

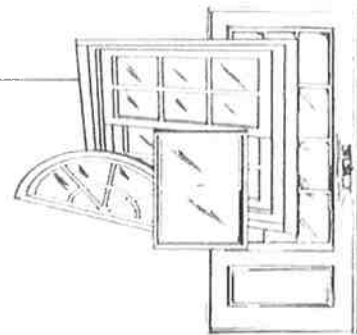
# CERTIFIED TESTING LABORATORIES

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**Report Number: CTLA 2017W**  
**CTL Certification #: 08-0528.05**  
**DC Not. #: 10005**

**Report Date: April 7, 2010**  
**Test Date: February 22 – 26<sup>th</sup>, 2010**  
**March 15 – 19<sup>th</sup>, 2010**

## STRUCTURAL PERFORMANCE TEST REPORT

**Client: QMI Security Solutions**  
**1661 Glenlake Avenue**  
**Itasca, IL 60143**

**Test Specifications: TAS 201 (Large Missile), TAS 202 (Structural Loads Only) & TAS 203**

### Design Pressures:

Test Sample # 3 (Specimen 1) & # 4 (Specimen 2): + 30.0 psf., - 30.0 psf.

Test Sample # 5 (Specimen 3) & # 6 (Specimen 4): + 100.0 psf., - 100.0 psf.

### Product type:

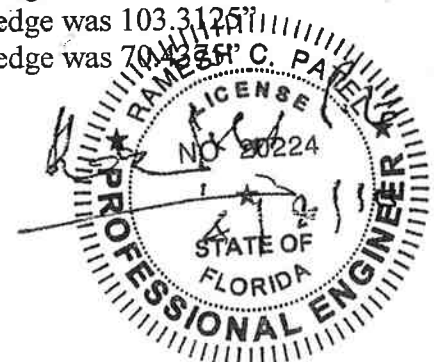
Test Sample # 3 (Specimen 1): 13'-0" x 8'-10" with US60ER, 1138ER and P55DER Slats  
Test Sample # 4 (Specimen 2): 13'-0" x 8'-10" with P55TER, P55ER 2<sup>nd</sup> and P55ER Slats  
Test Sample # 5 (Specimen 3): 8'-6" x 8'-10" with US60ER, 1138ER and P55DER Slats  
Test Sample # 6 (Specimen 4): 5'-9" x 8'-10" with P55TER, 1138ER and P55ER Slats

### Overall Size:

Test Sample # 3 & 4 (Specimen 1 & 2): 156" wide x 106" high overall (opening size)  
Test Sample # 5 (Specimen 3): 102" wide x 106" high overall (opening size)  
Test Sample # 6 (Specimen 4): 69" wide x 106" high overall (opening size)

### Configuration:

All Samples/Specimens: One (1) Operable Single Curtain consisting of seamed shutter slats.  
Test Sample # 3 (Specimen 1): Slat length measuring from edge of slat to edge was 157.375"  
Test Sample # 4 (Specimen 2): Slat length measuring from edge of slat to edge was 157.375"  
Test Sample # 5 (Specimen 3): Slat length measuring from edge of slat to edge was 103.3125"  
Test Sample # 6 (Specimen 4): Slat length measuring from edge of slat to edge was 70.4375"



## **Curtain:**

### Test Sample # 3 & 5 (Specimen 1 & 3):

Curtain consisted of three (3) different slat types. Each slat type made up a curtain height of 32.00". The curtain slats from top of curtain to bottom were as follows. Aluminum 1138ER slats each measuring 0.402" wide x 1.526" high with a wall thickness of 0.075" (*refer to drawing # GAH-45827*). PVC P55DER slats each measuring 0.551" wide x 2.194" high with a wall thickness of 0.045" (*refer to drawing # 10A17116*). Aluminum US60ER slats each measuring .562" wide x 2.155" high with a wall thickness of 0.050" (*refer to drawing # GAH-47632*). An aluminum base slat was utilized at bottom of curtain and measured 0.492" wide x 2.031" high with a wall thickness of 0.050" (*refer to drawing # QMI-408*). Each slat was interlocked by sliding together and utilized a plastic end cap secured to each end of slats with two (2) #4 x 0.750" Phillips CS SMS with one (1) #12 x 2.50" Square drive PH SMS utilized to interface with rails. P55 double ER slats each had two (2) #12 x 2.50" Square drive PH SMS utilized to interface with rails.

### Test Sample # 4 & 6 (Specimen 2 & 4):

Curtain consisted of three (3) different slat types. Each slat type made up a curtain height of 32.00". The curtain slats from top to bottom were as follows. PVC P55ER 2<sup>nd</sup> slats each measuring 0.551" wide x 2.194" high with a wall thickness of 0.045" (*refer to drawing # 10A17116*). PVC P55TER slats each measuring 0.551" wide x 2.194" high with a wall thickness of 0.045" (*refer to drawing # 10A17116*). PVC P55ER slats each measuring 0.551" wide x 2.194" high with a wall thickness of 0.045" (*refer to drawing # 10A17116*). An aluminum base slat was utilized at bottom of curtain and measured 0.492" wide x 2.031" high with a wall thickness of 0.050" (*refer to drawing # QMI-408*). Each slat was interlocked by sliding together and utilized a plastic end cap secured to each end of slats with two staples with one (1) #12 x 2.50" Square drive PH SMS utilized to interface with rails.

### All Samples/Specimens:

One (1) aluminum two piece header box assembly consisted of the following, main box fastened to end cap with four (4) # 8 x ½ pan head self drilling screw and cover box was fastened to end cap with three (3) #8 x ½" pan head self drilling screws. One 2 ¾" steel shaft inside header box with ½" x 1" long metallic pin at left side sliding into a 4" x 4" metallic plate with groove at end cap. One 5/8" x 1 3/16" long metallic pin at right side of shaft sliding into operating assembly with crank handle. The header box was inserted in top of side rails with a 2 ½" long aluminum stub at each end cap. Aluminum roller clip was fastened to top of guide utilizing two (2) #8-32 x 0.4375" SS machine screws with flat washer #8 Stainless 0.4375" OD .031" thick with a nylon roller secured to roller clip with Allen head.

## **Guides:**

### All Samples/Specimens:

One (1) extruded aluminum spring stop snap cover retain rail measured 3.400" wide by 1.090" high overall was located in left jamb (*refer to drawing # QMI-487*) and one (1) extruded aluminum 2 piece spring stop retain rail consisting of an inner half measuring 3.500" wide x 1.090" high (*refer to drawing # QMI-488*) and an outer half measuring 3.500" wide x 1.002" high located in right jamb (*refer to drawing # QMI-489*). The 2 piece rail was secured together utilizing #8-18 x 0.750" Phillips PH SDS 410 S.S. screw (*as stated by manufacturer*). The rails were secured to the filled CMU each utilizing ¼" x 2.250" Tapcon (*refer to installation details for spacing*). The left rail utilizing an aluminum snap cover measuring 3.400" wide x 1.090" high (*refer to drawing # QMI-351*).



### Reinforcement:

#### All Samples/Specimens

| Quantity | Description                                                                                     | Location                                                                                       |
|----------|-------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------|
| One (1)  | Aluminum extrusion measuring 0.370" wide x 0.580" high ( <i>refer to drawing # GAS-45356</i> ). | Each P55 top ER slat & P55 double ER slat x full length                                        |
| One (1)  | Aluminum extrusion measuring 0.319" wide x 0.372" high ( <i>refer to drawing # GAS-46374</i> ). | Each P55 double ER slat, P55 ER slat and alternating P55 ER 2 <sup>nd</sup> slat x full length |

### Weather-stripping:

#### All Samples/Specimens

| Quantity | Description                                      | Location                                   |
|----------|--------------------------------------------------|--------------------------------------------|
| One (1)  | Vinyl Bulb 0.370" wide x 0.375" high             | Bottom base slat                           |
| Four (4) | 0.270" wide x 0.270" high Pile with integral fin | Spring stop snap cover retain rail         |
| Two (2)  | 0.270" wide x 0.270" high Pile with integral fin | 2 piece Spring stop retain rail out half   |
| Two (2)  | 0.270" wide x 0.270" high Pile with integral fin | 2 piece spring stop retain rail inner half |

### INSTALLATION:

#### Methods of Attachment:

##### Test Sample # 3 & 4 (Specimen 1 & 2):

Specimen was secured to filled concrete block test buck through rail utilizing the following:

**Left Jamb:** Nineteen (19) ¼" x 2.250" Tapcon located at 3.00" from floor and maximum of 4.00" on center thereafter.

**Right Jamb:** Twenty-two (22) ¼" x 2.250" Tapcon located 3.00" from floor and maximum of 4.00" on center thereafter.

##### Test Sample # 5 (Specimen 3):

Specimen was secured to filled concrete block test buck through rail utilizing the following:

**Left Jamb:** Thirty-one (31) ¼" x 2.250" Tapcon located at 3.00" from floor and maximum of 3.00" on center thereafter.

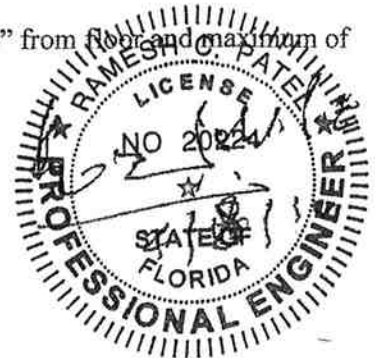
**Right Jamb:** Thirty-one (31) ¼" x 2.250" Tapcon located 3.00" from floor and maximum of 3.00" on center thereafter.

##### Test Sample # 6 (Specimen 4):

Specimen was secured to filled concrete block test buck through rail utilizing the following:

**Left Jamb:** Nineteen (19) ¼" x 2.250" Tapcon located at 3.00" from floor and maximum of 5.00" on center thereafter.

**Right Jamb:** Twenty-two (22) ¼" x 2.250" Tapcon located 3.00" from floor and maximum of 5.00" on center thereafter.



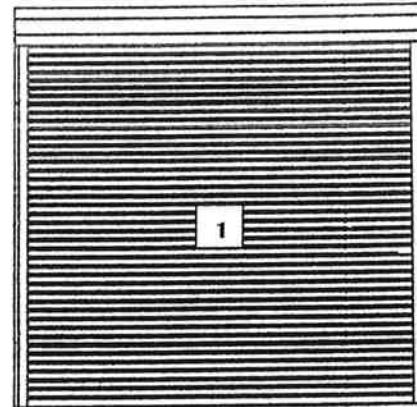
## Performance Test Results

### SEQUENCE OF TESTS PERFORMED:

#### Test Sequence: TAS 202

1. ½ Test Pressure Positive- ASTM E330-02
2. ½ Test Pressure Negative- ASTM E330-02
3. Design Pressure Positive- ASTM E330-02
4. Design Pressure Negative- ASTM E330-02
5. Full Test pressure Positive- ASTM E330-02
6. Full Test Pressure Negative- ASTM E330-02

### Measurement Locations



### Deflection / Permanent Set Indicator Positions:

Deflection / Permanent Set were measured with one (1) CDI Dial Indicator located at center mid-span of curtain

### STATIC AIR PRESSURE TESTS: TAS 202

#### Test Sample # 3 (Specimen 1)

#### Positive Loads (Design Load + 30.0 psf.)

| Range of test      | Time (sec.) | Actual Load (psf.) | Location | Deflection | Permanent Set |
|--------------------|-------------|--------------------|----------|------------|---------------|
| 50 % Test Pressure | 30          | 22.5               | 1        | 5.660"     | 1.120"        |
| Design Pressure    | 30          | 30.0               | 1        | 4.818"     | 0.878"        |
| Test Pressure      | 30          | 60.0               | 1        | 5.834"     | 0.000"        |

#### Negative loads (Design Pressure – 30.0 psf.)

| Range of test      | Time (sec.) | Actual Load (psf.) | Location | Deflection | Permanent Set |
|--------------------|-------------|--------------------|----------|------------|---------------|
| 50 % Test Pressure | 30          | 22.5               | 1        | 5.496"     | 0.312"        |
| Design Pressure    | 30          | 30.0               | 1        | 6.350"     | 0.000"        |
| Test Pressure      | 30          | 60.0               | 1        | 5.382"     | 0.000"        |

**Results recorded are gross numbers**

**Recovery @ Test Load:**      Positive:      **100.0 %**  
Negative:      **100.0 %**

**Note:** The shutter system was fully operable prior to and at the conclusion of this test, and did not sustain any damage that would render it inoperable. The shutter system remained in the track throughout the duration of the test.



### **STATIC AIR PRESSURE TESTS: TAS 202**

#### **Test Sample # 4 (Specimen 2)**

#### **Positive Loads (Design Load + 30.0 psf.)**

| Range of test      | Time (sec.) | Actual Load (psf.) | Location | Deflection | Permanent Set |
|--------------------|-------------|--------------------|----------|------------|---------------|
| 50 % Test Pressure | 30          | 22.5               | 1        | 6.415"     | 1.220"        |
| Design Pressure    | 30          | 30.0               | 1        | 5.612"     | 0.152"        |
| Test Pressure      | 30          | 60.0               | 1        | 5.078"     | 0.000"        |

#### **Negative loads (Design Pressure – 30.0 psf.)**

| Range of test      | Time (sec.) | Actual Load (psf.) | Location | Deflection | Permanent Set |
|--------------------|-------------|--------------------|----------|------------|---------------|
| 50 % Test Pressure | 30          | 22.5               | 1        | 6.446"     | 1.622"        |
| Design Pressure    | 30          | 30.0               | 1        | 5.135"     | 0.232"        |
| Test Pressure      | 30          | 60.0               | 1        | 5.801"     | 0.620"        |

**Results recorded are gross numbers**

**Recovery @ Test Load:** Positive: **100.0 %**  
Negative: **89.3 %**

**Note:** The shutter system was fully operable prior to and at the conclusion of this test, and did not sustain any damage that would render it inoperable. The shutter system remained in the track throughout the duration of the test.

### **STATIC AIR PRESSURE TESTS: TAS 202**

#### **Test Sample # 5 (Specimen 3)**

#### **Positive Loads (Design Load + 100.0 psf.)**

| Range of test      | Time (sec.) | Actual Load (psf.) | Location | Deflection | Permanent Set |
|--------------------|-------------|--------------------|----------|------------|---------------|
| 50 % Test Pressure | 30          | 75.0               | 1        | 7.236"     | 0.535"        |
| Design Pressure    | 30          | 100.0              | 1        | 7.655"     | 0.875"        |
| Test Pressure      | 30          | 150.0              | 1        | 7.880"     | 0.490"        |

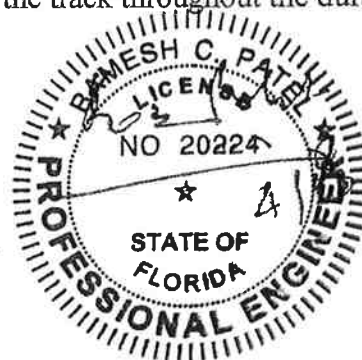
#### **Negative loads (Design Pressure – 100.0 psf.)**

| Range of test      | Time (sec.) | Actual Load (psf.) | Location | Deflection | Permanent Set |
|--------------------|-------------|--------------------|----------|------------|---------------|
| 50 % Test Pressure | 30          | 75.0               | 1        | 7.575"     | 0.720"        |
| Design Pressure    | 30          | 100.0              | 1        | 7.360"     | 0.325"        |
| Test Pressure      | 30          | 150.0              | 1        | 7.890"     | 0.000"        |

**Results recorded are gross numbers**

**Recovery @ Test Load:** Positive: **93.8 %**  
Negative: **100.0 %**

**Note:** The shutter system was fully operable prior to and at the conclusion of this test, and did not sustain any damage that would render it inoperable. The shutter system remained in the track throughout the duration of the test.



### **STATIC AIR PRESSURE TESTS: TAS 202-94**

#### **Test Sample # 6 (Specimen 4)**

##### **Positive Loads (Design Load + 100.0 psf.)**

| Range of test      | Time (sec.) | Actual Load (psf.) | Location | Deflection | Permanent Set |
|--------------------|-------------|--------------------|----------|------------|---------------|
| 50 % Test Pressure | 30          | 75.0               | 1        | 4.617"     | 0.203"        |
| Design Pressure    | 30          | 100.0              | 1        | 4.440"     | 0.343"        |
| Test Pressure      | 30          | 150.0              | 1        | 5.429"     | 0.106"        |

##### **Negative loads (Design Pressure – 100.0 psf.)**

| Range of test      | Time (sec.) | Actual Load (psf.) | Location | Deflection | Permanent Set |
|--------------------|-------------|--------------------|----------|------------|---------------|
| 50 % Test Pressure | 30          | 75.0               | 1        | 5.071"     | 0.153"        |
| Design Pressure    | 30          | 100.0              | 1        | 4.575"     | 0.092"        |
| Test Pressure      | 30          | 150.0              | 1        | 5.091"     | 0.071"        |

**Results recorded are gross numbers**

**Recovery @ Test Load:**      Positive:      **98.0 %**  
                                         Negative:      **98.6 %**

**Note:** The shutter system was fully operable prior to and at the conclusion of this test, and did not sustain any damage that would render it inoperable. The shutter system remained in the track throughout the duration of the test.

#### **Impact Test: Large Missile**

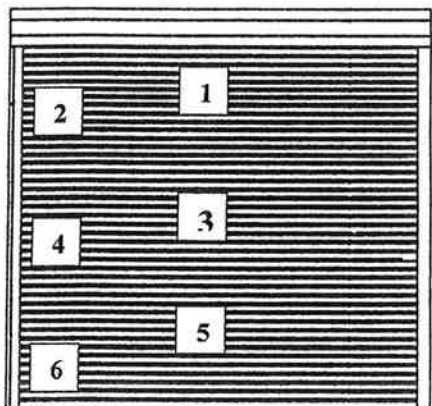
Impact tests were conducted in accordance with **TAS 201-94**

Each specimen was impacted with an 8 ft., 9 lb. Southern yellow pine 2" x 4" at the following locations:

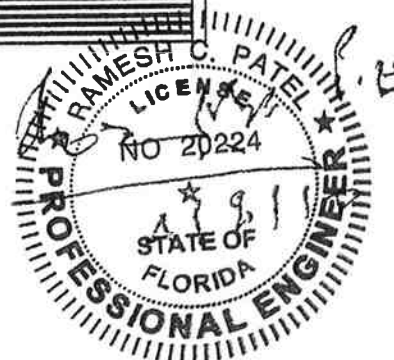
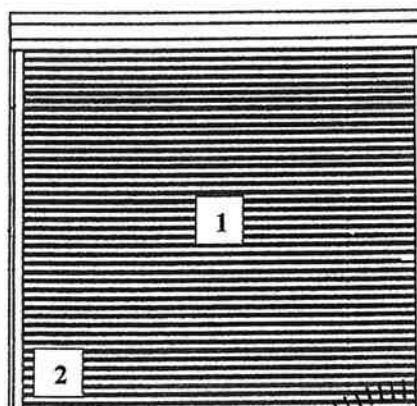
X measurement from left edge of curtain.

Y measurement from top edge of curtain.

#### **Test Sample # 3 (Specimen 1)**



#### **Test Sample # 4 (Specimen 2)**



**Impact Test: Large Missile (Continued)**

**Test Sample # 3 (Specimen 1)**

| Impact No. | Speed ft/sec. | X Measurement | Y Measurement | Deflection @ Impact |
|------------|---------------|---------------|---------------|---------------------|
| 1.         | 50.1          | 82.750"       | 14.500"       | 1.625"              |
| 2.         | 50.5          | 9.000"        | 22.000"       | 1.125"              |
| 3.         | 49.1          | 83.000"       | 45.500"       | 2.000"              |
| 4.         | 49.1          | 8.500"        | 55.000"       | 1.250"              |
| 5.         | 50.1          | 82.500"       | 78.000"       | 1.750"              |
| 6.         | 49.5          | 7.250"        | 87.500"       | 1.375"              |

Note: Location 4 – An overall slat separation crack extended laterally 37" and was centered at the impact location where the slat separation crack depth was ½".

**Test Sample # 4 (Specimen 2)**

| Impact No. | Speed ft/sec. | X Measurement | Y Measurement | Deflection @ Impact |
|------------|---------------|---------------|---------------|---------------------|
| 1.         | 49.9          | 77.000"       | 46.000"       | 1.875"              |
| 2.         | 49.9          | 8.000"        | 55.000"       | 1.250"              |

Note: Location 1 – An overall slat separation crack extended laterally 139" and was centered at the impact location where the slat separation crack depth was 3.5".

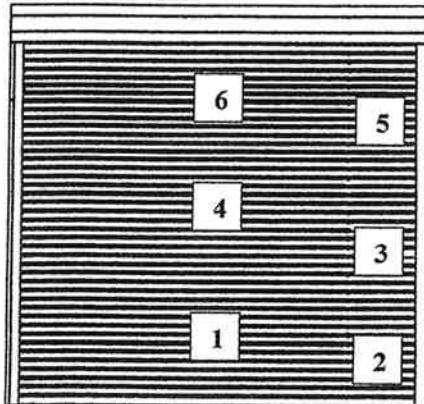
Location 2 – An overall slat separation crack extended laterally 43" and was centered at the impact location where the slat separation crack depth was 7".

**Impact Test: Large Missile (Continued)**

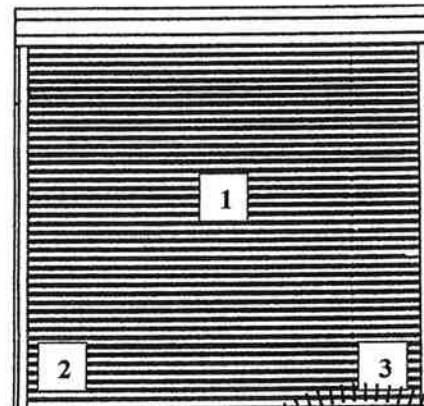
X measurement from left edge of curtain.

Y measurement from top edge of curtain.

**Test Sample # 5 (Specimen 3)**



**Test Sample # 6 (Specimen 4)**



**Impact Test: Large Missile (Continued)**

**Test Sample # 5 (Specimen 3)**

| Impact No. | Speed ft/sec. | X Measurement | Y Measurement | Deflection @ Impact |
|------------|---------------|---------------|---------------|---------------------|
| 1.         | 49.5          | 51.000"       | 78.000"       | 1.500"              |
| 2.         | 50.3          | 95.500"       | 88.000"       | 1.000"              |
| 3.         | 49.3          | 95.250"       | 56.000"       | 1.125"              |
| 4.         | 50.1          | 50.500"       | 45.500"       | 1.375"              |
| 5.         | 50.1          | 94.750"       | 26.250"       | 1.250"              |
| 6.         | 49.1          | 51.250"       | 14.500"       | 1.625"              |

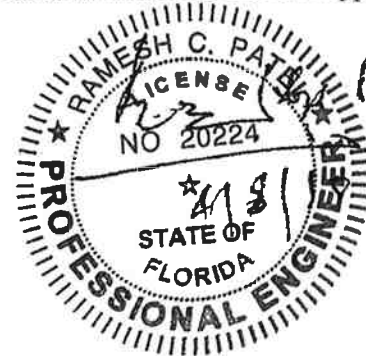
**Note:** Location 1 – An overall slat separation crack extended laterally 4.5" and was centered at the impact location where the slat separation crack depth was ½".  
Location 2 – An overall slat separation crack extended laterally 32" and was centered at the impact location where the slat separation crack depth was 2".  
Location 3 – An overall slat separation crack extended laterally 7" and was centered at the impact location where the slat separation crack depth was ½".  
Location 4 – An overall slat separation crack extended laterally full length and was centered at the impact location where the slat separation crack depth was 2".

**Test Sample # 6 (Specimen 4)**

| Impact No. | Speed ft/sec. | X Measurement | Y Measurement | Deflection @ Impact |
|------------|---------------|---------------|---------------|---------------------|
| 1.         | 49.3          | 40.000"       | 47.000"       | 1.250"              |
| 2.         | 49.7          | 12.000"       | 87.000"       | 1.125"              |
| 3.         | 49.7          | 65.000"       | 86.500"       | 1.000"              |

**Note:** Location 1 – An overall slat separation crack extended laterally 48" and was centered at the impact location where the slat separation crack depth was 2".  
Location 2 – An overall slat separation crack extended laterally 8" and was centered at the impact location where the slat separation crack depth was ½".  
Location 3 – An overall slat separation crack extended laterally 7" and was centered at the impact location where the slat separation crack depth was ½".

**Results:** All specimens tested resisted the large missile impact, unless otherwise noted above, without penetration of the inner plane of the shutter, with no separation of slat engagement at interlocks and no slippage from tracks.



### **Fatigue Loading Test (TAS 203)**

Cycle tests were conducted in accordance with TAS 203-94

#### **Test Sample # 3 (Specimen 1)**

**Positive loads (Design Pressure) +30.0 psf.**

| <u>Range of Test</u> | <u>Actual Load (psf.)</u> |      | <u># of Cycles</u> | <u>Cycles/min.</u> |
|----------------------|---------------------------|------|--------------------|--------------------|
| 0.0 – 0.5            | 0.0                       | 15.0 | 600                | 55                 |
| 0.0 – 0.6            | 0.0                       | 18.0 | 70                 | 55                 |
| 0.0 – 1.3            | 0.0                       | 39.0 | 1                  |                    |

Deflection taken center mid-span

**671 cycles completed**

**Deflection**  
6.875"

**Set**  
0.375"

**Negative loads (Design Pressure) -30.0 psf.**

| <u>Range of Test</u> | <u>Actual Load (psf.)</u> |      | <u># of Cycles</u> | <u>Cycles/min.</u> |
|----------------------|---------------------------|------|--------------------|--------------------|
| 0.0 – 0.5            | 0.0                       | 15.0 | 600                | 55                 |
| 0.0 – 0.6            | 0.0                       | 18.0 | 70                 | 55                 |
| 0.0 – 1.3            | 0.0                       | 39.0 | 1                  |                    |

Deflection taken center mid-span

**671 cycles completed**

**Deflection**  
5.625"

**Set**  
0.250"

Specimen showed no resultant failure or duress after cycle test. No failure of fasteners.

Specimen and fasteners did not become disengaged during test procedure.

#### **Test Sample # 4 (Specimen 2)**

**Positive loads (Design Pressure) +30.0 psf.**

| <u>Range of Test</u> | <u>Actual Load (psf.)</u> |      | <u># of Cycles</u> | <u>Cycles/min.</u> |
|----------------------|---------------------------|------|--------------------|--------------------|
| 0.0 – 0.5            | 0.0                       | 15.0 | 600                | 55                 |
| 0.0 – 0.6            | 0.0                       | 18.0 | 70                 | 55                 |
| 0.0 – 1.3            | 0.0                       | 39.0 | 1                  |                    |

Deflection taken center mid-span

**671 cycles completed**

**Deflection**  
5.125"

**Set**  
0.125"

**Negative loads (Design Pressure) -30.0 psf.**

| <u>Range of Test</u> | <u>Actual Load (psf.)</u> |      | <u># of Cycles</u> | <u>Cycles/min.</u> |
|----------------------|---------------------------|------|--------------------|--------------------|
| 0.0 – 0.5            | 0.0                       | 15.0 | 600                | 55                 |
| 0.0 – 0.6            | 0.0                       | 18.0 | 70                 | 55                 |
| 0.0 – 1.3            | 0.0                       | 39.0 | 1                  |                    |

Deflection taken center mid-span

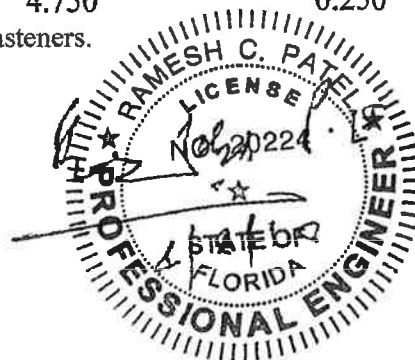
**671 cycles completed**

**Deflection**  
4.750"

**Set**  
0.250"

Specimen showed no resultant failure or duress after cycle test. No failure of fasteners.

Specimen and fasteners did not become disengaged during test procedure.



### Fatigue Loading Test (TAS 203) (Continued)

#### Test Sample # 5 (Specimen 3)

##### **Positive loads (Design Pressure) +100.0 psf.**

| <u>Range of Test</u> | <u>Actual Load (psf.)</u> |       | <u># of Cycles</u> | <u>Cycles/min.</u> |
|----------------------|---------------------------|-------|--------------------|--------------------|
| 0.0 – 0.5            | 0.0                       | 50.0  | 600                | 55                 |
| 0.0 – 0.6            | 0.0                       | 60.0  | 70                 | 55                 |
| 0.0 – 1.3            | 0.0                       | 130.0 | 1                  |                    |

Deflection taken center mid-span

**671 cycles completed**

**Deflection**

7.500"

**Set**

0.500"

##### **Negative loads (Design Pressure) -100.0 psf.**

| <u>Range of Test</u> | <u>Actual Load (psf.)</u> |       | <u># of Cycles</u> | <u>Cycles/min.</u> |
|----------------------|---------------------------|-------|--------------------|--------------------|
| 0.0 – 0.5            | 0.0                       | 50.0  | 600                | 55                 |
| 0.0 – 0.6            | 0.0                       | 60.0  | 70                 | 55                 |
| 0.0 – 1.3            | 0.0                       | 130.0 | 1                  |                    |

Deflection taken center mid-span

**671 cycles completed**

**Deflection**

6.250"

**Set**

0.250"

Specimen showed no resultant failure or duress after cycle test. No failure of fasteners.

Specimen and fasteners did not become disengaged during test procedure.

#### Test Sample # 6 (Specimen 4)

##### **Positive loads (Design Pressure) +100.0 psf.**

| <u>Range of Test</u> | <u>Actual Load (psf.)</u> |      | <u># of Cycles</u> | <u>Cycles/min.</u> |
|----------------------|---------------------------|------|--------------------|--------------------|
| 0.0 – 0.5            | 0.0                       | 15.0 | 600                | 55                 |
| 0.0 – 0.6            | 0.0                       | 18.0 | 70                 | 55                 |
| 0.0 – 1.3            | 0.0                       | 39.0 | 1                  |                    |

Deflection taken center mid-span

**671 cycles completed**

**Deflection**

3.250"

**Set**

0.125"

##### **Negative loads (Design Pressure) -100.0 psf.**

| <u>Range of Test</u> | <u>Actual Load (psf.)</u> |      | <u># of Cycles</u> | <u>Cycles/min.</u> |
|----------------------|---------------------------|------|--------------------|--------------------|
| 0.0 – 0.5            | 0.0                       | 15.0 | 600                | 55                 |
| 0.0 – 0.6            | 0.0                       | 18.0 | 70                 | 55                 |
| 0.0 – 1.3            | 0.0                       | 39.0 | 1                  |                    |

Deflection taken center mid-span

**671 cycles completed**

**Deflection**

3.500"

**Set**

0.750"

Specimen showed no resultant failure or duress after cycle test. No failure of fasteners.

Specimen and fasteners did not become disengaged during test procedure.

The results obtained and reported apply only to the specimens tested.

**Comments:** Nominal 2-mil polyethylene film was used to seal against air leakage during structural loads. The film was used in a manner that did not influence the test results.



**Drawings to be submitted:**

Submittal drawings numbered as listed and marked with the CTL stamp are a part of this report submitted by our client (QMI Security Solutions): S-1209-EG sheet 1 thru 5 of 5, QMI-487, QMI-488, QMI-489, QMI-408, QMI-395, QMI-410, QMI-477, QMI-351, GAH-47632, QMI-409, GAH-45827, QMI-331, 10A17116, GAS-46374 and GAS-45356.

**Remarks:** Detailed drawings were available for laboratory records and comparison to the tested specimen at the time of this report. A copy of this report along with representative sections of the tested specimens will be retained by CTL for a period of ten (10) years. The results obtained apply only to the specimens tested.

This test report does not constitute certification of this product, but only that the above results were obtained using the designated test methods and they indicate compliance with the performance requirements (paragraphs as listed) of the above referenced specification.

Certified Testing Laboratories assumes that all information provided by the client is accurate, and that all physical and chemical properties of the components are as stated by the Manufacturer.

*Certified Testing Laboratories, Inc.*

**Clients Witness Present:**

Milt Prosperi - QMI Security Solutions  
Don Fowler - QMI Security Solutions

**All Tests Witnessed and Performed By:**

Justin Mobley - CTL  
Ryan Blakely - CTL  
Ted Scanlon - CTL  
Ramesh Patel, P.E.

*Jonathan Pittenger*

Jonathan Pittenger  
Lab Technician  
Architectural Division



Ramesh Patel, P.E.  
Florida Reg. # 20224  
Structural Engineer

Cc.

QMI Security Solutions (3)  
Dade County (1)  
Ramesh Patel, P.E. (1)  
File (1)



Technical drawing of a mechanical part, likely a gear or a similar component, showing dimensions and tolerances. The drawing includes a cross-section view and a side view. Key dimensions and tolerances are as follows:

- Overall width: .499
- Overall height: .255 P.L./T.R.
- Top left corner: 2.365 R.
- Top right corner: .200Ø
- Top center: .135 R.
- Top center: 135°
- Top center: .010 R. TYP 3
- Top center: .050 ±.006
- Top center: .201 T.R.
- Top center: .248
- Top center: .319 T.R.
- Top center: .090 T.R.
- Top center: .122 T.R.
- Top center: .153 T.R.
- Top center: .097
- Top center: .020 R. TYP 4(\*)
- Top center: .010 DP X 90° (S)
- Top center: .010 R. INDULEX AMERICA INC. ID.
- Top center: .372 ±.008

ACTUAL SIZE

INDALEX AMERICA INC. ID.  
.010 DP X 90° (3)

PRODUCTION DRAWING  
8/13/01  
RELEASED DATE:  
9. 88A00089  
RELEASED BY:  
DESTROY ALL PREVIOUS COPIES



**CERTIFIED TESTING LABORATORIES**

**ARCHITECTURAL DIVISION  
7252 NARCOOSSEE ROAD  
ORLANDO, FLORIDA 32822**

CTIA No. 201703  
Date Verified: 4/2/12  
Verified By: g

ALUMINUM ASSOCIATION STANDARD TOLERANCES  
APPLY UNLESS SPECIFIED OTHERWISE  
UNSPECIFIED WALL THICKNESS -  
UNSPECIFIED RADIUS - 0.16  
DIFF. RATING: 3



**INDALEX**  
ALUMINUM SOLUTIONS

INDALEX AMERICA INC.  
2905 OLD OAKWOOD RD  
GAINESTVILLE, GA. 30504  
770-535-1349  
800-544-3801

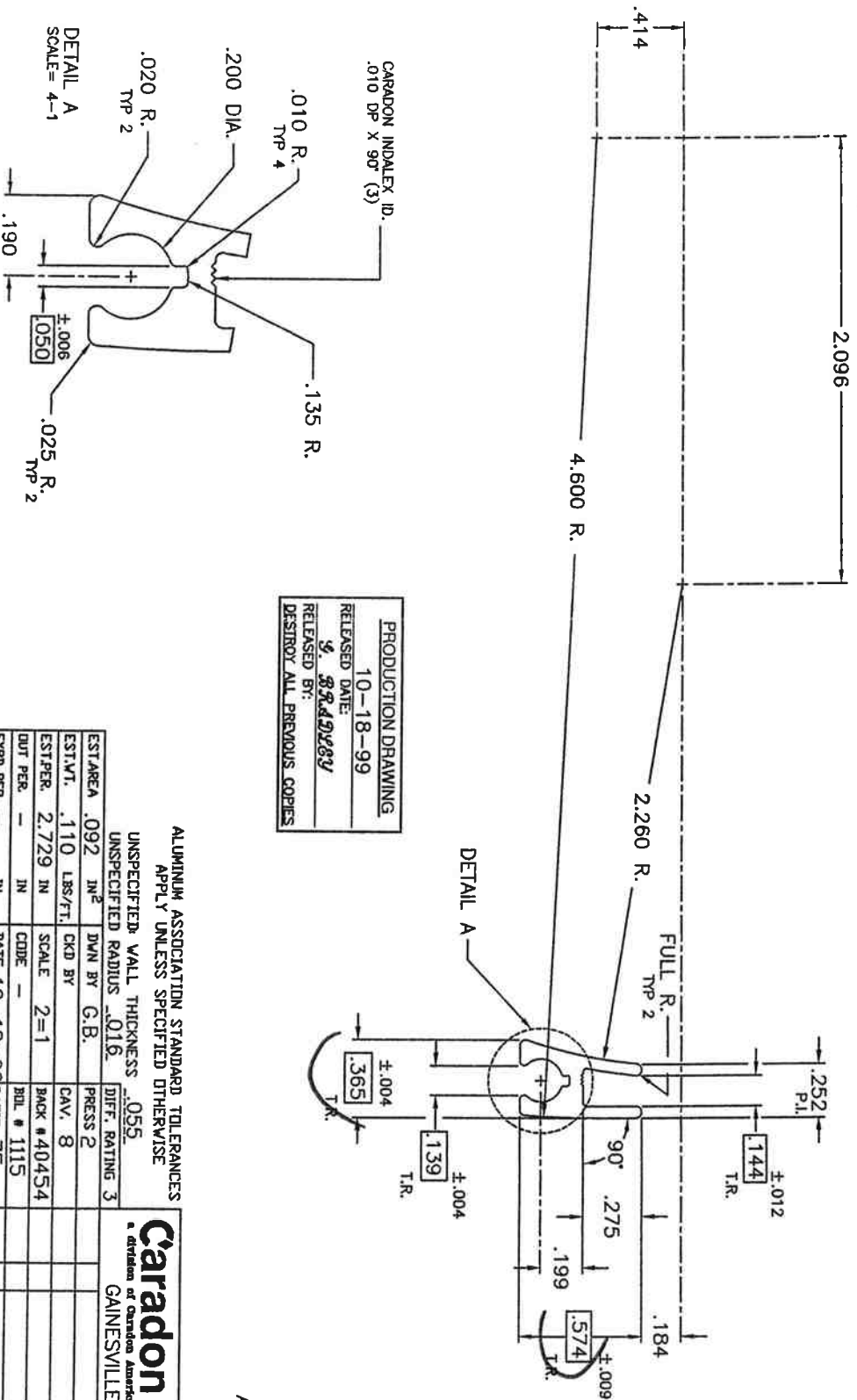
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ARCHITECTURAL DIVISION  
7252 NARCOOSSEE ROAD  
ORLANDO, FLORIDA 32822

CTLA No. 201702  
Date Verified: 11/8/12  
Verified By: [Signature]

|             |                         |              |          |         |           |      |
|-------------|-------------------------|--------------|----------|---------|-----------|------|
| CUSTOMER    | ROLL-A-WAY              | CUSTOMER NO. | 3-12-422 | DIE NO. | GAS-45356 | REV. |
| DESCRIPTION | P55 END RETENTION REBAR | PROPOSAL NO. | R5371-1  |         |           |      |



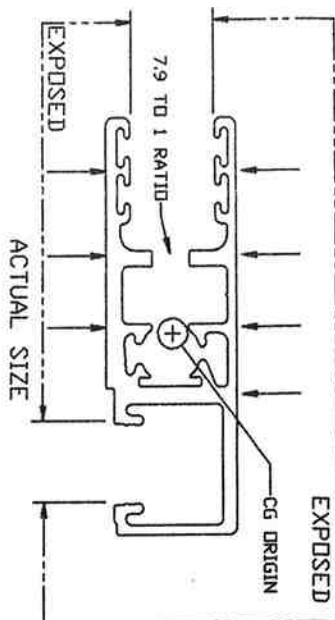
PRODUCTION DRAWING  
10-18-99  
RELEASED DATE:  
9. 88.42263  
RELEASED BY:  
DESTROY ALL PREVIOUS COPIES

ACTUAL SIZE

NO  
EXPOSED  
SURFACES

|                                                                                |           |                 |        |          |             |
|--------------------------------------------------------------------------------|-----------|-----------------|--------|----------|-------------|
| ALUMINUM ASSOCIATION STANDARD TOLERANCES<br>APPLY UNLESS SPECIFIED OTHERWISE   |           |                 |        |          |             |
| UNSPECIFIED WALL THICKNESS .055                                                |           |                 |        |          |             |
| UNSPECIFIED RADIUS .016                                                        |           |                 |        |          |             |
| EST. AREA                                                                      | .092      | IN <sup>2</sup> | DWN BY | G.B.     | PRESS 2     |
| EST. WT.                                                                       | .110      | LB/FT.          | CKD BY |          | CAV. 8      |
| EST. PER.                                                                      | 2.729     | IN              | SCALE  | 2=1      | BACK #40454 |
| EXP. PER.                                                                      | -         | IN              | CODE   | -        | BLL # 1115  |
| FACTOR                                                                         | 25        | IN              | DATE   | 10-18-99 | RATD 75     |
| C.C.D.                                                                         | .670      | IN              | ALUDY  | 6005-T5  | BLADE -     |
| Caradon Indalex<br>a division of Caradon America, Inc.<br>GAINESVILLE, GEORGIA |           |                 |        |          |             |
| DIE NO.                                                                        | GAS-45356 | DATE            | SYM    | REVISION | BY          |

STRUCTURAL STREAKS EXPECTED

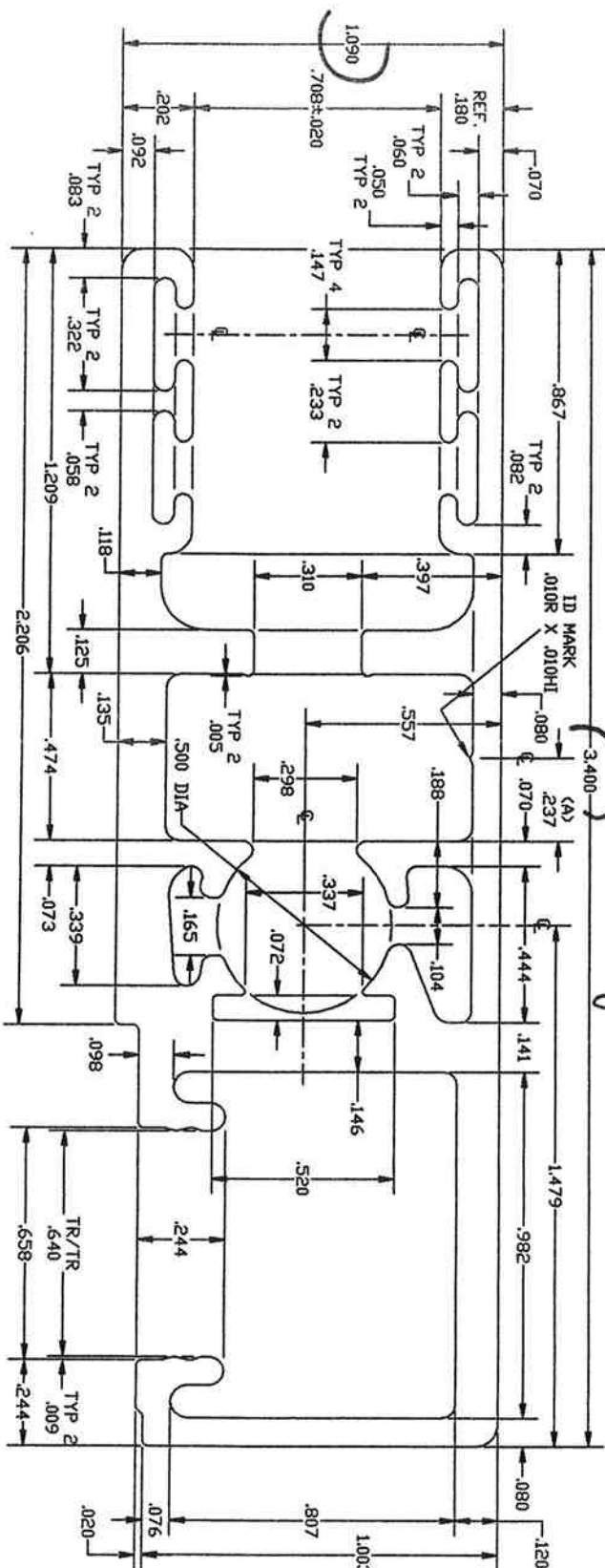


ARCHITECTURAL DIVISION  
7252 NARCOSSEE ROAD  
ORLANDO, FLORIDA 32822

CTLA No. 2017W  
Date Verified: 4/2/10  
Verified By: [Signature]

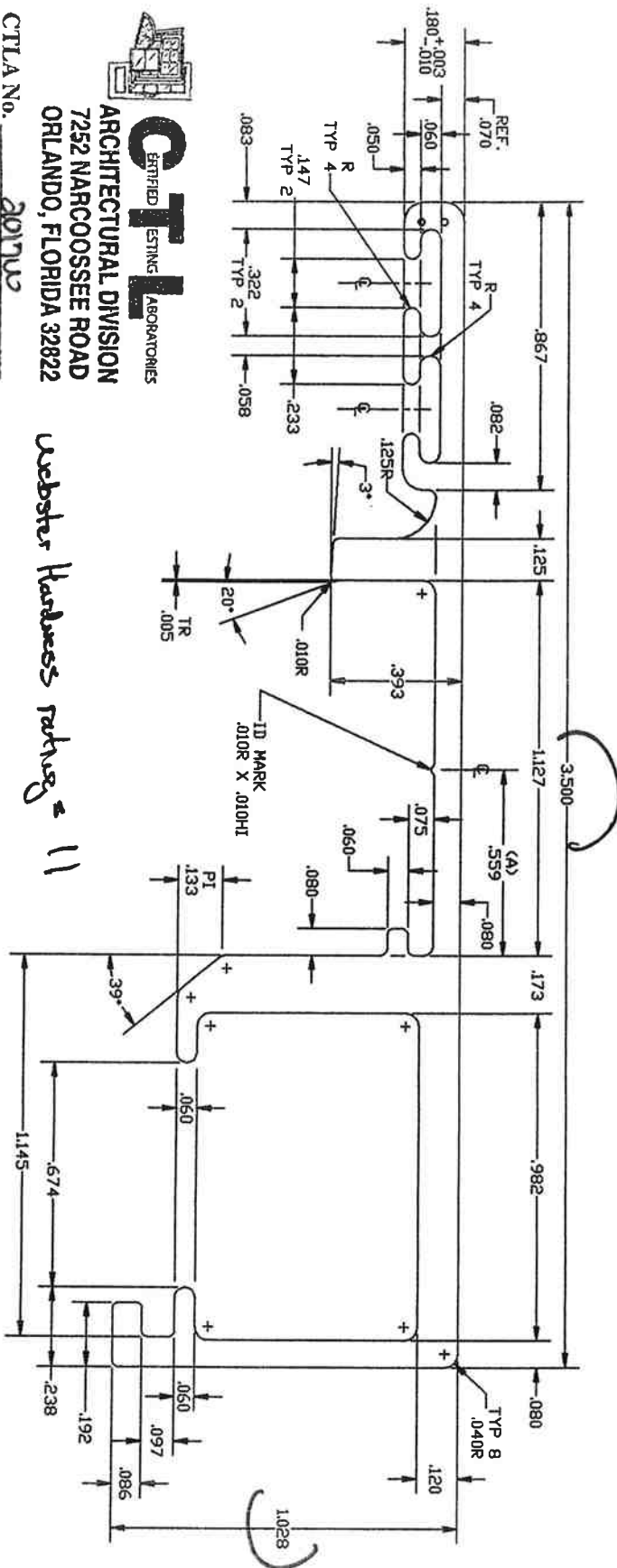
| Standard Aluminum Association tolerances apply unless otherwise noted. |                             |                     |               | DIE NUMBER |               | REV |
|------------------------------------------------------------------------|-----------------------------|---------------------|---------------|------------|---------------|-----|
| CUST PART #:                                                           | THICK WALL R & S SNAP COVER | REL. DATE 1-7-10 LB | ALLOY 6063-T5 | EUC        | QMI-487       |     |
| PROPOSAL (A) 1-7-10 LB                                                 |                             |                     |               | 199        |               | A   |
|                                                                        |                             |                     |               |            | FINISH 204-R1 |     |

THE ELECTRONIC GEOMETRY  
IS TO GOVERN THE DIMENSIONS  
FOR THIS SHAPE. THEREFORE  
SOME DIMENSIONS MAY NOT BE  
SHOWN.



| REV             | DESCRIPTION OF REVISION                             | DATE            | BY    |
|-----------------|-----------------------------------------------------|-----------------|-------|
| 1               | FOR CIRCUMSCRIBING CIRCLE SIZES LESS THAN 10 INCHES |                 |       |
| 0.125 - 0.249   | 0.007                                               | 0.500 - 0.749   | 0.009 |
| 0.250 - 0.499   | 0.010                                               | 0.750 - 0.999   | 0.010 |
| 0.500 - 0.749   | 0.012                                               | 1.000 - 1.249   | 0.015 |
| 0.750 - 0.999   | 0.015                                               | 1.250 - 1.499   | 0.020 |
| 1.000 - 1.249   | 0.020                                               | 1.500 - 1.749   | 0.025 |
| 1.250 - 1.499   | 0.025                                               | 1.750 - 1.999   | 0.030 |
| 1.500 - 1.749   | 0.030                                               | 2.000 - 2.499   | 0.035 |
| 1.750 - 1.999   | 0.035                                               | 2.500 - 2.999   | 0.040 |
| 2.000 - 2.499   | 0.040                                               | 3.000 - 3.499   | 0.045 |
| 2.500 - 2.999   | 0.045                                               | 3.500 - 3.999   | 0.050 |
| 3.000 - 3.499   | 0.050                                               | 4.000 - 4.499   | 0.055 |
| 3.500 - 3.999   | 0.055                                               | 4.500 - 4.999   | 0.060 |
| 4.000 - 4.499   | 0.060                                               | 5.000 - 5.499   | 0.065 |
| 4.500 - 4.999   | 0.065                                               | 5.500 - 5.999   | 0.070 |
| 5.000 - 5.499   | 0.070                                               | 6.000 - 6.499   | 0.075 |
| 5.500 - 5.999   | 0.075                                               | 6.500 - 6.999   | 0.080 |
| 6.000 - 6.499   | 0.080                                               | 7.000 - 7.499   | 0.085 |
| 6.500 - 6.999   | 0.085                                               | 7.500 - 7.999   | 0.090 |
| 7.000 - 7.499   | 0.090                                               | 8.000 - 8.499   | 0.095 |
| 7.500 - 7.999   | 0.095                                               | 8.500 - 8.999   | 0.100 |
| 8.000 - 8.499   | 0.100                                               | 9.000 - 9.499   | 0.105 |
| 8.500 - 8.999   | 0.105                                               | 9.500 - 9.999   | 0.110 |
| 9.000 - 9.499   | 0.110                                               | 10.000 - 10.499 | 0.115 |
| 9.500 - 9.999   | 0.115                                               | 10.500 - 10.999 | 0.120 |
| 10.000 - 10.499 | 0.120                                               | 11.000 - 11.499 | 0.125 |
| 10.500 - 10.999 | 0.125                                               | 11.500 - 11.999 | 0.130 |
| 11.000 - 11.499 | 0.130                                               | 12.000 - 12.499 | 0.135 |
| 11.500 - 11.999 | 0.135                                               | 12.500 - 12.999 | 0.140 |
| 12.000 - 12.499 | 0.140                                               | 13.000 - 13.499 | 0.145 |
| 12.500 - 12.999 | 0.145                                               | 13.500 - 13.999 | 0.150 |
| 13.000 - 13.499 | 0.150                                               | 14.000 - 14.499 | 0.155 |
| 13.500 - 13.999 | 0.155                                               | 14.500 - 14.999 | 0.160 |
| 14.000 - 14.499 | 0.160                                               | 15.000 - 15.499 | 0.165 |
| 14.500 - 14.999 | 0.165                                               | 15.500 - 15.999 | 0.170 |
| 15.000 - 15.499 | 0.170                                               | 16.000 - 16.499 | 0.175 |
| 15.500 - 15.999 | 0.175                                               | 16.500 - 16.999 | 0.180 |
| 16.000 - 16.499 | 0.180                                               | 17.000 - 17.499 | 0.185 |
| 16.500 - 16.999 | 0.185                                               | 17.500 - 17.999 | 0.190 |
| 17.000 - 17.499 | 0.190                                               | 18.000 - 18.499 | 0.195 |
| 17.500 - 17.999 | 0.195                                               | 18.500 - 18.999 | 0.200 |
| 18.000 - 18.499 | 0.200                                               | 19.000 - 19.499 | 0.205 |
| 18.500 - 18.999 | 0.205                                               | 19.500 - 19.999 | 0.210 |
| 19.000 - 19.499 | 0.210                                               | 20.000 - 20.499 | 0.215 |
| 19.500 - 19.999 | 0.215                                               | 20.500 - 20.999 | 0.220 |
| 20.000 - 20.499 | 0.220                                               | 21.000 - 21.499 | 0.225 |
| 20.500 - 20.999 | 0.225                                               | 21.500 - 21.999 | 0.230 |
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| 23.500 - 23.999 | 0.255                                               | 24.500 - 24.999 | 0.260 |
| 24.000 - 24.499 | 0.260                                               | 25.000 - 25.499 | 0.265 |
| 24.500 - 24.999 | 0.265                                               | 25.500 - 25.999 | 0.270 |
| 25.000 - 25.499 | 0.270                                               | 26.000 - 26.499 | 0.275 |
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| 26.000 - 26.499 | 0.280                                               | 27.000 - 27.499 | 0.285 |
| 26.500 - 26.999 | 0.285                                               | 27.500 - 27.999 | 0.290 |
| 27.000 - 27.499 | 0.290                                               | 28.000 - 28.499 | 0.295 |
| 27.500 - 27.999 | 0.295                                               | 28.500 - 28.999 | 0.300 |
| 28.000 - 28.499 | 0.300                                               | 29.000 - 29.499 | 0.305 |
| 28.500 - 28.999 | 0.305                                               | 29.500 - 29.999 | 0.310 |
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| 29.500 - 29.999 | 0.315                                               | 30.500 - 30.999 | 0.320 |
| 30.000 - 30.499 | 0.320                                               | 31.000 - 31.499 | 0.325 |
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| 31.500 - 31.999 | 0.335                                               | 32.500 - 32.999 | 0.340 |
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| 41.500 - 41.999 | 0.435                                               | 42.500 - 42.999 | 0.440 |
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| 58.000 - 58.499 | 0.600                                               | 59.000 - 59.499 | 0.605 |
| 58.500 - 58.999 | 0.605                                               | 59.500 - 59.999 | 0.610 |
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| 63.500 - 63.999 | 0.655                                               | 64.500 - 64.999 | 0.660 |
| 64.000 - 64.499 | 0.660                                               | 65.000 - 65.499 | 0.665 |
| 64.500 - 64.999 | 0.665                                               | 65.500 - 65.999 | 0.670 |
| 65.000 - 65.499 | 0.670                                               | 66.000 - 66.499 | 0.675 |
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| 66.500 - 66.999 | 0.685                                               | 67.500 - 67.999 | 0.690 |
| 67.000 - 67.499 | 0.690                                               | 68.000 - 68.499 | 0.695 |
| 67.500 - 67.999 | 0.695                                               | 68.500 - 68.999 | 0.700 |
| 68.000 - 68.499 | 0.700                                               | 69.000 - 69.499 | 0.705 |
| 68.500 - 68.999 | 0.705                                               | 69.500 - 69.999 | 0.710 |
| 69.000 - 69.499 | 0.710                                               | 70.000 - 70.499 | 0.715 |
| 69.500 - 69.999 | 0.715                                               | 70.500 - 70.999 | 0.720 |
| 70.000 - 70.499 | 0.720                                               | 71.000 - 71.499 | 0.725 |
| 70.500 - 70.999 | 0.725                                               | 71.500 - 71.999 | 0.730 |
| 71.000 - 71.499 | 0.730                                               | 72.000 - 72.499 | 0.735 |
| 71.500 - 71.999 | 0.735                                               | 72.500 - 72.999 | 0.740 |
| 72.000 - 72.499 | 0.740                                               | 73.000 - 73.499 | 0.745 |
| 72.500 - 72.999 | 0.745                                               | 73.500 - 73.999 | 0.750 |
| 73.000 - 73.499 | 0.750                                               | 74.000 - 74.499 | 0.755 |
| 73.500 - 73.999 | 0.755                                               | 74.500 - 74.999 | 0.760 |
| 74.000 - 74.499 | 0.760                                               | 75.000 - 75.499 | 0.765 |
| 74.500 - 74.999 | 0.765                                               | 75.500 - 75.999 | 0.770 |
| 75.000 - 75.499 | 0.770                                               | 76.000 - 76.499 | 0.775 |
| 75.500 - 75.999 | 0.775                                               | 76.500 - 76.999 | 0.780 |
| 76.000 - 76.499 | 0.780                                               | 77.000 - 77.499 | 0.785 |
| 76.500 - 76.999 | 0.785                                               | 77.500 - 77.999 | 0.790 |
| 77.000 - 77.499 | 0.790                                               | 78.000 - 78.499 | 0.795 |
| 77.500 - 77.999 | 0.795                                               | 78.500 - 78.999 | 0.800 |
| 78.000 - 78.499 | 0.800                                               | 79.000 - 79.499 | 0.805 |
| 78.500 - 78.999 | 0.805                                               | 79.500 - 79.999 | 0.810 |
| 79.000 - 79.499 | 0.810                                               | 80.000 - 80.499 | 0.815 |
| 79.500 - 79.999 | 0.815                                               | 80.500 - 80.999 | 0.820 |
| 80.000 - 80.499 | 0.820                                               | 81.000 - 81.499 | 0.825 |
| 80.500 - 80.999 | 0.825                                               | 81.500 - 81.999 | 0.830 |
| 81.000 - 81.499 | 0.830                                               | 82.000 - 82.499 | 0.835 |
| 81.500 - 81.999 | 0.835                                               | 82.500 - 82.999 | 0.840 |
| 82.000 - 82.499 | 0.840                                               | 83.000 - 83.499 | 0.845 |
| 82.500 - 82.999 | 0.845                                               | 83.500 - 83.999 | 0.850 |
| 83.000 - 83.499 | 0.850                                               | 84.000 - 84.499 | 0.855 |
| 83.500 - 83.999 | 0.855                                               | 84.500 - 84.999 | 0.860 |
| 84.000 - 84.499 | 0.860                                               | 85.000 - 85.499 | 0.865 |
| 84.500 - 84.999 | 0.865                                               | 85.500 - 85.999 | 0.870 |
| 85.000 - 85.499 | 0.870                                               | 86.000 - 86.499 | 0.875 |
| 85.500 - 85.999 | 0.875                                               | 86.500 - 86.999 | 0.880 |
| 86.000 - 86.499 | 0.880                                               | 87.000 - 87.499 | 0.885 |
| 86.500 - 86.999 | 0.885                                               | 87.500 - 87.999 | 0.890 |
| 87.000 - 87.499 | 0.890                                               | 88.000 - 88.499 | 0.895 |
| 87.500 - 87.999 | 0.895                                               | 88.500 - 88.999 | 0.900 |
| 88.000 - 88.499 | 0.900                                               | 89.000 - 89.499 | 0.905 |
| 88.500 - 88.999 | 0.905                                               | 89.500 - 89.999 | 0.910 |
| 89.000 - 89.499 | 0.910                                               | 90.000 - 90.499 | 0.915 |
| 89.500 - 89.999 | 0.915                                               | 90.500 - 90.999 | 0.920 |
| 90.000 - 90.499 | 0.920                                               | 91.000 - 91.499 | 0.925 |
| 90.500 - 90.999 | 0.925                                               | 91.500 - 91.999 | 0.930 |
| 91.000 - 91.499 | 0.930                                               | 92.000 - 92.499 | 0.935 |
| 91.500 - 91.999 | 0.935                                               | 92.500 - 92.999 | 0.940 |
| 92.000 - 92.499 | 0.940                                               | 93.000 - 93.499 | 0.945 |
| 92.500 - 92.999 | 0.945                                               | 93.500 - 93.999 | 0.950 |
| 93.000 - 93.499 | 0.950                                               | 94.000 - 94.499 | 0.955 |
| 93.500 - 93.999 | 0.955                                               | 94.500 - 94.999 | 0.960 |
| 94.000 - 94.499 | 0.960                                               | 95.000 - 95.499 | 0.965 |
| 94.500 - 94.999 | 0.965                                               | 95.500 - 95.999 | 0.970 |
| 95.000 - 95.499 | 0.970                                               | 96.000 - 96.499 | 0.975 |
| 95.500 - 95.999 | 0.975                                               | 96.500 - 96.999 | 0.980 |
| 96.000 - 96.499 | 0.980                                               | 97.000 - 97.499 | 0.985 |
| 96.500 - 96.999 | 0.985                                               | 97.500 - 97.999 | 0.990 |
| 97.000 - 97.499 | 0.990                                               | 98.000 - 98.499 | 0.995 |
| 97.500 - 97.999 | 0.995                                               | 98.500 - 98.999 | 1.000 |

ACTUAL SIZE



**WARRANTY:**

Bonnell warrants that the product(s) supplied by Bonnell shall be free from defects in workmanship and material and shall conform to all descriptions and specifications, as agreed between Bonnell and Purchaser. BONNELL DISCLAIMS ANY OTHER WARRANTY, EXPRESS OR IMPLIED, WHETHER CREATED BY CONTRACT, BY STATUTE OR OTHERWISE BY OPERATION OF LAW, INCLUDING ALL WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.

PURCHASER'S DESIGNS, PLANS, DRAWINGS, SPECIFICATIONS AND REQUIREMENTS

For any product that is not included in Bonnell's standard product line offered for sale generally, in the great course of Bonnell's business, it is agreed that Purchaser has engaged Bonnell to manufacture such product to Purchaser's specifications and requirements. Bonnell shall not be responsible for the adequacy of plans, drawings, specifications and requirements regarding such product or for the adequacy of the design represented thereby. Bonnell also shall not be responsible for the adequacy of the materials incorporated in such product or for making or not making statements concerning the sufficiency and applicability of the design. Bonnell shall not be responsible for the accuracy of the information provided by Purchaser or its agents. Bonnell may terminate this agreement at any time without notice if it determines that Purchaser does not respect its product which shall be set forth above. All designs, plans, orders, or drawings of whatever type submitted to Bonnell by Purchaser in such products are used to make the same property of Bonnell.

ALL DESIGNS, NAMES, MARKS, OR DISTINGUISHING OF WHATEVER KIND OWNED BY HANCOCK WITH RESPECT TO SUCH PRODUCTS ARE AND SHALL REMAIN THE SOLE PROPERTY OF HANCOCK.

|                                                                        |                     |               |               |     |
|------------------------------------------------------------------------|---------------------|---------------|---------------|-----|
| Standard Aluminum Association tolerances apply unless otherwise noted. |                     |               | DIE NUMBER    | REV |
| CUST PART #:                                                           | TITLE BLOCK: REV A  |               | QMI-488       | A   |
| CUST PART NAME: THICK WALL R & S 2 PC. INNER HALF                      | EUC                 |               |               |     |
| PROPOSAL: (A) 1-7-10 LB                                                | REL. DATE 1-7-10 LB | ALLOY 6005-T5 | FINISH 204-R1 |     |

Standard Aluminum Association tolerances apply unless otherwise noted

| A                                                    | ID MARK LOCATION MOVED              | 1-15-10                             | 1300     |
|------------------------------------------------------|-------------------------------------|-------------------------------------|----------|
| REV                                                  | DESCRIPTION OF REVISION             | DATE                                | BY       |
| Standard Nominal Wall Thickness Tolerance Chart (4)  |                                     |                                     |          |
| For Circumferential Shell Stress Less than 10 inches |                                     |                                     |          |
| Up thru 0.124                                        | 0.06                                | 0.250 - 0.499                       | 0.003    |
| 0.125 - 0.249                                        | 0.07                                | 0.500 - 0.749                       | 0.009    |
|                                                      |                                     | Hollows 10% .010 min                | .060 min |
|                                                      |                                     |                                     | CGK      |
| Structural values estimated for reference only.      |                                     |                                     |          |
| 1x                                                   | .0200 $\times 10^6$ mm <sup>4</sup> | .048 in <sup>4</sup>                | 1x       |
| 5x                                                   | 1.003 $\times 10^3$ mm <sup>3</sup> | .784 in <sup>3</sup>                | 5x       |
|                                                      |                                     | 5.192 $\times 10^2$ mm <sup>3</sup> |          |
|                                                      |                                     | 53.47 mm <sup>3</sup>               |          |
|                                                      |                                     | 2.105 in <sup>3</sup>               |          |

Structural values estimated for reference only.

QMP-488



|                  |          |    |             |        |                   |        |                    |
|------------------|----------|----|-------------|--------|-------------------|--------|--------------------|
| UNRECORDED WALLS |          | mm | MASS:       | 1.123  | g/cm <sup>3</sup> | .755   | lb/in <sup>3</sup> |
| UNRECORDED FLOOR |          | m  | EAST PER:   | 325.50 | m/s               | 12.815 | m                  |
|                  | .38R     | m  | OUT PER:    |        | m/s               |        | s/s                |
|                  | .015R    | m  | EXP PER:    |        | m/s               |        | s/s                |
| DATE:            | 12/1/9   |    | BUFF PER:   |        | m/s               |        | s/s                |
| DRAWN:           | CUST/LMB |    | BUFF TURNS: |        | m/s               | Solid  |                    |
| SCALE:           | 3-1      |    | FACTOR:     | 290    | m/s               | 17     | m/s                |
| THUMB:           | NO       |    | C.C.D.:     | 92.66  | m/s               | 3.648  | m/s                |

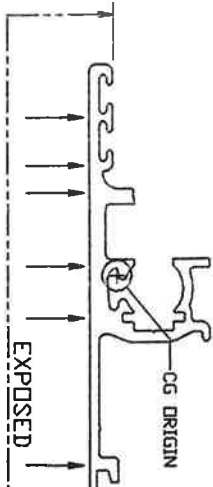
STRUCTURAL STREAKS EXPECTED



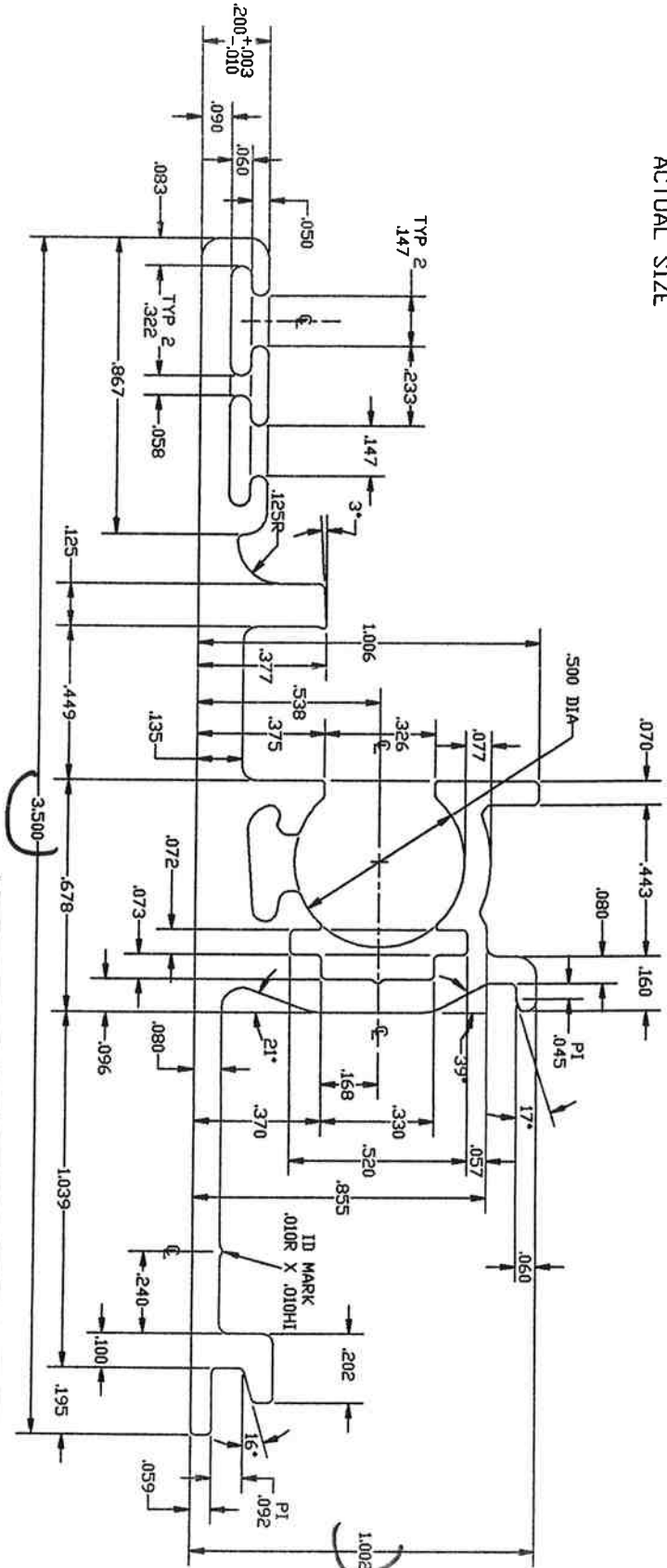
ARCHITECTURAL DIVISION  
7252 NARCOOSSEE ROAD  
ORLANDO, FLORIDA 32822

CPLA No. 201700

Date Verified: 4/3/12  
Verified By: [Signature]



ACTUAL SIZE



THE ELECTRONIC GEOMETRY  
IS TO GOVERN THE DIMENSIONS  
FOR THIS SHAPE. THEREFORE  
SOME DIMENSIONS MAY NOT BE  
SHOWN.

| Standard Nominal Wall Thickness Tolerance Chart (4) |            |              |                |
|-----------------------------------------------------|------------|--------------|----------------|
| For Circumscribing Circle Sizes Less than 10 inches | 10" - 100" | 100" - 1000" | 1000" and over |
| Up thru 0.124                                       | 0.006      | 0.008        | 0.010          |
| 0.125 - 0.249                                       | 0.007      | 0.009        | 0.010          |
| 0.250 - 0.499                                       | 0.008      | 0.010        | 0.012          |
| 0.500 - 0.749                                       | 0.009      | 0.012        | 0.015          |
| 0.750 - 0.999                                       | 0.010      | 0.015        | 0.020          |
| 1.000 - 1.249                                       | 0.012      | 0.020        | 0.025          |
| 1.250 - 1.499                                       | 0.015      | 0.025        | 0.030          |
| 1.500 - 1.749                                       | 0.018      | 0.030        | 0.035          |
| 1.750 - 1.999                                       | 0.020      | 0.035        | 0.040          |
| 2.000 - 2.249                                       | 0.022      | 0.040        | 0.045          |
| 2.250 - 2.499                                       | 0.025      | 0.045        | 0.050          |
| 2.500 - 2.749                                       | 0.028      | 0.050        | 0.055          |
| 2.750 - 2.999                                       | 0.030      | 0.055        | 0.060          |
| 3.000 - 3.249                                       | 0.032      | 0.060        | 0.065          |
| 3.250 - 3.499                                       | 0.035      | 0.065        | 0.070          |
| 3.500 - 3.749                                       | 0.038      | 0.070        | 0.075          |
| 3.750 - 3.999                                       | 0.040      | 0.075        | 0.080          |
| 4.000 - 4.249                                       | 0.042      | 0.080        | 0.085          |
| 4.250 - 4.499                                       | 0.045      | 0.085        | 0.090          |
| 4.500 - 4.749                                       | 0.048      | 0.090        | 0.095          |
| 4.750 - 4.999                                       | 0.050      | 0.095        | 0.100          |
| 5.000 - 5.249                                       | 0.052      | 0.100        | 0.105          |
| 5.250 - 5.499                                       | 0.055      | 0.105        | 0.110          |
| 5.500 - 5.749                                       | 0.058      | 0.110        | 0.115          |
| 5.750 - 5.999                                       | 0.060      | 0.115        | 0.120          |
| 6.000 - 6.249                                       | 0.062      | 0.120        | 0.125          |
| 6.250 - 6.499                                       | 0.065      | 0.125        | 0.130          |
| 6.500 - 6.749                                       | 0.068      | 0.130        | 0.135          |
| 6.750 - 6.999                                       | 0.070      | 0.135        | 0.140          |
| 7.000 - 7.249                                       | 0.072      | 0.140        | 0.145          |
| 7.250 - 7.499                                       | 0.075      | 0.145        | 0.150          |
| 7.500 - 7.749                                       | 0.078      | 0.150        | 0.155          |
| 7.750 - 7.999                                       | 0.080      | 0.155        | 0.160          |
| 8.000 - 8.249                                       | 0.082      | 0.160        | 0.165          |
| 8.250 - 8.499                                       | 0.085      | 0.165        | 0.170          |
| 8.500 - 8.749                                       | 0.088      | 0.170        | 0.175          |
| 8.750 - 8.999                                       | 0.090      | 0.175        | 0.180          |
| 9.000 - 9.249                                       | 0.092      | 0.180        | 0.185          |
| 9.250 - 9.499                                       | 0.095      | 0.185        | 0.190          |
| 9.500 - 9.749                                       | 0.098      | 0.190        | 0.195          |
| 9.750 - 9.999                                       | 0.100      | 0.195        | 0.200          |
| 10.000 - 10.249                                     | 0.102      | 0.200        | 0.205          |
| 10.250 - 10.499                                     | 0.105      | 0.205        | 0.210          |
| 10.500 - 10.749                                     | 0.108      | 0.210        | 0.215          |
| 10.750 - 10.999                                     | 0.110      | 0.215        | 0.220          |
| 11.000 - 11.249                                     | 0.112      | 0.220        | 0.225          |
| 11.250 - 11.499                                     | 0.115      | 0.225        | 0.230          |
| 11.500 - 11.749                                     | 0.118      | 0.230        | 0.235          |
| 11.750 - 11.999                                     | 0.120      | 0.235        | 0.240          |
| 12.000 - 12.249                                     | 0.122      | 0.240        | 0.245          |
| 12.250 - 12.499                                     | 0.125      | 0.245        | 0.250          |
| 12.500 - 12.749                                     | 0.128      | 0.250        | 0.255          |
| 12.750 - 12.999                                     | 0.130      | 0.255        | 0.260          |
| 13.000 - 13.249                                     | 0.132      | 0.260        | 0.265          |
| 13.250 - 13.499                                     | 0.135      | 0.265        | 0.270          |
| 13.500 - 13.749                                     | 0.138      | 0.270        | 0.275          |
| 13.750 - 13.999                                     | 0.140      | 0.275        | 0.280          |
| 14.000 - 14.249                                     | 0.142      | 0.280        | 0.285          |
| 14.250 - 14.499                                     | 0.145      | 0.285        | 0.290          |
| 14.500 - 14.749                                     | 0.148      | 0.290        | 0.295          |
| 14.750 - 14.999                                     | 0.150      | 0.295        | 0.300          |
| 15.000 - 15.249                                     | 0.152      | 0.300        | 0.305          |
| 15.250 - 15.499                                     | 0.155      | 0.305        | 0.310          |
| 15.500 - 15.749                                     | 0.158      | 0.310        | 0.315          |
| 15.750 - 15.999                                     | 0.160      | 0.315        | 0.320          |
| 16.000 - 16.249                                     | 0.162      | 0.320        | 0.325          |
| 16.250 - 16.499                                     | 0.165      | 0.325        | 0.330          |
| 16.500 - 16.749                                     | 0.168      | 0.330        | 0.335          |
| 16.750 - 16.999                                     | 0.170      | 0.335        | 0.340          |
| 17.000 - 17.249                                     | 0.172      | 0.340        | 0.345          |
| 17.250 - 17.499                                     | 0.175      | 0.345        | 0.350          |
| 17.500 - 17.749                                     | 0.178      | 0.350        | 0.355          |
| 17.750 - 17.999                                     | 0.180      | 0.355        | 0.360          |
| 18.000 - 18.249                                     | 0.182      | 0.360        | 0.365          |
| 18.250 - 18.499                                     | 0.185      | 0.365        | 0.370          |
| 18.500 - 18.749                                     | 0.188      | 0.370        | 0.375          |
| 18.750 - 18.999                                     | 0.190      | 0.375        | 0.380          |
| 19.000 - 19.249                                     | 0.192      | 0.380        | 0.385          |
| 19.250 - 19.499                                     | 0.195      | 0.385        | 0.390          |
| 19.500 - 19.749                                     | 0.198      | 0.390        | 0.395          |
| 19.750 - 19.999                                     | 0.200      | 0.395        | 0.400          |
| 20.000 - 20.249                                     | 0.202      | 0.400        | 0.405          |
| 20.250 - 20.499                                     | 0.205      | 0.405        | 0.410          |
| 20.500 - 20.749                                     | 0.208      | 0.410        | 0.415          |
| 20.750 - 20.999                                     | 0.210      | 0.415        | 0.420          |
| 21.000 - 21.249                                     | 0.212      | 0.420        | 0.425          |
| 21.250 - 21.499                                     | 0.215      | 0.425        | 0.430          |
| 21.500 - 21.749                                     | 0.218      | 0.430        | 0.435          |
| 21.750 - 21.999                                     | 0.220      | 0.435        | 0.440          |
| 22.000 - 22.249                                     | 0.222      | 0.440        | 0.445          |
| 22.250 - 22.499                                     | 0.225      | 0.445        | 0.450          |
| 22.500 - 22.749                                     | 0.228      | 0.450        | 0.455          |
| 22.750 - 22.999                                     | 0.230      | 0.455        | 0.460          |
| 23.000 - 23.249                                     | 0.232      | 0.460        | 0.465          |
| 23.250 - 23.499                                     | 0.235      | 0.465        | 0.470          |
| 23.500 - 23.749                                     | 0.238      | 0.470        | 0.475          |
| 23.750 - 23.999                                     | 0.240      | 0.475        | 0.480          |
| 24.000 - 24.249                                     | 0.242      | 0.480        | 0.485          |
| 24.250 - 24.499                                     | 0.245      | 0.485        | 0.490          |
| 24.500 - 24.749                                     | 0.248      | 0.490        | 0.495          |
| 24.750 - 24.999                                     | 0.250      | 0.495        | 0.500          |
| 25.000 - 25.249                                     | 0.252      | 0.500        | 0.505          |
| 25.250 - 25.499                                     | 0.255      | 0.505        | 0.510          |
| 25.500 - 25.749                                     | 0.258      | 0.510        | 0.515          |
| 25.750 - 25.999                                     | 0.260      | 0.515        | 0.520          |
| 26.000 - 26.249                                     | 0.262      | 0.520        | 0.525          |
| 26.250 - 26.499                                     | 0.265      | 0.525        | 0.530          |
| 26.500 - 26.749                                     | 0.268      | 0.530        | 0.535          |
| 26.750 - 26.999                                     | 0.270      | 0.535        | 0.540          |
| 27.000 - 27.249                                     | 0.272      | 0.540        | 0.545          |
| 27.250 - 27.499                                     | 0.275      | 0.545        | 0.550          |
| 27.500 - 27.749                                     | 0.278      | 0.550        | 0.555          |
| 27.750 - 27.999                                     | 0.280      | 0.555        | 0.560          |
| 28.000 - 28.249                                     | 0.282      | 0.560        | 0.565          |
| 28.250 - 28.499                                     | 0.285      | 0.565        | 0.570          |
| 28.500 - 28.749                                     | 0.288      | 0.570        | 0.575          |
| 28.750 - 28.999                                     | 0.290      | 0.575        | 0.580          |
| 29.000 - 29.249                                     | 0.292      | 0.580        | 0.585          |
| 29.250 - 29.499                                     | 0.295      | 0.585        | 0.590          |
| 29.500 - 29.749                                     | 0.298      | 0.590        | 0.595          |
| 29.750 - 29.999                                     | 0.300      | 0.595        | 0.600          |
| 30.000 - 30.249                                     | 0.302      | 0.600        | 0.605          |
| 30.250 - 30.499                                     | 0.305      | 0.605        | 0.610          |
| 30.500 - 30.749                                     | 0.308      | 0.610        | 0.615          |
| 30.750 - 30.999                                     | 0.310      | 0.615        | 0.620          |
| 31.000 - 31.249                                     | 0.312      | 0.620        | 0.625          |
| 31.250 - 31.499                                     | 0.315      | 0.625        | 0.630          |
| 31.500 - 31.749                                     | 0.318      | 0.630        | 0.635          |
| 31.750 - 31.999                                     | 0.320      | 0.635        | 0.640          |
| 32.000 - 32.249                                     | 0.322      | 0.640        | 0.645          |
| 32.250 - 32.499                                     | 0.325      | 0.645        | 0.650          |
| 32.500 - 32.749                                     | 0.328      | 0.650        | 0.655          |
| 32.750 - 32.999                                     | 0.330      | 0.655        | 0.660          |
| 33.000 - 33.249                                     | 0.332      | 0.660        | 0.665          |
| 33.250 - 33.499                                     | 0.335      | 0.665        | 0.670          |
| 33.500 - 33.749                                     | 0.338      | 0.670        | 0.675          |
| 33.750 - 33.999                                     | 0.340      | 0.675        | 0.680          |
| 34.000 - 34.249                                     | 0.342      | 0.680        | 0.685          |
| 34.250 - 34.499                                     | 0.345      | 0.685        | 0.690          |
| 34.500 - 34.749                                     | 0.348      | 0.690        | 0.695          |
| 34.750 - 34.999                                     | 0.350      | 0.695        | 0.700          |
| 35.000 - 35.249                                     | 0.352      | 0.700        | 0.705          |
| 35.250 - 35.499                                     | 0.355      | 0.705        | 0.710          |
| 35.500 - 35.749                                     | 0.358      | 0.710        | 0.715          |
| 35.750 - 35.999                                     | 0.360      | 0.715        | 0.720          |
| 36.000 - 36.249                                     | 0.362      | 0.720        | 0.725          |
| 36.250 - 36.499                                     | 0.365      | 0.725        | 0.730          |
| 36.500 - 36.749                                     | 0.368      | 0.730        | 0.735          |
| 36.750 - 36.999                                     | 0.370      | 0.735        | 0.740          |
| 37.000 - 37.249                                     | 0.372      | 0.740        | 0.745          |
| 37.250 - 37.499                                     | 0.375      | 0.745        | 0.750          |
| 37.500 - 37.749                                     | 0.378      | 0.750        | 0.755          |
| 37.750 - 37.999                                     | 0.380      | 0.755        | 0.760          |
| 38.000 - 38.249                                     | 0.382      | 0.760        | 0.765          |
| 38.250 - 38.499                                     | 0.385      | 0.765        | 0.770          |
| 38.500 - 38.749                                     | 0.388      | 0.770        | 0.775          |
| 38.750 - 38.999                                     | 0.390      | 0.775        | 0.780          |
| 39.000 - 39.249                                     | 0.392      | 0.780        | 0.785          |
| 39.250 - 39.499                                     | 0.395      | 0.785        | 0.790          |
| 39.500 - 39.749                                     | 0.398      | 0.790        | 0.795          |
| 39.750 - 39.999                                     | 0.400      | 0.795        | 0.800          |
| 40.000 - 40.249                                     | 0.402      | 0.800        | 0.805          |
| 40.250 - 40.499                                     | 0.405      | 0.805        | 0.810          |
| 40.500 - 40.749                                     | 0.408      | 0.810        | 0.815          |
| 40.750 - 40.999                                     | 0.410      | 0.815        | 0.820          |
| 41.000 - 41.249                                     | 0.412      | 0.820        | 0.825          |
| 41.250 - 41.499                                     | 0.415      | 0.825        | 0.830          |
| 41.500 - 41.749                                     | 0.418      | 0.830        | 0.835          |
| 41.750 - 41.999                                     | 0.420      | 0.835        | 0.840          |
| 42.000 - 42.249                                     | 0.422      | 0.840        | 0.845          |
| 42.250 - 42.499                                     | 0.425      | 0.845        | 0.850          |
| 42.500 - 42.749                                     | 0.428      | 0.850        | 0.855          |
| 42.750 - 42.999                                     | 0.430      | 0.855        | 0.860          |
| 43.000 - 43.249                                     | 0.432      | 0.860        | 0.865          |
| 43.250 - 43.499                                     | 0.435      | 0.865        | 0.870          |
| 43.500 - 43.749                                     | 0.438      | 0.870        | 0.875          |
| 43.750 - 43.999                                     | 0.440      | 0.875        | 0.880          |
| 44.000 - 44.249                                     | 0.442      | 0.880        | 0.885          |
| 44.250 - 44.499                                     | 0.445      | 0.885        | 0.890          |
| 44.500 - 44.749                                     | 0.448      | 0.890        | 0.895          |
| 44.750 - 44.999                                     | 0.450      | 0.895        | 0.900          |
| 45.000 - 45.249                                     | 0.452      | 0.900        | 0.905          |
| 45.250 - 45.499                                     | 0.455      | 0.905        | 0.910          |
| 45.500 - 45.749                                     | 0.458      | 0.910        | 0.915          |
| 45.750 - 45.999                                     | 0.460      | 0.915        | 0.920          |
| 46.000 - 46.249                                     | 0.462      | 0.920        | 0.925          |
| 46.250 - 46.499                                     | 0.465      | 0.925        | 0.930          |
| 46.500 - 46.749                                     | 0.468      | 0.930        | 0.935          |
| 46.750 - 46.999                                     | 0.470      | 0.935        | 0.940          |
| 47.000 - 47.249                                     | 0.472      | 0.940        | 0.945          |
| 47.250 - 47.499                                     | 0.475      | 0.945        | 0.950          |
| 47.500 - 47.749                                     | 0.478      | 0.950        | 0.955          |
| 47.750 - 47.999                                     | 0.480      | 0.955        | 0.960          |
| 48.000 - 48.249                                     | 0.482      | 0.960        | 0.965          |
| 48.250 - 48.499                                     | 0.485      | 0.965        | 0.970          |
| 48.500 - 48.749                                     | 0.488      | 0.970        | 0.975          |
| 48.750 - 48.999                                     | 0.490      | 0.975        | 0.980          |
| 49.000 - 49.249                                     | 0.492      | 0.980        | 0.985          |
| 49.250 - 49.499                                     | 0.495      | 0.985        | 0.990          |
| 49.500 - 49.749                                     | 0.498      | 0.990        | 0.995          |
| 49.750 - 49.999                                     | 0.500      | 0.995        | 1.000          |

QMI-489

34294 OMI ROLL SHUTTER  
D/B/A OMI ROLL SHUTTER SUPPLY  
1661 GLEN LAKE AVENUE

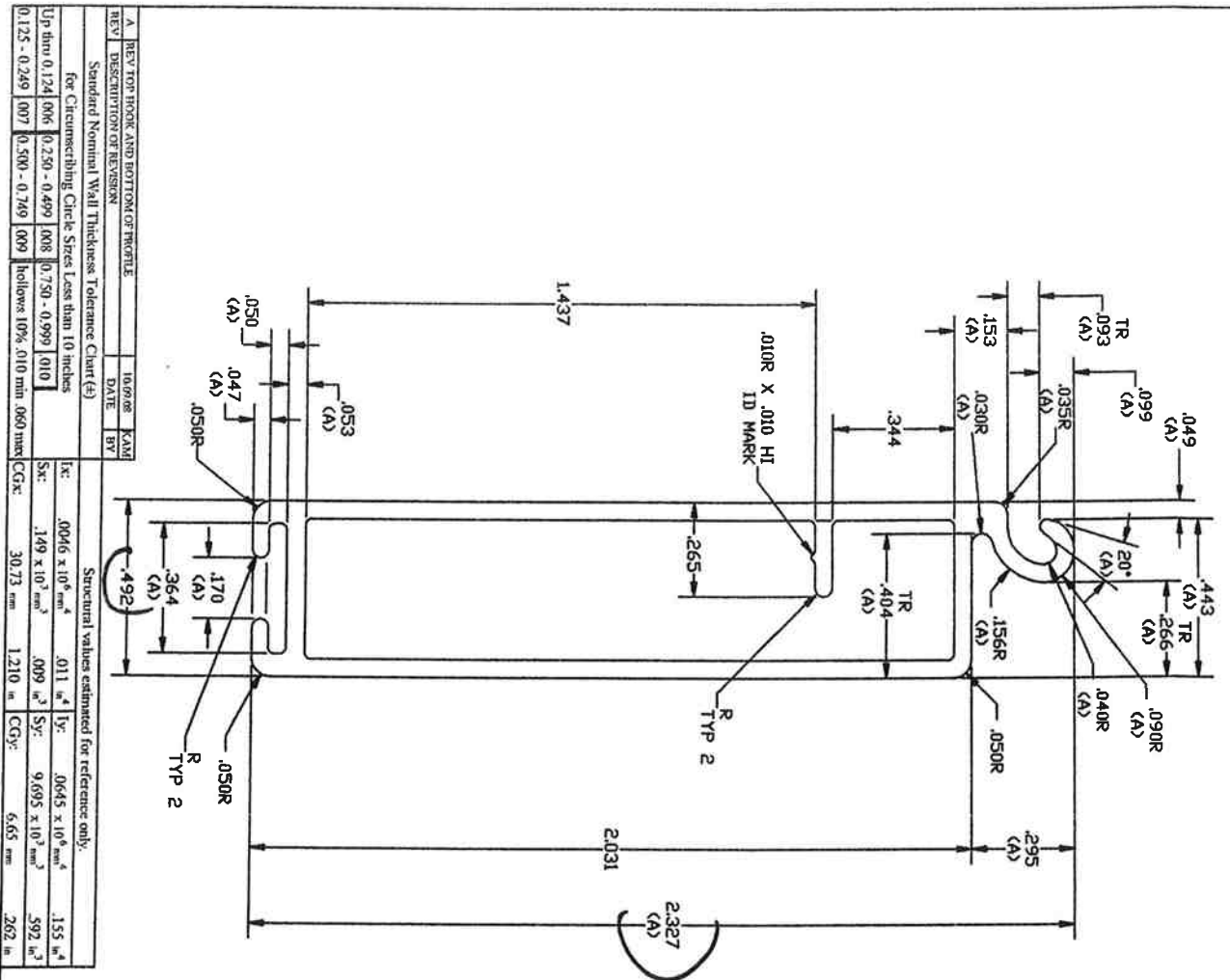
ITASCA IL 60143

BONNELL  
A L L M I N U N

DATE: 12/15/9 UNDESIGNED WALLS: 1.189 MASS: 799  
UNDESIGNED THICK: .38R EST PER: 339.19  
DATE: 12/15/9 UNDESIGNED THICK: .01SR EXP PER: 13.354

DRAWN: CUST/LMB BUFF TURNS: CLASS: Solid  
SCALE: 3-1 FACTOR: 255  
THIN BAR: NO C.C.D.: 92.50  
PAD CODE: NO PAD AREA: 3.642

| Standard Aluminum Association tolerances apply unless otherwise noted. |                     |                     |      |
|------------------------------------------------------------------------|---------------------|---------------------|------|
| CUST PART #                                                            | REL. DATE 1-7-10 LB | REL. DATE 1-7-10 LB | REL. |



| REV                                                 | DESCRIPTION OF REVISION                             | DATE                          | BY    |
|-----------------------------------------------------|-----------------------------------------------------|-------------------------------|-------|
| A                                                   | REV TOP HOOK AND BOTTOM OF PROFILE                  | 10/07/08                      | KAM   |
| REV                                                 | DESCRIPTION OF REVISION                             | DATE                          | BY    |
| 1                                                   | Standard Nominal Wall Thickness Tolerance Chart (e) |                               |       |
| for Circumscribing Circle Sizes Less than 10 inches |                                                     |                               |       |
| Up thru 0.124                                       | 0.006                                               | 0.750 - 0.999                 | 0.010 |
| 0.125 - 0.249                                       | 0.007                                               | 0.500 - 0.749                 | 0.009 |
|                                                     |                                                     | hollows 10% .010 min .060 max | CGK   |

QMI-408

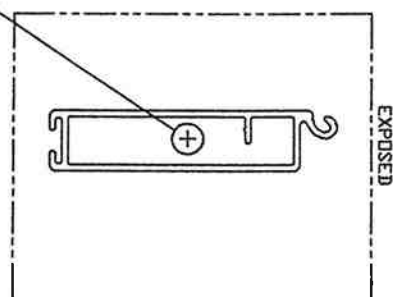
34294  
QMI ROLL SHUTTER  
D/B/A QMI ROLL SHUTTER SUPPLY  
1661 GLEN LAKE AVENUE  
ITASCA IL 60143

|                  |          |             |           |           |
|------------------|----------|-------------|-----------|-----------|
| UNDESIGNED WALLS | 1.27 mm  | MASS:       | .523 mm   | 3.57 mm   |
| UNDESIGNED HOLES | .050 in  | EST PER:    | 285.93 mm | 1.257 in  |
| OUT PER:         | .01R in  | EXP PER:    | 163.47 mm | 6.436 in  |
| DATE:            | 6/23/08  | EXP PER:    |           |           |
| DRAWN:           | CUSTOMER | BUFF TURNS: | CLASS:    | Hollow II |
| SCALE:           | 3-1      | FACTOR:     | 546       | 32        |
| THIN BAR:        | NO       | C.G.D.:     | 60.41     | 2.378 in  |
| P&D CODE:        | NO       | P&D AREA:   |           |           |

CTLA No. 201703  
Date Verified: 4/8/10  
Verified By: [Signature]

ARCHITECTURAL DIVISION  
7252 NARCOOSSEE ROAD  
ORLANDO, FLORIDA 32822

CG ORIGIN



WARRANTY:  
Bonnell warrants that the products supplied by Bonnell shall be free from defects in workmanship and materials and shall conform to all descriptions and specifications, as signed between Bonnell and Purchaser. BONNELL DISCLAIMS ANY OTHER WARRANTY, EXPRESS OR IMPLIED, WHETHER CREATED BY CONTRACT, BY STATUTE OR OTHERWISE BY OPERATION OF LAW, INCLUDING ALL WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. PURCHASER'S DESIGNS, PLANS, DRAWINGS, SPECIFICATIONS AND REQUIREMENTS.  
For any product that is not included in Bonnell's standard product line offered for sale generally in the direct sales of Bonnell's business, it is agreed that Purchaser has engaged Bonnell to manufacture such product to Purchaser's specifications and requirements. Bonnell shall not be responsible for the adequacy of plans, drawings, specifications and requirements regarding such product or for the adequacy of the design being represented hereby. Bonnell also shall not be responsible for the adequacy of the materials incorporated in such product or for testing or otherwise determining the sufficiency and applicability of the design. Bonnell shall not be responsible for determining or attesting that such product or the use or application of such product conforms with applicable federal, state or local laws, rules or regulations. Bonnell's only remedy with respect to such products shall be as set forth above.  
All Designs, plans, prints, or drawings of substance prepared by Bonnell with respect to such products and such shall remain the sole property of Bonnell.

|                                                                        |                     |              |     |
|------------------------------------------------------------------------|---------------------|--------------|-----|
| Standard Aluminum Association tolerances apply unless otherwise noted. |                     | DIE NUMBER   | REV |
| CUST PART #:                                                           | AL7 BASE SLAT       | QMI-408      | A   |
| CUST PART NAME:                                                        | REL. DATE 7/18/10MB | FINISH PAINT |     |
| PROPOSAL:                                                              | ALLOY 6005-15       |              |     |

**FOR POUR AND DEBRIDGE ONLY  
MUST BE SIGNED BEFORE RELEASE**

Bornel Aluminum products that all listed a polyethylene polymer thermal barrier that is not exclusively been aco-brated, filled or dry shrinkage and cracking of the polyethylene polymer thermal barrier if this profile can be aco-brated because of design constraints. Therefore, and debrided by Bornel Aluminum. Note: Not all listed & debrided profiles can be aco-brated because of design constraints. Therefore, Customer shall bear all responsibilities for product failure originated by dry shrinkage and cracking of the polyethylene polymer thermal barrier.

Can the profile be azo-branded? Yes \_\_\_\_\_ No \_\_\_\_\_

Customer Initials: \_\_\_\_\_  
I, hereby, authorize Bonnell Aluminum to perform and/or placing of the product.  
Customer Initials: \_\_\_\_\_  
I, hereby, decline for Bonnell Aluminum to perform and/or placing of the product.

APPROVED BY:

APPROVAL DATE:

APPROVED BY

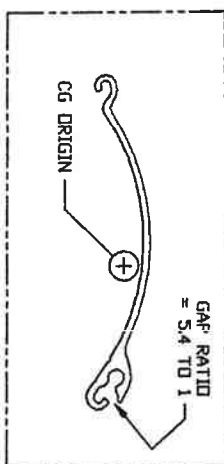
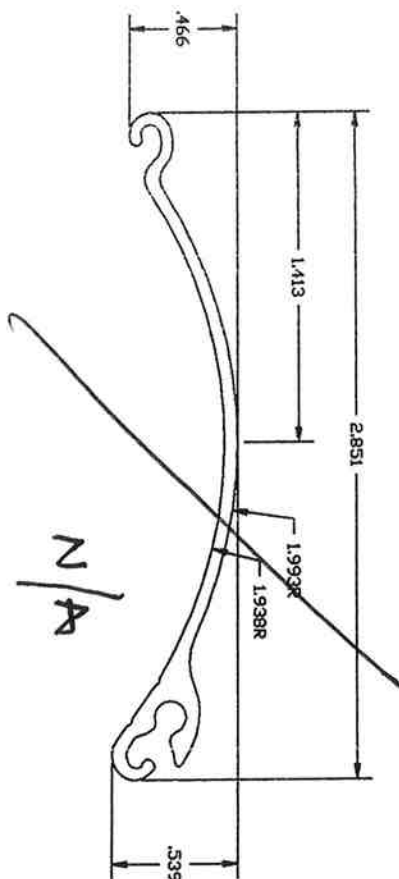
APPROVAL DATE

# PRELIMINARY

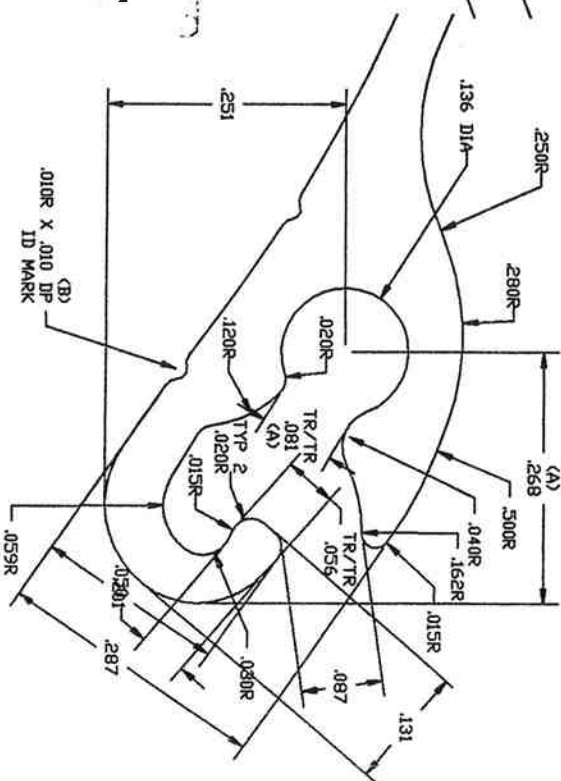
**FOR APPROVAL ONLY  
MUST BE SIGNED BEFORE RELEASE**

**AUTHORIZATION TO BEGIN THE CONSTRUCTION**

This drawing is not necessarily an exact copy of the customer's original. By your signature on this print you agree to accept the design, dimensions, and ID mark location as shown and to accept all legal responsibility for infringement of patents, copyright or industrial design relating to this drawing and to hold the WILLAM L. BONNELL COMPANY and its affiliates harmless from any claims, suits, actions, or demands arising therefrom. Please sign and return as soon as possible. Die construction cannot proceed until signed approval is received. If not shown, please indicate exposed surfaces.



ACTUAL SIZE



W 122 INTV

Bonnett warrants that the product(s) supplied by Bonnett shall be free from defects in workmanship and material and shall conform to all descriptions and specifications, as agreed between Bonnett and Purchaser. BONNETT DISCLAIMS ANY OTHER WARRANTY, EXPRESS OR IMPLIED, WHETHER CREATED BY CONTRACT, BY STATUTE OR OTHERWISE BY OPERATION OF LAW, INCLUDING ALL WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.

For any product that is not included in Bonetti's standard product line offered for sale generally in the marketplace, Bonetti agrees that Purchaser has engaged Bonetti to manufacture such product to Purchaser's specifications and requirements. Bonetti shall not be responsible for the adequacy of such design, drawings, specifications and requirements, including such product or for the adequacy of the design represented therein. Bonetti also shall not be responsible for the adequacy of the materials incorporated in such product or for testing or others in determining the sufficiency and applicability of the design. Bonetti shall not be responsible for, or assuming that such product or its use in application of such product conforms with applicable Federal, state or local laws, rules or regulations. Bonetti shall not be responsible for any injury or damage to persons or property resulting from such products that are not included in Bonetti's standard product line offered for sale generally in the marketplace.

All Designs, plans, notes, or drawings of whatever kind created by Bunnell with regard to such products, are and shall remain the sole property of Bunnell.

| REV | DESCRIPTION OF REVISION                     | DATE     | BY  | CHKD |
|-----|---------------------------------------------|----------|-----|------|
| 0   | 00000 WAS 11000, ADDED SECOND MARK          | 04/08/09 | KAM |      |
| 1   | REVISED ALLY1 FROM 75 TO 70 %               | 01/30/09 | KAM |      |
| A   | 2008 WAS 200, 081 WAS 067, NEW ONE REQUIRED | 04/16/08 | KAM |      |
| 2   | DEDUCTED A COUPLE RADIOS THAT WEREVT NEEDED | 04/15/08 | KAM |      |
| 1   | CLARIFIED BOTTOM RIGHT (04, 11)             | 04/15/08 | KAM |      |

CTIA No. 201700  
Date Verified: 4/2/10  
Verified By: g

**CPL** CERTIFIED TESTING LABORATORIES  
ARCHITECTURAL DIVISION  
7252 NARCOOSSEE ROAD  
ORLANDO, FLORIDA 32822

| Standard Nominal Wall Thickness Tolerance Chart (4) |      |                                  |      |
|-----------------------------------------------------|------|----------------------------------|------|
| for Characterizing Circle Sizes Less than 10 inches |      |                                  |      |
| Up thru 0.124                                       | .006 | 0.250 - 0.499                    | .008 |
| 0.125 - 0.249                                       | .007 | 0.500 - 0.749                    | .009 |
|                                                     |      | includes 10% .010 min. .060 max. |      |

| Structural values estimated for reference only. |                                  |     |                                  |
|-------------------------------------------------|----------------------------------|-----|----------------------------------|
| Ix:                                             | $.0017 \times 10^6 \text{ in}^4$ | Iy: | $.0770 \times 10^6 \text{ in}^4$ |
| Sx:                                             | $.207 \times 10^3 \text{ in}^3$  | Sy: | $1.860 \times 10^3 \text{ in}^3$ |
| Cx:                                             | 8.03 in                          | Cy: | 41.40 in                         |
|                                                 |                                  |     | 1.630 in                         |

QMI-395



34294 QMI ROLL SHUTTER  
D/B/A QMI ROLL SHUTTER SUPPLY  
1661 GLEN LAKE AVENUE

| UNDERCUT<br>CUT<br>WALL | MASS:               | 395        | 265                   |
|-------------------------|---------------------|------------|-----------------------|
| unseparated<br>Pulse    | .000 in<br>EST PER  | 188.24 mm  | 7.411 in              |
|                         | .AIR mm<br>EXP PER  |            |                       |
|                         | .016R in<br>EXP PER |            |                       |
| DATE:                   | 4/3/08              | BUF PER    |                       |
| DRAWN:                  | CUST:KAM            | BUF TUNNS: | CLASS: Smt-Hollow     |
| SCALE:                  | 2:1                 | FACTOR:    | 477 mm<br>middle      |
| THM BAR:                | NO                  | C.C.D.:    | 73.69 mm              |
| P&D CODE:               | NO                  | P&D AREA:  | 2.901 mm <sup>2</sup> |

|                                                                        |                         |                |              |            |     |
|------------------------------------------------------------------------|-------------------------|----------------|--------------|------------|-----|
| Standard Aluminum Association tolerances apply unless otherwise noted. |                         |                |              | DIE NUMBER | REV |
| CUST PART #:                                                           | TITLE MOD: N/A          |                | QMI-395      | B          |     |
| CUST PART NAME: SLAT                                                   | EUC                     |                |              |            |     |
| PROPOSAL: (1) 04/08/08 K.V.M                                           | REL. DATE: 4/10/08 THRB | ALLOY: 6063-T6 | FINISH: ANOD |            |     |

CG ORIGIN

**ACTUAL SIZE**

$$\frac{2}{A}$$

CTLA No. 2017W  
Date Verified: 4/2/10  
Verified By: gd

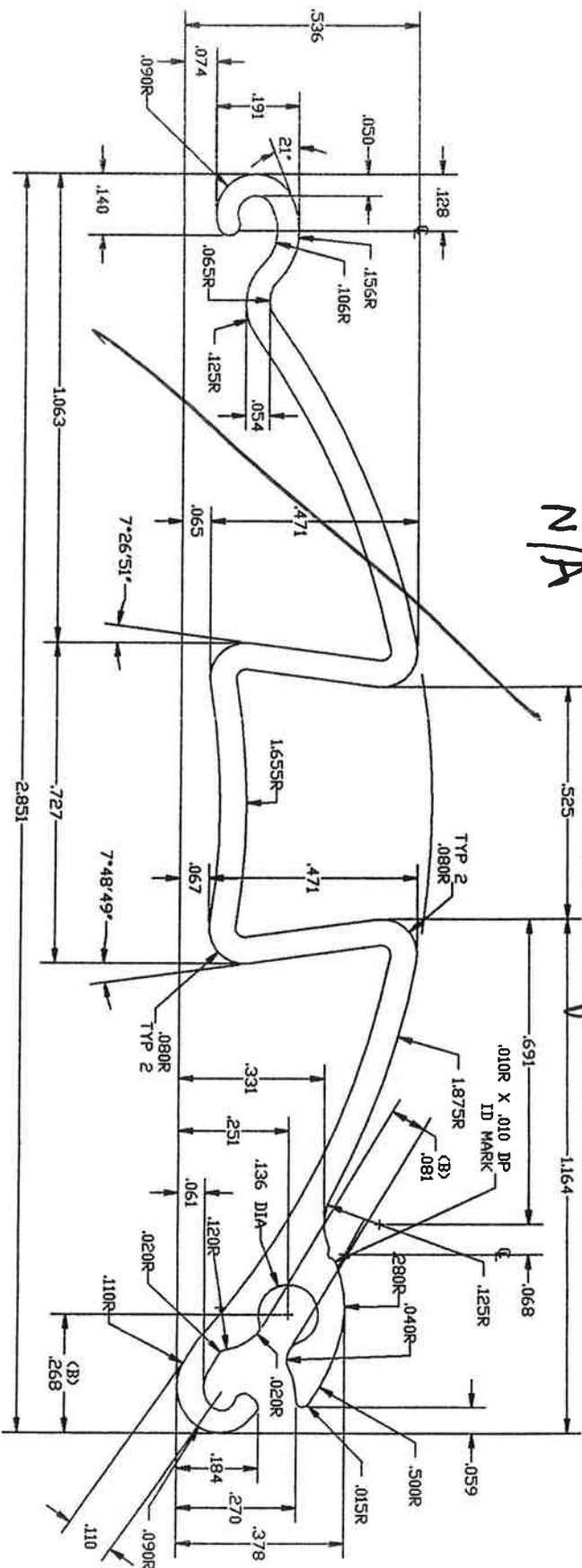


**CTL** CERTIFIED TESTING LABORATORIES  
ARCHITECTURAL DIVISION  
7252 NARCOOSSEE ROAD  
ORLANDO, FLORIDA 32822

|                                 |                          |               |     |              |   |
|---------------------------------|--------------------------|---------------|-----|--------------|---|
| CUST PART #:                    | TITLE BLOCK REV A        |               | EUC | QMI-410      | B |
| CUST PART NAME: AL7 FINGER PULL | CMT AND TO BLOCK REMOVED |               |     |              |   |
| PROPOSAL:                       | REL. DATE 7/1/8-TMB      | ALLOY 6060-T5 | 199 | FINISH PAINT |   |

|         |   |
|---------|---|
| QMI-410 | B |
|---------|---|

B



**WARRANTY:**

Bonnell warrants that the product(s) supplied hereunder shall be free from defects in workmanship and material and shall conform to all descriptions and specifications, as signed between Bonnell and Purchaser. BONNELL DISCLAIMS ANY OTHER WARRANTY, EXPRESS OR IMPLIED, WHETHER CREATED BY CONTRACT, BY STATUTE OR OTHERWISE BY OPERATION OF LAW, INCLUDING ALL WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, PURCHASER'S DESIGNS, PLANS, DRAWINGS, SPECIFICATIONS AND REQUIREMENTS.

**Warranty:** For any product that is not included in Bonnell's standard product line offered for sale generally in the United States, it is agreed that Purchaser has ordered Bonnell to manufacture such product to Purchaser's specifications and requirements. Bonnell shall not be responsible for the adequacy of print, drawings, specifications and requirements respecting such products or for the adequacy of the design represented thereby; Bonnell also shall not be responsible for the adequacy of the materials incorporated in such product or for testing or otherwise determining the sufficiency and applicability of the design. Bonnell warrants that such products will conform to the design as shown by the print, drawing, specification or other document submitted by Purchaser and that such products will conform to the design as shown by the print, drawing, specification or other document submitted by Purchaser in respect to such products that he has set forth above.

All designs, prints, photos, or drawings of whatever kind prepared by Bonnell will continue to be subject to such products and shall remain in the sole property of Bonnell.

All Designs, plans, notes, or drawings of whatever kind prepared by Bonnell with respect to such products are and shall remain the sole property of Bonnell.

|     |                                       |  |  |  |          |     |
|-----|---------------------------------------|--|--|--|----------|-----|
| REV | Description of Revision               |  |  |  | DATE     | BY  |
| B   | 254 W. 300. 001 WAS. 000              |  |  |  | 02-26-09 | THB |
| A   | COMPLETED & REVISED, NEW SET REQUIRED |  |  |  | 06-26-08 | THB |

Structural values estimated for reference only.

| Structural values estimated for reference only. |                                  |                     |                    |
|-------------------------------------------------|----------------------------------|---------------------|--------------------|
| IX:                                             | $0.021 \times 10^6 \text{ mm}^4$ | $.005 \text{ in}^4$ | $192 \text{ in}^4$ |
| Sx:                                             | $302 \times 10^3 \text{ mm}^3$   | $.018 \text{ in}^3$ | $122 \text{ in}^3$ |
| Gx:                                             | 6.88 mm                          | 2.71 in             | 39.93 mm           |
|                                                 |                                  | Gy:                 | 1.572 in           |

QMP-410



# BONNEL

34294 QMI ROLL SHUTTER  
D/B/A QMI ROLL SHUTTER SUPPLY  
1661 GLEN LAKE AVENUE  
ITASCA IL 60143

|                   |           |                 |        |
|-------------------|-----------|-----------------|--------|
| UNSPECIFIED WALLS | 1.52 mm   | MASS: 495       | 332    |
|                   | mm        | kg/m            | kg/m   |
| UNSPECIFIED RADE  | .060      | EST PER: 231.09 | 9.098  |
|                   | m         | m               | m      |
| DATE:             | 6/24/08   | OUT PER:        |        |
|                   | mm        | mm              | m      |
| DRAWN: CUST/TMB   | BUFF PER: | EXP PER:        |        |
|                   | mm        | mm              | m      |
| SCALE:            | 4:1       | BUFF TURNS:     | CLASS: |
|                   | mm        | mm              | mm     |
| THM BARE:         | NO        | FACTOR:         | 467    |
|                   | mm        | mm              | mm     |
| P&D CODE:         | NO        | C.C.D.:         | 73.69  |
|                   | mm        | mm              | mm     |
|                   |           | P&D AREA:       | 2.901  |
|                   |           | mm              | mm     |

# AZO-BRADE

FOR POUR AND DEBRIDGE ONLY  
MUST BE SIGNED BEFORE RELEASE

Bonnell Aluminum recommends that all filled & debridged profiles be azo-braded. Customer shall bear all responsibilities for product failure originated by dry shrinkage and cracking of the polyurethane polymer thermal barrier if this profile has not exclusively been azo-braded, filled and debridged by Bonnell Aluminum. Note: Not all filled & debridged profiles can be azo-braded because of design constraints. Therefore, Customer shall bear all responsibilities for product failure originated by dry shrinkage and cracking of the polyurethane polymer thermal barrier if this profile can not be azo-braded, filled and debridged by Bonnell Aluminum.

Can the profile be azo-braded? Yes        No       

Customer Initials:        I, hereby, authorize Bonnell Aluminum to perform azo-brading, filling and debridging of this profile.

Customer Initials:        I, hereby, decline for Bonnell Aluminum to perform azo-brading, filling and debridging of this profile.

APPROVED BY:       

APPROVAL DATE:       

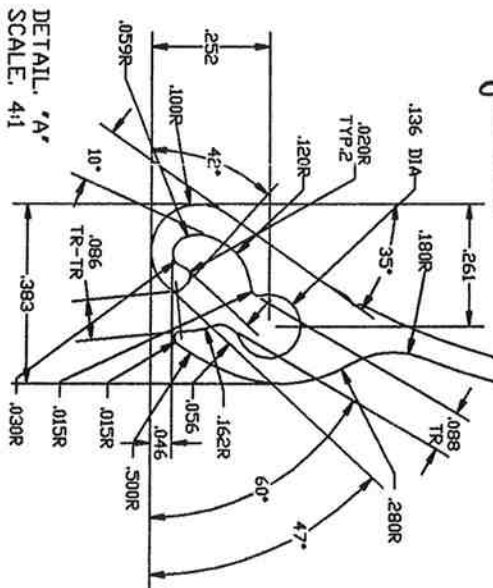
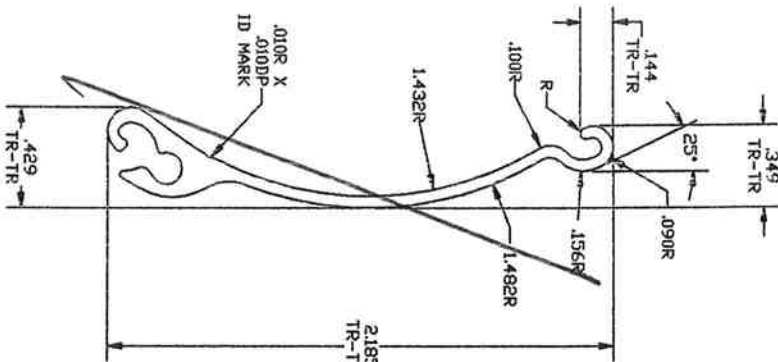


7252 NARCOOSSEE ROAD  
ORLANDO, FLORIDA 32822

CTLA No. 201703

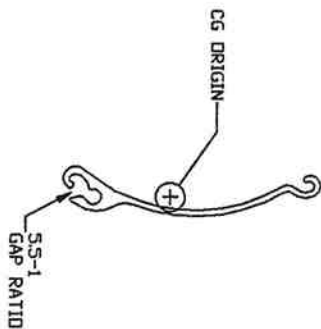
Date Verified: 4/8/12

Verified By:       



DETAIL 'A'  
SCALE: 4:1

ALL SURFACES EXPOSED



ACTUAL SIZE

# PRELIMINARY

FOR APPROVAL ONLY  
MUST BE SIGNED BEFORE RELEASE

AUTHORIZATION TO BEGIN DIE CONSTRUCTION

This drawing is not necessarily an exact copy of the customer's original. By your signature on this print you agree to accept the design, dimensions, and ID mark location as shown and to accept all legal responsibility for infringement of patents, copyright or industrial design relating to this drawing and to hold the WILLIAM L. BONNELL COMPANY and its affiliates harmless from any claims, suits, actions, or demands arising therefrom. Please sign and return as soon as possible. Die construction cannot proceed until signed approval is received. If not shown, please indicate exposed surfaces.

APPROVED BY:       

APPROVAL DATE:       

Standard Aluminum Association tolerances apply unless otherwise noted.

|                |                 |                 |         |            |     |
|----------------|-----------------|-----------------|---------|------------|-----|
| CUST PART #    | AL7             | TITLE           | MOCK-UP | DIE NUMBER | REV |
| CUST PART NAME | 2" STARTER SLAT | DATE FOR REVIEW | 199     | QMI-477    |     |
| PROPOSAL       | REL. DATE       | ALLOY           | 6063-T6 | FINISH     | AE  |

THE ELECTRONIC GEOMETRY IS TO GOVERN THE DIMENSIONS FOR THIS SHAPE. THEREFORE SOME DIMENSIONS ARE NOT SHOWN ON THIS DRAWING.

| Standard Nominal Wall Thickness Tolerance Chart (L) | Structural values estimated for reference only. |
|-----------------------------------------------------|-------------------------------------------------|
| for Extruding Circle Size Less than 10 inches       |                                                 |
| Up thru 0.124 006                                   | 0.250 - 0.499 008                               |
| 0.125 - 0.249 007                                   | 0.500 - 0.749 009                               |
|                                                     | hollows 10% .010 min .060 max                   |
|                                                     | St: .0008 x 10 <sup>6</sup> mm <sup>2</sup>     |
|                                                     | Sy: .025 x 10 <sup>3</sup> mm <sup>2</sup>      |
|                                                     | CCy: 32.66 mm                                   |
|                                                     | CCy: 1.286 in                                   |
|                                                     | CCy: 5.256 x 10 <sup>3</sup> mm <sup>2</sup>    |
|                                                     | CCy: 6.73 mm                                    |
|                                                     | CCy: .265 in                                    |

QMI-477

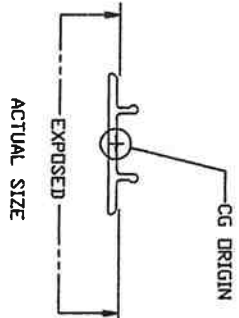
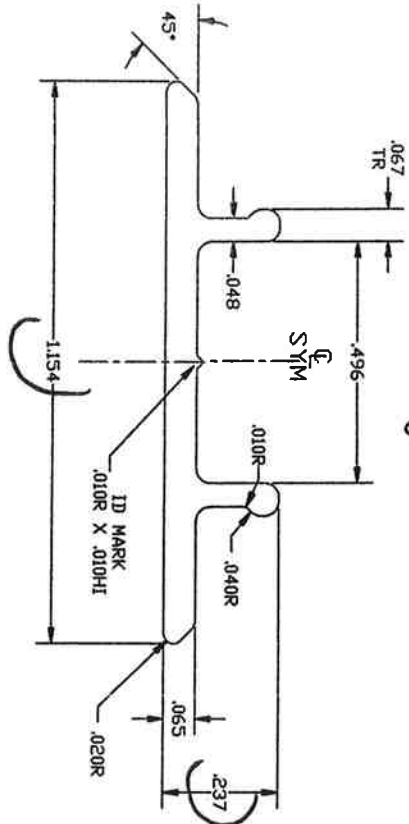
|                       |                  |          |         |             |       |
|-----------------------|------------------|----------|---------|-------------|-------|
| QMI ROLL SHUTTER      | UNFINISHED WALLS | 1.27 mm  | MASS    | 311         | 209   |
| 34294                 | UNFINISHED PACE  | .050 mm  | EST PER | 152.10      | 5.988 |
| 1661 GLEN LAKE AVENUE |                  |          | OUT PER |             |       |
| ITUSCA                |                  |          | EXP PER |             |       |
| IL                    |                  |          |         |             |       |
| 6043                  |                  |          |         |             |       |
| DATE: 10/29           | DRAWN: CUSTMTRW  | BUFF PER | CLASS   | Seal/Hollow |       |
| SCALE: 2:1            | FACTOR           | 489      |         |             |       |
| THIN BAR              | C.G.D.           | 56.56    |         |             |       |
| PAD CODE: NO          | PAD AREA         | 2.227    |         |             |       |

WARRANTY: Bonnell warrants that the product(s) supplied by Bonnell shall be free from defects in workmanship and material and shall conform to all descriptions and specifications as agreed between Bonnell and Purchaser. BONNELL DISCLAIMS ANY OTHER WARRANTY, EXPRESS OR IMPLIED, WHETHER CREATED BY CONTRACT, BY STATUTE OR OTHERWISE BY OPERATION OF LAW, INCLUDING ALL WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. PURCHASER'S DESIGNS, PLANS, OR DRAWINGS, SPECIFICATIONS AND REQUIREMENTS. For any product that is not included in Bonnell's standard product line offered for sale generally in the total course of Bonnell's business, it is agreed that Purchaser has engaged Bonnell to manufacture such product to Purchaser's specifications and requirements. Bonnell shall not be responsible for the adequacy of plans, drawings, specifications and requirements submitted by Purchaser or for the adequacy of the design recommended thereby. Bonnell also shall not be responsible for the adequacy of the materials incorporated in such product or for being in compliance with the sufficiency and applicability of the design. Bonnell shall not be responsible for determining or assuring that such product or the use or application of such product conforms with applicable federal, state or local laws, rules, or regulations. Bonnell's only warranty with respect to such products shall be as set forth above. All designs, plans, prints, or drawings of whatever kind prepared by Bonnell with respect to such products are and shall remain the sole property of Bonnell.

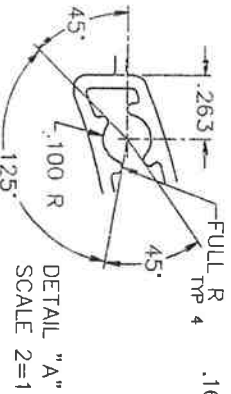


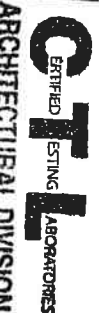
CTI  
ARCHITECTURAL DIVISION  
7252 MARCOSSSEE ROAD  
ORLANDO, FLORIDA 32822

CTIA No. 201702  
Date Verified: 4/8/10  
Verified By: [Signature]



| Standard Nominal Wall Thickness Tolerance Chart (A) |       | Structural Values estimated for reference only. |                           |            |                           |
|-----------------------------------------------------|-------|-------------------------------------------------|---------------------------|------------|---------------------------|
| for Circumscribing Circle Sizes Less than 10 inches |       |                                                 |                           |            |                           |
| Up thru 0.124                                       | 0.006 | 1X: .0000                                       | $10^{-6}$ in <sup>4</sup> | 1Y: .0037  | $10^{-6}$ in <sup>4</sup> |
|                                                     |       | 5X: .000                                        | $10^{-3}$ in <sup>3</sup> | 5Y: .256   | $10^{-3}$ in <sup>3</sup> |
| 0.125 - 0.249                                       | 0.007 |                                                 |                           |            |                           |
|                                                     |       | CGX: 4.57                                       | mm                        |            |                           |
|                                                     |       |                                                 |                           | CGY: 14.66 | mm                        |
|                                                     |       |                                                 |                           |            | .577 in                   |



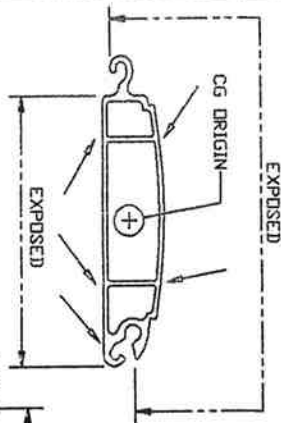


7252 NARCOOSSEE ROAD  
ORLANDO, FLORIDA 32822

CFEA No. 20173

Date Verified: 4/8/10

Verified By:                     



ACTUAL SIZE

—2.202—

$$\frac{Z}{A}$$

|                                                                        |                    |               |              |     |
|------------------------------------------------------------------------|--------------------|---------------|--------------|-----|
| Standard Aluminum Association tolerances apply unless otherwise noted. |                    |               | DIE NUMBER   | REV |
| CUST PART #:                                                           | TITLE BLOCK REV A  |               | QML-409      | A   |
| CUST PART NAME: A/L LOCK SLAT                                          | 199                |               |              |     |
| PROPOSAL:                                                              | REL. DATE 7/18-TMB | ALLOY 6005-T5 | FINISH PAINT |     |

STRUCTURAL STREAKS EXPECTED

Technical drawing of a mechanical part, likely a bracket or connector, showing dimensions and tolerances. The drawing includes a top view and a side view. Key dimensions include overall length of 2.202, overall width of 2.525, and various radii and thicknesses. A note indicates "EXPOSED" for a specific feature. A diagonal line is drawn across the main body of the part.

Dimensions and Tolerances:

- Overall Length: 2.202
- Overall Width: 2.525
- Top View Dimensions:
  - Top Left: .079, .050, .040, .005R, .047, .051, .040 ± .015, .040, .040R, .060R, .090R, .140, .182, .322
  - Top Right: .010R, .156R, .035R, .035R, .060R, .090R, .191, .256
- Side View Dimensions:
  - Left Side: .040 ± .015, .040, .060, .120R, .243, .136 DIA, .040R, .010R, .058, .040, .057, .005R, .500R, .015R, .030R, .054, .177, .067, .085, .515
  - Right Side: .040, .010R, .058, .040, .057, .005R, .500R, .015R, .030R, .054, .177, .067, .085, .515
- Other Features:
  - Diagonal Line: .010R X .010 DP ID MARK
  - Bottom Left: .051, .059R, .090R, .040R, .040 ± .015, .693, .260 (TR/TR), .268 (CA)

## WARRANTY

**BONNELL WARRANTS** that the product(s) supplied by Bonnell shall be free from defects in workmanship and material and shall conform to all descriptions and specifications, as agreed between Bonnell and Purchaser. **BONNELL DISCLAIMS** ANY OTHER WARRANTY, EXPRESS OR IMPLIED, WHETHER CREATED BY CONTRACT, BY STATUTE OR OTHERWISE BY OPERATION OF LAW, INCLUDING ALL WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.

For any product that is not included in Bonelli's standard product line offered for sale generally in the usual course of Bonelli's business, it is agreed that Purchaser has ordered Bonelli to manufacture such product to Purchaser's specifications and requirements. Bonelli shall not be responsible for the adequacy of prints, drawings, specifications and requirements respecting such product or for the adequacy of the design represented thereby. Bonelli also shall not be responsible for the adequacy of the material incorporated in such product for testing or otherwise determining the sufficiency and applicability of the design. Bonelli shall not be responsible for determining or assuring that such product or the use or application of such product conforms with applicable federal, state or local laws, rules or regulations. Bonelli's only warranty with respect to such products shall be as set forth above:

All design, print, prints, or drawings of whatever kind prepared by Bonelli with respect to such products or to such and their design the sole property of Bonelli.

4. All designs, plans, prints, or drawings of whatever kind prepared by Bonnell with respect to such products are and shall remain the sole property of Bonnell.

| REV                                                 | DESCRIPTION OF REVISION | DATE          | BY    |
|-----------------------------------------------------|-------------------------|---------------|-------|
| A                                                   | 348 W. 300              | 02-26-09      | TRB   |
| Standard Nominal Wall Thickness Tolerance Chart (#) |                         |               |       |
| for Circumscribing Circle Sizes Less than 10 inches |                         |               |       |
| Up thru 0.124                                       | 0.066                   | 0.250 - 0.499 | 0.008 |
| 0.125 - 0.249                                       | 0.007                   | 0.500 - 0.749 | 0.009 |
| Inches 10% 0.10 min .060 max                        |                         |               |       |

Structural values estimated for reference only.

| Structural values estimated for reference only. |                                  |      |                                  |
|-------------------------------------------------|----------------------------------|------|----------------------------------|
| IX:                                             | $.0037 \times 10^6 \text{ mm}^4$ | IX:  | $.0741 \times 10^6 \text{ mm}^4$ |
| Sx:                                             | $.497 \times 10^3 \text{ mm}^3$  | Sy:  | $2.175 \times 10^3 \text{ mm}^3$ |
| CGx:                                            | 7.54 mm                          | CGy: | 34.06 mm                         |
|                                                 |                                  |      | 1.341 in                         |

QMI-409



# BONNEL

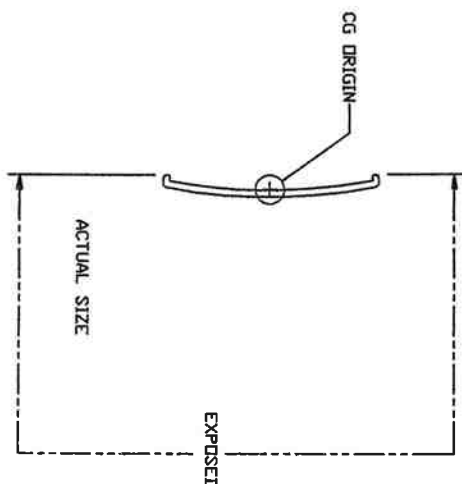
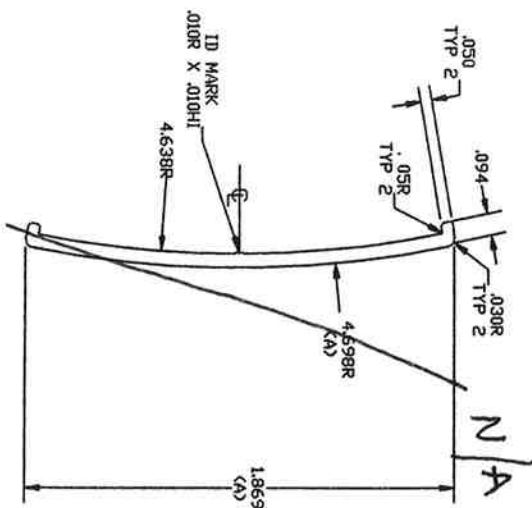
34294 QMI ROLL SHUTTER  
D/B/A QMI ROLL SHUTTER SUPPLY  
1661 GLEN LAKE AVENUE

[illegible]

[illegible]



ETPL# Nil. 201703  
Date Verified: 4/3/10  
Verified By: gf

[illegible]

|                                                                        |  |                        |  |               |  |              |   |
|------------------------------------------------------------------------|--|------------------------|--|---------------|--|--------------|---|
| Standard Aluminum Association trademarks apply unless otherwise noted. |  |                        |  | DIE NUMBER    |  | REV          |   |
| CUBRT PART #                                                           |  | TENSILE STRENGTH MIN A |  | EJC           |  | QMI-331      | A |
| CUBRT PART NAME: SLAT COVER                                            |  | MIN TENSILE STRENGTH   |  | 143           |  |              |   |
| PROCPORAL:                                                             |  | REL DATE 07/13/04 EAM  |  | ALLOY 6005-T5 |  | FINISH PAINT |   |

| A |  | B |  | C |  | D |  | E |  | F |  | G |  | H |  | I |  | J |  | K |  | L |  | M |  | N |  | O |  | P |  | Q |  | R |  | S |  | T |  | U |  | V |  | W |  | X |  | Y |  | Z |  |
|---|--|---|--|---|--|---|--|---|--|---|--|---|--|---|--|---|--|---|--|---|--|---|--|---|--|---|--|---|--|---|--|---|--|---|--|---|--|---|--|---|--|---|--|---|--|---|--|---|--|---|--|
| A |  | B |  | C |  | D |  | E |  | F |  | G |  | H |  | I |  | J |  | K |  | L |  | M |  | N |  | O |  | P |  | Q |  | R |  | S |  | T |  | U |  | V |  | W |  | X |  | Y |  | Z |  |
| A |  | B |  | C |  | D |  | E |  | F |  | G |  | H |  | I |  | J |  | K |  | L |  | M |  | N |  | O |  | P |  | Q |  | R |  | S |  | T |  | U |  | V |  | W |  | X |  | Y |  | Z |  |
| A |  | B |  | C |  | D |  | E |  | F |  | G |  | H |  | I |  | J |  | K |  | L |  | M |  | N |  | O |  | P |  | Q |  | R |  | S |  | T |  | U |  | V |  | W |  | X |  | Y |  | Z |  |
| A |  | B |  | C |  | D |  | E |  | F |  | G |  | H |  | I |  | J |  | K |  | L |  | M |  | N |  | O |  | P |  | Q |  | R |  | S |  | T |  | U |  | V |  | W |  | X |  | Y |  | Z |  |
| A |  | B |  | C |  | D |  | E |  | F |  | G |  | H |  | I |  | J |  | K |  | L |  | M |  | N |  | O |  | P |  | Q |  | R |  | S |  | T |  | U |  | V |  | W |  | X |  | Y |  | Z |  |
| A |  | B |  | C |  | D |  | E |  | F |  | G |  | H |  | I |  | J |  | K |  | L |  | M |  | N |  | O |  | P |  | Q |  | R |  | S |  | T |  | U |  | V |  | W |  | X |  | Y |  | Z |  |
| A |  | B |  | C |  | D |  | E |  | F |  | G |  | H |  | I |  | J |  | K |  | L |  | M |  | N |  | O |  | P |  | Q |  | R |  | S |  | T |  | U |  | V |  | W |  | X |  | Y |  | Z |  |
| A |  | B |  | C |  | D |  | E |  | F |  | G |  | H |  | I |  | J |  | K |  | L |  | M |  | N |  | O |  | P |  | Q |  | R |  | S |  | T |  | U |  | V |  | W |  | X |  | Y |  | Z |  |
| A |  | B |  | C |  | D |  | E |  | F |  | G |  | H |  | I |  | J |  | K |  | L |  | M |  | N |  | O |  | P |  | Q |  | R |  | S |  | T |  | U |  | V |  | W |  | X |  | Y |  | Z |  |
| A |  | B |  | C |  | D |  | E |  | F |  | G |  | H |  | I |  | J |  | K |  | L |  | M |  | N |  | O |  | P |  | Q |  | R |  | S |  | T |  | U |  | V |  | W |  | X |  | Y |  | Z |  |
| A |  | B |  | C |  | D |  | E |  | F |  | G |  | H |  | I |  | J |  | K |  | L |  | M |  | N |  | O |  | P |  | Q |  | R |  | S |  | T |  | U |  | V |  | W |  | X |  | Y |  | Z |  |
| A |  | B |  | C |  | D |  | E |  | F |  | G |  | H |  | I |  | J |  | K |  | L |  | M |  | N |  | O |  | P |  | Q |  | R |  | S |  | T |  | U |  | V |  | W |  | X |  | Y |  | Z |  |
| A |  | B |  | C |  | D |  | E |  | F |  | G |  | H |  | I |  | J |  | K |  | L |  | M |  | N |  | O |  | P |  | Q |  | R |  | S |  | T |  | U |  | V |  | W |  | X |  | Y |  | Z |  |
| A |  | B |  | C |  | D |  | E |  | F |  | G |  | H |  | I |  | J |  | K |  | L |  | M |  | N |  | O |  | P |  | Q |  | R |  | S |  | T |  | U |  | V |  | W |  | X |  | Y |  | Z |  |
| A |  | B |  | C |  | D |  | E |  | F |  | G |  | H |  | I |  | J |  | K |  | L |  | M |  | N |  | O |  | P |  | Q |  | R |  | S |  | T |  | U |  | V |  | W |  | X |  | Y |  | Z |  |
| A |  | B |  | C |  | D |  | E |  | F |  | G |  | H |  | I |  | J |  | K |  | L |  | M |  | N |  | O |  | P |  | Q |  | R |  | S |  | T |  | U |  | V |  | W |  | X |  | Y |  | Z |  |
| A |  | B |  | C |  | D |  | E |  | F |  | G |  | H |  | I |  | J |  | K |  | L |  | M |  | N |  | O |  | P |  | Q |  | R |  | S |  | T |  | U |  | V |  | W |  | X |  | Y |  | Z |  |
| A |  | B |  | C |  | D |  | E |  | F |  | G |  | H |  | I |  | J |  | K |  | L |  | M |  | N |  | O |  | P |  | Q |  | R |  | S |  | T |  | U |  | V |  | W |  | X |  | Y |  | Z |  |
| A |  | B |  | C |  | D |  | E |  | F |  | G |  | H |  | I |  | J |  | K |  | L |  | M |  | N |  | O |  | P |  | Q |  | R |  | S |  | T |  | U |  | V |  | W |  | X |  | Y |  | Z |  |
| A |  | B |  | C |  | D |  | E |  | F |  | G |  | H |  | I |  | J |  | K |  | L |  | M |  | N |  | O |  | P |  | Q |  | R |  | S |  | T |  | U |  | V |  | W |  | X |  | Y |  | Z |  |
| A |  | B |  | C |  | D |  | E |  | F |  | G |  | H |  | I |  | J |  | K |  | L |  | M |  | N |  | O |  | P |  | Q |  | R |  | S |  | T |  | U |  | V |  | W |  | X |  | Y |  | Z |  |
| A |  | B |  | C |  | D |  | E |  | F |  | G |  | H |  | I |  | J |  | K |  | L |  | M |  | N |  | O |  | P |  | Q |  | R |  | S |  | T |  | U |  | V |  | W |  | X |  | Y |  | Z |  |
| A |  | B |  | C |  | D |  | E |  | F |  | G |  | H |  | I |  | J |  | K |  | L |  | M |  | N |  | O |  | P |  | Q |  | R |  | S |  | T |  | U |  | V |  | W |  | X |  | Y |  | Z |  |
| A |  | B |  | C |  | D |  | E |  | F |  | G |  | H |  | I |  | J |  | K |  | L |  | M |  | N |  | O |  | P |  | Q |  | R |  | S |  | T |  | U |  | V |  | W |  | X |  | Y |  | Z |  |
| A |  | B |  | C |  | D |  | E |  | F |  | G |  | H |  | I |  | J |  | K |  | L |  | M |  | N |  | O |  | P |  | Q |  | R |  | S |  | T |  | U |  | V |  | W |  | X |  | Y |  | Z |  |
| A |  | B |  | C |  | D |  | E |  | F |  | G |  | H |  | I |  | J |  | K |  | L |  | M |  | N |  | O |  | P |  | Q |  | R |  | S |  | T |  | U |  | V |  | W |  | X |  | Y |  | Z |  |
| A |  | B |  | C |  | D |  | E |  | F |  | G |  | H |  | I |  | J |  | K |  | L |  | M |  | N |  | O |  | P |  | Q |  | R |  | S |  | T |  | U |  | V |  | W |  | X |  | Y |  | Z |  |
| A |  | B |  | C |  | D |  | E |  | F |  | G |  | H |  | I |  | J |  | K |  | L |  | M |  | N |  | O |  | P |  | Q |  | R |  | S |  | T |  | U |  | V |  | W |  | X |  | Y |  | Z |  |
| A |  | B |  | C |  | D |  | E |  | F |  | G |  | H |  | I |  | J |  | K |  | L |  | M |  | N |  | O |  | P |  | Q |  | R |  | S |  | T |  | U |  | V |  | W |  | X |  | Y |  | Z |  |
| A |  | B |  | C |  | D |  | E |  | F |  | G |  | H |  | I |  | J |  | K |  | L |  | M |  | N |  | O |  | P |  | Q |  | R |  | S |  | T |  | U |  | V |  | W |  | X |  | Y |  | Z |  |
| A |  | B |  | C |  | D |  | E |  | F |  | G |  | H |  | I |  | J |  | K |  | L |  | M |  | N |  | O |  | P |  | Q |  | R |  | S |  | T |  | U |  | V |  | W |  | X |  | Y |  | Z |  |
| A |  | B |  | C |  | D |  | E |  | F |  | G |  | H |  | I |  | J |  | K |  | L |  | M |  | N |  | O |  | P |  | Q |  | R |  | S |  | T |  | U |  | V |  | W |  | X |  | Y |  | Z |  |
| A |  | B |  | C |  | D |  | E |  | F |  | G |  | H |  | I |  | J |  | K |  | L |  | M |  | N |  | O |  | P |  | Q |  | R |  | S |  | T |  | U |  | V |  | W |  | X |  | Y |  | Z |  |
| A |  | B |  | C |  | D |  | E |  | F |  | G |  | H |  | I |  | J |  | K |  | L |  | M |  | N |  | O |  | P |  | Q |  | R |  | S |  | T |  | U |  | V |  | W |  | X |  | Y |  | Z |  |
| A |  | B |  | C |  | D |  | E |  | F |  | G |  | H |  | I |  | J |  | K |  | L |  | M |  | N |  | O |  | P |  | Q |  | R |  | S |  | T |  | U |  | V |  | W |  | X |  | Y |  | Z |  |
| A |  | B |  | C |  | D |  | E |  | F |  | G |  | H |  | I |  | J |  | K |  | L |  | M |  | N |  | O |  | P |  | Q |  | R |  | S |  | T |  | U |  | V |  | W |  | X |  | Y |  | Z |  |
| A |  | B |  | C |  | D |  | E |  | F |  | G |  | H |  | I |  | J |  | K |  | L |  | M |  | N |  | O |  | P |  | Q |  | R |  | S |  | T |  | U |  | V |  | W |  | X |  | Y |  | Z |  |
| A |  | B |  | C |  | D |  | E |  | F |  | G |  | H |  | I |  | J |  | K |  | L |  | M |  | N |  | O |  | P |  | Q |  | R |  | S |  | T |  | U |  | V |  | W |  | X |  | Y |  | Z |  |
| A |  | B |  | C |  | D |  | E |  | F |  | G |  | H |  | I |  | J |  | K |  | L |  | M |  | N |  | O |  | P |  | Q |  | R |  | S |  | T |  | U |  | V |  | W |  | X |  | Y |  | Z |  |
| A |  | B |  | C |  | D |  | E |  | F |  | G |  | H |  | I |  | J |  | K |  | L |  | M |  | N |  | O |  | P |  | Q |  | R |  | S |  | T |  | U |  | V |  | W |  | X |  | Y |  | Z |  |
| A |  | B |  | C |  | D |  | E |  | F |  | G |  | H |  | I |  | J |  | K |  | L |  | M |  | N |  | O |  | P |  | Q |  | R |  | S |  | T |  | U |  | V |  | W |  | X |  | Y |  | Z |  |
| A |  | B |  | C |  | D |  | E |  | F |  | G |  | H |  | I |  | J |  | K |  | L |  | M |  | N |  | O |  | P |  | Q |  | R |  | S |  | T |  | U |  | V |  | W |  | X |  | Y |  | Z |  |
| A |  | B |  | C |  | D |  | E |  | F |  | G |  | H |  | I |  | J |  | K |  | L |  | M |  | N |  | O |  | P |  | Q |  | R |  | S |  | T |  | U |  | V |  | W |  | X |  | Y |  | Z |  |
| A |  | B |  | C |  | D |  | E |  | F |  | G |  | H |  | I |  | J |  | K |  | L |  | M |  | N |  | O |  | P |  | Q |  | R |  | S |  | T |  | U |  | V |  | W |  | X |  | Y |  | Z |  |
| A |  | B |  | C |  | D |  | E |  | F |  | G |  | H |  | I |  | J |  | K |  | L |  | M |  | N |  | O |  | P |  | Q |  | R |  | S |  | T |  | U |  | V |  | W |  | X |  | Y |  | Z |  |
| A |  | B |  | C |  | D |  | E |  | F |  | G |  | H |  | I |  | J |  | K |  | L |  | M |  | N |  | O |  | P |  | Q |  | R |  | S |  | T |  | U |  | V |  | W |  | X |  | Y |  | Z |  |
| A |  | B |  | C |  | D |  | E |  | F |  | G |  | H |  | I |  | J |  | K |  | L |  | M |  | N |  | O |  | P |  | Q |  | R |  | S |  | T |  | U |  | V |  | W |  | X |  | Y |  | Z |  |
| A |  | B |  | C |  | D |  | E |  | F |  | G |  | H |  | I |  | J |  | K |  | L |  | M |  | N |  | O |  | P |  | Q |  | R |  | S |  | T |  | U |  | V |  | W |  | X |  | Y |  | Z |  |
| A |  | B |  | C |  | D |  | E |  | F |  | G |  | H |  | I |  | J |  | K |  | L |  | M |  | N |  | O |  | P |  | Q |  | R |  | S |  | T |  | U |  | V |  | W |  | X |  | Y |  | Z |  |
| A |  | B |  | C |  | D |  | E |  | F |  | G |  | H |  | I |  | J |  | K |  | L |  | M |  | N |  | O |  | P |  | Q |  | R |  | S |  | T |  | U |  | V |  | W |  | X |  | Y |  | Z |  |
| A |  | B |  | C |  | D |  | E |  | F |  | G |  | H |  | I |  | J |  | K |  | L |  | M |  | N |  | O |  | P |  | Q |  | R |  | S |  | T |  | U |  | V |  | W |  | X |  | Y |  | Z |  |
|   |  |   |  |   |  |   |  |   |  |   |  |   |  |   |  |   |  |   |  |   |  |   |  |   |  |   |  |   |  |   |  |   |  |   |  |   |  |   |  |   |  |   |  |   |  |   |  |   |  |   |  |

**QMI-331**

**THE WILLIAM L. BONNETT CO**  
CAPITAL PRODUCTS CORPORATION  
BOM-CLARK, 17 BOM-CLARK, INC.  
BOM-CLARK CO. THROUGH INVESTMENT, INC.

|                     |         |           |                       |                      |
|---------------------|---------|-----------|-----------------------|----------------------|
| UNREPORTED<br>WALLS | 1.52 mm | MASS      | 209 g/m <sup>2</sup>  | 1.40 m <sup>2</sup>  |
| UNREPORTED<br>ROOF  | .069 m  | EST PER   | 102.11 mm             | 4.070 m              |
|                     | .25R mm | OUT PER   |                       |                      |
|                     | .010R m | EXP PER   |                       |                      |
| DATE:               | 7/94    | BOF PER   |                       |                      |
| DRAWN               | CUSTOM  | BOF TURN: |                       |                      |
| SCALE               | 2:1     | F.C.D.:   | 489 mm                | 20' height           |
| TIMB BATT           | NO      |           | 47.74 mm <sup>2</sup> | 1.590 m <sup>2</sup> |
| PRD CODE:           | NO      | PRD AREA  |                       |                      |

# HVHZ AND VERIFICATION TEST SHUTTERS for FBC STATEWIDE APPROVAL (HVHZ AND NHVHZ)

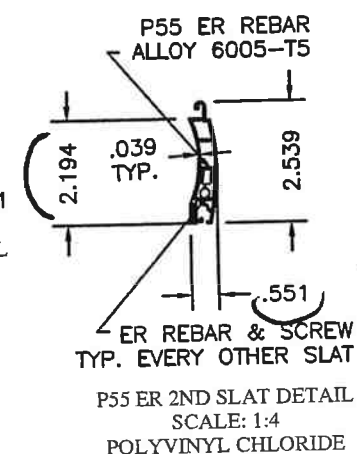
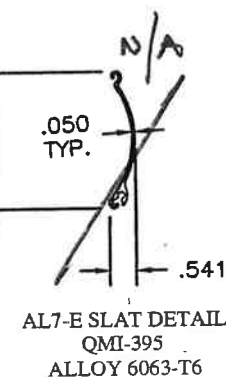
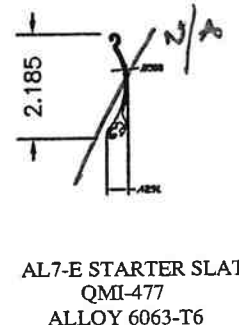
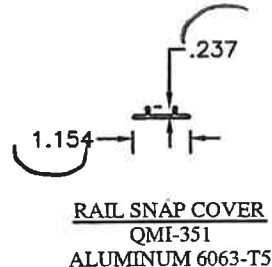
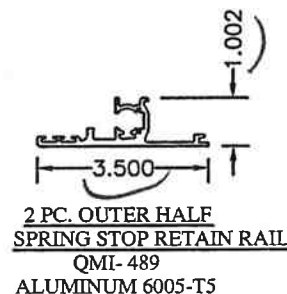
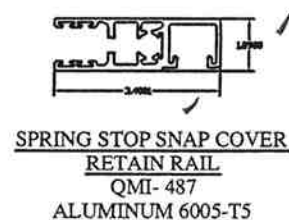
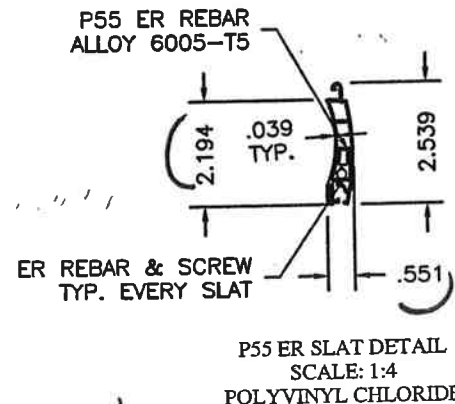
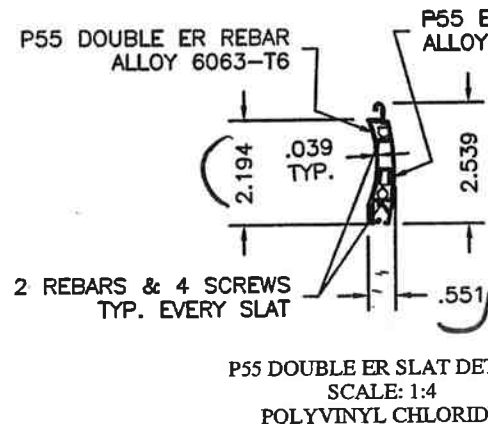
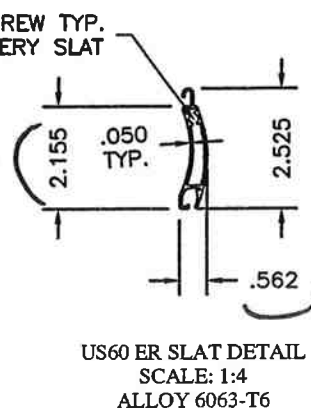
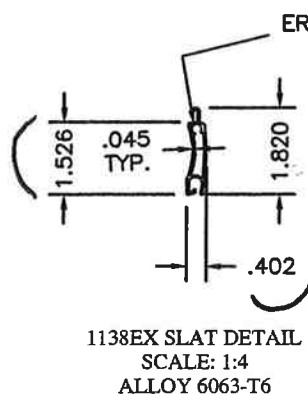
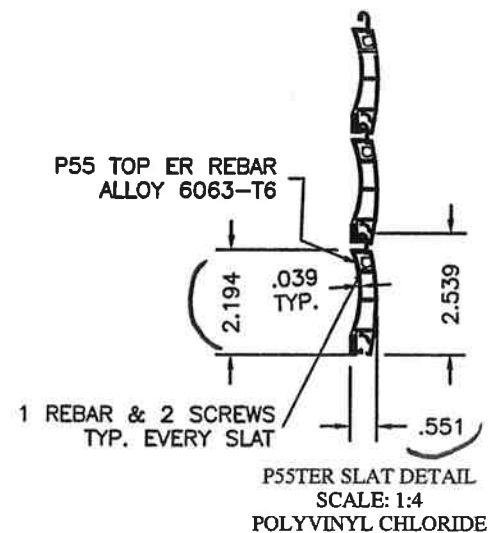
- Specimen 1** N/A 1. 4)EA 8' tall AL7-E shutter 233" rail to rail in width, tested at design of 35 PSF. (TAS 201, TAS 202, & TAS 203)  
**Specimen 2** N/A 2. 4)EA 8' tall AL7-E shutter 102" rail to rail in width, tested at design of 125 PSF. (TAS 201, TAS 202, & TAS 203)  
**Specimen 3** 3. 1)EA 8' tall shutter with 32" in height of US60ER, 1138ER, and P55DER at 156" width, design 30 PSF. (TAS 201, TAS 202, & TAS 203)  
**Specimen 4** 4. 1)EA\* 8' tall shutter with 32" in height of P55TER, P55ER 2nd, and P55ER at 156" width at design 30 PSF. (TAS 201, TAS 202, & TAS 203)  
5. 1)EA 8' tall shutter with 32" in height of US60ER, 1138ER, and P55DER at 102" width at design 100 PSF. (TAS 201, TAS 202, & TAS 203)  
6. 1)EA\* 8' tall shutter with 32" in height of P55TER, P55ER 2nd, and P55ER at 69" width at design 100 PSF. (TAS 201, TAS 202, & TAS 203)

\*(Impact P55TER only)

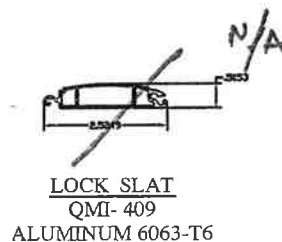
- NOTES:  
1. TESTING SHALL BE PER FBC AND TAS PROTOCOLS SUCH THAT THE FINAL TESTING REPORT SATISFIES OR EXCEEDS FBC/ TAS TESTING PROTOCOLS (WIND ZONE 4).  
2. DESIGN LOADING PRESSURES VARY BY SAMPLE WITH POSITIVE AND NEGATIVE PRESSURES EQUAL. SEE ADJACENT TABLE.  
3. SHUTTERS #2 THRU #6 HAVE A BUCK OPENING  $\frac{1}{8}$ " LESS THAN THE RAIL TO RAIL (T-T) DIMENSION.  
4. SHUTTER NUMBER 1 HAS A BUCK OPENING OF 230".

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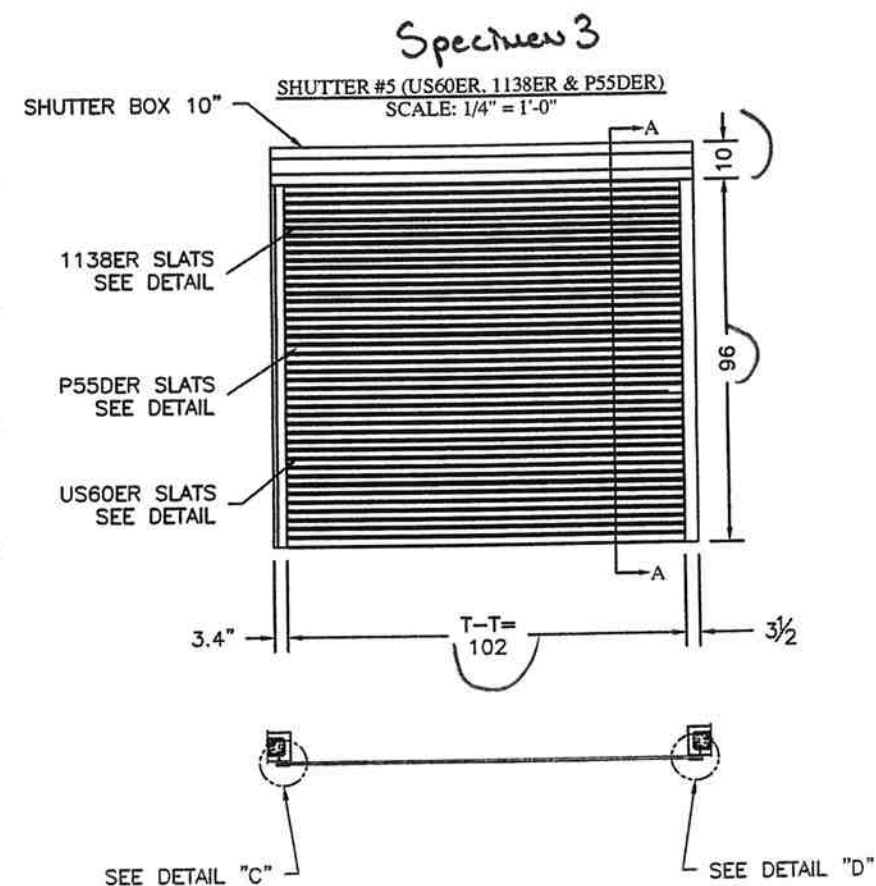
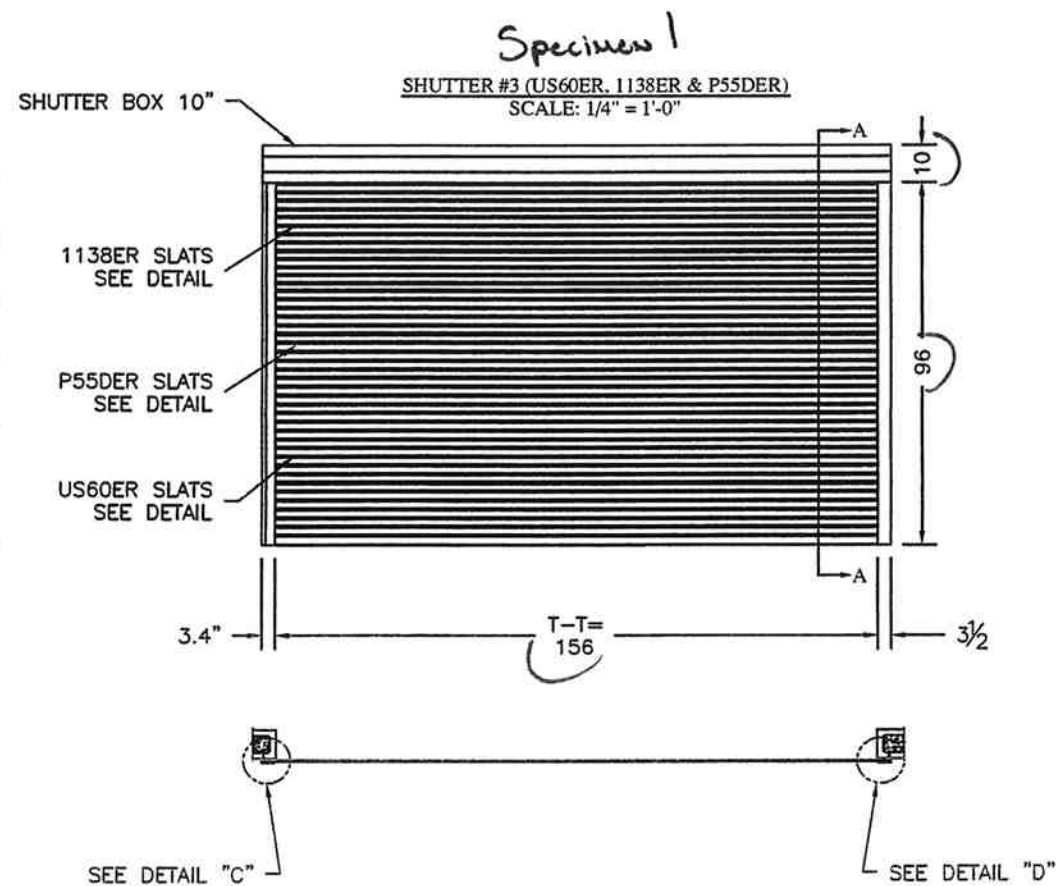
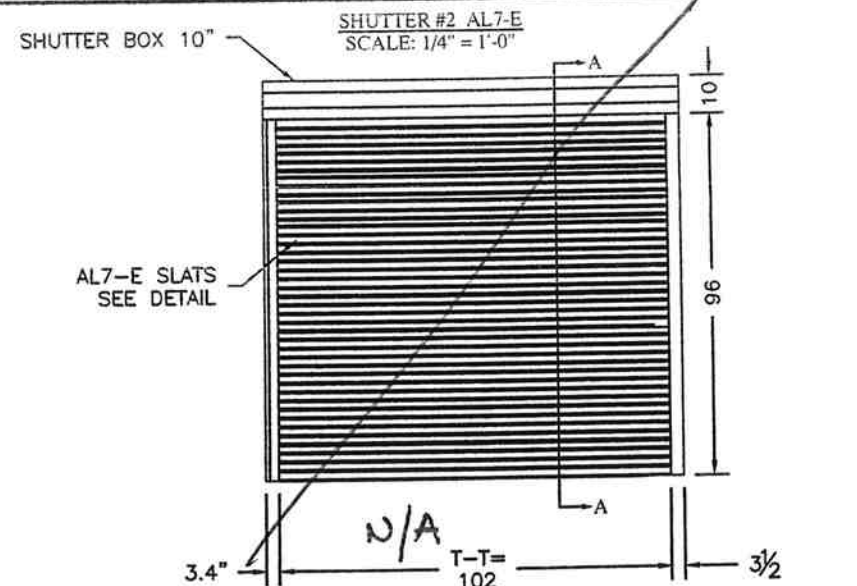
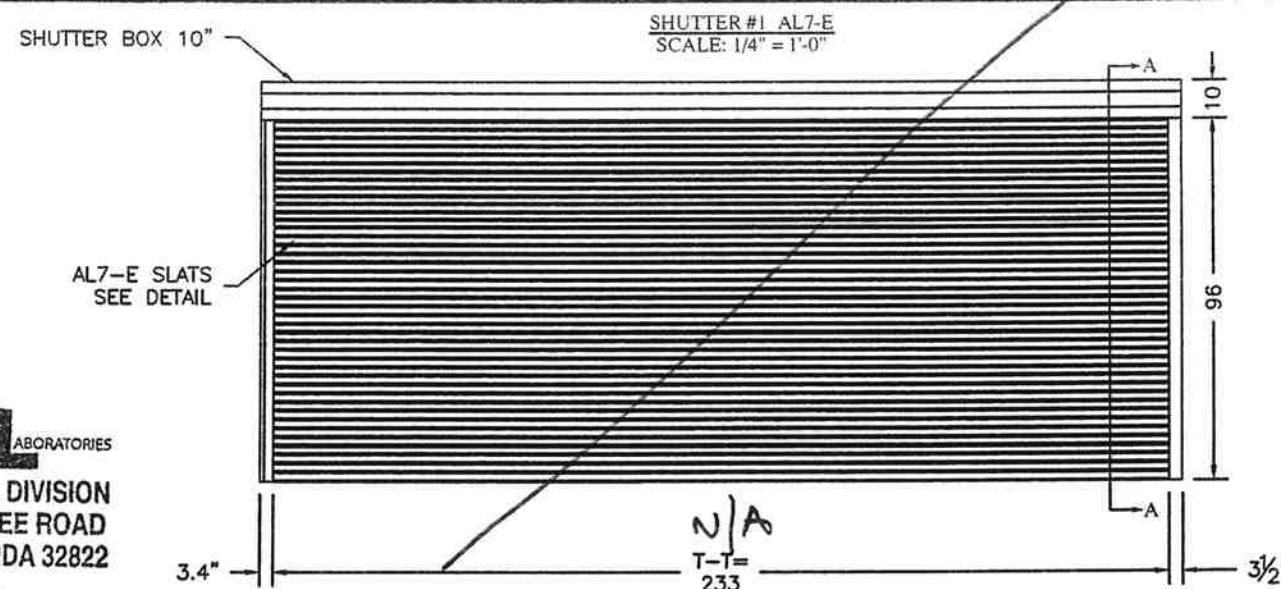
2 PC. RAIL ASSEMBLY SCREW  
#8-18 x 3/4 PHILLIPS PAN SDS 410 S.S.



| REV                                                                                                              | REVISION       |                       |        |              |                 |
|------------------------------------------------------------------------------------------------------------------|----------------|-----------------------|--------|--------------|-----------------|
|                                                                                                                  | A              | B                     | C      | D            | E               |
| THIRD ANGLE PROJECTION                                                                                           |                |                       |        |              |                 |
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| <b>Pol-a-way</b><br>HVHZ & VERIFICATION TESTING<br>AL7-E SINGLE WALL<br>EXTRUDED ALUMINUM SLAT                   |                |                       |        |              |                 |
| DRAWN: DLF                                                                                                       | DATE: 12-08-09 | CHECKED:              | DATE:  | MEASURED:    | DATE:           |
| APPROVED:                                                                                                        | DATE:          | DRAWING NO: S-1209-EG | REV: - | SHEET 1 OF 5 | SCALE: AS NOTED |

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| REVISION |  | DESCRIPTION |
|----------|--|-------------|
| REV      |  |             |
| A        |  |             |
| B        |  |             |
| C        |  |             |
| D        |  |             |
| E        |  |             |

|                                                                                                                                                                 |                       |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|
| THIRD ANGLE PROJECTION                                                                                                                                          |                       |
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| TITLE<br>HVHZ & VERIFICATION TESTING<br>AL7-E SINGLE WALL<br>EXTRUDED ALUMINUM SLAT                                                                             |                       |
| DRAWN: DLF                                                                                                                                                      | DATE: 12-08-09        |
| CHECKED:                                                                                                                                                        | DATE:                 |
| MEASURED:                                                                                                                                                       | DATE:                 |
| APPROVED:                                                                                                                                                       | DATE:                 |
| SIZE: B                                                                                                                                                         | DRAWING NO: S-1209-EG |
| SCALE: AS NOTED                                                                                                                                                 | SHEET 2 OF 5          |



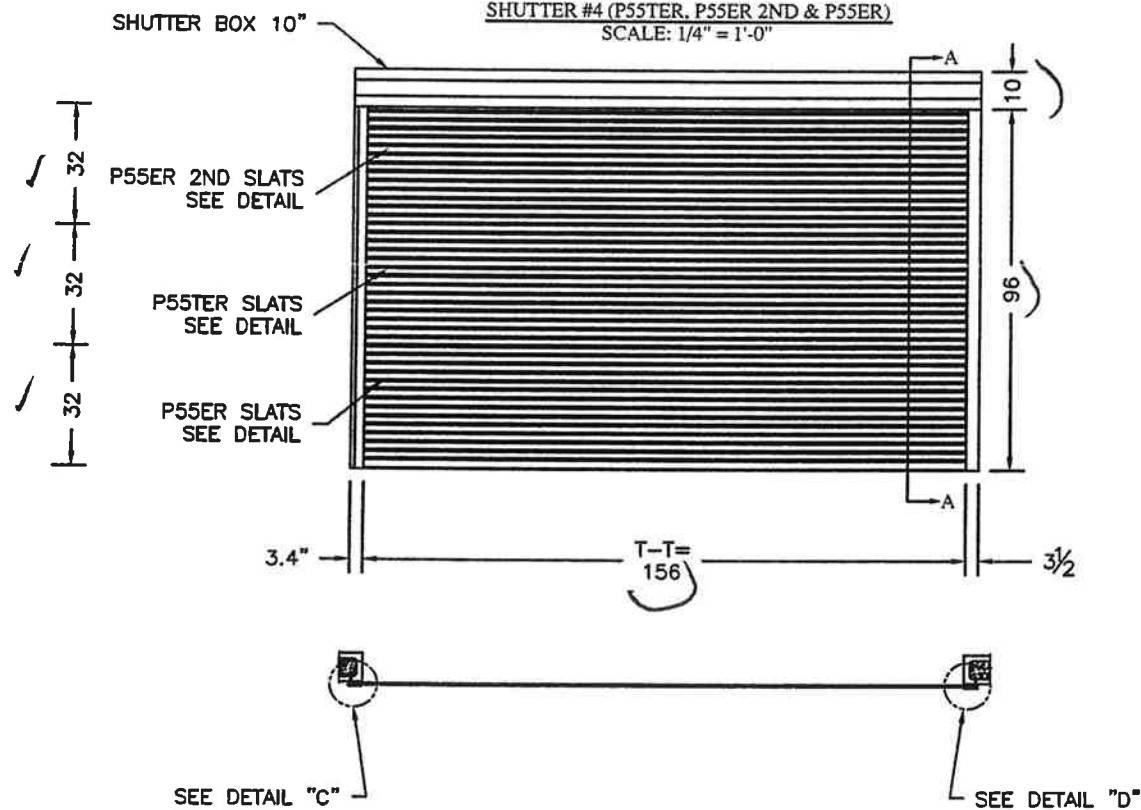
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Date Certified: 4/2/10  
Verified By: gp

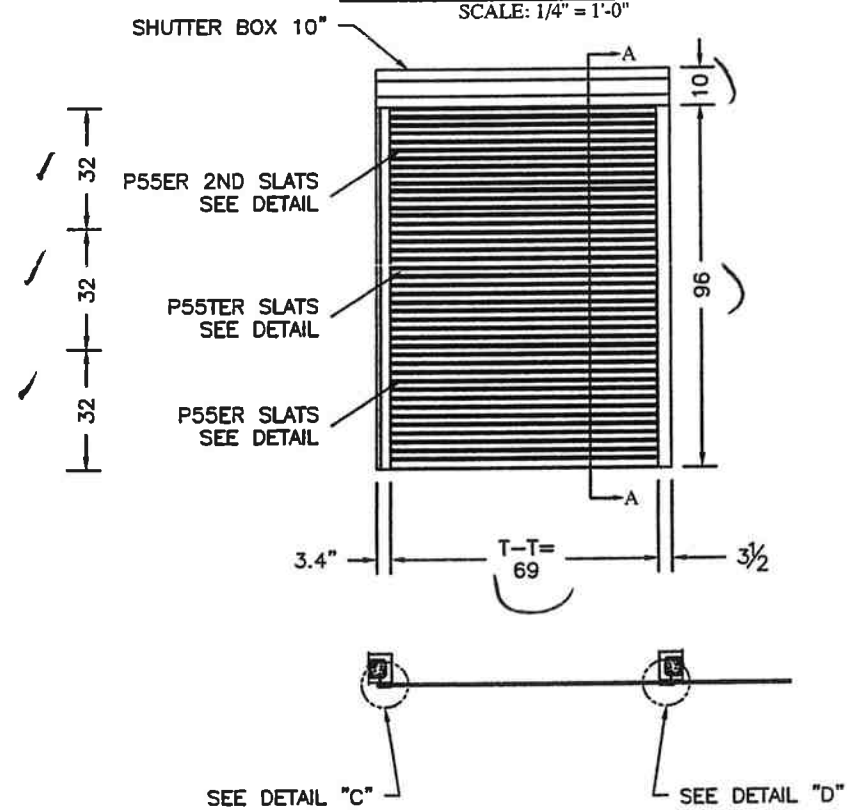
*Specimen 2*

SHUTTER #4 (P55TER, P55ER 2ND & P55ER)  
SCALE: 1/4" = 1'-0"

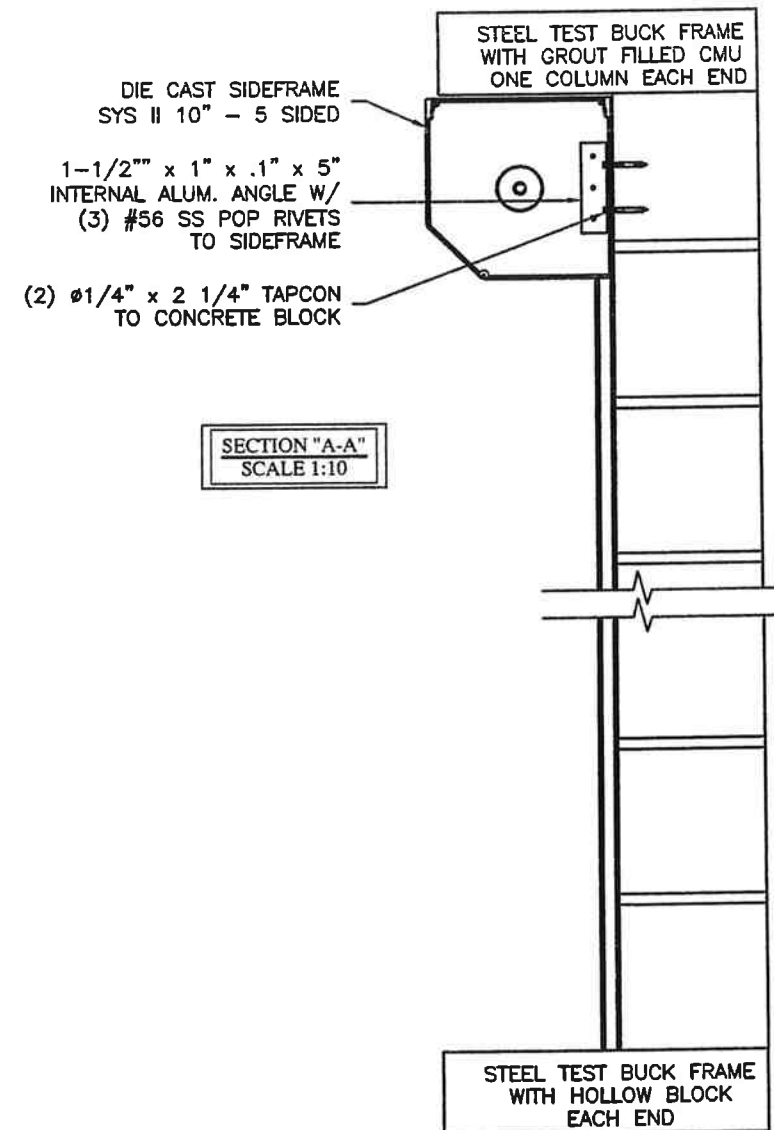
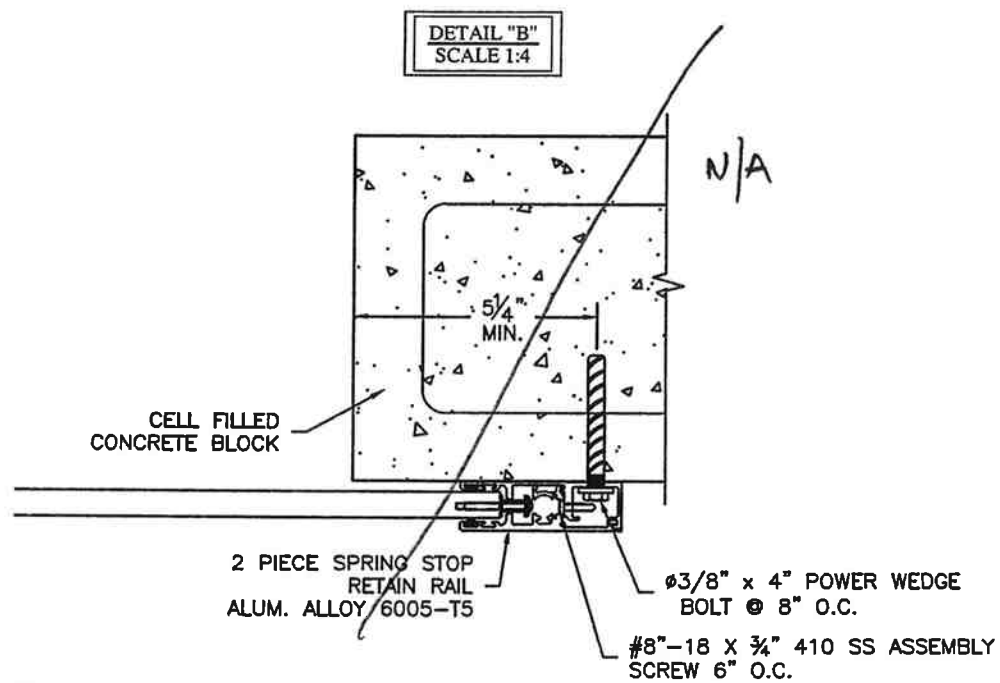
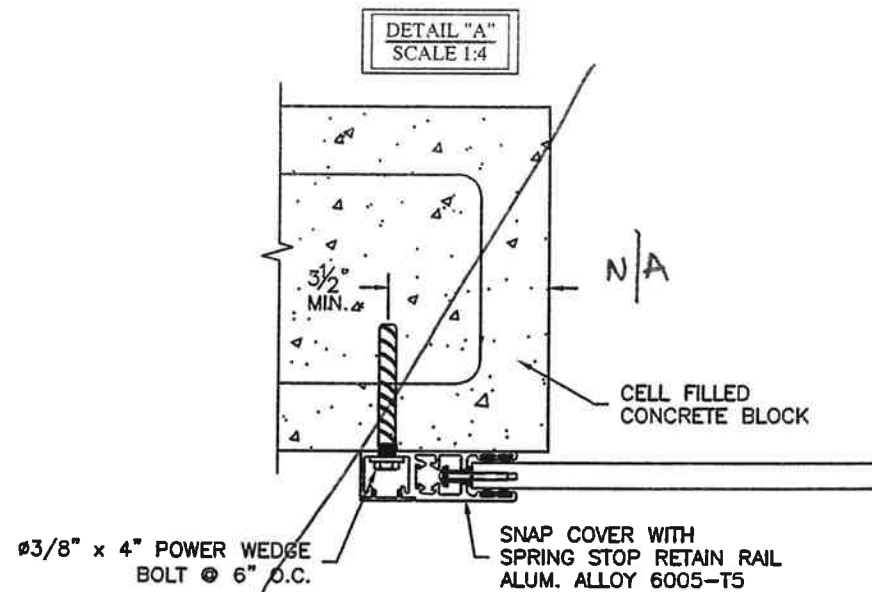


*Specimen 4*

SHUTTER #6 (P55TER, P55ER 2ND & P55ER)  
SCALE: 1/4" = 1'-0"



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|-----------|-------------|---------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| REV       | DESCRIPTION |                           |                                                                                                                                                 |                                                                                     |
| A         |             |                           |                                                                                                                                                 |                                                                                     |
| B         |             |                           |                                                                                                                                                 |                                                                                     |
| C         |             |                           |                                                                                                                                                 |                                                                                     |
| D         |             |                           |                                                                                                                                                 |                                                                                     |
| E         |             |                           |                                                                                                                                                 |                                                                                     |
| DRAWN:    | DLF         | DATE:                     | 12-08-09                                                                                                                                        |                                                                                     |
| CHECKED:  |             | DATE:                     |                                                                                                                                                 |                                                                                     |
| MEASURED: |             | DATE:                     |                                                                                                                                                 |                                                                                     |
| APPROVED: |             | DATE:                     |                                                                                                                                                 |                                                                                     |
| SIZE:     | B           | DRAWING NO.:              | S-1209-EG                                                                                                                                       | REV: -                                                                              |
| SCALE:    | AS NOTED    | SHEET                     | 3                                                                                                                                               | OF 5                                                                                |



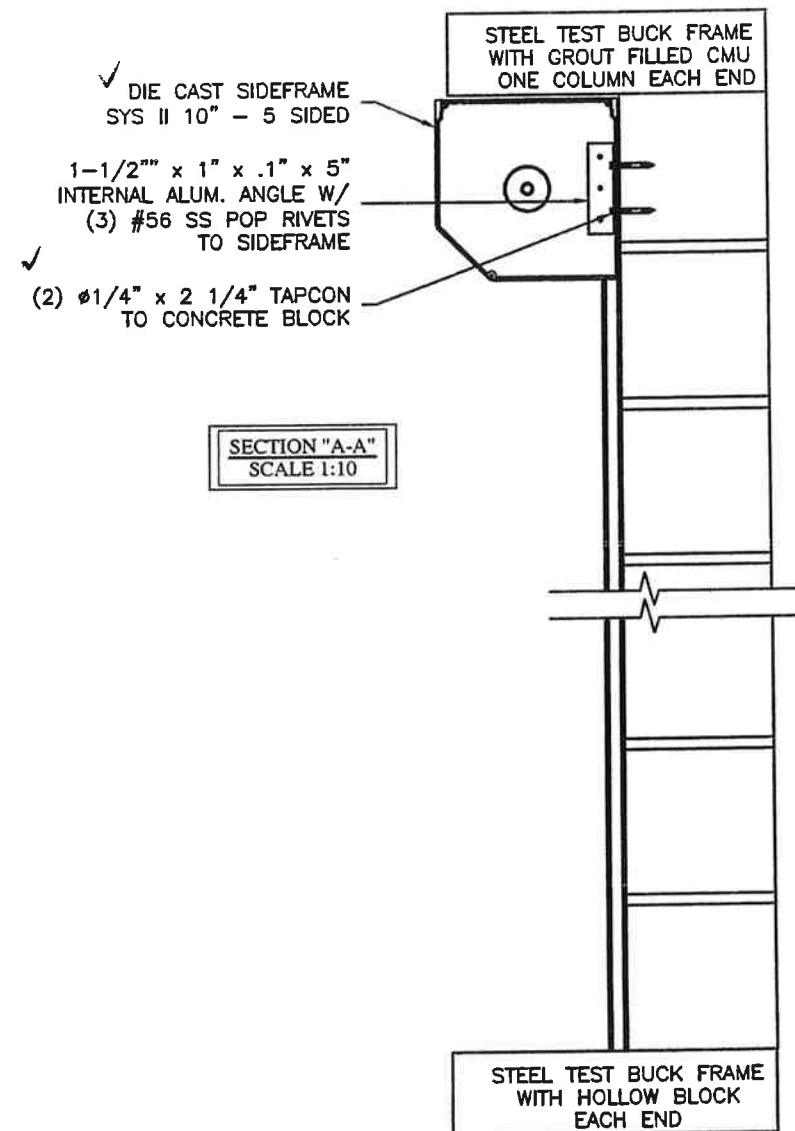
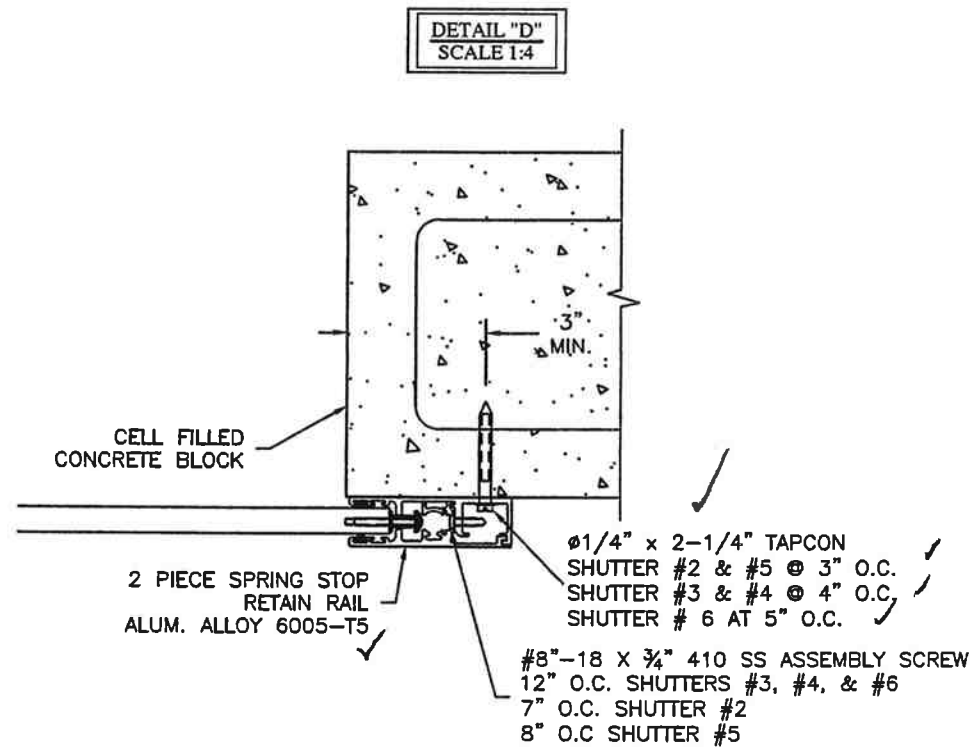
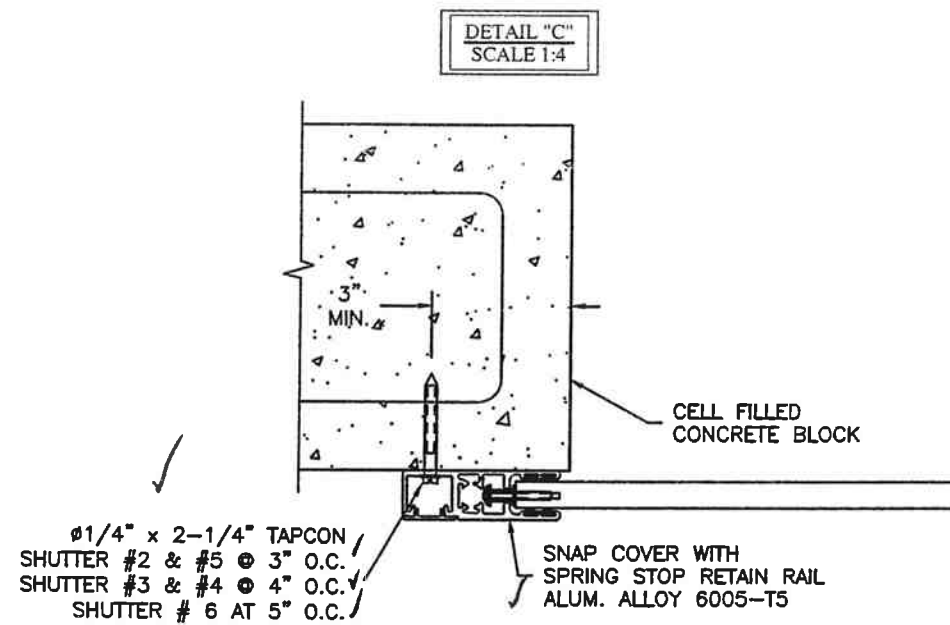
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Drawn: DLF  
Date: 2017W  
Verified: 4/8/10  
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| REVISION |  | THIRD ANGLE PROJECTION | DESCRIPTION |
|----------|--|------------------------|-------------|
| REV      |  |                        |             |
| A        |  |                        |             |
| B        |  |                        |             |
| C        |  |                        |             |
| D        |  |                        |             |
| E        |  |                        |             |

|                                                   |  |                                          |  |
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| Rollaway®<br>ROLLING SECURITY SYSTEMS             |  | TITLE: HVHZ & VERIFICATION TESTING       |  |
| DATE: 12-08-09                                    |  | AL7-E SINGLE WALL                        |  |
| DRAWING NO: S-1209-EG                             |  | EXTRUDED ALUMINUM SLAT                   |  |
| REV: -                                            |  | SHEET 4 OF 5                             |  |
| SCALE: AS NOTED                                   |  |                                          |  |



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| REVISION |             | THIRD ANGLE PROJECTION | TITLE                                                                      | DATE     | DRAWING NO. | SCALE    | SHEET | OF |
|----------|-------------|------------------------|----------------------------------------------------------------------------|----------|-------------|----------|-------|----|
| REV      | DESCRIPTION |                        |                                                                            |          |             |          |       |    |
| A        |             |                        | HVHZ & VERIFICATION TESTING<br>AL7-E SINGLE WALL<br>EXTRUDED ALUMINUM SLAT | 12-08-09 | S-1209-EG   | AS NOTED | 5     | 5  |
| B        |             |                        |                                                                            |          |             |          |       |    |
| C        |             |                        |                                                                            |          |             |          |       |    |
| D        |             |                        |                                                                            |          |             |          |       |    |
| E        |             |                        |                                                                            |          |             |          |       |    |

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