ROOF REPLACEMENT AND ASSOCIATED WORK AT THE HOOKSETT SAFETY CENTER
HOOKSETT, NH

July 31, 2024

Prepared For:

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GALE JN 841830
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DIVISION 27-42
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CONTRACT DRAWINGS

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SECTION 01 10 00

SUMMARY OF WORK

PART 1 - GENERAL

1.1 DESCRIPTION OF WORK

In general, the Contractor shall supply all labor, materials, equipment, temporary protection, tools and appliances necessary for the proper completion of the work, as required in the Specifications, in accordance with good construction practice, and as required by the materials manufacturer. The work includes, but is not limited to, the following items:

A. Supply all temporary shoring, lighting, barricades, signage and protection necessary to protect the building areas, building systems, and building patrons and public. Maintain such protection for the complete duration of the project.

B. Supply all disposal facilities, transportation and labor necessary to dispose of all demolished materials, dirt, and debris off-site in a legal dumping area. The Contractor shall obtain all permits necessary to transport and dispose of all materials, rubbish and debris.

C. Provide temporary fencing around set-up and storage locations. Set-up and lay down areas should be sufficient for all sub-trades to have adequate area to store materials and equipment. Set-up and lay down areas must be within areas designated by the Owner.

D. Complete all associated work in accordance with the project specifications and Contract Drawings. Coordinate the work with the Owner.

E. The Contractor shall provide all lifts, cranes, and equipment necessary to access and perform the work.

F. Remove and dispose of existing roofing materials including but not limited to, stone ballast, roof membrane, fiberboard, and insulation, down to the existing metal deck to remain at Roof Area A as indicated in the Contract Documents.

G. At Roof Areas B, C and D, remove and dispose of existing standing seam roof system including, but not limited to, standing seam metal panels and plywood deck down to the existing truss structure to remain.

H. At Roof Areas B, C and D, install cold-form metal framing structural augmentation at locations and as indicated in the Contract Documents.

I. Remove and dispose of associated roof flashings and components as indicated in the Contract Documents.

J. Existing top course of the concrete masonry unit backup wall to be grouted as indicated in the Contract Documents.

K. At Roof Areas B, C and D, furnish and install new asphalt shingle roof system and accessories including, but not limited to, asphalt shingles, synthetic felt underlayment, modified bitumen underlayment, plywood and nailable vent board, insulation, air/vapor retarder, and plywood deck over existing truss structure.

L. Install new snow tabs. Coordinate with Section 07 31 13 - Asphalt Shingles.

M. Install new adhered roofing assembly including, but not limited to thermoplastic roof membrane, coverboard, insulation, air/vapor retarder over a mechanically attached baseboard on the existing to remain metal deck at Roof Area A.

N. Install tapered insulation crickets at locations as indicated in the Contract Documents. Crickets are to be provided at mechanical units, sleepers and as required to shed water towards roof drains.

O. Install new access hatch. Extend existing ladder to new access hatch height. Coordinate with Section 07 54 00 - Thermoplastic Roofing and Flashing.

P. Install new vent-pipe flashing and associated components. Provide no-hub connections and cast-iron extensions at required vent pipes, to meet Code-required eighteen-inch (18”) minimum height off of new finished roof elevation.

Q. Install sheet metal and thermoplastic-clad flashings, pre-fabricated edge metals, sealants, and associated components at curbs, penetrations, rising walls, termination points, and additional locations as indicated in the Contract Documents. Coordinate with Sections 07 54 00 - Thermoplastic Roofing and Flashing and Section 07 62 00 - Sheet Metal Flashing.

R. Tie perimeter edge flashing into throughwall flashing at brick masonry walls. Coordinate work with Section 07 62 00 - Sheet Metal Flashing.

S. Provide membrane manufacturer’s walkways pads under sleepers and at locations as designated in the Contract Drawings.

T. Temporarily disconnect, store, and reinstall existing lightning protection components at locations and as indicated in the Contract Documents. Replace all clip/mounting brackets and/or hardware with new components that match existing and are compatible Lightning protection to be re-certified after reinstallation. Refer to Section 26 41 10 - Lightning Protection for additional information.

U. Remove existing roof drain bowl assembly and install new strainer, clamping rings, clamps, extenders and any other accessories for complete roof drain assembly. Coordinate interior access with the Owner.

V. Install wood blocking, plywood sheathing and sheet metal flashings at roof perimeters, rising walls and roof penetrations as indicated in the Contract Documents and as required to properly terminate the roof membrane and flashings.

W. Clean and restore all areas affected by the work including the site to the satisfaction of the Owner.

X. Resecure existing metal decking to the supporting framing at Roof Area A.

1.2 PROJECT CONDITIONS

A. Contractor to coordinate and strictly follow the Owner's requirements for construction including interior access and protection requirements. Contractor to obtain a copy from the Owner.

B. The building will be occupied during the construction period. The Contractor shall take all necessary precautions required to minimize disruption to the building, site occupants and users during the course of the work hereunder. No loud noise, loud radios, etc. will be allowed on the job site(s). The Contractor's full agreement and cooperation in this regard are essential elements to the successful performance of the work under this Contract. The Owner shall have the right, at his/her sole discretion to require removal of any of the Contractor's employees, Subcontractors, agents or personnel that are found in violation of standards of conduct.

C. The Contractor will be required to provide their own fall arrest system as required to access and work on the building.

D. Provide walk through overhead protection where work areas are above doors, walkways, or sidewalks in accordance with OSHA.

E. The Contractor shall comply with all requirements of the Owner regarding temporary protection, staging and use of the site.

F. All existing items including windows, doors, building, plant life and site features, including but not limited to, pavement, lawns, sidewalks, frames, glazing, flashings, sealants, and trim shall be protected from the effects of all new work. Any damages to existing to remain items resulting from construction will be repaired/replaced by the Contractor at no additional cost to the Owner.

G. All temporary protection shall be properly secured and able to withstand all perils of weather and use. The contractor to protect the building and grounds.

H. The Contractor shall supply, install and maintain all barriers; protection or warning lines; lights and lighting; and personnel as required to support the structure, fixtures and facilities affected by the work, and to segregate the work area(s) from pedestrian and/or vehicular traffic, as applicable, as well as to prevent damage to the building, its occupants and the surrounding site elements as required. All applicable OSHA and Department of Labor and Industry (DLI) requirements shall be strictly followed by the Contractor at all times during the performance of the work under this Contract. Refer to Section 01 50 00 - Temporary Facilities for additional information.

I. The Contractor shall schedule and execute all work without exposing the interior of the buildings to the effects of weather. Protect the buildings and their occupants and

users against such risks, at all times during the course of the work hereunder. All work/weather related damage shall be repaired/replaced to the satisfaction of the Owner at no additional cost to the Owner.

J. The Contractor shall conform to all requirements of this Specification as well as those of all manufacturers of materials used in performing the work hereunder.

K. All materials and workmanship shall be of the best quality and the highest standard of construction practice. Refer to the requirements of materials manufacturers and the specifications for handling and installation of all materials used in the work under this Contract.

L. Protect the buildings and site and any other areas not included in the scope of work. The Contractor shall replace or repair all damage to the buildings or site elements because of the performance of the work hereunder to the satisfaction of the Owner at no additional cost to the Owner.

M. The contractor shall provide protection for existing roof membrane and other roof top equipment, fenestration, penetrations, and similar items to protect from damage. Items damaged as a result of the work shall be repaired or replaced by the Contractor to the satisfaction of, and at no additional cost to the Owner.

N. Supply all labor, vacuums, tools, appliances, shoring, supports or other items required to properly support, elevate and protect fixtures, equipment, and facilities affected by the work and to properly install the work.

O. At the end of each workday, the Contractor shall confirm and make the site safe and secure to all public access to the building’s interior.

P. The Contractor shall notify the Owner a minimum of seventy-two hours (72 hrs.) in advance of doing any interior work so that the Owner may provide entry into the required areas.

Q. Remove only as much existing construction as can be completely replaced and made weathertight by the end of each workday including all flashing work. Install temporary barriers during all work breaks as required to protect the public and the work.

R. A disposal plan, materials delivery and storage plan shall be submitted by the Contractor (for Owner and Engineer review and approval) outlining all methods and techniques to be used in the transportation, storage and delivery of debris and materials at the site.

S. Supply all necessary disposal facilities, transportation and labor in connection therewith as necessary to legally dispose of all demolished materials, dirt and debris off-site. The Contractor shall obtain all permits required to transport and dispose of all materials rubbish and debris in strict compliance with all legal requirements.

T. Any open ducts, grills, thermostats, electric boxes or similar fixtures and/or items which could be soiled or adversely affected by the work shall be masked, protected and cleaned as necessary by the Contractor at no additional cost to the Owner.

U. Provide an adequate number of skilled workers who are trained and experienced in the necessary crafts and are completely familiar with the specified requirements and the methods needed for proper performance of the work of each trade.

V. The Contractor shall cooperate, coordinate, and work in harmony with all Contractors working at the site during the course of work hereunder.

W. The Contractor is to obtain the Owners approval to store construction materials on the roof.

X. Upon completion of the work, all temporary protection installed by the Contractor shall be removed and areas shall be cleaned to the satisfaction of the Owner.

Y. No residual construction debris or materials are to remain on the finished roof membrane. The Contractor is to clean the roof membrane of residual debris and material prior to final payment and to the acceptance of the Owner.

1.3 SUBMITTALS

A. Emergency Response Contacts
B. Project Contact Directory
C. Construction Schedule
D. Schedule of Values
E. Safety Plan
F. Material Data Sheets (MDS)
G. Safety Data Sheets (SDS)
H. Refer to technical specification sections for material submittals.

1.4 PRE-CONSTRUCTION CONFERENCE

A. A Pre-Construction Conference will be held with the Owner, Engineer, Contractor and all involved trades to discuss all aspects of the project. The Contractor's foreman or field representative will attend this Conference. The foreman must be English-speaking. The conference will not be held until all shop drawings and submittals have been received and reviewed by the Owner.

B. The Owner shall reserve the right to require an alternate Superintendent and/or Foreman.

C. Delivery of materials and commencement of construction shall not proceed until the preconstruction conference is held. Delays in obtaining a complete set of submittals shall not extend the Contracted completion date.

1.5 REFERENCES

A. Applicable Publications: Publications listed herein form a part of the Specification to the extent referenced and are indicated in the text by basic designation only. Applicable publications referenced shall be those that were issued and in use at the time of the Bid Submission.

1.6 EMERGENCY RESPONSE

A. The Contractor shall provide the Owner with after-hours (twenty-four hour [24 hr.]), emergency telephone numbers of the Contractor's Superintendent and Foreman.

B. The Contractor must respond to emergency situations or calls within two hours (2 hrs.).

1.7 CONSTRUCTION SCHEDULE

A. The Contractor shall be responsible for coordinating and scheduling all applicable trades as well as the erection of all staging, delivery of materials and disposal of existing materials scheduled to be removed within the time constraints established in the Contract.

1.	Mobilization Start	May 5, 2025
2.	Substantial Completion	August 4, 2025
3.	Final Completion	August 29, 2025

B. The Contractor's Construction Schedule shall clearly identify the on-site crew foreman and the size of the crew to be utilized. The crew size shall remain consistent and work shall be continuous throughout the project, from start-up to completion.

C. The Owner shall review the Contractor's Construction Schedule prior to the start of any work. It shall be the responsibility of the Contractor to supply the Owner with written notice, seventy-two hours (72 hrs.) in advance, if his work location(s) for a workday is different from the schedule. The Contractor shall update his Construction Schedule weekly and submit a copy to the Owner for review.

1.8 DIMENSIONS AND QUANTITIES

A. The Contractor shall verify all dimensions and quantities in the field prior to bid submission. The Project Plans and Drawings have been compiled from various sources and may not reflect the actual field conditions at the time of construction.

B. The Contractor is solely responsible for compliance with the project specifications, plans and drawings. Make necessary investigations and take necessary precautions to properly supply, fabricate, and install work.

C. Additional compensation due to unfamiliarity with project conditions will not be considered.

D. In case of inconsistency between Drawings and Specifications or within either document, the better quality and/or greater quantity of work shall be provided, as determined by the Owner.

1.9 SCHEDULE OF VALUES

A. Provide a line-item breakdown of construction labor and materials costs for each Specification Section included in these Contract Documents. Itemize units of work,

as they will be shown on the Application for Payment (use AIA Form G703). A value of work shall be itemized for each technical section within the Specification.

B. Provide line items values for Unit Price Work included in these Specifications by CSI Division.

C. Utilize AIA Forms G703 and G703A to prepare and submit the Schedule of Values.

D. Schedule of Values to include all unit costs and allowances within the final construction amount.

1.10 WORK RESTRICTIONS

A. Contractor shall maintain public driveway access at all times. On-Site Work Hours: Work shall be generally performed during normal business working hours of 7:00 AM to 6:00 PM, Monday through Friday, except otherwise indicated by the Owner.

B. Contractor shall maintain work areas in an orderly condition and will be responsible for clean-up and removal of debris to the Contractors dumpster on a daily basis. If, in the opinion of the Owner, clean-up is not being performed satisfactorily, the Owner shall, after twenty-four hours (24 hrs.) of having notified the Contractor of the same, have the work performed by others and all charges incurred thereby deducted from the next progress payment of the Contractor.

C. Use of the Site: Limit use of the premises to work in areas indicated. Confine operations to areas where work is directly being performed. Do not disturb portions of the site beyond the areas in which the Work is indicated.

D. Site Enclosure Fence: Required around perimeter of dumpster and storage/staging areas to enclose and prevent the general public from access.

1.11 PROGRESS MEETINGS

A. The Owner shall establish a time and date for reoccurring weekly meetings throughout the duration of the construction period in which the contractor's representative is required to attend. The Owner reserves the right to schedule additional meetings as deemed necessary, and/or change the reoccurring meeting and time.

1.12 MATERIAL SAFETY DATA SHEETS

A. Material Safety Data Sheets (MSDS) shall be submitted in complete sets for all products to be used prior to any work being performed.

1.13 GUARANTEES

A. Refer to specific Sections of this specification for systems and product warranty requirements. Verify with Manufacturer of proposed systems and products that specified warranty requirements are acceptable, without exception, prior to selecting materials for use on this project.

B. Submit a full Contractor Warranty of the Work to be free from defect in materials and workmanship upon Substantial Completion, and prior to final payment. This Warranty shall be for a period of two years (2 yrs.) from the date of Substantial Completion and shall be signed by a Principal of the Contractor's firm and sealed if a Corporation. Warranty shall include all work performed by sub-contractors. Separate two-year (2-yr.) subcontractor warranties shall be provided.

1.14 INDEMNIFICATION AND WAIVER OF LIENS

A. Beginning with the first Application for Payment and thereafter, the Contractor, Sub-Contractor(s) and suppliers shall submit an Indemnification and Waiver of Liens for the construction period covered by the previous application on the form attached as part of the required documentation in any application for payment.

1.15 DUST AND ODOR CONTROL

A. Contractor to coordinate and strictly follow the Owner's requirements for construction and temporary protection to mitigate dust and odor contamination within the interior of the facility.

B. The Contractor shall coordinate with the Owner the shutdown of HVAC intake units in the work areas, which may be affected by construction dust, fumes, odors or air borne debris at minimum of seventy-two hours (72 hrs.) in advance. If the Owner cannot shut down or cannot permit shut down of the air intakes, it shall be the responsibility of the Contractor to provide control of dusts, odors or fumes as required by the Owner and as necessary to protect the health and safety of the building's occupants.

C. The Contractor will install clear plastic secured with duct tape over all air intake vents at the beginning of each workday to reduce any construction related odors and dust from entering the building. The Contractor will remove the plastic at the end of each workday.

D. During removal operations, the Contractor shall be responsible for the containment of all dust, dirt, debris, overspray and/or run-off resulting from the performance of the work. The Contractor shall collect and contain all materials and repair any resulting damage to adjacent materials, building and/or site elements and personal property. Specific attention is drawn to the use of chemicals and cleaners that must be used responsibly in strict compliance with manufacturer's requirements and all applicable regulatory guidelines.

1.16 WORK INSIDE THE BUILDING

A. Contractor to coordinate and strictly follow the Owner's requirements for construction and temporary protection inside the building.

B. The Contractor shall not leave or store any tools, equipment, materials, debris or other items on or within the building unless permission is given by Owner.

C. Contractor shall not use building's dumpster for debris associated with this project.

D. The Contractor is not to be inside the building unless required to perform work and must provide the Owner a minimum of seventy-two hours (72 hrs.) notice.

1.17 CLEAN-UP

Restore property of the Owner to its original condition prior to the completion of construction. Refer to Section 01 50 00 - Temporary Facilities. General clean-up of the site shall be performed on a daily basis.

A. Clean, restore and/or replace items stained, dirtied, discolored or otherwise damaged due to the Work, as required by the Owner.

B. Clean roof, building (interior and exterior), landscaped and parking areas so they are free of trash, debris and dirt caused by, or associated with the Work.

C. Sweep paved areas clean.

D. Site clean-up shall be performed daily.

1.19 WORK UNDER OTHER CONTRACTS

A. General: Cooperate fully with separate contractors so work on those contracts may be carried out smoothly, without interfering with or delaying work under this Contract. Coordinate the Work of this Contract with work performed under separate contracts.

B. Separate Contract: The Owner reserves the right to perform construction operations at the site. Those operations may be conducted simultaneously with work under this Contract. No specific projects are planned at this time.

1.20 USE OF PREMISES

A. General: Contractor shall have full use of the rooftop for construction operations, including limited use of Project site as defined by the Owner, during construction period.

B. The Contractor is responsible for safety on the job site at all times. The Contractor shall take the appropriate actions to assure the areas of construction are secured from the public. The Contractor shall construct and/or install temporary fencing, signs and barricades as required assuring a safe and secure environment.

C. Contractor's staging/lay down area is to be coordinated through an Owner representative. Contractor is responsible for repairing any damage to staging/lay down area. Contractor shall not place trailers, equipment, lay down, storage facilities outside of project site after normal working hours. Contractor shall have no vehicles, trailers, storage containers in any fire lanes or prohibited areas.

D. Contractor shall not restrict the owner's access to the building's entrances area. If, the Contractor should need to temporarily restrict the owner's access to any areas, the Contractor shall submit a written notice to the Owner seventy-two hours (72 hrs.) in advance of access restriction.

E. Contractor to supply temporary facilities (toilets).

F. The Contractor must provide safe assisted means to access the roof from the exterior. Access must be maintained and secure at all times. The access must be locked or restricted during off work hours.
   1. Accessing the work areas by climbing or scaling existing obstacles or structures will not be allowed.
   2. Accessing the work areas through the interior of the building will not be allowed, there will be exterior access only.

PART 2 – PRODUCTS

NOT USED.

PART 3 – EXECUTION

NOT USED.

END OF SECTION

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SECTION 01 22 00

UNIT PRICES

PART 1 - GENERAL

1.1 GENERAL PROVISIONS

A. Examine all other Sections of the Specifications for requirements that affect work of this Section whether or not such work is specifically mentioned in this Section.

B. Coordinate work with that of all other trades affecting or affected by work of this Section. Cooperate with such trades to assure the steady progress of all work under the Contract.

1.2 DESCRIPTION OF WORK

This Section contains instructions and references other Contract Documents that relate to Unit Prices. The Owner may elect certain aspects of the work, whose quantities cannot be determined at this time, to be performed or deleted by the Contractor. If such work items are elected, the Contract price will be adjusted by the Unit Price amount shown for each item in the Bid Forms.

A. A Unit Price is an amount proposed by Bidders and stated on the Bid Form as a price per unit of measurement for materials or services that will be **added to or deducted** from the Contract Sum by Change Order in the event the estimated quantities of Work required by the Contract Documents are increased or decreased.

B. The Bidders shall submit with their Bids, prices for the performance of Unit Price work. The scope of the Unit Price work is defined within this section.

C. The successful Bidder shall coordinate related work and modify or adjust adjacent work as necessary to ensure that work affected by each Unit Price Item is complete and fully integrated into the project.

D. The specific quantities of Unit Price Work included in the Base Bid are provided herein. This applies to items whose exact quantities are unknown but are anticipated to exist, for example, deteriorated roof decking.

E. The specific quantities of Unit Price Work included in the Alternate scope of work are provided herein. This applies to items whose exact quantities are unknown but are anticipated to exist, for example, deteriorated roof decking.

F. The quantities of Unit Price Work listed in this Section and the bid and contract forms **are in addition to the quantities shown on the Contract Drawings (if any).**

G. The Unit Prices requested herein shall include a pro-rata share of all costs for materials, labor, equipment costs, overhead, profit, and applicable taxes.

H. Where not otherwise specified, Unit Prices cover net costs and credits to the Owner for executing authorized changes in the Work. No separate adjustments are made for labor, materials, transportation, handling, storage, overhead, profit, or other related work expenses.

I. If unit price quantities vary greater than twenty percent (20%) above the amounts carried in the Base Bid, the Owner reserves the right to re-negotiate lower unit price costs. The Contractor will be required to notify the Owner once they approach this limit as the work progresses.

1.3 SCOPE OF WORK

A. The Unit Prices for items of Work, as set forth in the Schedule of Unit Prices, shall be used to determine adjustments to the Contract Amount when changes in the Work involving said items are made in accordance with the Contract Documents.

B. Materials, methods of installation, and definitions of terms set forth under the various Unit Price items in the Schedule of Unit prices shall be as indicated in the Contract Documents.

C. The successful Bidder shall coordinate related work and modify or adjust adjacent work as necessary to ensure that work affected by each Unit Price Item is complete and fully integrated into the project.

1.4 APPLICABILITY OF UNIT PRICES

A. Prior to commencing removal or replacement of materials set forth in the schedule of Unit Prices, the Contractor shall notify the Owner in sufficient time to permit proper inspection and measurements to be taken. Only quantities that have been approved in writing by the Owner will be considered in the determination of adjustments to the Contract Sum.

B. Unit Price Work includes providing and installing all accessories and appurtenant work necessary to properly execute the Unit Price Work.

C. Performance of work not required by the Contract Documents, or which is not authorized by Change Order or Field Order, whether or not such work is set forth hereunder as a Unit Price item, shall not be considered cause for extra payment. The Contractor will be held fully responsible for such unauthorized work, including the performance of all corrective measures required by the Owner.

1.5 VERIFICATION OF UNIT PRICE QUANTITIES

The following minimum procedures must be included by the Contractor for each of the indicated unit repair items for the duration of the project:

A. Measurement and Payment: Refer to individual Specification Sections for work that requires establishment of unit prices and estimated quantities. Methods of measurement and payment for unit prices and estimated quantities are as follows:
   1. For work covered by scheduled quantities, notify the Owner and Engineer a minimum of twenty-four hours (24 hrs.) in advance of the performance of such work.
   2. Document such work in writing, identifying type of work, quantity and location of work. Submit documentation on Contractor's letterhead.
   3. All documentation of work covered by scheduled quantities will be subject to verification and approval by the Owner and Engineer.
   4. In order to be considered for payment, documentation for work covered by scheduled quantities shall be submitted within one month (1 mo.) of performance of such work. Requests for payment of such work submitted more than one month (1 mo.) after the work has been performed will not be accepted.
   5. Only documentation signed and verified by the Contractor, Trade, and the Owner's Representative will be considered valid. Documentation not signed by all these parties will be considered invalid.

B. The Contractor shall contact the Owner and Engineer if a Unit Price quantity is anticipated to be reached prior to exceeding that quantity. No additional costs will be awarded to the Contractor for additional Unit Price Work without written approval from the Owner and/or Engineer.

C. The Contractor must provide safe, adequate, and ample access to the Owner and Engineer for verification of the Unit Price Work throughout the course of construction.

D. The Contractor is required to track, and record actual placed and completed Unit Price Work throughout the course of construction and submit a breakdown to the Owner and Engineer on a weekly basis or as requested. The breakdown shall include the following for each Unit Price item:
   1. Completed quantity to date.
   2. Remaining quantity to date.
   3. Percentage of total quantity remaining.

1.6 UNIT PRICE SCHEDULE

A. The following unit prices as defined in the specifications are designated for items of work on the basis of unknown quantities or quantities estimated by the Engineer. These unit prices will be used to add or to deduct from the dollar amounts shown, depending on whether the actual amount is greater or less than the estimated amount. UNIT PRICES GIVEN HEREIN SHALL BE FOR ADDITIONAL WORK ONLY. DECREASED WORK SHALL BE AT THE "ADD" PRICE less fifteen percent (15%) overhead and profit.

B. The unit prices listed below are **above and beyond** that shown on the Contract Drawings and shall be included by the Contractor under the appropriate Base Bid Scope of Work The Contractor's Schedule of Values will carry each item under the bid amount selected for this project. Should the unit price work not be

performed on this project, the total amount, or remaining amount if portions of unit price work are performed, shall be credited to the Owner.

Unit Price Schedule

Section	Item	Estimated Quantity (**beyond drawings**)	Unit of Measure	Unit Price Dollar/Cents	Total Amount Dollar/Cents
05 31 00	Scrape, prime, and paint surface rust at corrugated metal deck	50	Square Feet	$_____	$_____
05 31 00	Replacement of deteriorated corrugated metal deck	50	Square Feet	$_____	$_____
05 40 00	Install new diagonal four-inch (4") deep 400S162-54 cold-formed metal stud bracing	12	Units	$_____	$_____
05 40 00	Install new two- and one-half inch (2-½") deep 250S200-97 cold-formed metal stud reinforcement	300	Linear Feet	$_____	$_____
06 10 00	Replacement of deteriorated plywood	15	Square Feet	$_____	$_____
06 10 00	Replacement of deteriorated wood blocking	15	Board Feet	$_____	$_____
07 54 00	Manufacturer's Walkway Pads	20	Units	$_____	$_____
26 41 00	Replacement of Air Terminals	5	Units	$_____	$_____

PART 2 – PRODUCTS

NOT USED.

PART 3 – EXECUTION

NOT USED.

END OF SECTION

SECTION 01 30 00

SHOP DRAWINGS AND SUBMITTALS

PART 1 - GENERAL

1.1 IN GENERAL

This section contains instructions for submittals and shop drawings required at various stages of the project. The following submittals will be required of all construction materials and systems:

A. List of materials stating manufacturer's name and address, as well as material trade name and manufacturer's designation.
B. Shop Drawings.
C. Samples (as specified in the Technical Sections).
D. Manufacturer’s Catalog Data.
E. Material Data Sheets (MDS).
F. Safety Data Sheets (SDS).
G. Manufacturer's Installation Instructions.
H. Construction Photographs.
I. Contractor's Schedule as it affects the contracted completion date and sequence of construction.

1.2 SUBMITTALS

The following submittals are required during the various phases of the Contract. Each submittal item shall have the technical section and paragraph number clearly indicated. All submittal items without the proper designations will be returned and will not be reviewed.

A. Contract Submissions: The Contractor shall provide electronic copies of the following submittals to the Architect/Engineer:
   1. Proposed Construction Schedule for completion of the Work specified in this project manual.
   2. List of Manufacturers for each product proposed. Include manufacturer's literature with system designations and a sample of the product guarantee.
   3. Shop Drawings.
   4. Complete Materials List.
   5. Manufacturer's Technical Literature as selected.
   6. Manufacturer's Instructions.
   7. Catalog Data ("SPEC-DATA" Sheets).
   8. Material Safety Data Sheets (MDS).
   9. Safety Data Sheets (SDS).
   10. Samples of materials of construction.
   11. Certificates as approved Applicator by Manufacturer.
   12. List of proposed storage facilities and their location(s).

13. Proposed location(s) of dumpsters.
14. Schedule of Values.
15. Emergency Response Contacts.
16. Disposal Plan and Methods of removal of materials.
17. Temporary protection procedures.
18. Staging/set-up procedures.

B. Weekly Submissions: At the end of each weekly period during construction, the Contractor shall submit an updated construction schedule and unit price breakdown which will show the status of the work with respect to the schedule, anticipated completion date and unit price work due to date. A list of all completed work is also required.

C. Resubmittals: All resubmittals required from the Contractor shall be submitted within five (5) working days of return of original submittals.

D. Permits: Prior to start of construction, the Contractor is to provide the Owner with copies of all building permits, licenses, and other documents required by the General Conditions.

E. Close-Out Submission: See Section 01 70 00 - Project Closeout for required Submittals.

F. OSHA Requirements: All employees to be employed at the worksite must have successfully completed a course in construction safety and health approved by the United States Occupational Safety and Health Administration that is at least ten hours (10 hrs.) in duration at the time the employee begins work.

1.3 SHOP DRAWINGS

A. Original Submittal: An electronic copy of all shop drawings shall be submitted for approval within five (5) days of Award of Contract.

B. Shop drawings for all aspects of this project shall be submitted. The shop drawings shall include existing conditions, all applicable dimensions, new products to be installed, locations, etc.

C. Resubmittal: When a resubmittal is required, the original transparency so indicating will be returned to the Contractor. After revision of the original, one (1) new reproducible and one (1) print shall be submitted for review.

D. Review: The above procedure shall be repeated until approval is obtained. The original reproducible copy of the reviewed shop drawing will be returned to the Contractor, at which time the Contractor shall make prints in sufficient numbers for the Engineer (four copies), as well as sufficient copies for his use.

E. Shop drawings of an engineering nature shall be sent directly to the Engineer for review, with a copy of the transmittal sent to the Owner.

F. Transmittal: All reproducibles shall be transmitted rolled in mailing tubes and not folded.

G. Changes on the submitted shop drawings that deviate from the Design Drawings must be brought to the Owners and Designers attention in writing prior to review. Changes must be clearly visible on the shop drawings in the form of written notation, ballooning or highlighting the intended change. A written description for the proposed change must also be included and submitted on company letterhead. Changes to drawings and details not submitted in accordance with these requirements will not be recognized as an approved deviation from the Design of Record. Construction repairs, renovations or replacements required as a result of shop drawing and submittal deviations that are not documented in accordance with these requirements are subject to removal and/or replacement by the Contractor, at the sole cost of the Contractor.

1.4 RECORD DRAWINGS

A. The Contractor shall provide a copy of all Contract Drawings showing as-built conditions and any Contract changes to the Owner at the completion of the project.

1.5 SAMPLES

A. Original Submittal: Four (4) samples, unless otherwise specified, of each item for which samples are required shall be furnished for approval. Approval shall be obtained prior to delivery of the materials to the project site. Such samples shall be representative of the actual material proposed for use in the project and of sufficient size to demonstrate design, color, texture, and finish when these attributes will be exposed to view in the finished work.

B. Resubmittal: All rejected samples will be returned upon request, and any or all resubmittals shall consist of four (4) new samples.

C. Review: Upon approval by the Engineer, one sample so noted will be returned and the remainder will be retained by the Engineer until completion of the work. When requested, all approved samples will be returned for installation, provided their identity is maintained in an approved manner until final acceptance of the project.

D. Important specific samples are specified in Technical Sections of the Specifications. The Contractor is cautioned to quickly provide specified samples.

E. Each submittal item shall have the technical section and paragraph number clearly indicated. All submittal items without the proper designations will be returned and will not be reviewed.

1.6 CATALOG DATA

A. Submittals: Four (4) copies of catalog data are required for the original submittal and each subsequent resubmittal along with shop drawings. Following review, one (1) copy will be returned with its status noted. If approved, such additional copies may be requested by the Engineer and shall be furnished without additional cost.

B. Data: Each submittal shall have all pertinent data contained therein that is applicable to the item submitted for review, adequately and permanently designated.

1.7 CERTIFICATES AND GUARANTEES

A. Certificates of performance, treatment, and conformance to specified standards (four [4] printed copies) shall be submitted prior to initiating work on the project.

B. Copies of all guarantees (four [4] printed copies) required on the project shall be submitted for review and acceptance as to form.

1.8 IDENTIFICATION

A. Data: All submittals for review shall have the following identification data, as applicable, contained thereon or permanently adhered thereto:
1. Project name and location.
2. Engineer's name.
3. Subcontractor's, Vendor's and/or Manufacturer's name and address.
4. Product Identification. (It is important that the specific product intended for use is indicated on manufacturer's literature).
5. Shop drawing title, drawing number, revision number and date of drawing and revision.
6. Applicable Contract Drawings and Specification Section numbers.

B. Catalog Data: Each separate catalog, brochure or single page submitted shall have the identification required hereinbefore.
1. Catalogs or brochures submitted containing multiple items for approval need the identification on the exterior and on each specific item clearly circled, flagged, or otherwise identified.
2. In the event that one or more of the multiple items are not approved in any submittal, the additional copies required will not be requested until all items are approved.
3. Do not commence work until every submittal is accepted.

C. Space: Vacant space approximately two- and one-half inches (2½”) wide by four inches (4”) high shall be provided adjacent to the identification data to receive the Engineer's status stamp.

1.9 CONTRACTOR'S RESPONSIBILITY

A. Representation: By his submittal of any shop drawing or catalog data, the Contractor thereby represents that he has determined and verified all field measurements, field construction criteria, materials, dimensions, catalog numbers and similar data, or will do so, and that he has checked and coordinated each item with other applicable approved shop drawings and the Contract requirements. Certification shall appear on each shop drawing stating that the Contractor has made this check. All drawings without this certification will be returned without examination.

B. Deviations: Changes on the submitted shop drawings that deviate from the Design Drawings must be brought to the Owners and Designers attention in writing prior to review. Changes must be clearly visible on the shop drawings in the form of written notation, ballooning or highlighting the intended change. A written description for the proposed change must also be included and submitted on company letterhead. Changes to drawings and details not submitted in accordance with these requirements will not be recognized as an approved deviation from the Design of Record. Construction repairs, renovations, or replacements required as a result of shop drawing and submittal deviations that are not documented in accordance with these requirements are subject to removal and/or replacement by the Contractor, at the sole cost of the Contractor.

C. Prohibitions: No portion of the work requiring a shop drawing, sample or catalog data shall be started, nor shall any materials be fabricated or installed, prior to the approval of such item.

D. Review: Project work, materials, fabrication, and installation shall conform with approved shop drawings, applicable samples, and catalog data.

E. Failure to submit shop drawings in ample time for review, approval, and resubmission (if required) prior to the commencement of construction shall not affect the completion date of the Contract.

F. Processing Time: Allow enough time for submittal review, including time for resubmittals, as follows. Time for review shall commence on Designer's receipt of submittal.

1. Initial Review: Allow **ten** (**10)** workdays for initial review of each submittal. Allow additional time if processing must be delayed to permit coordination with subsequent submittals. The Engineer will advise the Contractor when a submittal being processed must be delayed for coordination.
2. Concurrent Review: Where concurrent review of submittals by the Engineer's consultants, or other parties is required, allow **ten** (**10)** workdays for initial review of each submittal.
3. Direct Transmittal to Consultant: Where the Contract Documents indicate that submittals may be transmitted directly to Engineer's consultants, provide duplicate copy of the transmittal to the Engineer. The submittal will be returned to Engineer before being returned to Contractor.

4. If intermediate submittal is necessary, process it in same manner as initial submittal.
5. Allow **ten (10)** workdays for processing each re-submittal.
6. No extension of the Contract Time will be authorized because of failure to transmit submittals enough in advance of the Work to permit processing.
7. The engineer will schedule one (1) working day for submittal review for this project, typically on a Wednesday of each week. Unless a time critical submittal requires immediate attention, all individual, or partial submittal packages will be retained, and not reviewed until multiple items are provided until said designated day. The contractor shall take this into account when scheduling and coordinating submittal and construction activities to prevent delays in their work activities.
8. Multiple individual submittal reviews or incomplete packages are subject to potential back charges to the contractor due to unreasonable review times which may be required. The contractor is to provide complete submittal packages for technical section.

1.10 CONTRACTOR'S CONSTRUCTION SCHEDULE

A. Procedures: Comply with procedures required by the Owner.

B. Time Frame: Extend schedule from date established for commencement of the Work or the Notice to proceed to date of Final Completion.
1. Contractor shall indicate specific dates which may require the Designer's attention to proceed on a critical path.

C. Procurement Activities: Include procurement process activities for long lead items and major items, requiring a cycle of more than sixty (60) days, as separate activities in schedule. Procurement cycle activities include, but are not limited to, submittals, approvals, purchasing, fabrication, and delivery.

G. Submittal Review Time: Include review and resubmittal times. Coordinate submittal review times in Contractor's Construction Schedule with Submittals Schedule.

E. Substantial Completion: Indicate completion in advance of date established for Substantial Completion, and allow time for Owner, OPM, Designer's and administrative procedures necessary for certification of Substantial Completion.

F. Milestones: Include milestones indicated in the Contract Documents in schedule, including, but not limited to, the Notice to Proceed, interim milestones**,** Substantial Completion, and Final Completion.

G. Contract Modifications: For each proposed contract modification and concurrent with its submission, prepare a time-impact analysis to demonstrate the effect of the proposed change on the overall project schedule.

1.11 PRELIMINARY CONSTRUCTION SCHEDULE

A. Bar-Chart Schedule: Within twenty (20) days of written notice to proceed or contract award, submit preliminary horizontal bar-chart-type construction schedule prior to the Preconstruction conference.

B. Preparation: Indicate each significant construction activity separately. Identify first workday of each week with a continuous vertical line. Outline significant construction activities for the duration of construction.

1.12 CONTRACTOR'S CONSTRUCTION SCHEDULE, GANTT-CHART

A. Gantt-Chart Schedule: Submit a comprehensive, fully developed, horizontal Gantt-chart-type, Contractor's Construction Schedule within twenty (20) days of the Preconstruction meeting. Base schedule on the Preliminary Construction Schedule and any updates and feedback received since the start of Project.

B. Preparation: Indicate each significant construction activity separately. Identify first workday of each week with a continuous vertical line.
   1. For construction activities that require three months (3 mos.) or longer to complete, indicate an estimated completion percentage in twenty percent (20%) increments within time bar.

END OF SECTION

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SECTION 01 50 00

TEMPORARY FACILITIES

PART 1 – GENERAL

1.1 GENERAL

A. This Section contains instructions and requirements for the provision and utilization of temporary facilities to protect the Owner's property, the site and construction materials and daily maintenance and cleanup of the site during the project.

1.2 STORAGE FACILITIES

A. See Section 01 63 00 - Weather Protection and Materials Storage.

1.3 CONTRACTOR'S USE OF EXISTING FACILITIES

A. The building will be occupied and in use during construction. The Contractor shall provide all protection, guards, and barriers necessary to segregate the work area and adjacent or below areas from pedestrian and vehicular traffic. Protect existing building, building finishes, landscaping, and paved areas from damage.

B. Limit use of the premises to the work indicated, so as to allow for the Owner's uninterrupted occupancy and use. Confine operations to the areas indicated under the Contract. Conformance to the regulations set forth by the Owner, regarding use of existing facilities is mandatory.

C. Take precautions necessary and provide equipment, materials, and labor to adequately protect previous construction, the building, its contents, and occupants, and surrounding landscaped areas from damage due to construction as well as from inclement weather during construction.

D. Clean interior and exterior areas affected by the construction on a daily basis. Do not allow construction debris, waste materials, tools, excess packaging materials or other construction related materials to accumulate on the roof, in the facility, or at the exterior grounds and pavements.

E. Coordinate with the Owner for additional interior cleaning and protections required for the work.

F. See Section 01 63 00 - Weather Protection and Materials Storage for product storage facilities and requirements.

1.4 SANITARY FACILITIES

A. The contractor will furnish portable toilets. Temporary toilets shall be kept in a sanitary

condition at all times and properly supplied at appropriate locations by the Contractor until completion of the project. Use of the sanitary facilities within the building is not permitted.

1.5 BARRIERS

A. The Contractor shall install temporary fencing, warning lines, barriers, and the like, as required, to segregate the construction areas from existing facilities, occupants, and the public.

B. All Contractors are required to conform to OSHA requirements and all local, state, and federal safety regulations.

C. The Contractor shall provide guard lights on all barriers and all lighting necessary to prevent vandalism of work and storage areas. The Owner is not responsible for Contractor's losses due to damage or theft by vandals.

1.6 CRANES AND HOISTING EQUIPMENT

A. All hoisting equipment and machinery required for the proper and expeditious prosecution and progress of the work shall be furnished, installed, operated, and maintained in a safe condition by the Contractor. All costs for hoisting operating services shall be borne by the Contractor including street permits and police details.

1.7 ACCESS

A. Provide ladders, scaffolding, staging and hoists as required to access the project area(s) in accordance with OSHA and D.L.W.D. guidelines. Should damage to the building and/or grounds occur, restore damaged areas to the original condition and clean up debris.

B. Where scaffolding and staging is required for the proper installation of the work it shall be erected to provide a minimal impact on the site.

C. All barriers and warning lines shall be installed at the base of any scaffolding or staging and around ground areas below elevated staging.

D. Provide walk through overhead protection where work areas are above doors, walkways, or sidewalks in accordance with OSHA.

E. All scaffolding and staging shall be erected in conformance with all applicable state, federal and local codes. The Contractor shall follow all applicable local, state, and federal requirements regarding the construction of scaffolding and staging and the protection of public safety. Specific reference shall be made to the OSHA Construction Safety Regulations and all requirements of the New Hampshire Department of Labor (NHDOL).

1.8 SET-UP AREAS AND USE OF THE SITE

A. The Owner shall determine the locations of the Contractor's designated set-up areas. The Contractor may not utilize any other locations unless permission is obtained from the Owner.

B. The Contractor shall permit the Owner and Engineer access to the staging, work areas and test areas at any time, as required to perform inspections and review mock-ups. The Contractor shall not move or remove staging or access to the work areas until instructed by the Owner and Engineer to do so. Any staging or access to the work areas removed by the Contractor without approval of Owner and Engineer, shall be reinstalled and set-up at the request of the Owner and/or Engineer at no additional cost to the Owner.

C. Other specific requirements of the Owner will be addressed and outlined at the Pre-Construction meeting to be held prior to the start of work.

D. Take precautions necessary and provide equipment, materials, and labor to adequately protect previous construction, the building, its contents, and occupants, and surrounding landscaped areas from damage due to construction as well as from inclement weather during construction.

1.9 UTILITIES

A. The Owner, through exterior electrical outlets, if operable, will provide electrical service to the Contractor free of charge. Use shall be limited to construction hours. The Contractor and/or subcontractors shall provide their own electrical generator for welding equipment, HEPA vacuum, and grinding equipment. The Owner reserves the right to charge the Contractor(s) for excessive electrical service usage (i.e., wasteful usage). Should charges be considered, the Owner will notify the Contractor in writing of his intent forty-eight hours (48 hrs.) in advance.

B. Owner will provide water for construction purposes free of charge through exterior water spigots, if operable. The Owner reserves the right to charge the Contractor for excessive or wasteful use. Should charges be considered, the Owner will notify the Contractor in writing of his intent forty-eight hours (48 hrs.) in advance. The Contractor shall provide drinking water.

C. Contractor shall provide all other utilities required by the work.

D. Electrical work, including reinstallation of equipment and other work to be performed by the Contractor, shall be carried out without interference to the building's normal operation. Where work requires interruption of service, the Contractor shall make advance arrangements with the Owner for dealing with such interruption.

E. Ensure proper and safe operation and maintenance of utility systems within the construction limits, whether these are supplied by the Owner's distribution system or

otherwise, until the Owner accepts the work. Maintain and operate appurtenances within the construction area that serve the distribution system, subject to periodic inspection by the Owner's operating personnel. Inspection by any representative or personnel of the Owner shall not relieve the Contractor of his responsibilities in connection with operation and maintenance of these facilities and equipment.

1.10 TEMPORARY PROTECTION

A. Provide suitable Owner-approved temporary protection to prevent the entrance of debris, obstructions, and water infiltration into the building. Provide warning signs to reroute personnel around areas of dangerous work. Place warning barriers at roof perimeters and at deck openings. Clearly label temporary covers over deck openings. Do not permit openings to remain unprotected overnight. Schedule operations to allow for completion of new roofing over a predetermined area of roof within a day's work. Use special care to avoid damaging existing roofing and flashing when working on the roof of the building.

B. Provide temporary tie-ins between existing and new roof systems as specified and detailed. Tie-in construction shall completely prevent interior leaks, migration of moisture from existing to new construction and damage of any type to the facilities. Provide necessary quality control at tie-ins on a daily basis to prevent leaks.

C. Avoid traffic on completed roof areas. Coordinate work to prevent this situation. Should temporary access be required, provide temporary substrate protection for trafficked areas.

D. Protect materials scheduled for reuse from damage by placing them in labeled containers or wrappings stored in a weathertight trailer.

E. Provide temporary protection such as plywood and tarps for streets, drives, curbs, sidewalks, landscaping, and existing exterior improvements during all phases of the project.

1.11 FIRE PROTECTION

A. Provide necessary temporary fire protection for the buildings, their contents and materials during construction. Do not store combustibles inside the buildings or on the roofs. Store adhesives, caulks and cleaning solvents away from the building using a method approved by local fire officials. Should cutting, burning or welding be necessary, provide a fire watch during operations and for four hours minimum after completion of the operations.

B. Do not use open flames near adhesives, caulks or cleaning solvents as they will readily ignite. Rags soaked with cleaning solvent shall not be discarded in the dumpsters, but shall be stored in a separate metal receptacle and removed from the site daily.

C. Comply with local fire codes and obtain permits necessary from the local fire department. Provide a copy to the Owner. Provide recently tested, fully charged fire extinguishers around the storage area, rubbish receptacle and two fire extinguishers on the roof within fifty feet (50') of the Work.

1.12 HOT WORK REQUIREMENTS

A. All hot work including cutting, welding, brazing, etc. shall require a permit from the Medway Fire Department. The cost of any required fire watch required as condition of the permit shall be the responsibility of the Contractor. The cost of any local Fire Department paid details is the responsibility of the Contractor.

B. All welding and cutting shall be in accordance with all Medway Fire Department regulations.

C. The Contractor shall confirm that all persons engaged in hot work operations on the work site have completed a Hot Work Safety Certificate. Certificate shall be provided by the National Fire Protection Association or equivalent certificate, or course completion as determined and approved by the Head of the Medway Fire Department.

D. The Contractor will ensure that the requirements in the Contract Documents and any and all permits issued regarding Fire Protection and Prevention, including fire watch, are strictly adhered to during the entire Contract time, until Final Completion of the Work.

E. Torch cutting and/or welding operations by sub-contractors shall have the approval of the Contractor prior to start of such operations, and sub-contractors shall also submit Hot Work safety certificates.

F. Wherever electric or gas welding or cutting work is done in the vicinity of combustible material, or over areas where persons may be found, interposed shields of fireproof material shall be used to protect against fire damage or injury.

G. Personnel with suitable fire extinguishing equipment, training, and experience shall be stationed near welding and cutting operations to prevent the sparks from lodging in floor cracks or passing through floor or wall openings and from lodging in combustible materials.

H. Chemical extinguishers shall be available and ready for use in all locations where torch cutting and/or welding operations are in progress. At a minimum, chemical extinguishers shall be ten-pound (10-lb.) ABC fire extinguishers, or as directed by the fire department.

1.13 DEBRIS REMOVAL

A. The Owner shall designate crane and refuse container locations. This area shall be sectioned off with proper warning lines.

B. Removed materials shall not be thrown freely from the roof but shall be discarded in an enclosed chute, in order to reduce the spread of dust and other debris.

C. Supply adequate covered receptacles for waste, debris, and rubbish. One (1) receptacle will be allowed on site at a time and must be immediately removed from the site when full. Clean the project area daily and prior to moving the receptacle to another location on the site. Locations shall be as permitted by the Owner. Disposal shall be off-site in a legal dump authorized to accept construction demolition solid wastes. The Contractor shall be responsible for receptacle-related damage to site grounds.

D. Receptacles shall be removed from the site daily. Should, for any reason, receptacle removal is not possible on any given day, the Contractor shall move the receptacle a minimum of fifty feet (50') from the building or as required by local fire officials.

1.14 NOTIFICATION

A. Notify the Owner at least seventy-two hours (72 hrs.) in advance of the desire to extend, connect, disconnect, or turn on or off HVAC, steam, electric, water or other service from the Owner's supply systems. Authorized representatives of the Owner shall witness the actual operation. Plumbing, heating, and electrical work, including installation of equipment and any other work to be performed by the Contractor, shall be carried out without interference with the Owner's normal operation. Where work requires interruption of a service, make advance arrangements with the Owner for dealing with such interruption. All disconnections, extensions and reconnections of HVAC, steam, electric, water or other service shall be performed by a licensed and certified technician capable of completing the work.

1.15 ACCESS TO THE WORK

A. The Contractor is responsible for providing access to all roof areas included within the project's scope of work. Contractor is required to maintain, clean, and keep clear all exterior pathways utilized to access roof. Contractor shall be prohibited from entering office space, laboratory space, etc. without written authorization from the Owner. Tools, materials, or equipment will not be permitted within the building unless it is specifically required to complete the work. Failure to comply with Owner's requirements will result in the Contractor providing their own access to the roof at no additional cost to the Owner. A Contractor's staging and/ or laydown area will be designated by the Owner adjacent to the building.

1.16 ACCESS TO THE INTERIOR

A. The Owner will designate which portions of the site the Contractor may utilize and access for the performances of the work. The Contractor must submit a site plan indicating his locations of set up, material storage, and parking. Parking at other locations throughout the lot, without prior authorization, is subject to vehicle removal at no cost to the Owner.

B. All hoisting of equipment and materials must be done on the exterior of the building. No tools will be permitted inside the building unless they are specific to perform the required work.

C. The Contractors will be required to provide a clean change of clothes and shall be responsible for any damages or stained interior components should access to the interior be required.

D. The Contractor will be required to provide access to the designer and manufacturer's representatives at no additional cost, to review the work operations, and to perform final observations.

1.17 VEHICLES

A. Contractor to park vehicles in the designated storage/laydown location designated by the owner or at locations designated by the Owner.

1.18 TRAFFIC CONTROL

A. The Contractor shall arrange and pay for all police details required to control traffic affected by any part of the work.

1.19 CLEANUP

A. Site clean-up shall be complete and to the satisfaction of the Owner. Site clean-up shall be performed daily.

B. All building (interior and exterior), landscape and parking areas shall be cleaned of all trash, debris, and dirt caused by or associated with the work.

C. All landscape areas damaged or littered due to the work shall be raked clean and reseeded if required.

D. All paved areas shall be swept clean of debris daily. All paved areas shall be washed clean at the completion of work.

E. All areas stained, dirtied, discolored or otherwise damaged due to the work shall be cleaned, restored, or replaced as required.

1.20 SIGNS

A. If requested by Owner, the Contractor shall conspicuously post a project sign at ground level. This sign shall designate the project entrance. Only one (1) entry may be used by the Contractor. The entry location shall be as directed by the Owner.

B. The Contractor shall install adequate signage to inform facility users of any changes to existing conditions or construction areas.

C. The Contractor shall also construct a project sign which must be at least four feet tall by eight feet wide (4' tall x 8' wide) or as designated by the Owner. Contractor to provide small scale graphic illustration of the sign for review and approval prior to final construction.

PART 2 – PRODUCTS

NOT USED.

PART 3 – EXECUTION

NOT USED.

END OF SECTION

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SECTION 01 63 00

WEATHER PROTECTION AND MATERIALS STORAGE

PART 1 – GENERAL

1.1 GENERAL

A. The Contractor shall take the necessary precautions and provide all equipment, materials, and labor necessary to adequately protect the Contract Area, previous construction, the building and its contents and occupants, and surrounding landscape areas from damage due to the construction or inclement weather during construction.

B. No storage on or within the building will be allowed without prior authorization from the Owner and Engineer.

C. The Contractor shall provide all access to the work. Staging and other access shall be provided until new work has been accepted by the Owner.

D. Refer to the "Roofing Superintendent's Workbook" by the National Roofing Contractors Association and the Brick Industry Association (BIA) manual for additional information.

1.2 WEATHER PROTECTION

A. Weather protection shall mean the temporary protection of that work adversely affected by moisture, wind, heat and cold by covering, patching, sealing, enclosing, ventilating, cooling and/or heating. This protection shall be provided for all work areas, the building, and its contents, trafficked adjacent areas, and all construction materials and accessories.

B. The Contractor shall be responsible for protecting the Work form moisture in order to prevent the growth of fungus, bacteria, and other biological contaminates. Remove and replace work that has been wet for twenty-four hours (24 hrs.) or more, or that shows evidence of biological growth due to the presence of moisture.

C. The cost of heat, fuel, and power necessary for proper weather protection shall be the responsibility of the Contractor.

D. Installation of weather protection shall comply with all safety regulations, including provisions for adequate ventilation and fire protection devices.

1.3 FIRE PROTECTION

A. The Contractor shall provide all necessary temporary fire protection for the building, building contents and materials during construction. The Contractor shall provide incombustible protective blankets where necessary to protect surfaces or building contents from damage.

B. At no time shall any combustibles be stored inside the building. All adhesives, caulks and cleaning solvents shall be stored well away from the building in a method approved by local fire officials.

C. Should any cutting, burning, or welding be necessary, the Contractor shall provide a fire watch. This watch will continue during the operations and for four hours (4 hrs.) minimum after completion.

D. At no time shall open flames be present around adhesives, caulks, or cleaning solvents as they will readily ignite. Rags soaked with cleaning solvents shall not be discarded in the dumpsters but shall be stored in a metal receptacle and removed from the site daily.

E. The Contractor shall be required to comply with all local fire codes and shall obtain all permits necessary from the local fire department and provide one (1) copy to the Engineer.

F. The Contractor shall provide recently tested, fully charged fire extinguishers around the storage area, rubbish receptacle and two (2) within one hundred feet (100') of the work area or as specifically required by local fire officials.

G. Provide necessary temporary fire protection for the buildings, their contents, and materials during construction. Do not store combustibles inside the buildings or on the roofs. Store adhesives, caulks, and cleaning solvents away from the building using a method approved by local fire officials. Should cutting, burning, or welding be necessary, provide a fire watch during operations and for four hours (4 hrs.) minimum after completion of the operations.

H. Comply with local fire codes and obtain permits necessary from the local fire department. Provide a copy to the Owner. Provide recently tested, fully charged fire extinguishers round the storage area, rubbish receptacle and two fire extinguishers on the roof within fifty feet (50') of the Work.

1.4 MATERIALS STORAGE

A. In the event that materials are exposed to the elements, they shall be marked as unacceptable and immediately removed from the site. They may not be used.

B. On-site storage of materials is the responsibility of the Contractor. The Owner is not responsible for Contractor's losses due to damage or vandalism.

1.5 ROOF PROTECTION

A. The existing and newly installed roof systems shall be totally protected in the work areas by installation of a layer of rigid insulation followed by a layer of plywood. Plywood shall be adequately ballasted to prevent wind blow off of the plywood and roof system.

B. All existing and newly installed roof areas, trafficked during construction, shall be protected as noted above.

C. The Contractor and all Sub-Contractors are responsible for the prompt repair of any damage to the existing roof systems resulting from the work at the project.

1.6 NOTIFICATION

A. If, during the Contract period, the Contractor is notified of insufficient weather protection, he shall, immediately, properly restore the weather protection and repair or replace any damaged unprotected materials and systems. Should the Contractor not effect immediate repair or replacement when notified, the Owner shall have the proper protection installed at the Contractor's expense.

1.7 MANUFACTURER'S INFORMATION

A. The manufacturers of all the materials shall supply written instructions concerning the storage and handling of all supplied materials, including sealants, and accessories. The manufacturer shall also provide information concerning storage and handling of flammable or volatile materials.

B. Storage facilities shall be acceptable to the manufacturer and conform to his written requirements concerning temperature, humidity, ventilation, and the like.

C. The "shelf-life" of materials shall be provided with the date of manufacture of all perishables, including volatiles, caulkings, and mastics.

D. The Contractor shall supply a copy of all manufacturer's written instructions to the Owner and the Engineer as outlined in Section 01 33 00 - Shop Drawings and Submittals. The Contractor shall comply with all storage and handling requests and instructions of the manufacturer.

1.8 VOLATILE MATERIALS

A. The Contractor is reminded that the adhesives, solvents, bitumens, etc., are highly volatile and flammable materials. Do not store these materials, contaminated tools, applicators, or rags, on or within the buildings. No overnight storage on the roofs will be allowed. Do not transport materials through the building. Take precautions and closely follow the Specification requirements for fire protection on site during construction.

B. Locate and use flame-heated equipment so as not to endanger the structure, other materials on site, or adjacent property. Do not place flame-heated equipment on the roof. Locate and use flame-heated equipment in specific areas approved by the Owner. Do not relocate flame-heated equipment without prior approval from the Owner.

C. The use of flame-heated equipment or torches on the roof is prohibited unless specifically approved in writing by the Owner.

PART 2 – PRODUCTS

NOT USED.

PART 3 – EXECUTION

NOT USED.

END OF SECTION

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SECTION 01 70 00

PROJECT CLOSE-OUT

PART 1 - GENERAL

1.1 GENERAL

A. When the project is established to be substantially complete, preparations will be made to close out the project prior to Owner's final acceptance. The preparations are as follows:

1.2 SUBSTANTIAL COMPLETION

A. Substantial completion for this project is defined as the date when the Owner and Owner's Representative mutually agree and certify that all project related work has been properly installed and completed in a manner conforming to the Contract Documents. Work specified within the Contract Documents which has not been performed or has been performed in a manner which does not conform with the Contract Documents shall be deemed as not achieving substantial completion.

1.3 PUNCH LIST

A. After the project is determined to be substantially complete the Engineer and a representative of the Owner will tour the project and compile a "punch list" of minor unsatisfactory conditions. A copy of this list will be sent to the Contractor and will be used by the Contractor. He shall then correct the unsatisfactory conditions. When all items on the list have been corrected, the Contractor shall notify the Engineer and the Owner representative, and a reinspection will be made by that representative.

B. Minor "punch list" items shall be only those items which have been installed and are functional, requiring cosmetic repair or cleaning which does not affect the integrity of the system. Any work specified within the Contract Documents, which has not been performed or has been performed in a non-conforming manner to the Contract Documents shall not be defined as minor "punch-list" items and must be performed or corrected as appropriate in order to achieve substantial completion.

C. Should additional re-inspections be required due to punch list items which are reported to be complete but are not completed or improperly completed, the costs of these re-inspections will be assessed to the General Contractor.

1.4 PUNCH LIST RE-INSPECTIONS

A. After providing written notification to Owner and the Engineer that the punch list work has been completed, the Owner and the Engineer will perform one final inspection.

B. Should additional re-inspections be required due to punch list items which are not completed or improperly completed, the costs of these re-inspections will be assessed to the Contractor as liquidated damages.

1.5 MANUFACTURER'S INSPECTION

A. After the re-inspection by the Owner's representative, the Materials Manufacturer's representative will be required to tour the site. The representative shall determine if the materials have been installed as required by the Manufacturer.

B. Any items the representative determines were not so installed shall be reinstalled so as to comply with the Manufacturer's intended use. The Manufacturer shall forward a copy of the list of all items determined to be not installed as intended by the Manufacturer to the Engineer.

C. Costs associated with all manufacturer inspections shall be the responsibility of the General Contractor.

1.6 GUARANTEES

A. Upon completion of the work, and prior to final payment, the Contractor shall submit a Guarantee of his work to be free from defect in materials and workmanship. This Guarantee shall be for a period of two years (2 yrs.) and shall be signed by a Principal of the Contractor's firm and sealed if a corporation.

B. When both the Owner's representative and the Manufacturer's representative agree that the Contractor has performed according to the Specifications and has installed the materials to the satisfaction of the Manufacturer, the Contractor shall petition the Manufacturer for the materials guarantee. He shall forward this guarantee to the Owner and provide a copy for the Engineer.

C. The Contractor will be required to provide lien releases for their work. The Contractor shall then forward his guarantee covering the construction to the Owner and provide one (1) copy for the Engineer.

1.7 RETAINAGE RELEASE

A. When all guarantees, certifications, close out documents and requested lien releases have been received, the Owner shall release to the Contractor the project retainage and any other monies retained by the Owner to guarantee project completion. Except with the Owner's prior approval, payments to the Contractor shall be subject to retention of ten percent (10%).

1.8 DOCUMENTS REQUIRED FROM THE CONTRACTOR PRIOR TO FINAL PAYMENT

A. Documents will be submitted to the Engineer in triplicate, each set-in individual binders for submission to the Owner. These items include, but are not limited to, the following:
   1. All applicable manufacturer's warranties.
   2. Contractor's two-year (2-yr.) guarantee.
   3. Manufacturer's twenty-year (20-yr.) NDL roof system warranty.
   4. Executed Punch List Inspection letter(s).
   5. Consent of Surety Company to Final Payment (AIA Form G707).
   6. Lien Releases from Contractor, subcontractor, and suppliers (AIA Forms G706, G706A).
   7. Contractor's Affidavit of Payment of Debts and Claims.
   8. Final Application and Certificate for Payment.
   9. Completed waste shipment records and dumping manifests.
   10. As Built Drawings.
   11. Other documents which may be specifically required by the Owner or the Engineer.

PART 2 – PRODUCTS

NOT USED.

PART 3 – EXECUTION

NOT USED.

END OF SECTION

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SECTION 05 31 00

STEEL DECKING

PART 1 - GENERAL

1.1 IN GENERAL

A. Division 01, General Conditions, and all parts of the Bid and Contract Documents are made part of this Section as if fully repeated herein.

B. Refer to Division 01 for additional information.

1.2 SCOPE OF WORK

A. In general, the Contractor shall supply all labor, equipment, temporary protection, tools, and appliances necessary for the proper completion of the work as required in the Specifications, in accordance with good construction practice, and as required by the materials manufacturer, as amended. The work under this Section generally includes the following:

1. Supply all protection necessary to protect the building areas, building systems and landscape areas.
2. Resecure existing metal decking to the supporting framing at Roof Area A. Refer to the Contract Drawings for additional information regarding fastening patterns. Contractor shall investigate interior condition and map out interior conduit and equipment in close proximity to the deck flutes to not disturb the re-securement of the existing roof deck and to prevent damage to existing conduit and/or other items suspended from the existing structure.
3. Supply all shoring, supports, ramps, walkways, and other items or materials necessary to brace and support the structure, fixtures and facilities affected by the work. This includes, but is not limited to, heating ducts and lighting, and any item presently supported by or suspended from the metal deck and the structural members.
4. Scrape, prime, and paint areas of surface rusting on metal deck surfaces under unit price quantity scope of work. Coordinate with Section 01 22 00 – Unit Prices.
5. Remove and replace deteriorated areas of metal deck under unit price scope of work. Coordinate with Section 01 22 00 – Unit Prices.
6. Keep the building and areas below and around the construction area clean with as little accumulation of dust and debris as possible on a daily basis.
7. Clean all surfaces and areas affected by the work.

1.3 RELATED WORK SPECIFIED ELSEWHERE

A. Section 06 10 00 - Rough Carpentry
B. Section 07 54 00 - Thermoplastic Roofing and Flashing

C. Section 22 30 00 - Plumbing
D. Section 26 10 00 - Temporary Mechanical/ Electrical Disconnects

1.4 REFERENCES

A. The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only.
   1. AISC Specification for the Design, Fabrication, and Erection of Structural Steel for Buildings, (AISC Specifications)
      a. AISC M011 Manual of Steel Construction Allowable Stress Design
      b. AISC M013 Detailing for Steel Construction
      c. AISC S303 Code of Standard Practice for Steel Buildings and Bridges
   2. AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)
      a. ASTM A36/A36M (2012) Standard Specification for Carbon Structural Steel
      b. ASTM A123/A Standard Specification for Zinc Coatings on Iron and Steel Products.
      c. ASTM A307 (2010) Standard Specification for Carbon Steel Bolts and Studs, 60 000 PSI Tensile Strength
      d. ASTM F 436 (2011) Hardened Steel Washers
      e. ASTM A563 Standard Specification for Carbon and Alloy Steel Nuts
      f. ASTM A992/A992M (2011) Standard Specification for Structural Steel Shapes
   3. AMERICAN WELDING SOCIETY (AWS– Latest Edition)
      a. AWS A2.4 (2007) Standard Symbols for Welding, Brazing and Nondestructive Examination
      b. AWS D1.1/D1.1M (2010; Errata 2011) Structural Welding Code - Steel

1.5 SUBMITTALS

A. Refer to Section 01 33 00 - Shop Drawings & Submittals for additional information.

B. Submit certified copies of welder qualifications test records showing qualification in accordance with AWS D1.1.

C. Provide a project specific safety plan and job hazard analysis.

D. Product Data: For each type of product indicated. Include recommendations for application and use. Include test data substantiating that products comply with requirements.
   1. Show layout and types of deck panels, connection details, reinforcing members, cut deck openings, accessories, mechanical fasteners, and attachments to other construction.

E. Product certificates.

1.6 QUALITY ASSURANCE

A. Installer Qualifications: An experienced installer who has completed steel deck similar in material, design, and extent to that indicated for this Project and whose work has resulted in construction with a record of successful in-service performance.

B. Testing Agency Qualifications: An independent testing agency, acceptable to authorities having jurisdiction, qualified according to ASTM E 329 to conduct the testing indicated, as documented according to ASTM E 548.

C. AISI Specifications: Comply with calculated structural characteristics of steel deck according to AISI's "North American Specification for the Design of Cold-Formed Steel Structural Members."

D. Verify profile of existing deck prior to ordering new deck materials.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Protect steel deck from corrosion, deformation, and other damage during delivery, storage, and handling.

B. Stack steel deck on platforms or pallets and slope to provide drainage. Protect with a waterproof covering and ventilate to avoid condensation.

1.8 JOB CONDITIONS

A. The Contractor shall supply, install and maintain all shoring, supports, barriers, protection, temporary heat, warning lines, lighting and personnel required to support the structure, fixtures and facilities affected by his work and segregate the work area(s) from pedestrian or vehicular traffic, as well as to prevent damage to the building, occupants and the surrounding landscaped and paved areas.

B. Schedule and execute all work without exposing the interior building areas to inclement weather. Protect the existing building and its contents against all risks, and repair or replace all damage to the Owner's satisfaction.

C. Coordinate the work in this section with the work by other trades to ensure the orderly progress of the work.

D. Under no circumstances shall the Contractor remove existing materials and systems to the ground in an uncontrolled manner. Machinery or devices used shall be manufactured for this purpose. Adjacent building and property areas shall be protected from airborne debris.

E. During removal operations, the Contractor is responsible for the containment of all dust, dirt, debris, overspray, and run-off resulting from the work. The Contractor shall

collect and contain all materials and repair any resulting damage to adjacent surfaces, site fixtures or personal property. Specific attention is drawn to the use of chemicals and cleaners.

F. The Contractor is cautioned that ductwork, electrical conduits, communications conduits, and other utilities are in close proximity to the underside of the roof deck. The Contractor will be required to coordinate with the Owner to investigate the conditions and provide relocation and/or protection where needed. The Contractor will be responsible for coordinating all disconnects/reconnects associated with removal of deteriorated sections of roof deck and the installation of new roof deck with the Owner's electrical contractor.

G. Fully charged, inspected, and approved fire extinguishers shall be on site at all times. No cutting, grinding, or welding of any kind shall proceed without an approved, fully charged fire extinguisher.

H. The Contractor shall utilize skilled and experienced specialty workers to install all aspects of the work.

I. No deck replacement shall be done without the prior approval of the Owner and the Designer to be sure areas below have been prepared for the demolition work.

J. The Contractor shall be responsible for correctness of detailing, fabrication, and for the correct fitting of structural members. Substitution of sections or modification of connection details will not be accepted unless approved by the Designer. Welding shall be in accordance with AWS D1.1.

1.9 GUARANTEES

A. Upon completion of the work and prior to final payment, the Contractor shall submit a guarantee of their work as free from defect in materials and workmanship. The guarantee shall be for a period of two year (2 yrs.). The guarantee shall be signed by an officer of the Contractor's firm and sealed if a corporation.

1.10 UNIT PRICES

A. Technical requirements for related Unit Price work are defined in this section. *Refer to Division 01 Section "Unit Prices" for quantities to be carried in the Base Bid.* Any work in addition to those shown on the Contract Drawings shall be either added or deducted based on the unit costs.

PART 2 – PRODUCTS

2.1 METAL DECK REPLACEMENT AND ACCESSORIES

A. At locations of existing metal decking, the new replacement metal decking shall be Type B one- and one-half inch (1½") deep, or as required to match the existing metal deck profile, 20-gauge minimum decking with one foot (1'-0") minimum integral laps

or greater, as required to match the existing deck configuration with a minimum yield strength (Fy) of 40 ksi.

B. New metal deck panels shall be sized to bear on a minimum of three (3) supports. Deck span must be 2 span continuous minimum.

C. Metal decking shall be certified by the Steel Deck Institute and manufactured by Canam, United Steel Deck, Inc., Wheeling Corrugated Co., Roll Form Products, Inc., or Designer approved equal.

D. All Metal decking, lap strips, and cover plate sheet steel shall be fabricated of galvanized sheet material. Galvanized sheet materials shall conform to ASTM A653 Specifications with G-60 or G-90 galvanizing.

E. Lap plates at butt end joints between existing metal deck panels and lap joints between new metal decking and existing metal decking shall be one-eighth inch (⅛") thick minimum and six-inch (6") wide minimum.

F. Fasteners to secure new metal decking panels to existing framing, cover plates to existing metal deck panels, and cover plates to new metal deck panels shall be one-inch (1") long minimum No. 12 self-drilling, self-tapping screws such as TEKS Fasteners, as manufactured by Buildex Division, Illinois Tool Works, Inc., or approved equal.

2.2 PRIMER AND PAINT FOR DECK REPAIRS

A. Primer for metal decking repairs and steel framing shall be a zinc rich (ninety-three percent [93%] minimum zinc content) cold galvanizing compound such as "ZRC" by the ZRC Products Company or approved equal.

B. All paint materials shall be products of a recognized reliable manufacturer and shall be lead free.

C. Galvanizing Repair Paint: SSC-Paint 20, DOD-P-21035, or approved equal.

2.3 METAL DECK RESECUREMENT

A. Fasteners to secure existing metal decking panels to existing framing shall be 1-inch-long minimum Hilti S-MD 12-14 HWH #5 self-drilling, self-tapping screws, as manufactured by Hilti, Inc., or approved equal.

PART 3 – EXECUTION

3.1 EXAMINATION

A. Examine supporting frame and field conditions for compliance with requirements for installation tolerances and other conditions affecting performance.

3.2 GENERAL

A. The Contractor shall coordinate all work in this Section with the work in other sections as required for the work to proceed in an orderly fashion. Removal and replacement shall be performed in the specified, controlled manner so as to provide a watertight building at the end of each day's work, free of excessive build-up of trash, dust, dirt, and debris. The general procedure for this is listed below, and all items shall be done on a daily basis.

B. Decking found to be damaged, deteriorated, deflected or rusted must be reviewed by Owner or his Representative prior to roof system installation operations. Unsound steel deck panels shall be removed in their entirety. Partial panel replacement shall not be permitted.

C. Contractor shall notify Owner of damaged or deteriorated structural framing uncovered during deck replacement operations prior to installation of replacement decking.

D. Install deck panels and accessories according to applicable specifications and commentary in SDI Publication No. 30, manufacturer's written instructions, requirements in this Section, and as indicated.

E. Disconnect and/or support the electrical power and mechanical equipment fastened below the metal deck area to be replaced prior to the start of demolition.

3.3 REMOVAL OF DETERIORATED METAL DECK

A. Areas requiring replacement of the deck system shall first be reviewed with the Owner and the Designer prior to removal. At that time, the extent (and dimensions) of replacement for each area shall be defined.

B. Supply all tarps, warning lines and other means necessary to protect the building interior from damage, as well as the occupants.

C. Provide a fire watch as required by the local fire department within the building to prevent sparks from igniting and causing damage to the building.

D. Removals for deck replacement shall include extending over three (3) support members while ensuring that adjacent panels also extend over three (3) supports. All sharp edges and burs shall be ground smooth.

E. The limits of deck removal shall be defined with a clean, straight saw-cut through the metal decking. Remove areas of deteriorated decking by cutting to the nearest support. Support the deteriorated panel sections during cutting and lift out once free. Caution: Contractor shall investigate the underside of the roof deck to confirm if conduits are in close proximity of the cutting areas, or if equipment is secured to the decking.

F. Prior to removing deteriorated metal decking, clear all debris from flutes. The Contractor shall also review the underside of the existing roof deck to determine if there are suspended utilities, ceilings, equipment, etc., that are attached to the area(s) of existing metal decking designated to be removed and replaced. The Contractor shall temporarily remove or disconnect and restore all equipment and utilities, previously removed after the new metal roof deck is installed to its original condition.

3.3 METAL DECK RESECUREMENT

A. Resecure existing metal deck (and new sections of decking installed as part of Sections 3.2 & 3.3, as applicable) to existing framing with one-inch (1") long No.12 self-drilling, self-tapping screws. Fasteners shall be installed centered in the bottom flute of the existing metal deck. If welds are encountered, fasteners shall not be installed at flute locations with existing welds.

3.4 CLEANING AND PRIMING

A. Surficially rusted steel framing members (uncovered during deck removal work) and surficially rusted deck areas shall be mechanically cleaned of rust and scale according to Society for Protective Coating (SPC) SP-3 Standards and vacuumed clean.

B. Apply alkyd primer to cleaned deck and framing member areas, by brush, at rate of approximately three hundred square feet per gallon (300 s.f../gal.). Allow one to two hours (1-2 hrs.) drying time prior to deck/roofing installation.

END OF SECTION

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SECTION 05 40 00

COLD-FORMED METAL FRAMING

PART 1 - GENERAL

1.1 IN GENERAL

A. Division 01, General Conditions, and all parts of the Bid and Contract Documents are made part of this section as if fully repeated herein.

B. Refer to Division 01 for additional information.

1.2 SCOPE OF WORK

A. In general, the Contractor shall supply all labor, materials, equipment, temporary protection, tools, and appliances necessary for the proper completion of the work as required in the specifications, in accordance with good construction practice and as shown on the Contract Drawings. The work under this section generally includes the following:
   1. Reinforcement of existing roof truss top and bottom chords.
   2. Bracing of existing roof truss web members.
   3. Temporarily relocate interior furniture, ceiling, lights, etc. as required for the work.

1.3 RELATED WORK SPECIFIED ELSEWHERE

A. Section 053100 - Steel Decking

B. Section 061000 - Rough Carpentry

C. Section 073113 - Asphalt Shingles

D. Section 076200 - Sheet Metal Flashing

1.4 PROJECT CONDITIONS

A. The building and site will be occupied during construction. The Contractor shall take all necessary precautions to create as little disturbance or disruption to the building and occupants as possible during the course of the work. All entries and exits and access to emergency equipment must be kept clear at all times.

B. Field Measurements: Contractor shall field verify geometry of existing structural members to be reinforced and notify engineer if discrepancies between field measurements and the Contract Drawings are observed prior to steel fabrication.

1.5 SUBMITTALS

The following shall be submitted in accordance with the General Conditions and submittal requirements noted in Section 01 33 00 - Shop Drawings and Submittals.

A. Product Data: For each type of cold-formed metal framing product and accessory indicated.

B. Shop Drawings: Show layout, spacings, sizes, thicknesses, and types of cold-formed metal framing; fabrication; and fastening and anchorage details, including mechanical fasteners. Show reinforcing members, supplemental framing, strapping, bracing, bridging, splices, accessories, connection details, and attachment to adjoining work.
   1. Prepare shop drawings only after field measurements and documentation of existing conditions. All trades must participate in the shop drawings to produce a fully coordinated set.

C. Qualification Data: For professional engineer.

D. Product Test Reports: From a qualified testing agency, unless otherwise stated, indicating that each of the following complies with requirements, based on evaluation of comprehensive tests for current products:
   1. Steel sheet.
   2. Mechanical fasteners.
   3. Miscellaneous structural clips and accessories.

1.6 QUALITY ASSURANCE

A. Engineering Responsibility: Preparation of Shop Drawings, design calculations, and other structural data by a qualified professional engineer registered in the State of New Hampshire.

B. Professional Engineer Qualifications: A professional engineer who is legally qualified to practice in the jurisdiction where Project is located and who is experienced in providing engineering services of the kind indicated. Engineering services are defined as those performed for installations of cold-formed metal framing that are similar to those indicated for this Project in material, design, and extent.

C. Testing Agency Qualifications: An independent testing agency, acceptable to authorities having jurisdiction, qualified according to ASTM E329 to conduct the testing indicated.

D. Product Tests: Mill certificates or data from a qualified independent testing agency, or in-house testing with calibrated test equipment indicating steel sheet complies with requirements, including base-metal thickness, yield strength, tensile strength, total elongation, chemical requirements, ductility, and metallic-coating thickness.

E. Fire-Test-Response Characteristics: Where indicated, provide cold-formed metal framing identical to that of assemblies tested for fire resistance per ASTM E 119 by a testing and inspecting agency acceptable to authorities having jurisdiction.

F. AISI Specifications and Standards: Comply with AISI's "North American Specification for the Design of Cold-Formed Steel Structural Members" and its "Standard for Cold-Formed Steel Framing - General Provisions."

1. Comply with AISI's "Standard for Cold-Formed Steel Framing - Truss Design."
2. Comply with AISI's "Standard for Cold-Formed Steel Framing - Header Design."

G. Preinstallation Conference: Conduct conference at Project site to comply with requirements in Division 01.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Protect cold-formed metal framing from corrosion, deformation, and other damage during delivery, storage, and handling.

B. Store cold-formed metal framing, protect with a waterproof covering, and ventilate to avoid condensation.

1.8 JOB CONDITIONS

A. The Contractor shall supply, install and maintain all shoring, supports, barriers, protection, temporary heat, warning lines, lighting and personnel required to support the structure, fixtures and facilities affected by his work and segregate the work area(s) from pedestrian or vehicular traffic, as well as to prevent damage to the building, occupants and the surrounding landscaped and paved areas.

B. Schedule and execute all work without exposing the interior building areas to inclement weather. Protect the existing building and its contents against all risks, and repair or replace all damage to the Owner's satisfaction.

C. Coordinate the work in this section with the work by other trades to ensure the orderly progress of the work.

D. Under no circumstances shall the Contractor remove existing materials and systems to the ground in an uncontrolled manner. Machinery or devices used shall be manufactured for this purpose. Adjacent building and property areas shall be protected from airborne debris.

E. During removal operations, the Contractor is responsible for the containment of all dust, dirt, debris, overspray, and run-off resulting from the work. The Contractor shall collect and contain all materials and repair any resulting damage to adjacent surfaces, site fixtures or personal property. Specific attention is drawn to the use of chemicals and cleaners.

F. Fully charged, inspected, and approved fire extinguishers shall be on site at all times. No cutting, grinding, or welding of any kind shall proceed without an approved, fully charged fire extinguisher.

G. The Contractor shall utilize skilled and experienced specialty workers to install all aspects of the work.

1.9 WARRANTY

A. Manufacturer's Warranty: Submit, for Owner's acceptance, manufacturer's standard warranty document executed by authorized company official.

B. See Division 01, Section 01 10 00 - Summary of Work for contractor's warranty.

1.10 UNIT PRICES

A. Technical requirements for related Unit Price work are defined in this section. Refer to Division 01, Section 01 22 00 - Unit Prices for quantities to be carried in the Base Bid. Any work in addition to those shown on the Contract Drawings shall be either added or deducted based on the unit costs.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering cold-formed metal framing that may be incorporated into the Work include, but are not limited to, the following:

B. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. Dietrich Metal Framing; a Worthing Industries Company.
2. Marino Ware, A Division of Ware Industries.
3. Consolidated Fabricators Corp.
4. Allied Studco.
5. Evolution 1, LLC: Enviro-Beam pre-insulated framing assemblies.

2.2 PERFORMANCE REQUIREMENTS

A. Cold-Formed Steel Framing Standards: Unless more stringent requirements are indicated, framing shall comply with AISI S100, AISI S200, and the following:
1. Truss Reinforcing Members: AISI 240

B. Fire Resistance Ratings: Comply with ASTM E 119; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.

2.3 COLD-FORMED STEEL FRAMING MATERIALS

A. Steel Sheet: ASTM A 1003/A 1003M, Structural Grade, Type H, metallic coated, of grade and coating weight as follows:
1. Grade: ST50H or as required by structural performance.
2. Coating: G90 (Z275) or equivalent.

2.4 TRUSS CHORD REINFORCEMENT

A. *Steel Studs*: Manufacturer's standard C-shaped studs, of web depths indicated, punched, with stiffened flanges, and as follows:
1. 250S200-97

2.5 TRUSS WEB MEMBER BRACING

A. Steel Studs: Manufacturer's standard C-shaped studs, of web depths indicated, punched, with stiffened flanges, and as follows:
   1. 400S162-54

B. Connector Angle: Manufacturer's standard connector angles, as follows:
   1. Simpson Strong-Tie RCA333/54-R100 Rigid Connector Angle, or engineer approved equal

2.6 FRAMING ACCESSORIES

A. Fabricate steel-framing accessories from steel sheet, ASTM A 1003/A 1003M, Structural Grade, Type H, metallic coated, of same grade and coating weight used for framing members.

B. Provide accessories of manufacturer's standard thickness and configuration, unless otherwise indicated, as follows:
   1. Supplementary framing.
   2. Bracing, bridging, and solid blocking.
   3. Anchor clips.

2.7 ANCHORS, CLIPS, AND FASTENERS

A. Steel Shapes and Clips: ASTM A 36/A 36M, zinc coated by hot-dip process according to ASTM A 123/A 123M.

B. Mechanical Fasteners: ASTM C 1513, corrosion-resistant-coated, self-drilling, self-tapping steel drill screws.
   1. Head Type: Low-profile head beneath sheathing, manufacturer's standard elsewhere.

2.8 MISCELLANEOUS MATERIALS

A. Galvanizing Repair Paint: SSPC-Paint 20 or DOD-P-21035 or ASTM A 780.
   1. Provide interior, field-applied paint with a VOC content of 250 g/L or less, when calculated according to 40 CFR 59, Subpart D (EPA Method 24).

B. Shims: Load bearing, high-density multimonomer plastic, non-leaching.

C. Sealer Gaskets: Closed-cell neoprene foam, one-quarter inch (¼")thick, selected from manufacturer's standard widths to match width of bottom track or rim track members.

2.9 FABRICATION

A. Fabricate cold-formed metal framing and accessories plumb, square, and true to line, and with connections securely fastened, according to referenced AISI's specifications and standards, manufacturer's written instructions, and requirements in this Section.

1. Fabricate framing assemblies using jigs or templates.
2. Cut framing members by sawing or shearing; do not torch cut.
3. Fasten cold-formed metal framing members by screw fastening, clinch fastening, or riveting as standard with fabricator. Wire tying of framing members is not permitted.
    a. Locate mechanical fasteners and install according to Shop Drawings, with screw penetrating joined members by not less than three exposed screw threads.

B. Reinforce, stiffen, and brace framing assemblies to withstand handling, delivery, and erection stresses. Lift fabricated assemblies to prevent damage or permanent distortion.

C. Fabrication Tolerances: Fabricate assemblies' level, plumb, and true to line to a maximum allowable tolerance variation of one-eighth inch (⅛") in ten feet (10') [1:960] and as follows:
1. Spacing: Space individual framing members no more than plus or minus one-eighth inch (+/- ⅛" [3 mm]) from plan location. Cumulative error shall not exceed minimum fastening requirements of sheathing or other finishing materials.
2. Squareness: Fabricate each cold-formed metal framing assembly to a maximum out-of-square tolerance of one-eighth inch (⅛" [3 mm]).

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine supporting substrates and abutting structural framing for compliance with requirements for installation tolerances and other conditions affecting performance.
1. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Before sprayed fire-resistive materials are applied, attach continuous angles, supplementary framing, or tracks to structural members indicated to receive sprayed fire-resistive materials.

B. After applying sprayed fire-resistive materials, remove only as much of these materials as needed to complete installation of cold-formed framing without reducing thickness of fire-resistive materials below that are required to obtain fire-resistance rating indicated. Protect remaining fire-resistive materials from damage.

3.3 INSTALLATION, GENERAL

A. Cold-formed metal framing may be shop or field fabricated for installation, or it may be field assembled.

B. Install cold-formed metal framing according to AISI's "Standard for Cold-Formed Steel Framing - General Provisions" and to manufacturer's written instructions unless more stringent requirements are indicated.

C. Install cold-formed metal framing and accessories plumb, square, and true to line, and with connections securely fastened.
   1. Cut framing members by sawing or shearing; do not torch cut.
   2. Fasten cold-formed metal framing members by screw fastening, clinch fastening, or riveting. Wire tying of framing members is not permitted.
      a. Locate mechanical fasteners and install according to Shop Drawings, and complying with requirements for spacing, edge distances, and screw penetration.

D. Do not bridge building expansion and control joints with cold-formed metal framing. Independently frame both sides of joints.

E. Erection Tolerances: Install cold-formed metal framing level, plumb, and true to line to a maximum allowable tolerance variation of one-eighth inch (⅛") in ten feet (10') and as follows:
   1. Space individual framing members no more than plus or minus one-eighth inch (+/- ⅛") from plan location. Cumulative error shall not exceed minimum fastening requirements of sheathing or other finishing materials.

3.4 FIELD QUALITY CONTROL

A. Testing: Engage a qualified independent testing and inspecting agency to perform field tests and inspections and prepare test reports.

B. Testing agency will report test results promptly and in writing to Contractor and Engineer.

C. Remove and replace work where test results indicate that it does not comply with specified requirements.

D. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.

3.5 PROTECTION

A. Provide final protection and maintain conditions, in a manner acceptable to manufacturer and Installer, that ensure that cold-formed metal framing is without damage or deterioration at time of Substantial Completion.

END OF SECTION

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SECTION 06 10 00

ROUGH CARPENTRY

PART 1 - GENERAL

1.1 IN GENERAL

A. Division 01, General Conditions, and all parts of the Bid and Contract Documents are made part of this Section as if fully repeated herein.

B. Refer to Division 01 for additional information.

1.2 RELATED WORK SPECIFIED ELSEWHERE

A. Section 05 31 00 - Steel Decking
B. Section 07 54 00 - Thermoplastic Roofing and Flashing
C. Section 07 62 00 - Sheet Metal Flashing
D. Section 22 30 00 - Temporary Mechanical Disconnects

1.3 SCOPE OF WORK

In general, the Contractor shall supply all labor, materials, equipment, temporary protection, tools, and appliances necessary for the proper completion of the work in this Section, as required in the Specifications and in accordance with good construction practice. The work under this Section generally includes the following:

A. Install new wood blocking at roof penetrations, roof perimeters, roof to wall locations, and at locations as required to properly terminate the new roofing and flashing systems as indicated in the Contract Documents. Install wood shims where detailed.

B. At roof perimeter edge locations, coordinate the installation of wood blocking with section 07 54 00 - Thermoplastic Roofing and Flashing.

C. Coordinate work with grouting of top course of concrete masonry unit backup wall and other scope of work items outlined in section 07 54 00 - Thermoplastic Roofing and Flashing.

D. Install plywood at locations as indicated in the Contract Documents to provide a flush transition and clean surface to adhere new membrane.

E. Remove existing three-quarter inch (¾") thick plywood deck as required for installation of cold-formed steel truss augmentation. Install new three-quarter inch (¾") plywood deck after installation of steel truss augmentation. Coordinate installation of new plywood deck with 05 31 00 - Steel Decking.

F. Clean and restore all areas affected by the work.

1.4 JOB CONDITIONS

A. All surfaces to receive the new wood blocking shall be thoroughly dry. Should surface moisture such as dew exist, the General Contractor shall provide the necessary equipment to dry the surface prior to application. Do not dry with open flames.

B. Coordinate this work with the work described in other Sections of this Specification.

C. Do not leave any newly installed wood blocking or plywood exposed. Cover and protect all newly installed wood daily with the new flashing system.

D. Protect all existing and new wood stored on site to prevent moisture absorption. Use tarps over the wood pile (top, sides and bottom) elevated on pallets (one side lower to shed water).

E. If delays in the project exceeding one week (1 wk.) are anticipated due to inclement weather (or due to any other condition), all wood shall be stored in weatherproof box trailers or storage sheds in locations to be designated by the Owner.

1.5 SUBMITTALS

A. Submittals shall be made in accordance with the General Conditions and Section 01 33 00 - Shop Drawings and Submittals.

1.6 UNIT PRICES

A. Technical requirements for related Unit Price work are defined in this section. Refer to Division 01, Section 01 22 00 - Unit Prices for quantities to be carried in the Base Bid. Any work in addition to those shown on the Contract Drawings shall be either added or deducted based on the unit costs.

PART 2 - MATERIALS

2.1 DIMENSIONAL LUMBER

A. Dimensional lumber shall be construction grade Douglas Fir, Hem-Fir or Southern Yellow Pine, supplied and cut to the dimensions shown on the Details, as required for proper installation of the new work. All new exterior perimeter woodwork, nailers and wood blocking shall be minimum six inches (6”) wide, except where otherwise detailed.

B. All roof woodwork shall have a maximum moisture content of nineteen percent (19%) by weight on a dry weight basis. Kiln drying may be required to conform to maximum nineteen percent (19%) moisture content.

C. The Contractor is cautioned that oil and penta-based materials and preservatives are not compatible with built-up membranes and shall not be used.

2.2 PLYWOOD

A. Plywood shall be the following:
1. Plywood sheathing over masonry substrate shall be Grade A-C, exterior marine grade, minimum five-eighths inch (⅝”) thick, except where otherwise indicated.
2. New plywood deck shall be DOC PS 1, three-quarter inch (¾”) thickness. Factory mark panels according to indicated standard.

B. Plywood shall not be pressure treated. Plywood shall have maximum moisture content of fifteen percent (15%) by weight on a dry weight basis.

C. All plywood shall have grade stamps; plywood from contaminated areas will not be accepted.

2.3 FASTENERS AND ANCHORS

A. In general, all fasteners, anchors, nails, straps, and other accessories shall be of stainless steel, galvanized steel, or fluorocarbon coated steel. Galvanizing shall be hot dip in accordance with ASTM A153 Specifications. Electro-galvanized items shall not be used.

B. Fasteners for securing wood blocking to wood blocking shall be galvanized annular threaded ring shank nails. Fasteners shall be of sufficient length to penetrate the receiving member one- and one-quarter inch (1¼") minimum, except full depth into plywood.

C. Fasteners for securing plywood to concrete and masonry surfaces shall be one-quarter inch (¼”) diameter hammer drive anchors with zinc-alloy sheaths and stainless-steel inserts as manufactured by Star Fasteners, Rawl, or approved equal. Anchors shall be of sufficient length to penetrate the receiving substrate one- and one-quarter inch (1¼") minimum.

D. Fasteners for securing wood blocking to CMU blocks and brick masonry units shall be Kwik-Con II+Torx Hex Screw Anchor as manufactured by Hilti or approved equal. Fasteners shall be of sufficient length to penetrate the receiving substrate one- and three-quarter inch (1¾”) minimum.

E. Fasteners for securing new plywood deck and existing plywood deck at cut areas to supporting members (existing truss top chord or truss top chord reinforcement) shall be #12 Simpson PPHDQ134 Sheathing-to-CFS Screw or Engineer approved equal spaced a maximum of twelve inches (12”) on-center.

PART 3 - EXECUTION

3.1 GENERAL

A. Do not deliver to the site or install any material or system that has not been approved. Items installed without approval may be required to be removed.

B. Prepared surfaces must be clean and dry. Fill, chip or grind as required to provide a smooth, uniform surface.

C. During removal and replacement of woodwork, the Contractor shall report to the Engineer any structural supports which are deteriorated or unsuitable. Do not cover unacceptable areas until reviewed by the Engineer but provide temporary protection to the area in question.

D. All butt joints in woodwork shall be flush to provide a smooth, uniform line with no irregularities. Built-up blocking shall have butt joints staggered four feet (4') minimum layer to layer. The minimum length of any individual piece of woodwork shall be two feet (2'). All lengths of woodwork shall have a minimum of two (2) fasteners. Layers of wood blocking at corners shall be interlocked to provide additional stability.

E. Gypsum sheathing shall be free of defects including but not limited to broken corners, excessive moisture, dimensional irregularities and the like. Defective panels shall be marked and immediately removed from the site.
   1. Sheet metal or mesh patches at broken corners will not be allowed.
   2. Damage at corners will require either full replacement of the entire panel, or cutting and patching of the panel back to the next adjacent stud, providing two (2) full support points for the sheathing.

3.2 REMOVAL OF WOOD BLOCKING

A. Remove and dispose of all deteriorated wood blocking and all blocking scheduled to be removed and replaced in accordance with the Contract Drawings and this Specifications.

3.3 ROOF PERIMETER BLOCKING AND ROOF TO WALL BLOCKING

A. Refer to Factory Mutual (FM) Data Sheet 1-49 concerning spacing requirements for perimeter blocking anchorage. Anchors and fasteners that attach wood blocking to the structure shall have their spacing halved for an eight-foot (8 ft.) length away from exterior corners of the roof perimeter.

B. Cut butt joints in woodwork to provide a smooth, uniform line with no irregularities. Stagger butt joints at multiple layers of blocking four feet (4’) minimum, layer to layer. The minimum length of any individual piece of woodwork shall be two feet (2’), with a minimum of two (2) fasteners per piece.

C. Overlap wood blocking joints at corners from layer to layer.

D. Wood blocking to wood blocking connections shall be made using the specified nails spaced twelve inches (12") on-center maximum and staggered off the centerline of the woodwork being secured. Nails shall be of sufficient length to penetrate the receiving member one- and one-half inches (1½") minimum.

E. Wood blocking shall be fastened directly to the roof deck with the specified fasteners spaced twenty-four inches (24") on-center maximum, staggered off the centerline of the woodwork being secured. Predrilling of fastener holes shall be completed prior to installing fasteners.

F. Plywood shall be fastened to vertical masonry surfaces and concrete coping stone with the specified fasteners spaced eight inches (8") on-center both vertically and horizontally.

3.4 FASTENING OF WOODWORK

A. Wood blocking to wood blocking connections shall be made using the specified nails spaced twelve inches (12") on-center maximum and staggered off the centerline of the woodwork being secured. Nails shall be of sufficient length to penetrate the receiving member one- and one-half inches (1½") minimum.

B. Plywood shall be fastened to vertical concrete, CMU, and masonry surfaces with the specified fasteners spaced eight inches (8") on-center both vertically and horizontally.

C. Spacing of fasteners should not exceed twelve inches (12"), eight feet (8') each way from outside corners. Withdrawal resistance should be one hundred pounds (100 lbs.) per nail minimum.

3.5 FASTENING OF NEW PLYWOOD DECK

A. New plywood deck shall be cut such that each end fully bears along the top flange of the existing truss top chord or the truss top chord reinforcement. The existing plywood deck at cut areas shall fully bear on the opposite member (existing truss top chord or the truss top chord reinforcement). *Refer to the Contract Drawings for additional information.*

B. New plywood deck to existing truss top chord connections shall be made using the specified fasteners spaced twelve inches (12") on-center maximum and centered in the flange of the supporting member (existing truss top chord or the truss top chord reinforcement). Refer to the Contract Drawings for additional information.

C. Existing plywood deck to existing truss top chord connections at cut areas shall be made using the specified fasteners spaced twelve inches (12") on-center maximum and centered in the flange of the supporting member (existing truss top chord or the

truss top chord reinforcement). Refer to the Contract Drawings for additional information.

END OF SECTION

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SECTION 07 31 13

ASPHALT SHINGLES

PART 1 – GENERAL

1.1 IN GENERAL

A. Division 01, General Conditions, and all parts of the Bid and Contract Documents are made part of this Section as if fully repeated herein.

B. Refer to Division 01 for additional information.

1.2 RELATED WORK SPECIFIED ELSEWHERE

A. Section 05 40 00 - Cold-Formed Metal Framing

B. Section 06 10 00 - Rough Carpentry

C. Section 07 62 00 - Sheet Metal Flashing

1.3 SCOPE OF WORK

A. In general, the Contractor shall supply all labor, equipment, temporary protection, tools, and appliances necessary for the proper completion of the work as required in the Specifications, in accordance with good construction practice, and as required by the materials manufacturer, as amended. The work under this Section generally includes the following:

B. At Roof Areas B, C and D, remove and dispose of existing standing seam metal roof system including, but not be limited to, standing seam metal panels and plywood deck down to the existing truss structure to remain. Coordinate structural augmentation with Section 05 40 00 - Cold-Formed Metal Framing.

C. At Roof Areas B, C and D, furnish and install new asphalt shingle roof system and accessories including, but not be limited to, asphalt shingles, synthetic felt underlayment, modified bitumen underlayment, plywood and nailable vent board, insulation, air/vapor retarder, and plywood deck over existing truss structure.

D. Coordinate the installation of new sheet metal flashing, gutters, downspouts, valleys, and edge metal at locations and as indicated in the Contract Documents. Coordinate with Section 07 62 00 - Sheet Metal Flashing and Trim.

E. Install new roof ventilation components at locations and as indicated in the Contract Documents.

F. Install new snow tabs at locations and as indicated in the Contract Documents.

G. Clean and restore all areas affected by the work.

1.4 REFERENCES

A. National Roofing Contractors Association (NRCA) Roofing Manual: Steep-slope Roof Systems

1.5 SUBMITTALS

A. Submittals shall be made in accordance with the General Conditions and Section 01 33 00 - Submittal Procedures.

B. A sample roofing system warrantee and letter of confirmation from the roof shingle manufacturer stating that the Contract Documents have been reviewed and that there are no exceptions to the Specifications and Contract Drawings shall be submitted. The roofing system must meet UL 790, and be in conformance with all local and state building codes and is accepted by the manufacturer for the required warranty.

C. The Contractor shall submit the following procedural items with their submittal package:
   1. Methods of removal of materials.
   2. Temporary protection procedures.
   3. Fire watch procedures (if needed).
   4. List of local emergency numbers.
   5. Staging/set-up procedures.
   6. Schedule of roof renovations with coordination of structural improvements.

D. The Contractor shall submit the following samples with their submittal package:
   1. Color samples of asphalt shingles.
   2. Manufacturer’s literature and sample warranties.
   3. Shingle manufacturer’s installation instructions.

E. Provide the manufacturer’s product and installation literature for each item listed in Part 2 and other material anticipated for use on the project, for approval. Shop drawings are required indicating any anticipated changes.

1.6 QUALITY ASSURANCE

A. Fire-Resistance Characteristics: Where indicated, provide asphalt shingles and related roofing materials identical to those of assemblies tested for fire resistance per test method below by UL or another testing and inspecting agency acceptable to authorities having jurisdiction. Identify products with appropriate markings of applicable testing agency.

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

1.7 JOB CONDITIONS

A. Carefully coordinate the work in this section with the work in other sections to be sure the Contract Areas are in weather tight condition at the end of each day's work. This includes flashing work.

B. All surfaces to receive underlayment, shingle roofing or flashings shall be thoroughly dry. Should surface moisture such as dew exist, the Contractor shall provide the necessary equipment to dry the surface prior to application of roofing materials. No open flames will be allowed.

C. Completed roof areas shall be trafficked as little as practical. Work shall be coordinated to prevent this situation by working toward the roof edges and access ways. The Contractor shall provide protection for existing roof areas trafficked during construction.

D. Prior to, and during, asphalt shingle installation, all dirt and debris shall be removed from surfaces by sweeping and/or by similar methods.

E. The Contractor shall take all precautions to properly install the specified materials at cold temperatures. Consult with and follow all manufacturer requirements. Materials which have a temperature other than the recommended application temperature of the manufacturer shall not be installed.

F. The Contractor shall provide and equip as much labor force as is necessary to complete the project within the Contract period and in accordance with the Contract Documents without sacrificing workmanship quality.

G. Materials, equipment, and demolition debris shall not be stored on roof decks in such a manner as to overstress and/or damage the existing composite panels, deck and supporting structure. Placing of loads at midspans of framing shall be avoided. Superimposed loads shall be well distributed and shall not exceed twenty pounds per square foot (20 psf) at any given point of the roof at any time during the construction. Equipment, apparatus, construction materials, and demolition debris shall not, in any case, be allowed to load the roof structures in combination with any standing snow or ice upon the roofs.

H. The Contractor will be responsible for providing the staging/scaffolding required to access the roof area to perform the work.

I. The Contractor shall supply, install and maintain all shoring, supports, barriers, protection, warning lines, lighting and personnel required to support the structure, fixtures and facilities affected by his work and segregate the work area(s) from pedestrian or vehicular traffic, as well as to prevent damage to the building, occupants and the surrounding landscaped and paved areas.

J. The Contractor, his workmen, all his suppliers and agents shall make every effort to work in harmony with the building occupants.

K. All new and temporary construction, including equipment and accessories, shall be secured from vandalism or abuse.

L. Stored shingle bundles are not to be stacked more than six feet (6') high. Rolled underlayment shall be stored on ends, not laid flat.

M. The Contractor shall provide all necessary temporary protection and barriers to segregate the work area and to prevent damage to adjacent areas.

N. Under no circumstances shall the Contractor remove existing materials and systems to the ground in an uncontrolled manner. Adjacent building and property areas shall be protected from airborne debris.

1.8 WARRANTY

A. Special Warranty: Standard form in which manufacturer agrees to repair or replace asphalt shingles that fail in materials or workmanship within specified warranty period.

1. Material Warranty Period: Limited lifetime warranty but not less than forty years (40 yrs.), with first (1st) five years (5 yrs.) non-prorated.
2. Algae-Discoloration Warranty Period: Asphalt shingles will not discolor ten years (10 yrs.) from date of Substantial Completion.

B. See Division 01, Section 01 10 00 - Summary of Work for contractor's warranty.

PART 2 - PRODUCTS

2.1 ASPHALT SHINGLES

A. Asphalt shingles shall be architectural type, laminated type, algae-resistant, asphalt-impregnated fiberglass type with a granule surface, having a minimum exposure of five- and five-eighths inches (5-⅝"). Shingles shall be self-sealing wind resistant type with a U.L. 790 Class "A" fire rating classification, conforming to requirements of ASTM D3018, Type 1. Shingles shall also conform to ASTM D3462, ASTM D3161; Class F, and ASTM D7158; Class H. Color shall be selected from manufacturer's standard color chart by Owner. Shingles shall meet the minimum specifications herein or shall be one of the following:

1. Timberline Ultra HD as manufactured by GAF.
2. Landmark Premium as manufactured by CertainTeed.
3. Heritage as manufactured by TAMKO.
4. Duration Premium COOL by Owens Corning

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

2.2 UNDERLAYMENT MATERIALS

A. Modified Bitumen Underlayment: Self-Adhering Membrane Underlayment, High Temperature: ASTM D 1970, minimum of thirty millimeters (30 mil.) thick, slip-resisting, polyethylene-film-reinforced top surface laminated to layer of butyl or SBS-modified asphalt adhesive, with release paper backing; cold applied. Modified bitumen underlayment shall be as required by the manufacturer, Grace Ultra by GCP, WinterGuard HT by CertainTeed, WIP 300HT by Carlisle, or approved equal to meet the manufacturer's warranty requirements. Provide underlayment manufacturer's recommended accessories.

1. Thermal Stability: Stable after testing at two hundred forty degrees Fahrenheit (240ºF); ASTM D 1970.
2. Low-Temperature Flexibility: Passes after testing at minus twenty degrees Fahrenheit (-20ºF).

B. Synthetic Underlayment: High-performance synthetic roofing polymer-based scrim-reinforced water-resistant underlayment for use beneath asphalt shingles such as DiamondDeck as manufactured by CertainTeed, Deck-Armor by GAF, Slope Shield by VaproShield, or approved equal to meet the manufacturer's installation warranty requirements. Provide underlayment manufacturer's recommended accessories.

C. Slip sheet to be used between the underlayment and sheet metal, if required by the manufacturer to prevent adhesion shall be five pound (5 lb.) red rosin paper

2.3 AIR/VAPOR RETARDER

A. Self-adhering air/vapor retarder shall be thirty-two millimeters (32 mil) minimum composite consisting of rubberized asphalt and polyethylene, polypropylene, or polyester sheet as require by the membrane manufacturer such as V-Force Vapor Barrier Membrane as manufactured by Firestone, 725TR as manufactured by Carlisle Syntec, Versico 725 as manufactured by Versico, or approved equal. Utilize compatible primer with asphaltic coating.

2.4 COMPOSITE VENTED NAILBOARD

A. Composite Vented Insulation Board:

1. Composite board shall consist of two- and one-half inch (2.5") polyisocyanurate foam core factory bonded to spacers creating a one-inch (1") vented air space factory bonded to a five-eighths inch (⅝") thick CDX plywood board.
2. The CDX shall be rabbeted one-eighth inch (") on all sides to allow substrate expansion.
3. Board Size: Four feet by eight feet (4' x 8').
4. Air Space: One-inch (1").
5. Overall board thickness: Four- and one-eighth inches (4-⅛").

2.5 RIGID INSULATION

A. Polyisocyanurate: ASTM C 1289, Type II; Class I, Grade 2 (20 psi).

1. Flat Board Stock: Minimum thickness three inches (3.0").

2. Provide insulation that shall have an area weighted aged R-Value of 30 as required to meet the Long-Term Thermal Resistance (LTTR) value in accordance with ASTM C518 and the Building Code of the Town of Hooksett N.H., and IBC 2018 Edition factored with insulation included in the Composite Vented Nailboard.

2.6 ROOF CEMENT

A. Plastic roof cement shall be asphalt based, asbestos-free conforming to ASTM D4856, Type II. Plastic roof cement shall be provided in caulking gun tube containers where required for spot applications.

2.7 SHEET METAL TAB SNOW GUARDS

A. Snow guards shall be of copper construction as manufactured by Zaleski Sno-Guards and Roofing Specialists, Alpine Snow Guards, or the Vermont Slate Company. The snow guards shall have pre-punched fastener holes.

B. The Contractor shall verify pitch dimensions in the field to properly determine the required snow guard configuration as recommended by the snow guard manufacturer. The snow guard manufacturer shall confirm the fastening pattern of the snow guard system as required by the local State Building Code. All connections and fastener heads shall be fully soldered to provide a watertight assembly. The Contractor shall provide the written fastening pattern from the manufacturer based on the tab profile that is submitted.

C. Nails for snow guard tabs shall be large-headed, stainless steel, annular ring shanked nails of Number 11-gauge metal. Nails shall be 12D minimum, or as required by the snow guard tab manufacturer's snow load calculations for the specific tab submitted by the Sub-Contractor (confirmation of fastener will be required prior to the installation of the units).

D. At a minimum, the snow tabs shall be installed in a three-tier system minimum to match the existing snow tab pattern on the roof system. Additional tiers may be required by the manufacturer to meet the snow load requirements.

2.8 ACCESSORIES

A. Roofing Nails: ASTM F 1667; #304 stainless steel wire roofing nails, minimum 0.120-inch diameter, ring shanked shank, with a minimum three-eighths inch (⅜") diameter flat head and of sufficient length to penetrate three-quarter inch (¾") into solid wood decking or extend at least one-eighth inch (⅛") through sheathing.

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

C. Underlayment Nails: Aluminum or hot-dip galvanized-steel nails with one-inch (1") minimum diameter low-profile metal heads or plastic disc caps.

D. Composite Board Fasteners: Number 10, self-drilling, self-tapping screws with a five-eighths inch (⅝") diameter head. Length shall be sufficient to penetrate the entire assembly and the plywood substrate one-inch (1") minimum and one- and one-quarter inch (1-¼") maximum. Screws shall be fluorocarbon coated in accordance with FMG 4470 such as "Headlocks" as manufactured by OMG or accepted substitute.

PART 3 – EXECUTION

3.1 GENERAL WORKMANSHIP

A. Refer to the Residential Asphalt Roofing Manual and all recommendations of the Asphalt Roofing Manufacturers Association for the installation of roofing and flashing at this project.

B. The prepared existing roof surface must be dry, clean, and smooth with no obtrusions or irregularities.

C. Comply with the manufacturer's written instructions and these Specifications for all renovations and associated work.

D. Handle materials to prevent damage to building components and project site areas.

E. Flashings shall be installed along with roof systems to assure weathertight termination.

F. Do not cut any material with a solvent or dilutant unless specifically instructed by the manufacturer in writing.

3.2 PROTECTION OF ROOF SURFACES

A. Equipment (i.e. staging) and techniques shall be used which prevent damage to the roof as a result of foot or material traffic. The progression of work shall be laid out and presented to the Owner and Engineer to prevent other trades from working on or above completed roofing. Personnel who are working on the roof shall have proper shoes which will not damage the asphalt shingles, and shoe soles shall be made of a material which will aid in preventing falls.

3.3 REMOVAL OF EXISTING SYSTEM

A. All existing sheet metal roofing, flashing, plywood decking, and components included in this Contract shall be removed down to the existing truss structure. The Contractor shall follow the recommendations published in the NRCA Roofing Manual – Steep-slope Roof Systems.

B. Remove only as much roofing and flashings that can be made weather tight the same day. The entire existing sheet metal roof system shall be removed, and the underlayment installed, prior to the installation of the new shingle system.

C. Should damaged new shingles be encountered as a result of trafficking the roof system and where work involves partial replacement or repair of the roof, the Contractor shall remove and replace the damaged units at no additional cost to the owner.

3.4 PREPARATION OF EXISTING ROOF DECK

A. Coordinate deck removal and replacement and structural augmentation with others. Coordinate with Section 05 31 00 - Steel Decking, Section 05 40 00 - Cold Formed Metal Framing, Section 06 10 00 - Rough Carpentry.

B. Ensure that surfaces to receive the roofing are clean, thoroughly dry, and free from loose boards, and projecting ends that might damage the roofing. Provide the necessary equipment to dry the surface prior to application should surface moisture such as dew exist. Do not dry with open flames.

C. Foreign particles shall be cleaned from interlocking areas to ensure proper seating and to prevent water damming. Prior to installation of vents and other projections through roofs shall be properly flashed and secured in position, and projecting nails shall be driven firmly home.

D. Clean deck surfaces using brooms, air spray or other means necessary to provide a clean, smooth, uniform deck.

3.5 VAPOR RETARDER INSTALLATION

A. Apply manufacturer's approved primer to prepared substrate in accordance with the manufacturer's written instructions. The substrate must be clean, dry, and free of dust, grease, or other contaminants.

B. Self-Adhered vapor barrier must be installed on the same day as the primer application. Allow primer to dry completely and install the vapor retarder. Do not install when it is raining, snowing, or on wet/humid surfaces. Install in temperatures thirty-two degrees Fahrenheit (32ºF) and above.

C. Unroll self-adhered vapor barrier on the substrate without adhering for alignment. Overlap each preceding sheet by three inches (3") lengthwise following the reference line and by six inches (6") at each end. Stagger end laps by at least twelve inches (12"). Do not immediately remove the release sheet.

D. Once aligned, peel back a portion of the release sheet and press the membrane onto the substrate for initial adherence. Hold self-adhered vapor barrier tight and peel back the release sheet by pulling diagonally.

E. Use a seventy-five-pound (75 lb.) roller to press the self-adhered vapor barrier down into the substrate including the laps. Finish by aligning the edge of the roller

with the lower end of the side laps and rolling up the membrane. Do not cut the membrane to remove air bubbles trapped under the laps. Squeeze out air bubbles by pushing the roller to the edge of the laps.

3.6 UNDERLAYMENT INSTALLATION

A. General: Comply with underlayment manufacturer's written installation instructions applicable to products and applications indicated unless more stringent requirements apply.

B. Modified Bitumen Underlayment: Install modified bitumen underlayment atop roof decks as described in these specifications, as shown on the Contract Drawings, and recommended by the manufacturer. Modified bitumen underlayment sheets shall have six-inch (6") minimum horizontal laps and six-inch (6") end laps unless otherwise specified so as not to buck water. Modified bitumen sheets shall be installed per manufacturer's instructions and shall be sealed without wrinkles. Roll in all underlayment with rollers to assure one hundred percent (100%) adhesion. In general, modified bitumen underlayment shall be installed as follows:

1. At all eave and rake edge locations modified bitumen sheets shall extend up the roof deck thirty-six inches (36") minimum beyond the interior face of the existing exterior walls.
2. At all ridges, minimum eighteen inches (18”) on both sides of ridge.
3. At valleys, modified bitumen sheet shall extend eighteen inches (18”) minimum up slope on both sides of valley. Form six-inch (6") wide end and side laps per membrane manufacturer's written instructions. Membrane shall be applied starting at the low point and working upwards. All sheets shall be overlapped a minimum of six inches (6”).
4. At all roof penetrations, modified bitumen sheets shall extend thirty-six inches (36") minimum onto the roof deck above and on all sides of the penetration.
5. Modified bitumen underlayment shall not be left permanently exposed to sunlight. Membrane shall be covered with exposed roofing materials as soon as possible. Membrane damaged due to exposure to sunlight shall be patched prior to the application of final roof covering.
6. Membrane shall be applied only in fair weather when air and surface temperatures are above forty degrees Fahrenheit (> 40ºF).

C. Underlayment shall be as required by manufacturer and underlayment shall be installed in a two-ply application across the roof slope lapped to shed water. Underlayment shall be side lapped four inches (4”) minimum and shall have six-inch (6”) minimum end laps. Torn or otherwise damaged underlayment shall be replaced. Underlayment shall be secured with nails through tin disks as required to prevent wind damage and traffic damage during the roof renovations. All damaged sections shall be removed and replaced at no additional cost to the Owner.

D. Provide and install red rosin slip sheets at all locations where sheet metal flashings will rest over modified bitumen underlayment, or as required for separation between dissimilar metals.

3.7 ASPHALT SHINGLE INSTALLATION

A. Install shingles in accordance with manufacturer's instructions and these specifications. Remove manufacturer's cellophane protection strip from bottom surface of shingles to expose wind tab sealants.

B. Apply a starter course of shingles with the five-inch (5") exposure surface cut off. Install bottom edge of starter course overhanging the sheet metal counterflashing four inches (4"). Nail all shingles to deck at top of tabs and one-inch (1") in from each side along a line one- and one-half inches (1-½") above the lower edge install two (2) nails in center (six [6] nails per shingle). Install asphalt roofing cement at each shingle as indicated on the Contract Drawings.

C. Beginning at the starter course, install asphalt shingles. Apply subsequent courses of shingles allowing a five-inch (5") weather exposure of the course below. Stagger butt joints six inches (6") minimum between courses.

D. Remove six inches (6") from the end of the first (1st) shingle in the second (2nd) course to be installed. Remove twelve inches (12") from the end of the first (1st) shingle in the third (3rd) course, eighteen inches (18") from the end of the first (1st) shingle in the fourth (4th) course and so on. The first (1st) shingle in the seventh (7th) course will be a full shingle. Do not "rack" shingles by installing them with the end joints aligned over alternate courses.

E. Nail all shingles at third points and one-inch (1") in from each end along a line five-eighths inch (⅝") above the five-inch (5") exposure. Install two (2) nails at center point for a total of six (6) nails per shingle. Nails shall be below the line of wind seal adhesive. Trim to extend beyond the rake edge by one-quarter inch (¼") and as required to neatly extend existing rake lines.

F. Each course of shingles shall be installed neat and straight with no visible variation between adjoining shingles or cut-out lines. Utilize chalk lines and tape measures.

G. Partial shingles may be used only along roof to wall or edge locations, as required to stagger butt joints and shingle cutouts or as required to properly tie-into adjacent shingle roofing to remain.

H. Apply the plastic cement to each of the shingle tabs.

I. Open Valleys: Coordinate the installation of sheet metal valley flashing with Section 07 62 00 - Sheet Metal Flashing. Cut and fit asphalt shingles at open valleys, trimming upper concealed corners of shingle strips. Widen exposed portion of open valley one-eighth inch (⅛") in twelve inches (12") from highest to lowest point.

J. Ridge and Hip Cap Shingles: Maintain same exposure of cap shingles as roofing shingle exposure. Lap cap shingles at ridges to shed water away from direction of prevailing winds. Fasten with roofing nails of sufficient length to penetrate sheathing.

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

3.7 TAB SNOW GUARD INSTALLATION

A. Sheet metal tab snow guard system shall be installed to match the existing three-tier system, or as recommended by the snow guard manufacturer for the roof deck pitch with respect to the Massachusetts State Building Code snow load requirements.

B. Center the snow tab over the shingle tabs to provide a uniform appearance.

END OF SECTION

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SECTION 07 54 00

THERMOPLASTIC ROOFING AND FLASHING

PART 1 – GENERAL

1.1 IN GENERAL

A. Division 01, General Conditions, and all parts of the Bid and Contract Documents are made part of this Section as if fully repeated herein.

B. Refer to Division 01 for additional information.

1.2 RELATED WORK SPECIFIED ELSEWHERE

A. Section 05 31 00 - Steel Decking
B. Section 06 10 00 - Rough Carpentry
C. Section 07 62 00 - Sheet Metal Flashing
D. Section 22 30 00 - Plumbing
E. Section 26 10 00 - Temporary Mechanical/ Electrical Disconnects
F. Section 26 41 10 - Lightning Protection

1.3 SCOPE OF WORK

A. In general, the Contractor shall supply all labor, materials, equipment, temporary protection, tools, and appliances necessary for the proper completion of the work in this Section, as required in the Specifications, in accordance with good roofing practice, and as required by the materials manufacturer, as amended. The work under this Section generally includes the following:

B. Dispose of all demolished materials, dirt, rubbish, and debris off-site in a legal dumping area. The Contractor shall obtain all permits necessary to transport and dispose of all materials, rubbish and debris affected by the scope of work, including the work of the sub-contractors.

C. Supply all shoring and protection necessary to protect the building areas, building systems, and landscape areas.

D. The Contractor shall provide all scaffolding, lifts, cranes, and equipment necessary to perform the work.

E. Coordinate the temporary disconnection, storage, and reinstallation of existing lightning protection components at locations and as indicated in the Contract Documents. Lightning protection to be re-certified after reinstallation. *Refer to Section 26 41 10 - Lightning Protection for additional information.*

F. Remove and dispose of existing roofing materials including but not limited to, stone ballast, roof membrane, fiberboard, and insulation, down to the existing metal deck to remain at Roof Area A as indicated in the Contract Documents.

G. Remove and dispose of associated roof flashings and components as indicated in the Contract Documents. Coordinate with Section 07 62 00 - Sheet Metal Flashing.

H. Existing top course of the concrete masonry unit backup wall to be grouted as indicated in the Contract Documents.

I. Coordinate the installation of wood blocking, plywood sheathing and sheet metal flashings at roof perimeters, rising walls and roof penetrations as indicated in the Contract Documents and as required to properly terminate the roof membrane and flashings.

J. Install new adhered roofing assembly including, but not limited to Thermoplastic roof membrane, coverboard, insulation, air/vapor barrier and mechanically attached baseboard over the existing to remain metal deck at Roof Area A.

K. Install tapered insulation crickets at locations as indicated in the Contract Documents. Crickets are to be provided at mechanical units, sleepers and as required to shed water towards roof drains. Furnish and install crickets at locations in the Contract Drawings or as required by the manufacturer.

L. Install Roofing Manufacturer approved walkway pads at locations and as indicated in the Contract Documents.

M. Install new access hatch. Extend existing ladder to new access hatch height. Coordinate with Section 07 54 00 - Thermoplastic Roofing and Flashing.

N. Tie perimeter edge flashing into throughwall flashing at brick masonry walls. Coordinate work with Section 07 62 00 - Sheet Metal Flashing.

O. Coordinate the removal and replacement of existing roof drains. Coordinate with Section 22 30 00 - Plumbing for the replacement of roof drain bowls and associated components.

P. Install insulation at hot pipe locations. Coordinate installation with roof work. Coordinate the installation of sheet metal and insulation at hot pipe locations. Coordinate with Section 07 62 00 - Sheet Metal Flashing.

Q. Field flash all pipe penetrations. Install flashings, sealant, water cutoff mastic, and stainless-steel hose clamps. Coordinate vent pipe flashing work with the Plumbing Contractor per Section 22 30 00 - Plumbing for limits and work activities.

R. Coordinate work with the rising of the vent pipes to meet the required minimum height of eighteen inches (18”) and a maximum height of twenty-four inches (24”) with Section 22 30 00 - Plumbing.

S. Clean and restore all areas affected by the work to the satisfaction of the Owner.

1.4 JOB CONDITIONS

A. Coordinate the work in this Section with the work in other sections to ensure a watertight condition and the orderly progress of work.

B. Remove only as much existing roofing as can be replaced and made weathertight each day, including all flashing work.

C. Roofing shall not be applied when ambient temperature is less than forty degrees Fahrenheit (<40ºF) unless approved in writing by the Engineer and membrane manufacturer.

D. All surfaces to receive the new insulation, membrane, or flashings shall be thoroughly dry. Should surface moisture such as dew exist, the Contractor shall provide the necessary equipment to dry the surface prior to application. Do not dry with open flames.

E. All new and temporary construction, including equipment and accessories, shall be secured from wind damage or blow-off.

F. Temporary waterstops shall be installed at the end of each day's work and shall be removed before proceeding with the next day's work. Water stops shall be compatible with all materials and shall not emit dangerous or incompatible fumes.

G. The Contractor is cautioned that oil and penta-based materials and preservatives are not compatible with thermoplastic membranes.

H. The building will be open to normal use during the time of construction. The Contractor shall take all precautions to create as little disruption as possible during the course of the work.

I. All areas of existing deck exposed and repaired each day shall receive the new insulation and roof membranes, including flashing membranes, in the same day's operation. No decking, whether new or existing, shall be left exposed to the weather at the end of each workday.

J. Fully charged, inspected, and approved fire extinguishers shall be on site at all times. No cutting, grinding, or welding of any kind shall proceed without an approved fully charged fire extinguisher.

K. The Contractor shall remove only as much roofing, flashing, and associated components and other exterior waterproofing components as can be completely replaced in a given day's work, including all flashings and associated components as required to maintain the roof in a watertight, secure condition throughout the duration of the project.

L. Underside of roof deck is exposed within the occupied interior space below. Contractor to provide temporary protection as approved by the Owner, coordinate with Section 01 50 00 - Temporary Facilities.

1.5 SUBMITTALS

A. A sample roofing system warranty and letter of confirmation from the roof membrane manufacturer stating that the Contract Documents have been reviewed and that there are no exceptions to the Specifications and Contract Drawings shall be submitted. The roofing system must meet or exceed UL 790, Class A and be in conformance with all local and state building codes and is accepted by the manufacturer for the required warranty. The roofing system must meet the intent of Factory Mutual Class **1-60** in the inner Field, **1-90** in the Field, FM **1-105** at the Perimeters, and FM **1-150** at the Corners.

B. Provide a letter of approval from the insulation manufacturer and membrane manufacturer that the proposed insulation system is compatible with the specified adhesive system for uplift and will achieve the specified warranty.

C. The Contractor shall submit the following procedural items with their submittal package:
1. Methods of removal of materials.
2. Temporary protection procedures.
3. Fire watch procedures (if needed).
4. List of local emergency numbers.
5. Staging/set-up procedures.
6. Schedule of roof renovations.

D. The Contractor shall submit the following samples with their submittal package:
1. Manufacturer’s literature and sample warranties.

E. Provide the manufacturer’s product and installation literature for each item listed in Part 2 and other material anticipated for use on the project, for approval. Shop drawings are required indicating any anticipated changes.

F. The Contractor shall submit shop drawing plans indicating the insulation attachment pattern and locations, as required by the roof manufacturer.

G. The Contractor shall submit shop drawing plans indicating the cricket insulation layout.

H. Provide documentation indicating that the Contractor is a Certified Installer of the materials to be used.

I. Submit standard color samples for thermoplastic clad metal flashings and roof membrane colors.

J. Shop Drawings: Show fabrication and installation details for snow guard and roof hatch accessories.

1.6 WARRANTIES AND GUARANTEE

A. Roofing Contractor's Guarantee: Upon completion of the work, and prior to final payment, the Contractor shall submit a Guarantee of his work to be free from defect in materials and workmanship. This Guarantee shall be for a period of two years (2 yrs.) and shall be signed by a Principal of the Contractor's firm and sealed if a corporation. In the event any work related to the roofing, flashing, or metal work is found to be defective within two years of substantial completion, the roofing contractor shall remove and replace such at no additional cost to the Owner. The roofing Contractor's warranty obligation shall run directly to the building Owner, and a copy of the roofing signed warranty shall be sent to the roofing system's manufacturer.
   1. The duration of the Roofing Contractor's two-year (2-yr.) warranty shall run concurrent with the roofing system's manufacturer's twenty-year (20-yr.) warranty.

B. Roofing Systems Manufacturer's Warranty: The roofing manufacturer shall guarantee roof areas to be in a watertight condition and free from blistering, seam separation and the delamination of the roofing system components, for a period of twenty years (20 yrs.), from the date of final acceptance of the roofing system. The warranty shall be a twenty-year (20-yr.) no dollar limit, non-prorated total system labor and material warranty, for wind speeds up to seventy-two miles per hour (72 mph). The total system warranty shall include all roofing materials, related components and accessories including, but not limited to the substrate board, vapor retarder, insulation board, coverboard, roofing membrane, membrane flashings, fasteners, adhesives and termination metals and roof drain assemblies. The manufacturer shall repair leaks and defects in materials and workmanship as promptly after observation as weather and site conditions permit.

C. Roof Hatch Manufacturer's standard five (5) year warranty. Materials shall be free of defects in material and workmanship for a period of five years from the date of purchase. Should a part fail to function in normal use within this period, manufacturer shall furnish a new part at no charge.

PART 2 - PRODUCTS

2.1 THERMOPLASTIC ROOFING AND FLASHING MEMBRANES

A. Roofing membrane for installation of a fully adhered roof assembly over new insulation areas shall be an Elvaloy based Thermoplastic product such as the Seaman Corporation's Fibertite or Tremco 45 mil KEE sheet membrane meeting ASTM D6745, or a Polyvinyl Chloride (PVC) based Thermoplastic product such as the 60 mil Sarnafil, Carlisle or approved equal. Submission of substitute membranes that meet the requirements will be reviewed and approved for this project provided

they meet the minimum testing values described in this section. Color to be selected by the Owner, using standard manufacturer colors.

B. The polyvinyl chloride (PVC) shall have the following physical properties:

Minimum Thickness	ASTM D638	0.060
Tensile Strength	ASTM D638	1500 psi
Elongation at Break (machine x transverse)	ASTM D638	250% x 230%
Seam Strength	ASTM D638	75% of tensile strength
Tearing Resistance	ASTM D1004	10 lbf
Dynamic Puncture Resistance	D5635 D5602	7.3 ft-lb 33 lbf

C. The Elvaloy shall have the following properties:

Minimum Thickness	ASTM D751	0.045
Color	N/A	White/gray
Tensile Strength	ASTM D882	8500 psi
Breaking Strength	ASTM D751-Grab	375 x 350 lbs.
Seam Strength	ASTM D751	100% of fabric strength
Tear Strength	ASTM D751	100 lbs.
Dynamic Puncture Resistance	D5635	20 oules

D. Flashing membrane for installation of fully adhered flashings shall be a minimum 0.060" thick thermoplastic or as manufactured by the roofing membrane manufacturer. Color to match the field of roof membrane.

E. All materials and accessories used to install the roofing and flashing membrane systems shall be as manufactured or supplied by the membrane materials manufacturer. These materials include, but are not limited to, the following:
1. Bonding adhesive (as recommended by the roofing manufacturer).
2. Thermoplastic clad metal flashings.
3. Prefabricated flashing components, including but not limited to pipe flashing.
4. Membrane termination strips, peel stops, bars, fasteners, and plates.
5. Protection pad for areas indicated on the Contract Drawings shall be as manufactured by the membrane manufacturer.
    a. Flexible Walkways: Factory-formed, nonporous, heavy-duty, thermoplastic, heat-weldable, slip-resisting, surface-textured walkway pads or rolls approximately three-sixteenths inch (3/16") thick, and acceptable to membrane roofing system manufacturer.
6. Low VOC on all adhesives and sealants.

F. All membrane manufacturers' required details shall be considered a part of this project and incorporated into the project.

2.2 COVERBOARD

A. Cover board insulation shall be one-half inch (½") minimum thick, glass mat faced, moisture resistant gypsum board, or high density isocyanurate insulation board as required by the roofing manufacturer. The boards shall be a maximum of four feet by eight feet (4' x 8') in size and approved in writing by the membrane manufacturer. A copy of the written acceptance shall be forwarded to the Engineer. Cover board insulation shall conform to ASTM C1289 Type II specifications. Compressive strength for high density coverboard shall be greater than one hundred pounds per square inch (100 psi) in accordance with ASTM D2126. Water absorption shall be three-percent (3.0%) or less in accordance with ASTM C209.

2.3 ROOF INSULATION

A. All roof insulations proposed for this project shall be approved in writing by the membrane manufacturer for use with their membrane and as required to achieve the required roofing warranty. Copies of the written acceptance shall be forwarded to the Engineer.

B. Tapered and flat stock isocyanurate insulation shall be skinned with factory-applied fiberglass bituminous felt as manufactured by Celotex, Johns Manville, Firestone, or as supplied by the membrane manufacturer as required to meet membrane manufacturer's requirements and warranty. The isocyanurate insulation board shall conform to ASTM Specification C 1289, Type II, Class 1, Grade 2 (20 psi minimum).

1. The isocyanurate insulation shall have an area weighted aged R-Value of 30 at as required to meet the Long-Term Thermal Resistance (LTTR) value in accordance with ASTM C518 and the Building Code of the Town of Hooksett N.H., and IBC 2018 Edition. Note that tapered insulation more than one-inch (1") above the thinnest spot is not allowed to be factored into the average insulation value. (Not including drain sump areas).
2. The isocyanurate insulation board size shall be a minimum of two feet by two feet (2' x 2') if close to roof edge, or four feet by four feet (4' x 8') if located in field of roof square and of uniform dimension.
3. Isocyanurate insulation shall be approved in writing by the insulation and membrane manufacturer that the methods of attachment are covered under the membrane manufacturer's labor and material warranty. Copies of the written acceptance shall be forwarded to the Engineer.

C. Tapered edge strips shall consist of isocyanurate insulation. Isocyanurate insulation tapered edge strips shall meet ASTM C1289, Type II, Class 1, Grade 2 specifications.

D. Roof crickets shall consist of one-quarter inch (¼") per twelve-inch (12") slope.

2.4 COLD ADHESIVE FOR COVERBOARD AND INSULATION BOARD SECUREMENT

A. Adhesive to adhere the coverboard and insulation shall be a two-component, cold-process, asbestos free, low-rise polyurethane foam adhesive conforming to ASTM D276, D2556, D1875, D429, D816, D1876, D412. Adhesive shall meet the required FM rating and shall be approved in writing by the membrane manufacturer and included as part of the warranty coverage. Adhesive shall be Insta-Stik Professional Roofing Adhesive as manufactured by Insta-Foam Products, Inc., Olybond by OMG or an approved equal as recommended by the roofing manufacturer to achieve a full system warranty for the new roof system.

2.5 AIR/VAPOR RETARDER

A. Air/ vapor retarder shall be self-adhered, thirty-two millimeters (32 mil [0.8 mm]). Product shall be as recommended by the roof system manufacturer and approved in writing for use to meet the specified warranty.

2.6 BASEBOARD

A. Baseboard shall be one-half inch (½") minimum Securock Gypsum-Fiber Roof Board, manufactured by United States Gypsum Company, or as otherwise required by the membrane manufacturer to meet the intent of FM Global' s assembly requirement. The boards shall be maximum of four feet by eight feet (4' x 8') in size, unless otherwise required by the membrane manufacturer. The board shall be approved in writing by the membrane manufacturer. A copy of the written acceptance shall be forwarded to the Engineer.

2.7 ANCHORS, CLIPS, AND FASTENERS

In general, fasteners, straps, and other hardware shall be copper, brass, stainless steel, galvanized steel, or fluorocarbon coated steel. Galvanizing shall be hot dip in accordance with ASTM A153 specifications. Electro-galvanized items shall not be used.

A. All accessories, including, but not limited to nails, screws, clips, fastening strips, etc. shall be completely compatible with the material being fastened to prevent galvanic reaction and premature deterioration. Straps and other hardware shall be copper, brass, stainless steel, or hot-dip galvanized steel. Galvanizing shall be per ASTM A 153-82 specifications.

B. Fasteners for securing membrane sheeting shall be as approved by the manufacturer for the substrate and depth and shall meet the intent of Factory Mutual uplift rating requirements.

C. Baseboard fasteners over metal deck: #14 self-drilling, self-tapping, fluorocarbon coated screws of sufficient length to penetrate decking one-inch (1") minimum, one-and one-quarter inch (1¼") maximum.

2.8 SEALANTS AND ACCESSORIES

A. Sealant for exposed locations, vent pipes, etc., shall be a one-part polyurethane conforming to ASTM C920-87, Type S, Grade NS, Class 25, Uses NT, M, A, and O such as manufactured by Tremco, BASF-Sonneborn, Sika Corp., or approved equal.

B. Sealant for application at hot pipes shall be high temperature one (1) part silicone sealant, such as TremPro 644 HT manufactured by Tremco or approved equal.

C. Color(s) shall be selected by the Owner from the approved manufacturer's color chart. Colors shall be the manufacturer's available premium colors.

D. Primer shall be non-staining type as manufactured or recommended by the sealant manufacturer for each substrate.

E. Substrate cleaner shall be non-corrosive and non-staining as recommended by the sealant manufacturer. Cleaner shall be totally compatible with the sealant for each substrate.

F. Bond breaker tape shall be pressure-sensitive tape as recommended by the sealant manufacturer.

G. Masking material shall be commercially available masking tape of appropriate width or other material recommended by the sealant manufacturer. Self-adhesive masking materials shall be of low tack and completely strippable, leaving no adhesive residue behind when removed.

2.9 ROOF ACCESS HATCH

A. Roof hatches shall have insulated double-wall lids and frames with integral deck mounting flange and lid frame counterflashing. Curbs and lids shall have fully welded corners. Units shall be provided with continuous weathertight perimeter gasketing. Curbs and lids shall be thermally broken. Hatch shall be sized to match the existing, as manufactured by Bilco, or as manufactured by SafePro or A-Mezz Industrial Structures.

2.10 GROUT

A. General: Do not add admixtures including coloring pigments, air-entraining agents, accelerators, retarders, water repellent agents, anti-freeze compounds or other admixtures, unless otherwise indicated.
   1. Do not use calcium chloride in mortar or grout.

B. Mixing: Combine and thoroughly mix cementitious materials, water, and aggregates in a mechanical batch mixer; comply with reference ASTM standard for mixing time and water content.

C. Grout for Concrete Masonry Unit: Comply with ASTM C476 for grout for use in construction for reinforced and non-reinforced unit masonry. Grout to have a minimum of twenty-eight (28) day compressive strength of seven thousand pounds per square inch (7000 psi). Grout shall be non-shrink, non-metallic fast setting grout such as SikaGrout 428 FS by Sika Corporation, or Engineer approved equal.

D. Grout barriers for vertical cores shall consist of fine mesh wire; fiberglass, or expanded metal.

PART 3 - EXECUTION

3.1 GENERAL WORKMANSHIP

A. Do not deliver to site or install any material or system that has not been approved. Materials installed without approval may be required to be removed.

B. Maintain temporary protection of the new and existing roof system. The roof system will be cleaned to the satisfaction of the Owner and Engineer prior to final payment. All areas of stained membrane will be cut out and replaced by the Contractor at no additional cost to the Owner. Multiple patches in close proximity will not be acceptable and will require one (1) large patch.

C. The prepared roof deck surface must be dry, clean, and smooth. All loose, poorly adhered, or deteriorated materials shall be removed prior to installing the new insulation. Personnel shall be free of bitumen contaminants when installing the new roof membrane. Provide dryers, if necessary, to dry deck surfaces prior to installing new work. Open flame devices shall not be used.

D. Comply with the manufacturer's written instructions and these Specifications for all renovations and associated work.

E. Flashings shall be installed along with the membrane to assure weathertight termination.

F. Partial or unmarked cans or rolls of materials cannot be used.

G. Handle materials to prevent damage to building components and project site areas.

H. Do not cut any material with a solvent or dilatant unless approved by the Engineer, in writing, prior to use.

I. Keep covers tightly sealed on all canned and evaporative products to prevent premature curing.

J. Do not store rolls of membrane or flashings on the roof without the written consent of the Designer and Owner’s representative.

K. The Contractor is cautioned to investigate all existing conditions and materials of construction.

L. Refer to the publication, "Copper and Common Sense" by Revere Copper and Brass and all recommendations of the Sheet Metal and Air Conditioning Contractors National Association concerning methods and materials to be used in the fabrication and construction of sheet metal flashings.

3.2 REMOVAL OF EXISTING SYSTEM

A. Remove existing roofing systems, flashings, and associated components in their entirety down to the existing asphaltic coating. Cut existing membrane and insulation along straight lines. Remove roofing system and insulation without damaging the roof deck.

B. Sequence work to minimize building exposure between demolition and new roof materials installation. Install temporary roofing and flashing as necessary to maintain a watertight condition throughout the course of the work. Remove temporary work prior to installation of permanent roof system materials. Only remove as much roofing and flashings as can be made weathertight the same day with the new work. Arrange each day's termination point to prevent interruption of roof top drainage.

C. Coordinate the removal of existing drain bowls, strainers, clamping rings, and drain bowls from the existing drain assemblies; Coordinate with Section 22 30 00 - Plumbing.

D. Temporarily support exposed duct work.

E. Coordinate removal, disconnection, storage, and reinstallation of existing rooftop mechanical equipment in preparation for new roof system. Removals, lengthening/shortening, and reinstallations of mechanical equipment, including mechanical/electrical connections, are to be performed by licensed tradesmen. Costs for mechanical/electrical work shall be included in the Contractor's bid price. Coordinate with Section 26 10 00 - Temporary Mechanical Disconnects for additional information.

F. Remove existing mechanical equipment support curbs in preparation for installing new curbs at unit locations as indicated.

3.3 DECK PREPARATION

A. Allow moist deck sections to dry prior to application of roof insulation. Open flames are strictly prohibited from the roof areas.

B. Clean deck surfaces using brooms, air spray, or other means necessary to provide a clean, smooth, uniform deck.

C. Inspect roof decks for deteriorated areas not suitable for reuse.

3.4 BASEBOARD INSTALLATION METAL DECKS

A. Install baseboard with long joints in continuous, straight lines, perpendicular to roof slopes, with end joints staggered between rows. Tightly butt baseboards together.

B. Mechanically fasten the layers of base board and secure to roof deck using mechanical fasteners specifically designed and sized for fastening specified board-type roof insulation to deck type. Fasten insulation to resist uplift pressures to meet the intent of FM Global requirements to achieve the required wind uplift results.

D. Review underside of roof deck for the potential of existing conduits.

3.5 INSTALLATION OF SELF-ADHERED AIR/VAPOR RETARDER

A. Apply manufacturer's approved primer to prepared substrate in accordance with the manufacturer's written instructions. The substrate must be clean, dry, and free of dust, grease, or other contaminants.

B. Self-Adhered vapor barrier must be installed on the same day as the primer application. Allow primer to dry completely and install the vapor retarder. Do not install when it is raining, snowing, or on wet/humid surfaces. Install in temperatures thirty-two degrees Fahrenheit (32ºF) and above.

C. Unroll self-adhered vapor barrier on the substrate without adhering for alignment. Overlap each preceding sheet by three inches (3") lengthwise following the reference line and by six inches (6") at each end. Stagger end laps by at least twelve inches (12"). Do not immediately remove the release sheet.

D. Once aligned, peel back a portion of the release sheet and press the membrane onto the substrate for initial adherence. Hold self-adhered vapor barrier tight and peel back the release sheet by pulling diagonally.

E. Use a seventy-five-pound (75 lb.) roller to press the self-adhered vapor barrier down into the substrate including the laps. Finish by aligning the edge of the roller with the lower end of the side laps and rolling up the membrane. Do not cut the membrane to remove air bubbles trapped under the laps. Squeeze out air bubbles by pushing the roller to the edge of the laps.

3.6 INSTALLATION OF INSULATION SYSTEM

A. The multi-layer insulation system shall be installed on properly prepared, clean, dry surfaces. Insulation shall be installed in a minimum of two (2) lifts as to stagger all joints vertically and horizontally.

B. Allow moist vapor barrier sections to dry prior to application of roof insulation. Open flames are strictly prohibited from the roof areas. Ensure that vapor barrier surface and joints are clean of all debris and roofing materials.

C. Insulation boards shall be free of defects including but not limited to, broken corners, improperly adhered facers, excessive moisture, dimensional irregularities, and the like. Defective insulation boards shall be marked and immediately removed from the site.

D. The roof deck shall receive the self-adhered vapor retarder system prior to the installation of the insulation system.

E. Install the insulation boards in adhesive atop the properly installed vapor barrier. Stagger all end joints to the middle of the long dimension of adjacent insulation boards and stagger insulation layer to layer.
   1. Ensure that boards are totally adhered prior to application of roof membrane.
      a. Adhesive bead spacing shall conform to FM Global requirements.

F. Install one (1) or more layers of insulation under area of roofing to achieve required thickness.

G. The minimum dimension of cut insulation boards shall be twelve inches (12”) with a minimum surface area of two square feet (2 SQFT). Maximum size of insulation board is four feet by eight feet (4’ x 8’). Only full-sized insulation boards shall be used at roof perimeters and corners.

H. All insulation boards shall be installed tightly butted to adjacent insulation or wood blocking. If gaps greater than one-eighth inch (⅛”) exist between the boards, the board shall be cut out and replaced.

I. Insulation boards set in cold-process adhesive shall immediately be "walked-in" to assure full embedment. Poorly adhered boards shall be removed and replaced at no additional cost to the Owner.

J. Provide insulation crickets at high points and between drains as shown on contract drawings. To prevent ponding water and provide positive slope toward the drainage system. Set crickets in adhesive prior to setting cover boards, or as otherwise required by the roof membrane manufacturer to maintain the specified warranty.

K. Utilize tapered edge strips and fillers at drain locations. Step taper the surrounding insulation system down to the drain bowl location. Provide maximum sumps in conjunction with the tapered insulation system. Tie-in locations shall have a minimum sump of four feet by four feet (4’ x 4’).

3.7 COVERBOARD INSTALLATION

A. Install coverboard, in cold adhesive, applied in strict accordance with the adhesive manufacturer’s written instructions to achieve the required warranty.

B. Install the coverboard and immediately “walk” the system into place to spread the adhesive for maximum contact. Stagger all end joints to the middle of the long

dimension of adjacent boards, twenty-four inches (24") minimum. Continue to "walk" the coverboard every five to seven minutes (5-7 mins.) until firm adhesion is achieved. Ballast the boards to prevent cupping. Redistribute ballast to ensure full bonding of the system.

C. Ensure that the boards are totally adhered prior to application of roof membrane.
   1. Adhesive bead spacing shall conform to the up-lift requirement of FM Global.

3.8 THERMOPLASTIC MEMBRANE INSTALLATION

A. Refer to Section 06 10 00 - ROUGH CARPENTRY concerning the installation of the wood blocking, nailers and similar accessory woodwork. Confirm the proper installation of the wood blocking, nailers and similar accessory woodwork. Be sure all loose or deteriorated bituminous substances are removed with the original system. Clean any items designated to remain of all remaining bitumen or cover with acceptable buffer material.

B. Inspect surface of insulation prior to installation of roof membrane. Coverboard surface shall be clean and smooth with no excessive surface roughness. Contaminated surfaces or unsound surfaces such as broken or delaminated boards or insulation voids shall be removed and disposed of. Coverboards shall be swept and blown clean of all dust prior to applying bonding adhesives.

C. Adhere thermoplastic roof membrane system in accordance with the recommendations and requirements of the membrane materials manufacturer, as amended in these Specifications. Follow manufacturer requirements concerning application rates for cleaners, solvents, adhesives and similar materials. The application rates for these items given in these Specifications are to be considered nominal as the actual rates will vary manufacturer to manufacturer.

D. Do not apply any bonding adhesive to lap areas that are to be welded to flashings or adjacent sheets. Apply all sheets in the same manner, lapping all sheets as required by welding techniques.

E. Apply bonding adhesive to the insulation and membrane at the manufacturer's recommended application rates. Bonding adhesive shall be applied in strict accordance with the environmental limitations required by the manufacturer.

F. Press the bonded sheet firmly in place and roll in with. Fold back the remaining unbonded half of the sheet and repeat the bonding procedure.

G. The Contractor shall flash all roof drains in conjunction with the new roof system. Extend membrane one-half inch (½") minimum inside clamping ring with a continuous full bead of water cut-off mastic under the membrane. Ensure installation of roofing membrane will not allow for the penetration of mechanical fasteners within the central sump location.

3.9 HOT AIR WELDING OF MEMBRANE OVERLAPS

A. All seams to be hot air welded. Seam overlaps to be a minimum of three inches (3") wide, or as required by the membrane manufacturer. Welding equipment shall be provided or approved by the membrane manufacturer. All workers intending to use the equipment shall have completed a training course by the manufacturer's representative prior to initiating roof replacement operations. Certification of trained welders is required. Manufacturer to supply confirmation of welder training. All field seams exceeding ten feet (10') in length shall be welded utilizing an automatic welder. All seams to be clean and dry. Remove foreign materials from seams (dirt, oils, etc.) with MEK, Acetone, or authorized alternative. Use clean white cotton cloth and allow five minutes for solvents to dissipate prior to initiating welding.

B. All seams to be welded in accordance with manufacturer's instruction. The job foreman or supervisor shall inspect all completed seams on a daily basis. Inspection shall include, but not limited to, the probing of all field welded seams with a blunted, pointed instrument to inspect quality of the application and reduce the likelihood that operator or equipment deficiencies remain. One-inch (1") wide cross section samples of welded seams shall be taken at least four times daily. Correct welds display failure from shearing of membrane prior to weld separation. Each patch shall be patched by the Contractor at no extra charge to Owner. Each weld will be forwarded to the Owner's representative with approximate roof location and date labeled on each.

C. Hand welded seams shall be completed in two (2) stages. Warm up equipment for at least one minute prior to welding.
   1. Weld the back edge of the lap with a thin, continuous weld to prevent loss of hot air during the final weld.
   2. Insert the hot air nozzle into the lap, keeping the welding equipment at a forty-five-degree (45º) angle to the side lap. Once the material starts to flow, apply the hand roller at a right angle to the welding gun, and press lightly. For straight laps, use the one- and one-half inch (1½") wide nozzle. Correct weld speed will complete approximately twenty inches per minute (20"/min.). The hot air weld equipment shall have temperature adjustments to provide this proper speed and weld.

D. The manufacturer's automatic lap welding machine will be used for seams in excess of ten feet (10'). Follow the manufacturer's strict requirements, instructions, and local codes for electric supply, grounding, and overcurrent protection. The automatic weld machines power requirement is two hundred eighteen to two hundred thirty volts (218V-230V) at 30 amps. The availability of this voltage shall be verified at the work site on the roof before using the automatic welding machine. The use of portable generators is required at no additional cost to the Owner. Prior to utilizing the automatic weld machine on the roof, detailed instructions and operating procedure shall be obtained from the manufacturer's technical representatives.

E. Secure the membrane at all perimeters, and penetrations once all welding of adjacent sheet seams is completed. Extend membrane over and beyond all wood blocking as detailed. The membrane at all perimeter and flashing locations shall be anchored at

six inches (6") on-center maximum, with the specified fasteners through continuous bars or specified fasteners, should the installation of edge sheet metal not be installed on the same working day.

3.10 ADHERED MEMBRANE INSTALLATION

It is the intent of this Specification Section to provide the Owner with a new, adhered membrane, one hundred percent (100%) bonded to the insulation, of sufficient bond strength to resist the uplift pressures indicated for the field, perimeters, and corners respectively, in conformance with all local and state building codes, and is accepted by the manufacturer for the required warranty uplift pressures as defined in FM Data Sheet 1-28, current edition.

A. Refer to Section 06 10 00 - Rough Carpentry, regarding the installation of wood blocking and similar accessory woodwork. Be sure all loose or deteriorated bituminous substances are removed with the original system. Clean any items designated to remain of all remaining bitumen.

B. Inspect surface of insulation prior to installation of roof membrane. Insulation surface shall be clean and smooth with no excessive surface roughness. Contaminated surfaces or unsound surfaces such as broken or delaminated boards or insulation voids shall be removed and disposed. Cover boards shall be swept and blown clean of all dust prior to applying bonding adhesives.

C. Install adhered thermoplastic roofing on all roof areas designated to receive such. Install membrane system in accordance with the recommendations and requirements of the membrane material's manufacturer, as amended in these Specifications, or whichever is more restrictive. Follow manufacturer requirements concerning application rates for cleaners, solvents, adhesives and similar materials. The application rates for these items given in these Specifications are to be considered nominal and the actual rates will vary from manufacturer to manufacturer.

D. Position roofing membrane without stretching over the insulation. Lay sheets in a shingle fashion. Allow the membrane to relax for minimum one-half hour (½ hr.) before bonding. Fold the sheet back onto itself so that one-half (½) of the underside of the sheet is exposed. It is essential that the fold in the sheet be smooth, with no wrinkles or buckles, because these could cause wrinkles in the sheet during installation. Apply the bonding adhesive onto the substrate and allow the adhesive to cure or rise and apply the bonding adhesive again to both the sheet and the substrate per the manufacturer's requirements. Roll the membrane with a thirty-inch (30") wide, one hundred fifty pound (150 lb.) weighted segmented steel roller to set the membrane into the adhesive, being careful to avoid wrinkles. Brush down the bonded half of the sheet with a push broom to achieve maximum contact. Fold back the unbonded half (½) of the sheet and repeat the bonding procedure. No wrinkles shall be allowed in the completed application. Wrinkled sheets shall immediately be removed and replaced and not patched. Do not apply bonding adhesive in areas that are to be spliced to flashings or adjacent sheets. At end

laps, membrane shall be butted together and overlay with six-inch (6") wide cured cover strip.

E. Splice adjacent sheets in accordance with the manufacturer's written instructions using the manufacturer's double sided seam tapes (minimum six-inch [6"] tape). Totally clean areas to be spliced of all talc, dirt and other foreign substances using clean rags with manufacturer's splice wash cleaner or other manufacturer's recommended cleaner. Clean all seam areas at least twice in two (2) separate applications with new rags and cleaner each time. Change the rags and cleaner frequently. It is imperative that these seam areas be totally clean. Install manufacturer's in-seam sealant to cleaned seams as recommended by the membrane manufacturer. Apply seam tape for the full width (minimum six inches [6"]) of the lap splice. Totally clean the completed splice for a distance of one-inch (1") on either side of the edge of the top sheet using clean rags and cleaner. Apply a continuous bead of lap sealant to the edge of the spliced sheet and feather out bead using preformed trowel. Lap sealant must be set daily as the work progresses.

F. Nail off membrane, after relaxing, adhering and splicing, along all perimeters and around all flashing units. Membrane shall be nailed off with the hook strip flange or termination bar along perimeters as detailed. The membrane at all flashing locations shall be nailed off six inches (6") on-center maximum with the specified roofing nails through tin discs. In areas where no metal flanges are installed (such as at roof to wall details), the nailing shall be reduced to four inches (4") on-center maximum. All nailing shall be held back two inches (2") from the edge of the membrane. Vertical nailers, when used, shall be fastened eight inches (8") on-center. Extend membrane behind vertical nailers and secure through it.

G. Temporary waterstops shall be constructed to provide a one hundred percent (100%) watertight seal utilizing a raised temporary waterstop at the end of each day's work. Sweep back and totally clean the gravel and flood coat from the existing roof and set a two-inch by four-inch (2" x 4") stud atop the prepared area in sealant or materials recommended by the membrane manufacturer. Where stopping work on the new system, maintain the stagger of the insulation joints by installing partial fillers. Carry the new membrane up and over two-inch by four-inch (2" x 4") waterstop. Seal the edge of the new membrane onto the old membrane in a continuous heavy application of sealant or materials recommended by the membrane manufacturer. Weight the membrane down in the sealant with a two-inch by ten-inch (2" x 10") wood member with ballast on top. Ballast should be approximately twenty pounds per linear foot (20 lbs./l.f.). When work is resumed, remove all sealant, membrane, insulation fillers, etc. from the area of the waterstop. Do not reuse any of the materials in the new work. If inclement weather occurs while a temporary waterstop is in place, the Contractor shall provide the labor necessary to monitor the situation in order to maintain a watertight condition.

3.11 WATERSTOPS

A. All flashings shall be installed concurrently with the roof membrane in order to achieve a watertight condition as the work progresses. When a situation arises where a break in the day's work occurs in the central area of a roof, a temporary waterstop shall be constructed to provide a one hundred percent (100%) watertight seal, utilizing a raised temporary waterstop. Sweep back and totally clean the existing roof and set a two-inch by four-inch (2" x 4") stud atop the prepared area in roof cement as recommended by the membrane manufacturer. Where stopping work on the new system, maintain the stagger of the insulation joints by installing partial fillers.

B. Carry the new membrane up and over two-inch by four-inch (2" x 4") waterstop. Seal the edge of the membrane in a continuous heavy application of roof cement. Weight the membrane down in the sealant with a two-inch by ten-inch (2” x 10”) wood member with ballast on top. Ballast should be approximately twenty pounds per linear foot (20 lbs./l.f.)**.** When restarting work, remove all sealant, membrane, insulation fillers, etc. from the work area. Do not reuse any of the material in the new work. Cut off contaminated PVC membrane and dispose of immediately. If inclement weather occurs while a temporary waterstop is in place, the Contractor shall provide the labor necessary to monitor the situation to maintain a watertight condition. Do not impede drainage when installing waterstops.

3.12 MEMBRANE FLASHING

A. All flashings shall be installed concurrently with the roof membrane in order to maintain a watertight condition as the job progresses. No temporary membrane flashings shall be allowed without the prior written approval of the Owner. Approval, if given, will only be for specific locations on specific dates.

B. Provide quality control check for substrates to be free from contaminates prior to the installation of the new flashing membranes. Install the manufacturer’s buffer or protection sheets as required.

C. Follow the membrane manufacturer’s requirements and recommendations and these specifications. Do not proceed with work until all shop drawings and submittals are reviewed.

D. Flashing shall be fully adhered to compatible, smooth, dry, and solvent resistant surfaces. Reinforced/flashing sheets shall be used for flashing purposes as much as practical. Prefabricated components are to be used where practical at vent pipes, inside/outside corners, seams in sheet metal flashings, or at any other location where forming of membrane flashings is required.

E. No adhesive shall be applied in seam areas that are to be hot air welded. Flashing shall use longest possible lengths of flashing membrane over cap vertical seams and field membrane as required by manufacturer for hot air welding.

F. Install membrane securement disks and fasteners into structural deck(s) or vertical walls at the base of penetrations. Securement disks and fasteners may be required by the membrane manufacturer at the base of tapered edge strips, ridges, or other transitions. Contractor to comply with manufacturer's requirements if more stringent than these specifications.

G. Apply bonding adhesive to surface to be flashed and allow adhesive to dry to the touch. Do not allow adhesive to cure for more than one hour (1 hr.) prior to applying flashing membrane. Position flashing sheet and apply bonding adhesive to flashing membrane making sure bonding adhesive is not applied to overlap area of flashing and using longest possible lengths of flashing membrane. Apply bonding adhesive using rollers or brushes one hundred percent (100%) to all surfaces at a smooth, uniform rate, free of holidays, light spots, globs, or similar irregularities, all at the manufacturer's application rate. Allow membrane flashing surface of adhesive to dry to a tacky condition, such that adhesive strings occur when touched with a dry finger. After bonding adhesive becomes tacky on membrane flashing surfaces, roll flashing onto surface carefully to prevent wrinkles, fishmouth, bridging, or similar flaws. Unless otherwise detailed, top of membrane flashings must be minimum eight inches (8") above the surface of the roof membrane, three-inch (3") minimum above the bottom of metal counterflashing, and minimum three inches (3") past the limits of nail heads or other fasteners. Membrane flashings shall extend the full width of horizontal metal flashing flanges (i.e., gravel stops). After setting, roll membrane into place using a padded roller and heavy hand pressure. Roll one hundred percent (100%) of the surface for total adhesion with no wrinkles or bridging. After rolling, hot air weld vertical, side, and field membrane overlaps, laps of flashing sheet using minimum four-inch (4") wide overlaps. After hot air welding of the flashing sheet and overlaps, check welds with blunted instrument and re-weld deficiencies.

H. Inside and outside corners and other changes in direction of flashing sheets shall not be butt-type splices at the point of direction change. Flashing sheets shall be jointed past the change in direction. Prefabricated corners to be utilized where suitable. Outside vertical corners, such as around curb units, shall extend a minimum of two inches (2") around the corner for each flashing sheet. Adhere flashing sheets in place with light pressure. Field fabricated interior/exterior corners and miters shall be cut, and hot air welded in place. Flashings shall be installed in accordance with the approved shop drawings and manufacturer's instruction, unless amended. Flashings shall be turned up and over the tops of curbs as much as practical.

I. Pipe flashings can utilize prefabricated or field fabricated components. Prior to installation of flashings, Contractor is to remove all bituminous contaminants or apply an approved separation layer to pipe as a barrier against membrane contamination. Vent pipe flashing to utilize membrane cap which turns into vent pipe.

1. Where approved by the Engineer, in lieu of membrane cap termination, provide a continuous bead of sealant between membrane and pipe and install a stainless-steel hose clamp at top of flashing sheet. Install a buffer strip of membrane behind hose clamp to protect flashings.

J. Membrane flashing terminating on a vertical surface shall be mechanically fastened to the substrate.

3.13 WALKWAY PROTECTION PAD

A. Install manufacturer's walkway pad in locations as directed by the Owner, or as noted on the Contract Drawings.

B. Weld and/or adhere full perimeter of the walkway pad to the membrane roofing in accordance with the membrane manufacturer's printed instructions. Walkway pads shall be continuous except for gaps between sections to allow for drainage and inspection of seams, and to the satisfaction of the Owner.

3.14 SEALANTS – GENERAL

A. Do not leave any partially completed sections exposed to the elements overnight.

B. Comply with the manufacturer's written instructions and these Specifications pertaining to sealant installation.

C. Do not cut any material with a solvent or dilutant unless approved by the Engineer in writing.

D. Keep covers tightly sealed on all evaporative products to prevent premature curing.

3.15 HATCH, FAN AND VENT CURB INSTALLATION

A. At roof hatch and fan and vent curbs, provide continuous wood blocking to match insulation height.

B. Coordinate the installation of new sheet metal enclosure around the interior portion of the wood blocking and roof membrane to conceal the limits of the new construction with that of the interior finishes. Refer to Section 07 62 00 - Sheet Metal Flashing.

C. Set curb flange on wood blocking and secure with specified fasteners, minimum two (2) per side and maximum twenty-four inches (24") on-center.

D. Where new fan and vent curbs are specified for reuse, shim curb level with continuous wood blocking attached to the substrate as previously specified.

3.16 CLEAN-UP

A. All floor and adjacent areas, both interior and exterior, damaged or stained by the installation of the roofing work shall be repaired and cleaned of all dust, debris, and any other materials to the Owner's satisfaction.

B. The Contractor shall not demobilize the site until the completed work is toured by the Owner and Engineer. Any unsatisfactory items observed will be reported in “punch-list” form. These items shall be corrected immediately by the Contractor prior to demobilization from the job site. Final payment will not be made until all punch list items are complete and guarantees have been received.

C. All scaffolding, barriers, temporary facilities and the like shall be removed upon completion of the work. Areas damaged as a result of the Contractors equipment shall be restored to their original condition, all to the satisfaction of the Owner.

D. Refer to the Close-Out Procedures described in Division One for additional information.

END OF SECTION

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SECTION 07 62 00

SHEET METAL FLASHING

PART 1 - GENERAL

1.1 GENERAL PROVISIONS

A. Division 01, General Conditions and all parts of the Bid and Contract Documents are made part of this Section as if fully repeated herein.

B. Refer to Division 01 for additional information.

1.2 RELATED WORK SPECIFIED ELSEWHERE

A. Section 06 10 00 - Rough Carpentry
B. Section 07 54 00 - Thermoplastic Roofing and Flashing
C. Section 22 30 00 - Plumbing
D. Section 26 41 10 - Lightning Protection

1.3 DESCRIPTION OF WORK

Work Included: Provide labor, materials, and equipment necessary to complete the work of this Section, including but not limited to the following:

A. Supply all necessary chutes, disposal facilities, transportation, and labor necessary to dispose of all demolished materials, dirt, and debris off-site in a legal dumping area. The Contractor shall obtain all permits necessary to transport and dispose of all materials, rubbish, and debris.

B. Provide all necessary underlayment, miscellaneous flashing, attachment clips, and closure members to ensure a weathertight installation.

C. Install counter-flashings at roof membrane terminations.

D. Install blind nailers at all vertical roof membrane and sheet metal termination locations. Coordinate with Section 07 54 00 - Thermoplastic Roofing and Flashing.

E. Install sheet metal and thermoplastic-clad flashings, pre-fabricated thermoplastic-clad edge metals, sealants, and solders at curbs, penetrations, rising walls, termination points, and additional locations as indicated in the Contract Documents. Coordinate with Section 07 54 00 - Thermoplastic Roofing and Flashing.

F. Complete all associated work.

G. Clean and restore all areas affected by the work.

H. Coordinate the installation of new wood blocking and plywood with Section 06 10 00 - Rough Carpentry for the installation of sheet metal flashing, cleats, and membrane flashings indicated in the Contract Documents.

1.4 PERFORMANCE REQUIREMENTS

A. General: Install sheet metal flashing and trim to withstand wind loads, structural movement, thermally induced movement, and exposure to weather without failing, rattling, leaking, and fastener disengagement.

B. Thermal Movements: Provide sheet metal flashing and trim that allow for thermal movements resulting from the following maximum change (range) in ambient and surface temperatures by preventing buckling, opening of joints, hole elongation, overstressing of components, failure of joint sealants, failure of connections, and other detrimental effects. Provide clips that resist rotation and avoid shear stress as a result of sheet metal and trim thermal movements. Base engineering calculation on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.
   1. Temperature Change (Range): One hundred twenty degrees Fahrenheit (120ºF), ambient; one hundred eighty degrees Fahrenheit (180ºF), material surfaces

C. Water Infiltration: Provide sheet metal flashing and trim that do not allow water infiltration to building interior.

1.5 SUBMITTALS

A. Product Data: For each type of product indicated. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes.

B. Shop Drawings: Show layouts of sheet metal flashing and trim, including plans and elevations. Distinguish between shop- and field-assembled work. Include the following:
   1. Identify material, thickness, weight, and finish for each item and location in Project.
   2. Details for forming sheet metal flashing and trim, including profiles, shapes, seams, and dimensions.
   3. Details for fastening, joining, supporting, and anchoring sheet metal flashing and trim, including fasteners, clips, cleats, and attachments to adjoining work.
   4. Details of expansion-joint covers, including showing direction of expansion and contraction.

C. Samples for Verification: For each type of exposed finish required, prepared on Samples of size indicated below:
   1. Sheet Metal Flashing: Twelve inches (12”) long. Include fasteners, cleats, clips, closures, and other attachments.
   2. Trim: Twelve inches (12”) long. Include fasteners and other exposed accessories.
   3. Accessories: Full-size Sample.

D. Contractor to provide site safety plan and Job Hazard Analysis.

1.6 MOCK-UP TEST AREAS

A. Before full scale work is commenced, execute the following work for trial work areas to be reviewed by the Owner as to acceptability of color, texture, and appearance match with the existing construction. Test areas will be at locations established by the Owner.
   1. Two linear feet (2 LF) of counterflashing configuration.
   2. One (1) sample of a blind nailer configuration.
   3. Two linear feet (2LF) of each edge metal configuration.
   4. Two linear feet (2LF) of gutter configuration.
   5. Two linear feet (2LF) of ridge vent configuration.

B. Trial areas shall be repeated until acceptable results are obtained, and the accepted areas shall be a standard for all subsequent work. Construction of test areas shall be in conformance with all Contract Documents and shall use only submitted materials.

1.7 QUALITY ASSURANCE

A. Sheet Metal Flashing and Trim Standard: Comply with SMACNA's "Architectural Sheet Metal Manual." Conform to dimensions and profiles shown unless more stringent requirements are indicated.

B. Pre-Installation Conference: Conduct conference at Project site to comply with requirements in Division 01.
   1. Meet with the Owner, Designer, Owner's insurer if applicable, Installer, and installers whose work interfaces with or affects sheet metal flashing and trim including installers of roofing materials, roof accessories, and roof-mounted equipment.
   2. Review methods and procedures related to sheet metal flashing and trim.
   3. Examine substrate conditions for compliance with requirements, including flatness and attachment to structural members.
   4. Document proceedings, including corrective measures and actions required, and furnish copy of record to each participant.

1.8 DELIVERY, STORAGE, AND HANDLING

A. Deliver sheet metal flashing materials and fabrications undamaged. Protect sheet metal flashing and trim materials and fabrications during transportation and handling.

B. Unload, store, and install sheet metal flashing materials and fabrications in a manner to prevent bending, warping, twisting, and surface damage.

C. Stack materials on platforms or pallets, covered with suitable weathertight and ventilated covering. Do not store sheet metal flashing and trim materials in contact with other materials that might cause staining, denting, or other surface damage.

1.9 COORDINATION

A. Coordinate installation of sheet metal flashing and trim with interfacing and adjoining construction to provide a leak proof, secure, and noncorrosive installation.

1.10 WARRANTY AND GUARANTEE

A. Upon completion of the work, and prior to final payment, the Contractor shall submit a Guarantee of his work to be free from defect in materials and workmanship. This Guarantee shall be for a period of two years (2 yrs.) and shall be signed by a Principal of the Contractor's firm and sealed if a corporation.

PART 2 - PRODUCTS

2.1 SHEET METAL FLASHINGS, PREFORMED FLASHINGS, AND ACCESSORIES

A. Thermoplastic clad metal shall be 0.25-gauge galvanized steel or as required by the manufacturer with thermoplastic laminated to the exposed face. Color(s) to be selected by the Owner from the manufacturer's standard color selection.

B. Aluminum shall be 0.040'' and 0.050" thick Kynar 500 fluoropolymer coated aluminum as shown on the Contract Drawings. Aluminum shall be 3003 alloy, H-14 temper.

C. Pre-Manufactured, Fascia System: Pre-formed, architectural metal edge system.

D. Tin-Zinc alloy coated copper shall be cold rolled sheet copper conforming to ASTM B-101-78. Tin-Zinc coating shall be applied by hot dip process to achieve a coating approximately 0.5 mils thick. Sheet length shall be eight feet (8') maximum.

E. Stainless steel shall be 24-gauge ANSI 18-8 Type 304, 2D finish. Sheet length shall be eight feet (8'-0") maximum. Note, stainless steel is only anticipated to be used as hot pipe storm hoods.

F. Termination bars shall be one-eighth inch by one-inch (⅛" x 1") copper, aluminum, or stainless steel with pre-punched holes at six inches (6") on-center, or as required by the membrane manufacturer.

G. Rivets shall be three-sixteenths inch (3/16") diameter aluminum, stainless steel, or copper as required by the metal being secured.

H. Solder for tin-zinc alloy coated copper shall be pure tin conforming to ASTM B32 or lead-free, high-tin.
   1. Soldering Flux for copper shall be in accordance with the requirements of ASTM B 813.

I. All accessories, including but not limited to nails, screws, and clips shall be stainless steel, or galvanized steel and completely compatible with the surrounding metal to prevent galvanic reaction. Galvanizing shall be per ASTM A153-09.

J. Hose clamps shall be one-half inch (½") wide screw adjustable stainless-steel hose clamps with a minimum three-eighths inch (⅜") band width.

K. Sealant required incidental to sheet metal and flashing work shall be one-part acrylic conforming to Fed. spec. TT-S-230 such as "Mono" by Tremco or approved equal.

L. Sheet metal flashings shall be shop fabricated. All breaks, bends, and hems shall be uniform, clean, straight lines.
1. Flanges shall be four inches (4") wide minimum and hemmed.
2. Drip edges shall be hemmed three-quarter inch (¾") wide and break at a thirty-degree (30º) angle.
3. Clips shall be two inches (2") wide.
4. All flanges to be covered with roofing or flashing membranes shall have a one-quarter inch (¼") minimum hem on the edge.
5. All sheet metal joints shall have a six-inch (6") wide thermoplastic cover and sheet metal backer plates.
6. Blind nailers shall be four inches (4") wide, folded to two-inch (2") wide final dimension.
7. All aluminum joints shall be adequately overlapped, back-sealed, and riveted.
   a. Facias are not to receive rivets at joints, a six-inch (6") thermoplastic flashing strip is to be fully welded at joints.
8. Fascia reveals shall not exceed eight inches (8"). Fascia's requiring a greater vertical face greater than eight inches (8") shall be fabricated as a two-piece (2-pc.) system with each face of equal exposure.
9. Maintain equal fascia height around entire perimeter of roof area.

M. Fabrication Schedule:

Note: similar flashing components have been listed under multiple metal fabrications type and thicknesses. The Contractor shall coordinate the use of compatible metals to prevent galvanic corrosion and coordinate painted finish components at visible locations.
1. Thermoplastic Clad Sheet Metal (25-gauge minimum)
   a. Blind nailers.
   b. Pre-Fabricated Sheet Metal Fascia.
2. 16 oz. Tin Zinc Alloy Copper
   a. Sheet Metal Counterflashing.
3. 20 oz. Tin Zinc Alloy Copper
   b. Two-inch (2") wide Clips.
4. 0.040'' Thick Coated Aluminum
   a. Sheet Metal Skirt Flashing.
   b. Downspouts.
   c. Gutter.
   d. Gutter Hanger.

e. Outlet Tube.

5. 0.050'' Thick Coated Aluminum
   a. Continuous Hook Strips.
   b. Two-inch (2") wide clips.
6. Stainless Steel
   a. Hot pipe storm hood.
   b. Hot pipe curb.

2.2 DOWNSPOUT

A. Downspout straps, spacers shall be heavy weight aluminum one-quarter inch (¼") thick by one-inch (1") wide minimum and shall be secured to the wood blocking, fascia, or structure. Dogs shall have twist to eliminate drips over the edge.

B. Stiffening bars shall be continuous heavy weight aluminum bars one-quarter inch (¼") thick by three-quarter inch (¾") wide minimum. Bars shall be pre-punched to receive through bolts.

C. Screws for downspout straps shall be stainless steel and have one- and one-half inch (1-½") embedment minimum into the substrate.

D. Wire ball strainers for gutter/downspout assemblies shall be stainless steel wire, 0.018" thick.

E. Splash blocks shall be solid rubber that is UV-resistant and mold-resistant. Blocks to be weighted to not blow or float away after installation. Color to be determined by Owner.

2.3 MISCELLANEOUS MATERIALS

A. General: Provide materials and types of fasteners, solder, welding rods, protective coatings, separators, sealants, and other miscellaneous items as required for complete sheet metal flashing and trim installation.

B. Sealing Tape: Pressure-sensitive, one hundred percent (100) solids, polyisobutylene compound sealing tape with release-paper backing. Provide permanently elastic, nonsag, nontoxic, non-staining tape.

C. Elastomeric Sealant: ASTM C 920, elastomeric polyurethane polymer sealant; of type, grade, class, and use classifications required to seal joints in sheet metal flashing and trim and remain watertight.

D. Epoxy Seam Sealer: Two-part, noncorrosive, aluminum seam-cementing compound, recommended by aluminum manufacturer for exterior nonmoving joints, including riveted joints.

E. Slip sheet shall be fifteen-pound (15-lb.) red rosin paper.

2.4 RIDGE VENTS

A. Ridge vents shall be Hi-Perf ridge vents as manufactured by Metal-Era or approved equal. Color to be from manufacturer's standard color options and be as approved by the Owner.
   1. Ridge Vent Cover shall be 0.063" aluminum.
   2. Cover plates at each joint, eight inches (8") wide.
   3. Continuous Z-Brackets to be 20-gauge galvanized steel.
   4. Expanded metal support screens to be 0.050" aluminum.

2.5 SOFFIT VENTS

A. Soffit vents shall be Hi-Perf vented fascia as manufactured by Metal-Era or approved equal. Color to be from manufacturer's standard color options and be as approved by the Owner.
   1. Fascia cover material shall be 0.040" aluminum.
   2. Concealed splice plates at each joint, eight inches (8") wide.
   3. Vertical Z-Brackets to be 0.050" aluminum, twelve inches (12") on-center.

2.6 FASTENERS

A. In general, fasteners, straps and other hardware shall be copper, brass, stainless steel, or hot-dip galvanized steel. Galvanizing shall be per ASTM A 153 specifications. Electro-galvanizing will not be accepted.

B. Fasteners for securement of flashings and hook strips to concrete or masonry shall be one-quarter inch (¼") diameter hammer drive anchors with zinc sheaths and flat heads such as Zamac Nailins by Rawl, Star Fasteners, Unifast, or approved equal. Anchors shall be of sufficient length to penetrate the substrate one- and one-quarter inch (1-¼") minimum.

C. Fasteners for securement of flashings, blind nailers, and hook strips to wood blocking and plywood substrates shall be galvanized annular threaded ring shank nails. Fasteners shall be of sufficient length to penetrate the substrate one- and one-quarter inch (1-¼") minimum, except full depth of plywood.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, to verify actual locations, dimensions and other conditions affecting performance of work.
   1. Verify that substrate is sound, dry, smooth, clean, sloped for drainage, and securely anchored.
   2. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 SHEET METAL FLASHING - GENERAL

A. Sheet metal flashings shall be as specified herein. Refer to the recommendations of the Sheet Metal and Air Conditioning Contractors National Association concerning methods and materials to be used in the fabrication and construction of sheet metal flashings.

B. Form and fabricate sheets, seams, strips, cleats, integral flashings, and other components of the sheet metal flashings to profiles, patterns, shown and as required for permanently leak-proof construction configurations.

C. It is the intent of this Specification to utilize the most effective joint configuration possible to properly install strong, weathertight metal flashings. Comply with the following standards unless otherwise specified when fabricating metal components to be joined:
   1. Prefabricate corners of edge metal, counterflashings, and skirt flashing in one-piece sections with minimum lengths of eighteen inches (18”) in each dimension from the corner whenever possible.
   2. Whenever one-piece (1-pc.) construction is not possible, solderable metals shall utilize interlocked, crimped, and fully soldered seams and joints.
   3. Seams and joints of non-solderable metals shall be interlocked, riveted, and filled with sealant.
   4. Provide sheet metal closure components at transitions to rising walls and similar changes in plane for edge metal, expansion joint covers, and other termination flashings. Fully crimp and seal closures to continuous blind nailed cleats.

D. Comply with Military Specification MIL-S-6872B entitled, "General Specifications for Soldering Process" when forming soldered joint. Use conduction soldering methods. Areas to be joined shall be cleaned of all oil, grease, pencil marks, paint, dirt, or other foreign substances. Remove all burrs using files, grinding stones or other methods. Hold parts in place using clamps, jigs, and supports or by self-fixturing. If parts are tack-soldered to hold them in place, the area of tack-soldering shall be reworked into the final soldering. Parts cannot move during the soldering process.

E. Separate dissimilar metals by painting each metal surface in area of contact with a bituminous coating, by applying rubberized asphalt underlayment to each metal surface, or by other permanent separation as recommended by manufacturer’s or dissimilar metals.

3.3 SKIRT/COUNTER FLASHING

A. Install sheet metal skirt and counter flashings where indicated. Skirt metal flashings shall be fastened with the specified fasteners.

B. For clip-on counter flashings, crimp top vertical edge to existing counter flashing, which has been trimmed to receive clip-on flashing.

C. All fasteners shall be concealed. Secure low edge of flashing using clips spaced eight inches (8") on-center maximum. Secure clip to substrate with specified fastener and fully crimp to low edge.

3.4 CONTINUOUS CLEATS AND HOOK STRIPS

A. Form continuous cleats/hook strips with three-quarter inch (¾") kicks, bent out at a thirty-degree (30°) angle to the face or wall. Height and profile of continuous cleats/hook strips shall be as indicated on the Detail Drawings.

B. Secure continuous cleats/hook strips to wood blocking with the specified fasteners spaced at four inches (4") on-center, staggered.

C. Provide one-eighth inch (⅛") butt joints between hook strip sections.

3.5 SECUREMENT CLIPS

A. Secure clips to substrate with the specified fasteners at minimum six inches (6") on-center, or as indicated on the Detail Drawings.

B. Bend clips a minimum of one-inch (1") over bottom drip edge of flashing and crimp tightly.

3.6 THERMOPLASTIC CLAD FASCIA

A. Pre-formed thermoplastic clad sheet metal flashings shall be formed and installed as indicated in the detail drawings

B. All clad metal flashings shall be fastened into solid wood nailers with two (2) rows of the specified fasteners, four inches (4") on-center, staggered.

C. Flashings shall be installed to provide adequate resistance to bending and allow normal thermal expansion and contraction.

D. Adjacent sheets of thermoplastic clad flashings shall be spaced one-quarter inch (¼'') apart, and joints covered with two-inch (2'') wide aluminum tape with a four-inch (4'') wide strip of thermoplastic flashing membrane hot air welded over the joint, or as recommended by the manufacturer.

E. Hook new thermoplastic edge metal to clips.

F. Backer plates shall be installed behind all fascia-flashing joints. Set flange on roof and nail off with fascia flashing flange.

G. Sealant shall be applied with full beads between backer plates to fascia flashing joint.

H. Membrane stripping shall be installed over each fascia/flashing joint and heat welded.

I. Provide blind nailers at exposed ends where thermoplastic clad fascia meets rising walls as necessary and other locations as required to provide an aesthetic watertight termination of metal flashings.

3.7 COUNTERFLASHINGS

A. Fabricate new counterflashing and receivers to the dimensions and shapes where shown in the Contract Drawings and as specified herein.

B. Secure counter-flashings with clips where indicated. Fabricate and secure clips as previously specified.

3.8 BLIND NAILERS

A. Fabricate and install blind nailer with a two-inch (2") minimum leg inserted behind membrane. Fasten flashing through leg of blind nailer.

B. Fold blind nailer to two-inch (2") wide final dimension with one-half inch (½") hemmed edge over fastener.

C. Provide continuous beads of sealant at back and leading edges.

3.9 HOT PIPE

A. Coordinate with Section 07 54 00 - Thermoplastic Roofing and Flashing for installation.

B. Install the specified pipe insulation prior to installing flashings. Refer to the Detail Drawings for proper orientation.

C. Secure cone flashing flange to the pipe.

D. Install thermoplastic flashing and weld to cone flange, roof membrane, and up cone two-inch (2") minimum. Terminate flashing with roofing manufacturers water cut-off mastic and hose clamp on vertical up-turn.

E. It is extremely important that the wood blocking be held back a minimum of two inches (2") from the pipe insulation as the pipe exhausts high temperature gases that could create a fire hazard.

3.10 CLEANING AND PROTECTION

A. Clean exposed metal surfaces of substances that interfere with uniform oxidation and weathering.

B. Clean and neutralize flux materials. Clean off excess solder and sealants.

C. Remove temporary protective coverings and strippable films as sheet metal flashing and trim are installed. On completion of installation, clean finished surfaces, including

removing unused fasteners, metal filings, pop rivet stems, and pieces of flashing. Maintain in a clean condition during construction.

D. Replace sheet metal flashing and trim that have been damaged or that have deteriorated beyond successful repair by finish touchup or similar minor repair procedures.

END OF SECTION

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SECTION 22 30 00

PLUMBING

PART 1 - GENERAL

1.1 IN GENERAL

A. Division 01, General Conditions, and all parts of the Bid and Contract Documents are made part of this Section as if fully repeated herein.

B. Refer to Division 01 for additional information.

1.2 RELATED WORK SPECIFIED ELSEWHERE

A. Section 05 31 00 - Steel Decking
B. Section 07 54 00 - Thermoplastic Roofing and Flashing
C. Section 07 62 00 - Sheet Metal Flashing and Trim

1.3 SCOPE OF WORK

In general, the Contractor shall supply all labor, materials, equipment, temporary protection, tools, and appliances necessary for the proper completion of the work in this Section, as required in the Specifications and in accordance with good construction practice. The work under this Section generally includes the following:

A. Clear roof drain systems from roof level to the point where the leaders exit the building to achieve a free-flowing system prior to re-roofing operations and after new roof system is installed. Water test roof drains, pipe connections and flashings prior to demobilization.

B. Remove existing drain bowl assembly including, but not limited to, drain inserts, drain bowl, drain strainers, clamping rings, no-hub joints at all existing roof drain locations.

C. Coordinate drain bowl assembly installation with Section 07 54 00 - Thermoplastic Roofing and Flashing.

D. Install new drain bowl assemblies including bowls, cast-iron drain strainers, clamping rings, and no-hub joints at all existing roof drain locations. Provide vandal-proof drain strainers. Elevate drain assemblies a minimum of two inches (2”) above the deck to allow for insulation.

E. Coordinate interior access to drain locations with the Owner.

F. Install drain marker flags at all drain locations.

G. Provide all temporary protection, tools, and equipment necessary to remove and replace the existing drains and leaders as specified for the proper installation of the new roof drains.

H. All drains installed shall be completed and flashed in the same day's operation.

1.4 JOB CONDITIONS

A. The plumbing work shall be coordinated with the roofing contractor and the roof work in such a manner that drain bowl assemblies are installed prior to or concurrently with the roofing. Limit the number of drains removed and replaced prior to roof replacement to avoid moisture infiltration at drain locations.

B. No interior portions of the building shall be left exposed to the elements at the end of a day's work. The roofing contractor shall provide temporary drain flashings prior to roof replacement where drains are replaced.

C. All plumbing work shall be performed by a licensed plumber in accordance with the Massachusetts Plumbing and Gas Code, 248 CMR.

D. Notify the Engineer forty-eight hours (48 hrs.) in advance of drain leader cleaning operations in order that Owner representation may occur.

E. Notify Owner seventy-two hours (72 hrs.) in advance to acquire Owner's written permission to access interior spaces of the building.

1.5 SUBMITTALS

A. Manufacturer's literature shall be submitted for all items specified in Part 2 of this Section.

PART 2 - PRODUCTS

2.1 ROOF DRAIN COMPONENTS

A. Replacement roof drains shall be minimum six-inch (6") diameter coated cast iron with varying pipe sizes, or as required to match the existing diameter bottom outlet, large sump, extended collar and wide roof flange, as manufactured by Jay R. Smith Manufacturing Co., Series 1010-E-W, Josam, Zurn, Wade, Smith or approved equal. Replacement drain outlet diameters shall match the existing. Drain assemblies shall have non-puncturing cast iron clamping ring with integral gravel stop. All roof drain assemblies shall be installed with underdeck clamps. Drain strainers shall be cast iron, vandal resistant, of suitable size and configuration as provided by the drain manufacturer.

B. All accessories necessary or the proper installation of the new drain bowl assemblies, including but not limited to underdeck clamps, clamping rings with integral gravel stops and strainers, shall be of the same manufacturer as the drain bowls and be

completely compatible with the existing piping and surrounding materials. Drain sump caulking shall be as recommended by the supplier.

C. Drain bowl to leader pipe connections shall be no-hub connections. Verify in field all connections.

D. Elastomeric joint couplings to be used only at tie-ins from new to existing leader pipes shall conform to the Cast Iron Soil Pipe Institute (CISPI). Couplings shall be made using neoprene sleeves with stainless steel draw band clamp connections, four (4) clamps per sleeve.

E. Insulation for new drain bowl assemblies and drainpipe shall be pre-formed and skinned fibrous glass, minimum one-inch (1") thick of sufficient size to fit fixtures and piping, such as fiberglass ASJ/SSL-11 pipe insulation by OCF, with factory-applied jackets, or approved equal. Fittings shall be mitered of the same material. Joints shall be taped as recommended and supplied by the manufacturer of the insulation. Minimum R-value = 3.2 per inch thickness. Minimum thickness shall be two inches (2").

2.2 VENT PIPE EXTENSIONS

A. Vent pipe extensions: Schedule forty (40)-coated cast iron conforming to ASTM A74 sized to match existing pipe diameter. Pipes shall extend eighteen inches (18") minimum above completed roof surface.

B. No-hub connections for vent pipe extensions shall consist of neoprene couplings with stainless steel clamps, sized to match the existing pipe diameter.

2.3 ROOF DRAIN MARKERS

A. Roof Drain Marker as manufactured by Roof Drain Marker Co., LLC, of West Bridgewater, MA as supplied by the approved drain bowl manufacturer, or approved equal. Drain dome-mounted vertical fiberglass flag marker secured in aluminum socket in turn secured with pre-punched aluminum bracket configured for through-bolting to roof drain dome or approved equal.
   1. Flag Marker: Pultruded fiber-reinforced polymer rod, one-half inch (½" [12 mm]) diameter by forty-eight inches (48" [1219 mm]) long, with reflective dual-colored reversible ends enabling marking of selected drains.
   2. Flexural Strength, minimum, ASTM D 790: 700,000 psi (689 MPa).
   3. Impact Strength, minimum, ASTM D 256: 40 ft-lb/in.
   4. Marker Base: One-inch by one-inch by four-inch (1" x 1" x 4" [25 mm x 25 mm x 102 mm]) extruded aluminum bar, ASTM B 209 (ASTM B 209M), with milled flag receiver, threaded flag set screw retainer, and threaded base.
   5. Flag Bracket: 1-inch by 1-inch by 0.063-inch (25 mm x 25 mm x 1.60 mm) aluminum plate bracket, ASTM B 221 (ASTM B 221M).
   6. Fasteners: Alloy Group 2 (A4) stainless-steel bolts, ASTM F 593 (ASTM F 738M), and nuts, ASTM F 594 (ASTM F 836M).

PART 3 - EXECUTION

3.1 GENERAL

A. The Owner shall be notified at least seventy-two hours (72 hrs.) prior to all under deck work. All materials, equipment and daily clean up shall be the responsibility of the Contractor.

B. All work in this Section shall be coordinated with roof replacement work. All required work at drain locations shall be properly protected at all times from equipment and traffic.

C. All flashing-in of the roof drains and membrane repairs as a result of the plumbing work shall be the responsibility of and provided by the Contractor under Section 07 54 00 - Thermoplastic Roofing and Flashing.

D. The Contractor is cautioned to investigate all existing conditions and materials of construction. All replacement items, including but not limited to clamps and strainers must be completely compatible and match the existing system.

3.2 CLEANING OF DRAINAGE SYSTEM

A. Prior to re-roofing operations, clear all roof drain leader piping of any debris and clogs such that the system is free flowing.

B. Once the new replacement roof system has been installed, clear all roof drain leader piping of debris and clogs such that the system is free flowing.

C. The Contractor shall notify the Engineer and Owner a minimum of seventy-two hours (72 hrs.) in advance prior to cleaning drainage system, in order to allow the Engineer and Owner present during the cleaning operations.

D. The Contractor shall clear the existing leader pipe with Roto-rooter type equipment from the roof deck level to the point where the leader pipe exits the building. Flush the drain line with water upon completion of the cleaning.

3.3 REPLACEMENT ROOF DRAINS

A. Should it be required, complete all cuts through the existing deck so as to cause minimum damage to the deck and associated building components. Cut shall be the minimum size possible. Methods of deck removal shall be submitted by the Contractor and approved by the Engineer prior to demolition. The Contractor shall provide all interior and rooftop protection.

B. Make all drain to leader connections watertight and of sufficient strength.

C. Check all roof drain and leader pipe joints with a water test once roofing and flashing are complete and prior to installing drain system insulation to check for leaks. Repair all leaks to the satisfaction of the Owner.

3.4 VENT PIPE EXTENSION

A. Cut existing vent pipes to be raised to allow for the installation of the no-hub connections. Units shall extend eighteen inches (18") above finished roof surface.

3.5 INSULATION

A. Replacement Drains: Fibrous glass pipe insulation with factory-applied jackets shall be installed on all drain bowl assemblies and leader ties installed under this Contract, in accordance with the manufacturer's written specifications down to the elbow of the leader piping.

B. All insulation joints shall be taped with materials recommended and supplied by the insulation manufacturer.

C. If any sections of the existing roof drainage system are observed to be uninsulated, this situation shall be reported to the Engineer and Owner.

D. Coordinate interior access for installation with Owner. Contractor to temporarily remove and reinstall existing acoustical ceiling tiles.

3.6 CLEAN-UP

A. All floor and adjacent areas, both interior and exterior, damaged, or stained by the installation of the plumbing work shall be repaired and cleaned of all dust, debris, and any other materials to the Owner's satisfaction.

3.7 WATER TESTS

A. Perform water tests on roof drain assemblies, including leader piping, and on downspout assemblies. Notify the Owner forty-eight hours (48 hrs.) minimum prior to water tests in order that the Owner/Owner's representative may witness testing. Using a three-quarter inch (¾") garden hose run water into the drainage components for thirty minutes (30 min.). Inspect all drainage components for leakage and repair as required. Inform Owner of test findings.

END OF SECTION

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SECTION 26 10 00

TEMPORARY MECHANICAL/ELECTRICAL DISCONNECTS

PART 1 - GENERAL

1.1 IN GENERAL

A. Division 1, General Conditions and all parts of the Bid and Contract Documents are made part of this Section as if fully repeated herein.

B. Refer to Division 1 for additional information.

1.2 RELATED WORK SPECIFIED ELSEWHERE

A. Section 06 10 00 - Rough Carpentry
B. Section 07 54 00 - Thermoplastic Roofing and Flashing
C. Section 07 62 00 - Sheet Metal Flashing

1.3 SCOPE OF WORK

In general, the Contractor shall supply all labor, materials, equipment, temporary protection, tools, and appliances necessary for the proper completion of the work in this Section, as required in the Specifications and in accordance with good construction practice. The work under this Section generally includes the following:

A. Provide all temporary protection, lifts, manpower, and equipment to protect the building and its components.

B. Temporarily disconnect, remove, and support existing roof top fans, vents, and mechanical ventilation equipment. Fans and equipment shall be re-installed and reconnected after installation of roofing and flashing of roof curbs. Provide electrical extensions, mechanical ductwork extensions, and roof curb extensions as required to extend the equipment above the new roof surface.
   1. The Contractor is to provide extensions to air-intake locations on mechanical equipment as required by the Owner and to the Owner's satisfaction.
   2. The Contractor will be responsible for coordinating the replacement of the sleepers and conduit straps, which the existing electrical conduits and gas piping are mounted with Section 07 54 00 - Thermoplastic Roofing and Flashing. The contractor shall provide temporary support for all existing equipment mounted on sleepers, which are being removed during the roof replacement. Any damage to the existing roof top equipment shall be repaired and/or replaced by the contractor at no additional cost to the Owner. This shall include, but not be limited to, damaged piping and conduits, releasing of Freon gas, and/or containment and disposal of existing cooling agents. The Contractor shall investigate all equipment prior to performing the work and

notify the engineer/Owner of potential issues prior to performing the renovations.

C. Clean the existing air plenums and duct work of dust/debris prior to re-installation of fans and roof top equipment. Cleaning will be to a point of two feet (2') minimum below the roof line in all ductwork directions.

D. Coordinate the work in this section with the appropriate trades to insure the proper work sequence.

E. The Contractor shall temporarily disconnect existing piping, raise to allow adequate height for new wood blocking, insulation, and roof edge fascia metal and reconnect, where indicated on Contract Drawings. Contractor shall provide required permit(s) and coordinate with Owner to limit disruption to the building and rooftop equipment. Work shall be performed by licensed plumber.

F. Temporarily disconnect equipment support cables to perform re-roofing operations. Reconnect/secure at end of each workday. Provide adequate tension of support cables to eliminate sag in the cables.

G. Coordinate with Section 07 54 00 - Thermoplastic Roofing and Flashing for fastener and sheet metal flashing specifications.

1.4 JOB CONDITIONS

A. Schedule and execute all work without exposing the building interiors to inclement weather. Protect all new and existing roof work, the building and its contents from staining and damages. Segregate all work areas from the building occupants.

B. Notify the Owner at least seventy-two hours (72 hrs.) in advance of doing any interior demolition work so that the Owner may remove any portable items, such as furniture, from the area. Fixed items will not be removed and are to be protected by the Contractor.

C. The Contractor shall be responsible for shutting down, removal, temporary support, proper reinstallation with ductwork and electrical extensions as required, and turning on of each mechanical unit by the end of the workday as it relates to the removal and reinstallation of the mechanical equipment. If the mechanical unit is found operational prior to the shutdown procedures and does not operate upon completion of the work and restarting the equipment, the Contractor will be responsible for repairing/replacing said unit at no additional cost to the Owner.

D. The Contractor is cautioned to take all necessary precautions and make all investigations necessary to install the work. The Owner will not consider unfamiliarity with the job conditions as a basis for additional compensation.

E. The Contractor shall provide a minimum of two weeks' (2 wks.) notice prior to shutting down any mechanical services.

1.5 SUBMITTALS

A. The Contractor shall submit project literature and samples for the items listed in this section in accordance with Section 01 33 00 - Shop Drawings and Submittals.

B. Submit proposed lead times of materials and coordination efforts associated with replacement of units.

C. Submit proposed temporary shoring details and methods of re-attachment.

PART 2 - MATERIALS

NOT USED.

PART 3 - EXECUTION

3.1 GENERAL

A. All work in this Section shall be coordinated with roof replacement work.

B. All flashing-in of the mechanical work shall be the responsibility of and provided by the Roofing Contractor under Section 07 54 00 - Thermoplastic Roofing and Flashing.

C. The Contractor is cautioned to investigate all existing conditions and materials of construction.

D. Follow all applicable local, state, and federal requirements regarding construction of scaffolding and protection of the public safety for the work items included in this section. Specific reference should be made to OSHA Construction Safety Regulations. Provide warning lines, barricades, and similar items as required to restrict pedestrian access to hazardous areas. Job site safety shall be the Contractor's responsibility.

3.2 UTILITY SERVICES AND MECHANICAL/ELECTRICAL SYSTEMS

A. Existing Services/Systems: Maintain services/systems indicated to remain and protect them against damage during selective demolition operations.

B. Service/System Requirements: Locate, identify, disconnect, and seal or cap off indicated utility services and mechanical/electrical systems serving areas to be selectively demolished.
   1. Arrange to shut off indicated utilities with utility companies.
   2. If services/systems are required to be removed, relocated, or abandoned, before proceeding with selective demolition provide temporary services/systems that bypass area of selective demolition and that maintain continuity of services/systems to other parts of building.

a. Refer to Division 01, Section 01 50 30 - Temporary Facilities for additional information.

3. Protect existing mechanical/plumbing systems and drain lines during the project from freezing temperatures; do not leave exposed to the elements.
4. Partial or whole building shutdowns shall be coordinated so they do not impact occupied spaces during business hours.

3.3 REMOVAL AND REINSTALLATION OF ROOFTOP EQUIPMENT

A. The following is the scope of work required where the existing exhaust fans and mechanical equipment located on the roof must be temporarily disconnected, removed, and reconnected.
   1. Prior to temporarily lifting of any existing exhaust fans and mechanical equipment, the contractor shall test the exhaust fans and mechanical equipment to ensure they are functioning properly and report any problems to the owner.
   2. The Contractor shall coordinate all interruptions of power to existing exhaust fans and mechanical equipment with the Owner prior to any work.
   3. The Contractor shall ensure that the power to existing exhaust fans and mechanical equipment is turned off. The Mechanical contractor shall use lockout / tag-out procedures to ensure that the power is not turned on.
   4. The Contractor shall temporarily disconnect, remove, and support the existing roof-mounted exhaust fans, mechanical equipment, ductwork and wiring and reconnect the same, as required by job condition, after installation of a new roof and flashing of the roof curbs.
   5. The Contractor shall coordinate the heights of the existing mechanical unit curbs and fan curbs with that of the new insulation height to confirm which of the units will require raising and new duct and electrical extensions as required.
   6. Extend electrical conduits and wiring, and mechanical systems and ductwork as required due to the increased roof insulation height.
   7. Rooftop unit installation shall be coordinated to prevent exposing the interior to inclement weather. Utilize stainless steel capped EPDM washers at all fastener locations.
   8. The Contractor shall turn power back on to the exhaust fans and mechanical equipment after work has been completed by all other trades.
   9. After the existing exhaust fans and mechanical equipment have been reconnected, the Contractor shall test the exhaust fans and mechanical equipment to ensure they are functioning properly and report any problems to the Owner.

END OF SECTION

SECTION 26 41 00

LIGHTNING PROTECTION

PART 1 - GENERAL

1.1 IN GENERAL

A. Division 1, General Conditions, and all parts of the Bid and Contract Documents are made part of this Section as if fully repeated herein.

B. Refer to Division 1 for additional information.

1.2 RELATED WORK SPECIFIED ELSEWHERE

A. Section 07 54 00 – Thermoplastic Roofing and Flashing
B. Section 07 62 00 – Sheet Metal Flashing
C. Section 26 10 00 – Temporary Mechanical Disconnects/Reconnects

1.3 SCOPE OF WORK

In general, the Contractor shall supply all labor, materials, equipment, temporary protection, tools and appliances necessary for the proper completion of the work in this Section, as required in the Specifications and in accordance with good construction practice. The work under this Section generally includes the following:

A. Remove and store existing lightning protection conductor cables to allow the roof system to be removed and replaced. Coordinate this Work with Section 07 54 00 – Thermoplastic Roofing and Flashing.

B. Replace existing air terminals at equipment designated to remain. Replace all clip/mounting brackets and/or hardware with new components that match existing and are compatible. Coordinate this Work with Section 07 54 00 – Thermplastic Roofing and Flashing.

C. Provide new air terminals at parapet caps and other aluminum surfaces required where to match new materials.

D. Should damaged units be encountered during the removal process, notify the Owner/Engineer prior to disconnection, and replace as needed with the Owner's approval under a Unit Price scope of work.

E. Re-secure the existing lightning conductor cable to the new roof system with new securement clips.

F. Test the reinstalled system to confirm ground is achieved. Testing will be limited to the roofing components only, and not the entire building's system.

G. Clean and restore all areas affected by the work.

1.4 JOB CONDITIONS

A. The Contractor shall supply, install and maintain all shoring, supports, barriers, protection, temporary heat, warning lines, lighting and personnel required to support the structure, fixtures and facilities affected by his work and segregate the work area(s) from pedestrian or vehicular traffic, as well as to prevent damage to the building, occupants and the surrounding landscaped and paved areas.

B. The Contractor is cautioned to take all necessary precautions and make all investigations necessary to install the work. The Owner will not consider unfamiliarity with the job conditions as a basis for additional compensation.

C. The lightning protection work shall be coordinated with the roof work in such a manner that traffic on the new roof system is reduced.

D. The lightning protection work shall be performed by licensed electricians.

1.5 SUBMITTALS

A. The Contractor shall submit project literature and samples for the items listed in this section and in accordance with Section 01 33 00 - Shop Drawings and Submittals:
   1. Isometric and plan views showing layout and connections to the required metal surfaces. Include terminal, electrode and conductor sizes, and connection and termination details.
   2. Show the methods of mounting the system to the adjacent construction.
   3. Submit product data showing dimensions and materials of each component, and include indication of listing in accordance with ANSI/UL96.

B. Qualifications: Submit proof that the installer of the lightning protection system has had suitable and adequate experience installing other lightning protection systems, and is capable of installing the system as recommended by the manufacturer of the existing equipment.

C. Permits: Submit copies of the electrical permits prior to performing any electrical modifications. Submit copies of the electrical inspector’s final approval and inspection of the electrical systems.

D. Certifications: Two weeks (2 wks.) prior to the final inspection, deliver to the Engineer four (4) copies of the certification that the installed lightning protection system has been inspected above the roofline by a UL representative and has been approved by UL without variation.

E. Closeout: Provide the Owner with accurate as-built drawings and recommended guidelines for maintenance in accordance with Section 01 70 00 – Project Closeout.

F. Provide a project specific safety plan and Job Hazard Analysis.

1.6 REFERENCES

A. The lightning protection system and all components shall be designed, manufactured and installed in accordance with the latest applicable standards as follows:

1.	ANSI/NFPA 780	Standard for the Installation of Lightning Protection Systems
2.	ANSI/UL 96	Lightning Protection Components
3.	UL 96A	Installation Requirements for Lightning Protection

B. The system shall be designed and installed in accordance with the requirements of NFPA 780 and UL 96A to obtain Master Label on the building.

1.7 GUARANTEE

A. The Contractor shall supply the Owner with a minimum two-year (2-yr.) workmanship warranty for their work. In the event any work related to this section is found to be defective within two years (2 yrs.) of substantial completion, the Contractor shall remove and replace such at no additional cost to the Owner.

1.8 UNIT PRICES

A. Technical requirements for related Unit Price work are defined in this section. Refer to Division 01, Section 01 22 00 - Unit Prices for quantities to be carried in the Base Bid. Any work in addition to those shown on the Contract Drawings shall be either added or deducted based on the unit costs.

PART 2 – MATERIALS

2.1 METAL COMPONENTS

A. In general, protection system replacement components shall be made of materials that are resistant to corrosion or acceptably protected against corrosion. Combinations of materials that form electrolytic couples of such a nature that in the presence of moisture corrosion is accelerated shall not be used. One or more of the following materials shall be used:

B. Where copper is used, it shall be of the grade ordinarily required for commercial electrical work, generally designated as being of ninety-five percent (95%) conductivity when annealed.

C. Where alloys of copper are used, they shall be as substantially resistant to corrosion as copper under similar conditions.

D. Where aluminum is used, care shall be taken not to use it where contact could be made with earth or anywhere it could rapidly deteriorate. Conductors shall be of electrical grade aluminum.

E. Materials shall comply in weight, size and composition with the requirements of ANSI/UL96 and the NFPA Code relating to this type of structure.

F. Lightning rod equipment and fittings shall bear the UL Label.

G. Class I Materials shall be used on structures not more than seventy-five feet (75') in height. Class II Materials shall be used on structures over seventy-five feet (75') in height. Minimum material requirements for each type of conductor class are listed below:

Minimum Class I Material Requirements

		Copper		Aluminum	
Type of Conductor		**Standard**	**Metric**	**Standard**	**Metric**
Air Terminal, Solid	Diameter	3/8 in.	9.5 mm	1/2 in.	12.7 mm
Air Terminal, Tubular	Diameter	5/8 in.	15.9 mm	5/8 in.	15.9 mm
	Wall Thickness	0.032 in.	0.81 mm	0.064 in.	1.63 mm
Main Conductor, Cable	Size ea. Strand	17 AWG	1.04 mm^2	14 AWG	2.08 mm^2
	Wgt. Per Length	187 lb./ 1000 ft.	278 g/m	95 lb./1000 ft.	141 g/m
	Cross Sect. Area	57,400 CM	29 mm^2	98,600 CM	50 mm^2
Main Conductor, Solid Strip	Thickness	0.051 in.	1.30 mm	0.064 in.	1.63 mm
	Cross Sect. Area	57400 CM	29 mm^2	98600 CM	50 mm^2
Bonding Conductor, Cable (Solid or Stranded)	Size ea. Strand	17 AWG	1.04 mm^2	14 AWG	2.08 mm^2
	Cross Sect. Area	26,240 CM	13.3 mm^2	41,100 CM	20.8 mm^2
Bonding Conductor, Solid Strip	Thickness	0.051 in.	1.30 mm	0.064 in.	1.63 mm
	Width	1/2 in.	12.7 mm	1/2 in.	12.7 mm

Minimum Class II Material Requirements

Type of Conductor		Copper		Aluminum	
		Standard	**Metric**	**Standard**	**Metric**
Air Terminal, Solid	Diameter	1/2 in.	12.7 mm	5/8 in.	15.9 mm
Main Conductor, Cable	Size ea. Strand	15 AWG	1.65 mm^2	13 AWG	2.62 mm^2
	Wgt. Per Length	375 lb./ 1000 ft.	558 g/m	190 lb./1000 ft.	283 g/m
	Cross Sect. Area	115,000 CM	58 mm^2	192,000 CM	97 mm^2
Main Conductor, Solid Strip	Thickness	0.064 in.	1.63 mm	0.102 in	2.61 mm
	Cross Sect. Area	115000 CM	58 mm^2	192000 CM	97 mm^2
Bonding Conductor, Cable (Solid or Stranded)	Size ea. Strand	17 AWG	1.04 mm^2	14 AWG	2.08 mm^2
	Cross Sect. Area	26,240 CM	13.3 mm^2	41,100 CM	20.8 mm^2
Bonding Conductor, Solid Strip	Thickness	0.051 in.	1.30 mm	0.064 in.	1.63 mm
	Width	1/2 in.	12.7 mm	1/2 in.	12.7 mm

2.2 MANUFACTURERS

A. Equipment furnished by one (1) of the manufacturers below or an independent protection company shall be considered as equals:
   1. ERICO/Pentair.
   2. Alltech.
   3. Heary Brothers.
   4. Thomas & Betts.
   5. VFC.

2.3 AIR TERMINAL BASES

A. Air terminal bases shall provide a secure attachment to the structure, the air terminal and the conductor cable. The base shall be compatible with the structure, the air terminal and the conductor cable that is in contact with it.

2.4 CONNECTOR FITTINGS

A. A connector fitting shall be constructed so that a minimum of one- and one-half inches (1-½") of each conductor can be secured within the connector. It shall be compatible with the material being secured.

2.5 CLIPS

A. Clips for securing copper conductors shall be not less than 0.032" thick and not less than three-eighths inch (⅜") wide. Clips shall be placed not more than three feet (3') apart along a conductor.

2.6 GROUND ELECTRODES

A. Ground electrodes shall be as specified of proper size and material compatible with ground conditions and to obtain the desired minimum ground resistance.

2.7 FASTENERS

A. Fasteners shall be compatible with the materials being secured and of a size and type specified.

2.8 EXOTHERMIC WELDING

A. All bonding of lightning protection systems to building steel, ground rods, cable connections, connections below grade, etc. shall utilize exothermic welding grounding connections.

B. Exothermic welding components shall be as manufactured by Cadweld, Alltec, or approved equal.

PART 3 - EXECUTION

3.1 GENERAL

A. In general, an ordinary structure shall be any structure that is used for ordinary purposes whether commercial, industrial, farm, institutional, or residential. Ordinary structures not exceeding seventy-five feet (75') in height shall be protected with Class I Materials. Ordinary structures greater than seventy-five feet (75') in height and the remaining portion does not exceed seventy-five feet (75') in height, the requirements for Class II air terminals and conductors shall apply only to that portion exceeding seventy-five feet (75') in heights. Class II conductors from the higher portion shall be extended to ground and shall be interconnected with the balance of the system.

B. All work in this section shall be coordinated with the roof replacement work.

C. The Contractor is cautioned to investigate all existing conditions and materials of construction.

D. Copper lightning protection materials shall not be installed on aluminum roofing, siding, or other aluminum surfaces.

E. Aluminum lightning protection materials shall not be installed on copper surfaces.

3.2 AIR TERMINALS

A. The tip of the air terminal shall not be less than ten inches (10”) above the object or area it is to protect and should be aligned vertically.

B. Air terminals shall be secured against overturning by attachment to the object to be protected or by means of braces that shall be permanently and rigidly attached to the building. An air terminal exceeding twenty-four inches (24”) in height shall be supported at a point not less than one-half (½) its height.

C. Air terminal bases shall be secured with thermoplastic membrane or approved adhesives as detailed. Coordinate with Section 075420 – Thermoplastic Roofing.

3.3 ZONE PROTECTION

A. At a minimum, though additional is anticipated to be required to match the existing layout, the zone protection used at the site shall include the following strike termination locations:
   1. Strike termination devices shall be placed at or within two feet (2’) of edges and outside corners of the flat roofs.
   2. Strike termination devices shall be placed at intervals not exceeding twenty feet (20’).
   3. Strike termination devices twenty-four inches (24”) or more above the object or are to be protected shall be permitted to the placed at intervals not exceeding twenty-five feet (25’).
   4. Flat roofs that exceed fifty feet (> 50’) in width or length shall have additional strike termination devices located at intervals not to exceeds fifty feet (50’) on the flat areas.

3.4 RE-INSTALLATION

A. The Contractor shall survey the existing conductors and reuse where applicable. Reinstall the existing conductors as inconspicuously as practical and with the proper bends. Replace damaged components as required with the Owner’s approval and under a Unit Price scope of work.

B. Make connections of dissimilar metal with bimetallic type fittings to prevent electrolytic action.

C. Use exothermic welding type connections which form solid metal joints in the main vertical and horizontal conductors, and for connections that are not exposed in the finished work.

D. Protect copper conductors with stiff copper or brass tubing, which enclose the conductors from the top to the bottom of tubing, between one foot (1’) below and seven feet (7’) above the finished grade.

E. Sheath copper conductors, which pass over cast stone, cut stone, architectural concrete and masonry surfaces, with not less than one-sixteenth inch (1/16") thickness of lead to prevent staining of the exterior finish surfaces.

F. Bends in these conductors shall have no angle less than ninety degrees (90º). Bends shall have a radius of not less than eight inches (8").

G. Bonding conductors shall be connected to the bonding clamps allowing a reasonable amount of slack for expansion and contraction.

H. Connect exterior metal surfaces, located three feet (3') of the lightning protection system conductors, to the lightning protection system conductors to prevent flashovers.

I. Weld or bond the non-electrically continuous sections together and make them electrically continuous.

J. Verify the electrical continuity by measuring the ground resistance to earth at the ground level, at the top of the building or stack, and at intermediate points with a sensitive ohmmeter. Compare the resistance readings.

K. Connect the air terminals together with an exterior conductor connected to the structural steel framework at not more than sixty-foot (60') intervals.

L. Install ground connections to each at not more than sixty-foot (60') intervals; unless they penetrate the roof system.

M. Weld or braze bonding plates, not less than eight-inch (8") square, to cleaned sections of the steel and connect the conductors to the plates.

N. Do not pierce the structural steel in any manner. Connections to the structural steel shall conform to UL 96A.

3.5 CORROSION PROTECTION

A. Precautions shall be taken to provide the necessary protection against any potential deterioration of any lightning protection due to local conditions. Copper components installed within twenty-four inches (24") of the top of the chimney or vent emitting corrosive gases shall be protected by a hot-dipped lead coating or equivalent.

3.6 CLEANUP

A. All floor and adjacent areas, both interior and exterior, damaged or stained by the installation of the lightning protection work shall be repaired and cleaned of all dust, debris and any other materials to the Owner's satisfaction.

END OF SECTION

ROOF REPLACEMENT AND ASSOCIATED WORK AT THE
HOOKSETT SAFETY CENTER

15 LEGENDS DRIVE
HOOKSETT, NH 03106

PREPARED FOR
TOWN OF HOOKSETT
35 MAIN STREET
HOOKSETT, NH 03106

SITE MAP
NOT TO SCALE

LOCATION MAP
NOT TO SCALE

DRAWING NO	TITLE
G100	COVER SHEET
G101	SITE PLAN AND GENERAL NOTES
G102	ATTACHMENT LAYOUT PLAN, MODIFIED BITUMEN PLAN, ROOF CROSS SECTIONS
A101	OVERALL ROOF AREA PLAN AND CONCEPTUAL TAPERED INSULATION PLAN
A102	PARTIAL ROOF AREA PLAN
A103	PARTIAL ROOF AREA PLAN
A501	DETAILS
A502	DETAILS
A503	DETAILS
A504	DETAILS
S001	STRUCTURAL NOTES
S101	OVERALL ROOF AREA PLAN
S102	PARTIAL ROOF AREA PLANS AND STRUCTURAL DETAILS

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OWNER
TOWN OF HOOKSETT
35 MAIN STREET
HOOKSETT, NH, 03106

NO.	DATE	DESCRIPTION	BY

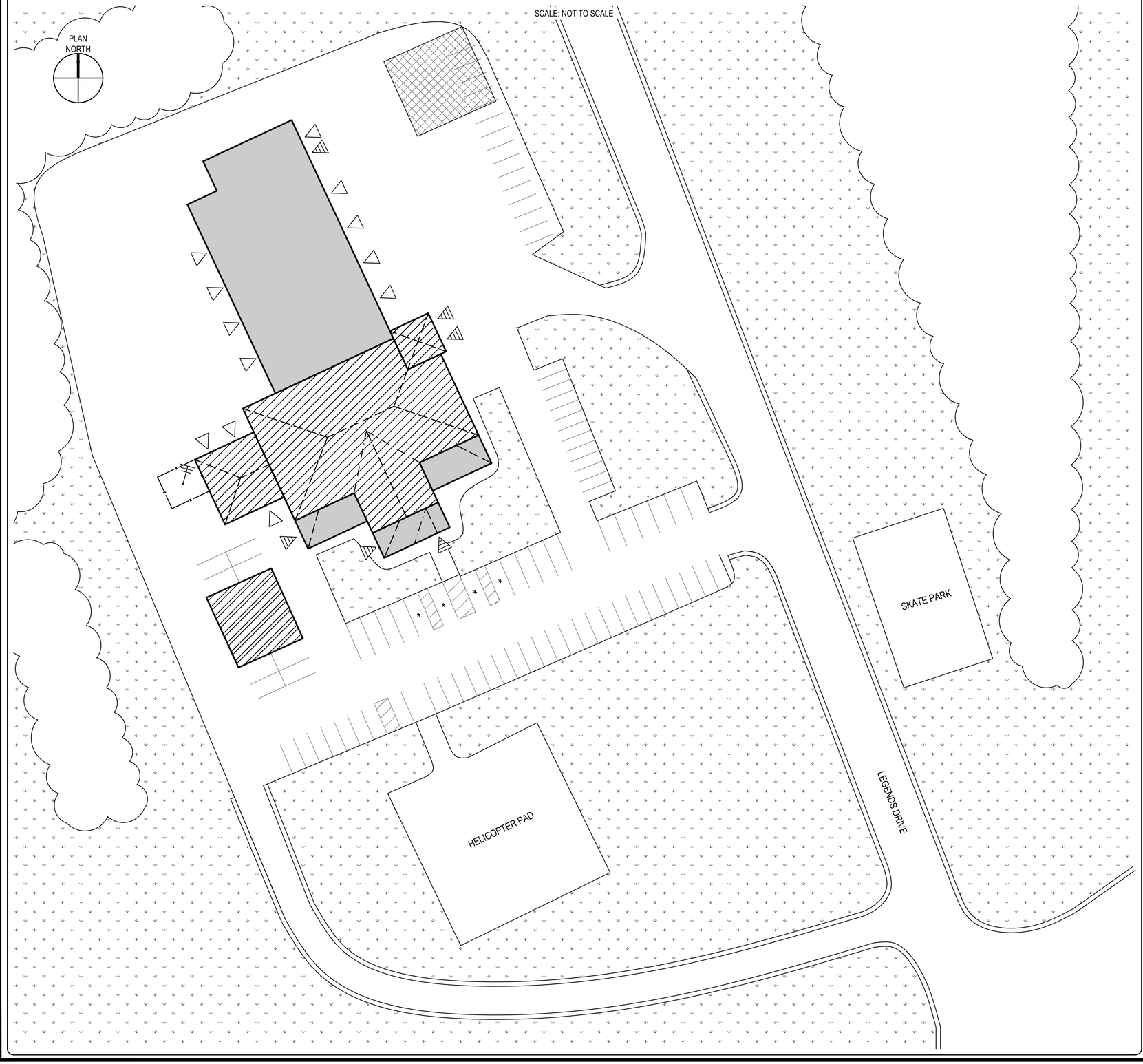
PROJECT NO.	841830
CADD FILE	841830 G100
DESIGNED BY	ALL
DRAWN BY	MRS
CHECKED BY	ACP/CM
DATE	8/1/24
DRAWING SCALE	NOT TO SCALE

GRAPHIC SCALE

SHEET TITLE
COVER SHEET

DRAWING NO.
G100

SITE PLAN



GENERAL NOTES

1. THE INFORMATION SHOWN ON THIS DRAWING HAS BEEN COMPILED FROM VARIOUS SOURCES AND MAY NOT REFLECT THE ACTUAL CONDITIONS AT THE TIME OF CONSTRUCTION.
2. FOR THE SAKE OF CLARITY, EACH INDIVIDUAL DETAIL HAS NOT BEEN INDICATED ON THE PLANS AND/OR ELEVATIONS. INSTALLATION DETAILS HAVE BEEN INDICATED FOR TYPICAL COMPONENTS AT RANDOM LOCATIONS.
3. HATCH PATTERNS ARE FOR REPRESENTATION ONLY AND SHOULD NOT BE USED AS A MEANS FOR QUANTIFYING.
4. JOB SITE SAFETY IS THE CONTRACTOR'S RESPONSIBILITY. GALE REPRESENTATIVES, INCLUDING SUBCONSULTANTS RETAINED BY GALE, MAY VISIT THE JOB SITE FROM TIME TO TIME. THESE VISITS ARE FOR CLARIFICATIONS OF SPECIFIC DESIGN RELATED ISSUES ONLY AND ARE NOT FOR THE PURPOSES OF JOB SITE SAFETY. IT IS THE CONTRACTOR'S SOLE RESPONSIBILITY TO COMPLY WITH ALL SITE SAFETY APPLICABLE REQUIREMENTS.
5. ALL ITEMS OF CONSTRUCTION SHALL BE IN ACCORDANCE WITH LOCAL, STATE, AND FEDERAL REGULATIONS APPLICABLE TO THE PROJECT.
6. THE CONTRACTOR SHALL REPORT DETERIORATED OR UNSUITABLE STRUCTURAL COMPONENTS OR SUBSTRATES TO THE OWNER PRIOR TO PERFORMING ANY INSTALLATION WORK.
7. THE CONTRACTOR IS CAUTIONED THAT DUE TO BUILDING OCCUPANCY, THE OWNER REQUIRES COMPLIANCE ON WORK HOURS, SCHEDULING, SET-UP, CLEANUP, PARKING, SECURITY, ETC. REFER TO SPECIFICATIONS FOR OWNER REQUIREMENTS.
8. DETAILS NOT DEPICTED SHALL BE CONSTRUCTED IN A MANNER CONSISTENT WITH THE DETAIL DRAWINGS.
9. REFER TO CONTRACT DOCUMENTS FOR WORK SCHEDULE LIMITATIONS.
10. THE CONTRACTOR SHALL BE RESPONSIBLE FOR REMOVING AND LEGALLY DISPOSING OF ALL MATERIALS LISTED AND/OR INDICATED ON THE DRAWINGS OR NOTED IN THE WRITTEN SPECIFICATIONS.
11. THE BUILDING SHALL BE MAINTAINED IN A DUST FREE CONDITION. THE CONTRACTOR SHALL PROVIDE ALL NECESSARY TEMPORARY PROTECTION TO ENSURE THE INTERIOR OF THE BUILDING REMAINS DUST FREE. NO DEMOLITION CAN PROCEED UNTIL AN APPROVED TEMPORARY PROTECTION SYSTEM IS IN PLACE.
12. DUE TO THE CONGESTION AROUND THE PROJECT SITE THE CONTRACTOR MUST PROVIDE DETAILED TRAFFIC AND SCAFFOLDING PLANS TO THE OWNER FOR REVIEW. THE CONTRACTOR WILL ONLY BE ALLOWED THE AREAS SHOWN FOR SETUP AND STORAGE OF MATERIALS.
13. NOTIFY THE OWNER OF WORK LOCATIONS A MINIMUM OF 72 HOURS IN ADVANCE IN ORDER THAT OCCUPANCY BELOW THE WORK AREAS MAY BE CONTROLLED.

SITE NOTES

1. CONTRACTOR SHALL PROVIDE ALL OVERHEAD PROTECTION AT BUILDING ENTRANCE WAYS IN ACCORDANCE WITH OSHA, LOCAL, STATE, AND FEDERAL GUIDELINES.
2. CONTRACTOR SHALL PROVIDE ALL TEMPORARY BARRICADES TO PREVENT PEDESTRIANS FROM ACCESSING THE WORK AREA OR FROM WALKING UNDER WORK LOCATIONS.
3. ALL OVERHEAD PROTECTION SHALL EXTEND A MINIMUM OF 8'-0" BEYOND THE BUILDINGS. BEYOND 8'-0", PROVIDE FENCING TO A POINT BEYOND THE CONTRACT LIMIT LINE.
4. CONTRACTOR SHALL PROVIDE TEMPORARY BARRICADES AT PEDESTRIAN WALKWAYS. CONTRACTOR WILL BE REQUIRED TO PROVIDE A MONITOR AT GROUND LEVEL TO WARN PEDESTRIAN TRAFFIC OF ABOVE ROOF LINE WORK.
5. THE CONTRACTOR IS CAUTIONED THAT THE DRIVES AND WALKWAYS IMMEDIATELY ADJACENT TO THE CONTRACT LIMIT LINE WILL BE ACTIVE AND OCCUPIED DURING CONSTRUCTION. CONTRACTOR SHALL ACCOMMODATE OWNER'S VEHICLE AND PEDESTRIAN REQUIREMENTS AND SHALL COORDINATE ACCESS TO ADJACENT BUILDINGS.
6. TREE LOCATIONS AND SIZES ARE APPROXIMATE AND ARE USED AS VISUAL REPRESENTATION ONLY.

LEGEND

- BUILDING OUTLINE
- HIP/RIDGE
- VALLEY
- ROADWAY
- RESTRICTED PARKING
- PARKING SPACE
- * ADA PARKING SPACE
- BUILDING NOT IN CONTRACT
- ROOF AREA NOT IN CONTRACT
- GRASS AREA
- PROPOSED CONTRACTOR LAYDOWN AND STORAGE AREA; FINAL LOCATION TO BE COORDINATED AND APPROVED BY OWNER.
- ROOF AREA IN CONTRACT
- APPROXIMATE AREA OF DENSE TREES
- BUILDING ENTRANCE
- OVERHEAD DOOR
- FENCE
- RADIO TOWER

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DATE	8/1/24
DRAWING SCALE	NOT TO SCALE

GRAPHIC SCALE

SHEET TITLE

SITE PLAN AND GENERAL NOTES

DRAWING NO.

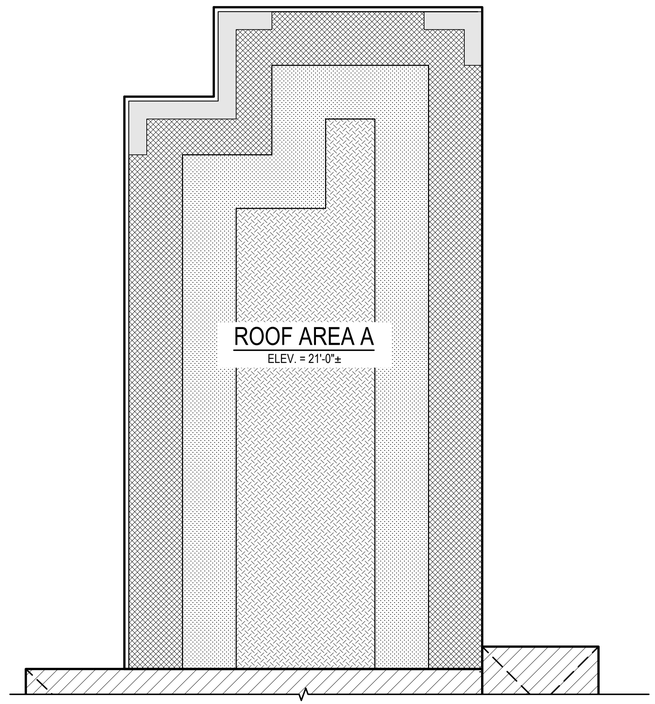
G101

ATTACHMENT LAYOUT PLAN

SCALE: NOT TO SCALE

PLAN NORTH

BASED ON FM GLOBAL DATA SHEET 1-28, ASCE 7-16						
ROOF AREA	ROOF ELEVATION	PERIMETER WIDTH	ZONE 1 PRIME FIELD RATING	ZONE 1 FIELD RATING	ZONE 2 PERIMETER RATING	ZONE 3 CORNER RATING
A	21'-0" ±	12'-0" ±	26 psf	41 psf	52 psf	68 psf

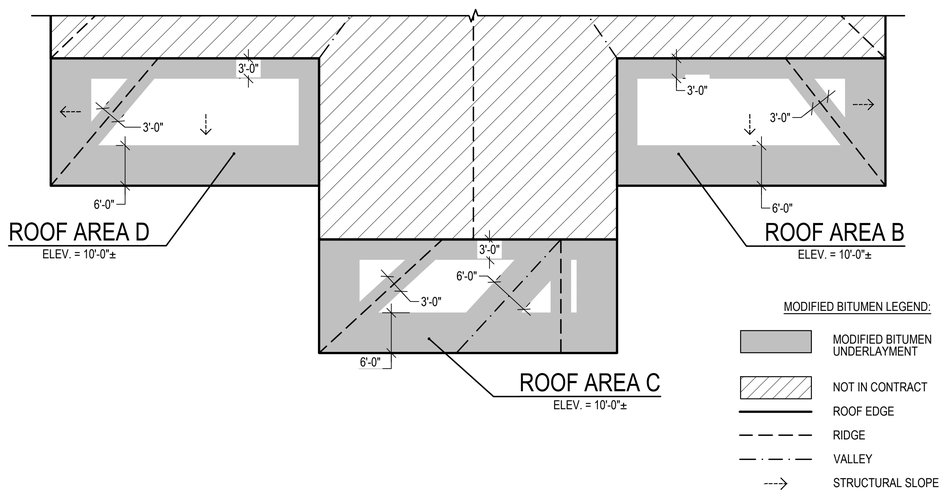


LEGEND:

- INNER FIELD OF ROOF
- OUTER FIELD OF ROOF
- PERIMETER OF ROOF
- CORNER OF ROOF
- NOT IN CONTRACT
- ROOF EDGE
- PARAPET

MODIFIED BITUMEN UNDERLAYMENT PLAN

SCALE: NOT TO SCALE



MODIFIED BITUMEN LEGEND:

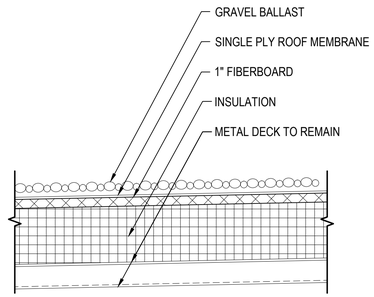
- MODIFIED BITUMEN UNDERLAYMENT
- NOT IN CONTRACT
- ROOF EDGE
- RIDGE
- VALLEY
- STRUCTURAL SLOPE

EXISTING ROOF CROSS SECTION

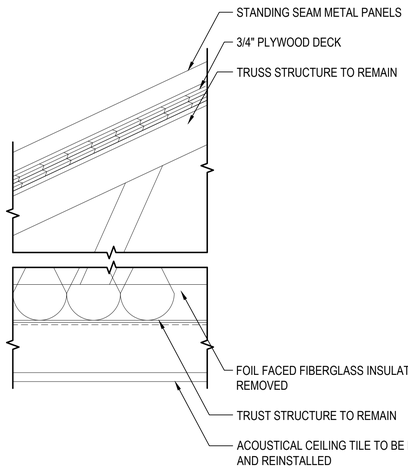
ALL ITEMS ARE EXISTING TO BE REMOVED UNLESS NOTED OTHERWISE

SCALE: 3"=1'-0"

0 3" 6" 9"



ROOF AREA A



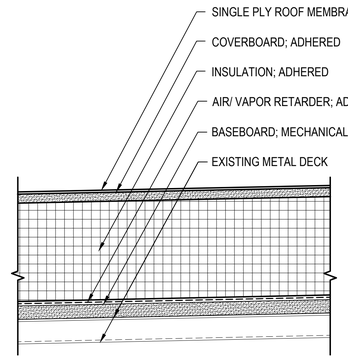
ROOF AREAS B, C, AND D

NEW ROOF CROSS SECTION

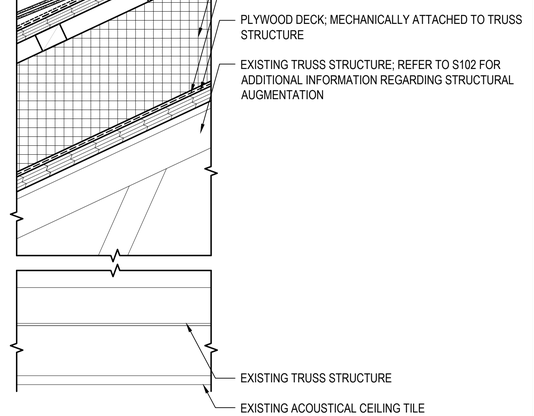
ALL ITEMS ARE NEW UNLESS OTHERWISE NOTED

SCALE: 3"=1'-0"

0 3" 6" 9"



ROOF AREA A



ROOF AREAS B, C, AND D

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DRAWN BY	MRS/ERS
CHECKED BY	ACP/CM
DATE	8/1/24
DRAWING SCALE	AS NOTED

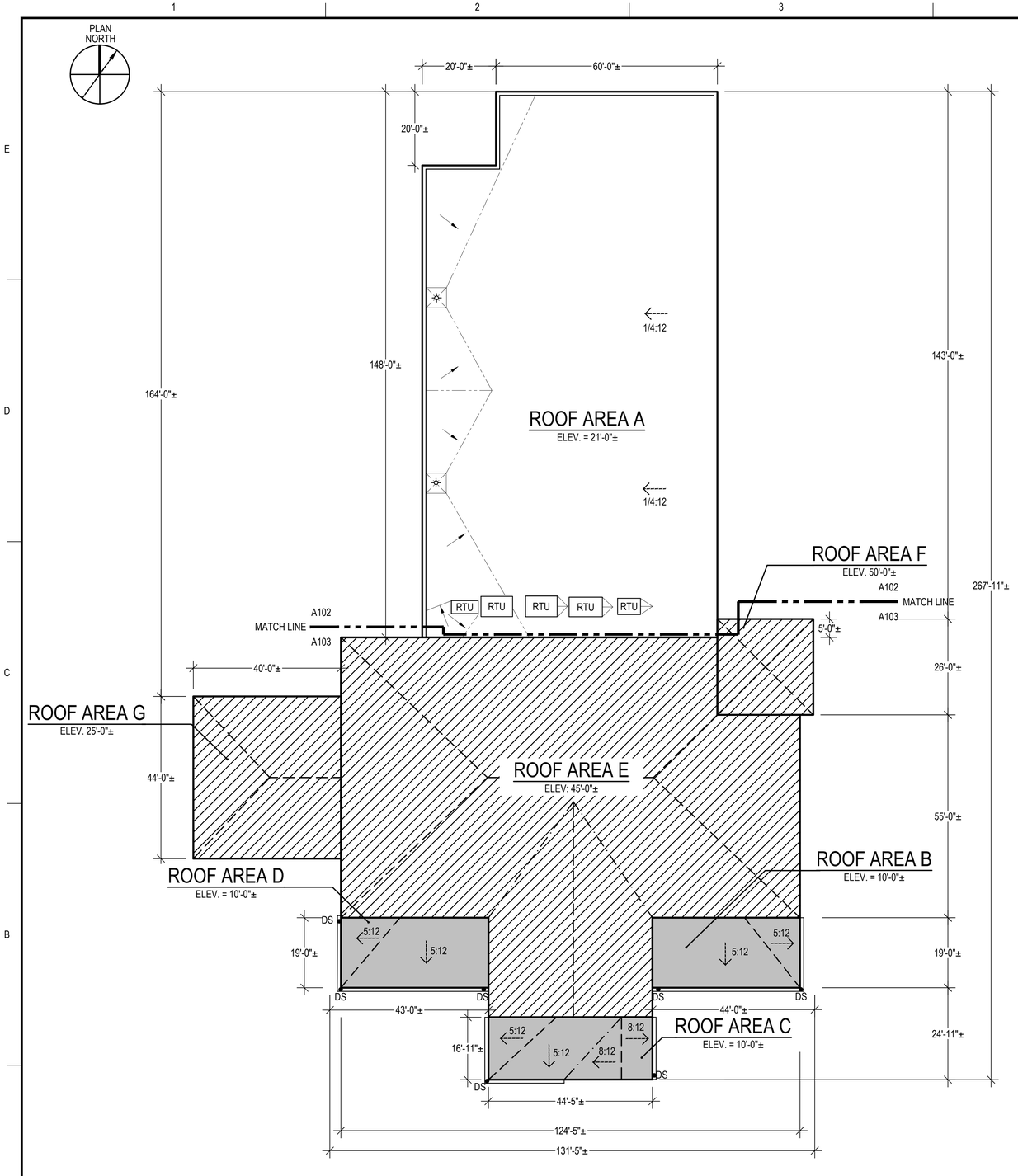
GRAPHIC SCALE

SHEET TITLE

ATTACHMENT LAYOUT PLAN, MODIFIED BITUMEN PLAN, ROOF CROSS SECTIONS

DRAWING NO.

G102



1 A101 OVERALL ROOF AREA
SCALE: 1/16" = 1'-0"

LEGEND

ALL ITEMS ARE EXISTING UNLESS DESIGNATED OTHERWISE

- ROOF EDGE
- PARAPET
- HIP/RIDGE
- VALLEY
- CRICKET
- CRICKET SLOPE INDICATOR
- DS — GUTTER WITH DOWNSPOUT
- ROOF AREA; NOT IN CONTRACT
- STEEP SLOPE ROOF
- STRUCTURAL SLOPE; # INDICATES SLOPE RATIO
- RTU — ROOF TOP MECHANICAL UNIT
- ROOF DRAIN

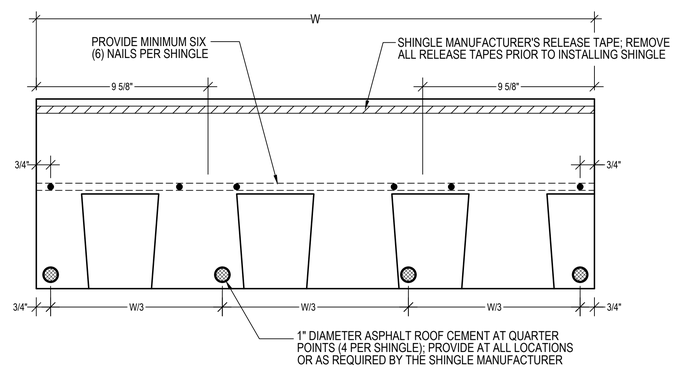
ROOFING NOTES

1. ROOFING AND FLASHING SHALL BE 100% WEATHERTIGHT ON A DAILY BASIS.
2. REMOVE ONLY AS MUCH ROOFING AS CAN BE REPLACED ON THE SAME DAY. NO PHASED CONSTRUCTION IS ALLOWED.
3. THE CONTRACTOR SHALL TAKE PRECAUTIONS TO PROTECT ADJACENT NOT IN CONTRACT ROOF SYSTEMS AND NEWLY INSTALLED ROOF AREAS. ANY DAMAGE THAT OCCURS AS A RESULT OF THE CONSTRUCTION SHALL BE REPAIRED BY THE CONTRACTOR AT NO ADDITIONAL COST TO THE OWNER.
4. CONTRACTOR TO VERIFY WITH BUILDING OWNER THE STATUS OF ALL HVAC EQUIPMENT, MECHANICAL UNITS, AND RELATED ROOFTOP PENETRATIONS. ALL ABANDONED ROOFTOP EQUIPMENT, STACKS, WOOD SLEEPERS, ETC. SHALL BE REMOVED AND LEGALLY DISPOSED OF OFF SITE. ALL ABANDONED CURBS SHALL BE REMOVED - EXISTING ROOF DECK SHALL BE PATCHED/ REPAIRED AND PREPARED TO RECEIVE NEW ROOFING SYSTEM.
5. RESECURE ALL PIPES, CONDUITS, ETC. AND REPLACE ALL FAILED, DETERIORATING, AND MISSING FASTENERS. REMOVE AND REPLACE ALL DETERIORATED SLEEPERS WITH NEW PRESSURE TREATED WOOD SLEEPERS. RELOCATE PIPE SUPPORTS AND SLEEPERS AS REQUIRED TO PROVIDE PROPER ATTACHMENT OF THE FASTENERS AND SUPPORT TO THE PIPES WITHOUT OBSTRUCTING ROOFTOP DRAINAGE; TYPICAL.
6. NIGHTLY TIE-IN OF THE ROOF INSULATION SYSTEM SHALL BE STAGGERED MINIMUM 12" BETWEEN EACH LAYER. LOOSE LAID BOARDS WILL BE REQUIRED TO PROVIDE TEMPORARY SUPPORT OF THE CONDITIONS. SHOULD STAGGERED INSULATION NOT BE PROVIDED, THE ROOF INSULATION IS SUBJECT TO REMOVAL AND REPLACEMENT AT NO ADDITIONAL COST TO THE OWNER.
7. REFER TO SHEET G101 FOR GENERAL NOTES.
8. AT ROOF AREA A, CONTRACTOR TO RESECURE THE CORRUGATED METAL DECK; REFER TO PROJECT SPECIFICATIONS FOR ADDITIONAL INFORMATION.

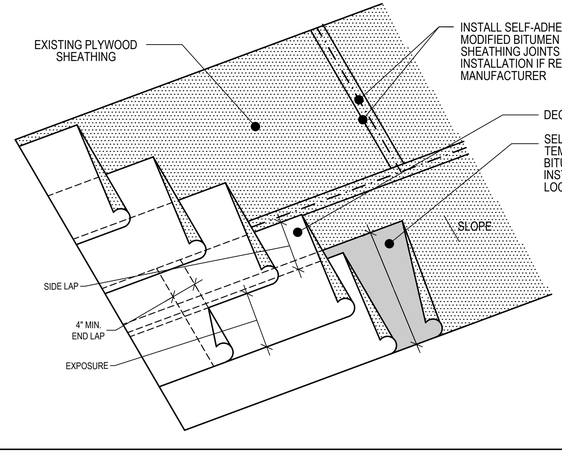
CRICKET INSULATION LAYOUT NOTES

1. ADJUSTMENTS TO WOOD BLOCKING HEIGHTS AND CONFIGURATIONS OF FLASHINGS TO CONFORM TO TAPERED INSULATION LAYOUT IS THE RESPONSIBILITY OF THE CONTRACTOR. NO ADDITIONAL COSTS WILL BE ALLOWED TO THE CONTRACTOR IF PROPOSED DETAIL CONFIGURATIONS ARE ALTERED.
2. ALL ROOF PENETRATIONS ARE NOT SHOWN ON THIS CONCEPTUAL LAYOUT; PROVIDE CRICKETS BEHIND UNITS TO PROMOTE DRAINAGE. CONTRACTOR TO VERIFY EXISTING ROOF DECK SLOPE AS THE WORK PROGRESSES.
3. THE STRUCTURAL SLOPE AT ROOF AREA TO RECEIVE FLAT STOCK INSULATION, ROOF AREA A IS ASSUMED TO BE 1/4" PER FOOT MINIMUM. FIELD MODIFICATIONS MAY BE REQUIRED TO PREVENT PONDING.
4. ANY PONDING WATER ENCOUNTERED AFTER THE INSTALLATION OF THE NEW ROOF SYSTEM SHALL BE ADDRESSED BY THE CONTRACTOR AT NO ADDITIONAL COST TO THE OWNER. PONDING WATER SHALL BE DEFINED AS 1/2" OF STANDING WATER WITHIN A 100 SQUARE FOOT AREA AFTER A 24 HOUR PERIOD.
5. REVIEW OF THE EXPOSED ROOF DECKS BY THE CONTRACTOR WILL BE REQUIRED PRIOR TO PLACEMENT OF THE INSULATION SYSTEM TO DETERMINE POTENTIAL UNFORESEEN LOW AREAS.

ASPHALT SHINGLE FASTENING AND WIND SEALING



TYPICAL UNDERLAYMENT CONFIGURATION



OVERLAPS	
EXPOSURE = WIDTH OF UNDERLAYMENT / 2	- 3"
SIDE LAP = WIDTH OF UNDERLAYMENT / 2	+ 3"

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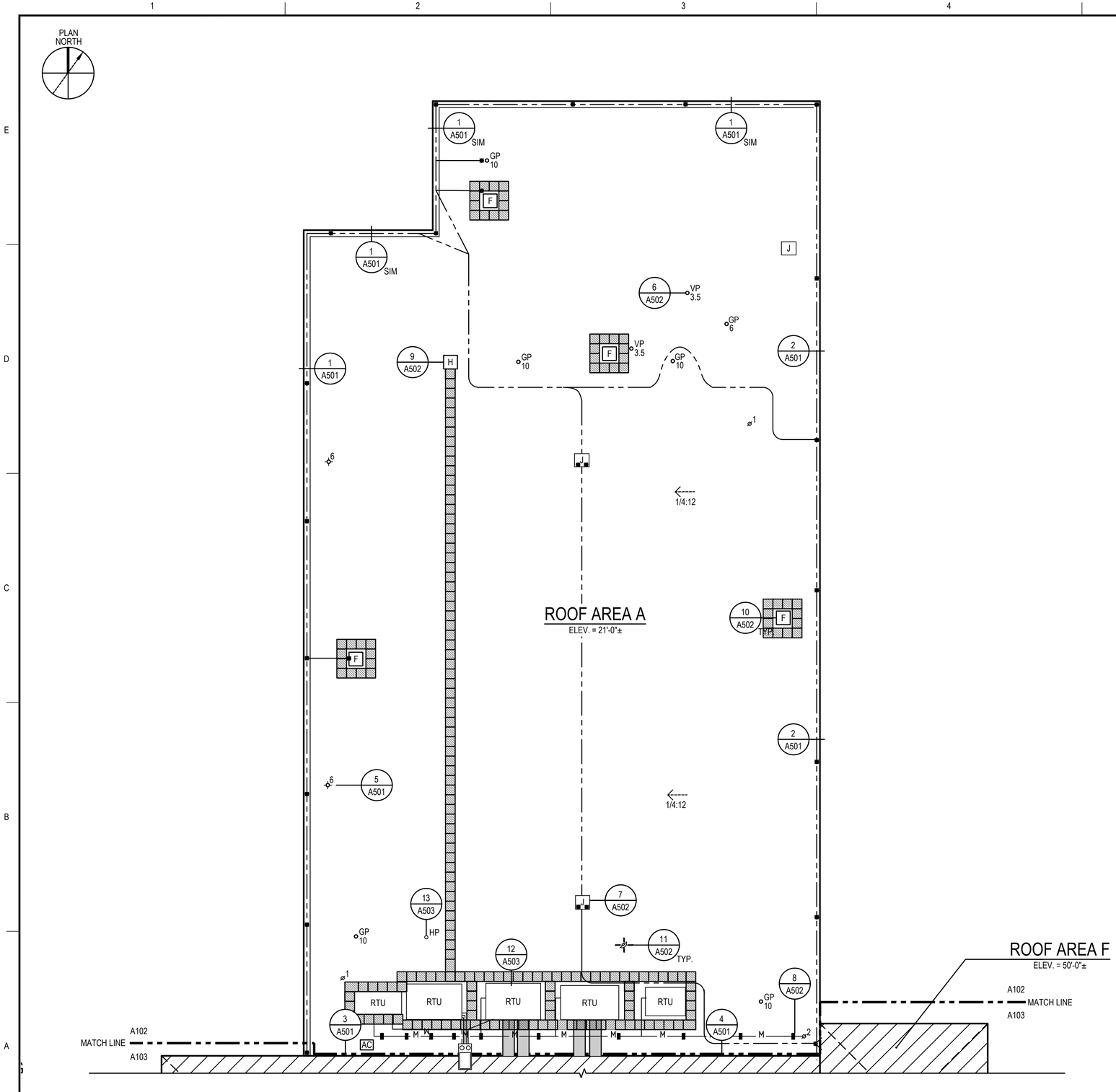
DATE	8/1/24
DRAWING SCALE	1/16"=1'-0"

GRAPHIC SCALE
0 8' 16' 32'

SHEET TITLE
OVERALL ROOF AREA PLAN AND CONCEPTUAL CRICKET INSULATION PLAN

DRAWING NO.
A101



1 A102 ROOF AREA SECTION
SCALE: 1/8" = 1'-0"

LEGEND

ALL ITEMS ARE EXISTING UNLESS DESIGNATED OTHERWISE

- ROOF EDGE
- PARAPET
- HIP/RIDGE
- VALLEY
- M — MECHANICAL PIPING
- LIGHTENING PROTECTION
- CONDUIT
- STEEP SLOPE ROOF
- AIR TERMINAL
- VP # — VENT PIPE; # INDICATES DIAMETER
- GP # — GAS VENT; # INDICATES DIAMETER
- HP — HOT PIPE
- F — FAN
- ⌀# — PIPE PENETRATION; # INDICATES DIAMETER
- - / A50- — DETAIL INDICATOR
- NEW WALKWAY PAD
- V — VENT
- H — HATCH
- BALLASTED SATELLITE DISH
- ROOF AREA; NOT IN CONTRACT
- DUCTWORK
- RTU — ROOF TOP MECHANICAL UNIT
- WALL MOUNTED TERMINAL
- J / J — J VENT
- STRUCTURAL SLOPE; INDICATES SLOPE RATIO
- # — ROOF DRAIN; # INDICATES DIAMETER
- DS — GUTTER WITH DOWNSPOUT
- NEW SNOWTABS

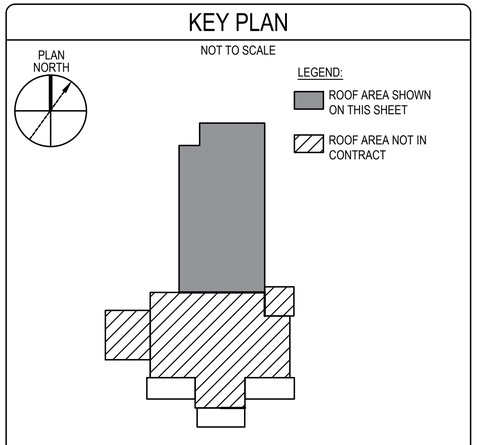
NOT ALL ITEMS MAY BE SHOWN ON THIS SHEET

SHEET NOTES

1. REFER TO SHEET G101 FOR GENERAL NOTES.
2. REFER TO A101 FOR ROOFING NOTES.

KEY PLAN

NOT TO SCALE



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35 MAIN STREET
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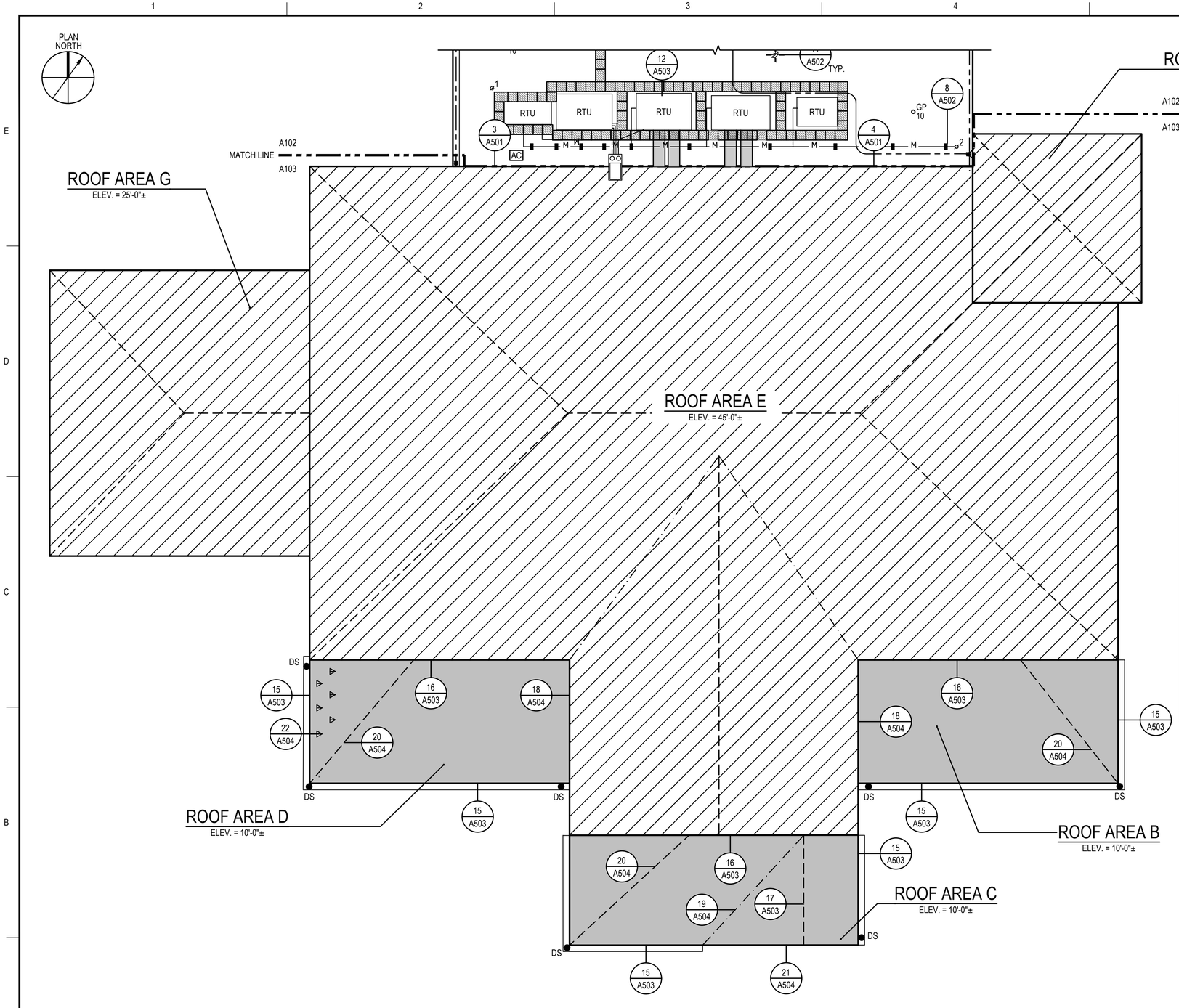
NO.	DATE	DESCRIPTION	BY

PROJECT NO.	841830
CADD FILE	841830 A100s
DESIGNED BY	ALL
DRAWN BY	MRS
CHECKED BY	ACP/CM
DATE	8/1/24
DRAWING SCALE	1/8"=1'-0"

GRAPHIC SCALE
0 4' 8' 16'

SHEET TITLE
PARTIAL ROOF AREA PLAN

DRAWING NO.
A102



LEGEND

ALL ITEMS ARE EXISTING UNLESS DESIGNATED OTHERWISE

- ROOF EDGE
- PARAPET
- HIP/RIDGE
- VALLEY
- M — MECHANICAL PIPING
- LIGHTENING PROTECTION
- CONDUIT
- STEEP SLOPE ROOF
- AIR TERMINAL
- VP # — VENT PIPE; # INDICATES DIAMETER
- GP # — GAS VENT; # INDICATES DIAMETER
- HP — HOT PIPE
- F — FAN
- ⌀# — PIPE PENETRATION; # INDICATES DIAMETER
- - / A50- — DETAIL INDICATOR
- NEW WALKWAY PAD
- V — VENT
- H — HATCH
- BALLASTED SATELLITE DISH
- ROOF AREA; NOT IN CONTRACT
- DUCTWORK
- RTU — ROOF TOP MECHANICAL UNIT
- WALL MOUNTED TERMINAL
- J / J — J VENT
- STRUCTURAL SLOPE; INDICATES SLOPE RATIO
- ROOF DRAIN; # INDICATES DIAMETER
- DS — GUTTER WITH DOWNSPOUT
- NEW SNOWTABS

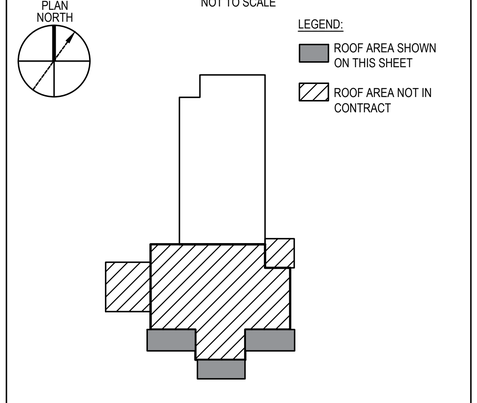
NOT ALL ITEMS MAY BE SHOWN ON THIS SHEET

SHEET NOTES

1. REFER TO SHEET G101 FOR GENERAL NOTES.
2. REFER TO A101 FOR ROOFING NOTES.

KEY PLAN

NOT TO SCALE



1 / A103 ROOF AREA SECTION
SCALE: 1/8" = 1'-0"

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PROJECT
ROOF REPLACEMENT & ASSOCIATED WORK
AT THE HOOKSETT SAFETY CENTER
15 LEGENDS DR
HOOKSETT, NH, 03106

OWNER
TOWN OF HOOKSETT
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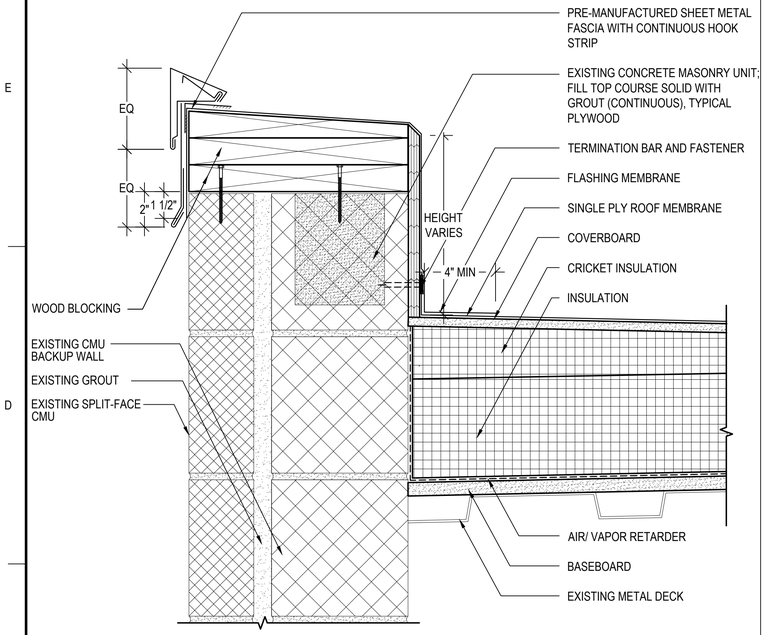
GRAPHIC SCALE
0 4' 8' 16'

SHEET TITLE
PARTIAL ROOF AREA PLAN

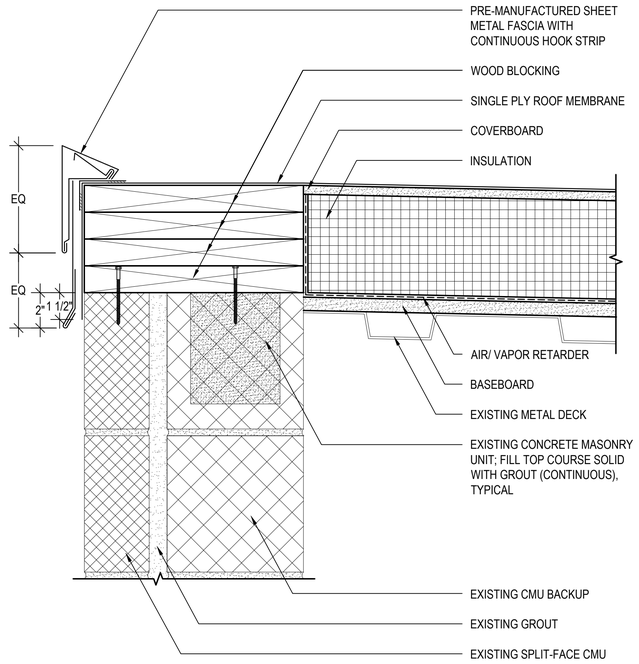
DRAWING NO.
A103

PROVIDE 2 PIECE SHEET METAL FASCIA IN A LENGTH TO ALIGN WITH BOTTOM OF SHEET METAL FASICA OF DETAIL 2/A501.



1 A501 ROOF EDGE TYPE 1

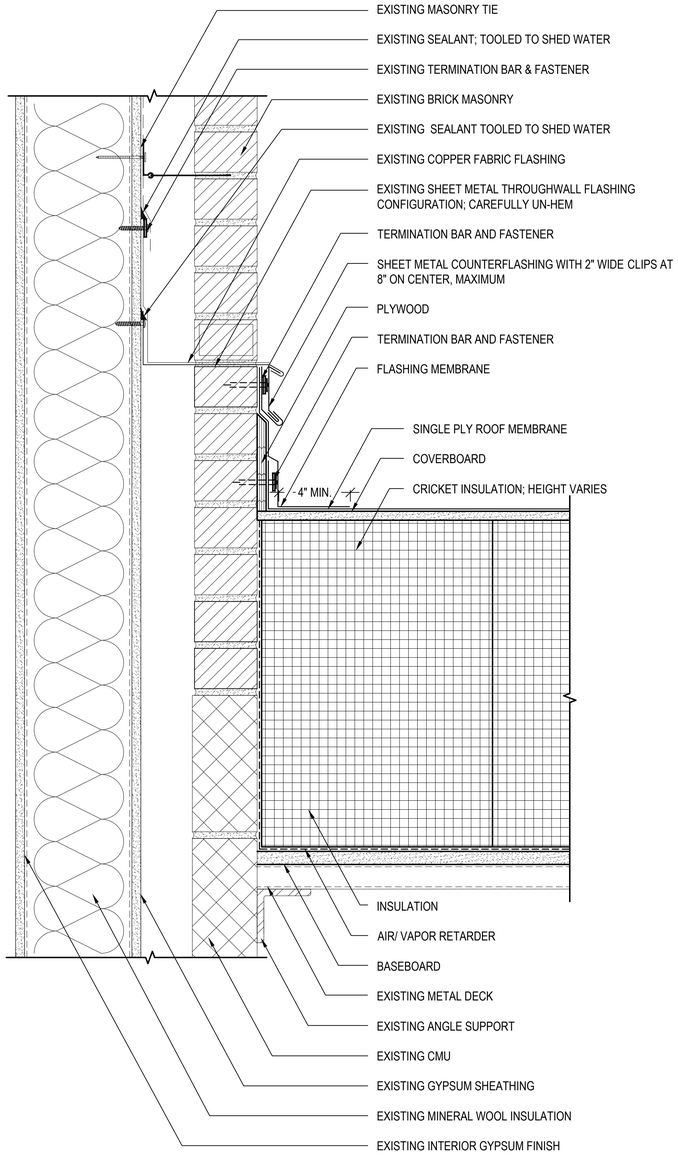
SCALE: 3"=1'-0"
(ALL ITEMS ARE NEW UNLESS DESIGNATED AS EXISTING)



2 A501 ROOF EDGE TYPE 2

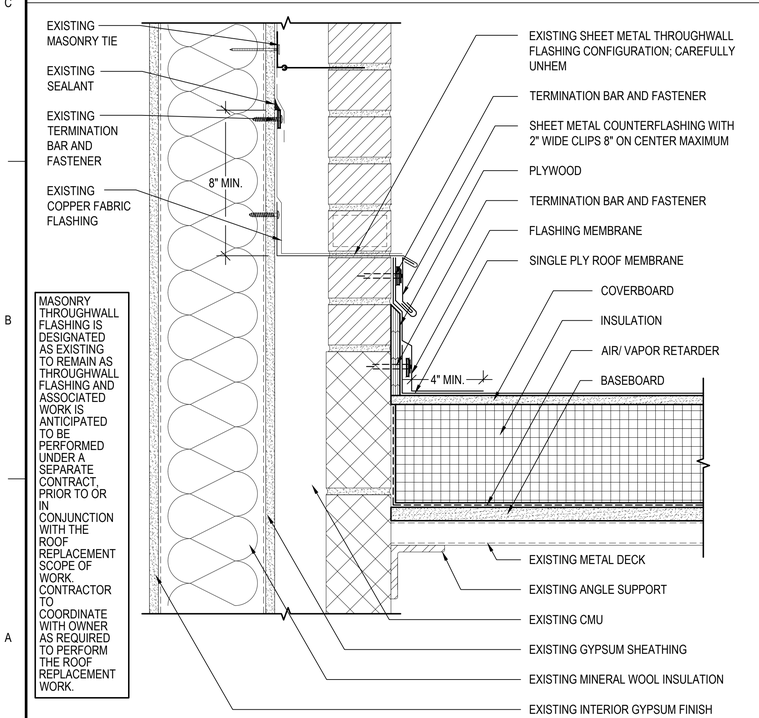
SCALE: 3"=1'-0"
(ALL ITEMS ARE NEW UNLESS DESIGNATED AS EXISTING)

MASONRY THROUGHWALL FLASHING IS DESIGNATED AS EXISTING TO REMAIN AS THROUGHWALL FLASHING AND ASSOCIATED WORK IS ANTICIPATED TO BE PERFORMED UNDER A SEPARATE CONTRACT, PRIOR TO OR IN CONJUNCTION WITH THE ROOF REPLACEMENT SCOPE OF WORK. CONTRACTOR TO COORDINATE WITH OWNER AS REQUIRED TO PERFORM THE ROOF REPLACEMENT WORK.



3 A501 RISING WALL FLASHING AT CRICKET

SCALE: 3"=1'-0"
(ALL ITEMS ARE NEW UNLESS DESIGNATED AS EXISTING)



MASONRY THROUGHWALL FLASHING IS DESIGNATED AS EXISTING TO REMAIN AS THROUGHWALL FLASHING AND ASSOCIATED WORK IS ANTICIPATED TO BE PERFORMED UNDER A SEPARATE CONTRACT, PRIOR TO OR IN CONJUNCTION WITH THE ROOF REPLACEMENT SCOPE OF WORK. CONTRACTOR TO COORDINATE WITH OWNER AS REQUIRED TO PERFORM THE ROOF REPLACEMENT WORK.

4 A501 RISING WALL FLASHING

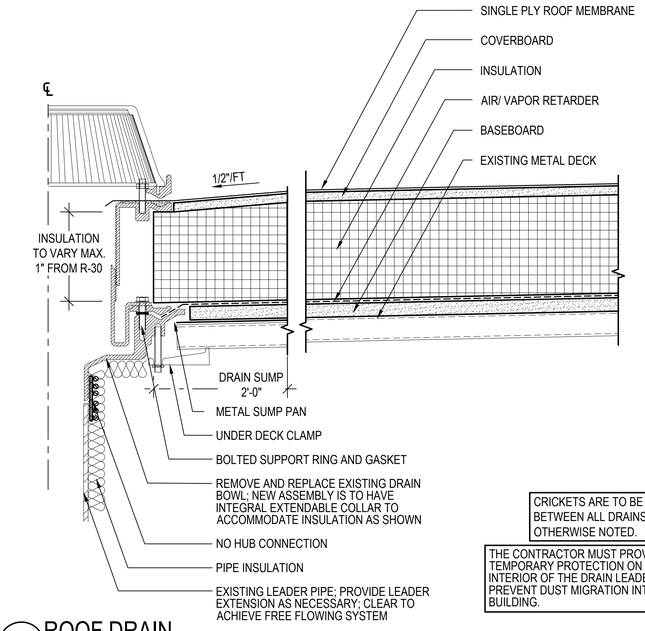
SCALE: 3"=1'-0"
(ALL ITEMS ARE NEW UNLESS DESIGNATED AS EXISTING)

SUMP INSULATION TO BE INSTALLED AS REQUIRED BY THE MANUFACTURER.

COORDINATE INTERIOR ACCESS WITH THE OWNER.

DRAIN PIPE INSULATION SHALL EXTEND 24" MINIMUM VERTICALLY, OR 12" BEYOND THE FIRST ELBOW DIRECTION, WHICH EVER IS LESS.

CLEAN DRAINS PRIOR TO AND AFTER COMPLETION OF THE ROOFING OPERATION.



CRICKETS ARE TO BE PROVIDED BETWEEN ALL DRAINS UNLESS OTHERWISE NOTED.

THE CONTRACTOR MUST PROVIDE TEMPORARY PROTECTION ON THE INTERIOR OF THE DRAIN LEADER LINE TO PREVENT DUST MIGRATION INTO THE BUILDING.

5 A501 ROOF DRAIN

SCALE: 3"=1'-0"
(ALL ITEMS ARE NEW UNLESS DESIGNATED AS EXISTING)

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DRAWING SCALE	3"=1'-0"

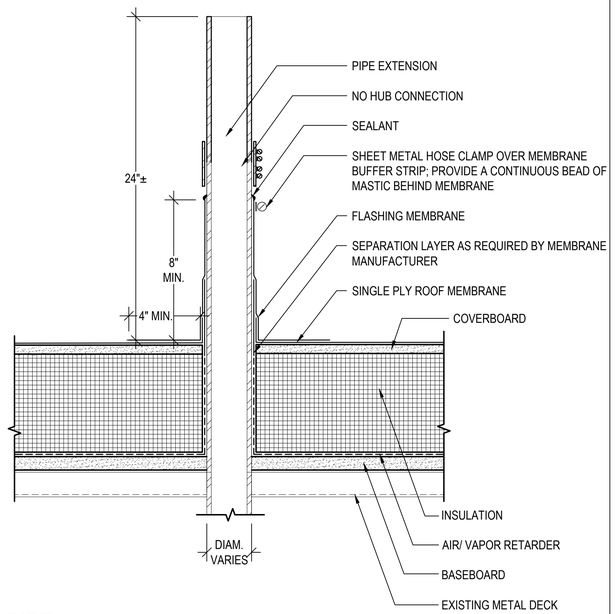
GRAPHIC SCALE

SHEET TITLE

DETAILS

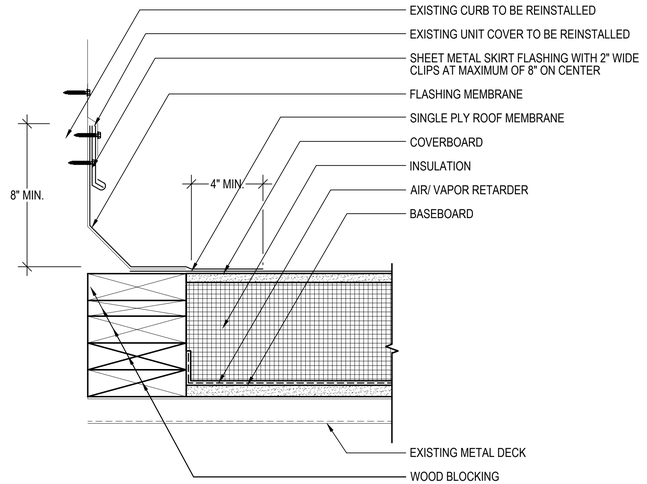
DRAWING NO.

A501



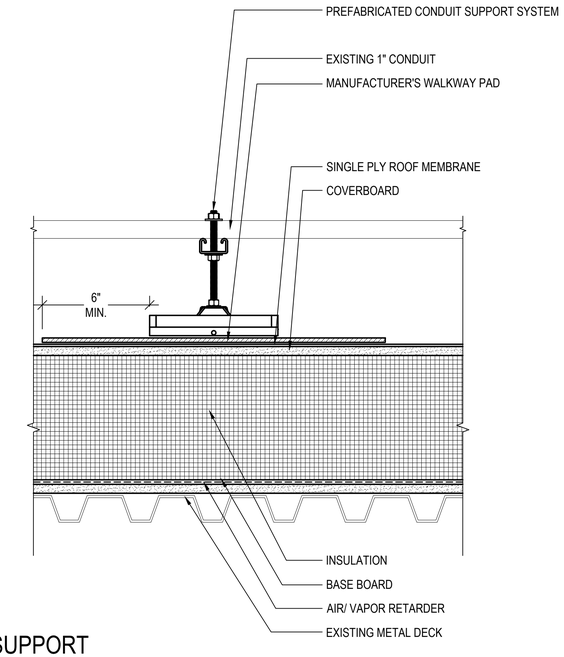
6 / A502 **VENT PIPE**
SCALE: 3"=1'-0"
(ALL ITEMS ARE NEW UNLESS DESIGNATED AS EXISTING)

J VENT TO BE TEMPORARILY DISCONNECTED AND RAISE TO ACCOMMODATE THE NEW FLASHING HEIGHT.



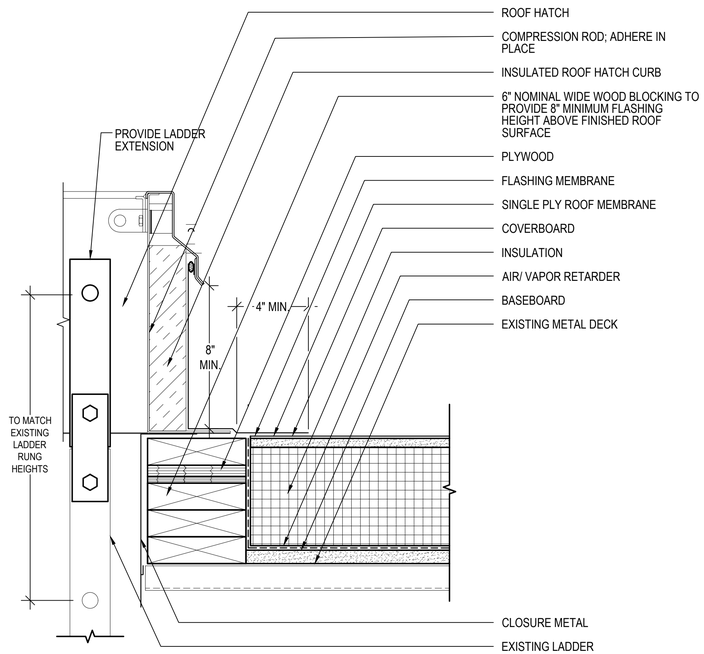
7 / A502 **J-VENT**
SCALE: 3"=1'-0"
(ALL ITEMS ARE NEW UNLESS DESIGNATED AS EXISTING)

CONDUIT LESS THAN OR EQUAL TO 1-1/4" SHALL BE SUPPORTED AT 5'-0" INTERVALS; CONDUIT GREATER THAN 1-1/4" SHALL BE SUPPORTED AT 8'-0" INTERVALS.



8 / A502 **PIPE SUPPORT**
SCALE: 3"=1'-0"
(ALL ITEMS ARE NEW UNLESS DESIGNATED AS EXISTING)

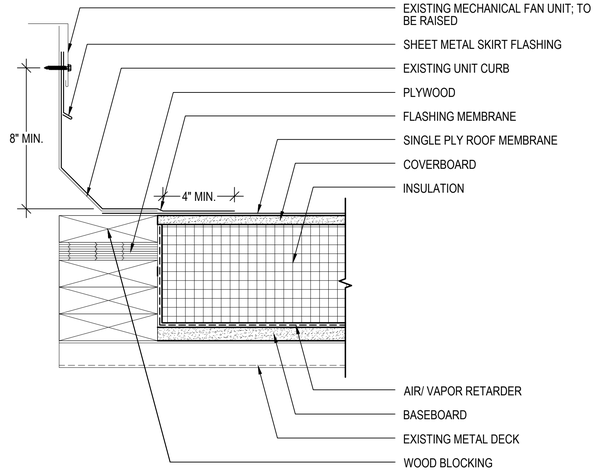
CL



9 / A502 **ROOF ACCESS HATCH**
SCALE: 3"=1'-0"
(ALL ITEMS ARE NEW UNLESS DESIGNATED AS EXISTING)

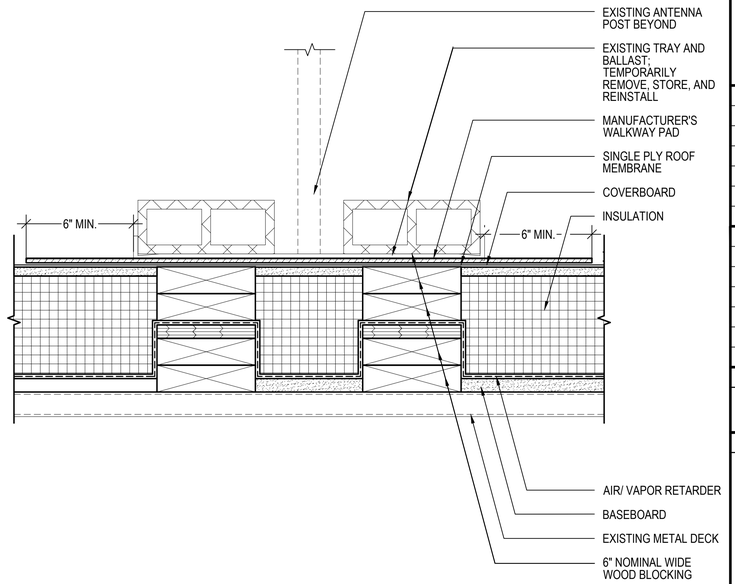
1. ALL DISCONNECTS/RECONNECTS SHALL BE PERFORMED BY LICENSED TRADES PERSONS.
2. TEMPORARILY DISCONNECT AND EXTEND ALL ELECTRICAL AND CONDENSER LINES AT AIR CONDITIONING UNITS AS REQUIRED TO RAISE THE UNITS TO ACCOMMODATE THE FINAL FINISHED ROOF HEIGHT.
3. RESECURE UNIT HOOD WITH STAINLESS STEEL FASTENERS THROUGH EPDM BACKED STAINLESS STEEL WASHERS.

PROVIDE MANUFACTURER'S WALKWAY PAD AROUND UNITS



10 / A502 **FAN CURB**
SCALE: 3"=1'-0"
(ALL ITEMS ARE NEW UNLESS DESIGNATED AS EXISTING)

COORDINATE WITH THE OWNER'S COMMUNICATION PROVIDER TO RE-ALIGN THE EQUIPMENT UPON COMPLETION OF THE ROOF INSTALLATION IN THIS AREA.



11 / A502 **SATELLITE DISH**
SCALE: 3"=1'-0"
(ALL ITEMS ARE NEW UNLESS DESIGNATED AS EXISTING)

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DRAWING SCALE	3"=1'-0"

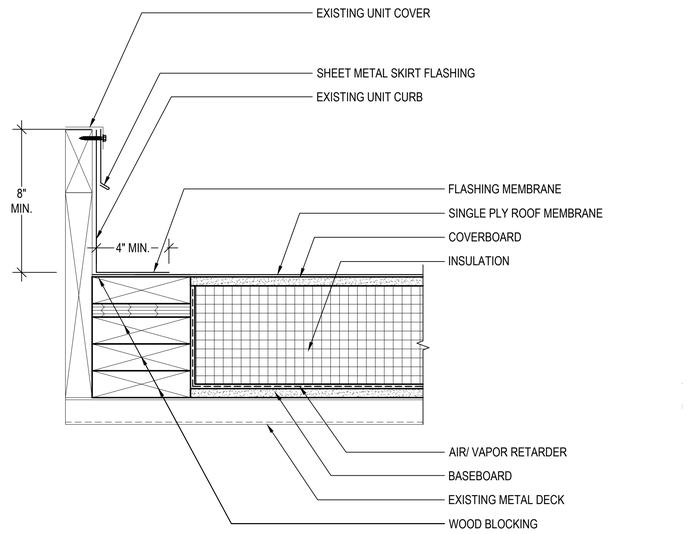
GRAPHIC SCALE
0 3" 6" 9"

SHEET TITLE
DETAILS

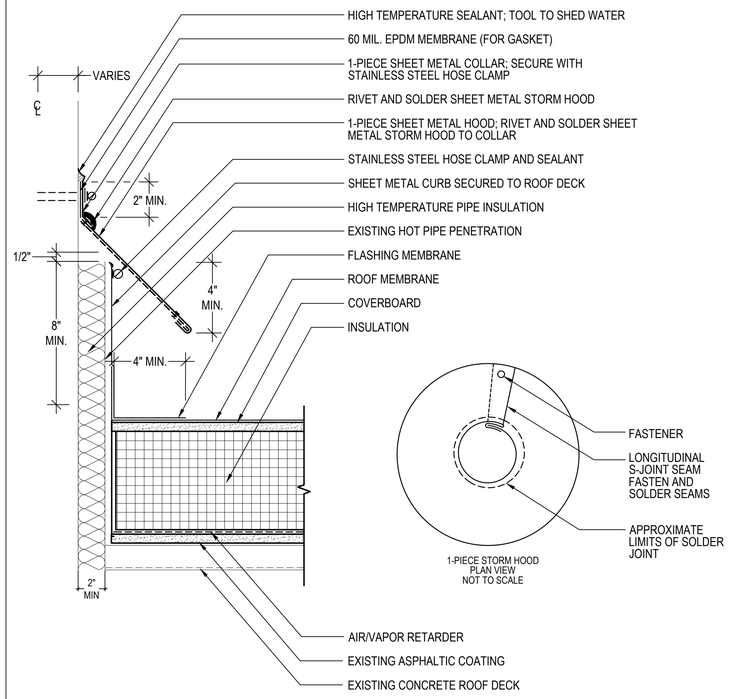
DRAWING NO.
A502

PROVIDE MANUFACTURER'S WALKWAY PAD AROUND UNITS

NOTES:
1. FOR ADDITIONAL INFORMATION, REFER TO APPROPRIATE ROOF EDGE DETAIL.
2. ALL DISCONNECTS/RECONNECTS SHALL BE PERFORMED BY LICENSED TRADES PERSONS.

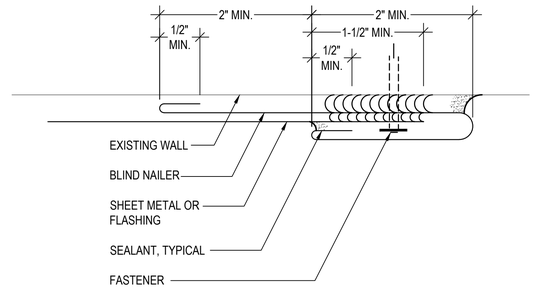


12 A503 ROOF TOP UNIT CURB
SCALE: 3"=1'-0"
(ALL ITEMS ARE NEW UNLESS DESIGNATED AS EXISTING)

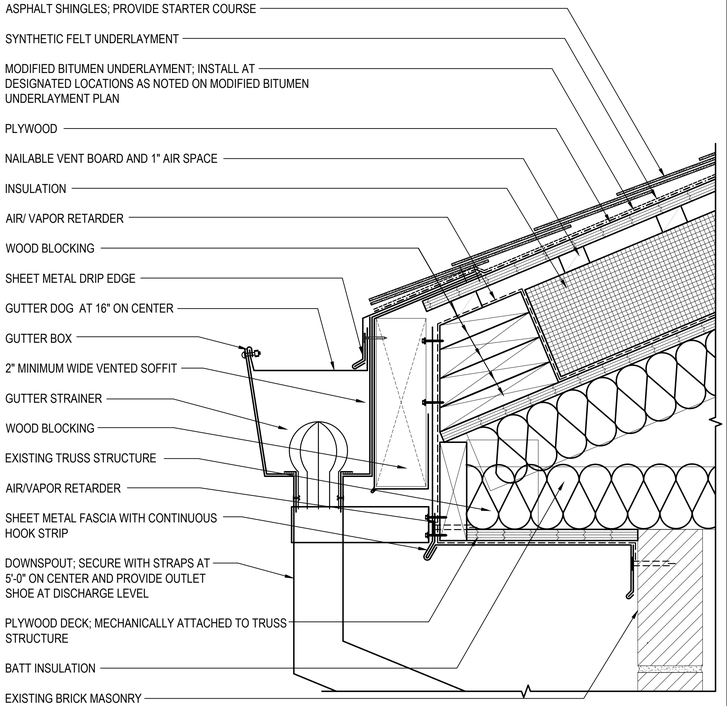


13 A503 HOT PIPE
SCALE: 3"=1'-0"
(ALL ITEMS ARE NEW UNLESS DESIGNATED AS EXISTING)

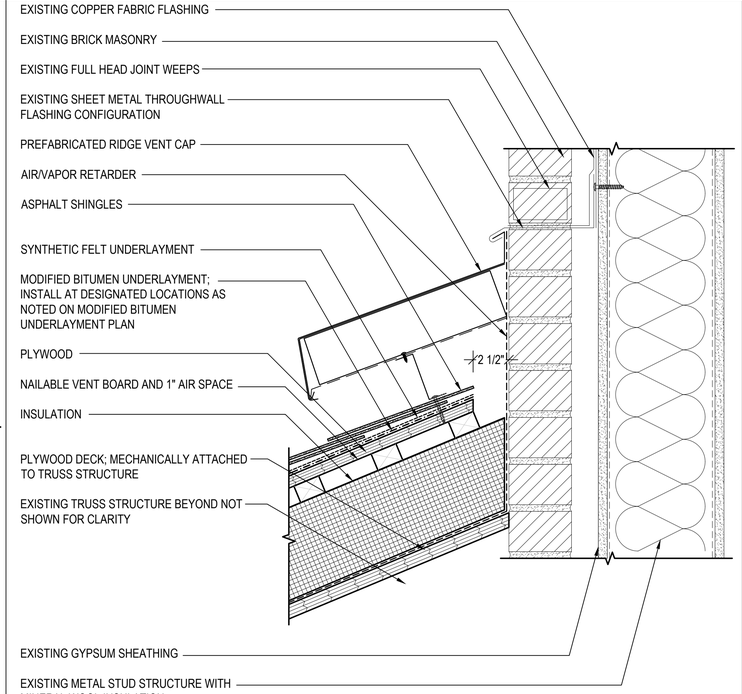
PLEASE NOTE THAT THIS DETAIL IS NOT INDICATED AT ALL LOCATIONS ON THE ROOF AREA PLANS.



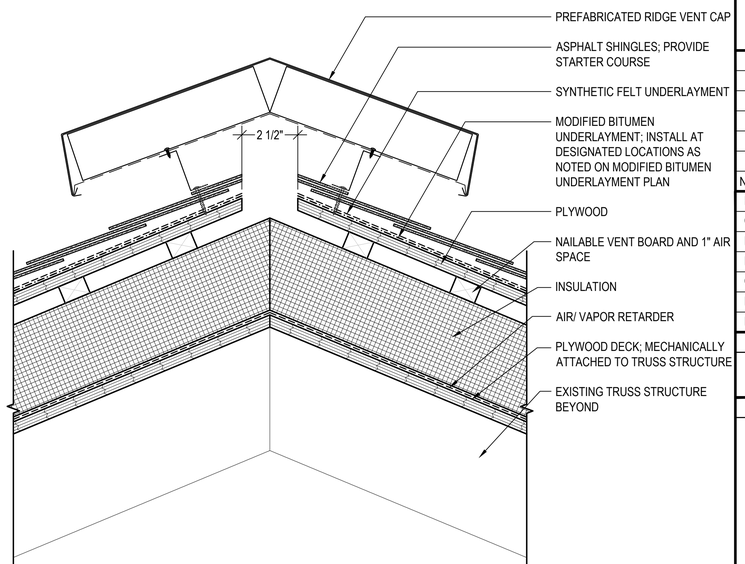
14 A503 TYPICAL BLIND NAILER
SCALE: NOT TO SCALE
(ALL ITEMS ARE NEW UNLESS DESIGNATED AS EXISTING)



15 A503 STEEP-SLOPE ROOF EAVE
SCALE: 3"=1'-0"
(ALL ITEMS ARE NEW UNLESS DESIGNATED AS EXISTING)



16 A503 STEEP-SLOPE RIDGE RISING WALL TRANSITION
SCALE: 3"=1'-0"
(ALL ITEMS ARE NEW UNLESS DESIGNATED AS EXISTING)



17 A503 STEEP-SLOPE ROOF RIDGE
SCALE: 3"=1'-0"
(ALL ITEMS ARE NEW UNLESS DESIGNATED AS EXISTING)

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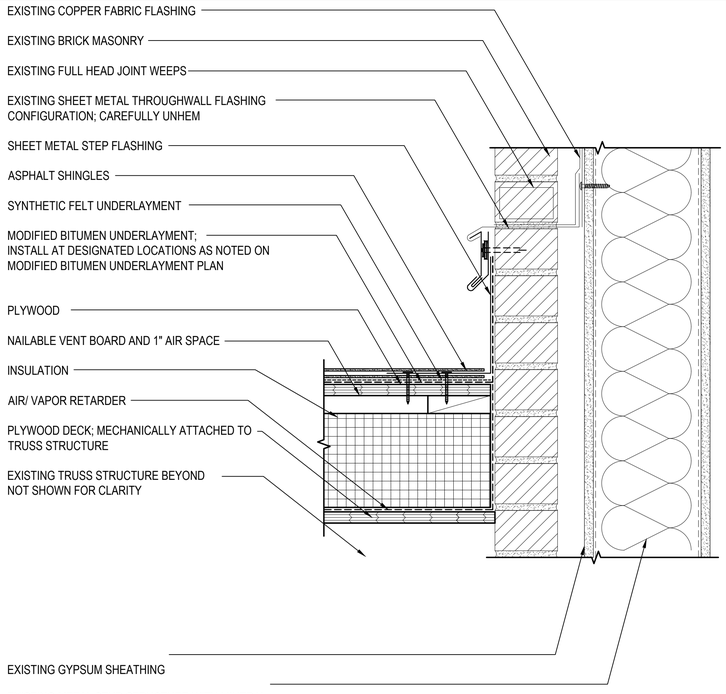
DRAWING SCALE	3"=1'-0"

GRAPHIC SCALE
0 3" 6" 9"

SHEET TITLE
DETAILS

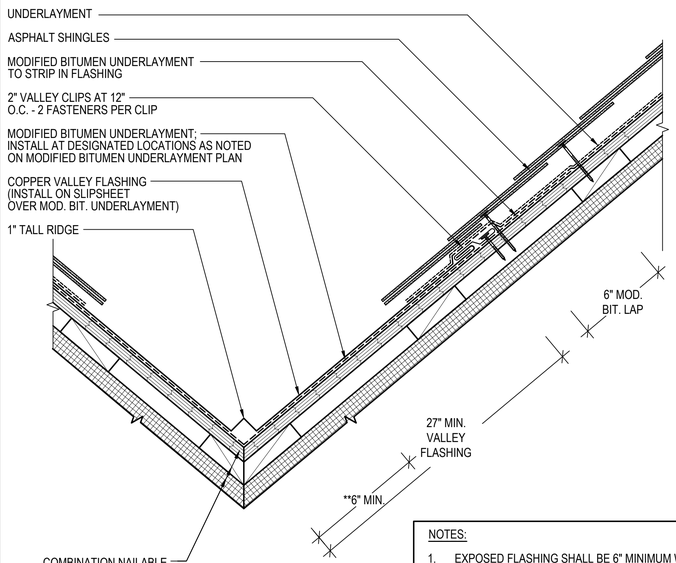
DRAWING NO.
A503



18 A504 STEEP-SLOPE ROOF RISING WALL FLASHING

SCALE: 3"=1'-0"
(ALL ITEMS ARE NEW UNLESS DESIGNATED AS EXISTING)

0 3" 6" 9"



NOTE:
AIR/VAPOR RETARDER AND PLYWOOD ROOF DECK NOT SHOWN FOR CLARITY

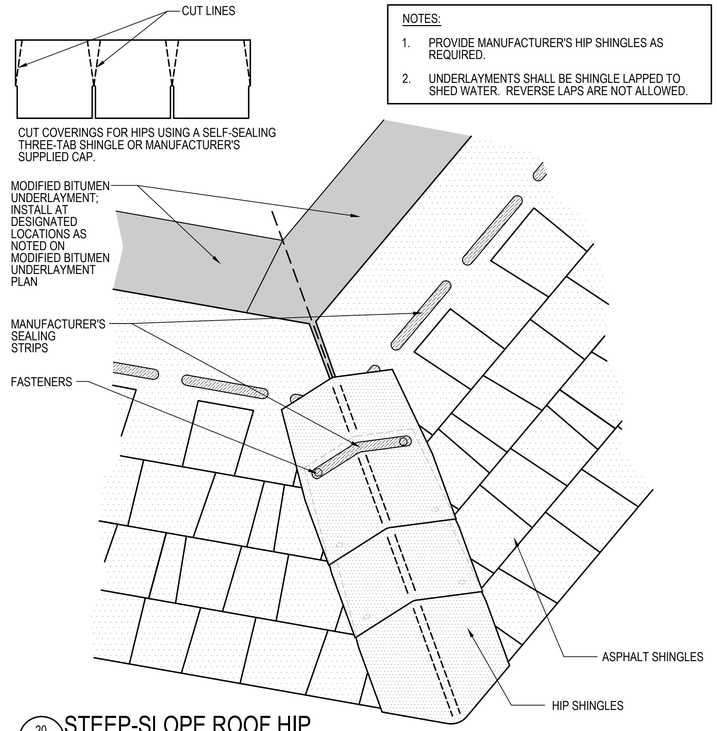
19 A504 STEEP-SLOPE ROOF VALLEY

SCALE: 3"=1'-0"
(ALL ITEMS ARE NEW UNLESS DESIGNATED AS EXISTING)

NOTES:

1. EXPOSED FLASHING SHALL BE 6" MINIMUM WIDE AT THE HIGH ELEVATIONS OF THE VALLEY ROOF AND BECOME GRADUALLY WIDER (1" PER 10 FOOT SECTION) AS IT APPROACHES THE ROOF EAVE.
2. PROVIDE 12" MINIMUM LAPS BETWEEN VALLEY SHEET METAL SECTIONS. FASTENERS SHOULD BE CONCEALED IN OVERLAP.
3. PROVIDE SLIP SHEET BELOW SHEET METAL COMPONENTS THAT ARE IN CONTACT WITH MODIFIED BITUMEN.
4. UNDERLAYMENTS SHALL BE SHINGLE LAPPED TO SHED WATER. REVERSE LAPS ARE NOT ALLOWED

0 3" 6" 9"

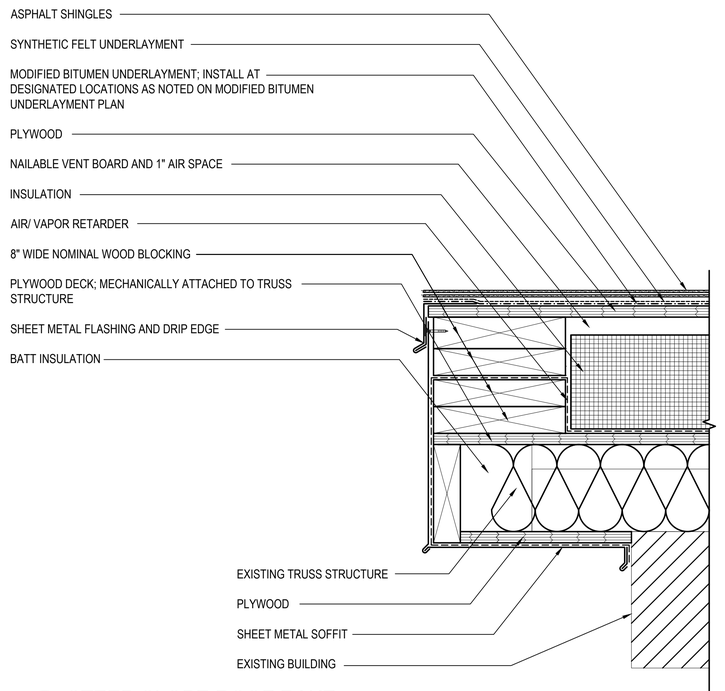


NOTES:

1. PROVIDE MANUFACTURER'S HIP SHINGLES AS REQUIRED.
2. UNDERLAYMENTS SHALL BE SHINGLE LAPPED TO SHED WATER. REVERSE LAPS ARE NOT ALLOWED.

20 A504 STEEP-SLOPE ROOF HIP

SCALE: NOT TO SCALE
(ALL ITEMS ARE NEW UNLESS DESIGNATED AS EXISTING)

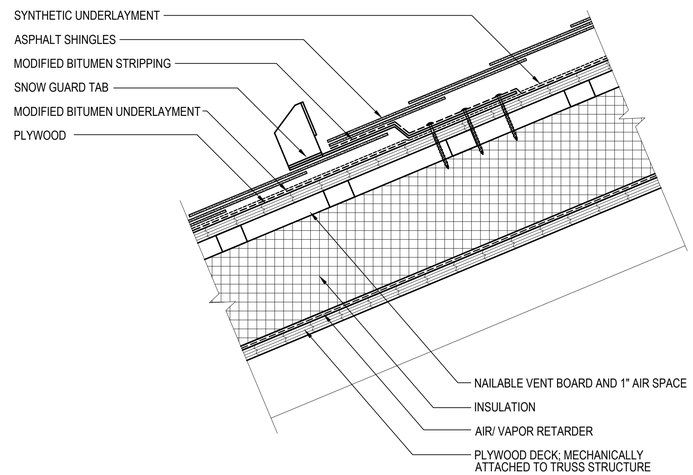


21 A504 STEEP-SLOPE ROOF RAKE

SCALE: 3"=1'-0"
(ALL ITEMS ARE NEW UNLESS DESIGNATED AS EXISTING)

SNOW GUARD TABS SHALL BE PLACED EVERY OTHER JOINT (18"-24" DEPENDING ON WIDTH OF SHINGLES), AND STAGGERED BETWEEN EVERY COURSE OF SHINGLES UNLESS RECOMMENDED OTHERWISE BY THE MANUFACTURER.

GAPS SHOWN FOR CLARITY



22 A504 PIPE RAIL SNOWGUARD ATTACHMENT DETAIL

SCALE: NOT TO SCALE
(ALL ITEMS ARE NEW UNLESS DESIGNATED AS EXISTING)

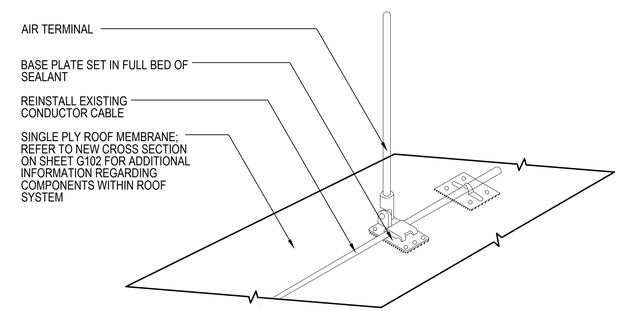
DETAIL SHOWN SCHEMATICALLY; ALL COMPONENTS ARE NOT SHOWN FOR CLARITY; REFER TO THE APPROPRIATE ROOF PLAN FOR ADDITIONAL INFORMATION.

AIR TERMINAL SHALL BE 10" MINIMUM ABOVE ADJACENT SURFACE. SHOULD AIR TERMINAL BE GREATER THAN 24", AIR TERMINALS SHALL BE BRACED.

CONTRACTOR SHALL ALSO INCLUDE REPLACEMENT OF THE FOLLOWING:

1. FIVE (5) BI-METALLIC COUPLINGS.
2. TWENTY (20) LINEAR FEET OF EXISTING ALUMINUM CONDUCTOR CABLE.

PROVIDE NEW AIR TERMINALS AT PARAPET CAPS AND OTHER ALUMINUM SURFACES WHERE REQUIRED TO MATCH NEW MATERIALS.



23 A504 LIGHTENING SUPPORT

SCALE: 3"=1'-0"
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GRAPHIC SCALE
0 3" 6" 9"

SHEET TITLE

DETAILS

DRAWING NO.
A504

GENERAL NOTES

1. STRUCTURAL DRAWINGS SHALL BE USED IN CONJUNCTION WITH PROJECT SPECIFICATIONS AND ARCHITECTURAL DRAWINGS. REFER TO ARCHITECTURAL DRAWINGS FOR DIMENSIONS AND/OR ELEVATIONS NOT SHOWN ON THE STRUCTURAL DRAWINGS.
2. ALL DIMENSIONS AND CONDITIONS MUST BE FIELD VERIFIED AND ANY DISCREPANCIES SHALL BE BROUGHT TO THE ATTENTION OF THE ARCHITECT AND ENGINEER BEFORE PROCEEDING WITH THE AFFECTED PORTION OF THE WORK.
3. SHOP DRAWINGS FOR LIGHT GAUGE METAL FRAMING SHALL BE SUBMITTED TO THE ENGINEER AND STAMPED ACCEPTANCE RECEIVED PRIOR TO FABRICATION. ERECTION SHALL PROCEED BASED ON ACCEPTED SHOP DRAWINGS ONLY. REFER TO PROJECT SPECIFICATIONS AND THESE DRAWING NOTES.
4. UNLESS NOTED OTHERWISE (U.N.O.), DETAILS SHOWN ON ANY DRAWINGS ARE TO BE CONSIDERED TYPICAL FOR SIMILAR CONDITIONS.
5. IN CASE OF CONFLICT AMONG CONTRACT DOCUMENTS, THE MORE SPECIFIC AND LOCALIZED INFORMATION IN THE FOLLOWING ASCENDING ORDER SHALL GOVERN: SPECIFICATIONS, NOTES, PLANS, SCHEDULES AND DETAILS.
6. THE CONTRACTOR SHALL PROVIDE ALL NECESSARY TEMPORARY SHORING AND BRACING FOR THE BUILDING DURING THE ENTIRE CONSTRUCTION PROCESS.
7. JOB SITE SAFETY IS THE CONTRACTOR'S RESPONSIBILITY. GALE REPRESENTATIVES, INCLUDING SUBCONSULTANTS RETAINED BY GALE, MAY VISIT THE JOB SITE FROM TIME TO TIME. THESE VISITS ARE FOR CLARIFICATIONS OF SPECIFIC DESIGN RELATED ISSUES ONLY AND ARE NOT FOR THE PURPOSES OF JOB SITE SAFETY. IT IS THE CONTRACTOR'S SOLE RESPONSIBILITY TO COMPLY WITH ALL SITE SAFETY APPLICABLE REQUIREMENTS.

CODE INFORMATION

1. ALL WORK SHALL CONFORM TO THE REQUIREMENTS OF THE FOLLOWING BUILDING CODES AND STANDARDS:
   - THE NEW HAMPSHIRE STATE BUILDING CODE - RSA 155-A:10
   - 2018 INTERNATIONAL BUILDING CODE
   - ASCE 7-16 MINIMUM DESIGN LOADS AND ASSOCIATED CRITERIA FOR BUILDINGS AND OTHER STRUCTURES
   - AISI S100-16 NORTH AMERICAN SPECIFICATION FOR THE DESIGN OF COLD-FORMED STEEL STRUCTURAL MEMBERS, 2016
   - AISI 202-15 CODE OF STANDARD PRACTICE FOR COLD-FORMED STEEL FRAMING, 2015
   - AISC SPECIFICATION FOR THE DESIGN, FABRICATION AND ERECTION OF STRUCTURAL STEEL FOR BUILDINGS.

ABBREVIATIONS

@	AT	MIN.	MINIMUM
BOT.	BOTTOM	O.C.	ON CENTER
CLR.	CLEAR	O/O	OUT TO OUT
CL	CENTERLINE	REINF.	REINFORCING
CONT.	CONTINUOUS	SIM.	SIMILAR
DIA.	DIAMETER	T.O	TOP OF
DWGS	DRAWINGS	T.O.	TOP OF WALL
ELEV.	ELEVATION	TYP.	TYPICAL
HORIZ.	HORIZONTAL	U.N.O.	UNLESS NOTED OTHERWISE
JT	JOINT	VERT.	VERTICAL
MAX.	MAXIMUM		
MEP	MECHANICAL, ELECTRICAL, & PLUMBING		

DEMOLITION NOTES

1. THE BUILDING WILL BE FULLY OCCUPIED DURING THE CONSTRUCTION, INCLUDING AREAS BELOW LOCATIONS REQUIRING STRUCTURAL AUGMENTATION. THE STRUCTURAL WORK SHALL BE PERFORMED FROM ABOVE.
2. REMOVE PLYWOOD AS REQUIRED TO PERFORM THE STRUCTURAL REPAIRS. INSTALL NEW PLYWOOD AFTER REPAIRS ARE COMPLETE IN ACCORDANCE WITH THE SPECIFICATIONS.
3. NO DEMOLITION WORK SHALL PROCEED UNTIL A PLAN HAS BEEN SUBMITTED TO AND APPROVED BY THE OWNER AND ENGINEER DETAILING THE METHODS AND EQUIPMENT TO BE USED TO DEMOLISH AND/OR SURFACE PREPARE STRUCTURES AND FEATURES.
4. ALL DEMOLISHED MATERIALS AND DEBRIS SHALL BE LEGALLY DISPOSED OF OFF SITE IN A MANNER SATISFACTORY TO THE OWNER AND CURRENT DEP/EPA REQUIREMENTS.
5. THE CONTRACTOR SHALL USE CAUTION WHILE PERFORMING DEMOLITION WORK NEAR THE EXISTING BUILDING STRUCTURES TO REMAIN.
6. ALL ITEMS NOTED TO BE REMOVED OR DEMOLISHED (NOT INDICATED TO BE REUSED) MUST BE PROPERLY DISPOSED OF.
7. CONDUCT DEMOLITION OPERATIONS AND REMOVE DEBRIS TO ENSURE MINIMUM INTERFERENCE WITH ROADS, STREETS, WALKS, AND OTHER ADJACENT OCCUPIED AND USED FACILITIES.
8. CONDUCT DEMOLITION OPERATIONS TO PREVENT INJURY TO PEOPLE AND DAMAGE TO EXISTING BUILDINGS, FACILITIES, AND SITE IMPROVEMENTS TO REMAIN.
9. USE WATER MIST AND OTHER SUITABLE METHODS TO LIMIT THE SPREAD OF DUST AND DIRT. COMPLY WITH GOVERNING ENVIRONMENTAL PROTECTION REGULATIONS.
10. REMOVE AND TRANSPORT DEBRIS IN A MANNER THAT WILL PREVENT SPILLAGE ON ADJACENT SURFACES AND AREAS.
11. CLEAN ADJACENT STRUCTURES OF DUST, DIRT, AND DEBRIS CAUSED BY SELECTIVE DEMOLITION OPERATIONS. RETURN ADJACENT AREAS TO CONDITION EXISTING BEFORE START OF SELECTIVE DEMOLITION.
12. DEMOLISH AND REMOVE EXISTING CONSTRUCTION ONLY TO THE EXTENT REQUIRED BY NEW CONSTRUCTION AND AS INDICATED. CONTRACTOR TO BE RESPONSIBLE FOR ANY CUTTING AND PATCHING THAT IS REQUIRED.
13. EXISTING STRUCTURES, UTILITY LINES AND EMBEDDED UTILITIES MUST BE IDENTIFIED BY THE OWNER AND CONTRACTOR, AND MARKED ON-SITE PRIOR TO INITIATING CONSTRUCTION. IN THE EVENT THAT ANY UNMARKED OR UNKNOWN STRUCTURE/UTILITY ARE UNCOVERED BY THE CONTRACTOR, WORK MUST HALT AND THE CONTRACTOR SHALL REPORT ITS FINDINGS TO THE OWNER'S SITE REPRESENTATIVE FOR INSTRUCTIONS BEFORE PROCEEDING FURTHER. THE EXISTING STRUCTURES AND UTILITIES WHICH ARE ADJACENT TO THE SITE AND THOSE TO REMAIN WITHIN THE LIMITS OF THE WORK SHALL BE PROTECTED AGAINST DAMAGE. THE CONTRACTOR SHALL BE FULLY RESPONSIBLE TO THE OWNER IN THE EVENT OF REMOVAL OF OR DAMAGE TO ANY EXISTING OBJECTS BY CONTRACTORS PERSONNEL, WHICH ARE INTENDED BY THE OWNER TO REMAIN IN PLACE.

METAL DECK NOTES

1. NEW STEEL DECK SHALL BE 1½" DEEP - 18 GAUGE, TYPE B, AS MANUFACTURED BY CANAM, OR AN ENGINEER APPROVED EQUAL. STEEL DECK SHALL CONFORM TO STEEL DECK INSTITUTE (SDI) SPECIFICATIONS. STEEL DECK SHALL BE FORMED STEEL SHEETS CONFORMING TO ASTM A653 GRADE 40 MINIMUM. BEFORE FORMING, STEEL SHEETS SHALL BE COATED WITH A ZINC COATING CONFORMING TO ASTM A653, G-90 COATING, UNO.
2. MINIMUM STRUCTURAL PROPERTIES (BASED ON MINIMUM F_y = 40 KSI) SHALL BE AS FOLLOWS:

   I_p = 0.290 IN^4 (NOTE: SUBSCRIPTS DENOTE POSITIVE & NEGATIVE BENDING)
   I_n = 0.300 IN^4
   S_p = 0.320 IN^3
   S_n = 0.320 IN^3

3. NEW METAL DECK PANELS SHALL BE SIZED TO BEAR ON A MINIMUM OF THREE (3) SUPPORTS. DECK SPAN MUST BE 2 SPAN CONTINUOUS MINIMUM.
4. METAL DECK AT ROOF AREA A SHALL BE RESECURED PER SDI REQUIREMENTS, 36/5 PATTERN MINIMUM AT EACH PERPENDICULAR END SUPPORT, OR AS OTHERWISE SPECIFIED BY THE ENGINEER.
5. DECK DETAILS AND FASTENER PATTERNS MUST BE SUBMITTED TO THE ENGINEER FOR REVIEW BEFORE PROCEEDING WITH FABRICATION AND INSTALLATION. REFER TO SPECIFICATIONS FOR SHOP DRAWING SUBMITTAL REQUIREMENTS.
6. END LAPS OF STEEL DECK SHEETS MUST BE A MINIMUM OF 2" AND MUST OCCUR OVER SUPPORTS ONLY; AT THESE POINTS FASTENING MUST BE PLACED WITH 36/5 FASTENING PATTERN.
7. FASTENERS FOR STEEL DECK ATTACHMENT TO STRUCTURAL STEEL (I.E. EXISTING OPEN WEB STEEL JOISTS) MUST BE HILTI S-MD 12-14X1" HWH#5 SELF DRILLING BI-METAL SCREWS, OR ENGINEER APPROVED EQUAL.
8. SIDELAP FASTENERS MUST BE HILTI S-MD #10-16X1" SELF DRILLING BI-METAL SCREWS, OR ENGINEER APPROVED EQUAL. SIDELAP FASTENER SPACING MUST NOT EXCEED 30" ON-CENTER.
9. FLAME CUTTING OF NEW STEEL DECK IS NOT PERMITTED.
10. STOCKPILING OF MATERIALS ON EXISTING STEEL FRAMING AND NEW STEEL ROOF DECK IS NOT PERMITTED UNTIL SPECIFIED FASTENING OF EXISTING STEEL DECK TO STRUCTURAL FRAMING HAS BEEN COMPLETELY INSTALLED. WEIGHT OF STOCKPILED MATERIALS ON ROOF ONCE EXISTING STEEL DECK HAS BEEN FASTENED SHALL NOT EXCEED 20 PSF.

COLD FORM METAL FRAMING NOTES

1. THE CONTRACTOR SHALL SUBMIT SHOP DRAWINGS MEETING THE PROJECT SPECIFICATIONS AND THE REQUIREMENTS OF THE DESIGN DOCUMENTS TO THE EOR FOR REVIEW AND APPROVAL PRIOR TO FABRICATION.
2. SHOP DRAWINGS SHALL INDICATE THE SIZES, LENGTH, LAYOUT, LOCATIONS, AND DETAILS OF LIGHT GAUGE METAL FRAMING AND FASTENERS. NOTE THAT THE RECORD DRAWINGS OF THE EXISTING COLD-FORMED METAL FRAMING WERE NOT AVAILABLE. DUE TO THE EXISTING DUCTWORK AND OTHER OBSTRUCTIONS ABOVE THE EXISTING CEILINGS, GALE WAS UNABLE TO MEASURE THE EXACT SIZE AND SPACING OF ALL EXISTING FRAMING MEMBERS. THE COLD-FORMED METAL FRAMING MAY NEED TO BE FIELD-MODIFIED TO ACCOMMODATE THE EXISTING TRUSS SPACINGS.
3. ALL LIGHT GAGE MEMBERS, GALVANIZED STUDS, AND ACCESSORIES SHALL BE DESIGNED AND FORMED IN ACCORDANCE WITH AISI, "SPECIFICATION FOR THE DESIGN OF COLD-FORMED STEEL STRUCTURAL MEMBERS", LATEST EDITION OF THE DOCUMENTS REFERENCED IN THE GENERAL NOTES.
4. THE EXTENT OF THE WORK FOR THE LIGHT GUAGE METAL TRUSS REINFORCEMENT IS DETAILED ON THE STRUCTURAL DRAWINGS. THESE NOTES SHALL APPLY IN CONJUNCTION WITH THE STRUCTURAL DRAWINGS AND THE PROJECT SPECIFICATIONS. INCONSISTENCIES SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER PRIOR TO PROCEEDING WITH THE AFFECTED PORTION OF THE WORK.
5. ALL STUDS, BRIDGING, STRAPPING, BLOCKING AND ACCESSORIES SHALL BE OF THE TYPE, SIZE, STEEL THICKNESS AND SPACING AS SHOWN OR AS NEEDED TO MEET THE PERFORMANCE CRITERIA AS INDICATED IN THESE NOTES OR SPECIFICATIONS. PRODUCTS FAILING TO MEET THESE MINIMUM PROPERTIES WILL BE REJECTED.
   STUDS, TRACK AND BRACING SHALL BE MANUFACTURED PER ASTM SPECIFICATION C-955. ALL GALVANIZED STUDS AND ACCESSORIES SHALL BE FORMED FROM STEEL THAT CONFORMS TO THE REQUIREMENTS OF ASTM A 1003 WITH MINIMUM YIELD STRENGTH (Fy) AS DENOTED BELOW:
   12, 14 AND 16 GAGE COMPONENTS SHALL BE FORMED FROM STEEL WITH A MINIMUM SPECIFIED YIELD STRENGTH OF 50,000 PSI.
   18 GAGE OR LIGHTER COMPONENTS, SHALL BE FORMED FROM STEEL WITH A MINIMUM SPECIFIED YIELD STRENGTH OF 33,000 PSI.
6. ALL MEMBERS AND ACCESSORIES SHALL BE FORMED FROM STEEL HAVING A GALVANIZED COATING MEETING THE REQUIREMENTS OF ASTM A653 WITH G-60 COATING.
7. PROVIDE CHANNEL SHAPED STUDS, RUNNERS, TRACKS, BLOCKING, CLIP ANGLES, SHOES, REINFORCEMENTS, FASTENERS AND OTHER ACCESSORIES RECOMMENDED BY THE MANUFACTURER FOR A COMPLETE FRAMING SYSTEM.
8. ALL COLD FORM TO COLD FORM STEEL CONNECTIONS SHALL BE MADE WITH MANUFACTURER'S STANDARD SELF-TAPPING PAN-HEAD, HEX-HEAD, OR WAFER-HEAD SHEET METAL SCREWS OF APPROPRIATE LENGTH. PENETRATION OF JOINED MATERIAL SHALL NOT BE LESS THAN THREE (3) EXPOSED THREADS.
9. CONTRACTOR SHALL PROVIDE TEMPORARY ERECTION BRACING AS REQUIRED UNTIL PERMANENT CONNECTIONS TO THE PRIMARY STRUCTURAL FRAMING CAN BE MADE.
10. CUT ALL LIGHT GAGE STEEL FRAMING MEMBERS WITH SAWS OR SHEARS. FLAME CUTTING IS NOT PERMITTED.
11. THE LIGHT GAGE STEEL FRAMING ERECTOR SHALL HAVE A MINIMUM 5 YEARS OF EXPERIENCE IN THE ERECTION OF LIGHT GAGE METAL FRAMING SYSTEMS.

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PROJECT
ROOF REPLACEMENT & ASSOCIATED WORK AT THE HOOKSETT SAFETY CENTER
15 LEGENDS DR
HOOKSETT, NH, 03106

OWNER
TOWN OF HOOKSETT
35 MAIN STREET
HOOKSETT, NH, 03106

NO.	DATE	DESCRIPTION	BY

PROJECT NO.	841830
CADD FILE	841830 S001
DESIGNED BY	MCC/AEO
DRAWN BY	MCC
CHECKED BY	AEO
DATE	8/1/24
DRAWING SCALE	N.T.S

GRAPHIC SCALE

SHEET TITLE

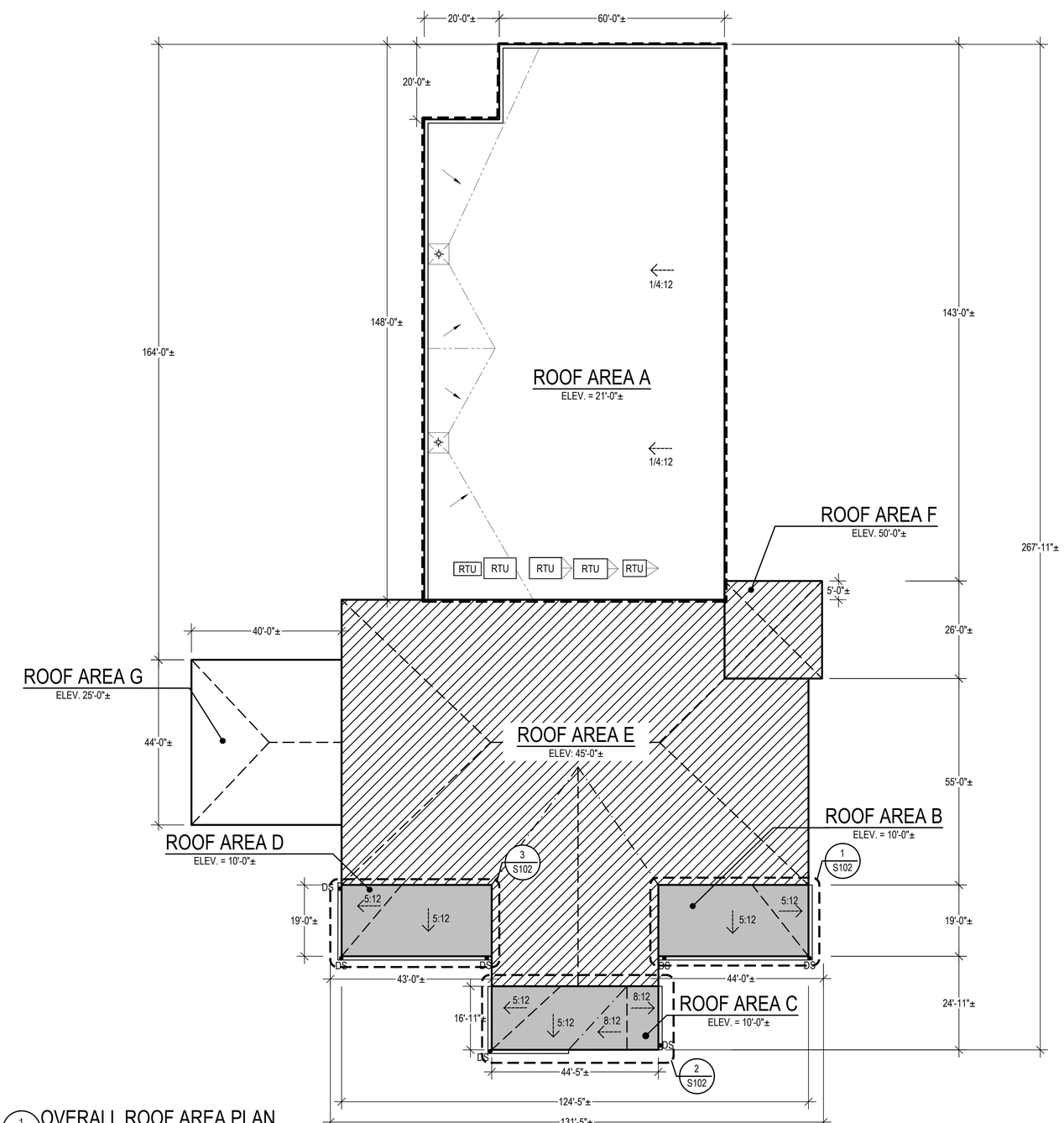
STRUCTURAL NOTES

DRAWING NO.

S001

#

PLAN NORTH



1 S101 OVERALL ROOF AREA PLAN
SCALE: 1/16" = 1'-0"

LEGEND

ALL ITEMS ARE EXISTING UNLESS DESIGNATED OTHERWISE

- ROOF EDGE
- PARAPET
- HIP/RIDGE
- VALLEY
- CRICKET
- CRICKET SLOPE INDICATOR
- DS — GUTTER WITH DOWNSPOUT
- ROOF AREA TO; NOT IN CONTRACT
- STEEP SLOPE ROOF
- STRUCTURAL SLOPE; # INDICATES SLOPE RATIO
- RTU — ROOF TOP MECHANICAL UNIT
- ROOF DRAIN
- EXTENTS OF EXISTING METAL DECK RESECUREMENT (ROOF AREA A ONLY). REFER TO DETAILS 8 & 9/S102 FOR RESECUREMENT DETAILS.

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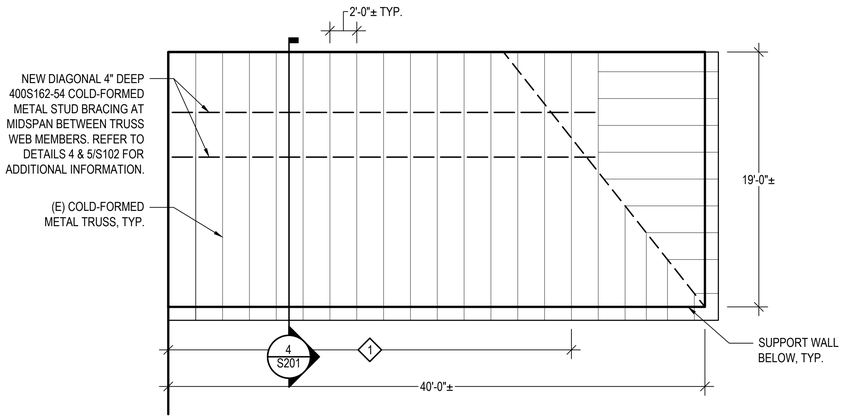
0 8' 16' 32'

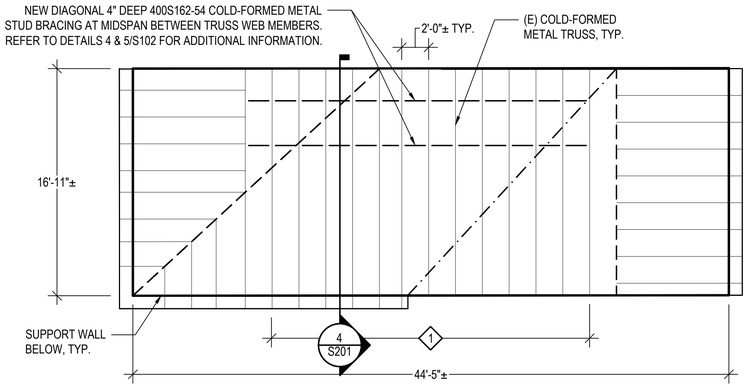
SHEET TITLE
OVERALL ROOF AREA PLAN

DRAWING NO.
S101



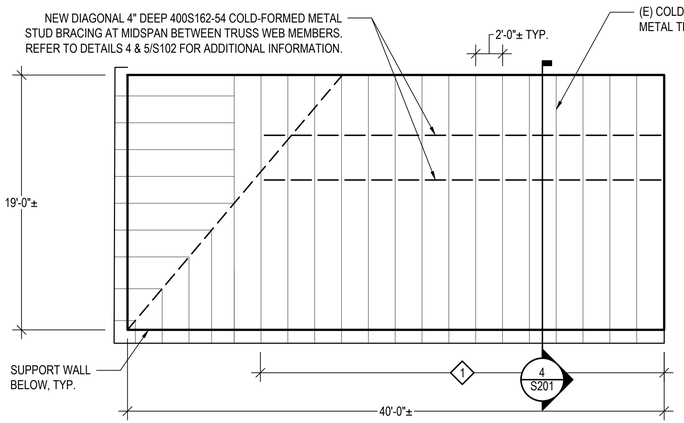
1 S102 ROOF AREA B FRAMING PLAN

SCALE: 3/16" = 1'-0"



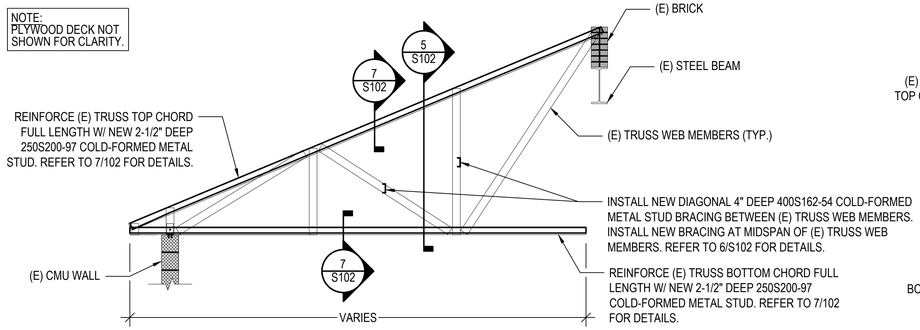
2 S102 ROOF AREA C FRAMING PLAN

SCALE: 3/16" = 1'-0"



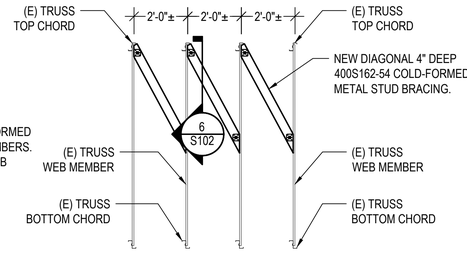
3 S102 ROOF AREA D FRAMING PLAN

SCALE: 3/16" = 1'-0"



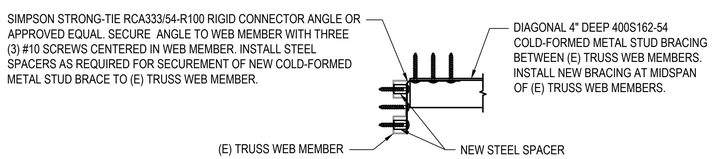
4 S102 TYPICAL TRUSS FRAMING ELEVATION

SCALE: 3/8" = 1'-0"



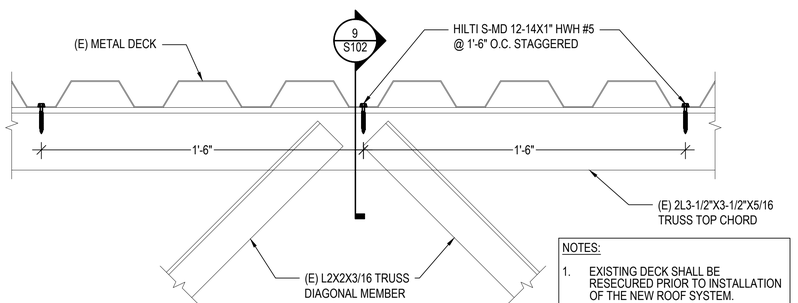
5 S102 TYPICAL TRUSS BRACING ELEVATION

SCALE: 3/8" = 1'-0"



6 S102 TYPICAL TRUSS WEB MEMBER BRACING

SCALE: 3" = 1'-0"

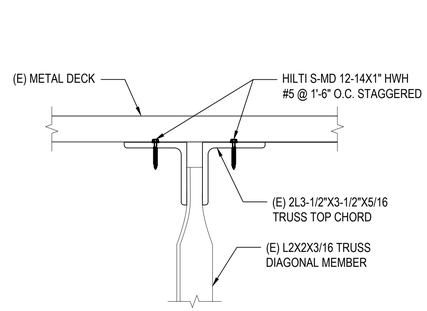


NOTES:

1. EXISTING DECK SHALL BE RESECURED PRIOR TO INSTALLATION OF THE NEW ROOF SYSTEM.
2. NEW HILTI S-MD 12-14X1" HWH #5 FASTENERS SHALL BE INSTALLED CENTERED IN THE EXISTING METAL DECK FLUTE. IF WELDS ARE ENCOUNTERED, FASTENERS SHALL BE RELOCATED TO THE NEAREST FLUTE WITHOUT AN EXISTING WELD.

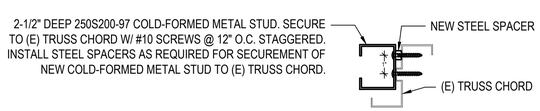
8 S102 DECK RESECUREMENT AT ROOF AREA A

SCALE: 3" = 1'-0"



9 S102 DECK RESECUREMENT AT ROOF AREA A - SECTION VIEW

SCALE: 3" = 1'-0"



NOTE: PLYWOOD DECK NOT SHOWN FOR CLARITY.

7 S102 TYPICAL TRUSS CHORD REINFORCEMENT

SCALE: 3" = 1'-0"

REPAIR NOTES

1 REINFORCE EXISTING TRUSS TOP CHORD WITH NEW 250S200-97 COLD-FORMED METAL STUD. REFER TO DETAILS 4 & 7/S102 FOR ADDITIONAL INFORMATION. REINFORCE EXISTING TRUSS BOTTOM CHORD WITH NEW 2-1/2" DEEP 250S200-97 COLD-FORMED METAL STUD. REFER TO DETAILS 4 & 7/S102 FOR ADDITIONAL INFORMATION. INSTALL NEW DIAGONAL 4" DEEP 400S162-54 COLD-FORMED METAL STUD BRACING AT MIDSPAN BETWEEN TRUSS WEB MEMBERS. REFER TO DETAILS 4,5, & 7/S102 FOR ADDITIONAL INFORMATION.

SHEET NOTES

1. EXISTING FRAMING PLAN AND TRUSS GEOMETRY IS BASED ON INFORMATION GATHERED FROM A FIELD INVESTIGATION PERFORMED BY GALE ON APRIL 18, 2024. GALE'S FIELD OBSERVATIONS WERE LIMITED BY EXISTING CEILING FINISHES, INSULATION, AND DUCTWORK IN THE ABOVE-CEILING SPACE. CONTRACTOR SHALL FIELD VERIFY EXISTING FRAMING CONFIGURATION AND GEOMETRY AND NOTIFY ENGINEER IF DISCREPANCIES ARE OBSERVED. CONTRACTOR SHALL FIELD VERIFY GEOMETRY OF EXISTING STRUCTURAL MEMBERS TO BE REINFORCED AND NOTIFY ENGINEER IF DISCREPANCIES ARE OBSERVED.
2. CONTRACTOR SHALL WORK AROUND EXISTING DUCTWORK, INSULATION, ETC. TO PERFORM THE STRUCTURAL AUGMENTATION WORK.
3. IF DAMAGED EXISTING TRUSS MEMBERS ARE OBSERVED DURING CONSTRUCTION, THE CONTRACTOR SHALL NOTIFY THE ENGINEER. THE ENGINEER SHALL PROVIDE SKETCHES FOR REINFORCEMENT FOR EACH OBSERVED DAMAGED MEMBER.

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DRAWING SCALE	1/8"=1'-0"

GRAPHIC SCALE
0 4' 8' 16'

SHEET TITLE
PARTIAL ROOF AREA PLANS AND STRUCTURAL DETAILS

DRAWING NO.
S102