

## MEMBRANE ROOF SYSTEM

### Part 1 - GENERAL

- 1.01 SUMMARY: A new replacement 2-level roof for the North Little Rock Sanitation Department at 500 West 13<sup>th</sup> Street (on Sycamore Street south of West 13<sup>th</sup> Street) including:
- A. Remove existing modified bitumen roofing and substrate to existing tongue and groove structural wood deck.
  - B. Repair or replacement and preparation of existing roofing tongue and groove structural wood deck. (Allow \$5000.00 for replacement of damaged roof deck and concealed materials.)
  - C. Roofing manufacturer's requirements for the specified warranty.
  - D. Install wood nailers for roofing attachment. (2.02.A)
  - E. New tapered insulation as required for membrane roofing. (2.01.C)
  - F. New elastomeric membrane roofing by Firestone or approved equal. (2.01.A)
  - G. Remove and replace metal roof edging and copings. (4.05)
  - H. Remove and replace all flashings including parapet cap flashings. (4.05)
  - I. New walkway pads. (2.01.M)
  - J. Remove and replace roof drains. (2.01.L)
  - K. Repair and preparation of existing conductors to receive new roof drains.
  - L. Other roofing-related items specified or indicated or otherwise necessary to provide a complete weatherproof roofing system.
  - M. Remove and replace wood glue-lam end caps and trim; match existing materials; prep and paint. (3.02 Painting)
  - N. Remove and replace trim, soffits, and fascias; match existing materials; prep and paint. Fascias appear to be T-111 plywood at building perimeter and are painted blue. (3.02 Painting)

- O. Remove and replace all gutters and downspouts. (2.03)
- P. Disposal of demolition debris and construction waste is the responsibility of Contractor. Perform disposal in manner complying with all applicable federal, state, and local regulations.
- Q. Comply with the published recommendations and instructions of the roofing membrane manufacturer, at <http://manual.fsbp.com>. (Firestone is specified - approved equals are acceptable.)
- R. Commencement of work by the Contractor shall constitute acknowledgement by the Contractor that this specification can be satisfactorily executed, under the project conditions and with all necessary prerequisites for warranty acceptance by roofing membrane manufacturer. No modification of the Contract Sum will be made for failure to adequately examine the Contract Documents or the project conditions.
- S. Seal all exterior joints of wood and metal with compatible sealant.

#### 1.02. REFERENCES

- A. Referenced Standards: These standards form part of this specification only to the extent they are referenced as specification requirements.
- B. ASTM C 1289 - Standard Specification for Faced Rigid Cellular Polyisocyanurate Thermal Insulation Board; 2004.
- C. ASTM D 638 - Standard Test Method for Tensile Properties of Plastics; 2003.
- D. ASTM D 1004 - Standard Test Method for Initial Tear Resistance of Plastic Film and Sheeting; 2003.
- E. ASTM D 1079 - Standard Terminology Relating to Roofing, Waterproofing, and Bituminous Materials; 2005a.
- F. ASTM D 6878 - Standard Specification for Thermoplastic Polyolefin Based Sheet Roofing; 2003.
- G. CAN-ULC-S770 - Standard Test Method Determination of L-Term Thermal Resistance Of Closed-Cell Thermal Insulating Foams; 2003.
- H. FM 1-28 - Design Wind Loads; Factory Mutual System; 2002.
- I. FM 1-29 - Roof Deck Securement and Above Deck Roof Components; Factory Mutual System; 2005.
- J. PS 1 - Construction and Industrial Plywood; 1995.
- K. PS 20 - American Softwood Lumber Standard; 2005.

## 1.03 DEFINITIONS

- A. Roofing Terminology: Refer to ASTM D 1079 for definition of terms related to roofing work not otherwise defined in the section.
- B. LTTR: Long Term Thermal Resistance, as defined by CAN-ULC S770.

## Part 2 - PRODUCTS

### 2.01 ROOF MATERIAL:

- A. Roofing system to be “Firestone UltraPly” TPO or approved equal.
- B. Membrane to be 60 mil minimum TPO and installed per manufacturers recommendations.
- C. Insulation to be tapered “Firestone 95+” ISO board or approved equal with 1-½” minimum thickness and ¼” per foot minimum slope and applied directly to existing tongue and groove structural wood roof deck.
- D. Any products or accessories used in the roof installation shall be approved by the manufacturer of the major roofing component.
- E. Roofing system must be a UL approved system.
- F. Roof system is to be a mechanically attached system.
- G. The contractor is to provide roof shop drawings with flashing details.
- H. The surface membrane is to be white.
- I. All flashings shall be installed according to roofing manufacturer’s specifications.
- J. Contractor shall supply owner with an installation manual complete with detailed drawings of installation methods of membrane and all flashings, UL/FM codes and data sheets.
- K. Contractor shall supply owner with a complete set of factory specifications for the system being installed.
- L. Remove and replace all roof drains matching existing, excluding conductors. Repair and prep conductors to receive new roof drains.

- M. Roof Walkway Pads: Non-reinforced TPO walkway pads, 0.130 inch (3 mm) by 30 inches (760 mm) by 40 feet (12.19 m) long with patterned traffic bearing surface; UltraPly TPO Walkway Pads by Firestone or approved equal.

## 2.02 ACCESSORY MATERIALS

- A. Wood Nailers: PS 20 dimension lumber, Structural Grade No. 2 or better Southern Pine, Douglas Fir; or PS 1, APA Exterior Grade plywood; pressure preservative treated.
  - 1. Width: 3-1/2 inches (90 mm), nominal minimum, or as wide as the nailing flange of the roof accessory to be attached to it.
  - 2. Thickness: Same as thickness of roof insulation.

## 2.03 GUTTERS AND DOWNSPOUTS:

- A. Gutters: Form in 8 foot sections, complete with end pieces, outlet tubes, and other special pieces as required. Size in accordance with SMACNA. Join sections with riveted and soldered or sealed joints. Furnish gutter supports spaced at 36" o.c., constructed of same metal as gutters. Provide standard bronze, copper, or aluminum wire ball strainers at each outlet. Finish to be SP in color as selected by Owner's representative.
  - a. Formed aluminum: 0.040 inch thick.
  - b. Pre-painted, zinc-coated steel: 0.028 inch thick.
- B. Downspouts: Formed in sections approximately 10 ft. long, complete with elbows and offsets. Join sections with minimum 1-1/2" telescoping joints. Provide fasteners for top, bottom, and 5' o.c. intermediately between, designed to securely hold downspouts not less than 1" away from walls. Material and finish to match gutters.
  - b. Formed aluminum: 0.040 inch thick.
  - b. Pre-painted, zinc-coated steel: 0.028 inch thick.

## 2.04 MATERIALS OWNERSHIP

- A. Except for items or materials indicated to be reused, reinstalled, or otherwise indicated to remain Owner's property, demolished materials shall become Contractor's property and shall be removed from Project site.

## 2.05 SUBMITTALS

### A. Product Data:

- 1. Provide membrane manufacturer's printed data sufficient to show that all components of roofing system, including insulation and fasteners, comply with the specified requirements and with the membrane manufacturer's requirements and recommendations for the system type specified; include data for each product used in conjunction with roofing membrane.
  - 2. Where UL requirements are specified, provide documentation that shows that the roofing system to be installed is UL-Classified approved, as applicable; include data itemizing the components of the classified or approved system.
- B. Samples: Submit samples of each product to be used.
  - C. Specimen Warranty: Submit prior to starting work.
  - D. Installer Qualifications: Letter from manufacturer attesting that the roofing installer meets the specified qualifications.
  - E. Pre-Installation Notice: Copy to show that manufacturer's required Pre Installation Notice (PIN) has been accepted and approved by the manufacturer.
  - F. Executed Warranty.

## 2.06 QUALITY ASSURANCE

- A. Manufacturer shall have manufactured the specified system for a minimum of 15 years.

## 2.07 DELIVERY, STORAGE AND HANDLING

- A. Deliver products in manufacturer's original containers, dry and undamaged, with seals and labels intact and legible.
- B. Store materials clear of ground and moisture with weather protective covering.
- C. Keep combustible materials away from ignition sources.

## 2.08 PROJECT CONDITIONS

- A. Owner will occupy portions of building immediately below re-roofing area. Conduct re-roofing so Owner's operations will not be disrupted. Provide Owner with not less than 72 hours notice of activities that may affect Owner's operations.
  - 1. Coordinate work activities daily with Owner so Owner can place protective dust or water leakage covers over sensitive equipment or furnishings, shut down HVAC and fire-alarm or detection equipment if needed, and evacuate occupants from below the work area if desired
  - 2. Before working over structurally impaired areas of deck, notify Owner to evacuate occupants from below the affected area. Verify that occupants below the work area have been evacuated prior to proceeding with work over the impaired deck area.
- B. Protect building to be re-roofed, adjacent buildings, walkways, site improvements, exterior planting, and landscaping from damage or soiling from re-roofing operations.
- C. Maintain access to existing walkways, corridors, and other adjacent occupied or used facilities.
- D. Owner assumes no responsibility for condition of areas to be re-roofed.
- E. Weather Condition Limitations: Do not apply roofing membrane during inclement weather or when a 40% chance of precipitation is expected.

## 2.09 WARRANTY

- A. Upon completion of installation, and acceptance by the Owner, the manufacturer will provide the Owner with a 15-year No Dollar Limit Warranty.
- B. Upon completion of installation, and acceptance by the Owner, provide the Owner with a 2-year installer guarantee warranting the roof, insulation, and flashings.
- C. Installer will submit a minimum of a two (2) year warranty to the membrane manufacturer with a copy directly to Owner.

## Part 3 PRODUCTS

### 3.01 AUXILIARY RE-ROOFING MATERIALS

A. General: Auxiliary re-roofing preparation materials recommended by roofing system manufacturer for intended use and compatible with components of new membrane roofing system.

B. Base Sheet Fasteners: Capped head, factory-coated steel fasteners, listed in FM Approval Guide.

### 3.02 PAINTING

- A. Manufacturers: Provide paints, enamels, and admixtures of first line quality as manufactured by Sherwin Williams, Glidden, Benjamin Moore, or Pittsburgh.
- B. Wood: Clean wood surfaces to be painted of all dirt, oil, or other foreign substances with scrapers, mineral spirits, and sandpaper, as required. Sandpaper smooth those surfaces exposed to view, and dust off. Prime, stain, or seal wood required to be job painted immediately upon delivery to job. Prime edges, ends, faces, undersides, and backsides of wood. Scrape and clean small, dry seasoned knots, and apply a thin coat of white shellac or other recommended knot sealer, before application of the priming coat.
- C. Ferrous Metals: Touch-up shop-applied prime coats which have damaged or bare areas. Wire-brush, solvent clean, and touch up with the same primer as the shop coat.
- D. Galvanized Surfaces: Clean free of oil and surface contaminates with an acceptable non-petroleum based solvent.
- E. All paint colors selected by Owner.

## Part 4 EXECUTION

### 4.01 PREPARATION

- A. Maintain temporary protection and leave in place until replacement roofing has been completed.
- B. During removal operations, have sufficient and suitable materials on-site to facilitate rapid installation of temporary protection in the event of unexpected rain.

- C. Verify that rooftop utilities and service piping have been shut off before commencing Work.
- D. Verify that openings, curbs, pipes, conduit, sleeves, ducts, and other items which penetrate the roof are set solidly, and that wood nailing strips are set in place.

#### 4.02 ROOF RE-COVER PREPARATION

- A. Broom clean existing deck surface.
- B. Coordinate with Owner's inspector to schedule time for test and inspections before proceeding with installation of roof system.
- C. Verify that existing deck is dry before proceeding with installation of new roof system.
- D. Maintain roof drains in functioning condition to ensure roof drainage at end of each workday. Prevent debris from entering or blocking roof drains and conductors. Use roof-drain plugs specifically designed for this purpose. Remove roof-drain plugs at end of each workday, when no work is taking place, or when rain is forecast.
  - 1. If roof drains will be temporarily blocked or unserviceable due to roofing system removal or partial installation of new membrane roofing system, provide alternative drainage method to remove water and eliminate ponding. Do not permit water to enter into or under existing membrane roofing system components that are to remain.

#### 4.03 EXISTING BASE FLASHINGS

- A. Remove existing base flashings around walls and penetrations.
- B. Clean substrates of contaminants such as asphalt, sheet materials, dirt, and debris.

#### 4.04 SINGLE-PLY MEMBRANE INSTALLATION

- A. Beginning at low point of roof, place membrane without stretching over substrate and allow to relax at least 30 minutes before attachment or splicing; in colder weather allow for longer relax time.
- B. Lay out the membrane pieces so that field and flashing splices are installed to shed water.



- C. Install membrane without wrinkles and without gaps or fishmouths in seams; bond and test seams and laps in accordance with membrane manufacturer's instructions and details.
- D. Install membrane adhered to the substrate, with edge securement as specified.
- E. Adhered Membrane: Bond membrane sheet to substrate using membrane manufacturer's recommended bonding material, application rate, and procedures.
- F. Edge Securement: Secure membrane at all locations where membrane terminates or goes through an angle change greater than 2 in 12 inches (1:6 ) using mechanically fastened reinforced perimeter fastening strips, plates, or metal edging as indicated or as recommended by roofing manufacturer.
  - 1. Exceptions: Round pipe penetrations less than 18 inches (460 mm) in diameter and square penetrations less than 4 inches (200 mm) square.
  - 2. Metal edging is not merely decorative; ensure anchorage of membrane as intended by roofing manufacturer.

#### 4.05 FLASHING AND ACCESSORIES INSTALLATION

- A. Install flashings, including laps, splices, joints, bonding, adhesion, and attachment, as required by membrane manufacturer's recommendations and details.
- B. Metal Accessories: Install metal edgings, gravel stops, and copings with horizontal leg of edge member over membrane and flashing over metal onto membrane.
  - 1. Follow roofing manufacturer's instructions.
  - 2. Remove protective plastic surface film immediately before installation.
  - 3. Install water block sealant under the membrane anchorage leg.
  - 4. Flash with manufacturer's recommended flashing sheet unless otherwise indicated.
  - 5. Where single application of flashing will not completely cover the metal flange, install additional piece of flashing to cover the metal edge.
- C. Roofing Expansion Joints: Install as recommended by roofing manufacturer.
- D. Flashing at Walls, Curbs, and Other Vertical and Sloped Surfaces: Install weathertight flashing at all walls, parapets, curbs, and other vertical and sloped surfaces that the roofing membrane abuts to; extend flashing at least 8 inches (200

mm) high above membrane surface.

1. Use the longest practical flashing pieces.
  2. Evaluate the substrate and overlay and adjust installation procedure in accordance with membrane manufacturer's recommendations.
  3. Complete the splice between flashing and the main roof sheet with specified splice adhesive before adhering flashing to the vertical surface.
  4. Provide termination directly to the vertical substrate.
- E. Flashing at Penetrations: Flash all penetrations passing through the membrane; make flashing seals directly to the penetration.
1. Pipes, Round Supports, and Similar Items: Flash with specified pre-molded pipe flashings wherever practical; otherwise use specified self-curing elastomeric flashing.
  2. Pipe Clusters and Unusual Shaped Penetrations: Provide penetration pocket at least 2 inches (50 mm) deep, with at least 1 inch (25 mm) clearance from penetration, sloped to shed water.
  3. Flexible and Moving Penetrations: Provide weathertight gooseneck set in sealant and secured to deck, flashed as recommended by manufacturer.

#### 4.06 FINISHING AND WALKWAY INSTALLATION

- A. Install walkways at access points to the roof, around rooftop equipment that may require maintenance.
- B. Walkway Pads: Adhere to the roofing membrane, spacing each pad at minimum of 1.0 inch (25 mm) and maximum of 3.0 inches (75 mm) from each other to allow for drainage.
  1. If installation of walkway pads over field fabricated splices or within 6 inches (150 mm) of a splice edge cannot be avoided, adhere another layer of flashing over the splice and extending beyond the walkway pad a minimum of 6 inches (150 mm) on either side.
  2. Prime the membrane, remove the release paper on the pad, press in place, and walk on pad to ensure proper adhesion.

#### 4.07 FIELD QUALITY CONTROL

- A. Perform field inspection and (and testing) as required.
- B. Correct defects or irregularities discovered during field inspection.

#### 4.08 FINAL INSPECTION

A. At completion of roofing installation and associated work, meet with Contractor, Owner's representative, installer, installer of associated work, Owner, roofing system manufacture's representative and other representative directly concerned with performance of roofing system.

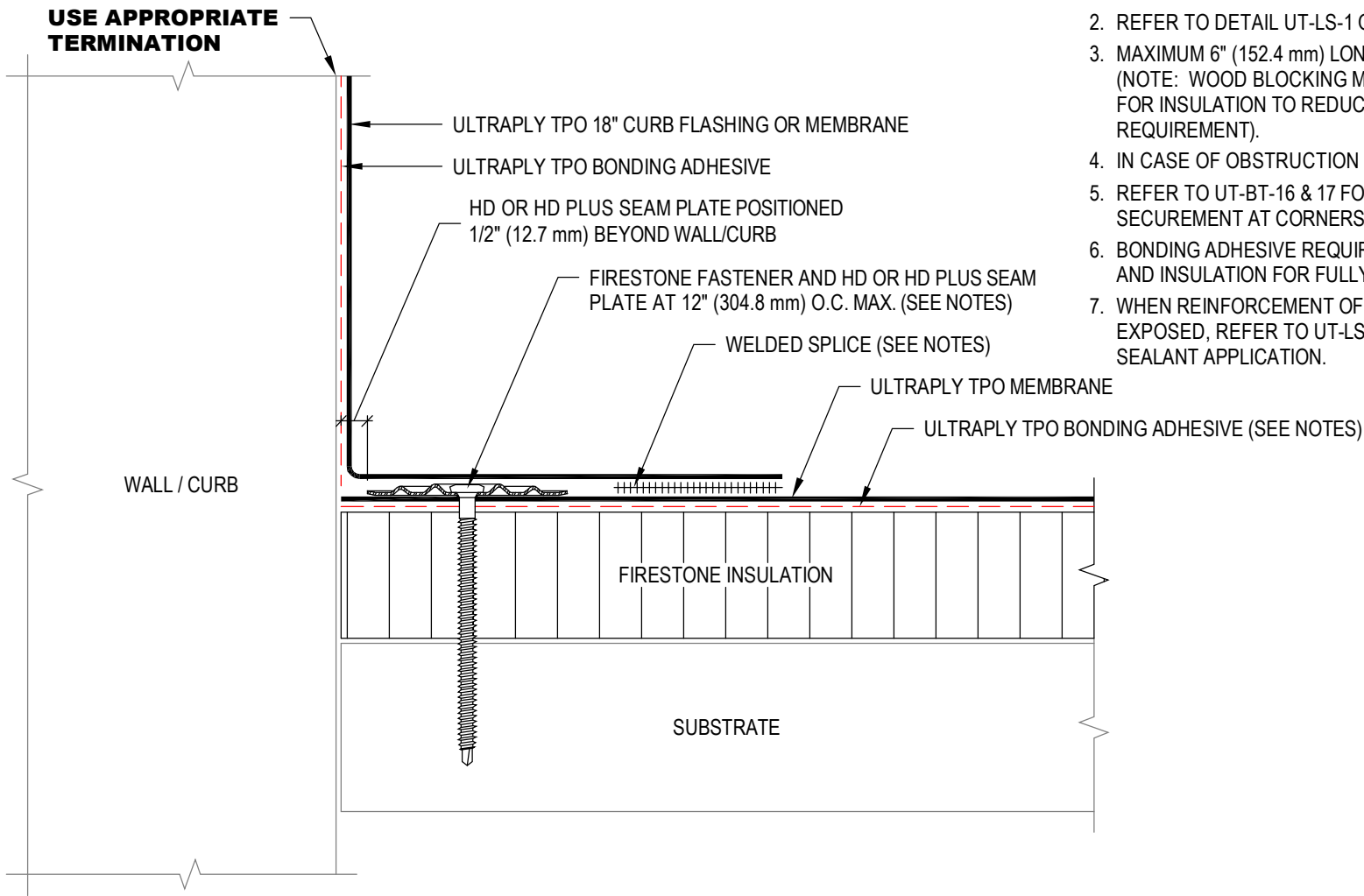
B. Walk roof surface areas of the building; inspect perimeter building edges as well as flashing or roof penetrations, wall, and other equipment. List all items requiring correction or completion and furnish copy of list to each party in attendance.

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

D. Notify the Owner upon completion of corrections. Following the final inspection, provide written notice of acceptance of the installation from the roofing system manufacturer.

- E. 100% performance and payment bond will be required if awarded bid.

END OF SECTION



**NOTES:**

1. REFER TO FIRESTONE WEBSITE FOR MOST CURRENT INFORMATION.
2. REFER TO DETAIL UT-LS-1 OR 2 FOR WELD WIDTH.
3. MAXIMUM 6" (152.4 mm) LONG FASTENERS. (NOTE: WOOD BLOCKING MAY BE SUBSTITUTED FOR INSULATION TO REDUCE FASTENER LENGTH REQUIREMENT).
4. IN CASE OF OBSTRUCTION REFER TO DETAIL UT-BT-5.
5. REFER TO UT-BT-16 & 17 FOR MEMBRANE SECUREMENT AT CORNERS.
6. BONDING ADHESIVE REQUIRED BETWEEN MEMBRANE AND INSULATION FOR FULLY ADHERED SYSTEMS.
7. WHEN REINFORCEMENT OF TPO MEMBRANE IS EXPOSED, REFER TO UT-LS-14 FOR CUT EDGE SEALANT APPLICATION.

MAXIMUM WARRANTY: **20 YEARS**

**BASE TIE-IN WITH HD SEAM PLATES FASTENED TO DECK**

ISSUE / REVISION DATE:

DETAIL NO.

1/1/2006

**UT-BT-1**

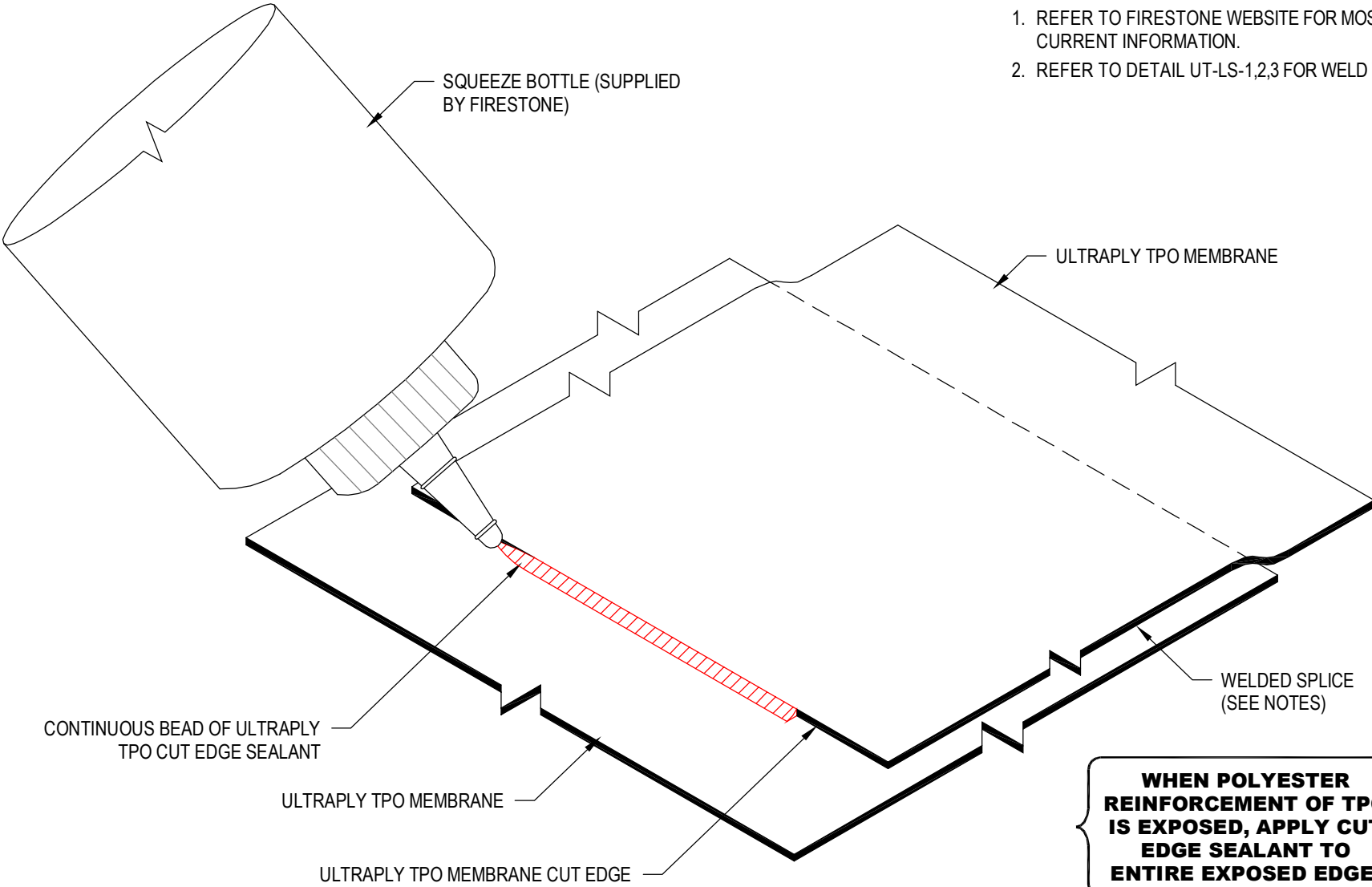
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ULTRAPLY™ TPO

ACCEPTABLE SYSTEMS: ALL

- NOTES:
1. REFER TO FIRESTONE WEBSITE FOR MOST CURRENT INFORMATION.
  2. REFER TO DETAIL UT-LS-1,2,3 FOR WELD WIDTH.



**WHEN POLYESTER REINFORCEMENT OF TPO IS EXPOSED, APPLY CUT EDGE SEALANT TO ENTIRE EXPOSED EDGE.**

MAXIMUM WARRANTY: **20 YEARS**

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**CUT EDGE TREATMENT APPLICATION**

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ACCEPTABLE SYSTEMS: ALL

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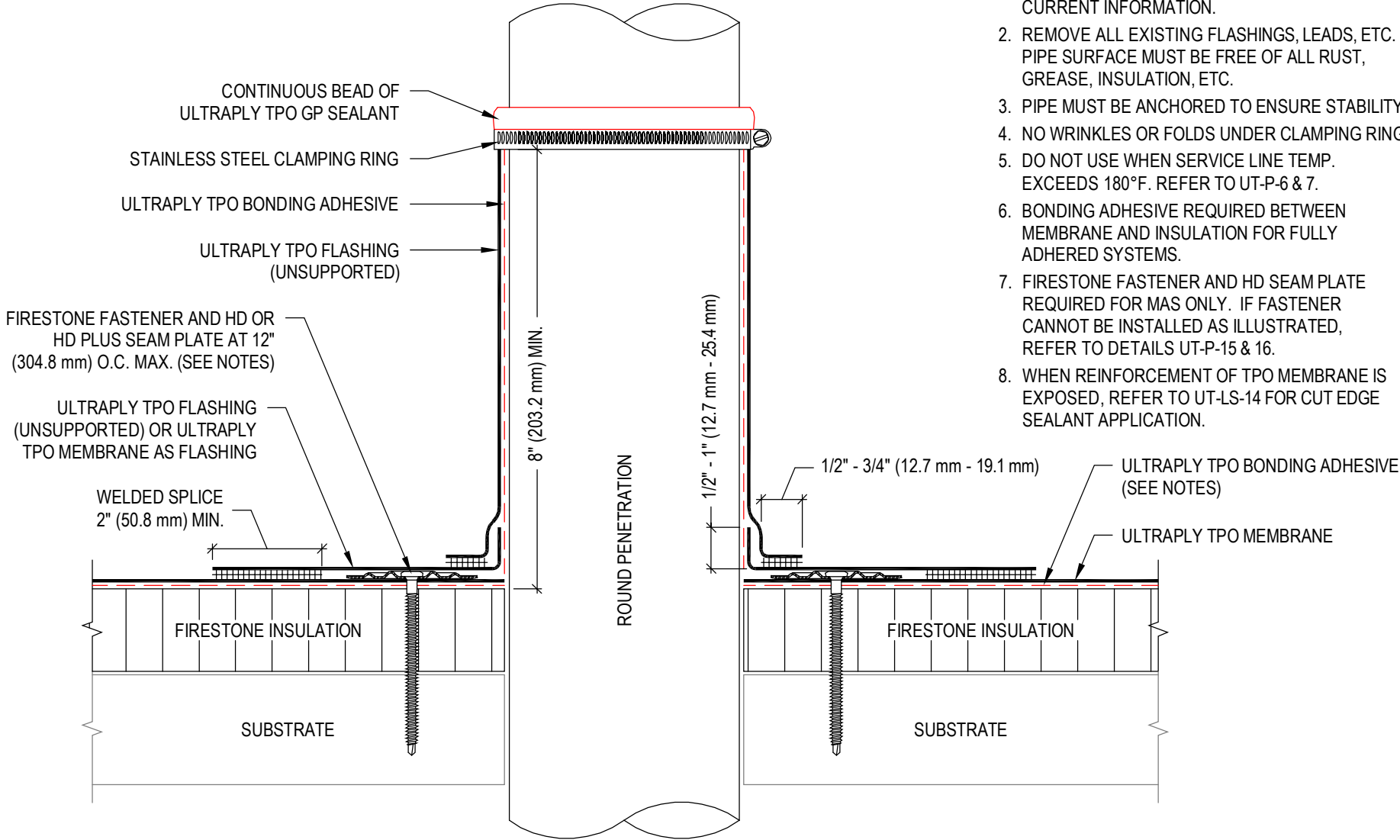
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DETAIL NO.

**UT-LS-14**

**NOTES:**

1. REFER TO FIRESTONE WEBSITE FOR MOST CURRENT INFORMATION.
2. REMOVE ALL EXISTING FLASHINGS, LEADS, ETC. PIPE SURFACE MUST BE FREE OF ALL RUST, GREASE, INSULATION, ETC.
3. PIPE MUST BE ANCHORED TO ENSURE STABILITY.
4. NO WRINKLES OR FOLDS UNDER CLAMPING RING.
5. DO NOT USE WHEN SERVICE LINE TEMP. EXCEEDS 180°F. REFER TO UT-P-6 & 7.
6. BONDING ADHESIVE REQUIRED BETWEEN MEMBRANE AND INSULATION FOR FULLY ADHERED SYSTEMS.
7. FIRESTONE FASTENER AND HD SEAM PLATE REQUIRED FOR MAS ONLY. IF FASTENER CANNOT BE INSTALLED AS ILLUSTRATED, REFER TO DETAILS UT-P-15 & 16.
8. WHEN REINFORCEMENT OF TPO MEMBRANE IS EXPOSED, REFER TO UT-LS-14 FOR CUT EDGE SEALANT APPLICATION.

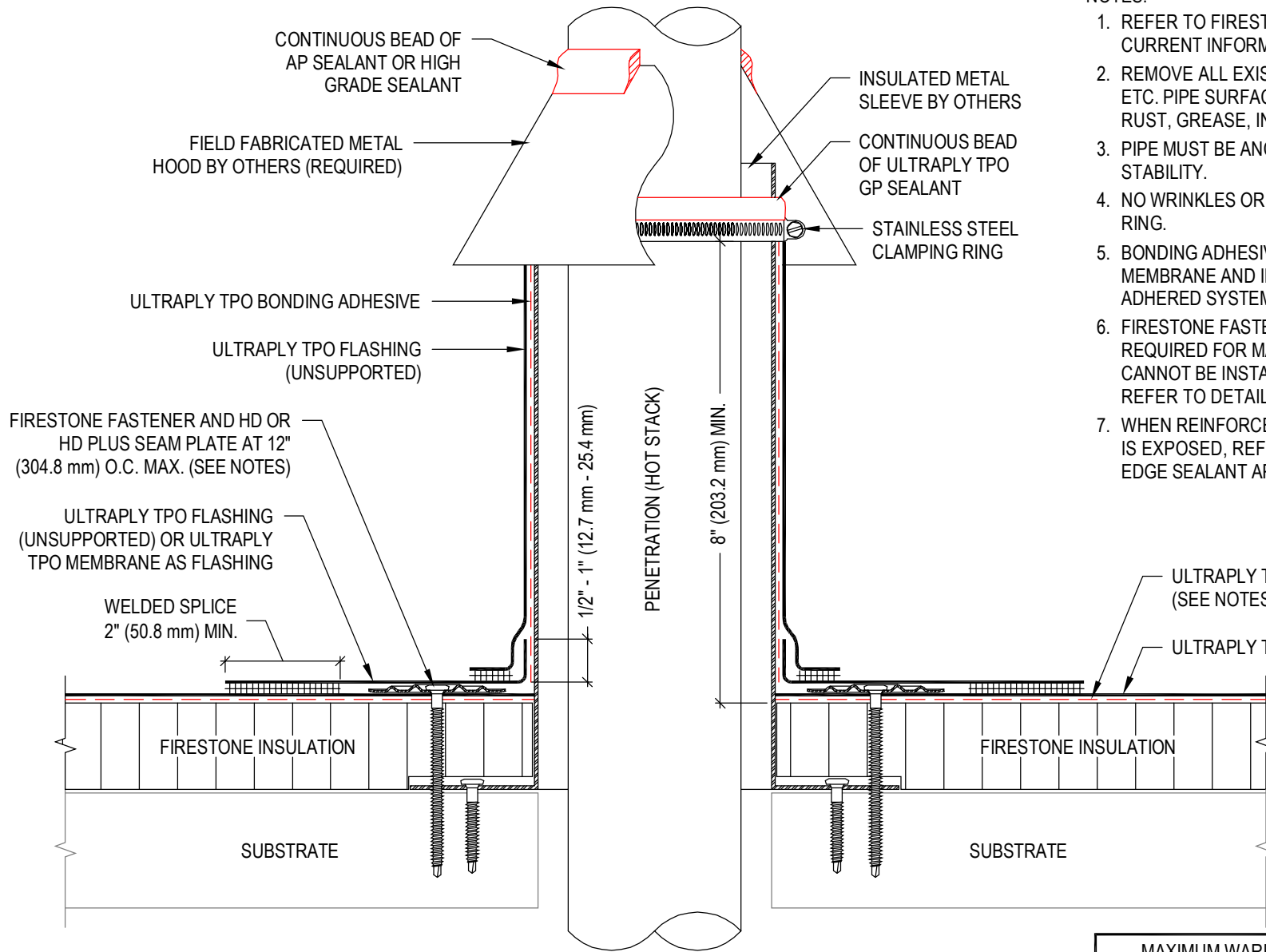


MAXIMUM WARRANTY: <b>20 YEARS</b>	
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**PENETRATION WITH ULTRAPLY TPO FLASHING (UNSUPPORTED)**

<b>ULTRAPLY™ TPO</b>	ACCEPTABLE SYSTEMS: ALL
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- NOTES:
1. REFER TO FIRESTONE WEBSITE FOR MOST CURRENT INFORMATION.
  2. REMOVE ALL EXISTING FLASHINGS, LEADS, ETC. PIPE SURFACE MUST BE FREE OF ALL RUST, GREASE, INSULATION, ETC.
  3. PIPE MUST BE ANCHORED TO ENSURE STABILITY.
  4. NO WRINKLES OR FOLDS UNDER CLAMPING RING.
  5. BONDING ADHESIVE REQUIRED BETWEEN MEMBRANE AND INSULATION FOR FULLY ADHERED SYSTEMS.
  6. FIRESTONE FASTENER AND HD SEAM PLATE REQUIRED FOR MAS ONLY. IF FASTENER CANNOT BE INSTALLED AS ILLUSTRATED, REFER TO DETAILS UT-P-15 & 16.
  7. WHEN REINFORCEMENT OF TPO MEMBRANE IS EXPOSED, REFER TO UT-LS-14 FOR CUT EDGE SEALANT APPLICATION.

MAXIMUM WARRANTY: <b>20 YEARS</b>	
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**PENETRATION (HOT STACK) WITH ULTRAPLY TPO FLASHING (UNSUPPORTED)**

**ULTRAPLY™ TPO**      ACCEPTABLE SYSTEMS: ALL

**USE APPROPRIATE TERMINATION DETAIL**

PRE-MOLDED ULTRAPLY TPO INSIDE/OUTSIDE CORNER WELDED IN PLACE (SEE NOTES)

ULTRAPLY TPO 18" CURB FLASHING OR MEMBRANE HEAT WELDED TO ULTRAPLY TPO FIELD SHEET (SEE NOTES)

ULTRAPLY TPO MEMBRANE (FIELD SHEET)

ULTRAPLY TPO T-JOINT COVER WELDED IN PLACE (SEE NOTES)

**NOTES:**

1. REFER TO FIRESTONE WEBSITE FOR MOST CURRENT INFORMATION.
2. REFER TO DETAIL UT-LS-1 OR 2 FOR WELD WIDTH.
3. T-JOINT COVER REQUIRED FOR .060 GAUGE MEMBRANE ONLY.
4. ULTRAPLY TPO FLASHING (UNSUPPORTED) (4"x4" MIN. WITH ROUNDED CORNERS) MAY BE USED IN LIEU OF T-JOINT COVER.
5. ULTRAPLY TPO FLASHING (UNSUPPORTED) MAY BE USED IN LIEU OF PRE-MOLDED ULTRAPLY TPO INSIDE/OUTSIDE CORNER **FOR A MAXIMUM WARRANTY OF 15 YEARS.**
6. WHEN REINFORCEMENT OF TPO MEMBRANE IS EXPOSED, REFER TO UT-LS-14 FOR CUT EDGE SEALANT APPLICATION.

**USE APPROP. BASE TIE-IN DETAIL**

MAXIMUM WARRANTY: **20 YEARS**

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**INSIDE CORNER WITH CONTINUOUS WALL FLASHING**

ULTRAPLY™ TPO

ACCEPTABLE SYSTEMS: ALL

ISSUE / REVISION DATE:

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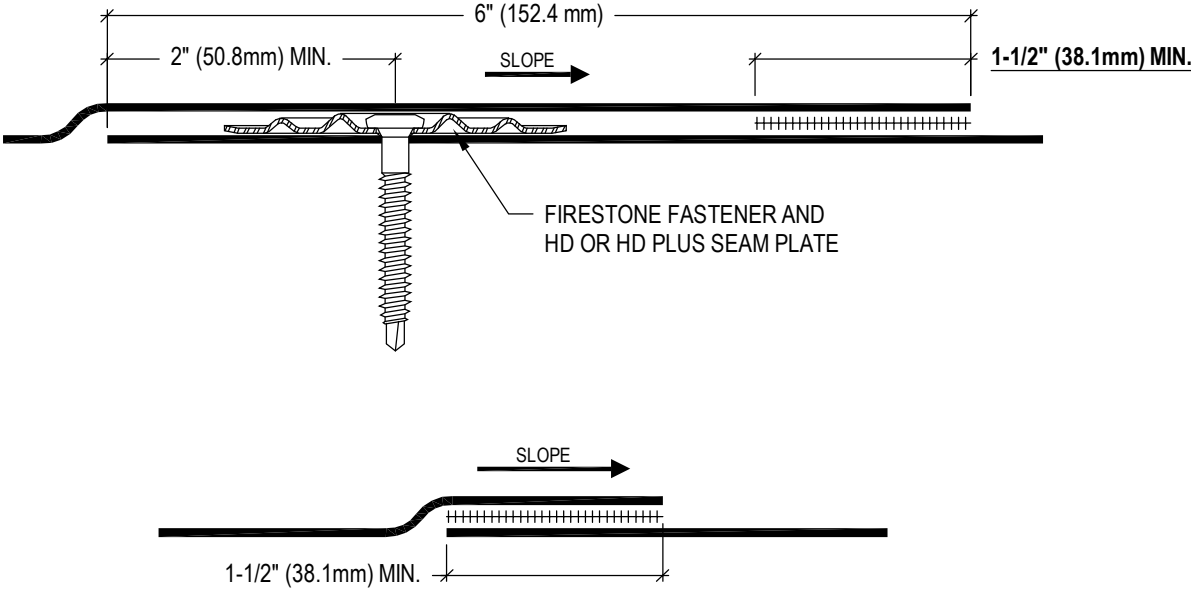
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DETAIL NO.

**UT-C-4**



NOTES:  
 1. REFER TO FIRESTONE WEB SITE FOR MOST CURRENT INFORMATION.



**WHEN POLYESTER REINFORCEMENT OF TPO IS EXPOSED, APPLY CUT EDGE TREATMENT TO ENTIRE EXPOSED EDGE. REFER TO UT-LS-14.**



**LAP SPLICE WITH 1-1/2" AUTOMATIC WELDER**

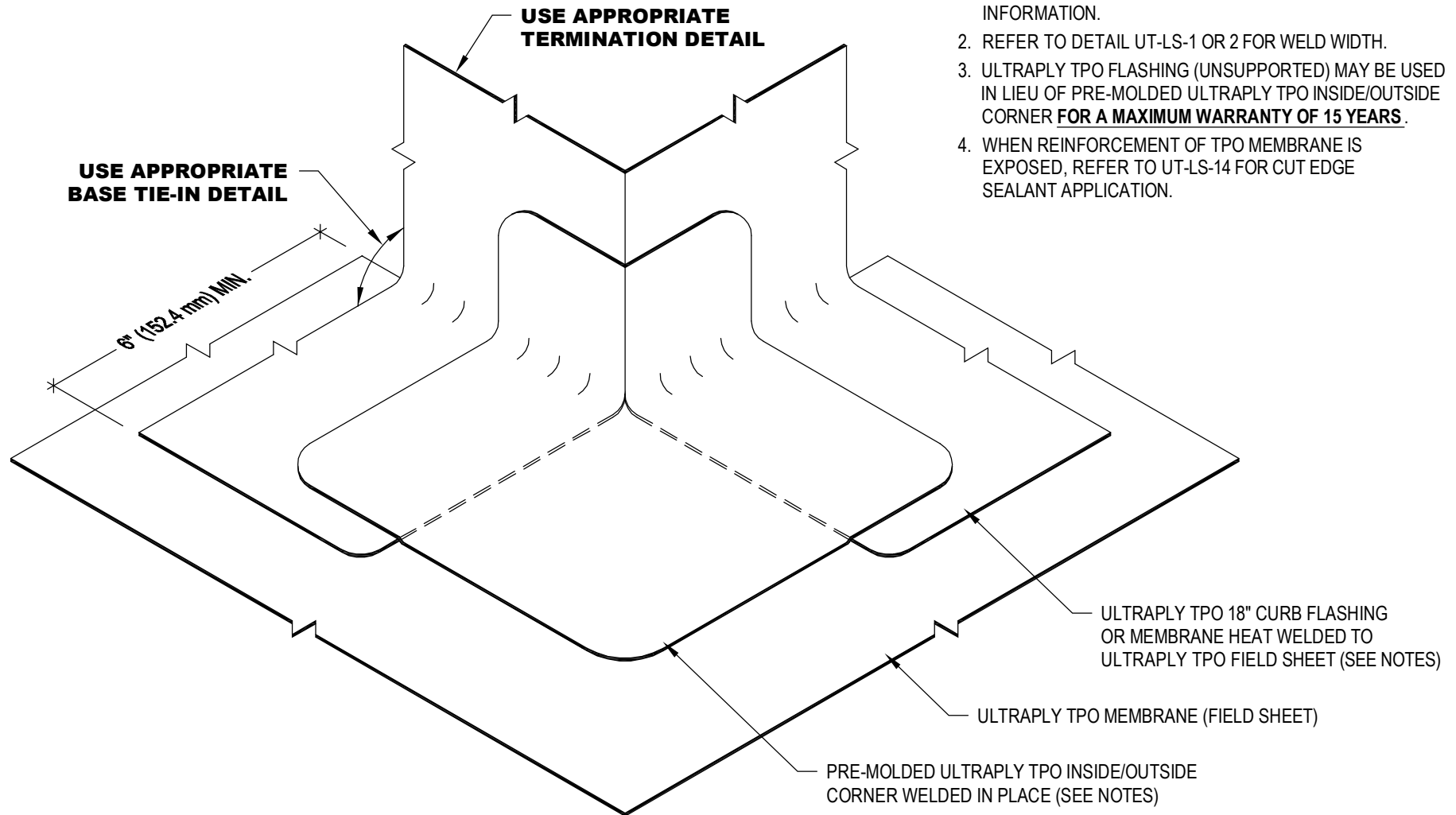
**ULTRAPLY™ TPO**

ACCEPTABLE SYSTEMS: ALL

MAXIMUM WARRANTY: <b>20 YEARS</b>	
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**NOTES:**

1. REFER TO FIRESTONE WEBSITE FOR MOST CURRENT INFORMATION.
2. REFER TO DETAIL UT-LS-1 OR 2 FOR WELD WIDTH.
3. ULTRAPLY TPO FLASHING (UNSUPPORTED) MAY BE USED IN LIEU OF PRE-MOLDED ULTRAPLY TPO INSIDE/OUTSIDE CORNER **FOR A MAXIMUM WARRANTY OF 15 YEARS**.
4. WHEN REINFORCEMENT OF TPO MEMBRANE IS EXPOSED, REFER TO UT-LS-14 FOR CUT EDGE SEALANT APPLICATION.



MAXIMUM WARRANTY: **20 YEARS**

**OUTSIDE CORNER**

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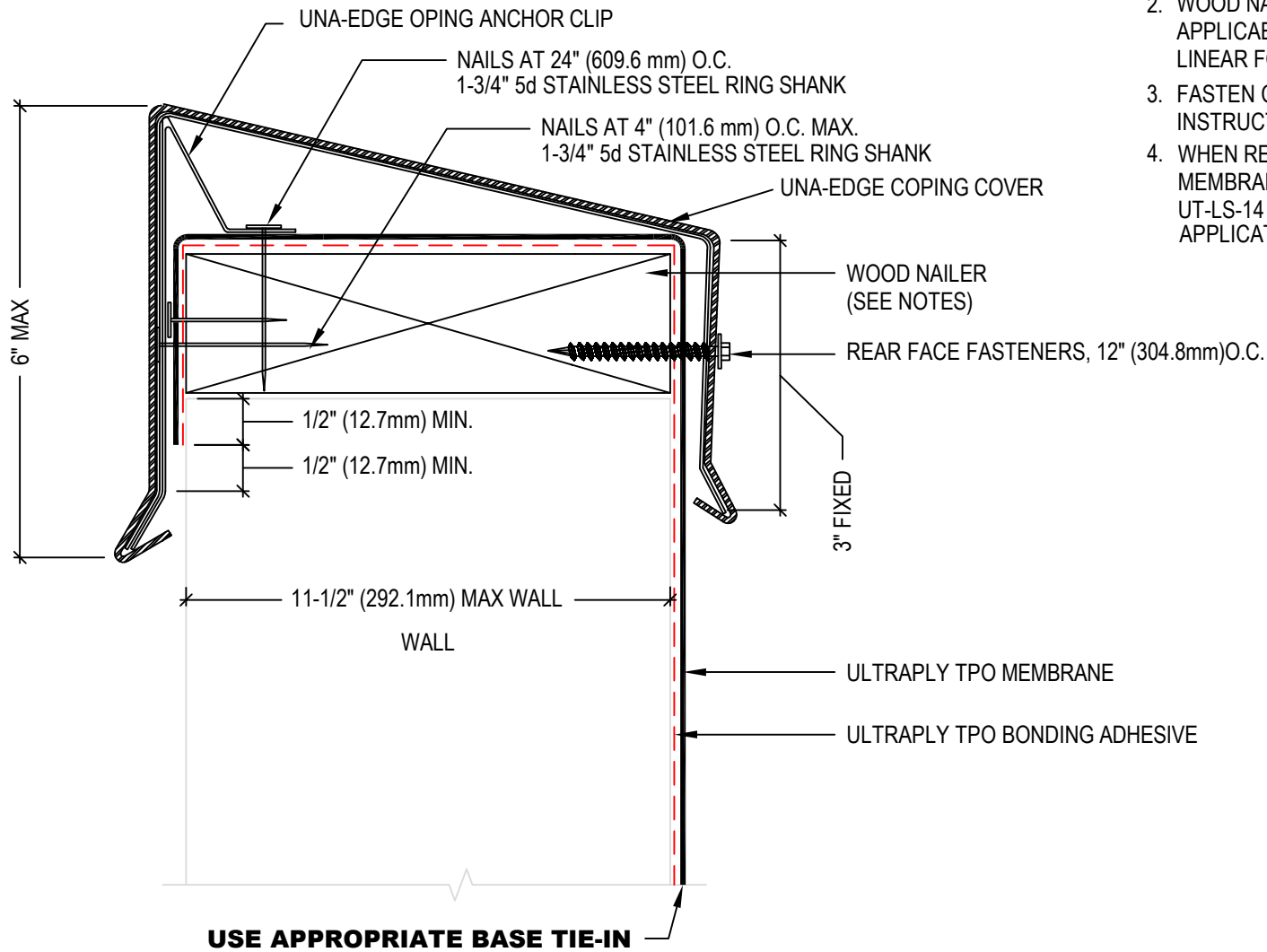
**UT-C-1**

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ULTRAPLY™ TPO

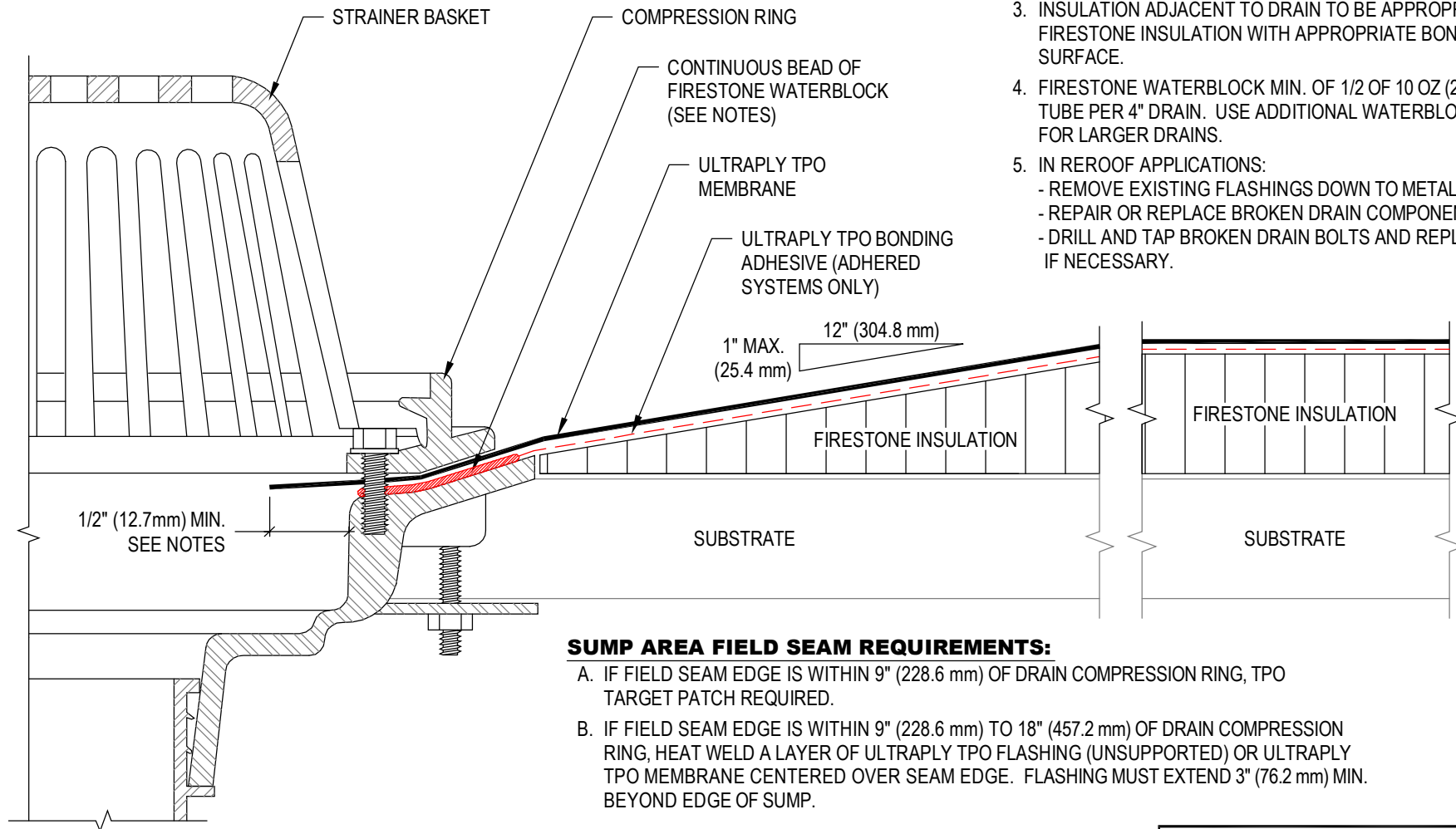
ACCEPTABLE SYSTEMS: ALL

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NOTES:

1. REFER TO FIRESTONE WEBSITE FOR MOST CURRENT INFORMATION.
2. WOOD NAILER MUST BE INSTALLED TO MEET APPLICABLE BUILDING CODES OR 200 LBS PER LINEAR FOOT MINIMUM IN ANY GIVEN DIRECTION.
3. FASTEN COPING CLEAT AS PER SUPPLIED INSTRUCTIONS AND FASTENERS.
4. WHEN REINFORCEMENT OF TPO MEMBRANE IS EXPOSED, REFER TO UT-LS-14 FOR CUT EDGE SEALANT APPLICATION.



**NOTES:**

1. REFER TO FIRESTONE WEB SITE FOR MOST CURRENT INFORMATION.
2. HOLE IN MEMBRANE SHOULD EXTEND A MINIMUM OF 1/2" (12.7 mm) BEYOND CLAMPING RING AND SHOULD NOT BE SMALLER THAN THE DIAMETER OF THE LEADER PIPE.
3. INSULATION ADJACENT TO DRAIN TO BE APPROPRIATE FIRESTONE INSULATION WITH APPROPRIATE BONDING SURFACE.
4. FIRESTONE WATERBLOCK MIN. OF 1/2 OF 10 OZ (295 ml) TUBE PER 4" DRAIN. USE ADDITIONAL WATERBLOCK FOR LARGER DRAINS.
5. IN REROOF APPLICATIONS:
  - REMOVE EXISTING FLASHINGS DOWN TO METAL BOWL
  - REPAIR OR REPLACE BROKEN DRAIN COMPONENTS
  - DRILL AND TAP BROKEN DRAIN BOLTS AND REPLACE IF NECESSARY.

**SUMP AREA FIELD SEAM REQUIREMENTS:**

- A. IF FIELD SEAM EDGE IS WITHIN 9" (228.6 mm) OF DRAIN COMPRESSION RING, TPO TARGET PATCH REQUIRED.
- B. IF FIELD SEAM EDGE IS WITHIN 9" (228.6 mm) TO 18" (457.2 mm) OF DRAIN COMPRESSION RING, HEAT WELD A LAYER OF ULTRAPLY TPO FLASHING (UNSUPPORTED) OR ULTRAPLY TPO MEMBRANE CENTERED OVER SEAM EDGE. FLASHING MUST EXTEND 3" (76.2 mm) MIN. BEYOND EDGE OF SUMP.

MAXIMUM WARRANTY: **20 YEARS**

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NOT TO SCALE

DETAIL NO.

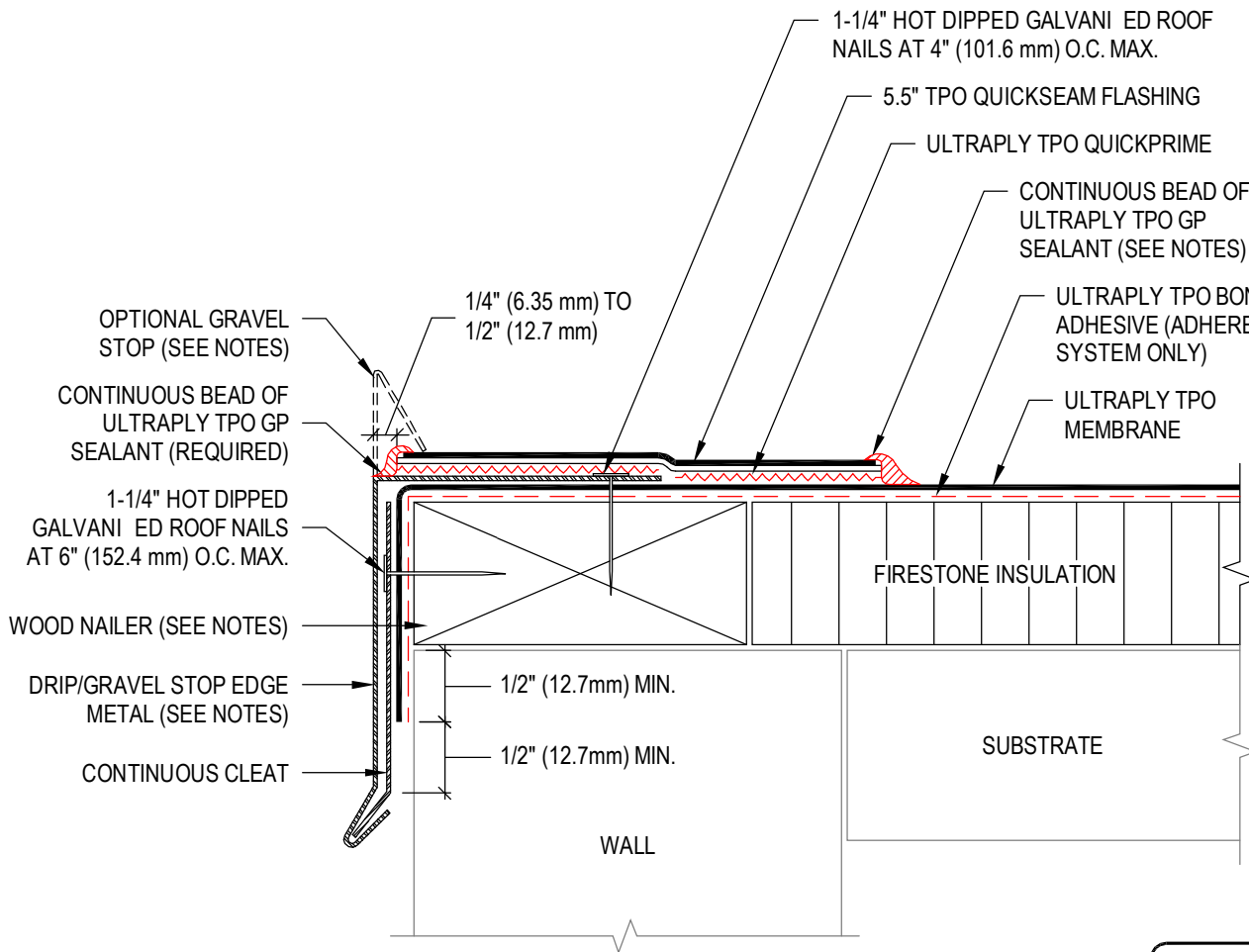
**UT-D-1**

**Firestone**  
 BUILDING PRODUCTS  
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**ROOF DRAIN**

ULTRAPLY™ TPO

ACCEPTABLE SYSTEMS: ALL

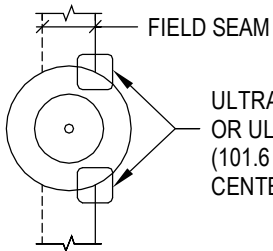


**NOTES:**

1. REFER TO FIRESTONE WEBSITE FOR MOST CURRENT INFORMATION.
2. INSTALL METAL WORK TO MANUFACTURER S REQUIREMENTS OR SMACNA RECOMMENDATIONS. IF SHOP FABRICATED METAL EDGE IS USED IT MUST MEET ANSI/SPRI ES-1 OR AN FM STANDARD.
3. GP SEALANT IS REQUIRED ALONG ENTIRE UPSLOPE EDGE OF QUICKSEAM FLASHING WHEN ROOF SLOPE IS 1" (25.4 mm) PER FOOT OR GREATER.
4. WOOD NAILER MUST BE INSTALLED TO MEET APPLICABLE BUILDING CODES OR 200 LBS PER LINEAR FOOT MINIMUM IN ANY GIVEN DIRECTION.
5. FLANGE OF METAL MUST BE FULLY SUPPORTED BY WOOD AND TERMINATED AT LEAST 1/2" (12.7 mm) FROM EDGE OF WOOD.
6. ON BALLASTED ROOFS, GRAVEL STOP HEIGHT MUST MEET OR EXCEED BALLAST OR PAVER HEIGHT (2" (50.8 mm) MIN. ABOVE ROOF SURFACE).
7. IF THE FLANGE OF THE METAL EDGE IS NOT COMPLETELY COVERED WITH QUICKSEAM FLASHING, THEN AN ADDITIONAL PIECE OF QUICKSEAM FLASHING SHALL BE INSTALLED AT ALL METAL SPLICES. REFER TO UT-RE-27.

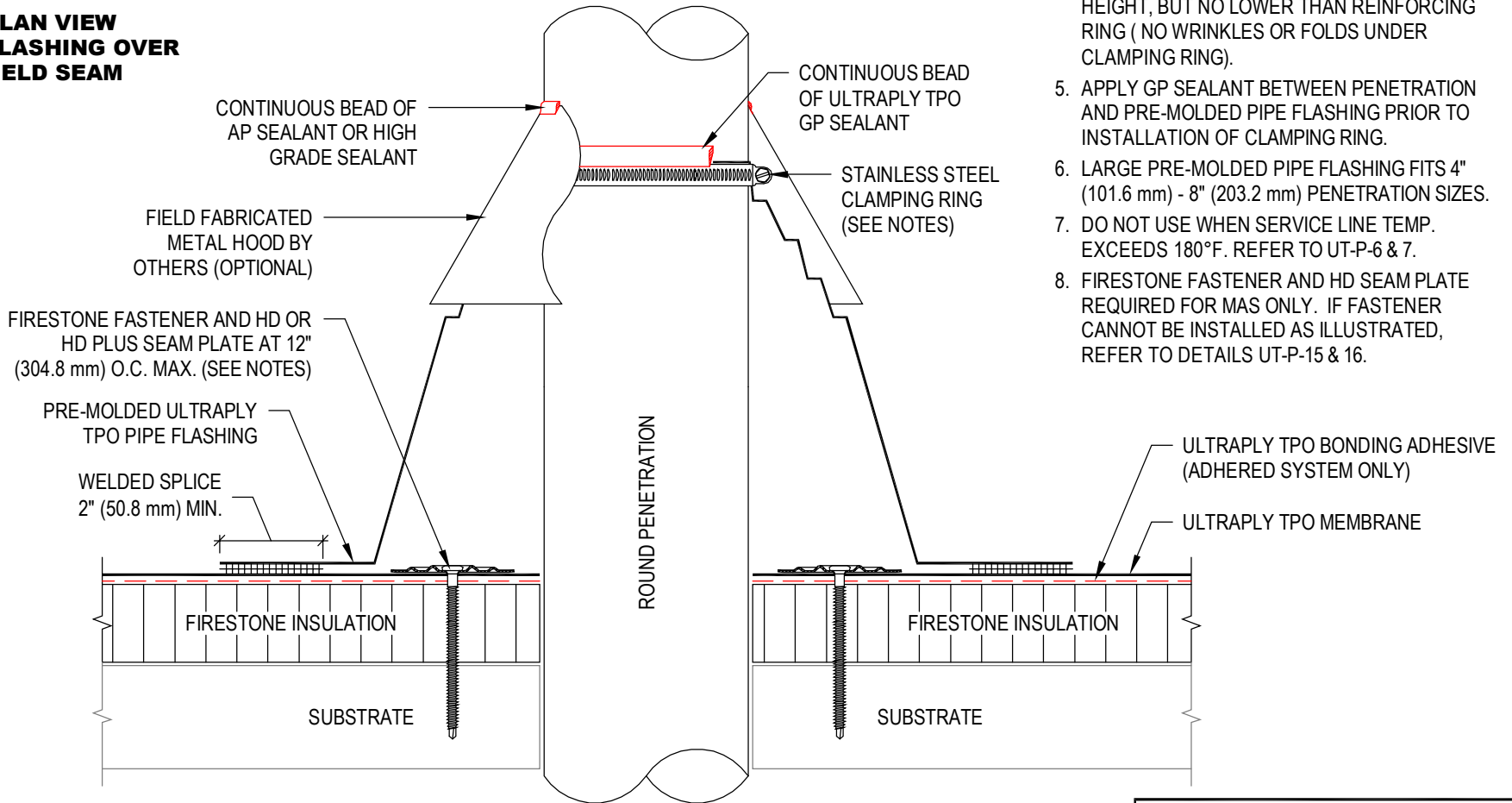
**THIS DETAIL IS APPROVED FOR A MAXIMUM OF 20 YEARS. REFER TO DETAIL UT-RE-21 FOR 25 YEAR REQUIREMENTS.**

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			<p>ISSUE / REVISION DATE: /1/2010</p>	<p>DETAIL NO. <b>UT-RE-20</b></p>
	<p><b>ULTRAPLY™ TPO</b></p>	<p>ACCEPTABLE SYSTEMS: ALL</p>	<p>NOT TO SCALE</p>	



ULTRAPLY TPO T-JOINT COVER  
OR ULTRAPLY TPO FLASHING (4"  
(101.6 mm) x 4" (101.6 mm) MIN.)  
CENTERED OVER INTERSECTION

**PLAN VIEW  
PIPE FLASHING OVER  
FIELD SEAM**



**NOTES:**

1. REFER TO FIRESTONE WEBSITE FOR MOST CURRENT INFORMATION.
2. REMOVE ALL EXISTING FLASHINGS, LEADS, ETC. PIPE SURFACE MUST BE FREE OF ALL RUST, GREASE, INSULATION, ETC.
3. PIPE MUST BE ANCHORED TO ENSURE STABILITY.
4. PRE-MOLDED PIPE FLASHING MAY BE CUT TO HEIGHT, BUT NO LOWER THAN REINFORCING RING ( NO WRINKLES OR FOLDS UNDER CLAMPING RING).
5. APPLY GP SEALANT BETWEEN PENETRATION AND PRE-MOLDED PIPE FLASHING PRIOR TO INSTALLATION OF CLAMPING RING.
6. LARGE PRE-MOLDED PIPE FLASHING FITS 4" (101.6 mm) - 8" (203.2 mm) PENETRATION SIZES.
7. DO NOT USE WHEN SERVICE LINE TEMP. EXCEEDS 180°F. REFER TO UT-P-6 & 7.
8. FIRESTONE FASTENER AND HD SEAM PLATE REQUIRED FOR MAS ONLY. IF FASTENER CANNOT BE INSTALLED AS ILLUSTRATED, REFER TO DETAILS UT-P-15 & 16.

MAXIMUM WARRANTY: **20 YEARS**

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**PENETRATION WITH ULTRAPLY TPO LARGE PIPE FLASHING**

ULTRAPLY™ TPO

ACCEPTABLE SYSTEMS: ALL

ISSUE / REVISION  
DATE:

1/1/2006

NOT TO SCALE

DETAIL NO.

**UT-P-1**