U.S. PLY, INC.

Pioneered with performance in mind... Engineered to stand the test of time.

OFFICAL US PLY INC. FIELD MEASURING AND TEMPLATE KIT

The U.S. PLY INC. Field Measuring and Template Kit was developed by USP as a tool to be used when measuring a roof for coping and/or fascia.

The information given below will allow the greatest success in producing a top quality, successful roof edge. This kit will also:

- **Quicken the fabrication and delivery of your material**
- **Ensure the proper fit of your material at special conditions**
- **Ensure that individual parts are fabricated correctly**
- **Provide guidelines for successful roof templates**

Materials Required:	This field measuring kit, tape measure, USP wall gauge, large 2 arm protractor, graph paper, pen, template paper (as required), duct tape for template paper, digital camera (highly recommended), medium size magic marker (for template), string line, hand tools for removing accessories on roof as required (screwdrivers, small pry bar, hand held hacksaw), sunblock, hat, lots of drinking water
PPE Required:	Safety harness and fall protection, steel toed shoes as required by general contractor. Hard hat and shoes with very good grip, gloves are recommended for any project. Cold weather/wind gear as required.
Skills Required:	Ability to read a tape measure and 2 arm protractor, adept in hand sketched drawings, prior knowledge of typical WPH miters, end caps, end terms, coping and fascia profiles, no fear of heights

This kit provides Step-by-Step field measurement guidelines/information for:

Field Measurement Information - Coping , Ledgecaps

Please refer to the figure on page 5 of this booklet. The following steps should be considered as guidelines and recommendations. The sequence may vary; however each step is important and should be addressed.

- Walk entire roof to determine areas where coping is required.
- A parapet wall needs a minimum dimension of 3 1/2" if coping is to be used. Otherwise consider fascia.
- Draw a rough "roof plan" using the supplied graph paper as best to scale as possible. You will be placing many notes on this plan, so make the plan fairly large. Use multiple sheets of graph paper if necessary, especially if many roof levels are present. If this is the case, a single piece of graph paper should show a total "roof plan" of all the areas. If available, an architectural plan will suffice- please use the same roof labeling as shown on the plan (N,S, E,W or Floor 1, etc)
- Use measuring wheel to determine overall lengths between miters.
- Move around the building and label miters as shown.
- Record wall width dimensions and any parapet slopes. If needed, use the wall gauge provided by USP, see page 12 regarding how to use the gauge. Wall width measurements should be taken at various locations depending upon the wall variability (see page 4 on info. regarding wall variability). A good rule of thumb is to take wall width and angle measurements every 5' on center if brick façade or other wall materials affect the wall width to be used.
- **Beware of what looks like a 90 degree corner; it may be greater than 2 degrees off, which could cause a true 90 miter not to fit correctly. Use the WPH protractor to check all miter angles. See page 5, miter M16 as an example.**
- Record miter information as shown on page 6; for miters other than standard inside (ID) or outside (OS) miters, a separate miter drawing will be required (as shown).
- **Beware of coping nailer slopes. The coping nailer may not be 90 degrees to the wall, which could cause a standard coping cap not to fit correctly. See page 12.**
- Continue around entire rooftop, labeling miters sequentially as shown on inside cover. Number the miters on the drawing as needed depending on job complexity.
- Measure and record the depth of the coverage required for each wall segment.
    - Note: If a face length is pre-determined, then verify that the face length will meet the SMACNA 1" cover criteria
- **Take digital pictures of special conditions whenever possible**
- Ensure that threaded rod "J-bolt" and nut which holds the nailer in place will not interfere with the coping or ledgecap.

Field Measurement Information - Fascia

- Follow the steps above for coping, but no wall width measurement or backleg verification is necessary.
- Site the wall to see if the wall fascade is straight..add text for visual inspection
- SMACNA requires a minimum of 1" height between bottom of nailer and top of drip- see page 12.

When making any template, please follow these guidelines

A. Do NOT measure wall until membrane is placed over parapet.
B. Mark the radius template with the actual size of the wall thickness. Do not add allowance for the coping. Please do not fold the template over the edge. Mark the start and stop point on the template & wall.
C. Mark the template indicating the "**topside**"of template.
D. Mark the template indicating the face side and the roof side of the building –see page 7.
E. If more than one template is needed for a complete condition, clearly mark **match lines** to indicate where each section starts and the next section begins.- See pages 6,7.
F. Mark locations of templates on a roof plan for our use in locating the correct template sequence**.**
G. Use **heavy tip** (not fine tip or pencil) **black permanent markers** and the enclosed template material for making templates.
H. Please only use one side of the material for making templates, and limit to one condition per section.
I. Mark the templates clearly with job name and number, if known, and date.
J. Verify the actual total footage along the outside face of walls (round dimensions up to the next inch). On short runs, be careful between corners or similar conditions to avoid short fill-in pieces and joints.
K. For parapets, check wall thickness at frequent intervals with a carpenter's square or a UPS Wall Thickness Gage (see page 12). Note the locations of minimum and maximum variations on the roof plan.
L. Construct templates for all radius conditions to straight conditions (see page 8).

Additional information for field measurements

M. With a square, make sure the wall or roof edge is flat and perpendicular to the building face. Note any variations on your roof plan.
N. Check for the following conditions or problems and make sure they are corrected: (see page 4 for additional wall variation information)

1. Brick or other wall-facing material must be level with the backup substrate. Wood "nailer" plate(s) must be level, not cupped up or down. Determine whether the wood plate should be replaced-this may require a conversation with the general contractor. See page 12 and 12 for more information.
2. Face or back of wood plate must be flush with wall faces; else notify contractor to cut the plate flush.
3. The distance from the top of the wood plate down to the top of the wall-facing material is the minimum area to consider for fascia coverage. Example: A Permasnap Coping with a standard nominal 4" face will provide approximately 2-3/8" coverage (drip edge is not considered coverage). Gaps below the wood plate must be covered and could require larger face height. See page 12.
4. For parapets, check distance from wall top to highest surface of the roof to allow for the 4" nominal coping back leg.
5. Make sure roofing material doesn't bunch up at inside or outside corners, causing a corner piece not to fit properly.
6. Check all the standard 90-degree corners with a square and the special corners with a 24" long bevel on the outside wall face. Check for same angle on the

inside face. Indicate the angle on a sketch, or make a full-size template. See page 5.

NOTE:
Our Production Team is skilled at successfully fabricating special items from templates. However, they **will not** fabricate if they need to guess at any dimensions or if there are any inconsistencies. For a successful job, please take special care in preparing your templates. W. P. Hickman Company reserves the right to reject templates that do not conform to these guidelines. If you have any questions, please call W.P. Hickman Engineering Dept. @ 1-800-892-9173

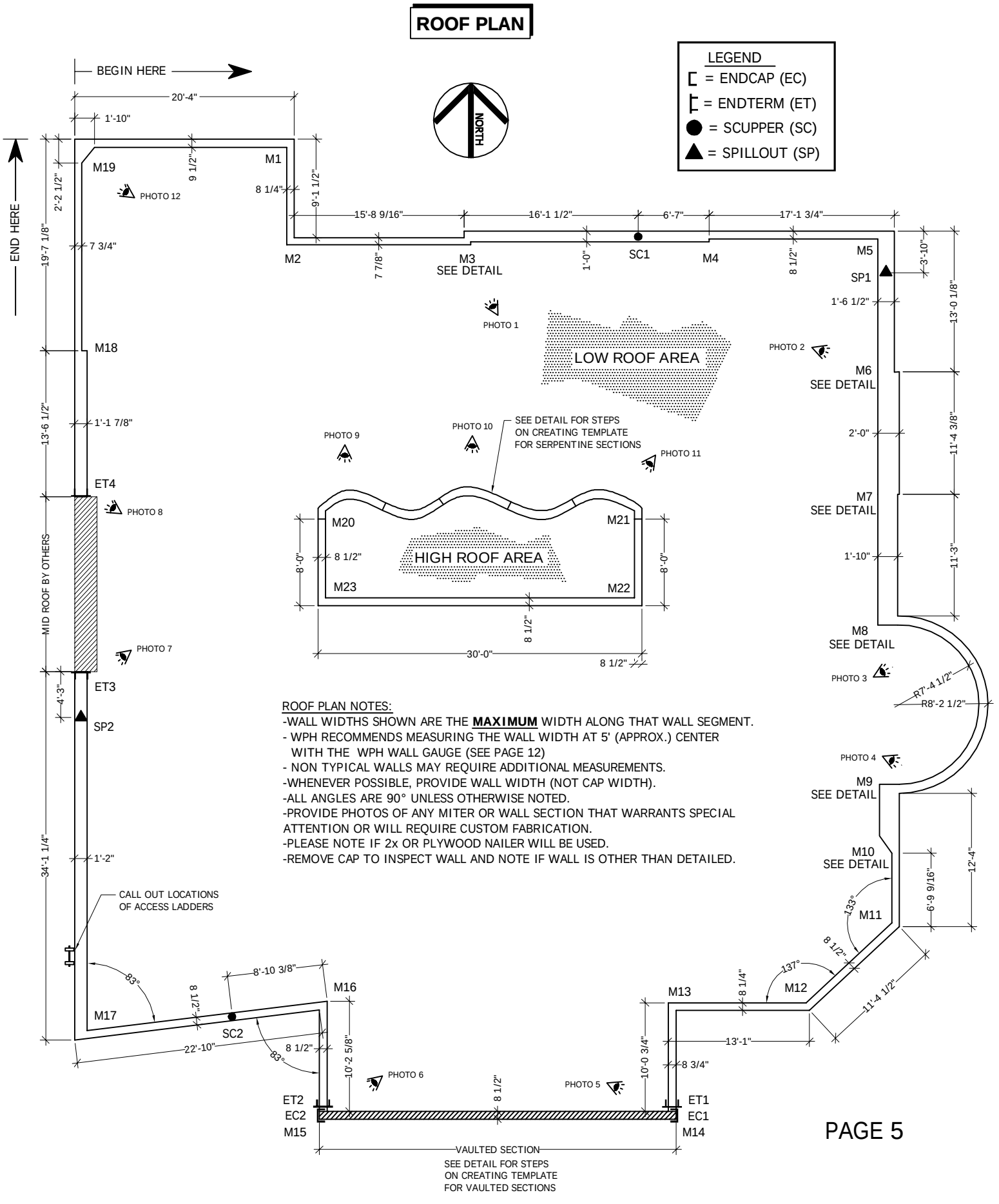
General Information Pertaining to Wall Variations

U.S. PLY Inc. can provide coping with an ES-1 wind rating, and warranty, using our engineered cleat which allows for generous wall variations. However, engineers, field representatives, and clients should be aware of building code tolerances regarding the construction of commercial walls. Wall variations outside of industry accepted standards affect the installation and appearance of U.S. PLY Inc. coping and fascia products.

Wall variations significantly larger than those shown in the table below may result in the delivery of multiple wall widths (slowing the coping installation process) and numerous in-line transition miters. Our experience has shown that clients may not be aware of the in-line transitions. A discussion of wall variations may be useful during the approval process.

Type of Wall	2006 Building Code Section	Other Reference(s)	Tolerances and Wall Variations
Masonry	Section 2104.1.1 - Tolerances	ACI 530.1/ASCE 6/TMS 602 Specifications, Section 3.3G – C – true to a line	+/- 1/4" tolerance in 10 feet of wall length **Rule of thumb**
Concrete	Section 1906 refers the reader to ACI 318; Section R6.1 of ACI 318 refers reader to ACI Committee 347 Document "Guide to Formwork for Concrete	ACI Committee 347, 622 Special Publication Number 4, "Formwork for Concrete" – Suggested Tolerances for Walls"	Variation in thickness is limited to -1/4" to +½".
Rough Lumber Framing		UFGS Guide Specifications; "Handbook of Construction Tolerances, Ballast, D.K., Section 6-6, pg 143.	Tolerance of ¼" in 8 ft. for layout, or straightness of plates and runners.
Steel beams (Spliced between column lines)	Section 2205 refers reader to AISC 360- "Specifications for Structural Steel Buildings"	AISC Load and Resistance Factor Design, Section 7.11.3 of AISC Code of Standard Practice, "Handbook of Construction Tolerances, Ballast, D.K., Section 3-7, pg 89.	Max. out of straightness "slope" of 1/500. For a 10' long beam, max. Out-of-straightness = ¼".
Stone		Dimension Stone Design Manual, "Handbook of Construction Tolerances, Ballast, D.K., Section 5-4, pg 125	+/- 1/4" tolerance in 10' feet of wall length, up to +/- 1/2" in 40'

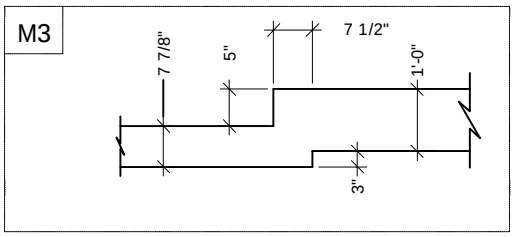
COPING INSTALLATION EXAMPLE

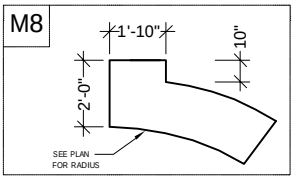


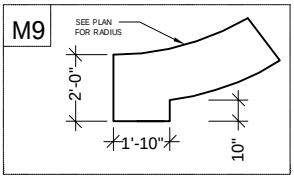
ROOF PLAN NOTES:

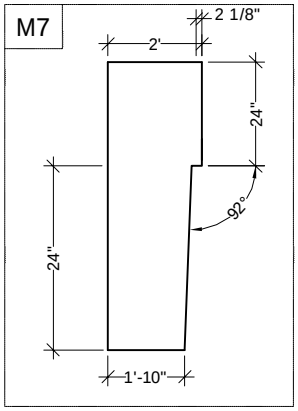
-WALL WIDTHS SHOWN ARE THE **MAXIMUM** WIDTH ALONG THAT WALL SEGMENT.
- WPH RECOMMENDS MEASURING THE WALL WIDTH AT 5' (APPROX.) CENTER WITH THE WPH WALL GAUGE (SEE PAGE 12)
- NON TYPICAL WALLS MAY REQUIRE ADDITIONAL MEASUREMENTS.
-WHENEVER POSSIBLE, PROVIDE WALL WIDTH (NOT CAP WIDTH).
-ALL ANGLES ARE 90° UNLESS OTHERWISE NOTED.
-PROVIDE PHOTOS OF ANY MITER OR WALL SECTION THAT WARRANTS SPECIAL ATTENTION OR WILL REQUIRE CUSTOM FABRICATION.
-PLEASE NOTE IF 2x OR PLYWOOD NAILER WILL BE USED.
-REMOVE CAP TO INSPECT WALL AND NOTE IF WALL IS OTHER THAN DETAILED.

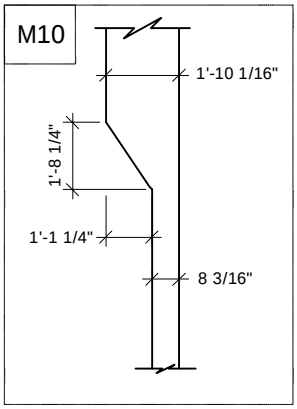
ROOF DETAILS

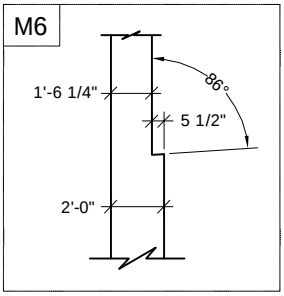




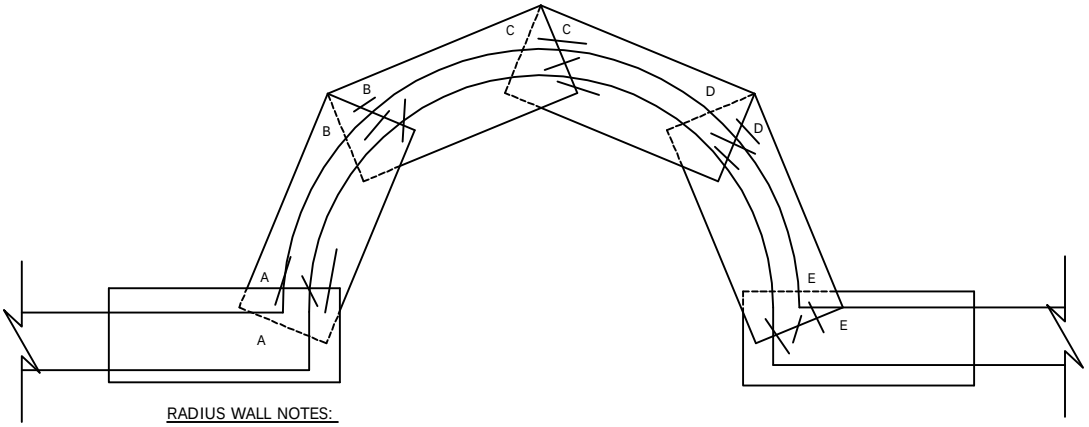






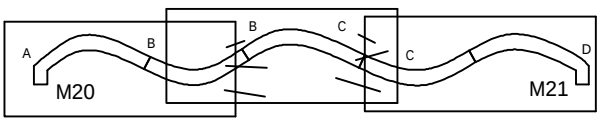


TEMPLATE PAPER
PROVIDED BY HICKMAN

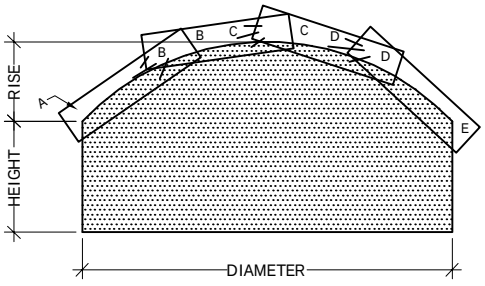


RADIUS WALL NOTES:

1. DRAW (3) LINES (MIN.) THAT CROSS OVER ADJACENT TEMPLATE EDGES WHILE PAPER IS FASTENED TO THE WALL. THESE LINES WILL ALLOW WPH TO REASSEMBLE THE TEMPLATE AND TAKE MEASUREMENTS.
2. MARK EACH TEMPLATE JOINT WITH MATCHING LETTERS TO INDICATE THE SEQUENCE OF INSTALLATION.
3. TRACE THE OUTSIDE WALL EDGE. MARK THIS LINE "FACE".
4. FOR COPING, TRACE INSIDE WALL EDGE. MARK THIS LINE "INSIDE".
5. DO NOT LET TEMPLATE PAPER FOLD OVER THE EDGE OF WALL OR VAULT.

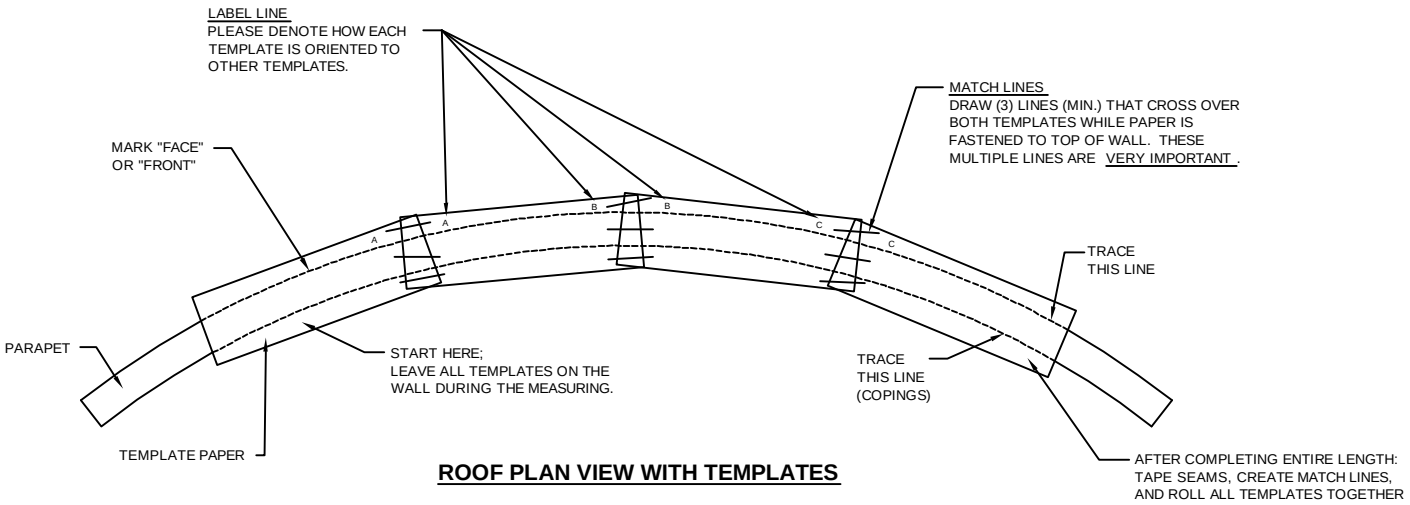


SERPENTINE WALL NOTES:
-USE MATCH LINES BETWEEN TEMPLATE SECTIONS
-TRACE BOTH INSIDE AND OUTSIDE EDGE. MARK AS "INSIDE" AND "FACE"



VAULTED WALL NOTES:
-TAKE NOTE OF EACH OF THE DIMENSIONS SHOWN TO THE LEFT.
-MINIMIZE NUMBER OF TEMPLATE SECTIONS USED FOR BEST RESULTS.
-CREATE TEMPLATE FOR TRANSITION MITERS WHEN NECESSARY.
-SEE PAGE 8 FOR VAULTED WALL TEMPLATE INSTRUCTIONS.
-SEE PAGE 7 FOR DIRECTIONS ON MATCH LINES.

COPING - TEMPLATE INSTRUCTIONS FOR RADIUS OR ARC WALLS



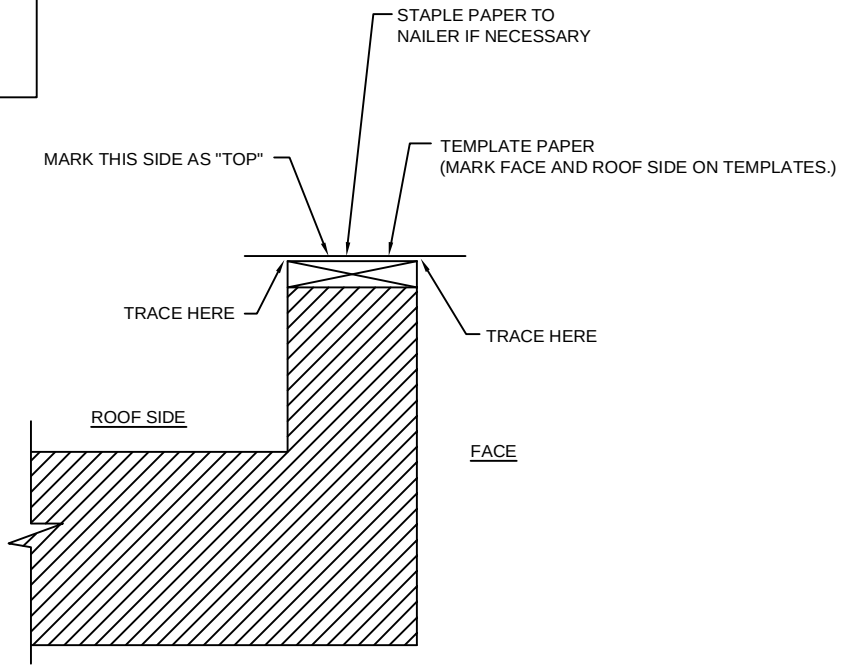
ROOF PLAN VIEW WITH TEMPLATES

EACH TEMPLATE SHOULD CONTAIN:

* PROJECT NAME
* TEMPLATE NUMBER OR ID
* A CONTACT NAME
* FACE SIDE

OTHER TEMPLATE NOTES:

* PLEASE LABEL THE ROOF PLAN DRWG -- WHERE DOES THIS TEMPLATE EXIST ON THE ROOF?

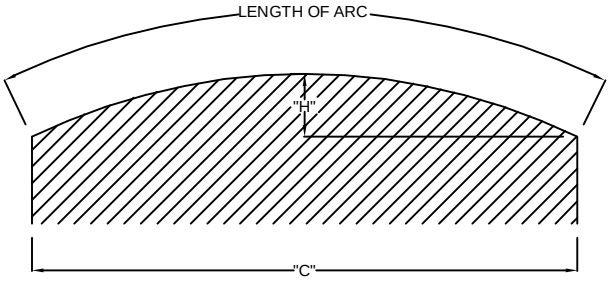


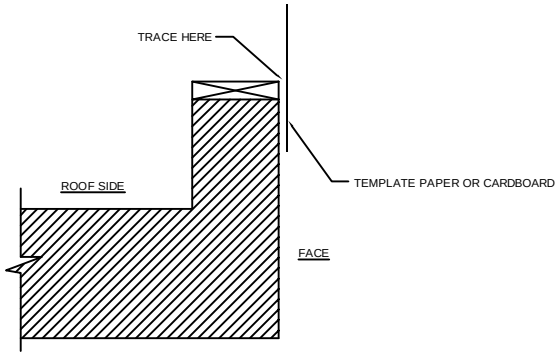
SECTION VIEW OF WALL

ADDITIONAL NOTES:

1: PROVIDE THE RADIUS FROM THE ARCHITECT'S DRAWINGS WHENEVER POSSIBLE. PLEASE NOTE ANY DIFFERENCES BETWEEN THE ARCHITECT DRAWINGS AND ACTUAL FIELD CONDITIONS.
2: MAKE A TEMPLATE OF THE COMPLETE LENGTH OF THE RADIUS (OR ARC) AND ITS ENDS.
3: IMPERFECTIONS ON THE TEMPLATES WILL BE SMOOTHED OUT UNLESS THEY ARE EXTREMELY NOTICEABLE. ANY INFORMATION THAT YOU CAN PROVIDE WILL IMPROVE THE FIT OF YOUR MATERIAL.

COPING - TEMPLATE INSTRUCTIONS FOR VAULTED WALLS



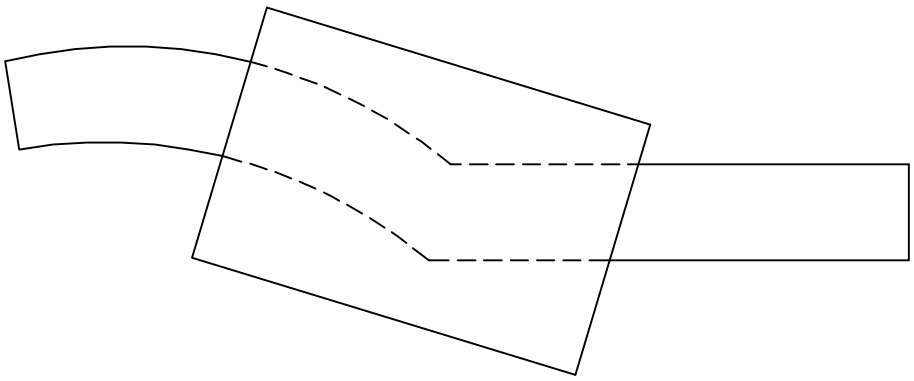


SECTION VIEW OF WALL

1: PLACE CARDBOARD FLAT AGAINST THE FACE OF WALL. DO NOT FOLD CARDBOARD OVER EDGE OF WALL.
2: USING A HEAVY MARKER, TRACE THE ARC ONTO THE CARDBOARD (TEMPLATE). THE CARDBOARD MAY ALSO BE CUT TO MATCH THE ARC, IF PREFERRED. IF THE CUTTING METHOD IS USED, PEASE INDICATE THE FACE OF THE TEMPLATE. SEE PAGE 7 FOR MATCH LINE INFORMATION.
3: NOTE ON THE TEMPLATE THE FIELD CHECKED DIMENSIONS "LENGTH OF ARC", "H", AND "C".
4: PROVIDE TEMPLATES FOR ANY VAULTED TO STRAIGHT TRANSITIONS (SEE BELOW). THESE ARE NECESSARY FOR PROPER FABRICATION.
5: CHECK ALL ARCS AND RADII VERY CAREFULLY. PROVIDE THE RADIUS FROM THE ARCHITECT'S DRAWINGS WHENEVER IT IS AVAILABLE. MAKE A TEMPLATE OF THE COMPLETE LENGTH AND ENDS.
6: IMPERFECTIONS ON THE TEMPLATES WILL BE SMOOTHED OUT UNLESS THEY ARE EXTEMELY NOTICEABLE. ANY INFORMATION THAT YOU CAN PROVIDE WILL IMPROVE THE FIT OF YOUR MATERIAL.

RADIUS TO STRAIGHT MITER

TEMPLATE REQUIRED FOR THIS CONDITION

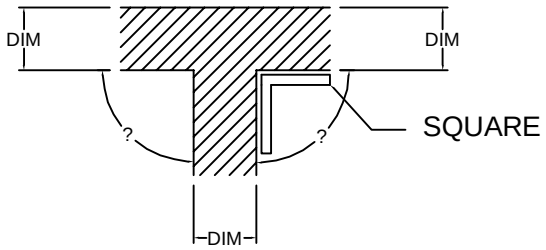


Templates must be made on material that is rigid, difficult to tear, and holds permanent marks. Examples of acceptable materials include our pre-supplied Hickman template paper, red rosin paper,
cardboard, poster board, sheet metal, plywood, black roofing felt (marked with a light grease or paint pencil) and thermoplastic membrane. Unacceptable materials include thin paper, plastic or
other sheeting. Please contact Hickman Customer Service if you have any template material questions.

COPING - TEMPLATE INSTRUCTIONS FOR "T" AND "Z" MITERS

Please check all of the Tees and Zees on your roof carefully. Provide a sketch of all miters with the required dimensions, or make a full-size template as necessary.

DEFINE FACE SIDE(S)



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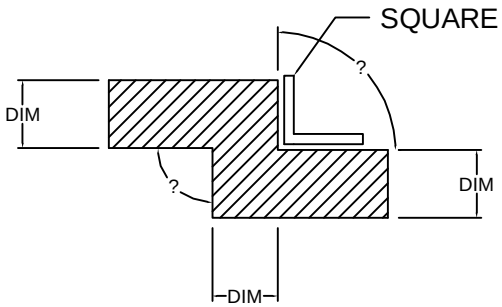
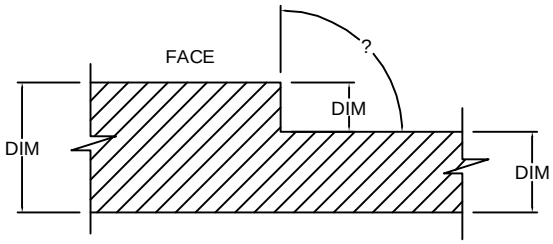
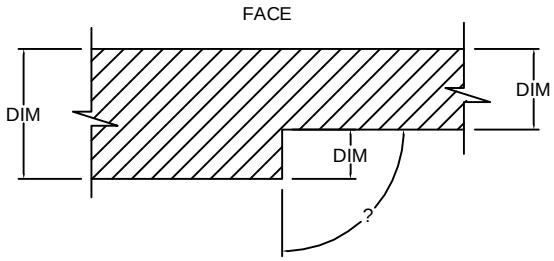


"T" MITER



"Z" MITER



EACH TEMPLATE SHOULD CONTAIN:

* PROJECT NAME
* TEMPLATE NUMBER OR ID
* A CONTACT NAME
* FACE SIDE

OTHER TEMPLATE NOTES:

* PLEASE LABEL THE ROOF PLAN DRWG -- WHERE DOES THIS TEMPLATE EXIST ON THE ROOF?

Templates must be made on material that is rigid, difficult to tear, and holds permanent marks. Examples of acceptable materials include our pre-supplied Hickman template paper, red rosin paper, cardboard, poster board, sheet metal, plywood, black roofing felt (marked with a light grease or paint pencil) and thermoplastic membrane. Unacceptable materials include thin paper, plastic or other sheeting. Please contact Hickman Customer Service if you have any template material questions.

COPING -- TEMPLATE INSTRUCTIONS FOR "T" AND "Z" MITERS - CONT'D

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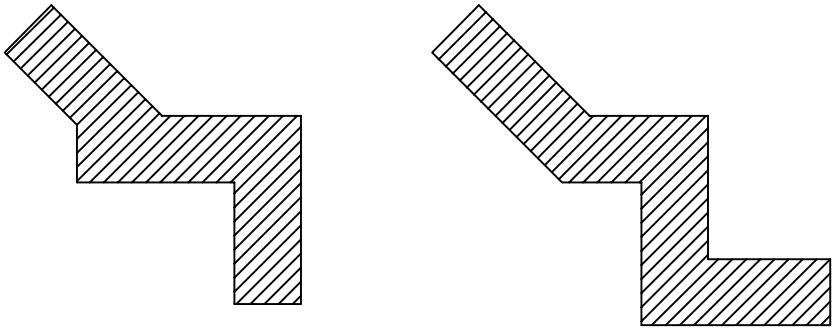
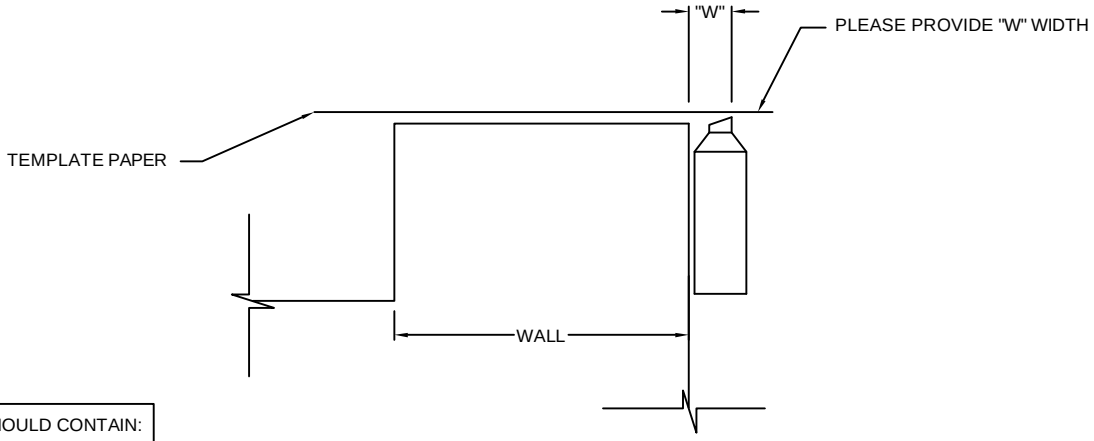
TEMPLATES SHOULD BE
USED FOR MITERS SUCH
AS THESE



OTHER MITERS

NOTE:
FOR ALL TEMPLATES, MEASURE THE DISTANCE FROM
THE WALL TO THE MARKER LINE AS SHOWN BELOW



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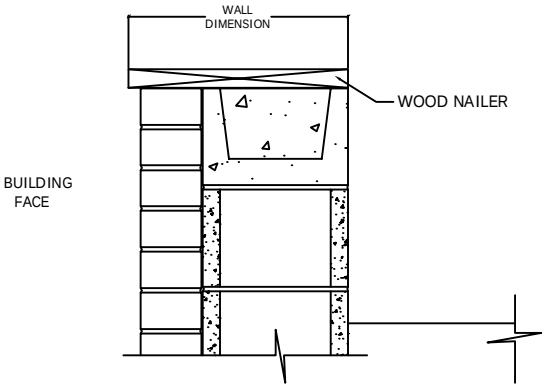
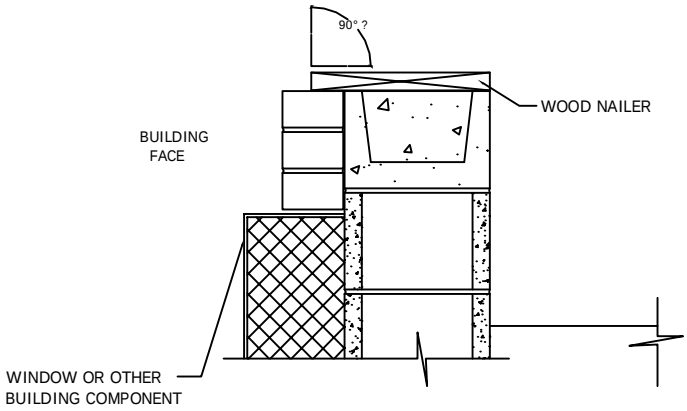
WALL CONDITIONS TO CONSIDER WHEN FIELD MEASURING



1) NAILER OVERHANGS THE WALL

NOTE:
PLEASE SEE CONTRACTOR ABOUT SAW CUTTING
THE NAILING PLATE PRIOR TO INSTALLATION TO
AVOID A GAP BETWEEN BRICK FACE AND COPING LEG

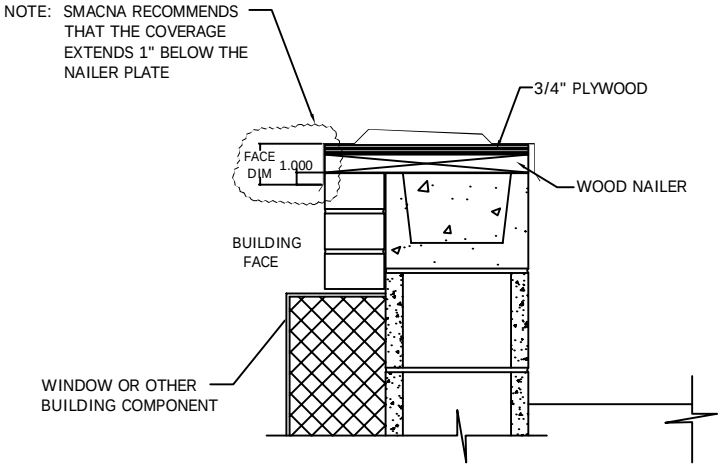
PROVIDE FRONT FACE
& BACK FACE SLOPE IF
NOT 90°



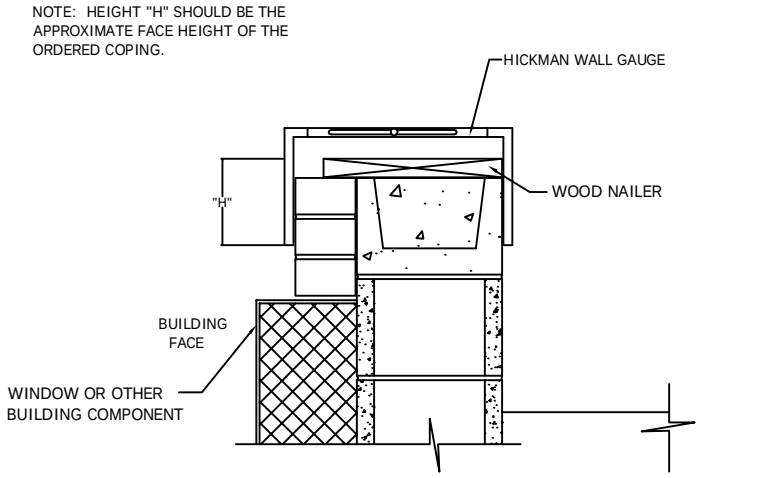
2) WALL IS WIDER THAN NAILER

NOTE: Per the ACI 530.1/ASCE 6/TMS 602 Building Code Specification for masonry walls, building code tolerances are +/-1/4" in 10 feet of wall length. Nearly identical tolerances are also found in wood and steel construction building code specifications. Thus the +/-1/4" in 10 feet is a good rule of thumb. See Page 4.
Wall variations and/or nailer dimensions may need to be discussed prior to coping or fascia installation. Poor nailer attachment will likely lead to poor coping or fascia performance.

WALL CONDITIONS TO CONSIDER WHEN FIELD MEASURING - CONT'D



3) CHECK FACE DIMENSION AGAINST QUOTE (IF AVAILABLE)



4) ENSURE THAT GAGE DOES NOT OVERHANG BUILDING COMPONENT (IN THIS CASE A WINDOW).

MEASURE INSIDE OF GAUGE LEGS WITH A TAPE MEASURE

NOTE: Per the ACI 530.1/ASCE 6/TMS 602 Building Code Specification for masonry walls, building code tolerances are +/-1/4" in 10 feet of wall length. Nearly identical tolerances are also found in wood and steel construction building code specifications. Thus the +/-1/4" in 10 feet is a good rule of thumb. See Page 4.

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