130 Derry Court
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NFRC U-FACTOR, SHGC, VT, & CONDENSATION RESISTANCE COMPUTER SIMULATION REPORT

Rendered to:
WINDOW FILM DEPOT

SERIES/MODEL:
Defense Lite Simulation Analysis - Single Aluminum Door

Report Number: **I8784.01-116-45**
Report Date: **09/18/18**

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NFRC U-FACTOR, SHGC, VT, & CONDENSATION RESISTANCE
COMPUTER SIMULATION REPORT

Rendered to:
WINDOW FILM DEPOT
4939 Lower Roswell Road
Marietta, Georgia 30068

Report Number:	I8784.01-116-45
Simulation Date:	09/18/18
Report Date:	09/18/18

Project Summary:
Architectural Testing, Inc., an Intertek Company (Intertek-ATI) was contracted to perform U-Factor, Solar Heat Gain Coefficient, Visible Transmittance, and Condensation Resistance* computer simulations in accordance with the National Fenestration Rating Council (NFRC). The products were evaluated in full compliance with NFRC requirements to the standards listed

**NFRC's Condensation Resistance rating is NOT equivalent to a Condensation Resistance Factor (CRF) determined in accordance with AAMA 1503.*

Standards:

ANSI/NFRC 100-2017:	*Procedure for Determining Fenestration Product U-Factors*
ANSI/NFRC 200-2017:	*Procedure for Determining Fenestration Product Solar Heat Gain Coefficient and Visible Transmittance at Normal Incidence*
NFRC 500-2017:	*Procedure for Determining Fenestration Product Condensation Resistance Values*

Software:

Frame and Edge Modeling:	THERM 7.4.4
Center-of-Glass Modeling:	WINDOW 7.4.14
Total Product Calculations:	WINDOW 7.4.14
Spectral Data Library:	IGDB 62.0

Simulations Specimen Description:

Series/Model:	Defense Lite Simulation Analysis - Single Aluminum Door
Type:	Swinging Door, Single Leaf Entrance Door
Frame Material:	AL Aluminum (Non-thermally broken)
Sash Material:	AL Aluminum (Non-thermally broken)
Standard Size:	960mm x 2090mm

Modeling Assumptions/Technical Interpretations:

1) To prevent air infiltration, tape was applied to all interior sash crack locations.

Specialty Products Table:

The specialty products method allow the manufacturer to determine the overall product SHGC and VT for any glazing option. The center of glass SHGC and/or VT must be determined using WINDOW 7.4.14. The method gives overall product SHGC and VT indexed on center of glass properties. All values used in the calculations are truncated to six decimal place precision.

	No Dividers	Dividers < 1	Dividers > 1
SHGC0	0.042794	0.045490	0.047971
SHGC1	0.584038	0.505281	0.433770
VT0	0.000000	0.000000	0.000000
VT1	0.541244	0.459790	0.384848

SHGC = SHGC0 + SHGCc (SHGC1 - SHGC0)

VT = VT0 + VTc (VT1 - VT0)

Validation Matrix:

The following products are part of a validation matrix. Only one is required for validation testing.

Product Line	*Report Number*
None	-

Spacer Option Description

	Sealant		
Spacer Type	*Primary*	*Secondary*	*Code*
Aluminum Spacer	Silicone	PIB	A1-D

Grid Option Description

Grid Size	*Grid Type*	*Grid Pattern*
None	-	-

Reinforcement Option Description

Location	*Material*
None	-

Gas Filling Technique Description

Fill Type	*Method*
None	-

Edge-of-Glass Construction

Interior Condition	EPDM gaskets between frame and glass
Exterior Condition	EPDM gaskets between frame and glass

Weatherstripping

Type	*Quantity*	*Location*
EPDM sweep gasket	1 row	Bottom rail
EPDM bulb gasket	1 row	Head, jamb

Frame/Sash Materials Finish

Interior	Painted aluminum
Exterior	Painted aluminum

NFRC 100/200/500 Summary Sheet
Defense Lite Simulation Analysis - Single Aluminum Door

ID	Pane Thickness 1	Gap Width 1	Pane Thickness 2	Gap Width 2	Pane Thickness 3	Gap Width 3	Pane Thickness 4	Gap Fill	Low-e (Surface#)	Tint	Spacer	Grid Type
	U-Factor			Solar Heat Gain Coefficient (SHGC) Grids (None / <1 / >=1)					Visible Transmittance (VT) Grids (None / <1 / >=1)		Condensation Resistance	
1	Dual Glazed Base System: DG: SB70XL on Starphire / air / clr (6mm/6mm) - 1" IG											
	0.223	0.500	0.225					AIR	0.018(#2)	CL	A1-D	N
	U-Factor		0.73	SHGC (N)				0.19	VT (N)	0.35	CR	17
2	Elevation "C" (Dual Glazed w/ 0.375" Defense Lite (wo/film), 1" x 0.125" Alum. Bar Trim)											
	0.376	0.421	0.223	0.500	0.225			AIR	0.018(#4)	CL	A1-D	N
	U-Factor		0.65	SHGC (N)				0.19	VT (N)	0.29	CR	20
3	Elevation "D" (Dual Glazed w/ 0.375" Defense Lite (wo/film), 1.125" Vinyl Trim)											
	0.376	0.421	0.223	0.500	0.225			AIR	0.018(#4)	CL	A1-D	N
	U-Factor		0.65	SHGC (N)				0.19	VT (N)	0.29	CR	20
4	Single Glazed Base System: SG: Energy Advantage (#2) (6mm)											
	0.222								0.157(#2)	CL	N	N
	U-Factor		0.90	SHGC (N)				0.42	VT (N)	0.44	CR	08
5	Elevation "C" (Single Glazed w/ 0.375" Defense Lite (wo/film), 1" x 0.125" Alum. Bar Trim)											
	0.376	0.796	0.222					AIR	0.157(#4)	CL	N	N
	U-Factor		0.72	SHGC (N)				0.39	VT (N)	0.37	CR	20
6	Elevation "D" (Single Glazed w/ 0.375" Defense Lite (wo/film), 1.125" Vinyl Trim)											
	0.376	0.796	0.222					AIR	0.157(#4)	CL	N	N
	U-Factor		0.72	SHGC (N)				0.39	VT (N)	0.37	CR	23

The Condensation Resistance results obtained from this procedure are for controlled laboratory conditions and do not include the effects of air movement through the specimen, solar radiation, and the thermal bridging that may occur due to the specific design and construction of the fenestration system opening.

Ratings values included in this report are for submittals to an NFRC-licensed IA and are not meant to be used directly for labeling purposes. Only those values identified on a valid Certification Authorization Report (CAR) by an NFRC accredited Inspection Agency (IA) are to be used for labeling purposes. The ratings values were rounded in accordance to NFRC 601, NFRC Unit and Measurement Policy.

Intertek-ATI is an NFRC accredited simulation laboratory and all simulations were conducted in full compliance with NFRC approved procedures and specifications. The values included in this report are not considered in compliance with ANSI/NFRC 100, ANSI/NFRC 200, and/or NFRC 500 unless the associated validation test requirements have been satisfied, as applicable.

Intertek-ATI will service this report for the entire test record retention period. Test records that are retained such as detailed drawings, datasheets, representative samples of test specimens, or other pertinent project documentation will be retained by Intertek-ATI for the entire test record retention period. The test record retention end date for this report is September 18, 2023.

Results obtained are simulated values and were secured by using the designated test methods. This report does not constitute certification of this product nor an opinion or endorsement by this laboratory. It is the exclusive property of the client so named herein and relates only to the product simulated. This report may not be reproduced, except in full, without the written approval of Intertek-ATI

For INTERTEK-ATI:

SIMULATED BY:

Digitally Signed by: Eric S. Leitner

Eric S. Leitner
Simulation Technician Team Leader
Simulator-In-Responsible-Charge

REVIEWED BY:

Digitally Signed by: Michael J. Thoman

Michael J. Thoman
Senior Director

ESL:esl
I8784.01-116-45

Attachments (pages): This report is complete only when all attachments listed are included.
Appendix A: Drawings and Bills of Material (5)

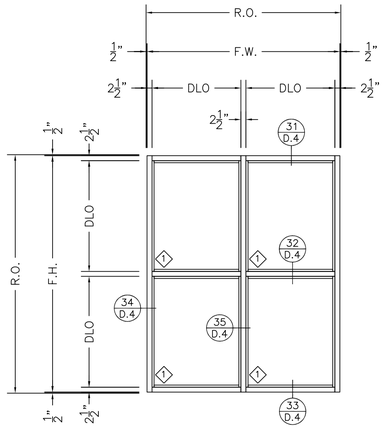
Revision Log

Rev. #	Date	Page(s)	Revision(s)
.01R0	09/18/18	All	- Original report issue

All drawings and Bills of Material used to simulate this product are enclosed in this Appendix

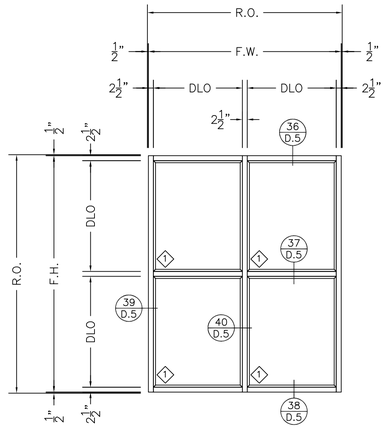
Appendix A

I8784.01-116-45



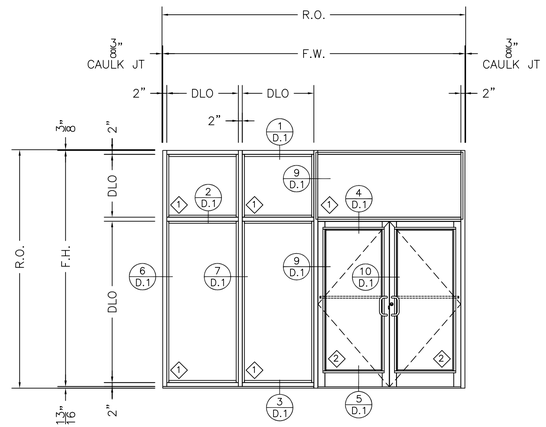
ELEVATION "A"

CURTAIN WALL: 2 1/2" x 7 1/2"
.236 DEFENSE LITE WITH
1" x .125 ALUM. BAR TRIM



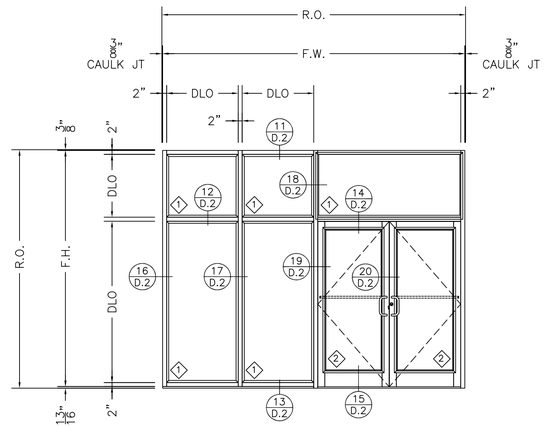
ELEVATION "B"

CURTAIN WALL: 2 1/2" x 7 1/2"
.236 DEFENSE LITE WITH
1.125 VINYL TRIM



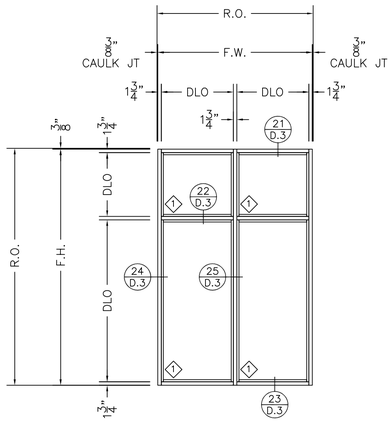
ELEVATION "C"

STOREFRONT 2" x 4 1/2"
.236 DEFENSE LITE WITH
1" x .125 ALUM. BAR TRIM
ALUMINUM DOOR WITH
.375 DEFENSE LITE



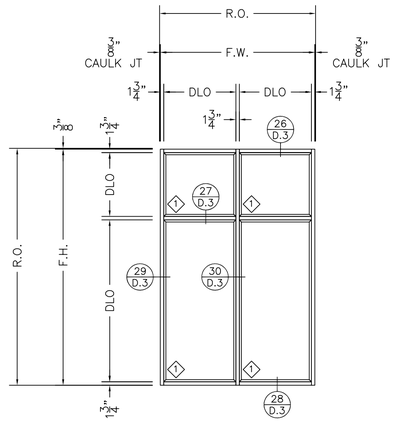
ELEVATION "D"

STOREFRONT 2" x 4 1/2"
.236 DEFENSE LITE WITH
1.125 VINYL TRIM
ALUMINUM DOOR WITH
.375 DEFENSE LITE



ELEVATION "E"

STOREFRONT 1 3/4" x 4 1/2"
.236 DEFENSE LITE WITH
1" x .125 ALUM. BAR TRIM



ELEVATION "F"

STOREFRONT 1 3/4" x 4 1/2"
.236 DEFENSE LITE WITH
1.125" VINYL TRIM

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ARCHITECT NAME AND LOCATION:

CUSTOMER NAME AND LOCATION:

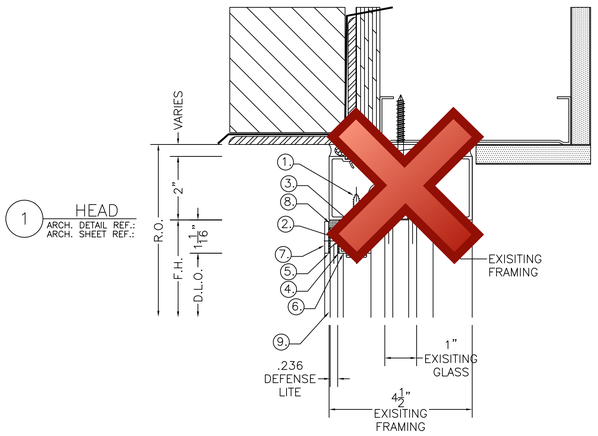
PROJECT NAME AND LOCATION:
DEFENSE LITE
DETAILS

DESCRIPTION:
ELEVATION SHEET

SCALE:	ISSUE DATE:
3/8":1'-0"	08/22/18
DRAWN BY:	SHEET NO.:
BS	E.1
JOB NUMBER:	

PARTS DESCRIPTION

1. #12 x 2" S.S. WITH SECURITY TIP & CSK WASHER 4" FROM EACH END & 12" O.C FOR STANDARD SYSTEM. 6" O.C FOR THE HIGH CRIME SYSTEM.
2. #12 x 1" S.S. WITH SECURITY TIP 3" FROM EACH END & 12" O.C. FOR STANDARD SYSTEM. 6 " O.C. FOR THE HIGH CRIME SYSTEM. REQUIRES ¼" HOLE DRILLED IN .236 DEFENSE LITE.
3. 1" WIDE HIGH BOND TAPE 1" TUBE TO EXISITING FRAMING.
4. ¾" WIDE HIGH BOND TAPE 1" TUBE TO NEW .236 DEFENSE LITE.
5. ¾" WIDE HIGH BOND TAPE NEW 1" FLAT BAR TO NEW .236 DEFENSE LITE.
6. 1" x 1" x .063 (6063) ALUM. TUBE
7. 1" x .125 (6061) FLAT ALUM. BAR
8. DOW 995 PERIMETER SEALANT
9. .236 DEFENSE LITE



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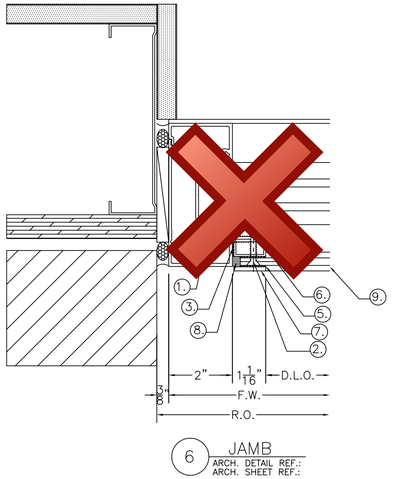

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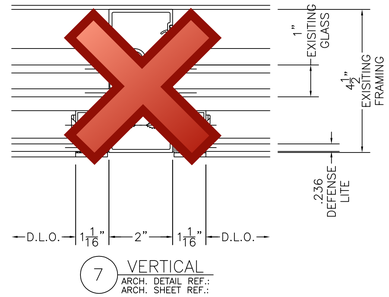

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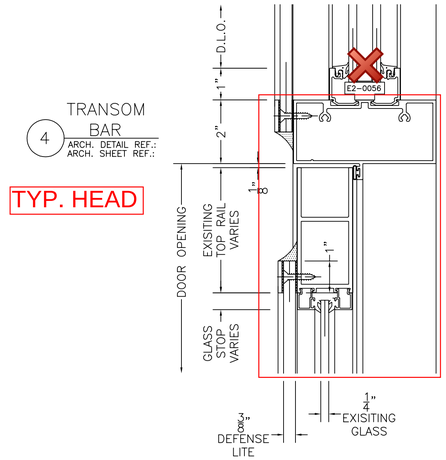

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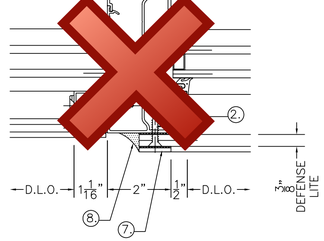

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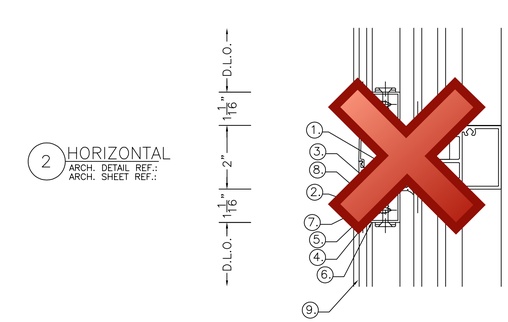

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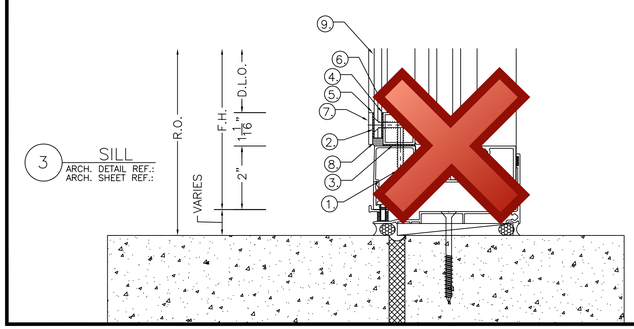

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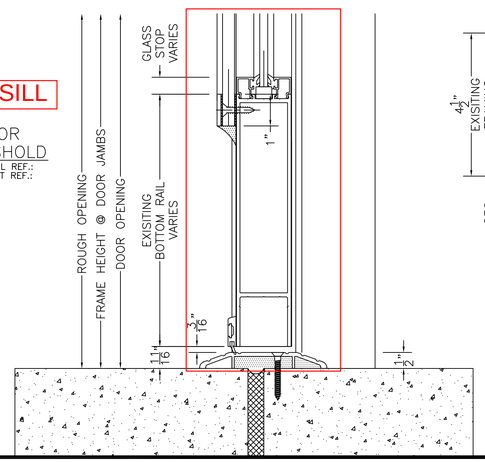

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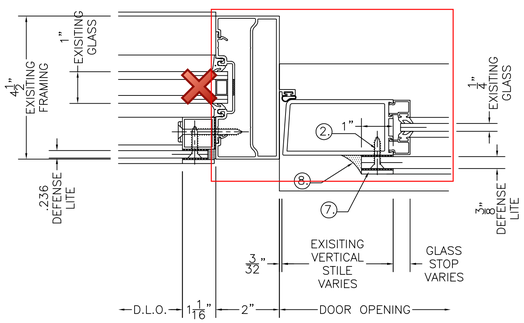

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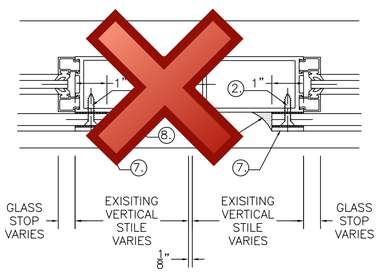

10 MEETING
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ARCHITECT NAME AND LOCATION:

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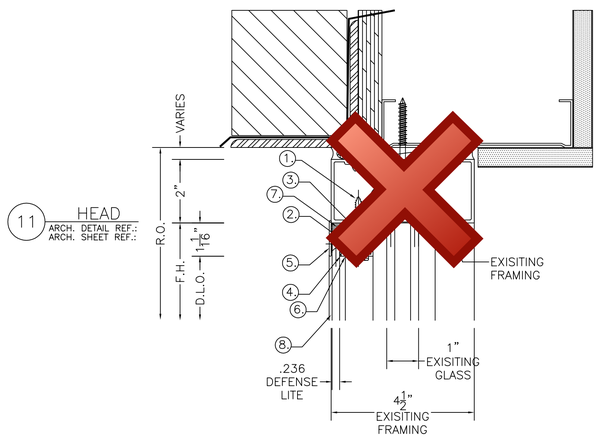
PROJECT NAME AND LOCATION:
DEFENSE LITE DETAILS

DESCRIPTION: DETAIL SHEET

SCALE:	ISSUE DATE:
1:2	08/22/18
DRAWN BY: BS	SHEET NO.: D.1
JOB NUMBER:	

PARTS DESCRIPTION

1. #12 x 2" S.S. WITH SECURITY TIP & CSK WASHER
   4" FROM EACH END & 12" O.C FOR STANDARD SYSTEM.
   6" O.C FOR THE HIGH CRIME SYSTEM.
2. #12 x 1" S.S. WITH SECURITY TIP
   3" FROM EACH END & 12" O.C. FOR STANDARD SYSTEM.
   6 " O.C. FOR THE HIGH CRIME SYSTEM.
   REQUIRES ¼" HOLE DRILLED IN .236 DEFENSE LITE.
3. 1" WIDE HIGH BOND TAPE
   1" TUBE TO EXISITING FRAMING.
4. ¾" WIDE HIGH BOND TAPE
   1" TUBE TO NEW .236 DEFENSE LITE.
5. VINYL BEAUTY STRIP WITH DOUBLE SIDED ACRYLIC BASED TAPE (COLOR DEPENDS ON JOB.)
6. 1" x 1" x .063 (6063) ALUM. TUBE
7. DOW 995 PERIMETER SEALANT
8. .236 DEFENSE LITE



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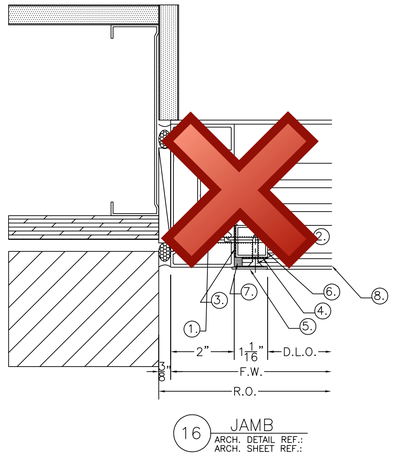

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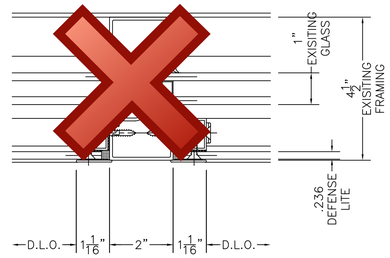

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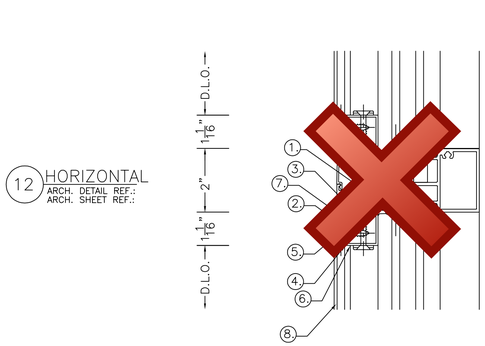

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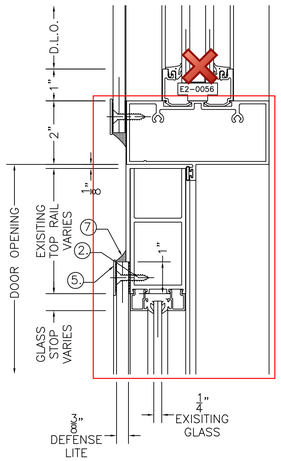
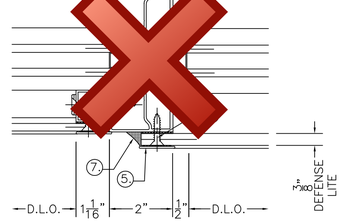
ARCH. SHEET REF.:

TYP. HEAD





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ARCH. SHEET REF.:

TYP. SILL

DOOR THRESHOLD
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ARCH. DETAIL REF.:
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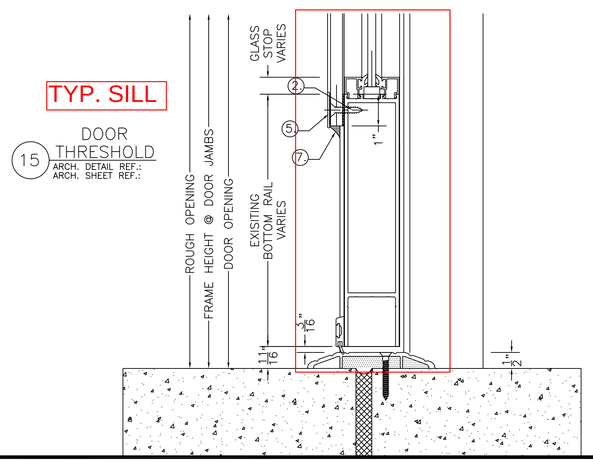

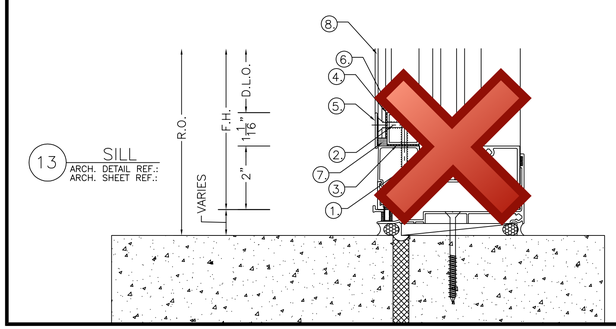

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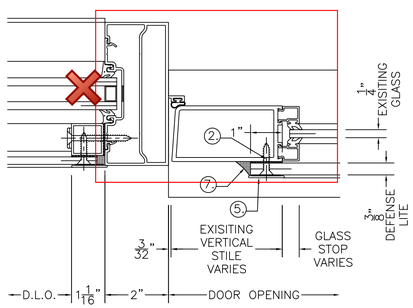
TYP. JAMB



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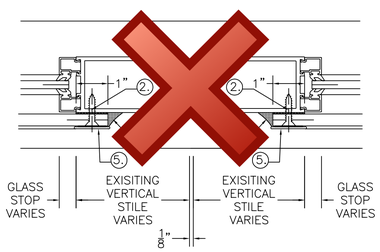

20 MEETING
ARCH. DETAIL REF.:
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NO.	REVISION	ISSUE DATE	BY	CKD

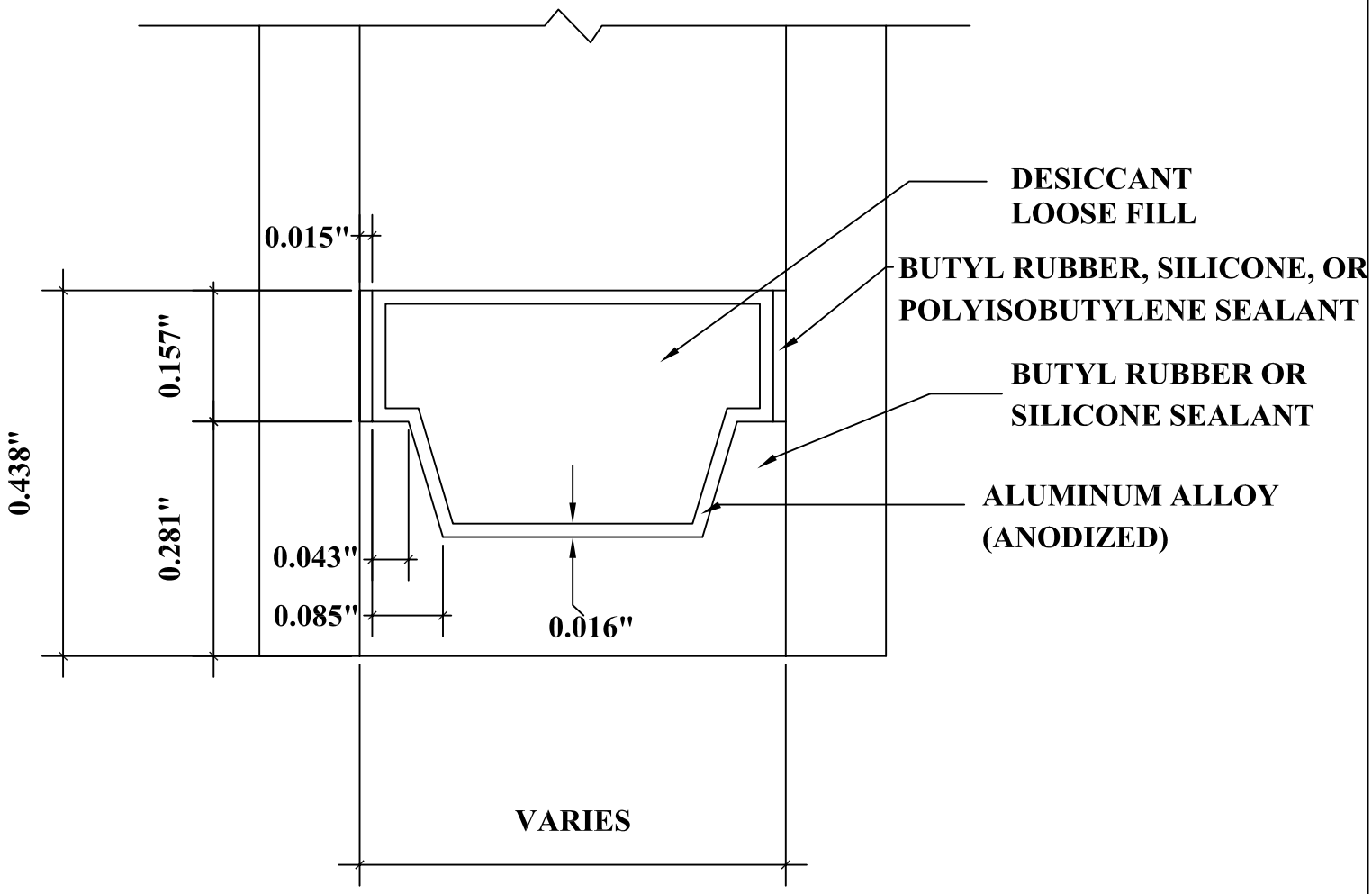
ARCHITECT NAME AND LOCATION:

CUSTOMER NAME AND LOCATION:

PROJECT NAME AND LOCATION:
DEFENSE LITE DETAILS

DESCRIPTION: DETAIL SHEET

SCALE:	ISSUE DATE:
1:2	08/22/18
DRAWN BY: BS	SHEET NO.: D.2
JOB NUMBER:	



DETAIL FOR THERMAL MODELING OF
ALUMINUM SPACER (A1-D)

COG Data for Door (I8784.01-116-45)

ID	IG Name	Overall IG Thickness (in)	Ufactor COG (Btu/h*ft2*F)	SHGC (COG)	RHG (Btu/h*ft2)	Tsol	Routsol	Rinsol	VLT (COG)	Rinvis	Routvis	Tuv	Tdw-K	Tdw-ISO
1	Single Glazed: Energy Advantage (#2) (6mm)	0.22	0.6436	0.7042	168.80	0.6615	0.0997	0.1130	0.8186	0.1082	0.1016	0.4939	0.5563	0.7117
2	Dual Glazed: SB70XL on Starphire / air / clr (6mm/6mm)	0.95	0.2850	0.2753	66.98	0.2447	0.5227	0.3747	0.6381	0.1264	0.1174	0.0572	0.2191	0.4289
3	0.375" Defense Lite (wo/film) over Single Glazed	1.39	0.3281	0.6455	152.60	0.5320	0.1171	0.1427	0.6781	0.1507	0.1319	0.0000	0.1662	0.4167
4	0.375" Defense Lite (wo/film) over Dual Glazed	1.74	0.1984	0.2754	66.20	0.1990	0.4124	0.3838	0.5291	0.1523	0.1427	0.0000	0.1203	0.3127

intertek
Total Quality. Assured.

Report #: I8784-116-45
Date: 9/18/2018
Verified by: