INTERNATIONAL AND FLORIDA BUILDING CODES
ENGINEERING EVALUATION REPORT

Report Number	0093-40	Issue Date	2025-08-18
Client	ENGAGE BUILDING PRODUCTS INC.	Issue Number	1-5934
Address	101-4441 76th Ave SE, Calgary, AB T2C 2G8	Expiry Date	2026-12-31

Subject

Engage Building Products Inc., Quickpanel Systems with 4mm Aluminum Composite Material (ACM) panel exterior cladding system.

Evaluation Scope

This report is provided to assist registered design professionals and building officials in the United States with determining compliance to the performance objectives in the named building codes. The product(s) described herein have been evaluated to the:
2024 International Building Code (IBC); 2023 Florida Building Code (FBC).

CSI DIVISION: 07 00 00 THERMAL AND MOISTURE PROTECTION
SUBDIVISIONS: 07 42 43 Composite Wall Panels

CODE SECTIONS AND STANDARDS

IBC Section	Description	Referenced Standard or Code Section[1]	Year
104.2.2.4	Determination of Compliance, Tests	-	-
1402.2	Exterior Walls, Weather Protection	-	-
1402.3	Exterior Walls, Wind Resistance	IBC Ch 16	-
1406	Metal Composite Materials (MCM)	-	-
1406.2	Exterior Wall Covering	IBC 1406.4 - 1406.13	-
1406.4	Structural Design	IBC Ch 16	-
1406.5	Approval	-	-
1406.6	Weather Resistance	IBC 1402	-
1406.7	Durability	-	-
1406.9	Surface Burning Characteristics	ASTM E84	2021a
1406.10	Type I, II, III, IV Construction	-	-
1406.10.1	Surface Burning Characteristics	ASTM E84	2021a
1406.10.2	Thermal Barriers	-	-
1406.11	Type V Construction	-	-
1406.13	Labeling	IBC 1703.5	-
1609.1.1	Determination of Wind Loads	ASCE 7	2022
1709.3	Load Test Procedures Not Specified	ASTM E330	2014(21)
2002.1	Aluminum General	AA ADM 1 & Ch 16	2020
CH 35	Referenced Standards	ASTM E331	2000(16)

1. Only the applicable reference standards and code sections sited in the main body text are listed. (-) indicates that the main body text covers the full explanation of the objective.

Compliance Statement: It is the opinion of Boca Engineering Co. that Quickpanel Systems with 4mm ACM when installed as described in this report, has demonstrated compliance with the listed sections of the named building codes. Design and performance information can be found in the Product Evaluation section this report.

This report has been prepared and reviewed on behalf of Boca Engineering Co. by:

Christopher Bowness, P.Eng., P.E.	2025-08-18 Issue Date	2026-12-31 Expiry Date

EVALUATION REPORT TERMS

1. This report is a general evaluation of the building code section requirements as identified and applies only to the samples that were evaluated. It does not imply any endorsement or warranty, nor that the signatory Engineer is the Designer of Record of any construction project for which the information is used.
   Rule 61G20-3 (17)(a) Definition: Evaluation report means a report based upon testing or comparative or rational analysis, or a combination thereof, from an approved product evaluation entity or a licensed Florida professional engineer or architect indicating that the product was evaluated to be in compliance with the Code or the intent of the Code and that the product complies with the Code or is, for the purpose intended, at least equivalent to that required by the Code.
2. This Evaluation Report expires 2026-12-31, open to renewal. Up to the renewal date, the report is valid until such time as the named product(s) changes, the Quality Assurance Agency changes, or provisions of the Code that relate to the product change.

CERTIFICATION OF INDEPENDENCE

1. Boca Engineering Co., it's employees and shareholders, do not have, nor do they intend to or will acquire, a financial interest in any company manufacturing or distributing products that they evaluate.
2. Boca Engineering Co. is not owned, operated, or controlled by any company manufacturing or distributing products that they evaluate.

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Product Evaluation

1.0 PRODUCT DESCRIPTION

QuickPanel Systems are aluminum composite panels with back framing stiffeners affixed to wall framing, serving as an exterior wall covering.

Aluminum Composite Material (ACM): The composite panel is nominally 4mm in thickness, composed of an inside and outside skin of nominal 0.5mm thick aluminum sheets bonded to a nominal 3mm thickness inner core of polyethylene with mineral (magnesium hydroxide) fire-retardant, and available in lengths of up 16 ft.

Sub-framing Stiffeners and Trims: The stiffeners and trims are two-piece 6063-T6 aluminum shaped in to the dimensions shown in the part drawings in the appendix.

Fasteners And Adhesives: The fastener used to attach stiffener backplate to framing is #10-12 x 1-1/2” HWH Self Drilling Screw. Stiffener top cap to panel attachment is either 1) Silicone adhesive with 1/16” x 1” Double-sided tape, or 2) Two strips of 1/16” x 1” Double-sided tape.

ACM panels are held in place with adhesive and the flanges of the snap-fit top cap of the edge trims, and adhered to the back-framing stiffeners.

Material	Specification / Grade
Sub-framing Stiffeners & Trims	Aluminum Grade: 6063-T6 Min. Tensile Yield: 25,000 psi Stiffener Top Cap: Mill finish Stiffener Back Plate: Powder Coated All other parts: Powder Coated
Aluminum Composite (ACM) Panels	4 mm total thickness 3 mm FR Core 0.5 mm 3000 Series Aluminum Skins Paint/Finish: PVDF AAMA 2605
	Relative Stiffness EI: 2200 lb-in^2/in-width
	Certified to ICC-ES AC25 by an accredited product certification agency[1]
Silicone	ASTM C920 Type S, Grade NS, Class 50, Use NT, G, and A, and ASTM C1184, Peel Adhesion tested with Aluminum
3M Double-sided tape	VHB RP+160GF
3M Tape Primer	Isopropyl alcohol

1. ACM panels supplied to ENGAGE are certified by the International Code Council's ICC-ES or an ICC-IAS accredited product certification body and labeled as meeting ICC-ES AC 25, *Acceptance Criteria for Metal Composite Material*.

2.0 INSTALLATION

2.1. Exterior cladding shall be installed in accordance with the respective state building code, manufacturer's published instructions and this report, subject to the limitations in section 4.0 LIMITATIONS.

2.2. Wall framing construction and water-resistive barrier for which the cladding is to be installed over shall be designed and installed in accordance with the respective state building code.

2.3. Assembly installation details that have been assessed:

a. Table 2 in ATTACHMENT 1: QUICKPANEL SYSTEMS WIND PRESSURE ASSEMBLY TABLES, and

b. Assembly diagrams in ATTACHMENT 2: ASSEMBLY DIAGRAMS.

3.0 CODE SECTIONS REVIEW

IBC Section — **Description**

104.2.2.4 **Determination of Compliance, Tests**

Tests conducted to demonstrate evidence of code compliance are by "test methods specified in this code or by other recognized test standards" as instructed by IBC 104.2.2.4.

1402.2 **Exterior Walls, Weather Protection**

A representative wall construction assembly with Quickpanel installed on light-frame construction with a water-resistive barrier and flashing as described in this evaluation report has been tested to and met the criteria of AAMA 508-21, *Voluntary Test Method and Specification for Pressure Equalized Rain Screen Wall Cladding Systems* at a test pressure of 6.2 psf to confirm that the wall assembly prevents accumulation of water and has an adequate means of drainage.

1402.3 **Exterior Walls, Wind Resistance**
The structural design loads described in this report are in accordance with Ch 16 of the IBC.

1406 **Metal Composite Materials (MCM)**
See commentary to 1406 sub-sections.

1406.2 **Exterior Wall Covering**
Quickpanel Systems used as an *exterior wall covering* comply with Sections 1406.4 through 1406.13.

1406.4 **Structural Design**
The structural design analysis conducted in this report is in accordance with Ch 16 of the IBC. Testing, strength and serviceability of the cladding system have been assessed following provisions in Aluminum Association AA ADM-20, *Aluminum Design Manual*.

1406.5 **Approval**
This evaluation report of *approved* tests and engineering analysis may be submitted to the *building official* to verify compliance with the requirements of Chapter 16 for wind *loads.*

1406.6 **Weather Resistance**
Quickpanel Systems complies with Section 1402 and is designed and constructed to resist wind and rain in accordance with this section and the manufacture's installation instructions. Also, see commentary to IBC 1402.2.

1406.7 **Durability**
Quickpanel Systems are constructed of generally *approved* materials commonly used in exterior construction and regarded as to maintain the performance characteristics required in Section 1406 for the duration of use. Validation of the core components having evidence of durability to variable and enduring climate conditions has been made accordingly.
Product components were tested to the following standards:

- 3M Tape was tested to ASTM E2264-level 3: 14x 12-hour cycles of -33° F - +180° F, adhered panels were then assessed for no evidence of warping or attachment failures.
- ACM panel bond testing meets ICC-ES AC 25- section 4.6 *Freeze-thaw criteria*: 10x freeze thaw cycles of: exposure to air 120°F for 8 hours, submersion in water at 75 °F for 8 hours, exposure to air at -20 °F for 16 hours. The conditioned panels are assessed to show no evidence of delamination and bond tested to ASTM D1781 and to receive an average peel torque value of equal to or greater than 22.5 inch-pounds per inch.
- Silicone: The specified silicone is labeled as meeting ICB Ch. 35 referenced standard ASTM C920, *Standard Specification for Elastomeric Joint Sealants*, as well as meeting ASTM C1184, *Standard Specification for Structural Silicone Sealants*. ASTM C1184 contains several tests assessing durability aspects, including: 1) Integrity after 21-days of heat aging at 190 ° F, 2) Testing minimum 50 psi tensile strength at i) 190 ° F, ii) -20 ° F, iii) after 7-days of water immersion, iv) after 5000 hrs of simulated UV light exposure.

1406.9 **Surface Burning Characteristics**
See commentary to IBC 1406.10.1

1406.10 **Type I, II, III, IV Construction**
Where installed on *buildings* of Types I, II, III and IV construction, Quickpanel Systems complies with Sections 1406.10.1 and 1406.10.2 for installations up to 40 feet (12, 192 mm) above *grade plane.* Installations above 40 ft have not been assessed.

1406.10.1 **Surface Burning Characteristics**
Quickpanel Systems have a *flame spread index* of no more than 25 and a *smoke-developed index* of not more than 450 when tested in accordance with ASTM E84.

1406.10.2 **Thermal Barriers**
Quickpanel Systems must be separated from the interior of a *building* by an *approved* thermal barrier consisting of ½- inch (12.7 mm) *gypsum wallboard* or material that meet the requirements of NFPA 275.

1406.11 **Type V Construction**
Quickpanel Systems are permitted to be installed on *buildings* of Type V construction.

1406.13 **Labeling**
Quickpanel Systems are *labeled* in accordance with Section 1703.5.

1609.1.1 **Determination of Wind Loads**
Wind load pressure (psf) applied to the cladding for use with the design values published in this report are determined in accordance with Chapter 30 of ASCE 7.

1709.3 **Load Test Procedures Not Specified**
The load test procedure in IBC-referenced standard ASTM E330 and design load factors in IBC 1709.3.1 were used in this evaluation.

2002.1 **Aluminum General**
The design of structural components using aluminum material complies with AA ADM 1.

CH 35 **Referenced Standards**
ASTM E331, *Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Uniform Static Air Pressure Difference,* was performed according to AAMA 508 section 6.1, and run for fifteen minutes at a specified pressure of 6.2 psf and a water spray rate of at least 5.0 U.S. gal/ft^2 per hour, having no water penetration through the backside of the assembly. ASTM E331 is a referenced standard in IBC 2024.

4.0 LIMITATIONS

1. This evaluation is for the base code requirements of the building system as addressed in this report. In some building applications, additional performance objectives may be required by code which must be addressed in the building design for those specific cases.
2. Design calculations, drawings, and special inspections are to be furnished for building projects by registered professionals as required by the respective jurisdictional authorities and codes.
3. The scope of evaluation does not include loads acting on Quickpanel exterior cladding due to earthquakes.

4. Wall assemblies with Quickpanel systems, to achieve the wall assembly water-resistance performance standards as stated in this report, must be constructed with the components of water-resistive barrier per IBC 1403.2, and flashing per IBC 1404.4.
5. Screws must be corrosion-resistant in accordance with IBC 1404.5.
6. Wall framing and sheathing to which the siding is attached must be designed and installed for the applicable wind pressure and other climate and occupancy loads as required by code for the construction project. Where framing and sheathing details are provided in this report, they represent the minimum tested or calculated materials for the required strength of attachment for the wall cladding. The wall framing structural design and performance is outside the scope of this report.
7. The scope of evaluation does not include siding applications where interior or exterior wall Fire Resistance rating, non-combustible or limited-combustible classification is required.

5.0 FIRE CLASSIFICATION

Summary of fire performance classifications found by testing to code referenced standards:
ASTM E84: Flame Spread Index (FSI): < 25, Smoke Developed Index (SDI): < 450, Class A
The ACM panels are classified as combustible material.

6.0 QUALITY ASSURANCE ENTITY

The products evaluated in this report are surveyed at the approved manufacturing locations with third-party quality assurance inspections and labeling by QAI.

7.0 MANUFACTURING PLANTS

The manufacturing plants of roofing materials covered in this evaluation report are located in: Calgary, AB.

8.0 LABELING

Labeling shall be in accordance with the requirements of the 2024 IBC, and the Accredited Quality Assurance Agency.

9.0 REFERENCE TESTING AND EVALUATION DOCUMENTS

Entity	Entity Accreditation[1]	Standards	Report No.	Issue Date
Boca Eng.	Note 2	ASTM E330	0093-31-1	2025-02-24
Intertek	IAS TL-274	AAMA 508	106028953COQ-010	2025-05-13
Intertek	IAS TL-274	ASTM E331	106028953COQ-010	2025-05-13
Engage	Note 3	ICC-ES AC 25 and ASTM E84	QCM2025-06-10[3]	2025-06-10
Intertek	IAS TL-144	ASTM E2264	L6017.01-201-44 R0[4]	2020-12-21
QAI	AA-723	Quality Assurance	QAI-2777	2025-08-08

1. Testing, certification, evaluation, and inspection agencies referenced have been verified to be accredited by the International Accreditation Service (www.iasonline.org) for the applicable scope, in good standing on the date of the evaluation, in accordance with ISO 17025 and ISO 17020 international standards for testing and inspection bodies.
2. Professional Engineer sealed report.
3. Quickpanel's purchasing specifications in QC documents requires the ACM panels to conform to ICC-ES AC25 which includes the ASTM E84 testing.
4. Test was performed for 3M and provided to ENGAGE with permission to use the data.

– END –

– ATTACHMENTS BEGIN NEXT PAGE –

Attachments

ATTACHMENT 1: QUICKPANEL SYSTEMS WIND PRESSURE ASSEMBLY TABLES

The Quickpanel Systems wind pressures tables have been developed to assist users with determining appropriate installation details for a range of wall construction components, building dimension plans, and site and environmental conditions. At any building height, when the Allowable Pressure (ASD) has been pre-determined by the designer or building official, the user only needs to check that the installation detail is shown as capable of that pressure or greater.

Table 2 Notes:

1. The siding has been tested to the published allowable pressures at the respective bending limitation of L/180 for wall heights up to 10 ft. Where framing and sheathing details are provided in these tables, this represents only the minimum tested or calculated materials for the required strength of attachment of the cladding. Primary structural building loads and capacity of the building framing is outside the scope of this table and must be designed and installed for the applicable wind, climate and occupancy loads as required by the code for the construction project. See ATTACHMENT 3 of the report for further discussion.
2. Further assembly details per Tables 2 and additional details in the assembly diagrams of this report to be followed.
3. Steel framing minimum yield strength of 33 ksi and 18 ga (43 mil) thickness, unless noted otherwise. The framing members may be substituted with i) any larger section dimension of the same material, ii) greater yield strength, and/or, iii) greater gauge thickness.
4. The structural framing and sheathing shall be designed and anchored to provide lateral bracing and properly transfer all loads to the structure. Framing design and installation is the responsibility of the engineer or architect of record for the project of installation.
5. Gypsum Sheathing (Gyp.) must comply with ASTM C1177 and be rated by the manufacturer for exterior use; gypsum thickness may not be increased.
6. Fasteners supplied with Quickpanel cladding must be used. Metal screws to conform to ASTM C1513.
7. Adhesives as specified in this report: i) Tape: 3M VHB RP+160GF double-sided tape, ii) Silicone: Labeled as compliant with ASTM C920 Type S, Grade NS, Class 50, Use NT, G, and A, and ASTM C1184.
8. Refer to manufacturer's data for information regarding adhesive's acceptable application temperature range of the atmosphere and substrate materials.
9. Allowable pressure (psf) (ASD) represents tested assembly ultimate pressure divided by a safety factor of 2.5.
10. Allowable wind pressure (ASD), as defined in ASCE 7-22 2.4.1 as 0.6W. To convert to Factored Design Resistance Pressure (psf) (LRFD), multiply Allowable Pressure (psf) (ASD) by 1.67.
11. Interpolation not permitted.

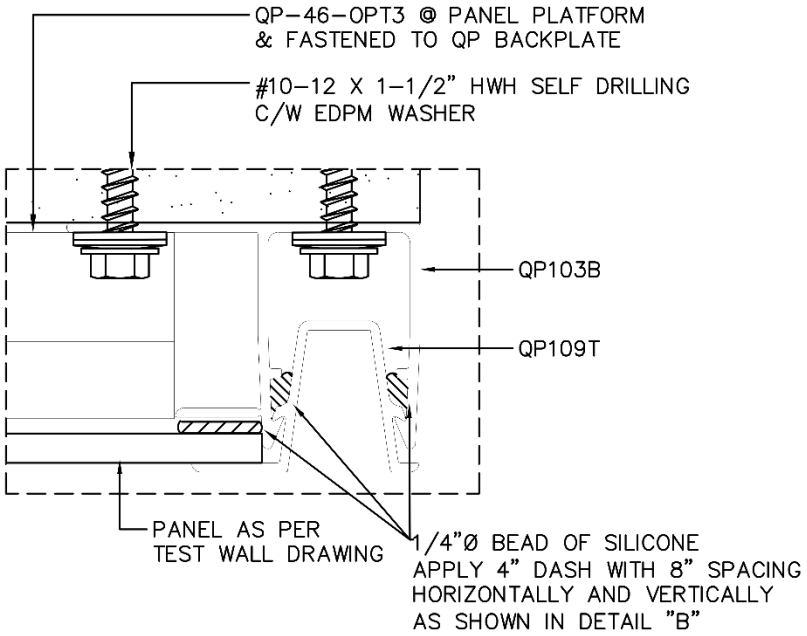
Table 2: Wind Assembly Details with Quickpanel 4 mm ACM – 2024 IBC; 2023 FBC Height Limit of 10 ft, Bending Defection Limit of L/180[1]						
Assembly Number[2]	**Stiffener Configuration[2]**	**Framing[3,4]**	**Sheathing[4,5]**	**Fastener - backplate into framing[6]**	**Adhesive – stiffener to ACM panel[7,8]**	**Allowable Pressure (psf) (ASD)[9,10,11]**
QG5	no stiffeners	2x6 18 ga 33 ksi steel stud @16"o/c	½" Drywall	#10 – 12 x 1-1/2" metal screw	NA	29
QI1	Horizontal, spaced @ 24" o/c	2x6 18 ga 33 ksi steel stud @16"o/c	½" Drywall	#10 – 12 x 1-1/2" metal screw	2-strips tape	56
QI3	Horizontal, spaced @ 12" o/c	2x6 16 ga 50 ksi steel stud @16"o/c	½" Drywall	#10 – 12 x 1-1/2" metal screw	2-strips tape	104
QI4	Horizontal, spaced @ 24" o/c	2x6 16 ga 50 ksi steel stud @16"o/c	½" Drywall	#10 – 12 x 1-1/2" metal screw	2-strips tape	85
QI5	Horizontal, along center line of panel	2x6 16 ga 50 ksi steel stud @16"o/c	½" Drywall	#10 – 12 x 1-1/2" metal screw	2-strips tape	58
QI6	Horizontal, along center line of panel	2x6 18 ga 33 ksi steel stud @16"o/c	½" Drywall	#10 – 12 x 1-1/2" metal screw	2-strips tape	58
QI7	2-Horizontal, along center line 2-5/8"apart	2x6 16 ga 50 ksi steel stud @16"o/c	½" Drywall	#10 – 12 x 1-1/2" metal screw	2-strips tape	73
QI9	Horizontal, spaced @ 12" o/c	2x6 18 ga 33 ksi steel stud @16"o/c	½" Drywall	#10 – 12 x 1-1/2" metal screw	2-strips tape	85
QI2	Horizontal, spaced @ 24" o/c	2x6 18 ga 33 ksi steel stud @16"o/c	½" Drywall	#10 – 12 x 1-1/2" metal screw	1-strip tape, 1-bead silicone	85
QI8	Horizontal, along center line of panel	2x6 16 ga 50 ksi steel stud @16"o/c	½" Drywall	#10 – 12 x 1-1/2" metal screw	1-strip tape, 1-bead silicone	49
QI10	Horizontal, spaced @ 24" o/c	2x6 16 ga 50 ksi steel stud @16"o/c	½" Drywall	#10 – 12 x 1-1/2" metal screw	1-strip tape, 1-bead silicone	123

1. See General Notes for Table 2 on page 9 for referenced superscript table notes.

ATTACHMENT 2: ASSEMBLY DIAGRAMS

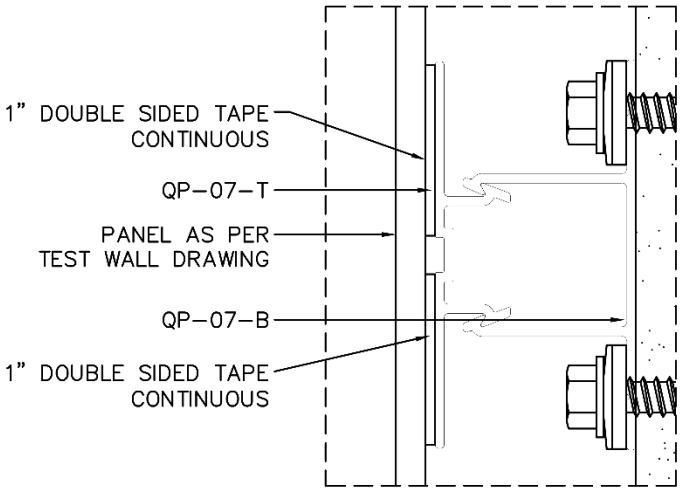
Begins next page.

QI TEST DETAILS 1of1



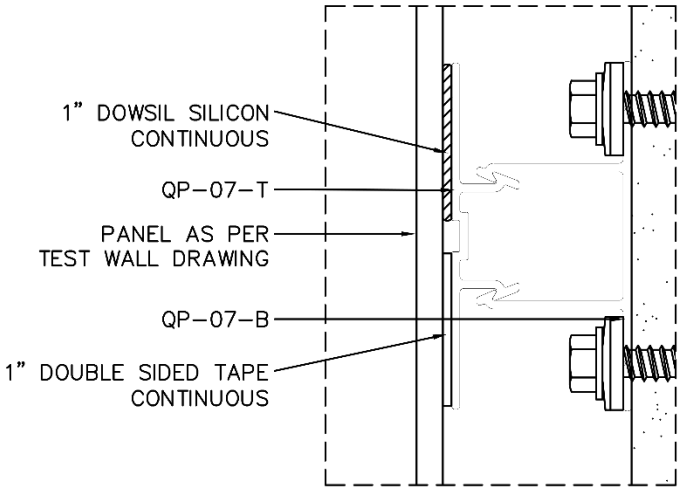
A QI FAB & SILICONE

Scale: NTS



B QP-07 OPT1 HORIZONTAL STIFFENER

Scale: NTS



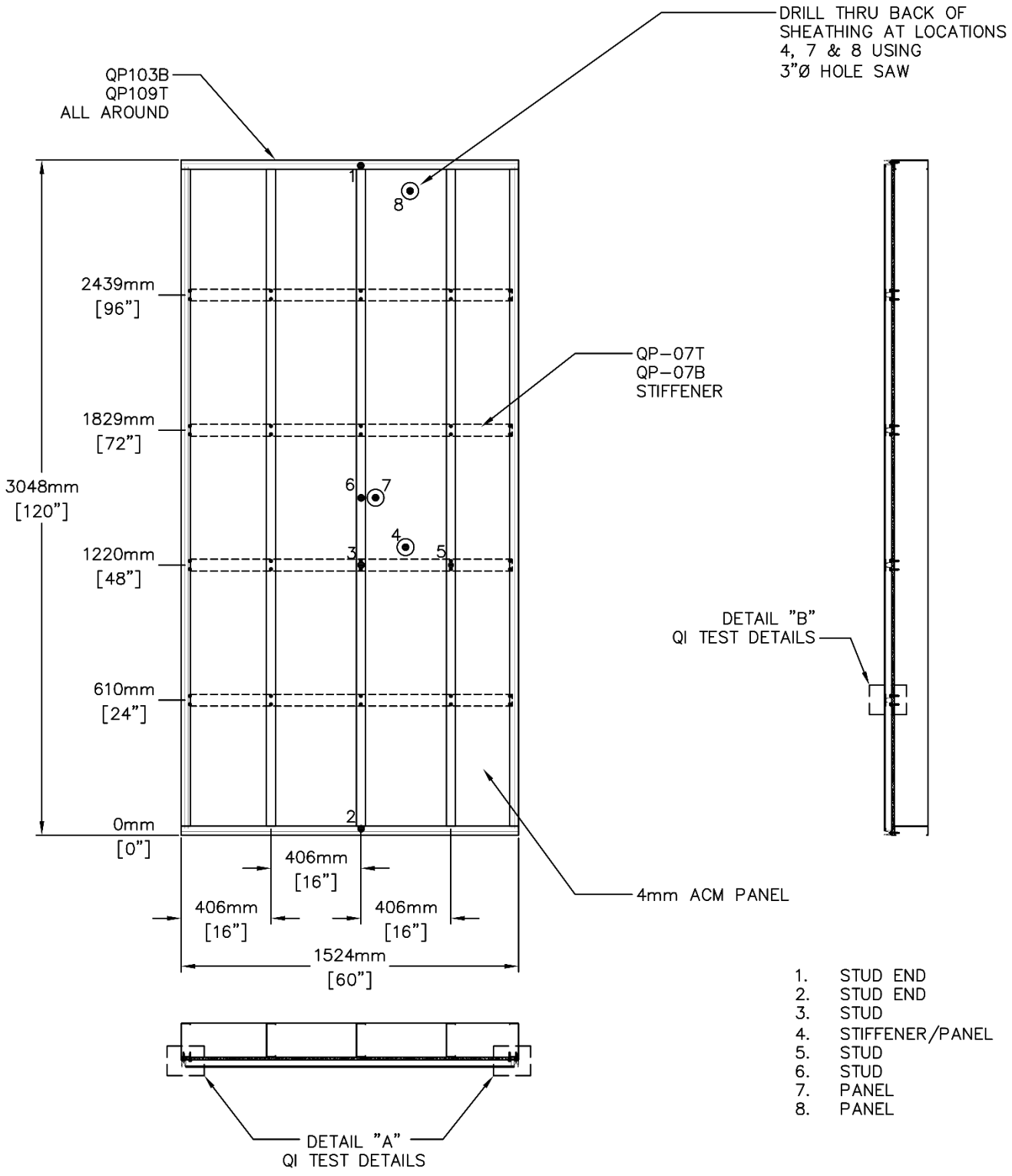
C QP-07-OPT2 HORIZONTAL STIFFENER

Scale: NTS

SILICONE TO BE DOWSIL 995
3M DOUBLE SIDED TAP

STIFFENER NAME CHANGED FROM QP-46B-OPT3 TO QP07T 09JAN2025
STIFFENER NAME CHANGED FROM QP-46B-OPT3 TO QP07B 09JAN2025
04SEP2024

QI1 TEST WALL

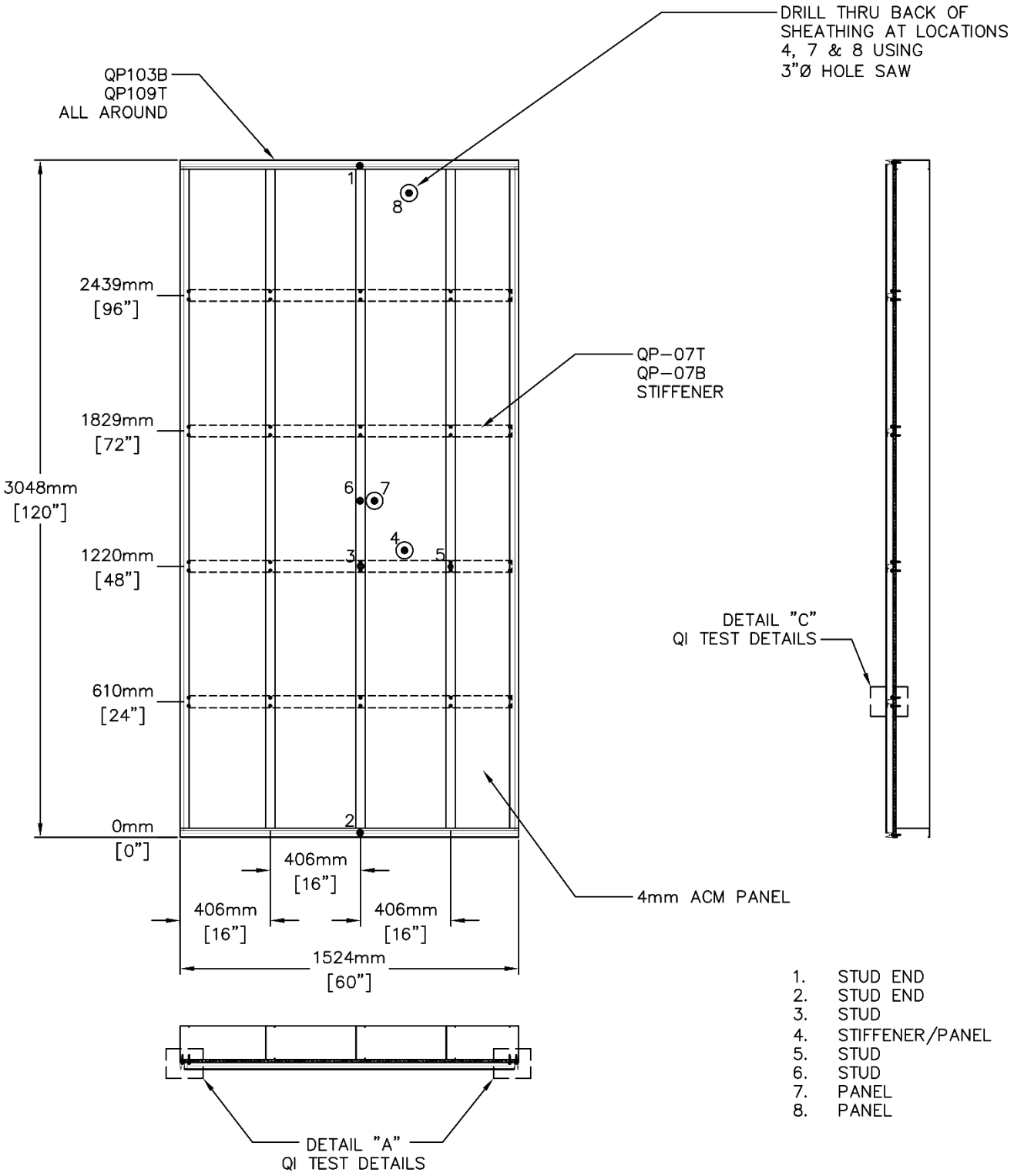


1. STUD END
2. STUD END
3. STUD
4. STIFFENER/PANEL
5. STUD
6. STUD
7. PANEL
8. PANEL

THREE MOCK-UP REQUIRED
2x6 18 Ga.(33KSI) STEEL STUDS W/ 1/2" DENSGLASS
4MM ACM PANEL
#10-12 X 1-1/2" HWH SELF DRILLING C/W EDPM WASHER
DOUBLE SIDED 3M TAPE ON STIFFENERS

STIFFENER NAME CHANGED FROM QP-46B-OPT3 TO QP07T 09JAN2025
STIFFENER NAME CHANGED FROM QP-46B-OPT3 TO QP07B 09JAN2025
WALL DETAILS CHANGED 15NOV2024
02SEP2024

QI2 TEST WALL

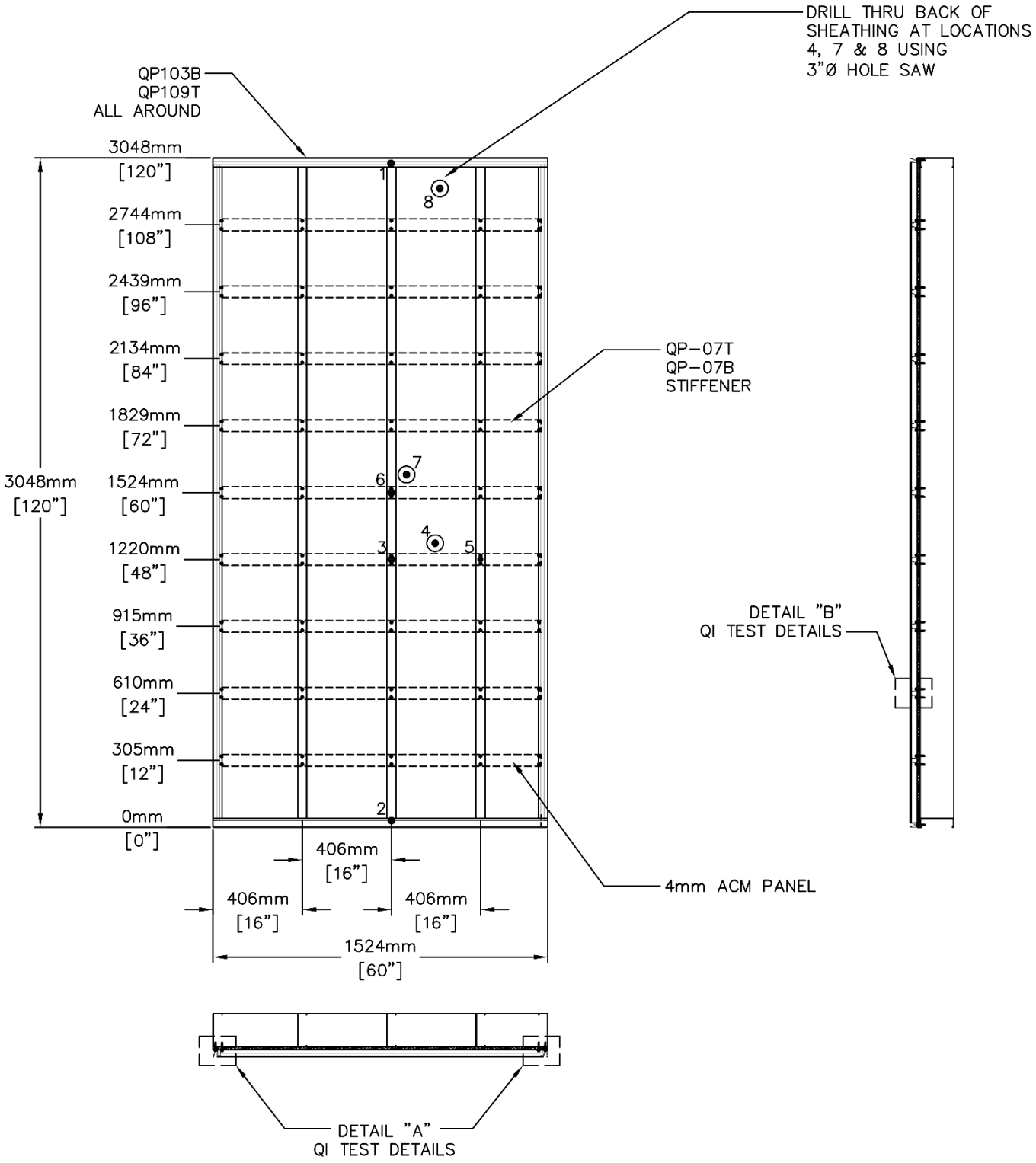


1. STUD END
2. STUD END
3. STUD
4. STIFFENER/PANEL
5. STUD
6. STUD
7. PANEL
8. PANEL

THREE MOCK-UP REQUIRED
2x6 18 Ga.(33KSI) STEEL STUDS W/ 1/2" DENSGLASS
4MM ACM PANEL
#10-12 X 1-1/2" HWH SELF DRILLING C/W EDPM WASHER
DOUBLE SIDED TAPE ON ONE SIDE AND SILICONE ON OTHER SIDE OF STIFFENER

STIFFENER NAME CHANGED FROM QP-46B-OPT3 TO QP07T 09JAN2025
STIFFENER NAME CHANGED FROM QP-46B-OPT3 TO QP07B 09JAN2025
WALL DETAILS CHANGED 15NOV2024
02SEP2024

QI3 TEST WALL



THREE MOCK-UP REQUIRED
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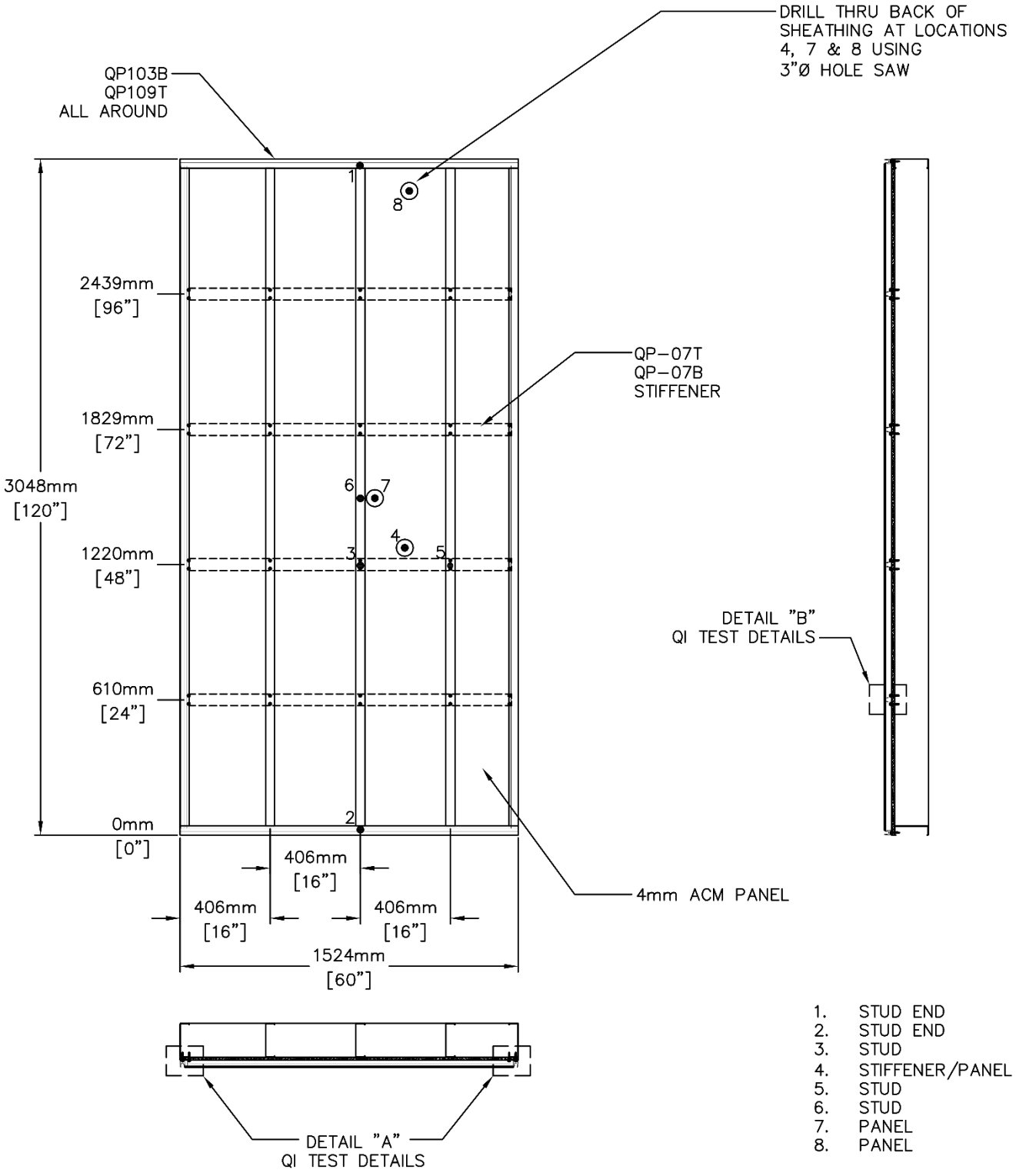
4MM ACM PANEL
#10-12 X 1-1/2" HWH SELF DRILLING C/W EDPM WASHER
DOUBLE SIDED 3M TAPE ON PANEL STIFFENERS

STIFFENER NAME CHANGED FROM QP-46B-OPT3 TO QP07T 09JAN2025
STIFFENER NAME CHANGED FROM QP-46B-OPT3 TO QP07B 09JAN2025
02SEP2024

QI4 TEST WALL

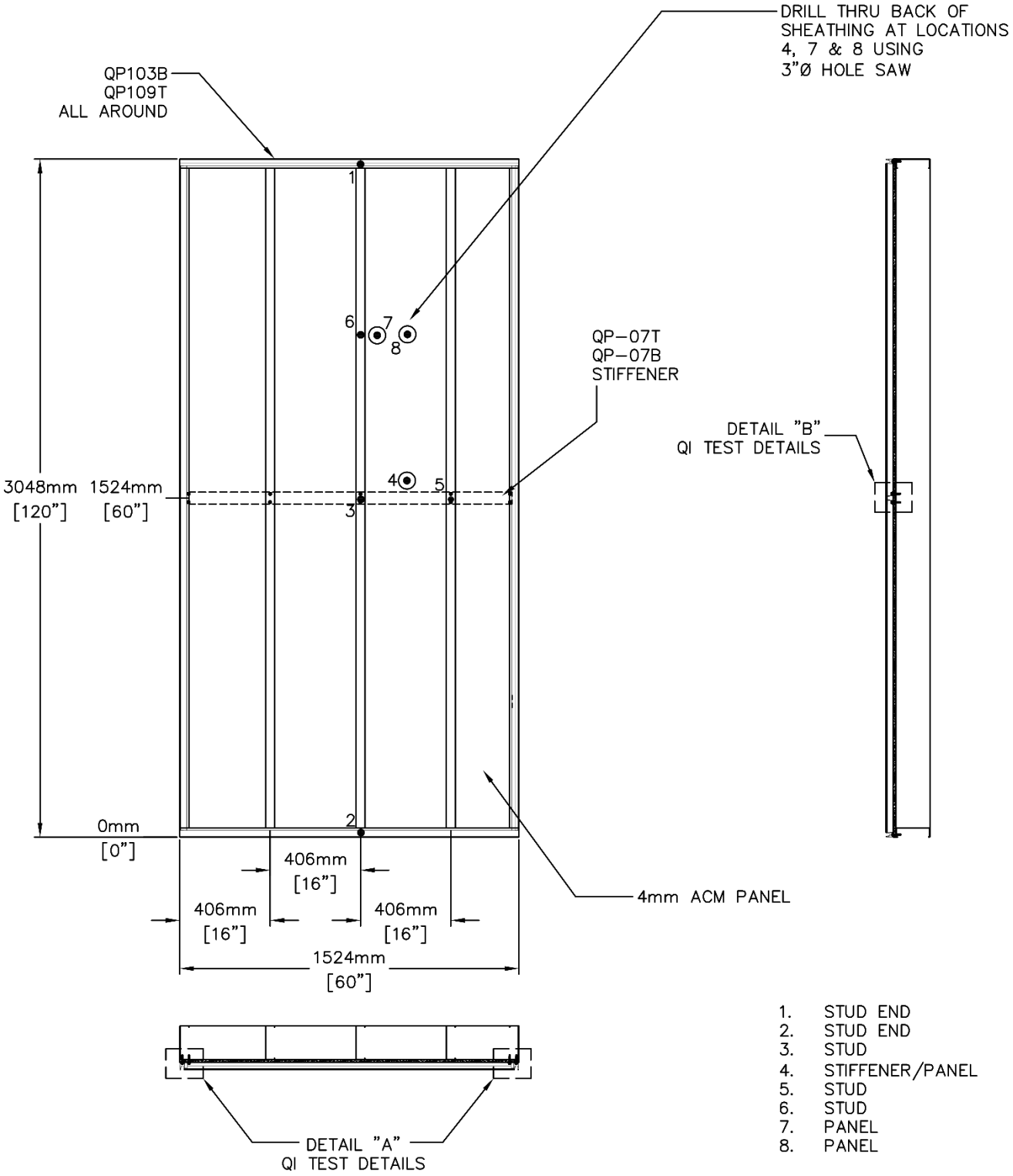


1. STUD END
2. STUD END
3. STUD
4. STIFFENER/PANEL
5. STUD
6. STUD
7. PANEL
8. PANEL

THREE MOCK-UP REQUIRED
2x6 16 Ga.(50KSI) STEEL STUDS W/ 1/2" DENSGLASS
4MM ACM PANEL
#10-12 X 1-1/2" HWH SELF DRILLING C/W EDPM WASHER
DOUBLE SIDED 3M TAPE ON PANEL STIFFENERS

STIFFENER NAME CHANGED FROM QP-46B-OPT3 TO QP07T 09JAN2025
STIFFENER NAME CHANGED FROM QP-46B-OPT3 TO QP07B 09JAN2025
02SEP2024

QI5 TEST WALL

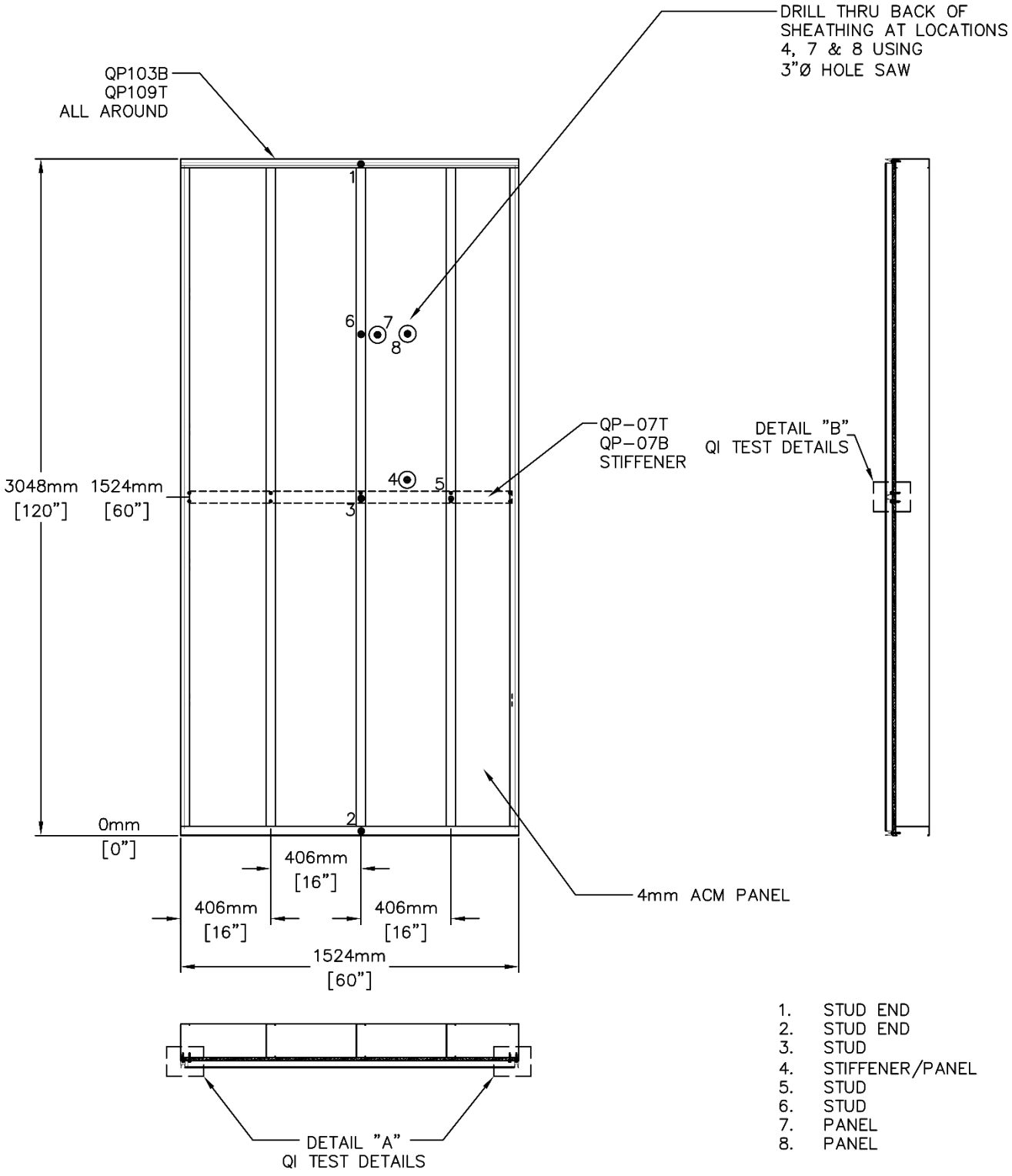


1. STUD END
2. STUD END
3. STUD
4. STIFFENER/PANEL
5. STUD
6. STUD
7. PANEL
8. PANEL

THREE MOCK-UP REQUIRED
2x6 16 Ga.(50KSI) STEEL STUDS W/ 1/2" DENSGLASS
4MM ACM PANEL
#10-12 X 1-1/2" HWH SELF DRILLING C/W EDPM WASHER
DOUBLESIDED TAPE ON PANEL STIFFENER

STIFFENER NAME CHANGED FROM QP-46B-OPT3 TO QP07T 09JAN2025
STIFFENER NAME CHANGED FROM QP-46B-OPT3 TO QP07B 09JAN2025
WALL DETAILS CHANGED 15NOV2024
02SEP2024

QI6 TEST WALL

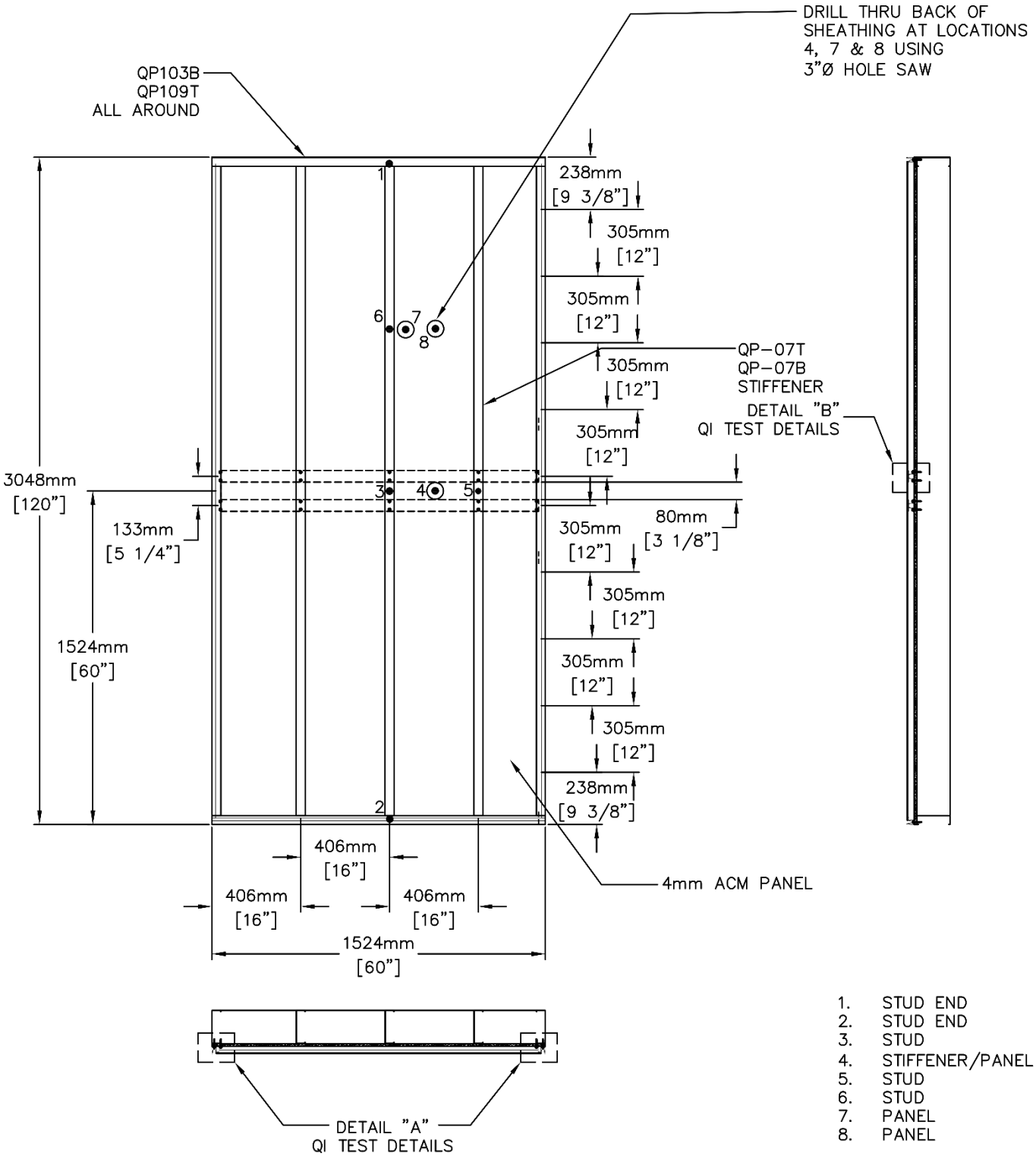


1. STUD END
2. STUD END
3. STUD
4. STIFFENER/PANEL
5. STUD
6. STUD
7. PANEL
8. PANEL

THREE MOCK-UP REQUIRED
2x6 18 Ga.(33KSI) STEEL STUDS W/ 1/2" DENSGLASS
4MM ACM PANEL
#10-12 X 1-1/2" HWH SELF DRILLING C/W EDPM WASHER
DOUBLESIDED TAPE ON PANEL STIFFENER

STIFFENER NAME CHANGED FROM QP-46B-OPT3 TO QP07T 09JAN2025
STIFFENER NAME CHANGED FROM QP-46B-OPT3 TO QP07B 09JAN2025
WALL DETAILS CHANGED 15NOV2024
02SEP2024

QI7 TEST WALL

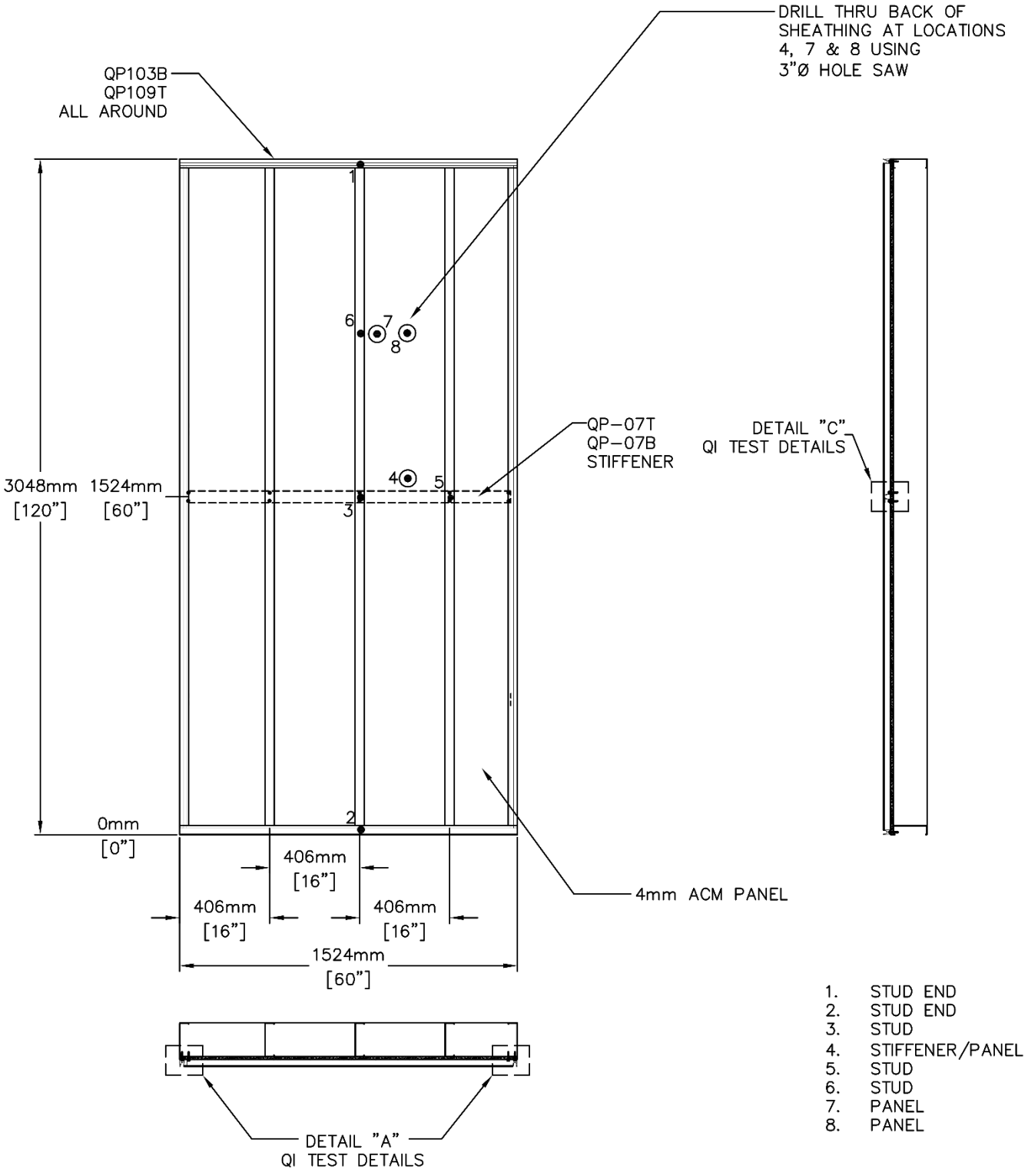


1. STUD END
2. STUD END
3. STUD
4. STIFFENER/PANEL
5. STUD
6. STUD
7. PANEL
8. PANEL

THREE MOCK-UP REQUIRED
2x6 16 Ga.(50KSI) STEEL STUDS W/ 1/2" DENSGLASS
4MM ACM PANEL
#10-12 X 1-1/2" HWH SELF DRILLING C/W EDPM WASHER
DOUBLE SIDED TAPE ON PANEL STIFFENERS

STIFFENER NAME CHANGED FROM QP-46B-OPT3 TO QP07T 09JAN2025
STIFFENER NAME CHANGED FROM QP-46B-OPT3 TO QP07B 09JAN2025
LOCATION OF STIFFENERS CHANGED 24OCT2024
02SEP2024

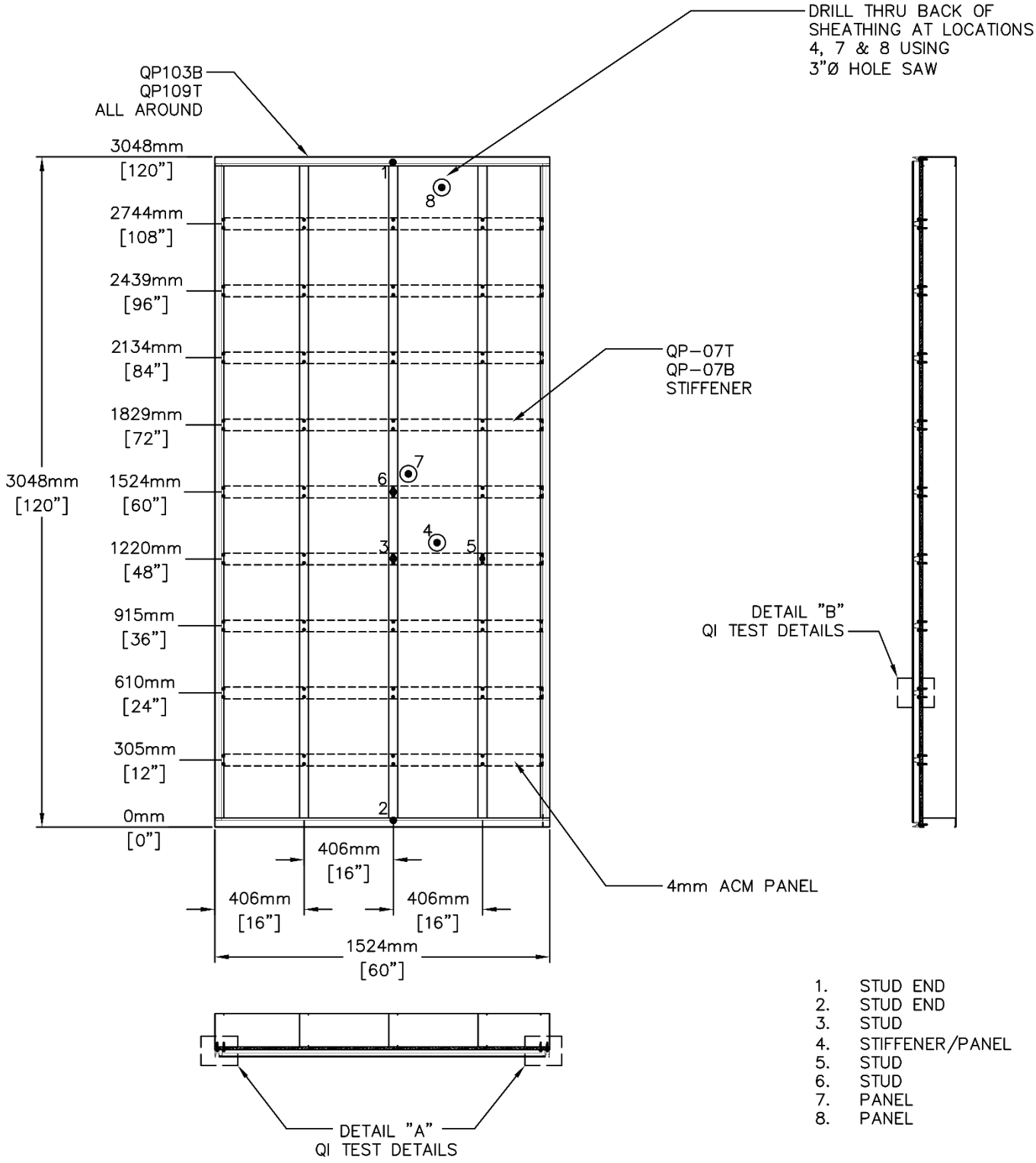
QI8 TEST WALL



THREE MOCK-UP REQUIRED
2x6 18 Ga.(50KSI) STEEL STUDS W/ 1/2" DENSGLASS
4MM ACM PANEL
#10-12 X 1-1/2" HWH SELF DRILLING C/W EDPM WASHER
DOUBLESIDED TAPE AND SILICONE ON STIFFENER

STIFFENER NAME CHANGED FROM QP-46B-OPT3 TO QP07T 09JAN2025
STIFFENER NAME CHANGED FROM QP-46B-OPT3 TO QP07B 09JAN2025
WALL DETAILS CHANGED 15NOV2024
02SEP2024

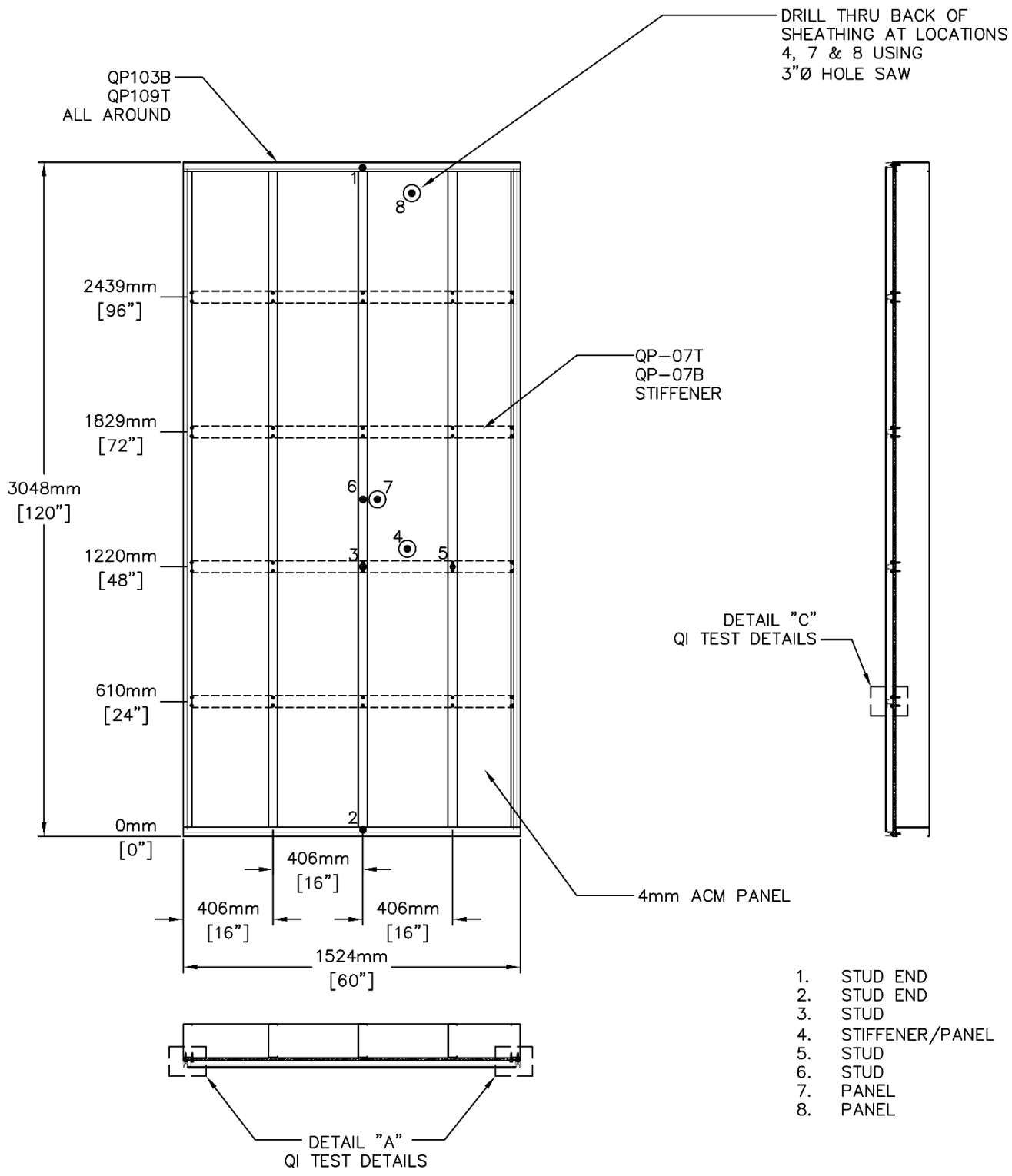
QI9 TEST WALL



THREE MOCK-UP REQUIRED
2x6 18 Ga.(33KSI) STEEL STUDS W/ 1/2" DENSGLASS
4MM ACM PANEL
#10-12 X 1-1/2" HWH SELF DRILLING C/W EDPM WASHER
DOUBLE SIDED 3M TAPE ON PANEL STIFFENERS

STIFFENER NAME CHANGED FROM QP-46B-OPT3 TO QP07T 09JAN2025
STIFFENER NAME CHANGED FROM QP-46B-OPT3 TO QP07B 09JAN2025
25NOV2024

QI10 TEST WALL

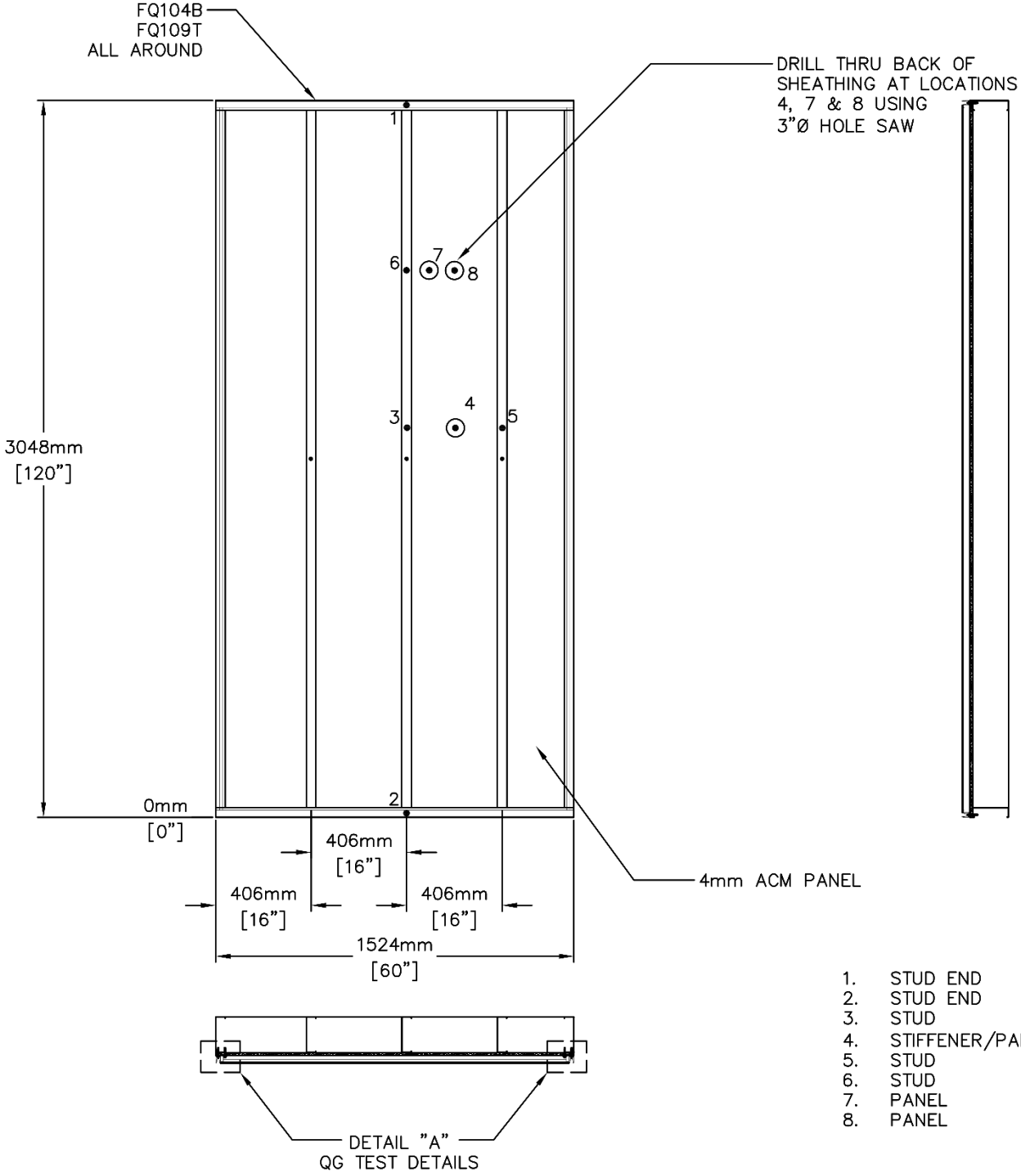


1. STUD END
2. STUD END
3. STUD
4. STIFFENER/PANEL
5. STUD
6. STUD
7. PANEL
8. PANEL

THREE MOCK-UP REQUIRED
2x6 16 Ga.(50KSI) STEEL STUDS W/ 1/2" DENSGLASS
4MM ACM PANEL
#10-12 X 1-1/2" HWH SELF DRILLING C/W EDPM WASHER
DOUBLE SIDED 3M TAPE & SILICON ON STIFFENERS

STIFFENER NAME CHANGED FROM QP-46B-0PT3 TO QP07T 09JAN2025
STIFFENER NAME CHANGED FROM QP-46B-0PT3 TO QP07B 09JAN2025
25NOV2024

QG5 TEST WALL



1. STUD END
2. STUD END
3. STUD
4. STIFFENER/PANEL
5. STUD
6. STUD
7. PANEL
8. PANEL

THREE MOCK-UP REQUIRED
2x6 18 Ga.(33KSI) STEEL STUDS W/ 1/2" DENSGLASS
4MM ACM PANEL
#10-12 X 1-1/2" HWH SELF DRILLING C/W EDPM WASHER

SENSORS LOCATION UPDATED 15JUL2024
25JUN2024

ATTACHMENT 3: DISCUSSION OF TESTING AND DESIGN EVALUATION PROCEDURE

ASCE 7 and the IBC provide guidance information of how to undertake a testing and engineering design analysis to make determining conclusions to the code requirements covered in this report. AA ADM 1 Chapter L, Deflections, and Appendix 1, Testing, provide objective statements that allow for a design by testing approach, affording the design professional and testing laboratory to determine the appropriate reference national standards to use to set testing procedures and deflection limits. The code clearly defines the loading criteria for exterior cladding.

The failure mode in the tests performed was a variety, inclusive of: i) disengagement of the aluminum top cap from the backplate, ii) panel disengaging from top cap, iii) fastener withdrawal, iv) framing yielding, v) adhesives disengaging, vi) sheathing failure. Following ADM 1, App. 1, the test load factors are set to meet or exceed the ASD safety factors (Ω) set within the standard for the respective loading/stress conditions of the aluminum components. The fastening screws and framing are steel, therefore safety factors from AISC 360 and AISI S100 are applied to these components. The respective minimum test load factors based on the individual test failure mode become:

Components	Stress Type	Ω ASD Safety Factor	Ref. Standard /Section
Aluminum stiffener and trims	Bending (rupture)	1.95	ADM 1, F.1
ACM Panel	Bending (rupture)	1.95	ADM 1, F.1
Steel Fastener	Tension	2.0	AISC 360, J3.7
Steel Fastener	Withdrawal	3.0	AISI S100, J4
Steel Framing	Bending	1.67	AISI S100, F2
Adhesive Failure	Shear/Tension	3.0[1]	Note 1
Sheathing Failure	Shear/Bending	3.0[1]	Note 1

1. These materials do not possess code-referenced national standards with published safety factors of stress failure modes. Typical good engineering practice would to be use S.F. of 3 in such case.

By review of the table, it is shown that the appropriate system test factor is in the range of 2.0 - 3.0 to the service-level design loads.

It is also common practice to run system structural tests that possess a variety of different material types and potential failure modes, such as this case, and assign a system test factor regardless of failure mode. IBC 1709.3, *Preconstruction Load Tests*, *Load Test Procedures Not Specified*, assigns the resulting allowable load of such tests to be taken as the lesser of the test load at the deflection limit (ref. Ch. 16) or the maximum load divided by 2.5. The testing criteria of IBC 1709.3 has been employed in this design evaluation.

Wall Framing Component Strength of Attachments

The maximum design wind pressures published in the report are exclusive to the tested strength of the cladding materials and the connection strength in to the wall framing. In many cases the actual design wind pressure would be less than the capacity of the cladding system. In any such and all cases in a building design, the actual design pressure imparted by the cladding in to the building framing (and all other forces imparted in to the framing) should be used to design the building framing members.

There are many variables that would be considered in the building frame design. The minimum framing members specified in this report to accept the cladding attachment forces would not necessarily adequately serve the overall building design loads and deflection limits. This is why the design tables and diagrams in the report advise that design capacity of "the building framing is outside the scope of this report and must be designed and installed for the applicable wind, climate and occupancy loads" of the building project. The variables in the framing design, including but not limited to the height of walls, whether they are vertical load-bearing or non-bearing, and the contribution of other climate loads along with the wind force transferred through the cladding, must all be taken in to account when specifying the structural components that the cladding will attach in to.

Deflection Limits

The bending deflection limits set for this design evaluation are L/180 for the deflection of the wall frame, and L/60 for the differential movement of the cladding member relative to the wall frame. With these deflection limits tested at the maximum wall height of 10 ft and cladding anchorage spans regarded as the maximum span in-between each location where the cladding is supported, the cladding panels were found to not dislodge or distort and return to the set position after releasing the service-level design loads as published. In-plane lateral deflection limits of the system were not assessed.

Weather Protection and Drainage

IBC 1402.2, Weather Protection, says "… Buildings shall be provided with a weather-resistant exterior wall assembly. The exterior wall assembly shall include: 1) flashing, as described in Section 1404.4. The exterior wall assembly shall be designed and constructed in such a manner as to prevent the accumulation of water within the exterior wall assembly by providing a 2) water-resistive barrier behind the exterior veneer, as described in Section 1403.2, and 3) a means for draining water that enters the assembly to the exterior…"

There is an exception that allows for a 2-hr ASTM E331 test of the construction mock-up to be conducted and to where "the exterior wall envelope design shall be considered to resist wind-driven rain where the results of testing indicate that water did not penetrate control joints in the exterior wall envelope, joints at the perimeter of openings or intersections of terminations with dissimilar materials."

In a testing-based code-compliance assessment the way to prove that the wall cladding system works to defend against pressurized water resistance and provide drainage in accordance with IBC 1402.2 is to test it. When the code does not provide a specific testing standard for a given performance requirement, an appropriate national or international standard published by a body accredited by American National Standards Institute (ANSI) is chosen. AAMA 508 and 509 testing has commonly been employed by industry to verify exterior walls system resistance to wind-driven rain and the means of drainage.

The evaluation has considered a construction mock-up test to AAMA 508-21 of Quickpanel 4mm ACM installed with typical horizontal and vertical joints and horizontal stiffeners at 24" o/c (ref. assemblies QI1, QI2, QI10 in Table 2 of this report), and that passing results verify that as per AAMA 508-21 Sections 6.6 and 6.7, "no water shall appear inboard of the simulated AWB (sheathing)" after 15-minute exposures to both static water pressure (run at 6.2 psf) and dynamic water pressure (run at 32 mph/6.2 psf), as showing adequate proof that the intent of IBC 1402.2 has been met. Designers and regulators should consider that wind-driven rain design pressures are generally taken at around 15% of the allowable maximum wind design pressure, though there is no definite code-reference that dictates this as a design value.

ATTACHMENT 4: INTERNATIONAL TO STATE CODE CROSS-REFERENCES

FLORIDA: 2023 FLORIDA BUILDING CODE (FBC)

FBC CATEGORY: Panel Walls
SUB-CATEGORIES: Siding

IBC Section[1]	FBC Section	Description	Referenced Standard or Code Section[2]	Year	FBC Comparison to IBC
104.2.2.4	104.11.2	Tests	-	-	Article content similar to IBC
1402.2	1403.2	Exterior Walls, Weather Protection	-	-	Article content same as IBC
1402.3	1403.3	Exterior Walls, Wind Resistance	FBC Ch 16	-	Article content same as IBC
1406	1407	Metal Composite Materials (MCM)	-	-	Article content same as IBC
1406.2	1407.2	Exterior Wall Finish	FBC 1407.4 through 1407.14	-	Article content same as IBC
1406.4	1407.4	Structural Design	FBC Ch 16	-	Article content same as IBC
1406.5	1407.5	Approval	-	-	Article content same as IBC
1406.6	1407.6	Weather Resistance	-	-	Article content same as IBC
1406.7	1407.7	Durability	-	-	Article content same as IBC
1406.9	1407.9	Surface Burning Characteristics	ASTM E84	2018b	Article content same as IBC
1406.10	1407.10	Type I,II,III,IV Construction	-	-	Article content same as IBC
1406.10.1	1407.10.1	Surface Burning Characteristics	ASTM E84	2018b	Article content same as IBC
1406.10.2	1407.10.2	Thermal Barriers	-	-	Article content same as IBC
1406.11	1406.12	Type V Construction	-	-	Article content same as IBC
1406.13	1407.14	Labeling	FBC 1703.5	-	Article content same as IBC
1609.1.1	1609.1.1	Determination of Wind Loads	ASCE 7	2022	Article content similar to IBC
1709.3	1709.3	Load Test Procedures Not Specified	ASTM E330	2014(21)	Article content same as IBC
2002.1	2002.1	Aluminum General	AA ADM 1, Ch 16	2020	Article content similar to IBC
CH 35	CH 35	Referenced Standards	ASTM E331	2000(16)	Article content same as IBC

1. IBC equivalent sections are listed in comparison to the corresponding state code.
2. Only the applicable reference standards and code sections cited in the main body text and this attachment are listed. (-) indicates that the main body text or this attachment covers the full explanation of the objective.

-END-