PROJECT MANUAL

FOR

ROOFING UPGRADE PROJECT

AT

Strawberry Point & Tam Valley Elementary Schools

Mill Valley, CA 94941

Project No. 2019/20-SP-TV-01

Mill Valley School District

425 Sycamore Ave

Mill Valley, CA 94941

415-389-7701

02/10/2020SECTION 01 1000
SUMMARY ROOFING UPGRADE

PROJECT MANUAL

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1.01 SUMMARY

A. Section includes:

1. Project information.
2. Work covered by Contract Documents.
3. Access to site.
4. Coordination with occupants.
5. Specification and drawing conventions.

B. Related Section:

1. Division 01.

1.02 PROJECT INFORMATION

A. Project Identification: Roofing Upgrade Project
1. Project Locations: Strawberry Point Elementary School, 117 E. Strawberry Lane, Mill Valley, CA 94941
2. Project Locations: Tam Valley Elementary School, 350 Bell Lane, Mill Valley, CA 94941

B. Owner: Mill Valley School District, 425. Sycamore Ave., Mill Valley, CA 94941.

1. Owner's Representative: John Binchi, Project Manager, jbinchi@mvschools.org 415-389-7701.

1.03 WORK COVERED BY CONTRACT DOCUMENTS

A. The Work of the Project is defined by the Contract Documents and consists of the following:

1. This Project for the Mill Valley School District is known as the "Roofing Upgrade Project. Project No. 2019/20-SP-TV-01" The project consists of Installing a single ply roofing system on all indicated modular/portable buildings at both the Strawberry Point & Tam Valley Elementary Schools. Remove and replace the gutter and down spouts systems on all modular/portable buildings for the Strawberry Point Elementary School. Apply a fluid-applied membrane roofing system to all areas indicated on the drawings for both the Strawberry Point & Tam Valley Elementary Schools.

B. Type of Contract.

1. Project will be constructed under a single prime contract.

C. General: Contractor shall have limited use of Project site for construction operations.

D. Use of Site: Limit use of Project site to work in areas indicated. Do not disturb portions of Project site beyond areas in which the Work is indicated.

1. Driveways, Walkways and Entrances: Keep driveways, loading areas, and entrances serving premises clear and available to Owner, Owner's employees, and emergency vehicles at all times. Do not use these areas for parking or storage of materials.

    a. Schedule deliveries to minimize use of driveways and entrances by construction operations.
    b. Schedule deliveries to minimize space and time requirements for storage of materials and equipment on-site.

E. Condition of Existing Building: Maintain portions of existing building affected by construction operations in a weather tight condition throughout construction period. Repair damage caused by construction operations.

1.04 COORDINATION WITH OCCUPANTS

A. . Perform the Work so as not to interfere with Owner's day-to-day operations. Maintain existing exits unless otherwise indicated.

1. Maintain access to existing walkways, corridors, and other adjacent occupied or used facilities. Do not close or obstruct walkways, corridors, or other occupied or used facilities without written permission from Owner and approval of authorities having jurisdiction.
2. Notify the Owner not less than forty-eight (48) hours in advance of activities that will affect Owner's operations.

B. Owner Limited Occupancy of Completed Areas of Construction: Owner reserves the right to occupy and to place and install equipment in completed portions of the Work, prior to Substantial Completion of the Work, provided such occupancy does not interfere with completion of the Work. Such placement of equipment and limited occupancy shall not constitute acceptance of the total Work.

1. Completion for each specific portion of the Work to be occupied prior to Owner acceptance of the completed Work.
2. Before limited Owner occupancy, data and electrical systems shall be fully operational, and required tests and inspections shall be successfully completed. On occupancy, Owner will operate and maintain data and electrical systems serving occupied portions of Work.
3. On occupancy, Owner will assume responsibility for maintenance and custodial service for occupied portions of Work.

1.05 SPECIFICATION AND DRAWING CONVENTIONS

A. Specification Content: The Specifications use certain conventions for the style of language and the intended meaning of certain terms, words, and phrases when used in particular situations. These conventions are as follows:

1. Imperative mood and streamlined language are generally used in the Specifications. The words "shall," "shall be," or "shall comply with," depending on the context, are implied where a colon (:) is used within a sentence or phrase.
2. Specification requirements are to be performed by Contractor unless specifically stated otherwise.

B. Division 01 General Requirements: Requirements of Sections in Division 01 apply to the Work of all Sections in the Specifications.

C. Drawing Coordination: Requirements for materials and products identified on the Drawings are described in detail in the Specifications. One or more of the following are used on the Drawings to identify materials and products:

1. Terminology: Materials and products are identified by the typical generic terms used in the individual Specifications Sections.
2. Abbreviations: Materials and products are identified by abbreviations scheduled on Drawings.
3. Keynoting: Materials and products are identified by reference keynotes referencing Specification Section numbers found in this Project Manual.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 01 1000

SECTION 01 7300

EXECUTION

PART 4 - GENERAL

1.01 SUMMARY

A. Section includes general administrative and procedural requirements governing execution of the Work including, but not limited to, the following:

1. Construction layout.
2. Field engineering and surveying.
3. Installation of the Work.
4. Cutting and patching.
5. Coordination of Owner-installed products.
6. Progress cleaning.
7. Starting and adjusting.
8. Protection of installed construction.
9. Correction of the Work.

B. Related Sections:
1. Division 07 Section "Penetration Firestopping" for patching penetrations in fire-rated construction.

1.02 INFORMATIONAL SUBMITTALS

1.03 QUALITY ASSURANCE

A. Cutting and Patching: Comply with requirements for and limitations on cutting and patching of construction elements.

1. Structural Elements: When cutting and patching structural elements, notify Owner of locations and details of cutting and await directions from the Owner before proceeding. Shore, brace, and support structural element during cutting and patching. Do not cut and patch structural elements in a manner that could change their load-carrying capacity or increase deflection.

2. Operational Elements: Do not cut and patch operating elements and related components in a manner that results in reducing their capacity to perform as intended or that results in increased maintenance or decreased operational life or safety.

3. Other Construction Elements: Do not cut and patch other construction elements or components in a manner that could change their load-carrying capacity, that

results in reducing their capacity to perform as intended, or that results in increased maintenance or decreased operational life or safety

4. Visual Elements: Do not cut and patch construction in a manner that results in visual evidence of cutting and patching. Do not cut and patch exposed construction in a manner that would, in Owner's opinion, reduce the building's aesthetic qualities. Remove and replace construction that has been cut and patched in a visually unsatisfactory manner.

1.04 WARRANTY

A. Existing Warranties: Remove, replace, patch, and repair materials and surfaces cut or damaged during installation or cutting and patching operations, by methods and with materials so as not to void existing warranties.

PART 5 - PRODUCTS

2.01 MATERIALS

A. General: Comply with requirements specified in other Sections.

1. For projects requiring compliance with sustainable design and construction practices and procedures, utilize products for patching that comply with requirements of Division 01 Section "Sustainable Design Requirements."

B. In-Place Materials: Use materials for patching identical to in-place materials. For exposed surfaces, use materials that visually match in-place adjacent surfaces to the fullest extent possible.

1. If identical materials are unavailable or cannot be used, use materials that, when installed, will provide a match acceptable to the Owner for the visual and functional performance of in-place materials.

PART 6 - EXECUTION

3.01 EXAMINATION

A. Examination and Acceptance of Conditions: Before proceeding with each component of the Work, examine substrates, areas, and conditions, with Installer or Applicator present where indicated, for compliance with requirements for installation tolerances and other conditions affecting performance. Record observations.

1. Verify compatibility with and suitability of substrates, including compatibility with existing finishes or primers.

2. Examine walls, floors, and roofs for suitable conditions where products and systems are to be installed.
3. Proceed with installation only after unsatisfactory conditions have been corrected. Proceeding with the Work indicates acceptance of surfaces and conditions.

3.02 PREPARATION

A Field Measurements: Take field measurements as required to fit the Work properly. Recheck measurements before installing each product. Where portions of the Work are indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication. Coordinate fabrication schedule with construction progress to avoid delaying the Work.

B. Space Requirements: Verify space requirements and dimensions of items shown diagrammatically on Drawings.

C. Review of Contract Documents and Field Conditions: Immediately on discovery of the need for clarification of the Contract Documents caused by differing field conditions outside the control of the Contractor, submit a request for information to Owner according to requirements in Division 01 Section "Project Management and Coordination."

3.03 CONSTRUCTION LAYOUT

A. Verification: Before proceeding to lay out the Work, verify layout information shown on Drawings, in relation to the property survey and existing benchmarks. If discrepancies are discovered, notify Architect and Construction Manager promptly.

3.04 FIELD ENGINEERING

3.05 INSTALLATION

A. General: Locate the Work and components of the Work accurately, in correct alignment and elevation, as indicated.

1. Make vertical work plumb and make horizontal work level.
2. Where space is limited, install components to maximize space available for maintenance and ease of removal for replacement.
3. Conceal pipes, ducts, and wiring in finished areas, unless otherwise indicated.

B. Comply with manufacturer's written instructions and recommendations for installing products in applications indicated.

C. Install products at the time and under conditions that will ensure the best possible results. Maintain conditions required for product performance until Substantial Completion.

D. Conduct construction operations so no part of the Work is subjected to damaging operations or loading in excess of that expected during normal conditions of occupancy.

E. Tools and Equipment: Do not use tools or equipment that produce harmful noise levels.

F. Templates: Obtain and distribute to the parties involved templates for work specified to be factory prepared and field installed. Check Shop Drawings of other work to confirm that adequate provisions are made for locating and installing products to comply with indicated requirements.

G. Attachment: Provide blocking and attachment plates and anchors and fasteners of adequate size and number to securely anchor each component in place, accurately located and aligned with other portions of the Work. Where size and type of attachments are not indicated, verify size and type required for load conditions.

1. Mounting Heights: Where mounting heights are not indicated, mount components at heights directed by Architect.
2. Allow for building movement, including thermal expansion and contraction.
3. Coordinate installation of anchorages. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors, that are to be embedded in concrete or masonry. Deliver such items to Project site in time for installation.

H. Joints: Make joints of uniform width. Where joint locations in exposed work are not indicated, arrange joints for the best visual effect. Fit exposed connections together to form hairline joints.

I. Hazardous Materials: Use products, cleaners, and installation materials that are not considered hazardous.

1.06 CUTTING AND PATCHING

A. Cutting and Patching, General: Employ skilled workers to perform cutting and patching. Proceed with cutting and patching at the earliest feasible time, and complete without delay.

1. Cut in-place construction to provide for installation of other components or performance of other construction, and subsequently patch as required to restore surfaces to their original condition.

B. Temporary Support: Provide temporary support of work to be cut.

C. Protection: Protect in-place construction during cutting and patching to prevent damage. Provide protection from adverse weather conditions for portions of Project that might be exposed during cutting and patching operations.

D. Adjacent Occupied Areas: Avoid interference with use of adjoining areas or interruption of free passage to adjoining areas.

F Cutting: Cut in-place construction by sawing, drilling, breaking, chipping, grinding, and similar operations, including excavation, using methods least likely to damage elements retained or adjoining construction. If possible, review proposed procedures with original Installer; comply with original Installer's written recommendations.

1. In general, use hand or small power tools designed for sawing and grinding, not hammering and chopping. Cut holes and slots neatly to minimum size required, and with minimum disturbance of adjacent surfaces. Temporarily cover openings when not in use.
2. Finished Surfaces: Cut or drill from the exposed or finished side into concealed surfaces.

E. Patching: Patch construction by filling, repairing, refinishing, closing up, and similar operations following performance of other work. Patch with durable seams that are as invisible as practicable. Provide materials and comply with installation requirements specified in other Sections, where applicable.

1. Inspection: Where feasible, test and inspect patched areas after completion to demonstrate physical integrity of installation.
2. Exposed Finishes: Restore exposed finishes of patched areas and extend finish restoration into retained adjoining construction in a manner that will minimize evidence of patching and refinishing.
3. Floors and Walls: Where walls or partitions that are removed extend one finished area into another, patch and repair floor and wall surfaces in the new space. Provide an even surface of uniform finish, color, texture, and appearance. Remove in-place floor and wall coverings and replace with new materials, if necessary, to achieve uniform color and appearance.
4. Ceilings: Patch, repair, or rehang in-place ceilings as necessary to provide an even-plane surface of uniform appearance.
5. Exterior Building Enclosure: Patch components in a manner that restores enclosure to a weathertight condition.

F. Cleaning: Clean areas and spaces where cutting and patching are performed. Remove paint, mortar, oils, putty, and similar materials from adjacent finished surfaces.

1.07 PROGRESS CLEANING

A. General: Clean Project site and work areas daily, including common areas. Enforce requirements strictly. Dispose of materials lawfully.

1. Comply with requirements in NFPA 241 for removal of combustible waste materials and debris.
2. Do not hold waste materials more than seven days during normal weather or three days if the temperature is expected to rise above 80 deg F (27 deg C).
3. Containerize hazardous and unsanitary waste materials separately from other waste. Mark containers appropriately and dispose of legally, according to regulations.

B. Site: Maintain Project site free of waste materials and debris.

C. Work Areas: Clean areas where work is in progress to the level of cleanliness necessary for proper execution of the Work.

1. Remove liquid spills promptly.
2. Where dust would impair proper execution of the Work, broom-clean or vacuum the entire work area, as appropriate.

D. Installed Work: Keep installed work clean. Clean installed surfaces according to written instructions of manufacturer or fabricator of product installed, using only cleaning materials specifically recommended. If specific cleaning materials are not recommended, use cleaning materials that are not hazardous to health or property and that will not damage exposed surfaces.

E. Concealed Spaces: Remove debris from concealed spaces before enclosing the space.

F. Exposed Surfaces in Finished Areas: Clean exposed surfaces and protect as necessary to ensure freedom from damage and deterioration at time of Substantial Completion.

G. Waste Disposal: Do not bury or burn waste materials on-site. Do not wash waste materials down sewers or into waterways.

H. During handling and installation, clean and protect construction in progress and adjoining materials already in place. Apply protective covering where required to ensure protection from damage or deterioration at Substantial Completion.

I. Clean and provide maintenance on completed construction as frequently as necessary through the remainder of the construction period. Adjust and lubricate operable components to ensure operability without damaging effects.

J. Limiting Exposures: Supervise construction operations to assure that no part of the construction, completed or in progress, is subject to harmful, dangerous, damaging, or otherwise deleterious exposure during the construction period.

1.08 PROTECTION OF INSTALLED CONSTRUCTION

A. Provide final protection and maintain conditions that ensure installed Work is without damage or deterioration at time of Substantial Completion.

B. Comply with manufacturer's written instructions for temperature and relative humidity.

1.09 CORRECTION OF THE WORK

A. Repair or remove and replace defective construction. Restore damaged substrates and finishes.

1. Repairing includes replacing defective parts, refinishing damaged surfaces, touching up with matching materials, and properly adjusting operating equipment.

B. Restore permanent facilities used during construction to their specified condition.

C. Remove and replace damaged surfaces that are exposed to view if surfaces cannot be repaired without visible evidence of repair.

D. Repair components that do not operate properly. Remove and replace operating components that cannot be repaired.

E. Remove and replace chipped, scratched, and broken glass or reflective surfaces.

END OF SECTION 01 7300

SECTION 01732 - SELECTIVE DEMOLITION

PART 7 - GENERAL

1.01 RELATED DOCUMENTS

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

1.02 SUMMARY

A. This Section includes the following for the said roof systems on: Portables @ Strawberry and TAM schools

1. Strawberry: Remove [e] metal roof and flashings to wood deck.

2. Strawberry and TAM: Remove existing metal gutters and downspouts.

3. Remove all dead equipment as designated / marked by owner.

4. Remove [e] edge metal to substrate.

5. Remove flashings on pipes and penetrations.

1.03 DEFINITIONS

A. Remove: Detach items from existing construction and legally dispose of them off-site, unless indicated to be removed and salvaged or removed and reinstalled.

B. Remove and Reinstall: Detach items from existing construction, prepare them for reuse, and reinstall them where indicated.

C. Existing to Remain: Existing items of construction that are not to be removed and that are not otherwise indicated to be removed, removed and salvaged, or removed and reinstalled.

1.04 SUBMITTALS

Regulatory requirements Comply with governing EPA notification regulations before beginning selective demolition. Comply with hauling and disposal regulations of authorities having jurisdiction.

A. Standards: Comply with ANSI A10.6 and NFPA 241.

B. Predemolition Conference: Conduct conference at Project site to comply with requirements.

1.05 PROJECT CONDITIONS

A. Owner will occupy portions of building immediately adjacent to selective demolition area. Conduct selective demolition so Owner's operations will not be disrupted.

B. Notify Owner of discrepancies between existing conditions and Drawings before proceeding with selective demolition.

C. Hazardous Materials: Hazardous materials are present in construction to be selectively demolished.

D. Storage or sale of removed items or materials on-site is not permitted.

E. Utility Service: Maintain existing utilities indicated to remain in service and protect them against damage during selective demolition operations.

1. Maintain fire-protection facilities in service during selective demolition operations.

1.06 WARRANTY

A. Existing Warranties: Remove, replace, patch, and repair materials and surfaces cut or damaged during selective demolition, by methods and with materials so as not to void existing warranties.

PART 8 - PRODUCTS (Not Used)

PART 9 - EXECUTION

1.01 EXAMINATION

A. Verify that utilities affected by the Work have been disconnected and capped.

B. Survey existing conditions and correlate with requirements indicated to determine extent of selective demolition required.

C. Inventory and record the condition of items to be removed and reinstalled and items to be removed and salvaged.

D. When unanticipated mechanical, electrical, or structural elements that conflict with intended function or design are encountered, investigate and measure the nature and extent of conflict. Promptly submit a written report to Owner**.**

E. Survey of Existing Conditions: Record existing conditions by use of preconstruction photographs.

1.02 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.

1. Comply with requirements for existing services/systems interruptions specified in Summary.

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. Owner will arrange to shut off indicated services/systems when requested by Contractor.
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.
3. Cut off pipe or conduit in walls or partitions to be removed. Cap, valve, or plug and seal remaining portion of pipe or conduit after bypassing.

1.03 PREPARATION

A. Site Access and Temporary Controls: Conduct selective demolition and debris-removal operations to ensure minimum interference with walks, walkways, and other adjacent occupied and used facilities.

1.04 SELECTIVE DEMOLITION, GENERAL

A. General: Demolish and remove existing construction only to the extent required by new construction and as indicated. Use methods required to complete the Work within limitations of governing regulations and as follows:
1. Remove decayed, vermin-infested, or otherwise dangerous or unsuitable materials and promptly dispose of off-site.
2. Locate selective demolition equipment and remove debris and materials so as not to impose excessive loads on supporting walls, floors, or framing.
3. Dispose of demolished items and materials promptly

B. Removed and Reinstalled Items:

1. Clean and repair items to functional condition adequate for intended reuse. Paint equipment to match new equipment.
2. Protect items from damage during transport and storage.
3. Reinstall items in locations indicated. Comply with installation requirements for new materials and equipment. Provide connections, supports, and miscellaneous materials necessary to make item functional for use indicated.

C. Existing Items to Remain: Protect construction indicated to remain against damage and soiling during selective demolition.

1.05 DEMOLITION PROCEDURES

A. Remove [e] metal roofing to the substrate on Strawberry Point & Tam Valley Elementary schools.

B. Remove [e] flashings on pipes/penetrations to substrate.

C. Remove [e] metal on perimeter edge.

D. Remove [e] gutters and downspouts.

E. Remove all equipment as designated by owner and dispose of properly.

1.06 DISPOSAL OF DEMOLISHED MATERIALS

A. General: Except for items or materials indicated to be recycled, reused, salvaged, reinstalled, or otherwise indicated to remain Owner's property, remove demolished materials from Project site and legally dispose of them in an EPA-approved landfill.

1. Do not allow demolished materials to accumulate on-site.
2. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.
3. Remove debris from elevated portions of building by chute, hoist, or other device that will convey debris to grade level in a controlled descent.

B. Burning: Do not burn demolished materials.

C. Disposal: Transport demolished materials off Owner's property and legally dispose of them.

1.07 CLEANING

A. Clean adjacent structures and improvements of dust, dirt, and debris caused by selective demolition operations. Return adjacent areas to condition existing before selective demolition operations began.

END OF SECTION 01732

SECTION 01 7300

EXECUTION

PART 10 - GENERAL

1.01 SUMMARY

A. Section includes general administrative and procedural requirements governing execution of the Work including, but not limited to, the following:

1. Construction layout.
2. Field engineering and surveying.
3. Installation of the Work.
4. Cutting and patching.
5. Coordination of Owner-installed products.
6. Progress cleaning.
7. Starting and adjusting.
8. Protection of installed construction.
9. Correction of the Work.

B. Related Sections:
1. Division 07 Section "Penetration Firestopping" for patching penetrations in fire-rated construction.

1.02 INFORMATIONAL SUBMITTALS

1.03 QUALITY ASSURANCE

A. Cutting and Patching: Comply with requirements for and limitations on cutting and patching of construction elements.

1. Structural Elements: When cutting and patching structural elements, notify Owner of locations and details of cutting and await directions from the Owner before proceeding. Shore, brace, and support structural element during cutting and patching. Do not cut and patch structural elements in a manner that could change their load-carrying capacity or increase deflection.

2. Operational Elements: Do not cut and patch operating elements and related components in a manner that results in reducing their capacity to perform as intended or that results in increased maintenance or decreased operational life or safety.

3. Other Construction Elements: Do not cut and patch other construction elements or components in a manner that could change their load-carrying capacity, that

results in reducing their capacity to perform as intended, or that results in increased maintenance or decreased operational life or safety

4. Visual Elements: Do not cut and patch construction in a manner that results in visual evidence of cutting and patching. Do not cut and patch exposed construction in a manner that would, in Owner's opinion, reduce the building's aesthetic qualities. Remove and replace construction that has been cut and patched in a visually unsatisfactory manner.

1.04 WARRANTY

A. Existing Warranties: Remove, replace, patch, and repair materials and surfaces cut or damaged during installation or cutting and patching operations, by methods and with materials so as not to void existing warranties.

PART 11 - PRODUCTS

2.02 MATERIALS

A. General: Comply with requirements specified in other Sections.

1. For projects requiring compliance with sustainable design and construction practices and procedures, utilize products for patching that comply with requirements of Division 01 Section "Sustainable Design Requirements."

B. In-Place Materials: Use materials for patching identical to in-place materials. For exposed surfaces, use materials that visually match in-place adjacent surfaces to the fullest extent possible.

1. If identical materials are unavailable or cannot be used, use materials that, when installed, will provide a match acceptable to the Owner for the visual and functional performance of in-place materials.

PART 12 - EXECUTION

3.03 EXAMINATION

A. Examination and Acceptance of Conditions: Before proceeding with each component of the Work, examine substrates, areas, and conditions, with Installer or Applicator present where indicated, for compliance with requirements for installation tolerances and other conditions affecting performance. Record observations.

1. Verify compatibility with and suitability of substrates, including compatibility with existing finishes or primers.

2. Examine walls, floors, and roofs for suitable conditions where products and systems are to be installed.
3. Proceed with installation only after unsatisfactory conditions have been corrected. Proceeding with the Work indicates acceptance of surfaces and conditions.

3.04 PREPARATION

A Field Measurements: Take field measurements as required to fit the Work properly. Recheck measurements before installing each product. Where portions of the Work are indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication. Coordinate fabrication schedule with construction progress to avoid delaying the Work.

B. Space Requirements: Verify space requirements and dimensions of items shown diagrammatically on Drawings.

C. Review of Contract Documents and Field Conditions: Immediately on discovery of the need for clarification of the Contract Documents caused by differing field conditions outside the control of the Contractor, submit a request for information to Owner according to requirements in Division 01 Section "Project Management and Coordination."

3.06 CONSTRUCTION LAYOUT

D. Verification: Before proceeding to lay out the Work, verify layout information shown on Drawings, in relation to the property survey and existing benchmarks. If discrepancies are discovered, notify Architect and Construction Manager promptly.

3.07 FIELD ENGINEERING

3.06 INSTALLATION

E. General: Locate the Work and components of the Work accurately, in correct alignment and elevation, as indicated.

1. Make vertical work plumb and make horizontal work level.
2. Where space is limited, install components to maximize space available for maintenance and ease of removal for replacement.
3. Conceal pipes, ducts, and wiring in finished areas, unless otherwise indicated.

F. Comply with manufacturer's written instructions and recommendations for installing products in applications indicated.

G. Install products at the time and under conditions that will ensure the best possible results. Maintain conditions required for product performance until Substantial Completion.

H. Conduct construction operations so no part of the Work is subjected to damaging operations or loading in excess of that expected during normal conditions of occupancy.

I. Tools and Equipment: Do not use tools or equipment that produce harmful noise levels.

J. Templates: Obtain and distribute to the parties involved templates for work specified to be factory prepared and field installed. Check Shop Drawings of other work to confirm that adequate provisions are made for locating and installing products to comply with indicated requirements.

K. Attachment: Provide blocking and attachment plates and anchors and fasteners of adequate size and number to securely anchor each component in place, accurately located and aligned with other portions of the Work. Where size and type of attachments are not indicated, verify size and type required for load conditions.

1. Mounting Heights: Where mounting heights are not indicated, mount components at heights directed by Architect.
2. Allow for building movement, including thermal expansion and contraction.
3. Coordinate installation of anchorages. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors, that are to be embedded in concrete or masonry. Deliver such items to Project site in time for installation.

L. Joints: Make joints of uniform width. Where joint locations in exposed work are not indicated, arrange joints for the best visual effect. Fit exposed connections together to form hairline joints.

M. Hazardous Materials: Use products, cleaners, and installation materials that are not considered hazardous.

1.02 CUTTING AND PATCHING

A. Cutting and Patching, General: Employ skilled workers to perform cutting and patching. Proceed with cutting and patching at the earliest feasible time, and complete without delay.

1. Cut in-place construction to provide for installation of other components or performance of other construction, and subsequently patch as required to restore surfaces to their original condition.

B. Temporary Support: Provide temporary support of work to be cut.

C. Protection: Protect in-place construction during cutting and patching to prevent damage. Provide protection from adverse weather conditions for portions of Project that might be exposed during cutting and patching operations.

D. Adjacent Occupied Areas: Avoid interference with use of adjoining areas or interruption of free passage to adjoining areas.

F Cutting: Cut in-place construction by sawing, drilling, breaking, chipping, grinding, and similar operations, including excavation, using methods least likely to damage elements retained or adjoining construction. If possible, review proposed procedures with original Installer; comply with original Installer's written recommendations.

1. In general, use hand or small power tools designed for sawing and grinding, not hammering and chopping. Cut holes and slots neatly to minimum size required, and with minimum disturbance of adjacent surfaces. Temporarily cover openings when not in use.
2. Finished Surfaces: Cut or drill from the exposed or finished side into concealed surfaces.

E. Patching: Patch construction by filling, repairing, refinishing, closing up, and similar operations following performance of other work. Patch with durable seams that are as invisible as practicable. Provide materials and comply with installation requirements specified in other Sections, where applicable.

1. Inspection: Where feasible, test and inspect patched areas after completion to demonstrate physical integrity of installation.
2. Exposed Finishes: Restore exposed finishes of patched areas and extend finish restoration into retained adjoining construction in a manner that will minimize evidence of patching and refinishing.
3. Floors and Walls: Where walls or partitions that are removed extend one finished area into another, patch and repair floor and wall surfaces in the new space. Provide an even surface of uniform finish, color, texture, and appearance. Remove in-place floor and wall coverings and replace with new materials, if necessary, to achieve uniform color and appearance.
4. Ceilings: Patch, repair, or rehang in-place ceilings as necessary to provide an even-plane surface of uniform appearance.
5. Exterior Building Enclosure: Patch components in a manner that restores enclosure to a weathertight condition.

F. Cleaning: Clean areas and spaces where cutting and patching are performed. Remove paint, mortar, oils, putty, and similar materials from adjacent finished surfaces.

1.03 PROGRESS CLEANING

A. General: Clean Project site and work areas daily, including common areas. Enforce requirements strictly. Dispose of materials lawfully.

1. Comply with requirements in NFPA 241 for removal of combustible waste materials and debris.
2. Do not hold waste materials more than seven days during normal weather or three days if the temperature is expected to rise above 80 deg F (27 deg C).
3. Containerize hazardous and unsanitary waste materials separately from other waste. Mark containers appropriately and dispose of legally, according to regulations.

B. Site: Maintain Project site free of waste materials and debris.

C. Work Areas: Clean areas where work is in progress to the level of cleanliness necessary for proper execution of the Work.

1. Remove liquid spills promptly.
2. Where dust would impair proper execution of the Work, broom-clean or vacuum the entire work area, as appropriate.

D. Installed Work: Keep installed work clean. Clean installed surfaces according to written instructions of manufacturer or fabricator of product installed, using only cleaning materials specifically recommended. If specific cleaning materials are not recommended, use cleaning materials that are not hazardous to health or property and that will not damage exposed surfaces.

E. Concealed Spaces: Remove debris from concealed spaces before enclosing the space.

F. Exposed Surfaces in Finished Areas: Clean exposed surfaces and protect as necessary to ensure freedom from damage and deterioration at time of Substantial Completion.

G. Waste Disposal: Do not bury or burn waste materials on-site. Do not wash waste materials down sewers or into waterways.

H. During handling and installation, clean and protect construction in progress and adjoining materials already in place. Apply protective covering where required to ensure protection from damage or deterioration at Substantial Completion.

I. Clean and provide maintenance on completed construction as frequently as necessary through the remainder of the construction period. Adjust and lubricate operable components to ensure operability without damaging effects.

J. Limiting Exposures: Supervise construction operations to assure that no part of the construction, completed or in progress, is subject to harmful, dangerous, damaging, or otherwise deleterious exposure during the construction period.

1.04 PROTECTION OF INSTALLED CONSTRUCTION

A. Provide final protection and maintain conditions that ensure installed Work is without damage or deterioration at time of Substantial Completion.

B. Comply with manufacturer's written instructions for temperature and relative humidity.

1.05 CORRECTION OF THE WORK

A. Repair or remove and replace defective construction. Restore damaged substrates and finishes.

1. Repairing includes replacing defective parts, refinishing damaged surfaces, touching up with matching materials, and properly adjusting operating equipment.

B. Restore permanent facilities used during construction to their specified condition.

C. Remove and replace damaged surfaces that are exposed to view if surfaces cannot be repaired without visible evidence of repair.

D. Repair components that do not operate properly. Remove and replace operating components that cannot be repaired.

E. Remove and replace chipped, scratched, and broken glass or reflective surfaces.

END OF SECTION 01 7300

SECTION 07540 – SINGLE PLY MEMBRANE ROOFING

PART 13 - GENERAL

1.01 RELATED DOCUMENTS

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

1.02 SUMMARY OF WORK-

A. This Section includes the following:
   1. TAM: Furnish and install [n] layer of high density EPS board between the ribs. Strawberry and TAM, furnish and install one [1] layer of primed Dens deck. Mechanically attach with screws and plates.
   2. Roof membrane: Fully adhered single ply membrane.
   3. Penetrations and projections.
   4. Installation of [n] perimeter metal
   5. Installation of [n] gutters
   6. Installation of [n] downspouts
   7. Miscellaneous details.

B. Related Sections include the following:
   1. Division 7 Section 1732 “Selective Demolition”
   2. Division 7 Section 7620 "Sheet Metal Flashing and Trim" for metal roof penetration flashings, flashings, and counterflashing’s.

1.03 DEFINITIONS

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

B. Design Uplift Pressure: The uplift pressure, calculated according to procedures in SPRI's "Wind Load Design Guide for Fully Adhered and Mechanically Fastened Roofing Systems," before multiplication by a safety factor.

1.04 PERFORMANCE REQUIREMENTS

A. General: Provide installed roofing membrane and base flashings that remain watertight; do not permit the passage of water; and resist specified uplift pressures, thermally induced movement, and exposure to weather without failure.

B. Material Compatibility: Provide roofing materials that are compatible with one another under conditions of service and application required, as demonstrated by roofing membrane manufacturer based on testing and field experience.

C. Roofing System Design: Provide a membrane roofing system that is identical to systems that have been successfully tested by a qualified testing and inspecting agency to resist uplift pressure calculated according to ASCE 7.

D. FMG Listing: Provide roofing membrane, base flashings, and component materials that comply with requirements in FMG 4450 and FMG 4470 as part of a membrane roofing system and that are listed in FMG's "Approval Guide" for Class 1 or noncombustible construction, as applicable. Identify materials with FMG markings.

1. Fire/Windstorm Classification: Class 1A **90**.

2. U.L. Class A fire rating

E. Roofing System Design: Provide a membrane roofing system that is identical to systems that have been successfully tested by a qualified testing and inspecting agency to resist the factored design uplift pressures calculated according to SPRI's "Wind Load Design Guide for Fully Adhered and Mechanically Fastened Roofing Systems."

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

G. Shop Drawings: For roofing system. Include plans, sections, details, and attachments to other Work.

1. Base flashings and membrane terminations.
2. Data sheet and color for Fascia metal
3. Data sheet for gutters and downspouts

H. Samples for Verification: For the following products:

1. 12-by-12-inch square of roofing membrane, of color specified.
2. New counterflashing metal
3. New perimeter metal

I. Installer Certificates: Signed by roofing system manufacturer certifying that Installer is approved, authorized, or licensed by manufacturer to install roofing system.

J. Qualification Data: For Installer and manufacturer.

K. Product Test Reports: Based on evaluation of comprehensive tests performed by manufacturer and witnessed by a qualified testing agency, for components of roofing system.

L. Research/Evaluation Reports: For components of membrane roofing system.

M. Maintenance Data: For roofing system to include in maintenance manuals.

N. Warranties: Special warranties specified in this Section. **Provide unexecuted copy of warranty for review and approval**.

O. Inspection Report: Copy of roofing system manufacturer's inspection report of completed roofing installation.

1.05 QUALITY ASSURANCE

A. Installer Qualifications: An employer of workers trained and certified by manufacturer, including a full-time on-site supervisor with a minimum of five years' experience installing products comparable to those specified, able to communicate verbally with Contractor, Architect, and employees, and qualified by the manufacturer to install manufacturer's product and furnish warranty of type specified. Contractor must have an established office/shop located within a fifty [50] miles radius of project to properly service project and leak response.

B. Manufacturer Qualifications: Approved manufacturer with UL listed roofing systems comparable to those specified for this Project, with minimum five years' experience in manufacture of comparable products in successful use in similar applications, and able to furnish warranty with provisions matching specified requirements.
   1. Approval of Comparable Products: Submit the following in accordance with project substitution requirements, within time allowed for substitution review:
      a. Product data, including certified independent test data indicating compliance with requirements.
      b. Samples of each component.
      c. Sample submittal from similar project.
      d. Project references: Minimum of five installations of specified products not less than five years old, with Owner and Architect contact information.
      e. Sample warranty, unexecuted with follow up inspections and dates indicated on warranty form.
      f. Sample copy of weekly report
   2. Substitutions following award of contract are not allowed except as stipulated in Division 01 General Requirements. Only prime contractor will be allowed to submit request for substitution.
   3. Approved manufacturers must meet separate requirements of Submittals Article.

C. Roofing Inspector Qualifications: A technical representative of manufacturer not engaged in the sale of products and experienced in the installation and maintenance of the specified roofing system, qualified to perform roofing observation and inspection specified in Field Quality Control Article, to determine Installer's compliance with the requirements of this Project, and approved by the manufacturer to issue warranty certification. The Roofing Inspector shall be one of the following:
   1. An authorized full-time technical employee of the manufacturer.
   2. An independent party certified as a Registered Roof Observer by the Roof Consultants Institute, retained by the Contractor or the Manufacturer and approved by the Manufacturer.

D. Manufacture Qualifications. A qualified manufacture that has UL listing, FMG approval for membrane roofing system identical to that used for this project.

E. Source Limitations: Obtain components for membrane roofing system **from** roofing membrane manufacturer.

F. Fire-Test-Response Characteristics: Provide membrane roofing materials with the fire-test-response characteristics indicated as determined by testing identical products per test method below by UL, FMG, or another testing and inspecting agency acceptable to authorities having jurisdiction. Materials shall be identified with appropriate markings of applicable testing and inspecting agency.

1. Fire-Resistance Ratings: UL Class A, for fire-resistance-rated roof assemblies of which roofing system is a part.

G. Preinstallation Conference: Conduct conference at Project site. Comply with requirements in Division 1 Section "Project Management and Coordination." Review methods and procedures related to roofing system including, but not limited to, the following:

1. Meet with Owner, Architect, Owner's insurer if applicable, testing and inspecting agency representative, roofing Installer, roofing system manufacturer's representative, deck Installer, and installers whose work interfaces with or affects roofing including installers of roof accessories and roof-mounted equipment.
2. Review methods and procedures related to roofing installation, including manufacturer's written instructions.
3. Review and finalize construction schedule and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
4. Examine deck substrate conditions and finishes for compliance with requirements, including flatness and fastening.
5. Review structural loading limitations of roof deck during and after roofing.
6. Review base flashings, special roofing details, roof drainage, roof penetrations, equipment curbs, and condition of other construction that will affect roofing system.
7. Review governing regulations and requirements for insurance and certificates if applicable.
8. Review temporary protection requirements for roofing system during and after installation.
9. Review roof observation and repair procedures after roofing installation.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Deliver roofing materials to Project site in original containers with seals unbroken and labeled with manufacturer's name, product brand name and type, date of manufacture, and directions for storing and mixing with other components.

B. Store liquid materials in their original undamaged containers in a clean, dry, protected location and within the temperature range required by roofing system manufacturer. Protect stored liquid material from direct sunlight.

1. Discard and legally dispose of liquid material that cannot be applied within its stated shelf life.

C. Protect roof insulation materials from physical damage and from deterioration by sunlight, moisture, soiling, and other sources. Store in a dry location. Comply with insulation manufacturer's written instructions for handling, storing, and protecting during installation.

D. Handle and store roofing materials and place equipment in a manner to avoid permanent deflection of deck.

1.07 PROJECT CONDITIONS

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

1.08 WARRANTY

A. Special Warranty: Manufacturer's standard warranty form, without monetary limitation, in which manufacturer agrees to repair or replace components of roofing system that fail in materials or workmanship within specified warranty period. Failure includes roof leaks.
   1. Special warranty includes roofing membrane, baseflashings, roofing membrane accessories, roof insulation, fasteners, cover boards, substrate board, and other components of roofing system, whether manufactured by or approved by the manufacturer for 20 [twenty] years from date of Substantial Completion.

B. Maintenance Service Agreement: Manufacturer's standard form, in which manufacturer agrees to provide the following service for the roof system during the second, fifth, tenth, and year fifteen of the warranty period specified above:
   1. Inspection of the roof membrane and associated roofing system components listed above by a manufacturer's technical service representative.
   2. Report of inspection documenting roofing conditions.
   3. Routine preventive maintenance and repairs to damage to the roof system, excluding such damage to the roof system excluded from the warranty and service agreements as a result of neglect, negligence, vandalism or other excluded cause as described in manufacturer's published terms and conditions at the date of this contract.
   4. General rooftop housekeeping and cleanup, subject to limits, but generally including removal of incidental debris.
   5. Special Project Warranty: Submit roofing Installer's warranty, on warranty form at end of this Section, signed by Installer, covering Work of this Section, including all components of roofing system such as roofing membrane, base flashing, roof insulation, fasteners, cover boards, substrate boards, vapor retarders, roof pavers, and walkway products, for the following warranty period: years from date of Substantial Completion.

C. Special project warranty: Submit roofing installers warranty, on warranty form at end of this section, signed by installer, covering work of this section, including all components of the membrane roofing system such as membrane, baseflashing, roof insulation, fasteners, walkway products, for the following warranty period:

C. 1. Contractor warranty period: Five [5] years from date of substantial completion

PART 14 - PRODUCTS

1.01 MANUFACTURERS

A. Basis of design: Product requirements in section are based upon Tremco, Inc. products named in Part 2 articles. Subject to compliance with requirements, provide the named product.

B. Manufacturer: Subject to compliance with requirements, provide the following:

1. Tremply KEE FB single ply membrane –CRRC approved membrane system in current edition meeting 110 SRI

2. Roof system meeting the following requirements:

a. Warranty requirements and coverage. Follow up inspections, housekeeping and preventative maintenance.

b. Regulatory requirements: Class A fire rated assembly. Wind uplift requirements meeting:

1.02 KEE ROOFING – KEE FLEECE BACKED MEMBRANE

A. Fabric-Reinforced KEE Sheet: Uniform, flexible sheet formed from a thermoplastic fabric or scrim reinforced, and as follows:

1. Thickness: **60 mils fleeced back product.**
2. Exposed Face Color: **White**
3. Physical Properties:

a. Tensile Strength: MD 520 lbf/in and XMD 406 lbf/in ASTM D 751, grab method.
b. Elongation at Break: 22% MD and 20% XMD ; ASTM D 751.
c. Tearing Strength: 150 lbf minimum; ASTM D 751, Procedure B.
d. Brittleness Point: Minus 22 deg F.
e. Linear Dimension Change: .6/.1 ; ASTM D 1204.
f. Seam strength : D 751 – 800 lbf

1.03 AUXILIARY MATERIALS

A. General: Auxiliary materials recommended by roofing system manufacturer for intended use and compatible with membrane roofing.

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

B. Sheet Flashing: Manufacturer's standard sheet flashing of same material, type, reinforcement, thickness, and color as KEE sheet membrane.

C. Sheet Flashing: Manufacturer's standard unreinforced thermoplastic sheet flashing, **55 mils** thick, minimum, of same color as sheet membrane.

D. Bonding Adhesive: Manufacturer's standard **water**-based bonding adhesive for membrane, and solvent-based bonding adhesive for base flashings. Elastomeric adhesive by roof systems manufacturer

E. Metal Termination Bars: Manufacturer's standard predrilled stainless-steel or aluminum bars, approximately 1 by 1/8-inch-thick; with anchors.

F. Fasteners: Factory-coated steel fasteners and metal or plastic plates meeting corrosion-resistance provisions in FMG 4470, designed for fastening membrane to substrate, and acceptable to membrane roofing system manufacturer.

G. Miscellaneous Accessories: Provide pourable sealers, preformed cone and vent sheet flashings, preformed inside and outside corner sheet flashings, T-joint covers, termination reglets, cover strips, and other accessories.

H. Liquid applied coatings: Alpha Guard fluid applied system consisting of: primer, base coat, fiberglass reinforcement and top coat. Primer: Multi use primer – Low volitale, water based quick drying primer, one [1] part used to promote adhesion Base coat –One [1] part, moisture triggered polyurethane base roof coating, fiberglass reinforcement- Medium fine fiber, rapid wetting chopped strand mat. Top coat – one [1] part moisture triggered polyurethane top coat.

I. Caulking: one [1] part polyurethane sealant.

J. EPS insulation: Expanded polystyrene insulation meeting ASTM C578, 2.8 lbs/pcf density by ICA –lite or equal

K. Dens Deck: ASTM C1177 coated fiberglass faced gypsum based Dens Deck, primed, ¼ inch in thickness, or equal.

L. Insulation/Dens Deck adhesive: Low rise foam, two [2] part, solvent free, elastomeric urethane adhesive.

PART 15 - EXECUTION

1.01 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, for compliance with the following requirements and other conditions affecting performance of roofing system:

1. Verify that roof openings and penetrations are in place and set and braced and that roof drains are securely clamped in place.
2. Verify that wood blocking, curbs, and nailers are securely anchored to roof deck at penetrations and terminations and that nailers match thicknesses of insulation.

1.02 PREPARATION

A. Clean substrate of dust, debris, moisture, and other substances detrimental to roofing installation per roofing system manufacturer's written instructions. Remove sharp projections. Using a power broom or acceptable means, remove all loose, non adhered gravel, dirt and debris.

B. Prevent materials from entering and clogging roof drains and conductors and from spilling or migrating onto surfaces of other construction. Remove roof-drain plugs when no work is taking place or when rain is forecast.

C. Complete terminations and base flashings and provide temporary seals to prevent water from entering completed sections of roofing system at the end of the workday or when rain is forecast. Remove and discard temporary seals before beginning work on adjoining roofing.

D. Dead/ unused equipment: Remove from roof and premises all dead or un-used equipment.

E. Nailer: On TAM, furnish and install [n] wood nailer around perimeter of roof. Fasten nailer to deck with heavy duty screws. In any areas where underside of deck is exposed, use approved adhesive to secure.

1.03 DENS DECK/INSULATION INSTALLATION

A. Coordinate installing membrane roofing system components so the wood deck is not exposed to precipitation or left exposed at the end of the workday.

B. Comply with membrane roofing system manufacturer's written instructions for installing roof substrate board.

C. Insulation: TAM- Furnish and install [n] 4lb density EPS foam board. Cut to fit between ribs of [e] metal roof. Insulation thickness shall meet height of rib.

D. Mechanically attach Dens Deck: Install one [1] layer of Primed Dens Deck and secure layer to deck using mechanical fasteners specifically designed and sized for fastening specified Dens Deck to deck type.

1. Fasten layer of Dens Deck according to requirements in FMG's "Approval Guide" for specified Windstorm Resistance Classification.
2. Fasten layer of Dens Deck to resist uplift pressure at corners, perimeter, and field of roof.
3. Install boards with long joints of Dens Deck in a continuous straight line with end joints staggered between rows, abutting edges and ends between boards. Fill gaps ¼ with like same product.
4. Trim surface where necessary so completed surface is flush and does not restrict flow of water.

E. Insulation/ Den deck @ exposed underside deck: Adhere insulation/Dens Deck in low rise foam adhesive in area where the underside of the deck is exposed.

1.04 FULLY ADHERED ROOFING MEMBRANE INSTALLATION

A. Install roofing membrane over area to receive roofing according to roofing system manufacturer's written instructions. Unroll roofing membrane and allow to relax before installing.

1. Install sheet according to ASTM D 5082.

B. Start installation of roofing membrane in presence of roofing system manufacturer's technical personnel.

C. Accurately align roofing membranes and maintain uniform side and end laps of minimum dimensions required by manufacturer. Stagger end laps.

D. Adhesively adhere roofing membrane securely at terminations, penetrations, and perimeter of roofing. Set fleeced back single ply membrane in manufacturers approved adhesive at the rate of 1 gallon per 100 square feet. Roll in for maximum adhesion as required prior to heat welding laps.

E. Apply roofing membrane with side laps shingled with slope of roof deck where possible.

F. Seams: Clean seam areas, overlap roofing membrane, and hot-air weld side and end laps of roofing membrane according to manufacturer's written instructions to ensure a watertight seam installation.

1. Test lap edges with probe to verify seam weld continuity. Apply lap sealant to seal cut edges of roofing membrane.
2. Verify field strength of seams a minimum of twice daily and repair seam sample areas.
3. Repair tears, voids, and lapped seams in roofing membrane that does not meet requirements.

G. Spread sealant or mastic bed over deck drain flange at deck drains and securely seal roofing membrane in place with clamping ring.

H. In-Splice Attachment: Secure one edge of roofing membrane using fastening plates or metal battens centered within membrane splice and mechanically fasten roofing membrane to roof deck. Field-splice seam.

I. Through-Membrane Attachment: Secure roofing membrane using fastening plates or metal battens and mechanically fasten roofing membrane to roof deck. Cover battens and fasteners with a continuous cover strip.

J. Install roofing membrane and auxiliary materials to ensure system is made watertight nightly.

1.05 BASE FLASHING/ DETAIL INSTALLATION

A. Install sheet flashings and preformed flashing accessories and adhere to substrates according to membrane roofing system manufacturer's written instructions.

B. Apply solvent-based bonding adhesive to substrate and underside of sheet flashing at required rate and allow to partially dry. Do not apply bonding adhesive to seam area of flashing.

C. Flash penetrations and field-formed inside and outside corners with sheet flashing.

D. Clean seam areas and overlap and firmly roll sheet flashings into the adhesive. Weld side and end laps to ensure a watertight seam installation.

E. Misc. flashings –As needed: Prime metal with Alpha Guard metal primer. Apply Alpha Guard base coat. while base is still wet, apply reinforcing mat and trowel in without wrinkles or voids. Apply top coat of Alpha Guard.

F. Penetrations/projections: Furnish and install pre-manufactured boot. Heat weld flange to field membrane. Clamp and caulk top of flashing.

G. Metal coping: Furnish and install new metal coping cap in areas as required.

H. Gravel stop: Furnish and install new gravel stop. Mechanically fasten flange three [3] inches OC staggered and strip in with single ply membrane. Heat weld directly to metal. See sheet metal section. Furnish and install new

I. Gutters /Downspouts: Furnish and install [n] gutters and related [n] downspouts Refer to Sheetmetal section.

1.06 FIELD QUALITY CONTROL

A. Testing Agency: Contractor will engage a qualified independent testing and inspecting agency or manufacturer to perform roof tests and inspections and to prepare test reports. Contractor to engage manufacturers technical staff for four [4] eight [8] hour days.

B. Final Roof Inspection: Arrange for roofing system manufacturer's technical personnel to inspect roofing installation on completion and submit report to MVUSD

1. Notify Owner 48 hours in advance of date and time of inspection.

C. Repair or remove and replace components of membrane roofing system where test results or inspections indicate that they do 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.

1.07 PROTECTING AND CLEANING

A. Protect membrane roofing system from damage and wear during remainder of construction period. When remaining construction will not affect or endanger roofing, inspect roofing for deterioration and damage, describing its nature and extent in a written report, with copies to Architect and Owner.

B. Correct deficiencies in or remove membrane roofing system that does not comply with requirements, repair substrates, and repair or reinstall membrane roofing system to a condition free of damage and deterioration at time of Substantial Completion and according to warranty requirements.

C. Clean overspray and spillage from adjacent construction using cleaning agents and procedures recommended by manufacturer of affected construction.

1.08 ROOFING INSTALLER'S WARRANTY

A. WHEREAS <**Insert name**> of <**Insert address**>, herein called the "Roofing Installer," has performed roofing and associated work ("work") on the following project:

1. Owner: <**Insert name of Owner.**>
2. Address: <**Insert address.**>
3. Building Name/Type: <**Insert information.**>
4. Address: <**Insert address.**>
5. Area of Work: <**Insert information.**>
6. Acceptance Date: <**Insert date.**>
7. Warranty Period: <**Insert time.**>
8. Expiration Date: <**Insert date.**>

B. AND WHEREAS Roofing Installer has contracted (either directly with Owner or indirectly as a subcontractor) to warrant said work against leaks and faulty or defective materials and workmanship for designated Warranty Period,

C. NOW THEREFORE Roofing Installer hereby warrants, subject to terms and conditions herein set forth, that during Warranty Period he will, at his own cost and expense, make or cause to be made such repairs to or replacements of said work as are necessary to correct faulty and defective work and as are necessary to maintain said work in a watertight condition.

D. This Warranty is made subject to the following terms and conditions:

1. Specifically excluded from this Warranty are damages to work and other parts of the building, and to building contents, caused by:

    a. lightning;
    b. peak gust wind speed exceeding <**Insert wind speed**> mph (m/sec);
    c. fire;
    d. failure of roofing system substrate, including cracking, settlement, excessive deflection, deterioration, and decomposition;
    e. faulty construction of parapet walls, copings, chimneys, skylights, vents, equipment supports, and other edge conditions and penetrations of the work;
    f. vapor condensation on bottom of roofing; and
    g. activity on roofing by others, including construction contractors, maintenance personnel, other persons, and animals, whether authorized or unauthorized by Owner.

2. When work has been damaged by any of foregoing causes, Warranty shall be null and void until such damage has been repaired by Roofing Installer and until cost and expense thereof have been paid by Owner or by another responsible party so designated.
3. Roofing Installer is responsible for damage to work covered by this Warranty but is not liable for consequential damages to building or building contents resulting from leaks or faults or defects of work.
4. During Warranty Period, if Owner allows alteration of work by anyone other than Roofing Installer, including cutting, patching, and maintenance in connection with penetrations, attachment of other work, and positioning of anything on roof, this Warranty shall become null and void on date of said alterations, but only to the extent said alterations affect work covered by this Warranty. If Owner engages Roofing

Installer to perform said alterations, Warranty shall not become null and void unless Roofing Installer, before starting said work, shall have notified Owner in writing, showing reasonable cause for claim, that said alterations would likely damage or deteriorate work, thereby reasonably justifying a limitation or termination of this Warranty.

5. During Warranty Period, if original use of roof is changed and it becomes used for, but was not originally specified for, a promenade, work deck, spray-cooled surface, flooded basin, or other use or service more severe than originally specified, this Warranty shall become null and void on date of said change, but only to the extent said change affects work covered by this Warranty.
6. Owner shall promptly notify Roofing Installer of observed, known, or suspected leaks, defects, or deterioration and shall afford reasonable opportunity for Roofing Installer to inspect work and to examine evidence of such leaks, defects, or deterioration.
7. This Warranty is recognized to be the only warranty of Roofing Installer on said work and shall not operate to restrict or cut off Owner from other remedies and resources lawfully available to Owner in cases of roofing failure. Specifically, this Warranty shall not operate to relieve Roofing Installer of responsibility for performance of original work according to requirements of the Contract Documents, regardless of whether Contract was a contract directly with Owner or a subcontract with Owner's General Contractor.

E. IN WITNESS THEREOF, this instrument has been duly executed this <**Insert day**> day of <**Insert month**>, <**Insert year**>.

1. Authorized Signature: <**Insert signature.**>
2. Name: <**Insert name.**>
3. Title: <**Insert title.**>

END OF SECTION 07540

SECTION 07620 - SHEET METAL FLASHING AND TRIM

PART 16 - GENERAL

1.01 RELATED DOCUMENTS

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

1.02 SUMMARY

A. This Section includes the following sheet metal flashing and trim:

1. Furnish and install new gutters and downspouts on Strawberry School only.
2. Furnish and install new perimeter metal, Strawberry and TAM
3. Furnish and install new coping cap, as required on Strawberry and TAM.
4. Furnish miscellaneous flashings and terminations as needed.

B. Related Sections include the following:

1. Division 01732 Section Select Demolition
2. Division Section 07540 KEE membrane roofing
3. Division Section 0756 00 Fluid applied membrane roofing

1.03 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.

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

1.04 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 Initial Selection: For each type of sheet metal flashing and trim indicated with factory-applied color finishes.

1. Include similar Samples of trim and accessories involving color selection.

D. Samples for Verification: For each type of exposed finish required, prepared on Samples of size indicated below:

1. Sheet Metal Flashing: 12 inches long. Include fasteners, **cleats, clips,** closures, and other attachments.
2. Trim: 12 inches long. Include fasteners and other exposed accessories.
3. Accessories: Full-size Sample.
4. Gravelstop
5. Gutters
6. Downspouts

1.05 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.

1. Copper Standard: Comply with CDA's "Copper in Architecture Handbook."

B. Preinstallation Conference: Conduct conference at Project site to comply with requirements in Division 1 Section "Project Management and Coordination."

1. Meet with Owner, Architect, 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, unit skylights, 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.

1.06 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.

1.07 COORDINATION

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

PART 17 - PRODUCTS

1.01 MANUFACTURERS

A. In other Part 2 articles where titles below introduce lists, the following requirements apply to product selection:

1. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, products specified.
2. Products: Subject to compliance with requirements, provide one of the products specified.

1.02 SHEET METALS

A. Gutters and downspouts: Galvanized steel sheet: ASTM A 526 twenty-four gauge, PAINT READY.

B. Edge metal :Kynar Coated Steel Sheet or KEE coated metal: Steel sheet metallic coated by the hot-dip process and prepainted by the coil-coating process to comply with ASTM A 755/A 755M.

1. Galvanized Steel Sheet: ASTM A 526, twenty-four [24] gauge
2. Exposed Finishes: Apply the following coating:

a. Kynar coated metal 500 or Hylar 5000 with pre-coated finish with 0.2 mil baked on primer and .08 mil baked on topcoat. For 1.0 dry mil thickness.

1) Color: Selected by owner.

2) KEE coated metal for new metal edge

C. Lead Sheet: ASTM B 749, Type L51121, copper-bearing lead sheet.

1.03 UNDERLAYMENT MATERIALS

A. Self adhering membrane: sheet complying with ASTM D 6163 Type I grade by roof systems manufacturer. SA by roof systems manufacture.

1.04 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. Fasteners: Wood screws, annular threaded nails, self-tapping screws, self-locking rivets and bolts, and other suitable fasteners designed to withstand design loads.

1. Nails for Copper Sheet: Copper or hardware bronze, 0.109 inch (2.8 mm) minimum and not less than 7/8 inch (22 mm) long, barbed with large head.
2. Exposed Fasteners: Heads matching color of sheet metal by means of plastic caps or factory-applied coating.
3. Fasteners for Flashing and Trim: Blind fasteners or self-drilling screws, gasketed, with hex washer head.
4. Blind Fasteners: High-strength aluminum or stainless-steel rivets.
5. Spikes and Ferrules: Same material as gutter; with spike with ferrule matching internal gutter width.

C. Solder for Copper: ASTM B 32, Grade Sn50, 50 percent tin and 50 percent lead.

D. Solder for Lead-Coated Copper: ASTM B 32, Grade Sn60, 60 percent tin and 40 percent lead.

E. Solder for Stainless Steel: ASTM B 32, Grade Sn60, with acid flux of type recommended by stainless-steel sheet manufacturer.

F. Solder for Zinc-Tin Alloy-Coated Stainless Steel: ASTM B 32, 100 percent tin.

G. Solder for Lead: ASTM B 32, Grade Sn50, 50 percent tin and 50 percent lead.

H. Solder for Zinc: ASTM B 32, 60 percent lead and 40 percent tin with low antimony, as recommended by manufacturer.

I. Burning Rod for Lead: Same composition as lead sheet.

J. Sealing Tape: Pressure-sensitive, 100 percent solids, polyisobutylene compound sealing tape with release-paper backing. Provide permanently elastic, nonsag, nontoxic, nonstaining tape.

K. 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.

L. Butyl Sealant: ASTM C 1311, single-component, solvent-release butyl rubber sealant, polyisobutylene plasticized, heavy bodied for hooked-type expansion joints with limited movement.

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

N. Bituminous Coating: Cold-applied asphalt mastic, SSPC-Paint 12, compounded for 15-mil (0.4-mm) dry film thickness per coat. Provide inert-type noncorrosive compound free of asbestos fibers, sulfur components, and other deleterious impurities.

O. Asphalt Roofing Cement: ASTM D 4586, asbestos free, of consistency required for application.

1.05 MANUFACTURED SHEET METAL FLASHING AND TRIM

A. Reglets: Units of type, material, and profile indicated, formed to provide secure interlocking of separate reglet and counterflashing pieces, and compatible with flashing indicated [**with factory- mitered and -welded corners and junctions**].

1. Manufacturers:
   a. Fry Reglet Corporation.

2. Material: **Galvanized steel, twenty-four [24] gauge**
3. Surface-Mounted Type: Provide with slotted holes for fastening to substrate, with neoprene or other suitable weatherproofing washers, and with channel for sealant at top edge.
4. Stucco Type: Provide with upturned fastening flange and extension leg of length to match thickness of applied finish materials.
5. Concrete Type: Provide temporary closure tape to keep reglet free of concrete materials, special fasteners for attaching reglet to concrete forms, and guides to ensure alignment of reglet section ends.
6. Masonry Type: Provide with offset top flange for embedment in masonry mortar joint.
7. Flexible Flashing Retainer: Provide resilient plastic or rubber accessory to secure flexible flashing in reglet where clearance does not permit use of standard metal counterflashing or where Drawings show reglet without metal counterflashing.
8. Counterflashing Wind-Restraint Clips: Provide clips to be installed before counterflashing to prevent wind uplift of counterflashing lower edge.

B. Retro fit drains: Marathon Aluminum retro drain assembly, available with PVC or TPO coating.

1.06 FABRICATION, GENERAL

A. General: Custom fabricate sheet metal flashing and trim to comply with recommendations in SMACNA's "Architectural Sheet Metal Manual" that apply to design, dimensions, metal, and other characteristics of item indicated. Shop fabricate items where practicable. Obtain field measurements for accurate fit before shop fabrication.

B. Fabricate sheet metal flashing and trim in thickness or weight needed to comply with performance requirements, but not less than that specified for each application and metal.

C. Fabricate sheet metal flashing and trim without excessive oil canning, buckling, and tool marks and true to line and levels indicated, with exposed edges folded back to form hems.

1. Seams for Aluminum: Fabricate nonmoving seams with flat-lock seams. Form seams and seal with epoxy seam sealer. Rivet joints for additional strength.
2. Seams for Other Than Aluminum: Fabricate nonmoving seams in accessories with flat-lock seams. Tin edges to be seamed, form seams, and solder.

D. Sealed Joints: Form nonexpansion but movable joints in metal to accommodate elastomeric sealant to comply with SMACNA recommendations.

E. Expansion Provisions: Where lapped or bayonet-type expansion provisions in the Work cannot be used, form expansion joints of intermeshing hooked flanges, not less than 1 inch (25 mm) deep, filled with [**elastomeric**] [**butyl**] sealant concealed within joints.

F. Conceal fasteners and expansion provisions where possible on exposed-to-view sheet metal flashing and trim, unless otherwise indicated.

G. Fabricate cleats and attachment devices from same material as accessory being anchored or from compatible, noncorrosive metal.

1. Thickness: As recommended by SMACNA's "Architectural Sheet Metal Manual"**and FMG Loss Prevention Data Sheet 1-49**] for application but not less than thickness of metal being secured.

1.07 LOW-SLOPE ROOF SHEET METAL FABRICATIONS

A. Roof Edge Flashing Gravel Stop and Fascia Caps: Fabricate in minimum 96-inch- long, but not exceeding 10-foot- long, sections. Furnish with 6-inch- wide joint cover plates.

1. Joint Style: **Lap, 4 inches wide.**

B. Copings: Fabricate in minimum 96-inch-long, but not exceeding 10-foot-long, sections. Fabricate joint plates of same thickness as copings. Furnish with continuous cleats to support edge of external leg and [**drill elongated holes for fasteners on**] interior leg. Miter corners, seal, and solder or weld watertight.

1. Joint Style: **Butt, with 12-inch wide concealed backup plate**
2. Fabricate copings from the following material:
   a. Galvanized Steel: Twenty-four [24] gauge in thickness.

C. Counterflashing: Fabricate from the following material:
1. Galvanized Steel: Twenty-four [24] gauge thick.

D. Flashing Receivers: Fabricate from the following material:

1. Galvanized Steel: Twenty-four [24] gauge thick TPA coated metal.

E. Roof-Penetration Flashing: Fabricate from the following material:

1. 4lb. leas sheet goods.

1.08 FINISHES

A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.

B. Protect mechanical and painted finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

C. Appearance of Finished Work: Variations in appearance of abutting or adjacent pieces are acceptable if they are within one-half of the range of approved Samples. Noticeable variations in the same piece are not acceptable. Variations in appearance of other components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

PART 18 - EXECUTION

1.01 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.

1.02 INSTALLATION, GENERAL

A. General: Anchor sheet metal flashing and trim and other components of the Work securely in place, with provisions for thermal and structural movement. Use fasteners, solder, welding rods, protective coatings, separators, sealants, and other miscellaneous items as required to complete sheet metal flashing and trim system.

1. Torch cutting of sheet metal flashing and trim is not permitted.

B. Metal Protection: Where dissimilar metals will contact each other or corrosive substrates, protect against galvanic action by painting contact surfaces with bituminous coating or by other permanent separation as recommended by fabricator or manufacturers of dissimilar metals.

1. Coat side of **lead** sheet metal flashing and trim with bituminous coating where flashing and trim will contact wood, ferrous metal, or cementitious construction.

2. Underlayment: Where installing metal flashing directly on cementitious or wood substrates, install a course of felt underlayment and cover with a slip sheet or install a course of polyethylene underlayment.
3. Bed flanges in thick coat of asphalt roofing cement where required for waterproof performance.

C. Install exposed sheet metal flashing and trim without excessive oil canning, buckling, and tool marks.

D. Install sheet metal flashing and trim true to line and levels indicated. Provide uniform, neat seams with minimum exposure of solder, welds, and **elastomeric** sealant.

E. Install sheet metal flashing and trim to fit substrates and to result in watertight performance. Verify shapes and dimensions of surfaces to be covered before fabricating sheet metal.

1. Space cleats not more than 12 inches (300 mm) apart. Anchor each cleat with two fasteners. Bend tabs over fasteners.

F. Expansion Provisions: Provide for thermal expansion of exposed flashing and trim. Space movement joints at a maximum of 10 feet (3 m) with no joints allowed within 24 inches (600 mm) of corner or intersection. Where lapped or bayonet-type expansion provisions cannot be used or would not be sufficiently watertight, form expansion joints of intermeshing hooked flanges, not less than 1 inch (25 mm) deep, filled with **elastomeric** sealant concealed within joints.

G. Fasteners: Use fasteners of sizes that will penetrate substrate not less than 1-1/4 inches (32 mm) for nails and not less than 3/4 inch (19 mm) for wood screws.

1. Galvanized or Prepainted, Metallic-Coated Steel: Use stainless-steel fasteners.
2. Aluminum: Use aluminum or stainless-steel fasteners.
3. Copper Use copper or stainless-steel fasteners.
4. Stainless Steel: Use stainless-steel fasteners.

H. Seal joints with **elastomeric** sealant as required for watertight construction.

1. Where sealant-filled joints are used, embed hooked flanges of joint members not less than 1 inch (25 mm) into sealant. Form joints to completely conceal sealant. When ambient temperature at time of installation is moderate, between 40 and 70 deg F (4 and 21 deg C), set joint members for 50 percent movement either way. Adjust setting proportionately for installation at higher ambient temperatures. Do not install sealant-type joints at temperatures below 40 deg F (4 deg C).
2. Prepare joints and apply sealants to comply with requirements in Division 7 Section "Joint Sealants."

I. Soldered Joints: Clean surfaces to be soldered, removing oils and foreign matter. Pretin edges of sheets to be soldered to a width of 1-1/2 inches (38 mm) except where pretinned surface would show in finished Work.

1. Do not solder **prepainted,** sheet.

2. PretStainless-Steel Soldering: Pretin edges of uncoated sheets to be soldered using solder recommended for stainless steel and phosphoric acid flux. Promptly wash off acid flux residue from metal after soldering.
3. Copper Soldering: Tin uncoated copper surfaces at edges of sheets using solder recommended for copper work.
4. Where surfaces to be soldered are lead coated, do not tin edges, but wire brush lead coating before soldering.
5. Lead-Coated Copper Soldering: Wire brush edges of sheets before soldering.
6. Do not use open-flame torches for soldering. Heat surfaces to receive solder and flow solder into joints. Fill joints completely. Completely remove flux and spatter from exposed surfaces.

J. Aluminum Flashing: Rivet or weld joints in uncoated aluminum where necessary for strength.

1.03 ROOF FLASHING INSTALLATION

A. General: Install sheet metal roof flashing and trim to comply with performance requirements [**, sheet metal manufacturer's written installation instructions,**] and SMACNA's "Architectural Sheet Metal Manual." Provide concealed fasteners where possible, set units true to line, and level as indicated. Install work with laps, joints, and seams that will be permanently watertight.

B. Roof Edge Flashing: Anchor to resist uplift and outward forces according to recommendations in FMG Loss Prevention Data Sheet 1-49 for specified wind zone and as indicated.

1. Interlock bottom edge of roof edge flashing with continuous cleats anchored to substrate at **24-inch** centers.

C. Pipe or Post Counterflashing: Install counterflashing umbrella with close-fitting collar with top edge flared for **elastomeric** sealant, extending a minimum of 4 inches over base flashing. Install stainless-steel draw band and tighten.

D. Counterflashing: Coordinate installation of counterflashing with installation of base flashing. Insert counterflashing in reglets or receivers and fit tightly to base flashing. Extend counterflashing 4 inches over base flashing. Lap counterflashing joints a minimum of 4 inches and bed with **elastomeric** sealant. **Furnish and install new skirt flashings.**

1. Secure in a waterproof manner by means of **snap-in installation and sealant or lead wedges and sealant**, **interlocking folded seam or blind rivets and sealant**, **anchor and washer at 36-inch centers**.

E. Roof-Penetration Flashing: Coordinate installation of roof-penetration flashing with installation of roofing and other items penetrating roof. Install flashing as follows:

1. Furnish and install [n] lead flashing and strip into [n] roof AG Bio.
2. Seal with **elastomeric** sealant and clamp flashing to pipes penetrating roof except for lead flashing on vent piping.
3. OPTION: Clean and prime penetration/projection: Apply base coat of AG Bio @ two [2] gallons per 100 square feet. While base still wet, embed polyester reinforcement and allow to cure. Apply AG Bio top @ the rate of two [2] gallons per 100 square feet.

FLASHING INSTALLATION

F. General: Install sheet metal wall flashing to intercept and exclude penetrating moisture according to SMACNA recommendations and as indicated. Coordinate installation of wall flashing with installation of wall-opening components such as windows, doors, and louvers.

G. Counterflashings/termination metal: Furnish and install [n] twenty-four [24] gauge GSM counterflashings termination metal and secure as specified. Metal to be Kynar with approved color unless otherwise stated.

H. Skirt metal: Furnish and install [n] GSM skirt metal under [e] counterflashing face and secure to eighteen [18] inches O.C. Metal to be Kynar unless with approved color unless otherwise stated.

I. Perimeter edge metal: General: Shall be 24 gauge Kynar metal coping. Color to be approved by MVUSD

J. Perimeter edge Strawberry /TAM portables: KEE coated 24 gauge metal.

K. Gutters and downspouts: Strawberry only: Furnish and install [n] gutters and downspouts. Size to match [e]. Metal to be “paint ready”

1.04 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 07620

SECTION 07 56 00.13 – FLUID-APPLIED MEMBRANE ROOFING

GENERAL

RELATED DOCUMENTS

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

SUMMARY

B. This Section includes cold fluid-applied roofing system, consisting of the following:

1. Clean and prepare roof and flashings for fluid applied system. Cleaning to consist of power-washing and water containment procedures. Perform work per State of California and EPA regulations.
2. Prep flashings, penetrations and projections to receive fluid applied coating.
3. Perform all field repairs etc. as required addressing blisters and defects.
4. Reinforcement of all penetrations and projections.
5. Installation of fluid applied over [e] expansion joints.
6. Re working of all drains/overflows and drainage devices.
7. Application of fluid applied roof membrane and flashings consisting of multiple coats of fluid-applied, fabric-reinforced, polyurethane coating.

C. Related Requirements:
1. Division 07 Section "Sheet Metal Flashing and Trim" for metal roof flashings, counterflashing's and scuppers.
2. Division 07 Section Selective Demolition

DEFINITIONS

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

PERFORMANCE REQUIREMENTS

E. General: Provide roofing membrane and base flashings that remain watertight; do not permit the passage of water; and resist specified uplift pressures, thermally induced movement, and exposure to weather without failure.

1. Accelerated Weathering: Roofing system shall withstand 2000 hours of exposure when tested according to ASTM G 152, ASTM G 154, or ASTM G 155.

F. Material Compatibility: Provide roofing materials that are compatible with one another under conditions of service and application required, as demonstrated by roofing manufacturer based on testing and field experience.

G. **Solar Reflectance Index**: Not less than 78 when calculated according to ASTM E 1980, based on testing identical products by a qualified testing agency.

H. **Energy Star Listing**: Provide roof coating that is listed on the DOE's ENERGY STAR "Roof Products Qualified Product List" for low-slope roof products.

I. **Energy Performance**: Roofing system shall have an initial solar reflectance index of not less than 0.70 and an emissivity of not less than 0.75 when tested according to CRRC-1.

J. **Exterior Fire-Test Exposure**: ASTM E 108, Class A for application and roof slopes indicated, as determined by testing identical membrane roofing materials by a qualified testing agency. Materials shall be identified with appropriate markings of applicable testing agency.

ACTION SUBMITTALS

K. Product Data: For each type of product specified.

1. Indicate CRRC Compliance.
2. Indicate Energy Star compliance.

L. Shop Drawings: Include plans, elevations, sections, details, and attachments to other work. Provide roof plan showing orientation and types of roof deck and orientation of membrane roofing and fastening spacings and patterns for mechanically fastened components.

1. Base flashings and terminations.

a. Indicate details meet requirements of NRCA and FMG required by this Section.

M. Samples for Verification: For the following products:

1. 8-by-10-inch (254-by-254-mm) square of fluid-applied hybrid roofing materials, including [base sheet and flashing sheet, of color specified.
2. 8-by-10-inch (254-by-254-mm) square of fabric reinforcement

INFORMATIONAL SUBMITTALS

N. Contractor's Product Certificate: Submit notarized certificate, indicating products intended for Work of this Section, including product names and numbers and manufacturers' names, with statement indicating that products to be provided meet the requirements of the Contract Documents.
1. Indicate UL listing.

O. Qualification Data: For Installer, Manufacturer, and Roofing Inspector.

1. Letter written for this Project indicating manufacturer approval of Installer to apply specified products and provide specified warranty.
2. Certificate indicating Installer is qualified in Project jurisdiction to perform asbestos abatement.

P. Product Test Reports: Based on evaluation of comprehensive tests performed by manufacturer and witnessed by a qualified testing agency, for components of roofing system.

Q. Warranties: Unexecuted sample copies of special warranties.

R. Photographs or Videotape: Show existing conditions of adjoining construction and site improvements, including exterior and interior finish surfaces, which might be misconstrued as having been damaged by re-coating operations. Submit before Work begins.

S. Inspection Reports: Daily reports of Roofing Inspector. Include weather conditions, description of work performed, tests performed, defective work observed, and corrective actions required and carried out.

CLOSEOUT SUBMITTALS

T. Maintenance Data: To include in maintenance manuals.

U. Warranties: Executed copies of approved warranty forms.

QUALITY ASSURANCE

V. Installer Qualifications: An employer of workers trained and certified by manufacturer, including a full-time on-site supervisor with a minimum of ten [10] year's experience installing products comparable to those specified, able to communicate verbally with Contractor, District, and employees, and the following:

1. Qualified by the manufacturer to install manufacturer's product and furnish warranty of type specified.
2. Have not filed for bankruptcy in the past ten [10] years.
3. Contractor submitting bid shall perform work.
4. Manufactures Field reports: Submit the required reports to Myla Grasso @ the Pleasanton Unified School District.
5. Contractor must have an established office/shop located within a fifty [50] mile radius of project to properly service project and leak response.

W. Manufacturer Qualifications: Approved manufacturer listed in this Section with UL listed products, with minimum ten [10] year's experience in manufacture of specified products in successful use in similar applications.

1. Approval of Other Manufacturers and Comparable Products: Submit the following in accordance with project substitution requirements, within time allowed for substitution review:

a. Product data, including certified independent test data indicating compliance with requirements.
b. Samples of each component.
c. Sample submittal from similar project.
d. Project references: Minimum of five installations of specified products not less than five years old, with Owner and Architect contact information.
e. Sample warranty.
f. Sample copy of weekly report

2. Substitutions following award of contract are not allowed except as stipulated in Division 01 General Requirements. Only prime contractors will be allowed to submit request for substitution.

3. Approved manufactures must meet separate requirements of Submittals Article

X. Roofing Inspector Qualifications: A technical representative of manufacturer not engaged in the sale of products and experienced in the installation and maintenance of the specified roofing system, qualified to perform roofing observation and inspection specified in Field Quality Control Article, to determine Installer's compliance with the requirements of this Project, and approved by the manufacturer to issue warranty certification. The Roofing Inspector shall be one of the following:

1. An authorized full-time technical employee of the manufacturer.
2. An independent party certified as a Registered Roof Observer by the Roof Consultants Institute, retained by the Contractor or the Manufacturer and approved by the Manufacturer.

Y. **Roofing Preinstallation Conference**: Conduct conference at Project site to comply with requirements in Division 01 Section "Project Management and Coordination." Review methods and procedures related to roofing system.

1. Meet with Owner; roofing materials manufacturer's representative; roofing Installer including project manager and foreman; and installers whose work interfaces with or affects roofing including installers of roof accessories and roof-mounted equipment requiring removal and replacement as part of the Work.
2. Review methods and procedures related to preparation, including membrane roofing system manufacturer's written instructions.
3. Review temporary protection requirements for existing roofing system that is to remain, during and after installation.
4. Review roof drainage during each stage of roofing and review roof drain plugging and plug removal procedures.
5. Review and finalize construction schedule, and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
6. Review base flashings, special roofing details, drainage, penetrations, equipment curbs, and condition of other construction that will affect re-coating.
7. Review HVAC shutdown and sealing of air intakes.
8. Review shutdown of fire-suppression, -protection, and -alarm and -detection systems.
9. Review procedures for asbestos removal or unexpected discovery of asbestos-containing materials.
10. Review governing regulations and requirements for insurance and certificates if applicable.
11. Review existing conditions that may require notification of Owner before proceeding.

PROJECT CONDITIONS

Z. Owner will occupy portions of building immediately below roofing area. Conduct roofing so Owner's operations will not be disrupted. Provide Owner with not less than 72 hours' notice of activities that may affect Owner's operations.

AA. Protect building, adjacent buildings, walkways, site improvements, exterior plantings, and landscaping from damage or soiling from roofing operations.

BB. Maintain access to existing walkways, corridors, and other adjacent occupied or used facilities.

CC. Weather Limitations: Proceed with roofing work only when existing and forecasted weather conditions permit Work to proceed without water entering into existing roofing system or building.

1. Store all materials prior to application at temperatures between 60 and 90 deg. F.
2. Apply coatings within range of ambient and substrate temperatures recommended by manufacturer. Do not apply materials when air temperature is below 50 or above 110 deg. F.
3. Do not apply roofing in rain, fog, or mist.

WARRANTY

DD. Special Warranty: Written warranty in which Manufacturer agrees to repair roof installations that fail in materials or workmanship within specified warranty period.

1. Failures include, but are not limited to, the following:

a. Membrane failures including rupturing, cracking, or puncturing.
b. Deterioration of membranes, coatings, metals, metal finishes, and other associated materials beyond normal weathering.

2. Qualified Installer Requirement: Installer must meet requirements of Quality Assurance Article.
3. Installation Inspection Requirement: By Roofing Inspector in accordance with requirements of Part 3 Field Quality Control Article.
4. Annual Manufacturer Inspection and Preventive Maintenance Requirement: By manufacturer's technical representative, to report maintenance responsibilities to Owner necessary for preservation of Owner's warranty rights. The cost of manufacturer's annual inspections and preventive maintenance is included in the Contract Sum. Inspections to occur in Years 2, 5 and, 10 following completion.
5. Warranty Period: Twenty [20] years from date of completion of roofing work.

EE. **Installer's Warranty**: Submit roofing Installer's warranty, on warranty form at end of this Section, signed by Installer, covering the Work of this Section and related Sections indicated above, including all components of built-up roofing such as built-up roofing membrane, base flashing, roof insulation, fasteners, cover boards, substrate boards, vapor retarders, roof pavers, and walkway products, for the following warranty period:

1. Warranty Period: **Five [5]** years from date of Substantial Completion.

PRODUCTS

MANUFACTURERS

FF. **Basis-of-Design Manufacturer/Product**: The roof system specified in this Section is based upon products of Tremco, Inc. that are named in other Part 2 articles. Subject to compliance with requirements, provide the named product or an approved comparable product by one of the following, based upon meeting the performance and warranty requirements:

GG. **Meet specification requirements for system performance, warranty coverage and follow up inspections/housekeeping, meeting CRRC requirements as listed in most current edition**.

1. Siplast corporation, PMMA

HH. Source Limitations: Obtain roofing materials, sheet flashings, protection cover boards, base sheet, baseflashing, cold adhesives and fluid applied membrane from single source from single manufacturer.

MATERIALS

II. General: Roofing materials recommended by roofing system manufacturer for intended use and compatible with components of existing membrane roofing system.

JJ. Temporary Roofing Materials: Selection of materials and design of temporary roofing is responsibility of Contractor.

KK. General: Provide adhesive and sealant materials recommended by roofing manufacturer for intended use and compatible with built-up roofing.

1. Liquid-type auxiliary materials shall comply with VOC limits of authorities having jurisdiction.
2. **Adhesives and sealants that are not on the exterior side of weather barrier** shall comply with the following limits for VOC content when calculated according to 40 CFR 59, Subpart D (EPA Method 24):

a. Plastic Foam Adhesives: 50 g/L.
b. Gypsum Board and Panel Adhesives: 50 g/L.
c. Multipurpose Construction Adhesives: 70 g/L.
d. Other Adhesives: 250 g/L.

e. Sealant Primers for Porous Substrates: 775 g/L.

FLUID-APPLIED ROOFING MEMBRANE

LL. Polyurethane Elastomeric Fluid-Applied System: ASTM D 7311, elastomeric, two-coat, two [2] component Bio based polyurethane fluid-applied roofing formulated for application to single ply roofing, with the following minimum physical properties:

1. Aliphatic Urethane Base Coat:

a. Basis of Design Product: Tremco, AlphaGuard Bio Base Coat, or equal.
b. Asbestos Content, EPA/600/R-93/116: None.
c. Volatile Organic Compounds (VOC), ASTM D 3960: Not greater than 40 g/L.
d. Percent solids (by weight), ASTM D 1644: Not less than 85 percent.

2. Aliphatic Urethane Top Coat: UV-stabilized, chemical-resistant top coat:

a. Basis of Design Product: Tremco, AlphaGuard Bio Top Coat, or equal.
b. Asbestos Content, EPA/600/R-93/116: None.
c. Volatile Organic Compounds (VOC), ASTM D 3960: Not greater than 45 g/L.
d. Elongation at break, ASTM D 7311: Not less than 340 percent
e. Tensile Strength, ASTM D 7311: Not less than 1,400 lbf/sq. in.
f. Tear Resistance, ASTM D 7311: Not less than 150 lbf/in.
g. Accelerated Weathering, 5000 hour, ASTM D 7311: Pass, no cracking or checking.
h. Percent solids (by weight), ASTM D 1353: Not less than 85 percent.
i. Color: [White, with Solar Reflectance Index meeting performance requirements] [As selected by Architect from manufacturer's standard colors].

MM. Polyester Reinforcement: Polyester mat for fluid-applied membrane and flashing.

1. Basis of Design Product: Tremco, AlphaGuard Perma Fab.

AUXILIARY ROOFING MEMBRANE MATERIALS

NN. General: Auxiliary materials recommended by roofing system manufacturer for intended use and compatible with existing roofing system and fluid-applied roofing system.

OO. Structural Concrete/Masonry Primer: Two-component, 100 percent solids, epoxy penetrating primer for concrete deck surfaces.

1. Basis of Design Product: Tremco, AlphaGuard C-Prime.

PP. Metal Surface Primer: Single-component, water based primer to promote adhesion of base coat to metal surfaces.

1. Basis of Design Product: Tremco, AlphaGuard M-Prime.

QQ. Asphaltic Surfaces Primer: Single-component, multi-substrate primer to promote adhesion of base coat to surfaces recommended by manufacturer.

1. Basis of Design Product: Tremco, AlphaGuard Re-Prime AlphaGuard WB Primer.

RR. Aggregate: For finish coat slip resistance: Silica sand, 20 – 40 mesh.

SS. Mastic Sealant: Polyisobutylene, plain or modified bitumen, nonhardening, nonmigrating, nonskinning, and nondrying.

TT. Miscellaneous Accessories: Provide miscellaneous accessories recommended by roofing system manufacture

PART 3 EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, for compliance with the following requirements and other conditions affecting performance of roofing system:

1. Verify that roof openings and penetrations are in place and curbs are set and braced and that roof drain bodies are securely clamped in place.
2. Verify that deck is securely fastened with no projecting fasteners and with no adjacent units in excess of 1/16 inch (1.6 mm) out of plane relative to adjoining deck.

3.2 PREPARATION

A. Remove existing baseflashing at all scupper locations. Square off existing base flashing, eighteen [18] inches on either side of the scupper and remove.

B. Clean substrate of dust, debris, algae growth, and other substances detrimental to roofing installation according to roofing manufacturer's written instructions. Remove sharp projections.

C. Protect existing roofing system that is indicated to remain, and adjacent portions of building and building equipment.

Mask surfaces to be protected. Seal joints subject to infiltration by coating materials.
Limit traffic and material storage to areas of existing roofing membrane that have been protected.
Maintain temporary protection and leave in place until replacement roofing has been completed.

D. Shut down air intake equipment in the vicinity of the Work in coordination with the Owner. Cover air intake louvers before proceeding with re-coating work that could affect indoor air quality or activate smoke detectors in the ductwork.

Verify that rooftop utilities and service piping affected by the Work have been shut off before commencing Work.

E. Maintain roof drains in functioning condition to ensure roof drainage at end of each workday. Prevent debris from entering or blocking roof drains and conductors. Use roof-drain plugs specifically designed for this purpose. Remove roof-drain plugs at end of each workday, when no work is taking place, or when rain is forecast.

Do not permit water to enter into or under existing membrane roofing system components that are to remain.

F. Remove existing repairs on field of roof, base flashings, drains and at penetrations/projections. Remove all failed caulking at roof to wall and roof to flashing intersections.

3.3 FLUID-APPLIED MEMBRANE ROOFING INSTALLATION, GENERAL

A. Install roofing membrane according to roofing manufacturer's written instructions.

1 Commence installation of fluid applied roofing in presence of manufacturer's technical personnel.

B. Coordinate installation of roofing so insulation [if exposed] and other components of roofing not permanently exposed are not subjected to precipitation or left uncovered at the end of the workday or when rain is forecast.

1. Provide tie-offs at end of each day's work to cover exposed roofing sheets and insulation with a course of coated felt set in roofing cement with joints and edges sealed.
2. Complete terminations and base flashings and provide temporary seals to prevent water from entering completed sections of roofing.
3. Remove and discard temporary seals before beginning work on adjoining roofing.

C. Substrate-Joint Penetrations: Prevent fluid-applied materials and adhesives from penetrating substrate joints, entering building, or damaging built-up roofing components or adjacent building construction.

3.4 REMOVAL AND REPLACEMENT OF DEFECTIVE ROOFING

A. 1. As directed, remove and replace any field membrane or baseflashing deemed to be in adequate

2. Cut out defective membrane and replace with two [2] ply Bio Endure system as specified.

3.5 CLEANING OF EXISTING MEMBRANE AND FLASHINGS:

A. Provide one of the following methods of cleaning roof membrane:

1. Power wash with minimum of 2,000 psi with approved power washing equipment.

2. Roof Tec or equal: Self contained roof cleaning process.

B. All water containment must be in compliance with current State and EPA regulations

C. Clean roof membrane to meet manufactures requirements for an acceptable substrate:

1. Power wash roof and flashing surfaces with a high pressure using 2,000 psi. Brush agitate the entire surface.
2. Using a roof cleaning service/system that uses only environmentally safe cleaning product thru cleaning, agitating and reclamation process. Equipment shall deliver over three [3] gallons per minute, rotating wash head, pressure 2,500 psi and water reclamation, 100 %.

D. Disposal of water used in roof cleaning

1. Provide owner with plan to properly dispose of water per local, State and EPA for approval prior to starting work.

3.6 FLUID-APPLIED MEMBRANE APPLICATION

A. Base Coat: Apply coating base coat to single ply surface in accordance with manufacturer's written instructions. Back roll to achieve minimum wet mil coating thickness: MODIFIED BITUMEN four [4] gallons per 100 square feet unless otherwise recommended by manufacturer; verify thickness of base coat as work progresses.

1. Apply base coat on prepared and primed surfaces and spread coating evenly. Embed polyester into base coat on all laps and seams.
2. Embed polyester reinforcement into wet base coat. Lap adjacent flashing pieces of polyester minimum 3 inches along edges and 6 inches at end laps.
3. Roll surface of polyester reinforcing to completely embed and saturate fabric. Leave finished base coat with fabric free of pin holes, voids, or openings.
4. Allow base coat to cure prior to application of top coat.
5. Following curing of base coat and prior to application of top coat, sand raised or exposed edges of polyester reinforcement.

B. Fluid-Applied Flashing Application: Complete base coat and polyester reinforcement at curbs.

1. Extend coating minimum of 8 inches up vertical surfaces and 4 inches onto horizontal surfaces.

C Top Coat: Apply top coat uniformly in a complete installation to flashings and field of roof.

3. Prime base coat prior to application of top coat if top coat is not applied within 72 hours of the base coat application, using manufacturer's recommended primer.
4. Apply top coat to flashings extending coating up vertical surfaces and out onto horizontal surfaces 4 inches. Install top coat over field base coat and spread coating evenly.
5. Back roll to achieve wet mil thickness of two [2] gallon per 100 square feet unless otherwise recommended by manufacturer.
6. Avoid foot traffic on new fluid-applied membrane for a minimum of 24 hours.

D. Drains: Install base coat onto surrounding membrane surface and metal drain bowl flange. Install target piece of polyester reinforcement immediately into wet base coat and roll to fully embed and saturate fabric. Re install clamping ring and strainer following application of top coat. Replace broken clamping ring as required. Furnish and install [n] bolts with washers.

E. Penetrations/projections: Install fluid applied roofing to and around penetration/projection. Remove and replace caulking at top of flashings/storm collar.

F. Walkways: Furnish and field apply fluid applied roofing and silca sand to match [e] walkways to form new walkway path. Walk ways to have different color than field of roof. Walkways shall be safety yellow.

G. Caulking: Remove and replace [e] caulking at all roofing to metal flashings and metal to metal flashings.

UU. Cover plates on copings: Furnish and install new four [4] inch twenty-four [24] gauge cover plates on all coping joints. Set plates in a bead of caulking on either side and secure with washered screws. Match color.

VV. Expansion joints: Clean and repair all laps, seams and defects with like same materials prior to coating with fluid applied roofing.

3.7 FIELD QUALITY CONTROL

WW. Roof Inspection: **Contractor shall engage** roofing system manufacturer's technical personnel to inspect roofing installation, and submit report to the owner. A minimum of three [3] eight [8] hour days are required. Notify owner 48 hours in advance of dates and times of inspections. Inspect work as follows:

1. Upon completion of preparation of first component of work, prior to application of re-coating materials.
2. Following application of re-coating to flashings and application of base coat to field of roof.
3. Upon completion of re-coating but prior to re-installation of other roofing components.

XX. Repair fluid-applied membrane where test inspections indicate that they do not comply with specified requirements.

YY. Arrange for additional inspections, at Contractor's expense, to verify compliance of replaced or additional work with specified requirements.

3.8 PROTECTING AND CLEANING

ZZ. Protect roofing system from damage and wear during remainder of construction period.

AAA. Correct deficiencies in or remove coating that does not comply with requirements, repair substrates, and reapply coating.

Clean overspray and spillage from adjacent construction using cleaning agents and procedures recommended by manufacturer of affected construction.

PART 19 - SECTION CONTINUES

3.9 ROOFING INSTALLER'S WARRANTY

A. WHEREAS _____ of _____, herein called the "Roofing Installer," has performed roofing and associated work ("work") on the following project:

1. Owner: _____
2. Address: _____
3. Building Name/Type: _____
4. Address: _____
5. Area of Work: _____
6. Acceptance Date: _____
7. Warranty Period: _____
8. Expiration Date: _____

B. AND WHEREAS Roofing Installer has contracted (either directly with Owner or indirectly as a subcontractor) to warrant said work against leaks and faulty or defective materials and workmanship for designated Warranty Period,

C. NOW THEREFORE Roofing Installer hereby warrants, subject to terms and conditions herein set forth, that during Warranty Period he will, at his own cost and expense, make or cause to be made such repairs to or replacements of said work as are necessary to correct faulty and defective work and as are necessary to maintain said work in a watertight condition.

D. This Warranty is made subject to the following terms and conditions:

1. Specifically excluded from this Warranty are damages to work and other parts of the building, and to building contents, caused by:

a. lightning;
b. peak gust wind speed exceeding **[74 mph (33 m/s)]**;
c. fire;
d. failure of roofing system substrate, including cracking, settlement, excessive deflection, deterioration, and decomposition;
e. faulty construction of parapet walls, copings, chimneys, skylights, vents, equipment supports, and other edge conditions and penetrations of the work;
f. vapor condensation on bottom of roofing; and

g. activity on roofing by others, including construction contractors, maintenance personnel, other persons, and animals, whether authorized or unauthorized by Owner.

2. When work has been damaged by any of foregoing causes, Warranty shall be null and void until such damage has been repaired by Roofing Installer and until cost and expense thereof have been paid by Owner or by another responsible party so designated.
3. Roofing Installer is responsible for damage to work covered by this Warranty but is not liable for consequential damages to building or building contents resulting from leaks or faults or defects of work.
4. During Warranty Period, if Owner allows alteration of work by anyone other than Roofing Installer, including cutting, patching, and maintenance in connection with penetrations, attachment of other work, and positioning of anything on roof, this Warranty shall become null and void on date of said alterations, but only to the extent said alterations affect work covered by this Warranty. If Owner engages Roofing Installer to perform said alterations, Warranty shall not become null and void unless Roofing Installer, before starting said work, shall have notified Owner in writing, showing reasonable cause for claim, that said alterations would likely damage or deteriorate work, thereby reasonably justifying a limitation or termination of this Warranty.
5. During Warranty Period, if original use of roof is changed and it becomes used for, but was not originally specified for, a promenade, work deck, spray-cooled surface, flooded basin, or other use or service more severe than originally specified, this Warranty shall become null and void on date of said change, but only to the extent said change affects work covered by this Warranty.
6. Owner shall promptly notify Roofing Installer of observed, known, or suspected leaks, defects, or deterioration and shall afford reasonable opportunity for Roofing Installer to inspect work and to examine evidence of such leaks, defects, or deterioration.
7. This Warranty is recognized to be the only warranty of Roofing Installer on said work and shall not operate to restrict or cut off Owner from other remedies and resources lawfully available to Owner in cases of roofing failure. Specifically, this Warranty shall not operate to relieve Roofing Installer of responsibility for performance of original work according to requirements of the Contract Documents, regardless of whether Contract was a contract directly with Owner or a subcontract with Owner's General Contractor.

E. IN WITNESS THEREOF, this instrument has been duly executed by:

1. Authorized Signature: _____
2. Name: _____
3. Date: _____

PART 20 - END OF SECTION 07 56 00.13

PERIMETER SHEETS (39” WIDE)

1. A minimum of two perimeter sheets shall be installed, parallel to all exterior roof perimeters, including parapet walls, expansion joints and other changes in the plane of the deck.

2. Install perimeter sheets square to chalk lines with proper shingling to avoid back water seams.

3. Adjoining rolls shall overlap the fastened edge a minimum of 4.5” maintaining proper shingling to avoid back water seams.

4. Factory Mutual I-90 classification may require more than two perimeter sheets at all exterior roof perimeters that are not bordered by a parapet, with a minimum height of 24” above the plane of the deck. FM always calls for a minimum perimeter of 4’.

FLASHING – (MEMBRANE)

Clean all vents, pipes, conduits, walls and stacks to bare metal. All protrusions must be properly secured to the roof deck. Remove and properly discard all lead, pipe and drain flashings. Flash all penetrations according to approved details.

A. Remove all cant strips and loose wall flashings.
   1. Cant strips are not required for Tremco Thermoplastic membranes, but are acceptable for use.

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B. Flash all curbs, parapets and interior walls in strict accordance with approved Details.

C. Tremco Inc. recommends the use of non-fleece back as the preferred flashing membrane.

D. All flashing shall be totally adhered to approved substrate with Bonding Adhesive or White Sheeting Bond applied in sufficient quantity to ensure total adhesion. If flashing is carried over the top of a parapet, it is recommended that the top of the parapet receive a coat of mastic or an air seal to prevent wind from traveling beneath the membrane and potentially billowing the flashing.

E. The base of all membrane flashing shall extend out on to the plane of the deck, beyond the wood nailer to a maximum width of 8”.

F. Vertical flashing shall be terminated no less than 8” above the plane of the deck with approved termination bar or metal cap flashing.

G. Vertical wall flashing terminations shall not exceed 30” without additional parallel horizontal rows of termination bars between the deck and the termination point of the flashing. Spacing between horizontal rows shall not exceed 24”.

FLASHING (METAL)

Thermoplastic coated metal is supplied in 4’ x 10’ pieces, 24 ga. galvanized with 20 mil. Thermoplastic laminated face.

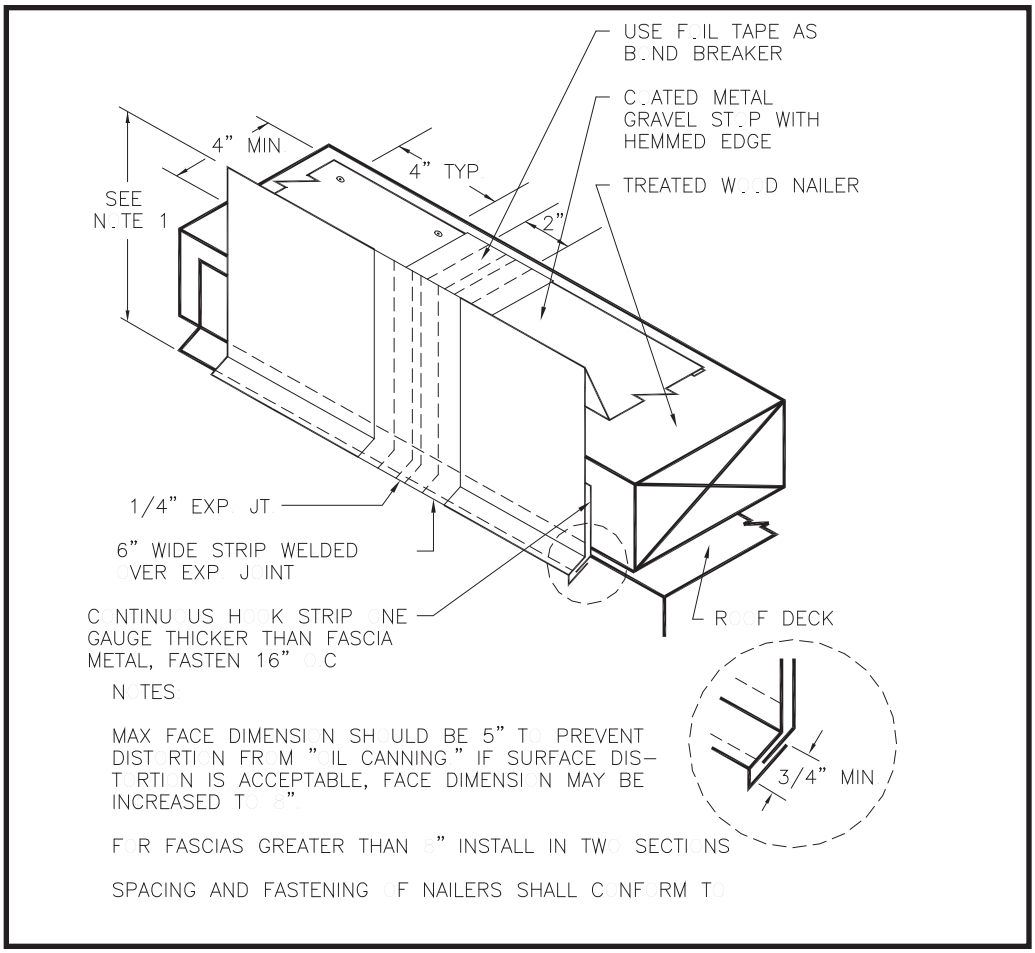
A. All perimeter edge details are to be fabricated from Coated Metal or an approved two-piece locking metal fascia.

B. Ensure all fascias are 4” lower than the bottom of the wood nailers.

C. All flanged metal flashings must be fabricated from Coated Metal.

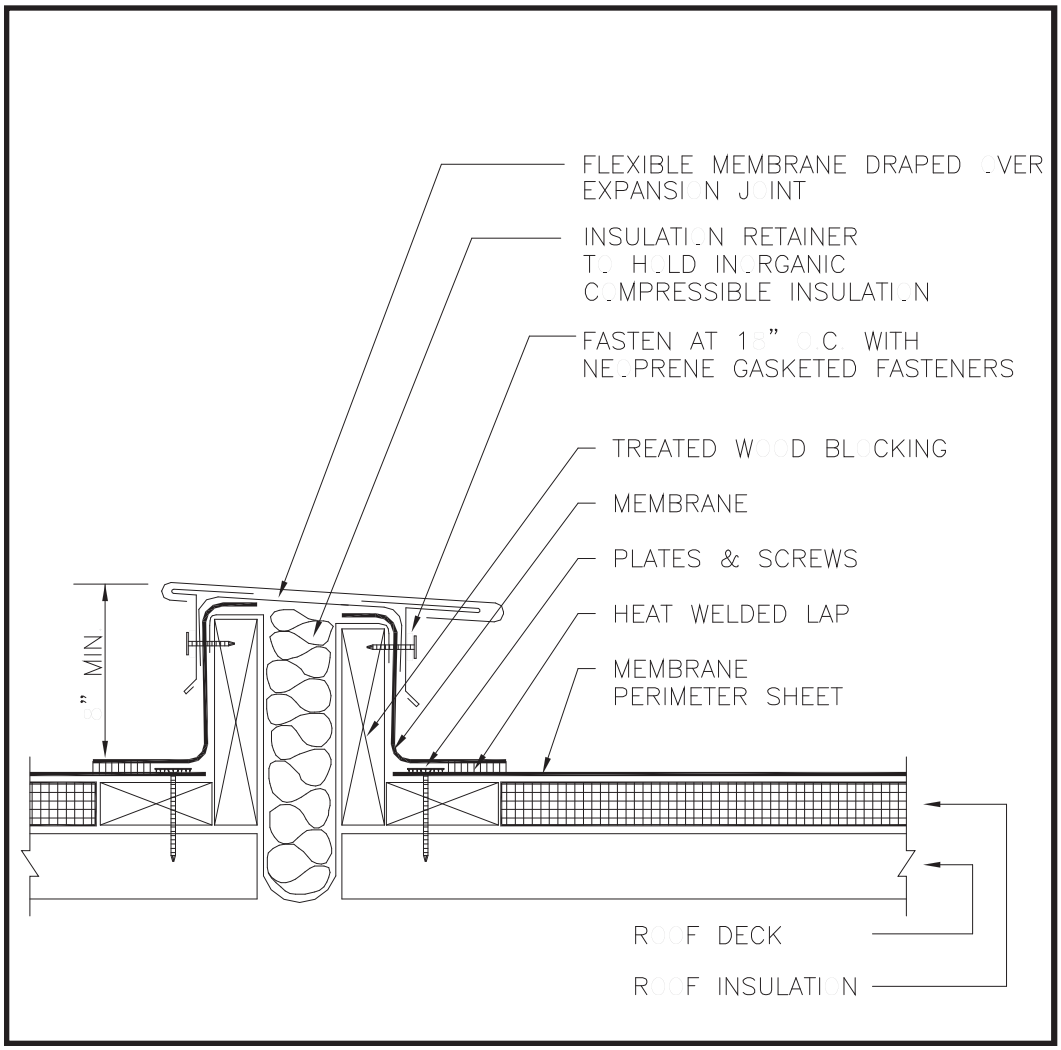
D. Always maintain a minimum 1/4” gap between metal joints to allow for expansion and contraction.

E. Use 6” wide membrane strip welded over 1/4” gap between metal joints.

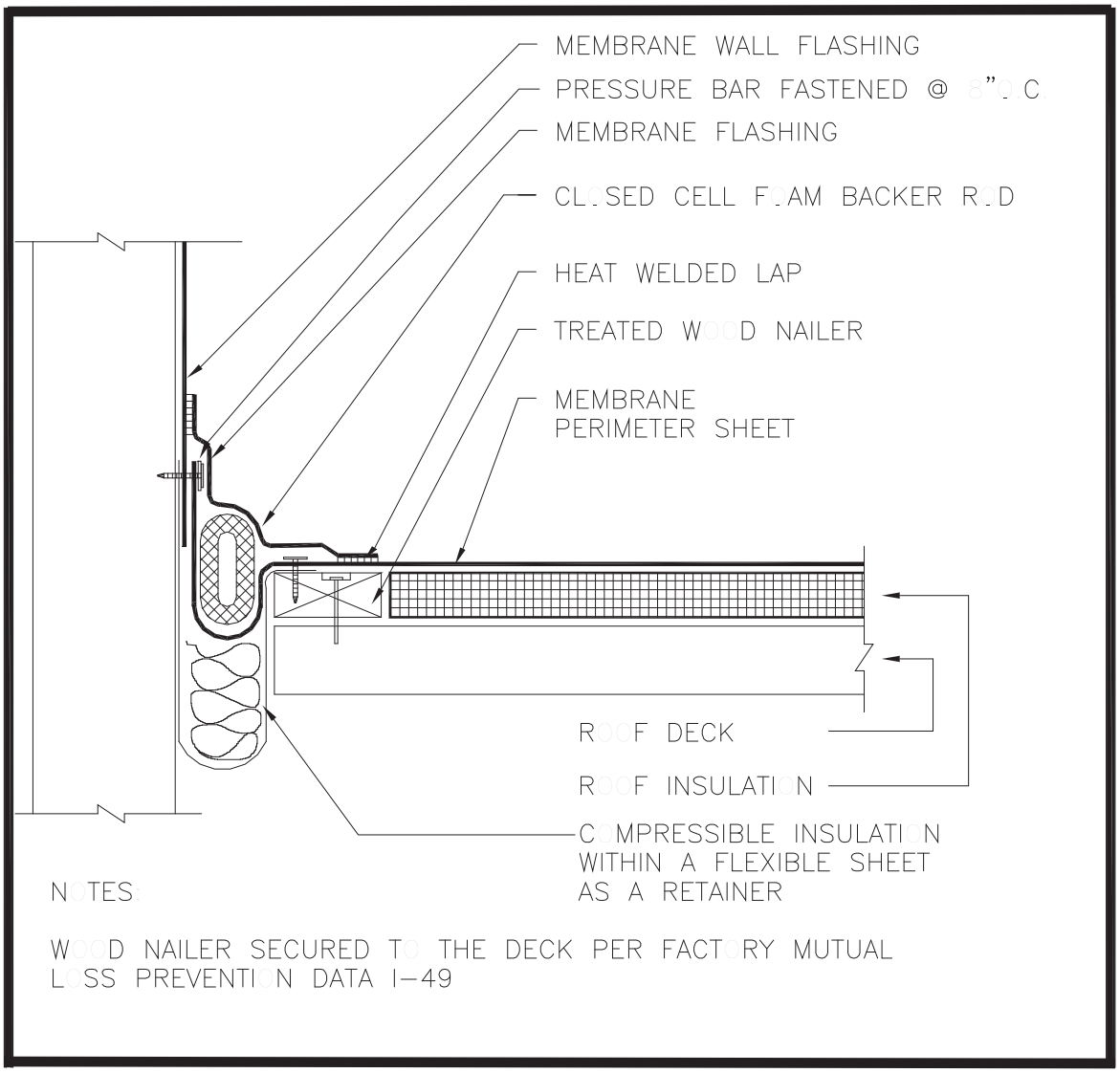


ROOF EXPANSION JOINTS

Flash all expansion joints in strict accordance with approved details. Fasten all expansion joint material according to specifications. Ensure the expansion material has sufficient material to expand to the widest point of expansion without causing undue stress on the expansion joint material.



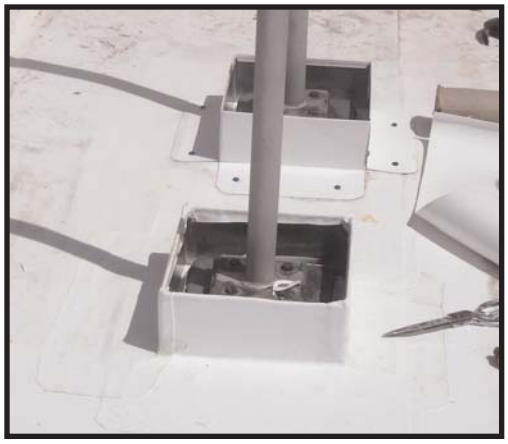
WALL EXPANSION JOINTS

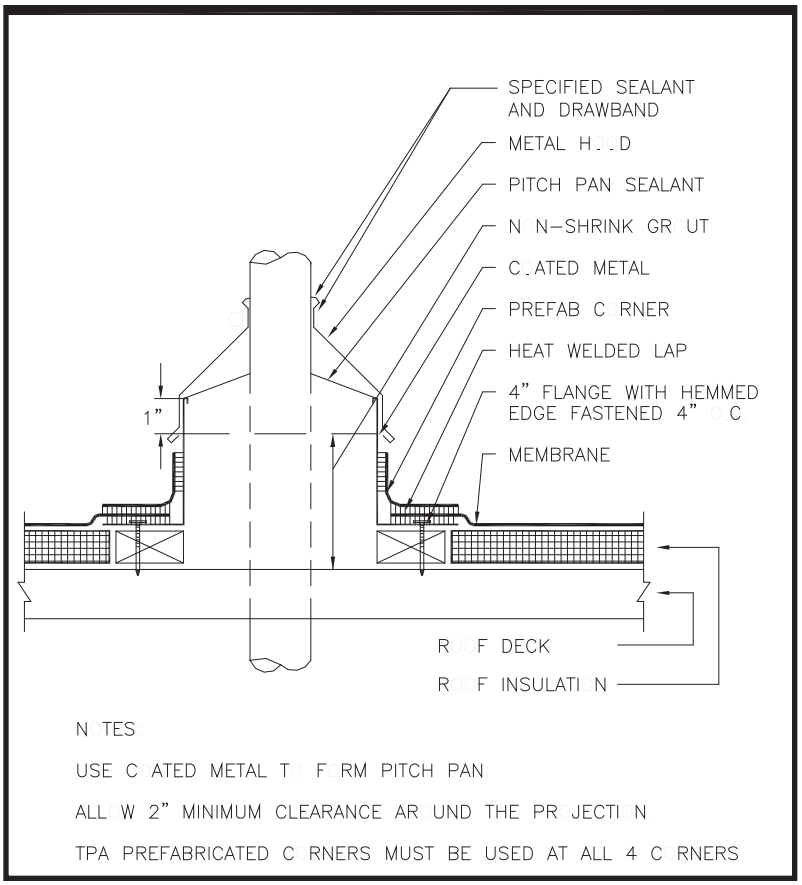


PITCH PANS

A. Every effort shall be made to eliminate the need for pitch pans, including the removal of existing pans. Contact your local representative for specific design recommendations.

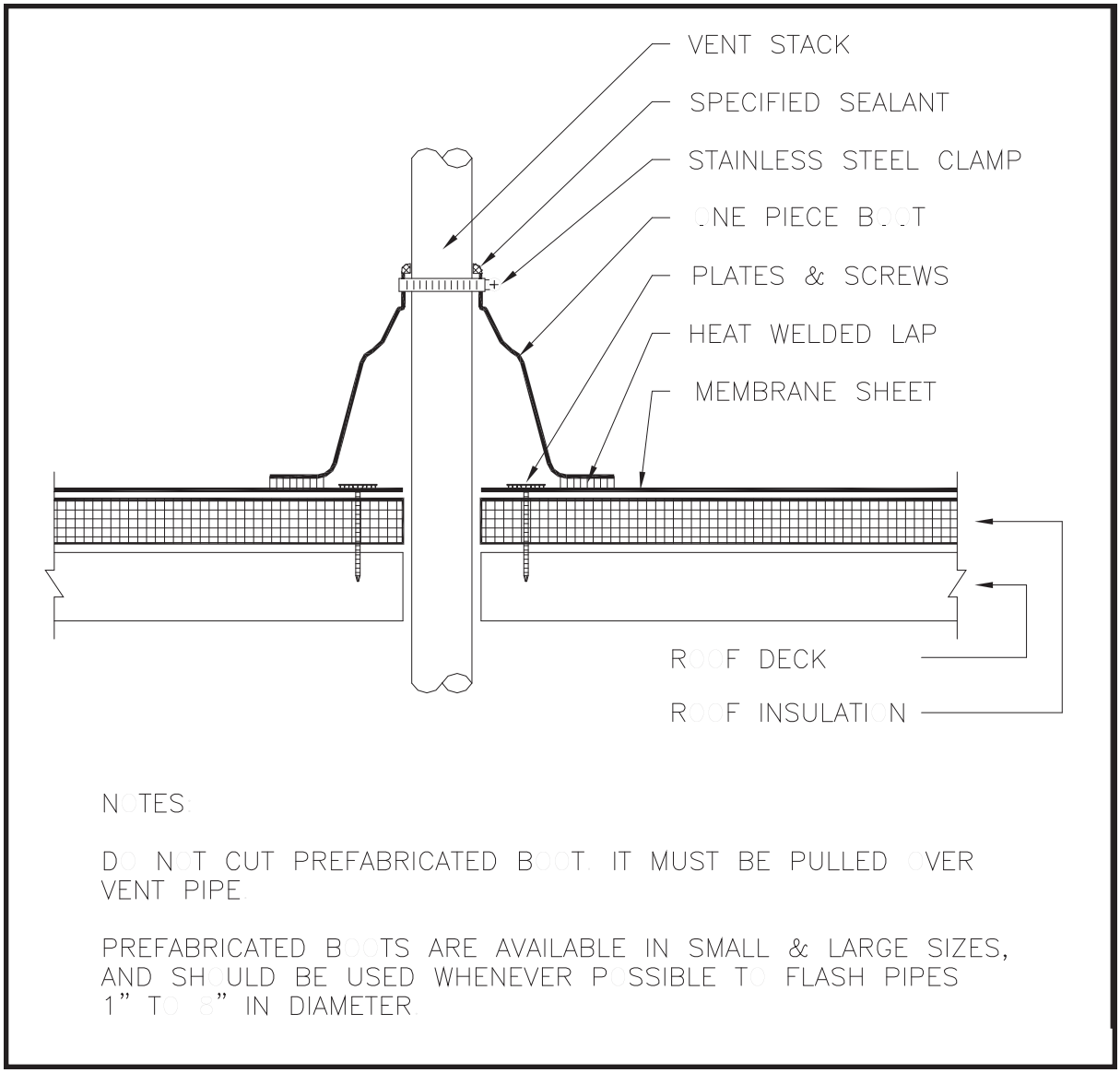
B. In the event of no viable alternative, fabricate pitch pans from TPA or TPO coated Metal and install pitch pans in strict accordance with Tremco Thermoplastic Membrane details ensuring proper attachment, maintaining a minimum 2” clearance around the penetration, with proper depth of sealant.





SOIL STACKS

Pre-formed stack:

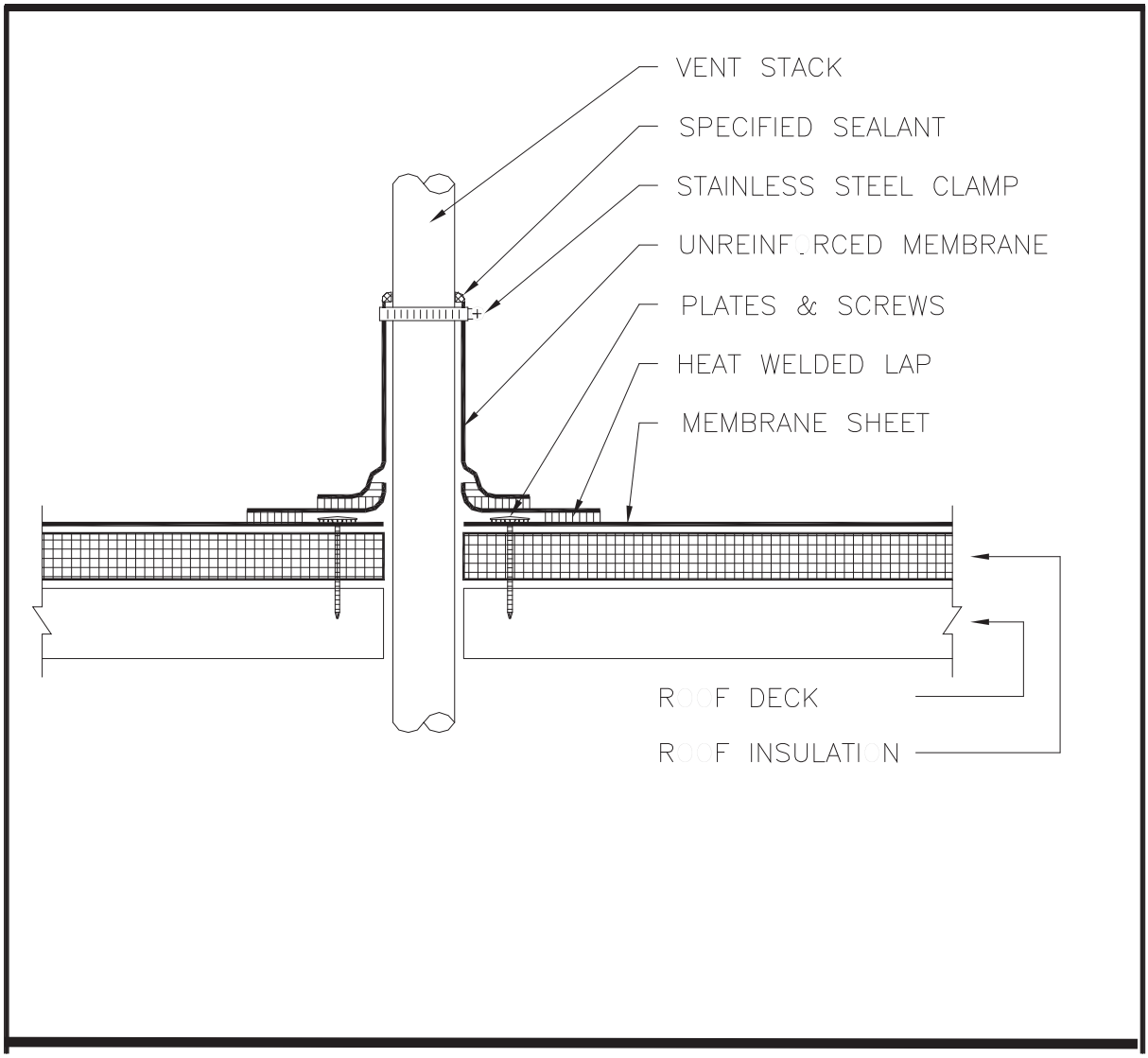


NOTES:

DO NOT CUT PREFABRICATED BOOT. IT MUST BE PULLED OVER VENT PIPE.

PREFABRICATED BOOTS ARE AVAILABLE IN SMALL & LARGE SIZES, AND SHOULD BE USED WHENEVER POSSIBLE TO FLASH PIPES 1" TO 8" IN DIAMETER.

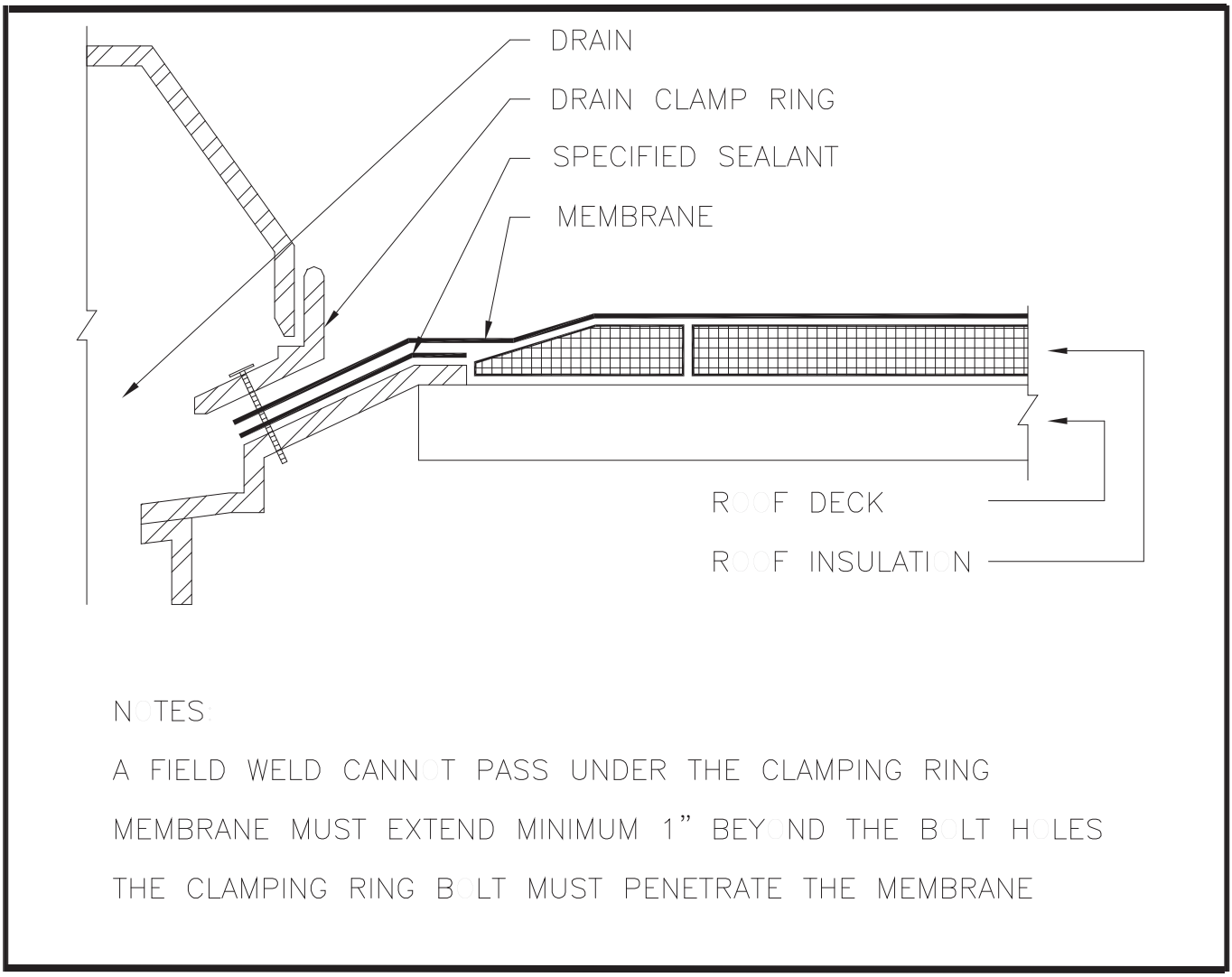
Field fabricated stack:



ROOF DRAINS

A. Flash all roof drains in strict accordance with roof drain detail. Replace any worn drain parts that may cut the roofing membrane or prevent a watertight seal. Replace all drain bolts or clamps holding the clamping ring to the drain basin. Ensure all drain basins are free of debris prior to leaving the roof after each day. Replace all broken drain domes.

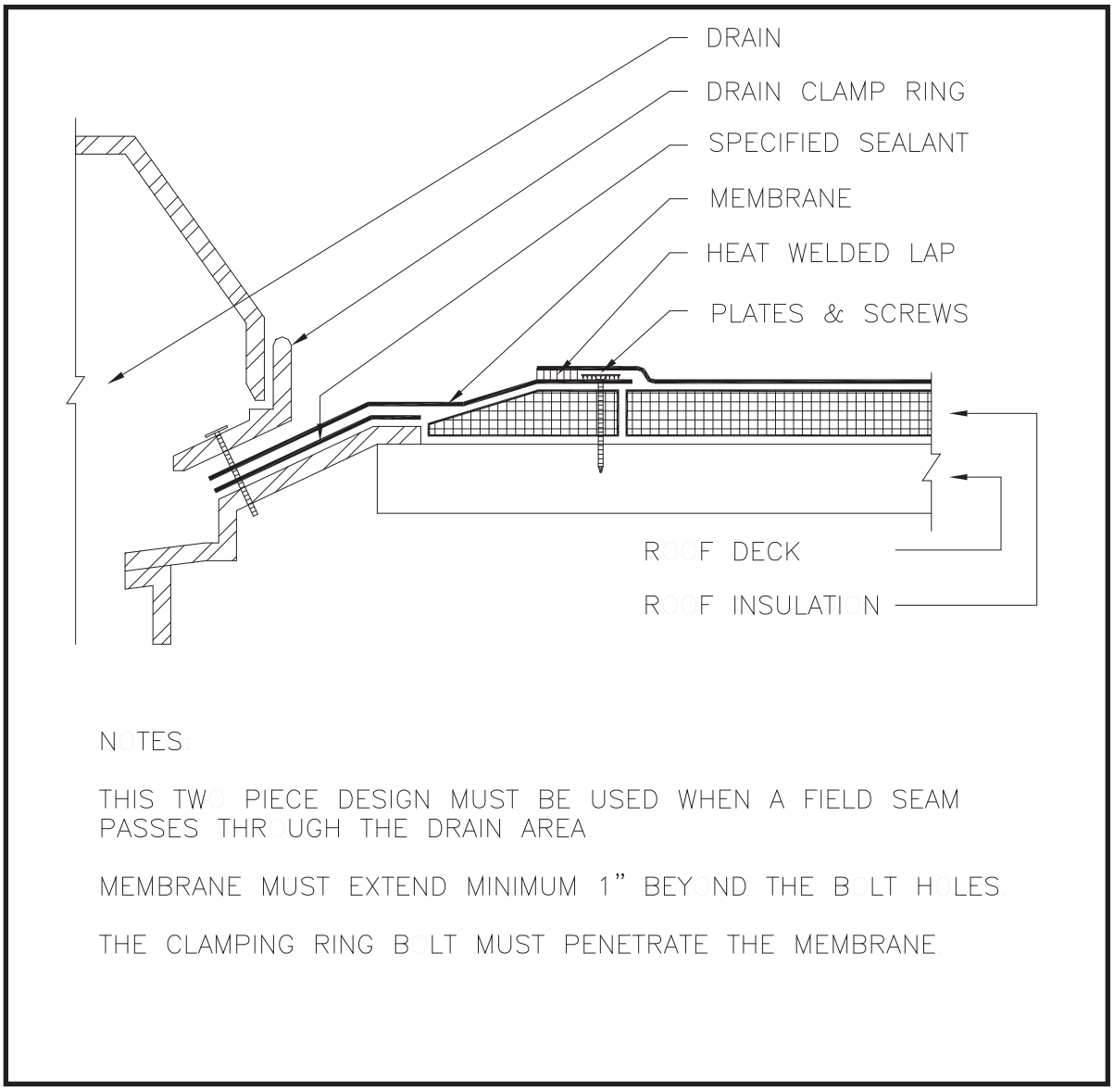
B. All drains shall have approved clamping rings.

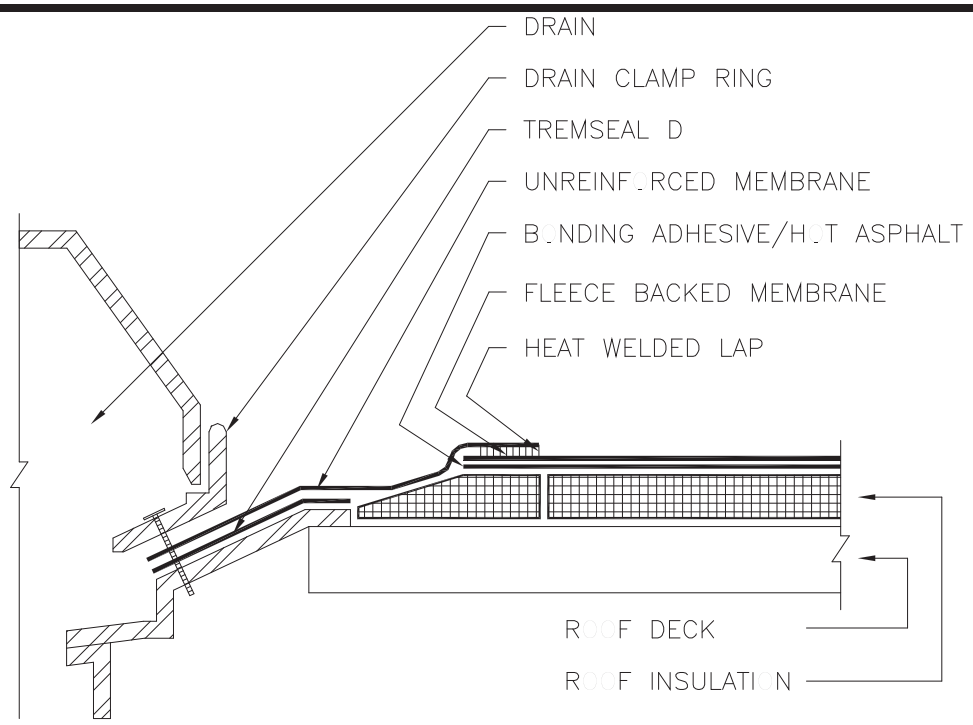


C. Un-reinforced Flashing Membrane must be used as a target flashing on the TPA FB / TPO FB Membrane.

D. Un-reinforced material not wide enough for sumped drain (change to standard material.)

E. A field weld must not pass under clamping ring.





NOTES

THIS TWO PIECE DESIGN MUST BE USED WHEN INSTALLING THE FLEECE BACKED MEMBRANE.

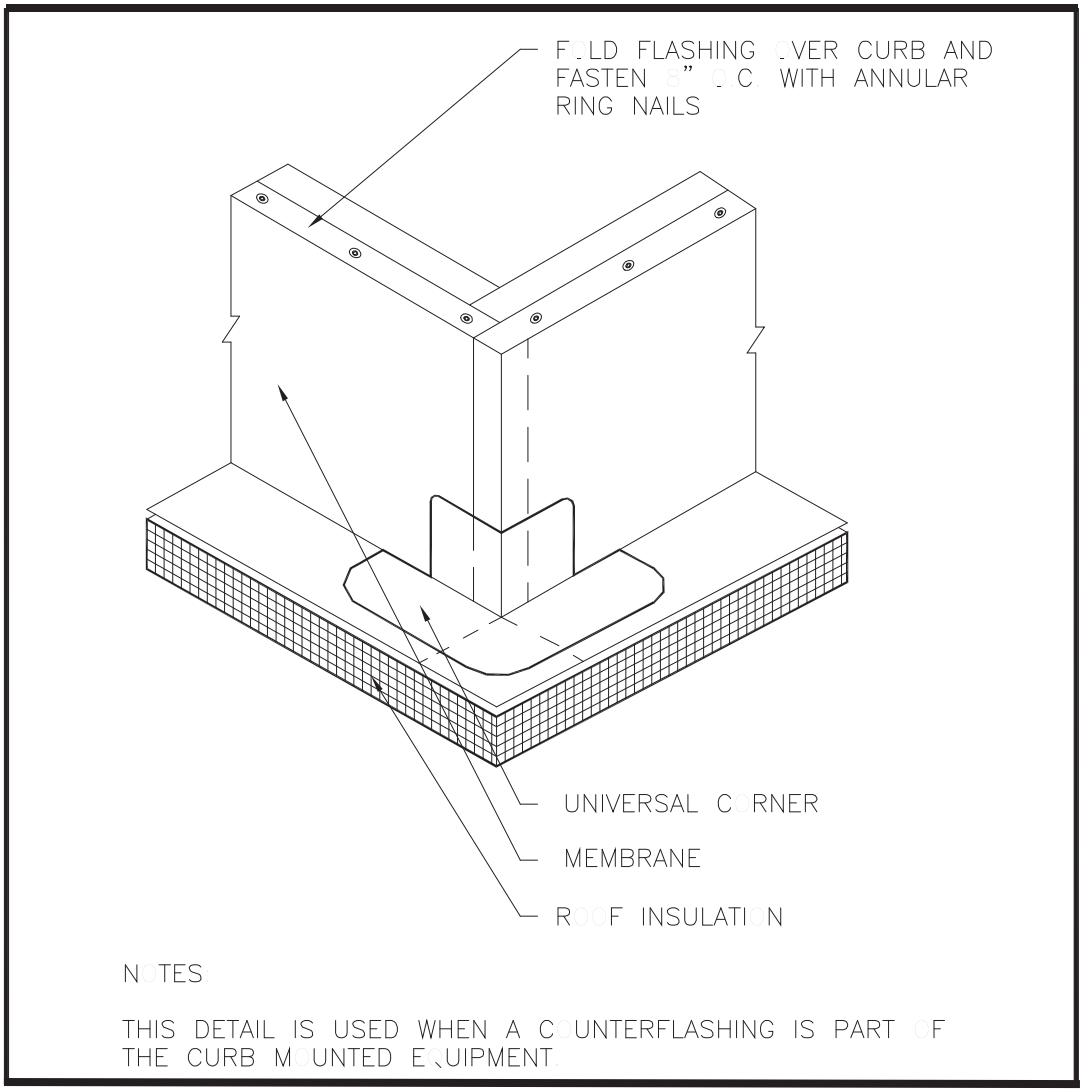
MEMBRANE MUST EXTEND MINIMUM 1" BEYOND THE BOLT HOLES.

FIELD WELD MUST NOT PASS UNDER THE CLAMPING RING.

THE CLAMPING RING BOLT MUST PENETRATE THE MEMBRANE.

CURBS AND CORNERS

All inside / outside corners shall be installed in strict accordance with Tremco details.



TEMPORARY SEALS

- At the end of each working day or the sign of rain, install a temporary watertight seal where the exposed edge of the completed new roofing terminates at the uncovered deck or old, existing roof surface.

- If the old roof surface is covered with slag, spud back 6” from where the membrane will be fastened to the deck. Use a sufficient sized strip of TPA / TPO membrane to bridge the new membrane and the roof deck.

- If using TPA / TPO membrane, the strip must be welded to the new roofing membrane and cemented to the cleaned roof deck.

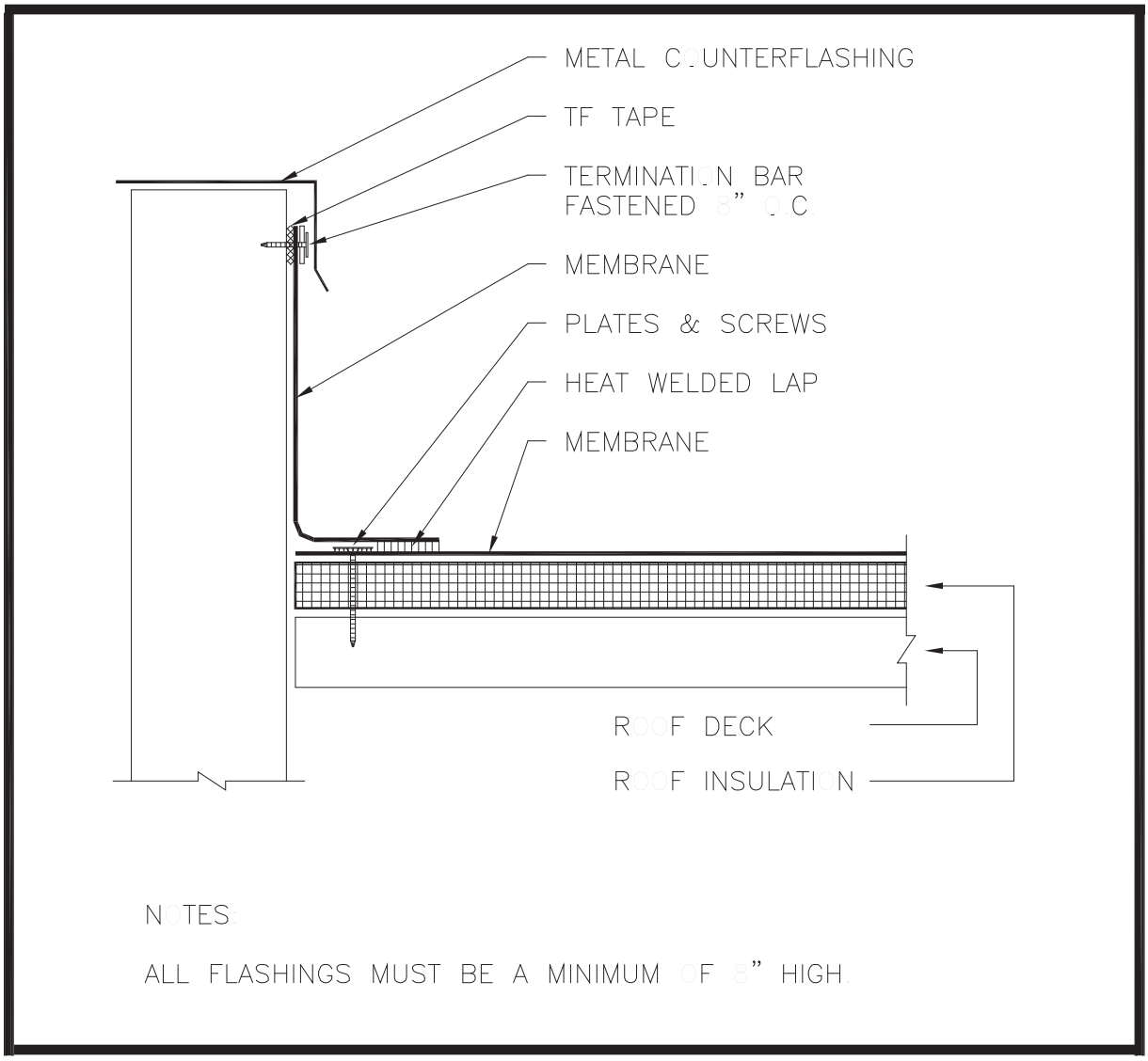
- Prior to the commencement of work, remove all temporary seals if they will cause water damage and any exposed roof cement if used. (DO NOT TRACK ROOF CEMENTS ONTO THE TPA ROOFING MEMBRANE).

INSPECTION

The following pages describe areas that will attract the attention of the Tremco Technical Representative during the warranty final inspection. Checking for proper welds and compliance with the job specifications will be their major concern. In general, they will be examining the roof to ensure that the contractor has executed the workmanship required to ensure the longevity of the system – not only for the full term of the warranty coverage but also for as many years as the system has the potential to provide. Unless the roof is “100%,” warranty must be withheld until all errors are corrected.

INSPECTION
FLASHING DETAILS

Install all flashing in a neat and uniform manner with a “rounding” of all exposed corners. Check to ensure that all flashing details are being installed in complete compliance with both the manufacturer’s and architect’s written specifications and detailed drawings. If there is any question or doubt on how to approach specific details, ask for clarification. Waiting until job completion is the wrong time to discover the detail has been improperly installed.

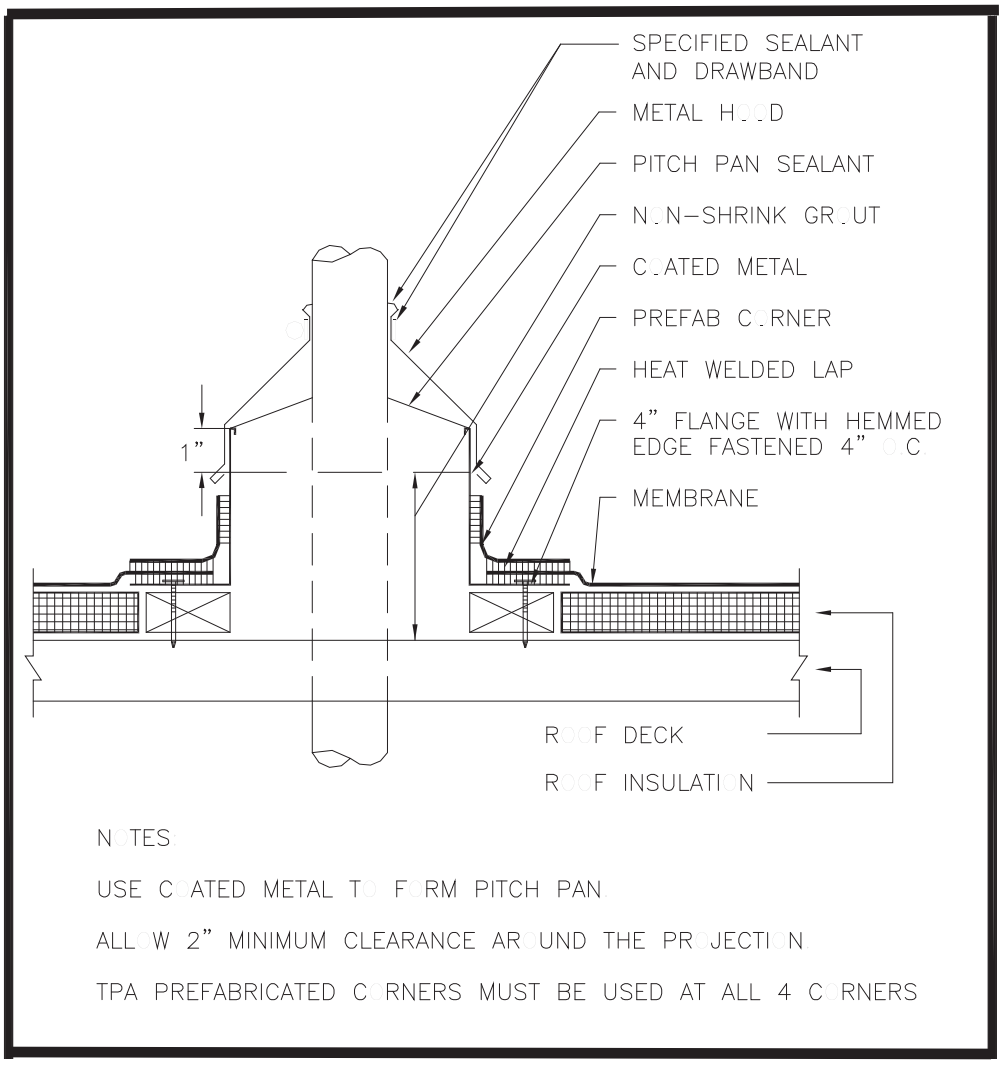


INSPECTION
STACKS

Inspect all the hand welds in the same manner as the field seams. Collars and / or prefabricated soil stack “boot’s” are to be tight fitting. Termination clamps are to be tight and properly caulked. If the stack is field fabricated, pay particular attention to the “fillets” that might be used to attach the collar to the flange. These fillets require a certain amount of expertise and are often times inadequately welded. Tremco requires full heat welding, which can only be accomplished with hand welding (not an automatic welding machine.)

INSPECTION
PITCH PANS

The key here, which is true for all flashing details, is in their initial installation. Proper attachment to the deck, rounded corners on metal flanges, good welds and sufficient laps are essential elements for optimum pitch pan performance.



Inspect and probe all the hand welds. When flashing pitch pans, it's a sound practice to weld as much area of the flashing on the pitch pan as possible. Be certain that corner fillets provide adequate coverage and are tightly welded. Voids will most often occur in the recess of the 90 degree angle on both sides of the fillet. Exposing the void and rewelding or extending the fillet are two possible remedies.

Check for positive adhesion of the trowelable sealer to the protrusion and the sides of the pitch pan. Pans are to be topped off with the sealer sloping away from the protrusion to provide a positive water shed.

NOTE: Etching of the pan and the protrusion greatly assist in promoting strong adhesion between the sealants used and the pan.

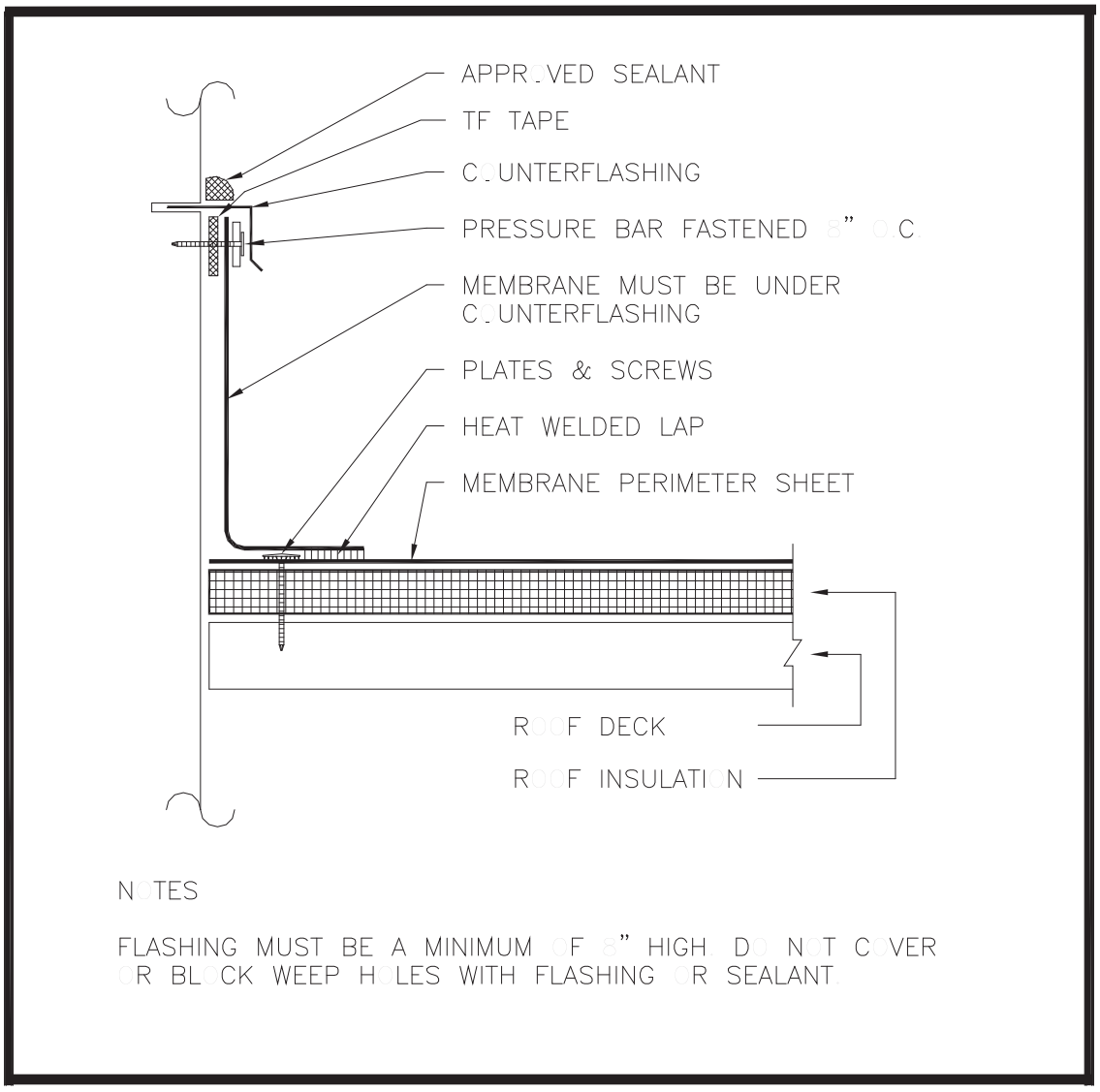
INSPECTION
TERMINATION BARS, WALL AND CURB FLASHINGS

Terminations are to be made a minimum of eight inches (8”) above the roof deck per NRCA recommendation. Check all the hand welds, especially the inside / outside corners. If prefabricated corners are not utilized, be sure that corner fillets provide adequate coverage over the corner cuts.

1. At exposed flashing terminations, be sure that a continuous bead of caulking is applied between the wall and the flashing membrane, directly behind the termination bar for a good compression seal.

2. Termination bars are to be prepunched with 9/32” or slots, securely anchored eight (8”) on center with a quarter inch (1/4”) spacing between bars.

3. When caulking the top of the termination bars, be sure to tool it in place and bevel it away from the wall over the termination bar to ensure a positive water shed over the termination.



INSPECTION
DRAINS & SCUPPERS

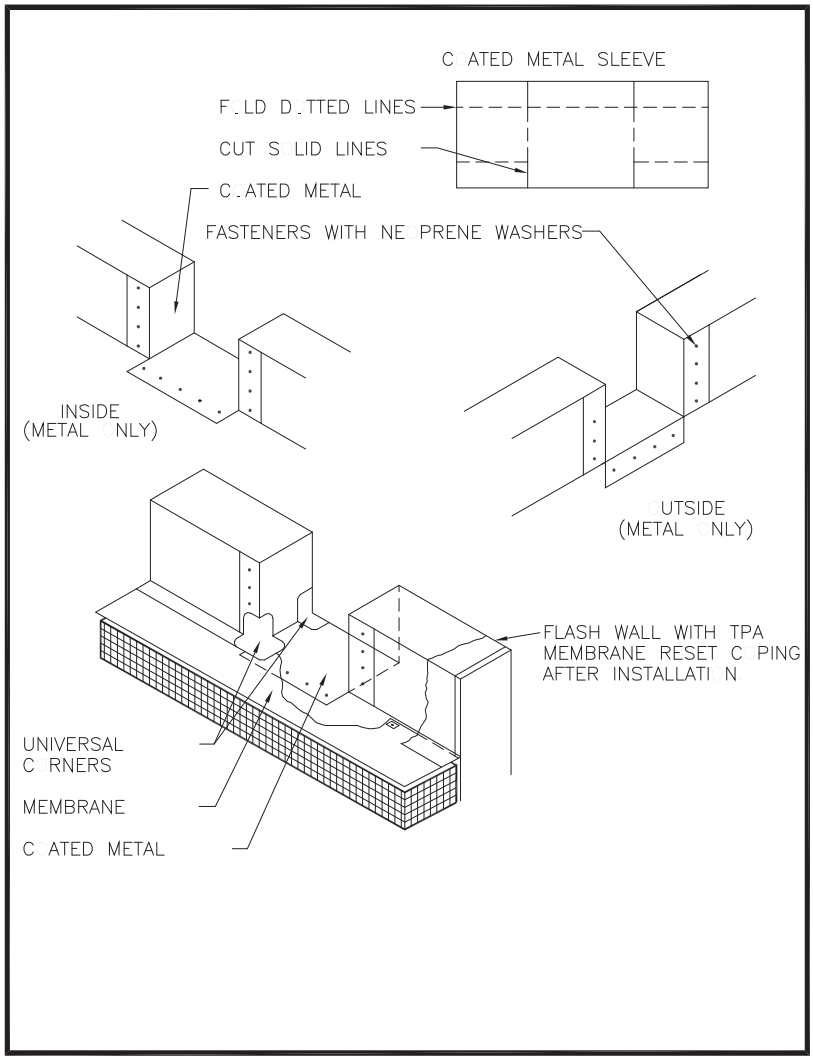
1. All drains are to be tapered twelve inches (12”) on all sides to provide positive drainage.

2. Lead flashings, if used, are to have a one inch (1”) lip extending into the drain bowl.

3. Apply a caulking bead of TremSEAL D between the drain flange and the membrane and between the membrane and the drain clamping ring.

4. Install the clamping ring tightly using the proper number of bolts required for the drain.

5. A minimum of one inch (1”) of roof membrane should be visible around the inside perimeter of the clamping ring. This action ensures proper anchorage of the membrane to the drain system.



INSPECTION
CLAD METALS AND PERIMETER FLASHINGS

The metal is to be installed according to specifications, neatly and securely anchored. Check all the perimeter welds and be especially critical when inspecting clad welds as they are the roofing systems first line of defense against wind uplift. All the metal joints are to be stripped in with membrane and heat welded.

INSPECTION
REPAIRS

- The physical properties of TPA and TPO membrane make it possible for it to be repaired by heat welding a patch at any time during its service life. The following guidelines will assure a reliable, water proof repair:

- Dirt, oils and other contaminants must be removed with a solvent such as Acetone or MEK. Use a clean white cotton rag and wipe the surface. Do not pour solvent directly on membrane as this may adversely affect the TPA and TPO membrane.

- Newly applied or slightly soiled membrane may be cleaned by using a good detergent like Spic and Span and a stiff bristle brush. Rinse well to remove detergent film before patching.

OBSERVE ALL PRECAUTIONARY INSTRUCTIONS ON THE LABELS OF THESE PRODUCTS FOR SAFE USE.

INSPECTION
PATCHES

When a patch is required, weld the entire patch if possible. After the weld cools, check the entire surrounding perimeter of the patch for any welding voids.

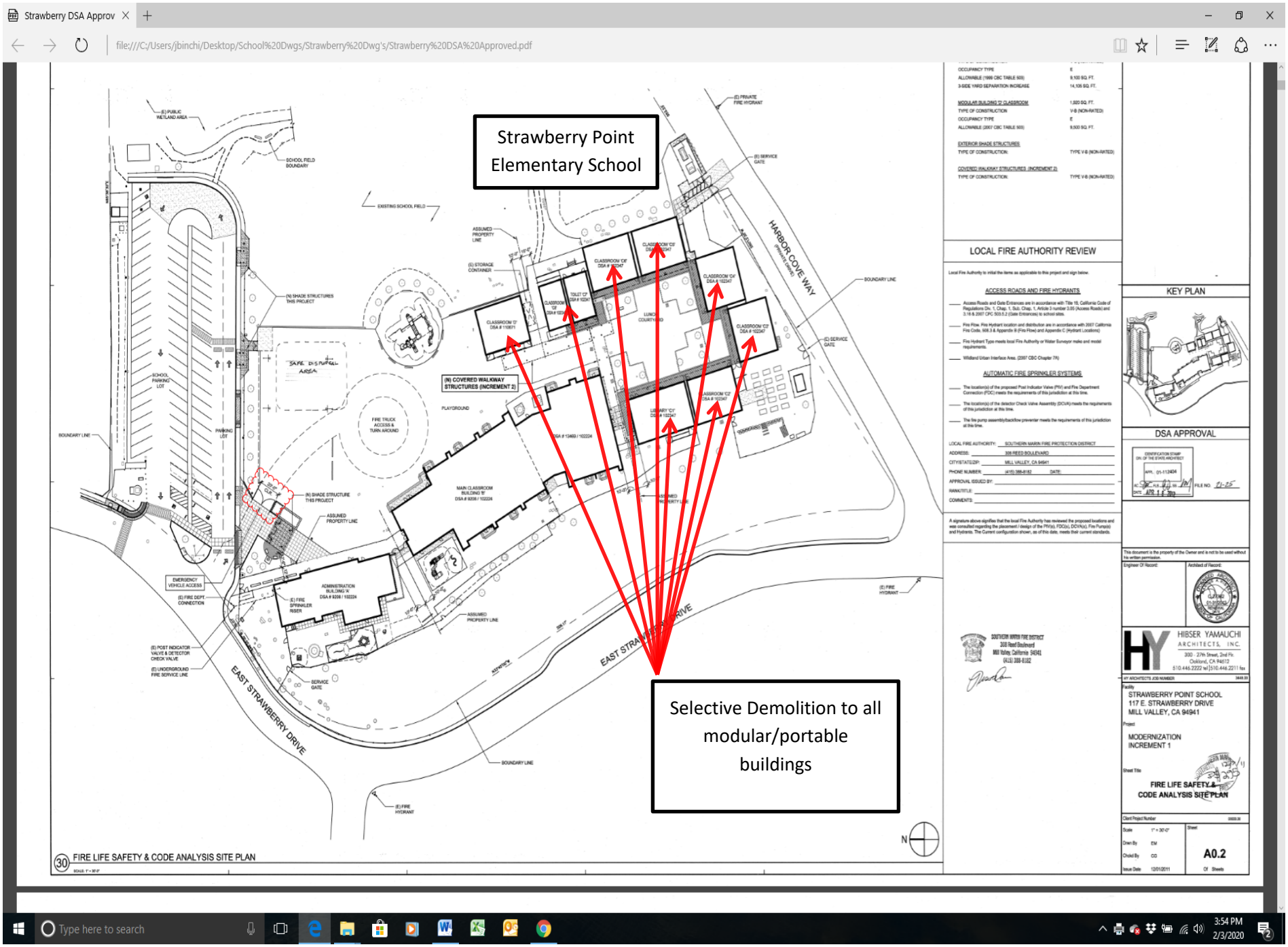
1. All areas to be patched must be clean and dry.

2. When patching over a seam, highlight the underlying seam edge.

3. Patches are to be uniform, rectangular with rounded corners and a minimum of four inches (4”) in width.

4. Whenever a seam requires multiple patches to the point where it becomes aesthetically displeasing, a minimum four (4”) wide capping or tape strip should be welded over the incorrectly welded seam.

5. Excessive patching of field seams because of inexperienced or poor workmanship will not be accepted at time of FINAL INSPECTION FOR WARRANTY.


Strawberry DSA Approv
file:///C:/Users/jbinchi/Desktop/School%20Dwgs/Strawberry%20Dwg's/Strawberry%20DSA%20Approved.pdf
Strawberry Point Elementary School
Selective Demolition to all modular/portable buildings
LOCAL FIRE AUTHORITY REVIEW
KEY PLAN
DSA APPROVAL
HIBSER YAMAUCHI ARCHITECTS, INC.
STRAWBERRY POINT SCHOOL
117 E. STRAWBERRY DRIVE
MILL VALLEY, CA 94941
MODERNIZATION INCREMENT 1
FIRE LIFE SAFETY & CODE ANALYSIS SITE PLAN
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EAST STRAWBERRY DRIVE
HARBOR COVE WAY
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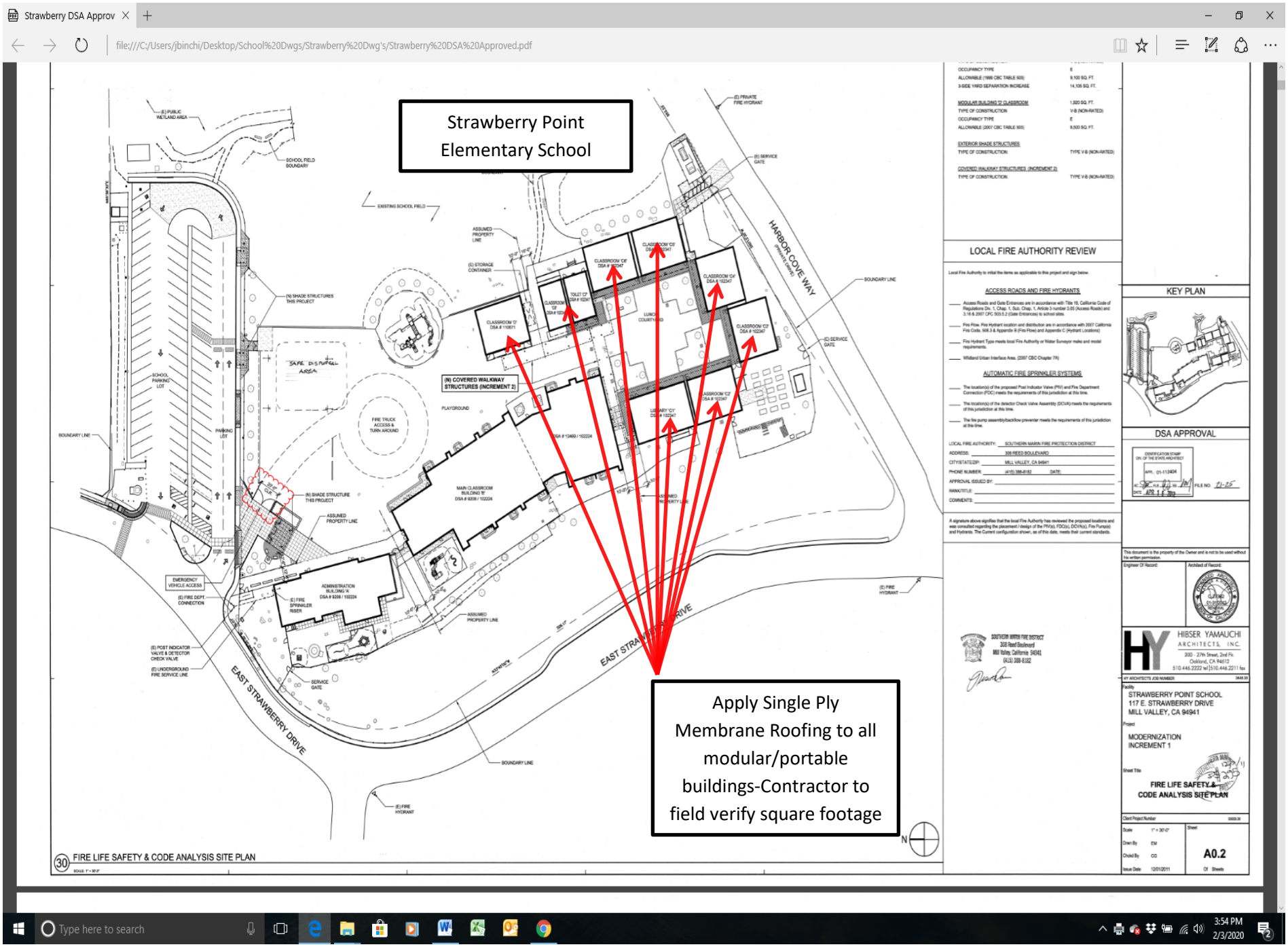
Strawberry DSA Approv
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Strawberry Point Elementary School
Apply Single Ply Membrane Roofing to all modular/portable buildings-Contractor to field verify square footage
LOCAL FIRE AUTHORITY REVIEW
KEY PLAN
DSA APPROVAL
HIBSER YAMAUCHI ARCHITECTS, INC.
STRAWBERRY POINT SCHOOL
117 E. STRAWBERRY DRIVE
MILL VALLEY, CA 94941
MODERNIZATION INCREMENT 1
FIRE LIFE SAFETY & CODE ANALYSIS SITE PLAN
A0.2
30 FIRE LIFE SAFETY & CODE ANALYSIS SITE PLAN
EAST STRAWBERRY DRIVE
HARBOR COVE WAY
(N) COVERED WALKWAY STRUCTURES (INCREMENT 2)
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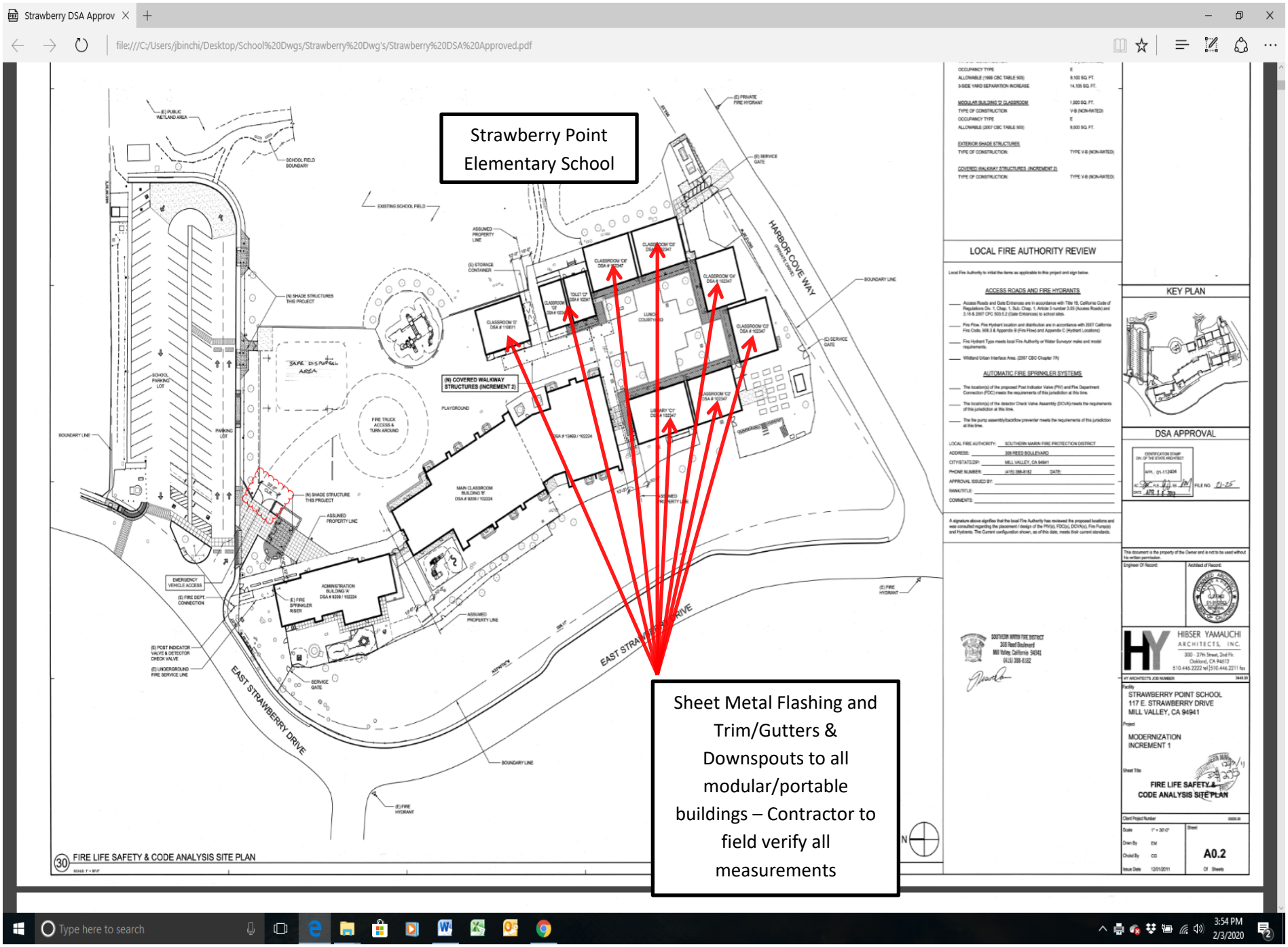
2/3/2020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Strawberry Point Elementary School
Sheet Metal Flashing and Trim/Gutters & Downspouts to all modular/portable buildings – Contractor to field verify all measurements
LOCAL FIRE AUTHORITY REVIEW
KEY PLAN
DSA APPROVAL
HIBSER YAMAUCHI ARCHITECTS, INC.
STRAWBERRY POINT SCHOOL
117 E. STRAWBERRY DRIVE
MILL VALLEY, CA 94941
MODERNIZATION INCREMENT 1
FIRE LIFE SAFETY & CODE ANALYSIS SITE PLAN
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30 FIRE LIFE SAFETY & CODE ANALYSIS SITE PLAN
EAST STRAWBERRY DRIVE
HARBOR COVE WAY
(N) COVERED WALKWAY STRUCTURES (INCREMENT 2)
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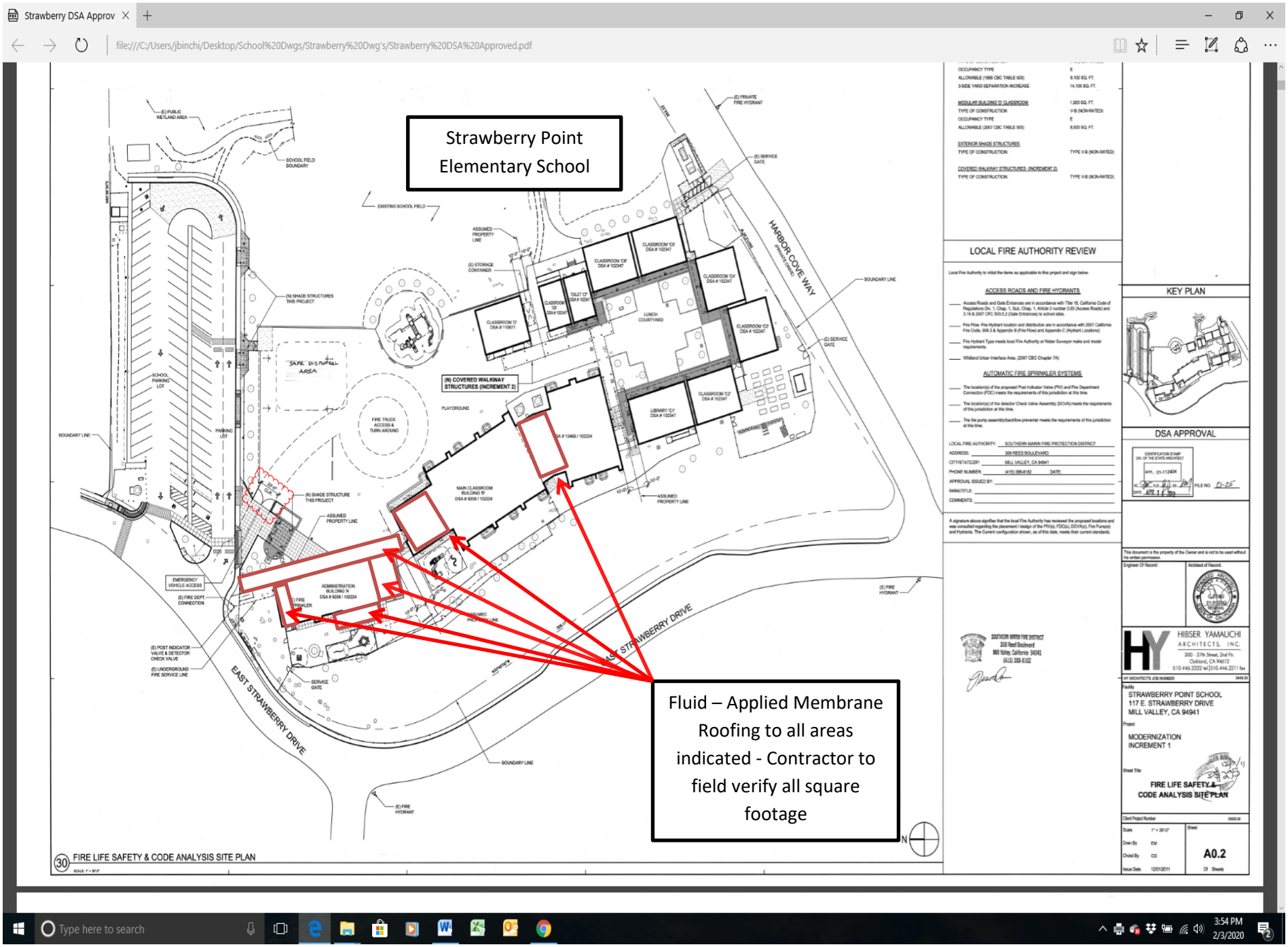
Strawberry DSA Approv
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Strawberry Point Elementary School
Fluid – Applied Membrane Roofing to all areas indicated - Contractor to field verify all square footage
LOCAL FIRE AUTHORITY REVIEW
KEY PLAN
DSA APPROVAL
HIBSER YAMAUCHI ARCHITECTS, INC.
STRAWBERRY POINT SCHOOL
117 E. STRAWBERRY DRIVE
MILL VALLEY, CA 94941
MODERNIZATION INCREMENT 1
FIRE LIFE SAFETY & CODE ANALYSIS SITE PLAN
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EAST STRAWBERRY DRIVE
STRAWBERRY DRIVE
HARBOR COVE WAY
(N) COVERED WALKWAY STRUCTURES (INCREMENT 2)
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Tam Valley Mod Conform

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Tam Valley Elementary School

Selected Demolition- Contractor to field verify square footage

40 SITE PLAN

MAIN BLDG AREA JUSTIFICATION:

PARKING SUMMARY:

LOCAL FIRE MARSHALL

DSA APPROVAL

HIBSER YAMAUCHI ARCHITECTS, INC.

TAMALPAIS VALLEY ELEMENTARY SCHOOL
350 Bell Lane, Mill Valley CA 94941

MODERNIZATION

CODE COMPLIANCE

A0.2

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Tam Valley Mod Conforı

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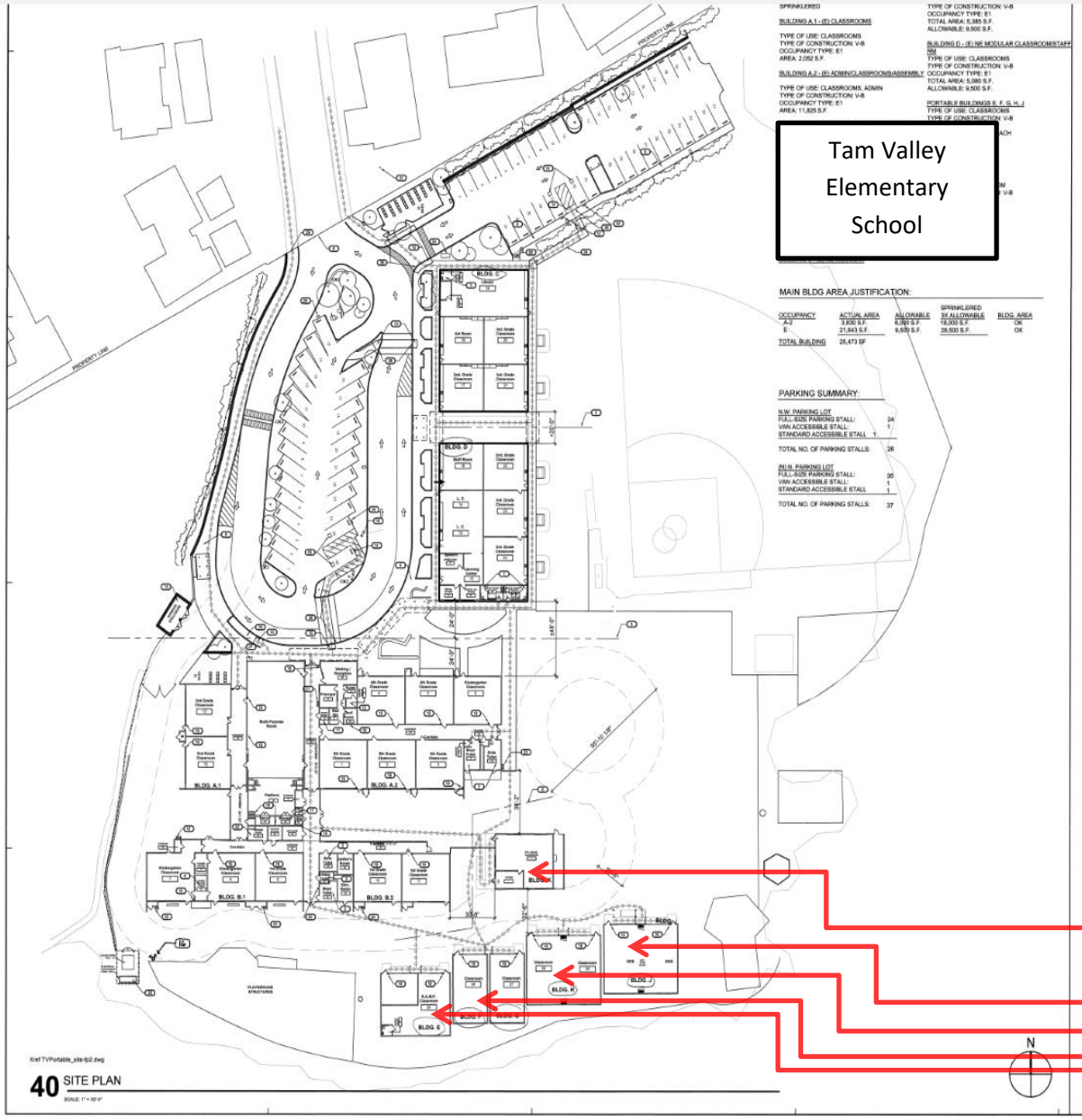
Tam Valley Elementary School

Single Ply Membrane Roofing



40 SITE PLAN

MAIN BLDG AREA JUSTIFICATION:

PARKING SUMMARY:

N.W. PARKING LOT
FULL-SIZE PARKING STALL: 24
VAN ACCESSIBLE STALL: 1
STANDARD ACCESSIBLE STALL 1
TOTAL NO. OF PARKING STALLS: 26

N.N. PARKING LOT
FULL-SIZE PARKING STALL: 35
VAN ACCESSIBLE STALL: 1
STANDARD ACCESSIBLE STALL 1
TOTAL NO. OF PARKING STALLS: 37

#	KEYNOTE:
1	(E) ACCESSIBLE BOYS & GIRLS STUDENT RESTROOM, DSA APPL. #59316
2	(E) ACCESSIBLE BOYS & GIRLS STUDENT RESTROOM, DSA APPL. #63973
3	(E) ACCESSIBLE UNISEX STAFF RESTROOM, DSA APPL. #63973
4	(E) ACCESSIBLE KINDERGARTEN, DSA APPL. 63973
5	ASSUMED PROPERTY LINE
6	PROPERTY LINE, S.C.D.
9	(N) CONC. WALKWAY, S.C.D.
10	DETECTABLE WARNING SURFACE.
11	(E) ACCESSIBLE UNISEX RESTROOM, DSA APPL. # 63973
12	(E) ACCESSIBLE NURSE'S RESTROOM, DSA APPL. #63973
13	(N) GARBAGE DUMPSTER AREA, S.C.D. & S.S.D.
14	(N) ACCESSIBLE PARKING SIGN ON STEEL POST, SEE DETAIL 9/A1.11
15	ISA SYMBOL, SEE DETAIL 9/A1.3
16	(N) FIRE HYDRANT, S.C.D.
17	(E) WHEEL CHAIR LIFT, DSA APPL. #63973
18	(N) ACCESSIBLE HI-LO DRINKING FOUNTAIN, SEE DETAIL 2/A1.11
19	(E) FIRE EXTINGUISHER W/ CURRENT CSFM CERTIFICATION TAG
20	(E) DRINKING FOUNTAIN
21	(E) HI-LO DRINKING FOUNTAIN AND GUARDRAILS, DSA APPL. 63973
22	(E) ACCESSIBLE KINDERGARTEN DRINKING FOUNTAIN , DSA APPL. #63973
23	(E) HI-LO ACCESSIBLE DRINKING FOUNTAIN, DSA APPL. #109854
24	(E) MAIN SWITCH BOARD, S.E.D.
25	(N) ELECTRICAL MAIN SWITCHBOARD, S.E.D., S.S.D.
26	(N) TOW AWAY SIGN ON STEEL, SEE DETAIL 14/A1.11
27	(E) FIRE SPRINKLER RISER, S.C.D.
28	(N) ACCESSIBLE STAIRS, S.C.D.
29	THERE ARE NO PUBLIC BUS-STOPS NEAR THE SCHOOL SITE.
30	(N) VAN ACCESSIBLE PARKING SIGN ON STEEL POST, SEE DETAIL 10/A1.11
31	(E) FIRE HYDRANT - PRIVATE HYDRANT
32	(E) ACCESSIBLE WOMEN'S RESTROOM, DSA APPL. #63973
34	(N) ACCESSIBLE PEDESTRIAN RAMP, S.C.D.
35	(N) ACCESSIBLE DROP OFF
36	FLUSH CONCRETE CURB, S.C.D.

LOCAL FIRE MARSHALL

LOCAL FIRE AUTHORITY REVIEW

ACCESS ROADS AND FIRE HYDRANTS

AUTOMATIC FIRE SPRINKLER SYSTEMS

SOUTHERN MARIN FIRE DISTRICT
308 Reed Boulevard
Mill Valley, California 94941
(415) 388-8182

DSA APPROVAL

HIBSER YAMAUCHI ARCHITECTS, INC.
300 - 27th Street, 2nd Flr.
Oakland, CA 94612
510.446.2222 tel | 510.446.2211 fax

TAMALPAIS VALLEY ELEMENTARY SCHOOL
350 Bell Lane, Mill Valley CA 94941

MODERNIZATION

CODE COMPLIANCE

A0.2

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Tam Valley Mod Conform

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Tam Valley Elementary School

MAIN BLDG AREA JUSTIFICATION:

PARKING SUMMARY:

LOCAL FIRE MARSHALL

LOCAL FIRE AUTHORITY REVIEW

ACCESS ROADS AND FIRE HYDRANTS

AUTOMATIC FIRE SPRINKLER SYSTEMS

DSA APPROVAL

40 SITE PLAN

Sheet Metal Flashing and Trim-Replace flashing system above administrative office – Contractor to field verify LF

HIBSER YAMAUCHI ARCHITECTS, INC.

TAMALPAIS VALLEY ELEMENTARY SCHOOL
350 Bell Lane, Mill Valley CA 94941

MODERNIZATION

CODE COMPLIANCE

A0.2

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Tam Valley Mod Conform

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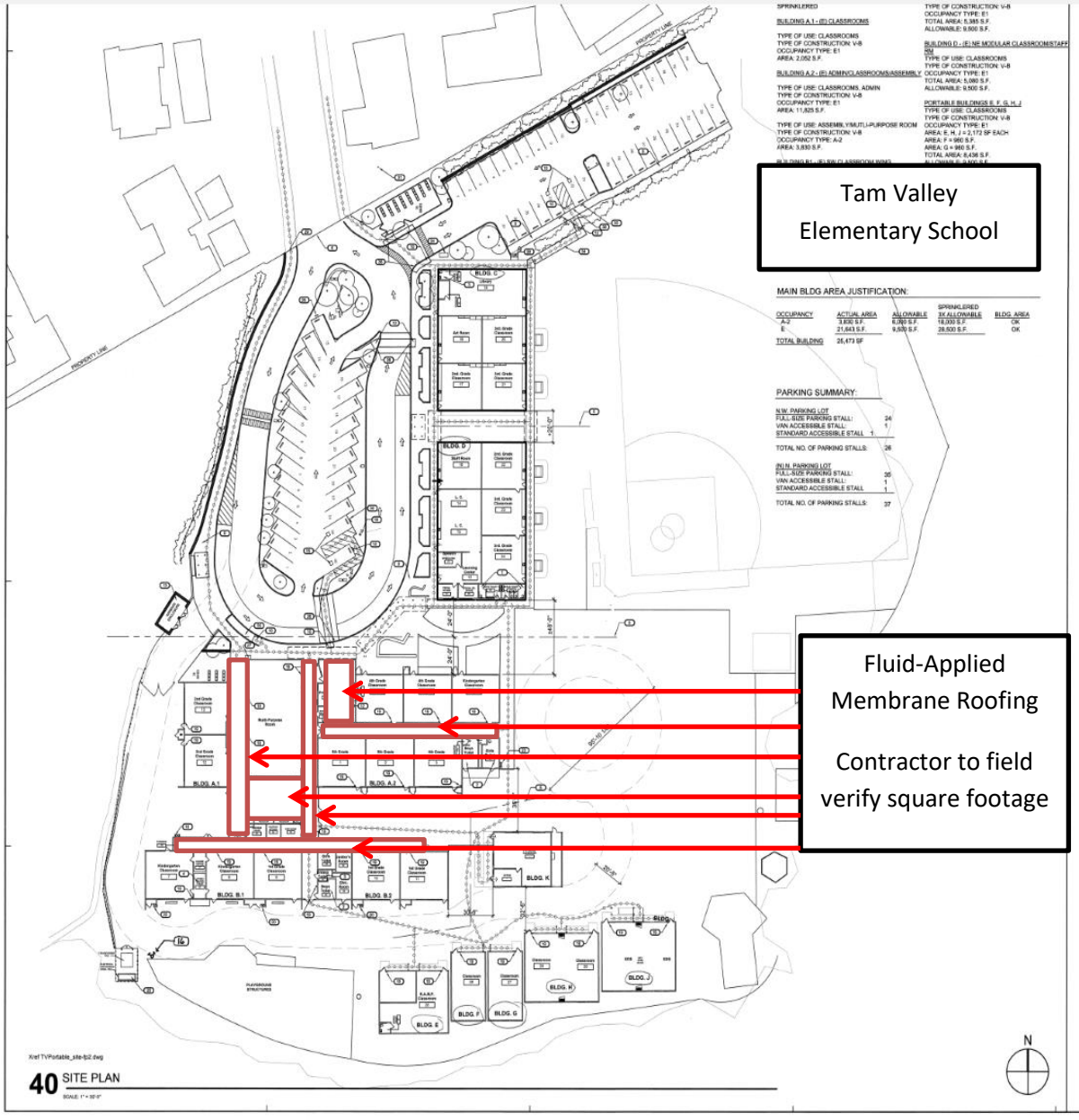

Tam Valley
Elementary School

Fluid-Applied
Membrane Roofing

Contractor to field
verify square footage

40 SITE PLAN

MAIN BLDG AREA JUSTIFICATION:

PARKING SUMMARY:

LOCAL FIRE MARSHALL

DSA APPROVAL

HIBSER YAMAUCHI ARCHITECTS, INC.

TAMALPAIS VALLEY ELEMENTARY SCHOOL
350 Bell Lane, Mill Valley CA 94941

MODERNIZATION

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