1.01 DESCRIPTION OF WORK

A. It is the intent of the specification that the new work will provide a watertight facility. The attached specifications describe the minimum acceptable standards of construction and finish.

B. Provide a white Elvaloy® based thermoplastic fleece backed sheet roof system as indicated in these specifications for the Houston Community College System Facility known as Katy Campus. The roof shall be installed in accordance with the attached specifications and in strict accordance with the manufacturer's recommended procedures.

1.02 CHANGES

A. Changes to specifications and drawings will not be acceptable unless approved in writing by the manufacturer and the Owner.

1.03 TAXES

A. Except as otherwise provided in the Contract Documents the Contract Price includes all applicable federal, state and local taxes. The purchase, lease, rental, storage, use or other consumption of tangible personal property, for the performance of this Contract by the Contractor, is exempted from state and local sales tax pursuant to the provisions of Article 20.04 (Y) of the Texas Limited Sales Excise and Use Tax Act. To claim the benefit of this exemption, the Contractor must comply with such procedures as may be prescribed by the State Comptroller of Public Accounts.

1.04 WORKING TIME

A. A working day is defined as a calendar day, not including Saturdays, Sundays, or legal holidays, in which weather or other conditions not under the control of the company will permit the performance of the principal units of work underway for a continuous period of not less than seven (7) hours between 6:00 A.M. and 6:00 P.M. For every Saturday on which the company chooses to work, one day will be charged against the working time when weather conditions will permit seven (7) hours of work as delineated above. A principal unit of work shall be that unit which controls the completion time of the agreement. Nothing in this item shall be construed as prohibiting the company from working on Saturdays if it so desires.

1.05 INSPECTION

A. An inspection shall be made by a representative of the material manufacturer of the completed project to ensure that said project was installed in accordance with the manufacturer's specifications and illustrated details. Upon this approval of the project, the specified warranty or warranties shall be written.

1.06 BASE PROPOSAL

A. The Contractor will furnish all labor and materials, and all of the collective costs applicable will be shown as a total Base Proposal costs.

1.07 QUALITY ASSURANCE

A. All work and materials hereinafter specified shall be best of kind described and, unless specified otherwise, shall be new and of best quality. The specified roofing system shall have been used successfully in the United States for a minimum of ten (10) years.

B. All materials will be securely fastened in place in a watertight, neat and workmanlike manner. All workmen shall be thoroughly experienced in the particular class of work upon which employed. All work shall be done in accordance with these specifications and shall meet the approval in the field of the Owner's representative. Contractor's representative and/or job supervisor shall have a complete copy of specifications and drawings on job site at all times.

C. Contractor shall plan and conduct the operations of the work so that each section started on one day is complete, details installed and thoroughly protected before the close of work for that day.

D. Where any material is specified by proprietary name, trade name, name of manufacturer, generic name, or catalog number with the addition of such expressions as "or equal"/"or approved equal", it is understood that the material named is intended and no substitution will be allowed without written approval by the Owner's representative three (3) calendar days prior to proposal due date.

E. Should a specified material not be available, a substitution shall require approval (in writing) of the Owner's representative and the roof system manufacturer issuing the warranty before being utilized on this project.

F. Unless otherwise indicated, the materials to be used in this specification are those specified and denote the type, quality, performance, etc. required. All proposals shall be based upon the use of specified material.

G. A Contractor who proposes to quote on the basis of an "or equal"/"or approved equal" alternate material or system shall submit to the Owner's representative the following information, at least five (5) calendar days prior to scheduled proposal opening. Only one request for substitution will be considered for each material or system. When substitution is not accepted, specified product or system shall be used.
   1. A one (1) gallon sample of any adhesive, coating, mastic, or sealant and a three foot by five foot (2' x 2') sample of any sheeting or rolled goods as may be specified.
   2. A certificate from an accredited testing laboratory comparing the physical and performance attributes of the proposed material with those of the specified materials.
   3. A list of at least three (3) local jobs where the proposed alternate material was used under similar conditions and written documentation showing successful installation in the United States of similar size and scope for a minimum of ten (10) years. These jobs must be available for inspection by the Owner's representative.
   4. In the event a substitution is acceptable by the Owner, all contractors shall be notified of the acceptable alternate within three (3) calendar days prior to proposal opening.

5. During the course of work, the Owner's representative may secure from the containers at the job site, samples of the materials being used and submit the samples to an independent testing laboratory for comparison. If the results of the independent testing laboratory prove that the materials are not comparable and equal to the specified materials, the Contractor shall pay for the testing and the Owner reserves the right to reduce the amount of the proposal by twenty percent (20%) if all work has already been completed before the test results become known. If the contract work is not completed when the test results become known, the Owner shall impose a penalty in proportion to the amount of work already completed, and all remaining work shall be completed with the specified materials.

H. Application of materials shall be in strict accordance with the manufacturer's recommendations. In the instance of a conflict between these specifications and those of the manufacturer, the most stringent shall take precedence.

I. Roofing system manufacturer shall have approval for FM Global wind uplift requirements and shall meet Underwriter's Laboratory fire rating.

J. Roof system shall be installed in accordance with FM Global requirements.

1.08 PROCEDURE FOR USE OF SUBSTITUTION REQUEST FORM

A. Substitution request **including all required documentation** must be delivered to the Owner's Representative's office no later than the date indicated in the specifications. Requests submitted late will not be considered.

B. The Individual or Firm requesting a substitution must document that the requested substitution is equal or superior to the specified product. Failure to provide clear, accurate, and adequate documentation will be grounds for rejection.

C. Required documentation shall consist of applicable information which would aid the Architect in making an informed decision. Include **side by side product comparisons**, technical data, laboratory test results, product drawings, etc.

D. If use of the proposed product would result in changes to the design of the building, the submittal shall describe fully the changes required to the drawings or specifications. Any cost differences resulting from modifications to the drawings and specifications and the cost of making the changes shall be borne by the Product Supplier.

E. **No** product will be considered "as equal" to the product specified until it has been included as an allowable substitution, in a written Addendum to the project.

1.09 EXAMINATION OF PREMISES

A. Before submitting proposals for his work, each contractor shall be held to have examined the premises and satisfied himself as to the existing conditions under which he will be obliged to work.

1.10 PROTECTION OF WORK AND PROPERTY

A. Work: The contractor shall maintain adequate protection of all his work from damage and shall protect the Owner's and adjacent property from injury or loss arising from this contract. He shall provide and maintain at all times any OSHA required danger signs, guards, and/or obstructions necessary to protect the public and his workmen from any dangers inherent with or created by the work in progress. All federal, state, and city rules and requirements pertaining to safety and all EPA standards, OSHA standards, NESHAP regulations pertaining to asbestos as required shall be fulfilled by the contractor as part of his bid.

B. Property: Protect existing planting and landscaping as necessary or required to provide and maintain clearance and access to the work of this contract. Examples of two categories or degrees of protection are generally as follows:
1. Removal, protection, preservation, or replacement and replanting of plant materials.
2. Protection of plant materials in place, and replacement of any damage resulting from the contractor's operations.

C. Twenty-four Hour Call: The contractor shall have personnel on call twenty-four (24) hours per day, seven (7) days per week for emergencies during the course of a job. The Owner's project manager is to have the twenty-four (24) hour numbers for the contact. Contractor must be able to respond to any emergency call and have personnel on-site within two (2) hours after contact. Numbers available to the Owner's project manager are to be both home and office numbers for:
1. Job Foreman
2. Job Superintendent
3. Owner or Company Officer

1.11 PROTECTION OF PERSONS AND PROPERTY

A. Safety Precautions and Programs: The contractor shall be responsible for initiating, maintaining and supervising all safety precautions and programs in connection with the performance of the Contract.

B. Safety of Persons and Property: The contractor shall take reasonable precautions for safety of, and shall provide reasonable protection to prevent damage, injury or loss to:
1. Employees on the work and other persons who may be affected thereby.
2. The work, materials and equipment to be incorporated therein, whether in storage on or off the site, under care, custody or control of the contractor or the contractor’s Subcontractors or Sub-subcontractors.
3. Other property at the site or adjacent thereto, such as trees, shrubs, lawns, walks, pavements, roadways, structures and utilities not designated for removal, relocation or replacement in the course of construction.

C. The contractor shall give notices and comply with applicable laws, ordinances, rules, regulations and lawful orders of public authorities bearing on safety of persons or property or their protection from damage, injury or loss.

D. The contractor shall erect and maintain, as required by existing conditions and performance of the contract, reasonable safeguards for safety and protection, including posting danger signs and other warnings against hazards, promulgating safety regulations and notifying owners and users of adjacent sites and utilities.

E. The contractor shall comply to all OSHA requirements and any other local, state or federal regulations pertaining to protection and safety of persons or property.

F. The contractor and all Subcontractors shall take all necessary precautions to keep the premises free of fire and safety hazards. The contractor shall prevent all agents, employees, licensees and invitees of the contractor from smoking on the Owner's premises and from operating or using any flame, sparks or explosion hazard producing devices anywhere on or about the premises without the written approval of the Owner's representative.

G. The contractor shall designate a responsible member of the contractor's organization at the site whose duty shall be the prevention of accidents. This person shall be the contractor's superintendent unless otherwise designated by the contractor in writing to the Owner's representative.

H. The contractor shall not load or permit any part of the construction or site to be loaded so as to endanger its safety.

1.12 PRE-CONSTRUCTION CONFERENCE

A. A conference shall be scheduled by the Owner's representative and conducted at the work site prior to start of work. The Contractor's project supervisor or foreman and the Owner's representative shall attend. Job schedule, submittals, existing conditions, and specifications shall be reviewed and any questions arising shall be resolved to the satisfaction of all parties prior to start of work. Contractor shall begin work within five (5) calendar days following Owner's signing of contract and/or issuance of the written notice to proceed with work, weather permitting.

1.13 SUBMITTALS

A. Upon receipt of Notice of Acceptance of this proposal, the Contractor shall submit the following items. All submittals shall be submitted to the Owner/Owner's representative within ten (10) calendar days of the date on the Notice of Acceptance and prior to the award of contract.
   1. Contractor's executed insurance certificate.
   2. Material manufacturer's approval/acceptance of the specifications and details as written or noted for this project, fastener pattern layout, insulation, fasteners and all related materials.
   3. Contractor's executed payment and performance bonds as required.
   4. Shop drawings of all perimeter and projection details, and sheet metal details approved by manufacturer, for Owner's approval if proposed details differ from those included with this proposal package. These drawings shall be approved by the membrane manufacturer and submitted at the preconstruction conference for Owner review and approval prior to work start.
   5. Approved applicator must submit a roof drawing which will be employed in the project if proposed drawing differs from that included with this proposal package.
   6. Shop Drawings and Product Data:

a) Manufacturer's Details: All termination details and other details normally required by the membrane manufacturer's Technical Specifications, including both standard details and special details, shall be furnished by the Contractor and shall be approved in writing by the manufacturer, the company project manager, and the Owner's representative prior to final installation.
b) Date and mark shop drawings to show name of project, Owner, Contractor, origination Subcontractor, manufacturer or supplier, and separate details as pertinent.
c) Shop drawings shall completely identify specification sections and locations at which materials or equipment are to be installed.
d) Minimum drawing size shall be eight and one-half inches by eleven inches (8-1/2" x 11").
e) Submit sufficient copies of manufacturer's descriptive data including catalog sheets for materials, equipment and fixtures, showing dimensions, performance characteristics and capacities, diagrams and controls, schedules, and other pertinent information required.
f) Submit brochures and other submittal data that cannot be reproduced economically, in such quantities to allow the Owner to retain four copies of each after review. Mark product data to show the name of project, Owner, Contractor, originating Subcontractor, manufacturer or supplier, and separate details if pertinent.
g) Product data shall completely identify specification sections and locations at which materials or equipment are to be installed.
h) Accompany each submittal with a separate transmittal letter in duplicate, containing date, project title and number, Contractor's name and address, number of each shop drawing, product data and samples submitted, and notification of deviations from Contract Documents.
i) Three sets of prints from the final sepias will be returned to the Owner for record. The cost of printing all sepias and all prints is the responsibility of the Contractor.

7. Detailed project sequencing, staging, material loading, manpower plans, and detailed project construction schedule for approval.
8. Sample of warranty that is to be issued upon project completion.
9. Submit list of all mechanical, electrical, rigging, sheet metal, and other Subcontractors with evidence of Subcontractor's insurance coverage in compliance with contract requirements.
10. Project superintendent's resume and project experience list for proposed system.
11. Contractor shall submit written statement that their company or any Subcontractor they may use is not employing workers classified as undocumented workers on this project.
12. Samples of all materials not supplied or prior approved by the roofing membrane manufacturer shall be submitted to the manufacturer for written approval prior to installation start.

1.14 USE OF PREMISES

A. The Contractor is advised that the Owner will occupy the building at all times, and the Contractor must provide all safeguards required to protect personnel and to keep noise levels as low as reasonably possible for each operation.

B. The Contractor shall:
1. Coordinate work in such a manner as to not interfere with the normal operation of the building.

2. Assume full responsibility for protection and safekeeping of products stored on premises.
3. Agree to hold the Owner harmless in any and all liability of every nature and description that may be suffered through bodily injuries, including death of any persons by reason of negligence of the Contractor, agents, employees, or Subcontractors.
4. The Contractor and all Subcontractors shall take all necessary precautions to prevent the use of alcoholic beverages on the Owner's premises.

C. Temporary Sanitary Facilities:
1. The contractor shall furnish and maintain temporary sanitary facilities for employees use during this project, including temporary toilets, wash facilities, and drinking water fixtures.
2. Toilet units shall be self-contained, single-occupant, of the chemical, aerated recirculation, or combustion type, properly vented and fully enclosed with a glass fiber reinforced polyester shell or similar nonabsorbent material.
3. Facilities shall be installed where they will best service the project's needs, with Owner's/Owner's Representative's approval.
4. Contractor shall provide toilet tissue, paper towels, paper cups, and similar disposable materials for each facility. Provide covered waste containers for used material.
5. All portable facilities shall comply with local laws, codes, and regulations.
6. Contractor shall be responsible to see that the units are removed in a timely manner after the completion of the project.

1.15 SAFETY

A. The contractor and all Subcontractors shall take all necessary precautions to keep the premises free of fire and safety hazards. The contractor shall prevent all agents, employees, licensees and invitees of the contractor from smoking on the Owner's premises and from operating or using any flame, spark or explosion hazard producing devices anywhere on or about the premises without the written approval of the Owner's representative.

1.16 INSPECTION OF WORK IN PROGRESS

A. The Owner's representative will require the material manufacturer's representative to periodically examine the work in progress, as well as on completion, in order to assist in ascertaining the extent the materials and labor procedures conform to the requirements of the specifications.

B. The authorized material manufacturer's field representative shall be responsible for:
1. Keeping the Owner's representative informed after periodic inspections as to the progress and quality of the work observed.
2. Calling to the attention of the Contractor those matters observed which are considered to be in violation of the contract requirements.
3. Reporting to the Owner's representative, in writing, any failure or refusal of the Contractor to correct unacceptable practices called to his attention.
4. Confirming, after completion of the work and based on his observation and test, that he has observed no application procedures in conflict with these specifications. Final payment will not be released until all specified warranties have been received by the Owner.

1.17 FIELD INSPECTION AND CONTRACTOR RESPONSIBILITY

A. The Owner's representative shall at all times have access to the job site and work areas. The Contractor will provide proper and safe facilities for such access and inspection.

B. Any time during the course of the project, an inspection may be deemed necessary by the Owner/Owner's representative to have one or all of the following members of the Contractor's organization present in person to inspect the work along with the Owner/Owner's representative: Owner, a Majority Stockholder, President and/or Chief Executive Officer of the contracting firm.

C. The Owner/Owner's representative, if deemed necessary, will notify in writing who in the Contractor's organization they want to inspect the work on the roof in addition to the Contractor's normal inspection. If the designated person or persons requested by the Owner/Owner's representative fails to respond within forty-eight (48) hours to the request, the work may be suspended, payment withheld and/or liquidated damages outlined in the specifications assessed until such time the individual(s) inspect(s) the work with the Owner/Owner's representative.

D. Neither the presence nor absence of the Owner's representative nor the manufacturer's representative, nor an inspection by the manufacturer of the work or operation of the Contractor, nor any failure by the manufacturer to detect, pinpoint, or object to any defect in the work completed, nor any deviation from these specifications, nor the acceptance by the manufacturer of any such defect or the approval of the manufacturer of any such deviation shall relieve the Contractor, or reduce, or in any way limit or divide, his full responsibility for the full performance of the work required of him under these specifications.

E. It shall be understood that such field inspection as the Owner's representative may cause to be performed by the material manufacturer will be performed by the material manufacturer solely for the benefit of the Owner and in an attempt to assist with the requirements of this specification. These requirements bind the Contractor even without such inspection.

F. No inspection or any act or omission of either the Owner's representative or the manufacturer's representative in connection with such inspection shall prejudice the Owner's right to strict conformance, or under any circumstances be construed to excuse or mitigate any mistake or non-conformance by the Contractor.

1.18 ON-SITE SUPERVISION

A. The Contractor is responsible for the management and control of the work. He shall give his personal superintendence of the work or have a competent resident manager or superintendent satisfactory to the Owner on the job site at all times while work is in progress, with full authority to act for the Contractor as his agent.

1.19 CHANGES OR EXTRA WORK

A. No change or addition shall be made except upon receipt by the Contractor of a signed order from the Owner authorizing such a change. No claims for an extra to the contract price shall be valid unless so authorized.

1.20 ROOFTOP EQUIPMENT

A. All equipment shall be moved by the roofing Contractor as required to install roofing materials complete and in accordance with the plans and specifications. When units or equipment are to be moved, they shall be disconnected and moved by the roofing Contractor to a protected area so as not to damage any part or component thereof, and shall be reset by the roofing Contractor and reconnected at the Contractor's expense, all according to local building codes. All disconnection and reconnection shall be performed by a mechanical and/or electrical company licensed to perform such work.

B. Where mechanical items, conduits, cables, raceways, piping or any other roof-top mounted item must be moved in any manner, or disconnected and reconnected as made necessary by the reroofing of the specified areas at the facility, all roof-top equipment, piping, insulation, wires, fiber optic cable, any information systems components, conduits, panels, motor starters, raceways, switches, antennas, satellite components, etc. shall be replaced or renewed to match existing if damaged by Contractor. NOTE: It is the responsibility of the Contractor to review the condition of any and all of the above noted, or similar, items with authorized Owner personnel to determine condition of said items PRIOR TO START OF WORK. If this review is not completed as prescribed, any and all damage found at the end of the work will be repaired solely at the contractor's expense.

C. Any action by roofing contractor personnel which causes interruption of the ongoing works of the Owner's facility will be repaired at the sole expense of the roofing contractor. Upon interruption of the Owner's ability to meet required tasks, Owner may immediately, and without the contractor's permission, take such action as necessary to repair said damage so that the Owner's work may be resumed. The Owner has the obligation to notify the contractor of such action as soon as possible, but in all cases must notify the contractor in writing within 48 hours of the occurrence of the incident.

1.21 FINAL INSPECTION

A. Upon job completion, a final inspection will be made by Owner's representative. Final payment will not be authorized for the work done until such inspection has been made and all work is found to have been performed in accordance with the specifications and to the satisfaction of the building Owner, and the specified warranties are issued.

B. The Contractor shall promptly remove any work that does not meet the requirements of the plans and specifications or is incorrectly installed or otherwise disapproved by the Owner as failing to meet with the plans and specifications. The Contractor shall promptly replace any such work without expense to the Owner and shall bear the cost of making good all work of other contractors or the Owner, destroyed or damaged by such removal or replacement.

1.22 WAGES AND OVERTIME

A. Overtime: Work that the Contractor performs on overtime for the Contractor's benefit is not billable to the Owner. The work that the Owner requests in writing to be performed during off hours is billable to Owner by the Contractor at the rate as proposed under unit cost.

B. Wage Rates:

1. Requirements:

a) Pay not less than the minimum wage scale and benefits indicated on the "Minimum Wage Schedule" provided herein.

b) Wages listed are minimum rates only.

c) No claims for additional compensation will be considered by the Owner because of payments of wage rates in excess of the applicable rate contained herein.

2. Applicable Statutes: Vernon's Civil Statutes, Section 2 of Article 5159a, which states as follows:

"...The Contractor shall forfeit as a penalty to the State, County, City and County, City, Town, District or other political subdivision on whose behalf the contract is made or awarded, ten dollars ($10.00) for each laborer, workman or mechanic, for each working day, or portion thereof, such laborer, workman or mechanic is paid less than the said stipulated rates for any work done under said contract, by him, or by any Subcontractor under him, and the public body awarding the contract shall cause to be inserted in the contract a stipulation to this effect..."

3. Payroll: In compliance with Article 5159a, Sections 2 and 3, of the Revised Civil Statute referenced above, the Owner reserves the rights as defined by Section 3 which states as follows:

"Sec. 3. The Contractor and each Subcontractor shall keep, or cause to be kept, an accurate record showing the names and occupations of all laborers, workmen and mechanics employed by him, in connection with the said public work, and showing also the actual per diem wages paid to each of such workers, which record shall be open at all reasonable hours to the inspection of the public body awarding the contract, its officers and agents."

4. Minimum Wage Rates:

a) Pay prevailing basic wage listed, plus any applicable fringe benefits.

PREVAILING WAGE SCALE NOTICE

i. Prevailing wages shall not be construed to prohibit the payment of more than the rates named. Under no condition shall any laborer, workman or mechanic employed on this job be paid less than the minimum wage scale.

ii. In execution of this contract, the Contractor must comply with all applicable state and federal laws, including, but not limited to, laws concerned with labor, equal employment opportunity, safety, and minimum wage.

iii. The following wage rates have been represented to the Owner as being relatively current and accurate. Anyone knowing these wage rates to be in error shall bring this to the attention of the Owner's representative so an Addendum can be issued, if the new rates can be substantiated. The Owner and Owner's representative shall not be held responsible for errors in these wage rates.

b) Basic Rates:

Classification (Trade/Craft)	Basic Wage Rates
Asbestos Worker/Insulator (Including Application of All Insulating Materials, Protective Coverings, Coatings and Finishing to All Type of Mechanical Systems)	$ 20.75
Boilermaker	23.14
Carpenter (Including Acoustical Ceiling Work)	22.50
Electrician (Including Pulling Wire and Low Voltage Wiring and Installation of Fire Alarms, Security Systems, Telephones, and Computers)	27.65
Elevator Mechanic	38.52
Plasterer	19.42
Plumbers (Excluding HVAC Pipe)	31.30
Pipefitters (HVAC Pipe Only)	29.39
Sprinkler Fitter (Fire Sprinklers)	25.40
Sheet Metal Worker (Including HVAC Duct and System Installation)	25.67
Asbestos Abatement Worker (Ceilings, Floors, and Walls Only)	17.27
Bricklayer	18.87
Cement Mason/Concrete Finisher	13.93
Drywall Finisher/Taper	16.27
Drywall Hanger, Including Metal Studs Installation	17.44
Formbuilder/Formsetter	12.77
Glazier	22.02
Insulator-Batt and Foam	14.87
Ironworkers:	
Reinforcing	12.14
Structural	22.02
Laborers:	
Common	11.76
Mason Tender (Brick)	13.47
Mason Tender (Cement)	10.48

Pipelayer	12.92
Plaster Tender	12.94
Lather	1973
Painter (Brush, Roller and Spray)	17.24
Pipefitters (Excluding HVAC Pipe)	29.39
Power Equipment Operator:	
Asphalt Paver	16.03
Backhoe	13.94
Crane	34.85
Forklift	16.00
Slab and Wall Saw	16.03
Roofer	15.40
Tile Finisher	12.00
Tile Setter	16.17
Truck Driver	14.18

Welders: Receive rate prescribed for craft performing operation to which welding is incidental.

c) Apprentice Pay - All Trades and Crafts: The minimum rate for apprentices shall be in accordance with the scale determined by an approved apprenticeship program or $1.00 per hour less than journeyman's rates, whichever is lower. An approved apprenticeship program is one approved by the U.S. Department of Labor, Bureau of Apprenticeship Training, and only apprentices enrolled in an approved program may be paid apprenticeship rates.

d) Base Per Diem Rate: Hours worked per day, times base hourly rate.

e) Multipliers for Overtime Rates:
   i. Over 40 hours per week: Base hourly rate times 1.5.
   ii. Holidays: Base hourly rate times 1.5.

1.23 PERMITS

A. The Contractor shall obtain and pay for all permits required, give all legal notices and pay all fees required for the work. Contractor shall comply with all ordinances and laws. Any and all work done which does not meet requirements of any local authorities must be properly redone, and incidental work replaced by the Contractor, without cost to the Owner.

1.24 SUBCONTRACTING OF WORK

A. The Owner shall have the right to accept or reject the use of any subcontractor. The Contractor shall submit a list of proposed Subcontractors with his proposal.

1.25 REJECTION OF PROPOSALS

A. The Owner reserves the right to reject any one or all proposals, to waive any formalities or irregularities, and to award the contract in the best interest of the College System.

1.26 SELECTION CRITERIA FOR QUALIFYING ROOFING PROPOSALS

A. It is not the policy of the Houston Community College System to purchase on the basis of low price alone. In evaluating proposals submitted, HCCS has the right under the Texas Education Code, Section 44, to take several items into consideration before entering into a contract. These considerations can include, but are not limited to:
   1. Specified physical properties of the materials/membrane utilized.
   2. Total proposal price.
   3. Suitability for the intended use.
      a) Proposed system shall follow NRCA guidelines and the system manufacturer's published specifications, and be installed in accordance with governing building codes, FM Global, Underwriter's Laboratories, SMACNA, etc.
      b) Is lap integrity dependent upon: 1) hot-air fusion monolithic weld, membrane to membrane;
      c) To substantiate Quality Assurance, please submit:
         i. Sample of field report.
         ii. Number of weekly jobsite visits to be performed.
         iii. Sample of job manifest.
      d) Warranty Comparison
         i. Warranty must be provided by manufacturer of membrane.
         ii. Submit disclaimers that affect proposed warranty. Does the published warranty list an exclusion for hail; i.e., is the warranty voided by hail? If there is no disclaimer in the published warranty, submit documentation stating what size hail the system is warranted up to, including historical supporting data and testing.
         iii. Submit documentation stating who is responsible for maintaining the integrity of laps in proposed system after contractor warranty expires.
         iv. Submit documentation to designate what specifically constitutes Owner's responsibilities concerning roof maintenance and what maintenance is specifically manufacturer's responsibility.
         v. Submit documentation stating that standard warranty shall cover all base flashing, parapet wall flashing, and top of parapet wall flashing.
   4. Attendance at Pre-Proposal Conference
   5. Probability of continuous availability and total long-term prices to acquire the vendor's goods and services.
   6. The reputation of the vendor and the vendor's goods and services.
   7. The quality of the vendor's goods and services.
   8. The extent to which the goods or services meet the HCCS needs.
   9. The vendor's past relationship and past performance with HCCS.
   10. Date of proposed delivery and placement.
   11. Safety record of vendor.
   12. Financial and technical resources of contractor adequate to service contract.
   13. Any relevant factor that a private business entity would consider in selecting a vendor.
   14. Qualification of insurance and bonds.

1.27 ADDENDA

A. Any verbal statement or inference prior to the proposal opening regarding modification of specifications is invalid unless so stated on an officially issued addendum.

1.28 DEMOLITION

A. All abandoned pitch pans, equipment, vents, curbs, and other such debris shall be removed by the Contractor. Abandoned items that require deck placement shall be marked by the Owner prior to proposal due date and/or the commencement of work. Contractor shall install new decking of like dimensions to provide a suitable substrate in areas where penetrations through the deck are removed.

1.29 CREWS AND EQUIPMENT

A. Contractor shall provide sufficient crews and equipment so that the project may progress without interruption or unnecessary delay.

1.30 FUTURE REPAIRS

A. Contractor certifies by acceptance of this project that any future repairs or alterations he might be called upon to execute after the project is complete, will be performed in accordance with the manufacturer's recommended procedures so as to not void the warranty.

1.31 NAILERS AND ROOF DECK

A. Contractor shall notify the Owner's representative of unforeseen areas of damaged decking. Where the damage is serious and extensive, it will be the Owner's prerogative to authorize removal and replacement.

B. Any areas of unusual deck deflection noticed by the Contractor during the course of the job that will cause an area of ponding water should be brought to the attention of the Owner's representative by the Contractor.

1.32 CONTRACT DOCUMENTS

A. In the event of a conflict between the reroofing specifications and the Owner's contract documents, the Owner's contract documents shall take precedence.

END OF SECTION 01100

SECTION 07535
FULLY ADHERED MULTI-PLY ROOF SYSTEM

PART 1 - GENERAL

1.01 AREAS COVERED

A. ALL ROOF AREAS

1.02 INSTALLER QUALIFICATIONS

A. Roofing Installer must be:
1. Currently prequalified with the Owner in accordance with Owner's prequalification requirements.
2. Currently in good standing with the manufacturer.

B. It shall remain each Contractor's responsibility to determine his current status with the manufacturer's certification plan.

1.03 QUALITY ASSURANCE

A. Applicator/Installer:
1. Acceptable to roof material manufacturer for the manufacturer's warranty requirements.
2. Five (5) years successful experience on projects similar in size and scope.
3. Experienced in the type of roofing work required.
4. Successfully completed previous projects warranted by the manufacturer.

B. Testing Laboratory Services: Test results shall meet or exceed established standards.

C. Underwriters Laboratories, Inc.; Roofing Covering: Class A fire hazard classification.

D. Comply with governing local, state, and federal regulations, safety standards, and codes.

1.04 REFERENCES (INCLUDING LATEST REVISIONS)

A. American Society for Testing and Materials:
1. ASTM B 209 - 90, Specification for Aluminum and Aluminum Alloy Sheet and Plate
2. ASTM C 719 - 86, Test Method for Adhesion and Cohesion of Elastomeric Joint Sealants Under Cycle Movement (Hockman Cycle)
3. ASTM C 794 - 80 (1986), Test Method for Adhesion-in-Peel of Elastomeric Joint Sealants
4. ASTM C 920 - 87, Specification for Elastomeric Joint Sealants
5. ASTM D 312 - 89, Specification for Asphalt Used in Roofing
6. ASTM D 1863 - 86, Specification for Mineral Aggregate Used on Built-up Roofs
7. ASTM D 2178 - 89, Specification for Asphalt Glass Felt Used in Roofing and Waterproofing
8. ASTM D 2824 - 85, Specification for Aluminum - Pigmented Asphalt Roof Coatings
9. ASTM D 4586 - 86, Specification for Asphalt Roof Cement, Asbestos Free
10. ASTM A 361 - 90, Sheet Steel, Zinc-Coated (Galv.) by the Hot-Dip Process for Roofing and Siding

11. ASTM C 177, Test for Thermal Laboratory Services
12. ASTM C 728, Perlite Thermal Insulation Board

B. Federal Specifications:
1. LLL-I-535B
2. SS-A-701B
3. SS-C-153
4. SS-C-153C
5. SS-R-620B
6. TT-C-498C
7. TT-P-320D
8. TT-S-00227E
9. TT-S-00230C
10. SS-S-001534 (GSA-FSS)
11. L-P-375

C. Industry Standards:
1. The National Roofing Contractors Association (NRCA) - Roofing and Waterproofing Manual
2. Single-ply Roofing Institute (SPRI) - A Professional Guide to Specifications Manual
3. Sheet Metal and Air Conditioning Contractors National Association (SMACNA) - Architectural Sheet Metal Manual

1.05 SUBMITTALS

A. Samples and Manufacturer's Submittals: Submit prior to delivery or installation.
1. Samples of all roofing system components including all specified accessories.
2. Submit samples of proposed warranty complete with any addenda necessary to meet the warranty requirements as specified.
3. Submit latest edition of manufacturer's specifications and installation procedures. Submit only those items applicable to this project.
4. A written statement from the roofing materials manufacturer approving the installer, specifications and drawings as described and/or shown for this project and stating the intent to guarantee the completed project.
5. Manufacturer's Equiviscous Temperatures (EVT) for the specified bitumens.

B. Shop Drawings: Provide manufacturer's approved details of all perimeter conditions, projection conditions, and any additional special job conditions which require details other than indicated in the drawings.

C. Maintenance Procedures: Within ten days of the date of Substantial Completion of the project, deliver to the Owner three copies of the manufacturer's printed instructions regarding care and maintenance of the roof.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Deliver materials in manufacturer's original, unopened containers and rolls with all labels intact and legible including labels indicating appropriate warnings, storage conditions, lot numbers, and usage instructions. Materials damaged in shipping or storage shall not be used.

B. Deliver materials requiring fire resistance classification to the job with labels attached and packaged as required by labeling service.

C. Deliver materials in sufficient quantity to allow continuity of work.

D. Handle and store material and equipment in such a manner as to avoid damage. Liquid products shall be delivered sealed, in original containers.

E. Handle rolled goods so as to prevent damage to edge or ends.

F. Select and operate material handling equipment so as not to damage existing construction or applied roofing.

G. Moisture-sensitive products shall be maintained in dry storage areas and properly covered. Provide continuous protection of materials against wetting and moisture absorption. Store roofing and flashing materials on clean raised platforms with weather protective covering when stored outdoors.

H. Store rolled goods on end.

I. Protect materials against damage by construction traffic.

J. The proper storage of materials is the sole responsibility of the contractor and any wet or damaged roofing materials shall be discarded, removed from the project site, and replaced prior to application.

K. Comply with fire and safety regulations, especially with materials which are extremely flammable and/or toxic. Use safety precautions indicated on labels.

L. Products liable, such as emulsions, to degrade as a result of being frozen shall be maintained above 40° F in heated storage.

M. No storage of materials shall be permitted on roof areas other than those materials that are to be installed the same day.

1.07 SITE CONDITIONS

A. Job Condition Requirements:
   1. Apply roofing in dry weather.
   2. Do not apply roofing when ambient temperature is below 40° F (4° C).
   3. Coordinate the work of the contractor with the work to be performed by the Owner's personnel, to ensure proper sequencing of the entire work. The Owner's personnel will be erecting interior protection for equipment, if required. The contractor is to schedule his work so that adequate time is allowed for the Owner’s personnel to perform the work. No roof work shall be performed until the Owner’s personnel have completed erection of the interior protection in that area.
   4. Proceed with roofing work only when weather conditions are in compliance with manufacturer's recommended limitations, and when conditions will permit the work to proceed in accordance with specifications.
   5. Schedule the work so the building will be left watertight at the end of each day. Do not remove more roofing material than can be reinstalled in any working day.

6. All surfaces to receive new roofing shall be smooth, dry, and free from dirt, debris, and foreign material before any of this work is installed. Competent operators shall be in attendance at all times equipment is in use. Materials shall be stored neatly in areas designated by the Owner. Load placed on the roof at any point shall not exceed the safe load for which the roof is designed.
7. The contractor shall take all necessary precautions to protect the roof mat and deck from damage. The contractor shall be responsible for repairing all new areas of damage caused by the negligence of the contractor, at the contractor's expense. The Owner's on-site representative shall determine damage caused by contractor negligence.
8. The contractor shall follow local, state, and federal regulations, safety standards, and codes for the removal, handling, and disposal of asbestos containing materials, if present. When a conflict exists, use the stricter document.
9. Follow insurance underwriter's requirements acceptable for use with specified products or systems.
10. Due caution should be exercised so as not to alter the structural integrity of the deck. When cutting through any deck, care should be taken so as not to damage the deck or any part of the deck, such as post tension cables, etc.
11. All kettles shall have afterburner, automatic thermostat control, and temperature gauge, all in working order.
12. The contractor is to verify the location of all interior ducts, electrical lines, piping, conduit, and/or similar obstructions. The contractor is to perform all work in such a manner as to avoid contact with the above mentioned items.
13. Surface and air temperatures should be a minimum 45° F during applications of cleaner and waterproof coating and remain above 45° F for a minimum of four (4) hours following applications. Verify compatibility of cleaner with coatings, paints, primers and joint sealers specified. Advise Owner's representative of any problems in this regard prior to commencing cleaning operations.
14. Temporary Sanitary Facilities: The contractor shall furnish and maintain temporary sanitary facilities for employees use during this project. These will be removed after the completion of the project. All portable facilities shall comply with local laws, codes, and regulations.

B. Protection of Work and Property:
1. Work: The contractor shall maintain adequate protection of all his work from damage and shall protect the Owner's and adjacent property from injury or loss arising from this contract. He shall provide and maintain at all times any OSHA required danger signs, guards, and/or obstructions necessary to protect the public and his workmen from any dangers inherent with or created by the work in progress. All federal, state, and city rules and requirements pertaining to safety and all EPA standards, OSHA standards, NESHAP regulations pertaining to asbestos as required shall be fulfilled by the contractor as part of his proposal.
2. Property: Protect existing planting and landscaping as necessary or required to provide and maintain clearance and access to the work of this contract. Examples of two categories or degrees of protection are generally as follows: a) removal, protection, preservation, or replacement and replanting of plant materials; b) protection of plant materials in place, and replacement of any damage resulting from the contractor's operations.

3. Twenty-four Hour Call: The contractor shall have personnel on call 24 hours per day, seven (7) days per week for emergencies during the course of a job. The Owner's Project Manager is to have the 24 hour numbers for the contact. Contractor must be able to respond to any emergency call and have personnel on-site within two (2) hours after contact. Numbers available to the Owner's Project Manager are to be both home and office numbers for:
   a) Job Foreman
   b) Job Superintendent
   c) Owner or Company Officer

C. Damage to Work of Others: The contractor shall repair, refinish, and make good any damage to the building or landscaping resulting from any of his operation. This shall include, but is not limited to, any damage to plaster, tile work, wall covering, paint, ceilings, floors, or any other finished work. Damage done to the building, equipment, or grounds must be repaired at the successful contractor's expense holding the Owner harmless from any other claims for property damage and/or personal injury.

D. Measurements: It will be the contractor's responsibility to obtain and/or verify any necessary dimensions by visiting the job site, and the contractor shall be responsible for the correctness of same. Any drawings supplied are for reference only.

E. Use of Premises:
1. The contractor is advised that the Owner will occupy the building at all times, and the contractor must provide all safeguards required to protect personnel and to keep noise levels as low as reasonably possible for each operation.
2. The contractor shall:
   a) Coordinate work in such a manner as to not interfere with the normal operation of the building.
   b) Assume full responsibility for protection and safekeeping of products stored on premises.
   c) Agree to hold the Owner harmless in any and all liability of every nature and description which may be suffered through bodily injuries, including death of any persons by reason of negligence of the contractor, agents, employees, or subcontractors.

F. Cleaning and Disposal of Materials:
1. Contractor shall keep the job clean and free from all loose materials and foreign matter. Contractor shall take necessary precautions to keep outside walls clean and shall allow no roofing materials to remain on the outside walls.
2. All waste materials, rubbish, etc., shall be removed from the Owner's premises as accumulated. Rubbish shall be carefully handled to reduce the spread of dust. A suitable scrap chute or hoist must be used to lower any debris. At completion, all work areas shall be left broom clean and all contractor's equipment and materials removed from the site.
3. All bituminous or roofing related materials shall be removed from ladders, stairs, railings, and similar parts of the building.
4. Debris shall be deposited at an approved disposal site.
5. The entire roof shall be cleaned by utilizing pressure washer with spread nozzle. Caution should be used to not allow the nozzle to be to close to the membrane.

1.08 WARRANTY

A. Twenty year NDL Warranty: The complete roofing system shall be guaranteed for a minimum of twenty (20) years from the date of substantial completion for this project. Guarantee responsibilities shall be as follows:
   1. Roofing contractor shall guarantee the entire roofing system for a period of five (5) years from the date of Substantial Completion.
      a) Central Campus West Wing guarantee the entire roofing system for a period of five (5) years from the date of Substantial Completion.
   2. The materials manufacturer shall guarantee the entire roofing system for a total period of twenty (20) years from the date of substantial completion.
   3. The entire roofing system shall be guaranteed to be watertight and against any failures of workmanship and materials. Repair of the system, including materials and labor, shall be done at no cost to the Owner.
   4. Warranty repairs shall be performed by a certified installer. The repairs shall be performed in accordance with the manufacturer's written instructions and recommended procedures so as to not void the warranty.

B. During the proposal period each Contractor shall make arrangements with the materials manufacturer to provide the required warranty. Refer to paragraph 1.05 SUBMITTALS for requirements concerning submittals of warranty.

PART 2 - PRODUCTS

2.01 GENERAL

A. Compatibility: Provide materials that are recommended by manufacturers to be fully compatible with indicated substrates, or provide separation materials as required to eliminate contact between incompatible materials.

B. Materials herein specified shall be supplied or approved in writing by the manufacturer issuing the warranty.

C. The white polyester reinforced fleece backed adhered Elvaloy® roofing system shall only be applied by manufacturer approved and trained roofing contractors.

2.02 ROOFING MEMBRANE

A. The white 67 mil polyester reinforced fleece backed Elvaloy® membrane shall have the following minimum physical properties.

Property	Test Procedure	Physical Properties
Color	ASTM D 751	White
Thickness	ASTM D 751	0.67" Nominal
Breaking Strength	ASTM D 751	235 lbs.
Elongation	ASTM D 751	>100%
Shore "A" Hardness	ASTM D 2240	83
Heat Aging	ASTM D 0573	90% of Original
Cold Resistance	ASTM D 2136	-40° F
Water Vapor Permeability	ASTM E 96	3.5g/m2/day
Wt. Change After Immersion	ASTM D 570	1.5% max.
Seam Strength	ASTM D 751	80% of sheet
Dimensional Stability	ASTM D 1240	0.5%
Accel. Weathering (Xenon Arc)	ASTM D 2565	10M hrs. (No change)
Underwriters Laboratories		Class A
Exceed	ASTM D 4434	
Reflectivity	CRRC	87
Emissivity	CRRC	85

2.03 FLASHING MEMBRANE

A. The flashing membrane shall be a white Elvaloy® polyester reinforced flexible sheet.

Property	Test Procedure	Physical Properties
Color		White
Thickness	ASTM D 751	.060" Nominal
Breaking Strength	ASTM D 751/D 638	>340 lbs.
Elongation	ASTM D 751/D 638	100%
Shore "A" Hardness	ASTM D 2240	83
Heat Aging	ASTM D 3045	90% of Original
Cold Resistance	ASTM D 2136	-40° F
Water Vapor Permeability	ASTM E 96	3.5g/m2/day
Wt. Change after Immersion	ASTM D 570	1.5% max.
Seam Strength	ASTM D 751	80%
Dimensional Stability	ASTM D 1204	0.5% or less
Accel. Weathering (Xenon Arc)	ASTM D 2565	after 10M hrs. (No Change)
Underwriters Laboratories		Class A
Exceed	ASTM D 4434	
Reflectivity	CRRC	.87
Emissivity	CRRC	.85

2.04 NON-REINFORCED MEMBRANE

A. The non-reinforced membrane shall have the following minimum properties.
   1. Description: Non-reinforced thermoplastic white membrane, thickness approximately 45 mils.
   2. Use: Inside/outside corners, multiangled intersections, sealant pockets and other conditions where molding of the membrane is required.

2.05 BITUMEN

A. Shall be ASTM D 312 Type IV extra steep asphalt.

Slope	Interply	Top Pour	Backnail	Strap
0 - ½" per 12"	Type IV	Type IV	No	No
½" - 2" per 12"	Type IV	Type IV	Yes	Strap if Possible
2" - 3" per 12"	Type IV	Type IV	Yes	Yes

2.06 CAULKS

A. Sealant for use at coping joints, reglet joints, etc., shall be a one-component urethane non-sag, gun grade sealant designed for use in active exterior joints, and shall meet or exceed Federal Specification No. 1 TT-S-00230C, Type II, Class A, ASTM C 920. Where joint surfaces are contained or are contaminated with bituminous materials, provide manufacturer's modified-type sealant (modified with coal-tar or asphalt as required).

2.08 FELTS

A. Shall be Underwriters Laboratory approved and listed in the FM Global Approval Guide.

B. Shall be venting base sheet, Underwriters Laboratory Type G-2, ASTM D 3672, Type II.

2.07 INSULATION

A. All insulation shall be approved in writing by the membrane manufacturer as to thickness, type, and manufacturer. All insulation must be approved for the specific application, Underwriters Laboratory approved, and be listed in the FM Global Approval Guide.

B. Polyisocyanurate Roof Insulation: Insulation shall be rigid polyisocyanurate foam board; thickness and LTTR-value shall be a minimum of 1.5" = 15.0 meeting Federal Specification No. HH-I-1972/1 or 2 with 20 psi minimum compressive strength and 2.0 pcf minimum density. Board shall be surfaced on four two (2) sides with non-asphaltic facer material, suitable for required taping.

C. Field Tapered polyisocyanurate Insulation; Stepped layers of twenty-four inch by forty-eight inch (48" x 48") board, to provide uniform slope to drains.

D. Fiberboard Insulation: Shall be thickness of 1/2", R of 1.32 and C of 0.76; board size four feet by eight feet (4' x 8'), impregnated six (6) sides with asphalt, Underwriters Laboratory approved and listed in the FM Global Approval Guide.

2.08 CANT STRIP

A. Shall be treated solid wood for structural meeting NRCA, FM Global and Underwriters Laboratory guidelines.

B. Shall be wood fiber where used for non-structural purposes. Shall be treated solid wood where used for structural purposes meeting NRCA, FM Global and Underwriters Laboratory guidelines. If solid wood cant is used where insulation exists, cant is to be toe nailed into treated solid wood nailer the same height as insulation.

2.09 WOOD

A. All nailers, cants and wooden curbs shall be treated lumber as required by NRCA, FM Global and Underwriters Laboratory guidelines.

2.10 FASTENERS

A. Fasteners and fastening plates or bars shall be listed in the FM Global Approval Guide, and be as recommended by the fastener manufacturer for the specific application.

B. Fastener for Brick: Shall be one-fourth inch by two inches (1/4" x 2"), zinc with plated steel or stainless steel nail, one piece unit, flat head.

C. Fastener for Steel Deck: Shall be a #14 fastener, fluorocarbon coated, with CR-10 coating. A minimum .200 diameter shank and .250 diameter thread. To be used with round pressure plates or bar, and having a fluorocarbon CR-10 coating, when subjected to thirty (30) Kesternich cycles (DIN 50018) shows less than ten percent (10%) red rust which surpasses FM Global Approval Standard 4470. Fasteners, plates, and/or bars shall be listed in the FM Global Approval Guide.

2.11 BONDING ADHESIVE FOR FLASHING

A. Description: Adhesive is a bonding cement of synthetic rubber for fully adhering membranes to various substrates.

Typical Liquid Properties (Room Temperature)	
Color	Amber/Yellow
Base Product	Neoprene
Solids	25%
Specific Gravity	.87
Pounds/Gallon	7.25
Viscosity (CPS)	2500
Solvents	Ketone, Toluene, Aliphatic Hydrocarbon, Zylene
Estimated Coverage	
2 Sided Application	55/70 sq. ft. (2/2.5 mils dry)
DOT Label Required	Flammable Liquid
Code - 584661	

B. Handling: Contains ingredients which could be harmful if mishandled. Contact with skin and eyes should be avoided and necessary protective equipment and clothing should be worn.

2.12 PITCH PAN SEALANT

A. Shall be one-part, self-leveling polyurethane sealant meeting Federal Specification No. TT-S-00230C, Type I, Class A, ASTM C 920, Type S, Grade P, Class 25, for use in new pitch pans.

2.13 ASPHALT ROOF PRIMER

A. Quick-dry asphalt-based primer for priming of asphalt roof surfaces.

Applicable Federal Specification	SS-A-701B
ASTM	D 41
Flash Point	105° F
Viscosity at 80° F (ASTM D 217)	50-60 K.U.
Weight per gallon	7.4 pounds
Drying time (to touch)	Min. 4 hours

2.14 WALKWAY PAD LOCATED AT THE ROOF HATCH AND HVAC COMPRESSOR SIDE

A. The walkway pad shall have the following minimum physical properties, and be applied with edges heat or solvent welded.

Property	Test Procedure	Physical Properties
Color		Blue
Size		30" wide x 60' long
Thickness	ASTM D 638	125" nominal
Specific Gravity	ASTM D 792	1.32g/cm/3
Tensile Strength	ASTM D 638	>2500 psi
Elongation	ASTM D 638	>300%
Cold Resistance	ASTM D 1043	-40° F
Water Vapor Permeability	ASTM E 96	2.8g/m2/day
Dimensional Stability	ASTM D 1240	0.5% or less
Ultraviolet Stability		12,000 hrs. Excellent

2.15 SEAM SEALER

A. Special caulk compatible with Elvaloy® and thermoplastic membrane to seal exposed cut edges.

2.16 TRIM STRIP

A. The trim strip shall be six inch (6") wide non-reinforced 45 mil thermoplastic used for capping butted ends of rolls. The trim strip shall be seamed with the use of hot-air welding.

2.17 PIPE BANDS

A. Pipe bands shall be stainless steel bands with self-locking heads and shall be tightened with hand tool for tension control and flush cut off.

2.18 PRE-MOLDED BOOTS

A. Non-reinforced thermoplastic tapered molds for various pipes, heat welded to field membrane and sealed at top with stainless steel pipe bands and seam sealer.

2.19 DELIVERY AND STORAGE

A. All materials shall be delivered with appropriate carton and can labels indicating appropriate warnings, storage conditions, lot numbers, and usage instructions. Materials damaged in shipping or storage shall not be used.

2.20 PRECAUTIONS

A. Some of the indicated materials are extremely flammable and/or toxic. Use precautions indicated on can and carton labels.

2.21 VERTICAL WALL SHIMMING MATERIAL

A. Shall be one of the following unless otherwise accepted by Owner's representative: OSB, exterior grade plywood, gypsum core board or concrete core board. Proper selection of material is required to achieve FM Global and UL guidelines.

2.22 MISCELLANEOUS MATERIALS

A. Other materials shall be as specified or of the best grade for the proposed use as recommended by the manufacturer.

PART 3 - EXECUTION

3.01 REFERENCE

A. The manufacturer's Technical Specifications shall be considered a part of this specification and should be referred to for more specific application procedures and recommendations.

B. Application of materials shall be in strict accordance with the manufacturer's recommendations except where more stringent requirements are shown or specified. In the instance of a conflict between these specifications and those of the manufacturer, the more stringent specifications shall take precedence.

C. General Installation:
1. Protect adjacent areas with tarpaulin or other durable materials.
2. Contractor shall prevent overspray, and be responsible for parking lot areas and/or adjoining areas not part of this contract.
3. Contractor shall be responsible for sealing, as required, all openings that may allow bitumen migration or drippage, i.e. pitch dams, envelopes, and filler strips.
4. Prepare surfaces according to manufacturer's or applicator's published instructions. All metal that is to receive bitumen, or come in contact with bitumen or adhesive, shall be first primed with appropriate primer. Any prefinished sheet steel that is to receive bitumen, or come in contact with bitumen or adhesive, shall be scored, scuffed or abraded prior to receiving primer.
5. Use cleaning materials or primers necessary to render an acceptable surface/substrate.
6. All surfaces/substrates shall be clean and dry prior to application of materials.
7. Prior to application of felts and membrane, all foreign matter, gravel, etc., shall be removed from the insulation and/or substrate. Gravel or debris between the insulation/substrate and plies is not acceptable.
8. Bitumen kettle shall have an afterburner, visible thermometer and thermostatic control or some other means to provide positive monitoring of the bitumen temperature when it is heated in accordance with manufacturer's instructions.
9. Ambient temperature shall be 45° F and rising.
10. The maximum heating temperature of Type IV asphalt shall be 525° F.

11. The temperature of Type IV asphalt shall be approximately 475° F ± at the point of application or as recommended by the membrane manufacturer.
12. Maintain kettle and/or tanker temperature at least 25° F below the actual flash point of the bituminous materials used.
13. Never heat the bituminous materials at high temperatures for prolonged periods of time.
14. Do not allow bituminous materials to stand in luggers for long periods.
15. Circulate bituminous materials.
16. Insulate hot transport lines if required.
17. Wrinkles, buckles, kinks, and fishmouths are not acceptable when laying membrane.
18. Where deteriorated base flashing is removed, primed cant strips shall be installed at the intersection of the deck and the vertical surfaces. All flashings shall be mechanically top-fastened with a termination bar a minimum of six inches (6") on center at the top leading edge, and be a minimum of eight inches (8") in height from finished membrane.
19. On slopes greater than one inch (1") in twelve inches (12"), refer to NRCA and/or manufacturer's guidelines for backnailing procedures and follow the more stringent guidelines for all specified materials.

3.02 SUBSTRATE PREPARATION

A. Tear-off: Remove all built-up roofing, flashing, insulation, and sheet metal down to the Lightweight fill substrate. Substrate shall be smooth, free of debris, sharp edges, and other surface irregularities prior to starting roofing application. Substrate repair shall be performed as required to minimum of NRCA standards.

3.03 CATEGORY II (NON-FRIABLE) ASBESTOS CONTAINING MATERIALS (ACM) REMOVAL

NOTE: Asbestos removal procedures are required (if asbestos is present) while removal of ACM roof materials takes place. The following procedures are to be followed as a minimum:

A. Roofing contractors who perform asbestos roof tear-off shall use hand tools such as axes, picks, shovels or mechanical equipment such as a "roof warrior" that uses a reciprocating wedge to tear roofing materials. Breaking and/or slicing of material is permitted. Sanding, grinding or abrading during handling is not permitted.

B. Wrap all rooftop ducts, vents or exhaust openings with 6 mil poly and tape.

C. Provide an Asbestos Hazard Control Supervisor (competent person) to oversee demolition.

D. Ensure employees have received OSHA required training in asbestos removal and health hazards associated with exposure to airborne asbestos fibers.

E. Roof will be sufficiently wetted down before removal to prevent dust, using pump-up garden sprayer or water hose with spray nozzle.

F. Perform personal and area air monitoring for at least the first three (3) days of the project in accordance with 29 CFR 1910.1001. Monitoring shall be done by either: 1) in-house certified abatement personnel; or 2) certified asbestos monitoring personnel from a certified outside source.

G. Asbestos Warning signs and tape shall be posted in tear-off area.

H. Based on air monitoring results, the contractor **MUST** execute a Written Negative Exposure Assessment Determination and keep on file at the project site along with air monitoring results.

I. Use airtight chutes or mechanical means to lower ACM from the roof. The ACM must be wrapped in poly and removed daily. If ACM is NOT wrapped, the disposal container must be enclosed.

J. Disposal: Can be disposed of as construction debris at any approved landfill.

3.04 NAILERS

A. Wooden nailers shall be installed at gravel stops, drip edges, and expansion joints on outside perimeter of building according to NRCA, Underwriters Laboratory and IBC guidelines.

B. All Construction: Nailers shall be the same height as the new recovery board being installed where required. Nailers shall be raised if necessary by anchoring an additional nailer of appropriate height to the existing nailer if the existing nailer is not to be replaced. Nailers shall be anchored to resist a pull-out force of one hundred seventy-five pounds (175#) per foot. Fasteners shall be no less than two (2) per nailer, and be spaced at three feet (3') on center maximum. Expansion joint nailers shall extend upward a minimum of eight inches (8") above finish roof height.

3.05 WOOD CANTS

A. Toe of cant shall be level with the surface to receive new roof membrane and in all cases anchored according to NRCA, Underwriters Laboratory and IBC guidelines.

3.06 INSULATION

A. Manufacturer's Instructions: In regard to attachment, the manufacturer's instructions or specifications shall determine the suitability for an application.

B. Precautions: The surface of the insulation must not be ruptured due to overdriving of fasteners.

C. Thermal insulation boards shall be laid on the substrate in parallel rows with end joints staggered and butted as close as possible. All joints shall be tight and at the roof perimeter and roof penetrations, insulation shall be cut neatly and fitted to reduce openings to a minimum. All openings one-fourth inch (1/4") or larger shall be filled with insulation.

D. Insulation shall be tapered or feathered at drains and scuppers to provide proper drainage (if applicable).

E. No more insulation shall be installed than can be covered by the completed roof system by the end of the day or the onset of inclement weather.

F. Tapered insulation and crickets, when specified, shall be placed in accordance with the drawings and/or as required to minimum of NRCA standards.

3.07 APPLICATION OF PLY SHEETS

A. Venting base sheet shall have two layers of specified insulation adhered in hot asphalt. All layers shall be solid mopped at the nominal rate of thirty pounds (30#) ± 20 percent per one hundred (100) square feet using steep asphalt Type IV as required by slope, properly heated. Specified layers shall be applied in accordance with the manufacturer's recommendations and in accordance with general practices as set forth by the NRCA Roofing Manual.

3.08 APPLICATION OF FLEECE BACKED MEMBRANE

A. Fully Adhered Application: Fully adhere membrane to acceptable substrate with hot steep asphalt applied at the rate specified by the manufacturer.
   1. The roof surface must be clean, dry and free of foreign material.
   2. Position sheets as indicated on approved shop drawings.
   3. Fold one end of the Elvaloy® sheet on top of itself until both ends meet. Apply hot steep asphalt to the prepared roof surface. The sheet can then be pulled and laid into the bonding material using care not to create any wrinkles.
   4. Carefully push into place from fold line to overlap, avoiding wrinkles and air pockets. Roll or broom membrane flat.
   5. Repeat procedure for other sheet half.
   6. Lap seams shall be done by lapping the two inch (2") selvedge edge over the non-selvedge edge of the previous roll. The selvedge edge seam shall be made with the heat gun method.
   7. Roll ends are butted together and capped with a six inch (6") wide trim strip. The trim strip is then seamed with the heat gun.
   8. Seam sealer shall be applied to all non-factory edges.

B. Lap Seaming Procedure: Overlap membrane for attachment method specified and hot-air welded with manufacturer's approved equipment.
   1. All surfaces to be weld shall be clean, dry and free of foreign material.
   2. All seams must then be checked with a needle probe and any voids repaired with the heat gun.
   3. Caulk all exposed cut edges with seam sealer.

3.09 FLASHING

A. Flash all penetrations, metal edge systems, walls, curbs, expansion joints, drains as shown on details and approved shop drawings with white reinforced Elvaloy® flashing membrane.
   1. Use prefabricated flashing accessories or components such as sealant pockets, premolded vent/pipe flashing.
   2. Mechanically fasten flashing at terminations according to approved details.
   3. Fastening membrane flashing <u>through</u> metal counterflashing is <u>not</u> acceptable.

B. Any lumber or shimming required for attachment or to make material flashing flush or level with offsets and/or transitions shall be incorporated in the flashing specifications.

3.10 WOOD NAILERS

A. Locate and install as shown on details; along gravel stops and drip edges and other areas as required by membrane manufacturer.

B. Anchor nailer to structural deck with manufacturer's approved fasteners, spaced appropriately for the specified installation; minimum withdrawal resistance: one hundred (100) pounds.

C. Height and Taper: Match top of adjacent construction within one-fourth inch (1/4"). Taper as required to provide continuous contact surface without creating ponding.

3.11 ROOF DRAINS

A. Inspect and test drain and drain lines prior to start of work in contact area. Open if blocked or clogged and repair/replace all broken, missing drain components and lines as required. Verify in writing that all drains and lines are free flowing and watertight prior to substantial completion. Comply with local plumbing codes.

B. Remove strainer and clamping ring repair (or replace if damaged) and reset.

C. Insert Drains (If Required): Install new drain inserts with permanent gaskets between insert and drain wall to prevent backflow of water and leakage.

D. Replacement Drains (If Required): Sized to match existing drain system. Install watertight to existing lines. Follow drain manufacturer's installation requirements.

3.12 WALKWAY PADS FOR ROOF HATCH AND HVAC UNITS

A. Fully adhere and heat weld walkway pads where shown on drawings or where required to provide protected pathways from rooftop access points to mechanical or other equipment requiring rooftop maintenance.

3.13 CLEANING

A. Clean exposed surfaces of excess cement, adhesive, sealants, mortar and paint associated with the new work.

B. Clean work area of excess roofing materials and installation debris daily.

C. Repair or replace defaced or disfigured finishes caused by the work.

D. At completion of re-roof the entire roof area shall be pressure washed.

3.14 PROTECTION

A. Protect all building surfaces against damage from roofing work.

B. Where traffic must continue over finished, installed roofing system, protect membrane, underlayment accessories and finishes from damage.

3.15 MEMBRANE PROTECTION

A. Where equipment pads, wood sleepers, or walkway slabs are to be installed over the roofing membrane, an additional layer of the roofing membrane shall be installed between the roofing membrane and the pad, sleeper, or slab. Due caution shall be exercised to prevent roofing membrane damage during placement. Where required, membrane shall be welded to field membrane to prevent slippage.

3.16 PIPING/CONDUIT

A. Piping/conduit shall be raised to NRCA recommended heights, and new supports furnished. Permanent supports shall be installed upon pads approved by membrane manufacturer. Coordinate work with Owner's representative.

B. All gas lines, piping, and conduits shall be coated with specified aluminum coating.

3.17 PIPE/EQUIPMENT SUPPORTS

A. Designated pipe/equipment supports shall be removed and replaced with new treated four inch by four inch (4" x 4") wood blocking. Pipe supports shall be placed approximately ten feet (10') on center. New blocks shall be set on a double layer of membrane, and attached to the pipe with suitable strapping. Double layer of membrane shall be adhered to the roof surface.

B. Gas lines three inches (3") and over must be supported on wood block with pipe roll stands.

3.18 OVERNIGHT SEAL

A. Shall be performed according to accepted roofing practice as outlined in the NRCA Roofing Manual, SPRI and membrane manufacturer's recommended procedure.

END OF SECTION 07535

SECTION 07600
SHEET METAL AND MISCELLANEOUS ACCESSORIES FOR FULLY ADHERED MULTI-PLY ROOF SYSTEM

PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes:
1. Provide flashing and sheet metal components for moisture protection.
2. Related accessories.

B. Related Sections: Section 07535 – Fully Adhered Multi-ply Roof System

1.02 SUBMITTALS

A. Product Data:
1. Submit shop drawings, product data and mockups of all sheet metal.
2. Reference Section 07535 – Fully Adhered Multi-ply Roof System

1.03 QUALITY ASSURANCE

A. Comply with governing codes and regulations. Provide products of acceptable manufacturers in satisfactory use in similar service for five (5) years. Use experienced installers. Deliver, handle and store materials in accordance with manufacturer's instructions.

B. Reference Standards: Applicable portions of SMACNA, ASTM and NAAMM publications.

1.04 WARRANTIES

A. Manufacturer's Product Warranty: Submit manufacturer's standard limited product warranty signed by the manufacturer's authorized official, guaranteeing to correct failures in product which may occur during the warranty period, without reducing or otherwise limiting any other rights to correction which the Owner/Project Consultant may have under the contract documents. Failure is defined to include product failure which leads to interruption of a watertight installation. Correction may include repair or replacement of failed product.

B. Contractor's Warranty Period: For roofing flashing and sheet metal, provide a written warranty which shall warrant work to be free of leaks and defects in materials and workmanship for five (5) years, starting from date of substantial completion.

C. Defects of the sheet metal occurring during the warranty period shall be promptly corrected by the contractor, and defects of the roofing shall be promptly corrected by the manufacturer at no additional cost to the Owner. Upon notification from the Owner or the Owner's representative that evidence of a defect exists, the responsible party shall immediately inform the Owner's representative of the date on which corrective work will be scheduled, and shall notify the Owner's representative when the corrective work has been completed.

PART 2 - PRODUCTS

2.01 SHEET METAL MATERIAL

A. Hot-dipped Galvanized Steel for use as counterflashings (where not visible from the ground), pitch pans and expansion joints: Minimum 24-gauge, G-90, hot-dipped galvanized metal, commercial quality, ASTM A 525.

B. Hot-dipped Galvanized Steel for use as continuous clips: Minimum 22-gauge, G-90, hot-dipped galvanized metal, commercial quality, ASTM A 525.

C. Prefinished Galvanized Sheet Steel (where visible from the ground): Shall be 24-gauge flat stock, prefinished with Kynar finish meeting ASTM A 446, forty-five and one-half inches to forty-eight inches width by one hundred twenty inches in length (45-1/2" - 48" x 120") for use as new metal edge gravel guard, downspouts, gutters, coping and miscellaneous metal. Standard color to be selected by Owner/Project Consultant.

D. Elvaloy® Cladded Metal: Shall be G-90 galvanized steel with 24 mil Elvaloy® membrane lamination; width shall be four feet, length shall be eight or ten feet.

E. All existing sheet metal shall be replaced with new metal of like gauge and type, or as specified on drawings.

2.02 FASTENERS

A. Fasteners shall be same metal as flashing/sheet metal, or other non-corrosive metal as recommended by sheet manufacturer for the specific application. Match finish of exposed heads with material being fastened.

B. Fasteners and fastening plates or bars shall be listed in the FM Global Approval Guide.

C. Fastener for Brick: Shall be one-fourth inch by two inches (1/4" x 2"), zinc with plated steel or stainless steel nail, one piece unit, flat head.

D. Screws: Self-taping sheet metal type with neoprene washer, as appropriate.

E. Pop Rivets: Full stainless steel Series 42 or 44, as appropriate.

F. Continuous Clip: Concealed hold-down clip type; of same materials as coping, gravel guard, sized to suit application. Use a continuous clip, minimum 22-gauge G-90 galvanized.

2.03 RELATED MATERIAL

A. Bituminous Paint: Acid and alkali resistant, black color.

B. Plastic Cement: FS SS-C-153, cutback asphalt type.

C. Solder: QQ-S-571 composition best suited for purpose; use high tin content, minimum 60/40, for stainless steel and monel alloy.

D. Sealant (for Sheet Metal): One-component polyurethane, conforming to requirements of FS TT-S-230C, non-staining and non-bleeding.

E. Miscellaneous Materials:
1. Metal Accessories: Provide sheet metal clips, straps, anchoring devices, and similar accessory units as required for installation of work, matching or compatible with material being installed, non-corrosive, size, and gauge required for performance.

PART 3 - EXECUTION

3.01 INSPECTION

A. Verify roof openings, curbs, pipes, sleeves, ducts or vents through roof are solidly set, cant strips and reglets in place, substrates are smooth and clean and nailing strips located.

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

C. Beginning of installation means acceptance of conditions.

3.02 PREPARATION

A. Field measure site conditions prior to fabricating work. Provide all shop drawings and mock-ups one month prior to installation to the Owner/Project Consultant for approval.

B. Install starter and edge strips and cleats before starting installation.

3.03 FABRICATION - GENERAL

A. Shop-fabricate work to greatest extent possible. Comply with details shown, and with applicable requirements of SMACNA "Architectural Sheet Metal Manual" and other recognized industry practices. Fabricate for waterproof and weather-resistant performance; with expansion provisions for running work, sufficient to permanently prevent leakage, damage or deterioration of the work. Form work to fit substrates. Comply with material manufacturer's instructions and recommendations. Form exposed sheet metal work without excessive oil-canning, buckling, and tool marks, true to line and levels as indicated, with exposed edges folded back to form hems.

B. Fabricate gravel stops/fascia, gutters/downspouts, counterflashings, pitch pans, expansion joints, and copings with new galvanized sheet metal as specified. Fabricate gravel guard and fascia to size and dimensions as indicated on the drawings. Fabricate light metal coping, gutters and downspouts as indicated.

C. Form sheet metal on bending brake.

D. Shape, trim and hand seam metal on bench insofar as practicable.

E. Form materials with straight lines, sharp angles and smooth curves.

F. Fold back edges on concealed side of exposed edge to form hem (1/2" minimum).

G. Weld or solder joints on parts that are to be permanently and rigidly assembled.

H. Submit sheet metal models for approval by the Owner/Project Consultant.

I. Limit single-piece lengths to ten feet (10').

J. Fabricate corner pieces with eighteen inch (18") extensions, metered and sealed by forming as one piece.

K. Surface sand flange prior to applying any primers on Kynar metal.

L. Backpaint flashing in contact with masonry or dissimilar materials with bituminous paint.

M. All existing or missing metal rooftop projections shall be replaced. New rooftop projection details shall be as recommended in NRCA or SMACNA handbooks. All rooftop projections shall be cleaned, all joints sealed, and painted with a rust inhibitive paint. Standard color to be selected by the Owner/Project Consultant.

N. All sheet metal shall be sealed and watertight.

O. Metal work should be secured so as to prevent damage from buckling or wind. Where clips are shown, these are to be continuous.

P. All metal to receive bitumen or adhesive shall be first primed with asphalt primer.

Q. All prefinished metal shall be sanded and/or abraded prior to receiving primer.

R. Seams: Fabricate non-moving seams in sheet metal with flat-lock seams. For metal other than aluminum, tin edges are to be seamed, form seams, and solder.

S. Expansion Provisions: Form expansion joints of intermeshing hooked flanges, not less than one inch (1") deep, filled with mastic sealant (concealed within joints).

T. Sealant Joints: Where movable, non-expansion type joints are indicated or required for proper performance of work, form metal to provide for proper installation of elastomeric sealant, in compliance with industry standards.

U. Separations: Provide for separation of metal from non-compatible metal or corrosive substrates by coating concealed surfaces at locations of contact, with bituminous coating or other permanent separation as recommended by manufacturer/fabricator.

V. Bed flanges of work in a thick coat of bituminous roofing cement where required for waterproof performance.

3.04 INSTALLATION

A. General: All sheet metal termination to vertical wall shall have a through-wall with receiver installed on masonry walls or prefabricated "Z" bar flashing pre-installed to fluid applied wall finished prior to installation of sheet metal termination. This applies to edge metal, base flashing closures and all vertical surface intersections. Refer to NRCA, SMACNA, and metal manufacturer's guidelines.

B. Elvaloy cladded metal shall be fabricated as needed; follow these specifications and standard sheet metal practice for attachment to roof details.

C. Coping:
1. Remove existing and replace with new metal coping as required for a permanent watertight installation.
2. All coping shall be manufactured with low profile standing seam metal.
3. Shall be minimum 24-gauge prefinished Kynar installed in ten foot (10') sections maximum.
4. Vertical fascia shall extend minimum two and one-half inches (2-1/2") or be minimum one and one-half inches (1-1/2") below bottom of nailer, whichever is greater.
5. Secure metal flashings per specifications.
6. Lock seams and end joints.
7. Form sections identical to profiles as shown or approved similar, to match existing building.
8. Fabricate corner pieces with minimum eighteen inch (18"), maximum forty-eight inch (48") extensions, formed and sealed with rivets and sealant, as one piece.
9. Hem exposed edges three-fourths inch (3/4") minimum.
10. Backpaint flashing in contact with masonry or dissimilar materials with bituminous paint. Surface sand before applying primers.
11. Integrate flashing in a manner consistent with detailing.
12. Provide and install continuous clip, minimum 22-gauge.
13. Shall be fabricated in accordance with all SMACNA provisions.
14. Refer to Section 07535 – Fully Adhered Multi-ply Roof System for more detailed information.

D. Counterflashing:
1. Remove existing and replace with new metal counterflashing as required for a permanent watertight installation.
2. Saw cut brick mortar joint to receive friction fit reglet and removable counterflashing as detailed and SMACNA Figure 4-3E.
3. Refer to Section 07535 – Fully Adhered Multi-ply Roof System for more detailed information.

E. Overflow Scupper, Collector Head and Downspout:
1. Fabrication:
a) Fabricate overflow scupper, collector head and downspout of profile and size indicated, taking care that the roof drain leader fits properly into the back of the collector head. Seal the pipe to the collector head for watertightness.
b) Field measure site conditions prior to fabricating work.
c) Fabricate with required connection pieces.
d) Fabricate section square, true, and accurate in size, in maximum possible lengths and free of distortion or defects detrimental to appearance or performance.
e) Hem exposed edges of metal.
f) Form and seal all metal joints; provide for expansion joints per SMACNA.

2. Installation:
   a) Install collector head, downspout, and accessories.
   b) Join lengths with seams pop riveted and sealed watertight. Flash and seal collector head to downspouts and accessories.
   c) Seal all metal joints watertight for full metal surface contact.
   d) Collector Head: SMACNA style profile; submit detail for approval.
   e) Downspouts: Rectangular profile. Seal all joints, four inches by six inches (4" x 6").
   f) Support Brackets, Joint Fasteners: Profiled to suit gutters and downspouts.
   g) Anchorage Devices: SMACNA requirements. Type recommended by fabricator.
   h) Collector Head Support: Kynar. Color and Finish to match, as recommended by SMACNA.
   i) Downspout Supports: Straps, Kynar. Color and Finish to match.

F. Pitch Pans:
1. Install pitch pans of 24-gauge cladded steel according to NRCA standards, minimum of six inches by six inches (6" x 6").
2. Pitch pans shall be fabricated to minimum of four inches (4") above the finished roof membrane.
3. Mastic shall be applied under pitch pan flange a minimum of one-half pound (1/2#) per linear foot.
4. All metal flanges shall be primed with asphalt primer prior to flashing installation. Inside of pitch pan shall be cleaned and primed as required by pitch pan sealant manufacturer.
5. All projections enclosed in pitch pans shall be cleaned in any manner suitable and coated with a rust inhibitive coating as approved by the Owner/Project Consultant. Coating shall be allowed to dry prior to pitch pan fill.
6. Base of pitch pans shall be filled with grout or cementitious binder to proper height and allowed to cure.
7. Top finish fill shall be self-leveling, one-part urethane, with maximum fill to within three-eighths inch (3/8") of top of pitch pan sides.
8. Strip metal flange of pitch pan with one strip of Type IV fiberglass felt set in hot bitumen extending from the outer edge of the flange a minimum of three inches (3") inward to base of pitch pan.
9. Strip-in fiberglass felt with membrane flashing set in hot asphalt extending from the outer edge of the Type IV fiberglass underlayment a minimum of three inches (3") inward to the base of the pitch pan.

3.05 FINISH

A. Backpaint concealed metal surfaces with bituminous paint where expected to be in contact with cementitious materials or dissimilar metals. Exposed surfaces to be provided with a factory applied fluorocarbon Kynar finish meeting ASTM A 446 and AAMA specification 605.2 for high performance coating.

B. New 24-gauge hot-dipped galvanized metal shall be painted on all locations visible from the ground with an industrial grade paint to match existing, or standard color selected by Owner/Project Consultant. Galvanized metal surface must be properly prepared by removing all oil, grease, and/or protective mill coatings by solvent cleaning surface in accordance with SSPC-SP1, and according to paint manufacturer's recommendation, to ensure proper adhesion of paint to metal.

END OF SECTION 07600

DETAIL DRAWINGS/ROOF PLANS

1.01 DETAIL DRAWINGS

A. The enclosed details for this project are intended primarily to present the proper installation of the membranes used for waterproofing at flashings, perimeter closures, roof projections, etc. Specific underlying construction configurations, such as walls, nailers, wood backing, structural steel, etc., which may currently be in place may or may not be accurately depicted on the attached details. Unless specifically called out in the accompanying written specifications, or where a detail is noted "AS DRAWN", and/or proper roofing and construction practices are not being followed, underlying construction configurations are to remain unchanged from those in place on the building prior to this reroofing.

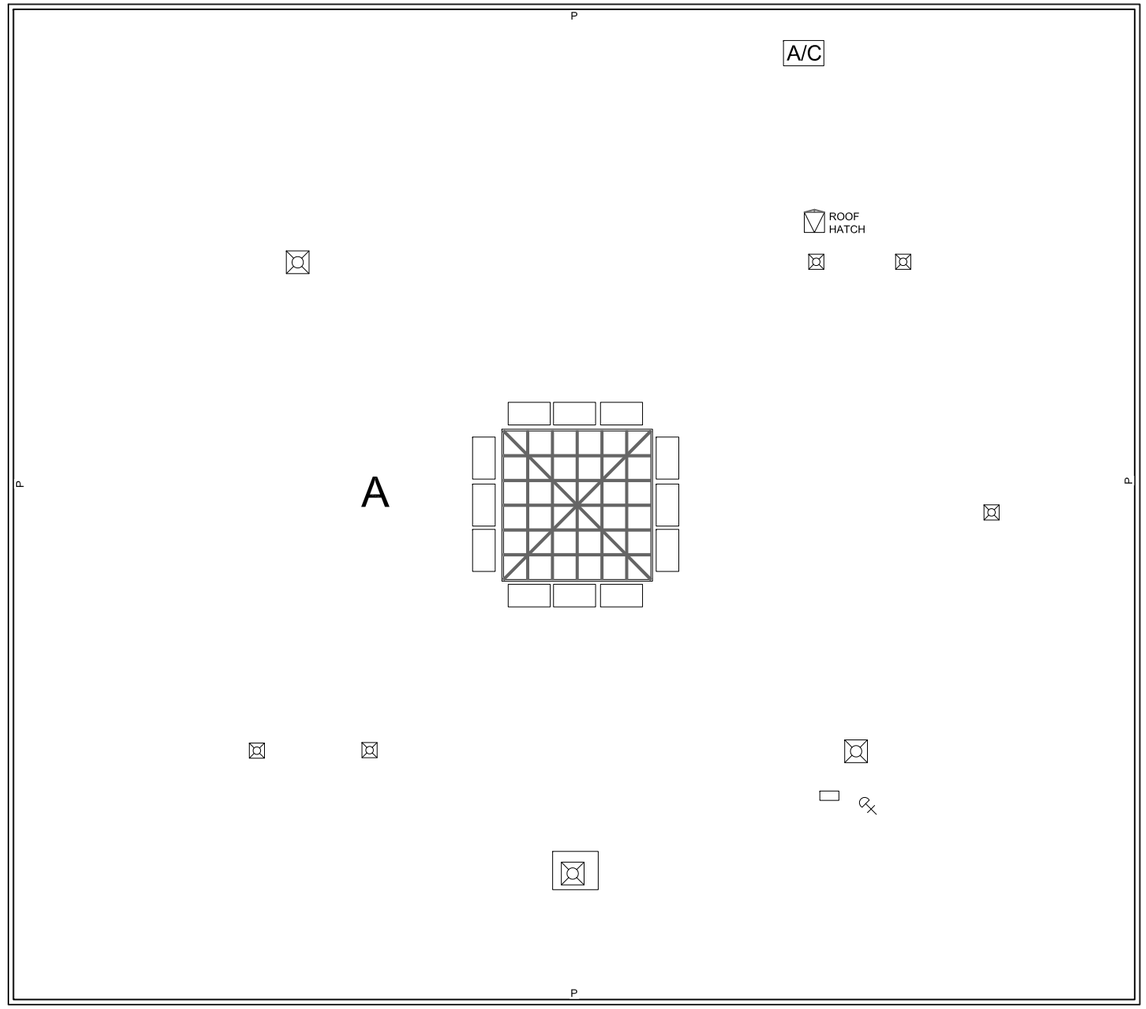
1.02 ROOF PLANS

A. Any drawings supplied are for reference purposes only. Dimensions, penetrations, curbs, etc. must be field verified. Those shown are typical but may not be all inclusive, and contractor shall be responsible for the correctness of same. Any existing insulation thickness, deck type or other details shown on the drawings shall be subject to contractor confirmation.

END OF SECTION

GENERAL ROOF NOTES

A. PROVIDE ALL REQUIRED UTILITY / STRUCTURAL COMPONENTS AND/OR CONNECTIONS FOR THE FUNCTIONAL USE OF ALL CONTRACTOR SUPPLIED EQUIPMENT OR APPLIANCES, REGARDLESS OF ANY OMISSIONS OR INCONSISTENCIES ENCOUNTERED IN THE CONSTRUCTION DOCUMENTS.
B. THE WORD 'PROVIDE' SHALL MEAN 'FURNISH AND INSTALL COMPLETE AND READY TO USE.'
C. IF DISCREPANCIES APPEAR BETWEEN THE DRAWINGS AND THE SPECIFICATIONS, THE HIGHER QUALITY, QUANTITY, AND PRICE SHALL SUPERSEDE.
D. THE GENERAL CONTRACTOR AND SUBCONTRACTORS SHALL BECOME FAMILIAR WITH THE PROJECT AND THE ON-SITE / OFF-SITE CONDITIONS PRIOR TO BIDDING OR COMMENCING WORK.
E. ROOF SLOPES SHOWN ON DRAWING ARE GENERAL AND CONCEPTUAL ONLY. PROVIDE POSITIVE DRAINAGE TO ALL ROOF DRAINS. VERIFY TAPER IN SHOP DRAWINGS.
F. PROVIDE TAPERED INSULATION CRICKETS (1/2"/FT. MIN. SLOPE) AT HIGH SIDE OF ALL MECHANICAL UNITS SMOKE VENTS, ROOF HATCHES & OTHER MISC. ROOF PENETRATIONS, TO SHED WATER AROUND & TO ENSURE POSITIVE ROOF DRAINAGE.
G. PROVIDE ADDITIONAL FULLY ADHERED MEMBRANES AS PROTECTION AT "SERVICE SIDE" OF ALL MECH. EQUIPMENT - FIELD VERIFY LOCATIONS. AS WELL AS PROTECTION AT "ACCESS SIDE" OF ALL ROOF HATCHES AND ROOF ACCESS LADDERS FIELD VERIFY LOCATIONS AND AT DOWNSPOUT LOCATIONS.
H. ALL WOOD BLOCKING AT ROOF EDGES ARE TO BE FABRICATED FROM CONT. 2X FR-WD BOARDS. PROVIDE LARGER 2X FR-WD AS REQUIRED PER DIMENSIONED DETAILED OR AS FIELD CONDITIONS DICTATE. ALL COPING TO BE SLOPED TOWARD THE INTERIOR.
I. ALL EXPOSED FLASHING, COPING (IF APPLICABLE) AND THEIR ACCESSORIES SHALL BE AS SPECIFIED. PAINT ALL METAL FLASHING THAT IS NOT PREFINISHED (TYP) AND VISIBLE FROM THE GROUND.
J. HEIGHT OF ALL NAILERS SHALL BE FLUSH WITH NEW INSULATION THICKNESS.
K. ALL THROUGH FLASHING SYSTEMS TO ACCOMMODATE 8" MINIMUM FLASHING HEIGHT FROM FINISHED ROOF SURFACE. PROVIDE END DAMS AS CONDITIONS ALLOW. ALL FLASHING TO HAVE 4" LAP MINIMUM AND OR STEP.
L. ALL PITCH PANS SHALL BE DOUBLE SOLDERED STAINLESS STEEL AND RECEIVE EITHER MECHANICALLY ATTACHED GOOSENECK OR METAL BONNETS. METAL BONNETS SHALL BE SECURED WITH CLAMPING RING AND SEALANT. SPECIAL CARE GIVEN TO WASH ALL METAL PRIOR TO INSTALLATION.
M. ANY CRACKS OR VOIDS IN RISE WALLS ABOVE COUNTER FLASHING SHALL BE REPAIRED WITH COMPATIBLE SEALANT.
N. ALL VERTICAL MEMBRANE FLASHING SHALL BE MECHANICALLY FASTENED AND INSTALLED WITH NEW METAL COUNTER FLASHING UTILIZING A CONTINUOUS CLIP. SLIDE METAL COVER PLATE DOWN OVER VERTICAL CLIP AND SEAL.
O. ALL PIPE AND CONDUIT SHALL RECEIVE PIPE SUPPORTS AND RELATED SHIMS, AND SHALL BE PLACED ON AN ADDITIONAL FULLY ADHERED ROOF MEMBRANE UNDER SPECIFIED WALK PAD PRIOR TO SURFACE APPLICATION. SUPPORTS TO OCCUR AT 10'-0" O.C. AND WITHIN 2'-0" OF ALL SLOPES, TEES AND CORNERS. ALL PIPE TO BE PAINTED PER BUILDING CODE REQUIREMENTS.



1 OVERALL ROOF PLAN
NOT TO SCALE
NORTH

ROOF LEGEND

LOW SLOPE ROOF SYSTEM

STATE OF TEXAS
RONALD C. WHITTINGTON
97088
LICENSED
PROFESSIONAL ENGINEER
8.7.15

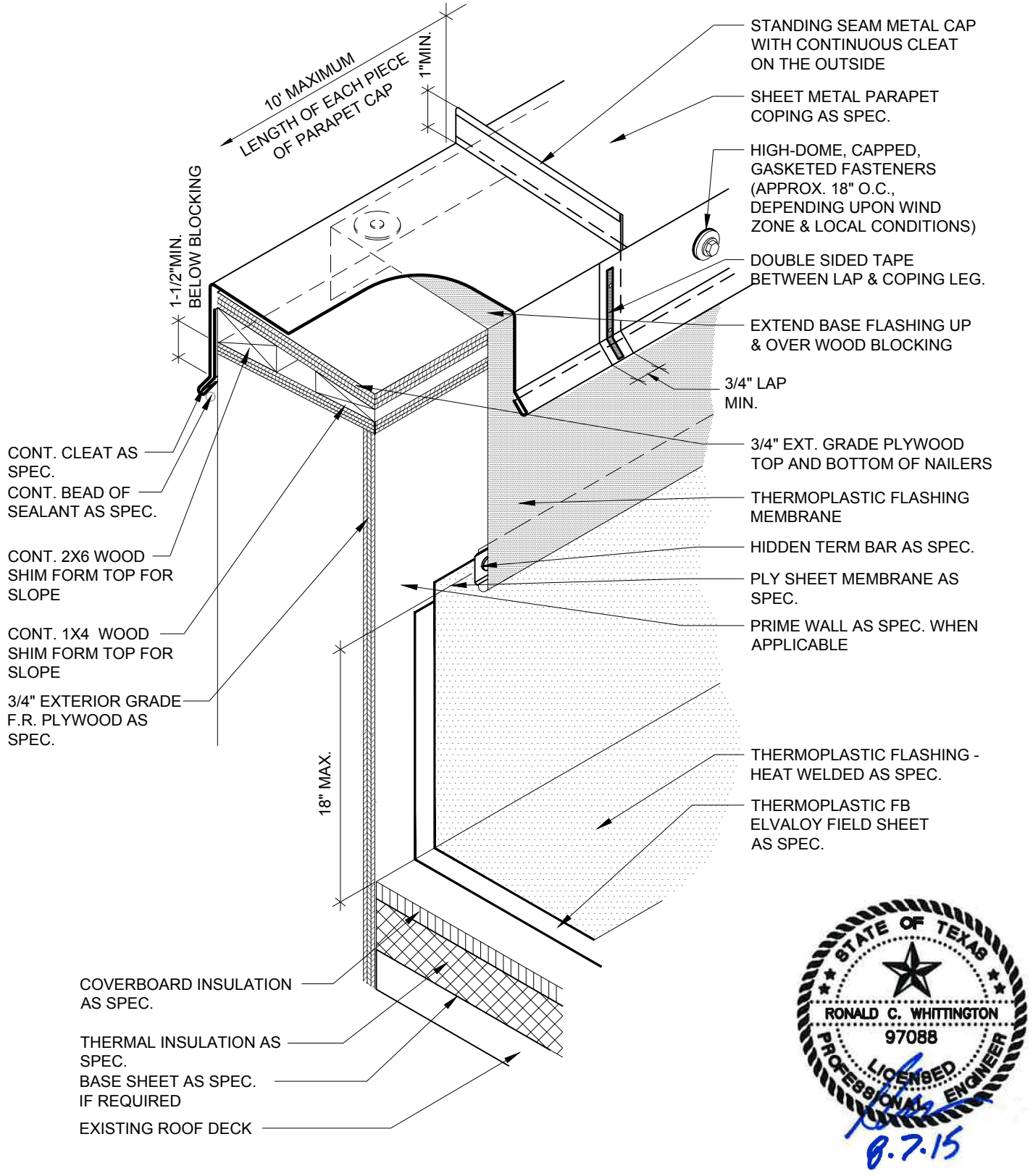
ARMKO INDUSTRIES, INC.
TEXAS REGISTERED ENGINEERING FIRM F - 6498

Contractor shall verify all substrates, dimensions, penetrations, curbs, etc. those shown are typical but may not be all inclusive.

PROJECT NO. 20150720-41
DATE: 08/07/15
DRAWN BY: CB/JA

PROJECT FOR :
HOUSTON COMMUNITY COLLEGE
NORTHWEST CAMPUS
KATY CAMPUS
1550 FOX LAKE DRIVE
HOUSTON, TEXAS

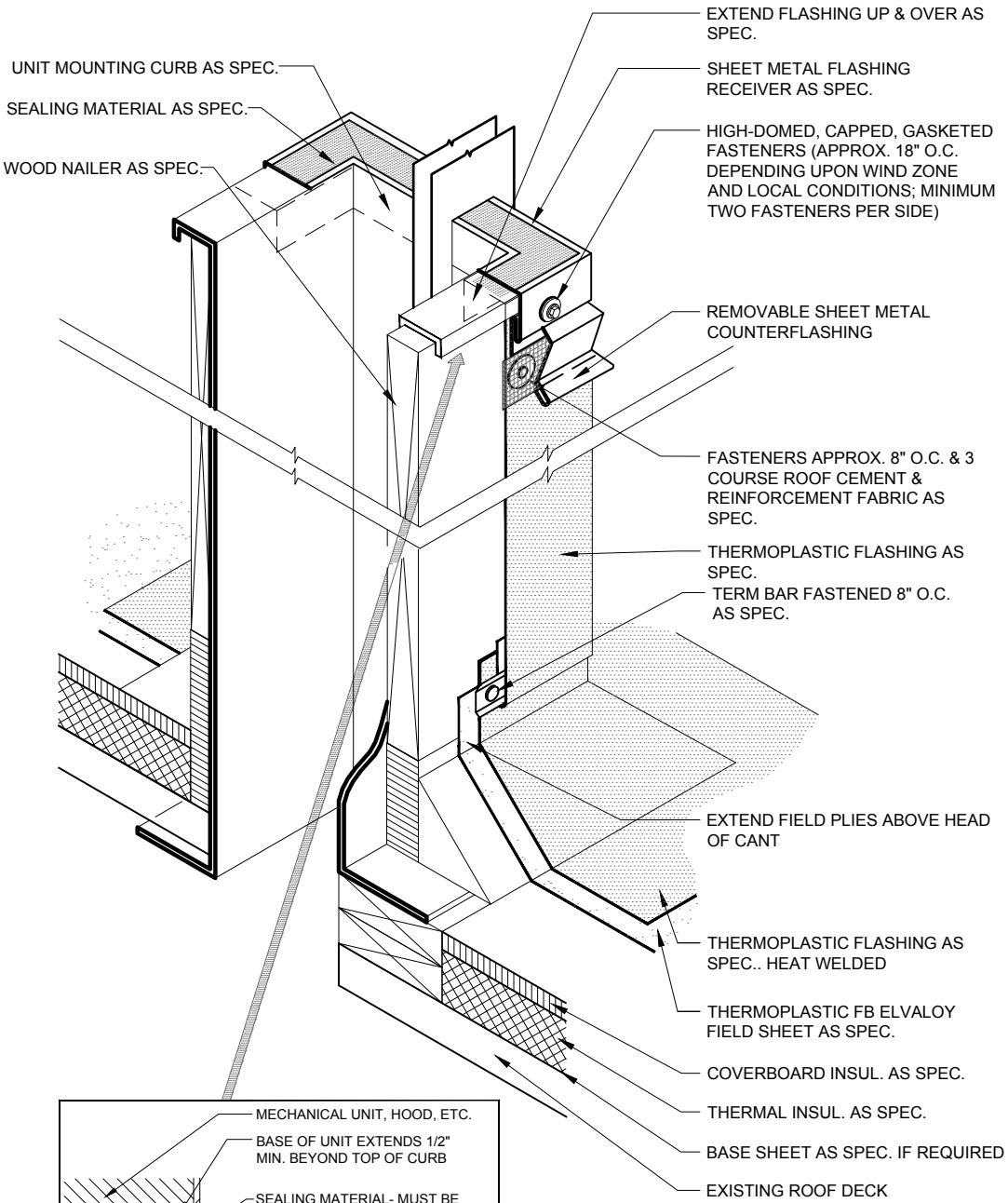
R1.01
OF
1

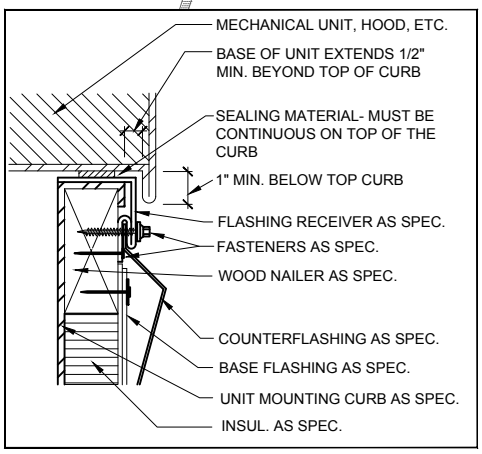


ARMKO INDUSTRIES, INC.

TEXAS REGISTERED ENGINEERING FIRM
F - 6498

PROJECT FOR : HOUSTON COMMUNITY COLLEGE NORTHWEST CAMPUS - KATY CAMPUS 1550 FOX LAKE DRIVE HOUSTON, TEXAS	R2.01 OF 9
DETAIL NAME: TALL PARAPET DETAIL	
PROJECT NO. 20150720-41	
SCALE : NOT TO SCALE | DATE: 08/07/15	DRAWN BY: CB/JA





NOTES:
1. THE CURB'S TOP WOOD NAILER, AND SEAL STRIP ARE TO BE SUPPLIED BY THE CURB MANUFACTURER.
2. ATTACH NAILER TO DECK WITH SUITABLE FASTENERS.
3. WHEN POSSIBLE, THE MECHANICAL UNITS SHOULD NOT BE SET UNTIL THE ROOF MEMBRANE AND FLASHING HAVE BEEN INSTALLED.

ARMKO INDUSTRIES, INC.

TEXAS REGISTERED ENGINEERING FIRM F - 6498

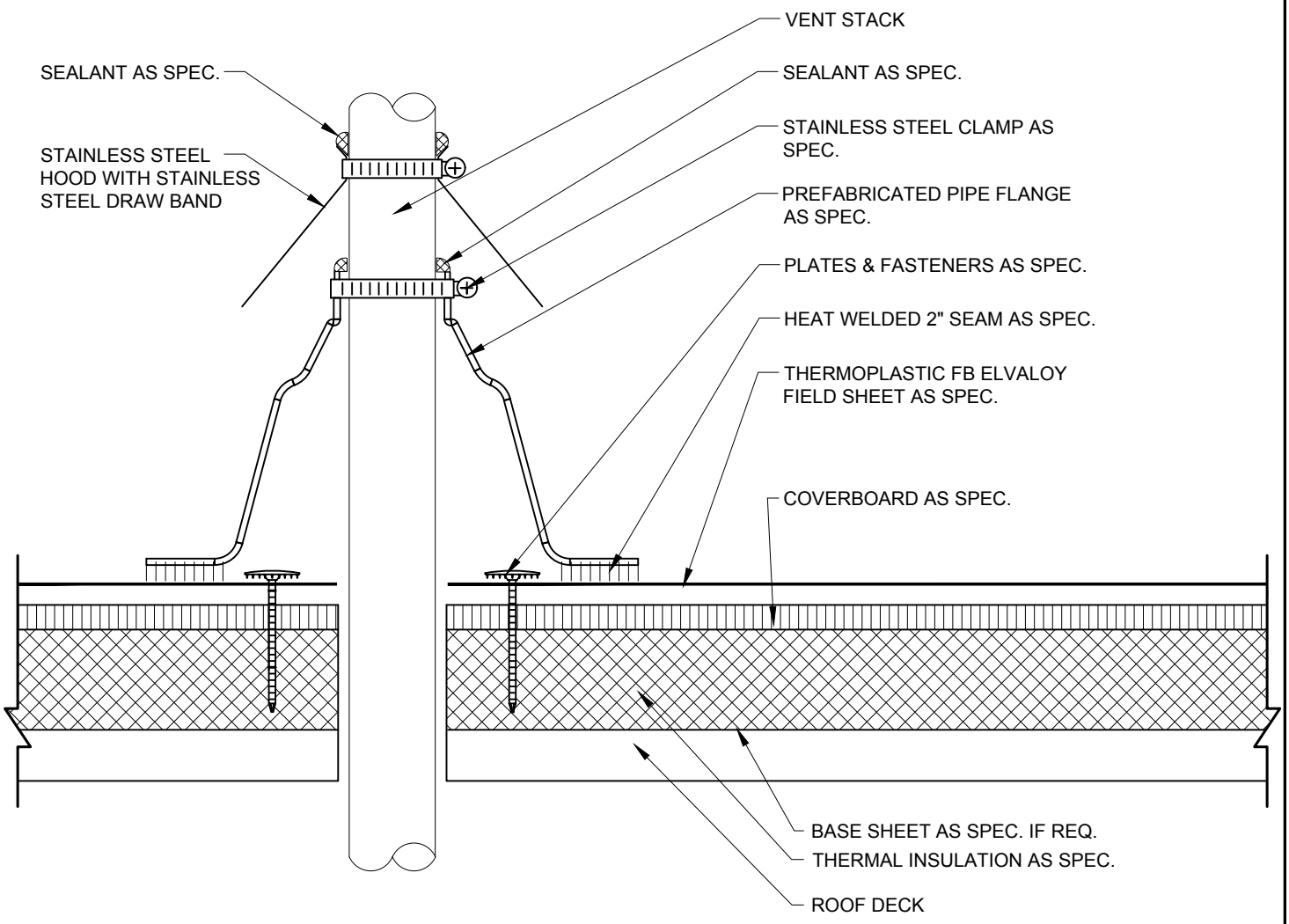
PROJECT FOR : HOUSTON COMMUNITY COLLEGE
NORTHWEST CAMPUS - KATY CAMPUS
1550 FOX LAKE DRIVE
HOUSTON, TEXAS

R2.02
OF
9

DETAIL NAME: TALL CURB DETAIL

PROJECT NO. 20150720-41

SCALE : NOT TO SCALE	DATE: 08/07/15	DRAWN BY: CB/JA



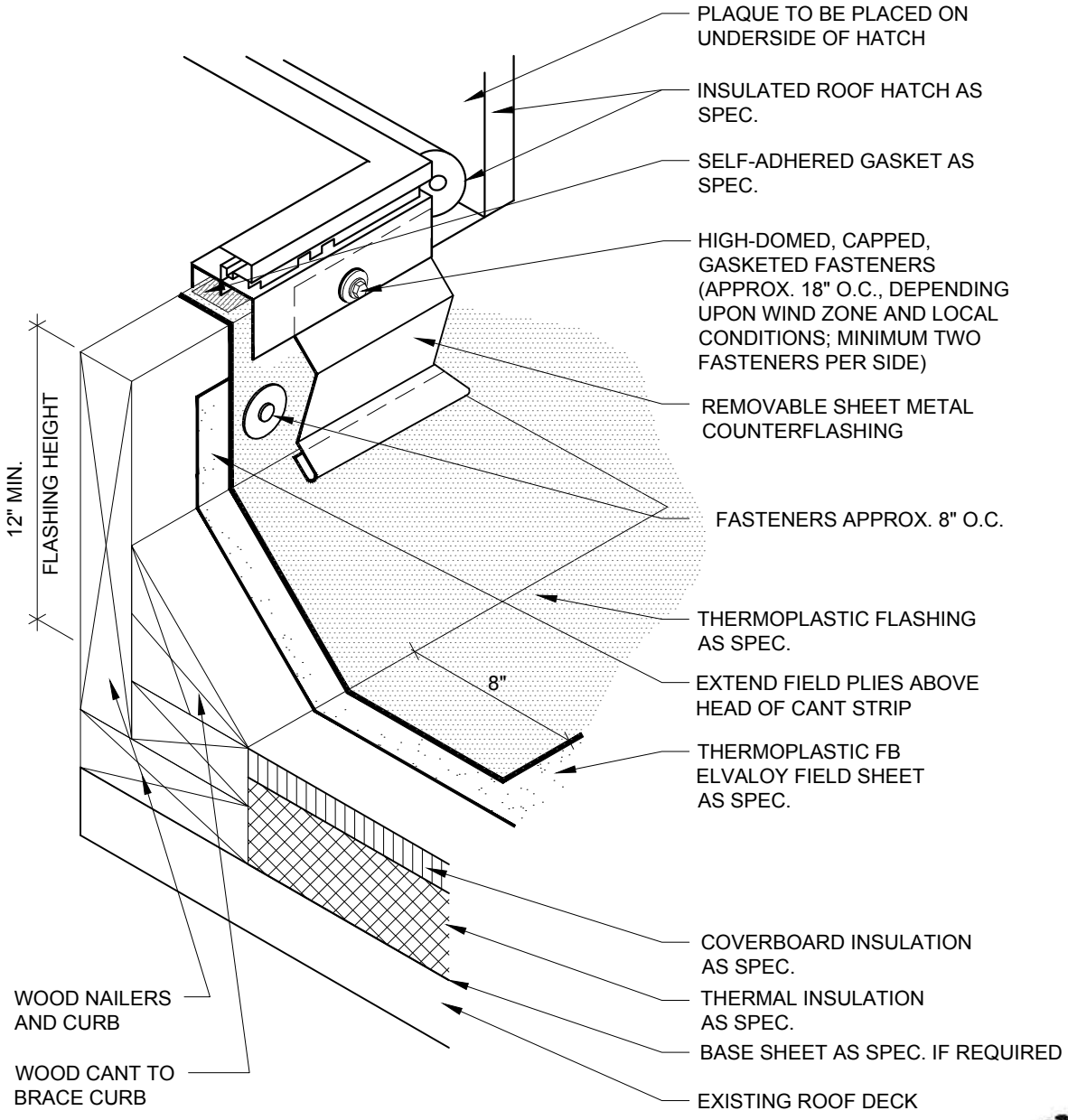
NOTE: PREFABRICATED PIPE FLANGES MAY NOT BE VERTICALLY CUT AND WELDED BACK TOGETHER. COVER ANY ASPHALT RESIDUE ON PIPE WITH ALUMINUM TAPE PRIOR TO INSTALLING MEMBRANE.

ARMKO INDUSTRIES, INC.

TEXAS REGISTERED ENGINEERING FIRM F - 6498

PROJECT FOR : HOUSTON COMMUNITY COLLEGE NORTHWEST CAMPUS - KATY CAMPUS 1550 FOX LAKE DRIVE HOUSTON, TEXAS	R2.03 OF 9
DETAIL NAME: VENT BOOT DETAIL	
PROJECT NO. 20150720-41	

SCALE : NOT TO SCALE	DATE: 08/07/15	DRAWN BY: CB/JA



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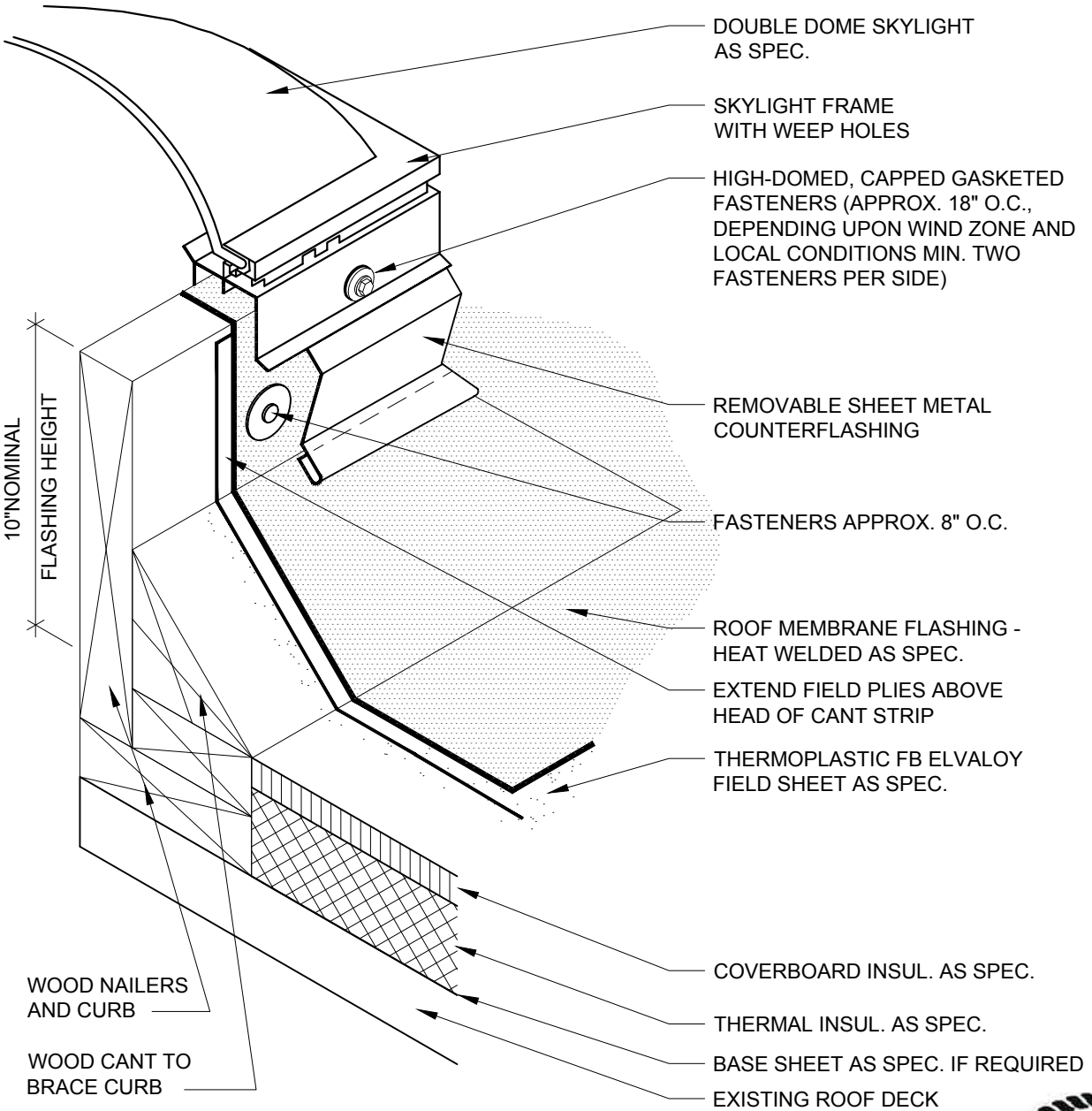
TEXAS REGISTERED ENGINEERING FIRM F - 6498

PROJECT FOR : HOUSTON COMMUNITY COLLEGE NORTHWEST CAMPUS - KATY CAMPUS 1550 FOX LAKE DRIVE HOUSTON, TEXAS	R2.04 OF 9
DETAIL NAME: ROOF HATCH DETAIL	
PROJECT NO. 20150720-41	

SCALE : NOT TO SCALE	DATE: 08/07/15	DRAWN BY: CB/JA



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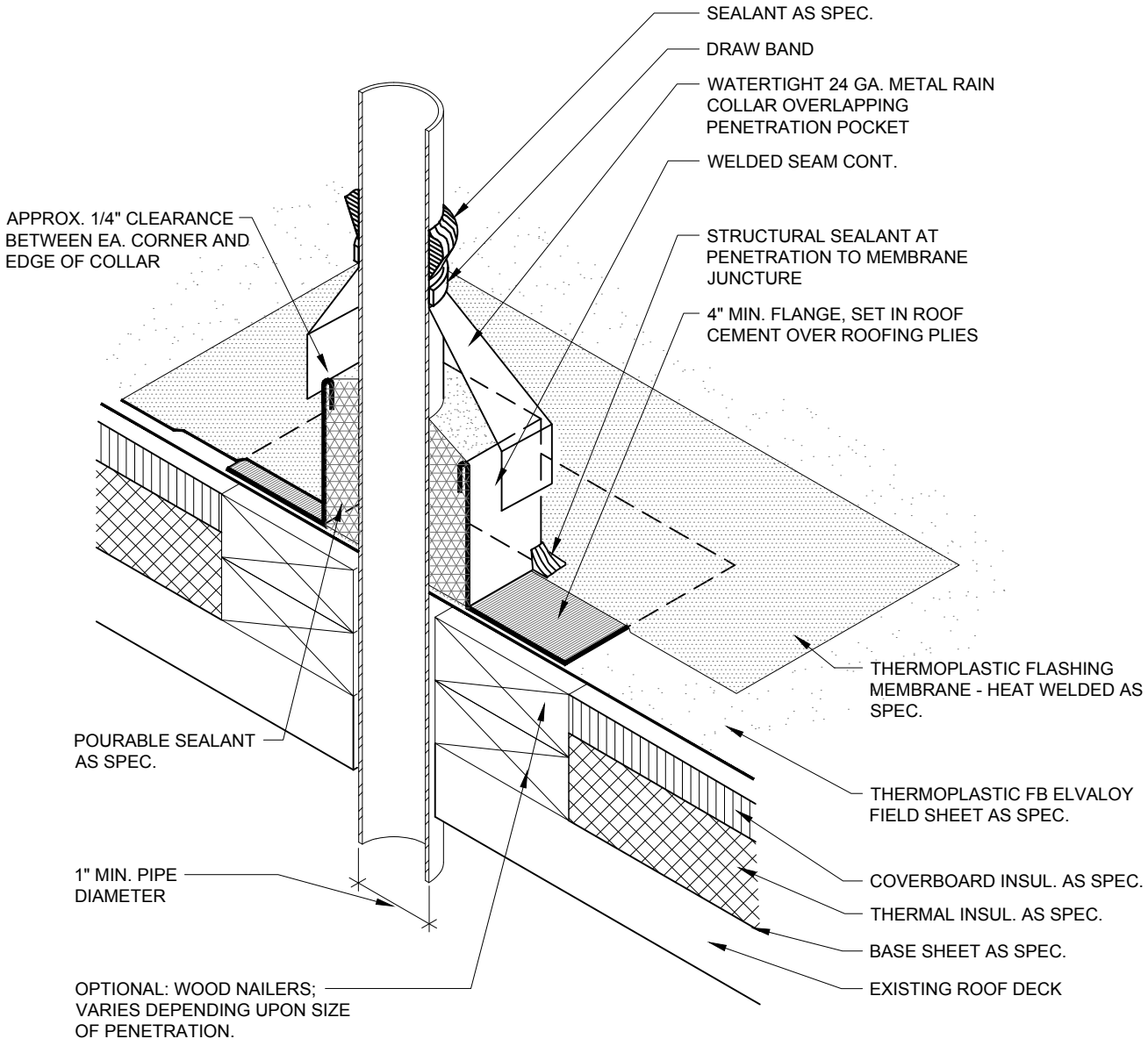
TEXAS REGISTERED ENGINEERING FIRM F - 6498

PROJECT FOR : HOUSTON COMMUNITY COLLEGE NORTHWEST CAMPUS - KATY CAMPUS 1550 FOX LAKE DRIVE HOUSTON, TEXAS	R2.05 OF 9
DETAIL NAME: SKYLIGHT FLASHING DETAIL	
PROJECT NO. 20150720-41	

SCALE : NOT TO SCALE	DATE: 08/07/15	DRAWN BY: CB/JA



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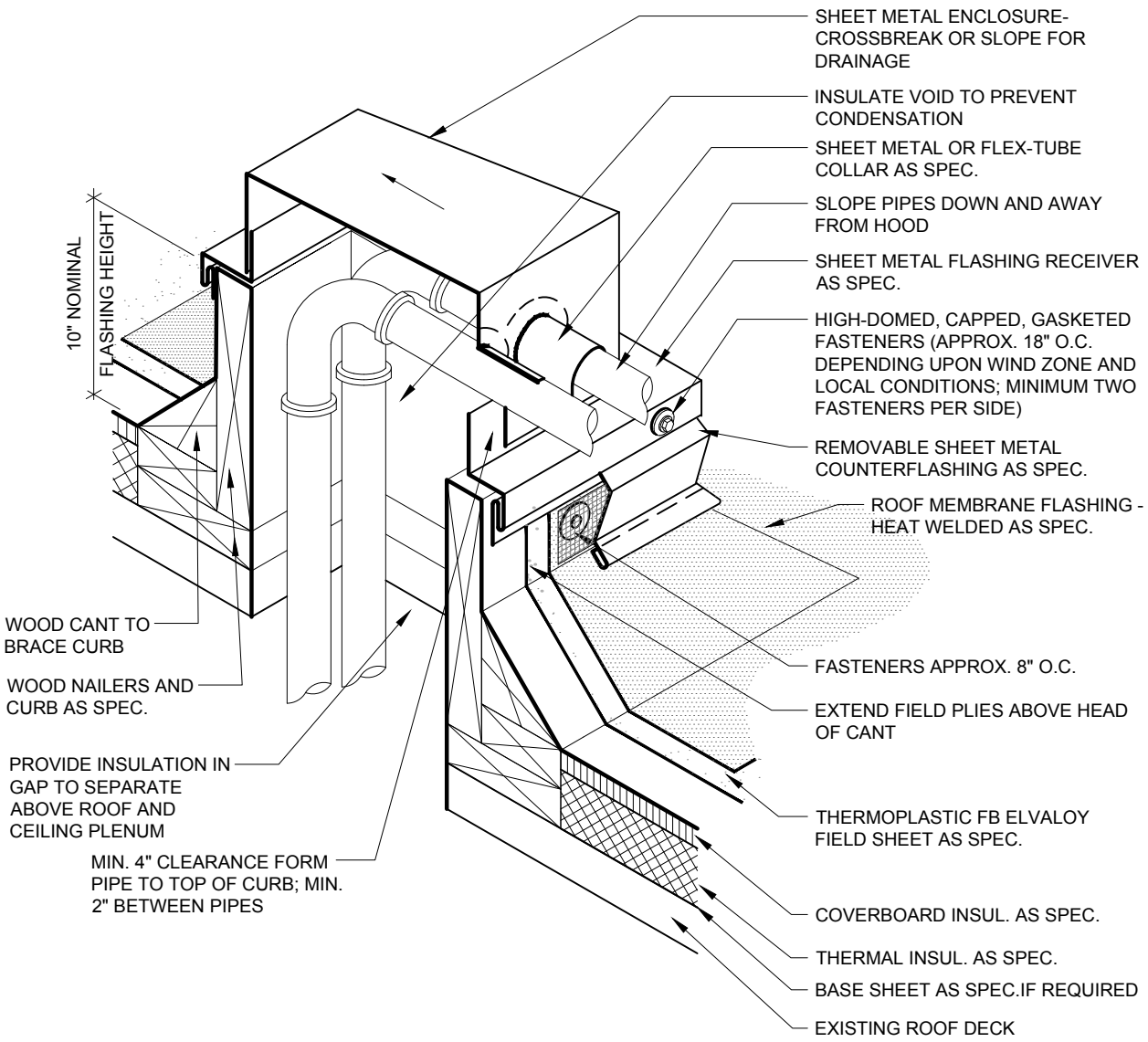
TEXAS REGISTERED ENGINEERING FIRM F - 6498

PROJECT FOR : HOUSTON COMMUNITY COLLEGE NORTHWEST CAMPUS - KATY CAMPUS 1550 FOX LAKE DRIVE HOUSTON, TEXAS		R2.06 OF 9
DETAIL NAME: PITCH PAN FLASHING DETAIL		
PROJECT NO. 20150720-41		
SCALE : NOT TO SCALE	DATE: 08/07/15	DRAWN BY: CB/JA



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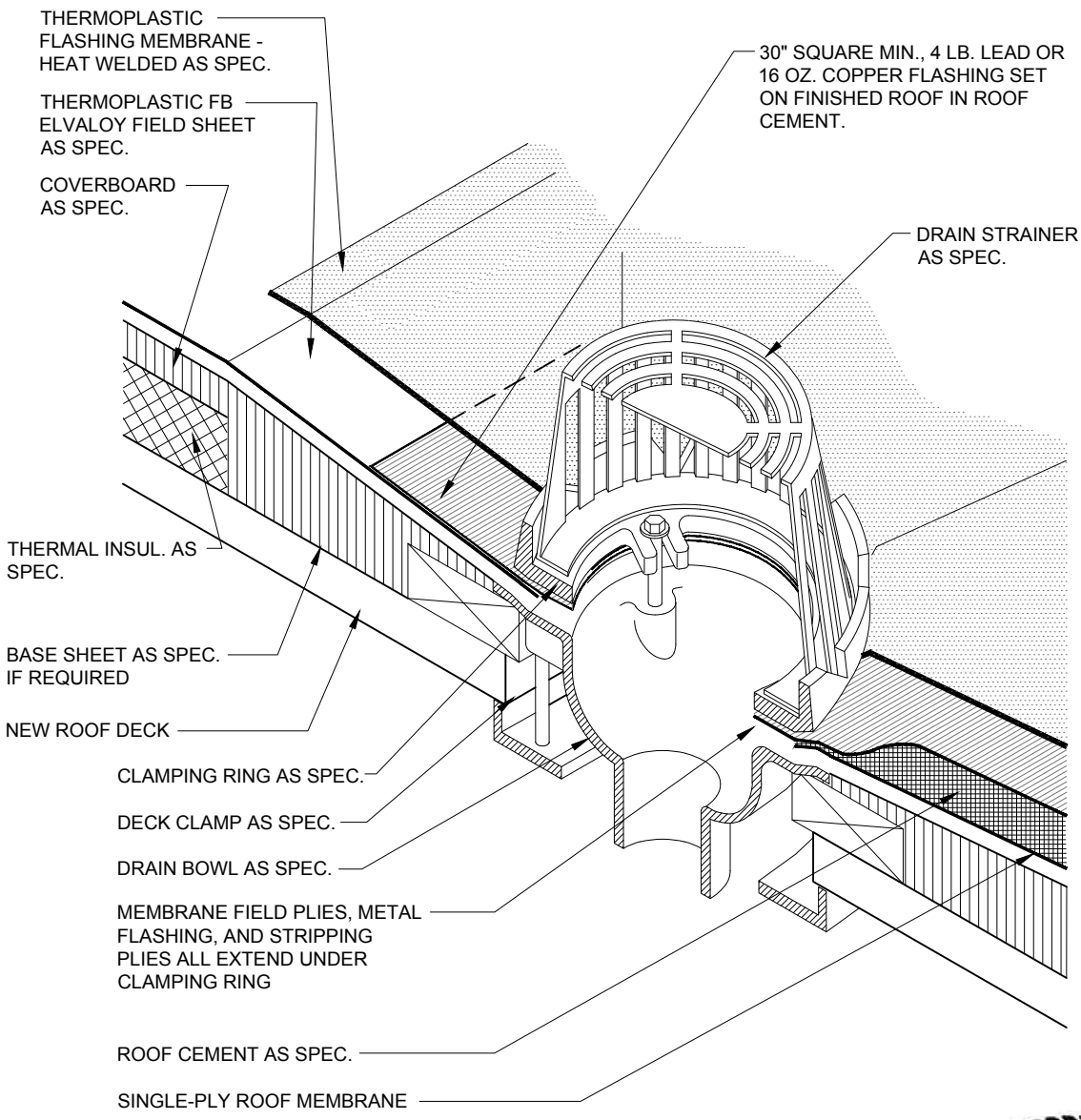
TEXAS REGISTERED ENGINEERING FIRM F - 6498

PROJECT FOR : HOUSTON COMMUNITY COLLEGE NORTHWEST CAMPUS - KATY CAMPUS 1550 FOX LAKE DRIVE HOUSTON, TEXAS		R2.07 OF 9
DETAIL NAME: PIPE BOX FLASHING DETAIL		
PROJECT NO. 20150720-41		
SCALE : NOT TO SCALE	DATE: 08/07/15	DRAWN BY: CB/JA

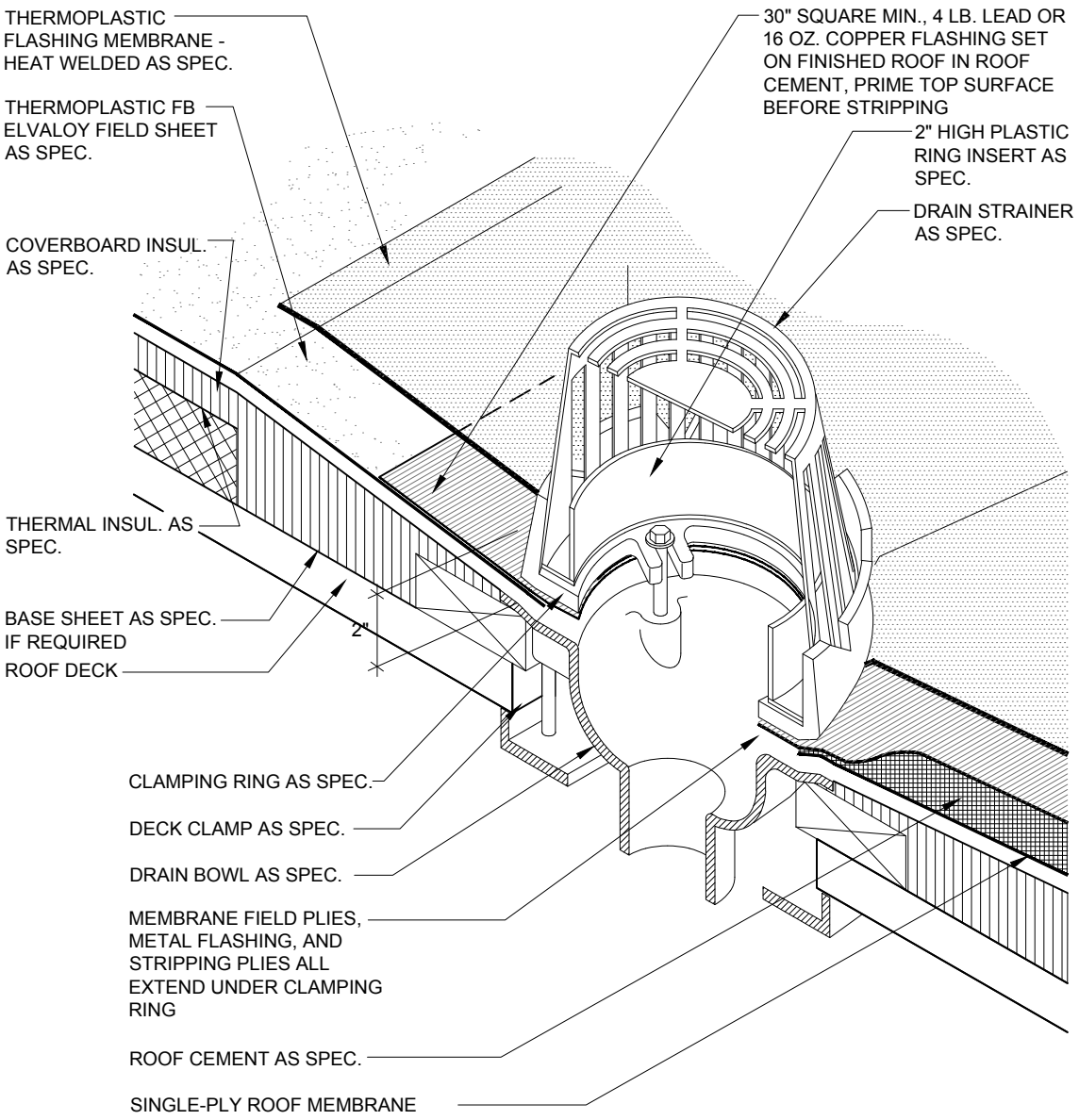


ARMKO INDUSTRIES, INC.

TEXAS REGISTERED ENGINEERING FIRM F - 6498

PROJECT FOR : HOUSTON COMMUNITY COLLEGE NORTHWEST CAMPUS - KATY CAMPUS 1550 FOX LAKE DRIVE HOUSTON, TEXAS	R2.08 OF 9
DETAIL NAME: PRIMARY ROOF DRAIN FLASHING DETAIL	
PROJECT NO. 20150720-41	

SCALE : NOT TO SCALE	DATE: 08/07/15	DRAWN BY: CB/JA



ARMKO INDUSTRIES, INC.

TEXAS REGISTERED ENGINEERING FIRM F - 6498

PROJECT FOR : HOUSTON COMMUNITY COLLEGE NORTHWEST CAMPUS - KATY CAMPUS 1550 FOX LAKE DRIVE HOUSTON, TEXAS	R2.09 OF 9
DETAIL NAME: OVERFLOW ROOF DRAIN FLASHING DETAIL	
PROJECT NO. 20150720-41	
SCALE : NOT TO SCALE | DATE: 08/07/15 | DRAWN BY: CB/JA	