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MANUFACTURING AND MACHINING SPECIFICATIONS

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F411

Report Number:
F411-45-2-MFG
Edition 10

Applicant:
Wolman Wood and Fire Protection GmbH
Werk Sinzheim E-EBE/WB
Bau 2, Dr.– Wolman – Str. 31-33
76547 Sinzheim, Germany

ATTENTION: Andreas Bolz, Business Manager Fire Protection Materials

APPLICABLE REQUIREMENTS:

CAN/ULC S104-15 (R2020)	*Standard Method for Fire Tests of Door Assemblies*
UL 10B (2020)	*Fire Tests of Doors Assemblies*
UL 10C (2021)	*Fire Tests of Doors Assemblies*
NFPA 252 - 2022	*Standard Methods of Fire Tests of Door Assemblies*

SUBJECT:

MANUFACTURING AND MACHINING SPECIFICATIONS FOR WOLMAN – 45 MINUTE CATEGORY “C” NEUTRAL AND POSITIVE PRESSURE FIRE RATED FRAMES WITH HOSE STREAM

45-MINUTE FIRE DOOR FRAME:

Materials:

Medium Density Fiberboard (MDF)

- Meeting ANSI A208.2
- Minimum 31 lbs./ft^3 density

Hardwood

- Minimum 27 lbs./ft^3 density

Proprietary Wolman Laminated Core:

Palusol SW 20-1 Core (0.3125" Thickness)
Palusol SW 45-1 Core (0.6250" Thickness)
Palusol SW 60-1 Core (0.6250" Thickness)

- Composite continuous core type

Proprietary Wolman Edge Sealing Material:

Palusol 100 (0.0787" Thickness)
Palusol SW2 (0.200" Thickness)

Maximum Sizes:

MDF with SW2 edge sealing: (See Figure 1)

Swing Type:		Maximum Dimensions		Figure:
		Width:	Height:	
Single Swing	**Rectangular**	3'6" (1067 mm)	7'9" (2362 mm)	1
	Arched Top	3'6" (1067 mm)	7'9" (2362 mm)	5
	Mulled Assembly	7'0" (2134 mm)	7'9" (2362 mm)	6-10
Standard Pairs		Not Permitted		
Double Egress Pairs		Not Permitted		

Two Layers* of SW 20-1 Cores or Single Layer of SW 45-1 Core: (See Figure 2)

Swing Type:	Maximum Dimensions		Figure:
	Width:	Height:	
Single Swing	3'6" (1067 mm)	9'0" (2743 mm)	2-3
Communicating	3'6" (1067 mm)	9'0" (2743 mm)	2-3
Standard Pairs	7'0" (2134 mm)	9'0" (2743 mm)	2-3
Double Egress Pairs	Not Permitted		

*** Note:** An MDF Interlayer is permitted between two layers of SW 20-1 cores for frame thickness addition up to 1" (See Figure 3).

Three Layers of SW 20-1 Cores or Single Layer of SW 60-1 Core:

Swing Type:	Maximum Dimensions		Figure:
	Width:	Height:	
Single Swing, Projecting	3'6" (1067 mm)	10'0" (3048 mm)	3

Limitations:

Minimum Frame Width:	4-3/4"
Maximum Frame Width:	Equivalent to wall thickness
Minimum Frame Thickness:	3/4" (-1/16") [MDF frame]
	5/8" (-1/16") [Wolman Palusol frame]
Minimum Rabbet for Door:	1-3/4"
Minimum Stop Height:	1/2"
Minimum Stop Width:	1-3/16"
	1-11/16" [Communicating Door Frame]
Maximum Frame Projection:	1 ¼" from wall face [See Figure 17]

Frame Components:

Medium Density Fiberboard (MDF) or Hardwood inlayed with Palusol SW2 (See Figure 1)

- Minimum 31 lbs./ft^3 density MDF, 27 lbs./ft^3 density Hardwood

Proprietary Wolman Laminated Core

- Two Layers of SW 20-1 Core (See Figure 2)
- Single Layer of SW 45-1 Core (See Figure 2)
- Three Layers of SW 20-1 Core (See Figure 4)
- Single Layer of SW 60-1 Core (See Figure 4)

Frame Additions:

Frame thickness additions:

- Addition of MDF Interlayer between Two Layers of SW 20-1 Core for frame thickness up to 1" (See Figure 3).
- Addition of MDF and Wolman SW20-1 Cores to the backside of the frame (See Figure 13).

Note: Frame thickness shall be increased to completely enclosed concealed closer, electric strike, and concealed hinge hardware (see drawings).

Frame depth additions:

- Addition of MDF or Hardwood to the frame back face to increase frame depth to be equivalent to the wall thickness (See Figure 13).

Frame length extension / splice:

See Figure 14 for splice method and location to extend frame length from 8 to 10 ft. or to splice frame legs.

Flat Laminated:	Maximum Thickness on frame opening side = 1/8"
Veneer Wrapped:	Minimum Thickness = 1/40" Veneer may be laminated over MDF.
Hardwood Facings:	Maximum ¼" ~~x 1"~~ Hardwood Facing fastened to the face of the frame

Stops:

Single Rabbet, Double Rabbet, or Double Rabbet Communicating Frame (applied: flat laminated or "T" Stop) (see Figures 1 to 5)

Material: MDF or Hardwood with minimum density of 27 lbs.ft^3 density

Stops must be applied with a small bead of glue or silicone behind the stop and fastened with finishing nails at 12" on center. Stops may be field applied to ensure proper fit with fire door.

Adhesives:

Any PVA or PUR listed adhesives for use in a 45 minute fire rated door assemblies.

Follow the adhesive manufacturers' instructions and bulletins for mixing, application rates, pressing parameters, cure temperatures, and safe use practices.

Arched Top Frames:

Full Arch, arched top door frame:

The frame remains the same as the rectangular frame except it features a half-of-door-width radius curve (see Figure 5). Two framed corner supports will be installed in the corners of the rough opening.

Shallow Arch, arched top door frame:

The frame remains the same as the rectangular frame except it features a large radius curve where the top hinge remains in the original location (see Figure 5).

Transom and Sidelite / Mulled Assemblies:

Mulled frames:

One frame will contain the active opening and the other a fixed panel or sidelite fastened to the frame (see Figures 8 and 9). Sidelites can be added to one or both

sides of the door frame.

Full frame mulled between 2 half width frames:

This assembly is a full frame that is mulled together between 2 half width frames (see Figure 7).

Transoms

Transom panels can be mulled above the active door, effectively reducing the height of the active door opening. The transom panel may contain a lite. Glazed transom with the glass directly set in the frame is not permitted.

Sidelites

There are four sidelite options, as follows:

1. Fully fastened Wolman 45 min rated door panel
2. Fully fastened Wolman 45 min rated door containing a lite (meeting the F411-1 Listing)
3. Wolman door core panel (limited sizing to the tested exposed core panel area – 34” x 88” or 40” x 76”)
4. Glazed frame – Wolman clip system using 3/16” ceramic glazing - maximum single lite size – 24” by 48”. Combination lites of max 2 units wide or 2 units high, or Combination lite consisting of 4 units - 2 wide by 2 high. See Figures 13 and 14.

Casing / Moulding:

Material: MDF or Solid wood with minimum density of 27 lbs./ft³ density
Minimum 3/8” thick x 1-1/2” wide.

Frame moulding to be applied with finishing nails at 12" on center.

Hardwood Facings: Maximum ¼” Hardwood Facing applied to the face of the frame members.

Hinge and Hardware Preparation:

Hinges and applicable hardware must be fire rated for use in openings at or above the fire rating of the frame system being installed. All hinges must be installed as per NFPA 80.

Preparation of hinges and hardware shall be made in accordance with NFPA 80, and the manufacturer’s installation instructions and templates.

Concealed Hinges:

Listed SOSS and TECTUS concealed hinges are permitted but require the frame thickness to be built-up to fully enclose the hinge body [See Figure 15].

Electric Strikes:

Listed electric strikes are permitted but require the frame thickness to be built-up to fully enclose the strike body. Maximum mortise depth 1 ½", maximum mortise height 3 ½" See Figure 15.

Electric Power Transfer – Mortise Type:

Listed EPT units listed for use in 45 minute rated wood or composite doors and to UL 10C are permitted when installed below the latch level on the hinge side.

Electric Raceways:

A ¼" diameter hole is permitted anywhere below 40" above the floor on the hinge or latch frame leg. Wire can then be routed through the hole for electronically controlled hardware. The hole may be left open or sealed with silicone caulking.

Mortised Door Closer:

Concealed closer allowed in the frame header. Maximum 2-1/6" x 3-5/8" x 12" pocket dimensions lined with Interdens Type 15 on 4 sides [See Figure 14].

Header is constructed with layers of Palusol SW cores. Minimum 3/8" frame header thickness above the concealed closer pocket [See Figure 14].

Installation:

Frame to be installed in accordance with installation instructions [See Figure 1 and Figure 21]. Installation instructions shall be shipped with frames.

Shims need to be installed as per the drawing in Figures 1 to 4. Silicone caulking applied between the jamb and rough opening on both sides of the assembly. Each hinge needs to be fastened through the shim into the frame with at least #12 x 2-1/2" screws. The frame can then be fastened at all non-hinge shim locations with 2" finishing nails. Follow NFPA 80 Installation guidelines.

Test Reports:

Test Report #	Date Issued
Intertek Test Report # 3168447-003(e)	June 29, 2009
QAI Engineering Evaluation # F411-5-1	November 18, 2013
QAI Engineering Evaluation # F411-5-4	June 5, 2014
QAI Engineering Evaluation # F411-5-8	April 16, 2015
QAI Engineering Evaluation # F411-5-9	April 16, 2015
QAI Engineering Evaluation # F411-5-27	October 16, 2017
QAI Engineering Evaluation # F411-5-28	October 16, 2017
QAI Engineering Evaluation # T848-22b	February 27, 2018
QAI Engineering Evaluation # T848-24M	May 15, 2019
QAI Engineering Evaluation # T1470- 4F	May 29, 2023
QAI Engineering Evaluation # T1470- 4E	May 29, 2023
QAI Test Report # T1470-3B	March 23, 2022
QAI Test Report # T1470-3F	March 28, 2022

APPENDIX

Page	Title
A1- A6	45 min door frame assembly details
A7	45 min arched top door frame assemblies
A8- A12	45 min sidelite and transom mulled door frame assemblies
A13 - A14	45 min. mulled sidelites with direct-set glazing
A15	Frame leg splice details
A16	Frame facing options
A17	Options for extending frame depth and thickness
A18	Construction details with concealed closer body in the frame
A19	Electric Strike Preparation
A20	Communicating Door/Frame Design
A21	Concealed Hinge Preparation
A22	Installation Instructions

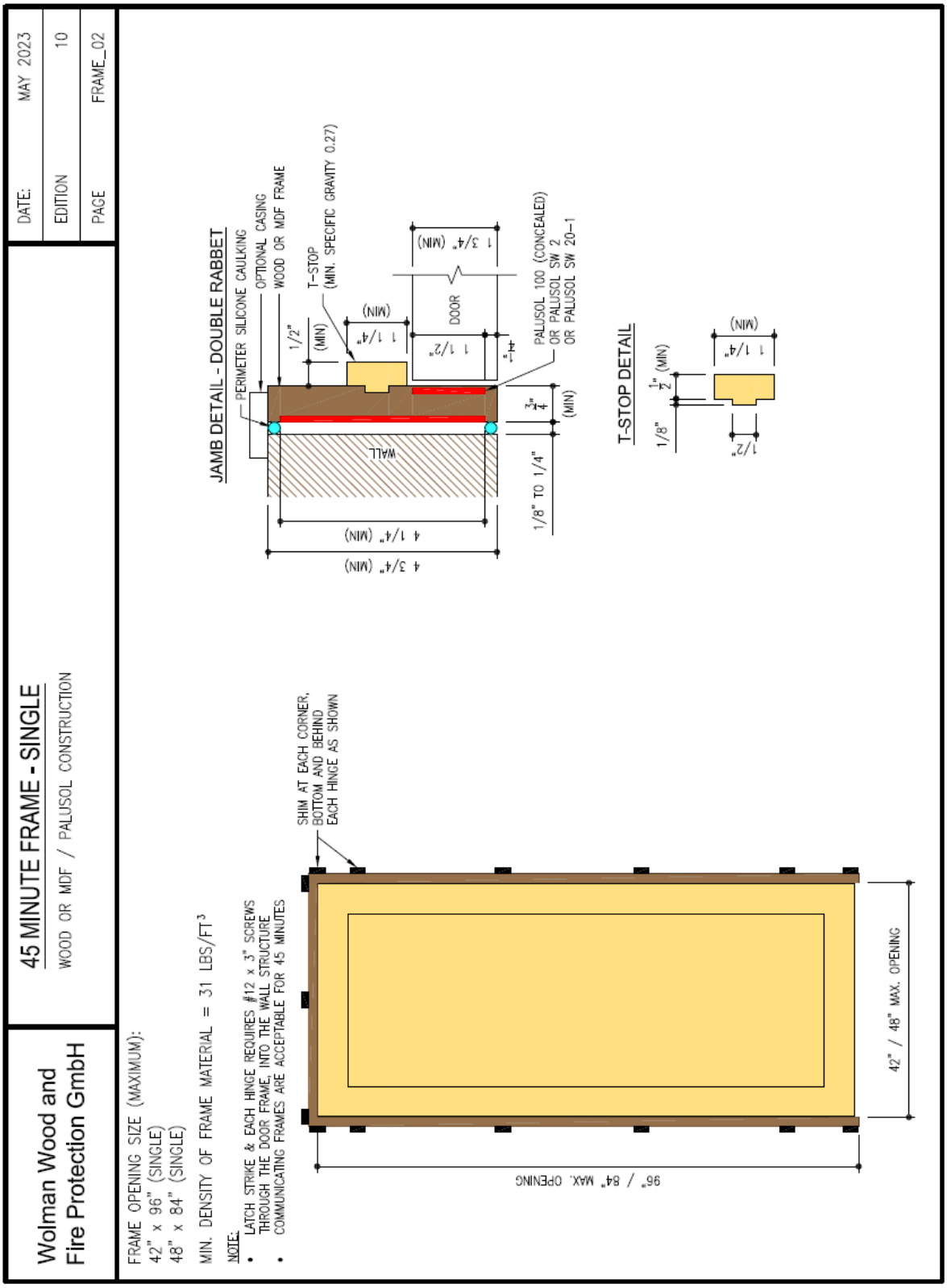

Figure 1: 45 min. max. 8 ft. high single door frame.

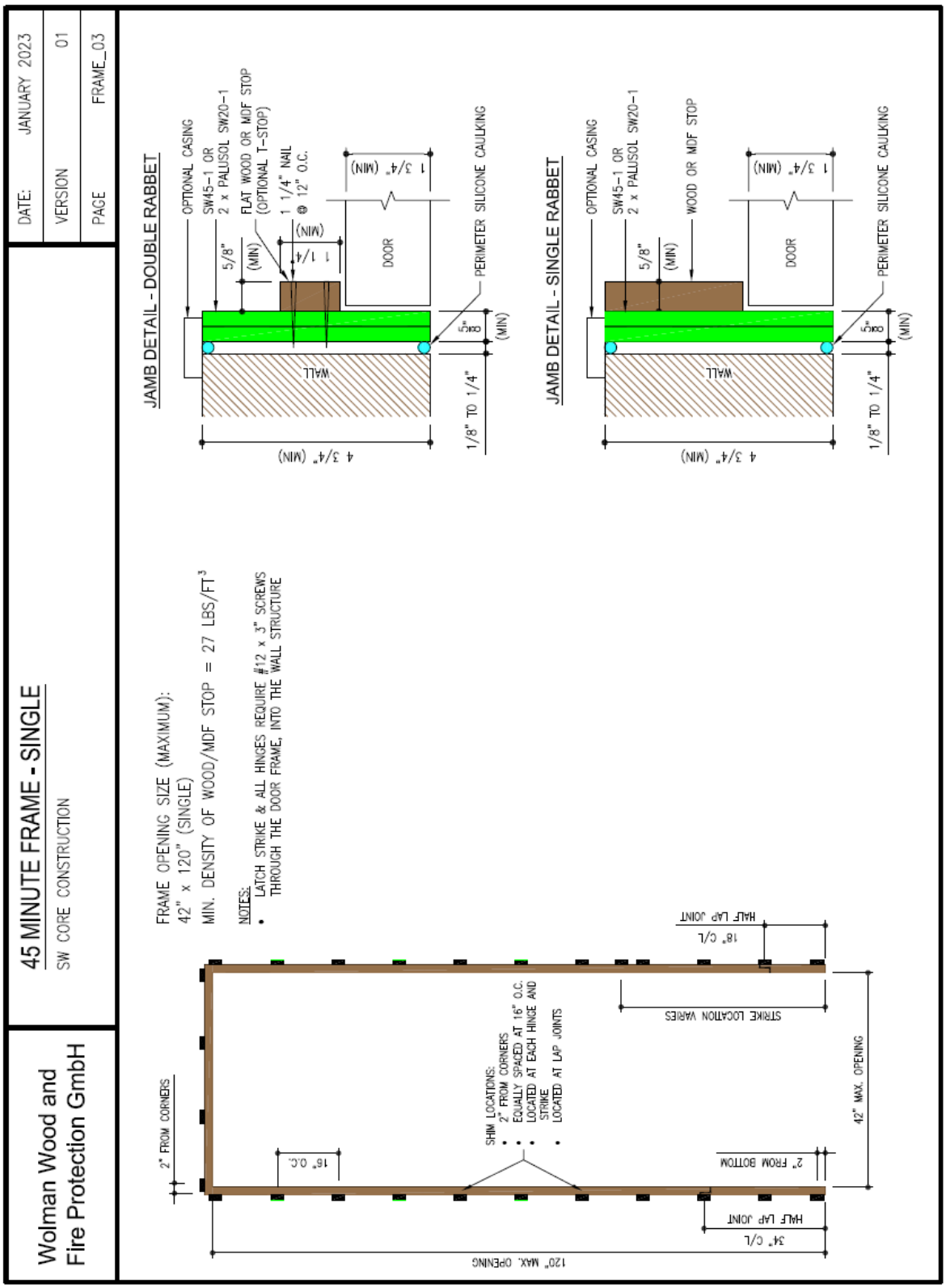

Figure 2: 45 min. max. 10 ft. high single door frame.

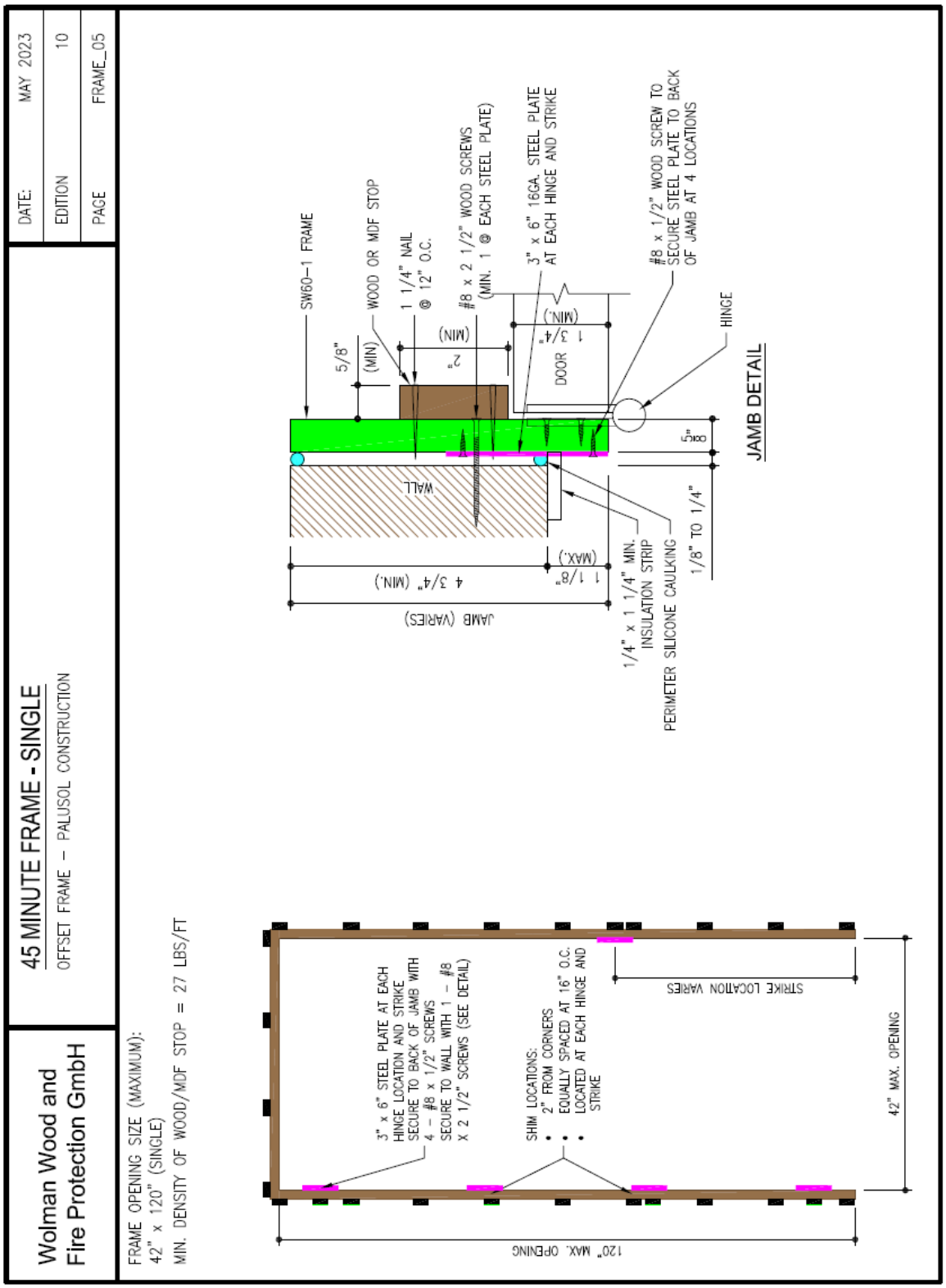

Figure 3: 45 min. max. 10 ft. high projecting design single door frame.

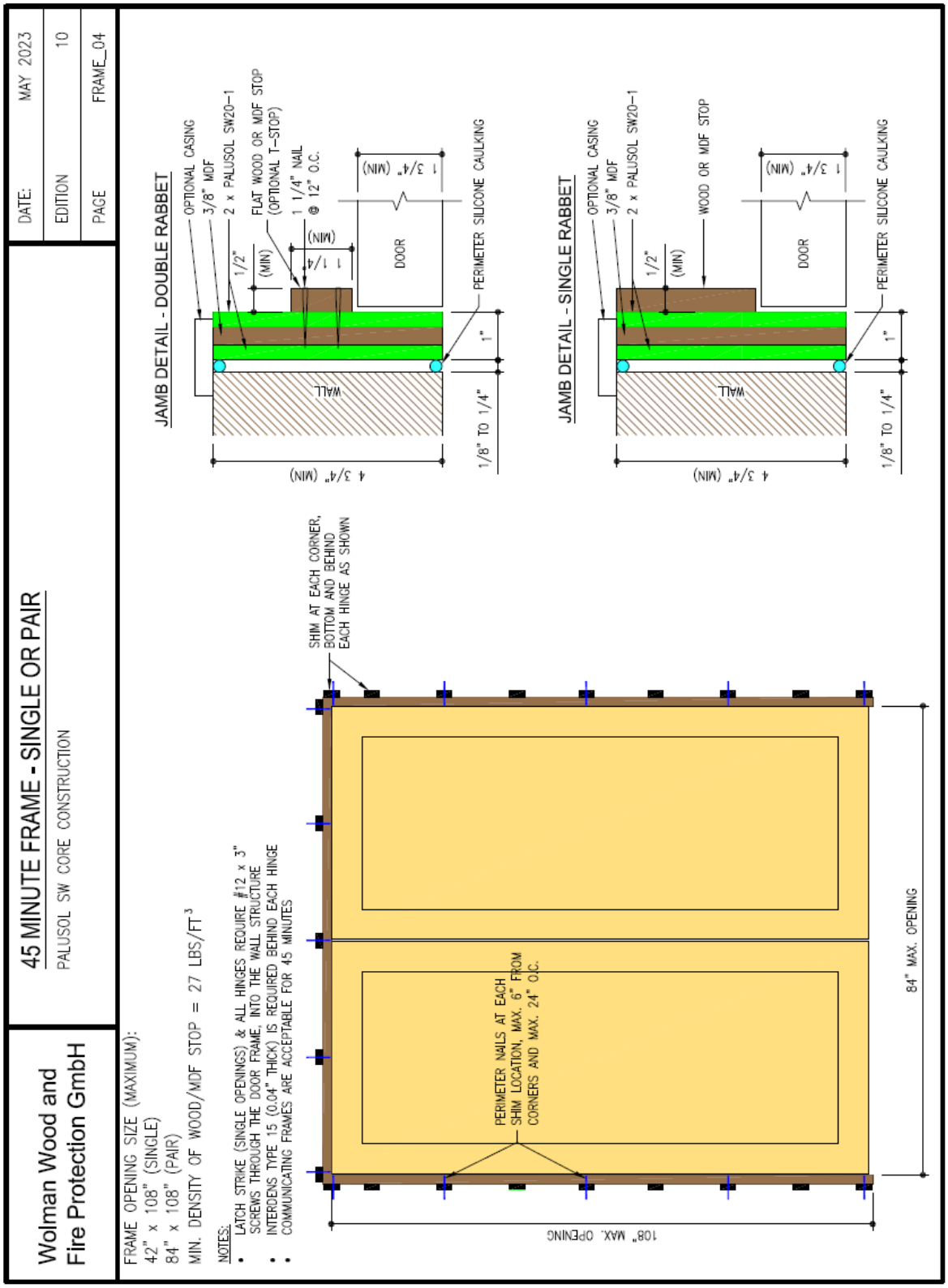

Figure 4: 45 min single/pair door frame, 1" thickness.

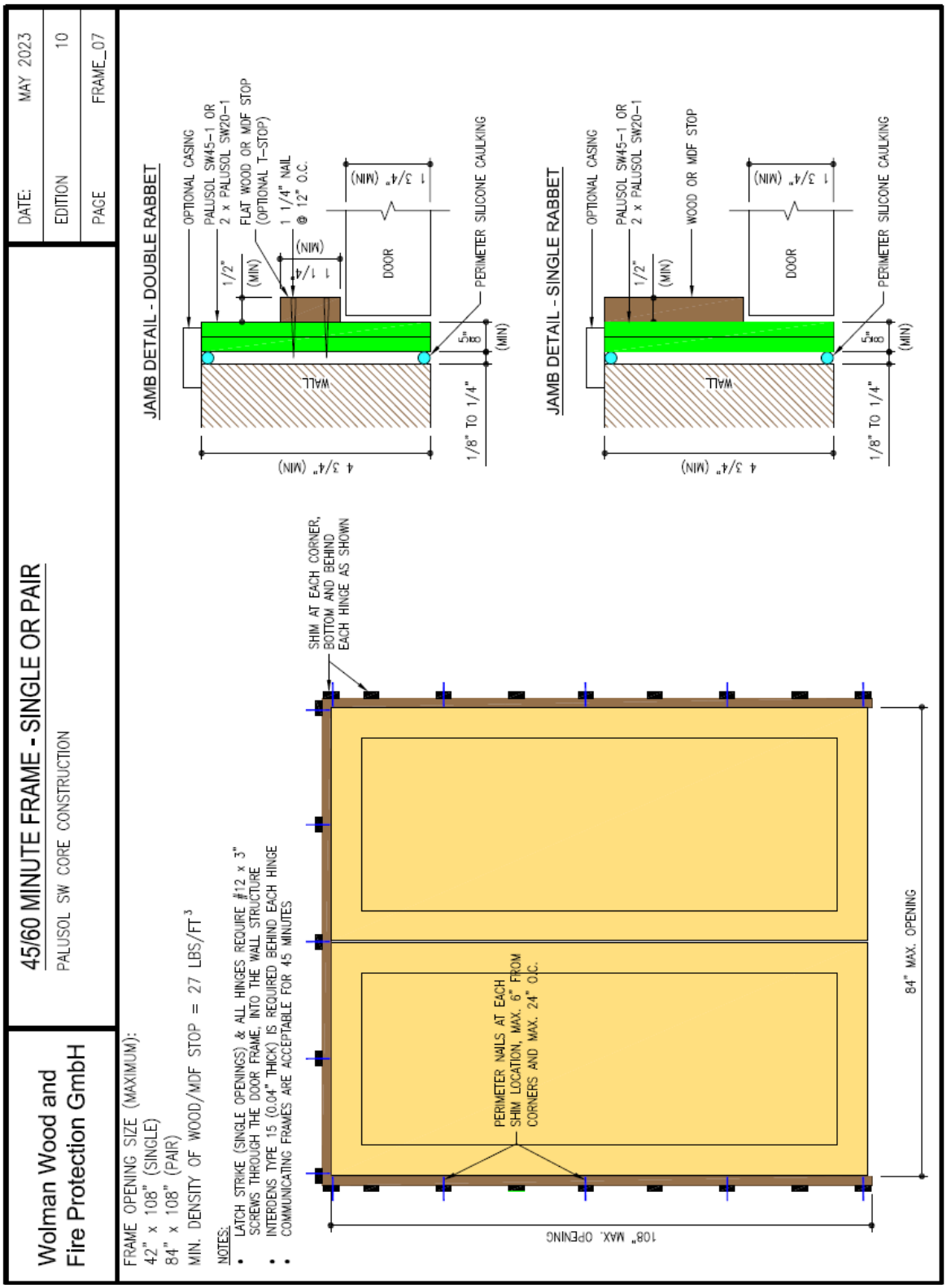

Figure 5: 45 min Wolman single/pair door frame.

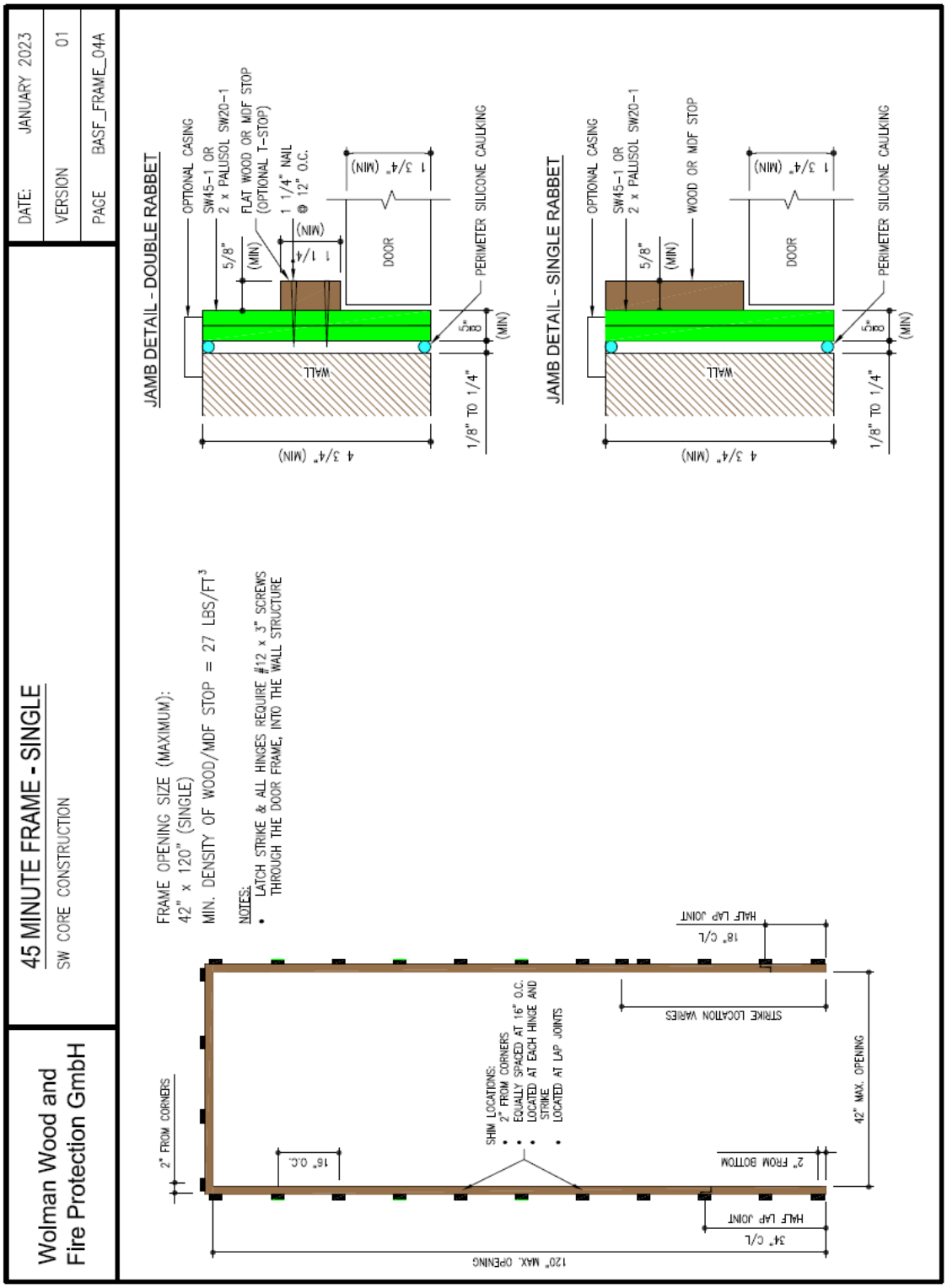

Figure 6: 45 min 10 ft. height frame construction

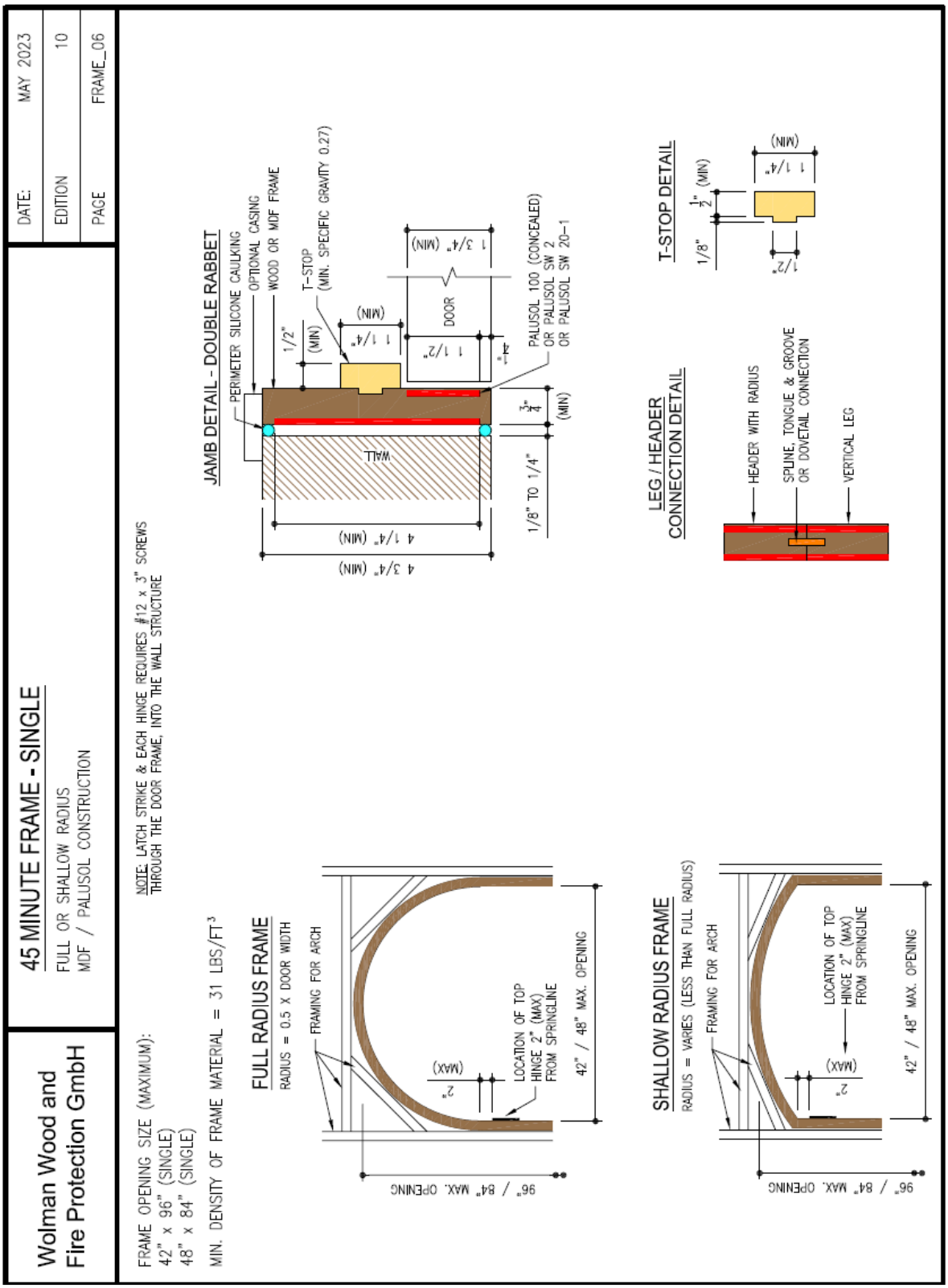

Figure 7: Full arch and low arch frame design.

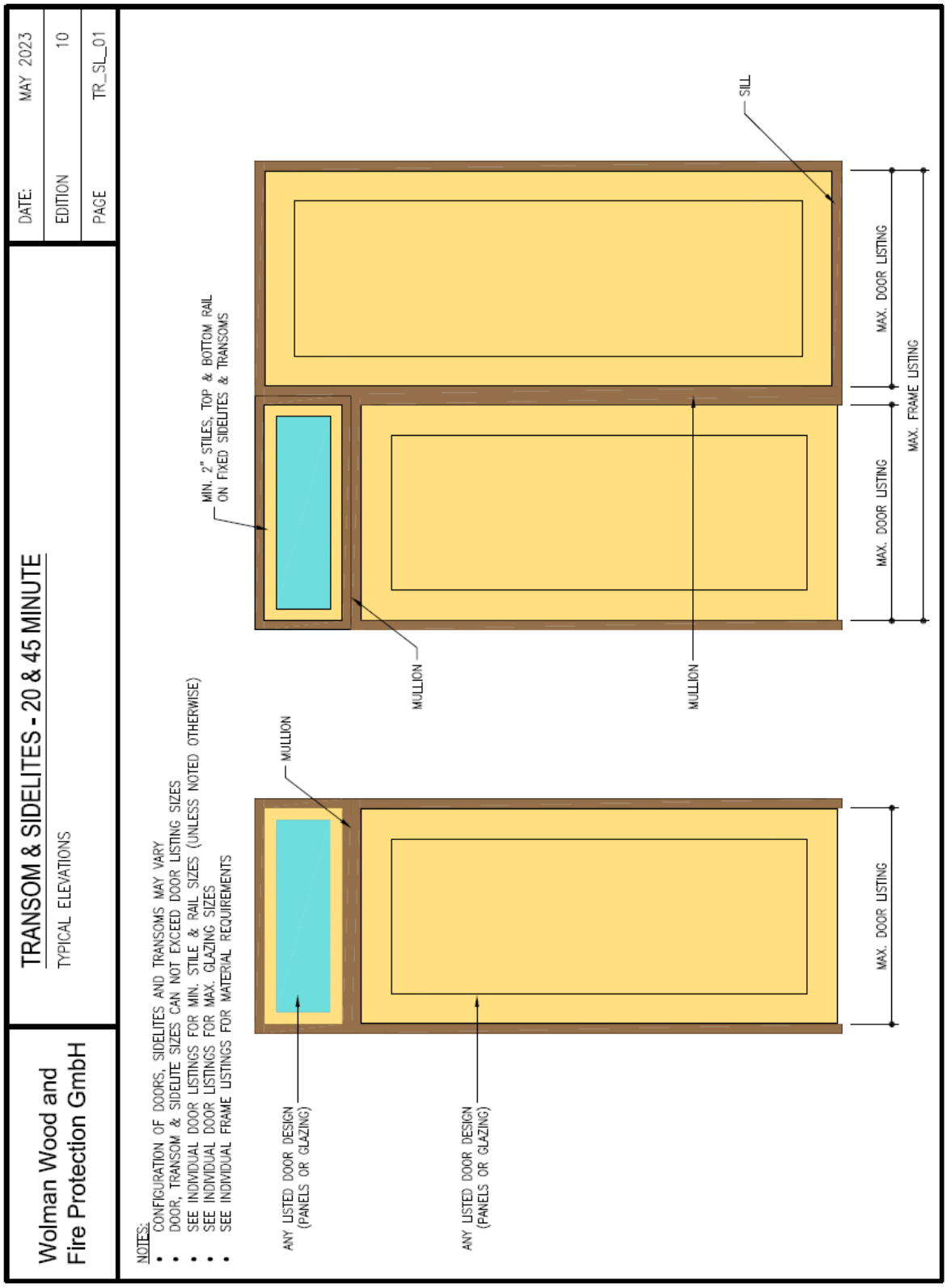

Figure 8: Two mulled frames with a sidelite and a transom.

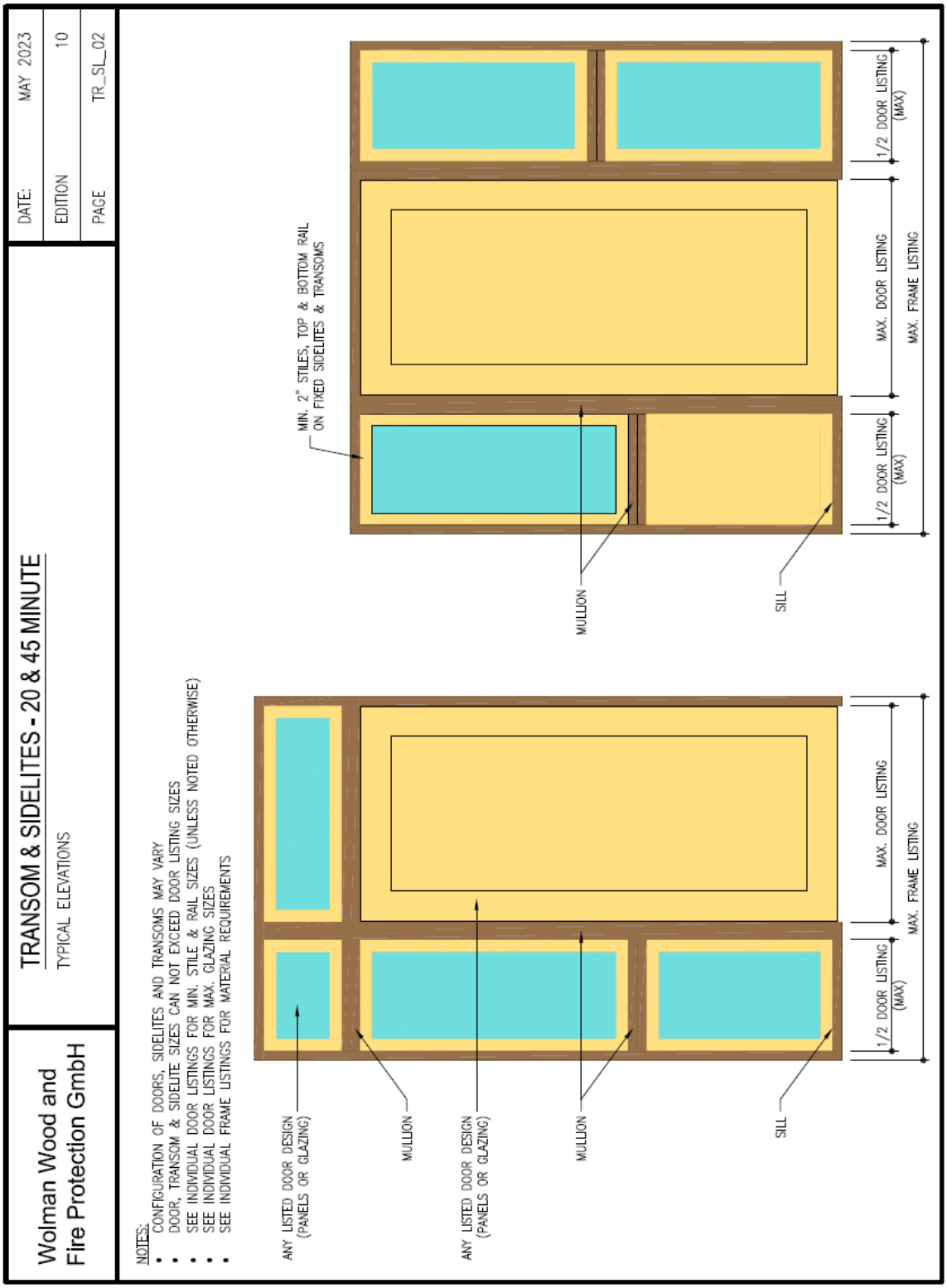

Figure 9: Two mulled frames with divided sidelite and a transom (left).
Full frame mulled together between 2 half width rated frames with divided sidelite (right).

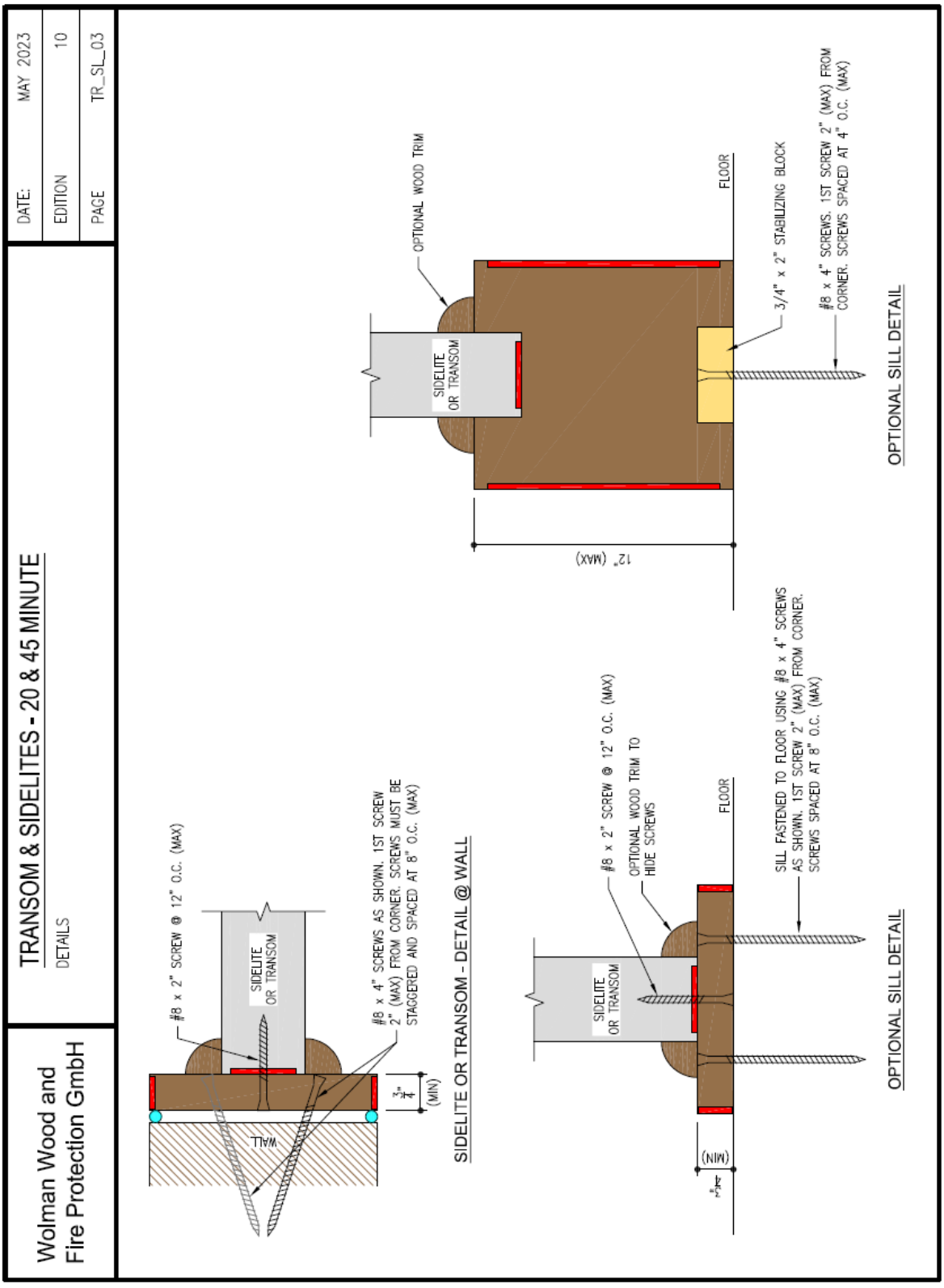

Figure 10: Connection details.

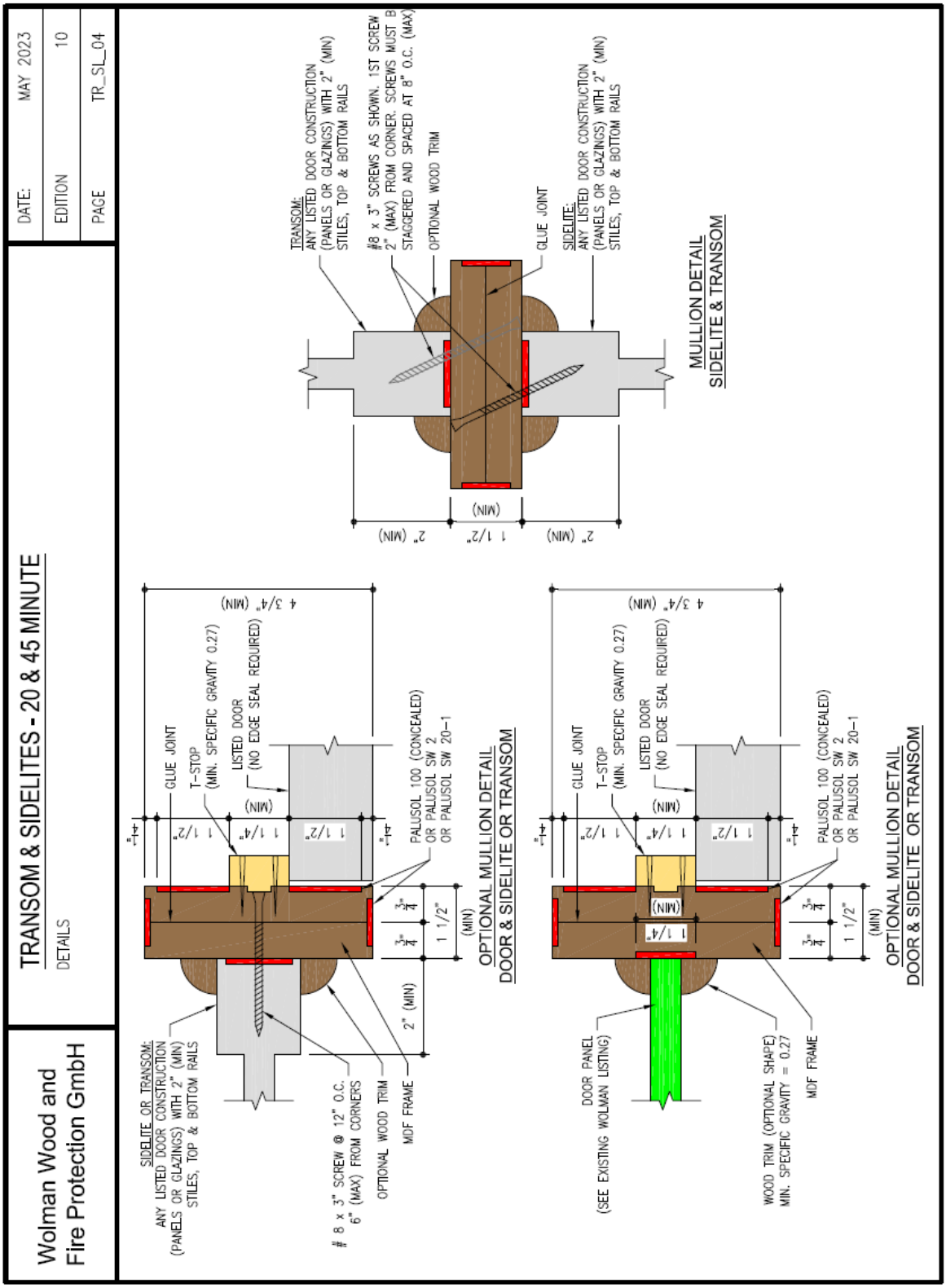

Figure 11: Mullion detail with Slab panel and listed lite kit sidelite.

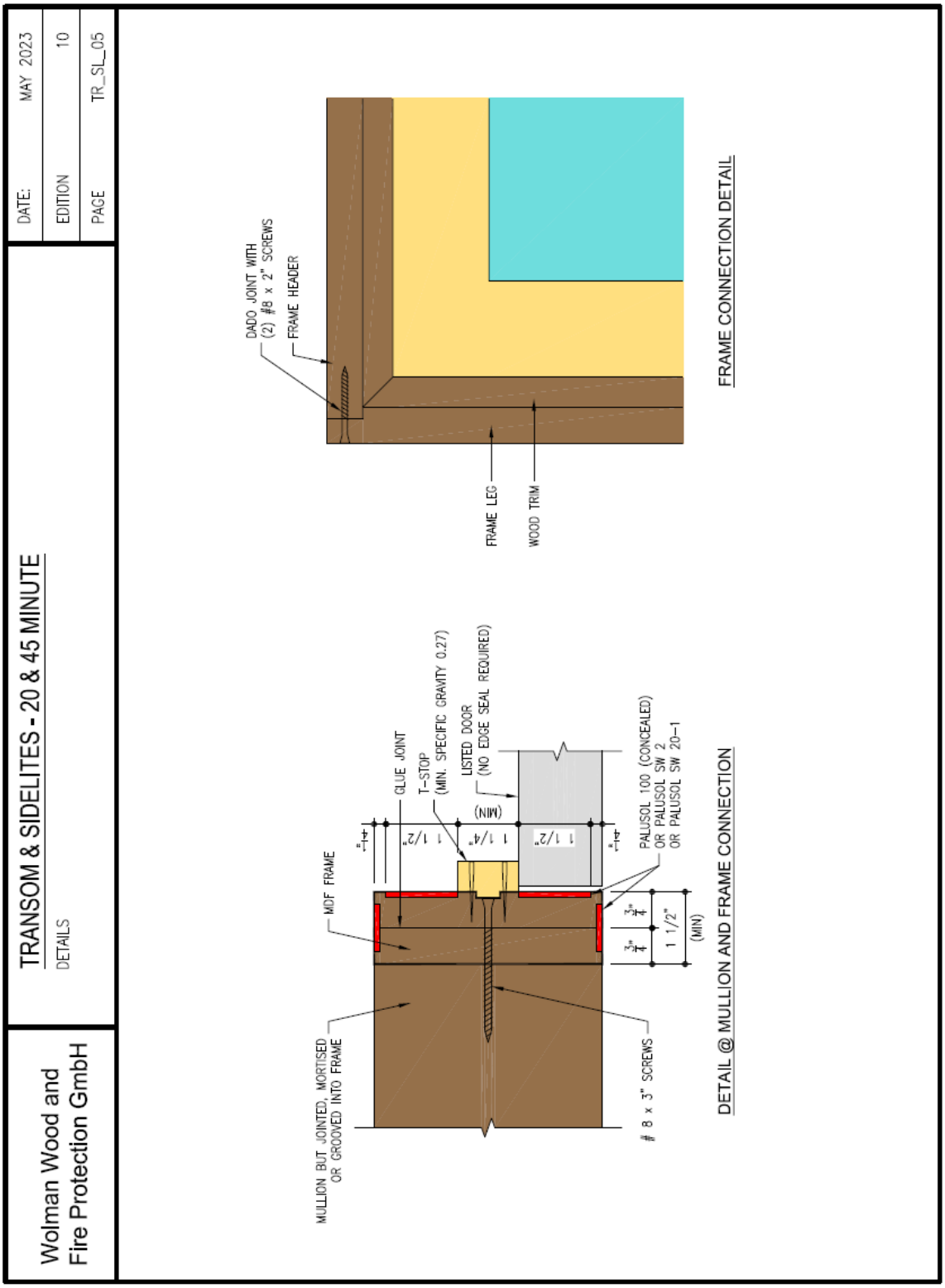

Figure 12: Mullion detail and frame connection detail.

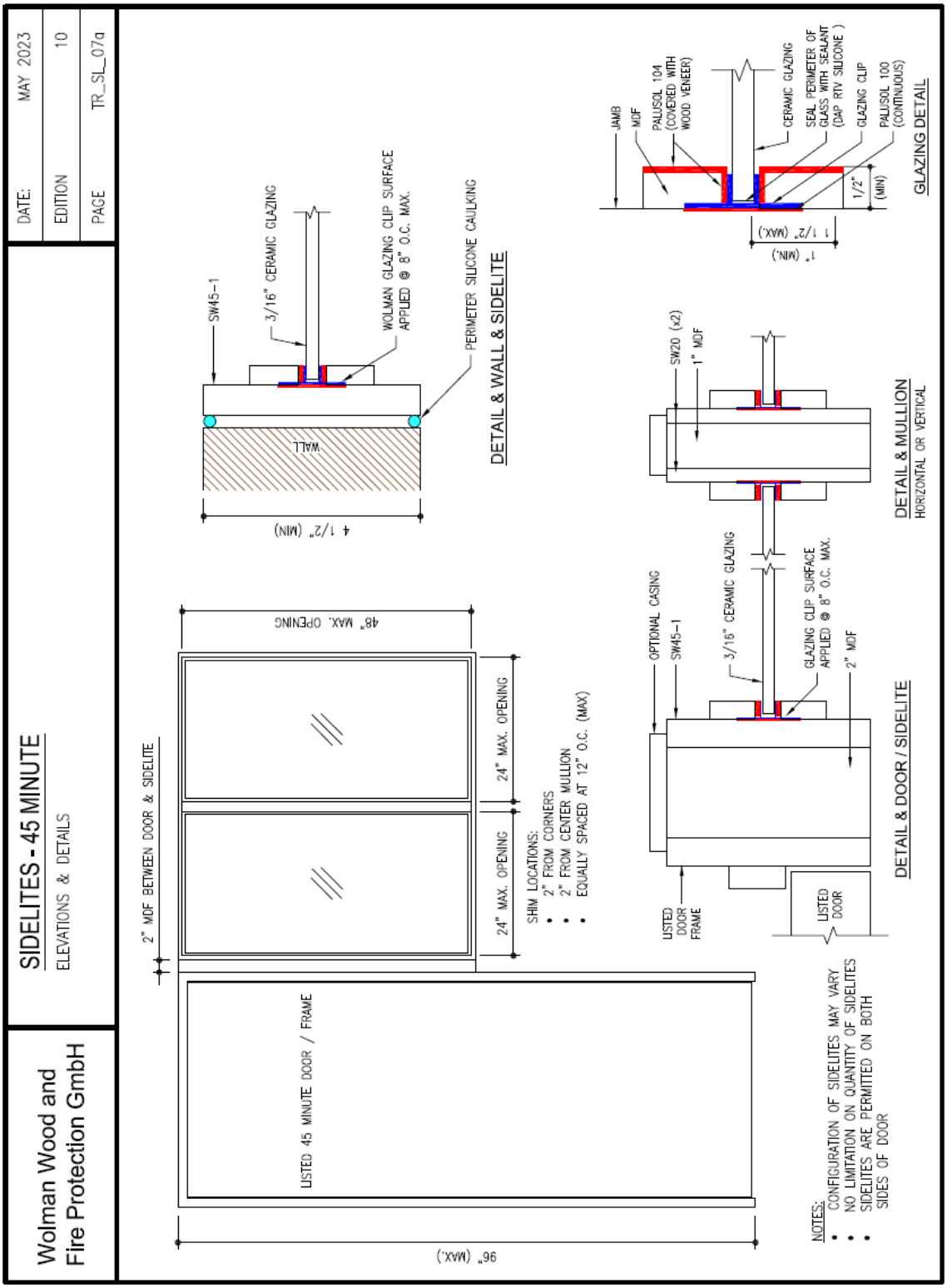

Figure 13: Mulled Sidelites with clip system direct-set glazing

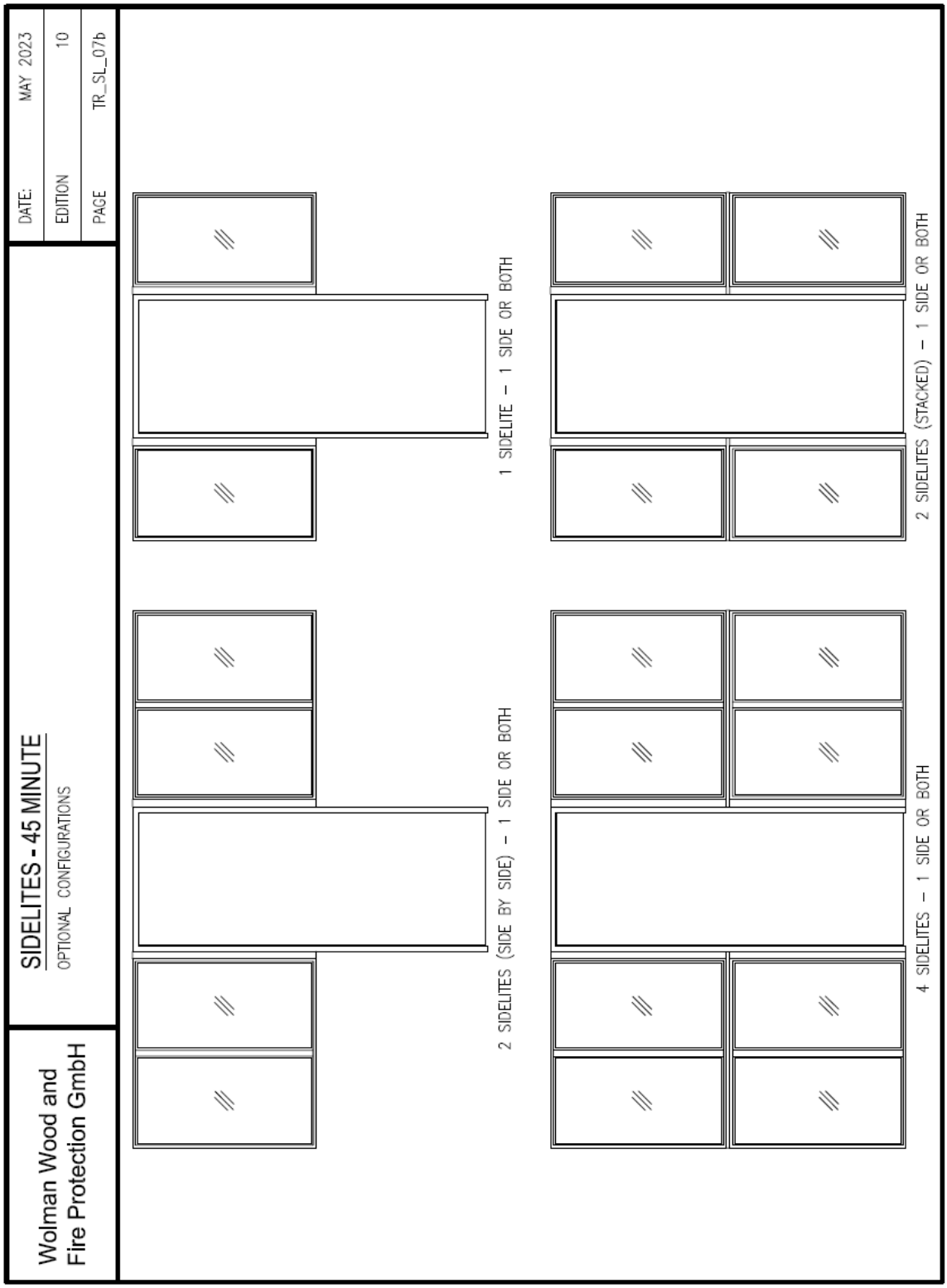

Figure 14: Mulled sidelite and fire window configurations with clip system

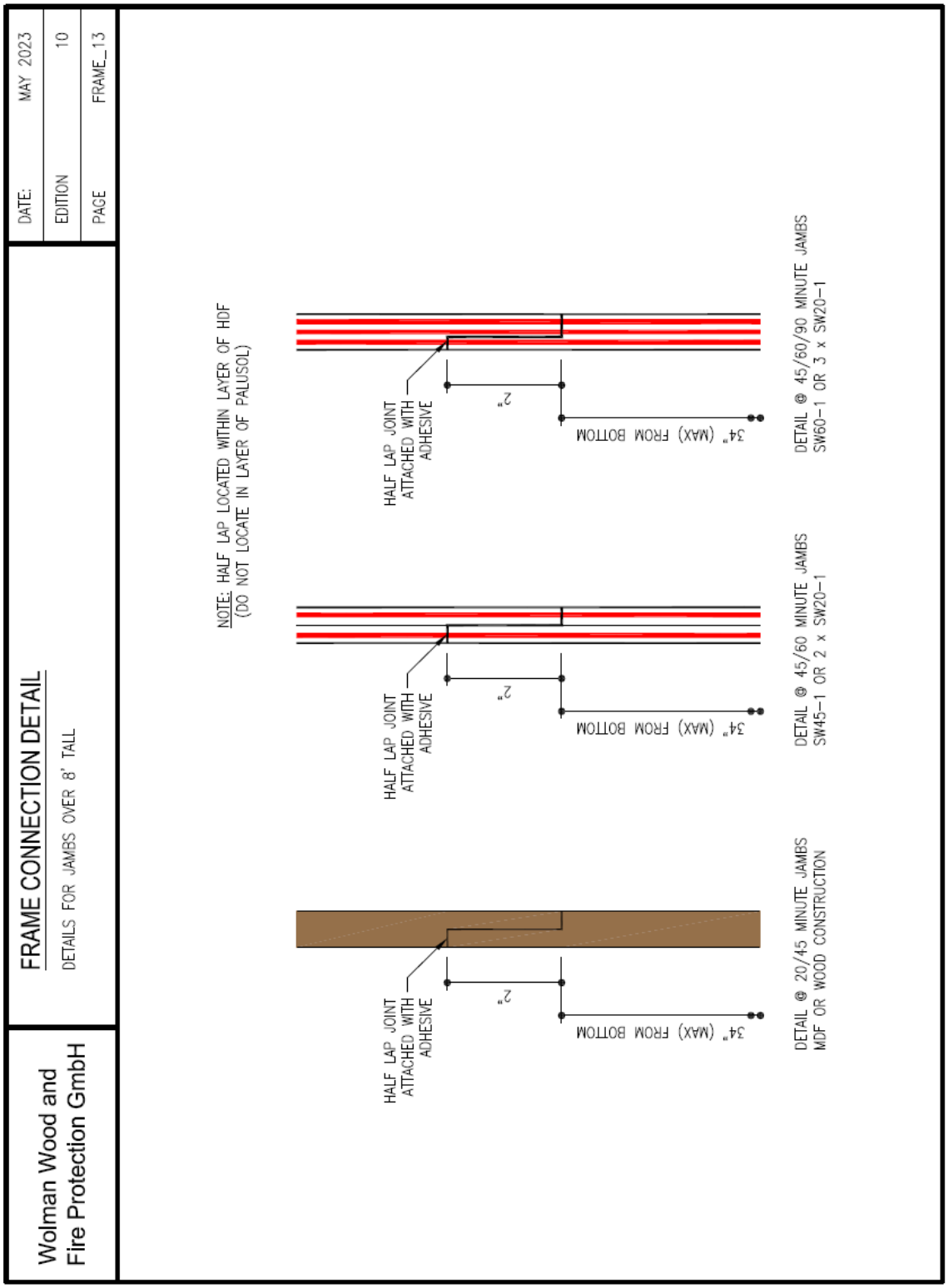

Figure 15: Frame leg extension lap joint detail

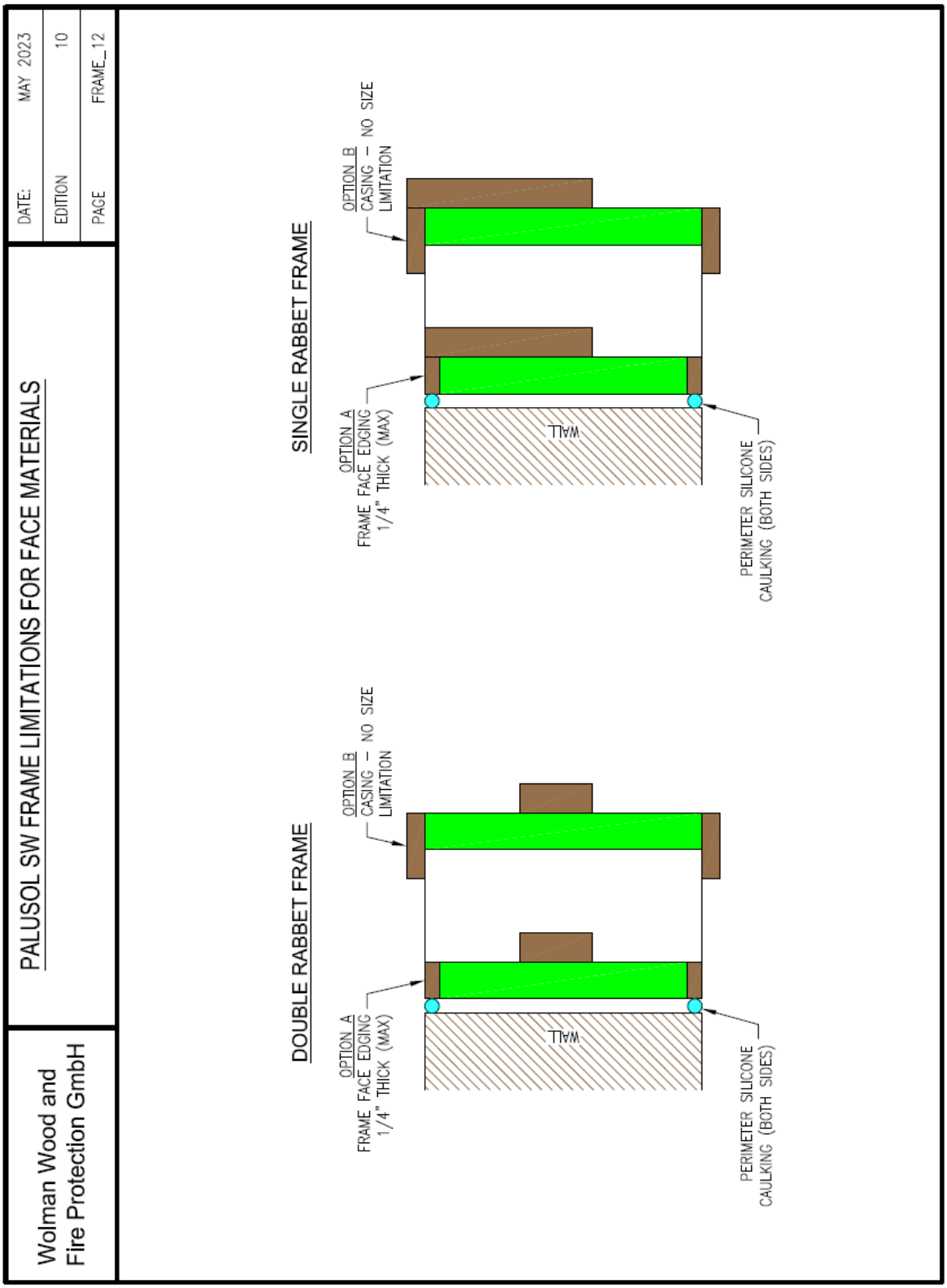

Figure 16: Frame facing options.

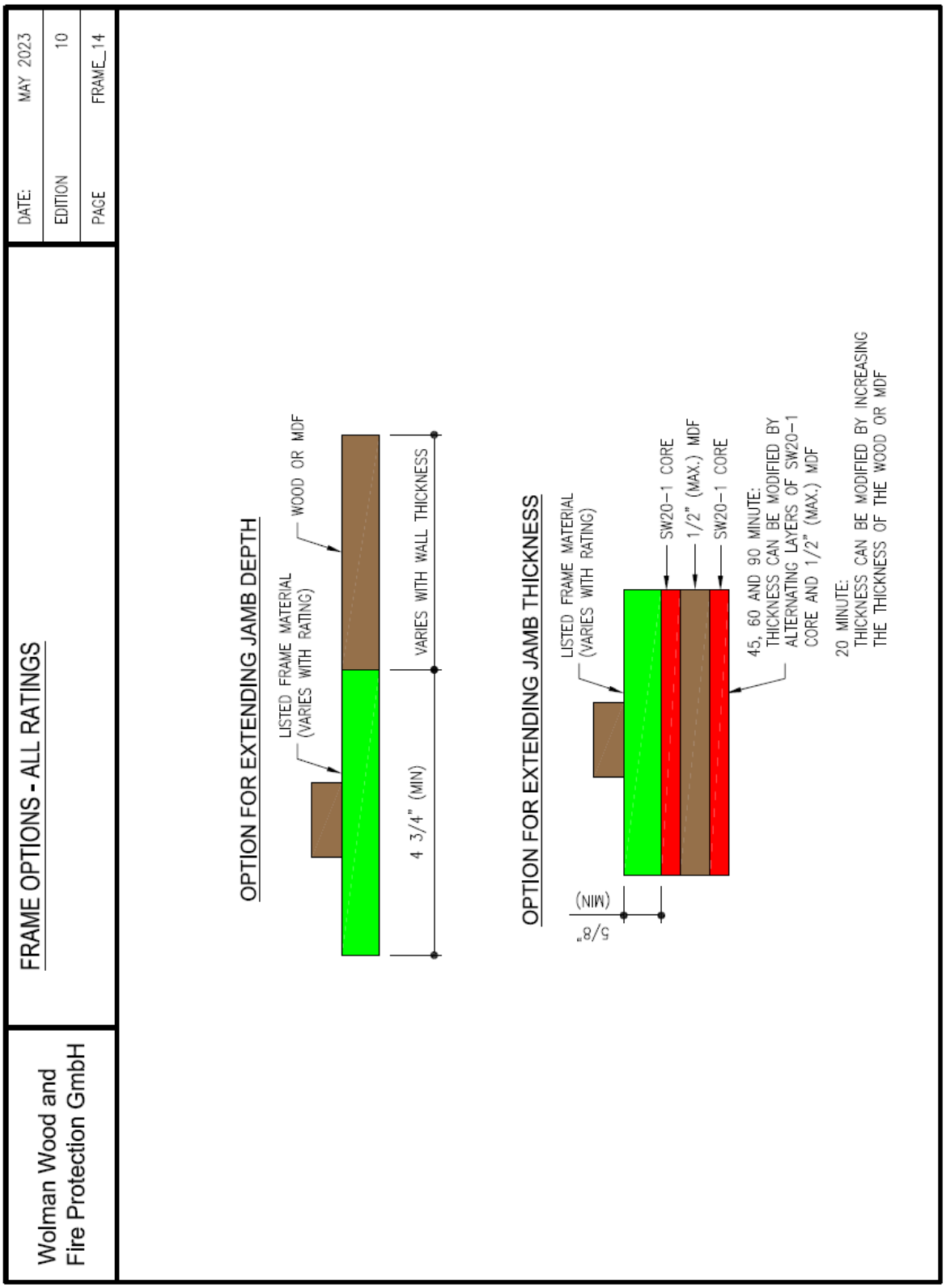

Figure 17: Options for extending jamb depth and thickness.

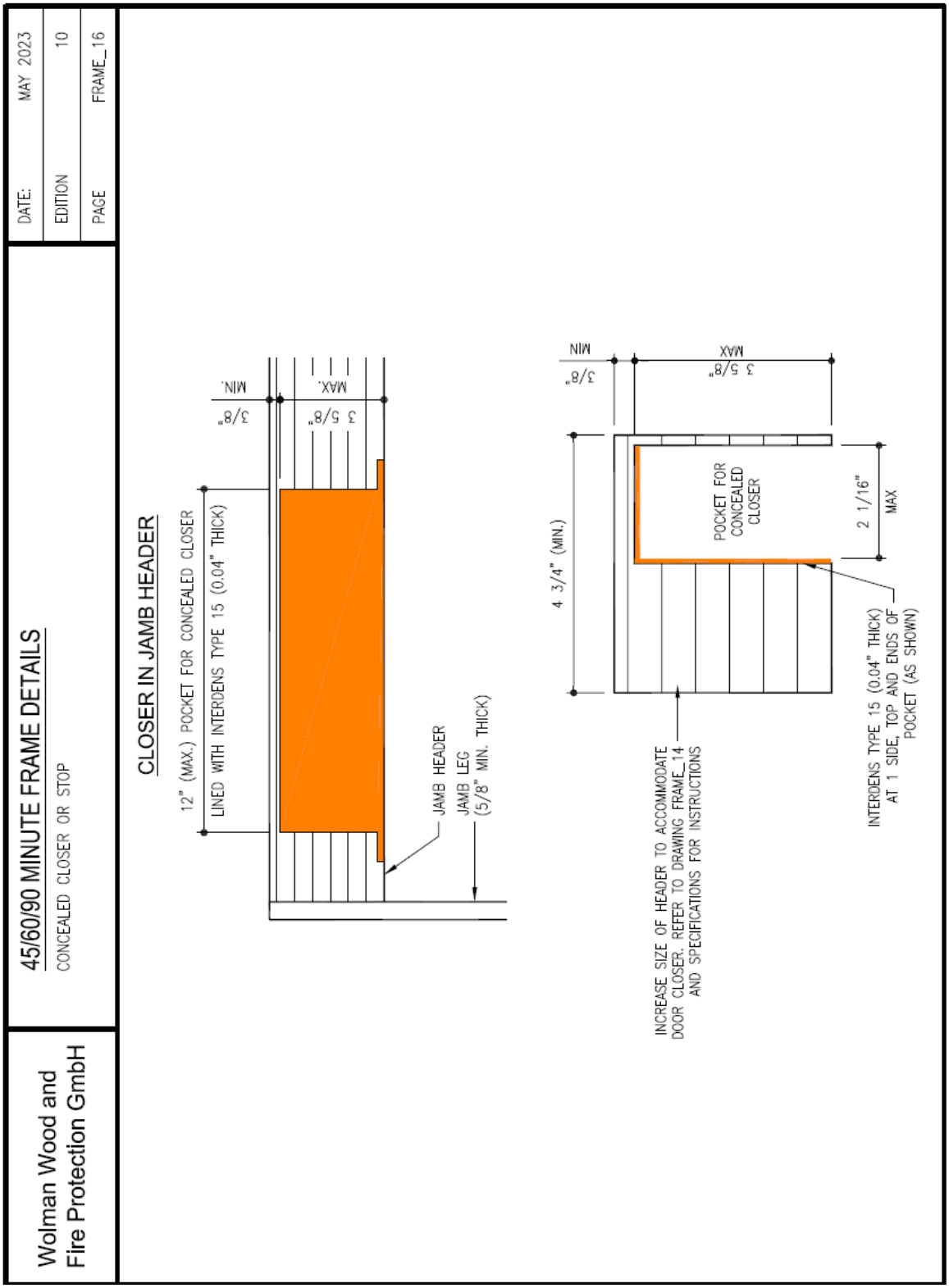

Figure 18: 45 to 90 minutes frame construction details with concealed closer body in the frame.

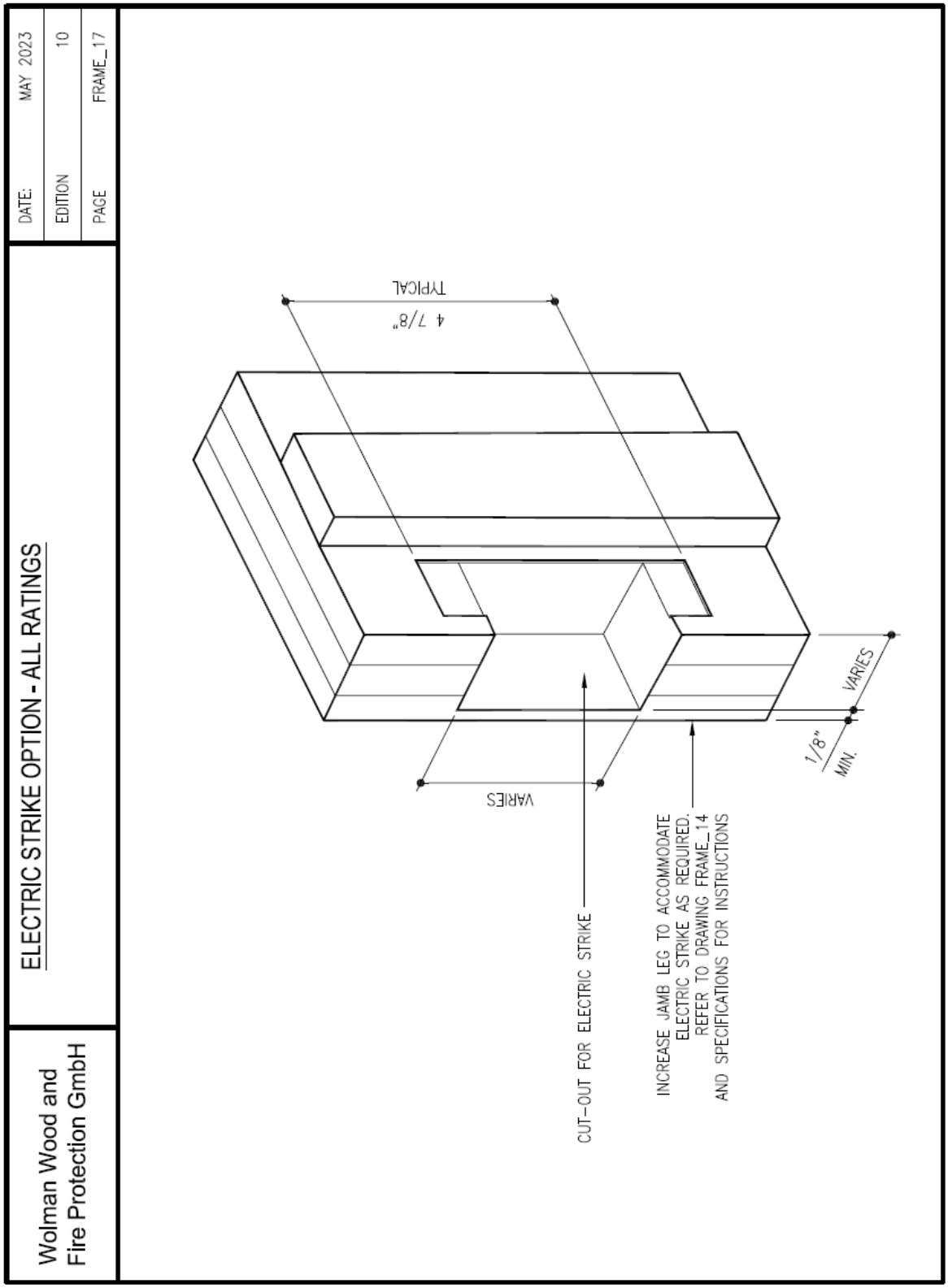

Figure 19: 45 to 90 minutes frame construction details with mortise electric strike

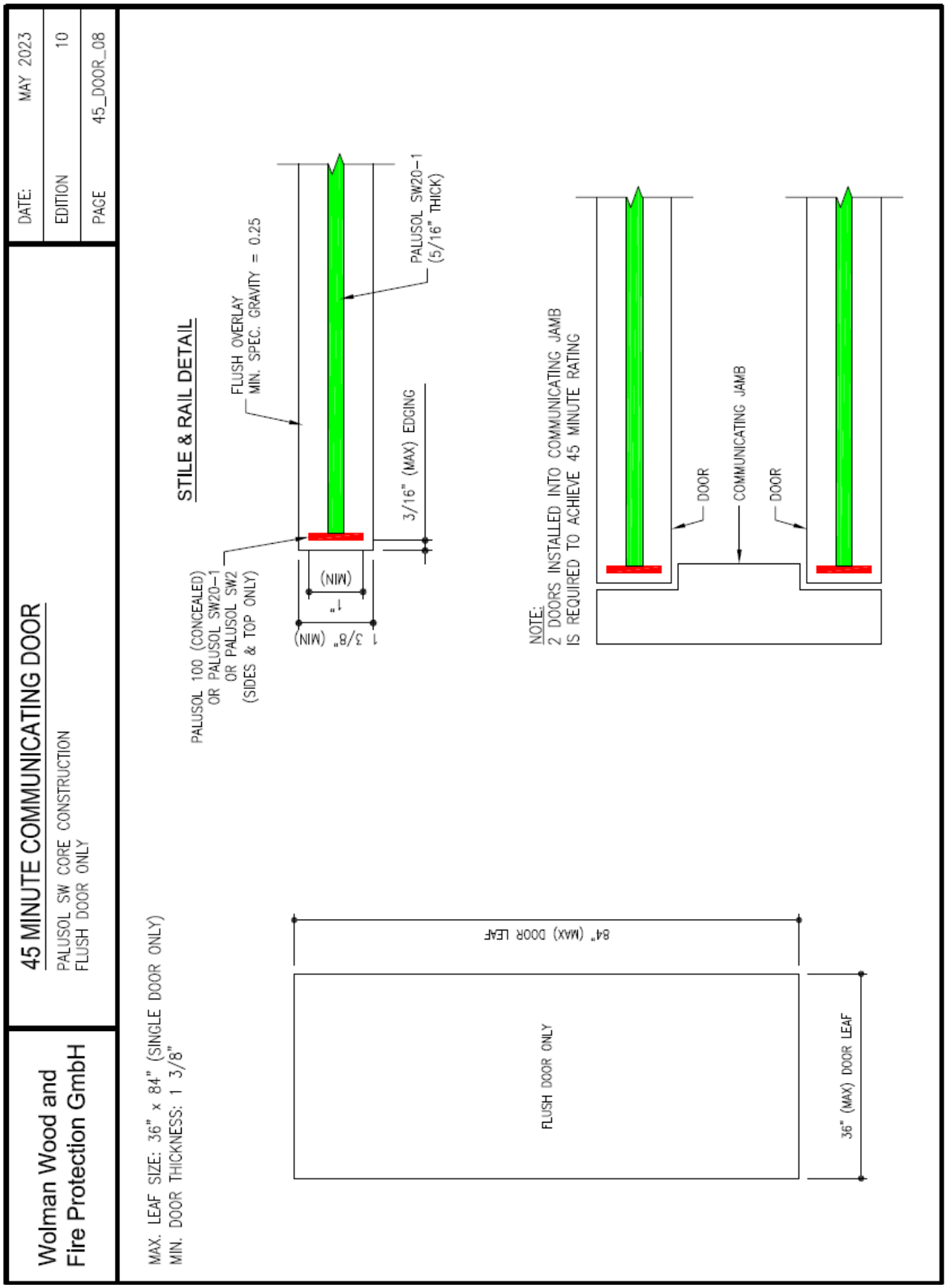

Figure 20: 20 to 45 minutes communicating doors/frame construction details.

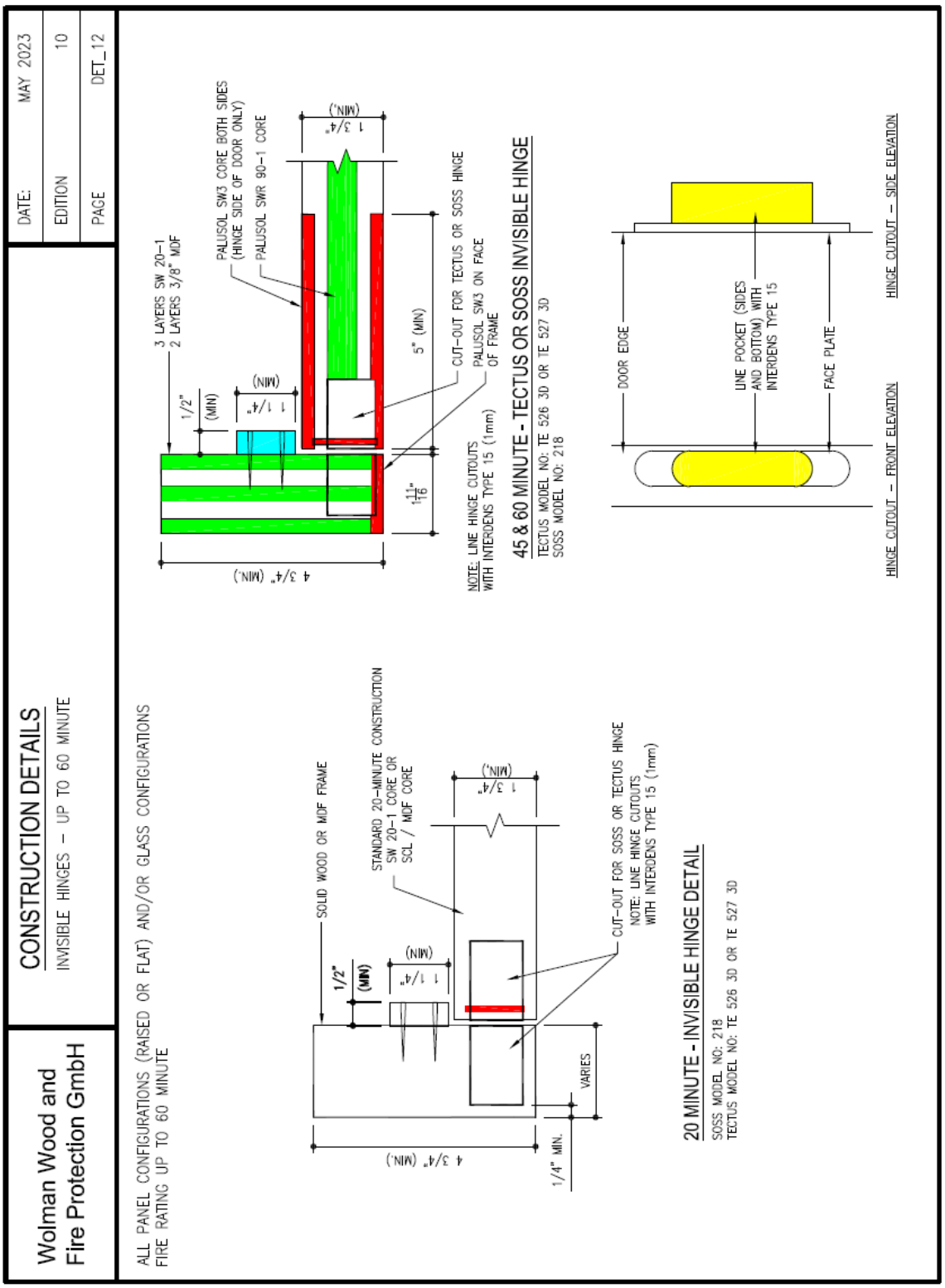

Figure 21: 20 to 60 minutes frame construction details with concealed hinges

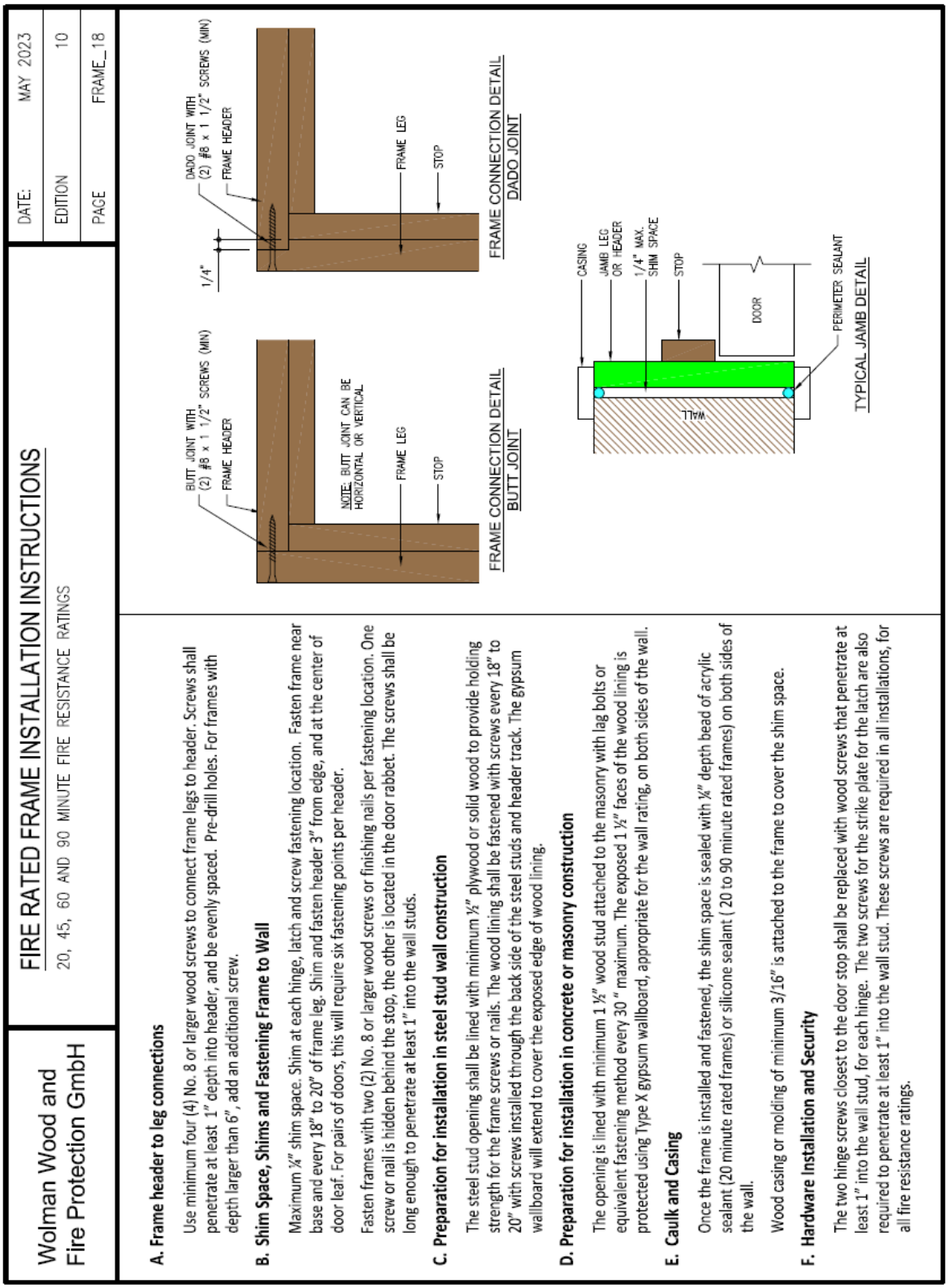

Figure 22: 45 to 90 minutes frame installation instructions