

WOLTERS ENGINEERING

ENGINEERING, DRAFTING, CONSULTING

15211 97th Road N
West Palm Beach, FL 33412
Ph/Fx: (561) 225-1982

PRODUCT EVALUATION

PRODUCT: LUXBAUM 10 FT. GLAZED WOOD OUTSWING BI-FOLD DOORS

MANUFACTURER: LUXBAUM WINDOWS & DOORS
2400 CENTREPARK WEST DRIVE, SUITE 150
WEST PALM BEACH, FL 33409

To all concerned,

The 10 ft. Glazed Wood Outswing Bi-Fold Door, manufactured by Luxbaum Windows & Doors, is a glazed wood door set in a wood frame. The door has been tested per TAS 201, 202, and 203 by Hurricane Test Lab LLC, with results shown in test report 0271-0213-08 (Specimens 1-4).

Technical Documentation:

1. Drawing "BI-FOLD DOOR", signed and sealed by Scott Wolters, PE.
2. Test Reports listed above by Hurricane Test Lab, LLC. signed and sealed by Vinu Abraham, PE.
3. Supplemental calculations to support "BI-FOLD DOOR", signed and sealed by Scott Wolters, PE.

I have reviewed this submittal per the requirements of FAC Product Approval Rule Chapter 61G20-3.005 (4). Based on the limitations listed below and those provided in the documents above, this product meets all the requirements of the 5th Edition (2014) Florida Building Code generally, and chapters 10, 11, 16, 23, and 24 specifically, including the HVHZ provisions.

Limitations: This door is approved for use inside and outside of the HVHZ. It is large and small impact resistant. Shutters are not required.

Overall Dimensions:

Maximum Frame Height:	128"
Maximum Frame Width:	Varies based on number of panels.
Maximum Panel Width	Varies – See chart on Sheet 1
Maximum Design Pressure:	+65/-70 psf

Glazing Options:

9/16" Monolithic Laminated
1/4" Annealed
0.090" SGP Interlayer+
1/4" Annealed

1 1/8" Insulated Laminated
3/16" Heat Strengthened
0.090" SGP Interlayer+
3/16" Heat Strengthened
1/2" Air Space
3/16" Tempered

+ I have evaluated the SentryGlas interlayer (NOA# 11-0624.02) referenced above and find that it complies with the requirements of the 5th Edition (2014) Florida Building Code for use in this product.

Locks:

Siegenia Multi-Point Lock at each panel
(Part# 3/45M5)
See Chart on Sheet 1 for Number of strikes and their locations

Hinges:


Frame Jambs to Panels:
(2) Centor Australia E4 Pivot sets and
(2) Centor Australia E4 Wall Pivot sets

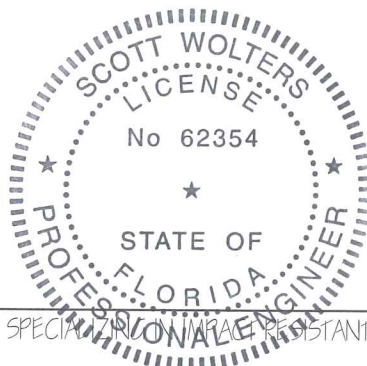
Panel to Panel:
(4) Centor Australia E4 Hinge sets
or
(2) Centor Australia E4 Hinge sets and
(2) Centor Australia E4 Intermediate Carrier sets

Note – (2) Centor Australia E4 Offset Carrier Sets are required at panels next to single swing panels.

If you have any questions or need more information concerning this approval please contact me.

Thank you,


Scott Wolters
FL PE# 62354
JUL 01 2015



SPECIALTY IN IMPACT RESISTANT CURTAIN WALLS, STOREFRONTS, & WINDOWS

GENERAL NOTES:

1. THESE DOOR SYSTEMS HAVE BEEN TESTED, ANALYZED & APPROVED FOR DESIGN PRESSURES NOT TO EXCEED THOSE SHOWN IN THE "ALLOWABLE DESIGN PRESSURE TABLE(S)".
2. OPENINGS, BUCKING & BUCKING FASTENERS MUST BE PROPERLY DESIGNED & INSTALLED TO TRANSFER WIND LOADS TO THE STRUCTURE.
3. ALL HARDWARE & FASTENERS SHALL BE IN ACCORDANCE WITH THESE DRAWINGS & SHALL NOT VARY UNLESS SPECIFICALLY MENTIONED ON THE DRAWINGS. SPECIFIED ANCHOR EMBED TO BASE MATERIAL SHALL BE BEYOND WALL FINISH OR STUCCO.
4. THE DETAILS & SPECIFICATIONS SHOWN HEREIN REPRESENT THE PRODUCTS TESTED & PROPOSED FOR WATER, AIR, FORCED ENTRY, IMPACT, CYCLIC & UNIFORM STATIC AIR PRESSURE TESTING IN CONFORMANCE WITH THE FLORIDA BUILDING CODE PROTOCOLS TAS-201, 202 & 203 FOR LARGE MISSILE IMPACT DOORS. SHUTTERS ARE NOT REQUIRED.
5. THESE DOOR SYSTEMS HAVE BEEN DESIGNED IN ACCORDANCE WITH AND MEET THE REQUIREMENTS OF THE CURRENT EDITION OF THE FLORIDA BUILDING CODE (FBC), INCLUDING THE HIGH VELOCITY HURRICANE ZONE (HVHZ) PROVISIONS.
6. ALL ANCHORS SECURING DOOR FRAME TO PRESSURE TREATED BUCKS OR WOOD FRAMING SHALL BE CAPABLE OF RESISTING CORROSION CAUSED BY THE PRESSURE TREATING CHEMICALS.
7. NO INCREASE IN ALLOWABLE STRESS HAS BEEN USED IN THE CERTIFICATION OF THIS PRODUCT. WIND LOAD DURATION FACTOR $C_d = 1.6$ WAS USED FOR WOOD SCREW ANALYSIS ONLY.
8. MATERIALS, INCLUDING BUT NOT LIMITED TO STEEL SCREWS, THAT COME INTO CONTACT WITH OTHER DISSIMILAR MATERIALS SHALL MEET THE REQUIREMENTS OF FLORIDA BUILDING CODE CHAPTER 20.
9. ALL WOOD MEMBERS OF DOORS THAT MAY POSSIBLY COME INTO CONTACT WITH MASONRY OR CONCRETE SUBSTRATES, ARE SUBJECT TO MOISTURE &/OR ARE SUBJECT TO THE OUTSIDE ENVIRONMENT SHALL BE OF AN APPROVED DURABLE SPECIES OR BE TREATED IN AN APPROVED METHOD WITH AN APPROVED PRESERVATIVE PER FBC CHAPTER 23.

LOCK STRIKE REQUIREMENTS

SIDE OF ACTIVE SWING PANEL	
PANEL HEIGHT	QUANTITY PER PANEL
108" AND UP	7
LESS THAN 108"	6
TOP & BOTTOM OF ALL PANELS	
PANEL WIDTH	QUANTITY PER PANEL
OVER 33"	4
33" & LESS	3

HINGE REQUIREMENTS

PANEL HEIGHT	QUANTITY PER PANEL
OVER 82 1/2"	4
82 1/2" & LESS	3
HINGE LOCATIONS ARE APPROXIMATELY 8" FROM TOP & BOTTOM OF DOOR FRAME TO HINGE CENTER AND EQUALLY SPACED BETWEEN.	

MAXIMUM PANEL WIDTH

ACTIVE SWING PANEL	37 1/2"
INACTIVE SWING PANEL	37"
FOLDING PANEL	37 3/16"
ACTIVE CORNER SWING PANEL	38 3/16"
INACTIVE CORNER SWING PANEL	38 13/16"

PANEL HEIGHT DIMENSIONS ARE APPROXIMATELY 8" LESS THAN THE FRAME HEIGHT DIMENSION

CORNER CONSTRUCTION:

FRAME: VERTICAL MEMBERS ARE COPED, BUTTED & JOINED TO THE HORIZONTAL MEMBERS WITH THREE(3) #1/2" X 2" WOOD DOWELS PER CORNER. CORNERS ARE SEALED/GLUED WITH WOOD GLUE.
PANEL: HORIZONTAL MEMBERS ARE COPED, BUTTED & JOINED TO THE VERTICAL MEMBERS WITH TWO(2) #1/2" X 2" & ONE(1) #5/8" X 2" WOOD DOWELS PER CORNER. CORNERS ARE SEALED/GLUED WITH WOOD GLUE.

ALLOWABLE DESIGN PRESSURE (ALL CONDITIONS)

+65/-70 PSF

FRAME ANCHOR REQUIREMENTS TABLE

OPENING TYPE (SUBSTRATE)	FRAME TO OPENING FASTENER TYPE	MINIMUM EMBED	MINIMUM EDGE DIST.
FRAME SCREWS			
MIN. 2X6 WOOD FRAME OR BUCK (MIN. GR. 3 & G=0.55)	NO. 12 SMS OR WOOD SCREW	1 1/4"	3/4"
MIN. 16 GA. 33 KSI METAL STUD	NO. 12 GR. 5 SELF TAP/DRILL SCREW	FULL	1/2"
MIN. 1/8" THK A36 STEEL	NO. 12 GR. 5 SELF TAP/DRILL SCREW	FULL	1/2"
MIN. 1/8" THK 6063-T5 ALUM.	NO. 12 GR. 5 SELF TAP/DRILL SCREW	FULL	1/2"
MIN. C-90 CMU	(1) 1/4" CONCRETE SCREW	1 1/4"	2"
(1) MIN. 2500 PSI CONCRETE	(1) 1/4" CONCRETE SCREW	1 3/4"	2"

CONCRETE SCREWS SHALL BE ELCO ULTRACONS OR CRETE-FLEX, ITW RAMSET/RED HEAD TAPCONS OR HILTI KWIK-CON II (HARDENED STEEL OR S.S.).

ANCHOR CLUSTERS REQ'D AT MEETING STILES PER CHART BELOW. SEE PATTERNS ON SHEET 7 FOR SPACING.

6" MAX. (2 ROWS; TYP. HEAD & SILL)

OVERALL MAXIMUM FRAME WIDTH VARIES WITH THE QUANTITIES OF PANELS USED IN THE DOOR UNIT. (9 PANELS MAXIMUM)

2 ROWS STAGGERED 12" MAX. O.C. (TYP. HEAD & SILL)

55 HEAD TO SUB-HEAD SCREWS. SEE SECTION A/5 & PARTS LIST FOR REQUIREMENTS.

6" MAX. (2 ROWS; TYP. HEAD & SILL)

8" MAX.

FRAME SCREWS WHERE SHOWN. SEE "FRAME ANCHOR REQUIREMENTS TABLE" ON THIS SHEET FOR REQUIREMENTS.

128" MAX. FRAME HEIGHT
113 7/16" MAX. D.L.O.

MID-RAIL MAY BE USED WITH ANY ELEVATION & MAY BE POSITIONED HORIZONTALLY OR VERTICALLY ANYWHERE WITHIN THE D.L.O. PROVIDING ITS SPAN DOES NOT EXCEED 28 1/2" AS SHOWN

16" MAX. O.C. (AT SIDES)

8" MAX.

SILL TO SUB-SILL SCREWS. SEE 55 SECTION A/5 & PARTS LIST FOR REQUIREMENTS.

EXTERIOR ELEVATION:
BI-FOLD DOOR WITH SWING PANEL

SCALE: 1/2" = 1'-0"

(3 PANELS SHOWN. HOWEVER, THE SYSTEM CAN BE EXPANDED UP TO 9 PANELS IN ONE OPENING, PROVIDED THE OPENING IS DESIGNED TO SUPPORT THE QUANTITY OF PANELS USED)

ANCHOR CLUSTERS REQ'D AT MEETING STILES PER CHART BELOW. SEE PATTERNS ON SHEET 7 FOR SPACING.

ANCHORS REQUIRED AT MEETING STILE CLUSTERS		
SUBSTRATE	FRAME HEIGHT	
	<96"	96"-128"
WOOD	6	8
METAL	4	5
CONCRETE	4	5

CMU IS NOT APPLICABLE AT HEAD & SILL

DATE: 04/01/2015

REVISION DESCRIPTION

NO.

10 FT GLAZED WOOD OUTSWING BI-FOLD DOORS

LUXBAUM, LLC
WINDOWS + DOORS

1501 NORTHPOINT PARKWAY, SUITE 101
WEST PALM BEACH, FL 33407
Ph: (561) 684-1500
www.luxbaum.com

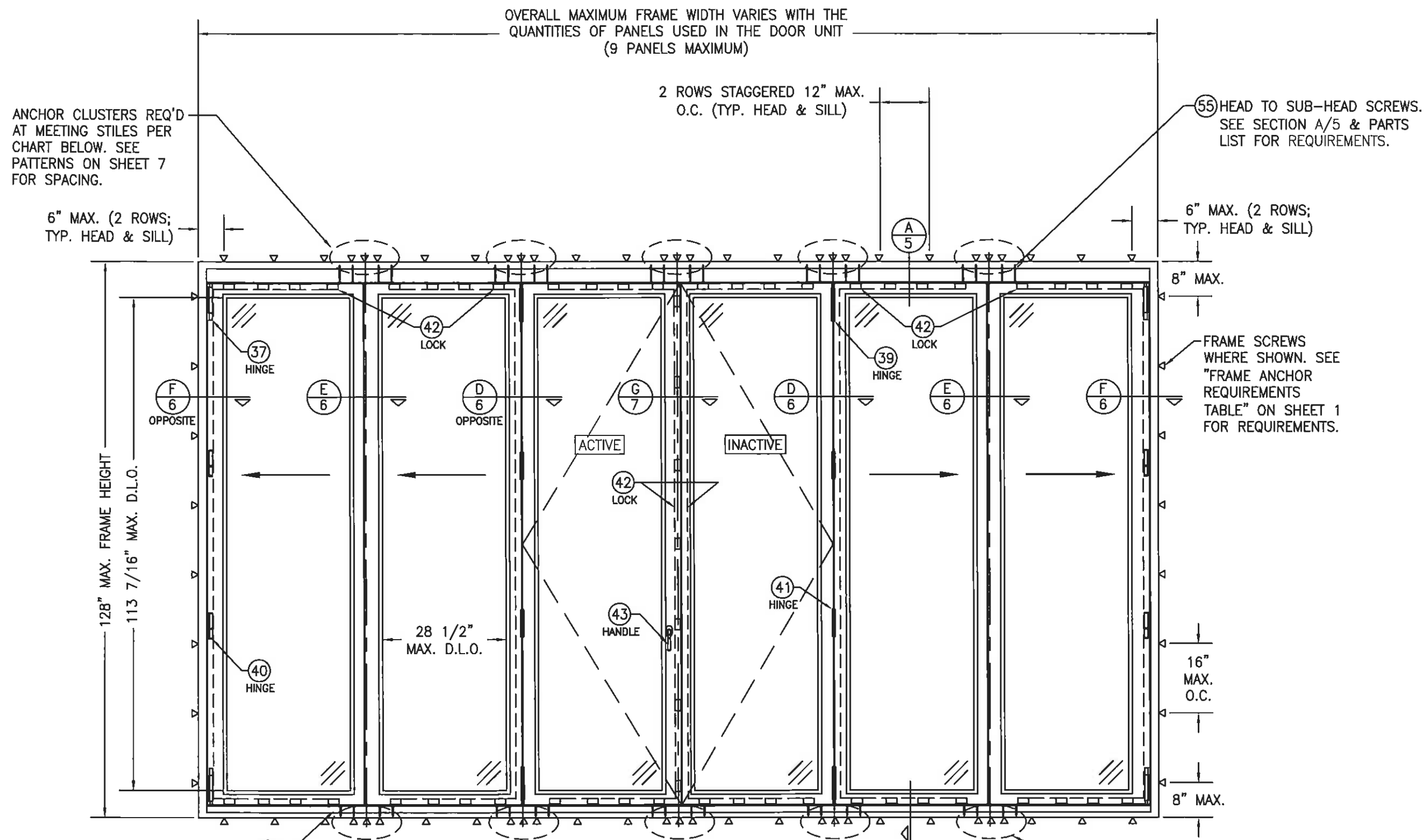


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WEST PALM BEACH, FL 33412

DRAWING NO.
BI-FOLD DOOR

SHEET NO.
1 OF 9



EXTERIOR ELEVATION:
 BI-FOLD DOOR WITH DOUBLE SWING PANELS
 SCALE: 1/2" = 1'-0"
 (6 PANELS SHOWN. HOWEVER, THE SYSTEM CAN BE EXPANDED UP
 TO 9 PANELS IN ONE OPENING, PROVIDED THE OPENING IS DESIGNED
 TO SUPPORT THE QUANTITY OF PANELS USED)

SUBSTRATE	FRAME HEIGHT	
	<96"	96"-128"
WOOD	6	8
METAL	4	5
CONCRETE	4	5

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DATE

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BI-FOLD DOOR

SHEET NO.
2 of 9

ANCHOR CLUSTERS REQ'D AT MEETING STILES PER CHART BELOW. SEE PATTERNS ON SHEET 7 FOR SPACING.

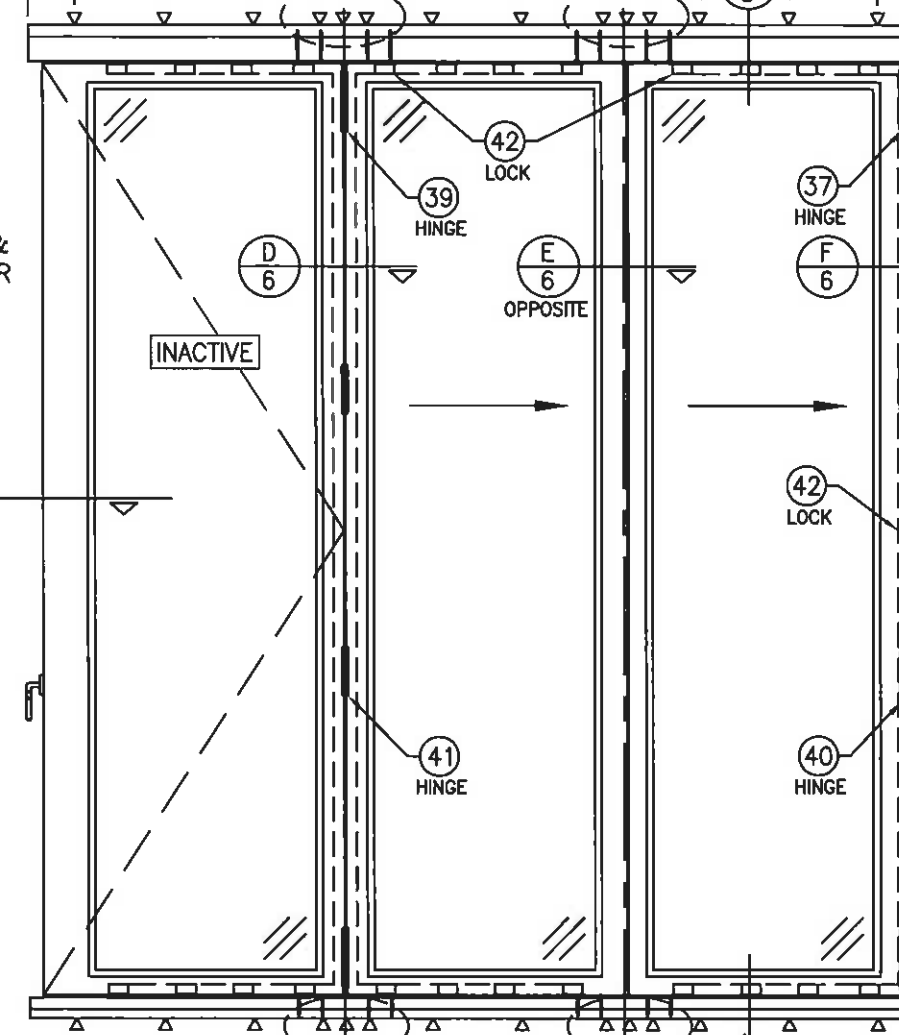
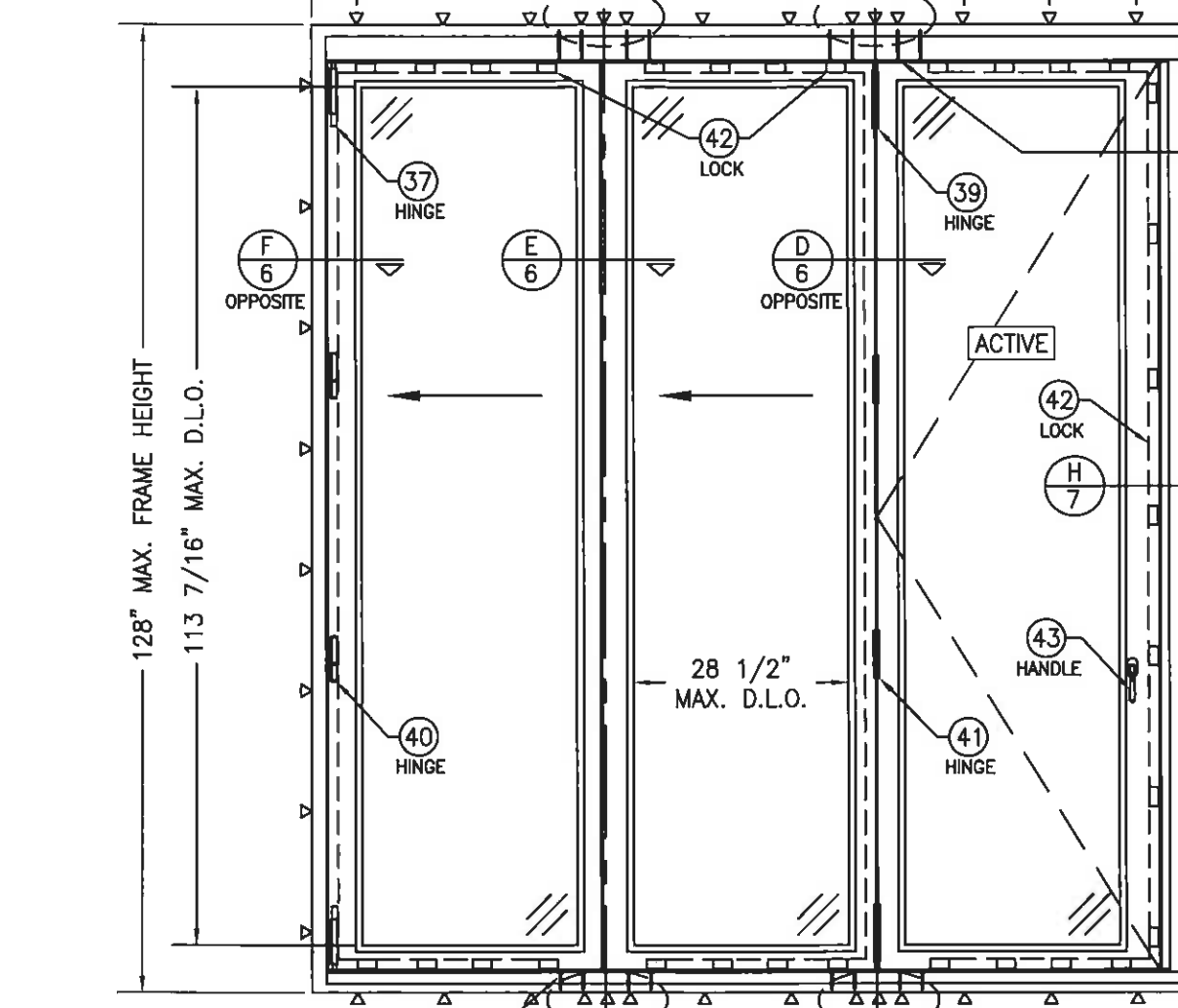
OVERALL MAXIMUM FRAME WIDTH VARIES WITH THE QUANTITIES OF PANELS USED IN THE DOOR UNIT (4 PANELS MAXIMUM EACH SIDE OF CORNER)
2 ROWS STAGGERED 12" MAX. O.C. (TYP. HEAD & SILL)

OVERALL MAXIMUM FRAME WIDTH VARIES WITH THE QUANTITIES OF PANELS USED IN THE DOOR UNIT (4 PANELS MAXIMUM EACH SIDE OF CORNER)
2 ROWS STAGGERED 12" MAX. O.C. (TYP. HEAD & SILL)

6" MAX. (2 ROWS; TYP. HEAD & SILL)

6" MAX. (2 ROWS; TYP. HEAD & SILL)

6" MAX. (2 ROWS; TYP. HEAD & SILL)



SILL TO SUB-SILL SCREWS. SEE SECTION A/5 & PARTS LIST FOR REQUIREMENTS.

FRAME SCREWS WHERE SHOWN. SEE "FRAME ANCHOR REQUIREMENTS TABLE" ON SHEET 1 FOR REQUIREMENTS.

FRONT VIEW

SIDE VIEW

ANCHOR CLUSTERS REQ'D AT MEETING STILES PER CHART BELOW. SEE PATTERNS ON SHEET 7 FOR SPACING.

EXTERIOR ELEVATION:
BI-FOLD DOOR WITH 90° CORNER
SCALE: 1/2" = 1'-0"

(3 PANELS SHOWN AT EACH SIDE. HOWEVER, THE SYSTEM CAN BE EXPANDED TO 4 PANELS ON EACH SIDE OF THE CORNER, PROVIDED THE OPENING IS DESIGNED TO SUPPORT THE QUANTITY OF PANELS USED)

ANCHORS REQUIRED AT MEETING STILE CLUSTERS		
SUBSTRATE	FRAME HEIGHT	
	<96"	96"-128"
WOOD	6	8
METAL	4	5
CONCRETE	4	5

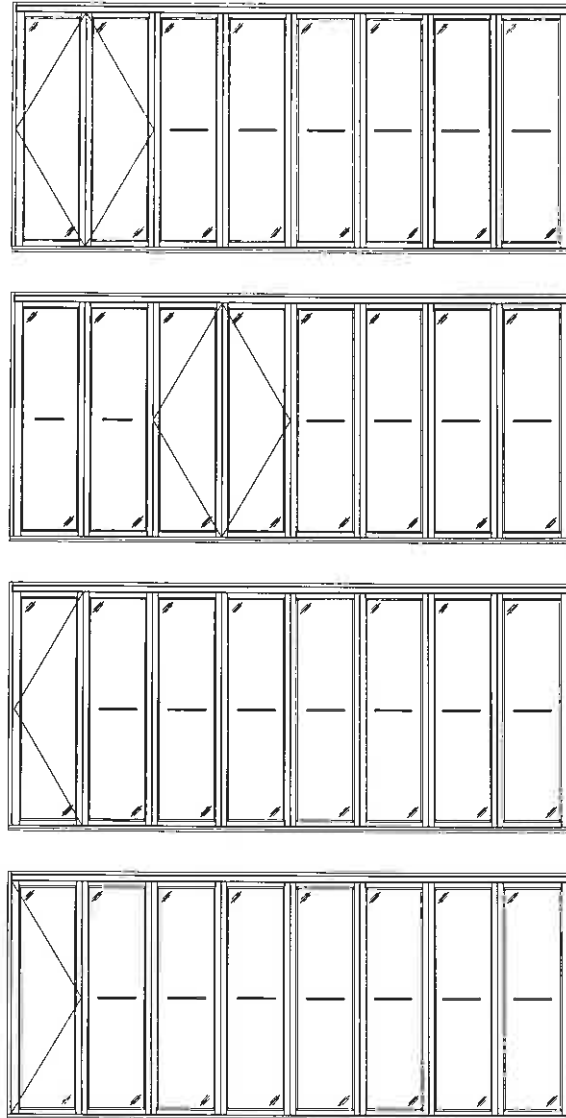
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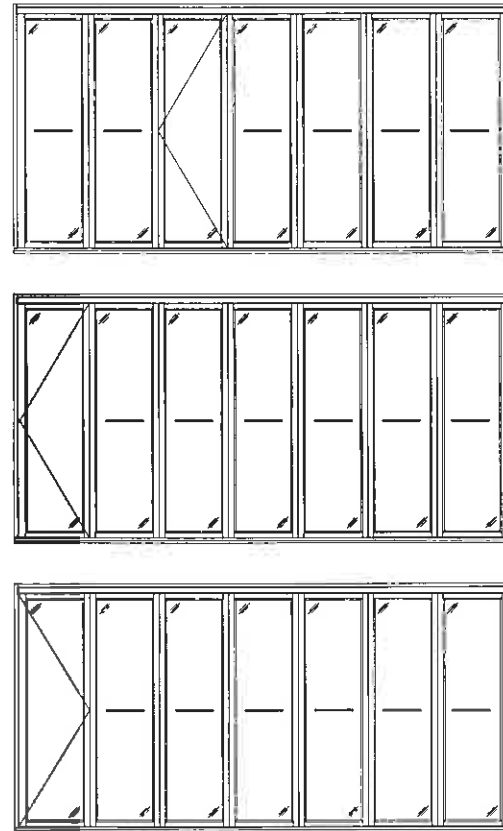
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DRAWING NO.
BI-FOLD DOOR
SHEET NO.
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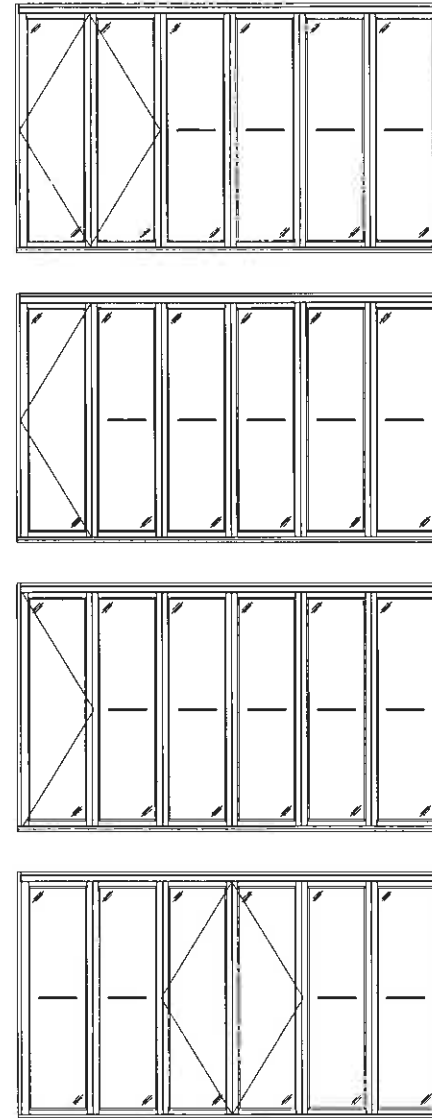
TYPICAL 8 PANEL CONFIGURATIONS



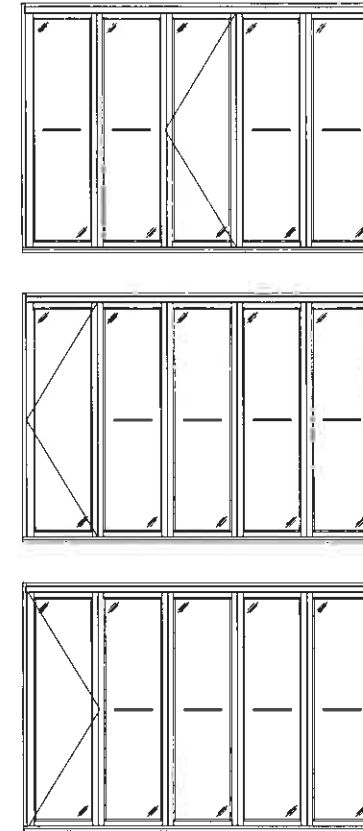
TYPICAL 7 PANEL CONFIGURATIONS



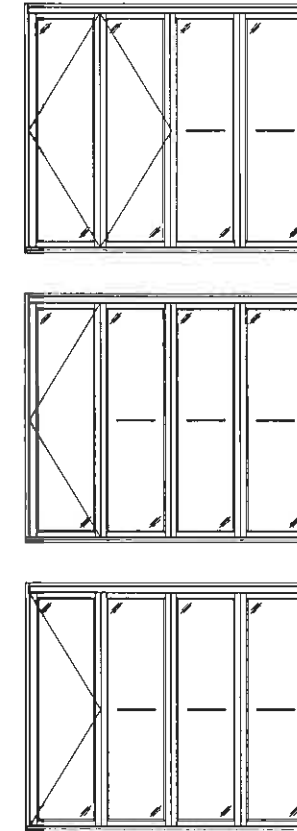
TYPICAL 6 PANEL CONFIGURATIONS



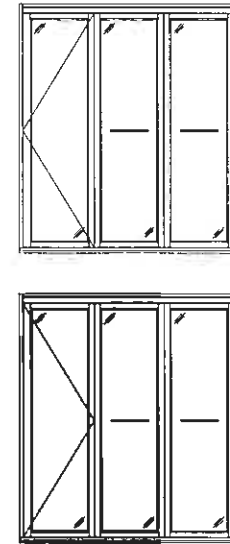
TYPICAL 5 PANEL CONFIGURATIONS



TYPICAL 4 PANEL CONFIGURATIONS



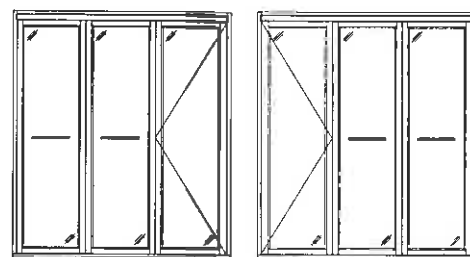
TYPICAL 3 PANEL CONFIGURATIONS



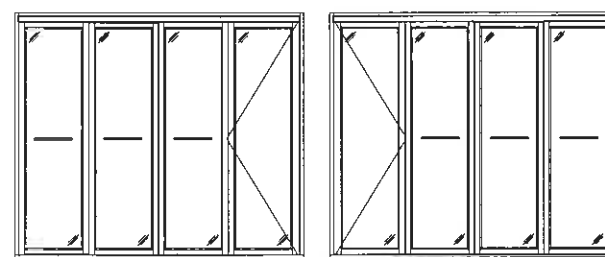
CONDITIONS SHOWN ARE THE MAJORITY OF THOSE USED. OTHER CONDITIONS OF FOLDING & SWING PANELS APPLY PROVIDING THEY ARE WITHIN THE SCOPE OF THE DETAILS WITHIN THIS DRAWING.

WHILE UP TO 8 PANELS IN ONE OPENING IS SHOWN, THE SYSTEM CAN BE EXPANDED UP TO 9 PANELS IN ONE DOOR FRAME OPENING PROVIDED THE OPENING IS DESIGNED TO SUPPORT THE LOADS TRANSFERRED FROM THE DOOR SYSTEM

TYPICAL 3 PANEL CORNER CONFIGURATION



TYPICAL 4 PANEL CORNER ONFIGURATION

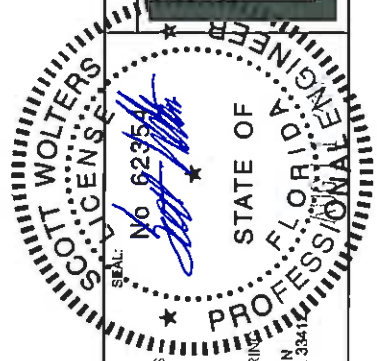


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NO.	REVISION DESCRIPTION	DATE

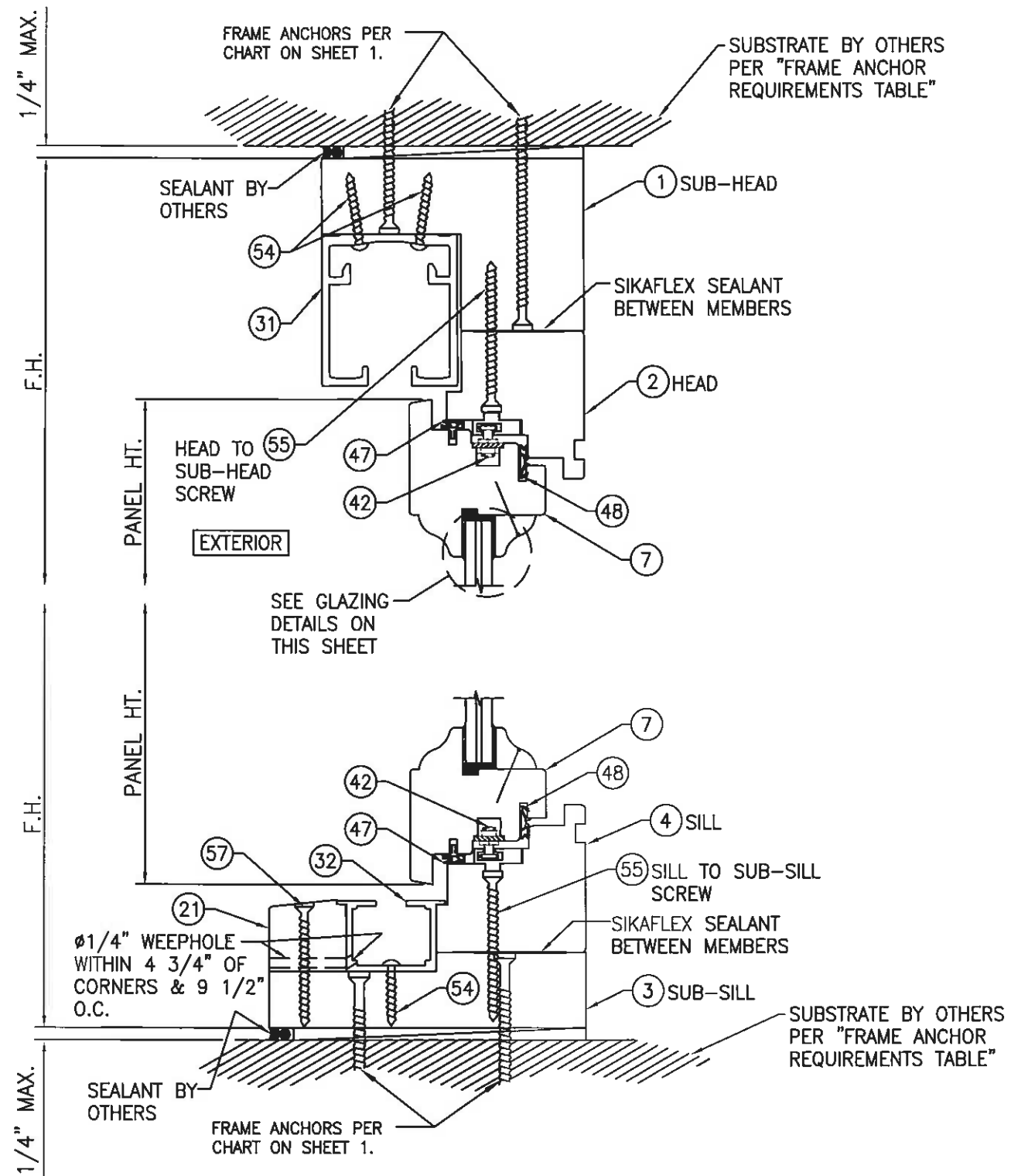
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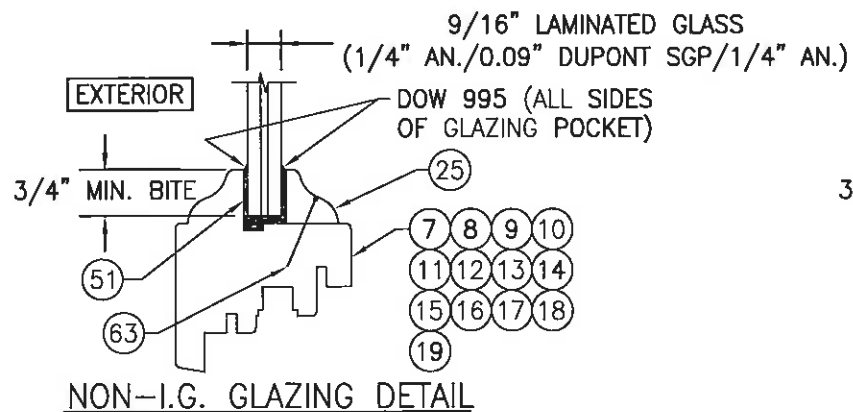


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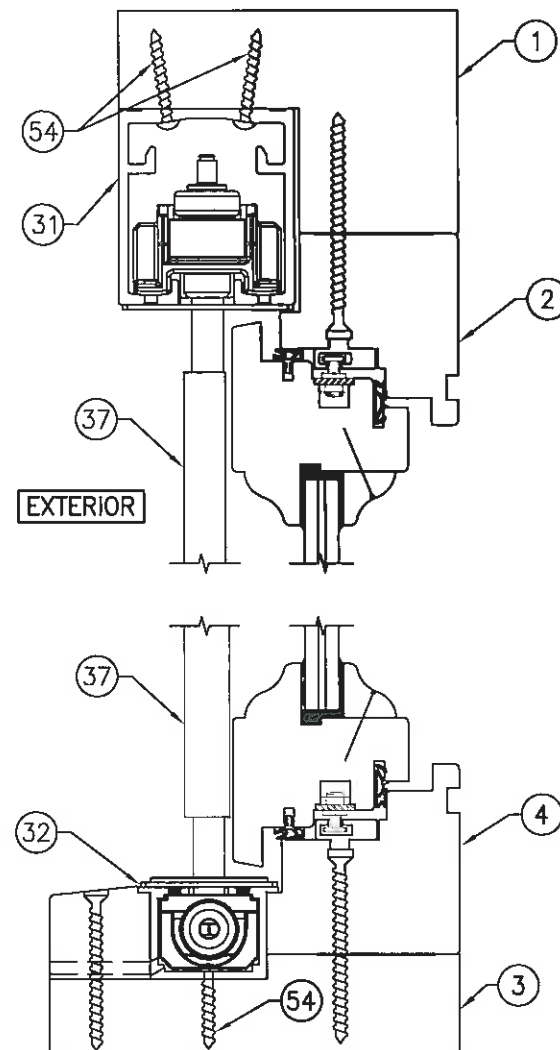
DRAWING NO.
BI-FOLD DOOR
SHEET NO.
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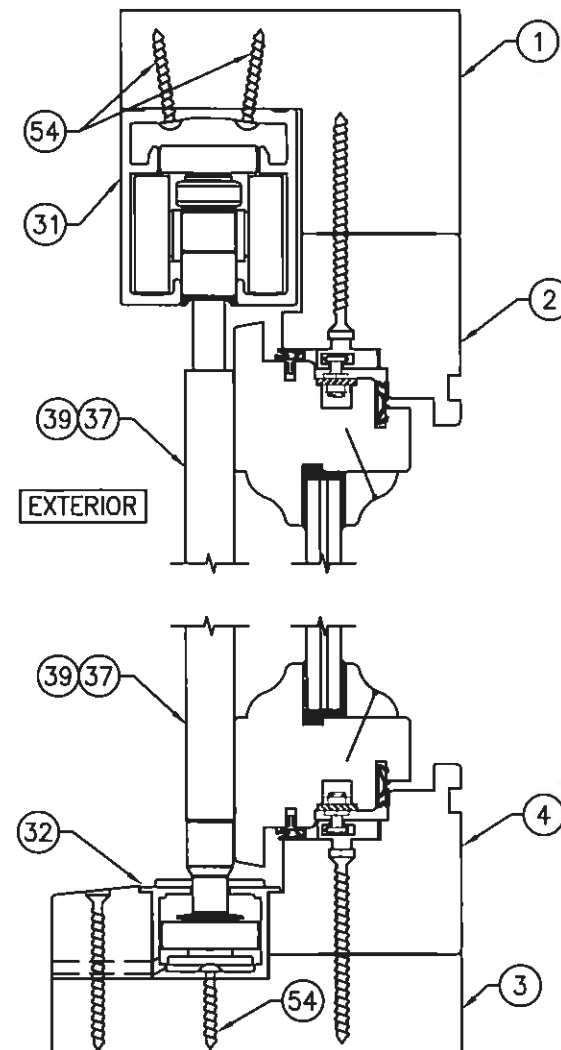
SECTION A
SCALE: 1/3 FULL



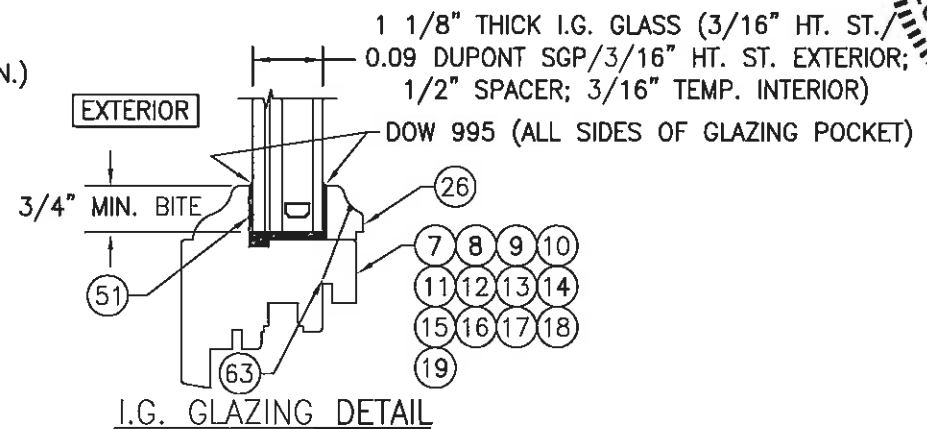
NON-I.G. GLAZING DETAIL



TYPICAL END PANEL ROLLER DETAIL
(FOR DETAIL & INSTALLATION NOT SHOWN, SEE SECTION A/5)



TYPICAL INTERMEDIATE PANEL ROLLER DETAIL
(FOR DETAIL & INSTALLATION NOT SHOWN, SEE SECTION A/5)



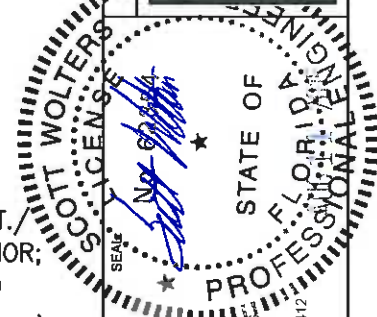
I.G. GLAZING DETAIL

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DATE	REVISION DESCRIPTION	NO.

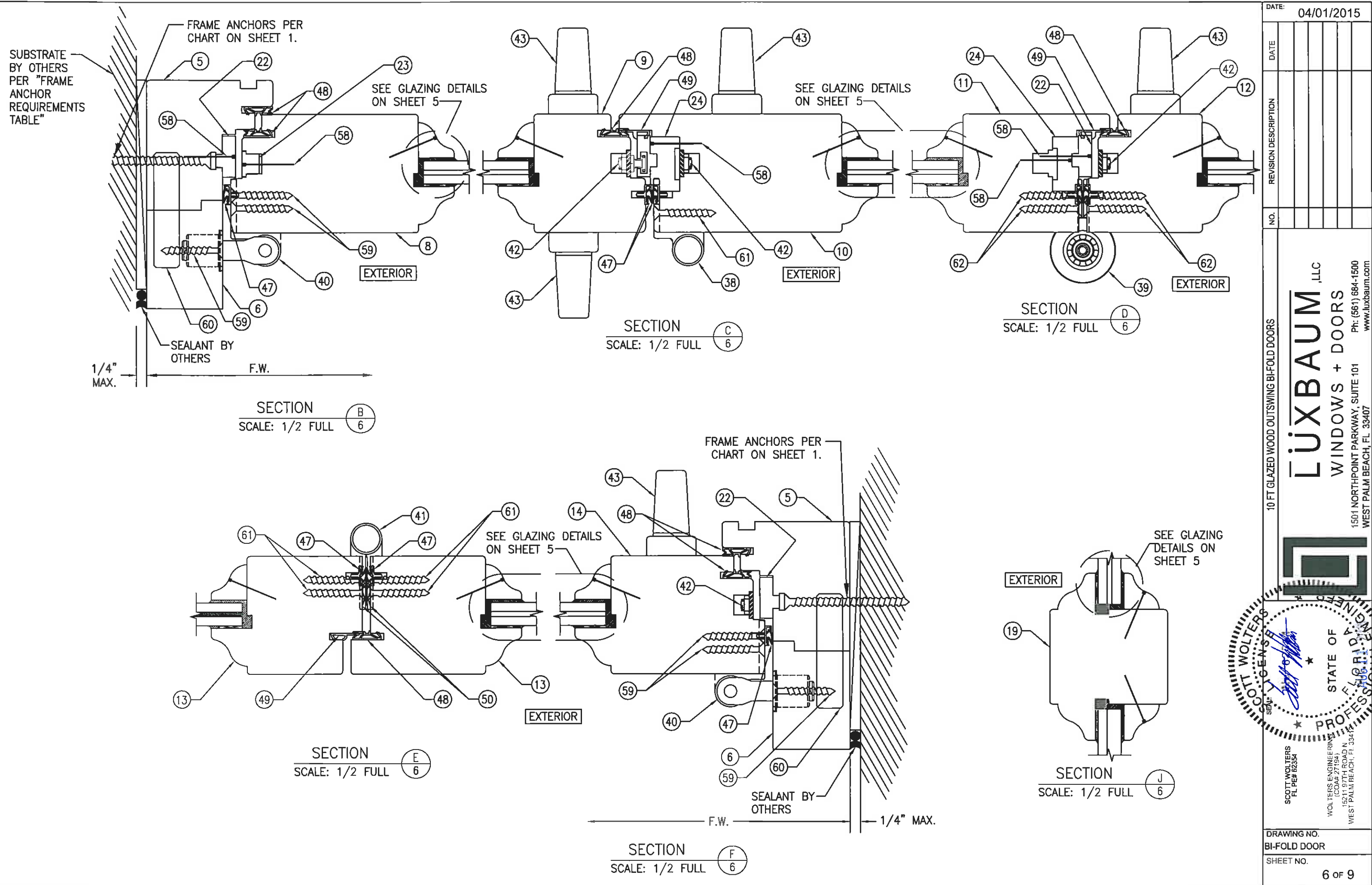
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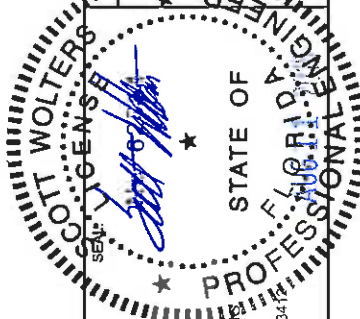
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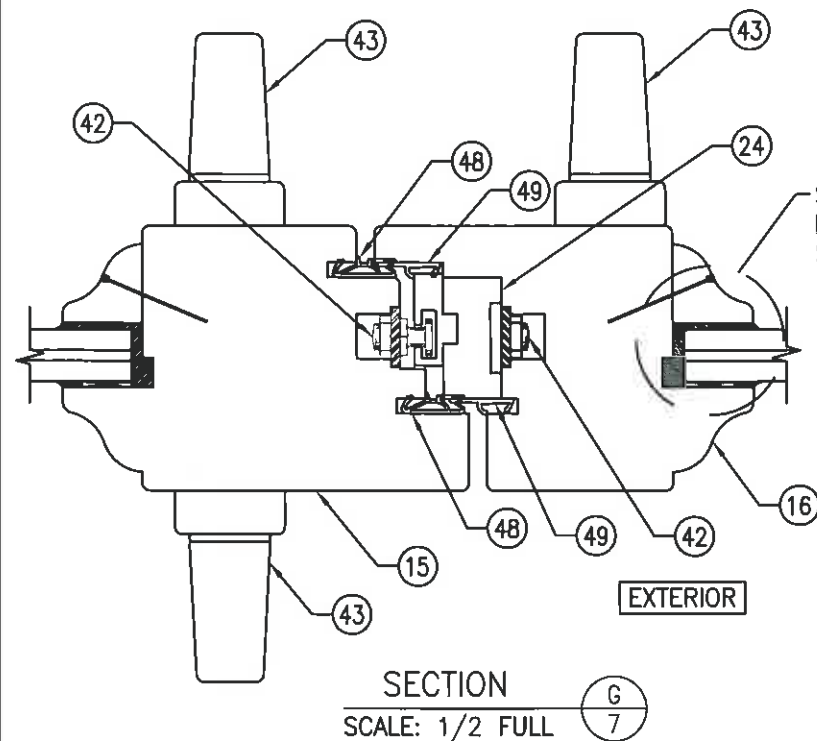


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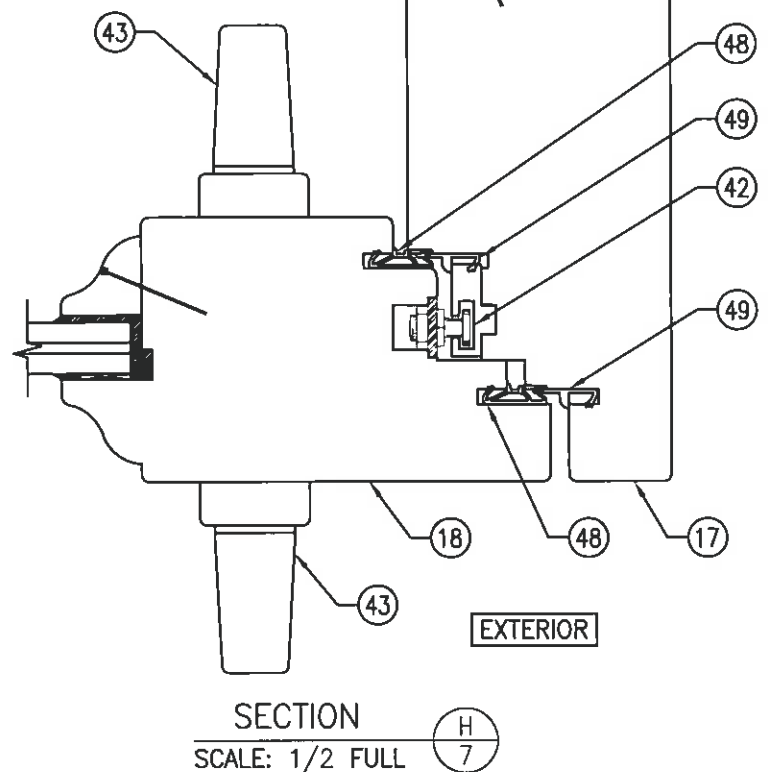
DRAWING NO.
BI-FOLD DOOR

SHEET NO.
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SEE GLAZING
DETAILS ON
SHEET 5

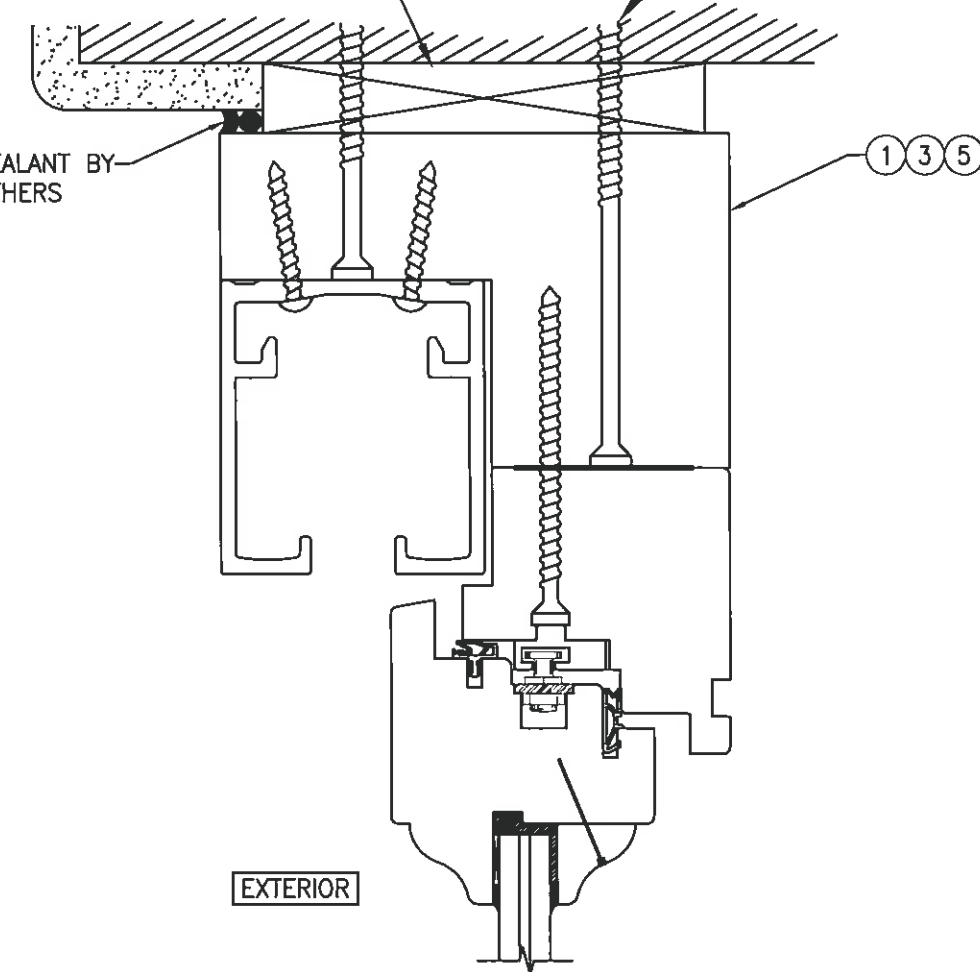
SEE GLAZING
DETAILS ON
SHEET 5



CONTINUOUS WOOD MEMBER LESS IN THICKNESS
THAN A 2X_ BUCK TO BE MIN. 5 1/2" DEEP
(NOT REQUIRED WHEN SHIM SPACE IS WITHIN
ALLOWABLE DIMENSIONS SHOWN IN SECTIONS).

SEALANT BY
OTHERS

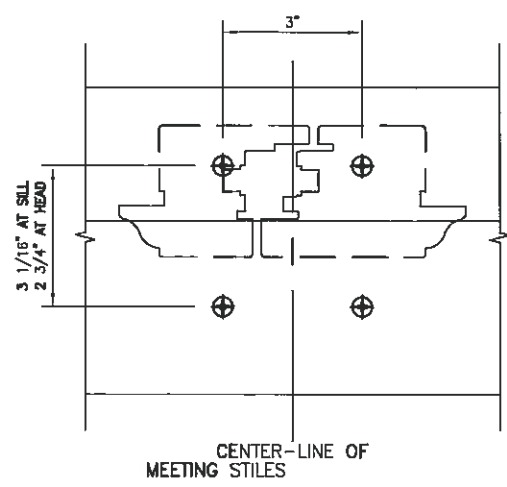
FRAME ANCHORS PER
CHART ON SHEET 1.



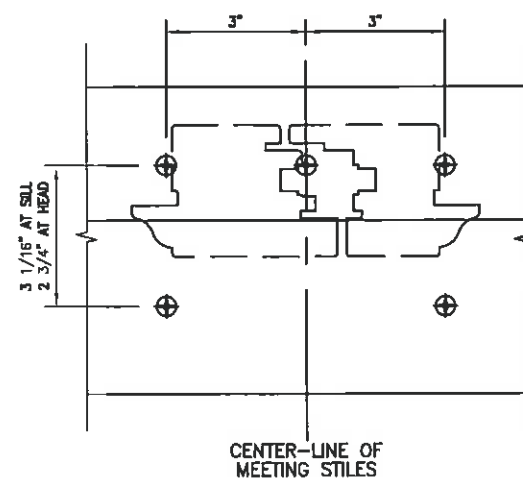
OPTIONAL DIRECT MOUNT DETAIL
TO SUBSTRATE WITH SPACER
(HEAD SECTION SHOWN, SILL & SIDES ARE INSTALLED SIMILAR)
(FOR DETAIL NOT SHOWN, SEE OTHER SECTIONS)

ANCHOR CLUSTERS AT HEAD AND SILL
(SEE CHART ON SHEETS 1-3)

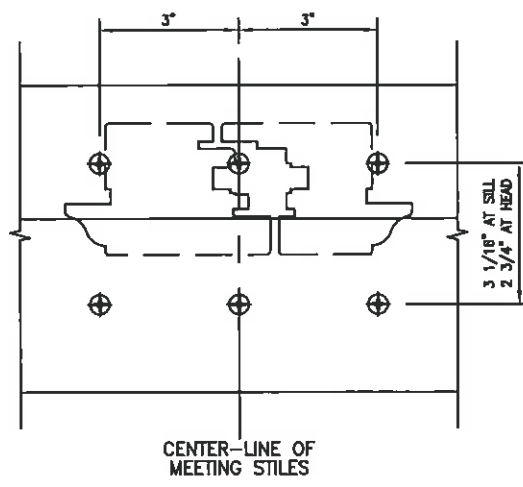
FOUR ANCHOR PATTERN



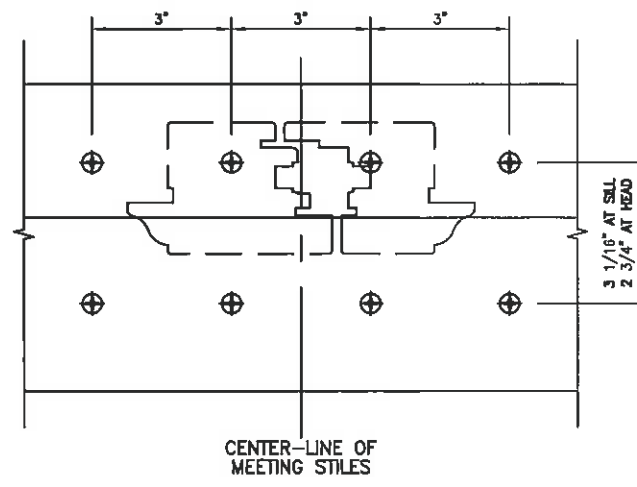
FIVE ANCHOR PATTERN



SIX ANCHOR PATTERN



EIGHT ANCHOR PATTERN



DATE 04/01/2015

REVISION DESCRIPTION

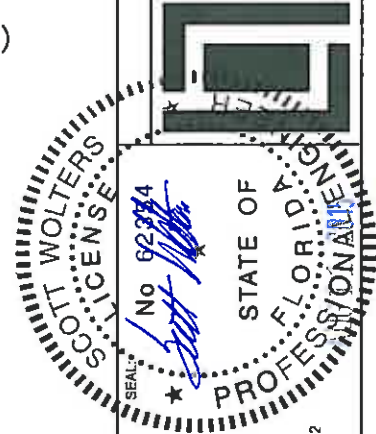
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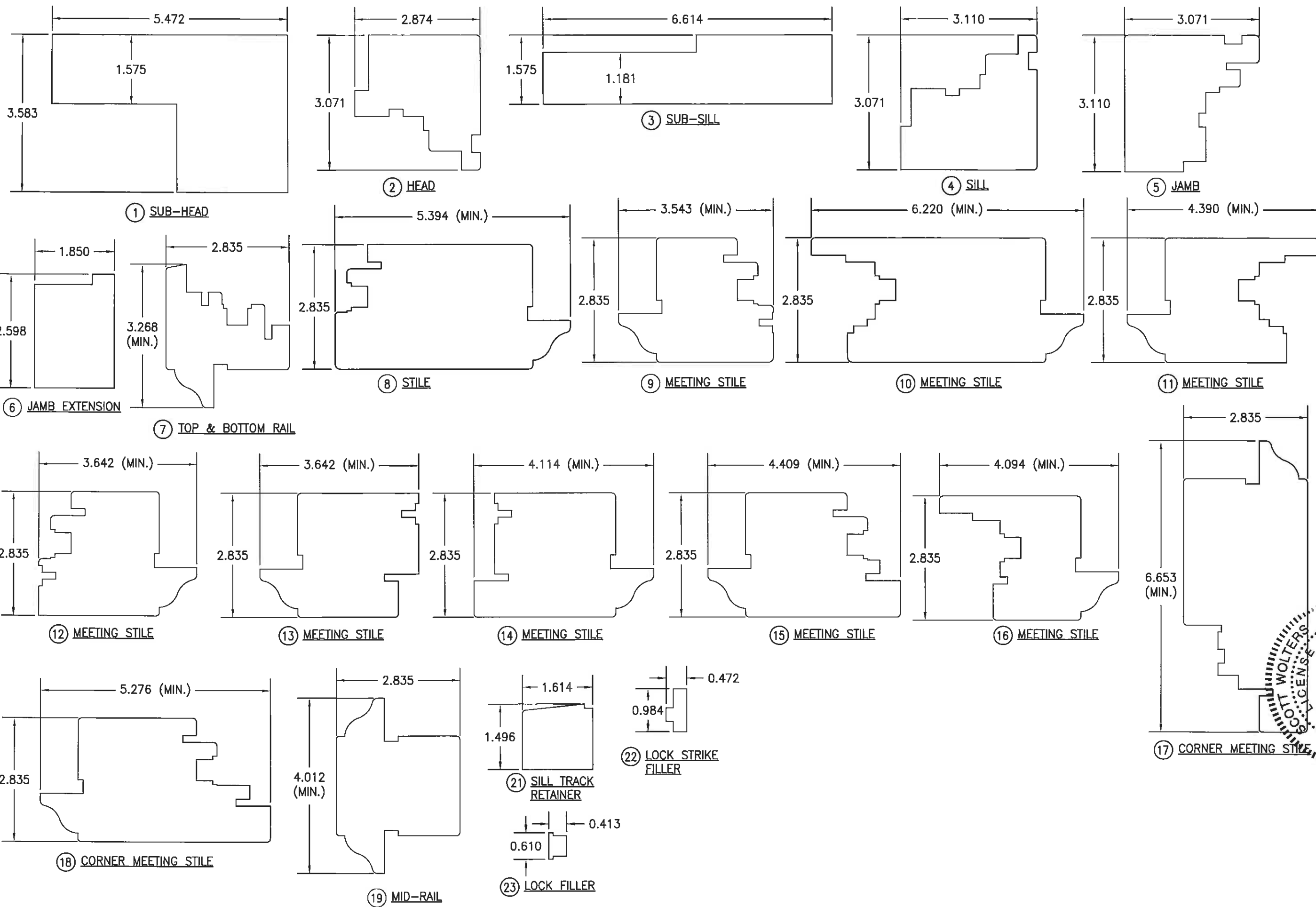


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SHEET NO.
7 of 9



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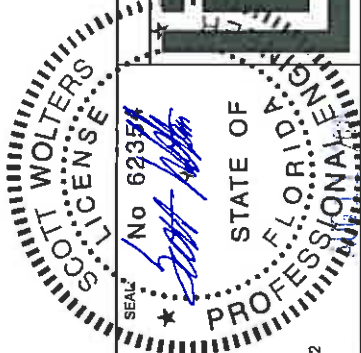
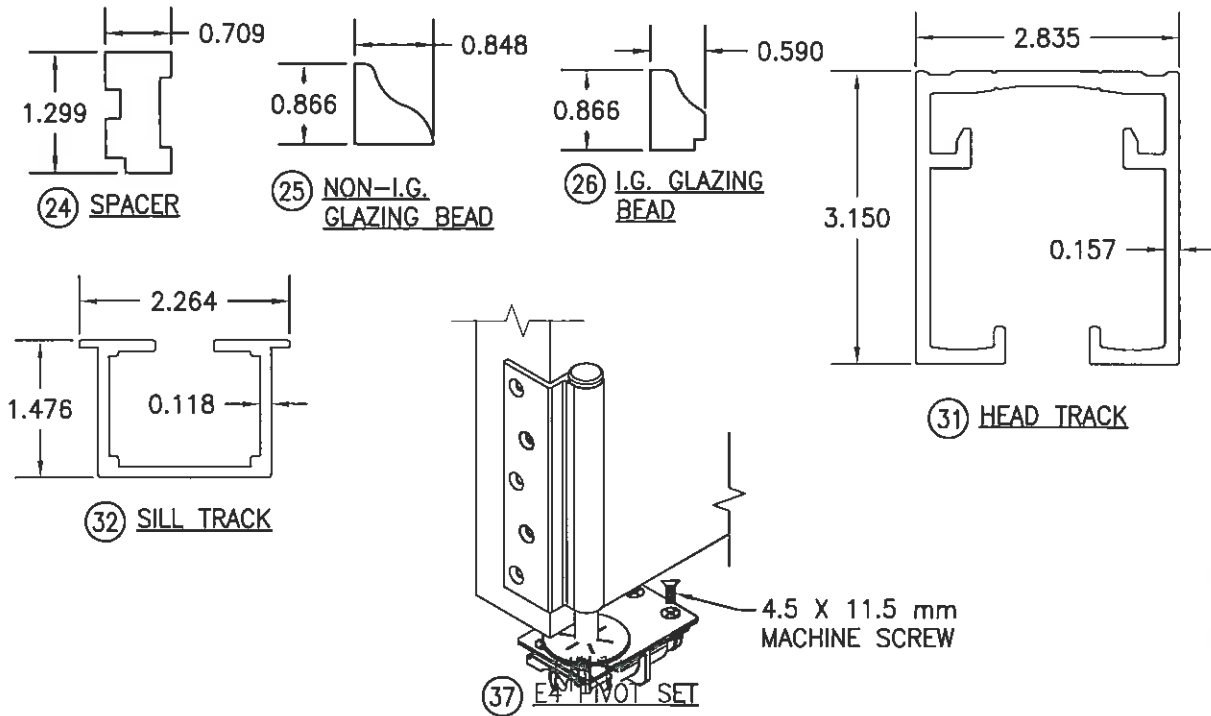
DRAWING NO.
BI-FOLD DOOR

SHEET NO.
8 of 9

ITEM #	ITEM DESCRIPTION	MANUFACTURER/NOTES
PARTS		
1	SUB-HEAD	WOOD
2	HEAD	WOOD
3	SUB-SILL	WOOD
4	SILL	WOOD
5	JAMB	WOOD
6	JAMB EXTENSION	WOOD
7	TOP & BOTTOM RAIL	WOOD
8	STILE	WOOD
9	MEETING STILE	WOOD
10	MEETING STILE	WOOD
11	MEETING STILE	WOOD
12	MEETING STILE	WOOD
13	MEETING STILE	WOOD
14	MEETING STILE	WOOD
15	MEETING STILE	WOOD
16	MEETING STILE	WOOD
17	CORNER MEETING STILE	WOOD
18	CORNER MEETING STILE	WOOD
19	MID-RAIL	WOOD
21	SILL TRACK RETAINER	WOOD
22	LOCK STRIKE FILLER	WOOD
23	LOCK FILLER	WOOD
24	SPACER	WOOD
25	NON-I.G. GLAZING BEAD	WOOD
26	I.G. GLAZING BEAD	WOOD
31	HEAD TRACK	6063-T5 ALUMINUM
32	SILL TRACK	6063-T5 ALUMINUM
HARDWARE		
37	E4 PIVOT SET	CENTOR AUSTRALIA
38	E4 OFFSET CARRIER SET	CENTOR AUSTRALIA
39	E4 INTERMEDIATE SET	CENTOR AUSTRALIA
40	E4 WALL PIVOT SET	CENTOR AUSTRALIA
41	E4 HINGE SET	CENTOR AUSTRALIA
42	MULTI-POINT LOCK	SIEGENIA, 3/4M5
43	HANDLE	AS REQUIRED TO OPERATE LOCK SYSTEM
SEALS & SEALANTS		
47	WEATHERSTRIP	DEVENTER, S 6577A
48	WEATHERSTRIP	DEVENTER, SV-12
49	WEATHERSTRIP	DEVENTER, S 6544
50	WEATHERSTRIP	KILLIAN HARDWARE COMPANY, V SHAPED
51	GLAZING SHIM	1/16" X 9/16" NEOPRENE WITHIN 1" FROM CORNERS 8" O.C.

ITEM #	ITEM DESCRIPTION	MANUFACTURER/NOTES
FASTENERS		
54	NO. 10 X 1 1/2" S.S. P.H. WOOD SCREW	WITHIN 4 1/2", 12 1/2" 20 1/2" FROM CORNERS & 16" MAX. O.C.
55	NO. 12 X 3" S.S. WOOD SCREW	WITHIN 6" FROM CORNERS & A TOTAL OF 4 CLUSTERED 3" & 6" FROM EACH MEETING STILE CENTERLINE
57	NO. 10 X 2 1/2" S.S. WOOD SCREW	WITHIN 3" FROM CORNERS & 16" MAX. O.C.
58	23 GA. X 1" FINISH NAIL	WITHIN 3" FROM CORNERS & 16" MAX. O.C.
59	NO 10 X 1 1/2" S.S. WOOD SCREW	5 PER HINGE INTO PANEL 2 PER HINGE INTO JAMB
60	Ø5/8" X 2 3/4" WOOD DOWEL	WITHIN 5 1/2" FROM CORNERS & 11 1/4" MAX. O.C.
61	NO 10 X 1 1/2" S.S. WOOD SCREW	5 PER HINGE INTO PANEL
62	NO 10 X 1 1/2" S.S. WOOD SCREW	5 PER HINGE INTO PANEL
63	23 GA. X 1 1/4" FINISH NAIL	WITHIN 2" FROM CORNERS & 4" MAX. O.C.

NOTE: WOOD USED IN TESTING WAS MERBAU MAHOGANY WITH A SPECIFIC GRAVITY OF G = 0.62 AND A MODULUS OF ELASTICITY OF E = 2,600,000 PSI. OTHER WOOD SPECIES APPLICABLE FOR USE WITH THIS PRODUCT ARE THOSE WITH A SPECIFIC GRAVITY OF 0.62 AND MODULUS OF ELASTICITY OF 2,600,000 PSI OR GREATER. ALL WOOD IS MINIMUM GRADE 2 MILLED BY LUXBAU, LLC TO SELECT.



LUXBAU, LLC
WINDOWS + DOORS
 1501 NORTHPOINT PARKWAY, SUITE 101
 WEST PALM BEACH, FL 33407
 Ph: (561) 684-1500
 www.luxbaum.com

DATE: 04/01/2015

DATE	REVISION DESCRIPTION	NO.

SCOTT WOLTERS
 FL PE# 62354
 WOLTERS ENGINEERING
 (COA# 27194)
 15211 97TH ROAD N
 WEST PALM BEACH, FL 33412

DRAWING NO.
 BI-FOLD DOOR
 SHEET NO.
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