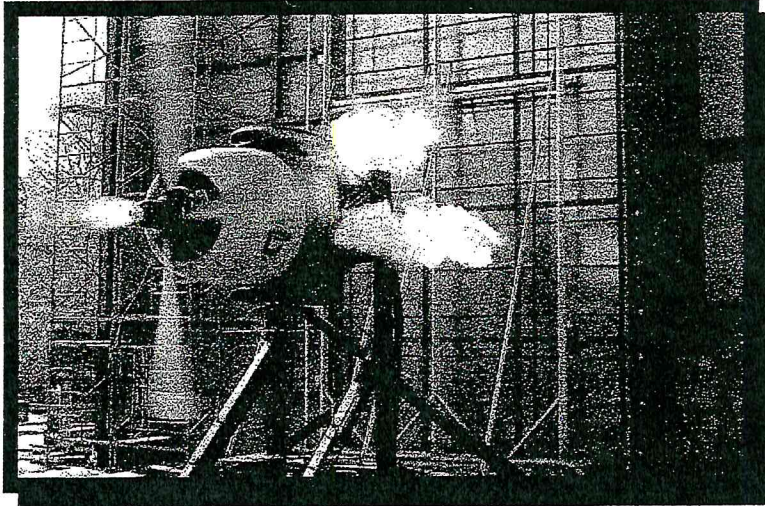




CONSTRUCTION CONSULTING LABORATORY, *INTERNATIONAL*



TEST REPORT:

**US ALUMINUM
3250 CURTAIN WALL SYSTEM
REPORT #CCLI-00-128**

October 27, 2000

Prepared for:

**US ALUMINUM CORPORATION
200 Singleton Drive
Waxahachie, TX 75165-5094**

1601 Luna Road
Carrollton, Texas 75006

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CURTAIN WALL MOCK-UP TESTING REPORT
US ALUMINUM 3250 CURTAIN WALL
REPORT # CCLI-00-128

October 27, 2000

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- APPENDIX A: US ALUMINUM MOCK-UP DRAWINGS
- APPENDIX B: DIAL INDICATOR LOCATION DIAGRAM
- APPENDIX C: STRUCTURAL DEFLECTION TABLES
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1. PROJECT DATA

<u>Project:</u>	3250 Curtain Wall Mock-Up Performance Testing
<u>Test Completion:</u>	October 23-24, 2000
<u>Tested For:</u>	US Aluminum 200 Singleton Drive Waxahachie, TX 75165-5094

Witnessed By: (All or Partial Viewing)

Gregg Hall	US Aluminum
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Brent Horton	Construction Consulting Laboratory, <i>International</i>
Kenneth H. Lloyd Jr., P.E.	Construction Consulting Laboratory, <i>International</i>
Wesley A. Wilson	Construction Consulting Laboratory, <i>International</i>
John Perry	Construction Consulting Laboratory, <i>International</i>
Jeff Crump	Construction Consulting Laboratory, <i>International</i>



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2. MOCK- UP DESCRIPTION

The mock-up test specimen was identified as a US Aluminum 3250 Curtain Wall. The mock-up specimen width was 16'-7" by 31'- 8½" high, (**Photograph 1**).

Series 3250:

A 4-sided captured, exterior glazed curtain wall system – 4 lites wide x 7 lites high. Glass was ¼" bronze tempered at the spandrel areas, and 1" overall insulated glass utilizing ¼" bronze tempered, ½" air space, and ¼" clear tempered. All glass sizes, vision and spandrel, were 47 ⅝" x 52 ½".

The system utilizes extruded aluminum tubular vertical mullions with open back horizontals. Vertical mullions are reinforced with steel channel attached to mullion with #10 x 2" tek screws on 12" centers. The fillers were not installed on the mock-up horizontals for observation purposes. The horizontals are attached to the vertical mullions using a die cast shear block with 2- #12 x 1¾" pph fasteners. The horizontal is secured to the shear block with 2-#8 x ¾" ss fasteners through the glazing channel into the die cast shear block. Head and sill anchorage of the vertical mullions is accomplished with extruded aluminum "T" anchors that slide fit into the verticals and are secured to the structure with ⅜" diameter bolts, one on each side of the mullion. Mullion splices utilize extruded aluminum splice sleeves, 6" long, that slide into the upper and lower mullions. The system utilizes injection molded nylon joint plugs at the vertical and horizontal intersections at the mullion tongues to create a zone dam. These were set into Dow Corning Silicone 795 Sealant. Injection molded nylon mullion end caps allow the perimeter seal to run uninterrupted across the vertical mullion intersection. Transition glazing of ¼" is accomplished using aluminum snap in ¼" adapter extrusions, sealed to the vertical mullions and horizontals. These were set into Dow Corning Silicone 795 Sealant. The glass is secured using extruded aluminum pressure plates with a ¼ - 20 x 1" hex washer head machine screw, 9" on center. The extruded aluminum pressure plates have an integral thermal isolator separating the exterior metal from the interior metal. The pressure plate is covered by a snap on extruded aluminum face cap. Gaskets in the system are a dense E.P.D.M. on the exterior, and a sponge E.P.D.M. on the interior. The gaskets, both interior and exterior, were installed in linear lengths. The horizontals butt into the vertical. The butt joints were set into Dow Corning 795 Silicone Sealant.

Drainage was provided by (5) ¼" weep holes located at ¼ points on the horizontal mullions of both the vision and spandrel lites for a total of 10 weep holes per lite. Drainage of the system is completed at each face cap by drainage at the intersection with the vertical members approximately 2 on each leg.




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Reference US Aluminum drawings, Titled "3250 Curtain Wall Mock-Up", **Appendix A.**

Drawing	Date
M1 thru M5	10-2-00

This report is not complete unless these drawings, stamped by this laboratory, are included.

 **CONSTRUCTION CONSULTING
LABORATORY, INTERNATIONAL**
1601 Luna Road
Carrollton, Texas 75006
Phone (972) 242-0556

Report # 128 Reviewed By: [Signature]
Date: 10/24/00

3. TEST EQUIPMENT

- 3.1 Test chamber consisted of structural steel beams, columns and bulkheads and was accessible through a bulkhead door.
- 3.2 Pressure differentials were created with reversible pumps for positive/negative loading.
- 3.3 Pressure differentials between the specimen interior and the atmosphere were measured with manometers.
- 3.4 Air infiltration was measured with a Meriam laminar flow element and a Dwyer inclined manometer.
- 3.5 Water was applied to the specimen from a spray rack equipped with swirl-type nozzles spaced two feet on center in vertical and horizontal directions, which, under controlled pressure, delivered a minimum of five gallons per square foot per hour on the specimen.
- 3.6 Dynamic winds were generated by a Curtis Wright 3350 Radial Aircraft Engine with a Four (4) bladed propeller, 13'-6" diameter, which formulates typical and atypical wind conditions.
- 3.7 Structural variations were measured with dial indicator gauges with maximum movement hands located throughout the test specimen.

4. TESTING ALLOWABLES

- 4.1 **AIR INFILTRATION:** Total amount of air infiltration shall not exceed **.06 scfm** per square foot (sf) of the curtain wall area tested.



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MAXIMUM ALLOWABLE 31.5 scfm (Based upon a Calculated Area of 525.8 sf)

4.2 STATIC WATER PENETRATION: There shall be no water penetration during or at the conclusion of a 15 psf test.

Note: "Uncontrolled water" is defined as any water that appears on any normally exposed interior surfaces, that is not contained or drained back to the exterior, or that can cause damage to adjacent materials or finishes. Water contained within drained flashings, gutters, and sills is not considered water leakage. The collection of up to one half (½) ounce of water (14.8 cc) in a fifteen (15) minute test period on top of any interior stop or stool integral with the wall system shall not be considered water leakage.

4.3 DYNAMIC WATER PENETRATION: There shall be no water penetration during or at the conclusion of a test at 100 mph.

4.4 DESIGN LOAD DEFLECTION: There shall be no system failure and deflection of aluminum members at 100% of design load, and shall not exceed L/175 or 0.75 inches whichever is less:

Vertical Span: $156''/175 = 0.89$ inches
Vertical Span Allowable = 0.75 inches

Horizontal Span: $60''/175 = 0.26$ inches
Horizontal Span Allowable = 0.26 inches

4.5 PROOF LOAD RESIDUAL: The permanent deformation of the aluminum members at 150% of design load shall not exceed L/1000.

Vertical Span Residual: $156''/1000 = 0.156$ inches

Horizontal Span Residual: $46 \frac{5}{8}''/1000 = 0.046$ inches

5. TESTING SEQUENCE

As used throughout this report, positive pressure applied to the test specimen is considered to be **inward** acting and negative pressure is considered to be **outward** acting. All location references or comments are as viewing the test specimen from the interior (room side) of the test chamber and wall system.

The US Aluminum drawings defined the design loads to be as follows:

Positive Design Load = +50 psf
Negative Design Load = -50 psf



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	TEST	TEST STANDARD
1.	Static Pressure Air Infiltration Test @ 6.24 psf	ASTM E283-91
2.	Static Pressure Water Penetration Test @ 15.0 psf	ASTM E331-93
3.	Dynamic Water Penetration @ 100 mph	AAMA 501.1- 94
4.	Structural Performance by Static Pressure Test @ 50% & 100%	ASTM E330-97
5.	Static Pressure Air Infiltration Test @ 6.24 psf	ASTM E283-91
6.	Static Pressure Water Penetration Test @ 15.0 psf	ASTM E331-93
7.	Dynamic Water Penetration @ 100 mph	AAMA 501.1- 94
8.	Structural Proof Load by Static Pressure Test @ 150%	ASTM E330-97

6. TESTING and RESULTS

6.1 Static Pressure Air Infiltration Test @ 6.24 psf per ASTM E283-91

The specimen was completely covered with an impervious visqueen material and sealed at the perimeter with tape, thus allowing no movement of air through the specimen or perimeter seal of the chamber.

The exterior face of the specimen was then subjected to a positive pressure differential of **6.24 psf**. Air infiltration was measured and recorded, thus indicating the amount of infiltration through the chamber.

Chamber Reading: **37.19 scfm**

The visqueen material covering the specimen was removed and the exterior face of the specimen was subjected to a positive pressure differential of **6.24 psf**. Air infiltration was measured, thus indicating the amount of infiltration through the chamber and the specimen. Subtracting the previous reading (chamber only) from this reading yields the amount of infiltration through the specimen.

Chamber and Specimen Reading: **40.43 scfm**

Results:

SPECIMEN & CHAMBER	CHAMBER	SPECIMEN ONLY (YIELD)	ALLOWABLE (NOT TO EXCEED)
40.43 scfm	37.19 scfm	3.24 scfm	31.5 scfm

6.2 Static Pressure Water Penetration Test @ 15.0 psf per ASTM E331-93

Water was applied to the exterior face of the specimen at a minimum rate of five (5) gallons per square foot per hour of wall area, in such a way as to completely



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and continuously cover the face of the specimen. (**Photograph 1**) Simultaneously, a positive **inward** differential static pressure of **15.0 psf** was applied against the face. The application of pressure and water was maintained for a period of fifteen (15) minutes, with observers inside the chamber checking for water penetration.

Results: No uncontrolled water penetration was observed.

6.3 Dynamic Water Penetration @ 100 mph Slipstream Velocity per AAMA 501.1-94

Water was applied to the exterior face of the specimen at a minimum rate of five (5) gallons per square foot per hour of wall area, in such a way as to completely and continuously cover the face of the specimen.

Simultaneously, the wall was subjected to sufficient airflow from an aircraft engine with a four bladed propeller, approximately 13'-6" in diameter, approximately 20'-0" in front of the specimen. The application of airflow and water was maintained for a period of fifteen (15) minutes, with observers inside the chamber checking for water penetration.

Results: No uncontrolled water penetration was observed.

6.4 Uniform Structural Test @ 50% and 100% of Design Loads per ASTM E330-97

Dial indicators were installed to measure deflection and residuals at ends and midspans of typical horizontal and vertical members.

Test: With the specimen set in a positive mode, all indicators were set on zero. A positive pressure of **25.0 psf (inward)** equal to 50% of the design load was applied and held for ten (10) seconds, then released. The indicators were read and the data recorded.

Results: Refer to Structural Deflection Table #1.

Test: A positive pressure of **50.0 psf (inward)** equal to 100% of the design load was applied and held for ten (10) seconds then released. The indicators were read and the data recorded.

Results: All the net midspan deflections were well below the allowable of 0.75 inches for the verticals and 0.26 for the horizontals. Refer to Structural Deflection Table #1.



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The vacuum/blower pumps were reversed and set to perform in a negative mode. The test specimen was subjected to a negative pressure of **-15.0 psf (outward)** equal to 30% of design load to set the specimen in a negative mode. The pressure was held for ten (10) seconds and released.

Test: With all indicators set on zero, the test specimen was subjected to a negative pressure of **-25.0 psf, (outward)** equal to 50% of design load. The pressure was held for ten (10) seconds and released. The indicators were read and data recorded.

Results: Refer to Structural Deflection Table #2.

Test: The test specimen was subjected to a negative pressure of **-50.0 psf, (outward)** equal to 100% of design load. The pressure was held for ten (10) seconds and released. The indicators were read and data recorded.

Results: All the net midspan deflections were well below the allowable of 0.75 inches for the verticals and 0.26 inches for the horizontals. Refer to Structural Deflection Table #2.

6.5 Static Pressure Air Infiltration Test @ 6.24 psf per ASTM E283-91

The specimen was subjected to a positive pressure differential of **6.24 psf**. Air infiltration was measured, thus indicating the amount of infiltration through the chamber and the specimen. Subtracting the previous reading (chamber only) from this reading yields the amount of infiltration through the specimen.

Chamber and Specimen Reading: **42.62 scfm**

Results:

SPECIMEN & CHAMBER	CHAMBER	SPECIMEN ONLY (YIELD)	ALLOWABLE (NOT TO EXCEED)
42.62 scfm	37.19 scfm	5.43 scfm	38.9 scfm

6.6 Static Pressure Water Penetration Test @ 15.0 psf per ASTM E331-93

Water was applied to the exterior face of the specimen at a minimum rate of five (5) gallons per square foot per hour of wall area, in such a way as to completely and continuously cover the face of the specimen. Simultaneously, a positive **inward** differential static pressure of **15.0 psf** was applied against the face. The application of pressure and water was maintained for a period of fifteen (15) minutes, with observers inside the chamber checking for water penetration.



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Results: No uncontrolled water penetration was observed.

6.7 **Dynamic Water Penetration @ 100 mph Slipstream Velocity per AAMA 501.1-94**

Water was applied to the exterior face of the specimen at a minimum rate of five (5) gallons per square foot per hour of wall area, in such a way as to completely and continuously cover the face of the specimen.

Simultaneously, the wall was subjected to sufficient airflow from an aircraft engine with a four bladed propeller, approximately 13'-6" in diameter, approximately 20'-0" in front of the specimen. The application of airflow and water was maintained for a period of fifteen (15) minutes, with observers inside the chamber checking for water penetration.

Results: No uncontrolled water penetration was observed.

6.8 **Structural Proof Load Test @ 150% of Design Load per ASTM E330-97**

Dial indicators were installed to measure deflection and residuals at ends and midspans of typical vertical and horizontal members. The test specimen was subjected to a positive pressure of **37.5 psf (inward)** equal to 50% of proof load to set the specimen in a positive mode. The pressure was held for ten (10) seconds and released.

Test: With the specimen set in a positive mode, all indicators were set on zero. A positive pressure of **75.0 psf, (inward)** equal to 150% of the design load was applied and held for ten (10) seconds, then released. The indicators were read and the data recorded.

Results: All of the measured midspan net residuals were below the allowable limits. Refer to Structural Deflection Table #3 for all the deflections and net residuals measured.

The vacuum/blower pumps were reversed and set to perform in a negative mode. The test specimen was subjected to a negative pressure of **-37.5 psf (outward)** equal to 50% of proof load to set the specimen in a negative mode. The pressure was held for ten (10) seconds and released.

Test: With all indicators set on zero, the test specimen was subjected to a negative pressure of **-75.0 psf, (outward)** equal to 150% of design load. The pressure was held for ten (10) seconds and released. The indicators were read and data recorded.



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Results: All of the measured midspan residuals were below the allowable limits. Refer to Structural Deflection Table #4 for all the deflections and residuals measured.

7. CONCLUSION

The tested specimen performed within the specified criteria.

Respectfully submitted,

CONSTRUCTION CONSULTING LABORATORY, *INTERNATIONAL*

KENNETH H. LLOYD JR., P.E.
MANAGER

WESLEY A. WILSON
TESTING MANAGER



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APPENDIXES



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APPENDIX A

US ALUMINUM MOCK-UP DRAWINGS

Drawing

Date

M1 thru M5

10/2/00



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APPENDIX B

DIAL INDICATOR LOCATION DIAGRAM

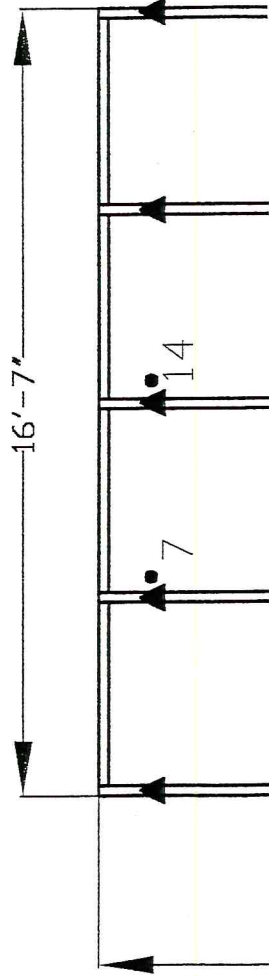


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DIAL INDICATORS

1. LOWER ANCHOR
2. LOWER MID-SPAN
3. BELOW SPLICE
4. ABOVE SPLICE
5. MID-ANCHOR
6. UPPER MID-SPAN
7. UPPER ANCHOR
8. LOWER ANCHOR
9. LOWER MID-SPAN
10. BELOW SPLICE
11. ABOVE SPLICE
12. MID-ANCHOR
13. UPPER MID-SPAN
14. UPPER ANCHOR
15. SPANDREL
16. VISION
17. VISION/VISION HORIZONTAL
17. EH END POINTS FOR 17
18. VISION/SPANDREL HORIZONTAL



LEGEND

- ▲ ANCHOR
- DIAL INDICATOR
- ≡ SPLICE

SHEET
US-1

PROJECT **3250 MOCK-UP
DIAL INDICATOR LOCATIONS**

OWNER **N/A**

CLIENT **U.S. ALUMINUM**

DRAWN **MA** DATE **10 / 23 / 00** CAD REF. SCALE **N/A**

CCI

Construction Consulting Laboratory
International

PROFESSIONAL ENGINEER
REGISTERED IN THE STATE OF MASSACHUSETTS

REV.	BY	DATE	DESCRIPTION



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APPENDIX C

STRUCTURAL DEFLECTION TABLES



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STRUCTURAL DEFLECTION DATA POSITIVE LOAD							
Indicator #	50% Design Load +25.0 psf			100% Design Load +50.0 psf			Allowable
	Total	Residual	Net	Total	Residual	Net	
1 ▲	.02	.00		.07	.01		
2 M	.23	.00	.15	.51	.00	.46	.75
3 S	.10	.00		.06	.00		
4 S	.04	.01		.07	.01		
5 ▲	.02	.00		.01	.00		
6 M	.08	.00	.06	.39	.12	.355	.75
7 ▲	.02	.00		.06	.01		
8 ▲	.03	.00		.07	.01		
9 M	.25	.01	.135	.51	.02	.305	.75
10 S	.15	.01		.25	.01		
11 S	.04	.00		.09	.00		
12 ▲	.02	.01		.02	.01		
13 M	.13	.00	.12	.31	.00	.285	.75
14 ▲	.00	.00		.03	.00		
15 Sp	.37	.00		.55	.01		
16 Vis	.23	.02		.36	.02		
17 H-ep	.30	.02		.54	.01		
17 Mh	.31	.02	.01	.56	.01	.025	.26
17 H-ep	.30	.02		.53	.01		
18 Mh	.16	.0	.035	.28	.00	0.125	.26

STRUCTURAL DEFLECTION TABLE 1

(Deflections shown in hundredths of an inch)
Movement in direction of load is shown as positive.
See Appendix B for specific indicator locations.

Legend:

- ▲ Anchor Location
- S Splice Location
- M Vertical Member Midspan
- H Horizontal Member Midspan
- H-ep Horizontal Member End Point
- Sp Spandrel Center Span
- Vis Vision Center Span

Definitions:

TOTAL DEFLECTION is the amount of movement recorded by the maximum movement hands at the full load indicated.

RESIDUAL DEFLECTION is the amount of change recorded between the before and after load dial indicator position.

NET DEFLECTION is the amount of movement of midspan member minus the average movement recorded at the anchors or end points.



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STRUCTURAL DEFLECTION DATA NEGATIVE LOAD							
Indicator #	50% Design Load -25.0 psf			100% Design Load -50.0 psf			
	Total	Residual	Net	Total	Residual	Net	Allowable
1 ▲	.06	.03		.06	.01		
2 M	.32	.05	.18	.48	.03	.435	.75
3 S	.14	.02		.19	.00		
4 S	.04	.02		.03	.03		
5 ▲	.02	.02		.03	.03		
6 M	.24	.03	.20	.43	.03	.375	.75
7 ▲	.06	.04		.08	.03		
8 ▲	.09	.05		.07	.01		
9 M	.34	.10	.245	.51	.03	.47	.75
10 S	.16	.04		.22	.02		
11 S	.09	.04		.13	.02		
12 ▲	.02	.00		.01	.00		
13 M	.19	.02	.165	.38	.04	.34	.75
14 ▲	.03	.01		.07	.03		
15 Sp	.33	.01		.52	.00		
16 Vis	.21	.00		.31	.00		
17 H-ep	.26	.00		.43	.00		
17 H	.29	.01	.025	.52	.01	.065	.26
17 H-ep	.27	.01		.48	.01		
18 H	.17	.02	.02	.28	.03	.075	.26

STRUCTURAL DEFLECTION TABLE 2

(Deflections shown in hundredths of an inch)
 See Appendix B for specific indicator locations.

Legend:

- ▲ Anchor Location
- S Splice Location
- M Vertical Member Midspan
- H Horizontal Member Midspan
- H-ep Horizontal Member End Point
- Sp Spandrel Center Span
- Vis Vision Center Span

Definitions:

TOTAL DEFLECTION is the amount of movement recorded by the maximum movement hands at the full load indicated.

RESIDUAL DEFLECTION is the amount of change recorded between the before and after load dial indicator position.

NET DEFLECTION is the amount of movement of midspan member minus the average movement recorded at the anchors or end points.



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PROOF LOAD DEFLECTION DATA-POSITIVE LOAD					
Indicator #	150% Design Load +75.0 psf				
	Total	Residual	Net Deflection	Net Residual	Residual
1 ▲	.21	.14			
2 M	.86	.20	.455	.04	.156
3 S	.42	.15			
4 S	.20	.12			
5 ▲	.16	.12			
6 M	.76	.16	.58	.00	.156
7 ▲	.20	.20			
8 ▲	.24	.18			
9 M	.95	.22	.69	.04	.156
10 S	.58	.23			
11 S	.34	.20			
12 ▲	.20	.12			
13 M	.67	.16	.50	.055	.156
14 ▲	.14	.09			
15 Sp	.69	.00			
16 Vis	.44	.02			
17 H-ep	.81	.01			
17 H	.83	.01	.135	.00	.046
17 H-ep	.58	.01			
18 H	.59	.21	.09	.02	.046

STRUCTURAL DEFLECTION TABLE 3

(Deflections shown in hundredths of an inch)
See Appendix B for specific indicator locations.

Legend:

- ▲ Anchor Location
- S Splice Location
- M Vertical Member Midspan
- H Horizontal Member Midspan
- H-ep Horizontal Member End Point
- Sp Spandrel Center Span
- Vis Vision Center Span

Definitions:

TOTAL DEFLECTION is the amount of movement recorded by the maximum movement hands at the full load indicated.

RESIDUAL DEFLECTION is the amount of change recorded between the before and after load dial indicator position.

NET DEFLECTION is the amount of movement of midspan member minus the average movement recorded at the anchors or end points.

NET RESIDUAL is the amount of permanent deformation recorded at the midspan of a member minus the average residual recorded at the anchor or end points.



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PROOF LOAD DEFLECTION DATA-POSITIVE LOAD					
150% Design Load -75.0 psf					
Indicator #	Total	Residual	Net Deflection	Net Residual	Residual
1 ▲	.08	.01			
2 M	.71	.06	.44		.156
3 S	.26	.04			
4 S	.04	.01			
5 ▲	.02	.02			
6 M	.62	.03	.56	.01	.156
7 ▲	.10	.02			
8 ▲	.09	.01			
9 M	.69	.04	.515	.03	.156
10 S	.30	.00			
11 S	.18	.01			
12 ▲	.02	.01			
13 M	.57	.02	.525	.005	.156
14 ▲	.07	.02			
15 Sp	.60	.00			
16 Vis	.40	.02			
17 H-ep	.70	.01			
17 H	.75	.02	.05	.01	.046
17 H-ep	.70	.01			
18 H	.51	.04	.23	.02	.046

STRUCTURAL DEFLECTION TABLE 4

(Deflections shown in hundredths of an inch)
See Appendix B for specific indicator locations.

Legend:

- ▲ Anchor Location
- S Splice Location
- M Vertical Member Midspan
- H Horizontal Member Midspan
- H-ep Horizontal Member End Jpoint
- Sp Spandrel Center Span
- Vis Visin Center Span

Definitions:

TOTAL DEFLECTION is the amount of movement recorded by the maximum movement hands at the full load indicated.

RESIDUAL DEFLECTION is the amount of change recorded between the before and after load dial indicator position.

NET DEFLECTION is the amount of movement of midspan member minus the average movement recorded at the anchors or end points.

NET RESIDUAL is the amount of permanent deformation recorded at the midspan of a member minus the average residual recorded at the anchor or end points.



CURTAIN WALL MOCK-UP TESTING REPORT
US ALUMINUM 3250 CURTAIN WALL
REPORT # CCLI-00-128

October 27, 2000

APPENDIX D

PHOTOGRAPH



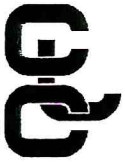
CURTAIN WALL MOCK-UP TESTING REPORT
US ALUMINUM 3250 CURTAIN WALL
REPORT # CCLI-00-128

October 27, 2000



Photograph 1

3250 Mock-Up



CURTAIN WALL MOCK-UP TESTING REPORT
US ALUMINUM 3250 CURTAIN WALL
REPORT # CCLI-00-128

October 27, 2000

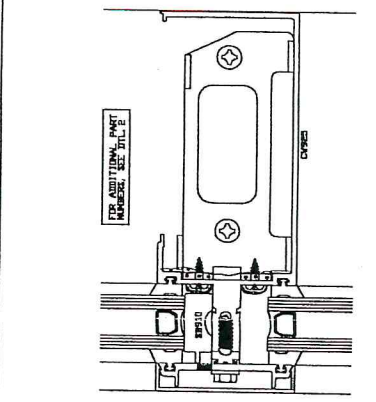
- END OF REPORT -

NO.	REVISION	DATE

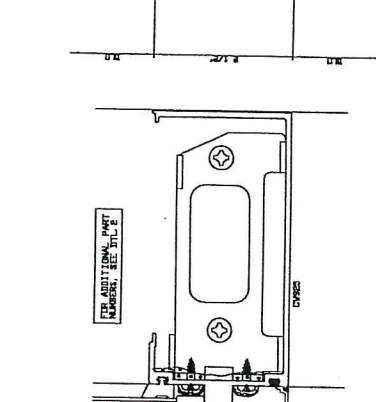
WRITTEN STATES ALUMINUM CORPORATION
 10000 WEST 10TH AVENUE
 DENVER, COLORADO 80202
 PHONE (303) 750-1000
 TELETYPE (303) 750-1000
 FAX (303) 750-1000

MOCK-UP
 3250 CURTAINWALL
 STRUCTURAL TEST

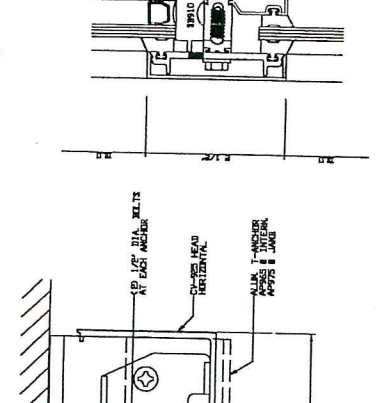
SCALE	1/4" = 1'-0"
DATE	10/24/00
PROJECT	MOCK-UP
NO.	2
OF	5



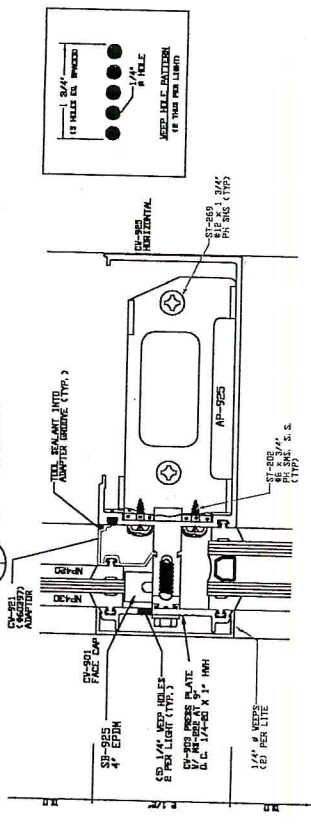
2B HORIZONTAL DETAIL
 1'-0" OVER 1'-0" VISION



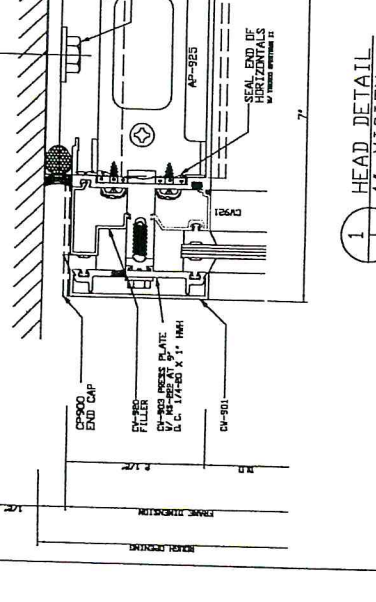
2A HORIZONTAL DETAIL
 1'-0" VISION/1/4" SPANDREL



1 HEAD DETAIL
 1'-0" VISION

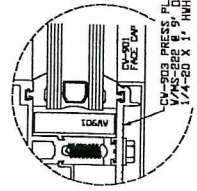


2 HORIZONTAL DETAIL
 1/4" SPANDREL/1'-0" VISION



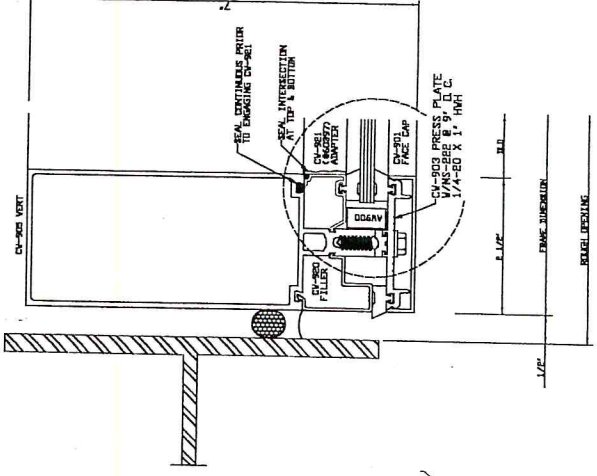
3 SILL DETAIL
 1/4" SPANDREL

CONSTRUCTION CONSULTING
LABORATORY, INTERNATIONAL
 1601 Luna Road
 Carrollton, Texas 75006
 Phone (972) 242-0556
 Report # 128 Reviewed By: *[Signature]*
 Date: 10/24/00

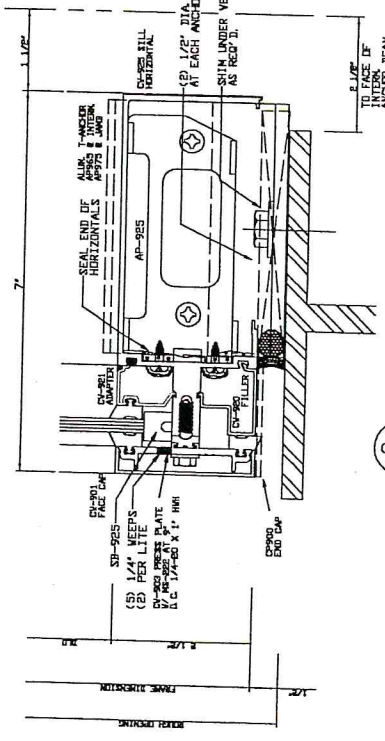


SEE DETAIL 4 FOR
 FULL DETAIL, NOTES AND DIMENSIONS

5 JAMB VERTICAL
 1'-0" VISION



4 JAMB VERTICAL
 1/4" SPANDREL



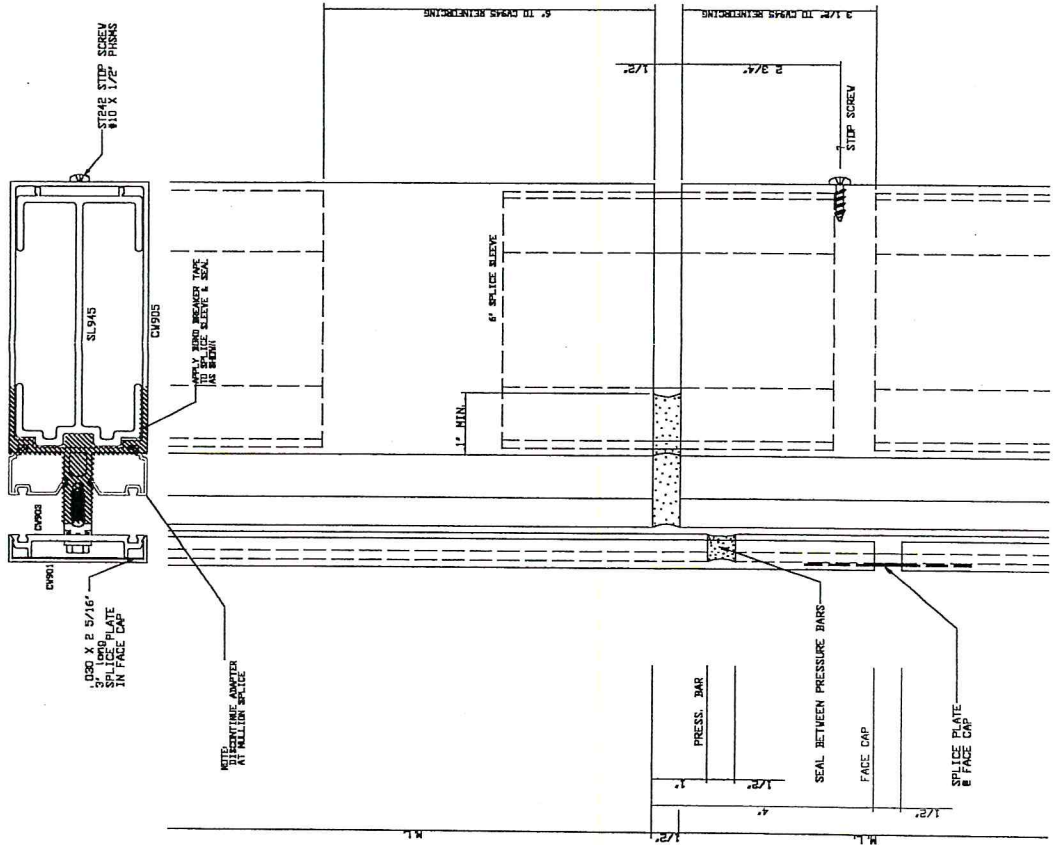
3 SILL DETAIL
 1/4" SPANDREL

NO.	REVISION	DATE	BY

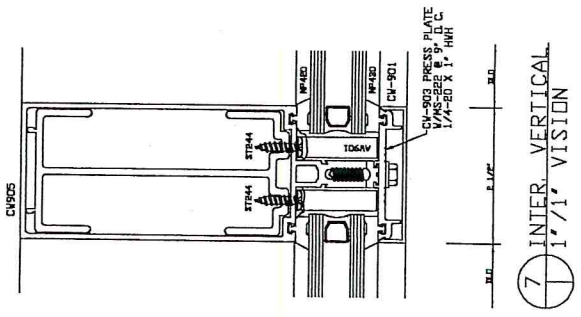
UNITED STATES ALUMINUM CORPORATION
 ALUMINUM DIVISION
 1000 WEST 10TH AVENUE
 DENVER, COLORADO 80202
 PHONE 303-733-1000
 CABLE 303-733-1000

MOCK-UP
 3250 CURTAINWALL
 STRUCTURAL TEST

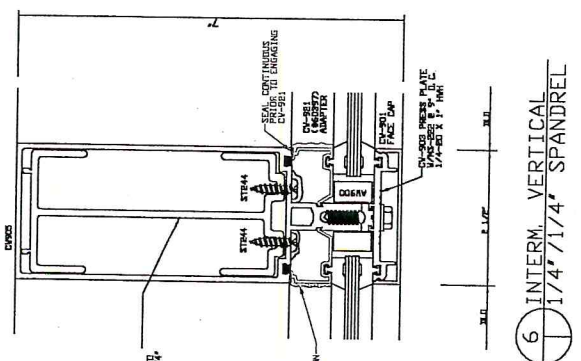
DRAWN BY
 G. HULL
 DATE
 10/2/00
 SCALE
 FULL SIZE
 DRAWING NO.
 MCK000-13
 SHEET
 3 5



10. SPLICE DETAIL
 CAPTURED VERTICAL



DETAIL NUMBERS 8 & 9 NOT USED



CONSTRUCTION CONSULTING
LABORATORY, INTERNATIONAL
 1601 Luna Road
 Carrollton, Texas 75006
 Phone (972) 242-0556
 Report # 128
 Date: 10/24/00

Reviewed By: [Signature]

REINFORCING CHAIRS NOT TO BE INSTALLED AT ALL X 3/4\"/>

SEAL INTERSECTION AT TOP VERTICAL CURTAINWALL

CH-9901 PRESS. PLATE 1/4\"/>

6. INTERM. VERTICAL
 1'-4\"/>

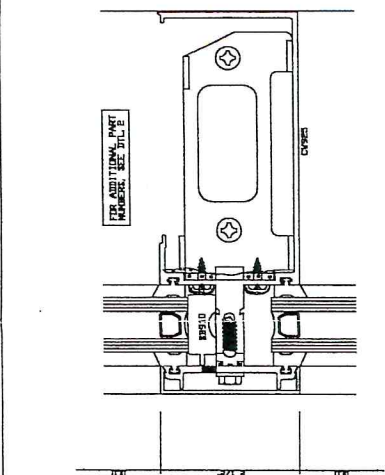
7. INTER. VERTICAL
 1'-1\"/>

NO.	REVISION	DATE	BY

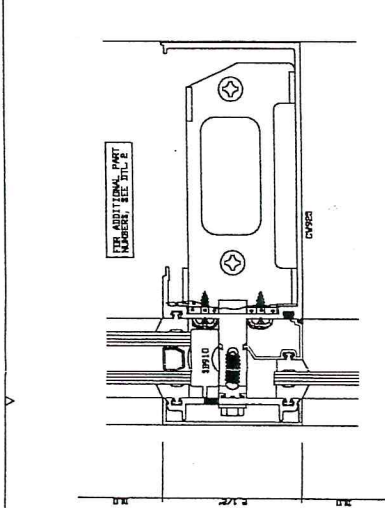
UNITED STATES ALUMINUM CORPORATION
 ALUMINUM DIVISION
 1900 BROADWAY
 PITTSBURGH, PA. 15222
 PHONE (412) 781-2000
 TELETYPE (412) 781-2000
 CABLE: ALUMINUM

MOCK-UP
 3250 CURTAINWALL
 STRUCTURAL TEST

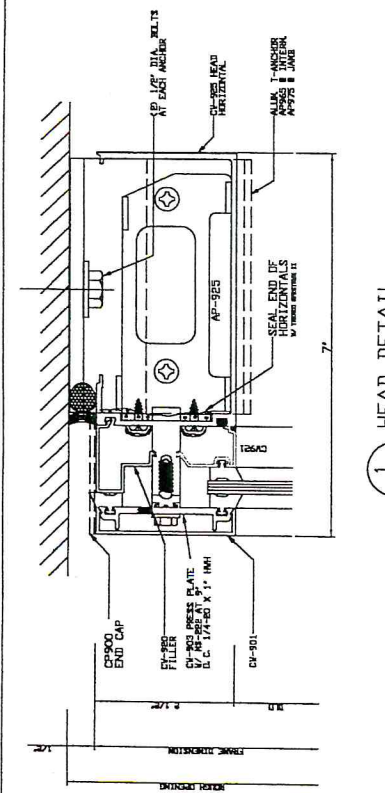
DATE	10/2/70
SCALE	FULL SIZE
DRAWING NO.	MOCK-UP-13
SHEET	2
OF	5



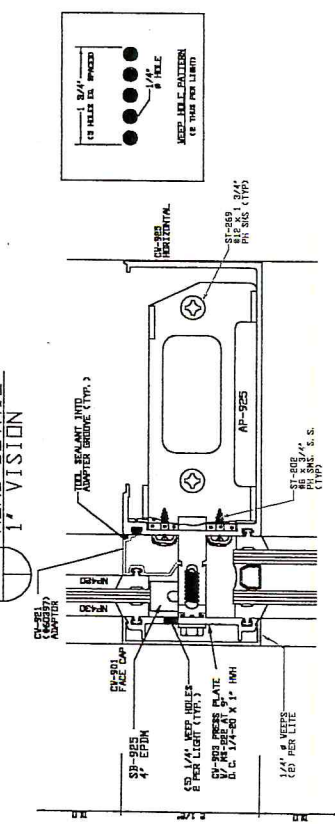
2A HORIZONTAL DETAIL
 1' VISION/1/4' SPANDREL



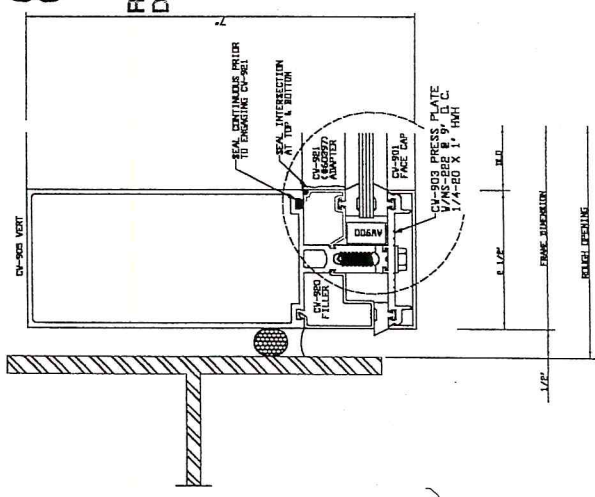
2B HORIZONTAL DETAIL
 1' OVER 1' VISION



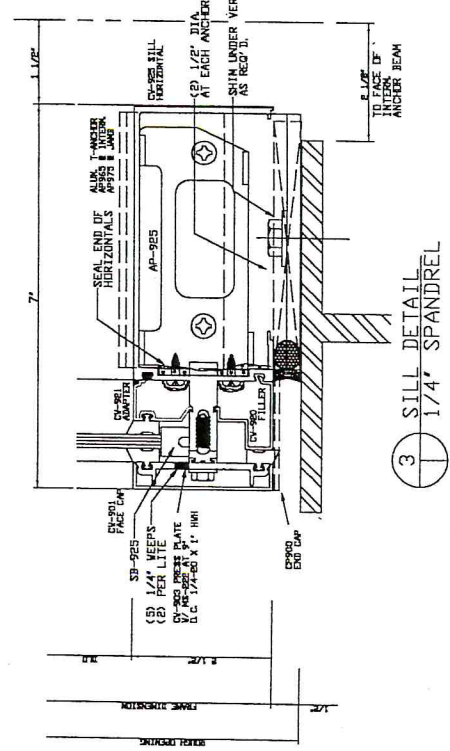
1 HEAD DETAIL
 1' VISION



2 HORIZONTAL DETAIL
 1/4' SPANDREL/1' VISION

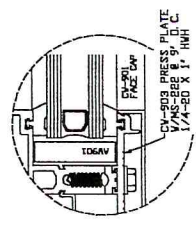


4 JAMB VERTICAL
 1/4' SPANDREL



3 SILL DETAIL
 1/4' SPANDREL

CONSTRUCTION CONSULTING
LABORATORY, INTERNATIONAL
 1601 Luna Road
 Carrollton, Texas 75006
 Phone (972) 242-0556
 Report # 128
 Reviewed By: *[Signature]*
 Date: 10/24/70



SEE DETAIL A FOR
 FULL DETAIL, NOTES AND DIMENSIONS

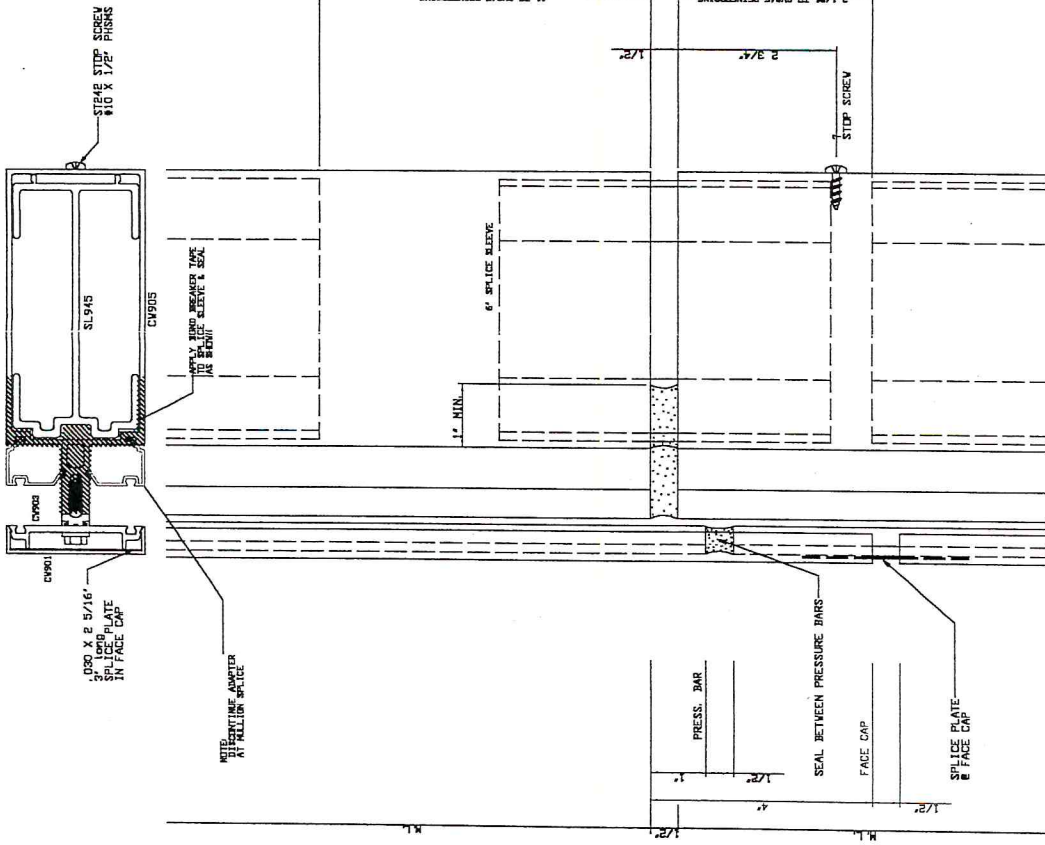
5 JAMB VERTICAL
 1' VISION

NO.	DATE	REVISION	BY

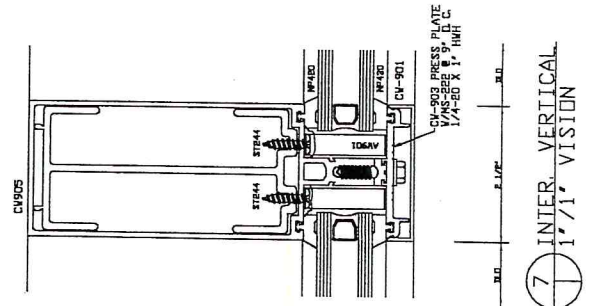
WRITER STATES ALUMINUM CORPORATION
 1000 WEST 10TH AVENUE
 DENVER, COLORADO 80202
 PHONE 303-733-1000
 TELETYPE 303-733-1000
 FAX 303-733-1000

MOCK-UP
 3250 CURTAINWALL
 STRUCTURAL TEST

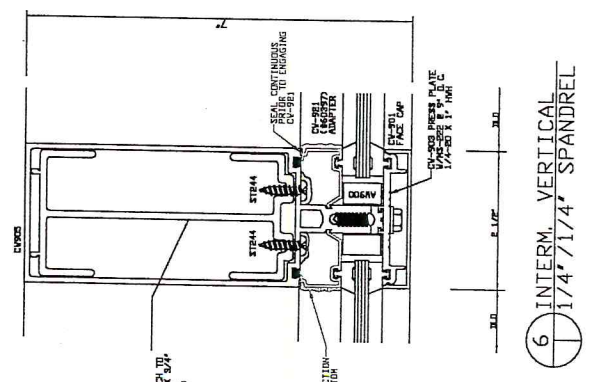
DRAWN BY	G. HALL
DATE	10/28/00
PROJECT	MOCK-UP
FULL SIZE	
TRAINING #	REC000-13
REVISION	
SHEET	3 OF 5



10 SPlice DETAIL
 CAPTURED VERTICAL



7 INTER. VERTICAL
 1' / 1' VISION



6 INTERM. VERTICAL
 1/4' / 1/4' SPANDREL

CONSTRUCTION CONSULTING
LABORATORY, INTERNATIONAL
 1601 Luna Road
 Carrollton, Texas 75006
 Phone (972) 242-0556
 Report # 128
 Date: 10/24/00

Reviewed By: [Signature]
 Date: 10/24/00

DETAIL NUMBERS 8 & 9 NOT USED

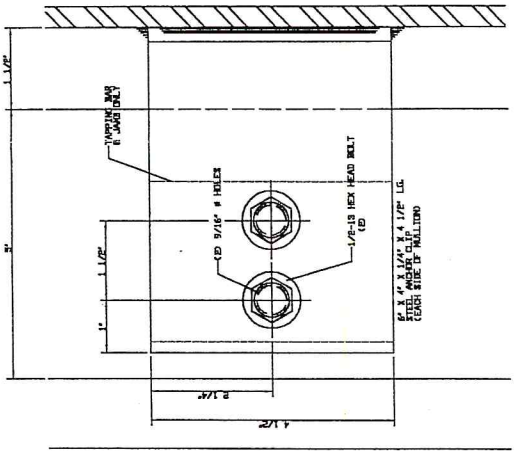
NO.	REV.	DATE

BRITISH STATES ALUMINUM CORPORATION
 BRITISH STATES ALUMINUM CORPORATION
 BRITISH STATES ALUMINUM CORPORATION

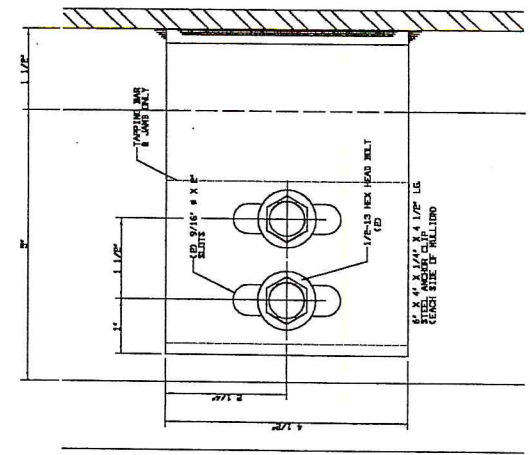
MOCK-UP
 3250 CURTAINWALL
 STRUCTURAL TEST

DATE	10/2/00
SCALE	FULL SIZE
DRAWN BY	MEGDD-13
CHECKED BY	

4
 5



12 WINDLOAD ANCHOR
 SEE PLAN VIEWS
 14/8 FOR TYPICAL VERTICAL
 15/5 FOR JAMB VERTICAL



13 DEADLOAD ANCHOR
 SEE PLAN VIEWS
 14/8 FOR TYPICAL VERTICAL
 15/5 FOR JAMB VERTICAL

DETAIL NUMBER 11 NOT USED

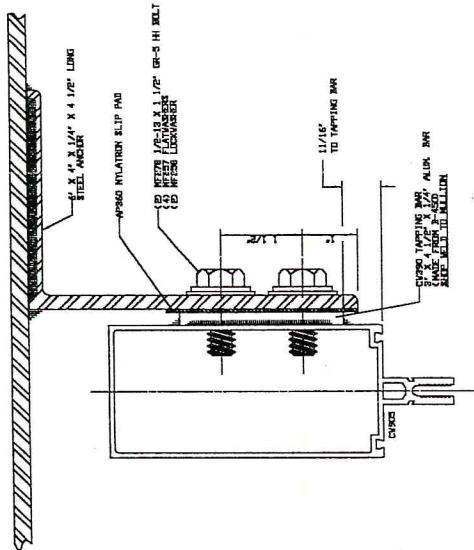
CS CONSTRUCTION CONSULTING
 LABORATORY, INTERNATIONAL
 1601 Luna Road
 Carrollton, Texas 75006
 Phone (972) 242-0556
 Report # 118
 Date: 10/24/00
 Reviewed By: [Signature]

NO.	REVISION	DATE

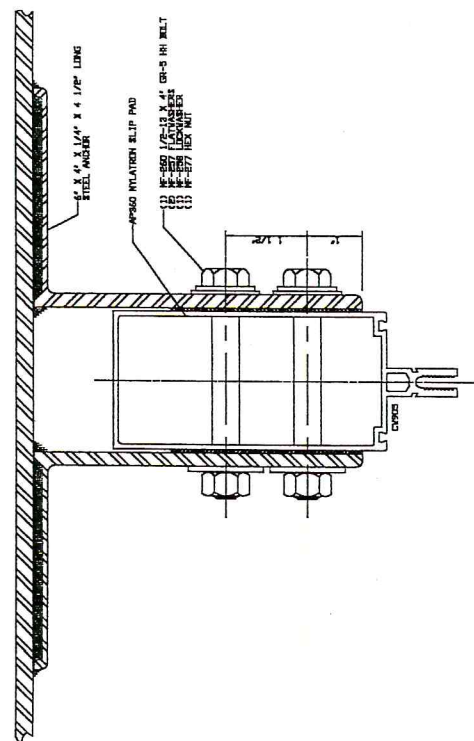
UNITED STATES ALUMINUM CORPORATION
 ALUMINUM DIVISION
 1000 WEST 10TH AVENUE
 DENVER, COLORADO 80202
 PHONE (303) 733-1000
 TELETYPE (303) 733-1000
 CABLE: ALUMINUM
 MAILING LIST AVAILABLE

MOCK-UP
 CURTAIN WALL
 STRUCTURAL TEST

DESIGNED BY
 G. HALL
 DATE
 10/2/00
 SCALE
 FULL SIZE
 DRAWING NO.
 M2000-13
 SHEET
 5
 OF
 5



15 ANCHOR PLAN
 JAMB VERTICAL
 (LEFT JAMB SECTION-RT. DRP.)



14 ANCHOR PLAN
 INTERM. VERTICAL

**CONSTRUCTION CONSULTING
 LABORATORY, INTERNATIONAL**
 1601 Luna Road
 Carrollton, Texas 75006
 Phone (972) 242-0556
 Report # 128 Reviewed By: *[Signature]*
 Date: 10/24/00