



**BUILDING CODE COMPLIANCE OFFICE (BCCO)
PRODUCT CONTROL DIVISION**

**MIAMI-DADE COUNTY, FLORIDA
METRO-DADE FLAGLER BUILDING
140 WEST FLAGLER STREET, SUITE 1603
MIAMI, FLORIDA 33130-1563
(305) 375-2901 FAX (305) 375-2908**

www.buldingcodeonline.com

NOTICE OF ACCEPTANCE (NOA)

TRACO Security Windows & Doors, Inc.

**71 Progress Avenue
Cranberry Township, PA 16066**

SCOPE:

This NOA is being issued under the applicable rules and regulations governing the use of construction materials. The documentation submitted has been reviewed by Miami-Dade County Product Control Division and accepted by the Board of Rules and Appeals (BORA) 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 Division (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. BORA reserves the right to revoke this acceptance, if it is determined by Miami-Dade County Product Control Division 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: Aluminum Tube Mullion (w/Steel Reinforcement) – L.M.I.

APPROVAL DOCUMENT: Drawing No. **06-TRA-0005**, titled "Aluminum Tube Mullions with Steel Reinforcement", sheets 1 through 3 of 3, dated 12/1/06, prepared by Engineering Express, signed and sealed by Frank L. Bennardo, 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 Division.

MISSILE IMPACT RATING: Large and Small Missile Impact Resistant

LABELING: Each unit shall bear a permanent label with the manufacturer's name or logo, city, state and following statement: "Miami-Dade County Product Control Approved", unless otherwise noted herein.

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 and renews NOA # **01-1218.02** and consists of this page 1 and evidence page E-1, as well as approval document mentioned above.

The submitted documentation was reviewed by **Manuel Perez, P.E.**



**NOA No. 06-1228.01
Expiration Date: January 2, 2008
Approval Date: February 1, 2007
Page 1**

TRACO Security Windows & Doors, Inc.

NOTICE OF ACCEPTANCE: EVIDENCE SUBMITTED

A. DRAWINGS

1. Manufacturer's die drawings and sections.
2. Drawing No **06-TRA-0005**, Sheets 1 through 3 of 3, titled "Aluminum Tube Mullions with Steel Reinforcement", dated 12/1/06, prepared by Engineering Express, signed and sealed by Frank L. Bennardo, P.E.

B. TESTS

1. Test reports on: 1) Uniform Static Air Pressure Test, per PA 202-94 along with marked-up drawings and installation diagram of two mullied Aluminum Single Hung Windows, prepared by Miami Testing Laboratory, Inc., Test Report No. **MTL-16602**, dated 12/01/95, signed and sealed by David Gale Ober, P.E.
(Submitted under previous NOA # 99-0104.01)
2. Test reports on: 1) Large Missile Impact Test per PA 201-94
2) Cyclic Wind Pressure Loading per PA 203-94 along with marked-up drawings and installation diagram of two mullied Aluminum Double Hung Windows, prepared by Fenestration Testing Laboratory, Inc., Test Report No. **FTL-1350**, dated 12/12/95, signed and sealed by Gilbert Diamond, P.E.
(Submitted under previous NOA # 99-0104.01)

C. CALCULATIONS

1. Anchor verification calculations and structural analysis, complying with FBC-2004, , dated 12/8/06, prepared by Engineering Express, signed and sealed by Frank L. Bennardo, P.E.

D. QUALITY ASSURANCE

1. Miami Dade Building Code Compliance Office (BCCO).

E. MATERIAL CERTIFICATIONS

1. None.

F. STATEMENTS

1. Statement letter of conformance, dated 12/12/06, prepared by Engineering Express, signed and sealed by Frank L. Bennardo, P.E.
2. Statement letter of no financial interest, dated 12/12/06, prepared by Engineering Express, signed and sealed by Frank L. Bennardo, P.E.
3. Statement letter from manufacturer stating that the product has not changed and requesting a One-Year Renewal to allow the time to perform a verification test, dated December 12, 2006, signed by John Heinlein, Traco Testing Coordinator.
4. Letter from laboratory confirming manufacturer has contracted and scheduled verification tests, issued by Farabaugh Engineering and Testing, Inc., dated 12/7/06, signed by Daniel Farabaugh, P.E., president.

G. OTHER

1. Notice of Acceptance No. **01-1218.02**, issued to TRACO Security Windows & Doors, Inc. for their Aluminum Tube Mullion with Steel Reinforcement, approved on 01/02/02 and expiring on 01/2/07.

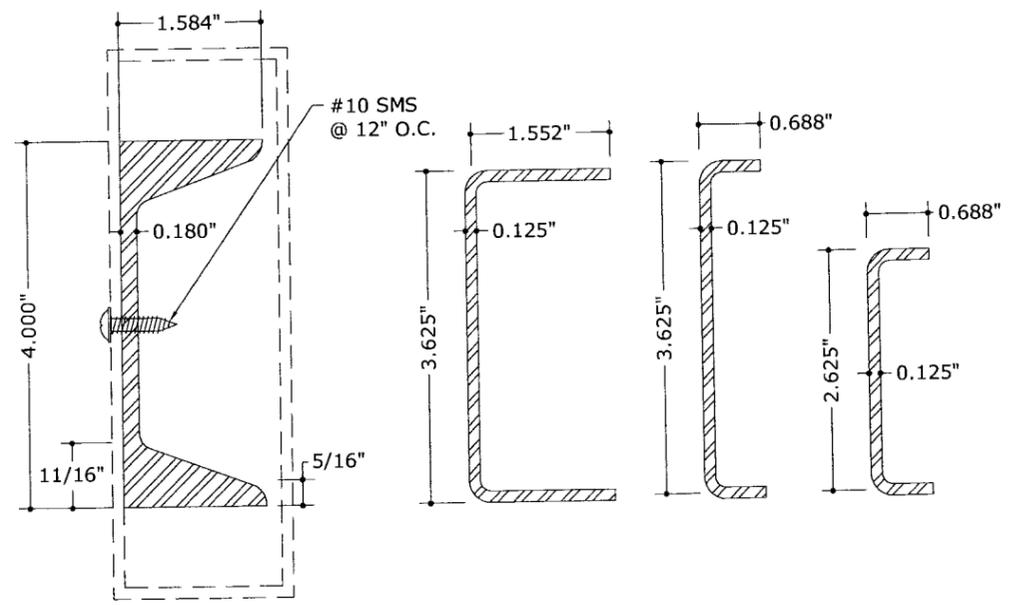
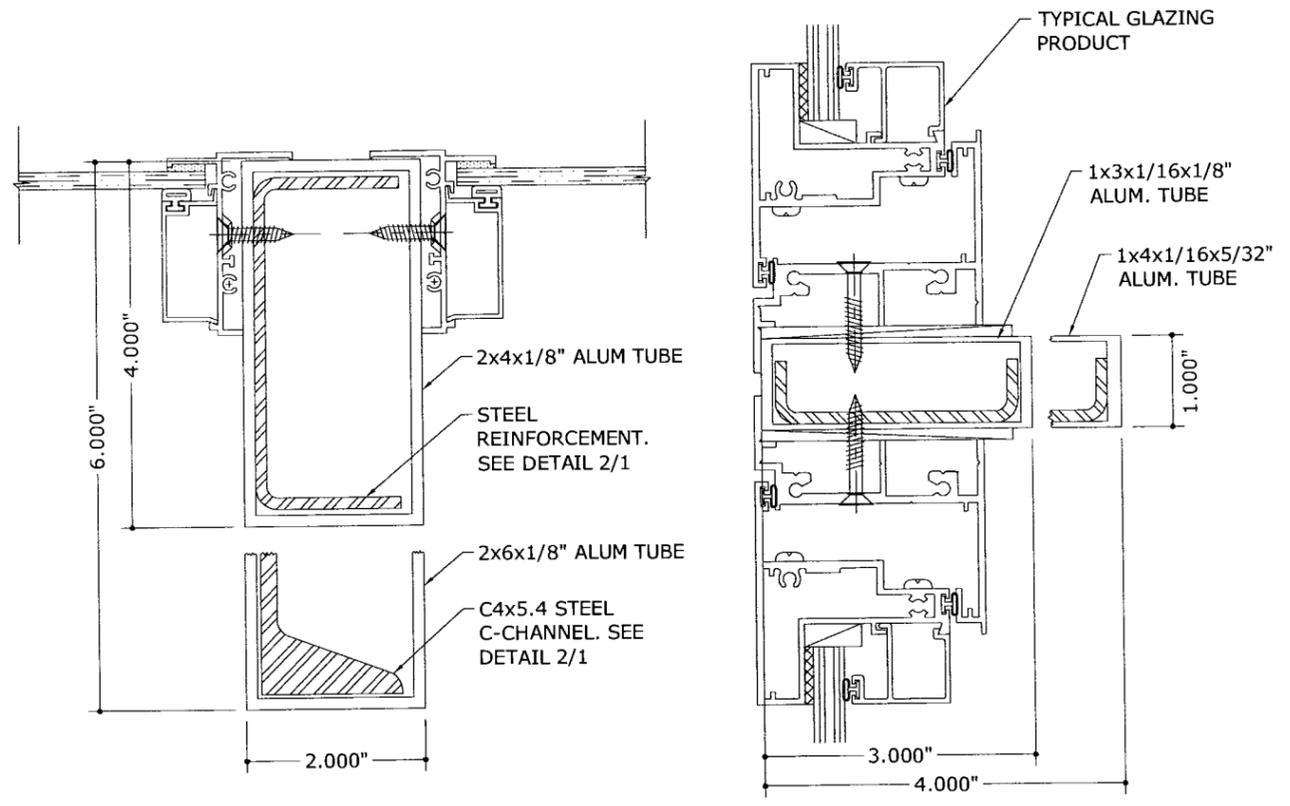

Manuel Perez, P.E.
Product Control Examiner
NOA No. 06-1228.01

Expiration Date: January 2, 2008
Approval Date: February 1, 2007

ALUMINUM TUBE MULLIONS WITH STEEL REINFORCEMENT

LARGE MISSILE IMPACT RESISTANT

FRANK L. BENNARDO, P.E.
#PE0046549
12/12/2006
EX ENGINEERING EXPRESS®
160 SW 12th AVENUE, # 106
DEERFIELD BEACH, FL 33442
PH: (954) 354-0660 FAX: (954) 354-0443
WWW.ENGEXP.COM
CERT. OF AUTH. #9885
A FRANK L. BENNARDO, P.E., INC. INNOVATION



2 STEEL REINFORCEMENTS
1 SCALE: N.T.S.

1 TYPICAL REINFORCED MULLIONS SUPPORTING FENESTRATION PRODUCTS
1 HORIZONTAL OR VERTICAL INSTALLATION
SEE WINDOW OR DOOR APPROVAL FOR FASTENER SIZES AND SPACING

GENERAL NOTES

1. THE SYSTEM DESCRIBED HEREIN HAS BEEN DESIGNED AND TESTED IN ACCORDANCE WITH THE 2004 FLORIDA BUILDING CODE, FOR USE WITHIN THE HIGH VELOCITY HURRICANE ZONE, PER TAS 201 / 203 AND THE 2000 ALUMINUM DESIGN MANUAL.
2. NO 33-1/3% INCREASE IN ALLOWABLE STRESS HAS BEEN USED IN THE DESIGN OF THIS SYSTEM. WIND LOAD DURATION FACTOR Cd=1.6 HAS BEEN USED FOR WOOD ANCHOR DESIGN.
3. POSITIVE AND NEGATIVE DESIGN PRESSURES CALCULATED FOR USE WITH THIS SYSTEM SHALL BE DETERMINED BY OTHERS ON A JOB-SPECIFIC BASIS IN ACCORDANCE WITH THE GOVERNING CODE.
4. THE SYSTEM DETAILED HEREIN IS GENERIC AND DOES NOT PROVIDE INFORMATION FOR A SPECIFIC SITE. FOR SITE CONDITIONS DIFFERENT FROM THE CONDITIONS DETAILED HEREIN, A LICENSED ENGINEER OR REGISTERED ARCHITECT SHALL PREPARE SITE SPECIFIC DOCUMENTS FOR USE IN CONJUNCTION WITH THIS DOCUMENT.
5. PERMIT HOLDER SHALL VERIFY THE ADEQUACY OF THE EXISTING STRUCTURE TO WITHSTAND SUPERIMPOSED LOADS. WOOD BUCKS (BY OTHERS) SHALL BE ANCHORED PROPERLY TO TRANSFER LOADS TO THE EXISTING STRUCTURE.
6. ALL ALUMINUM TUBE EXTRUSIONS SHALL BE 6063-T5 ALUMINUM ALLOY, UNLESS NOTED OTHERWISE. ALL STEEL REINFORCING COMPONENTS SHALL BE A36 STEEL.
7. ALL FENESTRATION PRODUCTS TO BE USED WITH THESE MULLIONS SHALL MEET ALL APPLICABLE CODE REQUIREMENTS, e.g. WIND LOAD RESISTANCE, AIR & WATER INFILTRATION, FORCED ENTRY, SAFEGUARDS, ETC.
8. TOP & BOTTOM DETAILS SHOWN MAY BE INTERCHANGED AS FIELD CONDITIONS DICTATE. MULLIONS MAY BE MOUNTED VERTICALLY OR HORIZONTALLY AS APPLICABLE.
9. MULLIONS SHOWN HEREIN ARE LARGE MISSILE IMPACT RESISTANT. VERIFY IMPACT RESISTANCE OF FENESTRATION PRODUCTS TO BE USED WITH THESE MULLIONS.
10. ALL BOLTS & WASHERS SHALL BE ZINC COATED STEEL, GALVANIZED STEEL, OR STAINLESS STEEL WITH A MINIMUM TENSILE YIELD STRENGTH OF 60 KSI.
11. ALL STEEL IN CONTACT WITH ALUMINUM SHALL BE PAINTED OR PLATED.

PRODUCT REVISED
as complying with the Florida
Building Code
Acceptance No. 06-1228.01
Expiration Date, JAN. 2, 2008
By *Manuel Serrano*
Miami Dade Product Control
Division

71 Progress Avenue,
Cranberry Township, PA 16166
Tel. (724) 776-7000

TRACO
Windows & Doors Inc.

ALUMINUM TUBE MULLIONS WITH STEEL REINFORCEMENT
LARGE MISSILE IMPACT RESISTANT
MIAMI-DADE NOTICE OF ACCEPTANCE

DRWN	CHKD	DATE
CL <td>FLB <td>12/1/06</td> </td>	FLB <td>12/1/06</td>	12/1/06

REMARKS
INIT ISSUE

06-TRA-0005
SCALE: 01
PAGE DESCRIPTION:
1

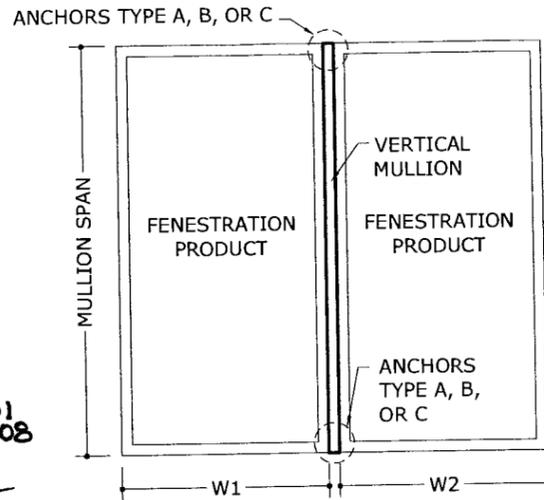
12/12/2006

ENGINEERING EXPRESS
160 SW 12th AVENUE, #106
DEERFIELD BEACH, FL 33442
PH: (954) 354-0660 FAX: (954) 354-0443
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A. FRANK L. BENNARDO, P.E., INC. INNOVATION

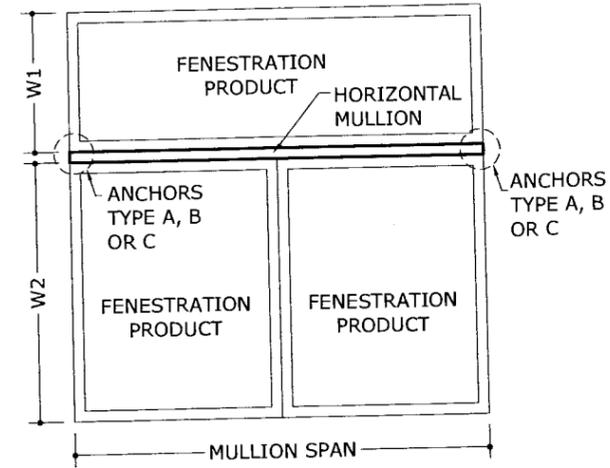
DESIGN LOAD SCHEDULES

1. TABLES BELOW GIVE ALLOWABLE PRESSURES IN PSF FOR EACH REINFORCED TUBE MULLION AT SPAN & TRIBUTARY DIMENSIONS SHOWN.
2. MULLION SPAN & TRIBUTARY SPAN ARE DEPICTED TO THE RIGHT.

PRODUCT REVISED
as complying with the Florida
Building Code
Acceptance No. 06-1228.01
Expiration Date JAN. 2, 2008
Manuel Perez
Miami Dade Product Control
Division



"TRIBUTARY SPAN" = $\frac{W1 + W2}{2}$



1" x 3" x 1/16" x 1/8" REINFORCED TUBE MULLION

Member Span	Tributary Span											
	24"	27"	30"	33"	36"	39"	42"	45"	48"	51"	54"	57"
144"	17.2	15.3	13.7	12.5	11.4	10.6	---	---	---	---	---	---
138"	19.5	17.3	15.6	14.2	13.0	12.0	11.1	10.4	---	---	---	---
132"	22.3	19.8	17.8	16.2	14.9	13.7	12.7	11.9	11.1	10.5	---	---
126"	25.6	22.8	20.5	18.6	17.1	15.8	14.6	13.7	12.8	12.1	11.4	10.8
120"	29.7	26.4	23.7	21.6	19.8	18.3	17.0	15.8	14.8	14.0	13.2	12.5
114"	34.6	30.8	27.7	25.2	23.1	21.3	19.8	18.5	17.3	16.3	15.4	14.6
108"	40.7	36.2	32.6	29.6	27.1	25.0	23.3	21.7	20.3	19.2	18.1	17.1
102"	48.3	42.9	38.6	35.1	32.2	29.7	27.6	25.8	24.2	22.7	21.5	20.3
96"	57.9	51.5	46.4	42.1	38.6	35.7	33.1	30.9	29.0	27.3	25.8	24.4
90"	68.1	60.5	54.5	49.5	45.4	41.9	38.9	36.3	34.0	32.0	30.3	28.7
84"	78.3	69.6	62.7	57.0	52.2	48.2	44.8	41.8	39.2	36.9	34.8	33.0
78"	91.1	80.9	72.8	66.2	60.7	56.0	52.0	48.6	45.5	42.9	40.5	38.3
72"	107.1	95.2	85.7	77.9	71.4	65.9	61.2	57.1	53.6	50.4	47.6	45.1
66"	127.8	113.6	102.3	93.0	85.2	78.7	73.0	68.2	63.9	60.2	56.8	53.8
60"	140.0	137.9	124.1	112.8	103.4	95.4	88.6	82.7	77.6	73.0	68.9	65.3
54"	140.0	140.0	140.0	139.7	128.0	118.2	109.7	102.4	96.0	90.4	85.3	80.9
48"	140.0	140.0	140.0	140.0	140.0	140.0	139.3	130.0	121.9	114.7	108.3	102.6
42"	140.0	140.0	140.0	140.0	140.0	140.0	140.0	140.0	140.0	140.0	140.0	134.5
36"	140.0	140.0	140.0	140.0	140.0	140.0	140.0	140.0	140.0	140.0	140.0	140.0
30"	140.0	140.0	140.0	140.0	140.0	140.0	140.0	140.0	140.0	140.0	140.0	140.0

2" x 4" x 1/8" REINFORCED TUBE MULLION

Member Span	Tributary Span											
	24"	27"	30"	33"	36"	39"	42"	45"	48"	51"	54"	57"
144"	67.2	59.8	53.8	48.9	44.8	41.4	38.4	35.9	33.6	31.6	29.9	28.3
138"	76.4	67.9	61.1	55.5	50.9	47.0	43.6	40.7	38.2	35.9	33.9	32.2
132"	87.3	77.6	69.8	63.5	58.2	53.7	49.9	46.5	43.6	41.1	38.8	36.7
126"	100.3	89.2	80.3	73.0	66.9	61.7	57.3	53.5	50.2	47.2	44.6	42.2
120"	112.4	99.9	89.9	81.7	74.9	69.1	64.2	59.9	56.2	52.9	49.9	47.3
114"	124.6	110.8	99.7	90.6	83.1	76.7	71.2	66.5	62.3	58.7	55.4	52.5
108"	139.0	123.6	111.2	101.1	92.7	85.6	79.5	74.2	69.5	65.4	61.8	58.5
102"	140.0	138.7	124.9	113.5	104.1	96.1	89.2	83.2	78.0	73.5	69.4	65.7
96"	140.0	140.0	140.0	128.3	117.6	108.6	100.8	94.1	88.2	83.0	78.4	74.3
90"	140.0	140.0	140.0	140.0	134.0	123.7	114.9	107.2	100.5	94.6	89.3	84.6
84"	140.0	140.0	140.0	140.0	140.0	140.0	132.0	123.2	115.5	108.7	102.7	97.3
78"	140.0	140.0	140.0	140.0	140.0	140.0	140.0	140.0	134.2	126.3	119.3	113.0
72"	140.0	140.0	140.0	140.0	140.0	140.0	140.0	140.0	140.0	140.0	140.0	132.8
66"	140.0	140.0	140.0	140.0	140.0	140.0	140.0	140.0	140.0	140.0	140.0	140.0
60"	140.0	140.0	140.0	140.0	140.0	140.0	140.0	140.0	140.0	140.0	140.0	140.0
54"	140.0	140.0	140.0	140.0	140.0	140.0	140.0	140.0	140.0	140.0	140.0	140.0
48"	140.0	140.0	140.0	140.0	140.0	140.0	140.0	140.0	140.0	140.0	140.0	140.0
42"	140.0	140.0	140.0	140.0	140.0	140.0	140.0	140.0	140.0	140.0	140.0	140.0
36"	140.0	140.0	140.0	140.0	140.0	140.0	140.0	140.0	140.0	140.0	140.0	140.0
30"	140.0	140.0	140.0	140.0	140.0	140.0	140.0	140.0	140.0	140.0	140.0	140.0

1" x 4" x 1/16" x 5/32" REINFORCED TUBE MULLION

Member Span	Tributary Span											
	24"	27"	30"	33"	36"	39"	42"	45"	48"	51"	54"	57"
144"	38.9	34.6	31.1	28.3	25.9	23.9	22.2	20.8	19.5	18.3	17.3	16.4
138"	44.2	39.3	35.4	32.2	29.5	27.2	25.3	23.6	22.1	20.8	19.6	18.6
132"	50.5	44.9	40.4	36.7	33.7	31.1	28.9	26.9	25.3	23.8	22.5	21.3
126"	55.9	49.6	44.7	40.6	37.2	34.4	31.9	29.8	27.9	26.3	24.8	23.5
120"	61.7	54.9	49.4	44.9	41.2	38.0	35.3	32.9	30.9	29.0	27.4	26.0
114"	68.6	60.9	54.8	49.9	45.7	42.2	39.2	36.6	34.3	32.3	30.5	28.9
108"	76.6	68.1	61.3	55.7	51.1	47.1	43.8	40.8	38.3	36.0	34.0	32.2
102"	86.1	76.5	68.9	62.6	57.4	53.0	49.2	45.9	43.0	40.5	38.3	36.2
96"	97.4	86.6	77.9	70.8	64.9	59.9	55.7	52.0	48.7	45.8	43.3	41.0
90"	111.1	98.8	88.9	80.8	74.1	68.4	63.5	59.3	55.6	52.3	49.4	46.8
84"	127.9	113.7	102.3	93.0	85.3	78.7	73.1	68.2	64.0	60.2	56.9	53.9
78"	140.0	132.3	119.0	108.2	99.2	91.6	85.0	79.4	74.4	70.0	66.1	62.6
72"	140.0	140.0	140.0	127.4	116.8	107.8	100.1	93.4	87.6	82.4	77.8	73.7
66"	140.0	140.0	140.0	140.0	139.4	128.7	119.5	111.5	104.5	98.4	92.9	88.0
60"	140.0	140.0	140.0	140.0	140.0	140.0	140.0	135.4	126.9	119.4	112.8	106.9
54"	140.0	140.0	140.0	140.0	140.0	140.0	140.0	140.0	140.0	140.0	139.7	132.4
48"	140.0	140.0	140.0	140.0	140.0	140.0	140.0	140.0	140.0	140.0	140.0	140.0
42"	140.0	140.0	140.0	140.0	140.0	140.0	140.0	140.0	140.0	140.0	140.0	140.0
36"	140.0	140.0	140.0	140.0	140.0	140.0	140.0	140.0	140.0	140.0	140.0	140.0
30"	140.0	140.0	140.0	140.0	140.0	140.0	140.0	140.0	140.0	140.0	140.0	140.0

2" x 6" x 1/8" REINFORCED TUBE MULLION

Member Span	Tributary Span											
	24"	27"	30"	33"	36"	39"	42"	45"	48"	51"	54"	57"
144"	140.0	138.2	124.4	113.1	103.7	95.7	88.8	82.9	77.7	73.2	69.1	65.5
138"	140.0	140.0	135.6	123.3	113.0	104.3	96.9	90.4	84.7	79.8	75.3	71.4
132"	140.0	140.0	140.0	134.9	123.6	114.1	106.0	98.9	92.7	87.3	82.4	78.1
126"	140.0	140.0	140.0	140.0	135.8	125.4	116.4	108.7	101.9	95.9	90.6	85.8
120"	140.0	140.0	140.0	140.0	140.0	138.4	128.5	120.0	112.5	105.8	100.0	94.7
114"	140.0	140.0	140.0	140.0	140.0	140.0	140.0	133.1	124.8	117.4	110.9	105.1
108"	140.0	140.0	140.0	140.0	140.0	140.0	140.0	140.0	139.2	131.0	123.7	117.2
102"	140.0	140.0	140.0	140.0	140.0	140.0	140.0	140.0	140.0	140.0	138.9	131.6
96"	140.0	140.0	140.0	140.0	140.0	140.0	140.0	140.0	140.0	140.0	140.0	140.0
90"	140.0	140.0	140.0	140.0	140.0	140.0	140.0	140.0	140.0	140.0	140.0	140.0
84"	140.0	140.0	140.0	140.0	140.0	140.0	140.0	140.0	140.0	140.0	140.0	140.0
78"	140.0	140.0	140.0	140.0	140.0	140.0	140.0	140.0	140.0	140.0	140.0	140.0
72"	140.0	140.0	140.0	140.0	140.0	140.0	140.0	140.0	140.0	140.0	140.0	140.0
66"	140.0	140.0	140.0	140.0	140.0	140.0	140.0	140.0	140.0	140.0	140.0	140.0
60"	140.0	140.0	140.0	140.0	140.0	140.0	140.0	140.0	140.0	140.0	140.0	140.0
54"	140.0	140.0	140.0	140.0	140.0	140.0	140.0	140.0	140.0	140.0	140.0	140.0
48"	140.0	140.0	140.0	140.0	140.0	140.0	140.0	140.0	140.0	140.0	140.0	140.0
42"	140.0	140.0	140.0	140.0	140.0	140.0	140.0	140.0	140.0	140.0	140.0	140.0
36"	140.0	140.0	140.0	140.0	140.0	140.0	140.0	140.0	140.0	140.0	140.0	140.0
30"	140.0	140.0	140.0	140.0	140.0	140.0	140.0	140.0	140.0	140.0	140.0	140.0

71 Progress Avenue,
Cranbury Township, PA 16166
Tel: (724) 776-7000

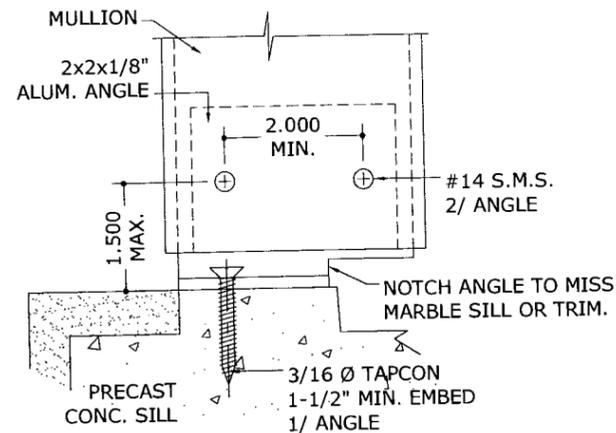
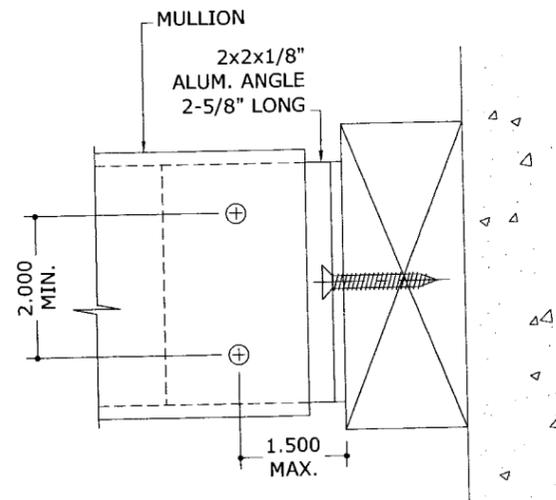
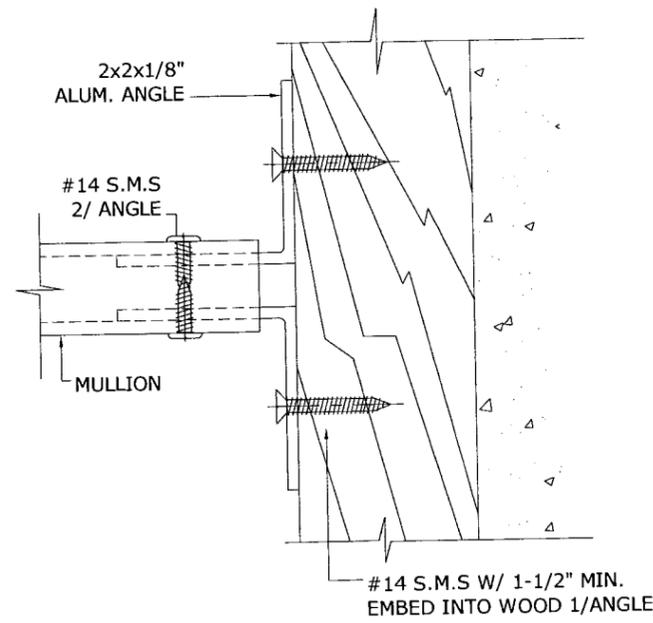


ALUMINUM TUBE MULLIONS WITH STEEL REINFORCEMENT
LARGE MISSILE IMPACT RESISTANT
MIAMI-DADE NOTICE OF ACCEPTANCE

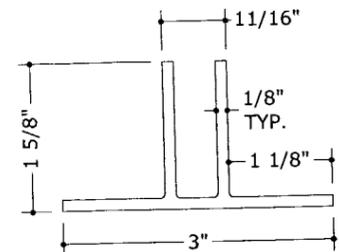
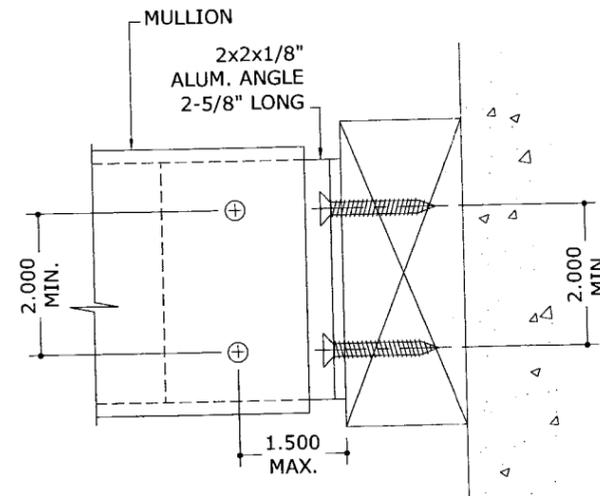
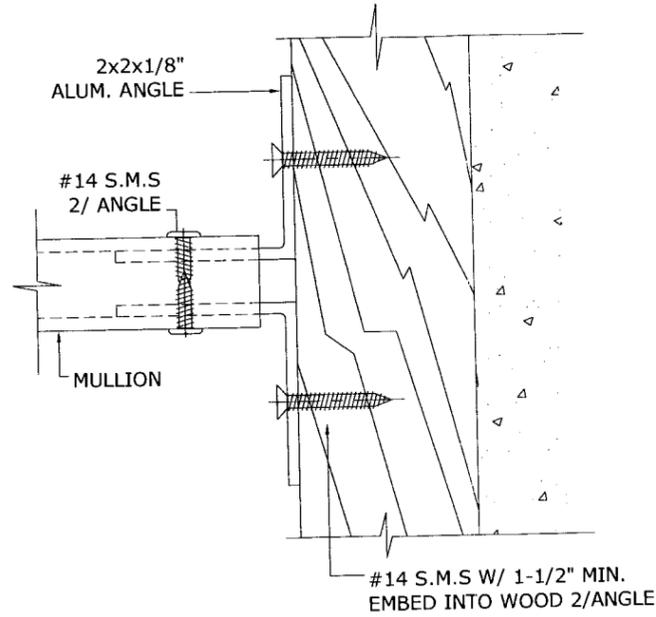
DRWN	CHKD	DATE
		12/1/06

06-TRA-0005
SCALE: 1/8" = 1'-0"
PAGE DESCRIPTION:

ANCHORS TYPE "A"



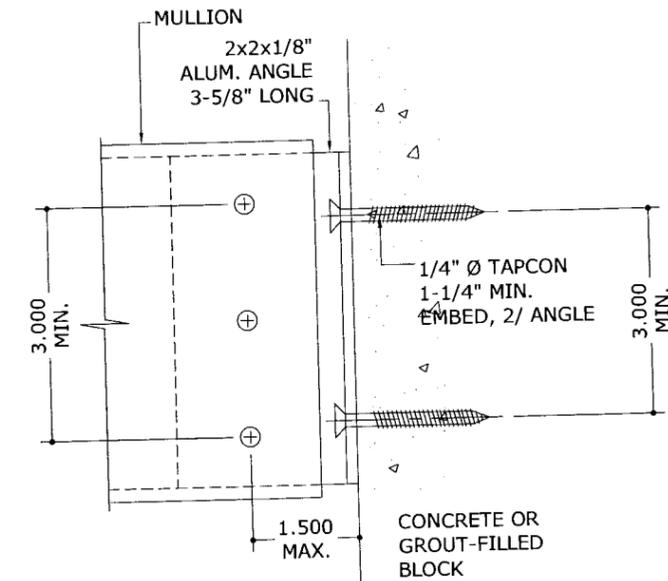
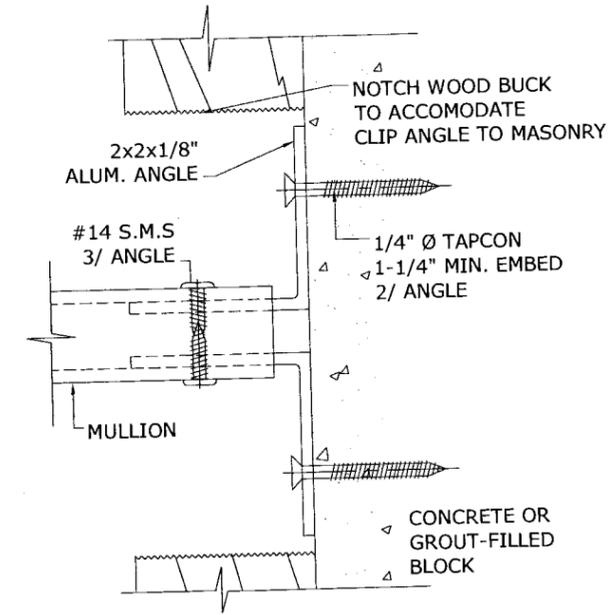
ANCHORS TYPE "B"



MULLION CLIP

- ALT. TO ANGLES FOR ALL ANCHOR TYPES
- THIS CLIP SHALL FLOAT INSIDE MULLION (NO SIDE FASTENERS REQ'D)

ANCHORS TYPE "C"



FRANK L. BENNARDO, P.E.
PE0046549

12/12/2006

ENGINEERING EXPRESS
160 SW 12th AVENUE, #106
DEERFIELD BEACH, FL 33442
PH: (954) 354-0660 FAX: (954) 354-0443
WWW.ENGEXP.COM
CERT OF AUTH #888
A FRANK L. BENNARDO, P.E., INC. INNOVATION

71 Progress Avenue,
Cranbury Township,
Tel: (724) 776-7000

TRACO
Windows & Doors Inc.
ALUMINUM TUBE MULLIONS WITH STEEL REINFORCEMENT
LARGE MISSILE IMPACT RESISTANT
MIAMI-DADE NOTICE OF ACCEPTANCE

DRWN	CHKD	DATE
CL	FLB	12/1/06
INIT	ISSUE	

06-TRA-0005
SCALE: 1/8" = 1'-0"
PAGE DESCRIPTION: 01

PRODUCT REVISED
as complying with the Florida
Building Code
Acceptance No. 06-1228-01
Expiration Date JAN. 2, 2008
By *Manuel Pise*
Miami Dade Product Control
Division

F:\01 Project Files\Traco (TRA)\2006 Jobs\06-TRA-0005 Mullions with Steel Reinf. LMI (NOA)\06-TRA-0005_00a Mullions with Steel Reinf. LMI (NOA).dwg 12/12/2006 - 5:18pm clangley