Garland/DBS, Inc.
3800 East 91st Street
Cleveland, OH 44105
Phone: (800) 762-8225
Fax: (216) 883-2055

Enc. #3B

ROOFING MATERIAL AND SERVICES PROPOSAL

Ypsilanti Community Schools
Roofing 2019
1885 Packard Rd.
Ypsilanti, MI 48197

Date Submitted: 01/10/2019
Proposal #: 25-MI-190052
MICPA # 14-5903

Purchase orders to be made out to: Garland/DBS, Inc.

Please Note: The following budget/estimate is being provided according to the pricing established under the Master Intergovernmental Cooperative Purchasing Agreement (MICPA) with Cobb County, GA and U.S. Communities. This budget/estimate should be viewed as the maximum price an agency will be charged under the agreement. Garland/DBS, Inc. administered a competitive bid process for the project with the hopes of providing a lower market adjusted price whenever possible.

Scope of Work: Estabrook Elementry Restoration

1. Remove areas of wet insulation as identified in the infrared roof scan map, down to the metal decking. Replace in kind with polyisocyanurate insulation, ½" recovery board and cured 60 mil membrane; making permanent tie-ins surrounding the effected area. The Base Bid for this restoration should include a minimum of 500 sq. ft. of replacement. Additional wet insulation found, during installation, shall be replaced at the predetermined bid price provided on the Bid Form.
2. Repair any existing ridges, splits, punctures or tears to the existing membrane roofing where necessary.
3. Remove/Replace two areas of negative slope with properly tapered insulation to promote positive drainage
4. Roof surface and flashings to be cleaned using power washer (2,000 psi) and 10% SimpleGreen or TSP solution. Soft bristle brooms will be used to remove areas of heavy dirt, debris, oil and scale. Contractors should anticipate a minimum of two cleanings prior to a final rinse.
5. Install Uni-Bond self-adhering seam tape to existing field seams, flashing base and roof penetration transitions (90 degrees) throughout.
6. Apply base coat of elastomeric coating at a rate of two gallons per square over selfadhering seam tape through the field and flashings.

7. Apply top coat of elastomeric coating at a rate of two gallons per square over all roof sections, including previously areas which received the base coat.
8. Clean up all debris and damage done to grounds, building and roof top (if any). Charcoal filters to be utilized at intakes the duration of the project.
9. Provide 2-year workmanship warranty.
10. Manufacturer direct warranty to be provided to owner upon completion.

Line Item Pricing

Item #	Item Description	Unit Price	Quantity	Unit	Extended Price
2.05	Tear-off & Dispose of Debris: SYSTEM TYPE BUR W/ Insulation and Mineral Surfacing - Metal Deck	$ 1.82	500	SF	$ 910
6.16.01	Roof Deck and Insulation Option: METAL ROOF DECK - COLD PROCESS APPLICATION - INSULATION OPTION: - Mechanically Fasten Polyisocyanurate / Adhere High Density Asphalt Coated Wood Fiber with Insulation Adhesive to Provide an Average R-Value of 20 In Compliance FM 1-90 Requirements	$ 3.22	500	SF	$ 1,610
23.151	Common Roof Repair Items: Set Roofing Cap Sheet Membrane in Mastic Installed Over Repair Area (< 500 SF)	$ 6.85	500	SF	$ 3,425
15.23	RESTORATIONS - RECOATING OF EXISTING ROOF SYSTEMS : ELASTOMERIC URETHANE COATING FOR SMOOTH OR MINERAL SURFACED MODIFIED ROOFS Power wash & Clean with TSP or Simple Green; Use Portable Blowers the Clear the Roof of Moisture; Install Base Coat / Top Coat as Specified (Urethane 2 Gallons per Sq.)	$ 5.43	75000	SF	$ 407,250
15.24	RESTORATIONS - RECOATING OF EXISTING ROOF SYSTEMS : LINEAR FOOT COST - REINFORCE SEAMS OF UREATHANE RESTORATION SYSTEM Add/Deduct for Reinforcing the Seams when Using an Elastomeric Urethane Coating; Seams Need 2 1/2" Gallons per Sq. w/ Reinforcement.	$ 2.72	45000	LF	$ 122,400
	Sub Total Prior to Multipliers				**$ 535,595**

22.48	JOB SITE SPECIFIC MULTIPLIERS APPLIED TO EACH LINE ITEM ON ASSOCIATE JOB: MULTIPLIER - ROOF SIZE IS GREATER THAN 50K SF LESS THAN 100K SF Multiplier Applied when Roof Size is Less than 100,000 SF, but Greater than 50,000 SF Fixed Costs: Equipment, Mobilization, Demobilization, Disposal, & Set-Up Labor are Spread Amongst a Larger Roof Area	-5%		%	$	(26,780)
	Sub-Totals After Multipliers				**$**	**508,815**

Base Bid Total Maximum Price of Line Items under the MICPA:	**$**	**508,815**
Proposal Price Based Upon Market Experience:	**$**	**498,636**

Garland/DBS Price Based Upon Local Market Competition:

1	**Schena Roofing**	**$**	**498,636**
2	Lutz Roofing	$	506,710
3	Schriber Roofing	$	566,980
4	TF Beck Company	$	870,709

Scope of Work: West Elementary – Replacement – Section A1

1. Remove existing membrane and insulation down to tectum decking.
2. Salvage existing nailable base sheet where possible.
3. Mechanically fasten two layers of 2" polyisocyanurate insulation, staggering joints throughout.
4. Adhere ½" Securock recovery board per wind up-lift calculations in Type IV, steep-slope hot bitumen adhesive.
5. Sump all drains using tapered insulation ¼:12 to an (8') diameter to promote positive drainage.
6. Install fiberglass/polyester reinforced modified base sheet and SBS modified smooth cap sheet throughout the field of the roof in Type IV hot bitumen adhesive. Install in a shingle fashion from low to high point of the roof slope to promote positive drainage.
7. Install fiberglass/polyester modified base sheet and modified mineral cap sheet to all flashings in specified trowel-grade mastic. Three-course all vertical flashing seams with aluminized mastic and reinforcement.
8. Install new lead at all soil/heat stacks, including targets at the base.
9. Install reglet-mounted and surface-mounted counter flashings where detailed. Additional masonry joint cuts may be required to provide adequate flashing heights.
10. Apply specified primer over field modified cap sheet.
11. Apply cold-process, polymer modified flood coat at specified rate and embed pea-gravel throughout field.
12. Attached new 20-gauge steel metal coping caps to match existing color where necessary.
13. Apply two coats of aluminized coating to all exposed mineral-surfaced flashings and roof-top penetrations.

14. Clean up all debris and damage done to grounds, building and roof top (if any). Charcoal filters to be utilized at intakes the duration of the project.
15. Provide 2-year workmanship warranty.
16. Manufacturer direct warranty to be provided to owner upon completion

Line Item Pricing

Item #	Item Description	Unit Price	Quantity	Unit	Extended Price
2.06	Tear-off & Dispose of Debris: SYSTEM TYPE BUR W/ Insulation and Mineral Surfacing - Wood / Tectum Deck	$ 1.82	12200	SF	$ 22,204
6.13.01	Roof Deck and Insulation Option: TECTUM ROOF DECK - HOT APPLICATION - ASTM D 312 TYPE III OR IV ASPHALT - INSULATION OPTION: - Mechanically Attach Base Sheet Utilizing FM 1-90 Attachment Patterns & Hot Mop Polyisocyanurate / Hot Mop Wood Fiber or Perlite to Provide an Average R-Value of 20 In Compliance with FM 1-90 Requirements	$ 3.82	12200	SF	$ 46,604
4.33	Insulation Recovery Board & Insulations Options: ADDITIONAL INSULATION OPTION (OVER AN EXISTING ROOF) Install 2.0" of Polyisocyanurate Insulation Over an Existing Roof. All Wet Insulation Must be Replaced Prior to Installation of New Course of Insulation	$ 1.60	12200	SF	$ 19,520
12.11.02	2-PLY ROOF SYSTEMS - COMBINATIONS OF A BASE PLY & A CAP SHEET (TOP PLY) PLEASE NOTE: BASE PLY & CAP SHEET COMBINATIONS MUST BE APPROVED BY THE MANUFACTURER: ROOF CONFIGURATION 1 Ply Modified Base Sheet Adhered in Hot ASTM D 312 Type III or IV Asphalt: BASE PLY OPTION: - ASTM D 6163 SBS Fiberglass Reinforced Modified Bituminous Sheet Material Type III - 220 lbf/in tensile	$ 3.04	12200	SF	$ 37,088

12.21.02	2-PLY ROOF SYSTEMS - COMBINATIONS OF A BASE PLY & A CAP SHEET (TOP PLY) PLEASE NOTE: BASE PLY & CAP SHEET COMBINATIONS MUST BE APPROVED BY THE MANUFACTURER: ROOF CONFIGURATION 1 Ply Cap Sheet, Flood Coat and Aggregate Adhered in Hot ASTM D 312 Type III OR IV Asphalt: ROOFING MEMBRANE OPTION: - ASTM D 6163 SBS Fiberglass Reinforced Modified Bituminous Sheet Material Type III - Minimum of 220 lbf/in tensile	$ 4.37	12200	SF	$ 53,314
20.11.02	NEW FLASHINGS FOR ROOFING SYSTEMS & RESTORATION OPTIONS: ROOF FLASHINGS FOR MODIFIED & COAL TAR PITCH ROOF SYSTEMS: Minimum 1 Ply of Base Flashing and Mineral Cap Sheet Installed in Hot ASTM D 312 Type III or IV Asphalt;FLASHING OPTION: - BASE PLY: SBS Modified Fiberglass Reinforced Base Flashing Ply w/ Tensile Strength of 215 lbf/in tensile (ASTM D 5147); TOP PLY: ASTM D 6163 SBS Fiberglass Reinforced Modified Bituminous Sheet Material Type III - 220 lbf/in tensile	$ 14.66	1500	SF	$ 21,990
	Metal Stretch Out Detail - New 20Ga Coping Cap	$ 17.60	550	LF	$ 9,680
5.31	Coat New Roofing With Elastomeric Coating: ROOF SYSTEM TYPE Apply an Aluminum Coating per Specifications (1 Gallon per Square per Coat - 2 Coats Required) - Smooth or Mineral Surfaced Modified	$ 1.54	1500	SF	$ 2,310
	Sub Total Prior to Multipliers				**$ 212,710**
22.12	JOB SITE SPECIFIC MULTIPLIERS APPLIED TO EACH LINE ITEM ON ASSOCIATE JOB: MULTIPLIER - ROOF HAS LARGE AMOUNT OF PENETRATIONS / ROOF TOP OBSTRUCTIONS Multiplier Applied when Open Roofing Area is Limited Due to a Large Number of Roof Penetrations such as Soil Stacks, Sky Lights, Roof Drains, Exhaust Vents, HVAC Units, etc., or when there are a Large Amount of Roof Top Obstructions such as: Pipes, Duct Work, Electrical Wires, Hoses, etc.	50%		%	$ 106,355.00

22.46	JOB SITE SPECIFIC MULTIPLIERS APPLIED TO EACH LINE ITEM ON ASSOCIATE JOB: MULTIPLIER - ROOF SIZE IS GREATER THAN 10,000 SF, BUT LESS THAN 20,000 SF Multiplier Applied when Roof Size is Less than 20,000 SF, but Greater than 10,000 SF Fixed Costs: Equipment, Mobilization, Demobilization, Disposal, & Set-Up Labor are Not Completely Absorbed Across Roof Area	15%		%	$	31,906.50
	Sub-Totals After Multipliers				**$**	**350,972**

Base Bid Total Maximum Price of Line Items under the MICPA:	**$ 350,972**
Proposal Price Based Upon Market Experience:	**$ 320,805**

Garland/DBS Price Based Upon Local Market Competition:

1	**Lutz Roofing**	**$**	**320,805**
3	TF Beck Company	$	367,386
2	Schriber Roofing	$	402,842
4	Schena Roofing		No Bid

Scope of Work: West Elementary – Replacement – Section A2

1. Cut and remove existing mechanically attached membrane, leaving insulation in place.
2. Adhere ½" Securock recovery board per wind up-lift calculations in Type IV, steep-slope hot bitumen adhesive.
3. Sump all drains using tapered insulation ¼:12 to an (8') diameter to promote positive drainage.
4. Install fiberglass/polyester reinforced modified base sheet and SBS modified smooth cap sheet throughout the field of the roof in Type IV hot bitumen adhesive. Install in a shingle fashion from low to high point of the roof slope to promote positive drainage.
5. Install fiberglass/polyester modified base sheet and modified mineral cap sheet to all flashings in specified trowel-grade mastic. Three-course all vertical flashing seams with aluminized mastic and reinforcement.
6. Install new lead at all soil/heat stacks, including targets at the base.
7. Install reglet-mounted and surface-mounted counter flashings where detailed. Additional masonry joint cuts may be required to provide adequate flashing heights.
8. Apply specified primer over field modified cap sheet.
9. Apply cold-process, polymer modified flood coat at specified rate and embed pea-gravel throughout field.
10. Attached new 20-gauge steel metal coping caps to match existing color where necessary.
11. Apply two coats of aluminized coating to all exposed mineral-surfaced flashings and roof-top penetrations.

12. Clean up all debris and damage done to grounds, building and roof top (if any). Charcoal filters to be utilized at intakes the duration of the project.
13. Provide 2-year workmanship warranty.
14. Manufacturer direct warranty to be provided to owner upon completion.

Line Item Pricing

Item #	Item Description	Unit Price	Quantity	Unit	Extended Price
2.62	Tear-off & Dispose of Debris: SYSTEM TYPE BUR w/ Mineral Surfacing to the Existing Insulation (Insulation to be Re-Used)	$ 2.19	12700	SF	$ 27,813
4.21	Insulation Recovery Board & Insulations Options: RECOVERY BOARD TYPE 1/2" Treated Gypsum Insulation Board with Glass-Mat (e.g. DensDeck / Securock / Equal) Installed Over an Existing Roof Adhered in Hot ASTM D 312 Type III or IV Asphalt; Mopped	$ 1.31	12700	SF	$ 16,637
12.11.02	2-PLY ROOF SYSTEMS - COMBINATIONS OF A BASE PLY & A CAP SHEET (TOP PLY) PLEASE NOTE: BASE PLY & CAP SHEET COMBINATIONS MUST BE APPROVED BY THE MANUFACTURER: ROOF CONFIGURATION 1 Ply Modified Base Sheet Adhered in Hot ASTM D 312 Type III or IV Asphalt: BASE PLY OPTION: - ASTM D 6163 SBS Fiberglass Reinforced Modified Bituminous Sheet Material Type III - 220 lbf/in tensile	$ 3.04	12700	SF	$ 38,608
12.21.02	2-PLY ROOF SYSTEMS - COMBINATIONS OF A BASE PLY & A CAP SHEET (TOP PLY) PLEASE NOTE: BASE PLY & CAP SHEET COMBINATIONS MUST BE APPROVED BY THE MANUFACTURER: ROOF CONFIGURATION 1 Ply Cap Sheet, Flood Coat and Aggregate Adhered in Hot ASTM D 312 Type III OR IV Asphalt: ROOFING MEMBRANE OPTION: - ASTM D 6163 SBS Fiberglass Reinforced Modified Bituminous Sheet Material Type III - Minimum of 220 lbf/in tensile	$ 4.37	12700	SF	$ 55,499

20.11.02	NEW FLASHINGS FOR ROOFING SYSTEMS & RESTORATION OPTIONS: ROOF FLASHINGS FOR MODIFIED & COAL TAR PITCH ROOF SYSTEMS: Minimum 1 Ply of Base Flashing and Mineral Cap Sheet Installed in Hot ASTM D 312 Type III or IV Asphalt:FLASHING OPTION: - BASE PLY: SBS Modified Fiberglass Reinforced Base Flashing Ply w/ Tensile Strength of 215 lbf/in tensile (ASTM D 5147); TOP PLY: ASTM D 6163 SBS Fiberglass Reinforced Modified Bituminous Sheet Material Type III - 220 lbf/in tensile	$ 14.66	900	SF	$ 13,194
5.31	Coat New Roofing With Elastomeric Coating: ROOF SYSTEM TYPE Apply an Aluminum Coating per Specifications (1 Gallon per Square per Coat - 2 Coats Required) - Smooth or Mineral Surfaced Modified	$ 1.54	900	SF	$ 1,386
	Metal Stretch Out Detail - New 20Ga Coping Cap	$ 17.60	550	LF	$ 9,680
	Sub Total Prior to Multipliers				**$ 153,137**
22.12	JOB SITE SPECIFIC MULTIPLIERS APPLIED TO EACH LINE ITEM ON ASSOCIATE JOB: MULTIPLIER - ROOF HAS LARGE AMOUNT OF PENETRATIONS / ROOF TOP OBSTRUCTIONS Multiplier Applied when Open Roofing Area is Limited Due to a Large Number of Roof Penetrations such as Soil Stacks, Sky Lights, Roof Drains, Exhaust Vents, HVAC Units, etc., or when there are a Large Amount of Roof Top Obstructions such as: Pipes, Duct Work, Electrical Wires, Hoses, etc.	50%		%	$ 106,355
22.46	JOB SITE SPECIFIC MULTIPLIERS APPLIED TO EACH LINE ITEM ON ASSOCIATE JOB: MULTIPLIER - ROOF SIZE IS GREATER THAN 10,000 SF, BUT LESS THAN 20,000 SF Multiplier Applied when Roof Size is Less than 20,000 SF, but Greater than 10,000 SF Fixed Costs: Equipment, Mobilization, Demobilization, Disposal, & Set-Up Labor are Not Completely Absorbed Across Roof Area	15%		%	$ 22,970.55
	Sub-Totals After Multipliers				**$ 282,463**

Base Bid Total Maximum Price of Line Items under the MICPA: $ 282,463

Proposal Price Based Upon Market Experience: $ 256,356

Garland/DBS Price Based Upon Local Market Competition:

1	**Lutz Roofing**	**$**	**256,356**
2	Schriber Roofing	$	335,833

3	TF Beck Company	$ 337,640
4	Schena Roofing	No Bid

Scope of Work: West Elementary – Replacement – Section A3

1. Cut and remove existing mechanically attached membrane, leaving insulation in place.
2. Adhere ½" Securock recovery board per wind up-lift calculations in Type IV, steep-slope hot bitumen adhesive.
3. Sump all drains using tapered insulation ¼:12 to an (8') diameter to promote positive drainage.
4. Install fiberglass/polyester reinforced modified base sheet and SBS modified smooth cap sheet throughout the field of the roof in Type IV hot bitumen adhesive. Install in a shingle fashion from low to high point of the roof slope to promote positive drainage.
5. Install fiberglass/polyester modified base sheet and modified mineral cap sheet to all flashings in specified trowel-grade mastic. Three-course all vertical flashing seams with aluminized mastic and reinforcement.
6. Install new lead at all soil/heat stacks, including targets at the base.
7. Install reglet-mounted and surface-mounted counter flashings where detailed. Additional masonry joint cuts may be required to provide adequate flashing heights.
8. Apply specified primer over field modified cap sheet.
9. Apply cold-process, polymer modified flood coat at specified rate and embed pea-gravel throughout field.
10. Attached new 20-gauge steel metal coping caps to match existing color where necessary.
11. Apply two coats of aluminized coating to all exposed mineral-surfaced flashings and roof-top penetrations.
12. Clean up all debris and damage done to grounds, building and roof top (if any). Charcoal filters to be utilized at intakes the duration of the project.
13. Provide 2-year workmanship warranty.
14. Manufacturer direct warranty to be provided to owner upon completion.

Line Item Pricing

Item #	Item Description	Unit Price	Quantity	Unit	Extended Price
2.62	Tear-off & Dispose of Debris: SYSTEM TYPE BUR w/ Mineral Surfacing to the Existing Insulation (Insulation to be Re-Used)	$ 2.19	6200	SF	$ 13,578

4.21	Insulation Recovery Board & Insulations Options: RECOVERY BOARD TYPE 1/2" Treated Gypsum Insulation Board with Glass-Mat (e.g. DensDeck / Securock / Equal) Installed Over an Existing Roof Adhered in Hot ASTM D 312 Type III or IV Asphalt; Mopped	$ 1.31	6200	SF	$ 8,122
12.11.02	2-PLY ROOF SYSTEMS - COMBINATIONS OF A BASE PLY & A CAP SHEET (TOP PLY) PLEASE NOTE: BASE PLY & CAP SHEET COMBINATIONS MUST BE APPROVED BY THE MANUFACTURER: ROOF CONFIGURATION 1 Ply Modified Base Sheet Adhered in Hot ASTM D 312 Type III or IV Asphalt: BASE PLY OPTION: - ASTM D 6163 SBS Fiberglass Reinforced Modified Bituminous Sheet Material Type III - 220 lbf/in tensile	$ 3.04	6200	SF	$ 18,848
12.21.02	2-PLY ROOF SYSTEMS - COMBINATIONS OF A BASE PLY & A CAP SHEET (TOP PLY) PLEASE NOTE: BASE PLY & CAP SHEET COMBINATIONS MUST BE APPROVED BY THE MANUFACTURER: ROOF CONFIGURATION 1 Ply Cap Sheet, Flood Coat and Aggregate Adhered in Hot ASTM D 312 Type III OR IV Asphalt: ROOFING MEMBRANE OPTION: - ASTM D 6163 SBS Fiberglass Reinforced Modified Bituminous Sheet Material Type III - Minimum of 220 lbf/in tensile	$ 4.37	6200	SF	$ 27,094
20.11.02	NEW FLASHINGS FOR ROOFING SYSTEMS & RESTORATION OPTIONS: ROOF FLASHINGS FOR MODIFIED & COAL TAR PITCH ROOF SYSTEMS: Minimum 1 Ply of Base Flashing and Mineral Cap Sheet Installed in Hot ASTM D 312 Type III or IV Asphalt:FLASHING OPTION: - BASE PLY: SBS Modified Fiberglass Reinforced Base Flashing Ply w/ Tensile Strength of 215 lbf/in tensile (ASTM D 5147); TOP PLY: ASTM D 6163 SBS Fiberglass Reinforced Modified Bituminous Sheet Material Type III - 220 lbf/in tensile	$ 14.66	500	SF	$ 7,330
5.31	Coat New Roofing With Elastomeric Coating: ROOF SYSTEM TYPE Apply an Aluminum Coating per Specifications (1 Gallon per Square per Coat - 2 Coats Required) - Smooth or Mineral Surfaced Modified	$ 1.54	500	SF	$ 770
	Metal Stretch Out Detail - New 20Ga Coping Cap	$ 17.60	200	LF	$ 3,520
	Sub Total Prior to Multipliers				**$ 79,262**

22.12	JOB SITE SPECIFIC MULTIPLIERS APPLIED TO EACH LINE ITEM ON ASSOCIATE JOB: MULTIPLIER - ROOF HAS LARGE AMOUNT OF PENETRATIONS / ROOF TOP OBSTRUCTIONS Multiplier Applied when Open Roofing Area is Limited Due to a Large Number of Roof Penetrations such as Soil Stacks, Sky Lights, Roof Drains, Exhaust Vents, HVAC Units, etc., or when there are a Large Amount of Roof Top Obstructions such as: Pipes, Duct Work, Electrical Wires, Hoses, etc.	50%		%	$	53,178
22.45	JOB SITE SPECIFIC MULTIPLIERS APPLIED TO EACH LINE ITEM ON ASSOCIATE JOB: MULTIPLIER - ROOF SIZE IS GREATER THAN 5,000 SF, BUT LESS THAN 10,000 SF Multiplier Applied when Roof Size is Less than 10,000 SF, but Greater than 5,000 SF Fixed Costs: Equipment, Mobilization, Demobilization, Disposal, & Set-Up Labor are Not Completely Absorbed Across Roof Area	30%		%	$	23,778.60
	Sub-Totals After Multipliers				**$**	**156,218**

Base Bid Total Maximum Price of Line Items under the MICPA:	**$**	**156,218**
Proposal Price Based Upon Market Experience:	**$**	**130,677**

Garland/DBS Price Based Upon Local Market Competition:

1	**Lutz Roofing**	**$**	**130,677**
2	TF Beck Company	$	175,922
3	Schriber Roofing	$	195,796
4	Schena Roofing		No Bid

Scope of Work: West Elementary – Replacement – Section G

1. Remove existing membrane and insulation down to tectum decking.
2. Salvage existing nailable base sheet where possible.
3. Mechanically fasten two layers of 2" polyisocyanurate insulation, staggering joints throughout.
4. Adhere ½" Securock recovery board per wind up-lift calculations in Type IV, steep-slope hot bitumen adhesive.
5. Sump all drains using tapered insulation ¼:12 to an (8') diameter to promote positive drainage.
6. Install fiberglass/polyester reinforced modified base sheet and SBS modified smooth cap sheet throughout the field of the roof in Type IV hot bitumen adhesive. Install in a shingle fashion from low to high point of the roof slope to promote positive drainage.

7. Install fiberglass/polyester modified base sheet and modified mineral cap sheet to all flashings in specified trowel-grade mastic. Three-course all vertical flashing seams with aluminized mastic and reinforcement.
8. Install new lead at all soil/heat stacks, including targets at the base.
9. Install reglet-mounted and surface-mounted counter flashings where detailed. Additional masonry joint cuts may be required to provide adequate flashing heights.
10. Apply specified primer over field modified cap sheet.
11. Apply cold-process, polymer modified flood coat at specified rate and embed pea-gravel throughout field.
12. Attached new 20-gauge steel metal coping caps to match existing color where necessary.
13. Apply two coats of aluminized coating to all exposed mineral-surfaced flashings and roof-top penetrations.
14. Clean up all debris and damage done to grounds, building and roof top (if any). Charcoal filters to be utilized at intakes the duration of the project.
15. Provide 2-year workmanship warranty.
16. Manufacturer direct warranty to be provided to owner upon completion

Line Item Pricing

Item #	Item Description	Unit Price	Quantity	Unit	Extended Price
2.06	Tear-off & Dispose of Debris: SYSTEM TYPE BUR W/ Insulation and Mineral Surfacing - Wood / Tectum Deck	$ 1.82	4500	SF	$ 8,190
6.13.01	Roof Deck and Insulation Option: TECTUM ROOF DECK - HOT APPLICATION - ASTM D 312 TYPE III OR IV ASPHALT - INSULATION OPTION: - Mechanically Attach Base Sheet Utilizing FM 1-90 Attachment Patterns & Hot Mop Polyisocyanurate / Hot Mop Wood Fiber or Perlite to Provide an Average R-Value of 20 In Compliance with FM 1-90 Requirements	$ 3.82	4500	SF	$ 17,190
4.33	Insulation Recovery Board & Insulations Options: ADDITIONAL INSULATION OPTION (OVER AN EXISTING ROOF) Install 2.0" of Polyisocyanurate Insulation Over an Existing Roof. All Wet Insulation Must be Replaced Prior to Installation of New Course of Insulation	$ 1.60	4500	SF	$ 7,200

12.11.02	2-PLY ROOF SYSTEMS - COMBINATIONS OF A BASE PLY & A CAP SHEET (TOP PLY) PLEASE NOTE: BASE PLY & CAP SHEET COMBINATIONS MUST BE APPROVED BY THE MANUFACTURER: ROOF CONFIGURATION 1 Ply Modified Base Sheet Adhered in Hot ASTM D 312 Type III or IV Asphalt: BASE PLY OPTION: - ASTM D 6163 SBS Fiberglass Reinforced Modified Bituminous Sheet Material Type III - 220 lbf/in tensile	$ 3.04	4500	SF	$ 13,680
12.21.02	2-PLY ROOF SYSTEMS - COMBINATIONS OF A BASE PLY & A CAP SHEET (TOP PLY) PLEASE NOTE: BASE PLY & CAP SHEET COMBINATIONS MUST BE APPROVED BY THE MANUFACTURER: ROOF CONFIGURATION 1 Ply Cap Sheet, Flood Coat and Aggregate Adhered in Hot ASTM D 312 Type III OR IV Asphalt: ROOFING MEMBRANE OPTION: - ASTM D 6163 SBS Fiberglass Reinforced Modified Bituminous Sheet Material Type III - Minimum of 220 lbf/in tensile	$ 4.37	4500	SF	$ 19,665
20.11.02	NEW FLASHINGS FOR ROOFING SYSTEMS & RESTORATION OPTIONS: ROOF FLASHINGS FOR MODIFIED & COAL TAR PITCH ROOF SYSTEMS: Minimum 1 Ply of Base Flashing and Mineral Cap Sheet Installed in Hot ASTM D 312 Type III or IV Asphalt:FLASHING OPTION: - BASE PLY: SBS Modified Fiberglass Reinforced Base Flashing Ply w/ Tensile Strength of 215 lbf/in tensile (ASTM D 5147); TOP PLY: ASTM D 6163 SBS Fiberglass Reinforced Modified Bituminous Sheet Material Type III - 220 lbf/in tensile	$ 14.66	350	SF	$ 5,131
	Metal Stretch Out Detail - New 20Ga Coping Cap	$ 17.60	75	LF	$ 1,320
5.31	Coat New Roofing With Elastomeric Coating: ROOF SYSTEM TYPE Apply an Aluminum Coating per Specifications (1 Gallon per Square per Coat - 2 Coats Required) - Smooth or Mineral Surfaced Modified	$ 1.54	350	SF	$ 539
	Sub Total Prior to Multipliers				**$ 72,915**

22.43	JOB SITE SPECIFIC MULTIPLIERS APPLIED TO EACH LINE ITEM ON ASSOCIATE JOB: MULTIPLIER - ROOF SIZE IS GREATER THAN 2,000 SF, BUT LESS THAN 3,000 SF Multiplier Applied when Roof Size is Less than 3,000 SF, but Greater than 2,000 SF Fixed Costs: Equipment, Mobilization, Demobilization, Disposal, & Set-Up Labor are Not Completely Absorbed Across Roof Area	60%		%	$	43,749
	Sub-Totals After Multipliers				**$**	**116,664**

Base Bid Total Maximum Price of Line Items under the MICPA:	**$ 116,664**
Proposal Price Based Upon Market Experience:	**$ 115,797**

Garland/DBS Price Based Upon Local Market Competition:

1	**Lutz Roofing**	**$**	**115,797**
2	TF Beck Company	$	165,915
3	Schriber Roofing	$	168,673
4	Schena Roofing		No Bid

Potential issues that could arise during the construction phase of the project will be addressed via unit pricing for additional work beyond the scope of the specifications. This could range anywhere from wet insulation, to the replacement of deteriorated wood nailers. Proposal pricing valid 60 days from proposal date.

Clarifications/Exclusions:

1. Sales and use taxes are excluded. Please issue a Tax Exempt Certificate.
2. Permits are excluded.
3. Bonds are included.
4. Plumbing, Mechanical, Electrical work is excluded.
5. Masonry work is excluded.
6. Temporary protection is excluded.
7. Prevailing Wages are excluded.
8. Any work not exclusively described in the above proposal scope of work is excluded.

If you have any questions regarding this proposal, please do not hesitate to call me at my number listed below.

Respectfully Submitted,

Joe Slovasky

Joe Slovasky
Garland/DBS, Inc.
(216) 430-3523

CONTRACT AMENDMENT
Sealed Bid # 14-5903

Date of Amendment: May 18, 2017

Owner: Cobb County Board of Commissioners. Cobb County, Georgia
Contractor: Garland/DBS, Inc.
Project: Roofing Supplies and Services, Waterproofing and Related Products and Services

Current Contract Term: January 1, 2017 to December 31, 2017

This action amends the current contract dated September 22, 2014, for Sealed Bid # 14-5903. It is valid when signed by both the Owner and Contractor. The signature of the Contractor indicates his agreement herewith, including any adjustments in the contract pricing, contract term, or contract scope. This price and payment constitutes full compensation for all costs in connection with and incidental to items and services specified in the Contract.

Item # 1: Approval of Price Increase

This amendment serves as confirmation that Cobb County Government has approved an average price increase of 3.78% on the total product line for materials listed under Garland/DBS, Inc.'s current Manufacturer's Price Lists. This increase will be retroactive to February 2, 2017.
Prices for roofing supplies and services, waterproofing, and related products and services (Attachment B) currently posted on the US Communities website will remain unchanged. Barring any unforeseen changes in market conditions, all prices will remain firm through December 31, 2017.

Item # 2: Product Line Addition

This amendment serves as confirmation that Cobb County Government has approved the addition of a line of water proofing products supplied by Urethane Polymers International, a Garland Industries subsidiary. UPI products listed on the revised price proposal sheet will be available under this Master Agreement and prices shall remain firm through December 31, 2017.

ACCEPTED - The above listed terms and conditions of this Amendment are satisfactory and are hereby accepted.

OWNER

Cobb County Board of Commissioners
100 Cherokee Street
Marietta, Georgia 30090

Signed: Joe Tommie

Title: Purchasing Director

Date: 5/24/2017

CONTRACTOR

Garland/DBS, Inc.
3800 East 91th Street
Cleveland, Ohio 44105

Signed: [signature]

Title: CONTROLLER & AUTHORIZED SIGNER

Date: 05/22/2017

CONTRACT AMENDMENT
Sealed Bid # 14-5903

Date of Amendment: August 4, 2015

Owner:	Cobb County Board of Commissioners. Cobb County, Georgia
Contractor:	Garland/DBS, Inc.
Project:	Roofing Supplies and Services, Waterproofing and Related Products and Services

Current Contract Term: January 1, 2014 to December 31, 2017

This action amends the current contract dated September 22, 2014, for Sealed Bid # 14-5903. It is valid when signed by both the Owner and Contractor. The signature of the Contractor indicates his agreement herewith, including any adjustments in the contract pricing, contract term, or contract scope. This price and payment constitutes full compensation for all costs in connection with and incidental to items and services specified in the Contract.

Item # 1: Approval of Price Increase

This amendment serves as confirmation that Cobb County Government has approved an average price increase of 1.3% on the total product line for materials listed under Garland/DBS, Inc.'s Manufacturer's Price Lists. This increase will be retroactive to May 1, 2015.
Prices for roofing supplies and services, waterproofing, and related products and services (Attachment B) currently posted on the U.S. Communities website will remain unchanged. Barring any unforeseen changes in market conditions, all prices will remain firm through December 31, 2016.

ACCEPTED - The above listed terms and conditions of this Amendment are satisfactory and are hereby accepted.

OWNER

Cobb County Board of Commissioners
100 Cherokee Street
Marietta, Georgia 30090

Signed: Joe Tommie

Title: Purchasing Director

Date: 08/06/2015

CONTRACTOR

Garland/DBS, Inc.
3800 East 91th Street
Cleveland, Ohio 44105

Signed:

Title: FRANK PERDICHIZZI CONTROLLER + AUTHORIZED SIGNER

Date: 08/05/15

CONTRACT AMENDMENT
Sealed Bid # 14-5903

Date of Amendment: April 6, 2015

Owner:	Cobb County Board of Commissioners. Cobb County, Georgia
Contractor:	Garland/DBS, Inc.
Project:	Roofing Supplies and Services, Waterproofing and Related Products and Services

Current Contract Term: January 1, 2014 to December 31, 2017

This action amends the current contract dated September 22, 2014, for Sealed Bid # 14-5903. It is valid when signed by both the Owner and Contractor. The signature of the Contractor indicates his agreement herewith, including any adjustments in the contract pricing, contract term, or contract scope. This price and payment constitutes full compensation for all costs in connection with and incidental to items and services specified in the Contract.

Item # 1: Verification of Contract Scope – Waterproofing and Related Products and Services

This amendment serves as confirmation that Waterproofing and Related Products and Services were solicited under the original contract scope for Bid # 14-5903. Materials related to waterproofing and related services were listed in the Pricing section (Attachment B) of the solicitation document and Garland/DBS, Inc. provided unit prices for these items in their bid response. It was the intent of Bid # 14-5903 to include these items so that Cobb County, GA and other governmental entities could utilize the contract for roofing related waterproofing projects, as well as, interior and exterior building stand-alone waterproofing projects.

ACCEPTED - The above listed terms and conditions of this Amendment are satisfactory and are hereby accepted.

OWNER

Cobb County Board of Commissioners
100 Cherokee Street
Marietta, Georgia 30090

Signed: Joe Tommie

Title: Purchasing Director

Date: 4/07/2015

CONTRACTOR

Garland/DBS, Inc.
3800 East 91th Street
Cleveland, Ohio 44105

Signed: [signature]

Title: CONTROLLER+ FRANK A. PERCIACIANTE AUTHORIZED SIGNER

Date: 04/07/2015

Ypsilanti Community Schools

1885 Packard Rd.

Ypsilanti, MI 48197

SUBJECT: Ypsilanti Community Schools – 2019 Roof Work

Addendum / Clarification – Appendix A

Q: Does Estabrook site currently have irrigation?

A: No.

Q: Will we be reusing walk-way pads at Estabrook?

A: Existing walk-way pads in good condition shall remain and receive top coat. The Base Bid should allot of replacing a quantity of (50) damaged/deteriorated walk-way pads as well.

Q: What work is to be completed on the expansion joints at Estabrook?

A: Expansion joints, specifically the seams, are to receive 6" coverstrip of cured EPDM. A top coat of the expansion joint is required as well.

Q: Will new pipe supports be required at West Elementary?

A: New, composite pipe supports will be required only for those areas which do not already have them. All existing wood pipe supports are to be replaced.

Q: What are the existing roof components at West Elementary?

A: Tectum decking / Vapor Barrier / Polyisocyanurate Insulation / EPDM

Q: What perimeter edge detail will be used at West Elementary?

A: A 20-gague, raised metal edge is to be installed at drip-edge details.

Q: Will new lead and sumped drains be required at West Elementary?

A: Yes, new lead and sumps which extend passed the lead tie-in will be required for internal drains.

Clarifications:

1. New pitch pans will be required for all mechanical equipment support lines to replace existing failed rubber boots.
2. Edge metal color to be "Dark Bronze."
3. Bid/Performance Bonds and costs associated with them will be provided by Garland/DBS, Inc.
4. Section A2 of West Elementary currently has 2" of polyisocyanurate insulation. A new nailer and gutter work will be required to match the new roof line of 4" polyisocyanurate insulation.

ROOF REPLACEMENT SPECIFICATIONS

ROOF PROJECT 2019

Estabrook Elementary (Site #1)
West Middle School (Site #2)

Note:

Pre-Bid Meeting:

Site #1
Wednesday, Dec. 19th, 2018 @ 10AM
Estabrook Elementary
1555 West Cross St.
Ypsilanti, MI 48198

Site #2
Immediately following Site #1
West Middle School
105 N. Mansfield St.
Ypsilanti, MI 48197

Bids Due:

Tuesday, January 8th, 2019 @ 5PM
Garland/DBS, Inc.
DBSBids@GarlandInd.com

Electronic bids, titled "Ypsilanti Public Schools 2019 Roof Project" to be submitted to:

Garland/DBS, Inc. at DBSBids@GarlandInd.com

SECTION 00 10 00 .001

SUMMARY OF WORK

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Attached SUMMARY OF WORK, INTENT OF THE SPECIFICATIONS, PROTECTION, HOUSEKEEPING, forms a component part of this section.

1.2 SUMMARY OF WORK: Estabrook Elementary - Restoration – Base Bid

A. Remove areas of wet insulation as identified in the infrared roof scan map, down to the metal decking. Replace in kind with polyisocyanurate insulation, ½" recovery board and cured 60 mil membrane; making permanent tie-ins surrounding the effected area. The Base Bid for this restoration should include a minimum of 500 sq. ft. of replacement. Additional wet insulation found, during installation, shall be replaced at the predetermined bid price provided on the Bid Form.

B. Repair any existing ridges, splits, punctures or tears to the existing membrane roofing where necessary.

C. Remove/Replace two areas of negative slope with properly tapered insulation to promote positive drainage.

D. Roof surface and flashings to be cleaned using power washer (2,000 psi) and 10% SimpleGreen or TSP solution. Soft bristle brooms will be used to remove areas of heavy dirt, debris, oil and scale. Contractors should anticipate a minimum of two cleanings prior to a final rinse.

E. Install Uni-Bond self-adhering seam tape to existing field seams, flashing base and roof penetration transitions (90 degrees) throughout.

F. Apply base coat of elastomeric coating at a rate of two gallons per square over self-adhering seam tape through the field and flashings.

G. Apply top coat of elastomeric coating at a rate of two gallons per square over all roof sections, including previously areas which received the base coat.

H. Clean up all debris and damage done to grounds, building and roof top (if any). Charcoal filters to be utilized at intakes the duration of the project.

I. Provide 2-year workmanship warranty.

J. Manufacturer direct warranty to be provided to owner upon completion.

1.3 SUMMARY OF WORK: West Elementary – Replacement – Sections A2 & A3

A. Cut and remove existing mechanically attached membrane, leaving insulation in place.

B. Adhere ½" Securock recovery board per wind up-lift calculations in Type IV, steep-slope hot bitumen adhesive.

C. Sump all drains using tapered insulation ¼:12 to an (8') diameter to promote positive drainage.

D. Install fiberglass/polyester reinforced modified base sheet and SBS modified smooth cap sheet throughout the field of the roof in Type IV hot bitumen adhesive. Install in a shingle fashion from low to high point of the roof slope to promote positive drainage.

E. Install fiberglass/polyester modified base sheet and modified mineral cap sheet to all flashings in specified trowel-grade mastic. Three-course all vertical flashing seams with aluminized mastic and reinforcement.

F. Install new lead at all soil/heat stacks, including targets at the base.

G. Install reglet-mounted and surface-mounted counter flashings where detailed. Additional masonry joint cuts may be required to provide adequate flashing heights.

H. Apply specified primer over field modified cap sheet.

I. Apply cold-process, polymer modified flood coat at specified rate and embed pea-gravel throughout field.

J. Attached new 20-gauge steel metal coping caps to match existing color where necessary.

K. Apply two coats of aluminized coating to all exposed mineral-surfaced flashings and roof-top penetrations.

L. Clean up all debris and damage done to grounds, building and roof top (if any). Charcoal filters to be utilized at intakes the duration of the project.

M. Provide 2-year workmanship warranty.

N. Manufacturer direct warranty to be provided to owner upon completion.

1.4 SUMMARY OF WORK: West Elementary – Replacement – Sections A1 & G

A. Remove existing membrane and insulation down to tectum decking.

B. Salvage existing nailable base sheet where possible.

C. Mechanically fasten two layers of 2" polyisocyanurate insulation, staggering joints throughout.

D. Adhere ½" Securock recovery board per wind up-lift calculations in Type IV, steep-slope hot bitumen adhesive.

E. Sump all drains using tapered insulation ¼:12 to an (8') diameter to promote positive drainage.

F. Install fiberglass/polyester reinforced modified base sheet and SBS modified smooth cap sheet throughout the field of the roof in Type IV hot bitumen adhesive. Install in a shingle fashion from low to high point of the roof slope to promote positive drainage.

G. Install fiberglass/polyester modified base sheet and modified mineral cap sheet to all flashings in specified trowel-grade mastic. Three-course all vertical flashing seams with aluminized mastic and reinforcement.

H. Install new lead at all soil/heat stacks, including targets at the base.

I. Install reglet-mounted and surface-mounted counter flashings where detailed. Additional masonry joint cuts may be required to provide adequate flashing heights.

J. Apply specified primer over field modified cap sheet.

K. Apply cold-process, polymer modified flood coat at specified rate and embed pea-gravel throughout field.

L. Attached new 20-gauge steel metal coping caps to match existing color where necessary.

M. Apply two coats of aluminized coating to all exposed mineral-surfaced flashings and roof-top penetrations.

N. Clean up all debris and damage done to grounds, building and roof top (if any). Charcoal filters to be utilized at intakes the duration of the project.

O. Provide 2-year workmanship warranty.

P. Manufacturer direct warranty to be provided to owner upon completion.

1.5 LIQUIDATED DAMAGES

A. Work shall begin on June 15th, 2019, or as agreed upon by all parties.

B. All work as required in these specifications and drawings shall be completed by August 5th, 2019, or as agreed upon by all parties.

C. Unless work is hampered by long period of inclement weather, by due proof of material unavailability, or by strike, the Owner will assess a penalty in the amount of $300.00 a day for each day beyond the agreed completion date.

1.6 INTENT OF THE SPECIFICATIONS

A. The intent of these specifications is to describe the material and methods of construction required for the performance of the work. In general, it is intended that the drawings shall delineate the detailed extent of the work. When there is a discrepancy between drawings, referenced specifications, and standards and this specification, this specification shall govern.

1.7 PROTECTION

A. The contractor shall use every available precaution to provide for the safety of the property owner, visitors to the site, and all connected with the work under the Contract.

B. All existing facilities both above and below ground shall be protected and maintained free of damage. Existing facilities shall remain operating during the period of construction unless otherwise permitted. All access roadways must remain open to traffic unless otherwise permitted.

C. Barricades shall be erected to fence off all construction areas from operations personnel.

D. Safety Requirements:

1. All application, material handling, and associated equipment shall conform to and be operated in conformance with OSHA safety requirements.

2. Comply with federal, state, and local and owner fire and safety requirements.

3. Advise owner whenever work is expected to be hazardous to owner employees and/or operations.

4. Maintain a crewman as a floor guard whenever roof decking is being repaired or replaced and whenever any roofing is being removed.

5. Maintain proper fire extinguisher within easy access whenever power tools, roofing kettles, and torches are being used. A MINIMUM OF A 2 HOUR FIRE WATER SHALL BE STRICTLY ADHERED TO WHENEVER PROPANE TORCHES ARE IN USE.

6. ALL SAFETY REQUIREMENTS OF THE BUILDING OWNER MUST BE FOLLOWED. NO EXCEPTIONS WILL BE PERMITTED. SAFETY ORIENTATION MEETING REQUIRED PRIOR TO PERFORMING ANY WORK.

1.8 Bid Result Protests:

A. Bids can only be protested by bidding contractors. Manufacturers, suppliers and or subcontractors are prohibited from filing a formal bid protest.

B. Any contractor that desires to protest the bid results can do so by putting up the amount of their bid bond for this project. If the protesting contractor prevails, the bid bond amount will be returned upon the completion of the protest and findings. Should the protesting contractor fail to prove the protest to the satisfaction of the Owner and the Owners Representative, the value of the bid bond will be retained by the owner to pay for the additional research and cost for the delay of the project.

1.9 HOUSEKEEPING

A. Keep materials neat and orderly.

B. Remove scrap, waste and debris from the project area.

C. Maintenance of clean conditions while work is in progress and cleanup when work is completed shall be inn strict accordance with the "General Conditions" of this contract.

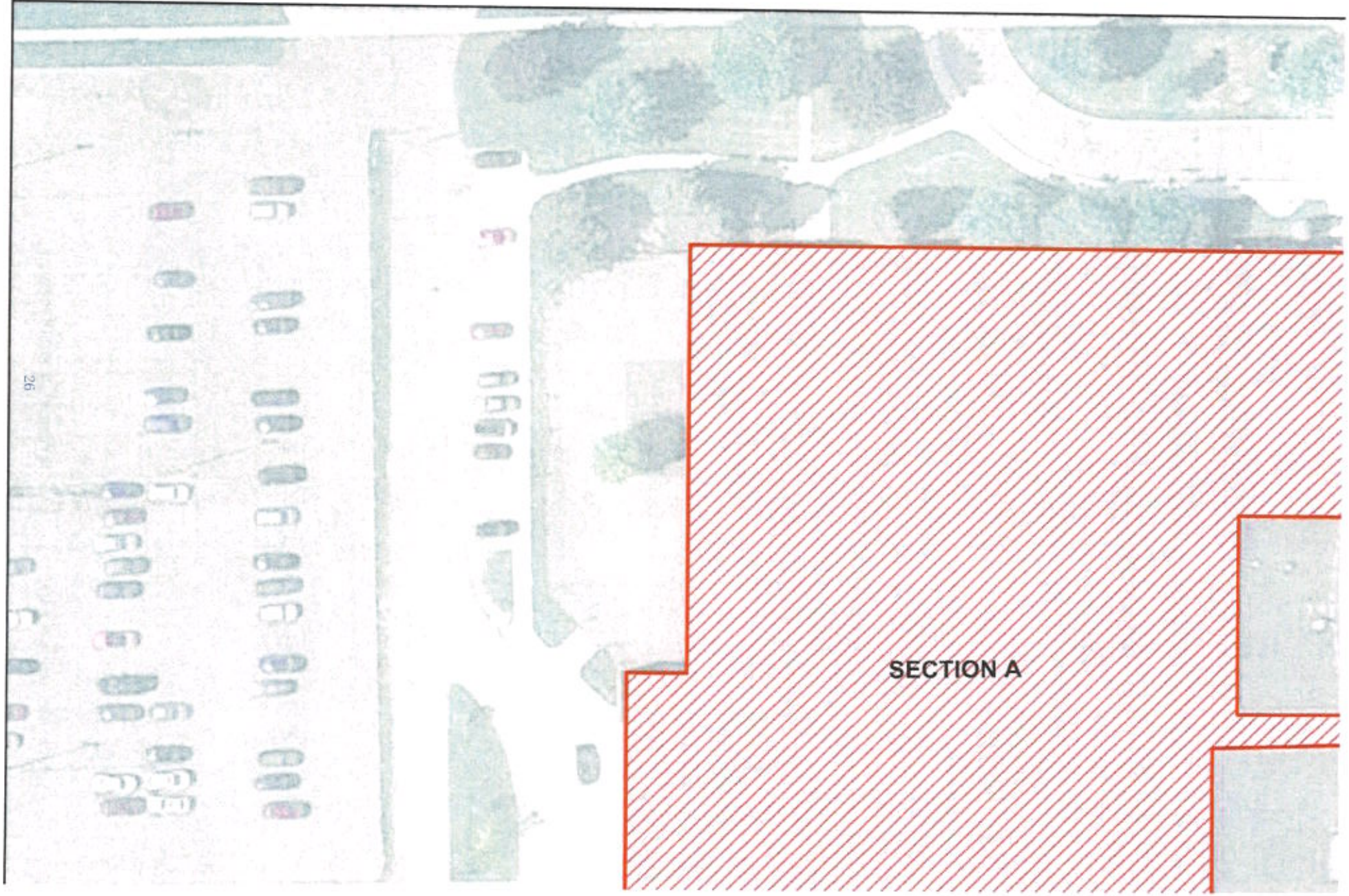
D. Fire protection during construction.

E. Follow all requirements established by the building owner.

END OF SECTION

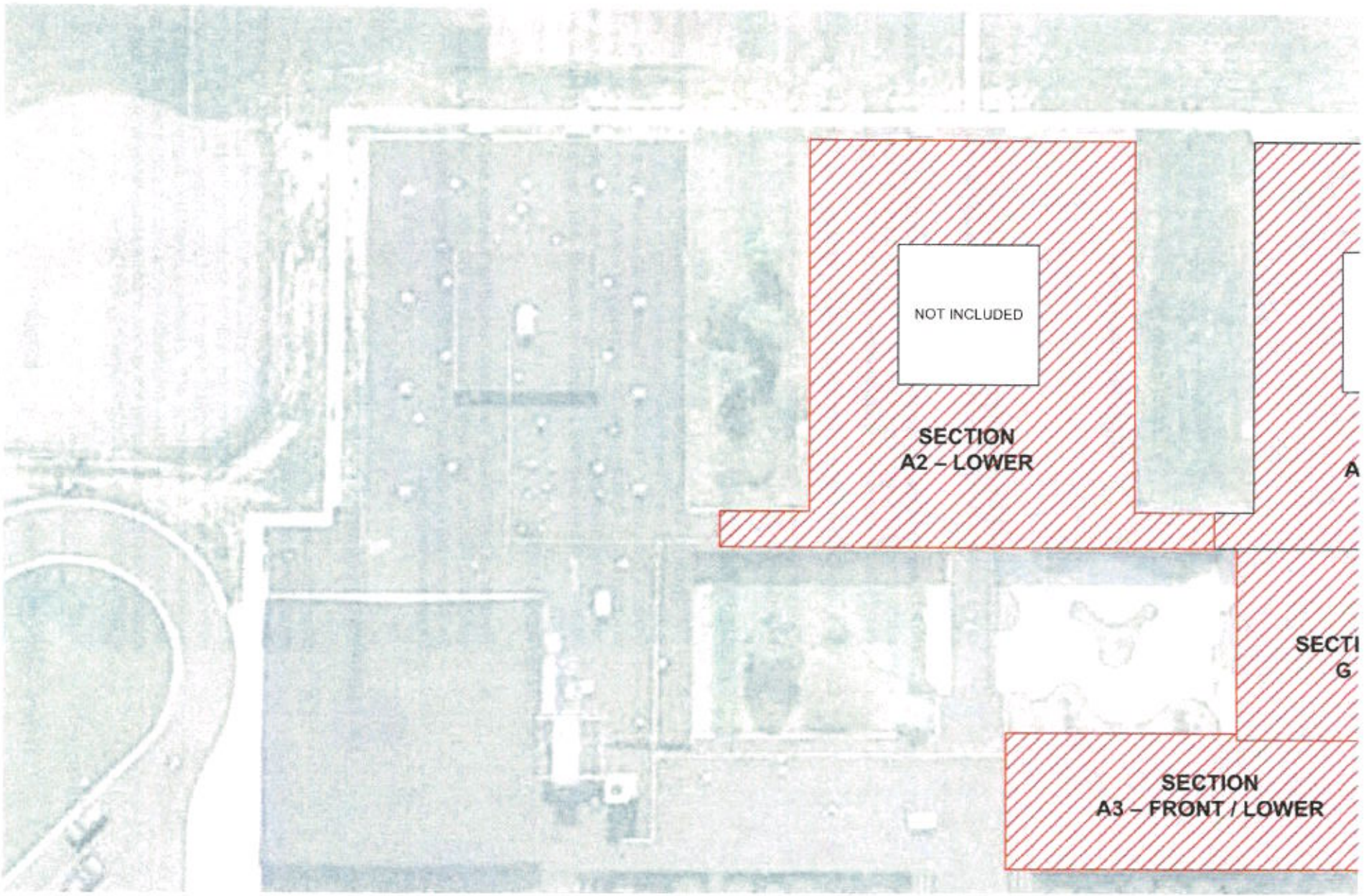
AUNITY SCHOOLS

NTI, MI



YPSILANTI COMMUNITY SCHOOLS

YPSILANTI, MI



SECTION 00 72 00

GENERAL CONDITIONS

PART 1 GENERAL

1.1 DEFINITIONS

A. The contract document consists of the AGREEMENT, the GENERAL CONDITIONS of the contract, the DRAWINGS and the SPECIFICATIONS, including all revisions hereto.

B. The Owner, the Contractor and the Owner's Representative shall be indicated as such throughout these documents. The term Contractor as used herein shall designate the successful bidder to whom the roof contract is awarded.

C. The term Owner shall be understood to be the Ypsilanti Community School District.

D. The term Owner's Representative shall be understood to mean the representative of the primary material manufacturer.

1.2 OWNER'S REPRESENTATIVE STATUS

A. The Owner's Representative shall have general Rights of Inspection of the work and is the agent of the Owner in all matters pertaining to the work as provided in the Contract Documents. The Owner's Representative has the authority to stop work whenever such stoppage may be necessary to ensure the proper execution of the contract and shall have authority to reject any and all materials, whether worked or unworked, if such materials are not in accordance with the plans and specifications.

1.3 CONDTION OF SITE

A. The bidders shall visit the site before submitting their bids and determine the field conditions affecting their work. In considering the bids, the Owner will assume that the bidders are aware of all items, pertinent to their work and have made allowance for same in their bids.

1.4 VERIFICATION OF DIMENSIONS AND ELEVATIONS

A. Dimensions and elevations indicated on the drawings in reference to existing structures or utilities are the best available data but are not guaranteed by the Owner's Representative and the Owner's Representative will not be responsible for their accuracy. Before bidding on any paperwork dependent upon the data involved, the Contractor shall field check and verify all dimensions, grades, lines, levels or other conditions of limitations at the site to avoid construction errors. If any work is performed by the Contractor or any of his/her subcontractors prior to adequate verification or applicable data, any resultant extra cost for adjustment of work as required to conform to existing limitations, shall be assumed by the Contractor without reimbursement or compensation by the Owner.

1.5 PROTECTION OF OWNER'S OPERATIONS

A. The Contractor shall erect such barriers, tarpaulins, doors, etc., as may be necessary to protect the Owner's operations while work is in progress. Any such openings that are essential to carrying on the work shall be securely closed by the Contractor when not in use to protect the Owner's operations.

1.6 PROTECTION OF WORK AND PROPERTY

A. The Contractor shall maintain adequate protection of all his/her work from damage and shall protect the Owner's and adjacent property from injury or loss arising from this contract. He/she shall provide and maintain at all times any danger signs, guards and/or obstructions necessary to protect the public and his/her workmen from any dangers inherent with or created by the work in progress. He/she shall hold the Owner harmless from any loss arising due to injury or accident to the public or his/her workmen, or from theft of materials stored at the job site. All materials will be stored in locations other than on roof surfaces except as necessary and shall then be placed on plywood or other type of material to protect the roof surface at all times.

B. Before starting any work, the Contractor shall protect all grounds, copings, paving and exterior of all buildings where work will be performed.

C. In those areas where materials and/or hot asphalt will be raised to the roof area, a protective covering shall be placed from the base of the wall extending up and over the top edge of the roof. This coverage shall be wide enough to assure that the exterior walls do not become stained or soiled during roofing operations.

D. Any areas of the building or grounds which have become stained or damaged in any way shall be repaired or replaced by the Contractor prior to the final inspections. The method of repair used must be acceptable to both the Owner and the Owner's Representative.

1.7 MATERIAL STORAGE AND CLEAN-UP

A. The Contractor shall keep the premises free from rubbish at all times and shall arrange his/her material storage so as not to interfere with the Owner's operations. At the completion of the job, all the unused material and rubbish shall be removed from the site. The ground shall be raked clean and the building shall be broom cleaned. If the Contractor refuses at any time to remove his/her debris from the premises, or to keep the working area clean, such cleaning will be completed by the Owner and deducted from the balance due the Contractor.

B. The Contractor shall also remove drippage of bitumen or adhesive from all walls, windows, floors, ladders and finished surfaces. Failure to do so will result in the work being done by others and the cost shall be deducted from the balance due the Contractor.

C. Materials must be delivered with manufacturer's label in tact and legible. Labels must be affixed to the outside of the package stating the type of product, name and address of the manufacturer. All materials shall be stored and protected against weather, vandalism, and theft. Any materials found to be damaged or missing shall be replaced by the Contractor at no cost to the Owner.

1.8 INSPECTION OF WORK

A. Where the drawings or specifications require the inspection and approval of any work in progress by the Owner's Representative, the Contractor shall give that Representative ample notice to allow for scheduling the inspection, which shall be made promptly to avoid delay of work. If work has progressed without the required inspections or approval by the Representative, it shall be uncovered for inspection at the Contractor's expense.

B. Uncovering of work not originally inspected, or uncovering questioned work may be ordered by the Owner's Representative and it shall be done by the Contractor. If examination proves such work to be incorrectly done or not done in accordance with the plans and specifications, the Contractor shall bear all cost of the reexamination. If the work is proven correctly installed, all such expense shall be born by the Owner.

1.9 INSPECTION OF WORK IN PROGRESS AND UPON COMPLETION

A. If directed by the Owner's Representative, the Contractor shall cut not more than four (4) cores, of approximately 200 square inches each, from every newly constructed roof area, in order to establish the amount of materials used per square foot, and shall restore all such areas to sound and watertight conditions as prior to the core testing.

B. In the event that such core cuts disclose any deficiency in materials, or soundness of construction, the Contractor shall, at his/her own expense, apply additional materials or otherwise correct the deficiencies to the satisfaction of the Owner's Representative.

C. Noncompliance with the terms of this specification and ensuing contract can result in either the cancellation of the contract, or complete replacement of the defective areas at the Contractor's expense. In the event of cancellation, the Owner will not be obligated to compensate the Contractor for any work undertaken in a defective manner

D. Damages caused by water infiltration resulting from the failure of the Contractor to secure each day's work in a weather tight manner, will be corrected at the Contractor's expense. Included as damages will be all labor costs incurred by the Owner as a result of such water infiltration.

E. The Owner will require the Owner's Representative to examine the work in progress, as well as upon completion, in order to ascertain the extent to which the materials and procedures conform to the requirements of these specifications and to the published instructions of the Manufacturer.

F. The authorized Owner's Representative shall be responsible for:
   1. Keeping the Owner informed on a periodic basis as to the progress and quality of the work;
   2. Calling to the attention of the Contractor those matters he/she considers to be in violation of the contract requirements;
   3. Reporting to the Owner any failure or refusal of the Contractor to correct unacceptable practices;
   4. Conducting preliminary and subsequent job-site meetings with the Contractor's official job representative;
   5. Supervising the taking of test cuts, and the restoration of such areas;
   6. Rendering any other inspection services which the Owner may designate; and

7. Certifying, after completion of the work, the extent to which the Contractor has complied with these specifications as well as to the published instructions of the Manufacturing Company.

G. The presence and activities of the Owner's Representative shall in no way relieve the Contractor of his/her contractual responsibilities.

1.10 MISCELLANEOUS UTILITIES

A. Electrical power will be furnished by the Owner for small tools only. All connections to the electrical system will be furnished by the Contractor.

B. Water for concrete, mortar, washing and drinking purposes will be furnished by the Owner. Any connections to the water system shall be completed by the Contractor.

C. At the completion of the work, or when the above connections are no longer required, the Contractor shall remove all connections and leave the facilities in a condition at least as satisfactory as prior to the commencement of his/her work.

D. Toilet facilities will be provided by the Contractor. The Contractor will be responsible for supplying a portable toilet on the job-site. The Contractor's personnel are not permitted to enter the building without proper authorization from the Owner or Owner's Representative.

1.11 CHANGES OR EXTRA WORK

A. The Owner may, without invalidating the original contract, order such changes or additions as may from time to time be deemed desirable. In so doing, the contract price shall be adjusted, as stated below, with all work being done under the conditions of the original contract except for such adjustments in extension of time as may be acceptable to the Owner. The value of such extra work shall be determined in one of the following ways:
   1. By firm adjustment;
   2. By cost plus with a guaranteed maximum;
   3. By cost with a fixed fee; or
   4. By unit cost.

B. If agreement is reached that the extra cost shall be handled as per methods 2, 3, or 4, the Contractor shall keep and compile a correct amount of the cost together with such vouchers, etc., as may be necessary to substantiate same for presentation to the Owner. The Owner's Representative shall have authority to make minor job changes or additions as may be necessary to expedite the job providing such changes do not involve additional material cost. No major change or addition shall be made except upon receipt by the Contractor of a signed order from the Owner authorizing such a change. No claims for an extra to the contract price shall be valid unless so authorized.

C. All work covered by unit prices submitted by the Contractor in his/her proposal must be covered by a written work order. The Owner's Representative will prepare the work order in triplicate covering the quantity of work and the total cost of the work. The work order which will be written at the end of each day, will be signed by the Owner's Representative and the Contractor's foreman and/or superintendent.

1.12 CORRECTION OF WORK PRIOR TO FINAL PAYMENT

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

1.13 CORRECTION OF WORK AFTER FINAL PAYMENT

A. The Contractor shall guarantee all materials and workmanship for two (2) years from date of final payment of the contract by the Owner. Any defects which may arise during this period shall be promptly repaired by the Contractor including any damage done to the Owner's property due to such defects.

1.14 DEDUCTION FOR UNCORRECTED WORK

A. If the Owner deems it unacceptable to have the Contractor correct work which has been incorrectly done, a deduction from the contract price shall be agreed upon therefore. Such a deduction from the contract price shall in no way affect the Contractor's responsibility for defects which may occur nor his/her ability for correcting them, and damage caused by them.

1.15 LIENS

A. The Contractor shall, if required by the Owner, furnish him/her with a release in full of all liens arising out of this contract or in lieu thereof, and receipts in full for all materials and labor on the job. In either case, the Contractor shall furnish an affidavit that the liens or receipts include all the labor and material for which a lien could be filed. In lieu of the above, the Contractor may at his/her option furnish a bond to indemnify the Owner against all hazard of liens. Neither part nor final payment shall in any way release the Contractor from the above obligation and in the event that part or full payment has been made and any lien remains undischarged, the Contractor shall refund to the Owner the necessary funds to discharge such a lien including all cost and attorney's fees.

1.16 JOB CONDITIONS

A. All surfaces to be covered shall be smooth, dry, and free from dirt, debris, and foreign material before any of this work is installed. Pumping equipment shall be located on the ground at a safe distance from building; the location being subject to the approval of the Owner. The Contractor shall be responsible for guarding against fires, and shall provide suitable fire extinguishers conveniently located at the site. Competent operators shall be in attendance at all times equipment is in use. Materials shall be stored neatly in areas designated by the Owner and dispersed so as to present a minimum fire hazard. Loads placed on the roof at any point shall not exceed the safe load for which the roof is designed.

B. There is NO SMOKING allowed inside any buildings and the Contractor shall be responsible for enforcement of this job rule at all times with his/her personnel.

C. The Contractor should be aware of Owner's property when tearing off the existing roof. This is required for removal of dirt, silt, debris, roof membrane and insulation from the roof surface in order to preserve the ecology, eliminate unsightly conditions and protect building faces. Specific locations will be discussed at the pre-bid conference.

D. Rolled Roofing Materials: All rolled roofing materials must be stored standing on end on a pallet or otherwise raised off of the roof. The materials are to be covered in a proper manner to assure that they will not become wet prior to application. Any materials that become wet or damaged must be removed from the job-site and replaced at the Contractor's expense.

E. Asphalt Kettle: Placement of the kettle shall be in a position so as not to interfere with the ongoing operations of the Owner. The asphalt to be used must be placed on a protective covering of some type until it is raised to the roof. A minimum of two (2) fire extinguishers and "Fire Out" must be adjacent to the kettle.

F. Ladders: Any ladders used on this project must be in good condition. The ladder must also be secured at the roof line at all times while in use. All ladders must be O.S.H.A. approved.

G. No drugs or alcoholic beverages are permitted on the grounds.

H. The Contractor shall place necessary barriers and/or protection around or under all work areas where his/her operations involve risk of injury to plant.

I. The Contractor will also protect the building structure from damage in the process of the job. In the event that damage does occur to any property or equipment, or the Owner's work in process, notification must be made within two (2) working days of the incidents to the Owner and Owner's Representative.

J. During the progress of the job, if waste material and rubbish are found or damage resulting from the Contractor's operations is found, or the Contractor does not comply with the requirement by keeping the premises free of accumulations and correct the damage, it shall be the Owner's prerogative to hire personnel to do so; and the cost of this work will be deducted from the balance due the Contractor.

K. Existing roof top equipment walls, windows, etc. shall be completely protected by masking or other effective methods. Any mastics or asphalt must be cleaned off metal surfaces.

L. The Contractor is responsible for protecting all materials from the elements. If any material, such as insulation, becomes wet, it cannot be installed and must be replaced at the Contractor's expense. NOTE: Insulation and rolled roofing materials must be covered with waterproof tarps at the end of each work day. Plastic wrappers supplied by the insulation manufacturer are not acceptable substitutes for tarps. The Owner's Representative will reject any covering method material which does not adequately protect roofing materials.

M. Anyone guilty of willful destruction or unlawful removal of company property will be dismissed from the job and is subject to prosecution by law.

N. Any lawns damaged by Contractor vehicles will be restored with a stand of grass at the Contractor's expense. Any damaged pavements will likewise be restored at the Contractor's expense.

O. The Contractor must verify that all materials can be installed to accommodate the building design, pertinent codes and regulations, and the manufacturer's current recommendations.

P. The Contractor will ensure that all substances are clean, dry, sound, smooth, and free of dirt, debris, and other contamination before any materials are supplied.

Q. Any isolated areas that must be torn off and replaced will be built-up to the height of the existing roof prior to the installation of the new roofing membrane system.

1.17 WORKMANSHIP

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

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

1.18 INSULATION

A. Insulation shall have accurate dimensional stability so as to properly conform to the surfaces of the roof, cants, curbs, pipes, etc. Joints between boards shall be tight and insulation shall be held back ½" from vertical surfaces and sumps. Insulation shall be protected from the weather at all times. No more insulation shall be laid than can be completely covered with roof materials on the same day. A base sheet shall not be considered as a proper weather barrier.

B. Insulation that becomes wet during or after installation shall be removed and replaced with dry insulation. If roofing is in place, the roofing shall be also replaced. All replacing work shall be done at no added cost to the Owner.

1.19 ROOF DECK

A. Contractor shall notify the Owner or Owner's Representative of any unforeseen areas of wet insulation. Where the damage is serious and extensive, it will be the Owner's prerogative to authorize removal and replacement of deteriorated roofing, insulation and repair of the vapor barrier, if present. Where damage to the roof deck is found, the Contractor shall furnish the Owner with a unit price for removal and replacement of the damaged deck.

1.20 SAFETY

A. Contractor shall conform to requirements as designated by the United States Federal Government (O.S.H.A.). Contractor shall abide by all regulations as outlined in the O.S.H.A. handbook and shall have a handbook on location at all times.

B. Contractors hereby acknowledged that they and their workers have undergone Safety Training and shall at all times act in compliance with all NRCA recommended safety compliance rules and regulations.

1.21 INSURANCE

A. The following standard indemnity agreement and minimum insurance requirements are incorporated in the Specifications for all work performed by Contractors for the

Owner, its affiliated and associated organizations or subsidiaries, hereinafter referred to as Owner.

1. THE CONTRACTOR AGREES TO INDEMNITY AND SAVE THE OWNER AND OWNER'S REPRESENTATIVE HARMLESS FROM AND AGAINST ANY AND ALL COSTS, LOSS AND EXPENSE, LIABILITY DAMAGES, OR CLAIMS FOR DAMAGES, INCLUDING COST FOR DEFENDING ANY ACTION, ON ACCOUNT OF ANY INJURY TO PERSONS (INCLUDING DEATH) OR DAMAGE TO OR DESTRUCTION OF PROPERTY OF THE OWNER, ARISING OR RESULTING FROM THE WORK PROVIDED FOR OR PERFORMED, OR FROM ANY ACT, OMISSION, OR NEGLIGENCE OF THE CONTRACTOR, SUBCONTRACTOR AND THEIR AGENTS OR EMPLOYEES. THE FOREGOING PROVISIONS SHALL IN NO WAY BE DEEMED RELEASED, WAIVED OR MODIFIED IN ANY RESPECT BY REASON OF ANY INSURANCE OR SURETY PROVIDED BY THE CONTRACTOR.
2. All sub-contractors are required to file Certificated of Insurance properly completed and signed by an authorized insurance company representative before their work commences on the job or job site. No monies will be paid until the acceptable certificates are on file with the Contractor. Such certificates shall provide that there will be no cancellation, reduction or modification of coverage without thirty (30) days prior written notice to the Contractor. In the event such certificates are not provided to the Contractor prior commencement of work, Contractor's failure to demand such certificates shall not be deemed a waiver of Subcontractor's requirement to obtain the subject insurance.
3. The Contractor shall provide and maintain standard fire, extended coverage perils, vandalism and malicious mischief insurance to protect the interest of both the Contractor and the Owner for materials brought into the job or stored on the premises. Such insurance shall be for 100% of the insurable value of the work to be performed including all items of labor and materials incorporated therein, materials stored at the job-site to be used in completing the work, and such other supplies and equipment incidental to the work as are not owned or rented by the Contractor, the cost of which are included in the direct cost of the work. This insurance shall not cover any tools, derricks, machinery, tar buckets, ladders, engines, workmen's quarters, boilers, pumps, wagons, scaffolds, forms, compressors, shanties, or other items owned or rented by the Contractor, the cost of which is not included in the direct cost of the work.
4. In accordance with Section (1.21), the Contractor and subcontractor(s) shall maintain the following insurance:
    a. Workmen's Compensation and Employer's Liability Insurance affording:
        1) Protection under the Workmen's Compensation Law of the States in which the work is performed; and
        2) Employer's Liability protection subject to a minimum limit of $100,000.
    b. Comprehensive General Liability Insurance in amounts not less than:
        1) Personal Injury: $1,000,000 per person
        (including bodily injury) $1,000,000 per occurrence
        2) Property Damage: $1,000,000 per occurrence
    c. Comprehensive Automobile Liability Insurance in the following minimum amounts:
        1) Bodily Injury $1,000,000 per person
        $1,000,000 per occurrence
        2) Property Damage $1,000,000 per occurrence
    d. This insurance shall:

1) Include coverage for the liability assumed by the Contractor under this section (section 1.21.A.1) (Indemnity);
2) Includes coverage for:
   a) Premises, operations and mobile equipment liability
   b) Completed operations and products liability
   c) Contractual liability insuring the obligation assumed by the subcontractor in this agreement.
   d) Liability which subcontractor may incur as a result of the operations, acts or omissions of subcontractors, suppliers or material men and their agents or employees; and
   e) Automobile liability including owned, non-owned and hired automobile.

e. All coverage will be on an occurrence basis and on a form acceptable to the Contractor.
   1) Include completed operation coverage which is to be kept in force by the Contractor for a period of not less than one year after completion of the work provided for or performed under these specifications;
   2) Not be subject to any of the special property damage liability exclusions commonly referred to as the exclusions pertaining to blasting or explosion, collapse or structural damage and underground property;
   3) Not be subject to any exclusion of property used by the insured or property in the case, custody or control of the insured or property as to which the insured for any purpose is exercising physical control; and
   4) The Certificate of Insurance furnished by the Contractor shall show specific reference that each of the foregoing items have been provided for.

5. The Certificates of Insurance furnished by the Contractor as evidence of the Insurance maintained by him shall include a clause obligating the Insurer to give the Owner thirty (30) days prior written notice or cancellation of any material change in the insurance.

1.22 WORK HOURS AND DAYS

A. When the Contract is awarded, the Contractor will contact the Owner's Representative to arrange the work schedule and the hours of the day that the workmen may be on the building. The job is to be bid under the assumption that all work will be performed on a straight time basis.

1.23 COMPLIANCE WITH LAWS

A. The Contractor shall give notices, pay all fees, permits and comply with all laws, ordinances, rules and regulations bearing on the conduct of work.

1.24 OWNER'S RULES

A. The Contractor and all his/her personnel/agent(s) shall abide by all rules created by the Owner. The Contractor must contact the Owner's Representative for specific information regarding the rules governing all operations of the project.

B. The Contractor shall properly notify all employees of conditions relating to roof areas with very poor condition and which will be worked on. After such notification, the

Contractor must take all necessary precautions to ensure the safety of his/her employees as well as the building personnel.

C. THE CONTRACTOR SHALL "HOLD HARMLESS" THE MATERIAL MANUFACTURER, AGAINST ANY LITIGATION ARISING FROM ANY ACCIDENTS DURING THE COURSE OF THE CONTRACT.

1.25 SAFETY AND ECOLOGY

A. The Contractor(s) shall conform to the requirements as designated by the United States Federal Governments (e.g., O.S.H.A).

1.26 ANTI-DISCRIMINATION IN EMPLOYMENT

A. Contractors and subcontractors shall not discriminate against any employees or applicant for employment, to be employed in performance of his/her contract, with respect to his/her hire, tenure, terms, conditions or privileges of employment because of his/her race, color, gender, sexual preference, religion, national origin, or ancestry.

PART 2 INSTRUCTIONS TO BIDDERS

2.1 WITHDRAWAL OR MODIFICATION OF BID

A. Any Bidder may withdraw his/her bid at any time before the scheduled closing date of the bid by appearing in person or by sending an authorized representative of the Bidder. An appointment should first be scheduled by calling the Owner's Representative. The Bidder or his/her representative shall be asked to sign, in writing that the bid was returned to him/her/ after the withdrawal from the contract, the Bidding Contractor may not resubmit them.

2.2 BID OPENINGS

A. Bids will be competitively solicited and electronically submitted to Garland DBS, Inc. for tallying and distribution.

2.3 QUESTIONS

A. Technical questions regarding this bid can be directed to:
   a. Brad Konvolinka at (734) 770-4343

B. If the Contractor feels a conflict exists between what is considered good roofing practice and these specifications, he/she shall state in writing all objections prior to submitting quotations.

C. It is the Contractor's responsibility, during the course of the work, to bring to the attention of the Owner's Representative any defective membrane, insulation or deck discovered which has not been previously identified.

2.4 RESPONSIBILITY FOR MEASUREMENTS AND QUANTITIES

A. The Bidding Contractors shall be solely responsible for all accuracy of all measurements and for estimating the material required to satisfy these specifications.

2.5 DISCREPANCIES AND ADDENDA

A. Should a Bidder find any discrepancies in the Drawings and Specifications, or should he be in doubt as to their meaning, he/she shall notify the Owner's Representative at once, who will send a written Addendum to all Bidders concerned. Oral instructions or decisions, unless confirmed by Addenda, will not be considered valid, legal or binding.

B. No extras will be authorized because of the Contractor's failure to include work called for in the Addenda in his/her bid.

C. It shall be the responsibility of all Bidders to call to the Owner's Representative's attention at the pre-bid meeting, any discrepancies which may exist between or with any of the contract documents, or any questions which may arise as to their true meaning.

D. Modifications to the specifications (if necessary) will be followed by an addendum; no verbal discussions or agreements shall be recognized.

2.6 COMPETENCY OF THE BIDDERS

A. To enable the Owner to evaluate the competency and financial responsibility of a Contractor, the low Bidder shall, when requested by the Owner, furnish the information indicated in Section 5.0 below, entitled Contractor's Qualification Statement, which shall be sworn to under oath by him/her or by a properly authorized representative of the Bidder.

2.7 DISQUALIFICATION OF BIDDERS

A. Any one or more of the following causes may be considered sufficient for the disqualification of a Bidder and the rejection of his/her bid(s):
   1. Failure to attend the pre-bid meeting;
   2. Evidence of collusion among Bidders;
   3. Lack of responsibility as revealed by either financial, experience or equipment statements, as submitted;
   4. Lack of expertise as shown by past work, and judged from the standpoint of workmanship and performance history;
   5. Uncompleted work under other contracts which, in the judgment of the Owner, might hinder or prevent the prompt completion of additional work if awarded; or
   6. Being in arrears on existing contracts, in litigation with an Owner, or having defaulted on a previous contract.

2.8 NOTICE OF AWARD

A. The award of this contract for the work is contingent upon receipt of an acceptable bid. Any part of or all bids may be rejected. All bids shall be good for a period of sixty (60) days following the date the bids are due. The contract shall be deemed as having been awarded when the formal notice of acceptance of his/her proposal has been duly served upon the intended awardee by an authorized officer or agent of the Owner.

2.9 WARRANTY

A. A written warranty which will commence from date of acceptance by Manufacturer must be supplied with the roof installation. This warranty will cover all defects in workmanship and materials. Damages caused by storm, vandalism and other trades are not included in the warranty. This warranty shall be from the manufacturer (See further, Statement of Policy).

B. A two (s) year workmanship warranty is required from the Contractor for all remedial maintenance done under the terms of this contract.

2.10 START AND COMPLETION DATE

A. Work shall begin on June 15th, 2019, or as agreed upon by all parties.

B. All work as required in these specifications and drawings shall be completed by August 5th, 2019, or as agreed upon by all parties.

C. Unless work is hampered by long period of inclement weather, by due proof of material unavailability, or by strike, the Owner will assess a penalty in the amount of $300.00 a day for each day beyond the agreed completion date.

D. The Contractor is responsible for supplying trained workmen in proper numbers and for scheduling and laying out his/her work, so that it will be started and completed in a professional manner within the time period indicated on his/her Proposal form.

E. If the Contractor sets equipment onto the job-site without commencing work immediately, the action will be considered "Spiking the job" which is unacceptable and will be considered a breach of contract by the Contractor; thereby, the contract will be terminated and the Contractor at no cost to the Owner, must remove his/her equipment and possessions from the job-site upon notification by the Owner.

2.11 PAYMENT

A. Payment for materials shall only be made after the material has been delivered to the job-site. An invoice for the material must be presented to the Owner for payment. Materials are not to be delivered to the job-site until the project is ready to begin. The Contractor must provide a release of lien from the Material Manufacturer. Subsequent requests for payment can made monthly. Final payment for the project will be made following completion, after final inspection has been made and an invoice presented to the Owner. A 10% retainer shall be held until delivery of the warranty.

B. When the job in progress is interrupted for two (2) weeks or longer by causes beyond the Contractor's control such as a strike, weather, acts of God, etc., the Owner agrees to pay, upon request of the Contractor, a price equivalent to the percentage of work completed at that time. Regular progress payments shall be made for labor and/or materials.

C. Each invoice shall be accompanied by a detailed estimate of the amounts and values of labor expended and materials purchased up to the last day of the preceding month. The amount of the invoice shall not exceed ninety percent (90%) of the labor and material values estimated for the preceding month.

D. Such payments shall be viewed by both parties as progress payments and shall not in any way relieve the Contractor of performance obligations under this contract, nor

shall such payments be viewed as approval or acceptance of work performed under this contract.

E. Final payment shall be withheld until all provisions of the specifications are met, including all necessary clean-up, and the Owner receives written verification of completion.

F. Upon completion of the job, the Owner, the Owner's Representative, and the Contractor will make final inspection of the work done, and the Owner's Representative if requested by Owner's Representative.

G. All payments for material used in the execution of this contract can be made by a check issued jointly, payable to the Contractor and Owner's Representative will sign a completion slip authorizing final payment.

H. If requested by the Owner and/or Owner's Representative, the Contractor shall provide a Letter of Credit from the bank to secure payment to material supplier.

I. If requested by the Owner and/or Owner's Representative, a certified check shall be paid by the Contractor to material supplied prior to release of order.

J. If requested by the Owner and/or Owner's Representative, a certified check shall be paid by the Contractor to material supplier via common carrier upon receipt of delivery.

K. Contractor shall have a pre-approved line of credit from the material supplier.

L. Final payment shall be made to the Contractor no later than thirty (30) days after job approval, providing the Contractor submits waivers of lien with his/her final invoice indicating that all suppliers have been paid.

2.12 PERFORMANCE AND PAYMENT BOND

A. The successful Contractor will be responsible for securing a performance and payment bond from an acceptable bonding company. The cost of the bond will be paid directly by the Contractor. Contractor has to identify his/her bonding company and agent, submitting this documentation with his/her proposal. Note: See "Instruction to Bidders."

B. Financial documentation prescribed by the Owner to ensure that the Contractor is financially sound and capable of supporting the project to its conclusion.

C. If the successful Bidder is incorporated, an affidavit authorizing persons to sign for the Corporation. This should be in the form of minutes of the meeting of the Board of Directors, authorizing person or persons to sign for this contract work and indicating a quorum being present.

2.13 TERMINATION BY THE OWNER FOR CAUSE

A. The Owner may terminate the contract and finish the work by whatever reasonable method he/she deems expedient if the Contractor:
   1. Persistently or repeatedly refuses to supply specified materials or to provide enough skilled workers to ensure the project will be completed within the time period indicated on his/her Proposal form;

2. Fails to make payment to sub-contractors and/or suppliers for labor and materials as stipulated in the contract documents; and
3. Is guilty of substantial breach of a provision of the contract documents.

B. When the Owner terminates the contract for any of the above reasons, the Contractor shall not be entitled to receive further payment until the work is finished. If the unpaid balance of the contract sum exceeds the cost of finishing the work, it will be paid to the Contractor. If the cost to finish the work exceeds the unpaid balance, the Contractor shall pay the difference to the Owner.

2.14 COMPLIANCE WITH LAWS

A. The Contractor shall give notices, pay all fees, permits and comply with all laws, ordinances, rules and regulations bearing on the conduct of work.

PART 3 --- CONTRACTOR'S INSTRUCTIONS

3.1 TAXES

A. Contractor must comply with all state, federal and local taxes. The Contractor shall accept sole and exclusive responsibility for any and all state federal taxes with respect to Social Security, old age benefits, unemployment benefits, withholding taxes and sales taxes.

3.2 CONTRACTOR'S LICENSE

A. All pertinent state and local licenses will be required.

3.3 QUALIFICATION OF BIDDERS

A. Provide State of Michigan pre-certification forms.

3.4 BUILDING PERMITS

A. The acquisition of the applicable permits and associated costs to obtain said permits will the responsibility of the successful Contractor.

3.5 JOB COORDINATION

A. Contractor is responsible for daily communication with the Owner or Owner's Representative relating to areas of roof work in order that the Owner may adequately protect tenant's personal belongings, and the people themselves against possible damage or injury. Contractor is also responsible for policing and protecting areas involving removal and replacement of roof projections, defective decking or other work involving deck penetration.

B. Twenty-four hours prior to starting of the project and/or delivery of materials, the Contractor shall notify _____Ypsilanti Community School District_____.

3.6 CLEAN-UP

A. Accumulated debris shall be removed periodically to assure maximum safety and sanitation at all times. At completion of work, the Contractor shall remove all excess material and debris from the site and leave all roof surfaces free from accumulations

of dirt, debris and other extraneous materials. The Contractor shall also remove any and all drippage of bituminous materials from the face of the buildings, floor, window, ladders and other finished surfaces.

3.7 SUPERINTENDENT

A. The Contractor shall keep a competent superintendent, satisfactory to the Owner and Owner's Representative, on the job at all times when work is in progress. The superintendent shall not be changed without notifying the Owner and the Owner's Representative unless the superintendent ceases to be in the employ of the Contractor.

B. The superintendent shall represent the Contractor in his/her absence and all directions and instructions given to the superintendent shall be as binding as if given directly to the Contractor.

C. The superintendent shall be responsible for the conduct of all the Contractor's employees on the premises and shall promptly take necessary measures to correct any abuses called to his/her attention by the Owner.

3.8 INSPECTIONS

A. Before any material applications are made, the Owner or his/her representative and the material supplier representative shall be available to ensure a complete understanding of the specification.

B. The accepted Material Manufacturer will have a representative on site a minimum of three (3) times a week to verify compliance with the specifications, answer questions that may arise and provide on-going inspection services.

C. A final inspection shall be conducted by Owner, Contractor, and the Owner's Representative upon being notified of completion of specified work and clean-up.

PART 4 – STATEMENT OF POLICY

4.1 ENGINEERING

A. In addition to high-quality products, the Material Manufacturer provides recommendations and/or specifications for the proper installation of its material. However, the Material Manufacturer does not, nor does its representative, practice engineering or architecture. The Material Manufacturer makes no judgments on, and hereby disclaim any responsibility for the soundness of any roof deck or other structural component of buildings upon which the Material Manufacturer products are applied, and further recommend a structural engineer to examine the deck conditions. Re-roofing or Ballasted Roofing Systems will require certification from a structural engineer that the structure will support the proposed additional weight.

4.2 GUARANTEES

A. A roofing guarantee is available for review from the Material manufacturer for the roofing systems published in these specifications. The guarantee will be issued only upon completion of all the guarantee requirements by an approved Contractor. Such guarantees cannot be altered or amended, nor may any other warranties, guarantees or representations be made by an agent or employee f the Material Manufacturer unless such alteration, amendment or additional representation is issued in writing

and is signed by a duly authorized officer of the Maternal Manufacturer, and sealed with the Material Manufacturer seal. This guarantee does not cover cosmetic deficiencies. THE MATERIAL MANUFACTURER WIL NOT BE RESPONSIBLE FOR ANY DAMAGES TO THE BUILDING OR ITS CONTENTS OR ANY OTHER CONSEQUENTIAL DAMAGES, AND ITS RESPONSIBILITY IS LIMITED TO REPAIRING LEAKS. The Contractor will warranty the roof to the Material Manufacturer for a period of two (2) years. The Contractor will inspect the roof with the Owner's Representative 18 months after completion, and, at the Contractor's expense, correct any workmanship defects before the 24th month following completion of the project.

4.3 APPROVED CONTRACTORS

A. The roof systems must be applied only by those contractors who have received approval from the Material Manufacturer for such installations. No guarantees will be issued when installation has been performed by a non-approved contractor.

4.4 ROOFING SEQUENCE

A. Phase roofing is not acceptable. Any insulation or base layers laid in any one day must be covered with the properly installed roof system that same day. Failure to do so will void any warranties and no guarantee will be issued for the roofing system.

4.5 ACCEPTABILITY OF COMPLETED WORK

A. The acceptability of completed roofing work will be based on its conformance to the contract requirement. The Material Manufacturer is not obligated to accept non-conforming work, and such non-conforming work may be rejected. The rejected work shall be promptly replaced or corrected in a manner and by methods approved by the Material Manufacturer at the Contractor's expense. The Material Manufacturer will instruct the Contractor's foreman and work crew on the proper methods of installation of the roofing system, and will follow-up on a regular basis to inspect the work being done. Any deficiencies from the specified work noted by the Material Manufacturer will be immediately reported to the Owner, along with recommended corrective actions necessary. The Material Manufacturer will not act in a supervisory capacity, and will not be responsible for the Contractor's errors or omissions.

4.6 ENGINEERING AND ROOF DECK

A. The Material Manufacturer nor its representatives, practice engineering nor architecture. It makes no judgments on, and hereby disclaim any responsibility for the soundness of any roof deck or other structural component of buildings upon which its products are applied. Re-roofing and general building structuring require certification from a structural engineer that the structure will support the proposed additional weight. In addition, the Contractor must notify the Owner or his/her representative on the job-site of any unforeseen areas of wet insulation. Where the damage is serious and extensive, it will be the Owner's prerogative to authorize removal and replacement of deteriorated roofing, insulation and repair of the vapor barrier if present. Where damage to the roof deck is found, the Contractor shall furnish the Owner with a unit price for removal and replacement of the damaged deck.

4.7 ASBESTOS IDENTIFICATION

A. The Material Manufacturer routinely conducts roof surveys and inspections in order to provide recommendations and/or specifications for the use of its products. However, the MATERIALS MANUFACTURER IS NOT, NOR ARE ITS REPRESENTATIVES, CERTIFIED TO IDENTIFY, HANDLE OR MONITOR ASBESTOS IN ROOFING, DECKING OR INSULATION. THEREFORE, IT MAKES NO JUDGMENTS ON AND HEREBY DISCLAIMS ANY RESPONSIBILITY FOR IDENTIFYING, HANDLING OR MONITORING ASBESTOS. If a building owner suspects that an asbestos condition exists on or under the roof area in question, Material Manufacturer can recommend licensed laboratories and technicians that can identify, remove, dispose of, and monitor the project.

4.8 ASBESTOS LIMITATIONS

A. The Owner has been informed, acknowledges and agrees that Material Manufacturer is not engaged in the business of identifying, abating, encapsulating or removing asbestos or asbestos containing materials from the work site and has not agreed to do so herein.

B. IN CONSIDERATION OF THE PROVISION HEREOF, THE OWNER HEREBY AGREES TO INDEMNIFY, DEFEND AND HOLD HARMLESS THE MATERIAL MANUFACTURER, ITS OWNERS, OFFICERS, DIRECTORS, EMPLOYEES AND AGENTS, INCLUDING THE ENGINEER FROM AND AGAINST ANY AND ALL LIABILITIES, DAMAGES, LOSSES AND EXPENSES (INCLUDING BUT NOT LIMITED TO ATTORNEY'S FEES) ARISING OUT OF, OR RELATING TO, ANY CLAIMS, DEMANDS, OR CAUSES OF ACTION OF ANY KIND,, ATTRIBUTABLE TO, ARISING OUT OF, OR RELATING TO THE PRESENCE OF ASBESTOS OR ASBESTOS-CONTAINING MATERIALS ON OR AT THE WORK SITE AND/OR THE ABATEMENT, ENCAPSULATION AND/OR THE REMOVAL THEREOF.

4.9 MOLD LIMITATIONS

A. The Garland Company makes no representation or warranty, express, implied, or otherwise, regarding mold, fungi, rust, corrosion or other bacteria or organism. Neither shall Garland have any duty to identify, nor accept any responsibility or liability for any claims associated with mold, fungi, rust, corrosion or other bacteria or organism related claims.

PART 5 CONTRACTOR'S QUALIFICATION STATEMENT

The undersigned certified oath that the information provided herein is true and sufficiently complete so as not to be misleading.

Submitted to: _____

_____

_____

Submitted by (Firm Name):_____

Address: _____

_____

Principal Office Location_____

Qualification Statement Submitted for- Project Name

_____

_____

Type of Work:

Site Preparation_____

General Construction_____

Roofing_____

Plumbing_____

HVAC_____

Sprinkler_____

Electrical_____

Other_____

Electrical_____

(File separate form for each classification of work)

Organization:

Please provide the following information concerning your organization:

Type of Entity:

Corporation_____

Partnership_____

Individual_____

Other_____

Name of Principal, Owners or Partners

Years of Service

Name Position with Organization

_____

_____

_____

_____

Number of years this organization has been in business_____

Have members of this organization operated under former names/business?

Yes_____ No_____

If "yes," list name, type of entity and names of principal, owners or partners.

_____

_____

_____

Provide a brief description of the general type of construction the firm performs. Please indicate for this project the work you intend to subcontract or perform.

Perform Subcontract

Earth Work_____ _____

Concrete Work_____ _____

Masonry Work_____ _____

Structural Work_____ _____

Roofing Work_____ _____

Sprinkler_____ _____

Plumbing_____ _____

HVAC_____ _____

Electrical_____ _____

Experience

Please list the type and number of educational projects your firm has constructed which were subject to the Owner Guidelines and other Ohio regulatory agency construction requirements:

Type Number

New Construction – Primary _____

New Construction – Secondary_____

Renovations – Primary_____

Renovations – Secondary_____

Please list on a separate sheet marked "Appendix A" the major construction projects your organization has in progress providing the name of project, owner, architect, contract amount, bonding company, insurance carrier, percentage complete and scheduled completion date.

Please list on a separate sheet marked "Appendix B" the major projects your organization has completed in the past five years, giving the name of project, owner, architect, contract amount, bonding company, date of completion and percentage of the cost of the work performed with your own forces.

Insurance and Bonds

Please list names of current insurance carrier and number of projects insured by carrier:

_____

_____

_____

Please list names of bonding company/agent utilized for projects constructed during the last five years:

_____

_____

Claims and Suits

Has your organization ever failed to complete any construction work it has been awards? Yes___ No___

Within the last five years, has any officer or principal of your organization ever been an officer or principal of another organization when it failed to complete a construction contract? (If the answer is yes, please describe in full.) Yes____ No____

Has there been in the last ten years, or is there now pending or threatened, any litigation, arbitration, investigation, or governmental or regulatory proceeding involving claims in excess of $100,000 or requesting a declaratory judgment or injunctive relief with respect to the construction or operation of any building which your firm, its principals, predecessors or affiliates constructed? Yes____ No____

Are all city, county, state and Federal taxes of any type, including real estate, FICA and Workmen's Compensation paid to date? Yes___ No_____

Is there any potential claim, demand, litigation, arbitration, investigation, governmental proceeding or regulatory proceeding involving your firm, or its principals, predecessors or affiliates? Yes___ No____

If the answer to either of the preceding questions is "Yes," please describe in full in an attachment referred to in the preceding paragraphs, is there any litigation, arbitration, investigation or governmental or regulatory proceeding.

In addition to the litigation, arbitration, investigation, governmental proceeding or regulatory proceeding now pending or threatened to which your firm is or may be a party, or are you aware of any potential claim or demand, which might otherwise affect the capacity of your firm to perform with respect to your involvement with the Owner, whether or not it concerns other work which you have undertaken? If so, please describe in full. Yes____ No_____

Bankruptcy

Has your firm, its principals, predecessors, or affiliates been the subject of any proceeding under the federal bankruptcy laws or any other proceedings under state or federal law in which a court or government agency has assumed jurisdiction over any of the assets or business of your firm, its principals, predecessors or affiliates? If so, please identify the proceedings, the court or governmental body and the date such jurisdiction was assumed in an attachment. Yes___ No___

Change Order History

Describe each instance the last five (5) years where change orders applied for during construction amounted in the aggregate to more than five percent (5%) of the contract price for any building which your firm constructed, or in which actual construction costs exceeded the contract price by more than five percent (5%) in an attachment.

Financial Condition

Please attach your organizations' last two (2) years' financial statements including your latest balance sheet and income statement showing the following:

Current assets (e.g., cash, joint venture accounts, receivable, accrued income, deposits, materials inventory and prepaid expenses):

Net Fixed Assets:

Other Assets:

Current Liabilities (e.g., accounts payable, notes payable, accrued expenses, provision for income taxes, advances, accrued salaries and accrued payroll taxes): List all older than 60 days.

Other Liabilities (e.g., capital stock, authorized and outstanding shares per values, earned surplus and retained earnings):

Name and address of firm preparing attached financial statement and date thereof.

References

Please list below Trade References:

_____

_____

Please list below Bank References:

END OF SECTION

SECTION 01 43 33.75

ROOFING MANUFACTURER'S FIELD SERVICES

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including the Conditions of the Contract and Division 07 Specification Sections apply to this Section.

1.2 SUMMARY

A. Section includes Manufacturer's field services for roofing assemblies.

B. Related Sections:
1. Section 07 05 00 – Common Work Results for Thermal and Moisture Protection.

C. Related Work Specified Elsewhere:
1. Roofing Material: Section 07 52 00- Modified Bituminous Membrane Roofing.

1.3 REFERENCES

A. International building Code (current edition) or local authority building code.

B. American Society of Civil Engineers (ASCE): ASCE 7, Minimum Design Loads for Buildings and Other Structures.

C. Factory Mutual Global (FMG): Roof Assembly Classifications.

D. National Roofing Contractors Association (NRCA): Roofing and Waterproofing Manual.

E. American National Standards Institute and Single Ply Roofing Institute (ANSI/SPRI): ANSI/SPRI ES-1 Testing and Certification Listing of Shop Fabricated Edge Metal.

1.4 SUBMITTALS FOR REVIEW

A. Product Data: Provide manufacturer's technical product data for each type of roofing product specified. Include data substantiating that materials comply with specified requirements.

B. Specimen Warranty: Provide an unexecuted copy of the warranty specified for this Project, identifying the terms and conditions required of the Manufacturer and the Owner.

C. Roofing System Manufacture's Evaluation: Provide a comprehensive written assessment comparing available roofing solutions with validation of why the roofing system selection for the specific project is suitable and appropriate.

D. Roofing System Manufacturer's Report Form: Provide a copy of the report form utilized by the roofing system manufacturer for progress inspections to monitor installation and quality.

E. Online Reporting Capabilities: Provide a sample of the roofing system manufacturer's online roof inspection report as well as information about how long inspection reports are available to owner.

1.5 SUBMITTALS FOR INFORMATION

A. Manufacturer's Installation Instructions: Submit installation instructions and recommendations indicating special precautions required for installing the membrane.

B. Manufacturer's Certificate: Certify that roof system furnished is approved by Factory Mutual Global, Underwriters Laboratories, Warnock Hersey or approved third party testing facility in accordance with ASTM E108, Class A for external fire and meets local or nationally recognized building codes.

C. Manufacturer's Certificate: Certify that materials are manufactured in the United States and conform to requirements specified herein, are chemically and physically compatible with each other, and are suitable for inclusion within the total roof system specified herein.

D. Manufacturer's Certificate: Submit a certified copy of the roofing manufacturer's ISO 9001 compliance certificate.

E. Written certification from the roofing system manufacturer certifying the applicator is currently authorized for the installation of the specified roof system.

F. Design Loads: Submit copy of manufacturer's minimum design load calculations according to ASCE 7, Method 2 for Components and Cladding. In no case shall the design loads be taken to be less than those detailed in Design and Performance Criteria article of this specification.

G. Qualification data for firms and individuals identified in Quality Assurance Article below.

H. Test Reports: Submit ANSI/SPRI ES-1 Testing and Certification Listing of Shop Fabricated Edge Metal Products.

I. Substitutions: Products proposed as equal to the products specified for this project shall meet all of the requirements in the appropriate Division 7 specifications and shall be submitted for consideration at least 7 days prior to the date that bids must be submitted.
   1. Proposals shall be accompanied by a copy of the manufacturer's standard specification Section. That specification Section shall be signed and sealed by a professional engineer licensed in the state in which the installation is to take place. Substitution requests containing specifications without licensed engineer certification shall be rejected for non-conformance.
   2. Manufacturer's checklist will be accompanied with any substitution to verify equal performance characteristics to those specified in Division 7 specification.
   3. The Owner's decision regarding substitutions will be considered final.

1.6 CONTRACT CLOSEOUT SUBMITTALS

A. Project Warranty: Provide specified warranty for the Project, executed by the authorized agent of the Manufacturer.

B. Roofing Maintenance Instructions: Provide a roof care and maintenance manual of manufacturer's recommendations for maintenance of installed roofing systems.

C. Insurance Certification: Assist Owner in preparation and submittal of roof installation acceptance certification as may be necessary in connection with fire and extended coverage insurance on roofing and associated work.

D. Inspection Logs: Copy of inspection reports as performed by the manufacturer shall be submitted at project closeout and include photographic documentation of installation progress, weather conditions, and personnel on the project at the time of every inspection.

1.7 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this Section with not less than [12] years documented experience and have ISO 9001 certification.

B. Installer Qualifications: Company specializing in specified roofing installation with not less than [5] years experience and authorized by roofing system manufacturer as qualified to install manufacturer's roofing materials.

C. Installer's Field Supervision: Maintain a full-time Supervisor/Foreman on job site during all phases of roofing work while roofing work is in progress. Maintain proper supervision of workmen.

D. Maintain a copy of the roof plans, details, and specifications in the possession of the Supervisor/Foreman and on the roof at all times.

E. Source Limitations: Obtain all primary components of roof system from a single manufacturer. Secondary products that are required shall be recommended and approved in writing by the roofing system Manufacturer.
   1. The manufacturer providing the roofing system warranty must verify that they manufacture a minimum of 75% of the products utilized in the roofing system of this project. Products that are private labeled shall not be considered as manufactured by the roofing system supplier.
   2. Upon request of the Architect or Owner, submit Manufacturer's written approval of secondary components in list form, signed by an authorized agent of the Manufacturer.

F. Source Quality Control: Manufacturer shall have in place a documented, standardized quality control program such as ISO-9001.

1.8 PRE-INSTALLATION CONFERENCE

A. Pre-Installation Roofing Conference: Convene a pre-roofing conference approximately two (2) weeks before scheduled commencement of roofing system installation and associated work.

B. Require attendance of installer of each component of associated work: installers of deck or substrate construction to receive roofing work: installers of rooftop units and other work in and around roofing that must precede or follow roofing work (including

mechanical work if any): architect and/or engineer: owner: roofing system manufacturer's full time employee: and other representatives directly concerned with performance of the Work, including (where applicable) owner's insurers, testing agencies and governing authorities. Objectives of conference include:

1. Review foreseeable methods and procedures related to roofing work, including set up and mobilization areas for stored material and work area.
2. Tour representative areas of roofing substrates (decks), inspect and discuss condition of substrate, roof drains, curbs, penetrations and other preparatory work performed by others.
3. Review structural loading limitations of deck and inspect deck for loss of flatness and for required attachment.
4. Review roofing system requirements (drawings, specifications and other contract documents).
5. Review required submittals both completed and yet to be completed.
6. Review and finalize construction schedule related to roofing work and verify availability of materials, installer's personnel, equipment and facilities needed to make progress and avoid delays.
7. Review required inspection, testing, certifying and material usage accounting procedures.
8. Review weather and forecasted weather conditions and procedures for coping with unfavorable conditions, including possibility of temporary roofing (if not a mandatory requirement).
9. Record discussion of conference including decisions and agreements (or disagreements) reached and furnish a copy of record to each party attending. If substantial disagreements exist at conclusion of conference, determine how disagreements will be resolved and set date for reconvening conference.

C. The Owner's Representative will designate one of the conference participants to record the proceedings and promptly distribute them to the participants for record.

D. The intent of the conference is to resolve issues affecting the installation and performance of roofing work. Do not proceed with roofing work until such issues are resolved to the satisfaction of the owner and [architect and/or engineer] of record. This shall not be construed as interference with the progress of Work on the part of the owner or [architect or engineer] of Record.

1.9 MANUFACTURER'S INSPECTIONS

A. When the Project is in progress, a full-time employee of the roofing system manufacturer must provide the following:

1. Report progress and quality of the work as observed. Progress reports must be published to an online system as referenced in Section 1.4.
2. Provide periodic (3, 4, or 5 days per week) roofing installation inspections: Inspections must include; photographic documentation of work in-progress and written statements of compliance with details/shop drawings.
3. Report to the owner, architect and/or engineer in writing any failure or refusal of the contractor to correct unacceptable practices called to the contractor's attention.
4. Confirm after project completion that the manufacturer has observed no application procedures in conflict with the specifications other than those that may have been previously reported and corrected.

1.10 WARRANTY

A. Upon completion of installation, and acceptance by the owner and architect and/or engineer, the manufacturer will supply to the owner the specified warranty.

B. Installer will submit a (2)- year workmanship warranty to the membrane manufacturer with a copy directly to the owner.

C. The roofing system manufacturer must have been in continuous business operation for a period of time at least as long as the length of the roof system warranty provided for this project.

1.11 DESIGN AND PERFORMANCE CRITERIA

A. Uniform Wind Uplift Load Capacity (required for each roof section)
   1. Installed roof system shall withstand negative (uplift) design wind loading pressures complying with the following criteria.
      Attachment shall be installed exactly as given in Part 3.

B. Snow Load: 25 psf.

C. Live Load: 20 psf, or not to exceed original building design.

D. Dead Load: Loading of the roof structure, due to tear off of existing and/or installation of new roofing materials shall not exceed the present loading due to weight of the existing roofing system by more than 1 psf.

E. Drainage Calculations: Drainage shall be calculated for all roof areas to determine suitability of all plumbing and gutter accommodations are sized appropriately to manage storm water runoff.

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION

3.1 EXECUTION, GENERAL

A. Comply with requirements of related Division 07 Section.

3.2 GENERAL INSTALLATION REQUIREMENTS

A. Cooperate with manufacturer, inspection and test agencies engaged or required to perform services in connection with installing the roof system.

B. Insurance/Code Compliance: Where required by code, install and test the roofing system to comply with governing regulation and specified insurance requirements.

3.3 FIELD QUALITY CONTROL

A. Roofing Manufacturer Representative shall perform field inspection as specified in Article titled: MANUFACTURER'S INSPECTIONS above. Inspections must include photographic documentation of installation progress, weather conditions, and personnel on the project at the time of inspection.

B. Correct defects or irregularities discovered during field inspection. Issues deemed defective must be re-inspected and determined suitable by the roofing manufacturer.

C. Require attendance of roofing materials manufacturers' representatives at site during installation of the roofing system. A copy of the specification shall also be on site at all times.

D. Frequent progress meetings shall be conducted during the performance of roof system installation and must be attended by the owner, architect or engineer, roofing system manufacturer's full time employee, and other representatives directly concerned with performance of the work.

3.4 FINAL INSPECTION

A. At the completion of the roofing installation and associated work, meet with contractor, architect or engineer, installer, installer of associated work, owner, roofing system manufacturer's representative, and other representatives directly concerned with performance of roofing system.

B. Walk roof surface areas of the building, inspect perimeter building edges as well as flashing of roof penetrations, walls, curbs and other equipment. List all items requiring correction or completion and furnish copy of list to each party in attendance.

C. Notify the owner upon completion of corrections.

D. The roofing system manufacturer reserves the right to request a thermographic scan of the roof during final inspection to determine if any damp or wet materials have been installed. The thermographic scan shall be provided by the roofing contractor.

E. If core cuts verify the presence of damp or wet materials, the roofing contractor shall be required to replace the damaged areas at his own expense.

F. Following the final inspection, provide written notice of acceptance of the installation from the roofing system manufacturer.

G. Immediately correct roof leakage during construction. If the contractor does not respond within twenty four (24) hours, the owner may exercise right to correct the Work under the terms of the Conditions of the Contract.

END OF SECTION

SECTION 07550
MODIFIED BITUMINOUS MEMBRANE ROOFING

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Hot Applied 2-Ply Asphalt Roofing (StressPly). (2.9) (3.5)

1.2 RELATED SECTIONS

A. Section 14333.75 – Roofing Manufacturer's Field Services

B. Section 7563 – Fluid Applied Roofing Restoration

1.3 REFERENCES

A. ASTM D 312 - Standard Specification for Asphalt used in Roofing.

B. ASTM D 451 - Standard Test Method for Sieve Analysis of Granular Mineral Surfacing for Asphalt Roofing Products.

C. ASTM D 1079 Standard Terminology Relating to Roofing, Waterproofing and Bituminous Materials.

D. ASTM D 1863 Standard Specification for Mineral Aggregate Used as a Protective Coating for Roofing.

E. ASTM D 2824 Standard Specification for Aluminum-Pigmented Asphalt Roof Coating.

F. ASTM D 4586 Standard Specification for Asphalt Roof Cement, Asbestos-Free.

G. ASTM D 4601 Standard Specification for Asphalt Coated Glass Fiber Base Sheet Used in Roofing.

H. ASTM D 5147 Standard Test Method for Sampling and Testing Modified Bituminous Sheet Materials.

I. ASTM D 6162 Standard Specification for Styrene Butadiene Styrene (SBS) Modified Bituminous Sheet Materials Using a Combination of Polyester and Glass Fiber Reinforcements.

J. ASTM E 108 - Standard Test Methods for Fire Test of Roof Coverings

K. National Roofing Contractors Association (NRCA): Roofing and Waterproofing Manual.

L. Sheet Metal and Air Conditioning Contractors National Association, Inc. (SMACNA) - Architectural Sheet Metal Manual.

M. Underwriters Laboratories, Inc. (UL): Fire Hazard Classifications.

N. ANSI-SPRI ES-1 Wind Design Standard for Edge Systems used with Low Slope Roofing Systems.

O. ASCE 7, Minimum Design Loads for Buildings and Other Structures

P. UL - Fire Resistance Directory.

Q. FM Approvals - Roof Coverings and/or RoofNav assembly database.

1.4 DESIGN / PERFORMANCE REQUIREMENTS

A. Perform work in accordance with all federal, state and local codes.

B. Exterior Fire Test Exposure: Roof system shall achieve a UL, FM or WH Class rating for roof slopes indicated on the Drawings as follows:
1. Underwriters Laboratory Class A Rating.

C. Design Requirements:
1. Uniform Wind Uplift Load Capacity
   a. Installed roof system shall withstand negative (uplift) design wind loading pressures complying with the following criteria.
      1) Design Code: ASCE 7, Method 2 for Components and Cladding.
      2) Importance Category:
         a) III.
      3) Importance Factor of:
         a) 1.15
      4) Wind Speed: 120 mph
      5) Ultimate Pullout Value: adhered system
      6) Exposure Category:
         a) B.
      7) Design Roof Height: 15 feet.
      8) Minimum Building Width: 100 feet.
      9) Roof Pitch: 1/4 :12.
      10) Roof Area Design Uplift Pressure:
         a) Reference Wind Up-Lift Calculations
2. Snow Load: 25 psf.
3. Live Load: 20 psf, or not to exceed original building design.
4. Dead Load:
   a. Installation of new roofing materials shall not exceed the dead load capacity of the existing roof structure.

D. Roof System membranes containing recycled or bio-based materials shall be third party certified through UL Environment.

1.5 SUBMITTALS

A. Submit under provisions of Section 01300.

B. 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 instructions.

C. Shop Drawings: Submit shop drawings including installation details of roofing, flashing, fastening, insulation and vapor barrier, including notation of roof slopes and fastening patterns of insulation and base modified bitumen membrane, prior to job start.

D. Design Pressure Calculations: Submit design pressure calculations for the roof area in accordance with ASCE 7 and local Building Code requirements. Include a roof system attachment analysis report, certifying the system's compliance with applicable wind load requirements before Work begins. Report shall be signed and sealed by a Professional Engineer registered in the State of the Project who has provided roof system attachment

analysis for not less than 5 consecutive years.

E. Recycled or Bio-Based Materials: Provide third party certification through UL Environment of roof System membranes containing recycled or bio based materials.

F. Verification Samples: For each modified bituminous membrane ply product specified, two samples, minimum size 6 inches (150 mm) square, representing actual product, color, and patterns.

G. Manufacturer's Certificates: Provide to certify products meet or exceed specified requirements.

H. Test Reports: Submit test reports, prepared by an independent testing agency, for all modified bituminous sheet roofing, indicating compliance with ASTM D5147.

I. Manufacturer's Fire Compliance Certificate: Certify that the roof system furnished is approved by Factory Mutual (FM), Underwritters Laboratories (UL), Warnock Hersey (WH) or approved third party testing facility in accordance with ASTM E108, Class A for external fire and meets local or nationally recognized building codes.

J. Closeout Submittals: Provide manufacturer's maintenance instructions that include recommendations for periodic inspection and maintenance of all completed roofing work. Provide product warranty executed by the manufacturer. Assist Owner in preparation and submittal of roof installation acceptance certification as may be necessary in connection with fire and extended coverage insurance on roofing and associated work.

1.6 QUALITY ASSURANCE

A. Perform Work in accordance with NRCA Roofing and Waterproofing Manual.

B. Manufacturer Qualifications: Company specializing in manufacturing products specified with documented ISO 9001 certification and minimum of twelve years of documented experience and must not have been in Chapter 11 bankruptcy during the last five years.

C. Installer Qualifications: Company specializing in performing Work of this section with minimum five years documented experience and a certified Pre-Approved Garland Contractor.

D. Installer's Field Supervision: Maintain a full-time Supervisor/Foreman on job site during all phases of roofing work while roofing work is in progress.

E. Product Certification: Provide manufacturer's certification that materials are manufactured in the United States and conform to requirements specified herein, are chemically and physically compatible with each other, and are suitable for inclusion within the total roof system specified herein.

F. Source Limitations: Obtain all components of roof system from a single manufacturer. Secondary products that are required shall be recommended and approved in writing by the roofing system Manufacturer. Upon request of the Architect or Owner, submit Manufacturer's written approval of secondary components in list form, signed by an authorized agent of the Manufacturer.

G. Litigation and settlements: provide a notarized statement from a corporate officer stating roofing system manufacturer has not settled litigation or paid fines to a public agency in excess of $20 million dollars.

1.7 PRE-INSTALLATION MEETINGS

A. Convene minimum two weeks prior to commencing Work of this section.

B. Review installation procedures and coordination required with related Work.

C. Inspect and make notes of job conditions prior to installation:
   1. Record minutes of the conference and provide copies to all parties present.
   2. Identify all outstanding issues in writing designating the responsible party for follow-up action and the timetable for completion.
   3. Installation of roofing system shall not begin until all outstanding issues are resolved to the satisfaction of the Owner.

1.8 DELIVERY, STORAGE, AND HANDLING

A. Deliver and store products in manufacturer's unopened packaging with labels intact until ready for installation.

B. Store all roofing materials in a dry place, on pallets or raised platforms, out of direct exposure to the elements until time of application. Store materials at least 4 inches above ground level and covered with "breathable" tarpaulins.

C. Stored in accordance with the instructions of the manufacturer prior to their application or installation. Store roll goods on end on a clean flat surface except store KEE-Stone FB 60 rolls flat on a clean flat surface. No wet or damaged materials will be used in the application.

D. Store at room temperature wherever possible, until immediately prior to installing the roll. During winter, store materials in a heated location with a 50-degree F (10-degree C) minimum temperature, removed only as needed for immediate use. Keep materials away from open flame or welding sparks.

E. Avoid stockpiling of materials on roofs without first obtaining acceptance from the Architect/Engineer.

F. Adhesive storage shall be between the range of above 50-degree F (10-degree C) and below 80-degree F (27-degree C). Area of storage shall be constructed for flammable storage.

1.9 COORDINATION

A. Coordinate Work with installing associated metal flashings as work of this section proceeds.

1.10 PROJECT CONDITIONS

A. 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.

1.11 WARRANTY

A. Upon completion of the work, provide the Manufacturer's written and signed NDL Warranty, warranting that, if a leak develops in the roof during the term of this warranty, due either to defective material or defective workmanship by the installing contractor, the manufacturer shall provide the Owner, at the Manufacturer's expense, with the labor and material necessary to return the defective area to a watertight condition.
   1. Warranty Period:
      a. 20 + 10 years from date of acceptance. Requires mid period inspection.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Acceptable Manufacturer: Garland Company, Inc. (The); 3800 E. 91st St., Cleveland, OH 44105. ASD. Toll Free: 800-321-9336. Phone: 216-641-7500. Fax: 216-641-0633. Web Site: www.garlandco.com.

B. Requests for substitutions will be considered in accordance with provisions of Section 01600.

C. The Products specified are intended and the Standard of Quality for the products required for this project. If other products are proposed the bidder must disclose in the bid the manufacturer and the products that they intend to use on the Project. If no manufacturer and products are listed, the bid may be accepted only with the use of products specified.
   1. Bidder will not be allowed to change materials after the bid opening date.
   2. If alternate products are included in the bid, the products must be equal to or exceed the products specified. Supporting technical data shall be submitted to the Owner for approval prior to acceptance.
   3. In making a request for substitution, the Bidder/Roofing Contractor represents that it has:
      a. Personally investigated the proposed product or method, and determined that it is equal or superior in all respects to that specified.
      b. Will provide the same guarantee for substitution as for the product and method specified.
      c. Will coordinate installation of accepted substitution in work, making such changes as may be required for work to be completed in all respects.
      d. Will waive all claims for additional cost related to substitution, which consequently become apparent.
      e. Cost data is complete and includes all related cost under his/her contract or other contracts, which may be affected by the substitution.
      f. Will reimburse the Owner for all redesign cost by the Designer for accommodation of the substitution.
   4. Owner reserves the right to be the final authority on the acceptance or rejection of any or all bids, proposed alternate roofing systems or materials that has met ALL specified requirement criteria.
   5. Failure to submit substitution package, or any portion thereof requested, will result in immediate disqualification and consideration for that particular contractors request for manufacturer substitution.

2.2 HOT APPLIED 2-PLY ASPHALT ROOFING - STRESSPLY, OPTIMAX, OR VERSIPLY

A. Base (Ply) Sheet: One ply bonded to the prepared substrate with Interply Adhesive:
   1. StressBase 80:

B. Modified Cap (Ply) Sheet: One ply bonded to the prepared substrate with Interply Adhesive.
   1. StressPly Plus:

C. Interply Adhesive: (1 and 2)
   1. Generic Type IV Asphalt:

D. Flashing Base Ply: One ply bonded to the prepared substrate with Interply Adhesive: except torch sheet.
   1. StressBase 80:

E. Flashing Cap (Ply) Sheet: One ply bonded to the prepared substrate with Interply Adhesive: except torch sheet.

1. StressPly Plus FR Mineral:

F. Flashing Ply Adhesive:
   1. Flashing Bond (not for use with KEE-Stone FB 60 Flashing):

G. Surfacing:
   1. Aggregate/Flood Coat
      a. Black-Knight/Black-Stallion Cold:
   2. Surface Coatings
      a. Garla-Brite:

PART 3 EXECUTION

3.1 EXAMINATION

A. Do not begin installation until substrates have been properly prepared.

B. Inspect and approve the deck condition, slopes and fastener backing if applicable, parapet walls, expansion joints, roof drains, stack vents, vent outlets, nailers and surfaces and elements.

C. Verify that work penetrating the roof deck, or which may otherwise affect the roofing, has been properly completed.

D. If substrate preparation and other conditions are the responsibility of another installer, notify Owner of unsatisfactory preparation before proceeding.

3.2 PREPARATION

A. General: Clean surfaces thoroughly prior to installation.
   1. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.
   2. Fill substrate surface voids that are greater than 1/4 inch wide with an acceptable fill material.
   3. Roof surface to receive roofing system shall be smooth, clean, free from loose gravel, dirt and debris, dry and structurally sound.
   4. Wherever necessary, all surfaces to receive roofing materials shall be power broom and vacuumed to remove debris and loose matter prior to starting work.
   5. Do not apply roofing during inclement weather. Do not apply roofing membrane to damp, frozen, dirty, or dusty surfaces.
   6. Fasteners and plates for fastening components mechanically to the substrate shall provide a minimum pull-out capacity of 300 lbs. (136 k) per fastener. Base or ply sheets attached with cap nails require a minimum pullout capacity of 40 lb. per nail.
   7. Prime decks where required, in accordance with requirements and recommendations of the primer and deck manufacturer.

B. Metal Deck: Metal deck shall be installed as specified in Section
   1. Fastening of the deck should comply with the anticipated live and dead loads pertaining to the building as well as applicable Code.
   2. Steel decks shall be minimum 22-gauge factory galvanized or zinc alloy coated for protection against corrosion.
   3. Suitable insulation shall be mechanically attached as recommended by the insulation manufacturer.
   4. Decks shall comply with the gauge and span requirements in the current Factory Mutual FM Approval Guide and be installed in accordance with Loss Prevention Data Sheet 1-28 or specific FM approval.
   5. When re-roofing over steel decks, surface corrosion shall be removed, and repairs to

severely corroded areas made. Loose or inadequately secured decking shall be fastened, and irreparable or otherwise defective decking shall be replaced.

3.3 INSTALLATION - GENERAL

A. Install modified bitumen membranes and flashings in accordance with manufacturer's instructions and with the recommendations provided by the National Roofing Contractors Association's Roofing & Waterproofing Manual, the Asphalt Roofing Manufacturers Association, and applicable codes.

B. General: Avoid installation of modified bitumen membranes at temperatures lower than 40-45 degrees F. When work at such temperatures unavoidable use the following precautions:
   1. Take extra care during cold weather installation and when ambient temperatures are affected by wind or humidity, to ensure adequate bonding is achieved between the surfaces to be joined. Use extra care at material seam welds and where adhesion of the applied product to the appropriately prepared substrate as the substrate can be affected by such temperature constraints as well.
   2. Unrolling of cold materials, under low ambient conditions must be avoided to prevent the likelihood of unnecessary stress cracking. Rolls must be at least 40 degrees F at the time of application. If the membrane roll becomes stiff or difficult to install, it must be replaced with roll from a heated storage area.

C. Commence installation of the roofing system at the lowest point of the roof (or roof area), working up the slope toward the highest point. Lap sheets shingle fashion so as to constantly shed water

D. All slopes greater than 2:12 require back-nailing to prevent slippage of the ply sheets. Use ring or spiral-shank 1 inch cap nails, or screws and plates at a rate of 1 fastener per ply (including the membrane) at each insulation stop. Place insulation stops at 16 ft o.c. for slopes less than 3:12 and 4 feet o.c. for slopes greater than 3:12. On non-insulated systems, nail each ply directly into the deck at the rate specified above. When slope exceeds 2:12, install all plies parallel to the slope (strapping) to facilitate backnailing. Install 4 additional fasteners at the upper edge of the membrane when strapping the plies.

3.4 INSTALLATION HOT APPLIED ROOF SYSTEM

A. Base/Felt Ply(s): Install base sheet or felt plies in twenty five (25) lbs (11.3kg) per square of bitumen shingled uniformly to achieve one or more plies over the entire prepared substrate. Shingle in direction of slope of roof to shed water on each area of roof. Do not step on base rolls until asphalt has cooled, fish mouths should be cut and patched.
   1. Lap ply sheet ends 8 inches (203 mm). Stagger end laps 2 inches (304mm) minimum.
   2. Install base flashing ply to all perimeter and projection details after membrane application.
   3. Extend plies 2 inches beyond top edges of cants at wall and projection bases.
   4. Install base flashing ply to all perimeter and projection details.
   5. Allow the one ply of base sheet to cure at least 30 minutes before installing the modified membrane. However, the modified membrane must be installed the same day as the base plies.

B. Modified Cap Ply(s): Solidly bond the modified membrane to the base layers with specified material at the rate of 25 to thirty 30 lbs. (11-13kg) per 100 square feet.
   1. Roll must push a puddle of hot material in front of it with material slightly visible at all side laps. Use care to eliminate air entrapment under the membrane. Exercise care during application to eliminate air entrapment under the membrane.
   2. Apply pressure to all seams to ensure that the laps are solidly bonded to substrate.
   3. Install subsequent rolls of modified membrane as above with a minimum of 4 inch (101 mm) side laps and 8 inch (203 mm) end laps. Stagger end laps. Apply

membrane in the same direction as the previous layers but stagger the laps so they do not coincide with the laps of the base layers.

4. Apply hot material no more than 5 feet (1.5 m) ahead of each roll being embedded.
5. Extend membrane 2 inches (50 mm) beyond top edge of all cants in full moppings of the specified hot material.

C. Fibrous Cant Strips: Provide non-combustible perlite or glass fiber cant strips at all wall/curb detail treatments where angle changes are greater than 45 degrees. Cant may be set in approved cold adhesives, hot asphalt or mechanically attached with approved plates and fasteners.

D. Wood Blocking, Nailers and Cant Strips: Provide wood blocking, nailers and cant strips as specified in Section 06114.
   1. Provide nailers at all roof perimeters and penetrations for fastening membrane flashings and sheet metal components.
   2. Wood nailers should match the height of any insulation, providing a smooth and even transition between flashing and insulation areas.
   3. Nailer lengths should be spaced with a minimum 1/8 inch gap for expansion and contraction between each length or change of direction.
   4. Nailers and flashings should be fastened in accordance with Factory Mutual "Loss Prevention Data Sheet 1- 49, Perimeter Flashing" and be designed to be capable of resisting a minimum force of 200 lbs/lineal foot in any direction.

E. Metal Work: Provide metal flashings, counter flashings, parapet coping caps and thru-wall flashings as specified in Section 07620 or Section 07710. Install in accordance with the SMACNA "Architectural Sheet Metal Manual" or the NRCA Roofing Waterproofing manual.

F. Termination Bar: Provide a metal termination bar or approved top edge securement at the terminus of all flashing sheets at walls and curbs. Fasten the bar a minimum of 8 inches (203 mm) o/c to achieve constant compression. Provide suitable, sealant at the top edge if required.

G. Flashing Base Ply: Install flashing sheets by the same application method used for the base ply.
   1. Seal curb, wall and parapet flashings with an application of mastic and mesh on a daily basis. Do not permit conditions to exist that will allow moisture to enter behind, around or under the roof or flashing membrane.
   2. Prepare all walls, penetrations, expansion joints and surfaces to be flashed with required primer at the rate of 100 square feet per gallon. Allow primer to dry tack free.
   3. Adhere to the underlying base flashing ply with specified hot material unless otherwise noted in these specifications. Nail off at a minimum of 8 inches (203 mm) o.c. from the finished roof at all vertical surfaces.
   4. Solidly adhere the entire sheet of flashing membrane to the substrate.
   5. Seal all vertical laps of flashing membrane with a three-course application of trowel-grade mastic and mesh.
   6. Coordinate counter flashing, cap flashings, expansion joints, and similar work with modified bitumen roofing work as specified.
   7. Coordinate roof accessories, miscellaneous sheet metal accessory items, including piping vents and other devices with the roofing system work.

H. Flood Coat/Aggregate:
   1. Install after cap sheets and modified flashing, tests, repairs and corrective actions have been completed and approved.
   2. Apply flood coat materials in the quantities recommended by the manufacturer.
   3. Uniformly embed aggregate in the flood coat of cold adhesive at a rate recommended by the manufacturer.
   4. Aggregate must be dry and placed in a manner required to form a compact,

embedded overlay. To aid in embedment, lightly roll aggregate.

I. Flashing Cap Ply: Install flashing cap sheets by the same application method used for the cap ply.
   1. Seal curb, wall and parapet flashings with an application of mastic and mesh on a daily basis. Do not permit conditions to exist that will allow moisture to enter behind, around or under the roof or flashing membrane.
   2. Prepare all walls, penetrations, expansion joints and where shown on the Drawings to be flashed with required primer at the rate of 100 square feet per gallon. Allow primer to dry tack free.
   3. Adhere to the underlying base flashing ply with specified flashing ply adhesive unless otherwise specified. Nail off at a minimum of 8 inches (203 mm) o.c. from the finished roof at all vertical surfaces.
   4. Coordinate counter flashing, cap flashings, expansion joints and similar work with modified bitumen roofing work as specified.
   5. Coordinate roof accessories, miscellaneous sheet metal accessory items with the roofing system work.
   6. All stripping shall be installed prior to flashing cap sheet installation.
   7. Heat and scrape granules when welding or adhering at cut areas and seams to granular surfaces at all flashings.
   8. Secure the top edge of the flashing sheet using a termination bar only when the wall surface above is waterproofed, or nailed 4 inches on center and covered with an acceptable counter flashing.

J. Surface Coatings: Apply roof coatings in strict conformance with the manufacturer's recommended procedures.

K. Roof Walkways: Provide walkways in areas indicated on the Drawings.

3.5 CLEANING

A. Clean-up and remove daily from the site all wrappings, empty containers, paper, loose particles and other debris resulting from these operations.

B. Remove asphalt markings from finished surfaces.

C. Repair or replace defaced or disfigured finishes caused by Work of this section.

3.6 PROTECTION

A. Provide traffic ways, erect barriers, fences, guards, rails, enclosures, chutes and the like to protect personnel, roofs and structures, vehicles and utilities.

B. Protect exposed surfaces of finished walls with tarps to prevent damage.

C. Plywood for traffic ways required for material movement over existing roofs shall be not less than 5/8 inch (16 mm) thick.

D. In addition to the plywood listed above, an underlayment of minimum 1/2 inch (13 mm) recover board is required on new roofing.

E. Special permission shall be obtained from the Manufacturer before any traffic shall be permitted over new roofing.

3.7 FIELD QUALITY CONTROL

A. Inspection: Provide manufacturer's field observations at start-up and at intervals of approximately 30 percent, 60 percent and 90 percent completion. Provide a final inspection

upon completion of the Work.

1. Warranty shall be issued upon manufacturer's acceptance of the installation.
2. Field observations shall be performed by a Sales Representative employed full-time by the manufacturer and whose primary job description is to assist, inspect and approve membrane installations for the manufacturer.
3. Provide observation reports from the Sales Representative indicating procedures followed, weather conditions and any discrepancies found during inspection.
4. Provide a final report from the Sales Representative, certifying that the roofing system has been satisfactorily installed according to the project specifications, approved details and good general roofing practice.

3.8 SCHEDULES

A. Base (Ply) Sheet:
   1. StressBase 80: 80 mil SBS (Styrene-Butadiene-Styrene) rubber modified roofing base sheet reinforced with a fiberglass scrim, performance requirements according to ASTM D 5147.
      a. Tensile Strength, ASTM D 5147
         1) 2 in/min. @ 0 +/- 3.6 deg. F MD 100 lbf/in XD 100 lbf/in
         2) 50mm/min. @ -17.78 +/- 2 deg. C MD 17.5 kN/m XD 17.5 kN/m
      b. Tear Strength, ASTM D 5147
         1) 2 in/min. @ 73.4 +/- 3.6 deg. F MD 110 lbf XD 100 lbf
         2) 50mm/min. @ 23 +/- 2 deg. C MD 489 N XD 444 N
      c. Elongation at Maximum Tensile, ASTM D 5147
         1) 2 in/min. @ 0 +/- 3.6 deg. F MD 4 % XD 4 %
         2) 50mm/min@ -17.78 +/- 2 deg. C MD 4 % XD 4 %
      d. Low Temperature Flexibility, ASTM D 5147, Passes -40 deg. F (-40 deg. C)

B. Thermoplastic/Modified Cap (Ply) Sheet:
   1. StressPly Plus: 105 mil SBS (Styrene-Butadiene-Styrene) rubber modified roofing membrane incorporating recycled rubber and reinforced with a fiberglass and polyester composite scrim. ASTM D 6162, Type III Grade S
      a. Tensile Strength, ASTM D 5147
         1) 2 in/min. @ 73.4 +/- 3.6 deg. F MD 310 lbf/in XD 310 lbf/in
         2) 50 mm/min. @ 23 +/- 2 deg. C MD 54.25 kN/m XD 54.25 kN/m
      b. Tear Strength, ASTM D 5147
         1) 2 in/min. @ 73.4 +/- 3.6 deg. F MD 500 lbf XD 500 lbf
         2) 50 mm/min. @ 23 +/- 2 deg. C MD 2224 N XD 2224 N
      c. Elongation at Maximum Tensile, ASTM D 5147
         1) 2 in/min. @ 73.4 +/- 3.6F MD 8% XD 8%
         2) 50 mm/min. @ 23 +/- 2 deg. C MD 8% XD 8%
      d. Low Temperature Flexibility, ASTM D 5147, Passes -30 deg. F (-34 deg. C)

C. Interply Adhesive:
   1. Generic Type IV Asphalt: Hot Bitumen, ASTM D 312, Type IV special steep asphalt having the following characteristics:
      a. Softening Point 210 deg. F - 225 deg. F
      b. Flash Point 500 deg. F
      c. Penetration @ 77 deg. F 15-25 units
      d. Ductility @ 77 deg. F 1.5 cm

D. Flashing Base Ply:
   1. StressBase 80: 80 mil SBS (Styrene-Butadiene-Styrene) rubber modified roofing base sheet reinforced with a fiberglass scrim, performance requirements according to ASTM D 5147.
      a. Tensile Strength, ASTM D 5147
         1) 2 in/min. @ 0 +/- 3.6 deg. F MD 100 lbf/in XD 100 lbf/in

2) 50 mm/min. @ -17.78 +/- 2 deg. C MD 17.5 kN/m XD 17.5 kN/m

b. Tear Strength, ASTM D 5147
   1) 2 in/min. @ 73.4 +/- 3.6 deg. F MD 110 lbf XD 100 lbf
   2) 50 mm/min. @ 23 +/- 2 deg. C MD 489 N XD 444 N

c. Elongation at Maximum Tensile, ASTM D 5147
   1) 2 in/min. @ 0 +/- 3.6 deg. F MD 4 % XD 4 %
   2) 50 mm/min. @ -17.78 +/- 2 deg. C MD 4 % XD 4 %

d. Low Temperature Flexibility, ASTM D 5147
   1) Passes -40 deg. F (-40 deg. C)

E. Flashing Ply Adhesive:
1. Flashing Bond: Asphalt roofing mastic V.O.C. compliant, ASTM D 4586, Type II trowel grade flashing adhesive.
   a. Non-Volatile Content ASTM D 4479 70 min.
   b. Density ASTM D 1475 8.3 lbs./gal. (1kg/l)
   c. Flash Point ASTM D 93 103 deg. F (39 deg. C)

F. Surfacing:
1. Flood Coat/Aggregate:
   a. Black-Knight/Black-Stallion Cold: Coal Tar protective roof coating; heavy-bodied, fiber reinforced, cold process polymer modified, coal tar roof coating having the following characteristics:
      1) Weight/Gallon 9.0 lbs./gal. (1.07 g/cm3)
      2) Solids by weight 87%
      3) Viscosity; Brookfield Heliopath, 2.5 rpm 120,000 cPs
      4) Roofing Aggregate: ASTM D 1863
         a) Slag.
         b) Pea gravel.
         c) White spar.
2. Flashing Cap (Ply) Sheet:
   a. StressPly Plus FR Mineral: 155 mil SBS (Styrene-Butadiene-Styrene) mineral surfaced, rubber modified roofing membrane reinforced with a fiberglass and polyester composite scrim. ASTM D 6162, Type III Grade G
      1) Tensile Strength, ASTM D 5147
         a) 2 in/min. @ 73.4 +/- 3.6 deg. F MD 310 lbf/in XD 310 lbf/in
         b) 50 mm/min. @ 23 +/- 2 deg. C MD 54.25 kN/m XD 54.25 kN/m
      2) Tear Strength, ASTM D 5147
         a) 2 in/min. @ 73.4 +/- 3.6 deg. F MD 500 lbf XD 500 lbf
         b) 50 mm/min. @ 23 +/- 2 deg. C MD 2224 N XD 2224 N
      3) Elongation at Maximum Tensile, ASTM D 5147
         a) 2 in/min. @ 73.4 +/- 3.6 deg. F MD 8% XD 8%
         b) 50 mm/min. @ 23 +/- 2 deg. C MD 8% XD 8%
      4) Low Temperature Flexibility, ASTM D 5147, Passes -30 deg. F (-34 deg. C)
3. Surface Coatings:
   a. Surfacing:
      1) Garla-Brite: ASTM D 2824 aluminum coating non-fibered aluminum roof coating non-fibered aluminum roof coating having the following characteristics:
         a) Flash Point 103 deg. F (39 deg. C) min.
         b) Weight/Gallon 7.9 lbs./gal. (1.0 g/cm3)

END OF SECTION

SECTION 07563
FLUID APPLIED ROOFING RESTORATION

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Single Ply Roof Restoration (1.4.E)(2.6)

1.2 RELATED SECTIONS

A. Roofing Material: Section 07 52 00- Modified Bituminous Membrane Roofing

1.3 REFERENCES

A. ASTM C 920 - Standard Specification for Elastomeric Joint Sealants.

B. ASTM C 1250 - Standard Test Method for Nonvolatile Content of Cold Liquid-Applied Elastomeric Waterproofing Membranes.

C. SRI - Solar Reflectance Index calculated according to ASTM E 1980.

D. SMACNA Architectural Sheet Metal Manual.

E. ANSI/SPRI ES-1 - Testing and Certification Listing of Shop Fabricated Edge Metal

F. National Roofing Contractors Association (NRCA) - Roofing and Waterproofing Manual.

1.4 SYSTEM DESCRIPTION

A. Single Ply Roof Restoration Renovation: work includes:
   1. Surface preparation: Remove membrane chalking, dust, dirt, and debris.
   2. Fascia Edges: Inspect and make repairs to membrane
   3. Parapets and Vertical Surfaces: Inspect and make repairs to any splits or membrane deterioration.
   4. Metal Flashings: Repair/Replace metal flashings, pitch pockets, etc.
   5. Roof Repairs: Repair blisters, stressed or cracked membrane. Cut back, patch with new membrane

1.5 SUBMITTALS

A. Submit under provisions of Section 01300.

B. 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.

C. Shop Drawings: Submit shop drawings including installation details of roofing, flashing, fastening, insulation and vapor barrier, including notation of roof slopes and fastening patterns of insulation and base modified bitumen membrane, prior to job start.

1.6 QUALITY ASSURANCE

A. Perform Work in accordance with NRCA Roofing and Waterproofing Manual.

B. Manufacturer Qualifications: Manufacturer: Company specializing in manufacturing products specified in this section with documented ISO 9001 certification and minimum twelve years and experience.

C. Installer Qualifications: Company specializing in performing Work of this section with minimum five years documented experience and a certified Pre-Approved Garland Contractor.

D. Installer's Field Supervision: Maintain a full-time Supervisor/Foreman on job site during all phases of roofing work while roofing work is in progress.

E. Product Certification: Provide manufacturer's certification that materials are manufactured in the United States and conform to requirements specified herein, are chemically and physically compatible with each other, and are suitable for inclusion within the total roof system specified herein.

F. Source Limitations: Obtain all components of roof system from a single manufacturer. Secondary products that are required shall be recommended and approved in writing by the roofing system Manufacturer. Upon request of the Architect or Owner, submit Manufacturer's written approval of secondary components in list form, signed by an authorized agent of the Manufacturer.

1.7 PRE-INSTALLATION CONFERENCE

A. Convene a pre-roofing conference approximately two weeks before scheduled commencement of roofing system installation and associated work.

B. Require attendance of installers of deck or substrate construction to receive roofing, installers of rooftop units and other work in and around roofing which must precede or follow roofing work including mechanical work, Architect, Owner, roofing system manufacturer's representative.

C. Objectives include:
1. Review foreseeable methods and procedures related to roofing work, including set up and mobilization areas for stored material and work area.
2. Tour representative areas of roofing substrates, inspect and discuss condition of substrate, roof drains, curbs, penetrations and other preparatory work.
3. Review structural loading limitations of deck and inspect deck for loss of flatness and for required attachment.
4. Review roofing system requirements, Drawings, Specifications and other Contract Documents.
5. Review and finalize schedule related to roofing work and verify availability of materials, installer's personnel, equipment and facilities needed to make progress and avoid delays.
6. Review required inspection, testing, certifying procedures.
7. Review weather and forecasted weather conditions and procedures for coping with unfavorable conditions, including possibility of temporary roofing.
8. Record conference including decisions and agreements reached. Furnish a copy of records to each party attending.

1.8 DELIVERY, STORAGE, AND HANDLING

A. Deliver and store products in manufacturer's unopened packaging with labels intact until ready for installation.

B. Store all roofing materials in a dry place, on pallets or raised platforms, out of direct exposure to the elements until time of application. Store materials at least 4 inches above ground level and covered with "breathable" tarpaulins.

C. Stored in accordance with the instructions of the manufacturer prior to their application or installation. Store roll goods on end on a clean flat surface. No wet or damaged materials will be used in the application.

D. Store at room temperature wherever possible, until immediately prior to installing the roll. During winter, store materials in a heated location with a 50 degree F (10 degree C) minimum temperature, removed only as needed for immediate use. Keep materials away from open flame or welding sparks.

E. Avoid stockpiling of materials on roofs without first obtaining acceptance from the Architect/Engineer.

F. Adhesive storage shall be between the range of above 50-degree F (10-degree C) and below 80-degree F (27-degree C). Area of storage shall be constructed for flammable storage.

1.9 PROJECT CONDITIONS

A. 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.

B. Weather Condition Limitations: Do not apply roofing system during inclement weather or when a 40 percent chance of precipitation or greater is expected.

C. Proceed with roofing work only when existing and forecasted weather conditions will permit unit of work to be installed in accordance with manufacturer's recommendations and warranty requirements.

D. Do not expose materials vulnerable to water or sun damage in quantities greater than can be weatherproofed during same day.

E. When applying materials with spray equipment, take precautions to prevent over spray and/or solvents from damaging or defacing surrounding walls, building surfaces, vehicles or other property. Care should be taken to do the following:
   1. Close air intakes into the building.
   2. Have a dry chemical fire extinguisher available at the jobsite.
   3. Post and enforce "No Smoking" signs.

F. Avoid inhaling spray mist; take precautions to ensure adequate ventilation.

G. Protect completed roof sections from foot traffic for a period of at least 48 hours at 75 degrees F (24 degrees C) and 50 percent relative humidity or until fully cured.

H. Take precautions to ensure that materials do not freeze.

I. Minimum temperature for application is 40 degrees F (4 degrees C) and rising for solvent based materials and 50 degrees F (10 degrees C) and rising for water based.

1.10 WARRANTY

A. Upon completion of the work, provide the Manufacturer's written and signed limited labor and materials Warranty, warranting that, if a leak develops in the roof during the term of this warranty, due either to defective material or defective workmanship by the installing

contractor, the manufacturer shall provide the Owner, at the Manufacturer's expense, with the labor and material necessary to return the defective area to a watertight condition.

1. Warranty Period:
   a. 5 plus 5 (10 years): 5 years from date of acceptance plus 5 additional years after required inspection by Garland.

B. Installer is to guarantee all work against defects in materials and workmanship for a period indicated following final acceptance of the Work.

1. Warranty Period:
   a. 2 years from date of acceptance.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Acceptable Manufacturer: Garland Company, Inc. (The), which is located at: 3800 E. 91st St.; Cleveland, OH 44105; Toll Free Tel: 800-321-9336; Tel: 216-641-7500; Fax: 216-641-0633; Email:request info (); Web:www.garlandco.com

B. Requests for substitutions will be considered in accordance with provisions of Section 01600.

2.2 ROOF RESTORATION SYSTEM FOR SINGLE PLY ROOFS

A. White-Knight Plus/ White-Stallion Plus:
   1. Primer: None.
   2. Coating: White-Knight Plus/ White-Stallion Plus.
   3. Flashing: Repair or replace as needed.
   4. Reinforcement: Apply White-Knight Plus Base Coat/ White-Stallion Plus Base Coat on seams and around penetrations only.
   5. Surfacing: None.

2.3 EDGE TREATMENT AND ROOF PENETRATION FLASHINGS

A. Flashing Boot - Rubbertite Flashing Boot: Neoprene pipe boot for sealing single or multiple pipe penetrations adhered in approved adhesives as recommended and furnished by the membrane manufacturer.

B. Vents and Breathers: Heavy gauge aluminum and fully insulated vent that allows moisture and air to escape but not enter the roof system as recommended and furnished by the membrane manufacturer.

C. Pitch pans, Rain Collar 24 gauge stainless or 20oz (567gram) copper. All joints should be welded/soldered watertight. See details for design.

D. Drain Flashings should be 4lb (1.8kg) sheet lead formed and rolled.

E. Plumbing stacks should be 4lb (1.8kg) sheet lead formed and rolled.

F. Fabricated Flashings: Fabricated flashings and trim are specified in Section 07620.
   1. Fabricated flashings and trim shall conform to the detail requirements of SMACNA "Architectural Sheet Metal Manual" and/or the CDA Copper Development Association "Copper in Architecture - Handbook" as applicable.

G. Manufactured Roof Specialties: Manufactured copings, fascia, gravel stops, control joints, expansion joints, joint covers and related flashings and trim are specified in Section 07710.
   1. Manufactured roof specialties shall conform to the detail requirements of SMACNA "Architectural Sheet Metal Manual" and/or the NRCA "Roofing and Waterproofing

Manual" as applicable.

PART 3 EXECUTION

3.1 EXAMINATION

A. Do not begin installation until substrates have been properly prepared.

B. Verify that work penetrating the roof deck, or which may otherwise affect the roofing, has been properly completed.

C. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

3.2 ROOF PREPARATION AND REPAIR

A. General:
1. Remove existing roof flashings from curbs and parapet walls down to the surface of the roof. Remove existing flashings at roof drains and roof penetrations.
2. Remove all wet, deteriorated, blistered or delaminated roofing membrane or insulation and fill in any low spots occurring as a result of removal work to create a smooth, even surface for application of new roof membranes.
3. Install new wood nailers as necessary to accommodate insulation/recovery board or new nailing patterns.
4. When mechanically attached, the fastening pattern for the insulation/recovery board shall be as recommended by the specific product manufacturer.
5. Re-roofing over coal tar pitch requires a mechanically attached recovery board or insulation and a base sheet prior to the application of roofing system.
6. Existing roof surfaces shall be primed as necessary and allowed to dry prior to installing the roofing system.

B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

C. Repair all defects such as deteriorated roof decks; replace saturated insulation board, replace loose or brittle membrane or membrane flashings. Verify that exiting conditions meet the following requirements:
1. Existing membrane is either fully adhered or that the membranes mechanical fasteners are secured and functional.
2. Application of roofing materials over a brittle roof membrane is not recommended.

D. Remove all loose dirt and foreign debris from the roof surface. Do not damage roof membrane in cleaning process.

E. Clean and seal all parapet walls, gutters and coping caps, and repair any damaged metal where necessary. Seal watertight all fasteners, pipes, drains, vents, joints and penetrations where water could enter the building envelope.

F. Clean the entire roof surface by removing all dirt, algae, paint, oil, talc, rust or foreign substance. Use a 10 percent solution of TSP (tri-sodium phosphate), Simple Green and warm water. Scrub heavily soiled areas with a brush. Rinse with fresh water to remove all TSP solution. Allow roof to dry thoroughly before continuing.

G. Repair existing roof membrane as necessary to provide a sound substrate for the liquid membrane. All surface defects (cracks, blisters, tears) must be repaired with similar materials.

H. Pre-Treatment of Known Growth - General Surfaces: Once areas of moss, mold, algae and

other fungal growths or vegetation have been removed and surfaces have also been thoroughly cleaned, apply a biocide wash at a maximum spread rate of 0.2 gallons/square (0.08 liters/m), to guard against subsequent infection. Allow to dry onto absorbent surfaces before continuing with the application. On non-absorbent surfaces, allow to react before thoroughly rinsing to remove all traces of the solution.

3.3 INSTALLATION

A. General Installation Requirements:
   1. Install in accordance with manufacturer's instructions. Apply to minimum coating thickness required by the manufacturer.
   2. Cooperate with manufacturer, inspection and test agencies engaged or required to perform services in connection with installing the roof system.
   3. Insurance/Code Compliance: Where required by code, install and test the roofing system to comply with governing regulation and specified insurance requirements.
   4. Protect work from spillage of roofing materials and prevent materials from entering or clogging drains and conductors. Replace or restore work damaged by installation of the roofing system.
   5. All primers must be top coated within 24 hours of application. Re-prime If more time passes after priming.
   6. Keep roofing materials dry during application. Phased construction can be allowed as long as no, more than 7 days pass between coats excluding primers.
   7. Coordinate counter flashing, cap flashings, expansion joints and similar work with work specified in other Sections under Related Work.
   8. Coordinate roof accessories and miscellaneous sheet metal accessory items, including piping vents and other devices with work specified in other Sections under Related Work.

B. Single Ply Roof Restoration Renovation: work includes:
   1. Surface preparation: Remove membrane chalking, dust, dirt, and debris.
   2. Flashing:
      a. Fascia Edges: Inspect and make repairs to membrane.
      b. Parapets and Vertical Surfaces: Inspect and make repairs to any splits or membrane deterioration.
      c. Metal Flashings: Repair/Replace metal flashings, pitch pockets, etc.
   3. Reinforcement: Base coat and treatment of field seams and around penetrations:
      a. Application of White-Knight Plus/ Stallion Plus or White-Knight Plus WC on field seams, flashings and around penetrations.
         1) Verify that the surface to be coated is properly prepared.
         2) Restore the surface to a suitable condition if roof surface becomes contaminated with dirt, dust or other materials that will interfere with adhesion of the coatings.
         3) Apply UniBond to flashings and field seams.
         4) Apply materials must be applied at specified dry film thickness.
         5) Apply White-Knight/ Stallion Plus or White-Knight Plus WC at minimum 6 inch wide stripe over all seams, flashings and around penetrations at 2.0 gallons per 100 SF.
         6) Allow to dry for a minimum of 24 hours before applying finish coats.
         7) On vertical surfaces to achieve proper application rate cut your application into two coats to avoid sagging and runs of coating.
   4. Coating: Application of White-Knight/ Stallion, White-Knight WC or White-Knight Plus/ Stallion Plus, White-Knight Plus WC finish coats.
      a. Apply White-Knight/ Stallion or White-Knight Plus/ Stallion Plus in a uniform manner.
      b. Use special attention to coating flashings and other critical areas to build adequate membrane thickness.

c. Use multiple coats on verticals to prevent sagging.
d. Apply at 2.0 gallons per 100 SF over the entire roof surface.

3.4 INSTALLATION EDGE TREATMENT AND ROOF PENETRATION FLASHING

A. Fabricated Flashings: Fabricated flashings and trim are provided as specified in Section 07620.
1. Fabricated flashings and trim shall conform to the detail requirements of SMACNA "Architectural Sheet Metal Manual" and/or the Copper Development Association "Copper in Architecture - Handbook" as applicable.

B. Manufactured Roof Specialties: Manufactured copings, fascia, gravel stops, control joints, expansion joints, joint covers and related flashings and trim are provided as specified in Section 07710.
1. Manufactured roof specialties shall conform to the detail requirements of SMACNA "Architectural Sheet Metal Manual" and/or the National Roofing Contractor's Association "Roofing and Waterproofing Manual" as applicable.

3.5 CLEANING

A. Clean-up and remove daily from the site all wrappings, empty containers, paper, loose particles and other debris resulting from these operations.

B. Remove asphalt markings from finished surfaces.

C. Repair or replace defaced or disfigured finishes caused by Work of this section.

3.6 PROTECTION

A. Provide traffic ways, erect barriers, fences, guards, rails, enclosures, chutes and the like to protect personnel, roofs and structures, vehicles and utilities.

B. Protect exposed surfaces of finished walls with tarps to prevent damage.

C. Plywood for traffic ways required for material movement over existing roofs shall be not less than 5/8 inch (16 mm) thick.

D. In addition to the plywood listed above, an underlayment of minimum 1/2 inch (13 mm) recover board is required on new roofing.

E. Special permission shall be obtained from the Manufacturer before any traffic shall be permitted over new roofing.

3.7 FIELD QUALITY CONTROL

A. Require attendance of roofing materials manufacturers' representatives at site during installation of the roofing system.

B. Perform field inspection and [and testing] as required under provisions of Section 01410.

C. Correct defects or irregularities discovered during field inspection.

3.8 FINAL INSPECTION

A. At completion of roofing installation and associated work, meet with Contractor, Architect, installer, installer of associated work, roofing system manufacturer's representative and others directly concerned with performance of roofing system.

B. Walk roof surface areas, inspect perimeter building edges as well as flashing of roof penetrations, walls, curbs and other equipment. Identify all items requiring correction or completion and furnish copy of list to each party in attendance.

C. If core cuts verify the presence of damp or wet materials, the installer shall be required to replace the damaged areas at his own expense.

D. Repair or replace deteriorated or defective work found at time above inspection as required to a produce an installation that is free of damage and deterioration at time of Substantial Completion and according to warranty requirements.

E. Architect upon completion of corrections.

F. Following the final inspection, provide written notice of acceptance of the installation from the roofing system manufacturer.

3.9 PROTECTION

A. Protect installed products until completion of project.

B. Touch-up, repair or replace damaged products before Substantial Completion.

3.10 SCHEDULES

A. Coatings:
1. Coating: White-Knight Plus/ White-Stallion Plus Base: Highly reflective multi- purpose, single-component aliphatic urethane, liquid waterproofing membrane.
   a. Tensile Strength: ASTM D 412, 2100 psi
   b. Tear Resistance: ASTM D 624, 160 lbs./in
   c. Elongation: ASTM D 412, 320%
   d. Density @ 77 degrees F (25 degrees C, ASTM D 2939) 10.4 lb./gal (1.2 g/m3)
   e. Flash Point: ASTM D 93, 110 degrees F min. (43 degrees C)
   f. Non-Volatile: ASTM D 75, Typical 83%
   g. Viscosity @ 77 degrees F (25 degrees C); Brookfield RVT, #4 Spindle 10 rpm9200 cP
   h. Wet Film Thickness@ 2 gal./100 sq. ft. (0.82 l/m2)
   i. VOC: 225 g/l
   j. Reflectance: 0.87
   k. Emittance: 0.89
   l. SRI: 110

B. Flashings
1. Coating: White-Knight Plus/ White-Stallion Plus: highly reflective multi- purpose, single-component aliphatic urethane, liquid waterproofing membrane.
   a. Tensile Strength: ASTM D 412, 2100 psi
   b. Tear Resistance: ASTM D 624, 160 lbs./in
   c. Elongation: ASTM D 412, 320%
   d. Density @ 77 degrees F (25 degrees C, ASTM D 2939) 10.4 lb./gal (1.2 g/m3)
   e. Flash Point: ASTM D 93, 110 degrees F min. (43 degrees C)
   f. Non-Volatile: ASTM D 75, Typical 83%
   g. Viscosity @ 77 degrees F (25 degrees C); Brookfield RVT, #4 Spindle 10 rpm9200 cP
   h. Wet Film Thickness @ 2 gal./100 sq. ft. (0.82 l/m2)
   i. VOC: 225 g/l
   j. Reflectance: 0.87
   k. Emittance: 0.89
   l. SRI: 110

C. Reinforcement
   1. Reinforcement Seam Tape: UniBond

END OF SECTION

Black-Knight®/Black-Stallion® Cold

since 1895

OVERVIEW & FEATURES

Black-Knight/Black-Stallion Cold is a specially formulated polymer-modified, cold-process roofing bitumen. It is a unique blend of refined tars, solvents, rubberized polymers, fibers and fillers that offer improved performance and superior sag resistance. Black-Knight/Black-Stallion Cold offers improved flexibility and impact resistance over conventional coal tar.

Black-Knight/Black-Stallion Cold is designed to be used as an interply adhesive for Garland's cold-applied Millennium® roof systems; as a flood coat over new and existing hot asphalt and coal tar built up roofs and modified bitumen roofs; or as a premium restoration material for previously graveled roofs.

Resistance to Aging & Weathering - Coal tar pitch provides natural resistance to moisture, chemicals, ultraviolet radiation, and aging. Black-Knight/Black-Stallion Cold's polymer-enhanced coal tar combines the water-resistance of coal tar with the strength and flexibility of advanced polymers for unmatched durability. A tight molecular structure allows Black-Knight/Black-Stallion Cold to maintain a natural resistance water, air and common chemicals that cause oxidation to the roof's surface.

Cost Effective - Black-Knight/Black-Stallion Cold offers superior long-term performance and low maintenance costs to reduce the life cycle costs associated with the roofing system. The high quality and performance of Black-Knight/Black-Stallion Cold will save building owners money year after year.

Self-Healing - Black-Knight/Black-Stallion Cold has cold-flow properties that allow it to slowly heal hairline cracks and alligatoring with elevated rooftop temperatures. Over the years, this process will continue, providing the owner with a long-term roofing solution by extending the life of the roofing system.

Low Odor - Due to its cold-applied nature, Black-Knight/Black-Stallion Cold eliminates many of the emissions associated with conventional coal tar.

APPLICATION

Black-Knight/Black-Stallion Cold can be applied by brush, spray, or squeegee as any other conventional, high-performance roof coating.

Interply Adhesive - When used in conjunction with Millennium Base and a Millennium modified membrane, Black-Knight/Black-Stallion Cold should be applied at 1.5-2.0 gal./100 sq. ft. (0.61-0.82 l/ m^2). Cold applied Millennium roof systems should not be installed above a 1:12 slope. For specific information on a cold applied Millennium roof system, please contact a local Garland representative.

Flood Coat & Restoration - Application for a flood coat on a new roof should be 4-5 gal./100 sq. ft. (1.63-2.04 l/m^2); application on an existing roof where gravel has been removed should be 6-8 gal./100 sq. ft. (2.45 - 3.26 l/m^2). Four hundred pounds (400 lbs.) of gravel per 100 sq. ft. should be applied following the application of Black-Knight/Black-Stallion Cold.

Black-Knight/Black-Stallion Cold should not be applied on roofs with a slope exceeding 1-1/2:12. Backnailing is required for slopes over 1/2:12. Please contact a local Garland representative for specifics.

PRECAUTIONS

- Do not use Black-Knight/Black-Stallion Cold over rubber or plastic substrates
- Use with adequate ventilation
- Keep away from open flame
- In depth safety information can be obtained from Garland's Contractor Safety Guide, SDS Sheet or the NRCA's Safety Awareness video
- Do not thin
- Do not use where product may come in contact with potable water
- Keep material warm prior to application when at or below 50°F (10°C). Store in a heated warehouse between 70°F-80°F at least 24 hours.
- As with all cold process materials, full cure is dependent on application rate, time and temperatures. Lingering odors are expected until product achieves full cure.
- Exterior use only
- Do not install as a flood coat over the StressPly SA system

Black-Knight/Black-Stallion Cold

Technical Data	Black-Knight/ Black-Stallion Cold
Viscosity (seconds) Stormer Viscometer, 600 g	125-175 sec.
Flash Point (ASTM D 93)	105°F (40°C)
Non-Volatile (ASTM D 4479)	Typical 77%
Weight per gallon Typical	9.4 lbs./gal (1.126 g/cm³)
Drying Time to touch @ 70°F (21.1°C)	4-6 Hours
Shelf Life	1 Year
Wet Film Thickness	
Interply	32 mils (812.8 mircons)
New Flood Coat	64-80 mils (1,625.6-2,032 microns)
Restoration	96-128 mils (2,438.4-3,251.2 microns)
Coverage	
Interply	1.5-2.0 gal/100 sq. ft. (.61-.82 l/m²)
New Flood Coat	4-5 gal/100 sq. ft. (1.63-2.04 l/m²)
Restoration	6-8 gal/100 sq. ft. (2.45-3.26 l/m²)
Packaging	5 gallon (18.9 l) pail 55 gallon (208.2 l) drum

For specific application recommendations, please contact your local Garland Representative or Garland Technical Service Department.

Eco Facts	Black-Knight/Black-Stallion Cold
VOC	270 g/l
Recycled Content	70%

Please refer to the product information, Material Safety Data Sheet, and labeling for the potential risks and benefits. Exposure to this product may cause skin and respiratory tract irritation; prolonged skin exposure may result in skin cancer; inhalation of vapors may cause central nervous system effects and long term exposure has been associated with kidney, bladder, scrotum and lung cancer.

For more information, visit us at: www.garlandco.com

The Garland Company, Inc.
3800 East 91st Street
Cleveland, OH 44105
FAX: 216-641-0633
Phone: 216-641-7500
Toll Free: 800-321-9336

Garland Canada Inc.
209 Carrier Drive
Toronto, Ontario
Canada, M9W 5Y8
FAX: 416-747-1980
Phone: 416-747-7995
Toll Free: 800-387-5991
(Only in Canada)

The Garland Company UK, LTD
Second Way Centre, Second Way
Avonmouth, Bristol UK BS11 8DF
Phone: 011 44 1174 401050 (Outside UK)
Toll Free: 0800 328 5560 (Only in UK)

Tests verified by independent laboratories. Actual roof performance specifications will vary depending on test speed and temperature. Data reflects samples randomly collected. ±10% variation may be experienced. The above data supersedes all previously published information. Consult your local Garland Representative or the home office for more information.

BK/BS C 0118

Black-Knight®/Black-Stallion® Primer

since 1895

OVERVIEW & FEATURES

Black-Knight/Black-Stallion Primer is a quick drying, coal tar roof primer and conditioner for surfaces that can be difficult to adhere to or that can be only marginally cleaned. Black-Knight/Black-Stallion Primer provides a good bonding surface over metal, concrete and masonry surfaces as well as existing coal tar membranes/felts prior to repairs and maintenance. Black-Knight/Black-Stallion Primer meets ASTM D 43.

Economical - A Black-Knight/Black-Stallion Primer application conserves finishing material by conditioning the surface and eliminating the tendency of the finishing material to absorb into the dried out, existing surface.

Fast Drying - Black-Knight/Black-Stallion Primer fully cures in approximately 1 hour at 77°F (25°C) at 50% or less humidity, depending on the thickness of application. A faster cure time means less down time on the project.

Maximum Surface Adhesion - Black-Knight/ Black-Stallion Primer ensures a long lasting flexible bond between the existing roof surface and the Garland finishing material.

APPLICATION

The roof surface should be clean and dry prior to an application of Black-Knight/Black-Stallion Primer. Any failed previous coating or improperly bonded material must be removed. Black-Knight/Black-Stallion Primer can be applied by spray, brush or roller at the rate of 0.5 to 1 gal/100 ft² (0.20 to 0.41 l/m²). In cold weather, keep the material in a heated area prior to use.

PRECAUTIONS

- Exterior use only
- Do not use Black-Knight/Black-Stallion Primer over rubber or plastic substrates
- Ensure adequate ventilation
- Keep away from open flame
- Do not thin this product
- Do not use where product may come in contact with potable water
- Keep material warm prior to application when at or below 50°F (10°C). Store in a heated warehouse between 70°F-80°F at least 24 hours.
- In-depth safety information can be obtained from the SDS

Technical Data	Black-Knight/Black-Stallion Primer
Non-Volatile (ASTM D 2369)	65-70%
Viscosity Saybolt Furol	35-75 sec.
Flash Point (ASTM D 93)	105°F (40°C)
Density @ 77°F (25°C)	9.1 lbs./gal (1.09 g/cm³)
Color	Light Orange
Shelf Life	1 year
Coverage	1/2 to 1 gal/100 ft² (0.20 to 0.41 l/m²)
Packaging	5 gal. pail (18.9 l) 55 gallon (208 l) drum

Eco-Facts	All-Knight/All-Stallion Primer
VOC	350 g/L

For specific application recommendations, please contact your local Garland Representative or Garland Technical Service Department.

Please refer to the product information, Safety Data Sheet, and labeling for potential risks and benefits. When used in conjunction with Black-Knight/Black-Stallion I.V or Black-Knight/ Black-Stallion Cold, exposure may cause skin and respiratory tract irritation; prolonged skin exposure may result in skin cancer and long term exposure has been associated with kidney, bladder, scrotum, and lung cancer.

CLASSIFIED UL

For more information, visit us at: www.garlandco.com

The Garland Company, Inc.
3800 East 91st Street
Cleveland, OH 44105
FAX: 216-641-0633
Phone: 216-641-7500
Toll Free: 800-321-9336

Garland Canada Inc.
209 Carrier Drive
Toronto, Ontario
Canada, M9W 5Y8
FAX: 416-747-1980
Phone: 416-747-7995
Toll Free: 800-387-5991
(Only in Canada)

The Garland Company UK LTD
Second Way Centre, Second Way
Avonmouth, Bristol UK BS11 8DF
Phone: 011 44 1174 401050 (Outside UK)
Toll Free: 0800 328 5560 (Only in UK)

Test verified by independent laboratories. Actual roof performance specifications will vary depending on test speed and temperature. Data reflects samples randomly collected. ± 10% variation may be experienced. The above data supersedes all previously published information. Consult your local Garland Representative or the home office for more information.

BK/BS P 0715

Flashing Bond®

OVERVIEW & FEATURES

Flashing Bond is a cold-applied, trowel-grade mastic designed for use as a patching and leak repair material on asphalt roofing systems. It contains high-solids content asphalt, additional fiber reinforcement and plasticizing oils that improve low temperature performance.

Factory Formulation Ensures Uniform Quality - Flashing Bond is factory formulated under rigid quality control conditions to ensure uniform product quality. This eliminates the variables inherent on the job site preparation of roof materials where quality control depends on the individual roofer's expertise.

Versatile - Flashing Bond is a multi-purpose material ideal for installing or maintaining flashings, sealing metal roof or gutter leaks and repairing holes, splits or blisters in the roof mat.

Long Lasting Performance - Flashing Bond is double-reinforced to outlast and outperform conventional roof cement. Long strand fibers provide inherent reinforcement and eliminate run or sag in vertical surface applications. Flashing Bond should be used in conjunction with Gar-Mesh® as the reinforcing membrane for the roof repair, which will reinforce Flashing Bond as steel rods reinforce concrete.

APPLICATION

Flashing Bond is ready to use straight from the container. There is no settling or oil separation. In cold weather, store at room temperature to ensure workability. Flashing Bond should be applied to clean dry surfaces.

Repairs - Trowel a base coat of Flashing Bond over the area to be repaired. Imbed a strip of Gar-Mesh into the base coat and top dress with Flashing Bond. The top coat should be sufficiently thick so that the weave in the membrane is completely covered (1 gal./7 lineal ft. @ 8 in. wide x 1/4 in. deep).

Flashing System - As part of a Garland flashing system, Flashing Bond is applied with a multi-ply flashing application beginning with a base ply of Garland two-ply base sheet and followed by one of Garland's StressPly® family of smooth or mineral membranes as cap sheet. The result is a high performance, multi-ply, modified cold applied flashing system.

Apply Flashing Bond at a rate of 4-6 gal./100 sq. ft. (1.6- 2.4 l/m²), per flashing ply with a 1/8" (3 mm) notched trowel. Bleed out at all overlap edges should be visible to ensure complete contact. The flashing should be mechanically secured at the end of each work day.

PRECAUTIONS

- As with all cold process materials, full cure is dependent on application rate, time and temperatures. Lingering odors are expected until product achieves full cure.
- Do not use this product on coal tar roofs.

Flashing Bond®

Technical Data	Flashing Bond
Flash Point (ASTM D 93)	103°F (39.4°C) min.
Density @77°F (25°C) (ASTM D 1475)	8.3 lbs./gal. (1 g/cm³)
Non-Volatile (ASTM D 4586)	70% min.
Viscosity @77°F (25°C) Mobilometer, 1500 g	Typical 7 sec.
Water Resistance Under Good Drainage Conditions	Excellent
Shelf Life	1 year
Coverage	
Flashing Install	4–6 gal/sq. (1.6–2.4 l/m²)
Flashing Repairs 1/4 in. thickness (6.3 mm thickness)	7 lin. ft./gal. covers 8 in. wide (0.27 m/l covers 20 cm wide)
Shelf Life	1 year
Packaging	3 gallon pail (11.4 l) 5 gallon pail (18.9 l)

Eco-Facts	Flashing Bond
VOC	200 g/L
Recycled Content	
Post Consumer	N/A
Post Industrial	5.6%

Product meets and/or exceeds ASTM D 4586, Type II, Class I

For specific recommendations and coverage rates, please contact your local Garland Representative or Garland Technical Service Department.

CLASSIFIED UL

MIAMI-DADE COUNTY APPROVED

For more information, visit us at: www.garlandco.com

The Garland Company, Inc.
3800 East 91st Street
Cleveland, OH 44105
FAX: 216-641-0633
Phone: 216-641-7500
Toll Free: 800-321-9336

Garland Canada Inc.
209 Carrier Drive
Toronto, Ontario
Canada, M9W 5Y8
FAX: 416-747-1980
Phone: 416-747-7995
Toll Free: 800-387-5991
(Only in Canada)

The Garland Company UK, LTD
Second Way Centre, Second Way
Avonmouth, Bristol UK BS11 8DF
Phone: 011 44 1174 401050 (Outside UK)
Toll Free: 0800 328 5560 (Only in UK)

 FB 1017

Silver-Flash®

since 1895

OVERVIEW & FEATURES

Silver-Flash is a cold-applied, silver trowel-grade mastic designed for three course applications on flashings, patching and leak repair. It is formulated with a premium oxidized asphalt base, a high quality premium leafing silver-aluminum paste, along with fibers and thixotropic additives that impart a brilliant finish and vertical sag resistance.

Silver-Flash can be used with any asphalt roofing system for rebuilding or maintaining flashings, repairing holes, splits or blisters in the roof surface. Not recommended for use when there is a 40% chance of rain in the forecast.

Cost Savings - Silver-Flash delivers a finished product on application eliminating the need to come back to aluminize black asphalt mastic and flashings after 30 days. This provides the building owner with a one-step application, which saves building owners and contractors time and money.

UV Stable - Unlike traditional mastics, Silver-Flash is silver in color right out of the pail and when applied turns a brilliant silver color, reflecting UV rays away from the application.

Multi-Purpose Application - Silver-Flash is a multi-purpose material ideal for rebuilding or maintaining flashings, repairing holes, splits or blisters in asphalt-based roof systems.

Reinforced for Long Lasting Performance - Silver-Flash is double-reinforced to outlast and outperform conventional roof mastics. It contains specialty clays, fibers, and a unique thixotropic additives that eliminates run or sag in a vertical surface application. Silver-Flash should be used in conjunction with Gar-Mesh as the reinforcement material in the roof repair.

APPLICATION

Silver-Flash is a ready to use as is from the container. In cold weather, store at room temperature to ensure workability. Silver-Flash should be applied to clean dry surfaces to achieve full adhesion. To prevent browning out of the material, use a clean trowel that has not been contaminated with regular asphaltic mastic. For best results, trowel a base coat of Silver-Flash over the area to be repaired. Embed Gar-Mesh into the base coat and then top dress with an additional layer of Silver-Flash. The top coat should be sufficiently thick so that the Gar-Mesh is fully embedded to achieve a complete seal.

PRECAUTIONS

- As with all cold process materials, full cure is dependent on application rate, time and temperatures. Lingering odors are expected until product achieves full cure.
- Do not apply unless temperatures are at least 50°F (10°C) and rising
- Do not apply if there is a threat of rain, dew or temperatures below 50°F (10°C) forecasted within 24 hours
- Avoid over working the material which can interfere with the leafing of the aluminum and cause the material to appear bronze or darker than desired
- Mix material with a Jiffy Mixer attached to a low speed power drill. Mix until the material is a consistent color.

Silver-Flash®

Technical Data	Silver-Flash
Flash Point (ASTM D 93)	100°F (37.7°C) min.
Density @ 77°F (25°C) (ASTM D 1475)	8.3 lb./gal. (1.0 g/cm³)
Non-Volatile (ASTM D 2369)	70% min.
Viscosity @ 77°F (25°C) Mobilometer 1500g	9-11 seconds
Shelf Life	1 year
Coverage	
Mat Repairs 1/4 in. thickness (6.3 mm thickness)	5 - 6 sq. ft./gal. (0.12 - 0.15 m²/l)
Flashing Repairs 1/4 in. thickness (6.3 mm thickness)	7 in. ft./gal. covers 8 in. wide (0.27 m/l covers 20 cm wide)
Packaging	3 gallon pail (11.4 l) 5 gallon pail (18.9 l)

Eco Facts	Silver-Flash
VOC	300 g/l
Recycled Content	
Post Consumer	N/A
Post Industrial	5.19%
Reflectivity	Typically 60%

For specific recommendations and coverage rates, please contact your local Garland Representative or Garland Technical Service Department.

For more information, visit us at: www.garlandco.com

The Garland Company, Inc.
3800 East 91st Street
Cleveland, OH 44105
FAX: 216-641-0633
Phone: 216-641-7500
Toll Free: 800-321-9336

Garland Canada Inc.
209 Carrier Drive
Toronto, Ontario
Canada, M9W 5Y8
FAX: 416-747-1980
Phone: 416-747-7995
Toll Free: 800-387-5991
(Only in Canada)

The Garland Company UK, LTD
Second Way Centre, Second Way
Avonmouth, Bristol UK BS11 8DF
Phone: 011 44 1174 401050 (Outside UK)
Toll Free: 0800 328 5560 (Only in UK)

S-F 0917

StressBase®

StressBase 80 • StressBase 120

since 1895

OVERVIEW & FEATURES

StressBase sheets are high-strength, puncture and fatigue resistant, rubber modified roofing membranes that consist of fiberglass reinforcement sandwiched by Styrene-Butadiene-Styrene (SBS) rubber in a high penetration index asphalt mixture.

StressBase sheets can be used as a nailable base sheet over approved substrates, as a base flashing for hot- and cold-applied roof systems or as an interply in Garland's hot or cold applied systems. StressBase is typically used in two (2) or three (3) ply modified systems and also can be used in three (3) or four (4) ply BUR's.

Advanced Rubber Technology - The modifier utilized inStressBase sheets is SBS (Styrene-Butadiene-Styrene). When the SBS rubber is properly dispersed throughout the high penetration asphalt, the rubber provides increased thermal shock resistance, UV protection, heat resistance, elongation, and low temperature flexibility. To ensure proper dispersion, a special high shear mixer is used in manufacturing.

High Strength - The StressBase membranes are reinforced with fiberglass. The high-strength provided by the fiberglass scrim resists the movement created by today's modern buildings. In addition, the fiberglass scrim in StressBase membranes provide adequate tensile strength in the machine and cross machine direction. This translates to long-term resistance to splits and tears in the modified roof system.

Security in Multi-Ply Construction - StressBase sheets are the base component of a multi-ply roof system. They combine the inherent advantages and proven performance of multi-ply protection with the strength, flexibility and elongation of elastomeric systems. This unique combination minimizes dependence on perfect workmanship, contact adhesive seaming, etc.

APPLICATION

Garland's StressBase sheets can be used in conjunction with Weatherking® and Green-Lock® to make up a cold-applied system. StressBase sheets can also be used with hot asphalt or Garlastic® as a multi-ply BUR, as the underlayment for Garland's HPR® roof systems or as a base flashing ply for hot-and-cold applied roof systems. Specifications for nailing to various decks are also available.

NOTE: All rolls must be cut in 18 ft. (5.5 m) lengths and allowed to relax prior to application.

StressBase®

Technical Data	StressBase 80	StressBase 120
Tensile Strength	MD 100 lbf./in. (17.5 kN/m) XD 100 lbf./in. (17.5 kN/m)	MD 100 lbf./in. (17.5 kN/m) XD 100 lbf./in. (17.5 kN/m)
Tear Strength	MD 110 lbf. (489 N) XD 100 lbf. (444 N)	MD 100 lbf. (444 N) XD 85 lbf. (378 N)
Elongation	MD 4% XD 4%	MD 4% XD 4%
Low Temperature Flex	passes -40°F (-40°C)	passes -40°F (-40°C)

Finished membrane meets and/or exceeds the performance criteria of ASTM D 6163, TYPE II.
Test Method ASTM D 5147 is tested at:
0.08 in/min @ 0 ± 3.6°F
(2.0 mm/min @ -18 ± 2°C)

Roll Dimensions	StressBase 80	StressBase 120
Width	3 ft. 3 in. (1m)	3 ft. 3 in. (1m)
Length	52 ft. (15.85 m)	34 ft. 8 in. (10.60 m)
Weight	100 lbs. (45.36 kg)	85 lbs. (38.55 kg)
Nominal Thickness	80 mils (2,032 microns)	120 mils (3,048 microns)
Net Coverage	150 sq. ft. (13.93 m²)	100 sq. ft. (9.29 m²)
Packaging	24 rolls/pallet	24 rolls/pallet

Eco-Facts	StressBase 80	StressBase 120
Recycled Content		
Pre-Consumer	27%	24%
Post-Consumer	-	-

For specific application recommendations, please contact your local Garland Representative or Garland Technical Service Department.

Installation of this product with hot oxidized asphalt may result in exposure to hazardous chemicals. Special care and attention for proper product installation must be followed in all cases. For specific details refer to the NIOSH safe handling practices in publication No. 2003-107, as well as OSHA standard 1910.134 for further exposure precautions.

Garland Greenhouse

VALIDATED

VALIDATED

MIAMI-DADE COUNTY APPROVED

FM APPROVED

This product meets the requirements of CSA 123.23.

For more information, visit us at: www.garlandco.com

The Garland Company, Inc.
3800 East 91st Street
Cleveland, OH 44105
FAX: 216-641-0633
Phone: 216-641-7500
Toll Free: 800-321-9336

Garland Canada Inc.
209 Carrier Drive
Toronto, Ontario
Canada, M9W 5Y8
FAX: 416-747-1980
Phone: 416-747-7995
Toll Free: 800-387-5991
(Only in Canada)

The Garland Company UK LTD
Second Way Centre, Second Way
Avonmouth, Bristol UK BS11 8DF
Phone: 011 44 1174 401050 (Outside UK)
Toll Free: 0800 328 5560 (Only in UK)

Tests verified by independent laboratories. Actual roof performance specifications will vary depending on test speed and temperature. Data reflects samples randomly collected. ± 10% variation may be experienced. The above data supersedes all previously published information. Consult your local Garland Representative or the home office for more information.

SB 80/120 0518

StressPly® Plus Membranes

StressPly Plus • StressPly Plus FR Mineral

since 1895

OVERVIEW & FEATURES

StressPly Plus membranes feature a high strength, mineral surfaced, UV resistant, rubber modified roof membrane designed for use as the waterproofing and reinforcement layer of a modified built-up roofing system. The sheets consist of a fiberglass/polyester reinforcement sandwiched by a unique Styrene-Butadiene-Styrene (SBS) in a high penetration index asphalt mixture containing post-consumer recycled rubber from scrap tires.

StressPly Plus membranes are designed for use as the top component in a roofing system where fire retardancy is required. It can also be used in conjunction with Garland's HPR® products as well as with conventional glass base sheets or fiberglass roofing felts. In addition, StressPly Plus membranes can be used as the top ply in a two-ply flashing system. It can also be used to repair splits, cracks, and other deteriorated areas in existing asphalt based roofing systems. Specifications are available for either hot or cold applied systems.

Environmentally Friendly - StressPly Plus membranes utilize post-consumer scrap from waste tires. With absolutely no sacrifice in quality, StressPly Plus membranes maintain Garland's reputation as a manufacturer of high performance roofing systems while benefitting the environment.

Superior Strength - StressPly Plus membranes are reinforced with a fiberglass/polyester scrim that provides tensile strength in excess of 300 pounds per inch in the machine and cross machine direction. The superior strength provided by the fiberglass/polyester scrim resists the movement created by today's modern buildings. This translates to long-term resistance to splits and tears in the roof system.

Factory Formulation Reduces Labor Expense - StressPly Plus FR Mineral is coated with reflective mineral granules. Consequently, there's no need to flood coat and gravel or aluminize the membrane's surface. Roof projects can be completed on a more timely basis. The end result is substantial savings in labor expense.

Superior Fire Resistance - StressPly Plus FR Mineral contains a fire retardant that is added to the compound during the manufacturing process. As a result, it will maintain its fire rating for the life of the membrane. StressPly Plus FR Mineral has a Class A fire rating over a combustible roof deck.

APPLICATION

Hot-Applied

StressPly Plus membranes can be used with ASTM D 312, Type III or IV asphalt, Garland's HPR All-Temp Asphalt or modified asphalt. One or two plies of ASTM D 2178, Type IV or VI fiberglass felt are solidly bonded to the approved substrate. The StressPly Plus membrane is then solidly adhered to these base layers with mopping asphalt.

Cold-Applied

StressPly Plus membranes can also be applied in Garland's cold applied Weatherking® or Green-Lock® membrane adhesive. One or two layers of heavy duty Garland approved ASTM D 4601, Type II base sheets are applied in Weatherking or Green-Lock membrane adhesive to the approved substrate. The StressPly Plus membrane is then adhered to these base layers with Weatherking or Green-Lock membrane adhesive.

StressPly® Plus Membranes

Technical Data	StressPly Plus	StressPly Plus FR Mineral
Tensile Strength	*MD 310 lbf./in. (54.25 kN/m) *XD 310 lbf./in. (54.25 kN/m) **MD 325 lbf./in. (57 kN/m) **XD 325 lbf./in. (57 kN/m)	*MD 310 lbf./in. (54.25 kN/m) *XD 310 lbf./in. (54.25 kN/m) **MD 325 lbf./in. (57 kN/m) **XD 325 lbf./in. (57 kN/m)
***Tear Strength**	MD 500 lbf. (2224 N) XD 500 lbf. (2224 N)	MD 500 lbf. (2224 N) XD 500 lbf. (2224 N)
***Elongation**	MD 8.0% XD 8.0%	MD 8.0% XD 8.0%
***Low Temperature Flex**	-30° F (-34° C)	-30° F (-34° C)

Finished membrane meets and/or exceeds ASTM D 6162, TYPE III
Test Method ASTM D 5147 is tested at:
* 2 in./min @ 73.4 ± 3.6°F (50 mm/min @ 23 ± 2°C) ** 0.08 in/min @ 0 ± 3.6°F (2.0 mm/min @ -18 ± -3°C)

Roll Dimensions	StressPly Plus	StressPly Plus FR Mineral
Width	3 ft. 3 in. (1m)	3 ft. 3 in. (1m)
Length	34 ft. 8 in. (10.57 m)	26 ft. 2 in. (7.98 m)
Weight	85 lbs. (39 kg)	90 lbs.(40.8 kg)
Nominal Thickness	105 mils (2,667 microns)	155 mils (3,937 microns)
Net Coverage	100 sq. ft. (9.29 m²)	75 sq. ft. (6.96 m²)
Packaging	25 rolls/pallet	25 rolls/pallet

Eco-Facts	StressPly Plus	StressPly Plus FR Mineral
Recycled Content		
Pre-Consumer	22%	11%
Post-Consumer	0.4%	0.3%
Reflectance	-	***0.72
Emittance	-	***0.90
SRI	-	***89

***With upgrade option Sunburst Minerals (0.700-0.029a) CRRC results

For specific application recommendations, please contact your local Garland Representative or Garland Technical Service Department.

Installation of this product with hot oxidized asphalt may result in exposure to hazardous chemicals. Special care and attention for proper product installation must be followed in all cases. For specific details refer to the NIOSH safe handling practices in publication No. 2003-107, as well as OSHA standard 1910.134 for further exposure precautions.

Garland Greenhouse

VALIDATED

VALIDATED

This product meets the requirements of CSA 123.23.

For more information, visit us at: www.garlandco.com

The Garland Company, Inc.
3800 East 91st Street
Cleveland, OH 44105
FAX: 216-641-0633
Phone: 216-641-7500
Toll Free: 800-321-9336

Garland Canada Inc.
209 Carrier Drive
Toronto, Ontario
Canada, M9W 5Y8
FAX: 416-747-1960
Phone: 416-747-7995
Toll Free: 800-387-5991
(Only in Canada)

The Garland Company UK LTD
Second Way Centre, Second Way
Avonmouth, Bristol UK BS11 8DF
Phone: 011 44 1174 401050 (Outside UK)
Toll Free: 0800 328 5560 (Only in UK)

Tests verified by independent laboratories. Actual roof performance specifications will vary depending on test speed and temperature. Data reflects samples randomly collected. ± 10% variation may be experienced. The above data supersedes all previously published information. Consult your local Garland Representative or the home office for more information.

SP PVSP P FR Mkt 0518

UniBond™ ST

Polyester-Faced Adhesive Tape

since 1895

OVERVIEW & FEATURES

UniBond ST is a high-performance, fatigue resistant, self-priming, 100% solids tape designed for use with Garland cold- process restoration systems. This versatile tape will instantly seal and reinforce seams and penetrations on a variety of metal and single-ply roof systems and components. UniBond ST bonds aggressively to a variety of surfaces, including properly prepared EPDM, TPO, Hypalon, aged PVC, CPE, metal roofs, brick, concrete, and masonry. It is formulated with synthetic resins, thermoplastics, and non-curing rubber with a woven polyester facing.

UniBond ST is used on single-ply and metal roofs in conjunction with the CPR™ White, Revitalizer™ Metal, White-Knight®/White-Stallion®, White-Knight®/White-Stallion® Plus, and cold-applied roof maintenance systems to seal roof joints, seams, tears, flashings, copings, skylights, and gutters. Extremely flexible, with no memory, UniBond ST conforms to virtually any shape. UniBond ST seals to itself so it can be cut and folded around an object. A UV stable finish coat must be applied to UniBond ST on the same day - do not expose the UniBond ST fabric surface to the elements.

Seals & Reinforces – UniBond ST seals and reinforces seams and penetrations, fusing at a molecular level to a variety of substrates to create an instant, airtight and watertight barrier. This product forms a durable, monolithic restoration system when combined with Garland cold-applied roof coating systems: CPR White, Revitalizer Metal, White-Knight/White-Stallion, or White-Knight/White-Stallion Plus.

Multi-Purpose & User-Friendly – Can be used in various applications such as sealing seams, approved flashing details, and numerous maintenance repairs. Installation is as easy as applying a piece of tape. UniBond ST's built-in primer and advanced micro-sealant adhesive technology enables instant adhesion on contact. The versatility and trouble-free application makes UniBond ST an invaluable tool for maintenance and roof restoration.

Resilient & Flexible – The 100% solids content prevents shrinkage, aiding the long-term yield of 500% elongation and enabling UniBond ST to accommodate movement.

Service Temperature – UniBond ST maintains its physical properties at temperatures as low as -70°F (-56.6°C). This allows the tape to maintain a watertight seal even in extremely cold temperatures.

APPLICATION

Surface Preparation – Substrates must be clean and dry. Remove all moisture, dust, dirt or other foreign contaminants. Remove oil and grease, etc. with mineral spirits or a non-residue cleaner such as acetone or lacquer thinner. For larger jobs, power wash the surface with TSP or Simple Green. UniBond ST will not adhere to silicone sealants or silicone treated surfaces, water-proof treated surfaces, anti-stain treated surfaces, waxes, oily surfaces, dirt, or other loose elements on a surface.

Due to the variety of surfaces and unpredictable nature of certain substrates, a field test is recommended to determine the adhesion of UniBond ST.

Application - UniBond ST should be applied at a minimum application temperature of 40°F (4.44°C) and rising. To install UniBond ST, remove the release liner gradually to prevent contamination of the adhesive prior to application. Apply UniBond ST uniformly to prevent wrinkles and other discrepancies. DO NOT STRETCH.

Apply pressure starting at the center of the tape and work toward the outside edge with a steel roller or hands to activate the bonding process. Verify edges are tightly adhered to the surface.

Finish Coat - After the tape is properly adhered, the first coat of an approved Garland cold process roof coating must be applied over the polyester facing on the same day. Apply coating a minimum of 2 inches beyond the edge of the tape on each side. For specific coating application rates, see system application guidelines.

STORAGE

UniBond ST will not degrade in normal warehouse storage. In time, due to the aggressive adhesion of this product, the release liner may become difficult to remove. For this reason, the recommended shelf life is two years. Store indoors, out of direct sunlight between 60-80°F (15.6-26.7°C). Always rotate stock.

PRECAUTIONS

- Clean skin with mineral spirits, then wash thoroughly with soap and water.
- May be harmful if swallowed - do not induce vomiting; contact physician immediately.
- Keep away from heat and flames.
- Do not expose adhesive tape rolls to moisture.
- Do not use in freezing conditions.
- Do not apply the adhesive tape in the rain or over ice.
- Do not use on modified or BUR system surfaces.

UniBond™ ST

Technical Data	UniBond ST
Tensile Strength	4500 psi
Elongation	500%
Low Temperature Flexibility Pass ½ in. radius	-70°F (-56.6°C)
Service Temperature	-30 - 200°F (-34.4 - 93.3°C)
Permanence (ASTM E 96B)	.001 perms
Adhesion	> 20 lbs./in.
Shrinkage	No measurable shrinkage after 14 days
Nominal Thickness	30 mils (1 mm)
Shelf Life	2 years
Size	
length	50 ft. (15.24 m)
width*	4 in. (10.16 cm)
Packaging	6 rolls per case*, 300 L/ft.

*Available for special order in 6 in. or 12 in. widths, number of rolls per case will vary with roll size.

For specific application recommendations, please contact your local Garland Representative or Garland Technical Service Department.

For more information, visit us at: www.garlandco.com

The Garland Company, Inc.
3800 East 91st Street
Cleveland, OH 44105
FAX: 216-641-0633
Phone: 216-641-7500
Toll Free: 800-321-9336

Garland Canada Inc.
209 Carrier Drive
Toronto, Ontario
Canada, M9W 5Y8
FAX: 416-747-1980
Phone: 416-747-7995
Toll Free: 800-387-5991
(Only in Canada)

The Garland Company UK, LTD
Second Way Centre, Second Way
Avonmouth, Bristol UK BS11 8DF
Phone: 011 44 1174 401050 (Outside UK)
Toll Free: 0800 328 5560 (Only in UK)

UB ST 0917

White-Knight®/White-Stallion® Plus Base Coat

White-Knight/White-Stallion Plus Base Coat • White-Knight Plus Base Coat WC

since 1895

OVERVIEW & FEATURES

White-Knight/White-Stallion Plus Base Coat is a gray liquid waterproofing membrane designed as the initial layer of a White-Knight/White-Stallion Plus system to maintain, restore and upgrade the performance of roof systems. This multi-purpose, single-component, aliphatic urethane product restores aged roof systems. White-Knight Plus Base Coat WC is VOC compliant and meets South Coast AQMD standards.

White-Knight/White-Stallion Plus Base Coat can be used to coat aged single-ply, metal, smooth BUR, and modified bitumen roof systems. It can also be used as a repair material for maintenance applications. White-Knight/White-Stallion Plus can be applied by brush, roller or spray.

Waterproofing Protection - White-Knight/White-Stallion Plus Base Coat provides 26 dry mils of additional waterproofing protection to an existing roof system. This process will effectively extend the life of the roof system.

UV Resistant - This high performance coating protects the existing roof from the harmful effects of UV, greatly reducing thermal shock. The coating itself is UV resistant due to its aliphatic chemistry.

User Friendly - Ease of application makes White-Knight/White-Stallion Plus Base Coat fast and simple to install. This superior coating can be used to reinforce and seal laps, make spot repairs or restore entire roofing systems.

APPLICATION

Ensure all wet insulation is removed. An infrared roof scan is highly recommended. Remove all dirt, dust, and debris from the roof surface. Make necessary repairs and verify all repairs are securely bonded. Prior to coating any surface, be sure the coating will adhere by performing an adhesion test (ASTM D 903). Proper coverage rate is critical to the success of all coating projects, use a wet mil gauge to ensure proper coverage rates.

Single Ply Restoration System

Power wash the surface including flashings with TSP or Simple Green and then thoroughly rinse, paying special attention to drains and low spots. The first coat of White-Knight Plus Base Coat should be applied at approximately 2 gal./100 sq. ft. (0.82 l/m²) or 32 wet mils over all seams, flashings, and repaired areas. Any repaired areas must use cured membranes for the repairs. Allow roof system to dry for 24–48 hours, but no more than 72 hours. Then apply 2 gal./100 sq. ft. (0.82 l/m²) or 32 wet mils of White-Knight Plus to the field of the roof. The first layer may still be tacky at 24 hours.

Modified/BUR Reinforced System

Power wash the surface, including flashings, with TSP or Simple Green. Allow roof system to dry for 24–48 hours, then prime the entire roof surface with All-Knight®/All-Stallion® Primer at a rate of 0.5 gal./100 sq. ft. (0.21 l/m²). For the field of the roof and flashings, apply 2 gal./100 sq. ft. (0.82 l/m²) or 32 wet mils of White-Knight Plus Base Coat. Allow roof system to dry for 24–48 hours, but no more than 72 hours. Apply 2 gal./100 sq. ft. (0.82 l/m²) or 32 wet mils of White-Knight Plus. The first layer may still be tacky at 24 hours.

Metal Restoration System

Power wash the entire surface, including flashings, with TSP or Simple Green. All surfaces must be sound, dry, clean, and free of oil, dirt, grease, wax, mildew, loose or flaking paint and rust by scraping, sanding, wire brushing or blasting. Apply White-Knight Metal Primer over a small area at 0.25 gal./100 sq. ft. (0.11 l/m²) and let set for 20 minutes. Monitor to ensure adhesion and note if sag occurs. If any sag occurs, adjust coverage as necessary. Once adhesion is confirmed, apply White-Knight Metal Primer over the entire surface at 0.25 gal./100 sq. ft. (0.11 l/m²). The first coat of White-Knight Plus Base Coat should be applied at approximately 2 gal./100 sq. ft. (0.82 l/m²) or 32 wet mils, stripped in over all seams, around penetrations, and fasteners. Allow roof system to dry for 24-48 hours, but no more than 72 hours. Next, apply the finish coat of White-Knight Plus at 2 gal./100 sq. ft. (0.82 l/m²) or 32 wet mils over the entire roof. The first layer may still be tacky at 24 hours.

PRECAUTIONS

- Do not apply when temperatures are below 40°F (4.4°C), spray application is not recommended below 50°F (10°C) or if rain is in the forecast within 48 hours
- In areas where the roof is subject to foot traffic, it is recommended to apply walkway pads or a granule walkway surface
- Excess water on the roof surface can cause the roof to become slippery
- Reinforcement fabric should be used when coating over heavily alligatored surfaces, areas that pond water, and over surface irregularities
- Not intended to restore glaze coats of asphalt
- Prior to coating any surface, be sure the coating will adhere by performing an adhesion test (ASTM D 903)
- If spraying, consult the White-Knight/White-Stallion Plus Spray Application Guide

White-Knight®/White-Stallion® Plus Base Coat

Technical Data	White-Knight/White-Stallion Plus Base Coat (+WC)
Non-Volatile (ASTM D 75)	Typical 83%
Flash Point (ASTM D 93)	110°F min. (43.3°C)
Density @ 77°F (25°C) (ASTM D 2939)	10.4 lb./gal (1.2 g/m³)
Viscosity @ 77°F (25°C); 10 RPM, Brookfield RVT, #4 Spindle	9200 cP
Tear Resistance (ASTM D 624)	160 lbs./in
Elongation	320%
Tensile Strength (ASTM D 412)	2100 psi
Wet Film Thickness @ 2 gal./100 sq. ft. (0.82 l/m²)	32 mils (812.8 micros)
Color	Gray
Shelf Life	1 year, unopened
Coverage*	
Single-Ply	2 gal./100 sq. ft. (0.82 l/m²) seams
Modified/BUR	2 gal./100 sq. ft. (0.82 l/m²) entire roof
Metal	2 gal./100 sq. ft. (0.82 l/m²) seams
Packaging	5 gal. pail (18.9 l) 55 gal. drum (208.2 l)

**All systems are two coat applications; must top coat with White-Knight/White-Stallion Plus*

Eco-Facts	White-Knight/ White-Stallion Plus Base Coat	White-Knight Plus Base Coat WC
VOC	225 g/l	50 g/l

For specific application recommendations, please contact your local Garland Representative or Garland Technical Service Department.

For more information, visit us at: www.garlandco.com

The Garland Company, Inc.
3800 East 91st Street
Cleveland, OH 44105
FAX: 216-641-0633
Phone: 216-641-7500
Toll Free: 800-321-9336

Garland Canada Inc.
209 Carrier Drive
Toronto, Ontario
Canada, M9W 5Y8
FAX: 416-747-1980
Phone: 416-747-7995
Toll Free: 800-387-5991
(Only in Canada)

The Garland Company UK, LTD
Second Way Centre, Second Way
Avonmouth, Bristol UK BS11 8DF
Phone: 011 44 1174 401050 (Outside UK)
Toll Free: 0800 328 5560 (Only in UK)

WK/WS P BC + WK P BC WC 0917

White-Stallion® Plus

since 1895

OVERVIEW & FEATURES

White-Stallion Plus is a liquid waterproofing membrane designed to maintain, restore and upgrade the performance of aged roof systems. This is a highly reflective, multi-purpose, single-component, aliphatic urethane that provides a finished white roof surface.

White-Stallion Plus system can be used to coat aged single-ply, metal, smooth BUR, and modified bitumen roof systems. It can also be used as a repair material for maintenance applications. White-Stallion Plus can be applied by brush, roller or spray.

Energy Efficient - Provides added UV protection to prolong the life of the roof, while helping maintain internal temperatures and reducing cooling costs.

Waterproofing Protection - The White-Stallion Plus system will provide 26-53 dry mils of additional waterproofing protection to an existing roof system, extending the life of the roof system.

UV & Chemical Resistant - This high-performance aliphatic urethane coating protects the existing roof from the harmful effects of UV radiation, greatly reducing thermal shock. White-Stallion Plus is also uniquely formulated to provide superior chemical resistance to many oils, acids, and other contaminants.

User Friendly - Ease of application makes White-Stallion Plus fast and simple to install. This coating can be used to reinforce surfaces even without reinforcing fabrics. It can be used to seal laps, make spot repairs, or restore entire roofing systems.

APPLICATION

Ensure all wet insulation is removed. An infrared roof scan is highly recommended. Remove all dirt, dust, and debris from the roof surface. Make any necessary repairs and verify that repairs are securely bonded. Prior to coating any surface, be sure the White-Stallion Plus Base Coat will adhere by performing an adhesion test (ASTM D 903). Proper coverage rate is critical to the success of all coating projects, use a wet mil gauge to ensure proper coverage rates.

Single Ply Restoration System
Power wash the surface including flashings with TSP or Simple Green and then thoroughly rinse, paying special attention to drains and low spots. The first coat of White-Stallion Plus Base Coat should be applied at approximately 2 gal./100 sq. ft. (0.82 l/m²) or 32 wet mils over all seams, flashings, and repaired areas. Any repaired areas must use cured membranes for the repairs. Allow roof system to dry for 24-48 hours, but no more than 72 hours. Then apply 2 gal./100 sq. ft. (0.82 l/m²) or 32 wet mils of White-Stallion Plus to the field of the roof. The first layer may still be tacky at 24 hours.

Modified/BUR Reinforced System
Power wash the surface, including flashings, with TSP or Simple Green. Allow roof system to dry for 24-48 hours, then prime the entire roof surface with All-Stallion® Primer at a rate of 0.5 gal./100 sq. ft. (0.21 l/m²). For the field of the roof and flashings, apply 2 gal./100 sq. ft. (0.82 l/m²) or 32 wet mils of White-Stallion Plus Base Coat. Allow roof system to dry for 24-48 hours, but no more than 72 hours. Apply 2 gal./100 sq. ft. (0.82 l/m²) or 32 wet mils of White-Stallion Plus. The first layer may still be tacky at 24 hours.

Metal Restoration System
Power wash the entire surface, including flashings, with TSP or Simple Green. All surfaces must be sound, dry, clean, and free of oil, dirt, grease, wax, mildew, loose or flaking paint and rust by scraping, sanding, wire brushing or blasting. Apply White-Stallion Metal Primer over a small area at 0.25 gal./100 sq. ft. (0.10 l/m²) and let set for 20 minutes. Monitor to ensure adhesion and note if sag occurs. If any sag occurs, adjust coverage as necessary. Once adhesion is confirmed, apply White-Stallion Metal Primer over the entire surface at 0.25 gal./100 sq. ft. (0.10 l/m²). The first coat of White-Stallion Plus Base Coat should be applied at approximately 2 gal./100 sq. ft. (0.82 l/m²) or 32 wet mils, stripped in over all seams, around penetrations, and fasteners. Allow roof system to dry for 24-48 hours, but no more than 72 hours. Next, apply the finish coat of White-Stallion Plus at 2 gal./100 sq. ft. (0.82 l/m²) or 32 wet mils over the entire roof. The first layer may still be tacky at 24 hours.

PRECAUTIONS

- Do not apply when temperatures are below 40°F (4.4°C); spray application is not recommended below 50°F (10°C) or if rain is in the forecast within 48 hours
- In areas where the roof is subject to foot traffic, it is recommended to apply walkway pads or a granule walkway surface
- Excess water on the roof surface can cause the roof to become slippery
- Reinforcement fabric should be used when coating over heavily alligatored surfaces, areas that pond water, and over surface irregularities
- Not intended to restore glaze coats of asphalt
- Prior to coating any surface, be sure the coating will adhere by performing an adhesion test (ASTM D 903)
- If spraying, consult the White-Knight/White-Stallion Plus Spray Application Guide

White-Stallion® Plus

Technical Data	White-Stallion Plus
Non-Volatile (ASTM D 75)	Typical 63%
Flash Point (ASTM D 93)	110°F min. (43.3°C)
Density @ 77°F (25°C) (ASTM D 2939)	10.4 lb./gal (1.2 g/m³)
Viscosity @ 77°F (25°C); 10 RPM, Brookfield RVT, #4 Spindle	9200 cP
Tear Resistance (ASTM D 624)	160 lbs./in
Elongation	320%
Tensile Strength (ASTM D 412)	2100 psi
Wet Film Thickness @ 2 gal./100 sq. ft. (0.82 l/m²)	32 mils (812.8 micros)
Color	White
Shelf Life	1 year, unopened
Coverage*	
Single-Ply	2 gal./100 sq. ft. on seams – *base coat* + 2 gal./100 sq. ft. (0.82 l/m²) entire roof
Modified/BUR	2 gal./100 sq. ft. on entire roof – *base coat* + 2 gal./100 sq. ft (0.82 l/m²) entire roof
Metal	2 gal./100 sq. ft. on seams – *base coat* + 2 gal./100 sq. ft (0.82 l/m²) entire roof
Packaging	5 gal. pail (18.9 l) 55 gal. drum (208.2 l)

**All systems are two coat applications; first coat uses White-Stallion Plus Base Coat*

Eco-Facts	White-Stallion Plus
VOC	225 g/l
Reflectance	0.87
Emittance	0.90
SRI	111

For specific application recommendations, please contact your local Garland Representative or Garland Technical Service Department.

Garland Greenhouse®

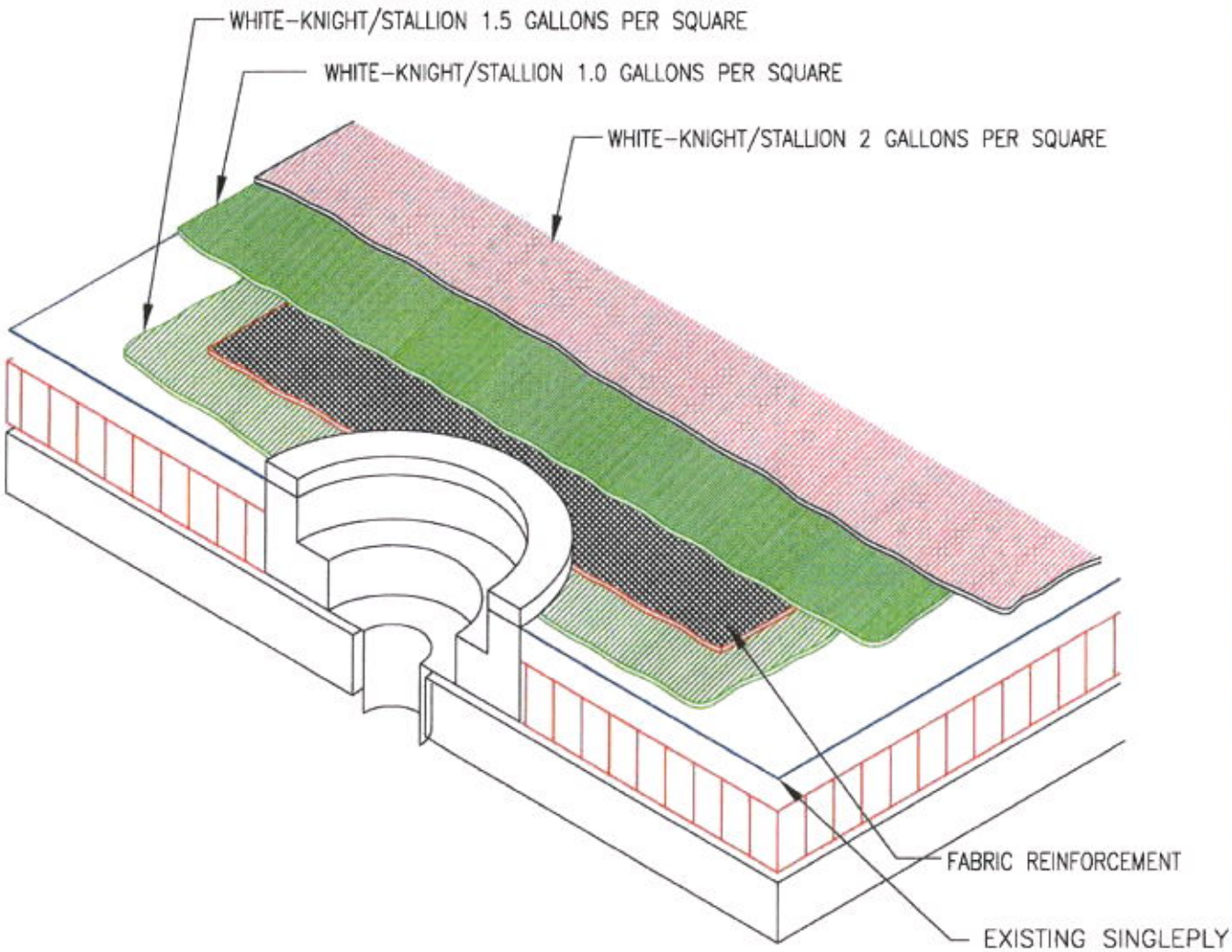
For more information, visit us at: www.garlandco.com

The Garland Company, Inc.
3800 East 91st Street
Cleveland, OH 44105
FAX: 216-641-0633
Phone: 216-641-7500
Toll Free: 800-321-9336

Garland Canada Inc.
209 Carrier Drive
Toronto, Ontario
Canada, M9W 5Y8
FAX: 416-747-1980
Phone: 416-747-7995
Toll Free: 800-387-5991
(Only in Canada)

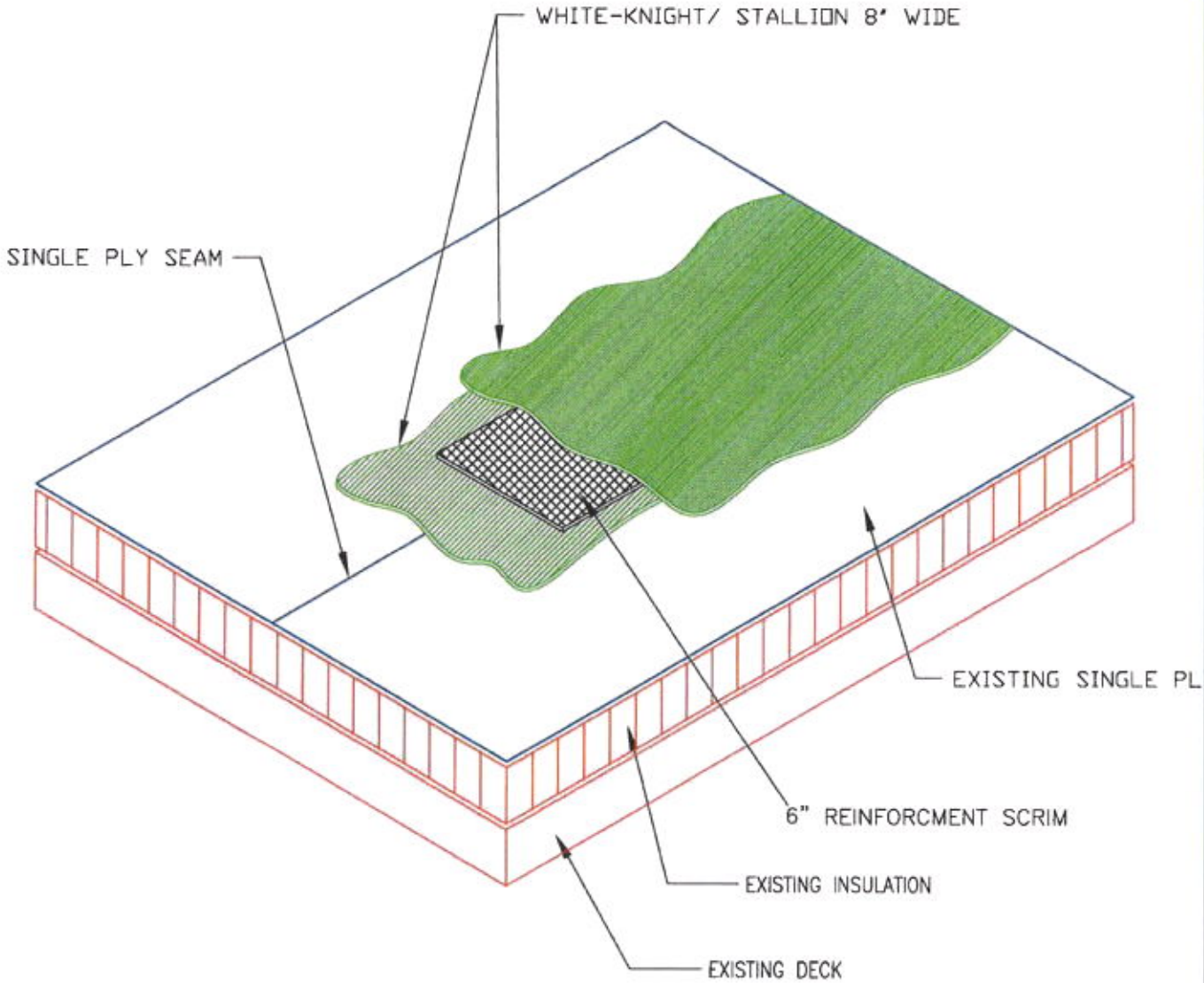
The Garland Company UK, LTD
Second Way Centre, Second Way
Avonmouth, Bristol UK BS11 8DF
Phone: 011 44 1174 401050 (Outside UK)
Toll Free: 0800 328 5560 (Only in UK)

WS P 0517



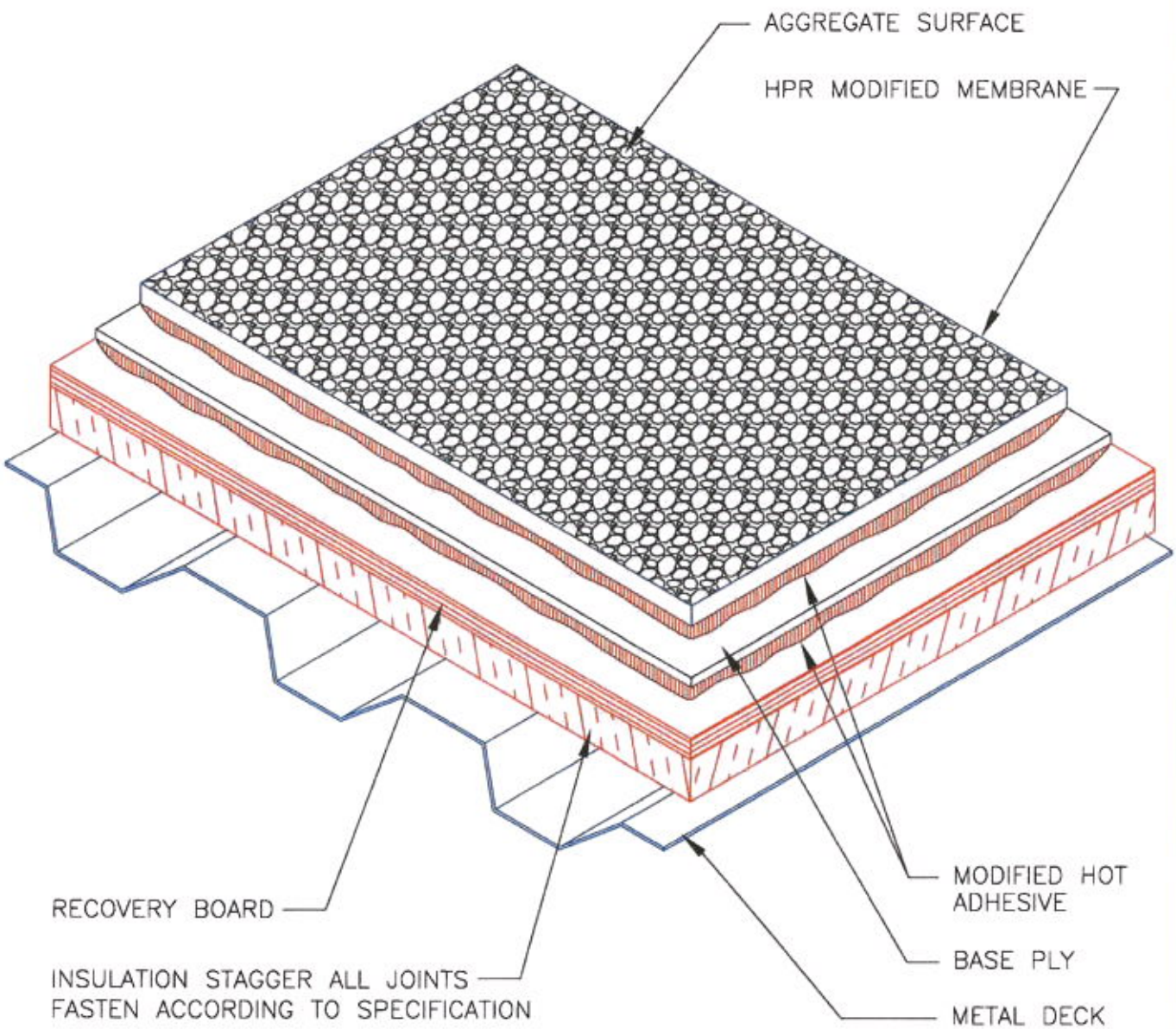
NOTES:

1. SINGLE PLY DRAIN DETAIL IS DONE IN A 2 COAT APPLICATION–1.5 GALLONS OF WHITE–KNIGHT/ STALLION, WORK IN REINFORCEMENT AND THEN ANOTHER 1.0 GALLON OF WHITE–KNIGHT/ STALLION.
2. ALLOW COATING TO DRY FOR AT LEAST 24 HOURS AND THEN COME BACK WITH A FULL APPLICATION OF 2 GALLONS A SQUARE ON THE ENTIRE SINGLE PLY.

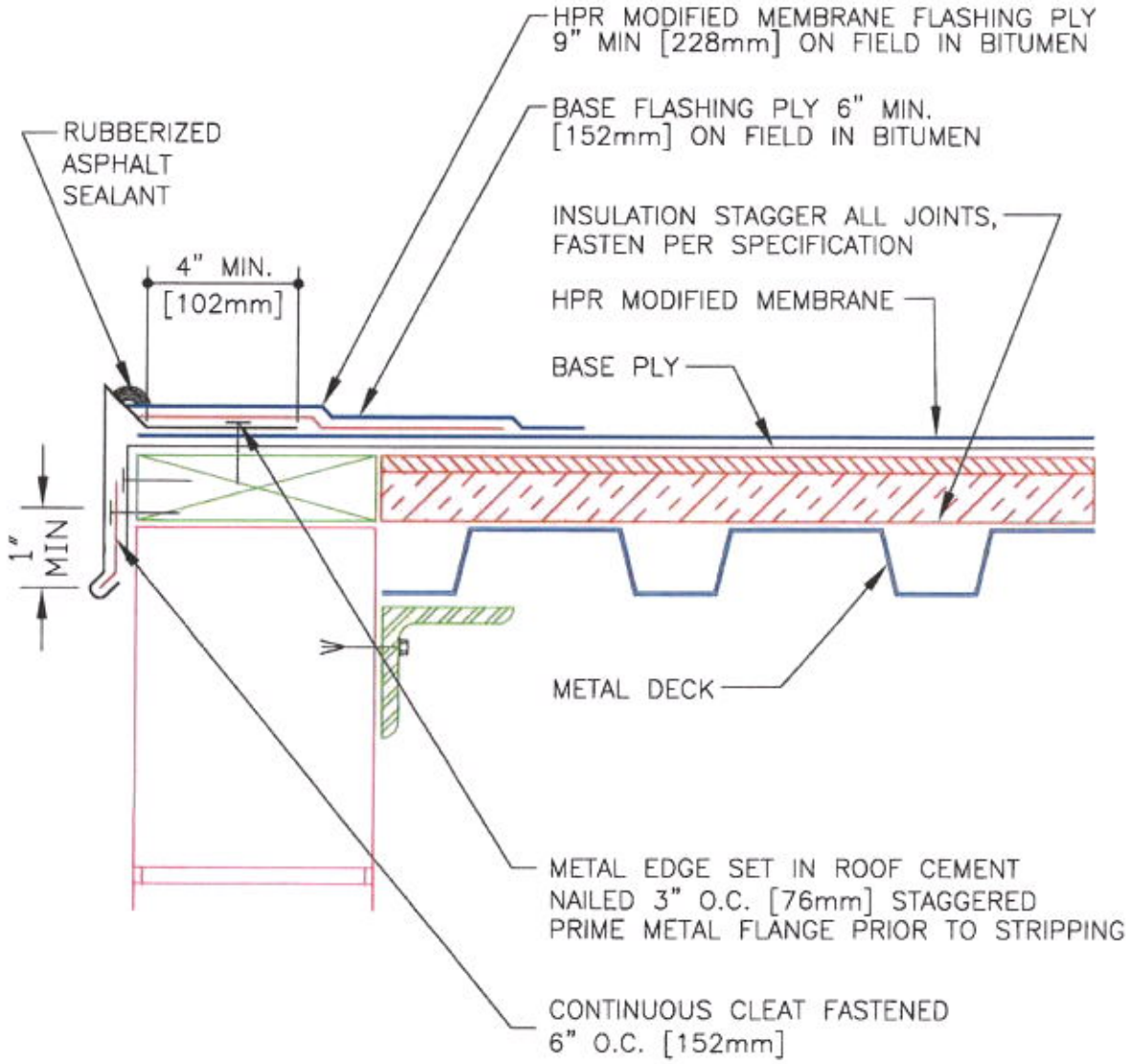


NOTES:

1. SINGLE PLY SEAM DETAIL IS DONE IN A 2 COAT APPLICATION–1.5 GALLONS OF WHITE–KNIGHT/ STALLION, WORK IN REINFORCEMENT AND THEN ANOTHER 1.0 GALLON OF WHITE–KNIGHT/ STALLION.
2. ALLOW COATING TO DRY FOR AT LEAST 24 HOURS AND THEN COME BACK WITH A FULL APPLICATION OF 2 GALLONS A SQUARE ON THE ENTIRE SINGLE PLY.



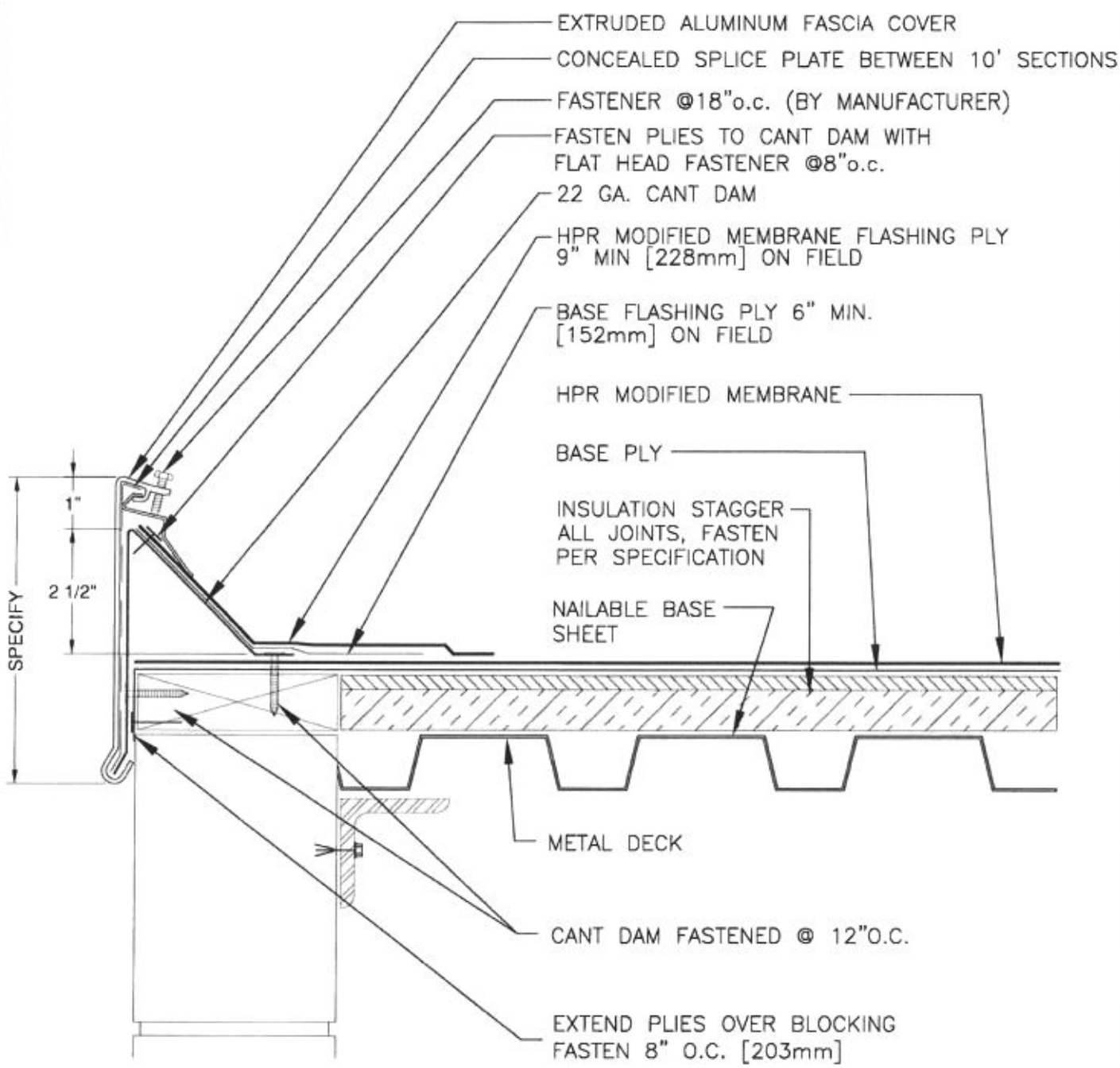
ALL PLIES SET IN BITUMEN SEE SPECIFICATIONS FOR SURFACING



ALL PLIES SET IN BITUMEN
SEE SPECIFICATIONS FOR SURFACING

FILENAME: MB2HM-10

METAL ROOF EDGE EXTRUDED



ALL PLIES SET IN BITUMEN SEE SPECIFICATIONS FOR SURFACING

GARLAND

since 1895

THE GARLAND COMPANY, INC.

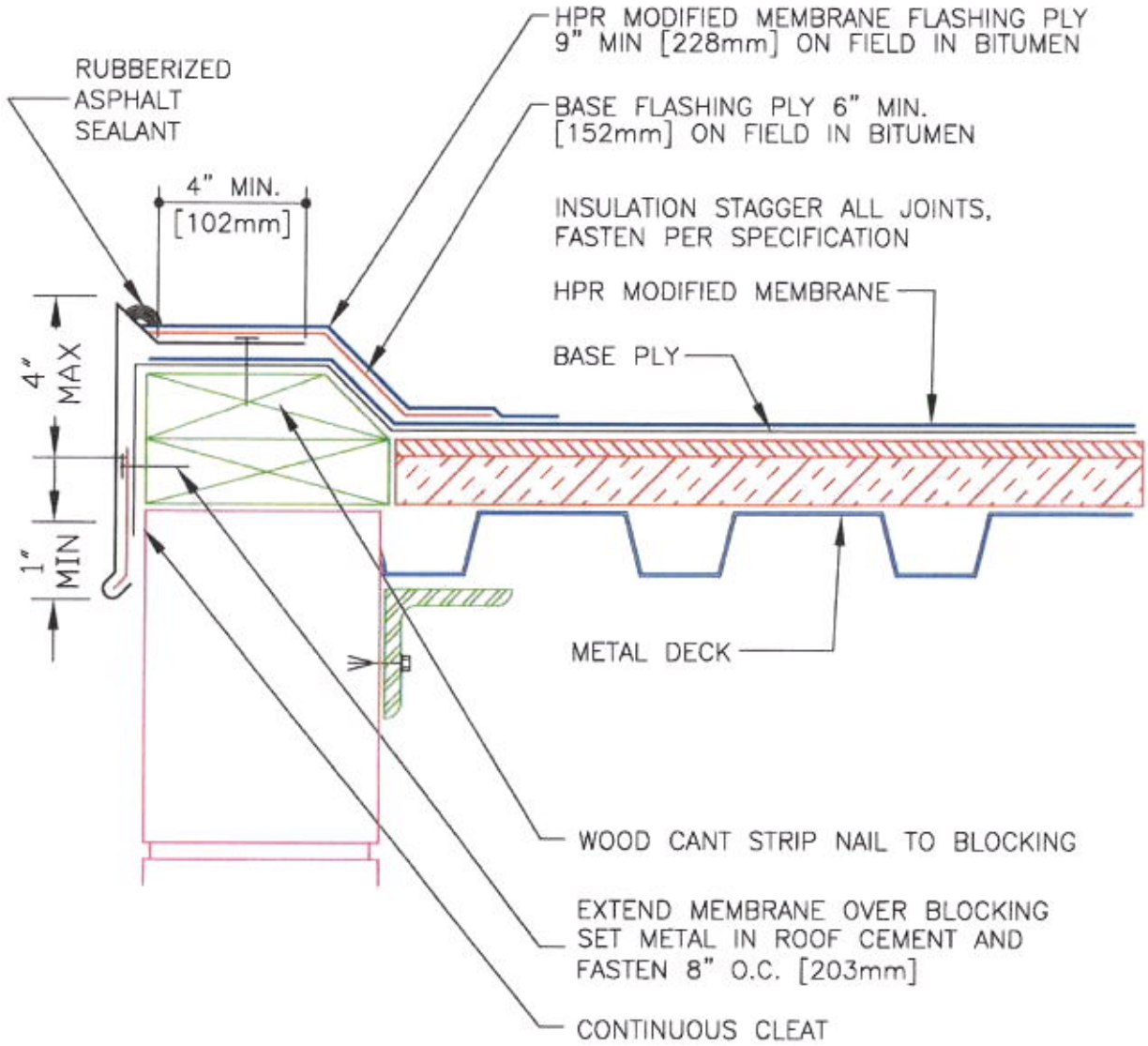
GARLAND CANADA, INC.

THE GARLAND COMPANY UK, LTD

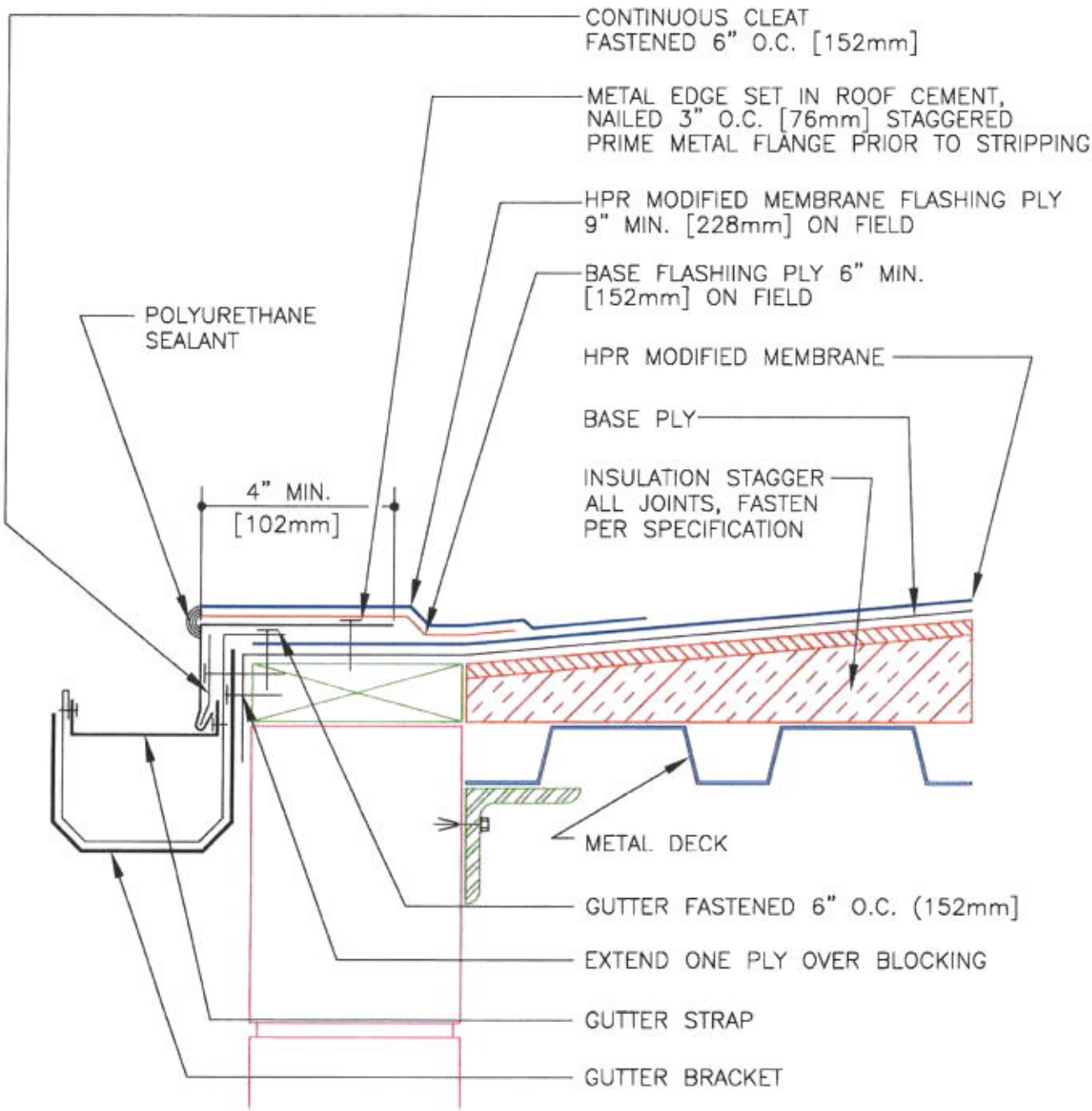
DETAIL:

METAL ROOF EDGE EXTRUDED

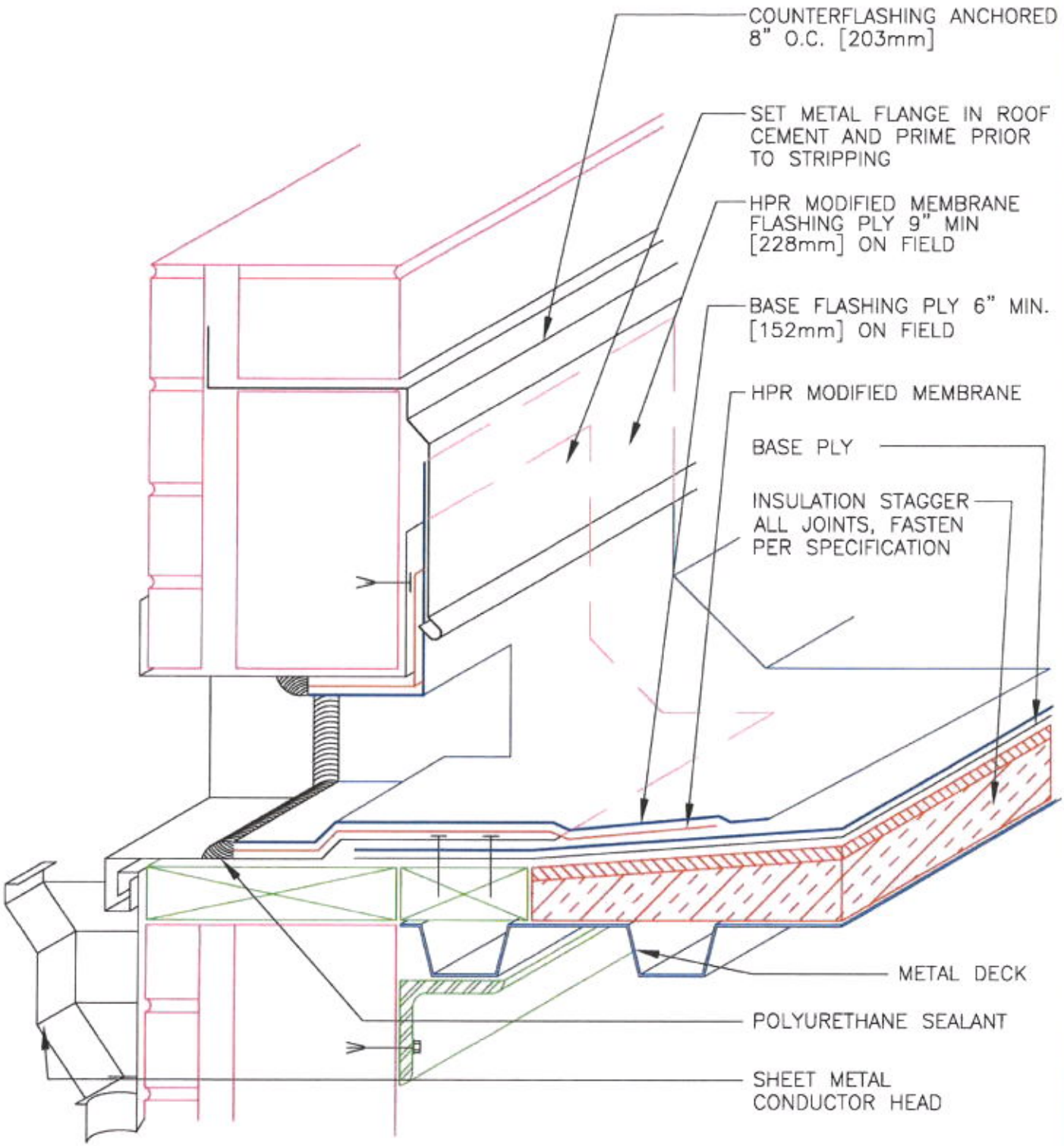
2 PLY HOT APPLIED



ALL PLIES SET IN BITUMEN
SEE SPECIFICATIONS FOR SURFACING



ALL PLIES SET IN BITUMEN SEE SPECIFICATIONS FOR SURFACING



ALL PLIES SET IN BITUMEN SEE SPECIFICATIONS FOR SURFACING

GARLAND

since 1895

THE GARLAND COMPANY, INC.

GARLAND CANADA, INC.

THE GARLAND COMPANY UK, LTD

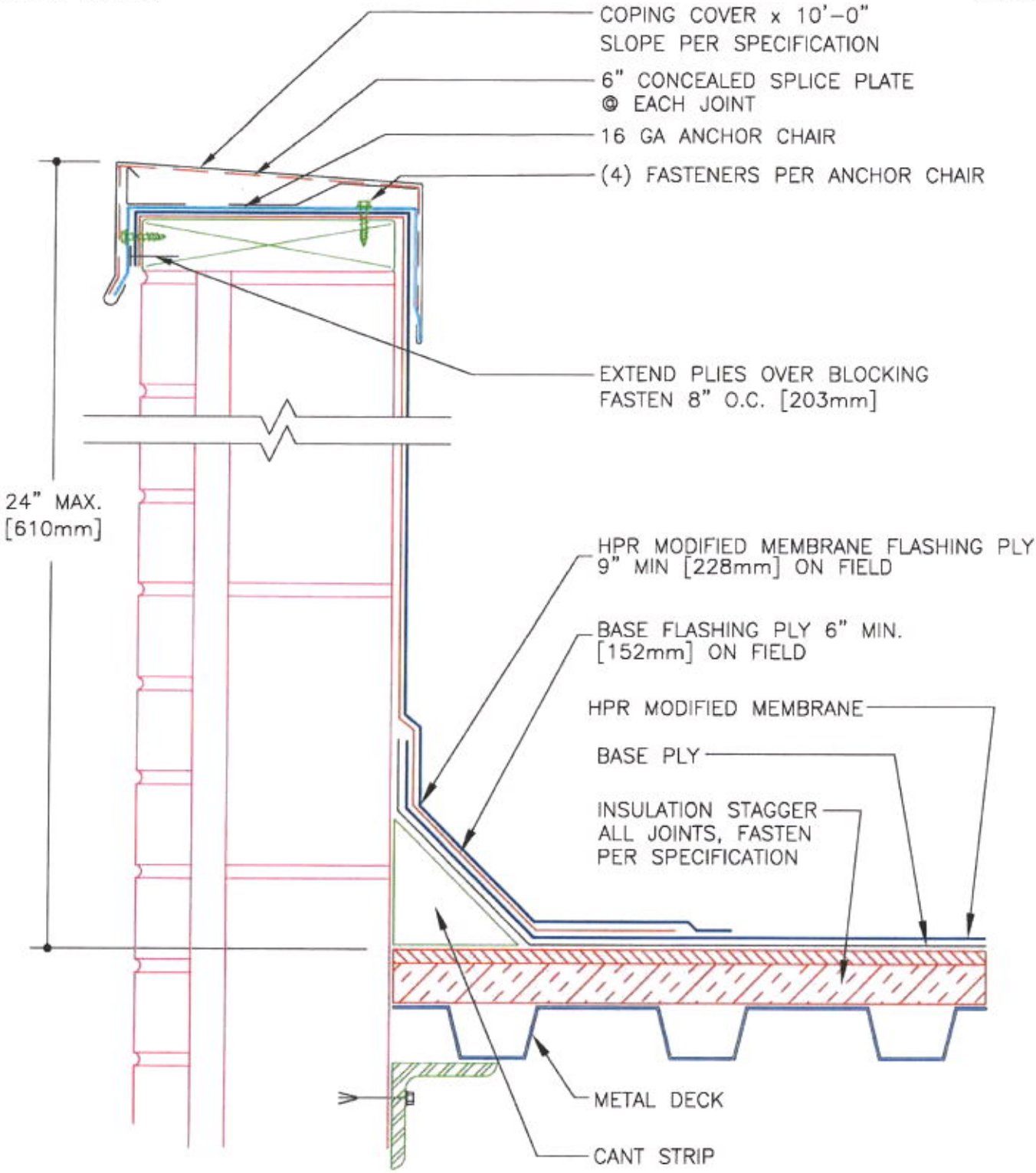
DETAIL:

SCUPPER (THROUGH WALL)

2 PLY-HOT APPLIED

FILENAME: MB2HM-20

COPING CAP



ALL PLIES SET IN BITUMEN SEE SPECIFICATIONS FOR SURFACING

GARLAND

since 1895

THE GARLAND COMPANY, INC.

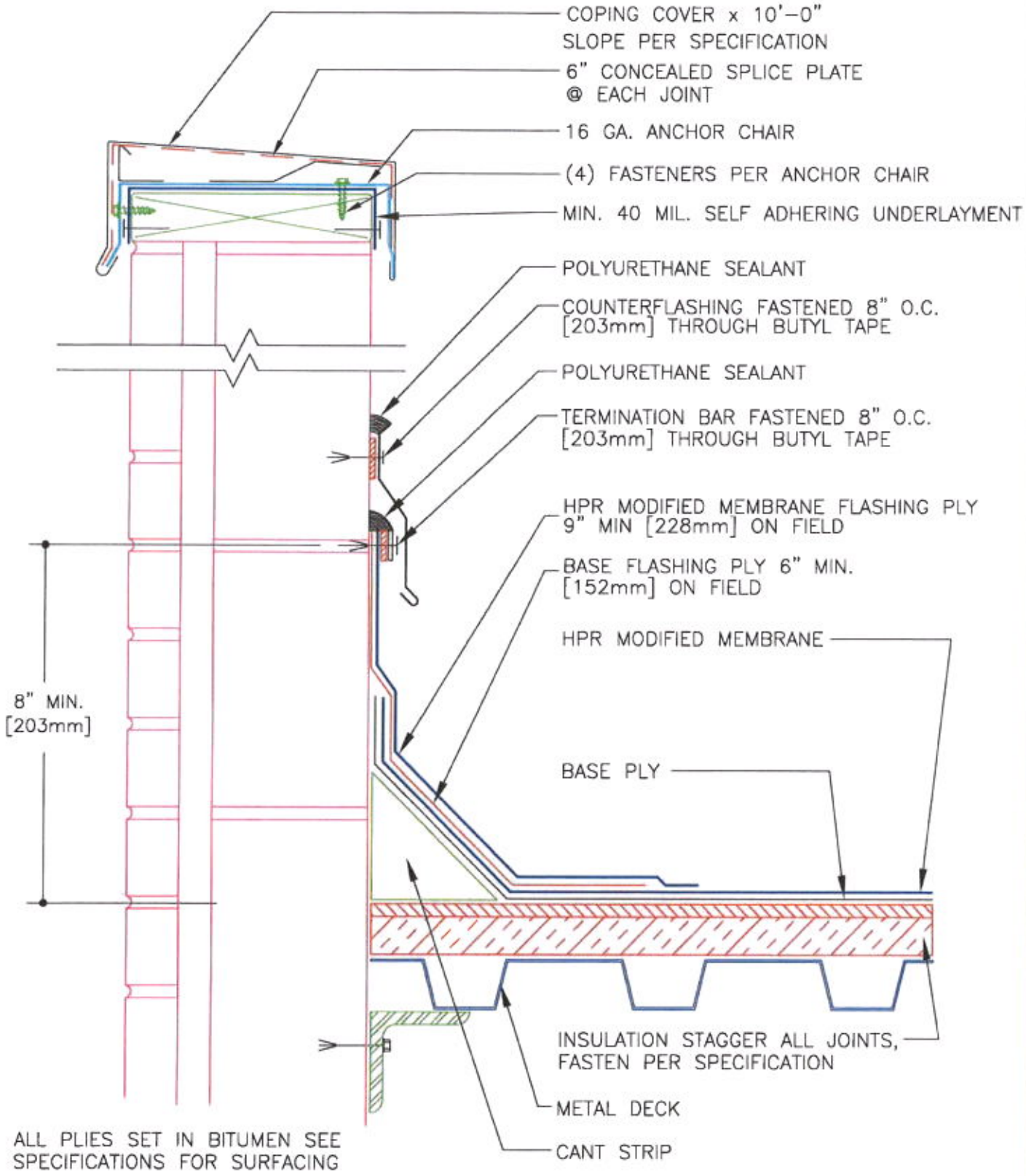
GARLAND CANADA, INC.

THE GARLAND COMPANY UK, LTD

DETAIL:

COPING CAP

2 PLY-HOT APPLIED



GARLAND

since 1895

THE GARLAND COMPANY, INC.

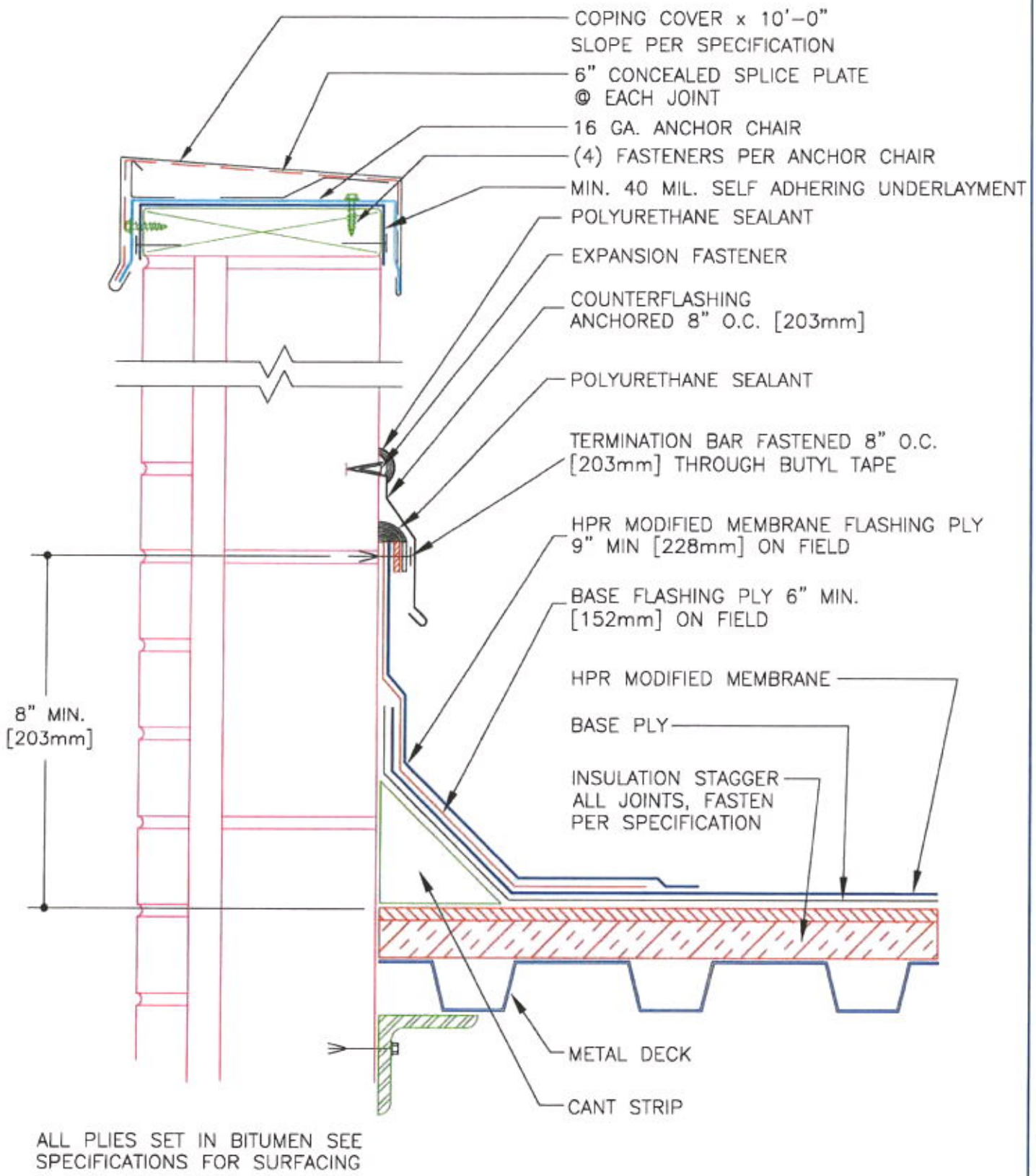
GARLAND CANADA, INC.

THE GARLAND COMPANY UK, LTD

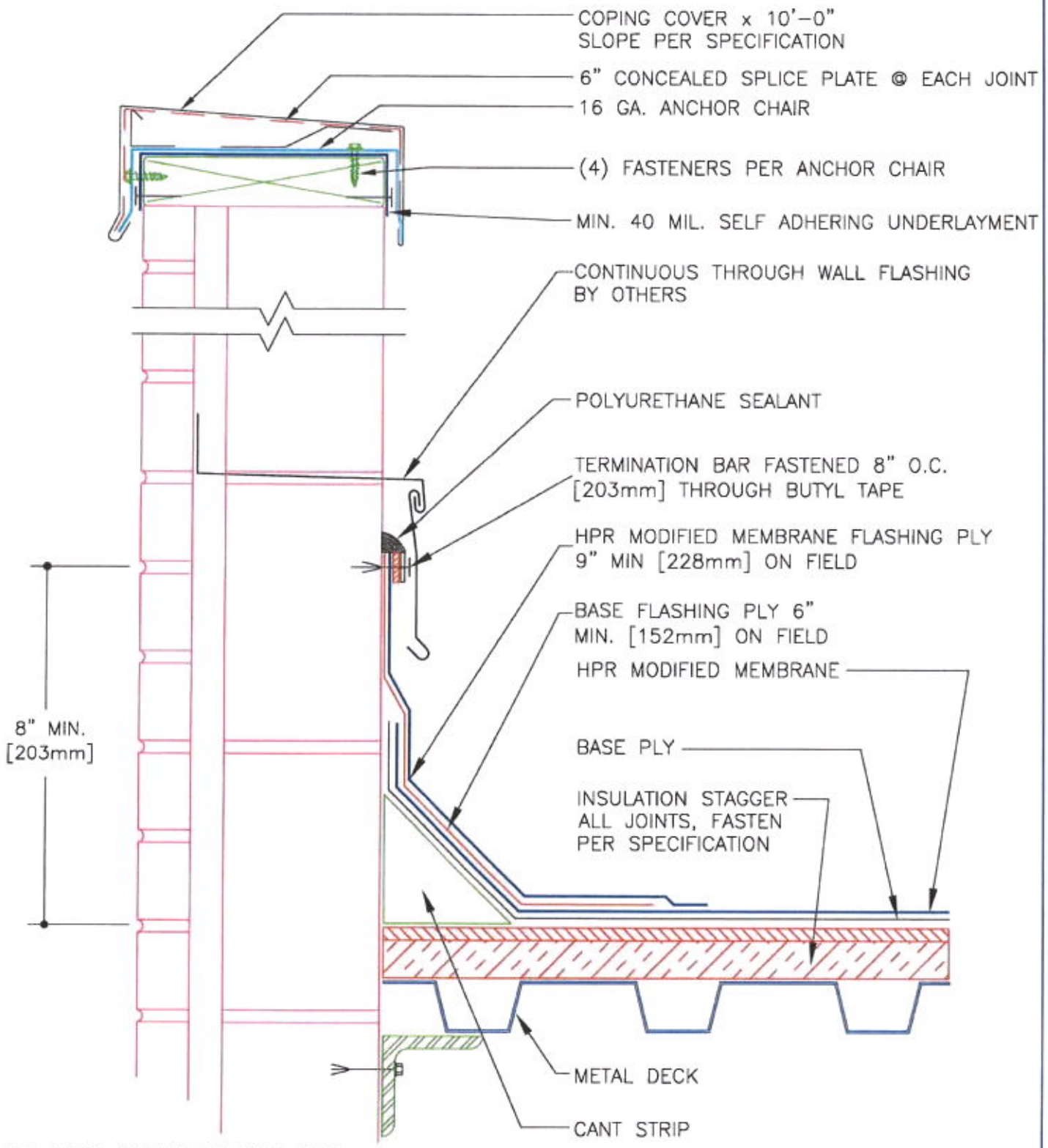
DETAIL:

SURFACE MOUNTED COUNTERFLASHING

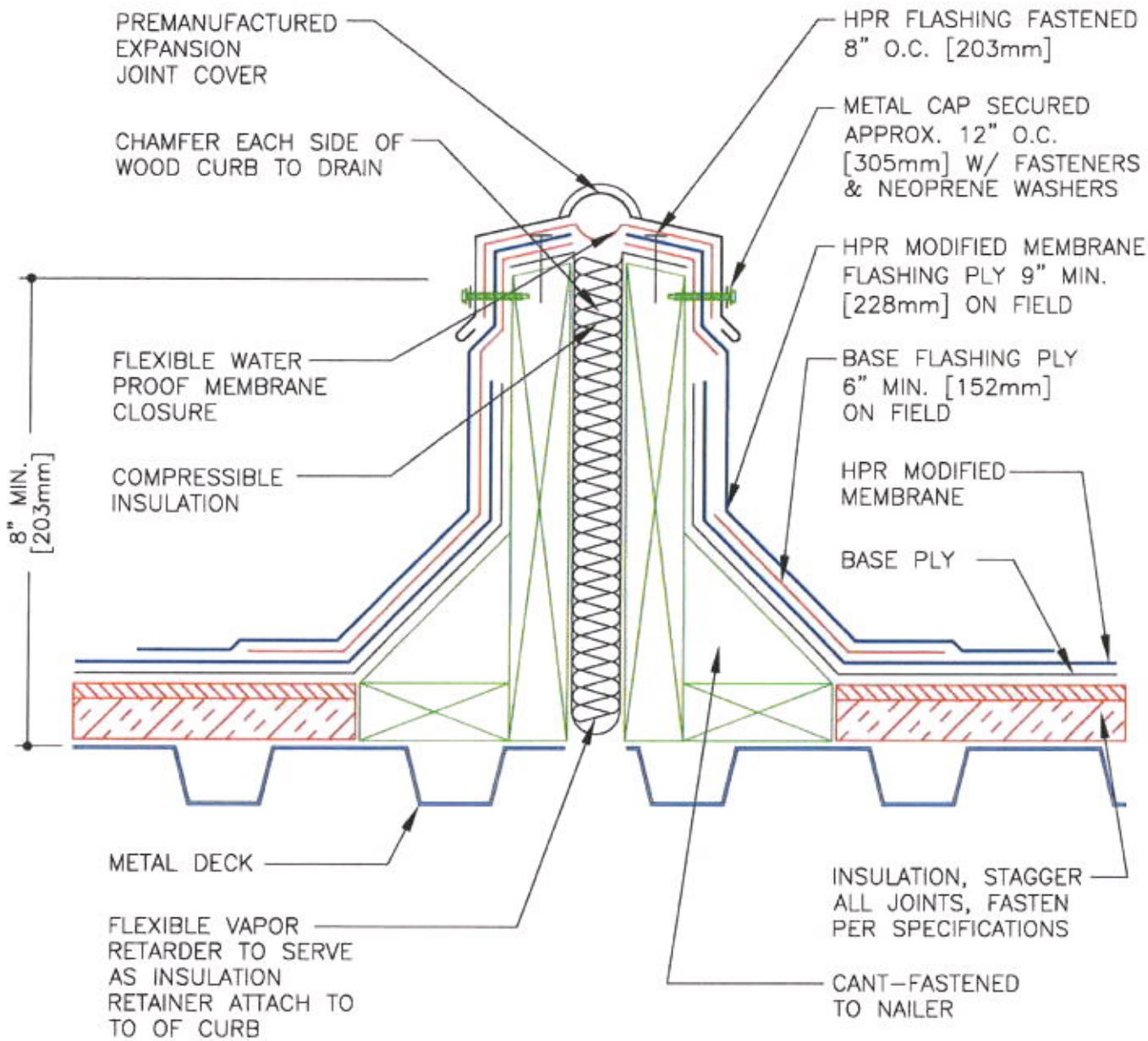
2 PLY-HOT APPLIED



ALL PLIES SET IN BITUMEN SEE SPECIFICATIONS FOR SURFACING



ALL PLIES SET IN BITUMEN SEE SPECIFICATIONS FOR SURFACING



ALL PLIES SET IN BITUMEN SEE SPECIFICATIONS FOR SURFACING

GARLAND since 1895

THE GARLAND COMPANY, INC.

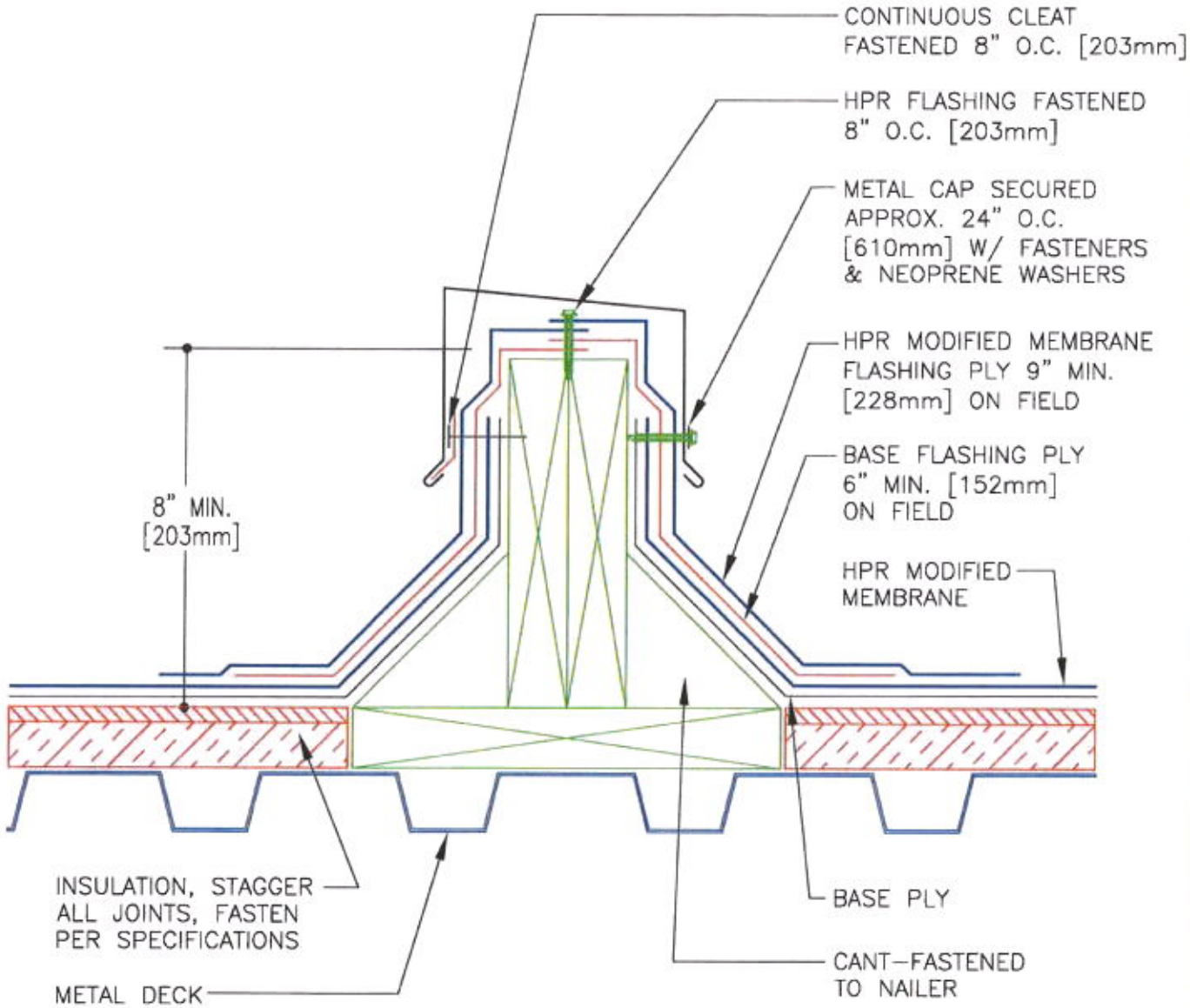
GARLAND CANADA, INC.

THE GARLAND COMPANY UK, LTD

DETAIL:

EXPANSION JOINT

2 PLY-HOT APPLIED



ALL PLIES SET IN BITUMEN SEE SPECIFICATIONS FOR SURFACING

GARLAND
since 1895

THE GARLAND COMPANY, INC.

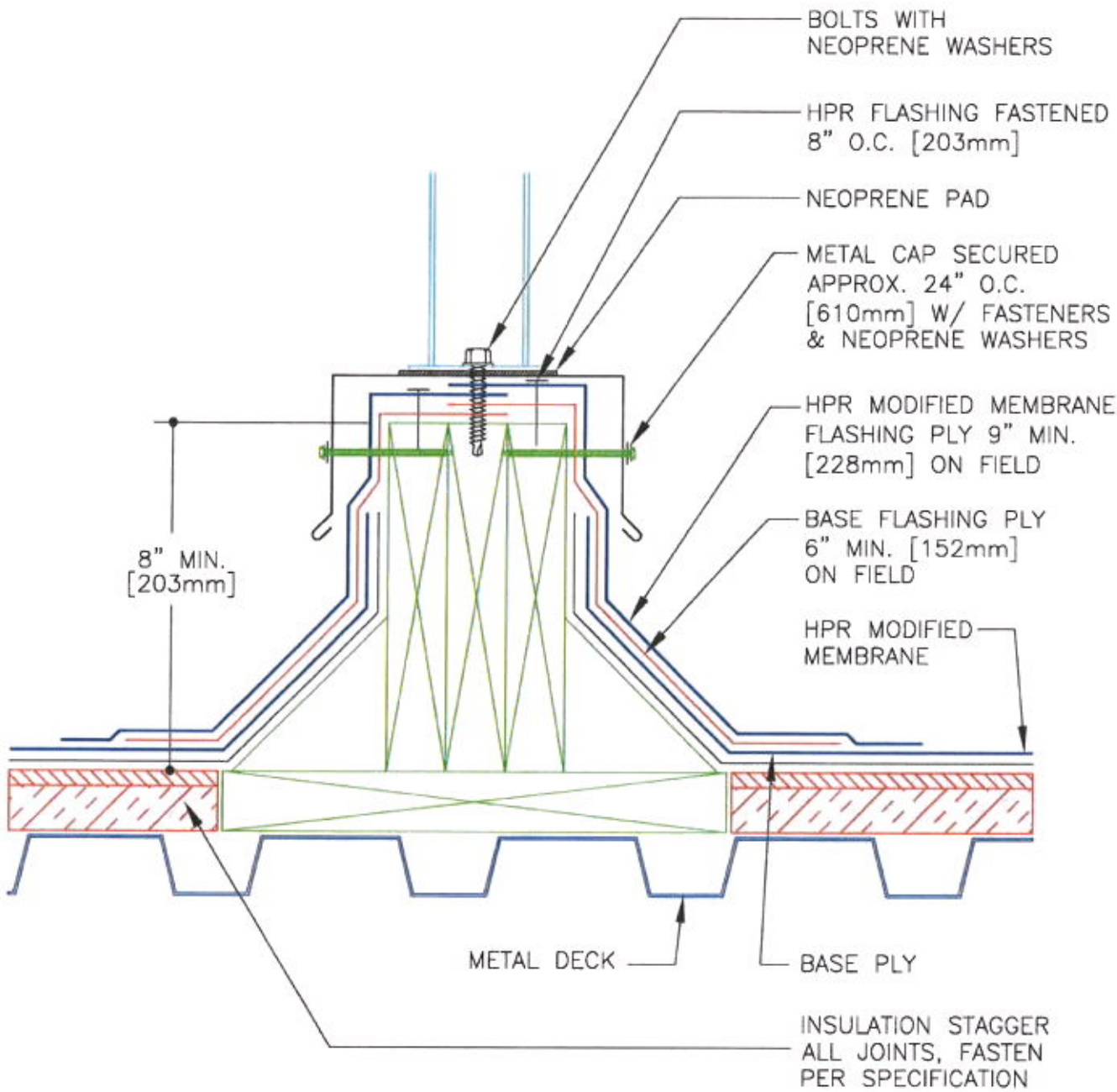
GARLAND CANADA, INC.

THE GARLAND COMPANY UK, LTD

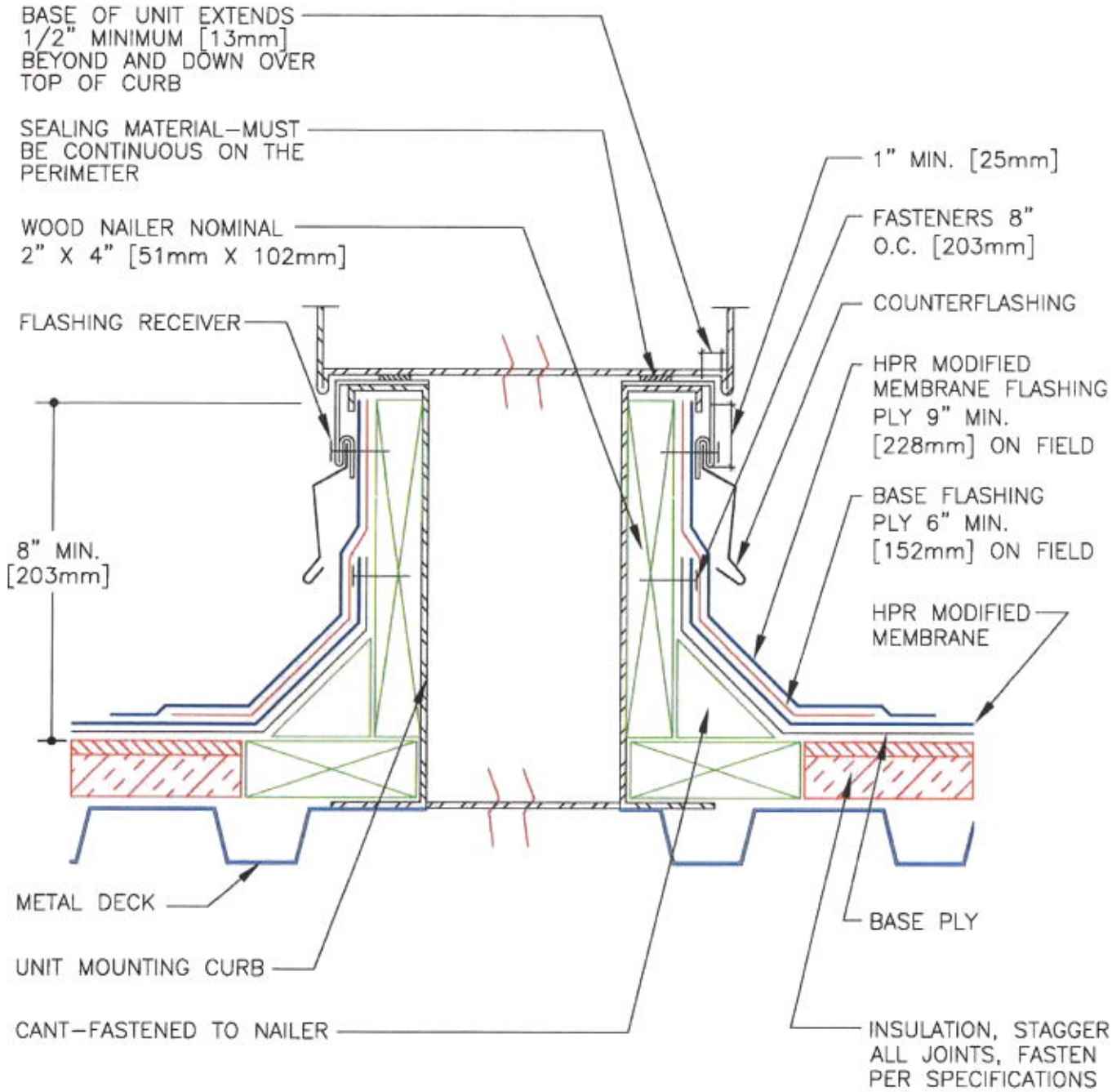
DETAIL:

AREA DIVIDER

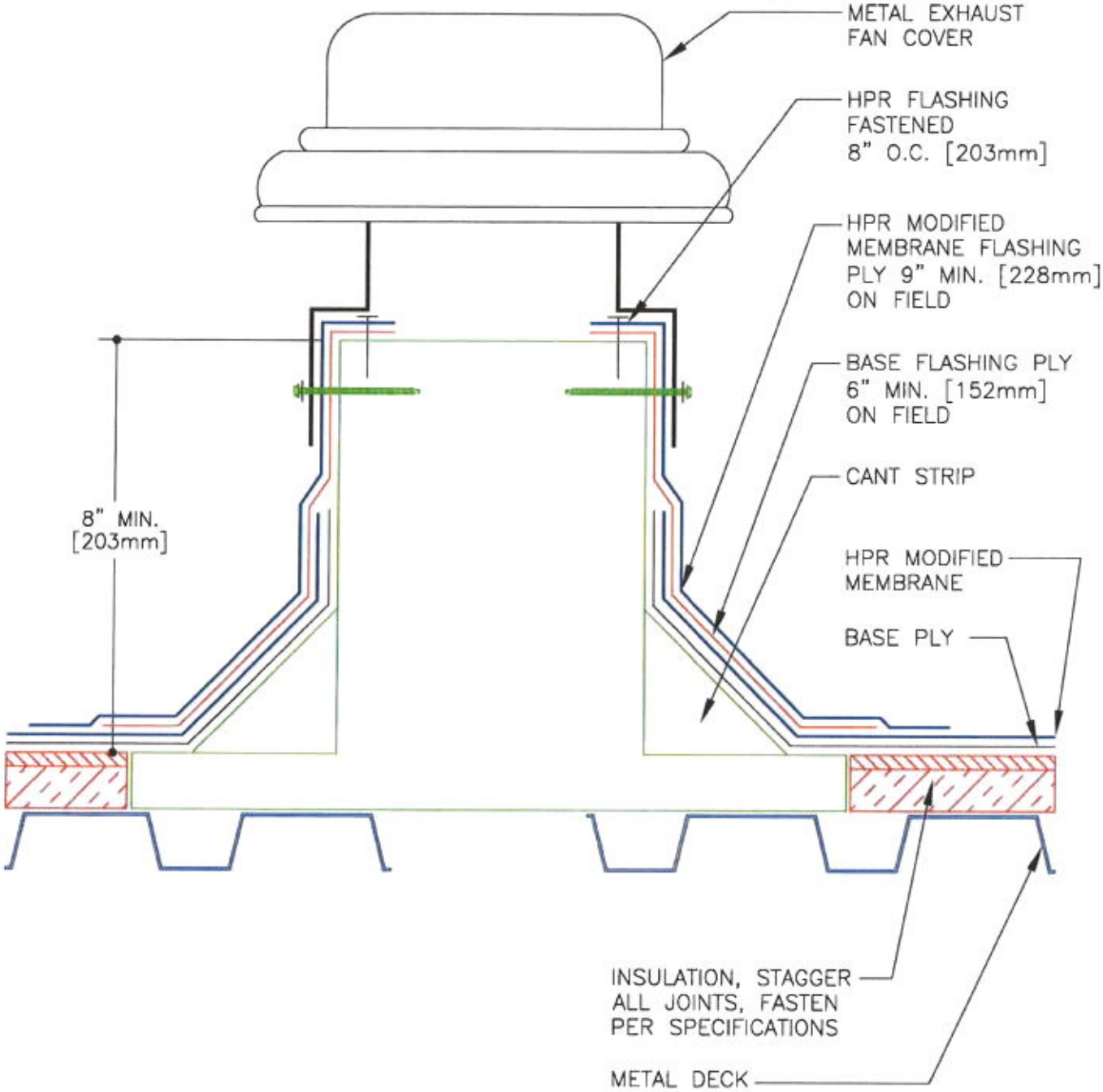
2 PLY-HOT APPLIED



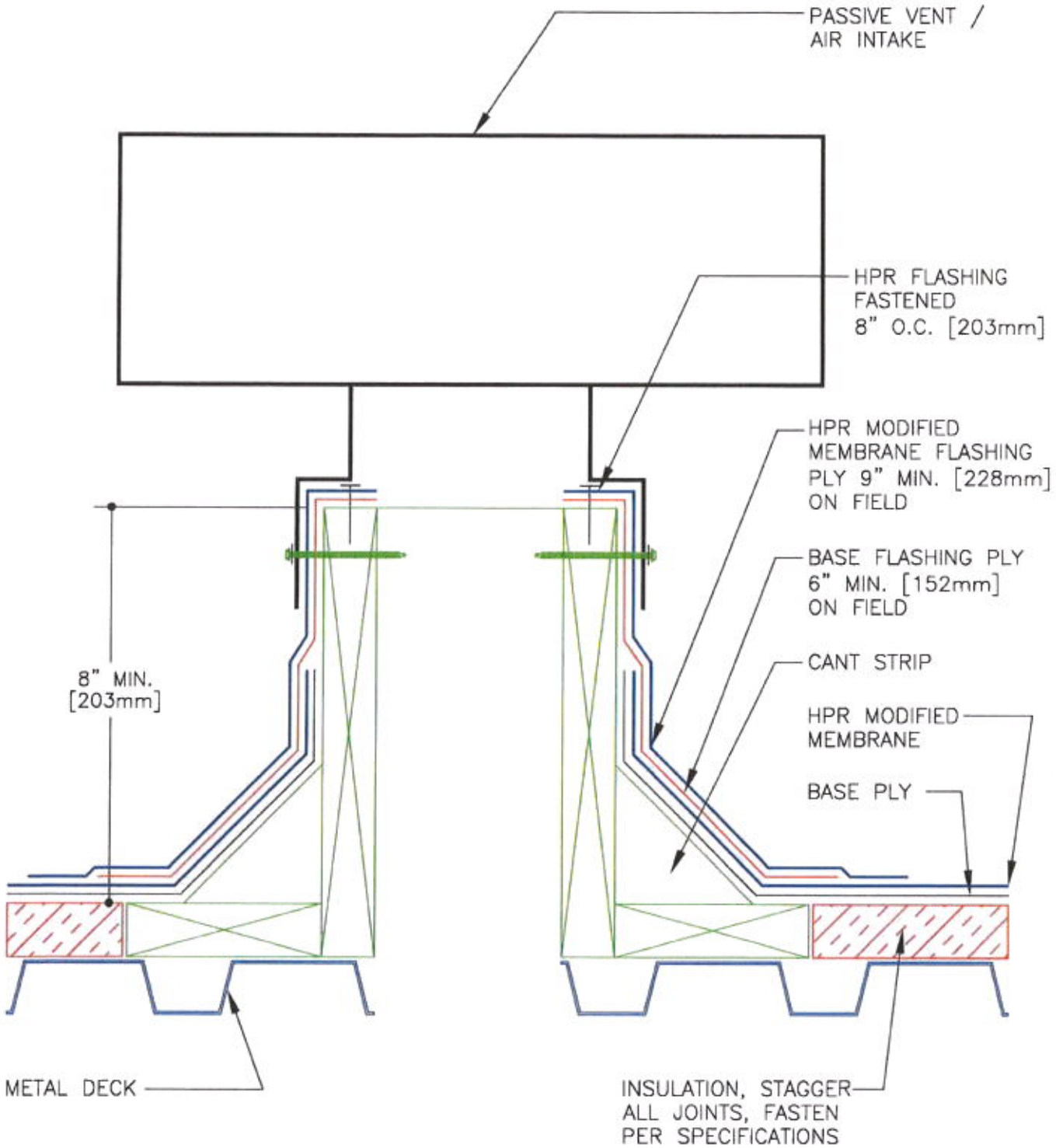
ALL PLIES SET IN BITUMEN SEE SPECIFICATIONS FOR SURFACING



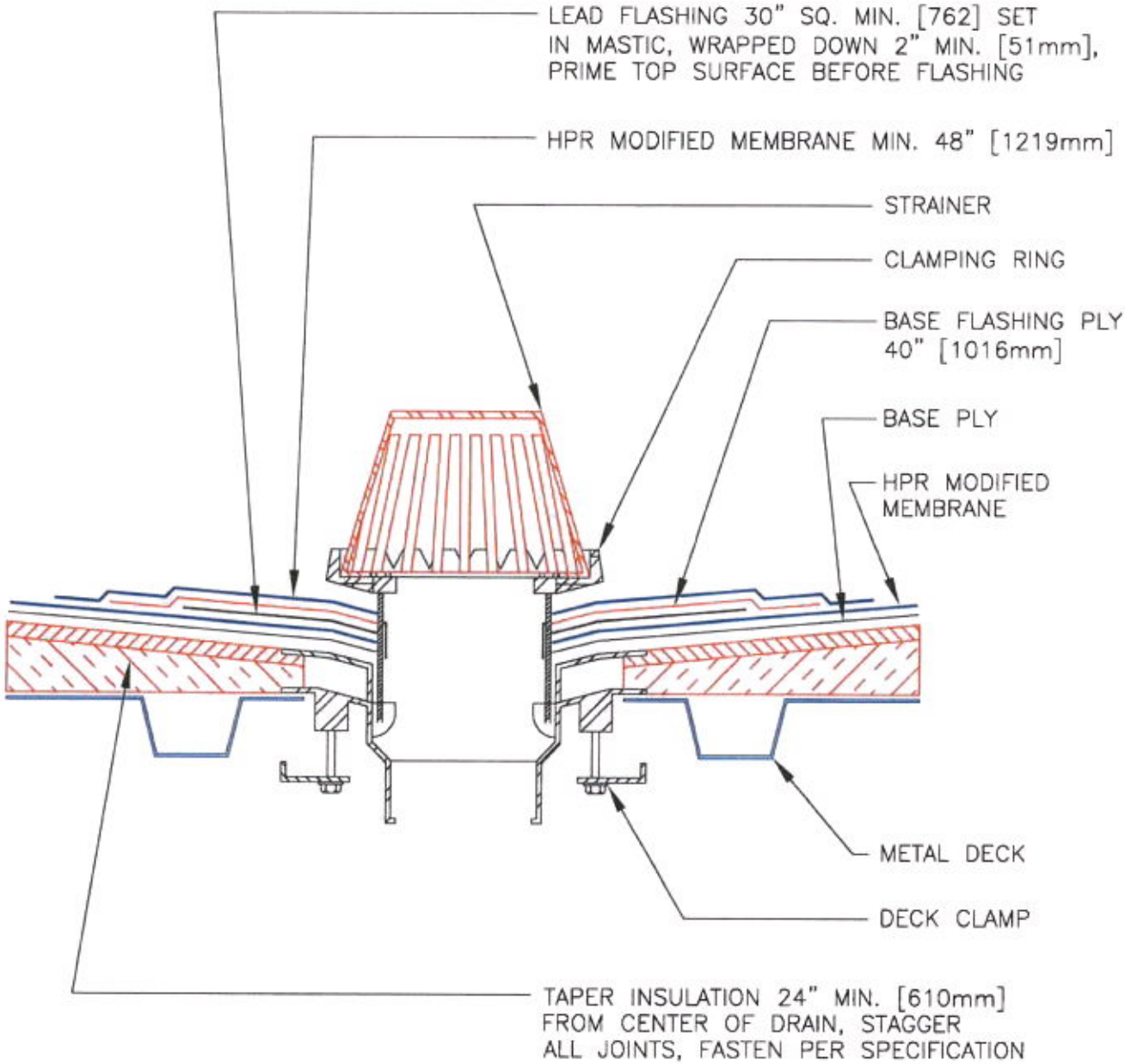
ALL PLIES SET IN BITUMEN SEE SPECIFICATIONS FOR SURFACING



ALL PLIES SET IN BITUMEN SEE SPECIFICATIONS FOR SURFACING



ALL PLIES SET IN BITUMEN SEE SPECIFICATIONS FOR SURFACING



ALL PLIES SET IN BITUMEN SEE SPECIFICATIONS FOR SURFACING

GARLAND

since 1895

THE GARLAND COMPANY, INC.

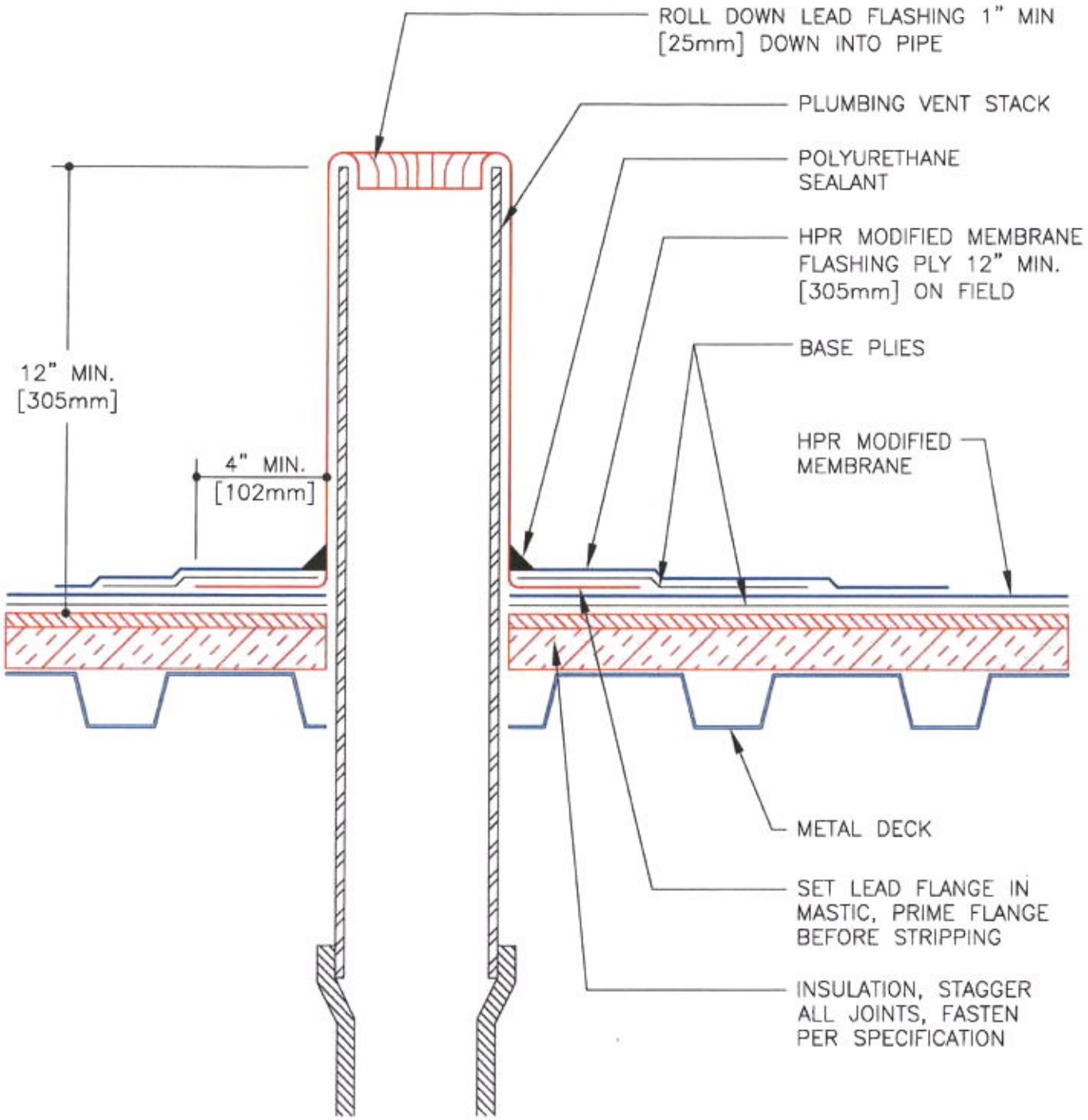
GARLAND CANADA, INC.

THE GARLAND COMPANY UK, LTD

DETAIL:

ROOF DRAIN

2 PLY-HOT APPLIED



ALL PLIES SET IN BITUMEN SEE SPECIFICATIONS FOR SURFACING

GARLAND

since 1895

THE GARLAND COMPANY, INC.

GARLAND CANADA, INC.

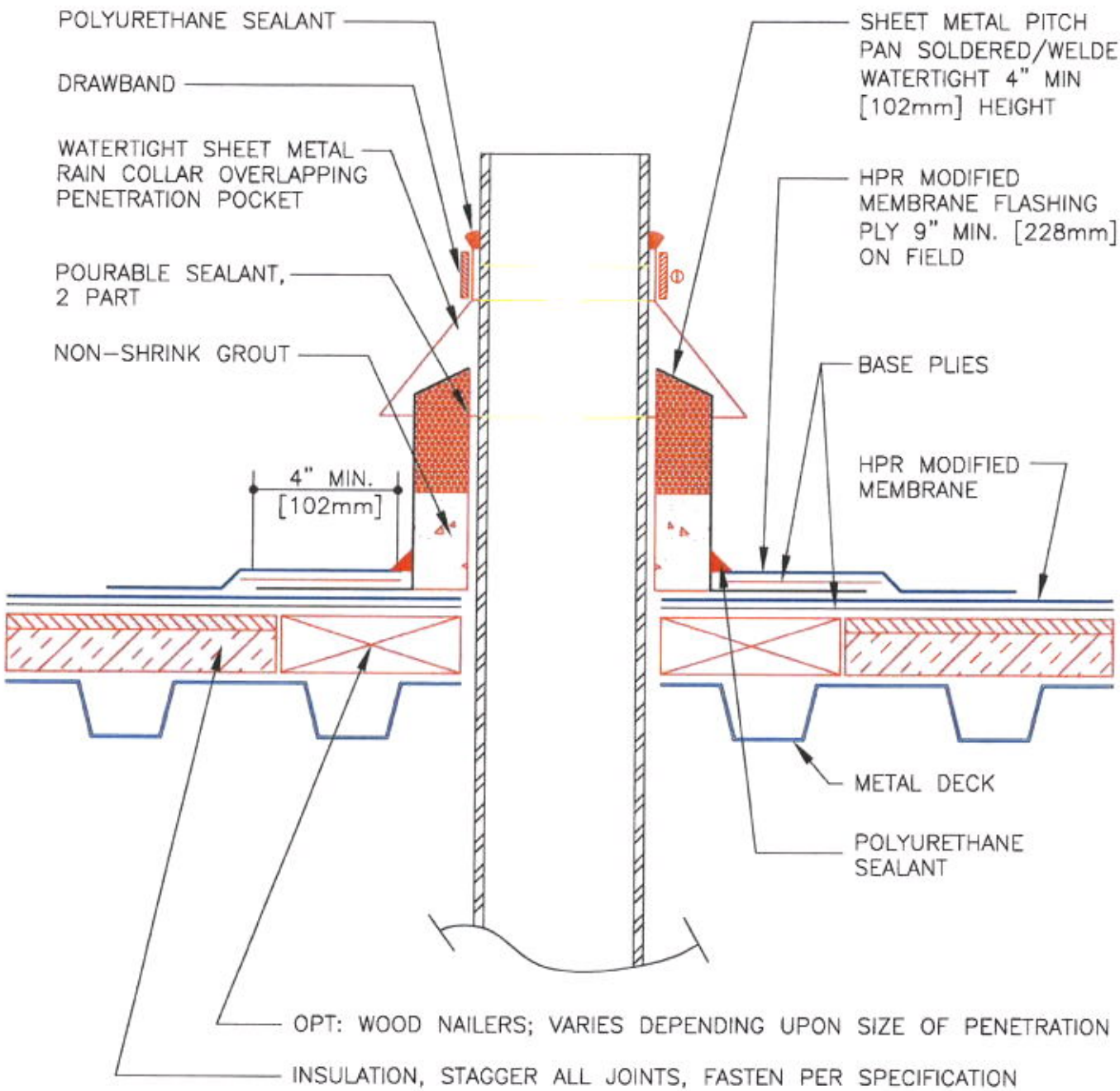
THE GARLAND COMPANY UK, LTD

DETAIL:

PLUMBING STACK

114

2 PLY-HOT APPLIED



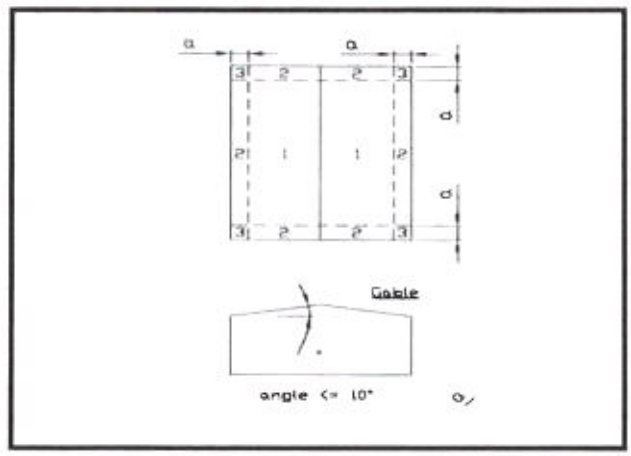
ALL PLIES SET IN BITUMEN SEE SPECIFICATIONS FOR SURFACING

The Garland Company, Inc.
Low Slope Roofing Wind Uplift Calculations
3800 East 91st Street
Cleveland, Ohio 44105-2197
Phone: (800) 321-9336 Fax (216) 883-2046

Project **Ypsilanti Community Schools**
Roof **Section A**
Sales Rep. **Brad Konvolinka** Location **Ypsilanti, MI**

Zone 1 psf **18.8** (mid roof)
Zone 2 psf **31.6** (eaves, ridge, hip)
Zone 3 psf **47.6** (corners)

Edge Zone Width "a"	6 ft.	0 in.
Fastener Safety Factor	3.00	
Importance	III	
Importance Factor	1	
Wind Speed (mph)	120	
Ultimate Pullout Value (lbs/screw)	456	
Exposure Category	C	
Design Roof	15.00	
Minimum Building Width	105.00	
Roof Pitch (X, Y)	0.25 :	12



System Type: **Modified Bitumen** System Type: **2 Ply Modified Bitumen Hot**
Surfacing: **Flood Coat/Gravel** Attachment Method: **Mech/ Fasten Insul/Board**

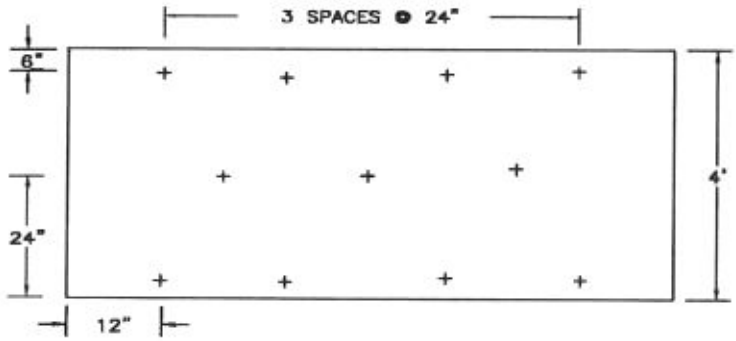
Zone 1 (mid roof) _11_ fasteners per 4' x 8' board
Zone 2 (eaves, ridge, hip) _11_ fasteners per 4' x 8' board
Zone 3 (corners) _22_ fasteners per 4' x 8' board

NOTES:

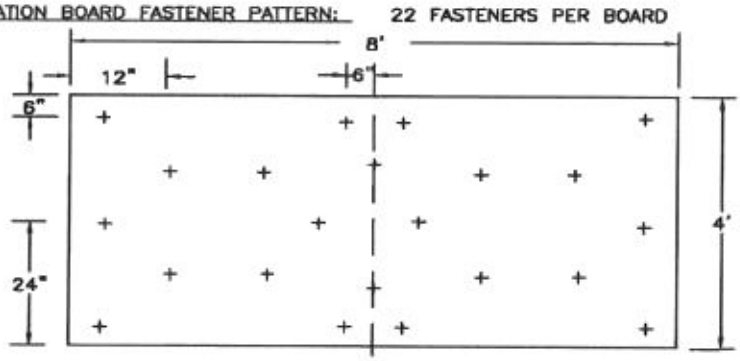
EDGE SECUREMENT: Edge metal system must be ANSI/SPRI ES-1 compliant, as required by sectio 1504.5 of International Building Code. Edge metal system may be an ANSI/SPRI ES-1 compliant premanufactured system, or formed by a contractor certified to fabricate an ANSI/SPRI ES-1 compliant system.

*Unless specifically stated otherwise, these calculations are based on ASCE 7-10 (American Society for Civil Engineers); if a specific building code is required, please specify.
*It is recommended to include the "Negative Uplift Pressures" in the specifications as well as the Safety Factor, Importance Factor, Building Category, Wind Speed, Ultimate Pullout Value, and Exposure.
*The Wind Speed is determined based upon geographical location.
*The Exposure and Importance Factors are needed to determine the uplift pressures.
If you have any questions, please call 800-321-9336 or respond to engineering@garlandind.com

ZONE 1 & 2 INSULATION BOARD FASTENER PATTERN: 11 FASTENERS PER BOARD



ZONE 3 INSULATION BOARD FASTENER PATTERN: 22 FASTENERS PER BOARD



THE GARLAND COMPANY, INC.
3800 EAST 91st STREET
CLEVELAND, OHIO 44105-2197
—PHONE 1-800-321-9336—
FAX 1-216-641-0633

DETAIL:

4 X 8 BOARD PATTERN

SECTION:

INSULATION BOARD FASTENER PATTERN

REV: 1 9/05

since 1895

PROJECT	**Ypsilanti Community Schools**
ROOF SECTION	**Section A**
DATE	**12/7/2018**
BASIC VELOCITY PRESSURE	**26.60** psf
DESIGN CODE	**ASCE 7-10**

System & Attachment Data

SYSTEM TYPE	Modified Bitumen
SYSTEM SCOPE	2 Ply Modified Bitumen Hot
SURFACING	Flood Coat/Gravel
ATTACHMENT METHOD	Mech/ Fasten Insul/Board
SUBSTRATE MATERIAL	Steel
SUBSTRATE THICKNESS	22 gauge
FASTENER TYPE	Steel: OMG Standard
FASTENER SAFETY FACTOR	3
ULTIMATE FASTENER PULLOUT	456 lbs/screw
ALLOWABLE FASTENER PULLOUT	152 lbs/screw

Building & Site Data

BASIC WIND SPEED	120	mph
EXPOSURE CATEGORY	C	
TOPOGRAPHY FACTOR	1.00	
BUILDING TYPE	Enclosed	
ROOF PITCH (X, Y)	0.25	12
RUN TO RIDGE	52.5	
EAVE HEIGHT	15	
DESIGN ROOF HEIGHT	15.00	ft
IMPORTANCE CLASS / FACTOR	III	1
MIN. BLDG WIDTH	105	ft
WIND-BORNE DEBRIS REGION	No	
PARAPET	No	
ROOF ANGLE	1.19	deg
PROTECTED OPENINGS	Yes	
ROOF TYPE	Gable	

	ZONE 1	ZONE 2	ZONE 3	ZONE 4	ZONE 5		
ROOF PRESSURE (psf)	18.8	31.6	47.6	18.7	23.0		
OVERHANG PRESSURE (psf)	27.13	27.13	44.69				
EDGE ZONE WIDTH "a" =	6.00	ft					