish S4S lumber, unless otherwise shown on drawings. Furnish lumber with a moisture content of 19 percent or less for material 3 inches and less in nominal thickness, unless otherwise specified.

B. Felt.
   1. Install pressure treated wood in contact with concrete.

C. Framing Members.
   1. Beams.
      a. 4 inches and less in width: No.2, DF, S-dry.
      b. 5 inches and wider: No. 1 DF.
   2. Joists and Stair Stringers.
      a. No. 2, DF, S-dry.
   3. Rafters.
      a. No. 2, DF, S-dry.
   4. Studs & Plates (2 x 4 and smaller): Stud or standard grade, DF, Larch, Hemlock, S-dry.
   5. Headers.
      b. Studs and Plates (2 x 6 and larger): No. 2, DF, Larch, Hemlock, S-dry.
      c. Blocking.
         1) Standard grade, DF, Larch, Hemlock, S-dry.
      a. No. 1, DF.
D. Subfloor.
   1. 1/2 inch CDX plywood 32/16.
   2. 2 x 6 T&G decking, Commercial Dex., DF, S-dry.

E. Exterior Sheathing.
   1. Roof Sheathing.
      a. (Wood shingles) 1 x 4 standard, DF; (exposed surfaces and soffits), 1 x 6, T&G, "B" finish, Kiln Dried (KD), Western Red Cedar (WRC).
      b. (Concealed Surfaces) 5/8 inch CDX ext. plywood, 24/0; (Exposed surface) 1/2 inch C-C ext., plywood 24/0.
      c. (Concealed Surfaces) 3/4 inch C-C ext. plywood, 30/12; (exposed surfaces and soffits) 1 x 6, T&G, "B" finish, KD, WRC.
      d. 2 x 6, T&G, decking, Commercial Dex., DF, S-dry.
   2. Wall Sheathing.
      a. 1/2 inch CDX, plywood 24/0.

F. Underlayment.
   1. Plywood.
      a. 1/2 inch underlayment C-C plugged exterior plywood.

PART 3 - EXECUTION

3.01 CONSTRUCTION
   A. Framing.
      1. Make joints in beam and girders over supports unless shown otherwise on the drawings.
      2. Nail built-up girders from both sides with 16d nails at 30 inches on center staggered in 2 rows. Provide 2 nails at each end of each piece and each splice.
      3. Set sills level and anchored on the foundation. Set in a full bed of Portland Cement mortar, if necessary to obtain full bearing. Provide flat washers on all anchor bolts.
4. Set joist with crown side up. Install solid blocking over supports. Provide a minimum of 1-1/2 inch bearing for each joists. Nail with two 16d nails at each bearing. Double joists under parallel partitions and at all openings.

5. Toenail rim joists to sill with 8d nails 16 on center.

6. Lap joists over girders 4 inches minimum. Nail with three 16d nails from each side.

7. Notching of joist will be allowed in the end 1/3 of the span only. Limit notching to 1/6 of the joist depth.

8. Set rafters with crown edge up. Cut birds-moutths to provide full bearing. Nail rafters to top plate with two 8d nails and to ceiling joists with three 16d or five 10d nails.

9. Fabricate trusses as shown on the drawings. Nail to top plate with four 10d nails. Install framing anchors where shown on the drawings.

10. Provide continuous length studs. Nail studs to top plate with four 8d toenails or two 16d end nails.

11. Install full length cripples at all openings. Nail cripples to studs with 16d nails at 24 inch on center. Toenail cripple to header with two 8d nails.

12. Provide headers, over opening, of a size indicated below:

<table>
<thead>
<tr>
<th>Maximum Span</th>
<th>Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>3'-6&quot;</td>
<td>2x6's</td>
</tr>
<tr>
<td>5'-0&quot;</td>
<td>2x8's</td>
</tr>
<tr>
<td>6'-6&quot;</td>
<td>2x10's</td>
</tr>
<tr>
<td>8'-0&quot;</td>
<td>2x12's</td>
</tr>
</tbody>
</table>

13. Space header material with plywood or surfaced lumber to equal the stud depth.

14. End nail studs to header with three 16d nails.

15. Do not splice columns. Cut ends square to provide full bearing. Nail columns top and bottom with four 16d toenails, or as shown on drawings.
B. Subfloor.

1. Lay plywood subfloor with face grain at right angles to supports.

2. Space panel ends and edges 1/32 inch. Stagger end joints. Nail with 8d nails 6 inch on center at edges, and 10 inch on center intermediate supports.

3. Install 2 inch T&G subfloor at right angles to the supports. Make joints over supports, unless end matched. Stagger end joints a minimum of 1 span. Nail with two 16d nails at each support, 1 blind nail and 1 face nail.

C. Exterior Sheathing.

1. Install roof sheathing at right angles to supports. Stagger end joints a minimum of 1 span. Nail with two 8d nails at each support.

2. Apply plywood roof sheathing with the face grain at right angles to supports. Stagger end joints. Nail with 8d nails 6 inch on center at edges and 12 inch on center at intermediate supports.

3. Apply 1x6 inch T&G roof sheathing at right angles to supports. Make all joints over supports. Stagger end joints. Nail with two 8d nails at each support.

4. Install 2 inch T&G roof sheathing at right angles to supports. Make joints over supports, unless end matched. Stagger end joints a minimum of 1 span. Nail with two 16d nails at each support, 1 blind nail and 1 face nail.

5. Apply plywood wall sheathing with the face grain vertical. Nail with 6d nails at 6 inch on center at edge and 12 inch on center at intermediate supports.

D. Underlayment.

1. Provide 1/16 inch between sheets. Nail with 3d ring shank. Nails 6 inch on center at edges and 8 inch on center in the field. Stagger joints with subfloor.

E. Treated Wood.

1. Field treat cuts and holes in pressure treated members with copper naphthenate.

F. Exposed Hardware.

1. Provide rough hardware for the proper installation of work. Install hot-dipped galvanized hardware, nails, bolts, etc. at locations exposed to the weather.
PART 4 - MEASUREMENT AND PAYMENT (NOT USED)

END OF SECTION
PART 1 — GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including the Conditions of the Contract and Division 01 Specification Sections apply to this section.

1.2 SUMMARY

A. Section includes roof insulation over the properly prepared deck substrate.

B. Related Sections:

1. Section 07311 – Asphalt Shingle Roofing.

1.3 REFERENCES

A. American Society for Testing and Materials (ASTM):


2. ASTM A653 Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvanized) by the Hot-Dip Process.


B. Cast Iron Soil Pipe Institute, Washington, D.C. (CISPI)

C. Factory Mutual Research (FM):

1. Roof Assembly Classifications.

D. National Roofing Contractors Association (NRCA):


E. Underwriters Laboratories, Inc. (UL):

1. Fire Hazard Classifications.

F. Warnock Hersey (WH):
1. Fire Hazard Classifications.

G. Sheet Metal and Air Conditioning Contractors National Association (SMACNA)

H. Steel Deck Institute, St. Louis, Missouri (SDI)

I. Southern Pine Inspection Bureau, Pensacola, Florida (SPIB)

J. Insulation Board, Polysiocyanurate (FS HH-I-1972)

K. Insulation Board, Thermal (Fiberboard) (FS LLL-1-535B)

1.4 SUBMITTALS

A. Product Data: Provide manufacturer's specification data sheets for each product in accordance with Division 01 Section Submittal Procedures.01300.

B. Provide approval letters from insulation manufacturer for use of their insulation within this particular roofing system type.

C. Provide a sample of each insulation type.

D. Shop Drawings

1. Submit manufacturer's shop drawings indicating complete installation details of tapered insulation system, including identification of each insulation block, sequence of installation, layout, drain locations, roof slopes, thicknesses, crickets and saddles.

2. Shop drawing shall include: Outline of roof, location of drains, complete board layout of tapered insulation components, thickness and the average "R" value for the completed insulation system.

E. Wind uplift calculation: insulation supplier shall provide a wind uplift calculation for insulation attachment to deck. Uplift calculation shall be per ASCE 7-05 and stamped by manufacturer’s California licensed structural engineer.

F. Certification

1. Submit roof manufacturer's certification that insulation fasteners furnished are acceptable to roof manufacturer.

2. Submit roof manufacturer's certification that insulation furnished is acceptable to roofing manufacturer as a component of roofing system and is eligible for roof manufacturer's system warranty.

1.5 QUALITY ASSURANCE

A. Fire Classification, ASTM E-108.

B. Manufacturer's Certificate: Certify that roof system furnished is approved by Factory Mutual, Underwriters Laboratories, Warnock Hersey or approved third party testing facility in accordance with ASTM E108, Class [A or B or C] for external fire and meets local or nationally recognized building codes.
C. Manufacturer's Certificate: Certify that the roof system is adhered properly to meet or exceed the requirements of FM 1-90.

D. Pre-installation Meeting: Refer to Division 07 roofing specifications for pre-installation meeting requirements.

1.6 DELIVERY, STORAGE AND HANDLING

A. Deliver products to site with seals and labels intact, in manufacturer's original containers, dry and undamaged.

B. Store all insulation materials in a manner to protect them from the wind, sun and moisture damage prior to and during installation. Any insulation that has been exposed to any moisture shall be removed from the project site.

C. Keep materials enclosed in a watertight, ventilated enclosure (i.e. tarpaulins).

D. Store materials off the ground. Any warped, broken or wet insulation boards shall be removed from the site.

PART 2 — PRODUCTS

2.1 PRODUCTS, GENERAL

A. Refer to Division 01 Section "Common Product Requirements."

B. Basis of Design: Materials, manufacturer's product designations, and/or manufacturer's names specified herein shall be regarded as the minimum standard of quality required for work of this Section. Comply with all manufacturer and contractor/fabricator quality and performance criteria specified in Part 1.

C. Substitutions: Products proposed as equal to the products specified in this Section shall be submitted in accordance with Bidding Requirements and Division 01 provisions.

1. Proposals shall be accompanied by a copy of the manufacturer's standard specification section. That specification section shall be signed and sealed by a professional engineer licensed in the state in which the installation is to take place. Substitution requests containing specifications without licensed engineer certification shall be rejected for non-conformance.

2. Include a list of three (3) projects of similar type and extent, located within a one hundred mile radius from the location of the project. In addition, the three projects must be at least five (5) years old and be available for inspection by the Architect, Owner or Owner's Representative.

3. Equivalency of performance criteria, warranty terms, submittal procedures, and contractual terms will constitute the basis of acceptance.

4. The Owner's decision regarding substitutions will be considered final. Unauthorized substitutions will be rejected.

2.2 INSULATION MATERIALS

1. OSB/Rigid Polyisocyanurate Roof Insulation; ASTM C1289:
   a. Qualities: Rigid, closed cell polyisocyanurate foam core bonded to heavy duty glass fiber mat facers.
   b. Panel thickness: 2”.
   c. OSB thickness: 5/8”.
   d. Compliances: UL, WH or FM listed under Roofing Systems
   e. Acceptable Products:
      1) Commercial Innovations
      2) Approved Equivalent


   1. Rigid Polyisocyanurate Roof Insulation; ASTM C1289:
      a. Qualities: Rigid, closed cell polyisocyanurate foam core bonded to heavy duty glass fiber mat facers.
      b. Thickness: 2”.
      c. Compliances: UL, WH or FM listed under Roofing Systems
      d. Acceptable Products:
         1) Commercial Innovations
         2) Approved Equivalent

C. Vapor retarder:

   2. Viking UDL by Commercial Innovations or approved equal.

D. Fasteners: Corrosion resistant screw fastener as recommended by roof membrane manufacturer.

   1. Factory Mutual Tested and Approved with three (3) inches coated disc for 1-90 rating, length required to penetrate metal deck one inch.
PART 3 — EXECUTION

3.1 EXECUTION, GENERAL

A. Comply with requirements of Division 01 Section "Common Execution Requirements."

3.2 INSPECTION OF SURFACES

A. Roofing contractor shall be responsible for preparing an adequate substrate to receive insulation.

1. Verify that work which penetrates roof deck has been completed.

2. Verify that wood nailers are properly and securely installed.

3. Examine surfaces for defects, rough spots, ridges, depressions, foreign material, moisture, and unevenness.

4. Do not proceed until defects are corrected.

5. Do not apply insulation until substrate is sufficiently dry.

6. Broom clean substrate immediately prior to application.

7. Use additional insulation to fill depressions and low spots that would otherwise cause ponding water.

8. Verify that temporary roof has been completed.

3.3 INSTALLATION

A. Vapor retarder installation

1. Prime surface of plywood per manufacturer’s recommendation.

2. Apply peel and stick membrane over entire roof surface.

B. Attachment with Mechanical Fasteners.

1. Approved insulation board layers shall be fully attached to the deck with an approved mechanical fastening system. As a minimum, the amount of fasteners shall be in accordance with manufacturer's wind uplift calculation. Otherwise, a minimum of one fastener per two square feet shall be installed.

2. Stagger and offset all insulation joints a minimum or 6”.

3. Filler pieces of insulation require at least two fasteners per piece if size of insulation is less than four square feet.

4. Spacing pattern of fasteners shall be as per manufacturer's recommendations to meet the FM requirements. Placement of any fastener from edge of insulation board shall be a minimum of three inches, and a maximum of six (6) inches.

5. Minimum penetration into deck shall be as recommended by the fastener manufacturer. There is a one (1) inch minimum for metal, wood and structural concrete decks where not specified by the manufacturer. For gypsum and cement-wood fiber decks, penetration shall be determined from pull-out test results with a minimum penetration of one and one-half (1 ½ ) inches.
3.4 CLEANING

A. Remove debris and cartons from roof deck. Leave insulation clean and dry, ready to receive roofing membrane.

3.5 CONSTRUCTION WASTE MANAGEMENT

A. Remove and properly dispose of waste products generated during installation. Comply with requirements of authorities having jurisdiction

END OF SECTION
PART 3
SECTION 07311
ASPHALT SHINGLES ROOFING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes the following:
   1. Asphalt shingles.
   2. Self-adhering sheet underlayment.

B. Related Sections include the following:
   1. Division 6 Section “Sheathing” for roof deck wood structural panels.
   2. Division 7 Section "Sheet Metal Flashing and Trim" for metal roof penetration flashings and counterflashings not part of this Section.

1.3 DEFINITIONS

A. Roofing Terminology: Refer to ASTM D 1079 and glossary of NRCA's "The NRCA Roofing and Waterproofing Manual" for definitions of terms related to roofing work in this Section.

1.4 SUBMITTALS

A. Product Data: For each type of product indicated.

B. Samples for Initial Selection: For each type of asphalt shingle, ridge and hip cap shingles ridge vent and exposed valley lining indicated.
   1. Include similar Samples of trim and accessories involving color selection.

C. Samples for Verification: For the following products, of sizes indicated, to verify color selected.
   2. Ridge and Hip Cap Shingles: Full-size ridge and hip cap asphalt shingle.
   3. Ridge Vent: 12-inch- (300-mm-) long Sample.
   4. Exposed Valley Lining: 12 inches (300 mm) square.
5. Self-Adhering Underlayment: 12 inches (300 mm) square.

D. Qualification Data: For Installer, including certificate signed by asphalt shingle manufacturer stating that Installer is approved, authorized, or licensed to install roofing system indicated.

E. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency or by manufacturer and witnessed by a qualified testing agency, for asphalt shingles.

F. Maintenance Data: For asphalt shingles to include in maintenance manuals.

G. Warranties: Special warranties specified in this Section.

1.5 QUALITY ASSURANCE

A. Source Limitations: Obtain specified products as required from warranting manufacturer as outlined in the specifications.

B. Fire-Test-Response Characteristics: Provide asphalt shingle and related roofing materials with the fire-test-response characteristics indicated, as determined by testing identical products per test method below by UL or another testing and inspecting agency acceptable to authorities having jurisdiction. Identify materials with appropriate markings of applicable testing and inspecting agency.

1. Exterior Fire-Test Exposure: Class A; ASTM E 108 or UL 790, for application and roof slopes indicated.

C. Pre-installation Conference: Conduct conference at Project site to comply with requirements in Division 1 Section "Project Management and Coordination."

D. MANUFACTURER’S INSPECTIONS

A. When the project is in progress, the base sheet system manufacturer will provide the following:
   1. Keep the Owner informed as to the progress and quality of the work as observed.
   2. Provide daily job site inspections during installation of the shingle roof system. Provide daily emailed progress reports to the Owner outlining the day’s roof renovation progress.
   3. Report to the Owner in writing any failure or refusal of the Contractor to correct unacceptable practices called to the Contractor’s attention.
   4. Confirm after completion that manufacturer has observed no applications procedures in conflict with the specifications other than those that may have been previously reported and corrected.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Store roofing materials in a dry, well-ventilated, weathertight location according to asphalt shingle manufacturer's written instructions. Store underlayment rolls on end on pallets or other raised surfaces. Do not double-stack rolls.

1. Handle, store, and place roofing materials in a manner to avoid significant or permanent damage to roof deck or structural supporting members.
B. Protect unused under-layment from weather, sunlight, and moisture when left overnight or when roofing work is not in progress.

1.7 PROJECT CONDITIONS

A. Weather Limitations: Proceed with installation only when existing and forecasted weather conditions permit asphalt shingle roofing to be performed according to manufacturer's written instructions and warranty requirements.

1. Install self-adhering sheet under-layment within the range of ambient and substrate temperatures recommended by manufacturer.

1.8 WARRANTY

A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace asphalt shingles that fail in materials or workmanship within specified warranty period. Materials failures include manufacturing defects and failure of asphalt shingles to self-seal after a reasonable time.

1. Material Warranty Period: 40 years from date of Substantial Completion, prorated, with first 5 years non-prorated.
2. Wind-Speed Warranty Period: Asphalt shingles will resist blow-off or damage caused by wind speeds up to 85 mph for 10 years from date of Substantial Completion.
3. Algae-Discoloration Warranty Period: Asphalt shingles will not discolor 10 years from date of Substantial Completion.

B. Special Project Warranty: Roofing Installer's warranty, on warranty form at end of this Section, signed by roofing Installer, covering Work of this Section, in which roofing Installer agrees to repair or replace components of asphalt shingle roofing that fail in materials or workmanship within the following warranty period:

1. Warranty Period: two years from date of Substantial Completion.

1.9 EXTRA MATERIALS

A. Furnish extra materials described below that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

1. Asphalt Shingles: 100 sq. ft of each type, in unbroken bundles.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. In other Part 2 articles where titles below introduce lists, the following requirements apply to product selection:
1. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, products specified.

### 2.2 GLASS-FIBER-REINFORCED ASPHALT SHINGLES


1. Available Products:
   a. GAF Materials Corporation - Timber-line
   b. Certainteed
   c. Owens Corning

2. Butt Edge: Straight cut.
3. Strip Size: Manufacturer's standard.
4. Algae Resistance: Granules treated to resist algae discoloration.
5. Color and Blends: from manufacturer’s standard color samples.

B. Hip and Ridge Shingles: Manufacturer's standard units to match asphalt shingles.

### 2.3 UNDERLAYMENT MATERIALS


2. As recommended by:
   a. Viking UDL by Commercial Innovations or approved equal.

### 2.4 RIDGE VENTS

A. Flexible Ridge Vent: Manufacturer's standard compression-resisting, three-dimensional open-nylon or polyester-mat filter bonded to a nonwoven, nonwicking geotextile fabric cover.

1. Available Products:
   a. GAF Materials Corporation; Cobra.
   b. Certainteed
   c. Owens Corning

2. Minimum Net Free Area: 4” min.
3. Width: Length of ridge.
4. Thickness: 1-1/2” min. thickness.

### 2.5 ACCESSORIES

A. Asphalt Roofing Cement: ASTM D 4586, Type II, asbestos free.
B. Roofing Nails: ASTM F 1667; aluminum, stainless-steel, copper, or hot-dip galvanized steel wire shingle nails, minimum 0.120-inch- (3-mm-) diameter, barbed shank, sharp-pointed, with a minimum 3/8-inch- (9.5-mm-) diameter flat head and of sufficient length to penetrate 3/4 inch (19 mm) into solid wood decking or extend at least 1/8 inch (3 mm) through OSB or plywood sheathing.

1. Where nails are in contact with metal flashing, use nails made from same metal as flashing.

2.6 METAL FLASHING AND TRIM
A. Sheet Metal Flashing and Trim: Comply with requirements in Division 7 Section "Sheet Metal Flashing and Trim."

1. Sheet Metal: aluminum per Section 07600.

PART 3- EXECUTION

3.0 EXAMINATION
1. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of work.

1. Examine roof sheathing to verify that sheathing joints are supported by framing and blocking or metal clips and that installation is within flatness tolerances.

2. Verify that substrate is sound, dry, smooth, clean, sloped for drainage, and completely anchored; and that provision has been made for flashings and penetrations through asphalt shingles.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.1 UNDERLAYMENT INSTALLATION

1. Adhering Sheet Underlayment: Install self-adhering sheet underlayment, wrinkle free, on entire roof deck. Comply with low-temperature installation restrictions of underlayment manufacturer if applicable. Install at locations indicated on Drawings, lapped in direction to shed water. Lap sides not less than 3-1/2 inches (89 mm). Lap ends not less than 6 inches (150 mm) staggered 24 inches (600 mm) between courses. Roll laps with roller. Cover underlayment within seven days.

3.2 METAL FLASHING INSTALLATION

2. General: Install metal flashings and other sheet metal to comply with requirements in Division 7 Section "Sheet Metal Flashing and Trim."
C. Install metal flashings according to recommendations in ARMA's "Residential Asphalt Roofing Manual" and asphalt shingle recommendations in NRCA's "The NRCA Roofing and Waterproofing Manual."

D. Apron Flashings: Extend lower flange over and beyond each side of downslope asphalt shingles and up the vertical surface.

E. Step Flashings: Install with a headlap of 2 inches and extend over the underlying asphalt shingle and up the vertical surface. Fasten to roof deck only.

F. Cricket Flashings: Install against the roof-penetrating element extending concealed flange beneath upslope asphalt shingles and beyond each side.

G. Open Valley Flashings: Install centrally in valleys, lapping ends at least 8 inches in direction to shed water. Fasten upper end of each length to roof deck beneath overlap.
   1. Secure hemmed flange edges into metal cleats spaced 2 inches apart and fastened to roof deck.

H. Rake Drip Edges: Install rake drip edge flashings over underlayment and fasten to roof deck.

I. Eave Drip Edges: Install eave drip edge flashings below underlayment and fasten to roof sheathing.

J. Pipe Flashings: Form flashing around pipe penetrations and asphalt shingles. Fasten and seal to asphalt shingles as recommended by manufacturer.

2.3 ASPHALT SHINGLE INSTALLATION


B. Install starter strip along lowest roof edge, consisting of an asphalt shingle strip with tabs removed with self-sealing strip face up at roof edge.
   1. Extend asphalt shingles 1/2 inch over fascia at eaves and rakes.
   2. Install starter strip along rake edge.

C. Install first and remaining courses of asphalt shingles stair-stepping diagonally across roof deck with manufacturer's recommended offset pattern at succeeding courses, maintaining uniform exposure.

D. Fasten asphalt shingle strips with a minimum of five roofing nails located according to manufacturer's written instructions.
   1. When ambient temperature during installation is below 50 deg F, seal asphalt shingles with asphalt roofing cement spots.

E. Ridge Vents: Install continuous ridge vents over asphalt shingles according to manufacturer's written instructions. Fasten with roofing nails of sufficient length to penetrate sheathing.
F. Ridge and Hip Cap Shingles: Maintain same exposure of cap shingles as roofing shingle exposure. Lap cap shingles at ridges to shed water away from direction of prevailing winds. Fasten with roofing nails of sufficient length to penetrate sheathing.

1. Fasten ridge cap asphalt shingles to cover ridge vent without obstructing airflow.

END OF SECTION
PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including the Conditions of the Contract and Division 01 Specification Sections apply to this section.

1.2 SUMMARY

A. Work described in this section includes underlayment, pre-formed metal roofing system complete with clips, perimeter and penetration flashing, and closures.

B. Related Work Specified Elsewhere:

1. Division 06 Section Rough Carpentry for wood substrate components.
2. Division 07 Section Roof Insulation.

1.3 REFERENCES

A. American Architectural Manufacturer Association (AAMA):


B. American Iron and Steel Institute (AISI):

1. 1996 Edition Specification for the Design of Cold-Formed Steel Structural Members.

C. American Society of Civil Engineers (ASCE):

D. American Society for Testing and Materials (ASTM):


E. Sheet Metal and Air Conditioning Contractors National Association (SMACNA):


1.4 SUBMITTALS FOR REVIEW

A. Samples illustrating thickness, finish, color and textures of materials.


C. Specimen Warranty: Provide an unexecuted copy of the warranty specified for this Project, identifying the terms and conditions required of the Manufacturer and the Owner.

D. Any material submitted as equal to the specified material must be accompanied by a report signed and sealed by a professional engineer licensed in the state in which the installation is to take place. This report shall show that the submitted equal meets the Design and Performance criteria in
this specification. Substitution requests submitted without licensed engineer approval will be rejected for non-conformance.

E. Shop drawings: Show roofing system with flashings and accessories in plan and elevation; sections and details. Include metal thickness and finishes, panel lengths, joining details, anchorage details, flashings and special fabrication provisions for termination and penetrations; thermal expansion provisions and rack mounted, panelized, polycrystalline solar photovoltaic panel clamping supports (PV). Indicate relationships with adjacent and interfacing work. Shop drawings must be completed by the metal roofing panel manufacturer's engineering department. Shop drawings shall be stamped by a professional licensed engineer in the State of California who is a full time employee of the roofing system manufacturer.

F. Product Data: Include manufacturer's detailed material and system description, sealant and closure installation instructions, engineering performance data and finish specifications. Provide product information for attachment of PV system.

G. Submit copy of certification from manufacturer stating that specified system has been tested in accordance with ASTM-1592 requirements by an independent Engineering Firm.

H. Structural load calc.: Roofing system manufacturer shall provide a structural load calculation verifying that the structure will support installation of a PV system over 70% of the roof area. Load calc. shall be stamped by a licensed professional engineer licensed in the State of California.

I. DSA approved PV system: provide names and projects numbers of at least two projects where DSA has approved all components of roofing assembly and PV solar assembly components.

J. Project close-out: roofing system manufacturer shall provide progress photos of installation of metal roofing system and as-built shop drawings of project showing all roofing assembly components, as installed.

K. Design test reports:

1. Indicate fastener types and spacings and provide fastener pullout values.
2. Submit copy of certification from manufacturer stating that specified system has been tested in accordance with ASTM-1592 requirements by an independent Engineering Firm. All test results must be submitted including Air (ASTM E 283 & E1680) and Water (ASTM E 331 & E 1646) Infiltration Tests.
M. Wind uplift calculation: Submit copy of manufacturer's design load calculations according to ASCE-7-02.

1.5 SUBMITTEDS FOR INFORMATION

A. Design and Test Reports: Provide the following certified test reports from an independent testing laboratory:

1. Independent laboratory testing report for system design load and seam integrity.

2. Professional engineer's documentation that roofing system incorporates sufficient allowance for stress and movement.

3. A letter from an officer of the manufacturing company certifying that the materials furnished for this project are the same as represented in tests and supporting data.

4. Manufacturer's verifications that the panels are factory roll formed.

B. Mill production reports certifying that the steel thicknesses are within allowable tolerances of the nominal or minimum thickness or gauge specified.

D. Design Loads: Submit copy of manufacturer's minimum design load calculations according to ASCE 7-02, Method 2 for Components and Cladding, sealed by a registered professional engineer employed by the system manufacturer as a full-time staff engineer. In no case shall the design loads be taken to be less than those detailed in Design and Performance Criteria article.

D. Qualification Data for Roofing Installer. Refer to Quality Assurance Article below.

E. Certification of work progress inspection frequency. Refer to Quality Assurance Article below.

F. Pre-installation Roofing Conference Proceedings. Refer to Quality Assurance Article below.

1.6 CONTRACT CLOSEOUT SUBMITTEDS

A. Special Project Warranty: Provide specified warranty for the Project, executed by the authorized agent of the Manufacturer.

B. Roofing Maintenance Instructions. Provide a manual of manufacturer’s recommendations for maintenance of installed roofing systems.

C. Insurance Certification: Assist Owner in preparation and submittal of roof installation acceptance certification as may be necessary in connection with fire and extended coverage insurance on roofing and associated work.
D. Demonstration and Training Schedule: Provide a schedule of proposed dates and times for instruction of Owner’s personnel in the maintenance requirements for completed roofing work. Refer to Part 3 for additional requirements.

1.7 QUALITY ASSURANCE

B. Installer Qualifications: Engage an Installer who has completed the Manufacturer's Approved Roofing Contractor course and is currently certified for the installation of this roof system.

C. If required, fabricator/installer shall submit work experience and evidence of adequate financial Responsibility. The Owner’s representative reserves the right to inspect fabrication facilities in determining qualifications.

D. Source Limitations: Obtain all components of roof system from a single manufacturer, including roll goods materials if required. Secondary products that are required shall be recommended and approved in writing by the roofing system Manufacturer.

   1. Upon request of the Architect or Owner, submit Manufacturer’s written approval of secondary components in list form, signed by an authorized agent of the Manufacturer.

   2. Manufacturer shall have direct authority and control over all fabrication of steel components as well as the raw materials used in their fabrication.

E. Source Quality Control: Manufacturer shall have in place a documented, standardized quality control program such as ISO-9001 approval.

F. Engage the Manufacturer’s Field Representative to conduct required periodic inspections of work in progress as described herein and shall furnish written documentation of all such inspections.

G. Manufacturer shall provide the Owner project with a written statement that they will provide a site inspections 3 days a week that confirms that the project is being constructed as specified, by an experienced, full time employee of the company.

H. Manufacturer shall provide the Engineer of Record for this roofing project with a written statement that they will provide a site inspection 3 days a week that confirms that the project is being constructed as specified, by an experienced, full time employee of the company.

1.8 PRE-INSTALLATION CONFERENCE

A. Convene a pre-roofing conference approximately two (2) weeks before scheduled commencement of roofing system installation and associated work.

B. Require attendance of installer of each component of associated work, installers of deck or substrate construction to receive roofing work, installers of rooftop units and other work in and around roofing which must precede or follow roofing work.
(including mechanical work if any), Architect, Owner, roofing system manufacturer’s representative, and other representatives directly concerned with performance of the Work, including (where applicable) Owner’s insurers, testing agencies and governing authorities. Objectives of conference to include:

1. Review foreseeable methods and procedures related to roofing work, including set up and mobilization areas for stored material and work area.

2. Tour representative areas of roofing substrates (decks), inspect and discuss condition of substrate, roof drains, curbs, penetrations and other preparatory work performed by others.

3. Review structural loading limitations of deck and inspect deck for loss of flatness and for required attachment.

4. Review roofing system requirements (drawings, specifications and other contract documents).

5. Review required submittals both completed and yet to be completed.

6. Review and finalize construction schedule related to roofing work and verify availability of materials, installer’s personnel, equipment and facilities needed to make progress and avoid delays.

7. Review required inspection, testing, certifying and material usage accounting procedures.

8. Review weather and forecasted weather conditions and procedures for coping with unfavorable conditions, including possibility of temporary roofing (if not mandatory requirement).

9. Record discussion of conference including decisions and agreements (or disagreements) reached and furnish copy of record to each party attending. If substantial disagreements exist at conclusion of conference, determine how disagreements will be resolved and set date for reconvening conference.

G. Review notification procedures for inclement weather or non-working days.

D. The Owner’s Representative will designate one of the conference participants to record the proceedings and promptly distribute them to the participants for record.

E. The intent of the conference is to resolve issues affecting the installation and performance of roofing work. Do not proceed with roofing work until such issues are resolved the satisfaction of the Owner and Engineer of Record. This shall not be construed as interference with the progress of Work on the part of the Owner or Engineer of Record.

1.9 DELIVERY, STORAGE, AND HANDLING
A. Manufacturer’s responsibilities:

1. All roof panels shall be shipped from the manufacturer with polystyrene or similar cushioned packaging material separating the individual panels to minimize flexing, stressing, scratching or otherwise damaging the material during transit to the job.

2. Fully cover steel with tarpaulins or similar protective cover during transit to prevent dirt and debris from coming in contact with the finished goods.

B. Installer’s responsibilities:

1. Stack pre-finished materials to prevent twisting, bending, abrasion and denting and elevate one end to facilitate moisture run-off.

2. Unload roof panels using a boom or crane, supporting the panels in at least two locations during lifting, and never lift more than three panels at a time.

3. Protect moisture-sensitive materials and water-based from the weather.

4. Inspect materials upon delivery. Reject and remove physically damaged or marred material from project site.

1.10 PROJECT CONDITIONS

A. Determine that work of other trades will not hamper or conflict with necessary fabrication and storage and protection requirements for roofing system.

1. Protection:

   a. Protect completed roofing from subsequent construction operations. Comply with Manufacturer’s recommendations.

   b. Do not overload roof with stored materials.

   c. Support no roof-mounted equipment directly on the roofing system.

B. Ascertain that work of other trades which penetrates the roof or is to be made watertight by the roof is in place an approved prior to installation of roofing.

1.11 DESIGN AND PERFORMANCE CRITERIA

A. Thermal Expansion and Contraction:

1. Completed metal roofing and flashing system shall be capable of withstanding expansion and contraction of components caused by changes in
temperature without buckling, producing excess stress on structure, anchors or fasteners, or reducing performance ability.

2. The design temperature differential shall be not less than 160 degrees F.

3. Interface between panel and clip shall provide for unlimited thermal movement in each direction along the longitudinal direction.

4. Location of metal roofing rigid connector shall be at roof ridge unless otherwise approved by the Project Architect. Metal ridge connector may require design as per job conditions by specified manufacturer.

C. Uniform Positive Load Capacity.

1. The installed roof system shall be capable of resisting the following positive uniform roof loads: Roof Live Load of 20 psf.

2. Capacity to resist positive loads shall be determined by empirical calculations in accordance with AISI. Calculation shall be sealed by a registered professional engineer.

3. Installed roof system shall carry positive uniform design loads with a maximum system deflection of L/180 as measured at the rib (web) of the panel.


E. ASTM E283: Static pressure air infiltration:

<table>
<thead>
<tr>
<th>Pressure</th>
<th>Leakage Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>20.0 PSF</td>
<td>0.0022 cfm/sq.ft.</td>
</tr>
</tbody>
</table>

F. ASTM E331: Static pressure water infiltration:

<table>
<thead>
<tr>
<th>Pressure</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>5 Gal/Hr Per S.F. and Static</td>
<td>No Leakage</td>
</tr>
<tr>
<td>Pressure Of 20.0 Psf for 15 minutes.</td>
<td></td>
</tr>
</tbody>
</table>

G. ASTM E1680: Static pressure air infiltration (roof panels):

<table>
<thead>
<tr>
<th>Pressure</th>
<th>Leakage Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>20.0 PSF</td>
<td>0.0027 cfm/sq.ft.</td>
</tr>
</tbody>
</table>

H. ASTM E1646: Static pressure water infiltration (roof panels):

<table>
<thead>
<tr>
<th>Pressure</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>5 Gal/Hr Per S.F. and Static</td>
<td>No Leakage</td>
</tr>
<tr>
<td>Pressure Of 20.0 Psf for 15 minutes.</td>
<td></td>
</tr>
</tbody>
</table>
I. Capacities for gauge, span or loading other than those tested may be determined by interpolation of test results within the range of test data. Extrapolation for conditions outside test range are not acceptable.

1.12 WARRANTIES

A. Manufacturer shall execute a single warranty covering the following criteria. Multiple-source warranties are not acceptable.

1. Manufacturer’s 10 year weathertight warranty, including coverage for all trim, flashings, and penetrations associated with the roof area.

2. 20 year coverage on finish including checking, crazing, peeling, chalking, fading and/or adhesion.

3. Installer shall provide manufacturer with 5 year warranty covering roofing system installation and watertightness.

1.13 MANUFACTURER’S INSPECTIONS

A. When the project is in progress, the roofing system manufacturer will inspect the work not less than 3 days per week. In addition, the manufacturer will:

1. Keep the Architect or Owner informed as to the progress and quality of the work as observed.

2. Report to the Architect in writing any failure or refusal of the Contractor to correct unacceptable practices called to the Contractor’s attention.

3. Confirm after completion that manufacturer has observed no applications procedures in conflict with the specifications other than those that may have been previously reported and corrected.

PART 2 - PRODUCTS

2.1 PRODUCTS, GENERAL

A. Basis of Design: Materials, manufacturer’s product designations, and/or manufacturer's names specified herein shall be regarded as the minimum standard of quality required for work of this Section. Comply with all manufacturer and contractor/fabricator quality and performance criteria specified in Part 1.

B. Substitutions: Products proposed as equal to the products specified in this Section shall be submitted in accordance with Bidding Requirements and Division 01 provisions.
1. Proposals shall be accompanied by a copy of the manufacturer's standard specification section. That specification section shall be signed and sealed by a professional engineer licensed in the state in which the installation is to take place. Substitution requests containing specifications without licensed engineer certification shall be rejected for non-conformance.

2. Include a list of three (3) projects of similar type and extent, located within a one hundred mile radius from the location of the project. In addition, the three projects must be at least five (5) years old and be available for inspection by the Architect, Owner or Owner’s Representative.

3. Equivalency of performance criteria, warranty terms, submittal procedures, and contractual terms will constitute the basis of acceptance.

4. The Owner’s decision regarding substitutions will be considered final. Unauthorized substitutions will be rejected.

2.2 ACCEPTABLE MANUFACTURERS

A. The design is based upon Insul Span roofing systems engineered and manufactured by Commercial Innovations or approved equal.

2.3 METAL ROOFING SYSTEM

A. Materials.

1. Panel material: 26 ga., Galvanized steel, type G-90, smooth per ASTM A875-90.

2. Flashing and flat stock material: Fabricate in profiles indicated on drawings of same material, thickness, and finish as roof system, unless indicated otherwise.

B. Finishes:

1. Exposed surfaces for coated panels:
   a. Two coat coil applied, baked-on full-strength (70% resin) fluorocarbon coating system (polyvinylidene fluoride, PVF2), applied by manufacturer's approved applicator.
   b. Coating system shall provide nominal 1.0 mil dry film thickness, consisting of primer and color coat.
2. Unexposed surfaces for coated panels shall be baked-on polyester coating with .20 -.30 dry film thickness (TDF).

C. Characteristics:

1. Provide the same panel profile from a single manufacturer for all standing seam roof areas.

2. Standing Seam Panel Width: 40”.

3. Panel length: Full length without joints, including bends.

4. 2” urethane foam core insulation.

D. Accessories.

1. Fasteners:
   a. Concealed fasteners: Corrosion resistant steel fasteners (zinc plated, stainless steel or equal) designed to meet structural loading requirements. Provide #14 as the minimum fastener size.
   b. Exposed fasteners: not allowed.

2. Closures: Factory precut closed cell foam meeting ASTM D1056 or ASTM D3575, enclosed in metal channel matching panels when used at hip, ridge, rake, and jamb.

3. Provide all miscellaneous accessories for complete installation.

2.4 ACCESSORY PRODUCTS

A. Sealant:

1. Acceptable product:
   a. Concealed Application: Non-curing butyl sealant or equal.
   b. Exposed Application: Garland SS sealant or equal.

2. Colors: As selected by architect from sealant manufacturer's standard selection.
B. Underlayment:

1. Underlayment shall be applied to a thirty-six (36) inch wide area around entire perimeter of roof, in all valleys, and surrounding all roof penetrations.

2. Provide protective membrane/underlayment with “class A” fire rating over deck surfaces.
   a. Apply a single layer of self adhering, Viking UDL by Commercial Innovations or approved equal shingle fashion over the entire roof area beginning at the low end of the roof section. Allow for four inch (4”) side laps and eight inch (8”) end laps.

C. Bearing Plates:

1. Install bearing plates directly over rigid board insulation/underlayment at each anchor clip location.

2. Bearing plates shall be three by five (3 x 5) inch by sixteen (16) gauge, minimum galvanized steel.

3. Bearing plates shall be pre-punched with a hole pattern matching that of the panel anchor clips. Slotted holes are acceptable.

2.5 FABRICATION

A. Shop fabricate metal roofing and flashing components to the maximum extent possible, forming metal work with clear, sharp, straight, and uniform bends and rises. Hem exposed edges of flashings.

B. Form flashing components from full single width sheet in minimum ten (10) foot lengths. Provide shop fabricated, mitered corners, joined using closed end pop rivets and joint sealant.

C. Fabricate roofing and related sheet metal work in accordance with approved shop drawings and applicable standards.

PART 3 - EXECUTION

3.1 EXECUTION, GENERAL

A. Comply with requirements of Division 01 Section “Common Execution Requirements.”

3.2 PREPARATION
A. Design system so that the panel installation may be started and/or terminated at any given point in the area.

1. It is understood that the ongoing operations of the Owner are of a critical nature as to leak sensitivity. Do not work on more roof area than can be restored completely watertight in one day.

B. Remove existing loose material, dirt and debris from the roof area. All accumulations of asphalt or other repair materials shall be removed to provide a smooth, flat substrate without imperfections that will be evident in the finished work.

1. Existing metal details and other metal accessories specified for re-use that interfere with the installation of the new roof system shall be carefully removed and set aside for re-use.

2. Any metal described above that will come in contact with the new roof shall be checked for type and replaced or protected if galvanic action may be a problem.

C. Strip existing contaminating material from all metal components that are indicated to be re-utilized. Protect these metal components. Replace damaged components with new of similar type and dimension.

3.3 INSTALLATION, GENERAL

A. Install roof system when the atmospheric dry bulb temperature is minimum 40 degrees Fahrenheit and rising.

B. Install all components of the roof system in exact accordance with the manufacturer's standard published procedures as applicable to these project conditions and substrates.

C. Install all required vapor retarders, air seals and preliminary tapered, insulating substrates required per enclosed specifications.

3.4 ROOFING AND FLASHING INSTALLATION

A. Comply with all details and install roofing materials and flashings in accordance with approved shop drawings and manufacturer's product data, within specified erection tolerances.

B. Prepare roof for the installation of standing seam panels, including:
1. Install all decking, framing, and/or furring members as indicated in this specification and bid documents.

2. Install all insulation, vapor retarders, and/or air infiltration barriers as indicated in this specification and bid documents.

3. Install all underlayments and/or temporary water proofing materials as required in this specification and bid documents.

C. Directly over the completed roof substrate, install panel.

B. Isolate dissimilar metals and masonry or concrete from metals with bituminous coating. Use gasketed fasteners where required to prevent corrosive action between fastener, substrate, and panels.

C. Anchorage shall allow for temperature expansion/contraction movement without stress or elongation of panels, clips, or anchors. Attach clips to structural substrate using fasteners of size and spacing as determined by manufacturer's design analysis to resist specified uplift and thermal movement forces.

D. Seal laps and joints in accordance with roofing system manufacturer's product data.

E. Coordinate flashing and sheet metal work to provide weathertight conditions at roof terminations. Fabricate and install in accordance with standards of SMACNA Manual.

F. Provide for temperature expansion/contraction movement of panels at roof penetrations and roof mounted equipment in accordance with system manufacturer's product data and design calculations.

G. Installed system shall be true to line and plane and free of dents, and physical defects. In light gauge panels with wide flat surfaces, some oil canning may be present. Oil canning does not affect the finish or structural integrity of the panel and is therefore not cause for rejection.

H. Maximum variation from true planes or lines shall be one-fourth (1/4) inch in twenty (20) feet and three-eights (3/8) inch in forty (40) feet of more.

I. Form joints in linear sheet metal to allow for one-fourth (1/4) inch minimum expansion at twenty (20) feet on center maximum and eight (8) feet from corners.

J. At joints in linear sheet metal items, set sheet metal items in two (2) one-fourth (1/4) inch beads of butyl sealant. Extend sealant over all metal surfaces. Mate components for positive seal. Allow no sealant to migrate onto exposed surfaces.

K. Remove damaged work and replace with new, undamaged components.

P. Touch up exposed fasteners using paint furnished by roofing panel manufacturer and matching exposed panel surface finish.
Q. Clean exposed surfaces of roofing and accessories after completion of installation. Leave in clean condition at date of substantial completion. Touch up minor abrasions and scratches in finish.

3.5 CLEANING

A. Clean installed work in accordance with the manufacturer’s instructions.

B. Replace damaged work than cannot be restored by normal cleaning methods.

3.6 CONSTRUCTION WASTE MANAGEMENT

A. Remove and properly dispose of waste products generated during roofing procedures. Comply with requirements of authorities having jurisdiction.

3.7 FINAL INSPECTION

A. At completion of roofing installation and associated work, meet with Contractor, Architect, installer, installer of associated work, Owner, roofing system manufacturer’s representative, and other representatives directly concerned with performance of roofing system.

B. Inspect roofing work and flashing of roof penetrations, walls, curbs and other equipment. List all items requiring correction or completion and furnish copy of list to each party in attendance.

C. Repair or replace deteriorated or defective work found at time above inspection as required to a produce an installation which is free of damage and deterioration at time of Substantial Completion and according to warranty requirements.

D. Notify the Architect upon completion of corrections.

E. Following the final inspection, provide written notice of acceptance of the installation from the roofing system manufacturer.

F. Immediately correct roof leakage during construction. If the Contractor does not respond within twenty four (24) hours, the Owner will exercise rights to correct the Work under the terms of the Conditions of the Contract.

END OF SECTION
1.1 SUMMARY:

A. Scope of Work:
   1. Pool – Locker Room covered walkway.
      a. Remove all roofing and sheet metal the structural deck.
      b. Mechanically attach ½” wood fiber to the deck.
      c. Install base ply in hot asphalt.
      d. Install modified membrane in hot asphalt.
      e. Install new edge metal, and gutters. Install straps on gutters at 18” O.C.
      f. Coat all vertical flashing.

B. Related Documents: The Conditions of the Contract and Division 1 apply to this section as fully as if repeated herein.

1.2 REFERENCES:

A. The editions of the American Society for Testing and Materials (ASTM) Standards referenced herein apply to the work only to the extent specified by the references thereto.

1.3 SUBMITTALS:

A. Product Data: Submit certificates of compliance, manufacturer's specifications, installation instructions, and general recommendations for each roofing and insulation material required.

   1. Submit certificates of conformance, certified test reports, or other data indicating conformance of installation with the applicable reference standards.

B. Certificates: Applicator shall provide letter certifying that work has been installed in accordance with specifications and manufacturer's written instructions.

C. Submittal procedures and quantities are specified in Section 01334.

D. Warranty: sample warranty of single source labor and material warranty for asphalt roofing for a period of 20 years.

E. Submit roof plans, details, specifications and wind uplift. Wind uplift shall be per ASCE 7-05.

F. The Contract is based on the standards of quality established in the Contract Documents. To give all bidders equal opportunity, use of any materials or methods other than those specified will require the proper submittal information and must be pre-approved in written addenda 10 days prior to bid due date. Substitution requests must be a full submittal package stamped by a professional California civil or structural engineer to show all wind uplift and fire rating requirements have been met. Request can only be made by prime contractors.

1.4 QUALITY ASSURANCE:
A. Manufacturer: Obtain primary roofing materials from a single manufacturer who specializes in this particular field of roofing and who has been so engaged, successfully, for a period of at least 10 years immediately prior to this contract. Provide secondary materials as recommended by manufacturer of primary materials.

B. Applicator: A firm with not less than 5 years of successful experience in installation of roofing systems similar to those required for this project and who is acceptable to or licensed by manufacturer of primary roofing materials.

C. UL Listing: Provide labeled materials which have been tested and listed by UL in "Building Materials Directory" for application indicated, with UL or Warnoch Hersey Class A fire rated system for roof slopes indicated.

D. Pre-installation Conference: Before installing roofing system, conduct conference at Project site to comply with requirements of Section 01312. Notify participants at least 5 working days before conference.
   1. Meet with Owner; Architect; roofing installer, materials manufacturer, the sheet metal installer, the roofing accessories installer, the mechanical and electrical sub-contractors, Contractor, testing laboratory in attendance.
   2. Review methods and procedures related to roofing installation, including manufacturers written instructions.
   3. Examine deck substrate conditions and finishes for compliance with requirements, including flatness and fastening.
   4. Review flashings, special roofing details, roof drainage, roof penetrations, equipment curbs, and condition of other construction that will affect roofing.
   5. Review governing regulations and requirements for insurance, certificates, and inspection and testing.
   6. Review temporary protection requirements for roofing system during and after installation.
   7. Document proceedings, including corrective measures or actions required, and furnish copy of record to each participant.

1.5 DELIVERY, STORAGE AND HANDLING:

A. Deliver materials to the site in their original unbroken containers or packages bearing the manufacturers name, and brand designation. In addition, liquid materials shall bear the date of manufacture and manufacturers recommended shelf life.

B. Store materials at the site in a dry location, raised above the ground and protected from physical damage. Store materials, other than sheet roofing, at temperatures between 40 degrees F and 80 degrees F. Do not store materials past their shelf life.

C. If materials are stored on the roof, distribute the load so as not to exceed the designed live load limits of the roof construction.

1.6 PROJECT CONDITIONS:
A. Do not install the insulation and sheet roofing during high winds; wet, damp or foggy weather or when there is moisture or visible dampness on the substrate surface.

1.7 GUARANTEE:

A. Manufacturer’s warranty shall be a total system labor and material warranty including all built up bituminous roofing. This warranty shall provide the Owner with a single source of liability by guaranteeing the waterproofing system against leaks for a period of 20 years.

1.8 MANUFACTURER INSPECTIONS

A. Weekly inspection reports, including photos, by the roofing system manufacturer’s technical representative to the Owner and the Architect during installation.

PART 2 - PRODUCTS

2.1 MATERIALS:

A. Use basic products of one manufacturer throughout. Materials which are not available from the basic manufacturer shall be approved by him. In all cases, materials and application shall be in accordance with the requirements of this specification.

B. Product names for the modified bitumen built up roof system and waterproofing materials used in this section are based on performance requirements and characteristics of the Stressply Plus system from materials manufactured by the Garland Company and form the basis of the contract documents. When a particular trade name or performance standard is specified it shall be indicative of a standard required.

C. MODIFIED BITUMENOUS MATERIALS:

1. Base ply: 80 mil SBS (Styrene-Butadiene-Styrene) smooth surfaced rubber modified roofing membrane reinforced with a fiberglass scrim

2. The modified membrane will be where mineral surfacing is required:

   145 mil SBS (Styrene-Butadiene-Styrene) mineral surfaced rubber modified roofing membrane reinforced with a fiberglass and polyester scrim with the performance characteristics listed below.

4. Modified Membrane performance criteria

   Properties: FINISHED MEMBRANES
   TENSILE STRENGTH (ASTM D-5147)
   2 in/min. @ 73.4 ± 3.6 °F  MD 200 lbf/in.  CMD 200 lbf/in.
   ELONGATION at MAXIMUM TENSILE (ASTM D-5147)
   2 in/min. @ 73.4 ± 3.6 °F  MD 6.0%
   TEAR STRENGTH (ASTM D-5147)
   2 in/min. @ 73.4 ± 3.6 °F  MD 300 lbf. CMD 300 lbf.
   LOW TEMPERATURE FLEX. (ASTM D-5147) passes -30 °F
   Rubber content: 18% min.

4. The hot bitumen will consist of ASTM D-312 Type III steep asphalt.
5. All flashings will 40 mil SBS modified membrane base flashing ply covered by an additional layer of mineral surfaced modified bitumen membrane.

D. BITUMINOUS MATERIALS
2. Asphalt Roofing Mastic: V.O.C. compliant, ASTM D-2822, Type II.
3. Asphalt: Shall meet ASTM Specification D-312 Type III.

2.2 AUXILIARY MATERIALS:
A. Nails and Fasteners: Non-ferrous metal or galvanized steel, except that hard copper nails shall be used with copper; aluminum or stainless steel nails shall be used with aluminum; and stainless steel nails shall be used with stainless steel. Nails and fasteners shall be flush-driven through flat metal discs of not less than 1-inch diameter. Metal discs may be omitted when one piece composite nails or fasteners with heads not less than 1-inch diameter are used.

B. Cover board: ½” coated wood fiber, as approved by roofing system manufacturer.

C. Insulation fasteners: wood screws with 3” plastic plates, as approved by roofing system manufacturer.

D. Rosin sheet: red rosin type.

E. Coating for flashing: Title 24 approved white acrylic.

PART 3 - INSTALLATION

3.1 GENERAL INSTALLATION REQUIREMENTS:
A. Cooperate with manufacturer, inspection and test agencies engaged or required to perform services in connection with installing modified bitumen roofing system.

B. Protect other work from spillage of modified bitumen roofing materials, and prevent liquid materials from entering or clogging drains and conductors. Replace or restore other work damaged by installations of modified bituminous roofing system work.

C. Coordinate installing roofing system components so that insulation and roofing plies are not exposed to precipitation or left exposed overnight. Provide cut offs at end of each day's work to cover exposed ply sheets and insulation with two (2) plies of #15 organic felt set in full moppings of bitumen and with joints and edges sealed with roofing cement. Remove cut offs immediately before resuming work.

D. Asphalt Bitumen Heating: Heat and apply bitumen according to EVT Method as recommended by NRCA. Do not raise temperature above minimum normal fluid-holding temperature necessary to attain EVT (plus 5 °F at point of application) more than 1 hour prior to time of application. Determine flash point, finished blowing temperature, EVT, and fire-safe handling temperature of bitumen either by information from manufacturer or by suitable test. Do not exceed recommended temperature limits during bitumen heating. Do not heat to a temperature higher than 25° below flash point. Discard bitumen that has been held at temperature exceeding finishing blowing temperature (FBT) for more than 3 hours. Keep kettle lid closed except when adding bitumen.
D. Bitumen; Mopping Weights: For interply mopping, apply bitumen at the rate of approximately 25 lb. of asphalt per roof square (plus or minus 25 percent on a total job average basis).

E. Substrate Joint Penetrations: Prevent bitumen from penetrating substrate joints, entering building, or damaging roofing system components or adjacent building construction.

F. Apply roofing materials as specified herein unless recommended otherwise by manufacturer's instructions. Keep roofing materials dry before and during application. Do not permit phased construction. Complete application of roofing plies, modified sheet and flashing in a continuous operation. Begin and apply only as much roofing in one day as can be completed that same day.

3.2 INSTALLATION

A. Loose lay red rosin sheet.

B. Mechanically attach insulation to wood deck using fastening pattern meeting UL1-90 wind uplift requirements.

3.3 MEMBRANE APPLICATION:

A. Base ply: Install (1) one base ply sheet in 30 lbs. per square of bitumen shingled uniformly to achieve one ply throughout over the prepared substrate. Shingle in proper direction to shed water on each area of roof.

B. Lap ply sheet ends eight inches. Stagger end laps twelve inches minimum.

C. Extend plies two inches beyond top edges of cants at wall and projection bases.

D. The modified membrane shall then be solidly bonded to the base layers with specified asphalt at the rate of 35 lbs. per 100 square feet.

E. The roll must push a puddle of asphalt in front of it with asphalt slightly visible at all side laps. Care should be taken to eliminate air entrapment under the membrane.

F. Apply pressure to all seams to ensure that the laps are solidly bonded to substrate.

G. Subsequent rolls of modified shall be installed across the roof as above with a minimum of 4" side laps and 8" end laps. The end laps shall be staggered. The modified membrane shall be laid in the same direction as the underlayers, but the laps shall not coincide with the laps of the base layers.

H. Apply asphalt no more then five feet ahead of each roll being embedded.

I. Extend membrane 2” beyond top edge of all cants in full moppings of the specified asphalt as shown on the drawings.

3.4 FLASHING MEMBRANE INSTALLATION (GENERAL)

A. All curb, wall and parapet flashings shall be sealed with an application of mastic and mesh on a daily basis. No condition should exist that will permit moisture entering behind, around, or under the roof or flashing membrane.
B. Prepare all walls, penetrations and expansion joints to be flashed and where shown on the drawings, with asphalt primer at the rate of one gallon per 100 square feet. Allow primer to dry tack free.

C. The modified membrane will be used as the flashing membrane and will be adhered to an underlying base flashing ply per manufacturer’s recommendations and nailed off 8” O.C. at all vertical surfaces.

D. The entire sheet of flashing membrane must be solidly adhered to the substrate.

E. Seal all vertical laps of flashing membrane with a three course application of Flashing Bond and fiberglass mesh.

F. Counter flashing, cap flashings, expansion joints, and similar work to be coordinated with modified bitumen roofing work are specified in other sections.

G. Roof accessories, miscellaneous sheet metal accessory items, including piping vents and other devices to be coordinated with modified bituminous roof system work are in other sections.

H. Seal edge of roof with aluminized mastic.

3.5 SURFACING

A. Coat all vertical flashings at 1.5 gal. per sq. per coat. Apply 2 coats.

3.6 CLEAN UP

A. Clean up work soiled in the performance of work under this section. Restore or replace surfaces which have been damaged by work under this section.

END OF SECTION
PART 1 GENERAL

1.1 SECTION INCLUDES

A. Fabricated sheet metal items, including flashings, metal edges, counterflashings, and other items indicated in Schedule and as follows:
   1. Metal edge with continuous cleats.
   2. New reglet mounted counterflashing.
   3. Skirt flashing at curbs.
   4. Gutters.

1.2 RELATED REQUIREMENTS

A. Section 07220 – ROOF INSULATION
B. Section 07310 – ASPHALT SHINGLE ROOFING
C. Section 07550 – MODIFIED BITUMEN.

1.3 REFERENCE STANDARDS

A. ASTM A 653/A 653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
B. ASTM A 666 - Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar.
C. ASTM A792 Steel Sheet, Aluminum-Zinc Alloy-Coated, by the Hot-Dip Process
E. ASTM B486 Paste Solder
J. FS QQ-L-201 Specification for Lead Sheet

1.4 SUBMITTALS

A. See Section 01300 - Submittals, for submittal procedures.
B. Shop Drawings: Indicate material profile, jointing pattern, jointing details, fastening methods, flashings, terminations, and installation details.
   1. For manufactured and shop fabricated gravel stops, fascia, scuppers, and all other sheet metal fabrications.
   2. Indicate type, gauge and finish of metal.
C. Product data: Provide manufacturer's specification data sheets for each product:
1. Metal material characteristics and installation recommendations.
2. Submit color chart prior to material ordering and/or fabrication so that equivalent colors to those specific can be approved.

D. Manufacturer's installation instructions for reglets.

E. Samples: Submit two samples 8x10 inch in size illustrating metal finish color.
1. Submit two samples, 12 x 12 inch in size illustrating typical external corner, internal corner, and valley, junction to vertical dissimilar surface, material and finish.

F. Certification:
1. Submit roof manufacturer's certifications that metal fasteners furnished are acceptable to roof manufacturer.
2. Submit roof manufacturer's certification that metal furnished is acceptable to roofing manufacturer as a component of roofing system and is eligible for roof manufacturer's system warranty.
3. Submit certification that metal and fastening system furnished is Tested and Approved by Factory Mutual for 1-90 Wind Up-Lift Requirements.

G. Provide approval letters from metal manufacturer for use of their metal within this particular roofing system type.

H. Proof of fabricator and installer qualifications.

1.5 QUALITY ASSURANCE

A. Perform work in accordance with SMACNA Architectural Sheet Metal Manual requirements, except as otherwise indicated.

B. Manufacturer's Warranty: Pre-finished metal material shall require a written 20-year non-prorated warranty covering fade, chalking and film integrity. The material shall not show a color change greater than 5 NBS color units per ASTM D-2244 or chalking excess of 8 units per ASTM D-659. If either occurs material shall be replaced per warranty, at no cost to the Owner.

C. Contractor's Warranty: The Contractor shall provide the Owner with a notarized written warranty assuring that all sheet metal work including caulking and fasteners to be water-tight and secure for a period of five years from the date of final acceptance of the building. Warranty shall include all materials and workmanship required to repair any leaks that develop, and make good any damage to other work or equipment caused by such leaks or the repairs thereof.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Deliver materials in manufacturer's original, unopened containers or packages with labels intact and legible.

B. Stack material to prevent twisting, bending, and abrasion, and to provide ventilation. Slope metal sheets to ensure drainage.

C. Prevent contact with materials that could cause discoloration or staining.

PART 2 PRODUCTS

2.1 SHEET MATERIALS

A. Sheet metal material: 0.040" thickness aluminum, 3105-H14 alloy, smooth as per ASTM B209-96. referenced standards for specific applications indicated by IMETCO or approved equal.

2.2 ACCESSORIES

A. Fasteners:
1. Corrosion resistant screw fastener as recommended by metal manufacturer. Finish exposed fasteners same as flashing metal.
2. Fastening shall conform to Factory Mutual 1-90 requirements or as stated on section details, whichever is more stringent.

B. Plastic Cement: ASTM D 4586, Type I.
C. Rust inhibitive primer: Rust-Go Primer by The Garland Company or approved equal.
D. Paint: Rust Go White.
E. Nailers: Douglas fir.
F. Gutter brackets: double thickness of gutter material.
G. Gutter hangers: 0.1” aluminum. Prime and paint to match gutter.
H. Gutter liner: Solarbrite KEE by Commercial Innovations.

2.3 FABRICATION - GENERAL

A. Fabricate in accordance with referenced standards. Form sections true to shape, accurate in size, square, and free from distortion or defects. Form pieces as recommended by SMACNA standard for conditions required.
1. Provide reinforcements and supports as required for secure anchorage.
2. Make joints rigid. Seams mechanically strong and soldered or sealed to make watertight
3. Fabricate corners in one piece with legs extending 30-inches each way to field joint.
   Lap, rivet, and solder or seal corner seams watertight.
4. Turn up "end dam" flanges at ends of opening sill flashing pieces, lap with wall flashing and membranes to shed water.
5. Fabricate cleats of same material as sheet, minimum 3/4 inches wide, interlockable with sheet.
6. Hem exposed edges on underside 1/2 inch; miter and seam corners.
7. Solvent clean all sheet metal. Coat surfaces to be in contact with roofing or otherwise concealed with specified asphaltic paint; 0.015-inch minimum uniform thickness.

B. Form pieces in longest possible lengths.
C. Hem exposed edges on underside 1/2 inch; miter and seam corners.
D. Form material with flat lock seams, except where otherwise indicated. At moving joints, use sealed lapped, bayonet-type or interlocking hooked seams.
E. Fabricate corners from one piece with minimum 18 inch long legs; seam for rigidity, seal with sealant.
F. Fabricate vertical faces with bottom edge formed outward 1/4 inch (6 mm) and hemmed to form drip.

2.4 ROOFTOP EQUIPMENT

A. Sleepers: Portals Plus.

2.5 ROOF-RELATED SHEET METAL AND FLASHINGS

A. Roof-Related Sheet Metal and Flashings: As indicated, as specified in related sections, as required by roofing material manufacturers and referenced standards. Coordinate work of this section with related sections. Provide complete systems without conflict or omission.

PART 3 EXECUTION

3.1 EXAMINATION
A. Verify roof openings, curbs, pipes, sleeves, ducts, and vents through roof are solidly set, reglets in place, and nailing strips located.

B. Verify roofing termination and base flashings are in place, sealed, and secure.

C. Beginning of installation means acceptance of existing conditions.

D. Field measure site conditions prior to fabricating work.

3.2 PREPARATION

A. Install starter and edge strips, and cleats before starting installation.

B. Back paint concealed metal surfaces with protective backing paint to a minimum dry film thickness of 15 mil.

3.3 INSTALLATION

A. Install work watertight, without waves, warps, buckles, fastening stress, or distortion, allowing for expansion and contraction. Conform to referenced standards. Make metal joints watertight.

B. Fastening of metal to walls and wood blocking shall comply with SMACNA Architectural Sheet Metal Manual, Factory Mutual 1-90 wind uplift specifications and/or manufacturer's recommendations whichever is of the highest standard.

C. All accessories or other items essential to the completeness of sheet metal installation and water tight envelope of the building, whether specifically indicated or not, shall be provided.

D. Reglets: Install in accordance with manufacturer’s installation instructions.

E. Metal fascia and copings shall be secured to wood nailers at the bottom edge with a continuous cleat. Cleats shall be at least one gauge heavier than the metal it secures.

F. Install Sheet Membrane Waterproofing at closure flanges, under metal copings, caps and platforms; fully adhered, free of voids, blisters and buckling; roll as soon as practical following layout. Minimize exposure time to that period recommended by the manufacturer.

G. Flashing: Joints at 10-foot maximum spacing and at 2-1/2-feet from corners. Butt joints with 3/16-inch space centered over matching 8-inch long backing plate with sealer tape in laps.

H. Flanged flashings and roof accessories: Set on continuous sealer tape. Nail flanges through sealer tape and at 3-inch maximum spacing.

I. Isolate metal from dissimilar metal with 2 coats of specified asphaltic paint, sealer tape or other approved coating, specifically made to stop electrolytic action. Use only stainless steel fasteners to connect isolated dissimilar metals.

J. Joints, fastenings, reinforcements and supports: Sized and located as required to preclude distortion or displacement due to thermal expansion and contraction. Conceal fastenings wherever possible.

K. Secure flashings in place using concealed fasteners. Use exposed fasteners only where permitted.

L. Flexible Flashing Installation:
   1. Prime substrates as recommended by flexible flashing manufacturer, allow to dry.
   2. Install flexible flashings in maximum feasible lengths to minimize lap joints.
   3. Peel release paper from roll to expose rubberized asphalt and position flashing to center over joint location before applying. Move along opening or joint, being careful to put flashing as evenly as possible over the opening. Avoid fishmouths.
   4. Press flashing firmly into place with heavy hand pressure. Ensure continuous and intimate contact with substrate.
   5. If wrinkles develop, carefully cut out affected area and replace as outlined above.
   6. Apply plastic cement compound between metal flashings and felt flashings.
N. Fit flashings tight in place. Make corners square, surfaces true and straight in planes, and lines accurate to profiles.

O. Seal prefinished metal joints watertight.

P. Solder other metal joints for full metal surface contact. After soldering, wash metal clean with neutralizing solution and rinse with water.

Q. Connect downspouts and rain water leaders to storm sewer system. Seal connection watertight.

3.4 FIELD QUALITY CONTROL

A. Inspection will involve surveillance of work during installation to ascertain compliance with specified requirements.

B. Tolerances
   1. Exposed surfaces: Free of dents, scratches, abrasions, or other visible defects; clean, ready for painting.
   2. Set flashings and sheet metal to straight, true lines with exposed faces aligned in plane as indicated.

3.5 SHOP FABRICATED SHEET METAL

A. Installing Contractor shall be responsible for determining if the sheet metal systems are in general conformance with roof manufacturer's recommendations.

B. Metal work shall be shop fabricated to configurations and forms in accordance with recognized sheet metal practices.

C. Hem exposed edges.

D. Angle bottom edges of exposed vertical surfaces to form drip.

E. All corners for sheet metal shall be lapped with adjoining pieces fastened and set in sealant.

F. Joints for gravel stop fascia system, cap flashing, and surface-mount counterflashing shall be formed with a 1/4" opening between sections. The opening shall be covered by a cover plate or backed by an internal drainage plate formed to the profile of fascia piece. The cover plate shall be embedded in mastic, fastened through the opening between the sections and loose locked to the drip edges.

G. Install sheet metal to comply with Architectural Sheet Metal manual, Sheet Metal and Air Conditioning Contractor's National Associations, Inc.

END OF SECTION
Addendum 1: Attachment 2 - Roof Plan and Details
College of Marin
Indian Valley Campus
Pool/Shower Roofing
Addendum 1:
Attachment 3 - Electrical Layout

ELECTRICAL CONDUIT MAP
CONDUIT NESTED IN INSULATION
Typical of two buildings