

U.B. Howland Truss Co.
610 11th St. SW
Live Oak, FL 32064
(386) 382-1225
(386) 382-1234 (fax)
howlandtruss@n11.com

ROOF PITCH: 8/12

CLG PITCH: (2) TRAYS--
HBR & GREAT RM- DETAILS
NOTED ON LAYOUT

OVERHANG: 18" PLUMB

LOADING: 40 PSF
WIND LOAD: 130 MPH
EXPOSURE: C

EXT WALLS: 2 X 4 X 9", 10" & 11"

DATE: 10/15/19

9'-0"

10'-0"

11'-0"

(6) TRUSS TO TRUSS CONNECTIONS:

(6) HUS26

JOB #: 19-3628

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Job Name: LOT 21 BLACKBERRY FARMS
Customer: Gibraltar Contr.
Designer: Bob Glover
ADDRESS:
SALESMAN: DB
: <Not Found>
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plastpro

5200 W. CENTURY BLVD.
LOS ANGELES, CA 90045

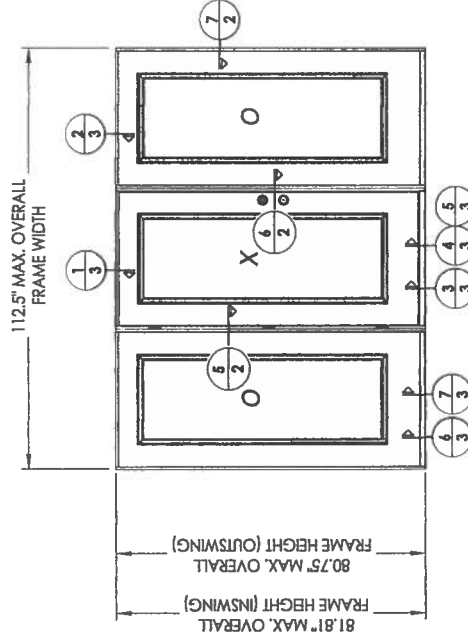
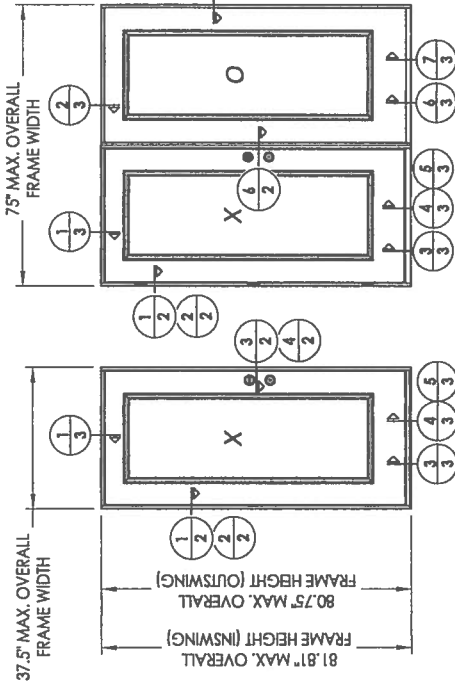
GLAZED FIBERGLASS SINGLE DOOR
w/ or w/out SIDELITE(S)
Inswing / Outswing
"IMPACT"

GENERAL NOTES

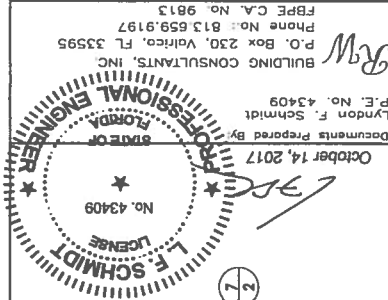
1. This product anchoring drawing has been developed and is in compliance with the 6th Edition (2017) Florida Building Code (FBC) structural requirements including the "High Velocity Hurricane Zone" (HVHZ). See the Certification Agency Certificate for sizes, specifications and rating.
2. Product anchors shall be as listed and spaced as shown on details. Anchor embedment to base material shall be beyond wall dressing or stucco.
3. When used in the "HVHZ" this product complies with Section 1626 of the Florida Building Code and does not require an impact resistant covering.
4. When used in areas outside of the "HVHZ" requiring wind borne debris protection this product complies with FBC Sections 1609.1.2 & R301.2.1.2 and does not require an impact resistant covering. This product meets missile level "D" and includes Wind Zone 4 as defined in ASTM E 1996 and FBC Sections 1609.1.2.2 & R301.2.1.2.1.
5. For 2x stud construction, anchoring of these units shall be the same as that shown for 2x buck masonry construction.
6. Site conditions that deviate from the details of this drawing require further engineering analysis by a licensed engineer or registered architect.
7. Outswing configurations utilizing the high dam sill (see Section 5/3), meet water infiltration requirements for "HVHZ". All other configurations do not meet the water infiltration requirements for the "HVHZ" and must be installed only in non-habitable areas or at habitable locations protected by an overhang or canopy such that the angle between the edge of canopy or overhang to sill is less than 45 degrees.

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SHEET #	DESCRIPTION
1	Typical elevations, design pressures & general notes
2	Horizontal cross sections
3	Vertical cross sections
4	Buck anchoring & bill of materials
5	Frame anchoring & glazing details



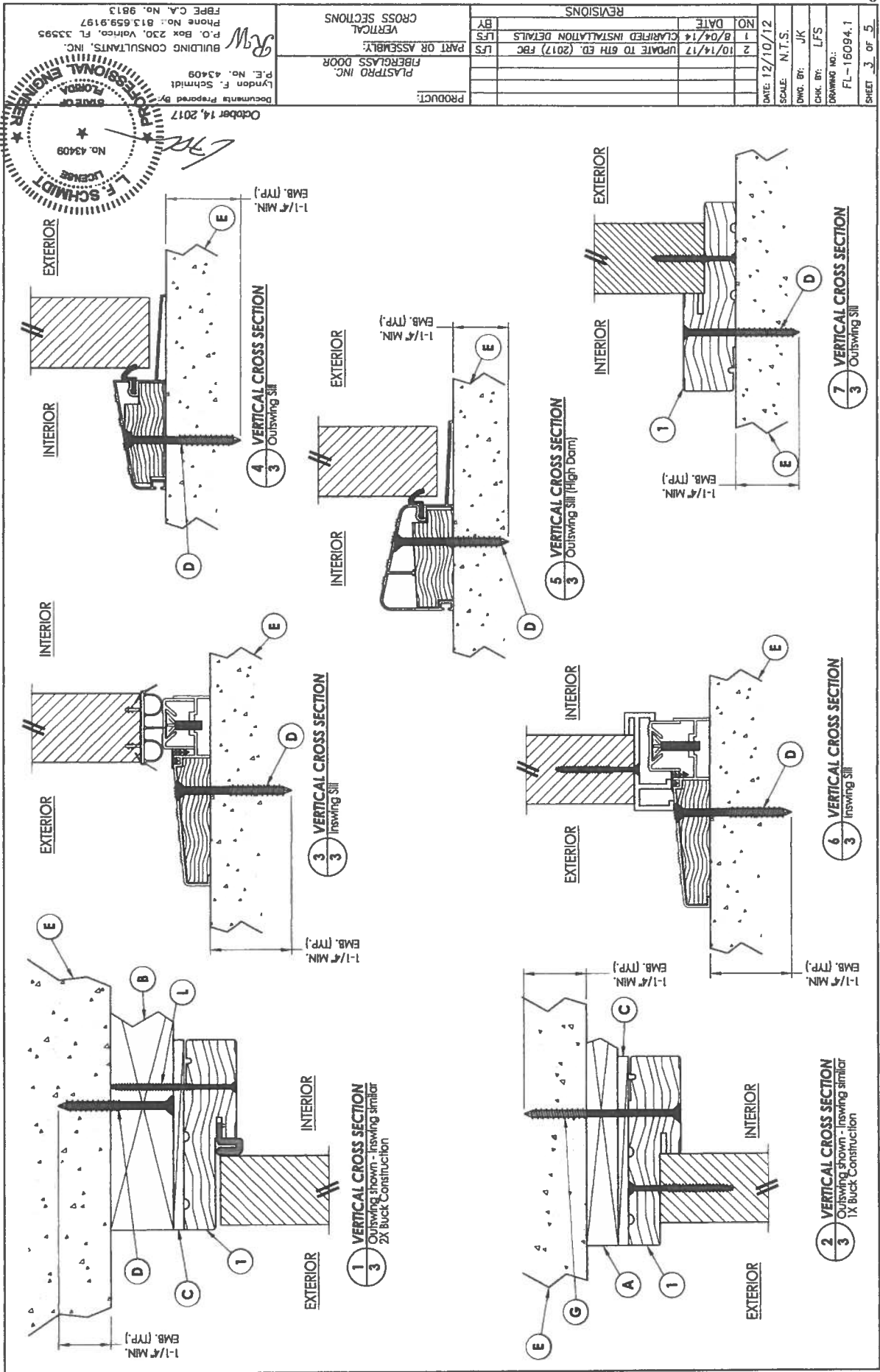
CONFIGURATION	MAX. FRAME DIMENSION	DESIGN PRESSURE (PSF)	
		POSITIVE	NEGATIVE
X	37.5" x 81.81"	+50.0	-50.0
XO/OX	75.0" x 81.81"	+50.0	-50.0
OXO	112.5" x 81.81"	+50.0	-50.0



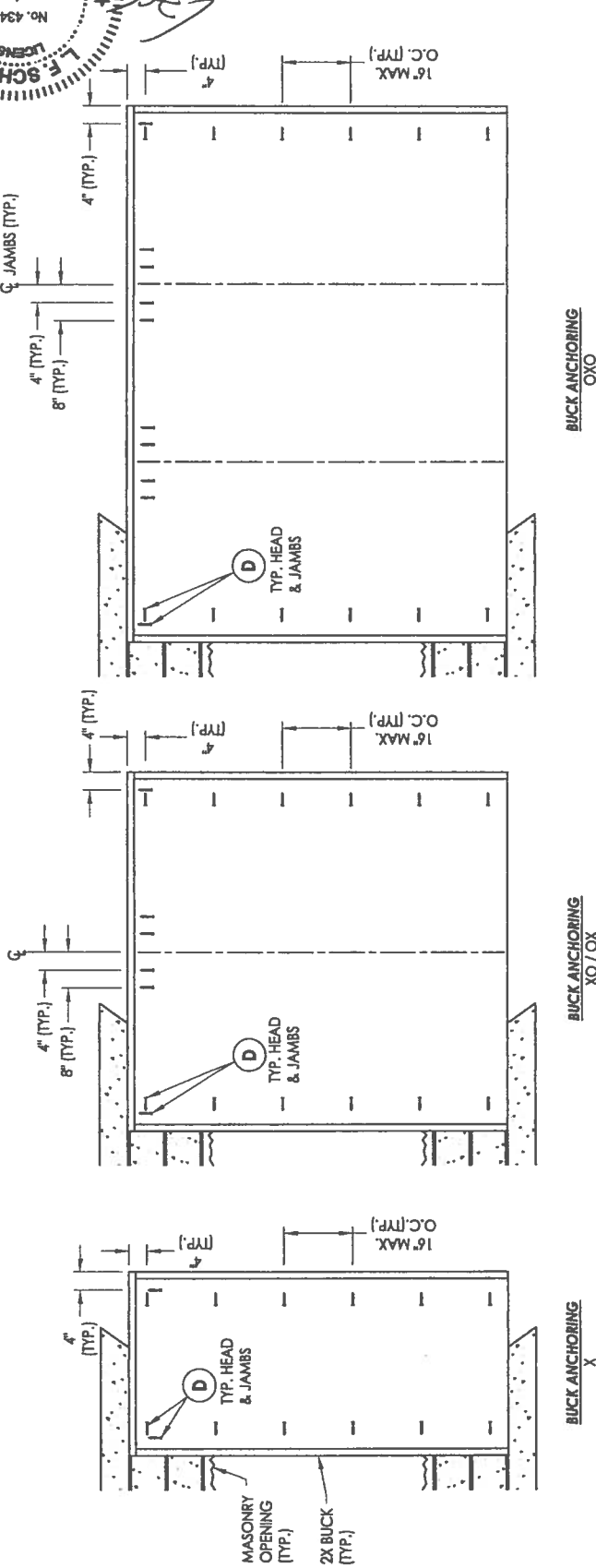
October 14, 2017
Documents Prepared By: Lyndon F. Schmidt
P.E. No. 43409
BUILDING CONSULTANTS, INC.
P.O. Box 230, Vero Beach, FL 33595
Phone No: 813 659.9197
FBPE C.A. No. 9813

PRODUCT: PLASTPRO
FIBERGLASS DOOR
PART OR ASSEMBLY:
TYPICAL ELEVATION, DESIGN PRESSURES & GENERAL NOTES

REVISIONS	
NO.	DATE
1	8/04/14
2	10/14/17
3	10/14/17
4	10/14/17
5	10/14/17
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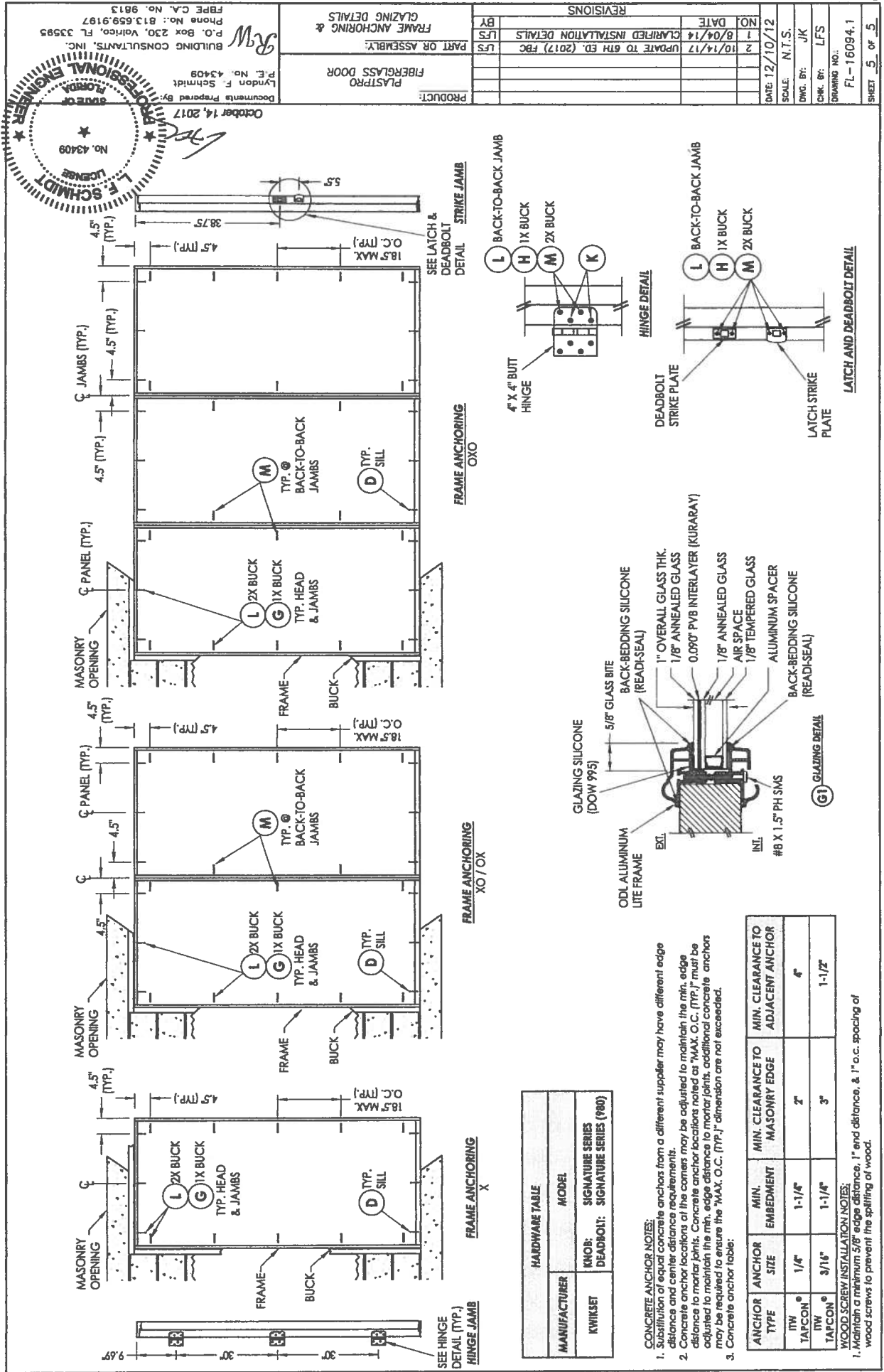
BILL OF MATERIALS		
ITEM #	DESCRIPTION	MATERIAL
A	1X BUCK (SG >= 0.55)	WOOD
B	2X BUCK (SG >= 0.55)	WOOD
C	1/4" MAX. SHIM SPACE	-
D	1/4" X 2-3/4" PFH ITW CONCRETE SCREW	STEEL
E	MASONRY - 3,000 PSI MIN. CONCRETE CONFORMING TO ACI 301 OR HOLLOW BLOCK CONFORMING TO ASTM C90	CONCRETE
G	1/4" X 3-3/4" PFH ITW CONCRETE SCREW	STEEL
H	3/16" X 1-1/4" PFH ITW CONCRETE SCREW	STEEL
K	#9 X 3/4" PFH WOOD SCREW	STEEL
L	#8 X 3" PFH WOOD SCREW (1-1/2" MIN. EMBEDMENT)	STEEL
M	#10 X 2-1/2" PFH WOOD SCREW	STEEL
1	FINGER JOINTED PINE HEAD & JAMB (SG >= 0.42)	WOOD



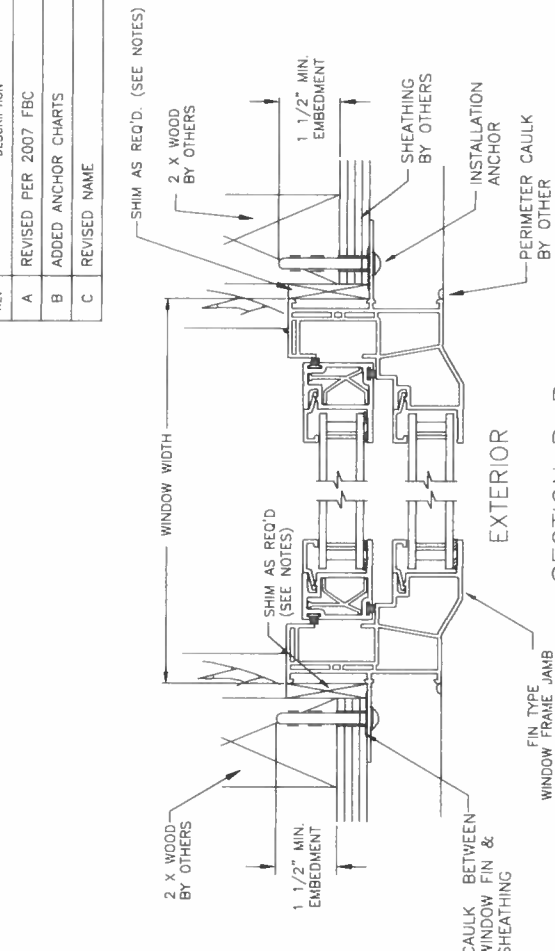
- CONCRETE ANCHOR NOTES:**
1. Substitution of equal concrete anchors from a different supplier may have different edge distance and center distance requirements.
 2. Concrete anchor locations at the corners may be adjusted to maintain the min. edge distance to mortar joints. Concrete anchor locations noted as "MAX. O.C. (TYP.)" must be adjusted to maintain the min. edge distance to mortar joints. additional concrete anchors may be required to ensure the "MAX. O.C. (TYP.)" dimension are not exceeded.
 3. Concrete anchor table:

ANCHOR TYPE	ANCHOR SIZE	MIN. EMBEDMENT	MIN. CLEARANCE TO MASONRY EDGE	MIN. CLEARANCE TO ADJACENT ANCHOR
ITW TAPCON®	1/4"	1-1/4"	2"	4"

DATE: 12/10/12	SCALE: N.T.S.	DWG. BY: JK	CHK. BY: LFS	DRAWING NO.: FL-16094.1	SHEET 4 OF 5
NO. 1	DATE 8/04/14	CLARIFIED INSTALLATION DETAILS	BY LFS		
2	10/14/17	UPDATE TO 6TH ED. (2017) FBC	BY LFS		
REVISIONS					
PRODUCT: PLASTPRO FIBERGLASS DOOR					
PART OR ASSEMBLY: BUCK ANCHORING & BILL OF MATERIALS					
Documents Prepared By: Lyndon F. Schmidt P.E. No. 43409					
October 14, 2017					
Professional Engineer L.F. SCHMIDT No. 43409 STATE OF FLORIDA					
BUILDING CONSULTANTS, INC. P.O. Box 230, Venice, FL 33595 Phone No: 813.659.9197 FBPE C.A. No. 9813					



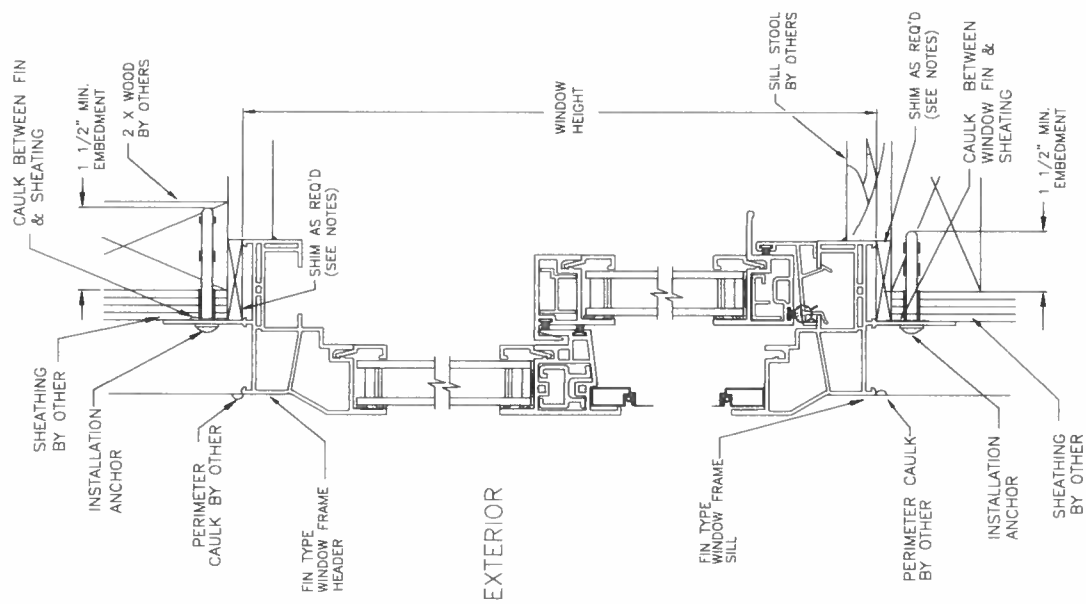
REVISIONS			
REV	DESCRIPTION	DATE	APPROVED
A	REVISED PER 2007 FBC	8/13/08	R.L.
B	ADDED ANCHOR CHARTS	01/25/12	R.L.
C	REVISED NAME	10/15/13	R.L.



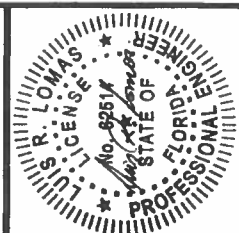
SECTION B-B

Vertical	
Window Vertical Call Size	Window Vertical I F D
2-4	27 1/2
3-0	35 1/2
3-8	43 1/2
4-0	47 1/2
4-4	51 1/2
4-8	55 1/2
5-0	59 3/4
SPCL	72

Horizontal	
Window Horizontal Call Size	Window Horizontal I F D
1-6	17 1/2
1-8	19 1/2
2-0	23 1/2
2-4	27 1/2
2-6	29 1/2
2-8	31 3/4
3-0	35 1/2
3-4	39 1/2
3-6	41 1/2
3-8	43 1/2
4-0	47 1/2
SPCL	53 1/8



SECTION A-A

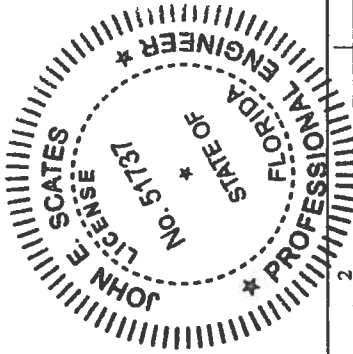


MI WINDOWS AND DOORS LLC
 1001 W. GROSSBY RD.
 CARROLLTON, TX 75006

SERIES GA 7050 RECTANGULAR PVC SH
 TILT WINDOW - 53 1/8 X 72
 INSTALLATION DETAILS AND DESIGN PRESURE CHART

DRAWN: R.L. DWG NO: 08-00248 REV: C

SCALE: NTS DATE: 9/09/07 SHEET: 2 OF 2



Window Options :

For Glass:

Max daylight opening 39-3/8 x 12-1/2" (up to +44.3/-51.5 psf)

Max daylight opening 16-3/4 x 10-1/4" (up to +50.7/-57.5 psf)

1/8" DSB

1/4" Tempered Glass

7/16" Insulated Glass

7/16" Tempered Insulated Glass

For Lexan:

Max daylight opening 16-3/4 x 10-1/4" (up to +44.7/-51.5 psf)

1/4" Lexan with Aluminum Frame

door height	section	quantity	strut	quantity	per blade
6'-6" to 7'-0"	4	4	3	4	3
7'-6" to 8'-0"	5	5	4	5	4
8'-3" to 8'-9"	5	5	4	5	4
9'-0" to 10'-6"	6	6	5	6	5
10'-9" to 12'-3"	7	7	6	7	6
12'-6" to 14'-0"	8	8	7	8	7
14'-3" to 15'-9"	9	9	8	9	8
16'-0" to 17'-6"	10	10	9	10	9
17'-9" to 19'-3"	11	11	10	11	10
19'-6" to 20'-0"	12	12	11	12	11

Track bracket quantities shown are for use with grade 2 or better spruce-pine-fir (SPF) or southern pine joints.

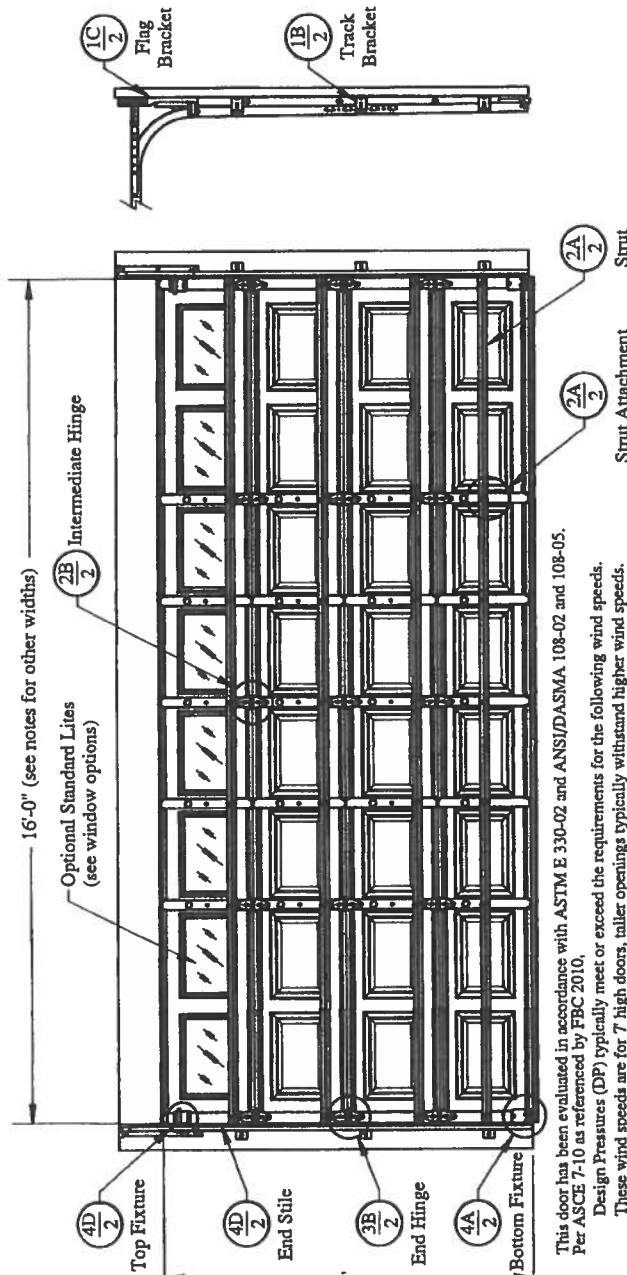
Supplemental Instructions contain details for doors up to 20'-0" high. These are required in addition to this drawing for installation. Always use supplemental instructions in addition to this drawing during door installation.

Model 2240, 2241, 2250, 2251

37.4 (psf) / - 41.6 (psf) at 08'-00" through 10.9 (psf) / - 12.1 (psf) at 21'-00"

C.H.I. Drawing: FZ3-16-01311

page 1 of 2



This door has been evaluated in accordance with ASTM E 330-02 and ANSI/DASMA 108-02 and 108-05.

Per ASCE 7-10 as referenced by FBC 2010.

Design Pressures (DP) typically meet or exceed the requirements for the following wind speeds. These wind speeds are for 7 high doors, taller openings typically withstand higher wind speeds.

Width	Design Pressure	Exposure "B"	Exposure "C"	Windows	Center Stiles
21'-00"	10.9 (psf) / - 12.1 (psf)	110 (mph)	93 (mph)	10	9
20'-00"	12.0 (psf) / - 13.3 (psf)	115 (mph)	98 (mph)	10	9
19'-00"	13.3 (psf) / - 14.8 (psf)	121 (mph)	102 (mph)	10	9
18'-06"	14.0 (psf) / - 15.6 (psf)	124 (mph)	105 (mph)	10	9
18'-00"	14.8 (psf) / - 16.4 (psf)	128 (mph)	108 (mph)	8	7
17'-06"	17.6 (psf) / - 19.6 (psf)	139 (mph)	117 (mph)	8	5
16'-00"	18.7 (psf) / - 20.8 (psf)	143 (mph)	121 (mph)	8	5
15'-00"	19.9 (psf) / - 22.2 (psf)	147 (mph)	124 (mph)	7	4
14'-00"	21.4 (psf) / - 23.8 (psf)	152 (mph)	128 (mph)	7	4
12'-00"	24.9 (psf) / - 27.7 (psf)	163 (mph)	138 (mph)	6	5
11'-00"	27.2 (psf) / - 30.3 (psf)	169 (mph)	143 (mph)	5	4
10'-06"	28.5 (psf) / - 31.7 (psf)	173 (mph)	146 (mph)	5	4
10'-00"	29.9 (psf) / - 33.3 (psf)	177 (mph)	149 (mph)	5	4
09'-06"	31.5 (psf) / - 35.0 (psf)	181 (mph)	153 (mph)	4	3
09'-00"	33.2 (psf) / - 37.0 (psf)	185 (mph)	156 (mph)	4	3
08'-06"	35.2 (psf) / - 39.2 (psf)	190 (mph)	160 (mph)	4	3
08'-00"	37.4 (psf) / - 41.6 (psf)	195 (mph)	165 (mph)	4	3

Pressures may be reduced by the ratio of width squared for a door wider than one shown. Pressures must be increased by the simple ratio of widths for a door narrower than one shown.

Supporting structural elements to be designed by registered professional engineer for specified wind loads. If door is not electrically operated, a lock must be installed. Maximum door height: 20'-0" Maximum section height: 21"

FL 15012R1

Professional Engineer's seal provided only for verification of windload construction details

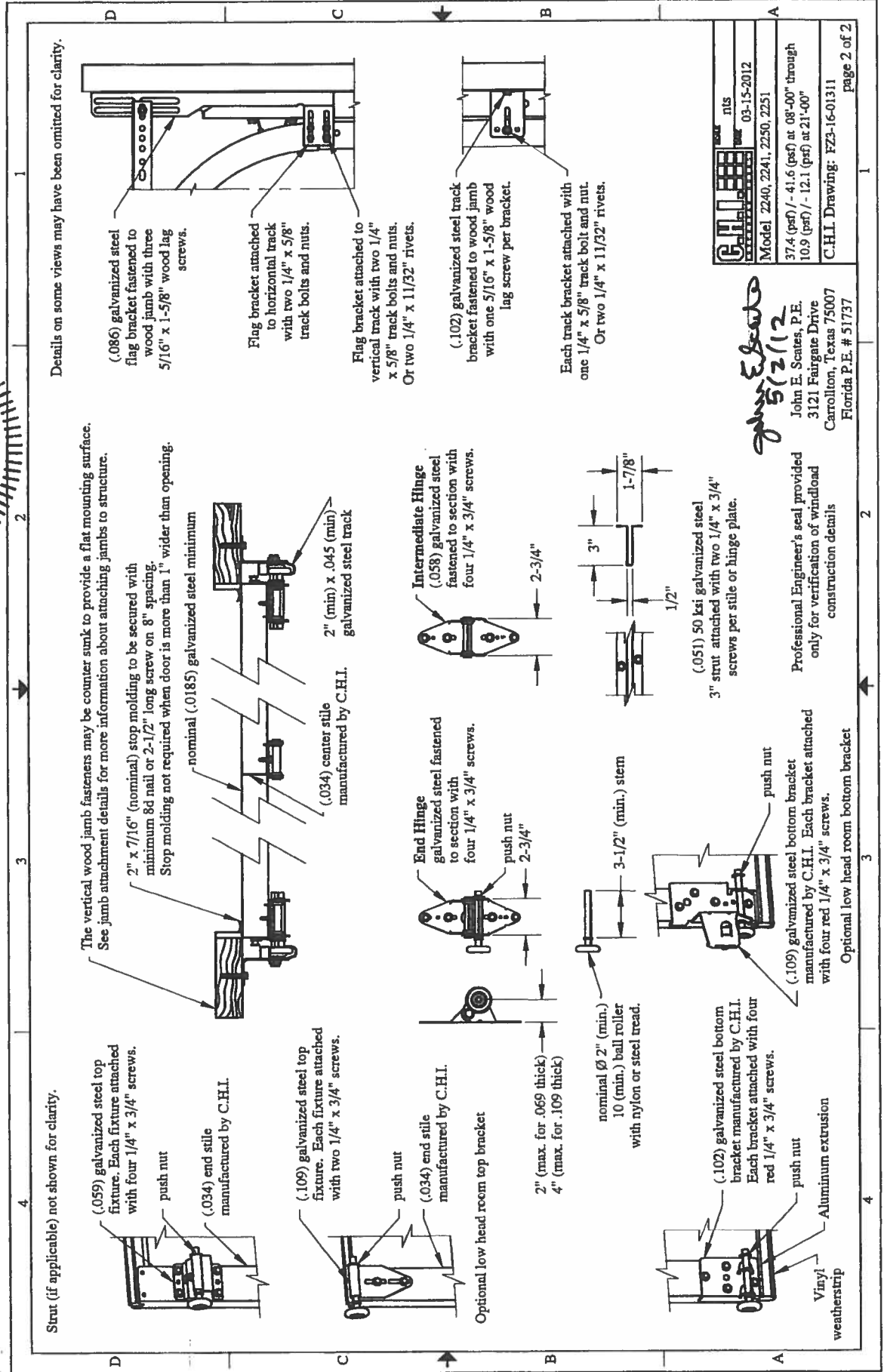
John E. Scates
3121 Fairgate Drive
Carrollton, Texas 75007
Florida P.E. # 51737

Model 2240, 2241, 2250, 2251

37.4 (psf) / - 41.6 (psf) at 08'-00" through 10.9 (psf) / - 12.1 (psf) at 21'-00"

C.H.I. Drawing: FZ3-16-01311

page 1 of 2





Application Instructions for **HERITAGE®** LAMINATED ASPHALT SHINGLES

Tuscaloosa, AL

FORMERLY HERITAGE® 30

THESE ARE THE MANUFACTURER'S APPLICATION INSTRUCTIONS FOR THE ROOFING CONDITIONS DESCRIBED. TAMKO BUILDING PRODUCTS, INC. ASSUMES NO RESPONSIBILITY FOR LEAKS OR OTHER ROOFING DEFECTS RESULTING FROM FAILURE TO FOLLOW THE MANUFACTURER'S INSTRUCTIONS. FAILURE TO FOLLOW THESE INSTRUCTIONS WILL ADVERSELY AFFECT COVERAGE UNDER THE LIMITED WARRANTY. SEE THE LIMITED WARRANTY FOR DETAILS.

THIS PRODUCT IS COVERED BY A LIMITED WARRANTY, THE TERMS OF WHICH ARE PRINTED ON THE WRAPPER.

IN COLD WEATHER (BELOW 40°F), CARE MUST BE TAKEN TO AVOID DAMAGE TO THE EDGES AND CORNERS OF THE SHINGLES.

IMPORTANT FASTENING INFORMATION: DO NOT PLACE FASTENERS ON OR ABOVE THE PAINT LINE ON THE SHINGLE. The paint line on the shingle is the upper-most edge of TAMKO's expanded Nail Zone. For complete details regarding TAMKO's expanded Nail Zone, see section 3 of these Application Instructions. Failure to follow fastening instructions, including but not limited to improper placement of fasteners on or above the paint line, will adversely affect coverage under TAMKO's applicable Limited Warranty. Avoid placing fasteners into the sealant strip.

IMPORTANT: It is not necessary to remove the plastic strip from the back of the shingles.

1. ROOF DECK

These shingles are for application to roof decks consisting of plywood or sheathing boards capable of receiving and retaining fasteners, and to inclines of not less than 2 in. per foot. For roofs having pitches 2 in. per foot to less than 4 in. per foot, refer to special instructions titled "Low Slope Application". For roofs having pitches greater than 21 in. per foot, refer to special instructions titled "Mansard Roof or Steep Slope Roof". Shingles must be applied properly. TAMKO assumes no responsibility for leaks or defects resulting from improper application, or failure to properly prepare the surface to be roofed over.

NEW ROOF DECK CONSTRUCTION: Roof deck must be smooth, dry and free from warped surfaces. It is recommended that metal drip edges be installed at eaves and rakes.

PLYWOOD: All plywood shall be exterior grade as defined by APA - The Engineered Wood Association. Plywood shall be a minimum of 3/8 in. thickness and applied in accordance with the recommendations of APA - The Engineered Wood Association.

SHEATHING BOARDS: Boards shall be well-seasoned tongue-and-groove boards and not over 6 in. nominal width. Boards shall be a 1 in. nominal minimum thickness. Boards shall be properly spaced and nailed.

2. VENTILATION

Inadequate ventilation of attic spaces can cause accumulation of moisture in winter months and a build up of heat in the summer. These conditions can lead to:

1. Vapor Condensation
2. Buckling of shingles due to deck movement.
3. Rotting of wood members.
4. Premature failure of roof.

To insure adequate ventilation and circulation of air, the ventilation system must include inlets and outlets. This may be accomplished with a combination of ridge and soffit vents or by using gable end vents. FHA minimum property standards require one square foot of net free ventilation area to each 150 square feet of space to be vented. This may be reduced to one square foot of ventilation

area per 300 square feet if at least 40% and not more than 50% of venting is provided not more than 3 feet below the ridge or if a Class I or II vapor barrier is installed on the warm in winter side of the ceiling in climate zones 6, 7, and 8 as recommended by the 2012 International Residential Code. For more information consult your design professional. If the ventilation openings are screened, the total area should be doubled.

IT IS PARTICULARLY IMPORTANT TO PROVIDE ADEQUATE VENTILATION.

3. FASTENERS

WIND CAUTION: Extreme wind velocities can damage these shingles after application when proper sealing of the shingles does not occur. This can especially be a problem if the shingles are applied in cooler months or in areas on the roof that do not receive direct sunlight. These conditions may impede the sealing of the adhesive strips on the shingles. The inability to seal down may be compounded by prolonged cold weather conditions and/or blowing dust. In these situations, hand sealing of the shingles is required. To insure immediate sealing, apply 4 quarter-sized dabs of TAM-PRO® Premium SBS Adhesive or TAMKO Tam-Seal Adhesive on the back of the shingle 1 in. (25mm) and 13 in. (330mm) in from each side and 1 in. (25mm) up from the bottom of the shingle. Press shingle firmly into the adhesive. For maximum wind resistance along rakes, install any TAMKO starter shingle including sealant or cement shingles to the underlayment and each other in a 4 in. (102mm) width of TAM-PRO SBS Adhesive or TAMKO Tam-Seal Adhesive. Caution: Apply ONLY a thin uniform layer of adhesive less than 1/8 in. (3mm) thick. Excessive amounts can cause blistering of the shingles and may soften the asphalt in certain underlayments resulting in the asphalt flowing, dripping and staining. Shingles must also be fastened according to the fastening instructions described below.

Correct placement of the fasteners is critical to the performance of the shingle. If the fasteners are not placed as shown in the diagram and described below, this will result in the termination of TAMKO's liabilities under the Limited Warranty. TAMKO will not be responsible for damage to shingles caused by winds in excess of the applicable mph as stated in the Limited Warranty. See Limited Warranty on the wrapper or tamko.com for details.

(Continued)

Visit Our Web Site at
tamko.com

Central District	220 West 4th St., Joplin, MO 64801	800-641-4691
Northeast District	4500 Tamko Dr., Frederick, MD 21701	800-368-2055
Southeast District	2300 35th St., Tuscaloosa, AL 35401	800-228-2656
Southwest District	7910 S. Central Exp., Dallas, TX 75216	800-443-1834
Western District	5300 East 43rd Ave., Denver, CO 80216	800-530-8868

05/14

HERITAGE® LAMINATED ASPHALT SHINGLES

Tuscaloosa, AL

FASTENING PATTERNS:

1) NAIL ZONE: The Nail Zone for standard fastening is defined as the 1-3/4 in. area beginning at 6-1/8 in. from the bottom edge of the shingle and ending at the paint line located at 7-7/8 in. from the bottom edge of the shingle. **DO NOT PLACE FASTENERS ON OR ABOVE THE PAINT LINE ON THE SHINGLE.**

2) Standard Fastening Pattern Options.

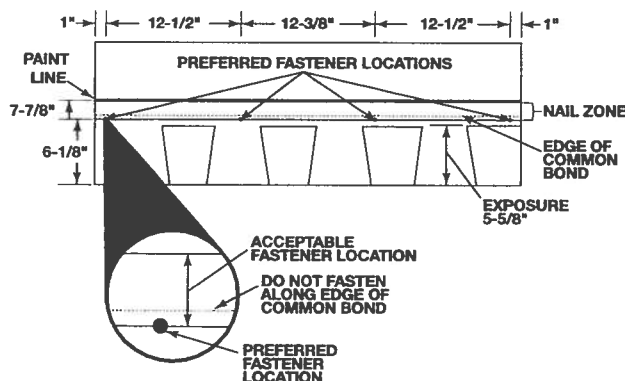
(For use on decks with slopes 2 in. per foot to 21 in. per foot.)

A. Preferred Fastener Location: Fasteners should be placed 6-1/8 in. from the bottom edge of the shingle, penetrating through the common bond, and located horizontally as shown in the Standard Fastening Pattern diagram.

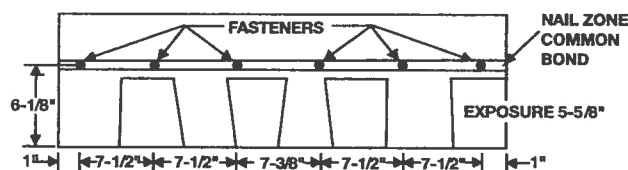
B. Acceptable Fastener Location: Fasteners must be placed in the 1-3/4 in. nailing area beginning at 6-1/8 in. from the bottom edge of the shingle and ending at the paint line located at 7-7/8 in. from the bottom edge of the shingle. Nails shall be located horizontally as shown in the Standard Fastening Pattern diagram.

CAUTION: Fasteners must not be driven into the edge of the common bond area. Avoid placing fasteners into the sealant strip.

STANDARD FASTENING PATTERN IN NAIL ZONE



3) Mansard Fastening Pattern. (For use on decks with slopes greater than 21 in. per foot.) One fastener 1 in. from each end and one fastener 8-1/2 in. from each end and one fastener 16 in. from each end for a total of 6 fasteners per shingle. (See Mansard and High Wind Fastening Pattern illustrated below.)

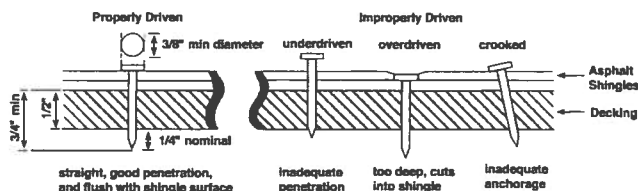


MANSARD AND HIGH WIND FASTENING PATTERN

4) High Wind Fastening Pattern. (For High Wind Application requirements) One fastener 1 in. from each end. One fastener 8-1/2 in. from each end and one fastener 16 in. from each end for a total of six (6) fasteners per shingle. In addition to this shingle fastening pattern requirement for High Wind Application, TAMKO also requires the use of TAMKO starter shingles including sealant strip at eaves and rakes. Alternatively, along rakes, cement shingles to the underlayment and each other in a 4 in. (102 mm) width of TAM-PRO SBS Adhesive or TAMKO Tam-Seal Adhesive. Caution: Apply ONLY a thin uniform layer of adhesive less than 1/8 in. (3mm) thick. Excessive amounts can cause blistering of the shingles and may soften the asphalt in certain underlayments resulting in the asphalt flowing, dripping and staining. High Wind Application is offered on new construction or complete tear-off applications only. It is not offered for recover applications. If High Wind Application requirements are not followed, the High Wind Application Warranty MPH, as stated on Table I in the Limited Warranty, reverts to the Standard Application Wind Warranty MPH limit. (See Mansard and High Wind Fastening Pattern illustrated above.)

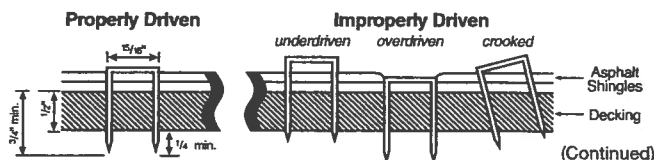
CAUTION: ALL FASTENERS FOR MANSARD AND HIGH WIND APPLICATIONS MUST BE DRIVEN INTO THE **NAIL ZONE COMMON BOND** (PREFERRED FASTENER LOCATIONS) AS SHOWN IN THE MANSARD AND HIGH WIND FASTENING PATTERN DIAGRAM.

NAILS: TAMKO recommends the use of nails as the preferred method of application. Standard type roofing nails should be used. Nail shanks should be made of minimum 12 gauge wire, and a minimum



head diameter of 3/8 in. Nails should be long enough to penetrate 3/4 in. into the roof deck. Where the deck is less than 3/4 in. thick, the nails should be long enough to penetrate completely through plywood decking and extend at least 1/8 in. through the roof deck. Drive nail head flush with the shingle surface.

STAPLES: If staples are used in the attaching process, follow the above instructions for placement. All staples must be driven with pneumatic staplers. The staple must meet the following minimum dimensional requirements. Staples must be made from a minimum 16 gauge galvanized wire. Crown width must be at least 15/16 in. (staple crown width is measured outside the legs). Leg length should be a minimum of 1-1/4 in. for new construction and 1-1/2 in. for reroofing thus allowing a minimum deck penetration of 3/4 in. The crown of the staple must be parallel to the length of the shingle. The staple crown should be driven flush with the shingle surface. Staples that are crooked, underdriven or overdriven are considered improperly applied.



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4. UNDERLAYMENT

UNDERLAYMENT: An underlayment must be applied over the entire deck before the installation of TAMKO shingles. Failure to add underlayment can cause premature failure of the shingles which is not covered by TAMKO's Limited Warranty.

Products which are acceptable for use as underlayment are:

Asphalt Saturated Felt Underlayments:

- TAMKO SuperX 15™ or SuperX 30™ Underlayment
- TAMKO No. 15 Asphalt Saturated Organic Felt
- Any TAMKO non-perforated asphalt saturated organic felt
- A non-perforated asphalt saturated organic felt which meets ASTM: D226, Type I or II or ASTM D4869

Specialty Underlayments:

- Tam-Shield® Synthetic Underlayment
- TAMKO Moisture Guard Plus®, TW Underlayment and TW Metal and Tile Underlayment® (additional ventilation may be required. Contact TAMKO's Technical Services Department for more information.)
- A self-adhesive underlayment designed for use with asphalt shingles which meets ASTM D1970.

For Asphalt Saturated Felt Underlayments:

Apply the felt when the deck is dry. On roof decks with slopes 4 in. per foot and greater apply the felt parallel to the eaves lapping each course of the felt over the lower course at least 2 in. Where ends join, lap the felt 4 in. If left exposed, the felt may be adversely affected by moisture and weathering. Laying of the felt and the shingle application must be done together.

For All Other Specialty Underlayments:

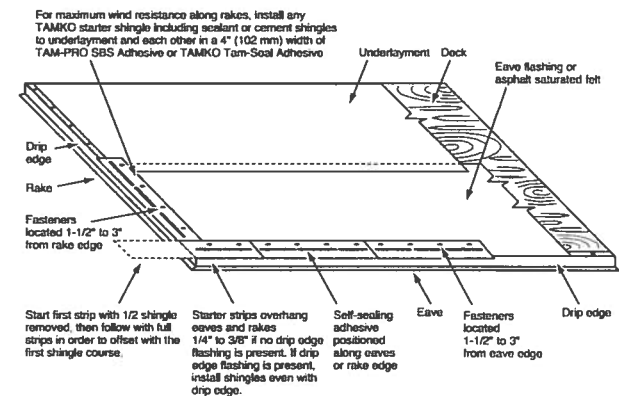
On roof decks with slopes 4 in. per foot and greater apply the underlayment parallel to the eaves in accordance with underlayment written application instructions. The underlayment should not be left exposed for a longer period of time than is specified in the underlayment's written application instructions. The final roof covering must be installed before the structure is exposed to adverse weather conditions, such as wind driven rain, high wind, hail, ice storms, etc.

In areas where ice builds up along the eaves or a back-up of water from frozen or clogged gutters is a potential problem, TAMKO's Moisture Guard Plus®, TW Metal and Tile Underlayment or TW Underlayment (or any specialty eaves flashing product) may be applied to eaves, rakes, ridges, valleys, around chimneys, skylights or dormers to help prevent water damage. Contact TAMKO's Technical Services Department for more information.

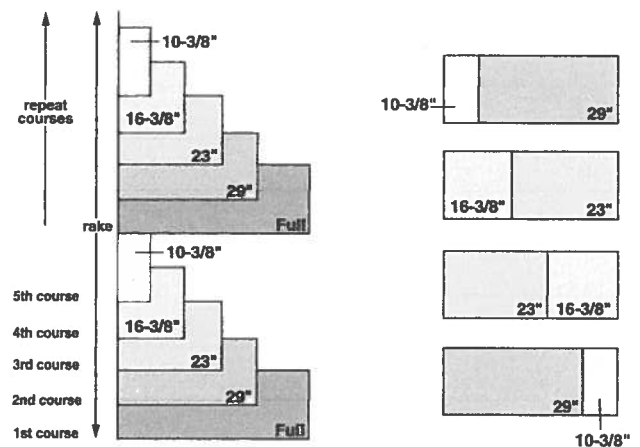
Substitute products as shingle underlayment should not be used.

5. APPLICATION INSTRUCTIONS

STARTER COURSE: A starter course may consist of TAMKO Shingle Starter, TAMKO 10-inch Starter or self-sealing 3-tab shingles. If self-sealing 3-tab shingles are used, remove the exposed tab portion and install with the factory applied adhesive adjacent to the eaves. Attach the starter course with approved fasteners along a line parallel to and 1.5 in. to 3 in. above the eaves edge. The starter course should overhang both the eaves and rake edges 1/4 in. to 3/8 in. if drip edge flashing is not used along the eaves or rakes. If drip edge flashing is present, install shingles even with the drip edge.



SHINGLE APPLICATION: Start the first course with a full size shingle and overhang the rake edge 1/4 in. if drip edge is not present. If drip edge is present, align shingle edge with drip edge flashing. Cut 10-3/8 in. from a full shingle to form a shingle 29 in. long. Use this to start the second course (see diagram below). Cut a 23 in. long shingle to start the third course. Use the remaining 16-3/8 in. piece of shingle to start the fourth course and use the remaining 10-3/8 in. piece to begin the fifth course. Continue up the rake as many rows as necessary using the same formula as outlined above.



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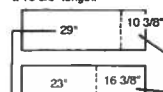
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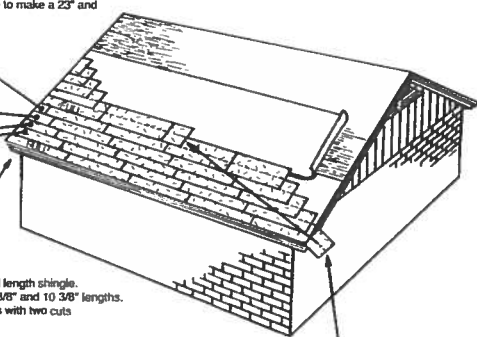
The butt of the shingle should be aligned with the top edge of the sawtooth of the underlying shingle for a 5-5/8 in. exposure (see shingle application drawing illustrated on this panel). When you make your final cut at the roof's edge, flip any pieces that are 8 in. or longer back onto the roof. These pieces can be worked in anywhere without creating zippers or color variations.

NOTE: Do not align joints of shingle courses when working in cut pieces. Joints should be no closer than 4 in. from one another.

1. Cut your first course shingle to make 29" and a 10 3/8" length. Cut a second shingle to make a 23" and a 16 3/8" length.



2. Begin application with a full length shingle. Then lay your 29", 23", 16 3/8" and 10 3/8" lengths. As you can see, three shingles with two cuts make five courses.



3. Continue working your way across the roof. When you make your final cut at the roof's edge, flip any pieces that are 8" or longer back onto the roof. These pieces can be worked in anywhere without creating zippers or color variations.
NOTE: Do not align joints of shingle courses when working in cut pieces. Joints should be no closer than 4" from one another.

6. LOW SLOPE APPLICATION

On pitches 2 in. per foot to 4 in. per foot cover the deck with two layers of underlayment. Begin by applying the underlayment in a 1/2-sheet width along the eaves and overhanging the drip edge by 1/4 to 3/4 in. Place a full-sheet width over the 1/2-sheet width starter piece, completely overlapping it. All succeeding courses will be positioned to overlap the preceding course by 1/2-sheet width. If winter temperatures average 25°F or less, thoroughly cement the laps of the entire underlayment to each other with TAM-PRO or TAMKO Plastic Roof Cement from eaves and rakes to a point of at least 24 in. inside the interior wall line of the building. As an alternative, TAMKO's Moisture Guard Plus®, TW Metal and Tile Underlayment, or TW Underlayment self-adhering underlayment may be used in lieu of the cemented felts.

7. MANSARD ROOF OR STEEP SLOPE ROOF

If the slope exceeds 21 in. per foot (60°), each shingle must be sealed with TAM-PRO SBS Adhesive or TAMKO Tam-Seal Adhesive immediately upon installation. Quarter-sized dabs of cement must be applied to shingles with a 5-5/8 in. exposure, use 6 fasteners per shingle. See Section 3 for the Mansard Fastening Pattern.

8. RE-ROOFING

Before re-roofing, be certain to inspect the roof decks. All plywood shall meet the requirements listed in Section 1.

It is not recommended to install laminated asphalt shingles directly over existing laminated shingles due to the unevenness of the existing

multi-layered shingles. The performance of the sealant feature may be compromised, preventing the shingles from sealing properly. It is acceptable to install laminated shingles over existing three-tab strip shingles which are flat and essentially intact. Nail down or remove curled or broken shingles from the existing roof. Replace all missing shingles with new ones to provide a smooth base. Shingles that are buckled usually indicate warped decking or protruding nails. Hammer down all protruding nails or remove them and refasten in a new location. Remove all drip edge metal and replace with new.

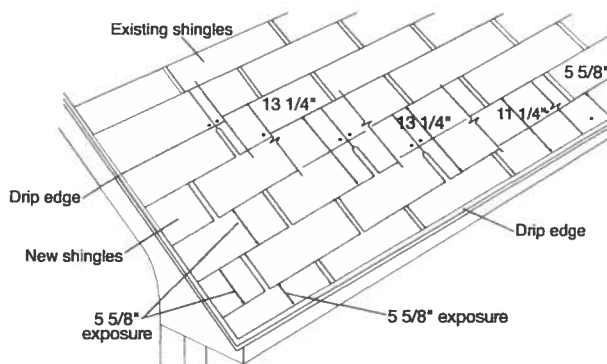
If re-roofing over an existing roof where new flashing is required to protect against ice dams (freeze/thaw cycle of water and/or the backup of water in frozen or clogged gutters), remove the old roofing to a point at least 24 in. beyond the interior wall line and apply TAMKO's Moisture Guard Plus®, TW Metal and Tile Underlayment, or TW Underlayment. Contact TAMKO's Technical Services Department for more information.

Measurements will vary when nesting over an existing 5 in. exposure single roof: Call TAMKO Technical Services for further information.

The nesting procedure described below is the preferred method for reroofing over existing metric size shingles with a 5-5/8 in. exposure. See description below:

Starter Course: Remove the tabs and an additional portion from the head of a full size shingle so that its height is equal to the exposure of the existing shingles. Position the resulting strip over the existing roof edge (with the factory-applied adhesive strip along the eaves). Cut approximately 6 in. from the rake end and apply the remaining portion at the eaves. Continue the starter strip by applying full length shingle strips cut to height as above, evenly along the existing roof at the eaves. The existing roof should overhang the eaves far enough to carry water off into the gutter. If this is not the case, cut and apply the starter strip so that it will provide sufficient overhang for proper drainage.

First Course: Remove an amount from the butt edge of a full-size shingle so that the remaining portion of the shingle fits between the butts of the existing third course. This course must also be applied evenly along the eaves edge of the new starter strip.



Second and Succeeding Courses: Remove 10-3/8 in. from the rake end of the first shingle in the second course, and continue with full width shingles for the remainder of the course, placing the top edge of each new shingle against the butt edge of the old shingle in the course above. This method should create an exposure of 5-5/8 in. after the first course. When beginning the succeeding courses continue to follow the Heritage application instructions. (See section 5).

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9. VALLEY APPLICATION

Over the shingle underlayment, center a minimum 36 in. wide sheet of TAMKO Moisture Guard Plus®, TW Metal & Tile Underlayment, or a minimum 50 lb. roll roofing in the valley. Nail the underlayment only where necessary to hold it in place and then only nail the outside edges.

IMPORTANT: PRIOR TO INSTALLATION, WARM SHINGLES TO PREVENT DAMAGE WHICH CAN OCCUR WHILE BENDING SHINGLES TO FORM VALLEY.

After valley flashing is in place:

- Apply the first course of shingles along the eaves of one of the intersecting roof planes and across the valley.

Note: For proper flow of water over the trimmed shingle, always start applying the shingles on the roof plane that has the lower slope or less height.

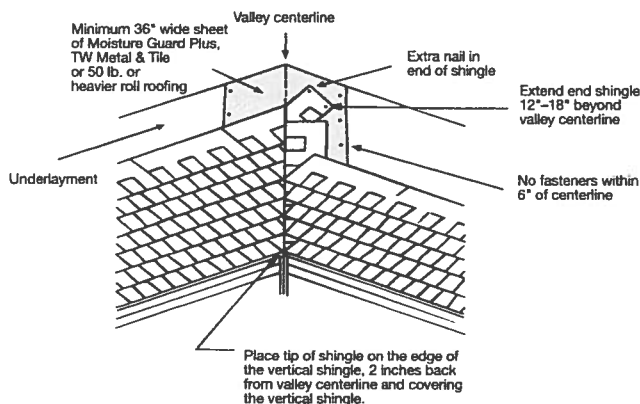
- Extend the end shingle at least 12 in. onto the adjoining roof. Apply succeeding courses in the same manner, extending them across the valley and onto the adjoining roof.
- Press the shingles tightly into the valley.
- Use normal shingle fastening methods.

Note: No fastener should be within 6 in. of the valley centerline, and two fasteners should be placed at the end of each shingle crossing the valley.

- To the adjoining roof plane, apply one row of shingles vertically facing the valley and 2 in. back from the valley centerline.

Note: For a neater installation, snap a chalkline over the shingles for guidance.

- To complete the valley, apply shingles on the adjoining roof plane by positioning the tip of the first shingle of each row at the 2 in. point from the centerline where the edge of the vertical shingle has been applied, covering the vertical shingle.



FOR ALTERNATE VALLEY APPLICATION METHODS, PLEASE CONTACT TAMKO'S TECHNICAL SERVICES DEPARTMENT AT 800-641-4691.

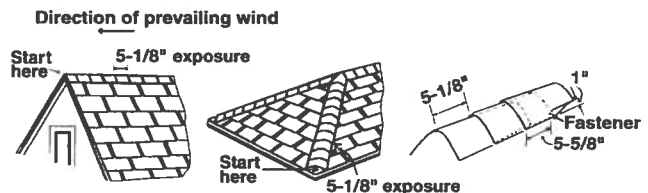
10. HIP AND RIDGE FASTENING DETAIL

Apply the shingles with a 5-1/8 in. exposure beginning at the bottom of the hip or from the end of the ridge opposite the direction of the prevailing winds. Secure each shingle with one fastener on each side, 5-5/8 in. back from the exposed end and 1 in. up from the edge.

TAMKO recommends the use of TAMKO Hip & Ridge shingle products. Where matching colors are available, it is acceptable to use TAMKO's Elite Glass-Seal shingles cut down to 12 in. pieces.

The length of the fastener should be long enough to penetrate through the roofing material and 3/4 in. into the wood decking or completely through approved plywood.

IMPORTANT: PRIOR TO INSTALLATION, CARE NEEDS TO BE TAKEN TO PREVENT DAMAGE WHICH CAN OCCUR WHILE BENDING SHINGLE IN COLD WEATHER.



THESE ARE THE MANUFACTURER'S APPLICATION INSTRUCTIONS FOR THE ROOFING CONDITIONS DESCRIBED. TAMKO BUILDING PRODUCTS, INC. ASSUMES NO RESPONSIBILITY FOR LEAKS OR OTHER ROOFING DEFECTS RESULTING FROM FAILURE TO FOLLOW THE MANUFACTURER'S INSTRUCTIONS. FAILURE TO FOLLOW THESE INSTRUCTIONS WILL ADVERSELY AFFECT COVERAGE UNDER THE LIMITED WARRANTY. SEE THE LIMITED WARRANTY FOR DETAILS. IF YOU HAVE ANY QUESTIONS REGARDING THESE APPLICATION INSTRUCTIONS, PLEASE CONTACT TAMKO'S TECHNICAL SERVICES DEPARTMENT AT 800-641-4691.

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