SECTION 07 54 00

PVC THERMOPLASTIC SINGLE-PLY ROOFING

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\*\* NOTE TO SPECIFIER \*\* Carlisle SynTec Systems; Thermoplastic Polyvinyl Chloride (PVC) Membrane Roofing.  
This section is based on the products of Carlisle SynTec Systems, which is located at:  
P. O. Box 7000  
Carlisle, PA 17013  
Toll Free Tel:   
800-4-SYNTEC  
Tel:   
717-245-7000  
Fax:   
717-245-7053  
Email:  [info@carlislesyntec.com](mailto:info@carlislesyntec.com?subject=RE:%20Spec%20Question%20(07540car):%20)  
Web: <https://www.carlislesyntec.com>   
  
 [ [Click Here](https://arcat.com/company/carlisle-syntec-systems-31255) ] for additional information.  
  
Carlisle's more than 40 years of manufacturing experience, over 10 billion square feet of membrane sold and nearly 250,000 warranted installations, positions the company as the single-ply roofing market leader. This role has been achieved through superior customer service and product innovation designed to enhance roof system performance and sustainability. When recently surveyed, architects and specifiers throughout the country, rated Carlisle superior to others for design and technical support and long-term warranties.

1. GENERAL
   1. SECTION INCLUDES

\*\* NOTE TO SPECIFIER \*\* Delete items below not required for project.

* + 1. Mechanically attached PVC thermoplastic single-ply roofing system.
    2. Fully adhered PVC thermoplastic single-ply roofing system.
    3. Roof insulation.
    4. Flashing accessories.
    5. Edgings and terminations.
    6. Roof garden components.
    7. Roof walkways.
  1. RELATED SECTIONS

\*\* NOTE TO SPECIFIER \*\* Delete any sections below not relevant to this project; add others as required.

* + 1. Section 03 30 00 - Cast-in-Place Concrete.
    2. Section 03 51 13 - Cementitious Wood Fiber Decks.
    3. Section 03 52 13 - Composite Concrete Roof Insulation.
    4. Section 05 36 00 - Composite Metal Decking.
    5. Section 06 10 00 - Rough Carpentry.
    6. Section 07 53 13 - Chlorinated-Polyethylene Roofing.
    7. Section 07 54 23 - Thermoplastic-Polyolefin Roofing.
    8. Section 07 62 00 - Sheet Metal Flashing and Trim.
    9. Section 07 70 00 - Roof and Wall Specialties and Accessories.
    10. Section 08 60 00 - Roof Windows and Skylights.
    11. Section 22 30 00 - Plumbing Equipment.
  1. REFERENCES

\*\* NOTE TO SPECIFIER \*\* Delete references from the list below that are not actually required by the text of the edited section.

* + 1. American Society of Civil Engineers (ASCE) - ASCE 7 - Minimum Design Loads for Buildings and Other Structures, Current Revision.
    2. ASTM International (ASTM):
       1. ASTM C 208 - Standard Specification for Cellulosic Fiber Insulating Board.
       2. ASTM C 578 - Standard Specification for Rigid, Cellular Polystyrene Thermal Insulation.
       3. ASTM C 1289 - Standard Specification for Faced Rigid Cellular Polyisocyanurate Thermal Insulation Board.
       4. ASTM D 41 - Standard Specification for Asphalt Primer Used in Roofing, Dampproofing, and Waterproofing.
       5. ASTM D 226 - Standard Specification for Asphalt-Saturated Organic Felt Used in Roofing and Waterproofing.
       6. ASTM D 312 - Standard Specification for Asphalt Used in Roofing.
       7. ASTM D 412 - Standard Test Methods for Vulcanized Rubber and Thermoplastic Elastomers-Tension.
       8. ASTM D 1079 - Standard Terminology Relating to Roofing, Waterproofing, and Bituminous Materials.
       9. ASTM D 2178 - Standard Specification for Asphalt Glass Felt Used in Roofing and Waterproofing.
       10. ASTM D 4263 - Standard Test Method for Indicating Moisture in Concrete by the Plastic Sheet Method.
       11. ASTM D 4434 - Standard Specification for Poly (Vinyl Chloride) Sheet Roofing.
       12. ASTM D 4491 - Standard Test Methods for Water Permeability of Geotextiles by Permittivity.
       13. ASTM D 4869 - Standard Specification for Asphalt-Saturated Organic Felt Underlayment Used in Steep Slope Roofing.
       14. ASTM E 96 - Standard Test Methods for Water Vapor Transmission of Materials.
    3. Factory Mutual (FM Global):
       1. Approval Guide.
          1. Factory Mutual Standard 4470 - Approval Standard for Class 1 Roof Covers.
          2. Loss Prevention Data Sheets 1-28, 1-29.
    4. International Code Council (ICC):
       1. International Building Code (IBC).
    5. National Roofing Contractors Association (NRCA) - Low Slope Roofing and Waterproofing Manual, Current Edition.
    6. Sheet Metal and Air Conditioning Contractors National Association, 1nc. (SMACNA) - Architectural Sheet Metal Manual.
    7. Underwriters Laboratories (UL):
       1. TGFU R1306 - "Roofing Systems and Materials Guide".
       2. UL-790 - Standard Test Method for Fire Tests of Roof Coverings.

\*\* NOTE TO SPECIFIER \*\* Retain only design criteria required for the project and delete those not required or not applicable.

* 1. DESIGN CRITERIA
     1. Wind Uplift Performance:

\*\* NOTE TO SPECIFIER \*\* Select required wind uplift performance criteria. Performance may be specified by referencing ASCE-7, by reference of an FM tested assembly, or by utilizing a DORA Assembly number.

* + - 1. Roof system is designed to withstand wind uplift forces as calculated using the current revision of ASCE-7.

\*\* NOTE TO SPECIFIER \*\* Insert the appropriate FM rating as found in the current FM Guide.

* + - 1. Roof system is designed to achieve a FM 1-\_\_\_ wind uplift rating.

\*\* NOTE TO SPECIFIER \*\* Insert the appropriate DORA Assembly number as found in the current Directory of Roof Assemblies (DORA) by SPRI.

* + - 1. Roof system is designed to achieve a DORA Assembly number \_\_\_ .
    1. Fire Resistance Performance:

\*\* NOTE TO SPECIFIER \*\* Delete fire rating not required.

* + - 1. Roof system will achieve a UL Class A rating when tested in accordance with UL-790.
      2. Roof system will achieve a UL Class B rating when tested in accordance with UL-790.
      3. Roof system will achieve a UL Class C rating when tested in accordance with UL-790.

\*\* NOTE TO SPECIFIER \*\* Insert LTTR Value. Modify R value' to LTTR value' where Polyisocyanurate insulation is not used in the system.

* + 1. Thermal Performance: Roof system will achieve a minimum R value not less than \_\_\_\_.
    2. Drainage: Provide a roof system with positive drainage where all standing water dissipates within 48 hours after precipitation ends.
    3. Building Codes:
       1. Roof system will meet the requirements of all federal, state and local code bodies having jurisdiction.

\*\* NOTE TO SPECIFIER \*\* Delete the next paragraph if LEED Credit is not required on this project.

* 1. LEED CERTIFICATION:
     1. Coordinate with Section 01 11 13 - Work Covered by Contract Documents.
     2. Submittals Required:
        1. SSc7.2 Heat Island Effect - Roof (LEED Form).
        2. MRc4 Recycled Content (LEED Form).
        3. MRc5 Local and Regional Materials (LEED Form).
        4. EQc4.1 Low-Emitting Materials - Adhesives and Sealants (LEED Form).
  2. SUBMITTALS
     1. Submit under provisions of Section 01 30 00.
     2. Product Data: Manufacturer's data sheets on each product to be used, including:
        1. Preparation instructions and recommendations.
        2. Storage and handling requirements and recommendations.
        3. Installation methods.
     3. Detail Drawings:
        1. Submit approved plan, section, elevation or isometric drawings which detail the appropriate methods for all flashing conditions found on the project.
        2. Coordinate approved drawings with locations found on the Contract Drawings.

\*\* NOTE TO SPECIFIER \*\* Delete selection samples if colors have already been selected.

* + 1. Selection Samples: For each finish product specified, two complete sets of chips representing manufacturer's full range of available colors, membranes, and thicknesses.
    2. Verification Samples: For each finish product specified, two samples, minimum size 4 inches (100 mm) square representing actual product, color, and patterns.
  1. QUALITY ASSURANCE
     1. Manufacturer Qualifications: All primary products specified in this section will be supplied by a single manufacturer with a minimum of twenty (20) years experience.
     2. Installer Qualifications:
        1. All products listed in this section are to be installed by a single installer with a minimum of five (5) years demonstrated experience in installing products of the same type and scope as specified.

\*\* NOTE TO SPECIFIER \*\* retain one of the next two paragraphs only if manufacturer supplied guaranties are specified. Delete if not required.

* + - 1. Installer shall be capable of extending the Manufacturer's Labor and Materials guarantee.
      2. Installer shall be capable of extending the Manufacturer's No Dollar Limit guarantee.

\*\* NOTE TO SPECIFIER \*\* Include a mock-up if the project size and/or quality warrant taking such a precaution. The following is one example of how a mock-up on a large project might be specified. When deciding on the extent of the mock-up, consider all the major different types of work on the project.

* + 1. Mock-Up: Provide a mock-up for evaluation of surface preparation, installation techniques and workmanship.
       1. Finish areas designated by Architect.
       2. Do not proceed with remaining work until workmanship, color, and sheen are approved by Architect.
       3. Refinish mock-up area as required to produce acceptable work.
  1. DELIVERY, STORAGE, AND HANDLING
     1. Store products in manufacturer's unopened packaging until ready for installation.
     2. Store and dispose of hazardous materials, and materials contaminated by hazardous materials, in accordance with requirements of local authorities having jurisdiction.
  2. PROJECT CONDITIONS
     1. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's absolute limits.
  3. WARRANTY

\*\* NOTE TO SPECIFIER \*\* Modify the included text as required.

* + 1. At project closeout, provide to Owner or Owners Representative an executed copy of the manufacturer's Total System warranty, outlining its terms, conditions, and exclusions from coverage.

\*\* NOTE TO SPECIFIER \*\* Select Warranty Duration based on specified roof assembly.

\*\* NOTE TO SPECIFIER \*\* 10-year warranty is available for:  
 - Adhered 50-, 60- and 80-mil PVC  
 - Mechanically Fastened 50-, 60- and 80-mil PVC  
 - Adhered 105-, 115- and 135-mil PVC FleeceBACK

* + - 1. Duration: 10 Years.

\*\* NOTE TO SPECIFIER \*\* 15-year warranty is only available for:  
 - Adhered 50-, 60- and 80-mil PVC  
 - Mechanically Fastened 50-, 60- and 80-mil PVC  
 - Adhered 105-, 115- and 135-mil PVC FleeceBACK

* + - 1. Duration: 15 Years.

\*\* NOTE TO SPECIFIER \*\* 20-year warranty is only available for:  
 - Adhered 50-, 60- and 80-mil PVC  
 - Mechanically Fastened 80-mil PVC  
 - Adhered 105-, 115- and 135-mil PVC FleeceBACK

* + - 1. Duration: 20 Years.

\*\* NOTE TO SPECIFIER \*\* 25-year warranty is only available for:.  
- Adhered 60- and 80-mil PVC  
 - Mechanically Fastened 60- and 80-mil PVC  
- Adhered 115- and 135-mil PVC FleeceBACK

* + - 1. Duration: 25 Years.

\*\* NOTE TO SPECIFIER \*\* 30-year warranty is only available for:  
- Adhered 80-mil PVC  
 - Mechanically Fastened 80-mil PVC  
- Adhered 135-mil PVC FleeceBACK

* + - 1. Duration: 30 Years.

\*\* NOTE TO SPECIFIER \*\* Delete if not required. Puncture coverage is only available for:  
- Adhered 60- and 80-mil PVC  
- Mechanically Fastened 60- and 80-mil PVC  
- Adhered 115- and 135-mil PVC FleeceBACK

* + - 1. Coverage to be extended to include accidental punctures in accordance with terms stated in the Warranty document
      2. Coverage to be extended to include hail damage in accordance with terms stated in the Warranty document.
      3. Coverage to be extended to include roof edge metal water tightness in accordance with terms stated in the Warranty document.

1. PRODUCTS
   1. MANUFACTURERS
      1. Acceptable Manufacturer: Carlisle SynTec Systems, which is located at: P. O. Box 7000; Carlisle, PA 17013; ASD Toll Free Tel: ; 800-4-SYNTEC; Tel: ; 717-245-7000; Fax: ; 717-245-7053; Email: <info@carlislesyntec.com>; Web: <https://www.carlislesyntec.com>.

\*\* NOTE TO SPECIFIER \*\* Delete one of the following two paragraphs; coordinate with requirements of Division 1 section on product options and substitutions.

* + 1. Substitutions: Not permitted.
    2. Requests for substitutions will be considered in accordance with provisions of Section 01 60 00 - Product Requirements.
  1. SCOPE / APPLICATION
     1. Roof System: Provide a waterproof roof system, capable of withstanding uplift forces as specified in this section.

\*\* NOTE TO SPECIFIER \*\* Retain only attachment methods that apply to this project. Delete all others.

* + - 1. Membrane Attachment: Mechanically Attached.
      2. Membrane Attachment: Fully Adhered.
    1. Base Flashing: Provide a waterproof, fully adhered base flashing system at all penetrations, plane transitions and terminations.

\*\* NOTE TO SPECIFIER \*\* Delete the next paragraph if insulation beneath the membrane is not specified.

* + 1. Insulation: Provide a roof insulation system beneath the finish membrane.
  1. MEMBRANE ATTACHMENT: MECHANICALLY ATTACHED

\*\* NOTE TO SPECIFIER \*\* Delete the next article if a base sheet is not required. Delete base sheet not required.

* + 1. Carlisle FR Base Sheet 1S: A non-asphaltic, resin-bound, fiberglass-reinforced mat, coated on one side with a mineral-filled fire-resistant coating (42 inches (1067 mm) wide and 200 feet (60960 mm) long). Designed for use as a suitable substrate for direct application of Mechanically Fastened Roofing Systems over decks requiring a fastened base sheet.
    2. Carlisle SureMB 70 SA Modified Base Sheet: 70-mil smooth surface, self-adhered base ply. Reinforced with a fiberglass mat that is saturated and coated with asphaltic bitumen and SBS elastomer and meets ASTM D6163 Type 1, Grade S. 70 SA is designed to be used as a base ply or interplay in Carlisle's multiple-ply system and can be used as an air and vapor barrier or temporary (up to 60 days) roof. Available in 39-3/8" wide and 61' long (200 square feet) weighing 0.39 lbs per square foot.
    3. Carlisle SureMB 90 Modified Base Sheet - 90-mil Glass fiber, reinforced, SBS-modified asphalt, base sheet that meets ASTM D 6163 Type I, Grade S for SBS-modified bituminous sheet materials. May be used as an air barrier, vapor barrier and temporary (Up to 60 days) roof. Available in 39-3/8" wide and 49'-1" long (161 square feet) weighing 0.58 lbs per square foot.
    4. Carlisle SureMB 120TG Base Sheet - a smooth-surfaced, torch-grade SBS base ply, reinforced with a non-woven polyester mat that is saturated and coated with asphaltic bitumen and SBS elastomers.
    5. Carlisle SureMB 90TG Base - 94-mil smooth-surfaced, SBS, torch-applied membrane. Reinforced with a fiberglass mat that is saturated and coated with asphaltic bitumen and SBS elastomers which meets ASTM D6163 Type I, Grade S. SureMB 90TG is designed for use as a base-ply or inter-ply in Carlisle's multiple-ply system and can be used as an air barrier, vapor barrier or temporary (Up to 60 days) roof. Available in rolls 39-3/8" wide and 49'-1" long (164 square feet) and weighing 0.57 lbs per square foot.
    6. VapAir Seal 725TR Air/Vapor Barrier - a 40-mil composite consisting of 35-mils of self-adhering rubberized asphalt laminated to a 5-mil woven polypropylene film.
    7. VapAir Seal MD Air/Vapor Barrier - a reinforced composite aluminum foil with self-adhesive SBS backing and removable poly release film. Used for direct application over metal decks.

\*\* NOTE TO SPECIFIER \*\* Delete membranes not required. Modify the included text as instructed.

* + 1. Sure-Flex PVC Membrane as manufactured by Carlisle SynTec Systems:
       1. Membrane consists of polyester fabric that is encapsulated between the monolithically formed PVC based top and bottom plies. The combination of the fabric and PVC plies provide Sure-Flex Reinforced PVC membranes with high breaking strength, tearing strength, and puncture resistance.

\*\* NOTE TO SPECIFIER \*\* Select Membrane Color. Delete two of the next three paragraphs.

* + - 1. Color: White.
      2. Color: Gray.
      3. Color: Light Gray.
      4. Color: Slate Gray.
      5. Color: Tan.

\*\* NOTE TO SPECIFIER \*\* Delete membrane thickness not required.

* + - 1. Membrane Thickness: 50 mil nominal.
         1. Thickness over Scrim (ASTM D 4434): 0.0220 inches (0.559 mm) minimum.
         2. Breaking Strength (ASTM D 751): 320 lbf/in (56 kN/m) minimum.
         3. Tearing Strength (ASTM D 751): 120 lbf/in (534 N/m) minimum.
         4. Elongation (ASTM D 751): 30 percent minimum.

\*\* NOTE TO SPECIFIER \*\* Delete sheet width not required.

* + - * 1. Field Sheet Width: 81 inches (2057 mm) maximum.
        2. Field Sheet Width: 120 inches (3048 mm) maximum.
        3. Length: 100 feet (30.5 m) maximum.
      1. Membrane Thickness: 60 mil nominal.
         1. Thickness over Scrim (ASTM D 4434): 0.027 inches (0.686 mm) minimum.
         2. Breaking Strength (ASTM D 751): 330 lbf/in (58 kN/m) minimum.
         3. Tearing Strength (ASTM D 751): 130 lbf/in (578 N/m) minimum.
         4. Elongation (ASTM D 751): 30 percent minimum.

\*\* NOTE TO SPECIFIER \*\* Delete sheet width not required.

* + - * 1. Field Sheet Width: 81 inches (2057 mm) maximum.
        2. Field Sheet Width: 120 inches (3048 mm) maximum.
        3. Length: 100 feet (30.5 m) maximum.
      1. Membrane Thickness: 80 mil nominal.
         1. Thickness over Scrim (ASTM D 4434): 0.037 inches (0.940 mm) minimum .
         2. Breaking Strength (ASTM D 751): 360 lbf/in (63 kN/m) minimum.
         3. Tearing Strength (ASTM D 751): 132 lbf/in (587 N/m) minimum.
         4. Elongation (ASTM D 751): 30 percent minimum.

\*\* NOTE TO SPECIFIER \*\* Delete sheet width not required.

* + - * 1. Field Sheet Width: 81 inches (2057 mm) maximum.
        2. Field Sheet Width: 120 inches (3048 mm) maximum.
        3. Length: 75 feet (22.86 m) maximum.
    1. Sure-Flex KEE HP PVC Membrane as manufactured by Carlisle SynTec Systems:
       1. Membrane consists of polyester fabric that is encapsulated between the monolithically formed KEE HP PVC based top and bottom plies. PVC membrane enhanced with KEE HP/ High Performance Elvaloy copolymer (Elvaloy(r) KEE-Ketone Ethylene Ester) provides enhanced chemical resistance, heat resistance, UV resistance and long-term weldability.

\*\* NOTE TO SPECIFIER \*\* Delete colors not required.

* + - 1. Color: White.
      2. Color: Tan.
      3. Color: Gray.
      4. Color: Light Gray.
      5. Color: Slate Gray.

\*\* NOTE TO SPECIFIER \*\* Delete membrane thickness not required.

* + - 1. Membrane Thickness: 50 mil nominal.
         1. Thickness over Scrim (ASTM D 4434): 0.024 inches (0.61 mm) minimum.
         2. Breaking Strength (ASTM D 751): 290 lbf/in (51 kM/m) minimum.
         3. Tearing Strength (ASTM D 751): 125 lbf (556 N) minimum.
         4. Elongation (ASTM D 751): 30 percent minimum.
         5. Field Sheet Width: 120 inches (3048 mm) maximum.
         6. Length: 100 feet (30.5 m) maximum.
      2. Membrane Thickness: 60 mil nominal.
         1. Thickness over Scrim (ASTM D 4434): 0.029 inches (0.74 mm) minimum.
         2. Breaking Strength (ASTM D 751): 320 lbf/in (56 kN/m) minimum.
         3. Tearing Strength (ASTM D 751): 120 lbf (534 N) minimum.
         4. Elongation (ASTM D 751): 30 percent minimum.
         5. Field Sheet Width: 120 inches (3048 mm) maximum.
         6. Length: 100 feet (30.5 m) maximum.
      3. Membrane Thickness: 80 mil nominal.
         1. Thickness over Scrim (ASTM D 4434): 0.036 inches (0.91 mm) minimum.
         2. Breaking Strength (ASTM D 751): 330 lbf/in (58 kN/m).
         3. Tearing Strength (ASTM D 751) 150 lbf (667 N) minimum.
         4. Elongation (ASTM D 751): 30 percent minimum.
         5. Field Sheet Width: 120 inches (3048 mm) maximum.
         6. Length: 75 feet (22086 m) maximum.
    1. Sure-Flex APEEL PVC Membrane: PVC membrane laminated to a protective film to protect the membrane during installation from scuffs and dirt accumulation
       1. Color: White.
       2. Membrane Thickness: 60 mil nominal.
          1. Thickness over Scrim: 0.020 inches (0.508 mm).
          2. Breaking Strength (ASTM D 751): 250 lbf/inch (1.1 kN/m) minimum.
          3. Tear Resistance (ASTM D 751): 55 lbf/inch (245 N/m) minimum.
          4. Elongation (ASTM D 751): 25 percent.
       3. Field Sheet Dimensions:
          1. Width: 5 feet (1.5 m) maximum.
          2. Width: 10 feet (3.05 m) maximum.
          3. Length: 100 feet (30.5 m) maximum.
    2. Sure-Flex APEEL PVC KEE HP Membrane: PVC membrane enhanced with KEE HP/ High Performance Elvaloy copolymer (Elvaloy KEE-Ketone Ethylene Ester) provides enhanced chemical resistance, heat resistance, UV resistance and long-term weldability. PVC KEE HP membrane laminated to a protective film to protect the membrane during installation from scuffs and dirt accumulation
       1. Color: White.
       2. Membrane Thickness: 60 mil nominal.
          1. Thickness over Scrim: 0.020 inches (0.508 mm).
          2. Breaking Strength (ASTM D 751): 250 lbf/inch (1.1 kN/m) minimum.
          3. Tear Resistance (ASTM D 751): 55 lbf/inch (245 N/m) minimum.
          4. Elongation (ASTM D 751): 25 percent.
       3. Field Sheet Dimensions:
          1. Width: 5 feet (1.5 m) maximum.
          2. Width: 10 feet (3.05 m) maximum.
          3. Length: 100 feet (30.5 m) maximum.
    3. Sure-Flex PVC FleeceBACK Membrane as manufactured by Carlisle SynTec Systems:
       1. Sure-Flex FleeceBACK 115 or 135 membrane incorporates 60- or 80-mil thick polyester Reinforced PVC membrane laminated to a 55-mil non-woven fleece backing resulting in a total finished sheet thickness of 115, or 135- mils.

\*\* NOTE TO SPECIFIER \*\* Delete colors not required.

* + - 1. Color: White.
      2. Color: Tan.
      3. Color: Gray.
      4. Color: Light Gray.
      5. Color: Slate Gray.

\*\* NOTE TO SPECIFIER \*\* Delete membrane thickness not required.

* + - 1. Membrane Thickness: 115 mil nominal.
         1. Thickness over Scrim (ASTM D 4434): 0.027 inches (0.686 mm) minimum.
         2. Breaking Strength (ASTM D 751): 420 lbf (73 kN/m) minimum.
         3. Tearing Strength (ASTM D 751): 420 lbf/in (73 kN/m) minimum.
         4. Elongation at Break (ASTM D 751): 30 percent minimum.
         5. Field Sheet Width: 120 inches (3048 mm) maximum.
         6. Length: 100 feet (30.5 m) maximum.
      2. Membrane Thickness: 135 mil nominal.
         1. Thickness over Scrim (ASTM D 4434): 0.037 inches (0.940 mm) minimum.
         2. Breaking Strength (ASTM D 751): 450 lbf (79kN/m) minimum.
         3. Tearing Strength (ASTM D 751): 160 lbf (711 N) minimum.
         4. Elongation at Break (ASTM D 751): 30 percent minimum.
         5. Field Sheet Width: 120 inches (3048 mm) maximum.
         6. Length: 75 feet (22.86 m) maximum.
    1. Sure-Flex KEE HP PVC FleeceBACK Membrane as manufactured by Carlisle SynTec Systems:
       1. Sure-Flex KEE HP FleeceBACK 105, 115 or 135 membrane incorporates 50-, 60- or 80-mil thick Polyester Reinforced KEE HP membrane laminated to a 55-mil non-woven fleece backing resulting in a total finished sheet thickness of 105-, 115, or 135- mils.

\*\* NOTE TO SPECIFIER \*\* Delete colors not required.

* + - 1. Color: White.
      2. Color: Tan.
      3. Color: Gray.
      4. Color: Light Gray.
      5. Color: Slate Gray.

\*\* NOTE TO SPECIFIER \*\* Delete membrane thickness not required.

* + - 1. Membrane Thickness: 105 mil nominal.
         1. Thickness over Scrim (ASTM D 4434): 0.0240 inches (0.610 mm) minimum.
         2. Breaking Strength (ASTM D 751): 410 lbf/in (72 kN/m) minimum.
         3. Tearing Strength (ASTM D 751): 120 lbf (534 N) minimum.
         4. Elongation at Break (ASTM D 751): 35 percent minimum.
         5. Field Sheet Width: 120 inches (3048 mm) maximum.
         6. Length: 100 feet (30.5 m) maximum.
      2. Membrane Thickness: 115 mil nominal.
         1. Thickness over Scrim (ASTM D 4434): 0.029 inches (0.740 mm) minimum.
         2. Breaking Strength (ASTM D 751): 450 lbf/in (79 kN/m) minimum.
         3. Tearing Strength (ASTM D 751): 150 lbf (534 N) minimum.
         4. Elongation at Break (ASTM D 751): 35 percent minimum.
         5. Field Sheet Width: 120 inches (3048 mm) maximum.
         6. Length: 100 feet (30.48 m) maximum.
      3. Membrane Thickness: 135 mil nominal.
         1. Thickness over Scrim (ASTM D 4434): 0.036 inches (0.910 mm) minimum.
         2. Breaking Strength (ASTM D 751): 500 lbf/in (87 kN/m) minimum.
         3. Tearing Strength(ASTM D 751): 150 lbf (534 N) minimum.
         4. Elongation at Break (ASTM D 751): 35 percent minimum.
         5. Field Sheet Width: 120 inches (3048 mm) maximum.
         6. Length: 75 feet (22.86 m) maximum.
  1. MEMBRANE ATTACHMENT: FULLY ADHERED

\*\* NOTE TO SPECIFIER \*\* Delete membranes not required. Modify the included text as instructed.

* + 1. Carlisle FR Base Sheet 1S: A non-asphaltic, resin-bound, fiberglass-reinforced mat, coated on one side with a mineral-filled fire-resistant coating (42 inches (1067 mm) wide and 200 feet (60960 mm) long). Designed for use as a suitable substrate for direct application of Mechanically Fastened Roofing Systems over decks requiring a fastened base sheet.
    2. Carlisle SureMB 70 SA Modified Base Sheet: 70-mil smooth surface, self-adhered base ply. Reinforced with a fiberglass mat that is saturated and coated with asphaltic bitumen and SBS elastomer and meets ASTM D6163 Type 1, Grade S. 70 SA is designed to be used as a base ply or interplay in Carlisle's multiple-ply system and can be used as an air and vapor barrier or temporary (up to 60 days) roof. Available in 39-3/8" wide and 61' long (200 square feet) weighing 0.39 lbs per square foot.
    3. Carlisle SureMB 90 Modified Base Sheet - 90-mil Glass fiber, reinforced, SBS-modified asphalt, base sheet that meets ASTM D 6163 Type I, Grade S for SBS-modified bituminous sheet materials. May be used as an air barrier, vapor barrier and temporary (Up to 60 days) roof. Available in 39-3/8" wide and 49'-1" long (161 square feet) weighing 0.58 lbs per square foot.
    4. Carlisle SureMB 90TG Base - 94-mil smooth-surfaced, SBS, torch-applied membrane. Reinforced with a fiberglass mat that is saturated and coated with asphaltic bitumen and SBS elastomers which meets ASTM D6163 Type I, Grade S. SureMB 90TG is designed for use as a base-ply or inter-ply in Carlisle's multiple-ply system and can be used as an air barrier, vapor barrier or temporary (Up to 60 days) roof. Available in rolls 39-3/8" wide and 49'-1" long (164 square feet) and weighing 0.57 lbs per square foot.
    5. Carlisle SureMB 120TG Base Sheet - a smooth-surfaced, torch-grade SBS base ply, reinforced with a non-woven polyester mat that is saturated and coated with asphaltic bitumen and SBS elastomers.
    6. VapAir Seal 725TR Air/Vapor Barrier - a 40-mil composite consisting of 35-mils of self-adhering rubberized asphalt laminated to a 5-mil woven polypropylene film.
    7. VapAir Seal MD Air/Vapor Barrier - a reinforced composite aluminum foil with self-adhesive SBS backing and removable poly release film. Used for direct application over metal decks.
    8. Sure-Flex PVC Membrane as manufactured by Carlisle SynTec Systems:
       1. Membrane consists of polyester fabric that is encapsulated between the monolithically formed PVC based top and bottom plies. The combination of the fabric and PVC plies provide Sure-Flex Reinforced PVC membranes with high breaking strength, tearing strength, and puncture resistance.

\*\* NOTE TO SPECIFIER \*\* Select Membrane Color. Delete two of the next three paragraphs.

* + - 1. Color: White.
      2. Color: Gray.
      3. Color: Light Gray.
      4. Color: Slate Gray.
      5. Color: Tan.

\*\* NOTE TO SPECIFIER \*\* Delete membrane thickness not required.

* + - 1. Membrane Thickness: 50 mil nominal.
         1. Thickness over Scrim (ASTM D 4434): 0.0220 inches (0.559 mm) minimum.
         2. Breaking Strength (ASTM D 751): 320 lbf/in (56 kN/m) minimum.
         3. Tearing Strength (ASTM D 751): 120 lbf/in (534 N/m) minimum.
         4. Elongation (ASTM D 751): 30 percent minimum.

\*\* NOTE TO SPECIFIER \*\* Delete sheet width not required.

* + - * 1. Field Sheet Width: 81 inches (2057 mm) maximum.
        2. Field Sheet Width: 120 inches (3048 mm) maximum.
        3. Length: 100 feet (30.5 m) maximum.
      1. Membrane Thickness: 60 mil nominal.
         1. Thickness over Scrim (ASTM D 4434): 0.027 inches (0.686 mm) minimum.
         2. Breaking Strength (ASTM D 751): 330 lbf/in (58 kN/m) minimum.
         3. Tearing Strength (ASTM D 751): 130 lbf/in (578 N/m) minimum.
         4. Elongation (ASTM D 751): 30 percent minimum.

\*\* NOTE TO SPECIFIER \*\* Delete sheet width not required.

* + - * 1. Field Sheet Width: 81 inches (2057 mm) maximum.
        2. Field Sheet Width: 120 inches (3048 mm) maximum.
        3. Length: 100 feet (30.5 m) maximum.
      1. Membrane Thickness: 80 mil nominal.
         1. Thickness over Scrim (ASTM D 4434): 0.037 inches (0.940 mm) minimum.
         2. Breaking Strength (ASTM D 751): 360 lbf/in (63 kN/m) minimum.
         3. Tearing Strength (ASTM D 751): 132 lbf/in (587 N/m) minimum.
         4. Elongation (ASTM D 751): 30 percent minimum.

\*\* NOTE TO SPECIFIER \*\* Delete sheet width not required.

* + - * 1. Field Sheet Width: 81 inches (2057 mm) maximum.
        2. Field Sheet Width: 120 inches (3048 mm) maximum.
        3. Length: 75 feet (22.86 m) maximum.

\*\* NOTE TO SPECIFIER \*\* Sure-Flex 50-mil, 60-mil or 80-mil thick Reinforced FRS PVC (Polyvinyl Chloride) Membrane is designed specifically for Fully Adhered applications using liquid applied bonding adhesives. Delete if not required.

* + 1. Sure-Flex FRS PVC Membrane as manufactured by Carlisle SynTec Systems:
       1. Membrane consists of Fiberglas Reinforced Scrim that is encapsulated between the monolithically formed PVC based top and bottom plies. The combination of the fabric and PVC plies provide Sure-Flex FRS PVC membranes with enhanced dimensional stability.

\*\* NOTE TO SPECIFIER \*\* Select Membrane Color. Delete two of the next three paragraphs.

* + - 1. Color: White.
      2. Color: Gray.
      3. Color: Light Gray.
      4. Color: Slate Gray.
      5. Color: Tan.

\*\* NOTE TO SPECIFIER \*\* Delete membrane thickness not required.

* + - 1. Membrane Thickness: 50 mil nominal.
         1. Thickness over Scrim (ASTM D 4434): 0.0160 inches (0.406 mm) minimum.
         2. Tensile Strength (ASTM D 638): 1500 psi (110.4 MPa) minimum.
         3. Tear Resistance (ASTM D 1004): 10 lbf (45 N) minimum.
         4. Elongation at Break (ASTM D 638): 250 percent minimum machine direction. 220 percent minimum cross machine direction.
         5. Field Sheet Width: 120 inches (3048 mm) maximum.
         6. Length: 100 feet (30.5 m) maximum.
      2. Membrane Thickness: 60 mil nominal.
         1. Thickness over Scrim (ASTM D 4434): 0.034inches (0.86 mm) minimum.
         2. Breaking Strength (ASTM D 751): 85 lbf/in(15kN/m) minimum.
         3. Tear Resistance (ASTM D 1004): 20 lbf (88 N) minimum.
         4. Elongation at Break (ASTM D 638): 310 percent minimum.
         5. Field Sheet Width: 120 inches (3048 mm) maximum.
         6. Length: 80 feet (24.4 m) maximum.
      3. Membrane Thickness: 80 mil nominal.
         1. Thickness over Scrim (ASTM D 4434): 0.040 inches (1.02 mm) minimum.
         2. Breaking Strength (ASTM D 751): 85 lbf/in(15kN/m) minimum.
         3. Tear Resistance (ASTM D 1004): 25 lbf (111 N) minimum.
         4. Elongation at Break (ASTM D 638): 380 percent minimum.
         5. Field Sheet Width: 120 inches (3048 mm) maximum.
         6. Length: 65 feet (19.8 m) maximum.
    1. Sure-Flex PVC KEE HP Membrane as manufactured by Carlisle SynTec Systems:
       1. Membrane consists of polyester fabric that is encapsulated between the monolithically formed PVC KEE HP based top and bottom plies. PVC membrane enhanced with KEE HP/ High Performance Elvaloy copolymer (Elvaloy(r) KEE-Ketone Ethylene Ester) provides enhanced chemical resistance, heat resistance, UV resistance and long-term weldability.

\*\* NOTE TO SPECIFIER \*\* Delete colors not required.

* + - 1. Color: White.
      2. Color: Tan.
      3. Color: Gray.
      4. Color: Light Gray.
      5. Color: Slate Gray.

\*\* NOTE TO SPECIFIER \*\* Delete membrane thickness not required.

* + - 1. Membrane Thickness: 50 mil nominal.
         1. Thickness over Scrim (ASTM D 4434): 0.024 inches (0.61 mm) minimum.
         2. Breaking Strength (ASTM D 751): 290 lbf/in (51 kN/m) minimum.
         3. Tearing Strength (ASTM D 751): 125 lbf (556 N) minimum.
         4. Elongation (ASTM D 751): 30 percent minimum.
         5. Length: 100 feet (30.5 m) maximum.
      2. Membrane Thickness: 60 mil nominal.
         1. Thickness over Scrim (ASTM D 4434): 0.029 inches (0.74 mm) minimum.
         2. Breaking Strength (ASTM D 751): 320 lbf/in (56kN/m) minimum.
         3. Tearing Strength (ASTM D 751): 120 lbf (534 N) minimum.
         4. Elongation (ASTM D 751): 30 percent.
         5. Field Sheet Width: 120 inches (3048 mm) maximum.
         6. Length: 100 feet (30.5 m) maximum.
      3. Membrane Thickness: 80 mil nominal.
         1. Thickness over Scrim (ASTM D 4434): 0.036 inches (0.91 mm) minimum.
         2. Breaking Strength (ASTM D 751): 330 lbf/in (58kN/m) minimum.
         3. Tearing Strength (ASTM D 751): 150 lbf (667 N) minimum.
         4. Elongation (ASTM D 751): 30 percent.
         5. Field Sheet Width: 120 inches (3048 mm) maximum.
         6. Length: 75 feet (22.86 m) maximum.
    1. Sure-Flex APEEL PVC Membrane: PVC membrane laminated to a protective film to protect the membrane during installation from scuffs and dirt accumulation.
       1. Color: White.
       2. Membrane Thickness: 60 mil nominal.
          1. Thickness over Scrim: 0.028 inches (0.711 mm).
          2. Breaking Strength (ASTM D 751): 320 lbf/in (56 kN/m) minimum.
          3. Tearing Strength (ASTM D 751): 120 lbf/in (534 N/m) minimum.
          4. Elongation (ASTM D 751): 30 percent minimum.
       3. Field Sheet Dimensions:
          1. Width: 5 feet (1.5 m) maximum.
          2. Width: 10 feet (3.05 m) maximum.
          3. Length: 100 feet (30.5 m) maximum.
    2. Sure-Flex APEEL PVC KEE HP Membrane: PVC membrane enhanced with KEE HP/ High Performance Elvaloy copolymer (Elvaloy KEE-Ketone Ethylene Ester) provides enhanced chemical resistance, heat resistance, UV resistance and long-term weldability. PVC KEE HP membrane laminated to a protective film to protect the membrane during installation from scuffs and dirt accumulation
       1. Color: White.
       2. Membrane Thickness: 60 mil nominal.
          1. Thickness over Scrim: 0.020 inches (0.508 mm).
          2. Breaking Strength (ASTM D 751): 250 lbf/in (1.1 kN/m) minimum.
          3. Tear Resistance (ASTM D 751): 55 lbf/in (245 N/m) minimum.
          4. Elongation (ASTM D 751): 25 percent.
       3. Field Sheet Dimensions:
          1. Width: 5 feet (1.5 m) maximum.
          2. Width: 10 feet (3.05 m) maximum.
          3. Length: 100 feet (30.5 m) maximum.
    3. Sure-Flex PVC FleeceBACK Membrane as manufactured by Carlisle SynTec Systems:
       1. Sure-Flex FleeceBACK 115 or 135 membrane incorporates 60- or 80-mil thick polyester Reinforced PVC membrane laminated to a 55-mil non-woven fleece backing resulting in a total finished sheet thickness of 115, or 135- mils.

\*\* NOTE TO SPECIFIER \*\* Delete colors not required.

* + - 1. Color: White.
      2. Color: Tan.
      3. Color: Gray.
      4. Color: Light Gray.
      5. Color: Slate Gray.

\*\* NOTE TO SPECIFIER \*\* Delete membrane thickness not required.

* + - 1. Membrane Thickness: 115 mil nominal.
         1. Thickness over Scrim (ASTM D 4434): 0.027 inches (0.686 mm) minimum.
         2. Breaking Strength (ASTM D 751): 420 lbf/in (73 kN/m) minimum.
         3. Tearing Strength (ASTM D 751): 420 lbf/in (73 kN/m) minimum.
         4. Elongation at Break (ASTM D 751): 30 percent minimum.
         5. Field Sheet Width: 120 inches (3048 mm) maximum.
         6. Length: 100 feet (30.5 m) maximum.
      2. Membrane Thickness: 135 mil nominal.
         1. Thickness over Scrim (ASTM D 4434): 0.037 inches (0.940 mm) minimum.
         2. Breaking Strength (ASTM D 751): 450 lbf/in (79 kN/m) minimum.
         3. Tearing Strength (ASTM D 751): 160 lbf (711 N) minimum.
         4. Elongation at Break (ASTM D 751): 30 percent minimum.
         5. Field Sheet Width: 120 inches (3048 mm) maximum.
         6. Length: 75 feet (22.86 m) maximum.
    1. Sure-Flex PVC FRS FleeceBACK Membrane as manufactured by Carlisle SynTec Systems:
       1. Sure-Flex PVC FRS FleeceBACK 115 or 135 membrane incorporates 60- or 80-mil thick Fiberglass Reinforced PVC membrane laminated to a 55-mil non-woven fleece backing resulting in a total finished sheet thickness of 115, or 135- mils.

\*\* NOTE TO SPECIFIER \*\* Delete colors not required.

* + - 1. Color: White.
      2. Color: Tan.
      3. Color: Gray.
      4. Color: Light Gray.
      5. Color: Slate Gray.

\*\* NOTE TO SPECIFIER \*\* Delete membrane thickness not required.

* + - 1. Membrane Thickness: 115 mil nominal.
         1. Thickness over Scrim (ASTM D 4434): 0.030 inches (0.762 mm) minimum.
         2. Breaking Strength (ASTM D 751): 450 lbf/in (79 kN/m) minimum.
         3. Tearing Strength (ASTM D 751): 60 lbf (267 N) minimum.
         4. Elongation at Break (ASTM D 638): 100 percent minimum.
         5. Field Sheet Width: 120 inches (3048 mm) maximum.
         6. Length: 80 feet (24.4 m) maximum.
      2. Membrane Thickness: 135 mil nominal.
         1. Thickness over Scrim (ASTM D 4434): 0.040 inches (1.016 mm) minimum.
         2. Breaking Strength (ASTM D 751): 500 lbf/in (88 kN/m) minimum.
         3. Tearing Strength (ASTM D 751): 60lbf (267 N) minimum.
         4. Elongation at Break (ASTM D 638): 100 percent minimum.
         5. Field Sheet Width: 120 inches (3048 mm) maximum.
         6. Length: 65 feet (19.8 m) maximum.
    1. Sure-Flex KEE HP FRS FleeceBACK Membrane as manufactured by Carlisle SynTec Systems:
       1. Sure-Flex KEE HP FRS FleeceBACK 105, 115 or 135 membrane incorporates 50-, 60- or 80-mil thick Fiberglass Reinforced Elvaloy PVC membrane laminated to a 55-mil non-woven fleece backing resulting in a total finished sheet thickness of 105-, 115, or 135- mils.

\*\* NOTE TO SPECIFIER \*\* Delete colors not required.

* + - 1. Color: White.
      2. Color: Tan.
      3. Color: Gray.
      4. Color: Light Gray.
      5. Color: Slate Gray.

\*\* NOTE TO SPECIFIER \*\* Delete membrane thickness not required.

* + - 1. Membrane Thickness: 105 mil nominal.
         1. Thickness over Scrim (ASTM D 4434): 0.018 inches (0.46 mm) minimum.
         2. Breaking Strength (ASTM D 751): 360 lbf/in (63 kN/m) minimum.
         3. Tearing Strength (ASTM D 751): 75 lbf (333 N) minimum.
         4. Elongation at Break (ASTM D 751): 15 percent minimum.
         5. Field Sheet Width: 120 inches (3048 mm) maximum.
         6. Length: 100 feet (30.5 m) maximum.
      2. Membrane Thickness: 115 mil nominal.
         1. Thickness over Scrim (ASTM D 4434): 0.027 inches (0.690 mm) minimum.
         2. Breaking Strength (ASTM D 751): 400 lbf/in (70 kN/m) minimum.
         3. Tearing Strength (ASTM D 751): 75 lbf (333 N) minimum.
         4. Elongation at Break (ASTM D 638): 15 percent minimum.
         5. Field Sheet Width: 120 inches (3048 mm) maximum.
         6. Length: 80 feet (24.4 m) maximum.
      3. Membrane Thickness: 135 mil nominal.
         1. Thickness over Scrim (ASTM D 4434): 0.038 inches (0.970 mm) minimum.
         2. Breaking Strength (ASTM D 751): 450 lbf/in (79 kN/m) minimum.
         3. Tearing Strength (ASTM D 751): 90 lbf (400 N) minimum.
         4. Elongation at Break (ASTM D 638): 15 percent minimum.
         5. Field Sheet Width: 120 inches (3048 mm) maximum.
         6. Length: 65 feet (19.8 m) maximum.
    1. Sure-Flex KEE HP PVC FleeceBACK Membrane as manufactured by Carlisle SynTec Systems:
       1. Sure-Flex KEE FRS FleeceBACK 105, 115 or 135 membrane incorporates 50-, 60- or 80-mil thick polyester Reinforced Elvaloy PVC membrane laminated to a 55-mil non-woven fleece backing resulting in a total finished sheet thickness of 105-, 115, or 135- mils.

\*\* NOTE TO SPECIFIER \*\* Delete colors not required.

* + - 1. Color: White.
      2. Color: Tan.
      3. Color: Gray.
      4. Color: Light Gray.
      5. Color: Slate Gray.

\*\* NOTE TO SPECIFIER \*\* Delete membrane thickness not required.

* + - 1. Membrane Thickness: 105 mil nominal.
         1. Thickness over Scrim (ASTM D 4434): 0.0240 inches (0.610 mm) minimum.
         2. Breaking Strength (ASTM D 751): 410 lbf/in (72 kN/m) minimum.
         3. Tearing Strength(ASTM D 751): 120 lbf (534 N) minimum.
         4. Elongation at Break (ASTM D 751): 35 percent minimum.
         5. Field Sheet Width: 120 inches (3048 mm) maximum.
         6. Length: 100 feet (30.5 m) maximum.
      2. Membrane Thickness: 115 mil nominal.
         1. Thickness over Scrim (ASTM D 4434): 0.029 inches (0.740 mm) minimum.
         2. Breaking Strength (ASTM D 751): 450 lbf/in (79 kN/m) minimum.
         3. Tearing Strength (ASTM D 751): 150 lbf (534 N) minimum.
         4. Elongation at Break (ASTM D 751): 35 percent minimum.
         5. Field Sheet Width: 120 inches (3048 mm) maximum.
         6. Length: 100 feet (30.5 m) maximum.
      3. Membrane Thickness: 135 mil nominal.
         1. Thickness over Scrim (ASTM D 4434): 0.036 inches (0.910 mm) minimum.
         2. Breaking Strength (ASTM D 751): 500 lbf/in (87 kN/m) minimum.
         3. Tearing Strength (ASTM D 751): 150 lbf (534 N) minimum.
         4. Elongation at Break (ASTM D 751): 35 percent minimum.
         5. Field Sheet Width: 120 inches (3048 mm) maximum.
         6. Length: 75 feet (22.86 m) maximum.

\*\* NOTE TO SPECIFIER \*\* Delete the next article if insulation is not required. Retain only insulation type(s) required and delete all others.

* 1. INSULATION

\*\* NOTE TO SPECIFIER \*\* Available in 4 feet x 8 feet standard size with a thickness from 1 to 4 inches. 4 feet x 4 feet tapered panels are also available. Delete if not required.

* + 1. Polyisocyanurate: A foam core insulation board covered on both sides with glass fiber reinforced facer (GRF) meeting ASTM C 1289, Type II, Class 1. Carlisle InsulBase.

\*\* NOTE TO SPECIFIER \*\* Delete grade not required.

* + - 1. Compressive Strength: Grade 2 (20 psi) (138 kPa).
      2. Compressive Strength: Grade 3 (25 psi) (173 kPa).

\*\* NOTE TO SPECIFIER \*\* Available in 4 feet x 8 feet standard size with a thickness from 1 to 4 inches. 4 feet x 4 feet tapered panels are also available. Delete if not required.

* + 1. Polyisocyanurate: A foam core insulation board covered on both sides with a coated glass fiber mat facer (CGF) meeting ASTM C 1289, Type II, Class 2. Carlisle SecurShield.

\*\* NOTE TO SPECIFIER \*\* Delete grade not required.

* + - 1. Compressive Strength: Grade 2 (20 psi) (138 kPa).
      2. Compressive Strength: Grade 3 (25 psi) (173 kPa).

\*\* NOTE TO SPECIFIER \*\* Available in 4 feet x 8 feet standard size with a thickness from 2 to 4-1/2 inches. 4 feet x 4 feet tapered panels are also available. Delete if not required.

* + 1. Composite Board: Composite insulation panel comprised of 1/2 inch (13 mm) high-density Polyiso cover board laminated during the manufacturing process to SecurShield rigid Polyiso roof insulation meeting ASTM C1289. Carlisle SecurShield HD Composite.

\*\* NOTE TO SPECIFIER \*\* Delete grade not required.

* + - 1. Top Layer: ASTM C1289 Type II, Class 4, Grade 1.
      2. Compressive Strength: 80 psi min. (551 kPa).
      3. Board Thickness: 1/2 inch (13 mm).
      4. Bottom Layer: ASTM C1289 Type II, Class 2.
      5. Compressive Strength: Grade 2 (20 psi) (138 kPa).
    1. Composite Board: Polyisocyanurate foam insulation with 1/2 inch (13 mm) wood fiber roof insulation laminated to one side and glass fiber reinforced facers (GRF) laminated to one side, meeting or exceeding the requirements of ASTM C 1289. Carlisle HP-WF.
       1. Compressive Strength (Polyiso): 20 psi (138 kPa).
       2. Compressive Strength (Wood Fiber): 35 psi (241.5 kPa).
       3. Density (Polyiso): 2 lb per cubic foot (24 kg/cu m) minimum.
    2. Composite Board: Polyisocyanurate foam insulation with 7/16 inch (11 mm) Oriented Strand Board (OSB) laminated to one side and glass fiber reinforced facers (GRF) laminated to one side, meeting or exceeding the requirements of ASTM C1289, Type V, Class 1. Carlisle StormBase Composite.

\*\* NOTE TO SPECIFIER \*\* Delete facer board thickness not required.

* + - 1. Oriented Strand Board: 7/16 inch (11 mm).
      2. Oriented Strand Board: 5/8 inch (16 mm).
      3. Compressive Strength (Wood Fiber): 35 psi (241.5 kPa).
      4. Density (Polyiso): 2 lb per cubic foot (24 kg/cu m) minimum.
    1. Expanded Polystyrene (EPS): Rigid, closed cell foam insulation meeting ASTM C 578. Carlisle InsulFoam.

\*\* NOTE TO SPECIFIER \*\* Select Compressive strength based on insulation type. Delete three of the next four paragraphs. Must be overlaid with a cover board.

* + - 1. Compressive Strength: Type I - 10 psi (0.7 kg/sq.cm.) min.
      2. Compressive Strength: Type II - 20 psi (1.1 kg/sq.cm.) min.
      3. Compressive Strength: Type VIII - 15 psi (2.1 kg/sq.cm.) min.
      4. Compressive Strength: Type IX - 25 psi (1.75 kg/sq.cm.) min.
    1. Composite Expanded Polystyrene (EPS): InsulFoam expanded polystyrene (EPS) insulation laminated with a top surface of 1/2 inch (13 mm) thick SecurShield HD. Carlisle InsulFoam HD Composite.
    2. Laminated Expanded Polystyrene (EPS): InsulFoam expanded polystyrene (EPS) insulation laminated with a top surface. Carlisle InsulLam.

\*\* NOTE TO SPECIFIER \*\* Available in 4 feet x 8 feet boards with thickness from 1-1/2 inches to 7 inches. Delete top surface not required.

* + - 1. Top Surface: 7/16 inch (11 mm) thick Oriented Strand Board (OSB),
      2. Top Surface: 5/8 inch (16 mm) thick Oriented Strand Board (OSB),
      3. Top Surface: 1/2 inch (13 mm) Dens Deck Prime.
      4. Top Surface: 1/2 inch (13 mm) Securock.
      5. Top Surface: 1/2 inch (13 mm) HP Recovery Board.

\*\* NOTE TO SPECIFIER \*\* Designed for low-sloped roof applications that employ mechanically fastened or Self Adhered, Sure-Weld TPO SAT membranes. Available in 4 feet x 8 feet size. Delete if not required.

* + 1. Laminated Expanded Polystyrene (EPS): A closed-cell lightweight expanded polystyrene (EPS) with a factory-laminated fiber glass facer. Nominal density of 1.25 lbs/cubic ft (pcf). Meets ASTM C578, Type VIII. Carlisle InsulFoam SP.
    2. Extruded Polystyrene (XPS): Rigid, closed-cell structured thermal barrier meeting ASTM C 578. Foamular, distributed by Carlisle.

\*\* NOTE TO SPECIFIER \*\* Select insulation type. Specify 404RB or 604RB where garden Roof Assemblies are required. Delete type not required. Must be overlaid with a cover board.

* + - 1. Foamular 250: Compressive Strength - 25 psi (1.75 kg/sq. cm.) minimum.
      2. Foamular 400: Compressive Strength - 40 psi (2.8 kg/sq.cm.) minimum.
      3. Foamular 600: Compressive Strength - 60 psi (4.2 kg/sq.cm.) minimum.
      4. Foamular 1000: Compressive Strength - 100 psi (7.03 kg/sq.cm.) minimum.
    1. Extruded Polystyrene (XPS): Rigid, closed-cell recovery board meeting ASTM C 578. Foamular Durapink, distributed by Carlisle.

\*\* NOTE TO SPECIFIER \*\* Select insulation type. Delete two of the next three paragraphs. Must be overlaid with a cover board.

* + - 1. 1 inch (25 mm): Compressive Strength - 25 psi (1.75 kg/sq.cm.) minimum.
      2. 3/4 inch (19 mm): Compressive Strength - 25 psi (1.75 kg/sq.cm.) minimum.
      3. 1/2 inch (13 mm): Compressive Strength - 18 psi (1.27 kg/sq.cm.) minimum.
    1. Extruded Polystyrene (XPS): Rigid, closed-cell structured thermal barrier meeting ASTM C 578. Dow Styrofoam, distributed by Carlisle.

\*\* NOTE TO SPECIFIER \*\* Select insulation type based on project requirements. Specify Roofmate where Garden roof assemblies are required. Delete three of the next four paragraphs. Must be overlaid with a cover board.

* + - 1. Deckmate: Compressive Strength - 18 psi (1.27 kg/sq.cm.) minimum.
      2. Deckmate Plus: Compressive Strength - 25 psi (1.75 kg/sq.cm.) minimum.
      3. Roofmate: Compressive Strength - 40 psi (2.8 kg/sq.cm.) minimum.
      4. Plazamate: Compressive Strength - 60 psi (4.2 kg/sq.cm.) minimum.
    1. Water-resistant and silicone treated gypsum panel with embedded fiberglass facer on both sides and pre-primed on one side, GP Gypsum DensDeck Prime, distributed by Carlisle.

\*\* NOTE TO SPECIFIER \*\* Delete thickness not required.

* + - 1. Board Thickness: 1/4 inch (6 mm).
      2. Board Thickness: 3/8 inch (10 mm).
      3. Board Thickness: 1/2 inch (13 mm).
      4. Board Thickness: 5/8 inch (15 mm).
    1. Water-resistant and silicone treated gypsum panel with embedded fiberglass facer on both sides. GP Gypsum Dens-Deck, distributed by Carlisle.

\*\* NOTE TO SPECIFIER \*\* Delete thickness not required.

* + - 1. Board Thickness: 1/4 inch (6 mm).
      2. Board Thickness: 1/2 inch (13 mm).
      3. Board Thickness: 5/8 inch (15 mm).
    1. Moisture-, mold- and impact-resistant, nonstructural fiber-reinforced gypsum panel made from 95 percent recycled materials. Securock, distributed by Carlisle.

\*\* NOTE TO SPECIFIER \*\* Delete thickness not required.

* + - 1. Board Thickness: 1/4 inch (6 mm).
      2. Board Thickness: 3/8 inch (10 mm).
      3. Board Thickness: 1/2 inch (13 mm).
      4. Board Thickness: 5/8 inch (15 mm).
    1. SecurShield HD Polyiso Cover board: Rigid board with coated glass fiber mat facers (CGF) on both sides, meeting or exceeding the requirements of ASTM C 1289, Type II, Class 4, Grade 1.
       1. Compressive Strength: 80 psi min. (551 kPa).
       2. Board Thickness: 1/2 inch (13 mm).
    2. SecurShield HD Plus Polyiso Cover board: Rigid board with coated glass fiber mat facers (CGF) on both sides, meeting or exceeding the requirements of ASTM C 1289, Type II, Class 4, Grade 1. Designed for higher uplift with fewer fasteners per board.
       1. Compressive Strength: 80 psi min. (551 kPa).
       2. Board Thickness: 1/2 inch (13 mm).

\*\* NOTE TO SPECIFIER \*\* Delete the entire next article if insulation adhesive is not required.

* 1. INSULATION ADHESIVE
     1. Flexible FAST Adhesive: A spray or extruded applied, two-component polyurethane, low-rise expanding foam adhesive used for attaching approved insulations to compatible substrates (concrete, cellular lightweight insulating concrete, gypsum, cementitious wood fiber, wood or steel) or existing smooth or gravel surfaced BUR, modified bitumen or cap sheets.
     2. Flexible FAST Dual Cartridge Adhesive: A two-component, polyurethane construction grade, low-rising expanding adhesive designed for bonding insulation to various substrates using a portable applicator.
     3. Flexible FAST Dual Tank Adhesive: A two-component, polyurethane construction grade, low-rise expanding adhesive designed for bonding insulation to various substrates using a portable applicator.
     4. Flexible FAST 5-gallon Jug Adhesive: a two-component, polyurethane construction grade, low-rise expanding adhesive designed for bonding insulation to various substrates, packaged for use with low pressure urethane equipment.
     5. OlyBond 500 BA - A two-component, polyurethane, low-rise expanding adhesive used to bond insulation to various substrates using a mechanical dispenser system.
     6. OlyBond Spot Shot - A two-component, polyurethane construction grade, low-rising expanding adhesive designed for bonding insulation to various substrates using a portable applicator.
  2. FLASHING ACCESSORIES
     1. Sure-Flex PVC Inside Corners: Pre-molded corner flashing for inside corners. 60 mil thickness.

\*\* NOTE TO SPECIFIER \*\* Delete color not required.

* + - 1. Color: White.
      2. Color: Gray.
      3. Color: Tan.
    1. Sure-Flex PVC Outside Corners: Pre-molded corner flashing for outside corners. 60 mil thickness.

\*\* NOTE TO SPECIFIER \*\* Delete color not required.

* + - 1. Color: White.
      2. Color: Gray.
      3. Color: Tan.

\*\* NOTE TO SPECIFIER \*\* PVC T-Joint Covers are required on all 60, and 80 mil PVC systems.

* + 1. Sure-Flex PVC T-Joint Covers: 60 mil thick non-reinforced PVC flashing cut into a 4.5 inch (114 mm) diameter circle used to seal step-offs at splice intersections.

\*\* NOTE TO SPECIFIER \*\* Delete color not required.

* + - 1. Color: White.
      2. Color: Gray.
      3. Color: Tan.
    1. Sure-Flex PVC Molded Pipe Flashings: A pre-molded flashing and clamping ring used for pipe penetrations. Available for 3/4 inch to 8 inch (19 to 203 mm) diameter pipes.
    2. Sure-Flex PVC Split Pipe Seals: Pre-fabricated flashing consisting of 60 mil thick reinforced Sure-Flex Membrane for pipes 1 inch to 6 inch (25 to152 mm) in diameter. A split (cut) and overlap tab are incorporated to allow the pipe seal to be opened and wrapped around the pipe when it is not possible to pull a standard pipe flashing over a round penetration.
    3. Sure-Flex PVC Square Tubing Wraps: Fabricated flashings made of 60 mil thick reinforced Sure-Flex membrane for square tubing. A split (cut) and overlap tab are incorporated into these parts to allow the seals to be opened and wrapped around a square penetration. Available for 3 inches, 4 inches and 6 inches (76, 102, 152 mm) diameter square tubing. Available in white or gray.
    4. Sure-Flex PVC Molded Sealant Pockets:
       1. Pre-fabricated, interlocking, 2-piece, injection molded, flexible pocket with a semi rigid PVC vertical wall and pre-formed deck flanges.
       2. Use in conjunction with Thermoplastic One-Part Pourable Sealer as specified in this section for waterproofing pipe clusters or other odd shaped penetrations. Forms a 7-1/2 inches by 6 inches (191 x 152 mm) oval when completed. Available in white only.
    5. PVC Overlayment Strip: Manufacturer's standard 80 mil PVC overlayment strip.
    6. Sure-Flex PVC Heat Weldable Walkway Rolls: Sure-Flex Membrane offering superior tear, puncture and weather resistance and designed to protect Sure-Flex membrane in those areas exposed to repetitive foot traffic or other hazards. Walkway material may be heat welded to Sure-Flex membrane using an automated heat welder or hand held heat welder. Walkway Rolls are 36 inches (914 mm) wide by 60 feet (18.3 M) long and are nominal 110 mils thick. Color - Gray.
    7. Sure-Flex PVC Crossgrip Walkway Rolls: Manufactured from PVC and may be used in lieu of standard Sure-Flex PVC Walkway Rolls when a walkway is to be loose-laid and not secured to the membrane. Loose-laid Crossgrip PVC Walkway Rolls are effective for winds up to 55 mph. Rolls are 36" wide by 33' long, available in white, gray and yellow.
    8. Sure-Flex PVC Non-Reinforced Flashing: 60 mil thick rolls 12 inches (305 mm) and 24 inches 610 mm) wide. Used for inside/outside corners and field fabricated pipe flashings when use of pre-molded accessories is not feasible. Available in white, gray, light gray slate gray and tan.
    9. Sure-Flex PVC Contour Rib Profile: Used to obtain the appearance of standing seam metal roofing with the performance of a PVC single-ply membrane. The Contour Rib Profile measures 1-1/4" tall and 2-1/8" wide, including the welding flanges, while the vertical profile is a substantial 3/8" thick. The profile has a continuous 1/8" diameter alignment hole, for use with fiberglass connecting pins, as well as a 1/8" fiberglass reinforcing cord for added strength. The Contour Rib Profile is available in white, gray, light gray, slate gray and tan, 10' lengths and packaged 20 per carton.

\*\* NOTE TO SPECIFIER \*\* Retain only products required on the project and delete all others.

* 1. CLEANERS, PRIMERS, ADHESIVES AND SEALANTS
     1. Low VOC PVC Bonding Adhesive: A high-strength solvent based adhesive that allows bonding of PVC and KEE-enhanced PVC membrane to various porous and non-porous substrates.
     2. HydroBond PVC Water Based Bonding Adhesive: A wet lay-in, one-sided dispersion adhesive. Compatible with only Sure-Flex PVC smooth-backed and FleeceBACK membranes, this product is ideal for bonding only PVC membranes to various porous and non-porous substrates (cannot be used with any KEE or KEE HP PVC bareback membranes).
     3. Flexible FAST Adhesive: A two-component (Part A and B), spray applied, low-rise adhesive for bonding FleeceBACK membrane to various surfaces.
     4. Flexible FAST Dual Cartridge Adhesive: A two component (Part A and B) extrusion applied, low rise adhesive for bonding FleeceBACK membrane and insulation to various surfaces.
     5. Flexible FAST Dual Tank Adhesive: A two component (Part A and B), extrusion applied, low rise adhesive for bonding FleeceBACK membrane and insulation to various surfaces.
     6. Flexible FAST 5-gallon Jug Adhesive: A two-component, polyurethane construction grade, low-rise expanding adhesive designed for bonding insulation to various substrates, packaged for use with spray application rigs.
     7. CAV-GRIP PVC Aerosol Contact Adhesive: a low-VOC, methylene chloride-free adhesive that can be used for a variety of applications including: adhering PVC bareback membranes to a variety of horizontal substrates and vertical walls (cannot be used with any KEE or KEE HP bareback membranes), as well as adhering FleeceBACK membranes to vertical walls. Coverage rate is approximately 400 sq. ft. per #40 cylinder and 800 sq. ft. per #85 cylinder as an adhesive for vertical walls, in a double-sided application; 750 sq. ft. per #40 cylinder and 1,500 sq. ft. per #85 cylinder as an adhesive, horizontally, for the field of the roof, in a double-sided applications.
     8. CAV-GRIP III Low-VOC Aerosol Contact Adhesive/Primer: a low-VOC, methylene chloride-free adhesive that can be used for a variety of applications including: Priming unexposed asphalt prior to applying Flexible FAST Adhesive and for adhering Sure-Flex FleeceBACK membrane to vertical walls. Coverage rate is approximately 2,000-2,500 sq. ft. per 40 lb cylinder and 4,000-5,000 sq. ft. per 85 lb cylinder as a primer, in a single-sided application; 750 sq. ft. per 40 lb cylinder and 1,500 sq. ft. per 85 lb cylinder as an adhesive for vertical walls, in a double-sided application; 1,000 sq. ft. per 40 lb cylinder and 2,000 sq. ft. per 85 lb cylinder as an adhesive, horizontally, for the field of the roof, in a double-sided application.
     9. Sure-Flex PVC Cut Edge Sealant: Free flowing, clear sealant designed for sealing cut edges of Sure-Flex reinforced membrane. Use of Cut-Edge Sealant to seal cut edges of PVC or KEE HP PVC Membranes is not required.
     10. Water Cut-Off Mastic: A one-component, low viscosity, self wetting, Butyl blend mastic used as a compression sealing agent between membrane and applicable substrates.
     11. White One-Part Pourable Sealer: Manufacturer's recommended product.
     12. CCW 702 Primer and 702LV Primer (Low VOC) - A single component, solvent based, high-tack primer used to provide maximum adhesion between Carlisle 725TR Air and Vapor Barrier and an approved substrate. Applied by spray or long nap roller with a coverage rating ranging from approximately 300 to 350 square feet per gallon on smooth finishes (i.e., concrete) to 75 square feet per gallon on porous surfaces (i.e., Dens-Deck Prime gypsum board). Available in 5-gallon containers. CCW 702LV Primer contains less than 250g/L VOCs and meets South Coast Air Quality Management District (SCAQMD) and Leadership in Energy and Environmental Design (LEED) Requirements for Volatile Organic Compounds.
     13. CCW 702 WB - a high-tack, water-based contact adhesive for promoting adhesion of Carlisle air/vapor barrier membranes and an approved substrate (i.e., concrete, Dens-Deck Prime and Securock). Applied by roller, brush or spray with an application rate of approximately 200 sq. ft. per gallon. Available in 5-gallon containers. CCW 702 WB Primer contains 57g/L VOCs and meets South Coast Air Quality Management District (SCAQMD) and Leadership in Energy and Environmental Design (LEED) Requirements for Volatile Organic Compounds.
     14. Universal Single-Ply Sealant: A 100 percent solids, solvent free, one-part polyether sealant that is used as a termination bar sealant. Available in white only.
     15. Thermoplastic One-Part Pourable Sealant: Single component, moisture curing, elastomeric polyether sealant that is compatible with Carlisle's Thermoplastic membranes. Provides a flexible, durable and long lasting seal around hard-to-flash penetrations in Thermoplastic Roofing Systems.
     16. PVC and KEE HP Membrane Cleaner: Clear, solvent-based cleaner used to loosen and remove contaminants from the surface of exposed membrane.

\*\* NOTE TO SPECIFIER \*\* Retain the next article only if insulation is asphalt adhered.

* 1. BITUMEN
     1. Hot Asphalt: Meets or exceeds requirements of ASTM D 312:

\*\* NOTE TO SPECIFIER \*\* Select required asphalt type. Delete two of the next three paragraphs.

* + - 1. Type: Type III.
      2. Type: IV.
      3. Type: SEBS.
    1. Cut-Back Asphalt Primer: ASTM D 41 primer for structural concrete decks, existing smooth BUR, mineral surfaced cap sheet, or modified bitumen membranes prior to mopping.
  1. FASTENERS

\*\* NOTE TO SPECIFIER \*\* Retain only fasteners required on the project and delete all others.

* + 1. HP Fastener: A threaded E-coat square head fastener for insulation attachment only. Used into steel, wood plank, minimum 15/32 inch (12 mm) thick plywood or minimum 7/16 inch (11 mm) thick oriented strand board (OSB).
    2. HP-X Fastener: A heavy duty #15 threaded fastener with a #3 Phillips drive used with Carlisle's Piranha Fastening Plate to secure Mechanically Fastened Roofing Systems. It is used on minimum 22 gauge steel decks or minimum 15/32 inch (12 mm) CDX plywood decks. It is also designed to offer an optimum combination of driving performance, back-out and corrosion resistance with excellent pullout performance.
    3. HP-Xtra Fastener: An oversized diameter (.315 inch (8 mm)) steel, threaded fastener used in conjunction with Piranha Xtra Plates for membrane securement into minimum 22 gauge steel or wood decks on Mechanically Fastened Roofing Systems.
    4. CD-10 Fastener: A hammer-driven, non-threaded E-Coat fastener for use with structural concrete decks rated 3,000 psi or greater.
    5. HD 14-10 Concrete Fastener: A #14 threaded fastener with a #3 Phillips drive used for minimum 3,000 psi concrete decks.
    6. InsulFast Fasteners: A threaded Phillips drive fastener used with Carlisle Insulation Plates for insulation attachment to steel or wood decks.
    7. Pre-Assembled ASAP Fastener: Carlisle's InsulFAST Fastener pre-assembled with a 3 inches (76 mm) diameter plastic plate used for insulation attachment only on Adhered and Mechanically Fastened Roofing Systems. Installed using Olympic Fasteners' Fastening Tool.
    8. HP-NTB Fastener: A glass-filled nylon fastener designed for securing insulation and/or membrane to specialty decks such as cement wood fiber, gypsum or lightweight concrete. The fastener is available with or without locking wire barbs which when engaged into the deck, can increase pullout and backout resistance of marginal decks.
    9. Lite-Deck Fastener: A oversized diameter fastener and associated 3 inches (76 mm) Lite-Deck Metal Plate for use on Adhered Roofing Systems to attach insulation to gypsum decks.
    10. HP Term Bar Nail-In: A 1-1/4 inches (32 mm) long expansion anchor with threaded drive pin used for fastening
    11. Sure-Seal Termination Bar or Seam Fastening Plates to concrete, brick or block walls.
    12. Piranha Plate: A 2-3/8 inches (60 mm) diameter metal barbed fastening plate used with Carlisle HP-X, CD-10 or HD 14-10 Fasteners for membrane or insulation securement. This plate can be used for membrane or insulation securement on Mechanically Fastened Roofing Systems.
    13. HP-Xtra Piranha Plate: A 2-3/8 inches (60 mm) diameter metal barbed fastening plate with an oversized hole for use with Carlisle HP-Xtra Fasteners for membrane securement on Mechanically Fastened Roofing Systems.
    14. Seam Fastening Plate: A 2 inches (51 mm) diameter metal plate used for insulation attachment on Mechanically Fastened Systems or membrane securement at angle changes on Adhered Systems in conjunction with the appropriate Carlisle Fastener.
    15. Insulation Fastening Plate: A nominal 3 inches (76 mm) metal plate used for insulation attachment in conjunction with the appropriate Carlisle Fastener.
    16. Oval Barbed Plate: A 2-3/4 inches x 1-1/2 inches (70 mm x 38 mm) oval metal barbed fastening plate for use with Carlisle HP-X fasteners for securement of 10 feet (3048 mm) wide PVC membrane on Mechanically Fastened Roofing Systems.
  1. EDGINGS AND TERMINATIONS
     1. SecurEdge 200: A snap-on edge system consisting of a 24 gauge galvanized metal water dam. Finish as noted on the Finish Schedule of the Contract Drawings.
     2. SecurEdge 300: A 24 gauge galvanized metal water dam. Finish as noted on the Finish Schedule of the Contract Drawings.
     3. SecurEdge 400: A 24 gauge galvanized metal water dam. Finish as noted on the Finish Schedule of the Contract Drawings.
     4. SecurEdge 2000: An anchor bar roof edge fascia system consisting of 0.100 inch (2.5 mm) thick extruded aluminum bar, corrosion resistant stainless steel fasteners and snap-on fascia cover.
     5. SecurEdge 3000: A metal anchor bar fascia system consisting of a 20 gauge steel retainer bar, corrosion resistant fasteners and aluminum or 24 gauge steel snap-on fascia cover.
     6. SecurEdge 4000: A metal anchor bar fascia system consisting of a 20 gauge steel retainer bar, corrosion resistant fasteners and aluminum or 24 gauge steel snap-on fascia cover.
     7. Sure-Seal Drip Edge: A 22 gauge pre-punched 90-degree angle cleat and 12 foot (3658 mm) long fascia sections. Kynar 500 or aluminum finish as noted on the Finish Schedule of the Contract Drawings.
     8. SecurEdge 200 Coping: An anchor cleat with pre-slotted holes, a concealed joint cover, and 10 or 12 foot sections of coping cap. Kynar 500 finish as noted on the Finish Schedule of the Contract Drawings.
     9. SecurEdge 300 Coping: An anchor cleat with pre-slotted holes, a concealed joint cover, and 10 or 12 foot sections of coping cap. Kynar 500 finish as noted on the Finish Schedule of the Contract Drawings.
     10. SecurEdge 400 Coping: An anchor cleat with pre-slotted holes, a concealed joint cover, and 10 or 12 foot sections of coping cap. Kynar 500 finish as noted on the Finish Schedule of the Contract Drawings.
     11. Sure-Seal Ballast Retaining Bar: A ballast retaining perimeter securement system comprised of a slotted extruded aluminum retention bar with integrated compression fastening strip.
     12. Sure-Seal Termination Bar: 1 inch (13 mm) wide, .098 inch (2.5 mm) thick extruded aluminum bar pre-punched 6 inches (152 mm) on center with sealant ledge to support Lap Sealant.
     13. SecurEdge Term Bar Fascia: A 1.75" wide formed aluminum termination bar with pre-slotted fastening holes for ease of locating and installing. The decorative cover is available in 0.040" aluminum or 24-gauge galvanized steel. SecurEdge Term Bar Fascia is manufactured in 12' lengths for fewer joints/seams, fewer sections to handle and faster installation.

\*\* NOTE TO SPECIFIER \*\* Delete if not required.

* 1. ROOF GARDEN COMPONENTS
     1. Roof Garden Assembly:

\*\* NOTE TO SPECIFIER \*\* Deep Roof Garden System (growth media depth of 8 inches and up) includes a variety of plants including turf grass, annual or perennial flowers, shrubs and small trees. This system will require regular maintenance, such as watering, fertilizing, mowing and weeding. This system typically requires a structural concrete roof deck to support the larger dead load. A temporary or permanent irrigation system is required in these assemblies. The anticipated weight above the membrane assembly is generally between 6.5 and 7.5 pounds per square foot, per inch of system depth, in a saturated state. Delete if not required.

* + - 1. Intensive planting system.

\*\* NOTE TO SPECIFIER \*\* Medium Depth Roof Garden System (growth media depth of 5 inches to 7 inches) includes plants such as sedums, herbs, grasses and other vegetation, which can grow in this depth of media. Drip, mist or spray irrigation systems may be required to support more diverse plant types or for installations in semi-arid climates. The anticipated weight above the membrane assembly is generally between 6 and 7 pounds per square foot, per inch of system depth, in a saturated state. Delete if not required.

* + - 1. Extensive planting system.

\*\* NOTE TO SPECIFIER \*\* Shallow Roof Garden System (growth media depth 2.5 inches to 4 inches) is ideally suited for areas likely to receive little maintenance. Recommended plants include sedums and herbs. A temporary or permanent irrigation system is recommended in these assemblies. The anticipated weight above the membrane assembly is generally between 5.5 and 6 pounds per square foot, per inch of system depth, in a saturated state. Delete if not required.

* + - 1. Ultra-Extensive.
    1. Drainage Components:

\*\* NOTE TO SPECIFIER \*\* Delete drainage components not required.

* + - 1. Carlisle's MiraDRAIN 9800 Drainage Board:
         1. Panel Thickness: 0.04 inches (1.02 mm).
         2. Water Flow Rate: 95 gpm/sq. ft. in accordance with ASTM D 4491.
      2. MiraDRAIN G4 Roof Garden Drainage Composite: High impact polystyrene core with "cups" and high-flow overflow drains. A non-woven 100% post-consumer recycled polyester combination filter fabric and green moisture retention mat is bonded to the retention side of the molded core to prevent passage of particles into the water reservoirs. Drainage composite holds up to 0.32 inch (8 mm) of rainfall.
         1. Panel Thickness: 1.21 inches (31 mm).
         2. Water Flow Rate: 75 gpm/sf. ft. accordance with ASTM D 4491.
    1. Protective Mats:

\*\* NOTE TO SPECIFIER \*\* Delete protective mats not required.

* + - 1. Protection Fabric: Carlisle CCW 200V.

\*\* NOTE TO SPECIFIER \*\* Designed to prevent abrasion to the membrane when a root barrier is used in Intensive and Extensive Roof Garden assemblies. Delete if not required.

* + - 1. Protection Fabric: Carlisle 300HV. Polypropylene non-woven needle-punched fabric that is stabilized to resist soil chemicals, mildew, and insects and is non-biodegradable.

\*\* NOTE TO SPECIFIER \*\* Used in Deep (Intensive) and Medium Depth (Extensive) Roof Garden Systems. Delete if not required.

* + - 1. Root Barrier: Carlisle 40-mil non-reinforced polypropylene sheet specifically formulated for use in below grade and vegetated application to resist root growth and soil bacteria.

\*\* NOTE TO SPECIFIER \*\* In certain Deep (Intensive) Roof Garden applications. Delete if not required.

* + - 1. Biobarrier: Synthetic hormone root barrier used in selective areas. Biobarrier repels root growth, discouraging contact with waterproofing membrane.

\*\* NOTE TO SPECIFIER \*\* Delete if not required.

* + 1. Hardscape:

\*\* NOTE TO SPECIFIER \*\* Delete hardscape not required.

* + - 1. Individual Concrete Plaza Pavers :2 feet x 2 feet x 2 inches (610 mm x 610 mm x 51 mm) thick precast concrete pavers weighing a minimum of 18 psf with a minimum compressive strength of 6500 psi.
      2. Paver Pedestals: Rubber paver pedestals to elevate the surface of the pavers above the roof membrane and promote positive drainage and protection from freeze/thaw.
      3. Stone Ballast: Nominal 1-1/2 inches (38 mm) diameter rounded water worn gravel which conforms to ASTM D448, gradation size #4, applied at a minimum of 10 pounds per square foot.
      4. Other: Roof garden products not specified in this section but required or indicated such as concrete curbs, landscape lumber and landscape products.

\*\* NOTE TO SPECIFIER \*\* Delete if not required.

* + 1. Greenscape:
       1. Growing Medium: A mixture of mineral and organic soil components as selected by the landscape architect/designer or other appropriate landscape professional for the intended vegetation and climate.

\*\* NOTE TO SPECIFIER \*\* Delete if not required.

* + 1. Vegetation:
       1. Sedum Tile: Fully pre-vegetated coconut fiber mat designed to provide immediate full vegetative coverage.
       2. Sedum Clippings and Gel: Un-rooted sedum cuttings dispersed on the surface of growth media in conjunction with a water retention gel to aid in the plant rooting process.
       3. Plugs: Plants are pre-grown into soil "plugs" to be inserted into the surface of the growth media. Typically delivered in 10" x 20" trays containing 24 - 72 individual plants.
  1. WALKWAYS

\*\* NOTE TO SPECIFIER \*\* Delete walkway not required.

* + 1. Hot-air weld walkway pads to the membrane with the manufacturer's current application guidelines
    2. Loose lay concrete pavers over an approved protection sheet in accordance with the manufacturer's current application guidelines.

1. EXECUTION
   1. EXAMINATION
      1. Do not begin installation until substrates have been properly prepared.
      2. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.
   2. PREPARATION
      1. Clean surfaces thoroughly prior to installation.
      2. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.
      3. Do not commence Work until all other work trades have completed jobs that require them to traverse the deck on foot or with equipment.
      4. A vapor retarder / temporary roof (Carlisle VapAir Seal725 TR Air & Vapor Barrier/Temporary Roof or Carlisle VapAir Seal MD Air & Vapor Barrier) may be applied to protect the inside of the structure prior to the roof system installation.

\*\* NOTE TO SPECIFIER \*\* Retain only deck types found on this project. Delete roof deck(s) not required.

* 1. SUBSTRATE PREPARATION
     1. Structural Concrete Deck:
        1. Minimum deck thickness for structural concrete is 4 inches (102 mm).
        2. Allow roof deck to cured prior to application of the roofing system. Where curing is in question, evaluate surface moisture and deck's dryness with the ASTM D 4263 or hot bitumen test procedures.
        3. Repair cracks greater than 1/8 inch (3 mm) in width in accordance with the deck manufacturer's recommendations.
        4. Sumps for the roof drains shall be provided in the casting of the deck.
        5. Where insulation is to be adhered with hot asphalt, prime the deck with asphalt/concrete primer, ASTM D 41 at the rate of one gallon per 100 square feet (0.4 l/sm). Allow the primer to dry prior to the application of the roofing system.
     2. Steel Deck:
        1. Metal decks shall be a minimum uncoated thickness of 22 gauge and have a G-90 galvanized finish on all panels.
        2. Decks must comply with the gauge and span requirements in the current Factory Mutual Approval Guide and be installed in accordance with Loss Prevention Data Sheet 1-28 or specific FM approval.
        3. Remove any surface corrosion and repair severely corroded areas. Properly fasten loose or inadequately secured decking.
     3. Wood Deck (Plank / Heavy Timber):
        1. Wood boards shall be at least 1 inch (25 mm) nominal thickness and have a nominal width of 4 feet-6 inches (1372 mm).
        2. All boards shall have a bearing on rafters at each end and be securely nailed.
        3. Cover knotholes or cracks in excess of 1/4 inch (6 mm) with securely nailed sheet metal.
     4. Wood Deck (Plywood Deck):
        1. Plywood sheathing shall be CDX grade, minimum 4 ply, and not less than 15/32 inch (12 mm) thick.
        2. Install deck over joists spaced 24 inches (610 mm) o.c. or less. Install deck with all sides bearing on and secured to joist and cross blocking.
     5. Cementitious Wood Fiber:
        1. Decks shall be protected from the weather during storage and application; any wet or deformed decking shall be removed and replaced.
        2. Anchor all panels against uplift and lateral movement.
        3. Install deck level. Any deflection, irregularities, or otherwise damaged panels must be corrected or replaced.
     6. Lightweight Insulating Concrete Deck:
        1. Lightweight insulating concrete decks are required to have a minimum thickness of 2 inches (51 mm), a minimum compressive strength of 200 psi (1.38 MPa) and a minimum density of 22 pcf (352 kg/sm) for Adhered Roofing Systems.
        2. Moisture content of existing Lightweight concrete must be under 20 percent when insulation is to be fastened directly to it.

\*\* NOTE TO SPECIFIER \*\* Insert project specific information regarding insulation types and attachment. Add or remove layers as necessary, or delete the entire article if not required.

* 1. INSULATION - SYSTEM DESIGN
     1. Base Layer:
        1. Type: \_\_\_\_\_\_\_\_\_\_\_\_.
        2. Thickness: \_\_\_\_\_\_ inches (\_\_\_ mm).
        3. Attachment Method: \_\_\_\_\_.
     2. Top Layer:
        1. Type: \_\_\_\_\_\_\_\_\_\_\_\_.
        2. Thickness: \_\_\_\_\_\_ inches (\_\_\_ mm).
        3. Attachment Method: \_\_\_\_\_.
     3. Tapered System:
        1. Type: \_\_\_\_\_\_\_\_\_\_\_\_.
        2. Field Slope: \_\_\_\_ inch per foot.
        3. Sump Slope: \_\_\_\_ inch per foot.
        4. Cricket Slope: \_\_\_\_ inch per foot.
        5. Attachment Method: \_\_\_\_\_.
  2. INSULATION PLACEMENT
     1. Install insulation or membrane underlayment over the substrate with boards butted tightly together with no joints or gaps greater than 1/4 inch (6 mm). Stagger joints both horizontally and vertically if multiple layers are provided.
     2. Secure insulation to the substrate with the required mechanical fasteners or insulation adhesive in accordance with the manufacturer's current application guidelines.
     3. Do not install wet, damaged or warped insulation boards.
     4. Stagger joints in one direction unless joints are to be taped. Install insulation boards snug. Gaps between board joints shall not exceed 1/4 inch (6 mm). Fill all gaps in excess of 1/4 inch (6 mm) with same insulation material.
     5. Wood nailers must be at least 3 1/2 inches (89 mm) wide or 1 inch (25 mm) wider than adjacent metal flange. Thickness must equal that of insulation but not less than 1 inch (25 mm) thickness.
     6. Miter and fill the edges of the insulation boards at ridges, valleys and other changes in plane to prevent open joints or irregular surfaces. Avoid breaking or crushing of the insulation at the corners.
     7. Do not install any more insulation than will be completely waterproofed each day.
  3. INSULATION ATTACHMENT
     1. Securely attach insulation to the roof deck for Adhered or Mechanically Fastened Roofing Systems. Attachment must have been successfully tested to meet or exceed the calculated uplift pressure required by the International Building Code (ASCE-7) or ANSI/SPRI WD-1.

\*\* NOTE TO SPECIFIER \*\* Delete the next paragraph if a Mechanically Attached system is specified. FM Loss Prevention Data Sheet 1-29 no longer uses 50 and 75 percent increased fastener density in perimeter and corner areas for Adhered assemblies above FM 1-75.

* + 1. Enhance the perimeter and corner areas in accordance with the International Building Code (ASCE-7) or ANSI/SPRI WD-1.

\*\* NOTE TO SPECIFIER \*\* Delete the next paragraph if asphalt applied insulation is not specified

* + 1. Install insulation layers, maximum 4 feet by 4 feet (1220 mm by 1220 mm) board size, in a full and uniform mopping of hot asphalt applied at the rate of 25 lb/square (1.2 kg/sm). Stagger the joints of additional layers in relation to the insulation joints in the layer(s) below by a minimum of 6 inches (152 mm).

\*\* NOTE TO SPECIFIER \*\* Delete the next paragraph if adhesive applied insulation is not specified

* + 1. Install insulation layers, maximum 4 feet by 4 feet (1220 mm by 1220 mm), applied with FAST adhesive, or a maximum 4 feet by 8 feet (1220 mm by 2438 mm), applied with Flexible FAST Adhesive, coverage rate as necessary to achieve the specified attachment and uplift rating. Press each board firmly into place after adhesive develops strings when touched, typically 1-1/2 to 2 minutes after adhesive was applied, and roll with a weighted roller. Add temporary weight and use relief cuts to ensure boards are well adhered. Stagger the joints of additional layers by a minimum of 6 inches (152 mm).

\*\* NOTE TO SPECIFIER \*\* Retain the next article ONLY if membrane is FULLY ADHERED

* 1. MEMBRANE PLACEMENT AND ATTACHMENT (Fully Adhered)
     1. Position Sure-Flex membrane over the acceptable substrate. Fold membrane sheet back lengthwise so half the underside of the membrane is exposed.
     2. Apply Sure-Flex Bonding Adhesive in accordance with the manufacturer's published instructions, to the exposed underside of the membrane and the corresponding substrate area. Do not apply Bonding Adhesive along the splice edge of the membrane to be hot air welded over the adjoining sheet. Allow the adhesive to dry until it is tacky but will not string or stick to a dry finger touch.
        1. Roll the coated membrane into the coated substrate while avoiding wrinkles. Brush down the bonded section of the membrane sheet immediately after rolling the membrane into the adhesive with a soft bristle push broom to achieve maximum contact.
        2. Fold back the unbonded half of the sheet lengthwise and repeat the bonding procedures.
     3. Position adjoining sheets to allow a minimum overlap of 2 inches (51 mm).
     4. Hot-air weld the Sure-Flex membrane sheets using the Automatic Hot Air Welding Machine or Hot Air Hand Welder in accordance with the manufacturer's hot air welding procedures.
     5. Continue to install adjoining membrane sheets in the same manner, overlapping edges a minimum of 2 inches (51 mm) and complete the bonding procedures as stated previously.

\*\* NOTE TO SPECIFIER \*\* Retain the next article ONLY if membrane is FLEECEBACK FULLY ADHERED

* 1. MEMBRANE PLACEMENT AND ATTACHMENT (FleeceBACK Fully Adhered)
     1. Position and unroll successive sheets and align to provide for a minimum 3 inch (76 mm) wide splice.
     2. Fold adjacent sheets in half lengthwise to expose an approximate 10 foot (3048 mm) wide substrate area.
     3. Membrane which will have the adjacent sheet spliced over it should be adhered to the substrate first. In this fashion, selvage edge splice area will not be contaminated by setting splice edge into the FAST or Flexible FAST Adhesive.
     4. Spray or extrude FAST or Flexible FAST Adhesive onto the substrate and allow to foam up approximately 1/8 inch (3 mm). Wait for the adhesive to achieve "string" when a small object is lifted out of the adhesive.
     5. Place the membrane into adhesive after adhesive develops strings when touched, typically 1-1/2 to 2 minutes after adhesive was applied, and roll with a 150 lb (68 kg) segmented weighted roller. Add temporary weight and use relief cuts to ensure boards are well adhered.
     6. Apply FAST or Flexible FAST Adhesive to the substrate and continue process described above until all sheets are fully bonded, allowing for necessary splice overlaps at selvage edges. At end laps (along the width of the sheet) membrane shall be butted together which will be overlaid with 6 inch wide Sure-Weld Reinforced Membrane hot air welded along all edges. Pressure-Sensitive Cover strip is not permitted in this situation.

\*\* NOTE TO SPECIFIER \*\* Retain the next article ONLY if membrane is MECHANICALLY ATTACHED.

* 1. MEMBRANE PLACEMENT AND ATTACHMENT (Mechanically Attached)
     1. Unroll and position membrane without stretching. Provide and secure both perimeter and field membrane sheets in accordance with the manufacturer's most current specifications and details.
     2. Secure the membrane with the required Carlisle Fasteners and Plates centered over the pre-printed marks approximately 1 1/2 inches (39 mm) from the edge of the membrane sheet.
     3. Install adjoining membrane sheets in the same manner in accordance with the manufacturer's current application requirements.
     4. Attachment Schedule:

\*\* NOTE TO SPECIFIER \*\* Select field fastener density based on wind design criteria specified by the Architect or Engineer.

* + - 1. Field (Zone 1) Fastener Density: 12 inches (305 mm) O.C.
      2. Field (Zone 1) Fastener Density: 18 inches (457 mm) O.C.
      3. Perimeter (Zones 2 and 3) Fastener Density: 12 inches (305 mm) O.C.

\*\* NOTE TO SPECIFIER \*\* Select the appropriate number of perimeter sheets specified by the Architect or Engineer. Insert the required number where not listed.

* + - 1. Perimeter (Half-width) Sheets: 2.
      2. Perimeter (Half-width) Sheets: 3.
      3. Perimeter (Half-width) Sheets: 4.
      4. Perimeter (Half-width) Sheets: \_.
  1. SEAM WELDING

\*\* NOTE TO SPECIFIER \*\* Retain the following Paragraph only if Sure-Flex APEEL PVC/KEE HP is specified. Delete if not required.

* + 1. APEEL Protective Film should be removed from within areas that are to be heat-welded together. In areas that do not require heat welding, the APEEL Protective Film can be left in place for up to 90 days.
    2. Hot-air weld membrane using an Automatic Hot Air Welding Machine or Hot Air Hand Welder in accordance with the manufacturer's current guidelines. At all splice intersections, roll the seam with a silicone roller to ensure a continuous hot air welded seam.

\*\* NOTE TO SPECIFIER \*\* Retain the next paragraph if 60 mil (1.5 mm) thick membrane is specified

* + 1. Overlay all splice intersections with Sure-Flex T-Joint Covers.
    2. Probe all seams once the hot air welds have thoroughly cooled (approximately 30 minutes).
    3. Repair all seam deficiencies the same day they are discovered.
    4. Apply Cut Edge Sealant on all cut edges of reinforced membrane (where the scrim reinforcement is exposed) after seam probing is complete. Cut Edge Sealant is not required but recommended on flat surfaces and is not required on vertical splices.
  1. FLASHING
     1. Flashing of parapets, curbs, expansion joints and other parts of the roof must be performed using Sure-Flex reinforced membrane. Sure-Flex non-reinforced membrane may be used for flashing pipe penetrations, Sealant Pockets, and scuppers, as well as inside and outside corners, when the use of pre-molded accessories is not feasible.
     2. Follow manufacturer's typical flashing procedures for all wall, curb, and penetration flashing including metal edging/coping and roof drain applications.

\*\* NOTE TO SPECIFIER \*\* Retain the following Paragraph only if Sure-Flex APEEL PVC/KEE HP is specified. Delete if not required.

* + 1. APEEL Protective Film should be removed and discarded after the completion of the roof system installation.

\*\* NOTE TO SPECIFIER \*\* Retain the following Paragraph only if Sure-Flex Contour Rib Profile is specified. Delete if not required.

* + 1. Sure-Flex Contour Rib Profiles:
       1. The Sure-Flex Contour Rib Profile is recommended for use with FleeceBACK PVC adhered roofing systems.
       2. The Sure-Flex Contour Rib Profiles should be positioned parallel to the laps of the installed PVC roofing system and parallel with the roof slope where possible.
       3. Ensure that all welding surfaces are clean and dry. Inspect all seam areas for proper weld prior to installing Sure-Flex Contour Rib Profile.
       4. Sure-Flex Contour Rib Profile spacing can be individually determined to achieve the desired appearance.
       5. Connecting multiple ribs is achieved by using fiberglass pins. Insert a pin half-way into the end of one profile. Connect the adjoining rib by inserting the exposed end of the pin into the alignment hole. Repeat previous steps for additional Sure-Flex Contour Rib profiles.
  1. WALKWAYS
     1. Install walkways at all traffic concentration points (such as roof hatches, access doors, rooftop ladders, etc.) and all locations as identified on the Contract Drawings.

\*\* NOTE TO SPECIFIER \*\* Select Walkway requirement. Delete one of the next two paragraphs.

* + 1. Hot-air weld Sure-Flex Walkway to the membrane in accordance with the manufacturer's current application guidelines.
    2. Loose lay concrete pavers over an approved protection sheet in accordance with the manufacturer's current application guidelines.
  1. DAILY SEALS
     1. On phased roofing, when the completion of flashings and terminations is not achieved by the end of the work day, a daily seal must be performed to temporarily close the membrane to prevent water infiltration.
     2. Complete an acceptable membrane seal in accordance with the manufacturer's requirements.
  2. CLEAN UP
     1. Perform daily clean-up to collect all wrappings, empty containers, paper, and other debris from the project site. Upon completion, all debris must be disposed of in a legally acceptable manner.
     2. Prior to the manufacturer's inspection for warranty, the applicator must perform a pre-inspection to review all work and to verify all flashing has been completed as well as the application of all caulking.
  3. PROTECTION
     1. Protect installed products until completion of project.
     2. Touch-up, repair or replace damaged products before Substantial Completion.

END OF SECTION