

## MIAMI-DADE COUNTY PRODUCT CONTROL SECTION

11805 SW 26 Street, Room 208 Miami, Florida 33175-2474 T (786) 315-2590 F (786) 315-2599

www.miamidade.gov/economy

## DEPARTMENT OF REGULATORY AND ECONOMIC RESOURCES (RER) BOARD AND CODE ADMINISTRATION DIVISION

## NOTICE OF ACCEPTANCE (NOA)

Ruskin Company 3900 Dr. Greaves Road Grandview, MO 64030

**SCOPE:** This NOA is being issued under the applicable rules and regulations governing the use of construction materials. The documentation submitted has been reviewed and accepted by Miami-Dade County RER-Product Control Section to be used in Miami-Dade County and other areas where allowed by the Authority Having Jurisdiction (AHJ).

This NOA shall not be valid after the expiration date stated below. The Miami-Dade County Product Control Section (In Miami-Dade County) and/ or the AHJ (in areas other than Miami-Dade County) reserve the right to have this product or material tested for quality assurance purposes. If this product or material fails to perform in the accepted manner, the manufacturer will incur the expense of such testing and the AHJ may immediately revoke, modify, or suspend the use of such product or material within their jurisdiction. RER reserves the right to revoke this acceptance, if it is determined by Miami-Dade County Product Control Section that this product or material fails to meet the requirements of the applicable building code.

This product is approved as described herein and has been designed to comply with the Florida Building Code, including the High Velocity Hurricane Zone.

#### **DESCRIPTION: Model ELF375DXD Aluminum Louver**

**APPROVAL DOCUMENT:** Drawing No. **60-021902-00D**, titled "ELF375DXD Louver", sheets 1 through 11 of 11, dated 05/26/2006, with revision **D** dated 03/02/2018, prepared by Ruskin Company, signed and sealed by Melissa M. Massar, P.E., bearing the Miami-Dade County Product Control revision stamp with the Notice of Acceptance number and expiration date by the Miami-Dade County Product Control Section.

#### MISSILE IMPACT RATING: Large and Small Missile Impact Resistant

**LABELING:** Each unit shall bear a permanent label with the manufacturer's name or logo, Geneva, AL and Juarez, Mexico, model/series, and following statement: "Miami-Dade County Product Control Approved", unless otherwise noted herein.

**LIMITATION:** This louver is to be installed in a location where the room behind the louver is designed to drain water penetrating into the room, and the room will house water resistant/ water proof equipment, components or supplies.

**RENEWAL** of this NOA shall be considered after a renewal application has been filed and there has been no change in the applicable building code negatively affecting the performance of this product.

**TERMINATION** of this NOA will occur after the expiration date or if there has been a revision or change in the materials, use, and/or manufacture of the product or process. Misuse of this NOA as an endorsement of any product, for sales, advertising or any other purposes shall automatically terminate this NOA. Failure to comply with any section of this NOA shall be cause for termination and removal of NOA.

**ADVERTISEMENT:** The NOA number preceded by the words Miami-Dade County, Florida, and followed by the expiration date may be displayed in advertising literature. If any portion of the NOA is displayed, then it shall be done in its entirety.

**INSPECTION:** A copy of this entire NOA shall be provided to the user by the manufacturer or its distributors and shall be available for inspection at the job site at the request of the Building Official.

This NOA **revises NOA # 18-0201.08** and consists of this page 1 and evidence pages E-1, E-2 and E-3, as well as approval document mentioned above.

The submitted documentation was reviewed by Carlos M. Utrera, P.E.

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MIAMIDADE COUNTY

NOA-No. 20-0909.02 Expiration Date: January 03, 2023 Approval Date: November 19, 2020 Page 1

### NOTICE OF ACCEPTANCE: EVIDENCE SUBMITTED

#### 1. EVIDENCE SUBMITTED UNDER PREVIOUS NOAS

#### A. DRAWINGS "Submitted under NOA # 15-0923.05"

1. Drawing No. **60-021902-01D** through **05B**, titled "ELF375DXD Louver", sheets 1 through 5 of 5, dated 05/26/2006, with revision **C**, dated 09/11/2015, prepared by Ruskin Company, signed and sealed by Chelsea GQ Welch, P.E.

#### B. TESTS "Submitted under NOA # 07-0621.07"

- 1. Test reports on 1) Uniform Static Air Pressure Test, Loading per FBC TAS 202-94
  - 2) Large Missile Impact Test per FBC, TAS 201-94
  - 3) Cyclic Wind Pressure Loading per FBC, TAS 203-94

along with marked-up drawings and installation diagram of ELF375DXD Test Louver, prepared by National Certified Testing Laboratories, Inc., Test Report No. **NCTL-210-3377-1**, dated 03/19/2007, signed and sealed by Gerard J. Ferrara, P.E.

#### C. CALCULATIONS "Submitted under NOA # 15-0923.05"

1. Louver and anchor calculations prepared by Ruskin Engineering, dated 09/08/2015, signed and sealed by Chelsea GQ Welch, P.E.

#### "Submitted under NOA # 07-0621.07"

2. Louver and anchor calculations prepared by Ruskin Engineering, dated 05/14/2007 and 11/20/2007, signed and sealed by Daniel J. Rau, P.E.

#### D. QUALITY ASSURANCE

1. Miami-Dade Department of Regulatory and Economic Resources (RER)

#### E. MATERIAL CERTIFICATIONS

1. None.

#### F. STATEMENTS "Submitted under NOA # 16-1110.03"

1. Distributor agreement dated 09/22/2016.

#### "Submitted under NOA # 15-0923.05"

2. Statement letter of code conformance to the 5<sup>th</sup> edition (2014) FBC, issued by Ruskin Company, dated 09/08/2015, signed and sealed by Chelsea GQ Welch, P.E.

#### "Submitted under NOA # 12-0816.02"

3. Statement letter of code conformance to 2010 FBC, issued by Ruskin Company, dated 06/13/2012, signed and sealed by Daniel J. Rau, P.E.

#### "Submitted under NOA # 07-0621.07"

4. No financial interest letter issued by Ruskin Company, dated 05/25/2007. signed and sealed by Daniel J. Rau, P.E.

Carlos M. Utrera, P.E. Product Control Examiner NOA-No. 20-0909.02

Expiration Date: January 03, 2023 Approval Date: November 19, 2020

#### NOTICE OF ACCEPTANCE: EVIDENCE SUBMITTED

#### 2. EVIDENCE SUBMITTED UNDER PREVIOUS NOA # 18-0201.08

#### A. DRAWINGS

1. Drawing No. **60-021902-00D**, titled "ELF375DXD Louver", sheets 1 through 11 of 11, dated 05/26/2006, with revision **D** dated 03/02/2018, prepared by Ruskin Company, signed and sealed by Melissa M. Massar, P.E.

#### B. TESTS

- 1. Test reports on 1) Uniform Static Air Pressure Test, Loading per FBC TAS 202-94
  - 2) Large Missile Impact Test per FBC, TAS 201-94
  - 3) Cyclic Wind Pressure Loading per FBC, TAS 203-94

along with marked-up drawings and installation diagram of ELF375DXD Test Louver, prepared by National Certified Testing Laboratories, Inc., Test Report No. **NCTL-210-4090-01**, dated 12/07/2017, signed and sealed by Douglas J. McDougall, P.E.

#### C. CALCULATIONS

1. Louver wind load review prepared by Ruskin Company, dated 03/08/2018, signed and sealed by Melissa M. Massar, P.E.

## D. QUALITY ASSURANCE

1. Miami-Dade Department of Regulatory and Economic Resources (RER)

#### E. MATERIAL CERTIFICATIONS

1. None.

#### F. STATEMENTS

- 1. Statement letter of code conformance to the 6<sup>th</sup> edition (2017) FBC issued by Ruskin Company, dated 03/08/2018, signed and sealed by Melissa M. Massar, P.E.
- 2. Statement letter of no financial interest issued by Ruskin Company, dated 03/08/2018, signed and sealed by Melissa M. Massar, P.E.
- 3. Laboratory compliance letter for Test Report No. NCTL-210-4090-01, issued by National Certified Testing Laboratories, Inc., dated 12/07/2017, signed and sealed by Douglas J. McDougall, P.E.

Carlos M. Utrera, P.E. Product Control Examiner NOA-No. 20-0909.02

Expiration Date: January 03, 2023 Approval Date: November 19, 2020

#### **Ruskin Company**

### NOTICE OF ACCEPTANCE: EVIDENCE SUBMITTED

#### 3. NEW EVIDENCE SUBMITTED

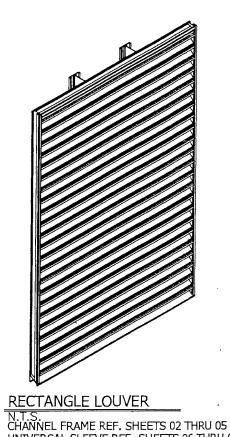
- A. DRAWINGS "Submitted under NOA # 18-0201.08"
  - 1. Drawing No. **60-021902-00D**, titled "ELF375DXD Louver", sheets 1 through 11 of 11, dated 05/26/2006, with revision **D** dated 03/02/2018, prepared by Ruskin Company, signed and sealed by Melissa M. Massar, P.E.
- B. TESTS
  - 1. None.
- C. CALCULATIONS
  - 1. None.
- D. QUALITY ASSURANCE
  - 1. Miami-Dade Department of Regulatory and Economic Resources (RER)
- E. MATERIAL CERTIFICATIONS
  - 1. None.
- F. STATEMENTS
  - 1. Statement letter of code conformance to the 7<sup>th</sup> edition (2020) FBC issued by Ruskin Company, dated 08/25/2020, signed and sealed by Melissa M. Massar, P.E.
  - 2. Statement letter of no changes and not been affected by any changes in the 2020 FBC issued by Ruskin Company, dated 08/25/2020, signed and sealed by Melissa M. Massar, P.E.

Carlos M. Utrera, P.E. Product Control Examiner NOA-No. 20-0909.02

Expiration Date: January 03, 2023 Approval Date: November 19, 2020

PARTS LIST							
	FOR CHANNEL FRAME LOUVER						
ITEM	DESCRIPTION	MATERIAL	ALLOY				
1	HEAD FRAME	.080" THK EXTRUDED ALUM.	6063-T6				
2	SILL FRAME	.125" THK EXTRUDED ALUM.	6063-T6				
3	JAMB FRAME	.080" THK EXTRUDED ALUM.	6063-T6				
4 5 6	BLADE	.080" THK EXTRUDED ALUM.	6063-T6				
5	BLADE BRACE	.080" THK EXTRUDED ALUM.	6063-T6				
6	2 X .125 STRAP	.125" THK EXTRUDED ALUM.	6063-T6				
7	H.V.B.S.	VARIES REF TABLE 1	6063-T6				
7A	H.V.B.S.	VARIES REF TABLE 1	6063-T6				
	MULTI SECTION C	ONNECTION PARTS					
8	MULLION SUPPORT	VARIES REF TABLE 2	6063-T6				
8A	MULLION SUPPORT	VARIES REF TABLE 2	6063-T6				
	3/8-16 X 3.000" LG A307 GRADE A	ZING DI ATED	-				
9	HHB W/ WASHER & LOCKNUT	ZINC PLATED					
	1/4-20 X 1.500" LG A307 GRADE A		_				
10	HHB BOLT W/ WASHER & LOCKNUT	ZINC PLATED					
	STANDARD UNIVERSAL SLEEVE						
11	FRONT FLANGE UNIVERSAL SLEEVE	.188" THK FORMED ALUM.	3003-H14 OR				
			5005-H34				
12	HEAD FRAME W/ INTEGRAL FLANGE		6063-T6				
13	SILL FRAME W/ INTEGRAL FLANGE	.125" THK EXTRUDED ALUM.	6063-T6				
14	JAMB FRAME W/ INTEGRAL FLANGE	.080" THK EXTRUDED ALUM.	6063-T6				
15	CONT. RETAINING ANGLE	.250" THK EXTRUDED ALUM.	6063-T6				
16	1/4-14 SAE GRADE 2 "HWH" TYPE	ZINC PLATED	<u>.</u>				
	"SD" SCREW	ZINC PLATED					
17	UNIVERSAL SLEEVE ATTACHMENT	.250" THK EXTRUDED ALUM.	6063-T6				
	ANGLE		0005-10				
INSTALLATION PARTS							
18	ATTACHMENT CLIP ANGLE	.250" THK EXTRUDED ALUM.	6063-T6				
19	#10-16 SAE GRADE 2 "HWH" "SD"	ZINC PLATED	_				
	SCREW W/ WASHER	ZINC FLATED	-				
20	SUBSTRATE FASTENER (BY OTHERS)	VARIES REF TABLE 3/11	_				

TABLE 1						
H.V.B.S.						
LOUVER SIZE						
HEIGHT > 60"	(2)70-021466-00B	.094" THK EXTRUDED ALUM.				
HEIGHT ≤ 60"	(2)70-021468-00B	.080" THK EXTRUDED ALUM.				
TABLE 2						
MULLION SUPPORT						
HEIGHT > 60"	(2)70-021466-00B	.094" THK EXTRUDED ALUM.				
HEIGHT ≤ 60"	(2)70-021468-00B	.080" THK EXTRUDED ALUM.				
	HEIGHT > 60" HEIGHT ≤ 60" HEIGHT > 60"	H.V.B.S.  LOUVER SIZE SUPPORT  HEIGHT > 60" (2)70-021466-00B  HEIGHT ≤ 60" (2)70-021468-00B  TABLE 2  MULLION SUPPOR  HEIGHT > 60" (2)70-021466-00B				



UNIVERSAL SLEEVE REF. SHEETS 06 THRU 08

### NOTES:

- 1) THE ELF375DXD HAS BEEN TESTED IN ACCORDANCE WITH MIAMI-DADE COUNTY PROTOCOLS TAS-201, 202 & 203 FOR LARGE MISSILE IMPACT, UNIFORM PRESSURE AND CYCLIC WIND PRESSURE.
- 2) THIS LOUVER SYSTEM IS APPROVED FOR APPLICATIONS WITH DESIGN PRESSURES OF +/- 130 PSF OR LESS, THIS LOUVER IS NON-BEARING AND IS NOT DESIGNED TO WITHSTAND BUILDING DEAD LOADS.
- 3) THIS LOUVER IS TO BE INSTALLED IN LOCATIONS WHERE THE ROOM BEHIND THE LOUVER IS DESIGNED TO DRAIN WATER THAT PENETRATES INTO THE ROOM AND THE ROOM WILL HOUSE WATER RESISTANT/ WATER PROOF EQUIPMENT, COMPONENTS, OR SUPPLIES.
- 4) RUSKIN DOES NOT DETERMINE THE STRUCTURAL INTEGRITY OF THE STRUCTURE. SUBSTRATE REQUIREMENTS GIVEN IN TABLE 3 ON SHEET 11 ARE AS NEEDED FOR ANCHORAGE ONLY.
- 5) MAXIMUM SINGLE SECTION SIZE: 90" WIDE X 120" HIGH, UNLIMITED WIDTH CAN BE ACCOMPLISHED BY PLACING SINGLE SECTIONS SIDE BY SIDE
- 6) SECTIONS OR ASSEMBLIES MAY BE STACKED VERTICALLY PROVIDING A SUITABLE STRUCTURAL SUPPORT IS DESIGNED AND INSTALLED BY OTHERS TO SUPPORT ALL LOADS TRANSFERRED FROM THE LOUVER.
- 7) ALL CMU BLOCK MUST BE GROUT FILLED. MIN. PRISM STRENGTH OF 1500 PSI AT TIME OF INSTALLATION. CMU BLOCKS MUST BE MN. TYPE 1, GRADE N, LIGHT, MEDIUM, OR NORMAL WEIGHT PER ASTM C90. GROUT AND MORTAR MUST COMPLY WITH FBC.
- 8) ALL WELDED ATTACHMENTS REQUIRE MIN. FILLER METAL OF 4043 ALUMINUM ALLOY WITH MIN. TENSILE STRENGTH OF 24 KSI.

#### ABBREVIATIONS:

CONT. - CONTINUOUS

H.V.B.S.- HIDDEN VERTICAL BLADE SUPPORT

H.H.B.S.- HIDDEN HORIZONTAL BLADE SUPPORT

L.D. - LOUVER DIMENSION

MAX. - MAXIMUM

MIN. - MINIMUM

NOM. - NOMINAL

N.T.E. - NOT TO EXCEED

O/C - ON CENTER

OPP. - OPPOSITE

R.O. - ROUGH OPENING

SIM. - SIMILAR

S.S. - SHIP SECTION

S.S.D. - SHIP SECTION DIMENSION

TYP, - TYPICAL

U.N.C. - UNLESS NOTED OTHERWISE

DIM. - DIMENSION

FLG. - FLANGE

D - SUBSTRATE DEPTH

ONALENG "MOIONALEM MELISSA M. MASSAR, P.E. NO. 84659

TOLERANCES

DECIMAL DIMENSIONS:
3 PLACE XXX ± 010
2 PLACE XX ± 020
FRACTION DIMENSIONS:±1/16
ANGLE DIMENSIONS ±2°
USE WIQ-007 & 008
UNLESS SPECIFIED OTHERWISE

**PRODUCT REVISED** as complying with the Florida **Building Code** NOA-No. 18-0201.08

Expiration Date 01/03/2023

Miami-Dade Product Control

BY: DLC DATE: 5/26/06

NOTES, PARTS LIST & ASSEMBLY VIEWS

**PRODUCT REVISED** as complying with the Florida **Building Code** 20-0909.02 NOA-No.

Expiration Date 01/03/2023

Huns

Miami-Dade Product Control

CJD | SDL | MMM 3/2/18 COMPLETE REVISION DWN.CHK'DAPPV'D. ECN DATE REVISION DESCRIPTION BY: BY: BY: PLOT SCALE 3900 DR. GREAVES RD GRANDVIEW, MO 64030 **RUSKIN** NONE ECN;\_ D SHEET 1 OF 11 ELF375DXD STANDARD DWG. NO. INSTALLATION

60-021902-00D

SHEET 01 - NOTES, PARTS LIST & DRAWING INDEX

SHEET 03 - ASSEMBLY 'A' CONNECTION DETAILS

SHEET 04 - ASSEMBLY 'A' ATTACHMENT DETAILS

SHEET 05 - ASSEMBLY 'A' ATTACHMENT DETAILS

SHEET 07 - ASSEMBLY 'B' CONNECTION DETAILS

SHEET 08 - ASSEMBLY 'B' ATTACHMENT DETAILS

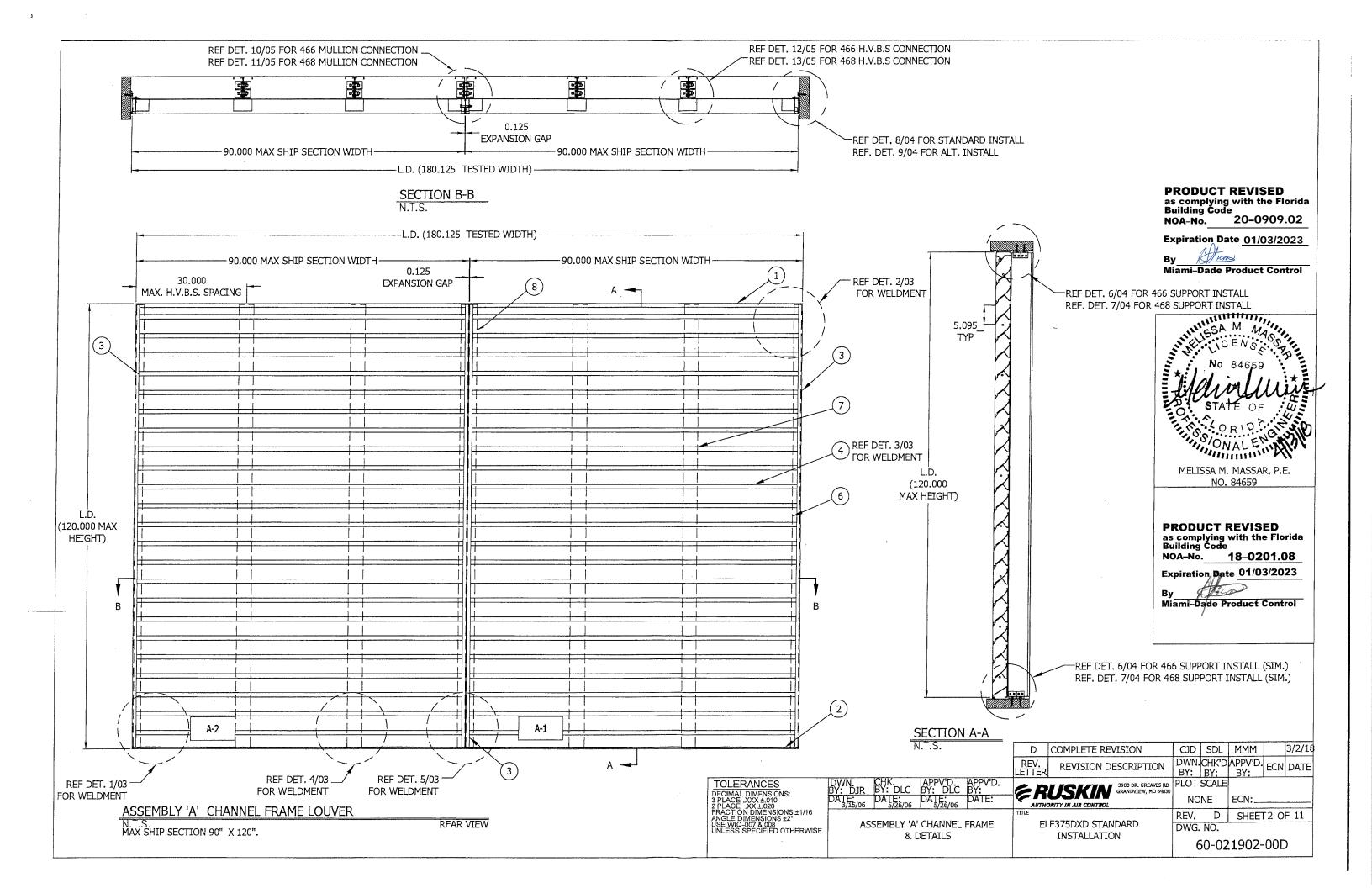
SHEET 02 - ASSEMBLY 'A' CHANNEL FRAME & DETAILS

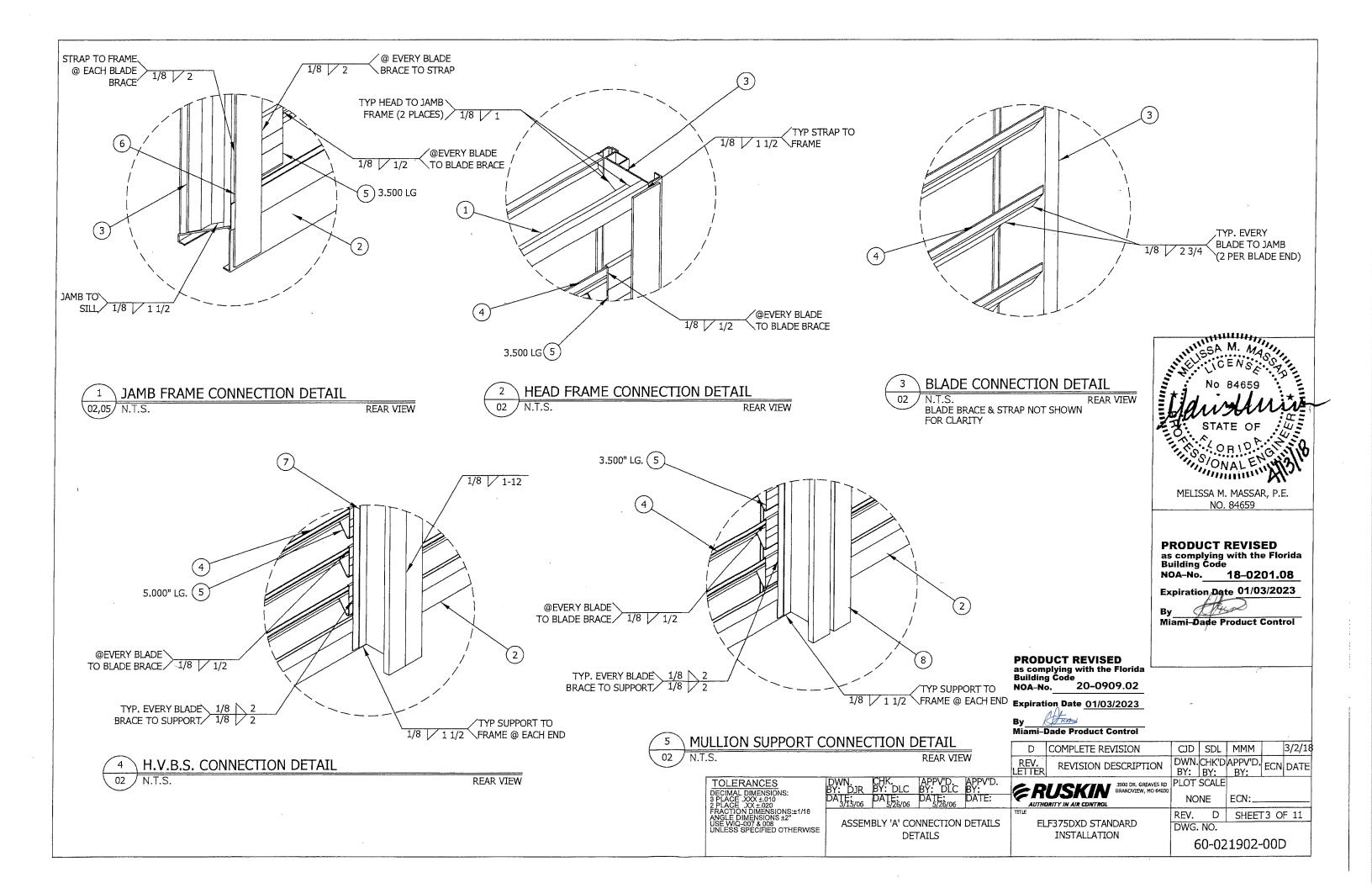
SHEET 06 - ASSEMBLY 'B' UNIVERSAL SLEEVE & DETAILS

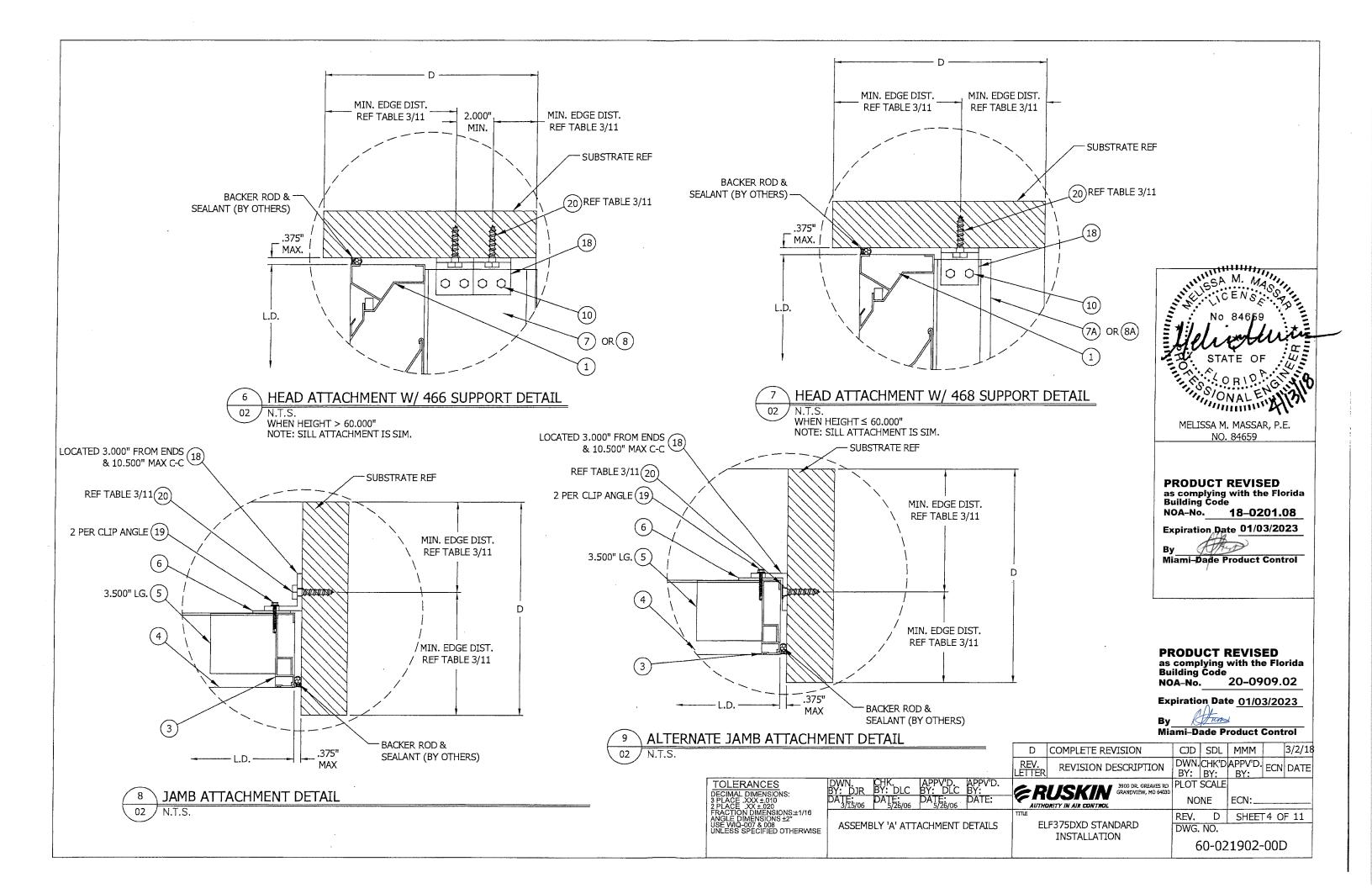
SHEET 09 - PARTS SHEET 10 - PARTS SHEET 11 - PARTS

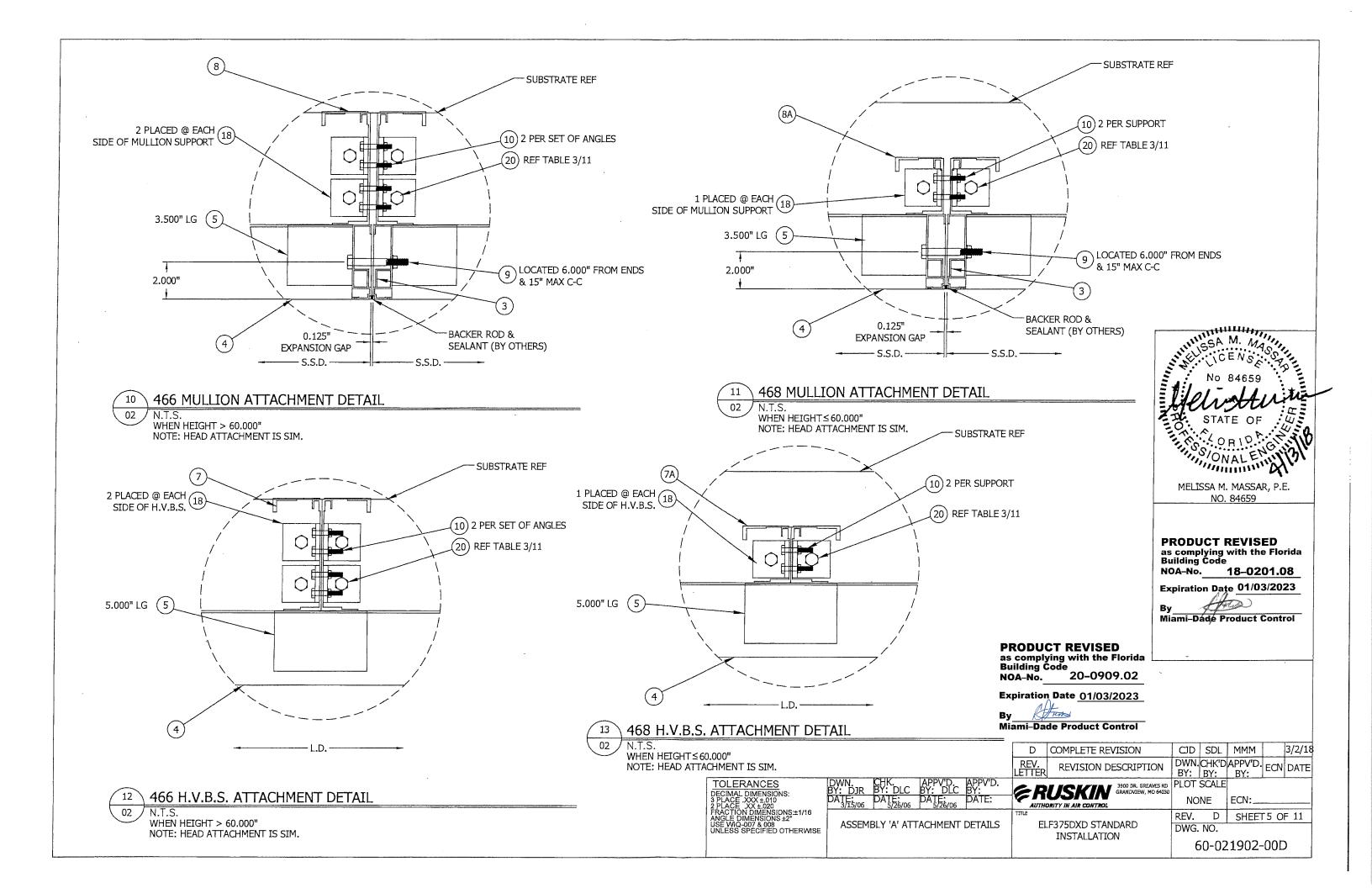
DRAWING INDEX:

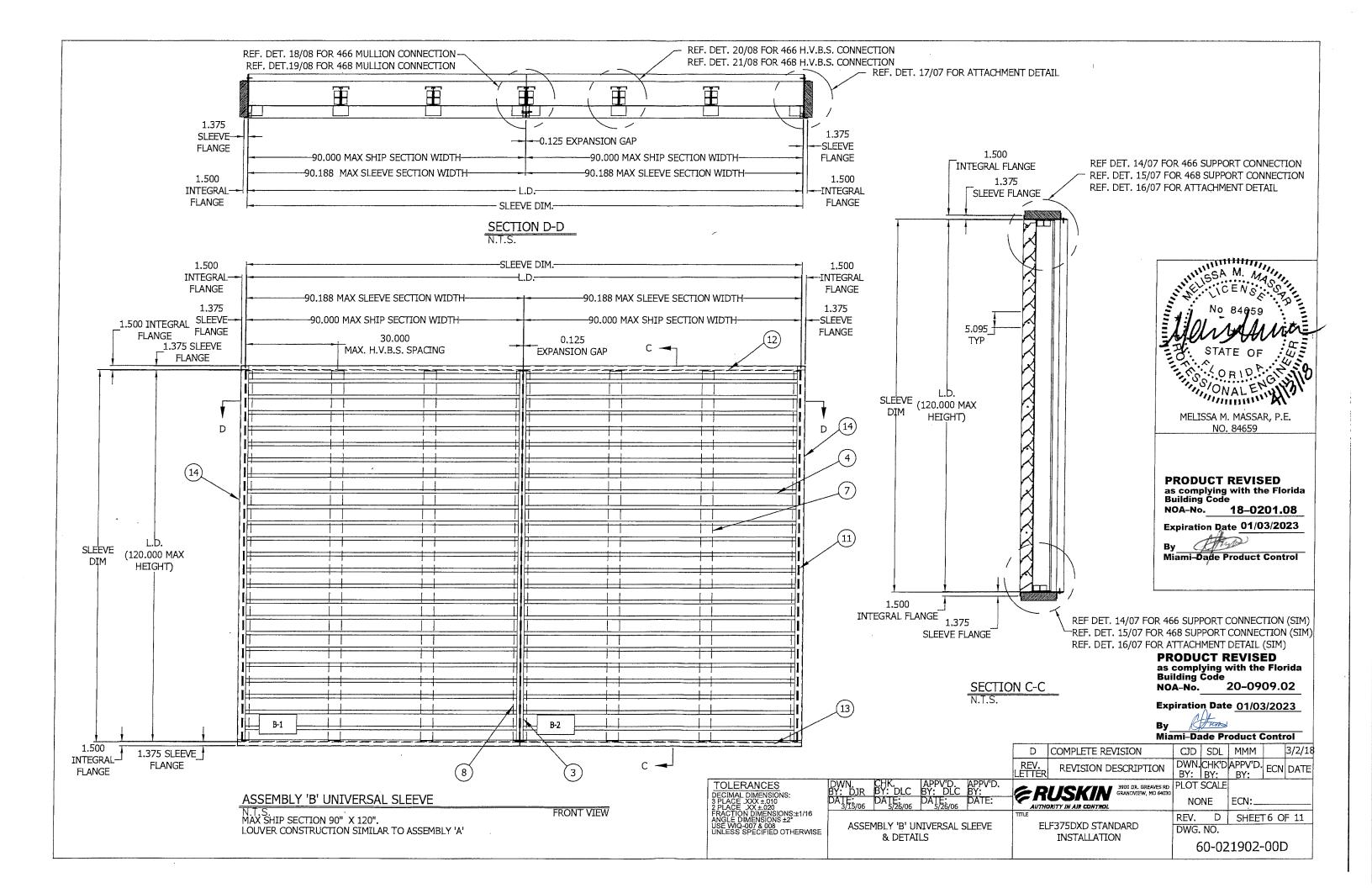
SUB. -SUBSTRATE

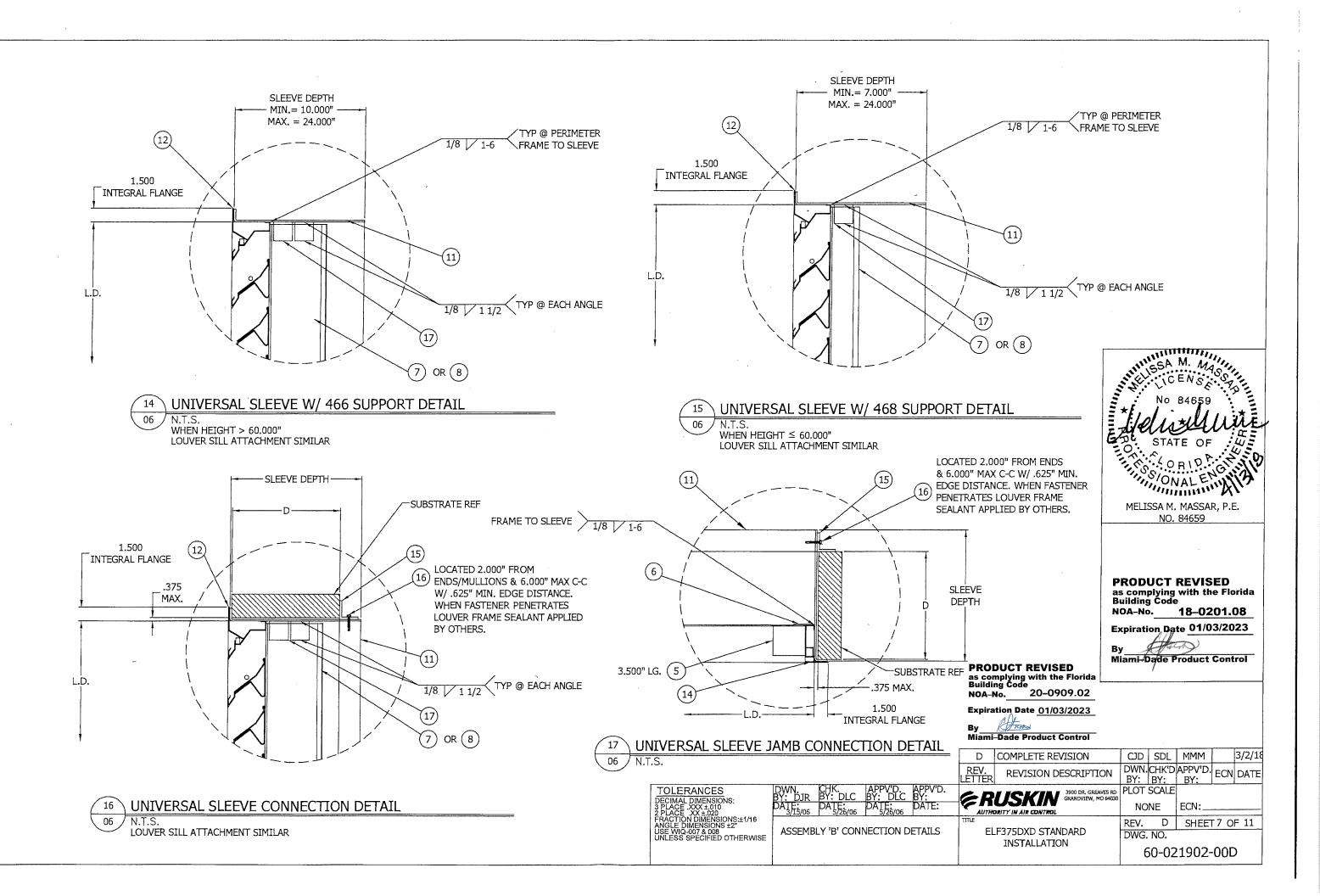


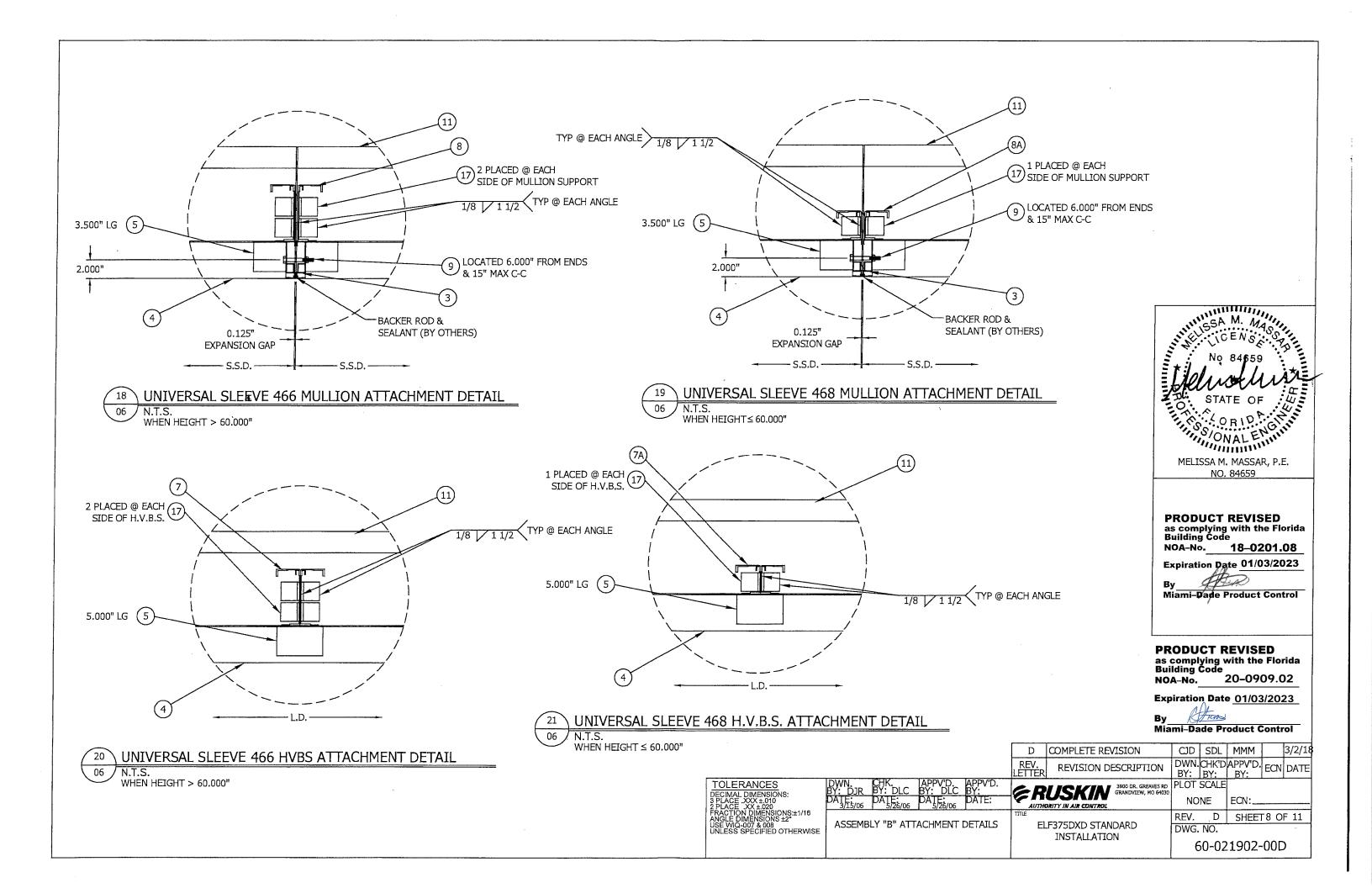


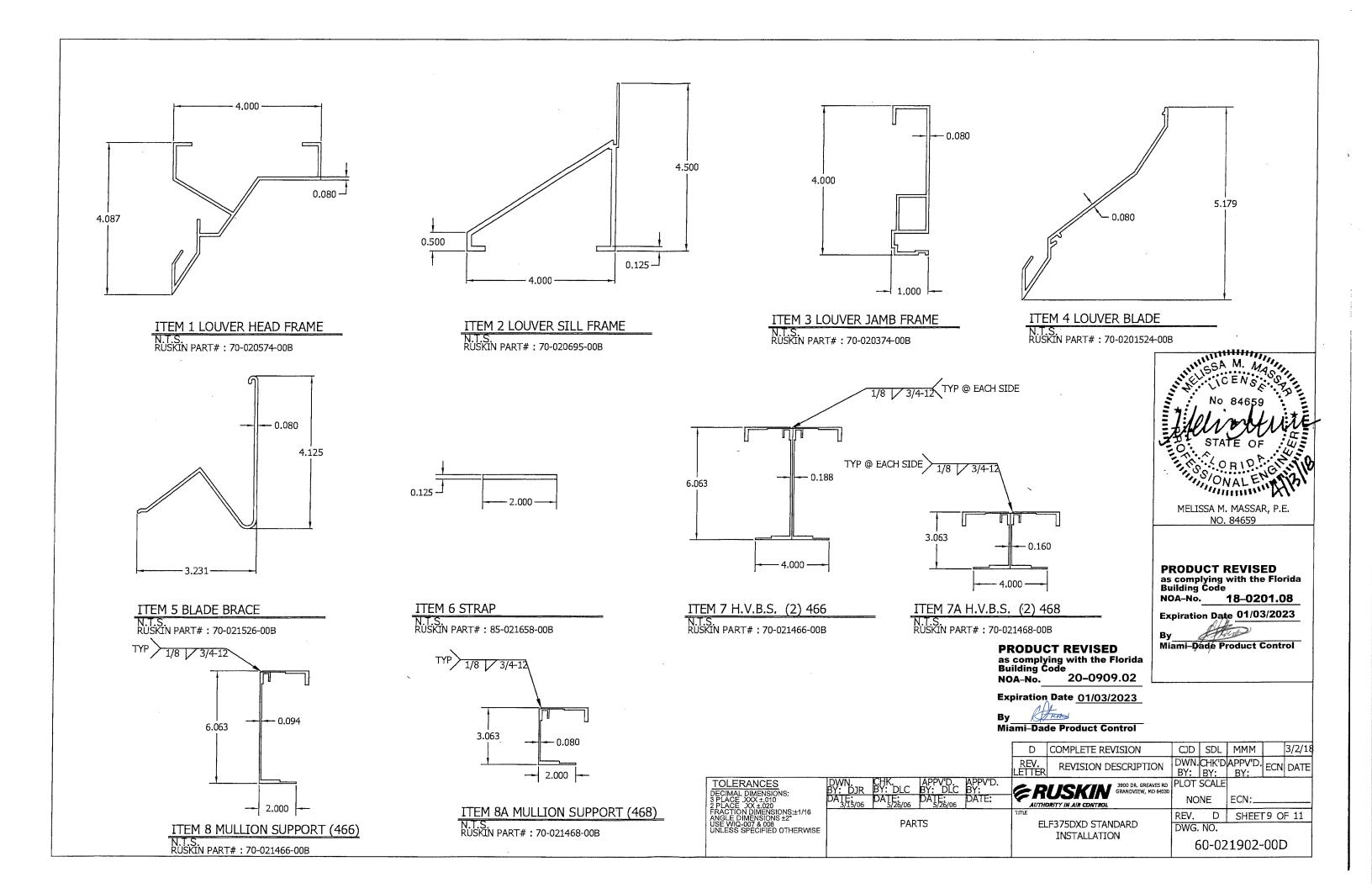


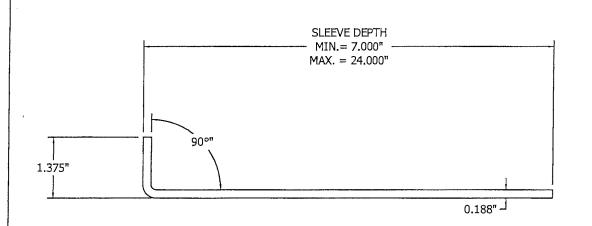




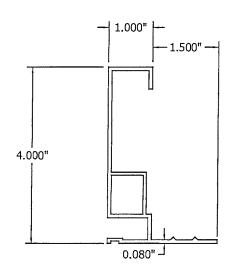








# ITEM 11 FRONT FLANGE UNIVERSAL SLEEVE



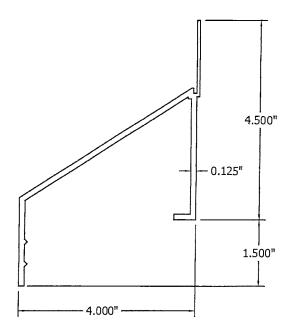
## ITEM 14 LOUVER JAMB FRAME W/ INTEGRAL FLANGE

N.T.S. RUSKIN PART#: 70-020404-00B OPTIONAL

1.500" 1.000" لـ <sub>"080.0</sub>0 5.587" 4.000"

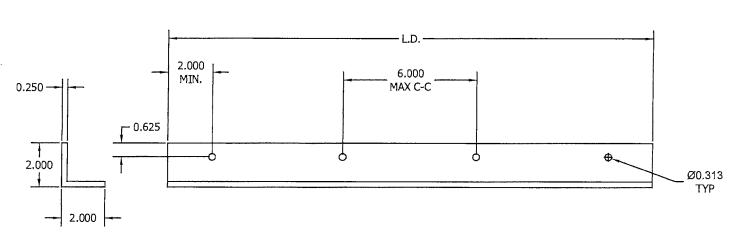
## ITEM 12 LOUVER HEAD FRAME W/ INTEGRAL FLANGE

N.T.S. RUSKIN PART#: 70-020641-00B OPTIONAL



## ITEM 13 LOUVER SILL FRAME W/ INTEGRAL FLANGE

N.T.S. RUSKIN PART#: 70-020836-00B OPTIONAL



ITEM 15 CONT. RETAINING ANGLE

MELISSA M. MASSAR, P.E. NO. 84659

PRODUCT REVISED

as complying with the Florida Building Code NOA-No. 18-0201.08

Expiration Date 01/03/2023

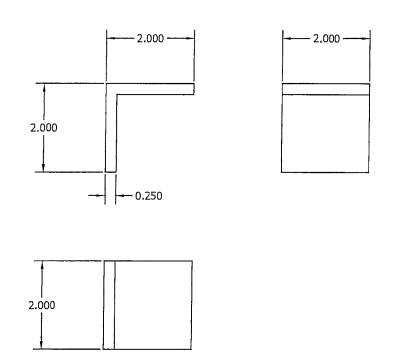
(III) Miami-Dade Product Control TOLERANCES
DECIMAL DIMENSIONS:
3 PLACE XXX ±.010
2 PLACE XXX ±.020
FRACTION DIMENSIONS:±1/16
ANGLE DIMENSIONS ±2°
USE WIQ-007 & 008
UNLESS SPECIFIED OTHERWISE PARTS

**PRODUCT REVISED** as complying with the Florida Building Code NOA-No. 20-0909.02

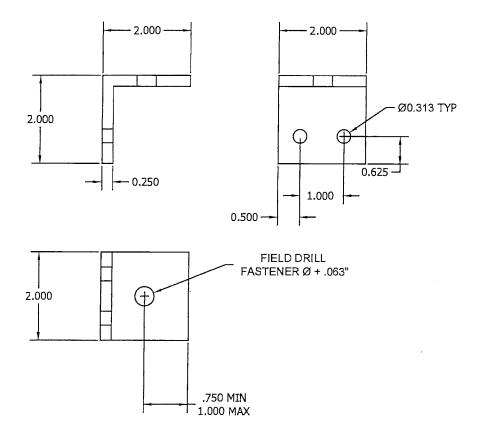
Expiration Date 01/03/2023

Stuns Miami-Dade Product Control

COMPLETE REVISION CJD SDL MMM DWN.CHK'DAPPV'D. ECN DATE BY: BY: BY: REVISION DESCRIPTION PLOT SCALE 3900 DR. GREAVES RD GRANDVIEW, MO 64030 **RUSKIN** NONE ECN:\_ REV. D SHEET100F 11 ELF375DXD STANDARD DWG, NO. INSTALLATION 60-021902-00D

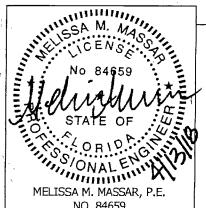


# ITEM 17 UNIVERSAL SLEEVE ATTACHMENT ANGLE



ITEM 18 ATTACHMENT CLIP ANGLE

TABLE 3 SUBSTRATE FASTENER (BY OTHERS) (ITEM 20)						
SUBSTRATE TYPE	MIN. SUBSTRATE REQUIREMENTS	FASTENER TYPE	MIN. EMBEDMENT		. EDGE DISTANCE HVBS/MULLION SUPPORT CLIP ANGLES	
WOOD	3" THICK, 0.42 SPECIFIC GRAVITY	3/8" DIA. BOLT W/ NUT, MIN. A307 GRADE A	3 THREADS BEYOND NUT	1 1/2"	1 1/2"	
		3/8" DIA. LAG SCREW, MIN. A307 GRADE A	2 5/8"	1 1/2"	1 1/2"	
STEEL	18 GA, 45 KSI TENSILE STRENGTH, 33 KSI YIELD STRENGTH	3/8" DIA. BOLT W/ NUT, MIN. A307 GRADE A	3 THREADS BEYOND NUT	3/4"	3/4"	
	14 GA, 45 KSI TENSILE STRENGTH, 33 KSI YIELD STRENGTH	1/4" DIA. SELF DRILLING SCREW, MIN. SAE GRADE 2*	3 THREADS BEYOND SUB. THICKNESS	1/2"	1/2"	
ALUMINUM	0.060" THICK, 20 KSI TENSILE STRENGTH, 15 KSI YIELD STRENGTH	3/8" DIA. BOLT W/ NUT, MIN. A307 GRADE A	3 THREADS BEYOND NUT	3/4"	3/4"	
	0.125" THICK, 20 KSI TENSILE STRENGTH, 15 KSI YIELD STRENGTH	5/16" DIA. SELF DRILLING SCREW, MIN. SAE GRADE 2*	3 THREADS BEYOND SUB. THICKNESS	5/8"	5/8"	
CONCRETE	CRACKED, 2500 PSI COMP. STRENGTH	1/4" DIA. HILTI KWIK HUS EZ, CARBON STEEL	2 1/2"	1 5/8"	5 1/2"	
		3/8" DIA. DEWALT SCREW-BOLT+, CARBON STEEL	3 1/4"	1 1/2"	4 7/8"	
	UNCRACKED, 2500 PSI COMP. STRENGTH	1/4" DIA. ELCO AGGRE-GATOR, 300 SERIES SS*	1 3/8"	3"	3"	
		3/8" DIA. ITW RED HEAD WEDGE ANCHOR, CARBON STEEL	2 3/8"	1 3/4"	3 7/8"	
GROUT FILLED CMU	ASTM C-90 BLOCK, 1500 PSI GROUT COMP. STRENGTH	1/4" DIA. DEWALT SCREW-BOLT+, CARBON STEEL	2 1/2"	2 3/8"	3"	
		1/4" DIA. ELCO AGGRE-GATOR, 300 SERIES SS*	2"	4"	4 <sup>n</sup>	



PRODUCT REVISED as complying with the Florida Building Code

NOA-No. 18-0201.08 Expiration Date 01/03/2023

By Affred Miami-Dade Product Control

PRODUCT REVISED
as complying with the Florida
Building Code
NOA-No. 20-0909.02

Expiration Date 01/03/2023

Stuns Miami-Dade Product Control

CJD SDL MMM

A M. MASSAR, P.E. NO. 84659		REV. REVISION DESCRIPTION	DWN.CHK'DAPPV'D. ECN DATE BY: BY: BY:
ANCES	DWN. CHK. APPV'D. APPV'D. BY: DJR BY: DLC BY: DLC BY:		PLOT SCALE
(X + 0.20)	DATE: DATE: DATE: DATE: DATE:	RUSKIN GRANDVIEW, MO 64030  AUTHORITY IN AIR CONTROL	NONE ECN:
DIMENSIONS:±1/16 IENSIONS ±2° 07 & 008 PECIFIED OTHERWISE	PARTS	ELF375DXD STANDARD INSTALLATION	REV. D SHEET11OF 11 DWG. NO.
		INSTALLATION	60-021902-00D

D COMPLETE REVISION