

File 40/8
102

CONTRACTOR'S SUBMITTAL TRANSMITTAL
LANTDIV NORFOLK 4-4355/3 (Rev. 11-80)

FROM CONTRACTOR
Trader Construction Co.

TO
Lockwood Greene/Six Associates

CONTRACT NO. **81-C-1766** TRANSMITTAL NO. **42B** DATE **Jan. 16, 1984**

PROJECT TITLE AND LOCATION
**Public Works
MCB
Camp Lejeune, N. C.**

CONTRACTOR USE ONLY

*List only one specification division per form.

List only one of the following categories on each transmittal form, and indicate which is being submitted

- Contractor Approved
- OICC Approval
- Deviation/Substitution For OICC Approval

REVIEWER USE ONLY

**ACTION CODES
A-Approved
D-Disapproved
AN-Approved as noted
RA-Receipt acknowledged.
C-Comments
R-Resubmit

ITEM NO.	PROJ. SPEC. SECT. & PARA. and/or PROJ. DWG. NO.	ITEM IDENTIFICATION (Type, size, model no., Mfg. name, dwg. or brochure number)	NO. OF COPIES	ACTION CODES	REVIEWER'S INITIALS CODE AND DATE
138	08515	F. H. Maloney, Glazing Gasket, Test Data		A	A.B. 7 Feb 84
		Air & Water Infiltration Requirements	7		

FEB 13 12 09 PM '84
 RECEIVED
 ROICC JANXCA

CONTRACTOR'S COMMENTS

PLEASE RETURN FOUR APPROVED COPIES

COPY OF TRANSMITTAL AND SUBMITTALS TO ROICC

ROICC, Camp Lejeune, N. C.

DATE RECEIVED BY REVIEWER **1/19/84**

FROM (Reviewer) **Six Associates, Inc.**

CONTRACTOR REPRESENTATIVE (Signature) *Ms. Dale Stallings*

TO **Trader Construction Co.**

- Submittals are returned with action indicated. Approval of an item does not include approval of any deviation from the contract requirements unless the contractor calls attention to and supports the deviation.
- Submittals are forwarded to LANTDIV with A-E recommendations indicated in REVIEWER USE ONLY Section and in comments below on ONE COPY of the transmittal form.

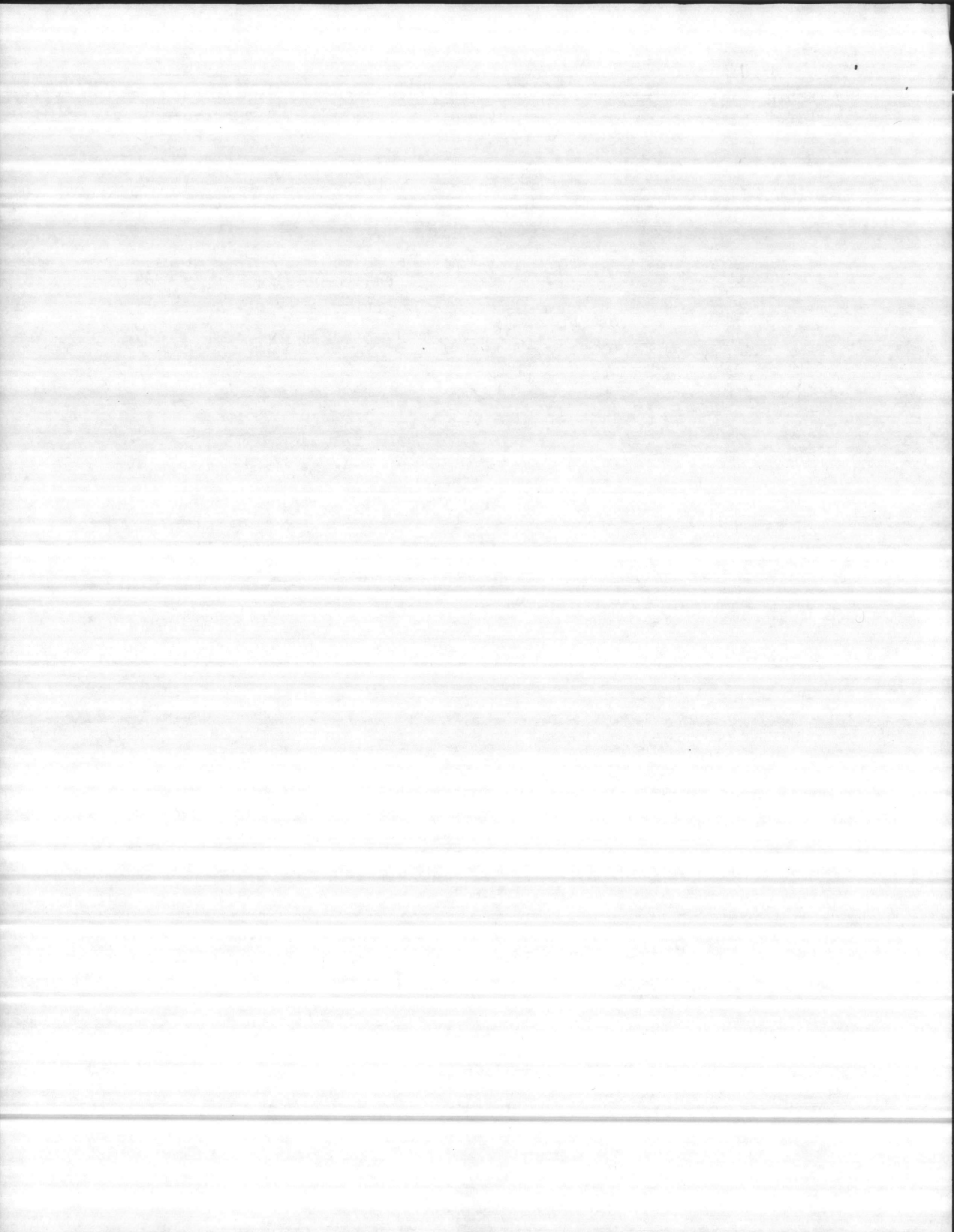
REVIEWER'S COMMENTS

COPY TO: FIELD
DATE: FEB 27 1984

COPIES TO:
ROICC (2) ✓
LANTDIV (1)
A-E (1)

DATE **2/7/84**

SIGNATURE *A.B. Joh*



08515-3
5.3.1
5.3.2

A. A. SAKHNOVSKY • CONSTRUCTION RESEARCH LABORATORY

7600 N. W. 79th AVENUE • MIAMI • FLORIDA 33166 • (305) 592-9222
(305) 592-9223

August 19, 1977

Dates Tested: July 21 and 22, 1977

Test No. 2603 - Curtain Wall Tested for
General Electric Credit, Canton, Ohio

Client: United Plate Glass Company of Akron

Description of Test Unit:

RECEIVED APR 28 1978
81-C-1766
"It is hereby certified that the (equipment) (material) shown and marked in this submit-
Contract No. 81-C-1766
approved, and is submitted to the allocat-
Certified by DS
Date 1-16-84

J-C Products Corporation extruded aluminum window wall glazed with F. H. Maloney ladder-type lockstrip gaskets with the wall set within a 7" band of project precast with exposed aggregate. The size of the window wall as 12' 4 11/16" wide (plus a 5 13/16" sheet metal corner return by 7' 6" high. The installation was three openings wide with each opening consisting of a nominal 5' 10" insulated vision light unit above a 1' 6" high Mirawal insulated panel.

Glass consisted of Chrome-A-Seal tinted unbanded 1" insulating glass units (1/4" annealed interior and exterior lights - 1/2" airspace).

The lights were 69 1/8" high with the side lights 46 3/8" wide and the center light 47 3/8" wide. The metal gasket retaining member openings agreed with the client's drawing.

The 1" Mirawal panel thickness varied plus and minus .040".

The gasket glazing channels and window sills were drained to the exterior. Refer to the specific details.

The test unit is in substantial conformance with the J-C Products drawing, Drawing No. 7612-46 MU, Sheet 1 of 1 dated 2/28/77 with the following exceptions or additions:

The corner intersections of the aluminum framing members were bedded in butyl sealant during assembly with the exterior excess wiped off.

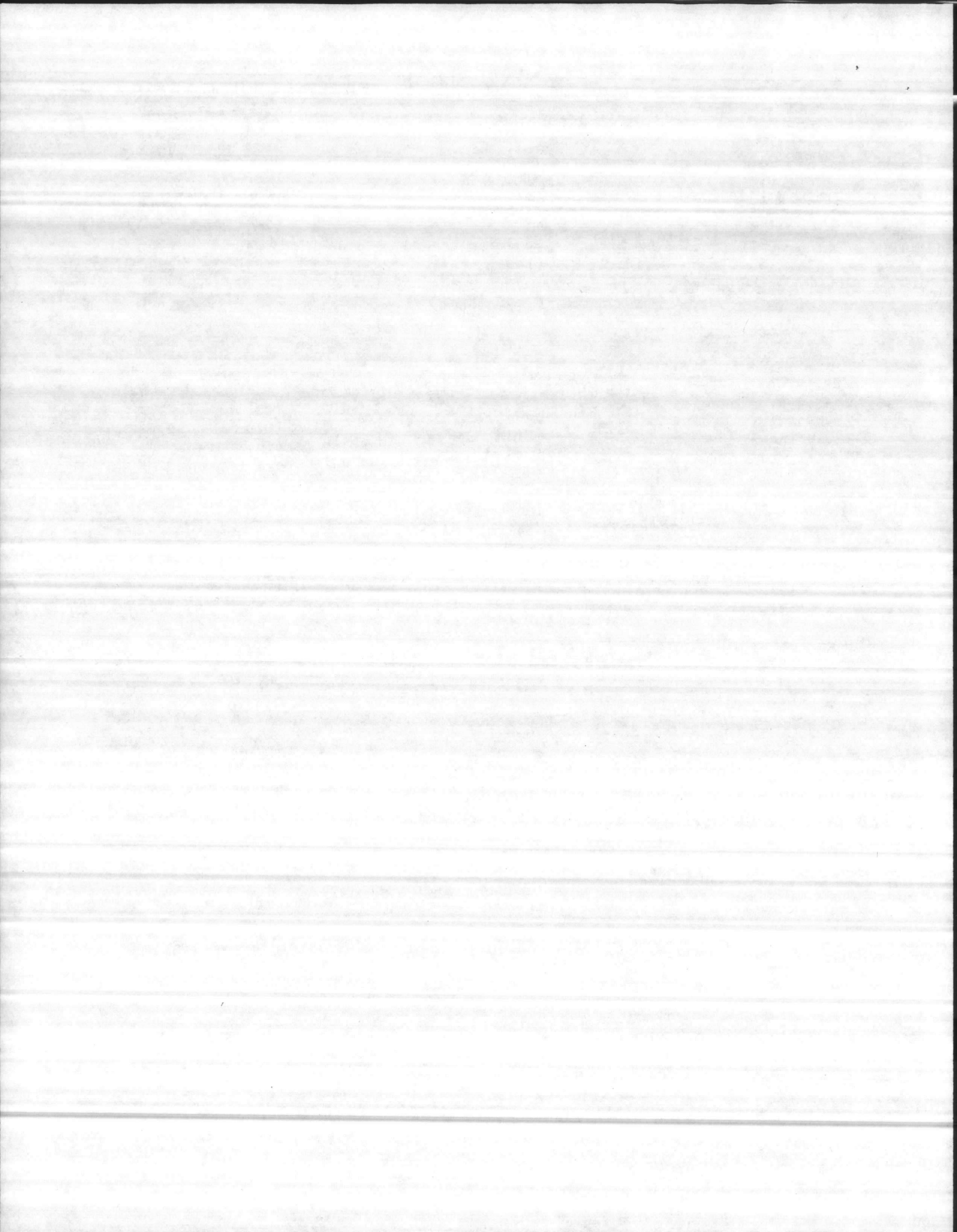
A field applied exterior seal of GE Silpruf was applied at the window wall jamb to corner sheet metal vertical intersection.

GE Silpruf silicone sealant was used for the window wall perimeter seals.

The mating surface of the lockstrip gasket flange and metal framing members was bedded in butyl sealant at the following locations:

- Bottom perimeter corners - 5" horizontally and vertically, exterior and interior flange
- Bottom of intermediate mullions - 5" wide, exterior and interior flange
- Top perimeter corners - 5" horizontally and vertically, exterior flange

The mating surfaces of the outer flange of the lockstrip gaskets and the glass or panels were sealed 2" horizontally and vertically at the upper corners of the glass and the lower left corner of the right panel.



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The window frame was anchored to the precast at the insert locations shown on the elevation with 1/4" diameter round head machine screws and regular washers fastened directly through a 5/16" x 1 1/4" slot in the 1/4" thick recessed portion of the frame. Refer to comments regarding Detail A-A.

At Section A-A:

The 1/8" plate and 1/4" aluminum bar were not used. The 5/16" x 1 1/4" slot was punched into the framing member (typical).

At Detail 2:

The weep holes were 3/16" diameter located at each light 3" from the daylight opening and at midspan.

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Contract Number 81-C-1766
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At Detail 3:

The weep holes in the web of the gasket were 1/4" diameter centered in each opening 1 1/2" from the daylight opening and at midspan.

The weep holes in the sill and bottom flange of the gasket in each opening were approximately 1/4" diameter and located several inches from the mullion. There were two holes per panel.

At Detail 6:

The window jambs and brake formed corner were not anchored to the structure.

Size of Test Window Wall:

12' 10 1/2" wide (developed width) by 7' 6" high

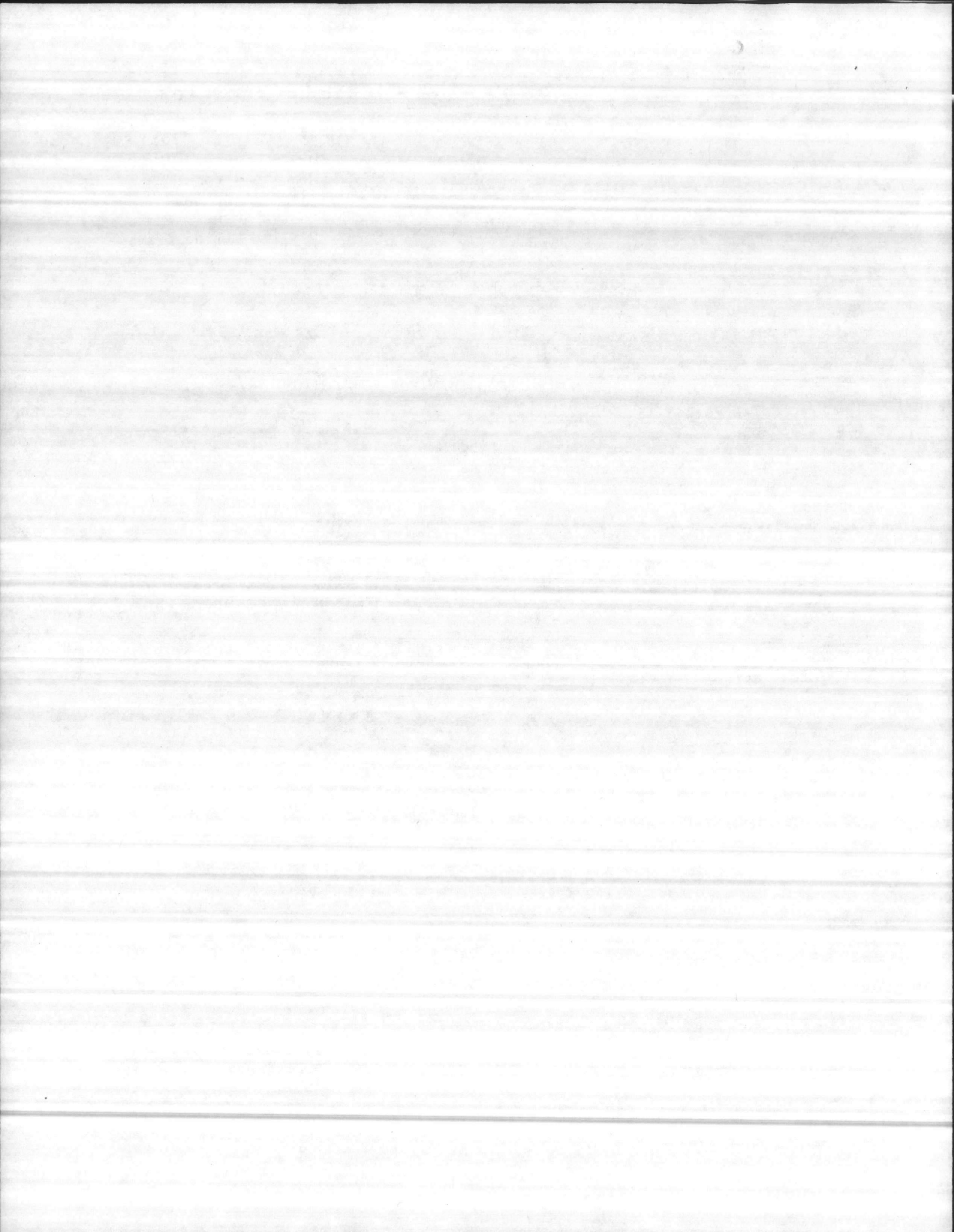
Witnessed by: Messrs. Ben Hawkins - United Plate Glass Co. of Akron
(for all or partial testing) Bob Baker - J-C Products Corporation
Jerry Courtney - F. H. Maloney Company
Tom Wright
Richard Sembello - Construction Research Laboratory

Manner of Testing:

The test sample was installed in a strong test chamber with anchorage designed to simulate job conditions. The test sample was tested for static pressure air and water infiltration, dynamic pressure water infiltration, and static pressure structural performance in substantial accordance with the current procedures described in the National Association of Architectural Metal Manufacturers (NAAMM) Metal Curtain Wall Manual.

The order of testing was as given below.

The wall was subjected to a positive 10 psf static pressure load per the current NAAMM procedure before conducting any tests.



08515-3
5.3.2

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All observations are referenced to viewing the test unit from the exterior. Where lights or panels are identified by number, they have arbitrarily been numbered from left to right

In the deflection data for the structural load testing, the number following the slant is the dial indicator reading taken after removal of the test load. The "net" deflection is the gross midspan deflection less the average end movement under load. The dial indicator are set to zero after each test load.

Test Conditions and Results:

Test I - Water Infiltration by Static Pressure

5.3.2 The wall was subjected to a water spray at the rate of five gallons per hour per square foot and static pressure of 4 psf for 15 minutes.

Results:

Allowed: No uncontrolled water infiltration.

Measured: No water infiltration.

Test II - Water Infiltration by Dynamic Pressure

5.3.2 The wall was subjected to a water spray at the rate of five gallons per hour per square foot and winds from a 3000 horsepower aircraft engine wind generator at nominal 10 psf (50% of 20 psf design load) for 15 minutes.

Results:

Allowed: No uncontrolled water infiltration.

Measured:

Leakage at the rate of approximately eight drops per minute occurred at the gasket at the upper right corner of panel #3 with a portion draining down the jamb gasket to the sill and the remainder dripping onto the sill.

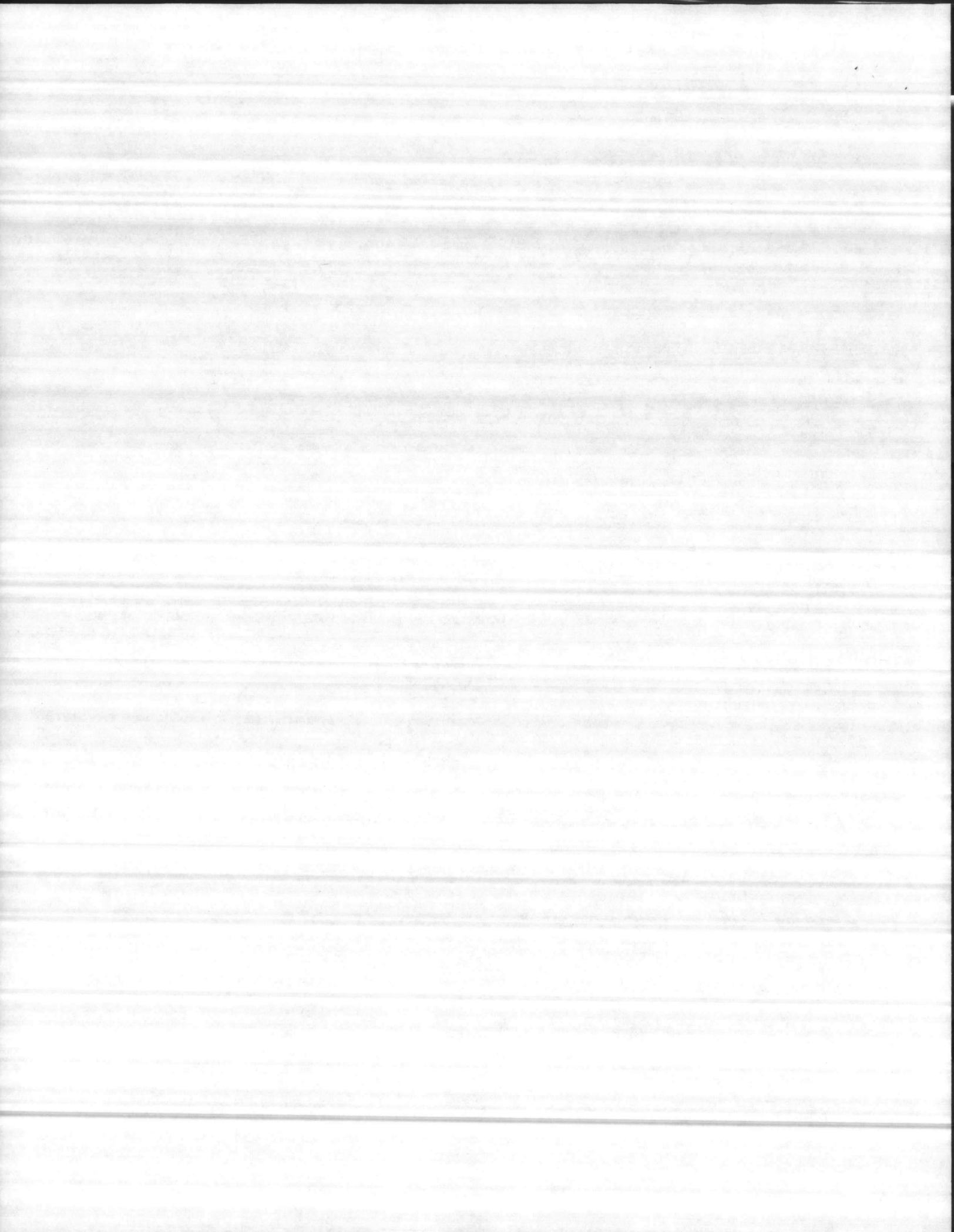
Leakage at the rate of approximately one drop per minute occurred at the bottom right corners of lights #2 and #3.

A trace leak occurred at the bottom left corner of light #2.

Test III - Structural Performance Tests by Static Pressure

The wall was subjected to the following structural loadings held for ten seconds each:

- + 10 psf - to remove slack at 50% of positive pressure design load
- + 20 psf - to measure deflection at 100% of positive pressure design load
- 10 psf - to remove slack at 50% of negative pressure design load
- 20 psf - to measure deflection at 100% of negative pressure design load
- 30 psf* - to demonstrate a safety factor of 150% of negative design load
- + 30 psf* - to demonstrate a safety factor of 150% of positive design load



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No damage or failures occurred as a result of the above noted loadings.

*These tests were not required by the project specifications.

Deflection measured at significant locations and the midspan of typical members was as follows:

Member	Span	Deflection (Inches)		Allowed 1/175 or 3/4" max. a design load
		Measured +20 psf	Measured -20 psf	
Typical intermediate mullion at bottom	81'-0" (approx)	.060/.015	.090/.020	
midspan		.300/.010	.270/.030	
top		.030/0	.100/.060	
midspan (net)		.255/.003	.175/-.010	.491
Midspan of typical intermediate framing member	47"	.010/0	.010/0	.269

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 Certified by _____
 Date 1-16-84

Note: Glass deflections were reported in the preliminary report submitted July 22, 1977.

5.3.1

Test IV - Air Infiltration by Static Pressure

The air infiltration through the wall at a static pressure of 1.56 psf (equal to a 25 MPH wind) was:

Allowed: 0.06 cfm per square foot or 5.5 cfm total

Measured: 0.005 cfm per square foot or 0.5 cfm total

Test V - Supplementary Structural Performance Tests by Static Pressure (These tests were not required by the project specifications)

The wall was subjected to the following structural loadings held for ten seconds each:

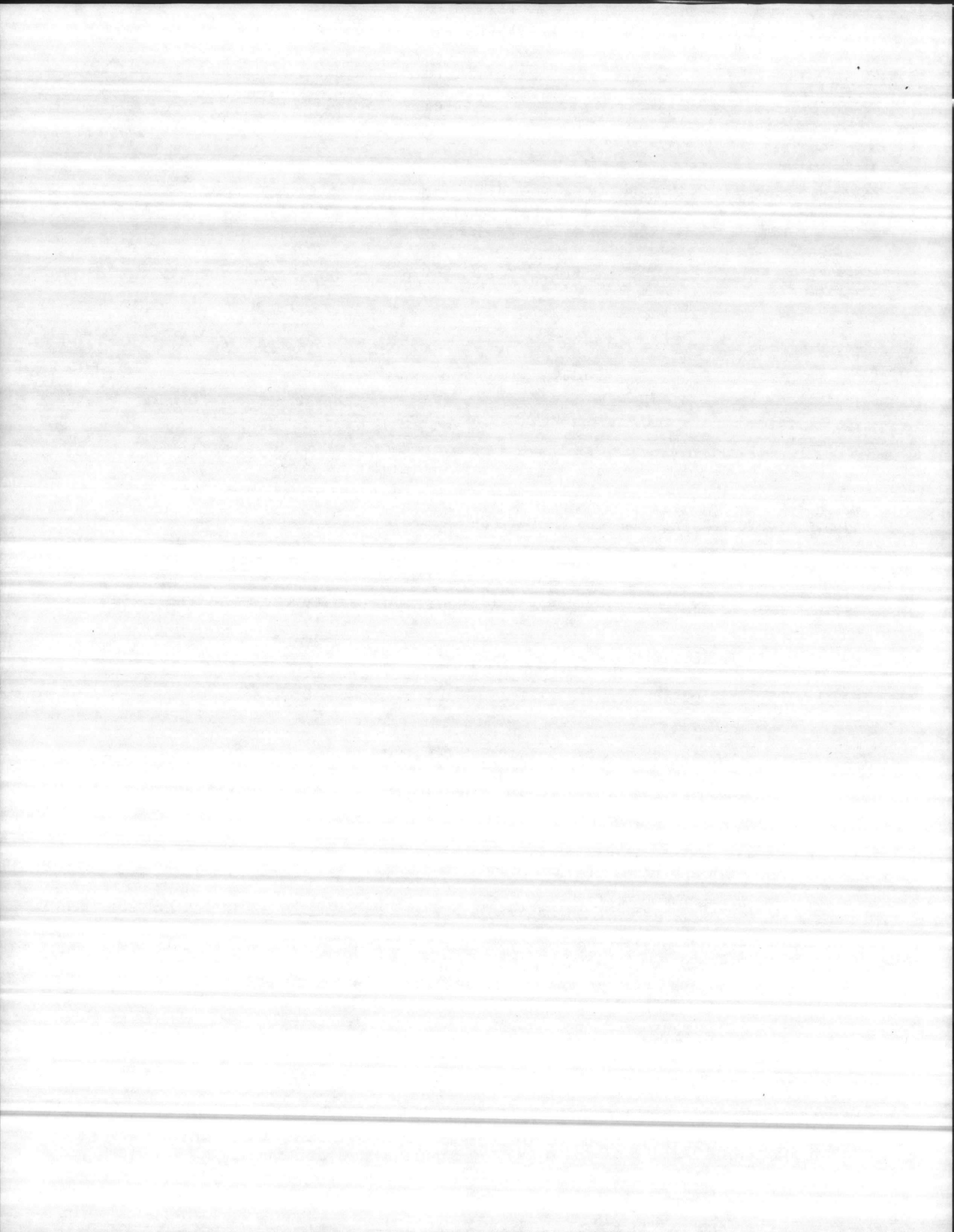
+ 45 psf - to demonstrate a safety factor of 225% of positive design load

The wall was also subjected to momentary loadings of -42 psf and -56 psf after which time testing was terminated.

No damage or failures occurred as a result of the above noted loadings.

Comments:

Interior gasket lip pressure along the entire top of the right panel and along a significant portion of the top of the other two panels was almost non-existent. Interior



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gasket lip pressure was marginal at several other corners. Where gasket lip pressure is inadequate a supplementary butyl wet seal between the interior gasket flange and glass should be applied to provide a watertight installation.

The intersection of the panel interior top gasket and lockstrip gasket jamb presents the possibility of a gasket seal discontinuity. A supplementary butyl seal at this location may be beneficial.

Insertion of a .003" thick feeler gage between the gasket sealing lips and infill is a good method of determining if adequate lip pressure is being attained. Adequate pressure would cause the feeler gage to be held snugly by the gasket or it may make it impossible to insert the gage.

The force of driving the gasket spline into the intermediate horizontal member broke several of the member assembly clip screws (see Detail 2). Care must be exercised in performing this operation.

All joints in the precast concealed by the window frame must be packed and sealed prior to window installation if the interior perimeter seals are to perform as a water barrier; however, even if this is done any water collected over 1/4" deep will leak to the interior through the metal to metal jointery of the sill cover and the vertical members. This seal is not required to make the wall system function.

Summary:

The wall was tested in accordance with the Architect's performance criteria for static pressure air and water infiltration, dynamic pressure water infiltration and static pressure structural performance. The wall has met the Architect's performance criteria for static pressure air and water infiltration and static pressure structural performance. The wall has met the intent of the Architect's performance criteria for dynamic pressure water infiltration considering the minor amount of leakage that occurred at a water test pressure of 50% of the structural design load.

Respectfully submitted,
CONSTRUCTION RESEARCH LABORATORY

"It is hereby certified that the (equipment) (material) shown and marked in this submittal is that proposed to be incorporated into
Richard Sembello
Richard Sembello

Contract Number N30470 81-C-1766 is in compliance with the Contract drawings and specifications, can be installed in the allocated space, and is submitted Government approval.

Certified by DS

Date 1-16-84

