SPECIFICATIONS

FOR ROOFING

AT

FIRE STATION NO. 1

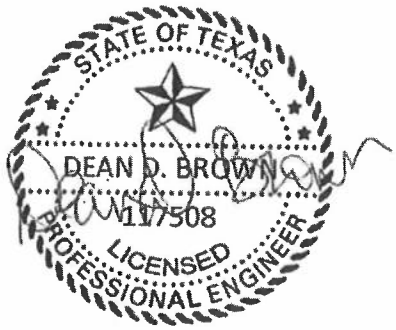
FOR THE

CITY OF NORTH RICHLAND HILLS

8001 SHADYWOOD

NORTH RICHLAND HILLS, TX 76180

PROJECT NUMBER: 21-1159-34



07-13-2021

Armko Industries, Inc.
Texas Registered Engineering Firm
F-006498

CONTRACTOR PROPOSAL FORM
CITY OF NORTH RICHLAND HILLS
FIRE STATION NO. 1
PROJECT NO. 21-1159-34

The purpose of this proposal is for The City of North Richland Hills to complete the replacement of the roof system at Fire Station 1, utilizing the

√ TIPS/TAPS, The Interlocal Purchasing System (TIPS) and
The Texas-Arkansas Purchasing System (TAPS)

which operates and serves as a procurement option for Governmental Agencies in accordance with any or all of the following statutes: Texas Local Government Code Chapters 252, 262, or 271; Texas Education Code Section 44.031; and/or Texas Government Code Chapter 791, which is also known as the Inter-local Cooperative Purchasing Act.

The proposal by the contractor shall be submitted via email to Gregory Wade, gwade@nrhtx.com, by July 21, 2021, 2:00 p.m. Questions regarding the specifications should be directed to Mr. Javier Flores 972-689-0314

The contract for the project will be between The City of North Richland Hills and the Roofing Contracting Company.

CONTRACT DOCUMENTS: Having examined the Proposal, Contract, General Instructions, Materials, Execution, and Drawings for Project No. 21-1159-34 and conditions for said roofing replacement work, and having examined the premises and circumstances affecting the work, the undersigned offer:

OFFER: To furnish all labor, material, tools, equipment, transportation, bonds, insurance certificates, incidentals, and other facilities, and to perform all work for the said roofing replacement for the following:

BASE PROPOSAL –

Work shall include:

- Cut all current blisters, air pockets, and bubbles in current modified bitumen membrane.
- Mechanically fasten 1/2" Gypsum board to the metal deck.
- Install 60-mil fleece back TPO mopped in hot asphalt.
- All control joints and coping stone joints to be raked and resealed using backer rod and caulk.
- Clean and prepare surface, to paint gutters and rivet straps with rust inhibitor paint.
- All open ends on existing metal roof are to be sealed.

_____ $_____

Unit Price Proposal:

1. Additional cost over and above the contract amount for replacing wet insulation: $_____ per square foot (nominal thickness of 1").

2. Remove and replace deteriorated nailers: $_____ per board foot.

The above proposal quoted by Contractor:

Signature: _____

Name Printed: _____

Title: _____

Company: _____

Date: _____

Contractor acknowledges receipt of the following addenda:

ADDENDUM #1:

_____ (Initial)

ADDENDUM #2:

_____ (Initial)

The above proposal accepted by Owner:

Signature: _____

Name Printed: _____

Title: _____

City: _____

Date: _____

NORTH RICHLAND HILLS

MINIMUM INSURANCE REQUIREMENTS

Contractors performing work on City property or public right-of-way for the City of North Richland Hills shall provide the City a certificate of insurance evidencing the coverages and coverage provisions identified herein. Contractors shall provide the City evidence that all subcontractors performing work on the project have the same types and amounts of coverages as required herein or that the subcontractors are included under the contractor's policy. The City, at its own discretion, may require a certified copy of the policy.

All insurance companies and coverages must be authorized by the Texas Department of Insurance to transact business in the State of Texas and must be acceptable to the City of North Richland Hills.

The following guidelines are designed to show the most common minimum insurance requirements for standard contracts and agreements with the City. Non-standard agreements may require additional coverage and/or higher limits. Coverage Amounts required for non-standard agreements to be determined by the department and the City Manager.

General Contracts for Services:
Service work, and general maintenance agreements, etc.

- ☐ Commercial General Liability
- ☐ Automobile Liability
- ☐ Workers' Compensation & Employer's Liability
- ☐ Payment and Maintenance Bond (if applicable)

See Exhibit A for insurance language to include in general contracts for services

Professional Services:
Consultants or other professionals including: accountants, attorneys, architects, engineers, medical professionals, medical services, etc.

- ☐ Commercial General Liability
- ☐ Automobile Liability
- ☐ Workers' Compensation & Employer's Liability
- ☐ Professional Liability or equivalent Errors & Omissions (appropriate to Contractor's profession)

See Exhibit B for insurance language to include in professional services contracts

Construction:
Building contractors for construction projects.

- ☐ Commercial General Liability
- ☐ Automobile Liability
- ☐ Workers' Compensation & Employer's Liability
- ☐ Professional Liability (if applicable for design function)
- ☐ Builder's Risk (required for new or existing property under construction)
- ☐ Payment and Maintenance Bond (if applicable)

See Exhibit C for insurance language to include in construction contracts

Information Technology/Network Access Services:

NRH
NORTH RICHLAND HILLS

For the purchasing and installation of technology-related software and equipment or contracting services that support, maintain or interact with the CITY'S technology systems.

- ☐ Commercial General Liability
- ☐ Automobile Liability
- ☐ Workers' Compensation & Employer's Liability
- ☐ Professional Liability (if applicable)
- ☐ Cyber Liability

See Exhibit D for insurance language to include in IT/network access services agreements

Standard Minimum Required Insurance Coverage

Insurance Type	Limit	Provision
Commercial General Liability	$1,000,000 Each Occurrence $2,000,000 Aggregate	City to be listed as additional insured and provided 30-day notice of cancellation or material change in coverage
	For Construction Projects: $2,000,000 Each Occurrence $4,000,000 Aggregate	
Automobile Liability	$1,000,000 Combined Single Limit	
Workers' Compensation	Texas Statutory Requirements	Waiver of subrogation in favor of City
Employer's Liability	$500,000 injury - each accident $500,000 disease - each employee $500,000 disease - policy limit	
Professional Liability (or equivalent Errors & Omissions coverage appropriate to the Contractor's profession)	$1,000,000 Each Occurrence	
Builder's Risk (required for new or existing property under construction)	100% Value	
Cyber Liability	$1,000,000 Each Occurrence	
Payment/Maintenance Bonds	In accordance with Chapter 2253 of the Texas Government Code	

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NORTH RICHLAND HILLS

EXHIBIT A

GENERAL CONTRACTS FOR SERVICES

For the duration of this Agreement, CONTRACTOR shall maintain the following minimum insurance which shall protect CONTRACTOR, its subcontractors, its sub-consultants and CITY from claims for injuries, including accidental death, as well as from claims for property damage which may arise from the performance of work under this Agreement.

A. Workers' Compensation and Employer's Liability Insurance:

Workers' Compensation	Texas Statutory
Employer's Liability	$500,000 injury - each accident
	$500,000 disease - each employee
	$500,000 disease - policy limit

B. Commercial General Liability:
On an "occurrence" basis, including, property damage, bodily injury, products and completed operations and personal & advertising injury with limits no less than $1,000,000 per occurrence and $2,000,000 aggregate.

C. Automobile Liability:
Covering any auto, or if CONTRACTOR has no owned autos, covering hired and non-owned autos with a Combined Single Limit no less than $1,000,000 per accident for bodily injury and property damage.

Insurance limits can be met with a combination of primary and excess/umbrella coverage.

The CITY, its officers, officials and employees are to be covered as "Additional Insured" on the commercial general liability and automobile liability policies as respects liability arising out of activities performed by or on behalf of the CONTRACTOR.

A waiver of subrogation in favor of the CITY, its officers, officials and employees shall be contained in the Workers' Compensation insurance policy.

Policies of insurance shall not be cancelled non-renewed, terminated, or materially changed unless and until thirty (30) days' notice has been given to CITY.

All insurance shall be issued by responsible insurance companies eligible to do business in the State of Texas and having an A.M. Best Financial rating of A- VI or better.

CONTRACTOR shall furnish the CITY certificates of insurance affecting coverage required. The certificates for each insurance policy are to be signed by a person authorized by that insurer to bind coverage on its behalf. Certificates of Insurance must be submitted on a form approved by the Texas Department of Insurance.

Payment and Maintenance Bonds (if applicable): CONTRACTOR shall procure Payment and Maintenance Bonds as applicable and in accordance with Chapter 2253 of the Texas Government Code.

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EXHIBIT B

PROFESSIONAL SERVICES

For the duration of this Agreement, CONTRACTOR shall maintain the following minimum insurance which shall protect CONTRACTOR, its subcontractors, its sub-consultants and CITY from claims for injuries, including accidental death, as well as from claims for property damage which may arise from the performance of work under this Agreement.

A. Workers' Compensation and Employer's Liability Insurance:

Workers' Compensation	Texas Statutory
Employer's Liability	$500,000 injury - each accident
	$500,000 disease - each employee
	$500,000 disease - policy limit

B. Commercial General Liability:
On an "occurrence" basis, including, property damage, bodily injury, products and completed operations and personal & advertising injury with limits no less than $1,000,000 per occurrence and $2,000,000 aggregate.

C. Automobile Liability:
Covering any auto, or if CONTRACTOR has no owned autos, covering hired and non-owned autos with a Combined Single Limit no less than $1,000,000 per accident for bodily injury and property damage.

D. Professional Liability (Errors and Omissions)
CONTRACTOR shall maintain Professional Liability (or equivalent) errors and omissions insurance appropriate to the CONTRACTOR'S profession, [enter description of Contractor's profession], with a limit no less than $1,000,000 per occurrence or claim.

Insurance limits can be met with a combination of primary and excess/umbrella coverage.

The CITY, its officers, officials and employees are to be covered as "Additional Insured" on the commercial general liability and automobile liability policies as respects liability arising out of activities performed by or on behalf of the CONTRACTOR.

A waiver of subrogation in favor of the CITY, its officers, officials and employees shall be contained in the Workers' Compensation insurance policy.

Policies of insurance shall not be cancelled non-renewed, terminated, or materially changed unless and until thirty (30) days' notice has been given to CITY.

All insurance shall be issued by responsible insurance companies eligible to do business in the State of Texas and having an A.M. Best Financial rating of A- VI or better.

CONTRACTOR shall furnish the CITY certificates of insurance affecting coverage required. The certificates for each insurance policy are to be signed by a person authorized by that insurer to bind coverage on its behalf. Certificates of Insurance must be submitted on a form approved by the Texas Department of Insurance.

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NORTH RICHLAND HILLS

EXHIBIT C

CONSTRUCTION

For the duration of this Agreement, CONTRACTOR shall maintain the following minimum insurance which shall protect CONTRACTOR, its subcontractors, its sub-consultants and CITY from claims for injuries, including accidental death, as well as from claims for property damage which may arise from the performance of work under this Agreement.

A. Workers' Compensation and Employer's Liability Insurance:

Workers' Compensation	Texas Statutory
Employer's Liability	$500,000 injury - each accident
	$500,000 disease - each employee
	$500,000 disease - policy limit

B. Commercial General Liability:

On an "occurrence" basis, including, property damage, bodily injury, products and completed operations and personal & advertising injury with limits no less than $2,000,000 per occurrence and $4,000,000 aggregate.

C. Automobile Liability:

Covering any auto, or if CONTRACTOR has no owned autos, covering hired and non-owned autos with a Combined Single Limit no less than $1,000,000 per accident for bodily injury and property damage.

D. Professional Liability (if contract involves design work)

CONTRACTOR shall maintain Professional Liability (or equivalent) errors and omissions insurance appropriate to the CONTRACTOR'S profession, [enter description of Contractor's profession], with a limit no less than $1,000,000 per occurrence or claim

E. Builder's Risk

CONTRACTOR shall maintain Builder's Risk Insurance providing All-Risk (Special Perils) coverage in an amount equal to one hundred percent (100%) of the completed value of the project in question and no coinsurance penalty provisions. The policy shall list the CITY as loss payee as their interests may appear.

Insurance limits can be met with a combination of primary and excess/umbrella coverage.

The CITY, its officers, officials and employees are to be covered as "Additional Insured" on the commercial general liability and automobile liability policies as respects liability arising out of activities performed by or on behalf of the CONTRACTOR.

A waiver of subrogation in favor of the CITY, its officers, officials and employees shall be contained in the Workers' Compensation insurance policy.

Policies of insurance shall not be cancelled non-renewed, terminated, or materially changed unless and until thirty (30) days' notice has been given to CITY.

All insurance shall be issued by responsible insurance companies eligible to do business in the State of Texas and having an A.M. Best Financial rating of A- VI or better.

CONTRACTOR shall furnish the CITY certificates of insurance affecting coverage required. The certificates for each insurance policy are to be signed by a person authorized by that insurer to bind coverage on its behalf. Certificates of Insurance must be submitted on a form approved by the Texas Department of Insurance.

Payment and Maintenance Bonds (if applicable): CONTRACTOR shall procure Payment and Maintenance Bonds as applicable and in accordance with Chapter 2253 of the Texas Government Code.

NRH
NORTH RICHLAND HILLS

EXHIBIT D

INFORMATION TECHNOLOGY/NETWORK ACCESS SERVICES

For the duration of this Agreement, CONTRACTOR shall maintain the following minimum insurance which shall protect CONTRACTOR, its subcontractors, its sub-consultants and CITY from claims for injuries, including accidental death, as well as from claims for property damage which may arise from the performance of work under this Agreement.

A. Workers' Compensation and Employer's Liability Insurance:

Workers' Compensation	Texas Statutory
Employer's Liability	$500,000 injury - each accident
	$500,000 disease - each employee
	$500,000 disease - policy limit

B. Commercial General Liability:
On an "occurrence" basis, including, property damage, bodily injury, products and completed operations and personal & advertising injury with limits no less than $1,000,000 per occurrence and $2,000,000 aggregate.

C. Automobile Liability:
Covering any auto, or if CONTRACTOR has no owned autos, covering hired and non-owned autos with a Combined Single Limit no less than $1,000,000 per accident for bodily injury and property damage.

D. Professional Liability (Errors and Omissions)
If appropriate for CONTRACTOR'S work, CONTRACTOR shall maintain Professional Liability (or equivalent) errors and omissions insurance appropriate to the CONTRACTOR'S profession, [enter description of Contractor's profession], with a limit no less than $1,000,000 per occurrence or claim.

E. Cyber Liability
CONTRACTOR shall maintain cyber liability (or equivalent) insurance. Such insurance shall provide limits of no less than $1,000,000 per occurrence. Coverage shall be sufficiently broad to respond to the duties and obligations as undertaken by the CONTRACTOR.

Insurance limits can be met with a combination of primary and excess/umbrella coverage.

The CITY, its officers, officials and employees are to be covered as "Additional Insured" on the commercial general liability and automobile liability policies as respects liability arising out of activities performed by or on behalf of the CONTRACTOR.

A waiver of subrogation in favor of the CITY, its officers, officials and employees shall be contained in the Workers' Compensation insurance policy.

Policies of insurance shall not be cancelled non-renewed, terminated, or materially changed unless and until thirty (30) days' notice has been given to CITY.

All insurance shall be issued by responsible insurance companies eligible to do business in the State of Texas and having an A.M. Best Financial rating of A- VI or better.

CONTRACTOR shall furnish the CITY certificates of insurance affecting coverage required. The certificates for each insurance policy are to be signed by a person authorized by that insurer to bind coverage on its behalf. Certificates of Insurance must be submitted on a form approved by the Texas Department of Insurance.

Other Insurance Requirements - To Be Included As Applicable

CONTRACTORs who serve or distribute liquor:

Liquor Legal Liability - CONTRACTOR shall maintain Liquor Legal Liability coverage covering the selling, serving, or furnishing of any alcoholic beverage performed by CONTRACTOR, or on its behalf. Such insurance shall provide limits of no less than $1,000,000.00 per occurrence.

CONTRACTORs who hold long-term leases:

Property Insurance – LESSEE shall maintain Property Insurance against all risks of loss to any improvements or betterments, at full replacement cost with no coinsurance penalty provision. The CITY shall be added as a Loss Payee to the policy as interests may appear.

CONTRACTOR's whose work involves chemicals or otherwise has a pollution exposure:

Contractors' Pollution Liability (or equivalent) – CONTRACTOR shall maintain Contractors' Pollution Liability with limits no less than $1,000,000.00 per occurrence or claim and $2,000,000 policy aggregate.

CONTRACTORs who take possession of City or public vehicles (e.g., parking lots operators, auto repair shops):

Garage Keepers Liability (or equivalent) – CONTRACTOR shall maintain Garage Keepers Liability or equivalent coverage for applicable property while in the CONTRACTOR'S care, custody or control. Coverage must include Comprehensive and Collision coverage. Such insurance shall provide limits equal to no less than the total value of CITY or public property in the CONTRACTOR'S care, custody and control at any one time.

CONTRACTORs who own and operate unmanned aircraft (drones):

UAS Liability (or equivalent) - CONTRACTOR shall procure and maintain for the duration of the contract insurance against claims for injuries to persons or damage to property which may arise from or in connection with the ownership, maintenance or use of Unmanned Aerial Systems (Drones). Coverage must include limits no less than $1,000,000 per occurrence and $2,000,000 aggregate.

A PURCHASE ORDER WILL NOT BE ISSUED WITHOUT EVIDENCE OF INSURANCE.

SECTION 07 01 55
TPO ROOFING SYSTEM

PART 1 - GENERAL

1.01 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.
3. Installer must be an experienced single firm specializing in the type of roofing repair and/or removal and replacement work required, employing only experienced workers for the class of work in which they are employed, having at least five (5) years successful experience on projects similar in size and scope and acceptable as applicators by the Owner's representative.
4. Contractor must have successfully completed previous projects warranted by the manufacturer.

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

1.02 QUALITY ASSURANCE

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

B. Underwriters Laboratory (Roofing Covering): Class A fire hazard classification.

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

1.03 REFERENCES (INCLUDING LATEST REVISIONS)

A. American Society for Testing and Materials:
1. ASTM B 209, Specification for Aluminum and Aluminum Alloy Sheet and Plate
2. ASTM C 719, Test Method for Adhesion and Cohesion of Elastomeric Joint Sealants Under Cycle Movement (Hockman Cycle)
3. ASTM C 794, Test Method for Adhesion-in-Peel of Elastomeric Joint Sealants
4. ASTM C 920, Specification for Elastomeric Joint Sealants
5. ASTM D 312, Specification for Asphalt Used in Roofing
6. ASTM D 1863, Specification for Mineral Aggregate Used on Built-up Roofs
7. ASTM D 2178, Specification for Asphalt Glass Felt Used in Roofing and Waterproofing
8. ASTM D 2824, Specification for Aluminum - Pigmented Asphalt Roof Coatings
9. ASTM D 4586, Specification for Asphalt Roof Cement, Asbestos Free
10. ASTM A 361, 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
4. American Society of Civil Engineers – ASCE 7

1.04 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.

1.05 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. Manufacturer's packaging and/or roll plastic is not acceptable for exterior storage. Tarpaulin with grommets shall be minimum acceptable for exterior coverings. All materials stored as above shall be minimum of four inches (4") off the substrate, and the tarpaulin tied off with rope.

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

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

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

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

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

H. 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.

I. Store rolled goods on end.

J. Protect materials against damage by construction traffic.

K. 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.

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

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

N. No storage of materials shall be permitted on roof areas other than those materials that are to be installed the same day. Any exception must be in written form.

O. The contractor is to erect a temporary chain link fence, minimum six feet (6') in height, around work area stage and kettles. Fence is to be secured on a daily basis.

1.06 SITE CONDITIONS

A. Job Condition Requirements:
   1. Apply roofing in dry weather.
   2. Do not apply roofing when ambient temperature is below 40° F.
   3. 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.
   4. 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.

5. 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.
6. 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.
7. 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.
8. Follow insurance underwriter's requirements acceptable for use with specified products or systems.
9. 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.
10. All kettles shall have an automatic thermostat control, and temperature gauge, all in working order.
11. 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.
12. 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.
13. 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 mobile, home and office numbers for:
   a) Job Foreman
   b) Job Superintendent
   c) Owner or Company Officer

B. 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.

C. 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.

D. 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. This is an active fire station. Do not encumber movement of the fire trucks or personnel.
   3. 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.

E. 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 contractor must use Republic Services for dumpsters or own their own.

1.07 WARRANTY

A. Twenty (20) 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 two (2) 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. Membrane manufacturer shall provide the written warranty as specified.
   4. 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.
   5. 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 SUBMITTALS paragraph in this section 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. Acceptable manufacturers: Johns-Manville, GAF, Firestone.

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

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

E. The manufacturer shall have 15 years UL listing for the membrane to be used on the project. Membrane manufacturer shall have a minimum of 15 years FM approval, and 15 years manufacturing experience with the roofing membrane specified for this project.

F. All roofing and roof accessories shall be installed in compliance with manufacturer's current specifications and details.

G. All materials used on the project shall be asbestos free.

H. Liquid-type auxiliary materials shall meet VOC limits of authorities having jurisdiction.

2.02 TPO ROOFING MEMBRANE

A. The white 60 mil thermoplastic polyolefin (TPO) membrane sheet shall be fabric reinforced with a backing of eight-ounce, non-woven polyester fleece, meeting ASTM D 6878.

Property	Test Procedure	Physical Properties
Overall Thickness w/o fleece	ASTM D 751	0.060 in
Coating over scrim	ASTM D 6878, Annex A	0.025 in
Breaking Strength	ASTM D 751, Grab Method	390 lb_f
Elongation at Reinforcement Break	ASTM D 751, Grab Method	25%
Tearing Strength	ASTM D 751	120 lb_f
Brittleness Point	ASTM D 2137	Pass
Ozone Resistance, no cracks	ASTM D 1149	Pass
Properties after Heat Aging	ASTM D 573	
Retention of Breaking Strength	ASTM D 751, Grab Method	>90%
Retention of Elongation at Break	ASTM D 751, Grab Method	>90%
Retention of Tearing Strength	ASTM D 751	>60%
Weight Change		<1%
Linear Dimensional Change	ASTM D 1204, 6 h @ 158°	<1%
Water Absorption	ASTM D 471	<3%
Weather Resistance @7x magnification	ASTM G 155, @7x magnification	>20,160 kJ/m^2
Puncture Resistance	FTM 101C Method 2031	
Dynamic Puncture Resistance MD	ASTM D 5635	Pass
Dynamic Puncture Resistance CD	ASTM D 5635	Pass
Static Puncture Resistance	ASTM D 5602	Pass

2.03 FLASHING MEMBRANE

A. The flashing membrane shall be a white polyester reinforced flexible sheet, as supplied by the roof membrane manufacturer.

2.04 NON-REINFORCED MEMBRANE

A. The non-reinforced membrane shall have the following minimum properties, as supplied by the roof membrane manufacturer, or approved equal.
   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 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), or approved equal.

B. To seal the leading edge of the membrane, to bond membrane at terminations with metal, and for open seam repair, sealant shall be a thermosetting, solvent free, non-slump, self-fixturing, multipurpose structural sealant which shall meet the following physical and performance properties, M-1 as manufactured by Chem Link Inc., or approved equal.

Properties	
Specific Gravity	1.62 (13.5 lbs./gallon)
Viscosity	800,000 cps Brookfield RTV, TF spindle, 4 rpm 70° F.
Shear Strength (ASTM D-1002)	300 psi+ (7 day ambient cure)
Elongation @ break (ASTM D-412)	300% (7 day ambient cure)
Hardness Shore A (ASTM C-661)	50 – 55 (14 day ambient cure)
Tack free time (ASTM C-679)	35 minutes
Low temperature flex	Minus 20° F: PASS
Slump (sag) (ASTM C-639)	Zero slump
Shrinkage (ASTM D-2453)	No measurable shrinkage (14 cay cure)
Service temperature	-40° F to 200° F

2.06 BITUMEN

A. Shall be ASTM D 312 Type IV 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

2.07 INSULATION

D. At Recovery Board: Impact-resistant, nonstructural, specially engineered gypsum and cellulose fiber panels with 95% recycled content; uniform water-resistance throughout core and surface. Board size four feet by four feet (4' x 4'), thickness 5/8"; conforming to ASTM C 1278, meeting FM 4470 Class 1 criteria, classified by Underwriters Laboratory, and listed in the FM Global Approval Guide. Board will meet the following physical properties, Securock™ Roof Board, as manufactured by USG Corporation, or approved equal.

Test	Typical Value	Test Method
Fire Resistance	Class A	UL 790
Permeance	≤ 30	ASTM C473
Surface water absorption	≤ 1.6 nominal grams	ASTM C473
Water resistance	Maximum 10% weight percentage gain	
Mold Resistance	Minimum rating of "10"	ASTM D3273

2.08 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 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, as manufactured by Olympic Manufacturing Group, Inc., or approved equal. Fasteners, plates, and/or bars shall be listed in the FM Global Approval Guide.

2.09 BONDING ADHESIVE FOR FLASHING

A. Description: Adhesive is a bonding cement of synthetic rubber for adhering membranes to various substrates, produced by Ashland Chemical, or approved equal.

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.

2.10 ASPHALT ROOF PRIMER

A. Quick-dry asphalt-based primer for priming of asphalt roof surfaces, or approved equal.

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

2.11 WOOD

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

2.12 SEAM SEALER

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

2.13 TRIM STRIP

A. The trim strip shall have the following minimum properties.
   1. Six inch (6") wide non-reinforced 45 mil thermoplastic used for capping butted ends of rolls.
   2. The trim strip is seamed with the use of hot-air welding.

2.14 CORNERS

A. Inside and outside corners shall be supplied by the membrane manufacturer and shall be of the same base material as the roof membrane.

2.15 PIPE BANDS

A. Stainless steel bands with self-locking heads.

B. Tighten with hand tool for tension control and flush cut off.

2.16 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.

2.17 PIPESTANDS (6" OR SMALLER - LESS THAN 9" OFF ROOF SURFACE)

A. Black, polycarbonate construction with stainless steel roller pin assembly suitable for gas lines and conduit set in finished roof assemblies, sized accordingly, as manufactured by Miro Industries, Inc., or approved equal.

2.18 PIPE HANGERS (6" AND LARGER – 9" TO 12" OFF ROOF SURFACE)

A. Shall be pre-assembled portable pipe hangers constructed of high density polypropylene plastic and UV inhibitors, sized according to outside pipe dimension, as manufactured by Portable Pipe Hangers, or approved equal.

2.19 ROOF DRAIN

A. Shall be all cast iron, minimum four inch (4"), as manufactured by Josam, or approved equal.

2.20 LEAD JACKS

A. Shall be four pound (4#) lead, and of dimensions required to completely cover existing plumbing stack.

2.21 LEAD FLASHING DRAINS

A. Shall be four pound (4#) lead, minimum thirty-six inches by thirty-six inches (36" x 36"), used for flashing of internal drains.

2.22 WALKWAY PAD

A. Shall be as recommended by the roof membrane manufacturer issuing the warranty.

2.23 TERMINATION/PRESSURE BARS

A. Aluminum strip shall be extruded channel bar with a mill finish, width one inch (1"), thickness 0.100" ± .008", leg height one-fourth inch (1/4") top and bottom, leg angle ninety degrees (90°), for perimeter and curb anchorage, having predrilled holes six inches (6") on center, as manufactured by Olympic Fasteners, or approved equal.

2.24 ROOF PLAQUE

A. Contractor shall provide a sixteen inch by sixteen inch (16" x 16") metal plaque which shall contain the information listed below. Fasteners to attach plaque shall be stainless steel, short enough to not penetrate outer surface of hatch or door where mounted. Location of hatch to be determined by Owner/Project Consultant.
   1. Architect name, phone number, contact person.
   2. School district phone number, contact person.
   3. School district emergency phone number.
   4. Contractor name, phone number, contact person.
   5. Subcontractor name, phone number, contact person.
   6. Roof Consultant, name, phone number, contact person.
   7. Roof system, warranty information.
   8. Roof Manufacturer, phone number, contact person.

2.25 VERTICAL WALL SHIMMING MATERIAL

A. Shall be one of the following unless otherwise accepted by Owner's representative: Exterior grade plywood. Proper selection of material is required to achieve FM Global and UL guidelines.

2.26 SELF-ADHERING UNDERLAYMENT FOR TEMPORARY WATERPROOFING

A. A premium heavyweight, minimum 60 mil, self-adhering underlayment, to use as an ice and water shield.

2.27 OVERNIGHT SEAL

A. Hot applied asphalt bitumen shall be provided for the purpose of night sealing the roof system.

2.28 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.

2.29 PRECAUTIONS

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

2.30 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 a 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 500° F.
11. The temperature of Type IV asphalt shall be approximately 430° 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. Provide a water test of each roof section prior to substantial completion. The test should simulate rainfall of one inch (1") per hour minimum.

20. 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 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.

3.03 MECHANICALLY FASTENED RECOVERY BOARD AT METAL DECKS

A. Cut all current blisters, air pockets, and bubbles in current modified bitumen membrane. Specified substrate board shall be mechanically fastened to conform to ASCE 7 criteria for wind uplift as dictated by wind zone applicable to location of project. Fasteners and fastening patterns shall be determined by building height, location and geographical area of the United States. It is the contractor's responsibility to consult current publications, literature, and bulletins of IBC and the manufacturer that are in effect at the time of this project. Boards shall be staggered and butted as close as possible with voids over one-fourth inch (1/4") to be filled.

B. Fasteners must penetrate the purlin a minimum of one inch (1"). Using a screw gun with a minimum of 1800 RPM, drive the fastener through the purlin until a slight depression is seen around the plate.

C. Caution should be taken not to overdrive the fastener causing stress plate surface to deflect more than one sixteenth inch (1/16").

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 APPLICATION OF FLEECE BACKED MEMBRANE

A. Adhered Application: Adhere membrane to acceptable substrate with hot 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 roof membrane on top of itself until both ends meet. Apply hot 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.

3.06 FLASHING

A. Flash all penetrations, metal edge systems, walls, curbs, expansion joints, drains as shown on details and approved shop drawings with white reinforced 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 through metal counterflashing is not 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.

3.07 BASE FLASHING (APPROXIMATELY 8" IN HEIGHT MINIMUM)

A. Base flashings shall be installed using the flashing membrane, with length of run not to exceed twenty linear feet (20').

B. Wooden nailers or curbs shall be installed at all edges and openings in the roof, mechanically fastened to the deck.

C. All existing substrates receiving flashing membrane shall be clean and primed with primer, prior to application as required.

D. All flashings shall be mechanically fastened with a termination bar a maximum of six inches (6") on center, be a maximum of eight inches (8") above finished roof height, extend a minimum of four inches (4") onto the field of horizontal roof membrane, and not exceed twenty linear feet (20') of run in length.

E. After proper termination of the base flashing at a minimum eight inch (8") height (or maximum eighteen inch (18") height), a saw cut reglet with counterflashing shall be installed according to NRCA and SMACNA guidelines.

F. All vertical flashing lap seams of the flashing membrane shall be hot-air welded.

G. All flashing membrane shall be adhered with flashing bonding adhesive to the vertical substrate and hot-air welded to the field of roof membrane; hot-air weld vertical laps.

H. Flashing laps shall be minimum two inch (2") width, no maximum. Hot-air weld of flashing lap shall be minimum two inch (2") width, no maximum.

I. Hot-Air Welding of Flashing Laps:
   1. When using a hand-held hot-air welder, the seams should be pressed together using a hand-held roller. The speed and temperature settings of the welding equipment can be affected by the weather conditions at the site of application, therefore, these parameters should be set by trial and error using two (2) pieces of the flashing membrane. Minimum width of hot-air weld two inches (2"), no maximum.
   2. Lay the laps together and apply pressure to the welded seam to ensure full adhesion.
   3. Allow the seams to set fully, and probe the entire length for voids. Reseam voids immediately with a hot-air gun and roller.

J. All hot-air welded seams/laps shall be tested daily with a probe for integrity, no variance.

3.08 VERTICAL WALL FLASHING (FOR USE APPROXIMATELY 8-18" ABOVE THE FINISHED ROOF LINE AND EXTENDING UPWARD)

A. Flashing membrane shall be installed on the vertical beginning a minimum of eight inches (8") above the finished roof line (where the base flashing is terminated), with length of run not to exceed twenty feet (20'). Flashing shall be installed in strict accordance with the manufacturer's recommendations.

B. The clad metal used to terminate the minimum eight inch (8") high base flashing shall be covered with the lower edge of the upper vertical flashing. The selvedge edge of the upper flashing shall be hot-air welded to the clad metal receiver. Care should be taken to ensure the top edge of the base flashing and bottom edge of the vertical flashing are both secured.

C. All existing substrates receiving flashing membrane shall be clean and primed with asphalt primer, prior to application.

D. All substrates receiving welded-seam flashing membrane shall be clean and primed with primer, prior to application when applicable.

E. The vertical wall flashing membrane shall be set in flashing bonding adhesive according to manufacturer's guidelines.

F. All vertical flashing lap seams of the flashing membrane shall be hot-air welded.

G. Flashing laps shall be minimum two inch (2") width, no maximum. Hot-air weld of flashing lap shall be minimum two inch (2") width, no maximum.

H. Immediately following the laying of the flashing membrane, it shall be pressed or rolled in the width direction of the membrane. This will prevent excessive entrapment of air beneath the membrane. The pressing or rolling shall be in the width direction and with the laps so as not to buck the laps.

I. Any flashing extending further than eighteen inches (18") up onto a vertical surface shall be installed using the strapped method and must be fastened with a termination bar or installed up and over the parapet wall and fastened to the nailer on the outside of the wall.

J. The flashing membrane shall be run up the wall in sheet widths, run under the coping cap and be terminated on the outside of the wall six inches (6") on center; then the coping cap shall be reset. All side laps are to be hot-air welded.

K. Hot-air Welding Laps:
1. When using a hand-held hot-air welder, the seams should be pressed together using a hand-held roller. The speed and temperature settings of the welding equipment can be affected by the weather conditions at the site of application, therefore, these parameters should be set by the contractor by using two (2) pieces of flashing membrane. Minimum width of hot-air weld shall be two inches (2").
2. Lay the laps together and apply pressure to the welded seam to ensure full adhesion.
3. Allow the seams to set fully, and probe the entire length for voids. Reseam voids immediately with a hot-air gun and roller.

L. All hot-air welded seams/laps shall be tested daily with a probe for integrity, no variance.

M. 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.

3.09 PERIMETER FASTENING

A. Wood nailers are required for perimeter gravel stops or drip edges. Field membrane and all plies shall be mechanically fastened to nailer on twelve inch (12") centers maximum.

3.10 EDGING FLASHINGS

A. An NRCA-approved gravel stop/fascia system shall be installed in strict accordance with published instructions to meet ES-1.

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

A. 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.

3.14 MEMBRANE CLEANING

A. After all membrane has been installed, it shall be cleaned with a cleaning agent compatible with the membrane to return the membrane to like new appearance.

3.15 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.

3.16 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.

3.17 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 industrial grade yellow paint.

3.18 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.

3.20 OVERNIGHT SEAL

A. Provide temporary weather protection during interval between demolition and removal of existing construction on exterior surfaces and installation of new construction to ensure that no water leakage or damage occurs to structure or interior areas of existing building.

B. Installation shall be performed according to accepted roofing practice as outlined in the NRCA Roofing Manual.

END OF SECTION 07 01 55

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

PROJECT FOR
CITY OF NORTH RICHLAND HILLS
FIRE STATION NO. 1
8001 SHADYWOOD LANE
NORTH RICHLAND HILLS, TX

R1.01

PROJECT NO. 21-1159-30-34

DATE: 07/13/2021

DRAWN BY: TA

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

ARMKO INDUSTRIES, INC.
Texas Registered Engineering Firm F-6488
13220 Starks Road
Flower Mound, TX 75028
(972)874-1388

SPECIFIC ROOF NOTES:

1. RAKE ALL MORTAR JOINTS AT CAST STONE COPING AND REINSTALL NEW SEALANT.

STATE OF TEXAS
DEAN D. BROWN
117508
LICENSED PROFESSIONAL ENGINEER

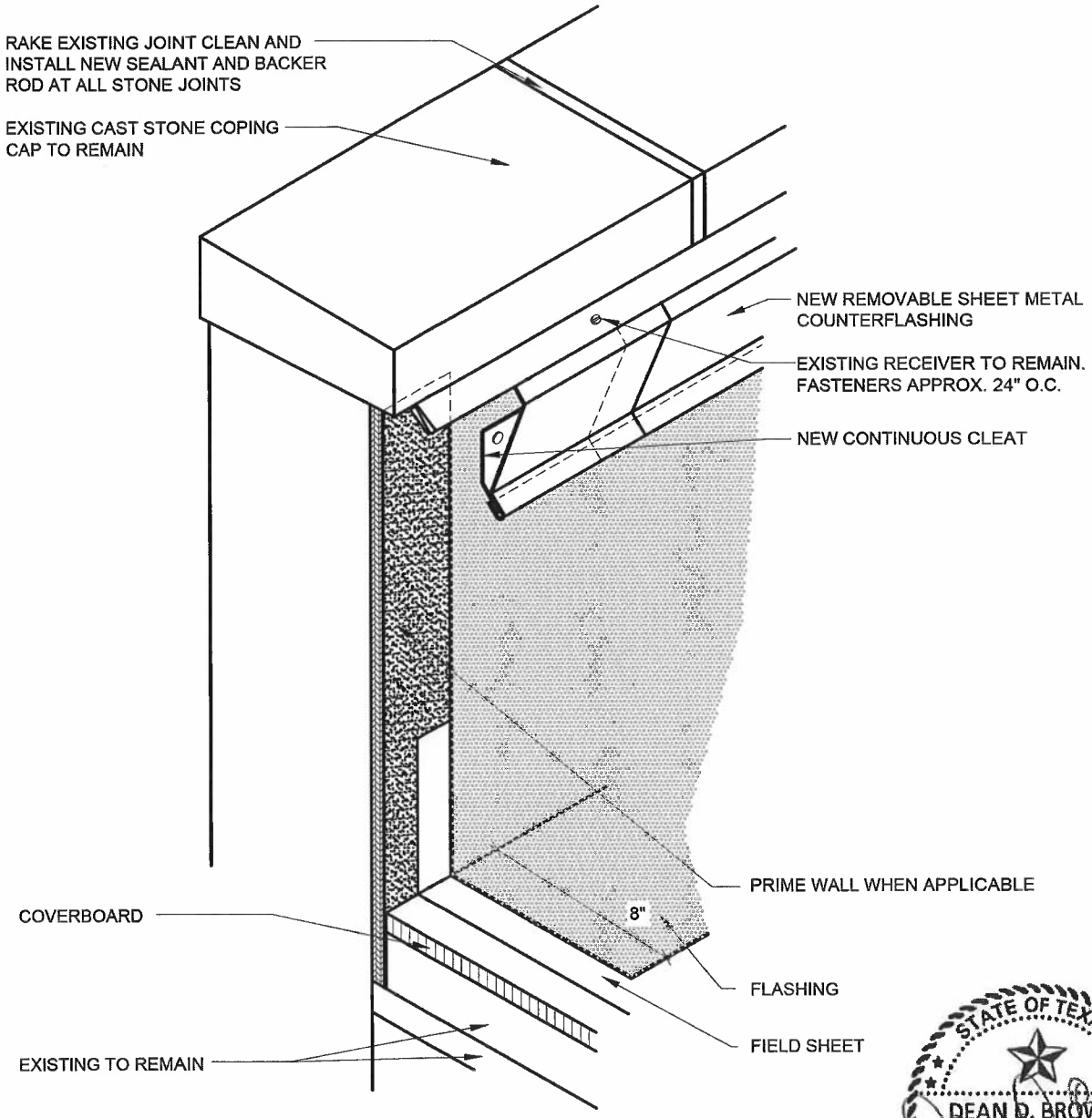
07/13/2021

ROOF LEGEND

LOW SLOPE ROOF SYSTEM

NOT IN CONTRACT

1 OVERALL ROOF PLAN
NOT TO SCALE

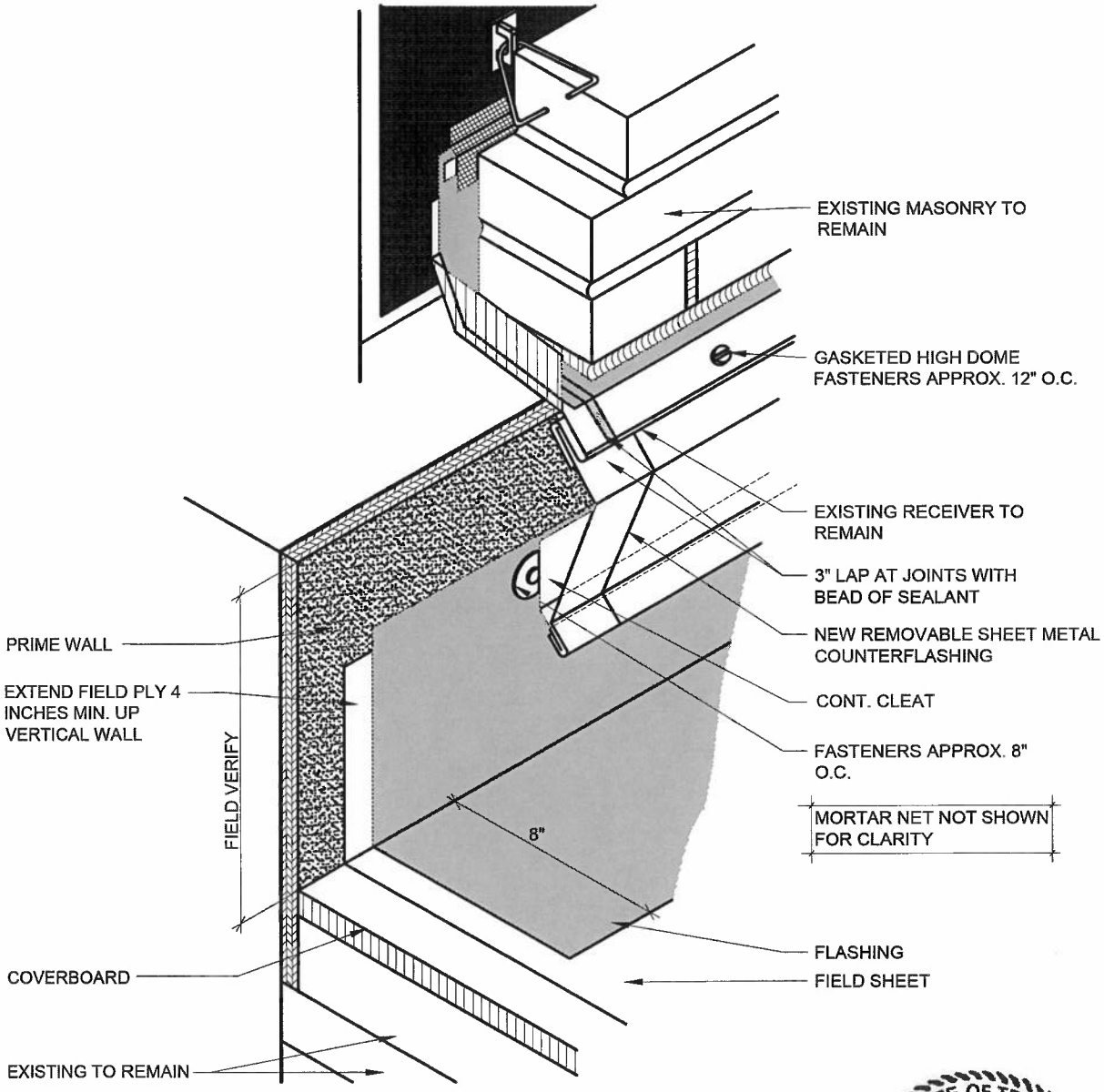


STATE OF TEXAS
DEAN D. BROWN
117508
LICENSED
PROFESSIONAL ENGINEER

07/13/2021

ARMKO INDUSTRIES, INC.
Texas Registered Engineering Firm F-6498
1320 Spinks Road
Flower Mound, TX 75028
(972)874-1388

PROJECT FOR: CITY OF NORTH RICHLAND HILLS FIRE STATION NO. 1 8001 SHADYWOOD LANE		R2.01
DETAIL NAME: LOW PARAPET		
PROJECT NO: 21-1159-30-34		
SCALE : NOT TO SCALE	DATE: 07/13/2021	DRAWN BY: BG

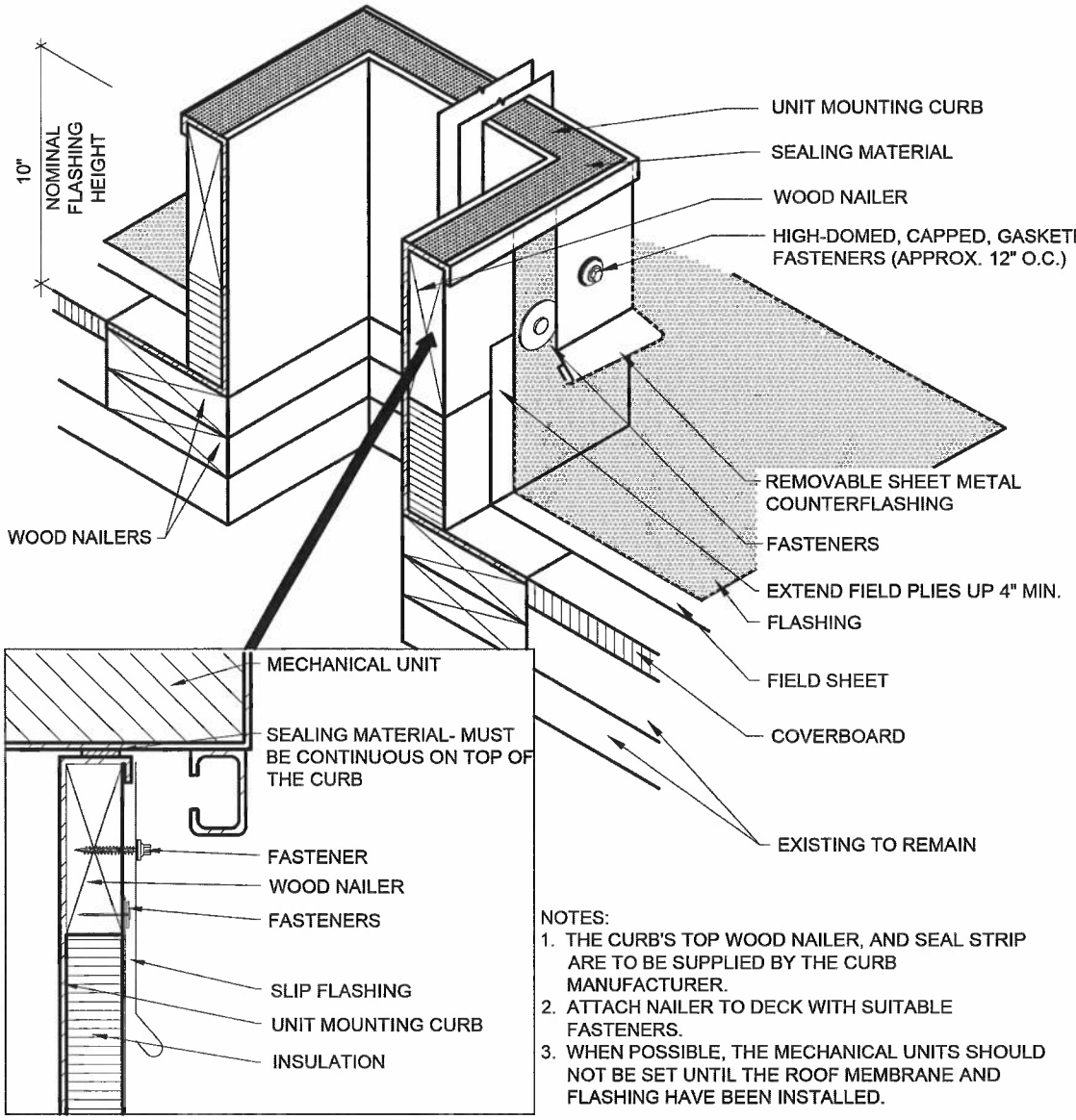


STATE OF TEXAS
DEAN D. BROWN
117508
LICENSED
PROFESSIONAL ENGINEER

07/13/2021

ARMKO INDUSTRIES, INC.
Texas Registered Engineering Firm F-6498
1320 Spinks Road
Flower Mound, TX 75028
(972)874-1388

PROJECT FOR: CITY OF NORTH RICHLAND HILLS FIRE STATION NO. 1 8001 SHADYWOOD LANE		R2.02
DETAIL NAME: RISE WALL FLASHING		
PROJECT NO: 21-1159-30-34		
SCALE : NOT TO SCALE	DATE: 07/13/2021	DRAWN BY: BG



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.

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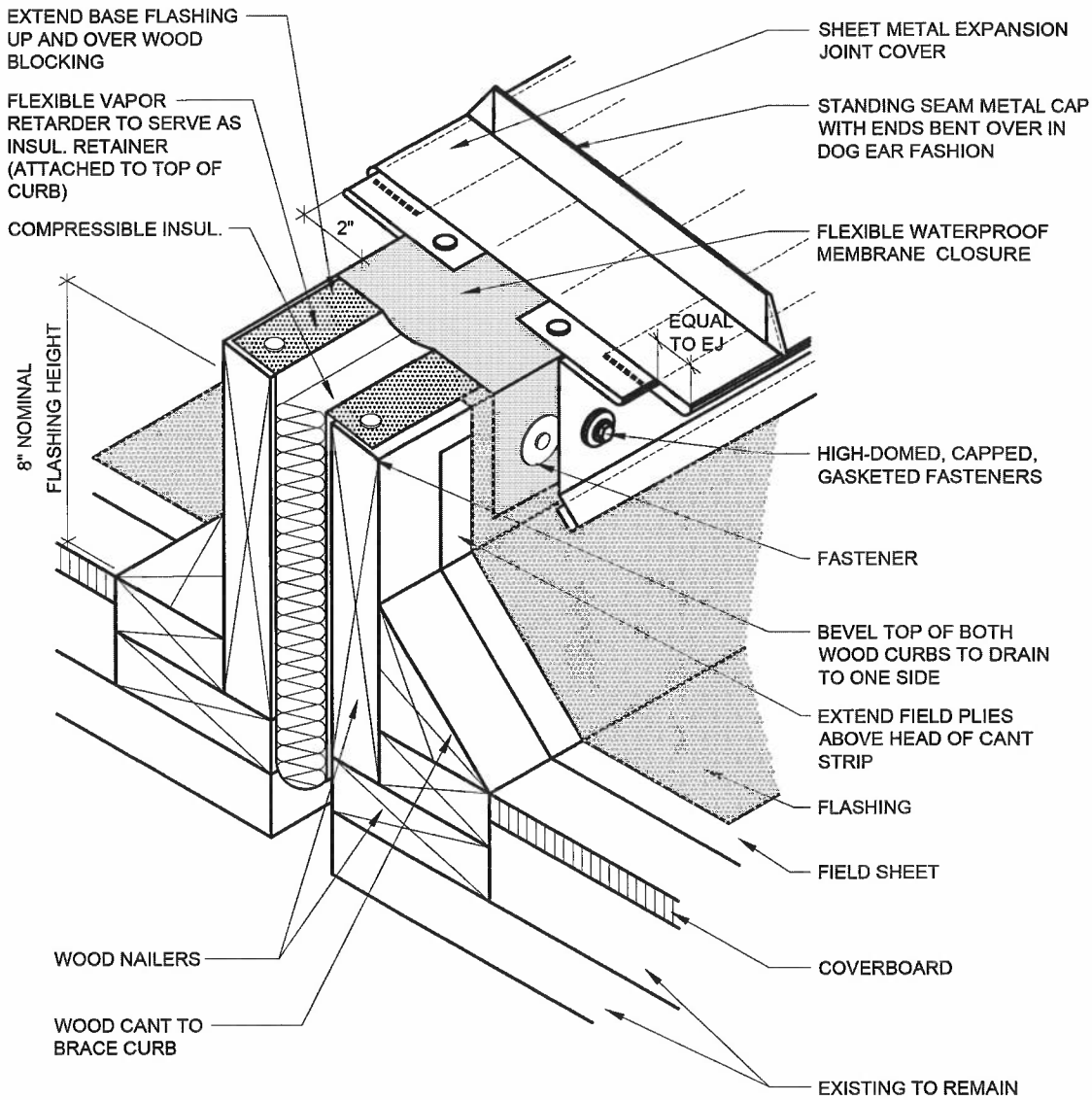
PROJECT FOR: CITY OF NORTH RICHLAND HILLS FIRE STATION NO. 1 8001 SHADYWOOD LANE	R2.03
DETAIL NAME: ROOF CURB	
PROJECT NO: 21-1159-30-34	
SCALE : NOT TO SCALE | DATE: 07/13/2021 | DRAWN BY: BG	



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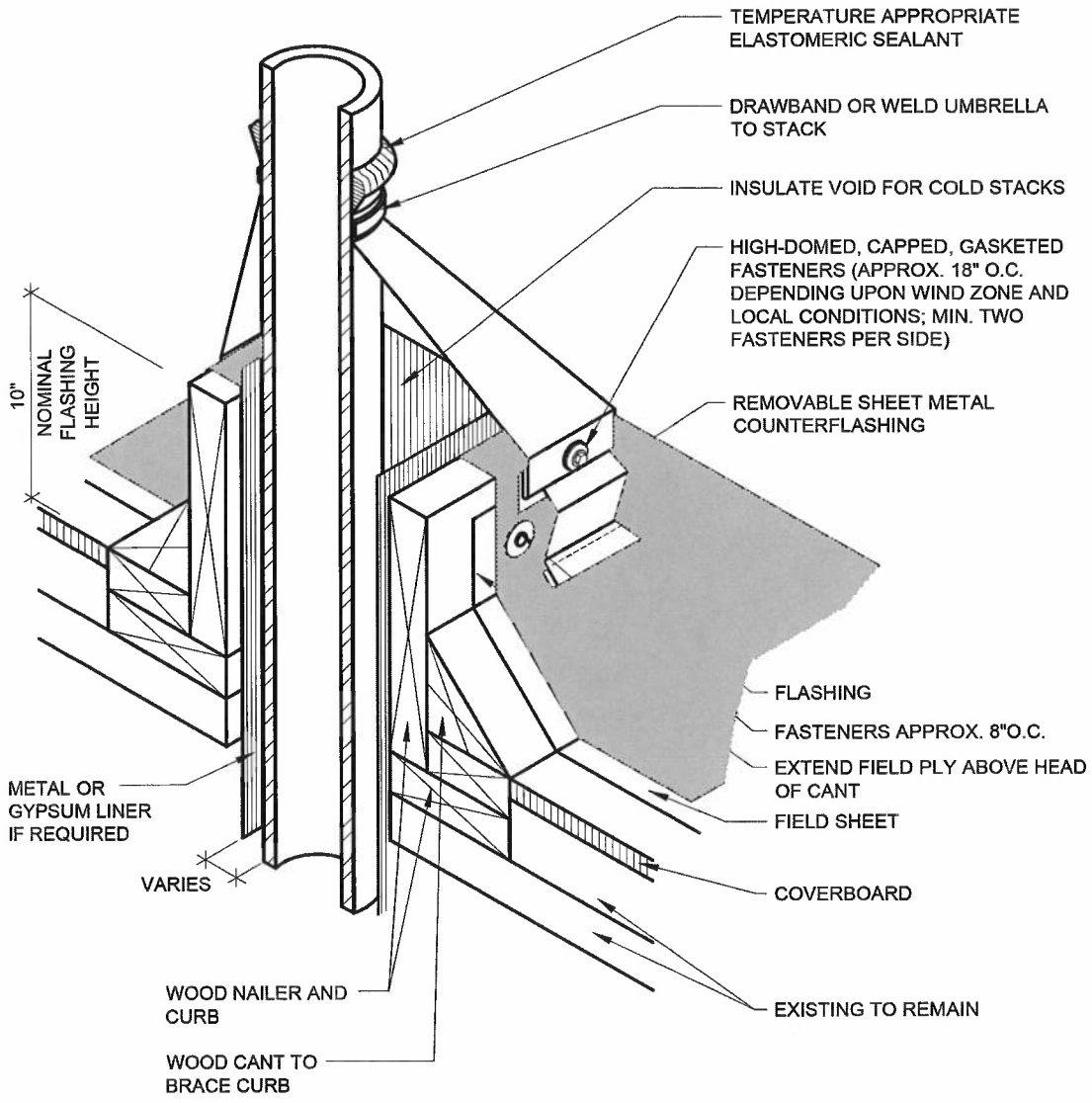
PROJECT FOR: CITY OF NORTH RICHLAND HILLS FIRE STATION NO. 1 8001 SHADYWOOD LANE		R2.04
DETAIL NAME: FIELD EXPANSION JOINT		
PROJECT NO: 21-1159-30-34		
SCALE : NOT TO SCALE	DATE: 07/13/2021	DRAWN BY: BG



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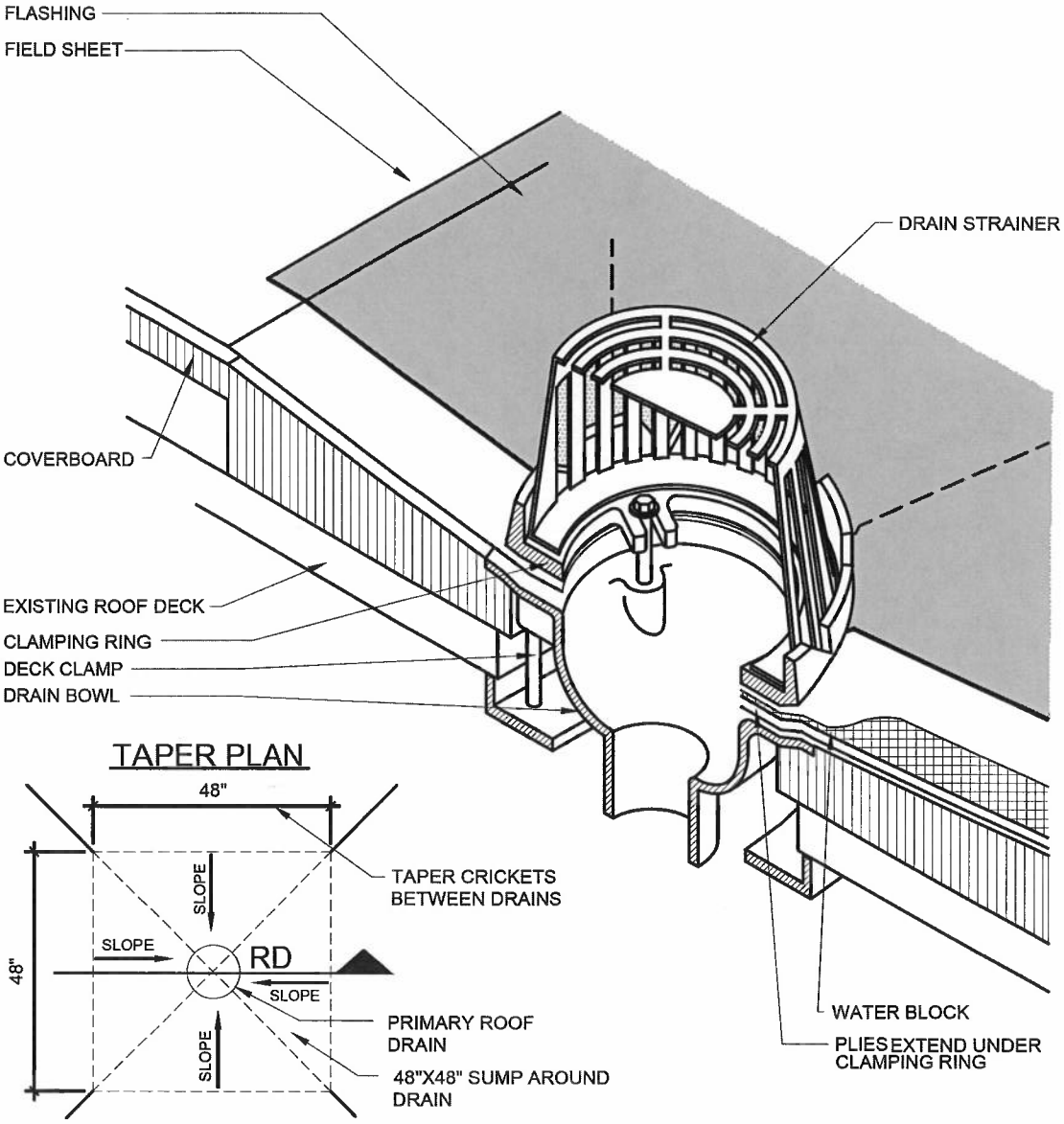
PROJECT FOR: CITY OF NORTH RICHLAND HILLS FIRE STATION NO. 1 8001 SHADYWOOD LANE	R2.05
DETAIL NAME: HOT STACK	
PROJECT NO: 21-1159-30-34	
SCALE : NOT TO SCALE | DATE: 07/13/2021 | DRAWN BY: BG	



TAPER PLAN

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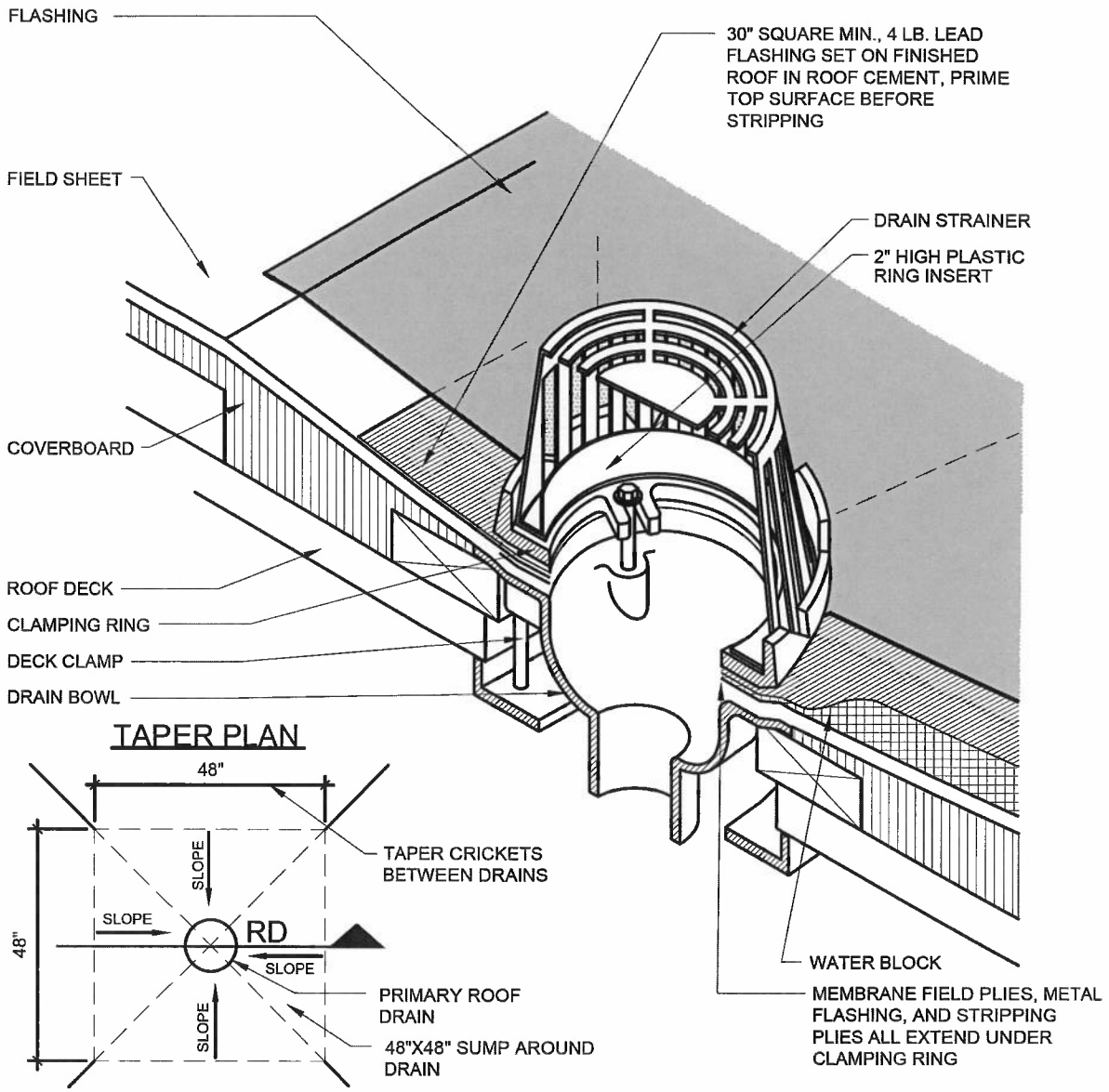
PROJECT FOR: CITY OF NORTH RICHLAND HILLS FIRE STATION NO. 1 8001 SHADYWOOD LANE		R2.06
DETAIL NAME: PRIMARY ROOF DRAIN		
PROJECT NO: 21-1159-30-34		
SCALE : NOT TO SCALE	DATE: 07/13/2021	DRAWN BY: BG



TAPER PLAN

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PROJECT FOR: CITY OF NORTH RICHLAND HILLS FIRE STATION NO. 1 8001 SHADYWOOD LANE		R2.07
DETAIL NAME: OVERFLOW ROOF DRAIN		
PROJECT NO: 21-1159-30-34		
SCALE : NOT TO SCALE	DATE: 07/13/2021	DRAWN BY: BG