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NORTHSTAR TECHNOLOGIES
FLORIDA BUILDING CODE TEST REPORT

SCOPE OF WORK
AAMA 501, TAS 201, TAS 202 AND TAS 203 TESTING ON EXTERIOR WALL PANEL SYSTEM

REPORT NUMBER
L4423.01-450-44 R0

TEST DATES
10/16/20 - 10/28/20

ISSUE DATE
12/16/20

RECORD RETENTION END DATE
10/28/24

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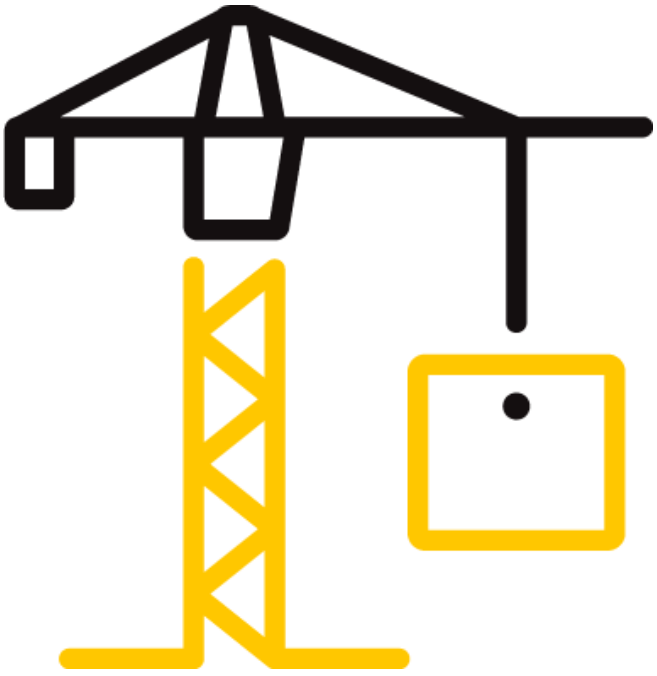

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TEST REPORT FOR NORTHSTAR TECHNOLOGIES

Report No.: L4423.01-450-44 R0
Date: 12/16/20

REPORT ISSUED TO

NORTHSTAR TECHNOLOGIES
365 Fifth Ave. S
Naples, Florida 34102

PROJECT

NORTHSTAR EXTERIOR WALL PANEL SYSTEM

VINU J. ABRAHAM LICENSE No. 53820 STATE OF FLORIDA PROFESSIONAL ENGINEER

For INTERTEK B&C:

COMPLETED BY:	Melissa Nuttall	**REVIEWED BY:**	Vinu J. Abraham, P.E.
TITLE:	Technician Team Leader - Products	**TITLE:**	Vice President - Products
SIGNATURE:	Digitally Signed by: Melissa Nuttall	**SIGNATURE:**	Digitally Signed by: Vinu Abraham
DATE:	12/16/20	**DATE:**	2020.12.18 12:59:35 -05'00'

AWR/MMN

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SECTION 1
SCOPE

Intertek Building & Construction (B&C) was contracted by Northstar Technologies to perform TAS 201, TAS 202, and TAS 203 testing in accordance with Florida Building Code requirements on their Exterior Wall Panel System. Testing was conducted at the Intertek B&C test facility in West Palm Beach, Florida. Results obtained are tested values and were secured using the designated test methods. This report includes complete written and photographic documentation of all testing performed and a copy of "As-Built" mock-up drawings.

This report does not constitute certification of this product nor an opinion or endorsement by this laboratory. This report and related test records that are retained such as "As-Built" mock-up drawings, datasheets, representative samples of test specimens, or other pertinent project documentation will be serviced by Intertek B&C for the entire test record retention period. At the end of this retention period, such materials shall be discarded without notice and the service life of this report by Intertek B&C will expire.

SECTION 2
TEST METHODS

Mock-up testing was performed in accordance with referenced test methods.

AAMA 501-15, *Methods of Test for Exterior Walls*

TAS 201-94, *Impact Test Procedures*

TAS 202-94, *Criteria for Testing Impact & Non Impact Resistant Building Envelope Components Using Uniform Static Air Pressure*

TAS 203-94, *Criteria for Testing Products Subject to Cyclic Wind Pressure Loading*

ASTM E283-04, *Standard Test Method for Determining Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Mock Up*

ASTM E330-14, *Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference*

ASTM E331-00(2009), *Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Uniform Static Air Pressure Difference*

ASTM E1886-13a, *Standard Test Method for Performance of Exterior Windows, Curtain Walls, Doors, and Impact Protective Systems Impacted by Missile(s) and Exposed to Cyclic Pressure Differentials*

ASTM E1996-14a, *Standard Specification for Performance of Exterior Windows, Curtain Walls, Doors, and Impact Protective Systems Impacted by Windborne Debris in Hurricanes*

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SECTION 3
LIST OF OFFICIAL OBSERVERS

NAME	COMPANY
Terry Roberts	Intertek B&C
Veron Wickham	Intertek B&C
Melissa Nuttall	Intertek B&C
Vinu Abraham, P.E.	Intertek B&C

SECTION 4
GENERAL MOCK-UP DESCRIPTION

Project Type
Exterior Wall Panel System

Mock-Up Size

Mock Ups 1, 2, 3: 8' wide by 12' high

Mock Ups 4, 5, 6: 14' 1-1/4" wide by 12' high

Material Source/Installation
The mock-up materials/components were supplied by Northstar Technologies. The installation of the mock-ups was completed by Intertek B&C.

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SECTION 5
FINAL TEST RESULTS

Protocols TAS 202-94 and AAMA 501-15, *Static Air Pressure*
Test Date(s): 9/4/19 through 10/26/20
The temperature during testing was 81°F to 85°F. The results are tabulated as follows:

Mock Up #1: Preload per ASTM E330

TITLE OF TEST	RESULTS	ALLOWED	NOTE
Preload @ +45psf	--	--	

Mock Up #1: Air Leakage per TAS 202/ASTM E283

TITLE OF TEST	RESULTS	ALLOWED	NOTE
Air Leakage, Infiltration at 1.57 psf (25 mph)	<0.01 cfm/ft^2	Report	1
Air Leakage, Infiltration at 6.27 psf (50 mph)	<0.01 cfm/ft^2	0.06 cfm/ft^2 max.	1

Note 1: Test Date 10/16/20 / Time: 10:38 AM (Air Note Only)

Mock Up #1: Water Penetration per TAS 202/ASTM E331

TITLE OF TEST	RESULTS	ALLOWED	NOTE
Water Penetration, 15% of Positive Design Pressure at 13.5 psf	Pass	No leakage	

Mock Up #1: Preload and Design Load per TAS 202/ASTM E330

LOAD (psf)	INDICATOR LOCATION	DEFLECTION (in.)		PERMANENT SET (in.)	
		MEASURED	ALLOWED	MEASURED	ALLOWED
+67.5	2	0.74	N/A	0.08	N/A
50% of Test Pressure	5	0.02	N/A	0.01	N/A
+90.0	2	0.94	1.20	0.10	N/A
Design Pressure	5	0.03	0.19	<0.01	N/A
-63.75	2	0.56	N/A	0.02	N/A
50% of Test Pressure	5	0.02	N/A	0.01	N/A
-85.0	2	0.78	1.20	0.04	N/A
Design Pressure	5	0.01	0.19	0.01	N/A

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Mock Up #1: Repeat Air Leakage per TAS 202/ASTM E283

TITLE OF TEST	RESULTS	ALLOWED	NOTE
Air Leakage, Infiltration at 1.57 psf (25 mph)	<0.01 cfm/ft^2	Report	2
Air Leakage, Infiltration at 6.27 psf (50 mph)	<0.01 cfm/ft^2	0.06 cfm/ft^2 max.	2

Note 2: Test Date 11/16/20 / Time: 2:12 PM (Air Note Only)

Mock Up #1: Repeat Water Penetration per TAS 202/ASTM E331

TITLE OF TEST	RESULTS	ALLOWED	NOTE
Water Penetration, 15% of Positive Design Pressure at 13.5 psf	Pass	No leakage	

Mock Up #1: Structural Overload Load per TAS 202/ASTM E330

LOAD (psf)	INDICATOR LOCATION	DEFLECTION (in.)		PERMANENT SET (in.)	
		MEASURED	ALLOWED	MEASURED	ALLOWED
+135.0 Test Pressure	2	1.27	N/A	0.08	0.29
	5	0.04	N/A	<0.01	0.04
-127.5 Test Pressure	2	1.19	N/A	0.09	0.29
	5	<0.01	N/A	<0.01	0.04

Note 3: *See Sketch #1 for indicator locations.*

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Mock Up #4: Preload per ASTM E330

TITLE OF TEST	RESULTS	ALLOWED	NOTE
Preload @ +45psf	--	--	

Mock Up #4: Air Leakage per TAS 202/ASTM E283

TITLE OF TEST	RESULTS	ALLOWED	NOTE
Air Leakage, Infiltration at 1.57 psf (25 mph)	0.01 cfm/ft^2	Report	4
Air Leakage, Infiltration at 6.27 psf (50 mph)	0.01 cfm/ft^2	0.06 cfm/ft^2 max.	4

Note 4: Test Date 10/22/20 (Air Note Only)

Mock Up #4: Water Penetration per TAS 202/ASTM E331

TITLE OF TEST	RESULTS	ALLOWED	NOTE
Water Penetration, 15% of Positive Design Pressure at 13.5 psf	Pass	No leakage	

Mock Up #4: Preload and Design Load per TAS 202/ASTM E330

LOAD (psf)	INDICATOR LOCATION	DEFLECTION (in.)		PERMANENT SET (in.)	
		MEASURED	ALLOWED	MEASURED	ALLOWED
+67.5	2	0.69	N/A	0.06	N/A
50% of Test Pressure	5	0.81	N/A	<0.01	N/A
+90.0	2	0.69	1.20	<0.01	N/A
Design Pressure	5	0.89	1.20	<0.01	N/A
-63.75	2	0.78	N/A	0.05	N/A
50% of Test Pressure	5	0.82	N/A	0.15	N/A
-85.0	2	1.09	1.20	<0.01	N/A
Design Pressure	5	0.91	1.20	0.03	N/A

Mock Up #4: Repeat Air Leakage per TAS 202/ASTM E283

TITLE OF TEST	RESULTS	ALLOWED	NOTE
Air Leakage, Infiltration at 1.57 psf (25 mph)	<0.01 cfm/ft^2	Report	5
Air Leakage, Infiltration at 6.27 psf (50 mph)	<0.01 cfm/ft^2	0.06 cfm/ft^2 max.	5

Note 5: Test Date 10/23/20 (Air Note Only)

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Mock Up #4: Repeat Water Penetration per TAS 202/ASTM E331

TITLE OF TEST	RESULTS	ALLOWED	NOTE
Water Penetration, 15% of Positive Design Pressure at 13.5 psf	Pass	No leakage	

Mock Up #4: Structural Overload Load per TAS 202/ASTM E330

LOAD (psf)	INDICATOR LOCATION	DEFLECTION (in.)		PERMANENT SET (in.)	
		MEASURED	ALLOWED	MEASURED	ALLOWED
+135.0 Test Pressure	2	1.36	N/A	0.25	0.29
	5	1.63	N/A	0.12	0.29
-127.5 Test Pressure	2	1.65	N/A	0.12	0.29
	5	1.28	N/A	0.14	0.29

Note 6: *See Sketch #2 for indicator locations.*

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Protocol TAS 201-94, *Large Missile Impact Procedures*
Test Dates: 10/18/20 through 10/28/20
The temperature during testing was 75°F to 85°F. The results are tabulated as follows:

Mock Up #1

IMPACT #	MISSILE WEIGHT (lbs.)	MISSILE LENGTH (in.)	MISSILE VELOCITY (ft./sec.)
1	9.0	96	49.5
2			50.1
3			50.1

Note 7: *See Sketch #3 for impact locations.*

Mock Up #2

IMPACT #	MISSILE WEIGHT (lbs.)	MISSILE LENGTH (in.)	MISSILE VELOCITY (ft./sec.)
1	9.0	96	49.7
2			49.8
3			49.6

Note 8: *See Sketch #4 for impact locations.*

Mock Up #3

IMPACT #	MISSILE WEIGHT (lbs.)	MISSILE LENGTH (in.)	MISSILE VELOCITY (ft./sec.)
1	9.0	96	51.3
2			49.5
3			49.4

Note 9: *See Sketch #5 for impact locations.*

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Mock Up #4

IMPACT #	MISSILE WEIGHT (lbs.)	MISSILE LENGTH (in.)	MISSILE VELOCITY (ft./sec.)
1	9.0	96	51.2
2			51.4
3			49.9
4			49.3
5			51.8

Note 10: *See Sketch #6 for impact locations.*

Mock Up #5

IMPACT #	MISSILE WEIGHT (lbs.)	MISSILE LENGTH (in.)	MISSILE VELOCITY (ft./sec.)
1	9.0	96	51.1
2			49.8
3			50.3

Note 11: *See Sketch #7 for impact locations.*

Mock Up #6

IMPACT #	MISSILE WEIGHT (lbs.)	MISSILE LENGTH (in.)	MISSILE VELOCITY (ft./sec.)
1	9.0	96	50.1
2			49.5
3			51.1

Note 12: *See Sketch #8 for impact locations.*

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Protocol TAS 203-94, *Cyclic Wind Pressure Loading*
Test Dates: 10/18/20 through 10/28/20
The temperature during testing was 75°F to 85°F. The results are tabulated as follows:

Mock Up #1: Cyclic Test Spectrum and Average Cycle Time per TAS 203

DESIGN PRESSURE	**STAGE**		
+90.0 / -85.0 psf	**1**	**2**	**3**
POSITIVE PRESSURE RANGE (psf)	0 – 45.0	0 – 54.0	0 – 117.0
AVERAGE CYCLE TIME (sec.)	3.9	4.2	1.0
NUMBER OF CYCLES	600	70	1
	4	**5**	**6**
NEGATIVE PRESSURE RANGE (psf)	0 – 42.5	0 – 51.0	0 – 110.5
AVERAGE CYCLE TIME (sec.)	3.3	3.6	1.0
NUMBER OF CYCLES	600	70	1

Mock Up #1: Positive Cyclic Load per TAS 203

INDICATOR LOCATION	**MAXIMUM DEFLECTION (in.)**	**PERMANENT SET (in.)**	**PERCENT RECOVERY**	
			MEASURED %	**ALLOWED %**
2	0.31	<0.01	> 99	> 90

Mock Up #1: Negative Cyclic Load per TAS 203

INDICATOR LOCATION	**MAXIMUM DEFLECTION (in.)**	**PERMANENT SET (in.)**	**PERCENT RECOVERY**	
			MEASURED %	**ALLOWED %**
2	0.19	0.01	95	> 90

Note 13: *See Sketch #9 for indicator locations.*

Mock Up #2: Cyclic Test Spectrum and Average Cycle Time per TAS 203

DESIGN PRESSURE	**STAGE**		
+90.0 / -85.0 psf	**1**	**2**	**3**
POSITIVE PRESSURE RANGE (psf)	0 – 45.0	0 – 54.0	0 – 117.0
AVERAGE CYCLE TIME (sec.)	3.9	4.3	1.0
NUMBER OF CYCLES	600	70	1
	4	**5**	**6**
NEGATIVE PRESSURE RANGE (psf)	0 – 42.5	0 – 51.0	0 – 110.5
AVERAGE CYCLE TIME (sec.)	4.3	5.4	1.0
NUMBER OF CYCLES	600	70	1

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Mock Up #2: Positive Cyclic Load per TAS 203

INDICATOR LOCATION	MAXIMUM DEFLECTION (in.)	PERMANENT SET (in.)	PERCENT RECOVERY	
			MEASURED %	ALLOWED %
2	0.21	0.02	> 90	> 90

Mock Up #2: Negative Cyclic Load per TAS 203

INDICATOR LOCATION	MAXIMUM DEFLECTION (in.)	PERMANENT SET (in.)	PERCENT RECOVERY	
			MEASURED %	ALLOWED %
2	0.14	<0.01	> 99	> 90

Note 14: *See Sketch #9 for indicator locations.*

Mock Up #3: Cyclic Test Spectrum and Average Cycle Time per TAS 203

DESIGN PRESSURE	STAGE		
+90.0 / -85.0 psf	**1**	**2**	**3**
POSITIVE PRESSURE RANGE (psf)	0 – 45.0	0 – 54.0	0 – 117.0
AVERAGE CYCLE TIME (sec.)	3.7	4.0	1.0
NUMBER OF CYCLES	600	70	1
	4	**5**	**6**
NEGATIVE PRESSURE RANGE (psf)	0 – 42.5	0 – 51.0	0 – 110.5
AVERAGE CYCLE TIME (sec.)	3.9	5.4	1.0
NUMBER OF CYCLES	600	70	1

Mock Up #3: Positive Cyclic Load per TAS 203

INDICATOR LOCATION	MAXIMUM DEFLECTION (in.)	PERMANENT SET (in.)	PERCENT RECOVERY	
			MEASURED %	ALLOWED %
2	0.15	<0.01	> 99	> 90

Mock Up #3: Negative Cyclic Load per TAS 203

INDICATOR LOCATION	MAXIMUM DEFLECTION (in.)	PERMANENT SET (in.)	PERCENT RECOVERY	
			MEASURED %	ALLOWED %
2	0.12	<0.01	> 99	> 90

Note 15: *See Sketch #9 for indicator locations.*

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Mock Up #4: Cyclic Test Spectrum and Average Cycle Time per TAS 203

DESIGN PRESSURE	STAGE		
+90.0 / -85.0 psf	**1**	**2**	**3**
POSITIVE PRESSURE RANGE (psf)	0 – 45.0	0 – 54.0	0 – 117.0
AVERAGE CYCLE TIME (sec.)	5.7	5.1	1.0
NUMBER OF CYCLES	600	70	1
	4	**5**	**6**
NEGATIVE PRESSURE RANGE (psf)	0 – 42.5	0 – 51.0	0 – 110.5
AVERAGE CYCLE TIME (sec.)	4.5	5.0	1.0
NUMBER OF CYCLES	600	70	1

Mock Up #4: Positive Cyclic Load per TAS 203

INDICATOR LOCATION	MAXIMUM DEFLECTION (in.)	PERMANENT SET (in.)	PERCENT RECOVERY	
			MEASURED %	ALLOWED %
2	0.38	<0.01	> 99	> 90

Mock Up #4: Negative Cyclic Load per TAS 203

INDICATOR LOCATION	MAXIMUM DEFLECTION (in.)	PERMANENT SET (in.)	PERCENT RECOVERY	
			MEASURED %	ALLOWED %
2	0.27	<0.01	> 99	> 90

Note 16: *See Sketch #10 for indicator locations.*

Mock Up #5: Cyclic Test Spectrum and Average Cycle Time per TAS 203

DESIGN PRESSURE	STAGE		
+90.0 / -85.0 psf	**1**	**2**	**3**
POSITIVE PRESSURE RANGE (psf)	0 – 45.0	0 – 54.0	0 – 117.0
AVERAGE CYCLE TIME (sec.)	4.3	4.9	1.0
NUMBER OF CYCLES	600	70	1
	4	**5**	**6**
NEGATIVE PRESSURE RANGE (psf)	0 – 42.5	0 – 51.0	0 – 110.5
AVERAGE CYCLE TIME (sec.)	4.0	4.6	1.0
NUMBER OF CYCLES	600	70	1

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Mock Up #5: Positive Cyclic Load per TAS 203

INDICATOR LOCATION	MAXIMUM DEFLECTION (in.)	PERMANENT SET (in.)	PERCENT RECOVERY	
			MEASURED %	ALLOWED %
2	0.33	0.01	97	> 90

Mock Up #5: Negative Cyclic Load per TAS 203

INDICATOR LOCATION	MAXIMUM DEFLECTION (in.)	PERMANENT SET (in.)	PERCENT RECOVERY	
			MEASURED %	ALLOWED %
2	0.17	0.01	94	> 90

Note 17: *See Sketch #11 for indicator locations.*

Mock Up #6: Cyclic Test Spectrum and Average Cycle Time per TAS 203

DESIGN PRESSURE	STAGE		
+90.0 / -85.0 psf	1	2	3
POSITIVE PRESSURE RANGE (psf)	0 – 45.0	0 – 54.0	0 – 117.0
AVERAGE CYCLE TIME (sec.)	4.4	5.2	1.0
NUMBER OF CYCLES	600	70	1
	4	5	6
NEGATIVE PRESSURE RANGE (psf)	0 – 42.5	0 – 51.0	0 – 110.5
AVERAGE CYCLE TIME (sec.)	4.4	4.5	1.0
NUMBER OF CYCLES	600	70	1

Mock Up #6: Positive Cyclic Load per TAS 203

INDICATOR LOCATION	MAXIMUM DEFLECTION (in.)	PERMANENT SET (in.)	PERCENT RECOVERY	
			MEASURED %	ALLOWED %
2	0.37	0.01	97	> 90

Mock Up #6: Negative Cyclic Load per TAS 203

INDICATOR LOCATION	MAXIMUM DEFLECTION (in.)	PERMANENT SET (in.)	PERCENT RECOVERY	
			MEASURED %	ALLOWED %
2	0.15	0.01	93	> 90

Note 18: *See Sketch #11 for indicator locations.*

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SECTION 6
CONCLUSION

The mock-ups met the specified performance requirements.

No signs of failure were observed in any area of the mock ups during the TAS 202 testing; as such, the mock ups satisfy the requirements of TAS 202. Upon completion of testing, mock ups tested for TAS 202-94 met the requirements of Section 1620 of the Florida Building Code, Building.

The large missiles impacted each intended target. Each impact location was carefully inspected. No signs of penetration, rupture, or opening after the large missile impact test were observed; as such, the mock ups satisfy the large missile requirements of TAS 201. Upon completion of testing, mock ups tested for TAS 201-94 met the requirements of Section 1626 of the Florida Building Code, Building.

No signs of failure were observed in any area of the mock ups during the cyclic load test; as such, the mock ups satisfy the cyclic load requirements of TAS 203. Upon completion of testing, mock ups tested for TAS 203-94 met the requirements of Section 1625 of the Florida Building Code, Building.

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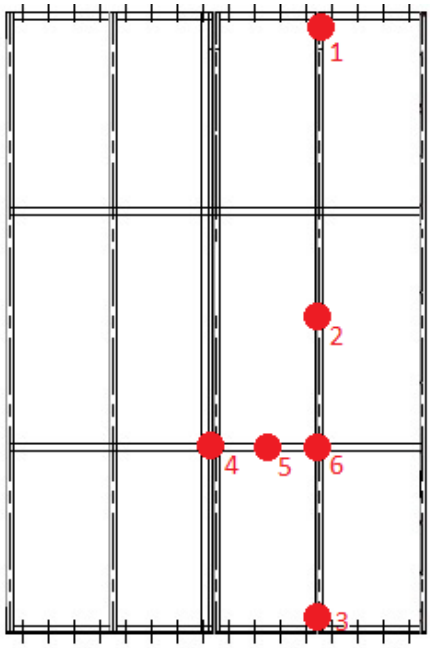
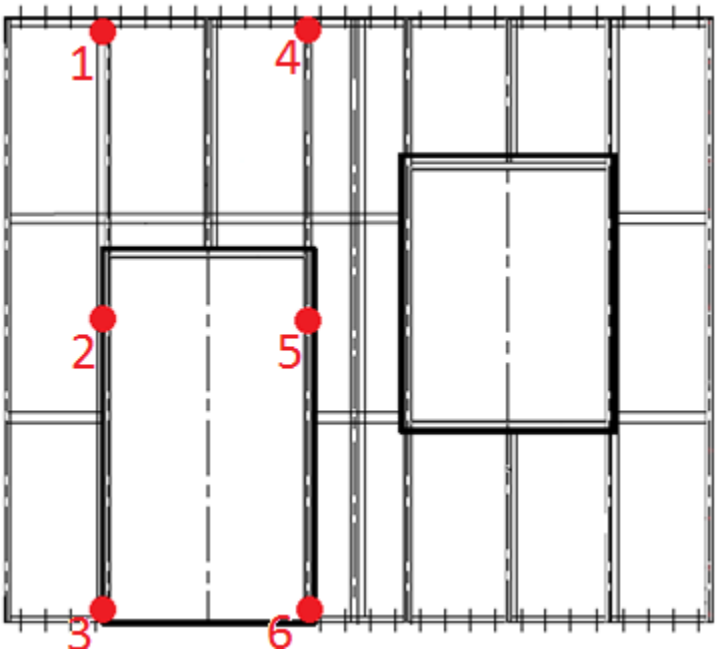
SECTION 7
SKETCHES



Sketch No. 1
Mock Up 1 – Structural Loads Indicator Locations



Sketch No. 2
Mock Up 4 – Structural Loads Indicator Locations

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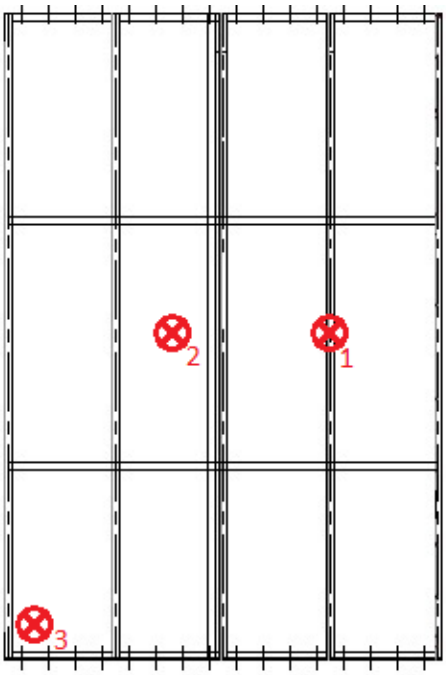
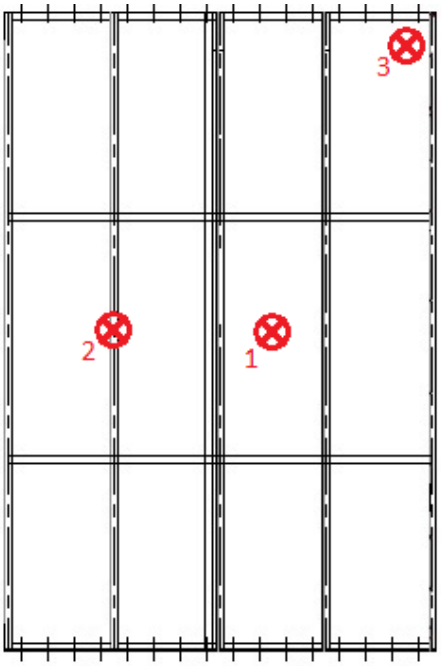
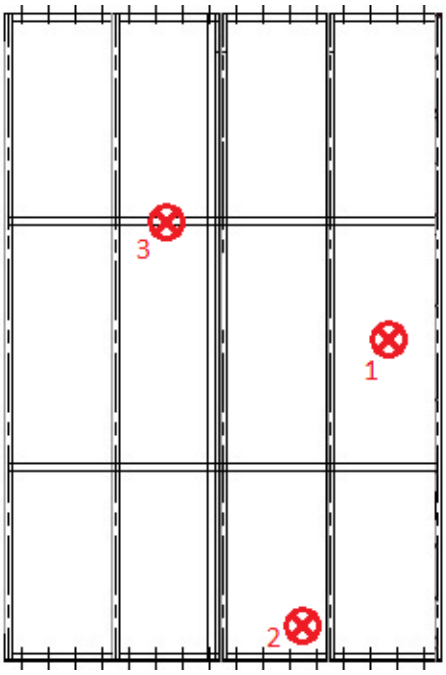


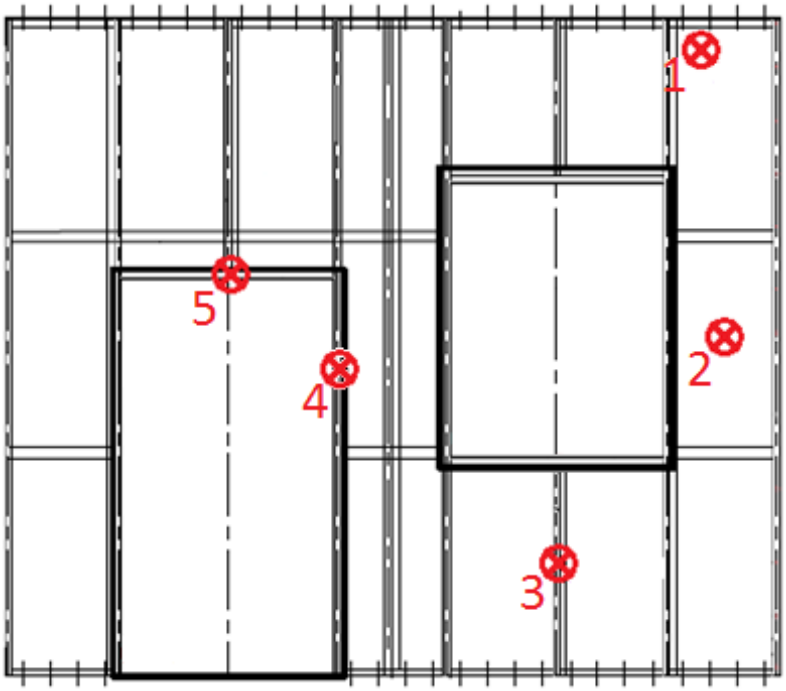
Sketch No. 3
Mock Up 1 –Impact Locations



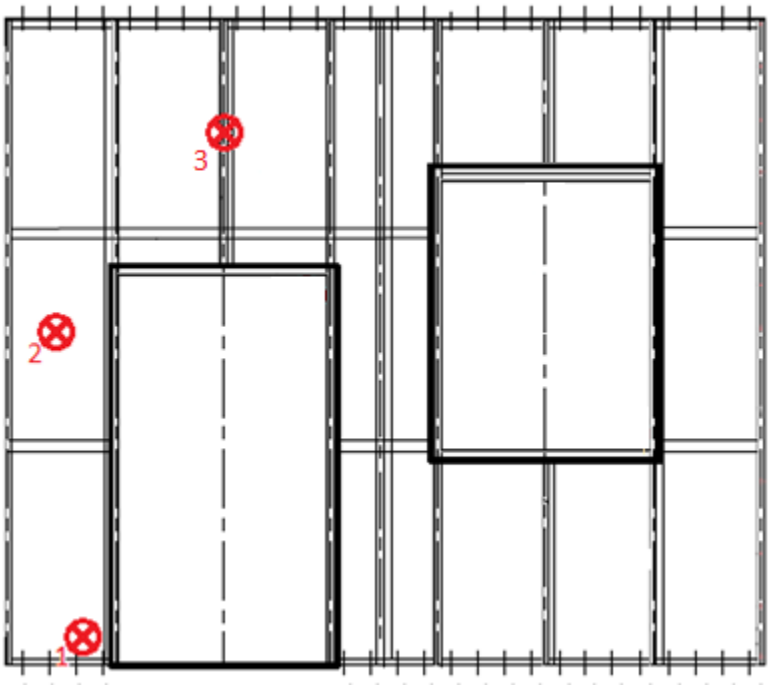
Sketch No. 4
Mock Up 2 –Impact Locations



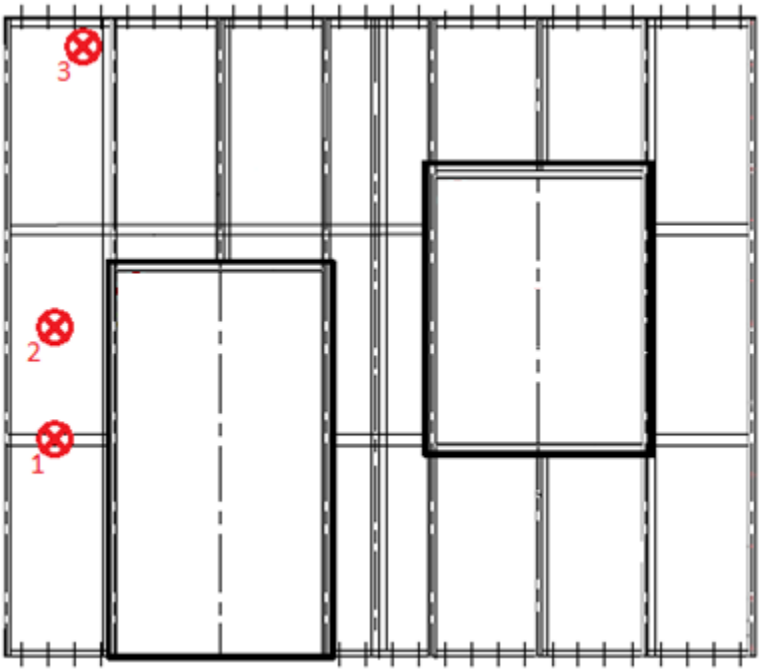
Sketch No. 5
Mock Up 3 –Impact Locations



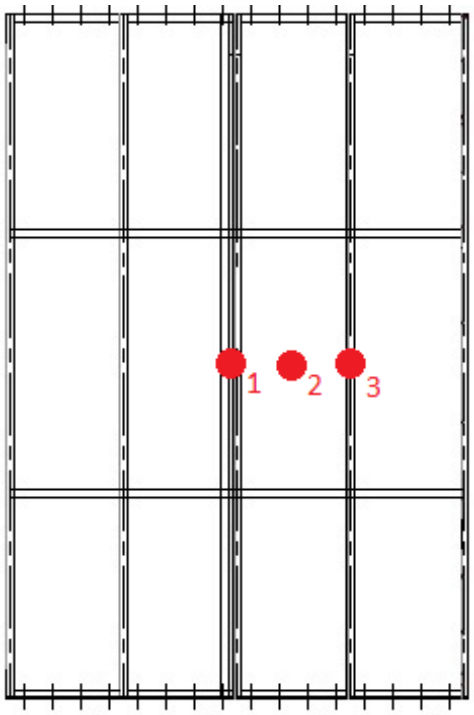
Sketch No. 6
Mock Up 4 –Impact Locations



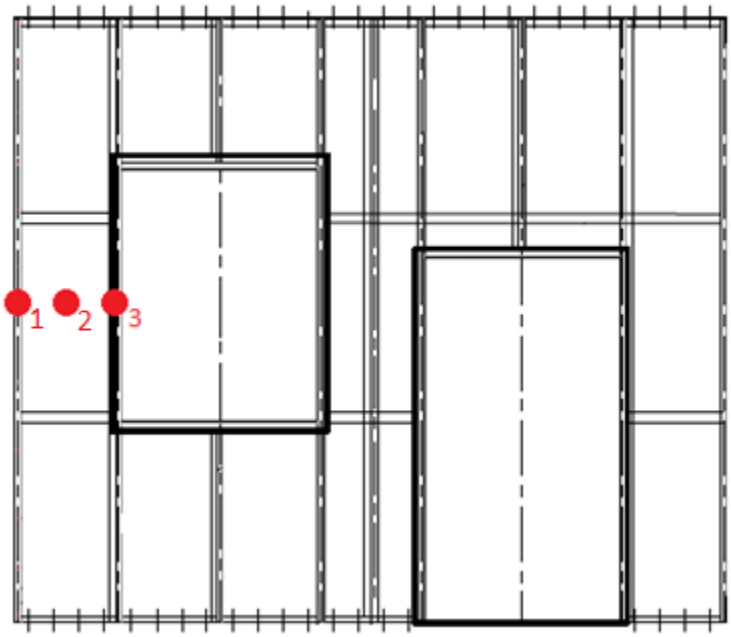
Sketch No. 7
Mock Up 5 –Impact Locations



Sketch No. 8
Mock Up 6 –Impact Locations



Sketch No. 9
Mock Ups 1, 2 & 3 – Cycling Indicator Location



Sketch No. 10
Mock Up 4, 5 & 6 – Cycling Indicator Location

2658 Electronics Way
West Palm Beach, Florida 33407

Telephone: 561-881-0020
www.intertek.com/building

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Report No.: L4423.01-450-44 R0
Date: 12/16/20

SECTION 8
PHOTOGRAPHS

Photo No. 1
Specimen #1 Negative Structural Loads

2658 Electronics Way
West Palm Beach, Florida 33407

Telephone: 561-881-0020
www.intertek.com/building

TEST REPORT FOR NORTHSTAR TECHNOLOGIES
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Photo No. 2
Specimen #4 Large Missile Impacts

SECTION 9
DRAWINGS

The "As-Built" drawings have been reviewed by Intertek B&C and are representative of the project reported herein. Project construction was verified by Intertek B&C per the drawings included in this report. Any deviations are documented herein or on the drawings.

NORTHSTAR EXTERIOR WALL PANEL SYSTEM

A FIBER REINFORCED POLYMER EXTERIOR WALL PANEL WITH A 1/4" THICK FIBER REINFORCED POLYMER BALLISTIC ARMOR PLATE SHEATHING BONDED TO A 6" FIBER REINFORCED POLYMER FRAME ASSEMBLY

DESIGN PRESSURE: +90 / -85 PSF
MISSILE IMPACT: LEVEL D
DEFLECTION LIMIT: L/120

intertek
Total Quality. Assured.

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Date: 12/16/20
Verified by:

NORTHSTAR TECHNOLOGIES GROUP INC
365 FIFTH AVE S.
NAPLES, FLORIDA 34102
239.850.6253

PINGLESE@NORTHSTARTGI.COM

NORTHSTARTGI.COM

ENGINEER

Scott Wolters
FL PE# 62354

Wolters Engineering
(COA# 27194)
15211 97th Road N.
West Palm Beach, FL 33412
561.225.1982

JOB NUMBER: 20201214

DATE:12.14.2020

DRAWN BY: P Inglese

REVISIONS

NO.	DATE	DRWN	CHKD
1	12.14.20	PI	PI

COVER PAGE

LARGE MISSILE

2"X4" 9.0 LB +0.25 / -0 +0 /-4
VELOCITY 50 FT/S
LEVEL “D”

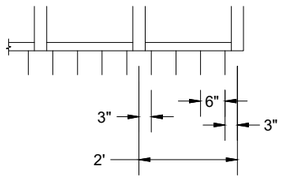
DESIGN PRESURE

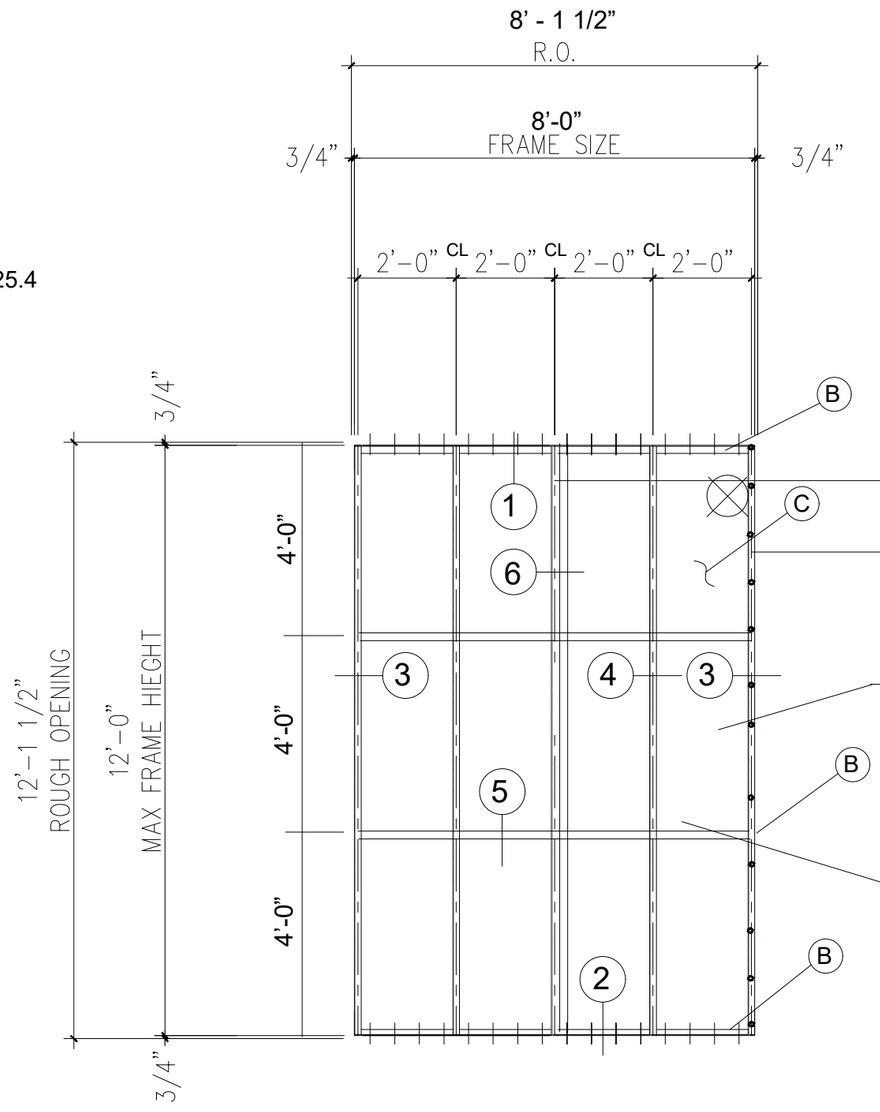
DESIGN PRESSURE: +90 / - 85 PSF
CYCLIC PRESSURE: FATIGUE SEQUENCE LOADING TABLE 1625.4

ANCHORING TYPE

5/16" DIA x 3-1/4" ULRACON BY ELCO
INTO SOUTHERN YELLOW PINE # 2 MIN. EDGE DISTANCE
FROM ANY WOOD EDGE.

ANCHORING @ HEAD & SILL





ELEVATION 1 - LARGE MISSILE

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PROJECT

Northstar Exterior Wall Panel

JOB NUMBER:

DATE: 09.23.2020

DRAWN BY: P Inglese

REVISIONS

NO.	DATE	DRWN	CHKD
1	09.23.20	PI	PI

1

LARGE MISSILE

2"X4" 9.0 LB +0.25 / -0 +0 /-4
VELOCITY 50 FT/S
LEVEL “D”

DESIGN PRESURE

DESIGN PRESSURE: +90 / - 85 PSF
CYCLIC PRESSURE: FATIGUE SEQUENCE LOADING TABLE 1625.4

ANCHORING TYPE

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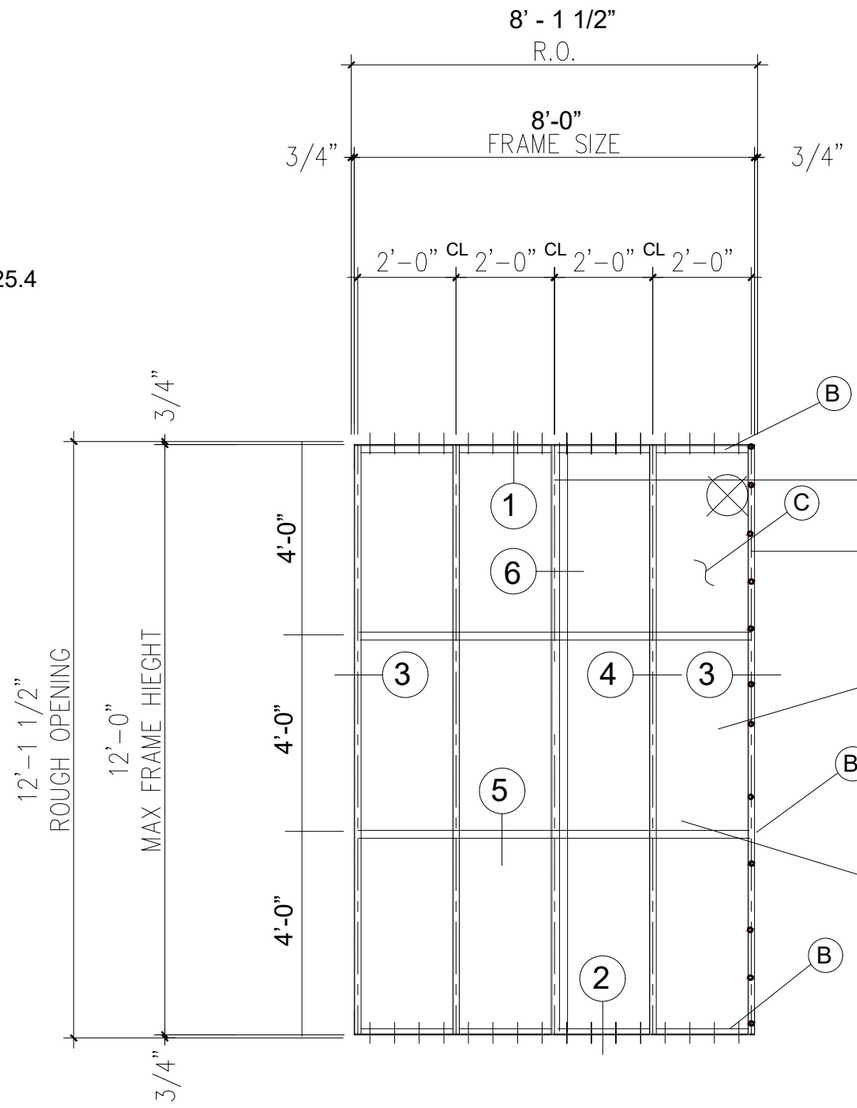
FROM ANY WOOD EDGE.



Double 6” stud at 4’-0” o.c

Single 6” stud at 2’-0” o.c

#14 x 1-1/2” ss Tek Screws at 12” o.c. all studs and horizontal cross braces

6” stud horizontal support at 4’-0” o.c

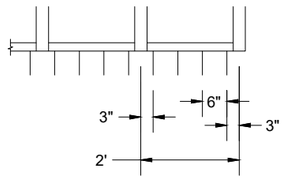
ARMOR PLATE COVER NOT SHOWN FOR CLARITY

6” stud horizontal support at 4’-0” o.c. (Typical)

1/8” bead of 3M Scotch-Weld Multi-Material Composite Urethane Epoxy on all vertical studs horizontal bracing to bond studs to Ballistic Armor Plate Sheathing

Wall panel to be fully assembled with Ballistic Armor Plate Sheathing epoxy and screwed into position in factory

ANCHORING @ HEAD & SILL



ELEVATION 2 - LARGE MISSILE

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DRAWN BY: P Inglese

REVISIONS

NO.	DATE	DRWN	CHKD
1	09.23.20	PI	PI

2

LARGE MISSILE

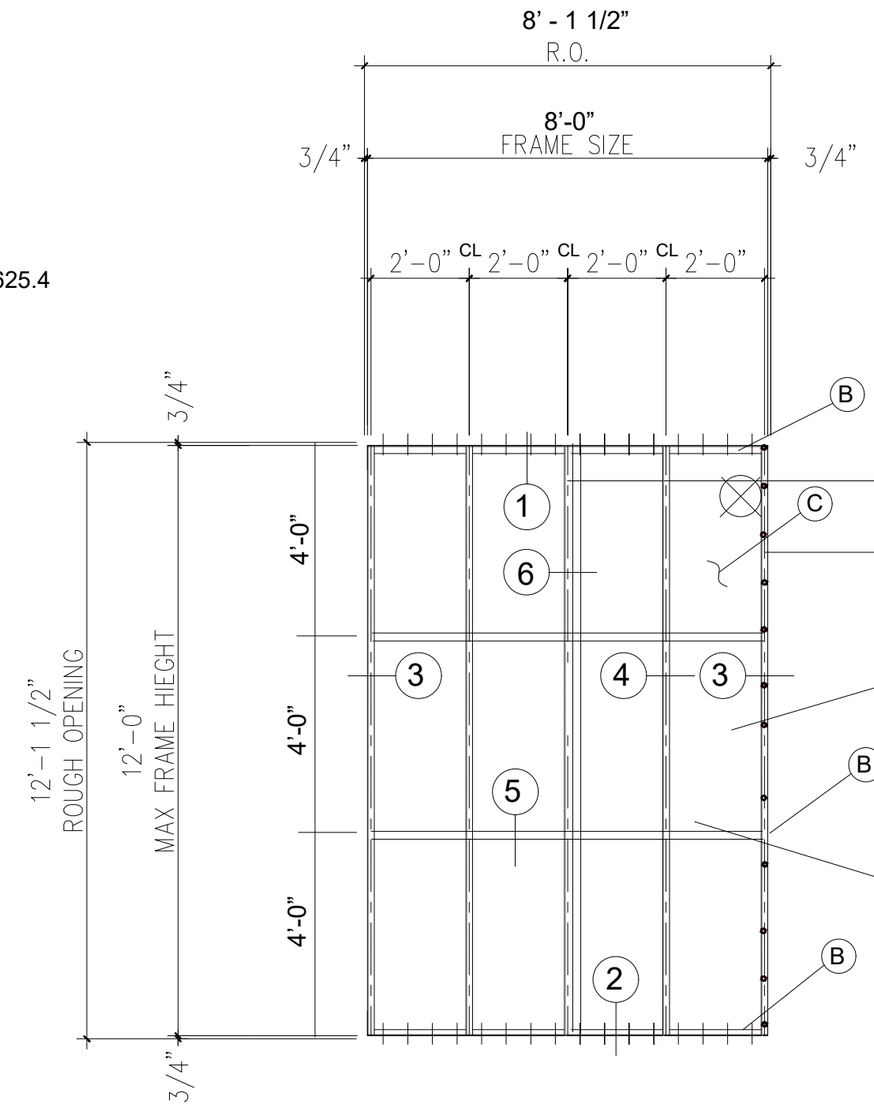
2"X4" 9.0 LB +0.25 / -0 +0 /-4
VELOCITY 50 FT/S
LEVEL “D”

DESIGN PRESURE

DESIGN PRESSURE: +90 / - 85 PSF
CYCLIC PRESSURE: FATIGUE SEQUENCE LOADING TABLE 1625.4

ANCHORING TYPE

5/16" DIA x 3-1/4" ULRACON BY ELCO
INTO SOUTHERN YELLOW PINE # 2 MIN. EDGE DISTANCE
FROM ANY WOOD EDGE.



Double 6” stud at 4’-0” o.c

Single 6” stud at 2’-0” o.c

#14 x 1-1/2” ss Tek Screws at 12” o.c. all studs and horizontal cross braces

6” stud horizontal support at 4’-0” o.c

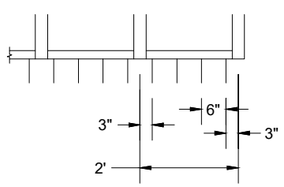
ARMOR PLATE COVER NOT SHOWN FOR CLARITY

6” stud horizontal support at 4’-0” o.c. (Typical)

1/8” bead of 3M Scotch-Weld Multi-Material Composite Urethane Epoxy on all vertical studs horizontal bracing to bond studs to Ballistic Armor Plate Sheathing

Wall panel to be fully assembled with Ballistic Armor Plate Sheathing epoxy and screwed into position in factory

ANCHORING @ HEAD & SILL



ELEVATION 3 - LARGE MISSILE

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PROJECT

Northstar Exterior Wall Panel

JOB NUMBER:

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DRAWN BY: P Inglese

REVISIONS

NO.	DATE	DRWN	CHKD
1	09.23.20	PI	PI

3

LARGE MISSILE

2"X4" 9.0 LB +0.25 / -0 +0 /-4
VELOCITY 50 FT/S
LEVEL “D”

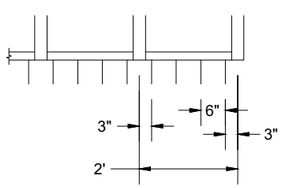
DESIGN PRESURE

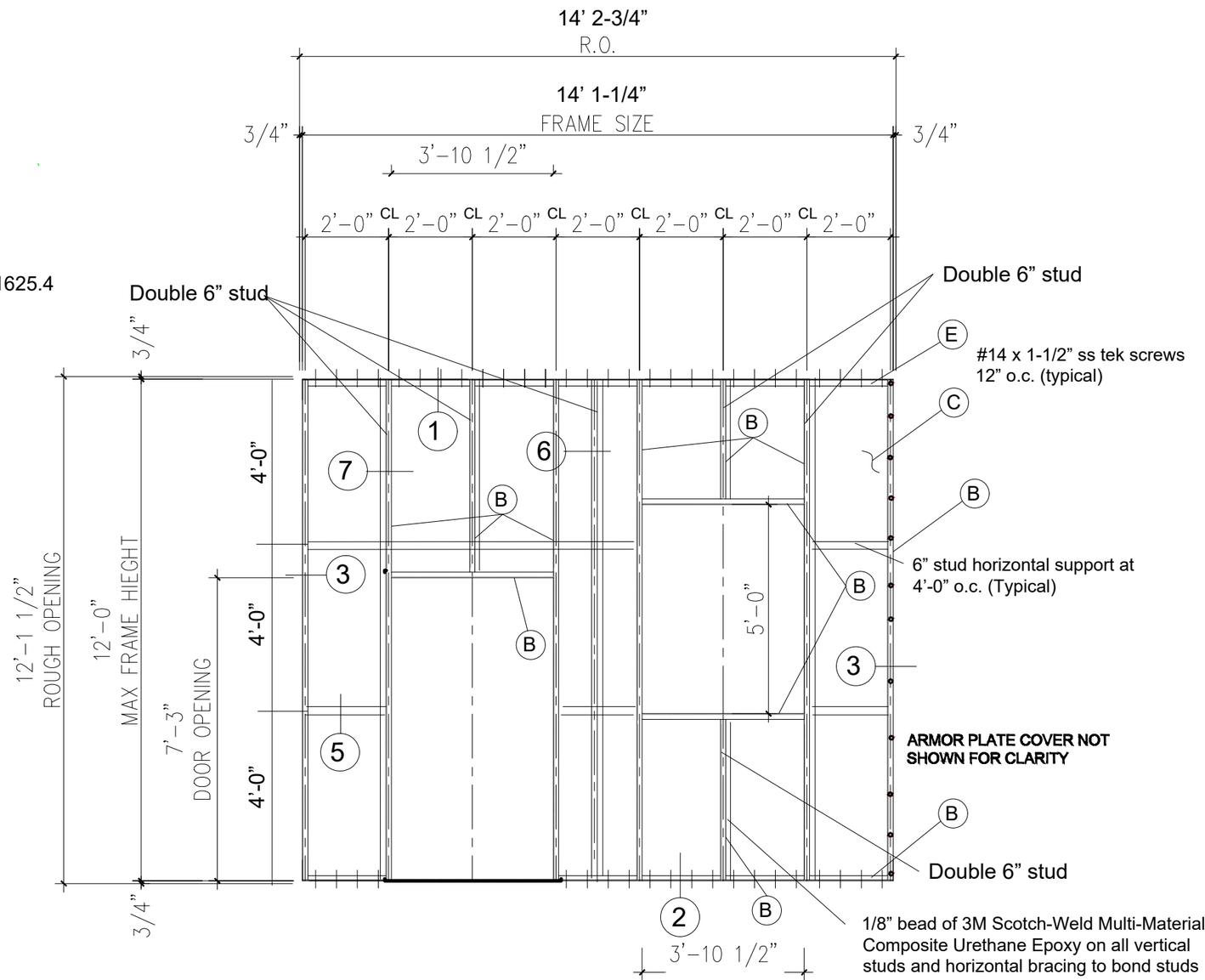
DESIGN PRESSURE: +90 / - 85 PSF
CYCLIC PRESSURE: FATIGUE SEQUENCE LOADING TABLE 1625.4

ANCHORING TYPE

5/16" DIA x 3-1/4" ULRACON BY ELCO
INTO SOUTHERN YELLOW PINE # 2 MIN. EDGE DISTANCE
FROM ANY WOOD EDGE.

ANCHORING SPACING @ HEAD & SILL





Wall panel to be fully assembled with Ballistic Armor Plate Sheathing epoxy and screwed into position in factory

ELEVATION 4 - LARGE MISSILE

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DRAWN BY: P Inglese

REVISIONS

NO.	DATE	DRWN	CHKD
1	00.23.20	PI	PI

4

LARGE MISSILE

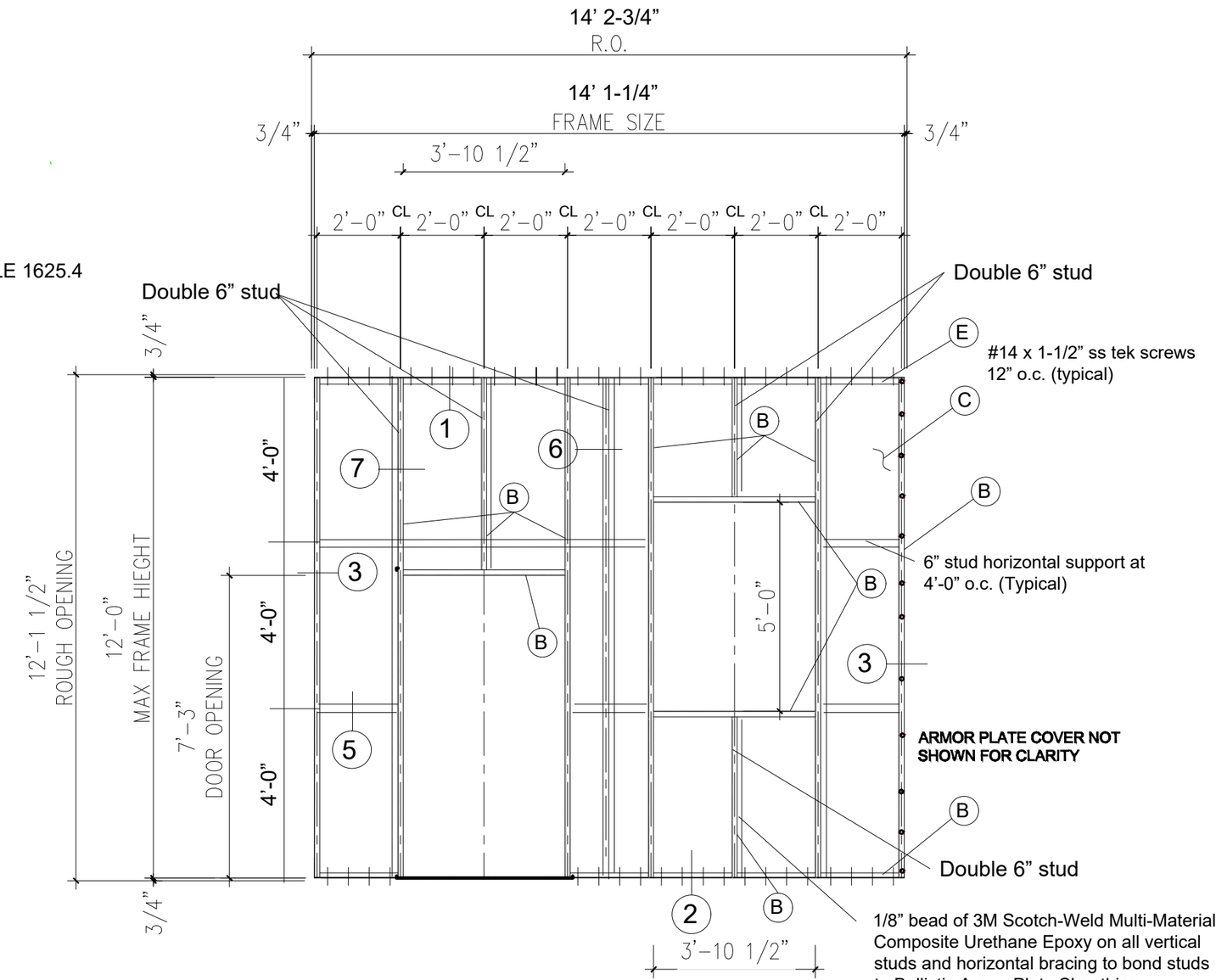
2"X4" 9.0 LB +0.25 / -0 +0 /-4
VELOCITY 50 FT/S
LEVEL “D”

DESIGN PRESURE

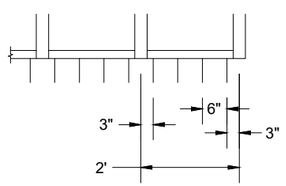
DESIGN PRESSURE: +90 / - 85 PSF
CYCLIC PRESSURE: FATIGUE SEQUENCE LOADING TABLE 1625.4

ANCHORING TYPE

5/16" DIA x 3-1/4" ULRACON BY ELCO
INTO SOUTHERN YELLOW PINE # 2 MIN. EDGE DISTANCE
FROM ANY WOOD EDGE.



ANCHORING SPACING @ HEAD & SILL



ELEVATION 5 - LARGE MISSILE

Wall panel to be fully assembled with Ballistic Armor Plate Sheathing epoxy and screwed into position in factory

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1	09.23.20	PI	PI

5

LARGE MISSILE

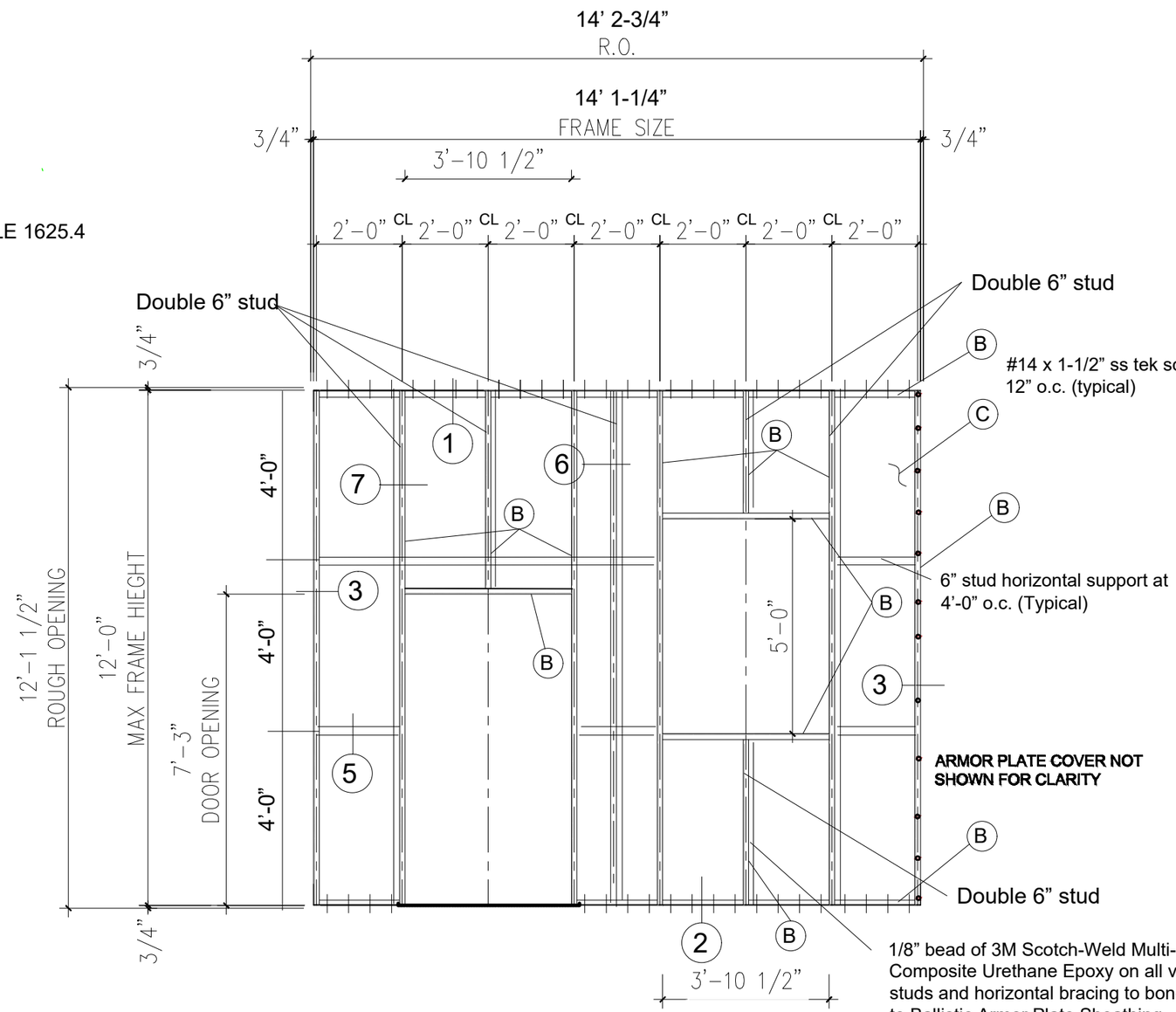
2"X4" 9.0 LB +0.25 / -0 +0 /-4
VELOCITY 50 FT/S
LEVEL “D”

DESIGN PRESURE

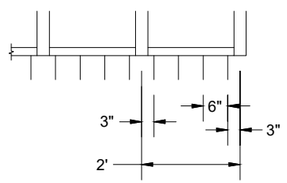
DESIGN PRESSURE: +90 / - 85 PSF
CYCLIC PRESSURE: FATIGUE SEQUENCE LOADING TABLE 1625.4

ANCHORING TYPE

5/16" DIA x 3-1/4" ULRACON BY ELCO
INTO SOUTHERN YELLOW PINE # 2 MIN. EDGE DISTANCE
FROM ANY WOOD EDGE.



ANCHORING SPACING @ HEAD & SILL



ELEVATION 6 - LARGE MISSILE

Wall panel to be fully assembled with Ballistic Armor Plate Sheathing epoxy and screwed into position in factory

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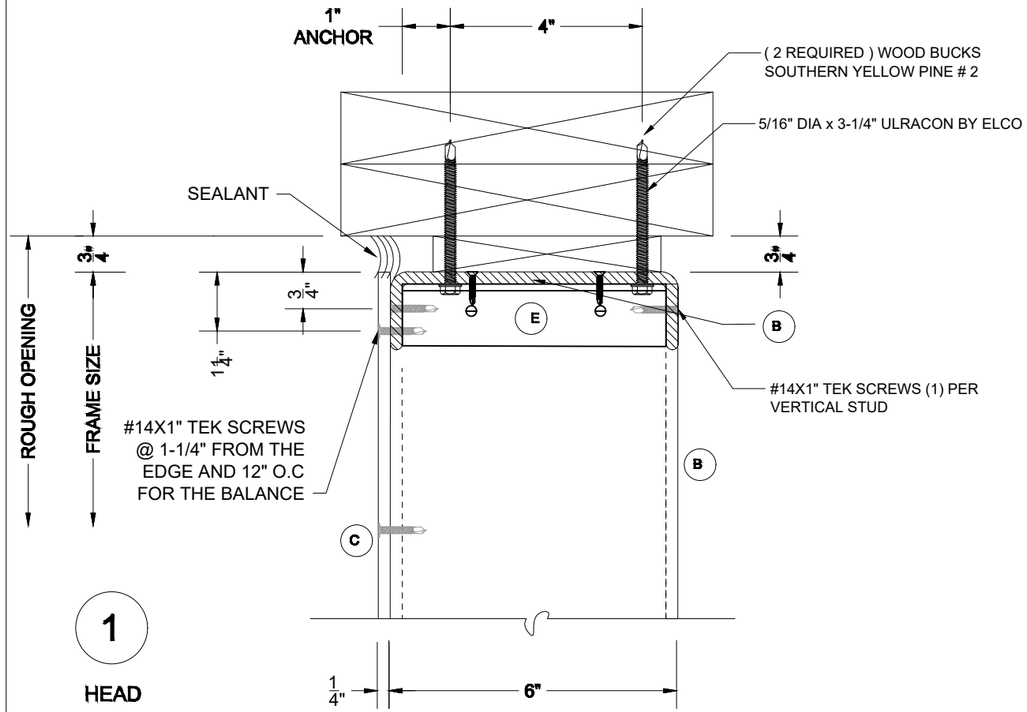
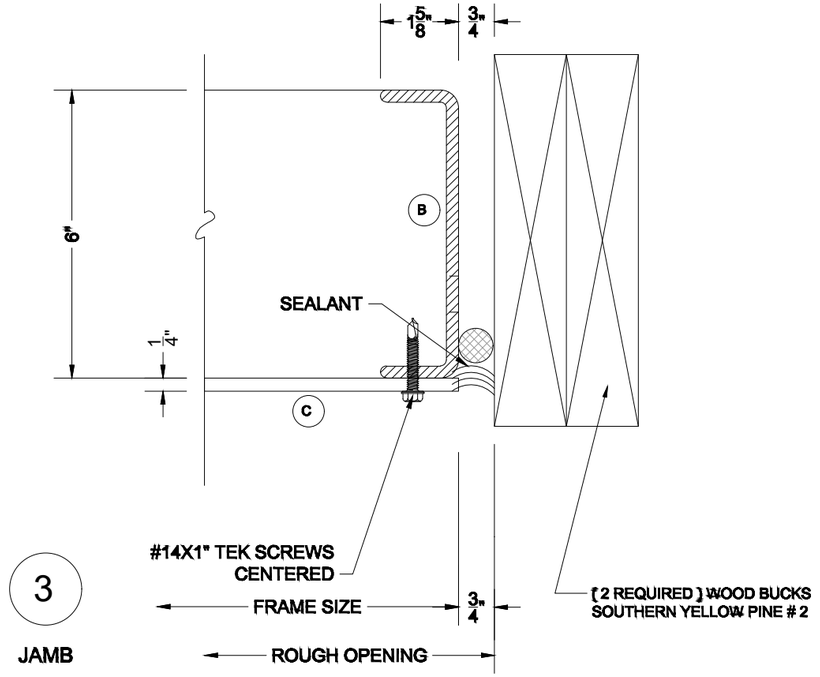


1

HEAD



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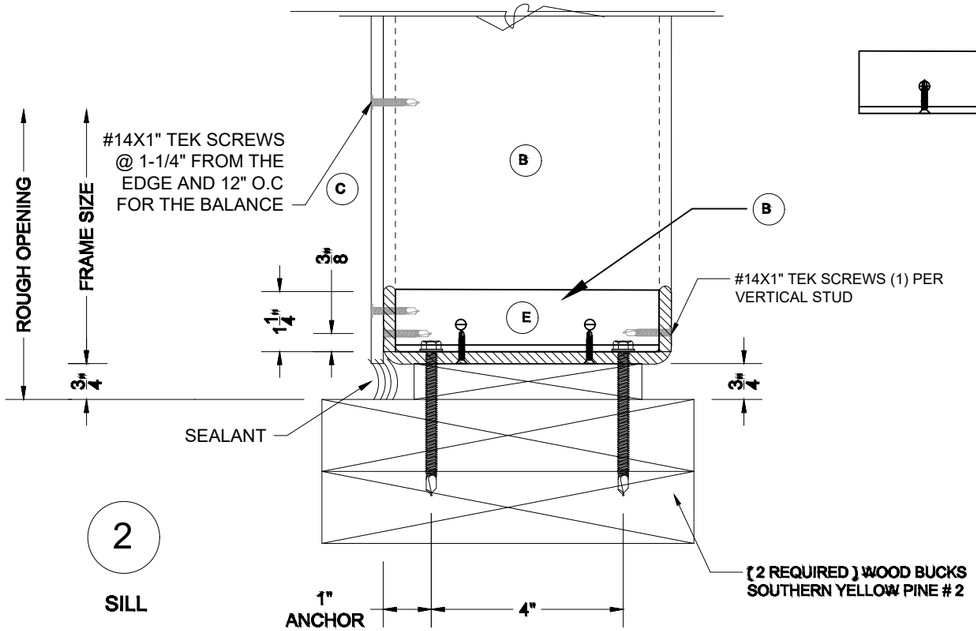
JAMB

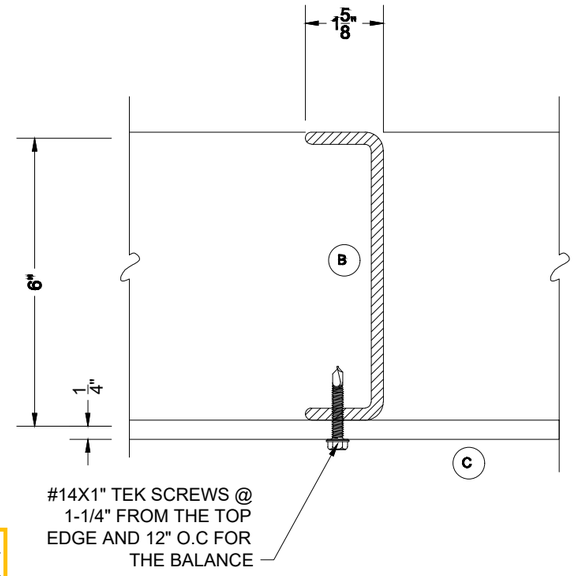


2

SILL

4

VERTICAL STUD



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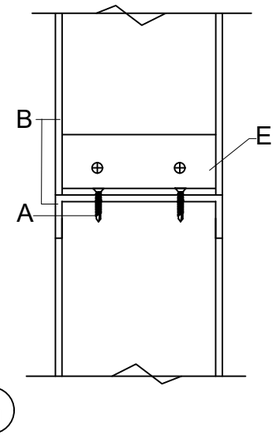
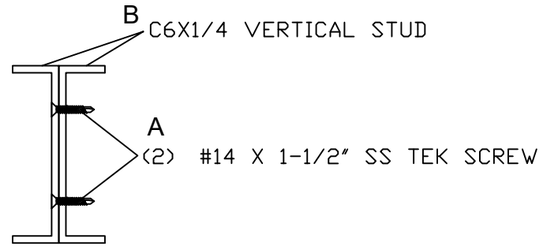


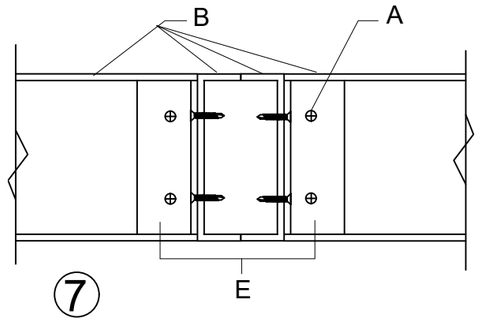
5

VERTICAL STUD TO HORIZONTAL STUD CONNECTION
AT END OF PANELS



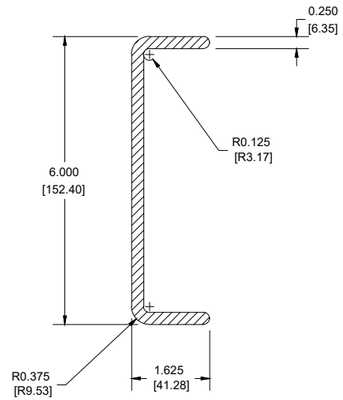
6

DOUBLE STUD CONNECTION DETAIL

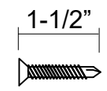


7

VERTICAL STUD TO HORIZONTAL ST
AT MID-POINT STUDS

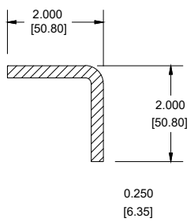


B **C6 X 1-5/8 STUDS**
(FIBERGLASS)



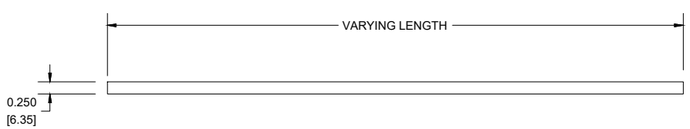
A #14 x 1-1/2” Self-Drilling Tek Screw
(stainless steel

F 3M Scotch - Weld Mult-Material
Composite Urethane Epoxy



E L2 x 1/4” CLIP ANGLE BRACKET

FIBERGLASS



C **FIBERGLASS BALLISTIC ARMOR PLATE**
(COMPOSITE MATERIAL)

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SECTION 10
REVISION LOG

REVISION #	DATE	PAGES	REVISION
0	12/16/20	N/A	Original Report Issue