Quality Accuracy Assurance

Fenestration Testing Laboratory, Inc.

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Report Date:	01/08/2009
Completion Date:	11/24/2008
Expiration Date:	11/24/2012
File Number:	08-634
Page:	1 of 6
Lab. Number:	5926
Report Number:	03

OFFICIAL TEST REPORT

MANUFACTURER: C.R. Laurence Company Inc.
ADDRESS: 2100 E. 38th Street, Vernon, CA 90058

SPECIFICATIONS: International Building Code, ASTM E330, ANSI Z97.1; CPSC 16 CFR 1201

Description Of Sample and Material Characteristics

Sample A-1:
Model Designation: Series: Weld Block on Steel Substrate Dry Glazed Aluminum Glass Glazed Railing System
Overall Size: 15' 1" (181") by 3' 6" (42") high.
Railing Parts: Railing consists of an aluminum **(alloy 6063-T52) square shoe base, part number **B5S20D. One 2" diameter two piece stainless steel hand rail part number **GR20 at top of system with one plastic glazing cap between glass and hand rail.
Glazing:
Material: 1/2" clear tempered glass.
Method: Sample is pocket glazed with a 3" glazing penetration at shoe base and 1 1/4" at top of hand rail using a vinyl wedge between glass and aluminum. System glazed at bottom with CRL TaperLock clamping system which locks the glass into position and consists of a "L" shaped setting block and TaperLocking clamps between glass and aluminum, each located 6" from each end and remaining on 12" centers.
Daylight Opening: Each lite is 60" by 36" high (total of three lites).
Railing Installation: The base shoe was fastened to the steel weld block part number **BSWB5 with a single row of number 1/2-13 by 3/4" long stainless steel socket head cap screws located 6 1/2" from each end and remaining on 12" center, the weld block was welded at two sides to a steel test fixture using a continuous weld.
Product markings: None

Sample A-2:
Model Designation: Series: Dry Glazed Concrete Mount Aluminum Glass Glazed Railing System
Overall Size: 15' 1" (181") by 3' 6" (42") high.
Railing Parts: Railing consists of an aluminum **(alloy 6063-T52) square shoe base, part number **B5S20D. One 2" diameter two piece stainless steel hand rail part number **GR20 at top of system with one plastic glazing cap between glass and hand rail.
Glazing:
Material: 1/2" clear tempered glass.
Method: Sample is pocket glazed with a 3" glazing penetration at shoe base and 1 1/4" at top of hand rail using a vinyl wedge between glass and aluminum. System glazed at bottom with CRL TaperLock clamping system which locks the glass into position and consists of a "L" shaped setting block and TaperLocking clamps between glass and aluminum, each located 6" from each end and remaining on 12" centers.
Daylight Opening: Each lite is 60" by 36" high (total of three lites).
Railing Installation: The shoe base was fastened to concrete test slab with a single row of No. 1/2 by 3 3/4" Hilti expansion bolt located 6" from each end and remainder on 6" centers.
Product markings: None

*Note: **as per manufacturer*

4/1/09

Description Of Sample and Material Characteristics

Sample A-3:
Model Designation: Series: Weld Block Dry Glazed Aluminum Glass Glazed Railing System
Overall Size: 15' 1" (181") by 3' 6" (42") high.
Railing Parts: Railing consists of an aluminum **(alloy 6063-T52) square shoe base, part number **B5T20D. One 2" diameter two piece stainless steel hand rail part number **GR20 at top of system with one plastic glazing cap between glass and hand rail.
Glazing:
Material: 1/2" clear tempered glass.
Method: Sample is pocket glazed with a 3" glazing penetration at shoe base and 1 1/4" at top of hand rail using a vinyl wedge between glass and aluminum. System glazed at bottom with CRL TaperLock clamping system which locks the glass into position and consists of a "L" shaped setting block and TaperLocking clamps between glass and aluminum, each located 6" from each end and remaining on 12" centers.
Daylight Opening: Each lite is 60" by 36" high (total of three lites).
Railing Installation: The shoe base was fastened to the steel weld block part number **BSWB5 with a single row of number 1/2-13 by 3/4" long stainless steel socket head cap screws located 6 1/2" from each end and remaining on 12" center, the weld block was welded to a steel test fixture.
Product markings: None

Sample A-4:
Model Designation: Series: Dry Glazed Concrete Fascia Mount Aluminum Glass Glazed Railing System
Overall Size: 15' 1" (181") by 3' 6" (42") high.
Railing Parts: Railing consists of an aluminum square shoe base, part number **B5S20F. One 2" diameter two piece stainless steel hand rail part number **GR20 at top of system with one plastic glazing cap between glass and hand rail.
Glazing:
Material: 1/2" clear tempered glass.
Method: Sample is pocket glazed with a 3" glazing penetration at shoe base and 1 1/4" at top of hand rail using a vinyl wedge between glass and aluminum. System glazed at bottom with CRL TaperLock clamping system which locks the glass into position and consists of a "L" shaped setting block and TaperLocking clamps between glass and aluminum, each located 3" from each end and remaining on 12 1/2" centers.
Daylight Opening: Each lite is 60" by 36" high (total of three lites).
Railing Installation: The shoe base was fastened to concrete test slab with a single row of No. 1/2 by 3 3/4" Hilti expansion bolt located 6 1/2" from each end and remainder on 6" centers.
Product markings: None

Sample A-7:
Model Designation: Series: Dry Glazed Fascia Mount to Steel Aluminum Glass Glazed Railing System
Overall Size: 15' 1" (181") by 3' 6" (42") high.
Railing Parts: Railing consists of an aluminum square shoe base, part number **B5S20F. One 2" diameter two piece stainless steel hand rail part number **GR20 at top of system with one plastic glazing cap between glass and hand rail.
Glazing:
Material: 1/2" clear tempered glass.
Method: Sample is pocket glazed with a 3" glazing penetration at shoe base and 1 1/4" at top of hand rail using a vinyl wedge between glass and aluminum. System glazed at bottom with CRL TaperLock clamping system which locks the glass into position and consists of a "L" shaped setting block and TaperLocking clamps between glass and aluminum, each located 3" from each end and remaining on 12 1/2" centers.

*Note: **as per manufacturer*

4/1/09

Description Of Sample and Material Characteristics

Sample A-7:
Daylight Opening: Each lite is 60" by 36" high (total of three lites).
Railing Installation: The shoe base was fastened to the steel tube with a single row of number 1/2-13 by 3/4" long stainless steel socket head cap screws located 6 1/2" from each end and remaining on 12" center, the steel tube was welded to a steel test fixture.
Product markings: None

*Note: **as per manufacturer*

OFFICIAL TEST RESULTS

Title of Test	Deflection	Measured	Permanent Set	Remarks
Sample A-1: (*Temperature: 79.0 F; Barometric Reading: 30.00 inches Hg*)				
Uniform Design Load Test (ASTM E330)				
Positive Load		60.8 psf		Passed
Reading at hand rail	0.985"		0.042"	
Recovery		97 percent		
Uniform Design Load Test (ASTM E330)				
Negative Load		60.8 psf		Passed
Reading at hand rail	1.093"		0.047"	
Recovery		96 percent		
Uniform Structural Load Test (ASTM E330)				
Positive Load		152.0 psf		Passed
Reading at hand rail	2.583"		0.096"	
Recovery		96 percent		
Uniform Structural Load Test (ASTM E330)				
Negative Load		152.0 psf		Passed
Reading at hand rail	2.673"		0.104"	
Recovery		96 percent		
Drop Load Test at left lite		400 foot pounds		Passed
Drop Load Test at center lite		400 foot pounds		Passed
Drop Load Test at right lite		400 foot pounds		Passed
Sample A-2: (*Temperature: 78.0 F; Barometric Reading: 30.03 inches Hg*)				
Uniform Design Load Test (ASTM E330)				
Positive Load		89.6 psf		Passed
Reading at hand rail	1.963"		0.098"	
Recovery		94 percent		
Uniform Design Load Test (ASTM E330)				
Negative Load		89.6 psf		Passed
Reading at hand rail	2.152"		0.105"	
Recovery		94 percent		
Uniform Structural Load Test (ASTM E330)				
Positive Load		224.0 psf		Passed
Reading at hand rail	3.566"		0.256"	
Recovery		93 percent		

4/1/09

OFFICIAL TEST RESULTS

Title of Test	Deflection	Measured	Permanent Set	Remarks
Sample A-2: *(Continued)*				
Uniform Structural Load Test (ASTM E330)				
Negative Load		224.0 psf		Passed
Reading at hand rail	3.615"		0.144"	
Recovery		96 percent		
Drop Load Test at left lite		400 foot pounds		Passed
Drop Load Test at center lite		400 foot pounds		Passed
Drop Load Test at right lite		400 foot pounds		Passed
Sample A-3: (*Temperature: 79.4 F; Barometric Reading: 29.94 inches Hg*)				
Uniform Design Load Test (ASTM E330)				
Positive Load		60.8 psf		Passed
Reading at hand rail	0.915"		0.038"	
Recovery		97 percent		
Uniform Design Load Test (ASTM E330)				
Negative Load		60.8 psf		Passed
Reading at hand rail	1.075"		0.042"	
Recovery		96 percent		
Uniform Structural Load Test (ASTM E330)				
Positive Load		152.0 psf		Passed
Reading at hand rail	2.515"		0.098"	
Recovery		96 percent		
Uniform Structural Load Test (ASTM E330)				
Negative Load		152.0 psf		Passed
Reading at hand rail	2.615"		0.107"	
Recovery		96 percent		
Drop Load Test at left lite		400 foot pounds		Passed
Drop Load Test at center lite		400 foot pounds		Passed
Drop Load Test at right lite		400 foot pounds		Passed
Sample A-4: (*Temperature: 78.5 F; Barometric Reading: 29.97 inches Hg*)				
Uniform Design Load Test (ASTM E330)				
Positive Load		89.6 psf		Passed
Reading at hand rail	0.878"		0.038"	
Recovery		96 percent		
Uniform Design Load Test (ASTM E330)				
Negative Load		89.6 psf		Passed
Reading at hand rail	0.979"		0.042"	
Recovery		96 percent		
Uniform Structural Load Test (ASTM E330)				
Positive Load		224.0 psf		Passed
Reading at hand rail	2.132"		0.066"	
Recovery		97 percent		

4/1/09

OFFICIAL TEST RESULTS

Title of Test	Deflection	Measured	Permanent Set	Remarks
Sample A-4: *(Continued)*				
Uniform Structural Load Test (ASTM E330)				
Negative Load		224.0 psf		Passed
Reading at hand rail	2.184"		0.088"	
Recovery		96 percent		
Drop Load Test at left lite		400 foot pounds		Passed
Drop Load Test at center lite		400 foot pounds		Passed
Drop Load Test at right lite		400 foot pounds		Passed
Sample A-7: (*Temperature: 78.6 F; Barometric Reading: 30.01 inches Hg*)				
Uniform Design Load Test (ASTM E330)				
Positive Load		89.6 psf		Passed
Reading at hand rail	0.956"		0.030"	
Recovery		96 percent		
Uniform Design Load Test (ASTM E330)				
Negative Load		89.6 psf		Passed
Reading at hand rail	1.042"		0.039"	
Recovery		96 percent		
Uniform Structural Load Test (ASTM E330)				
Positive Load		224.0 psf		Passed
Reading at hand rail	2.104"		0.063"	
Recovery		97 percent		
Uniform Structural Load Test (ASTM E330)				
Negative Load		224.0 psf		Passed
Reading at hand rail	2.215"		0.090"	
Recovery		96 percent		
Drop Load Test at left lite		400 foot pounds		Passed
Drop Load Test at center lite		400 foot pounds		Passed
Drop Load Test at right lite		400 foot pounds		Passed

Note: At conclusion of above tests, there was no apparent damage to the railing systems. The test specimens were covered with a 4 mil plastic sheeting to seal from air leakage when load tests were conducted, however this had no effect on the above test results.

4/1/09

REPORT REVISION HISTORY			
Rev	**Description of Change**	**Author of Report**	**Effective Date**
0	Initial Release	LBS	01/08/2009
1	Separate systems as per client request	MS	03/27/2009

Remarks: Representative samples of the test specimens, test report and detailed drawings will be retained by Fenestration Testing Laboratory for a period of four years from the original test date.

Drawings referenced in this document are an integral part of this report, therefore, are required when distributing this test report. Test results obtained represent the actual value of the tested specimens and do not constitute opinion, endorsement, or certification by this laboratory.

This test report is considered the exclusive property of the client named herein and is applicable to the sample tested. This report may not be reproduced without the approval of Fenestration Testing Laboratory, Inc.

Testing was conducted as per instructions received from your company representative.

Witnessed by:
Mr. Michael Wenzel, P.E.
Mr. Carlos Rionda, P. E.

Laboratory Technicians:
Mr. Roberto Robleto

Author of Report:
Ms. Leigh B. Sanchez

3 - C.R. Laurence Company Inc.

FENESTRATION TESTING LABORATORY, INC.

Manny Sanchez
Chief Executive Officer

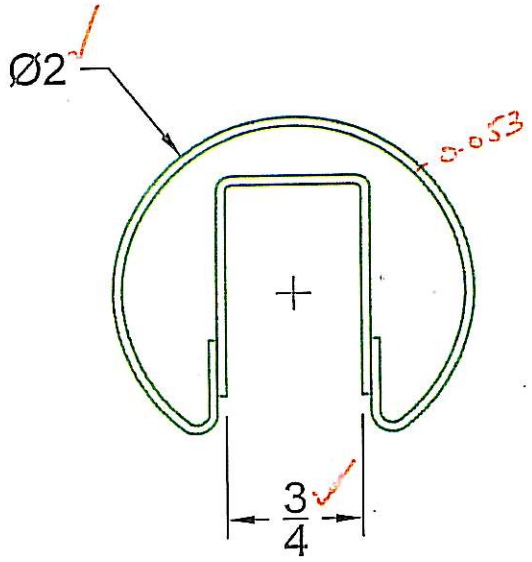
4/1/09

PENESTRATION TESTING LAB, INC

LAB # 5926

DATE: 2/10/09

DRAWING VERIFIED BY: JMK



C.R.LAURENCE CO.

ARCHITECTURAL PRODUCTS
LOS ANGELES, CA 90058
PH: 800-421-6144 FX: 800-262-3299
WWW.CRLAURENCE.COM

DESCRIPTION: 2" DIAMETER STAINLESS STEEL CAP RAIL

16 GA S.S. T304 ALLOY

CAT. NO: GR20xx

PART NO: GR20xx

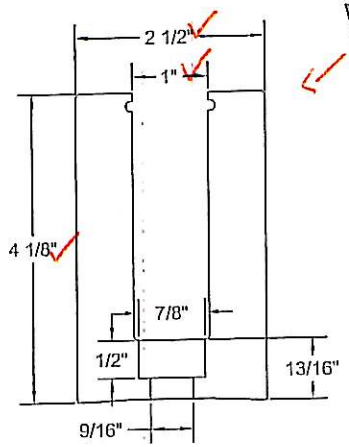
DRAWN BY: R.A.

DATE: 10/15/08

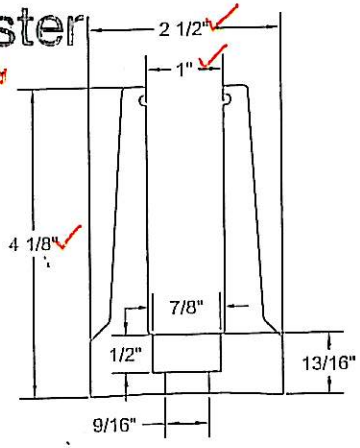
SCALE: N.T.S.

SHT 1 OF 1

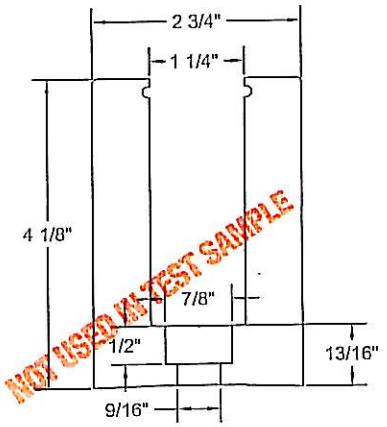
Not able to Webster



B5S20D
½" GLASS SQUARE BASE SHOE
DRILLED AT 12" ON CENTER
Samples A-1, A-2



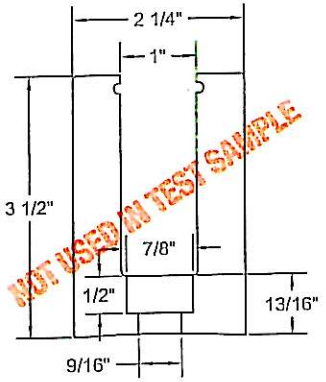
B5T20D
½" GLASS TAPERED BASE SHOE
DRILLED AT 12" ON CENTER
Samples A-3, A-6



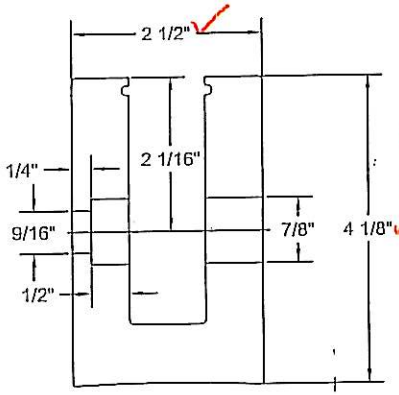
B7S20D
3/4" GLASS SQUARE BASE SHOE
DRILLED AT 12" ON CENTER

FENESTRATION TESTING LAB, INC

LAB # 5926
DATE: 2/10/09
DRAWING VERIFIED BY: MR



B5L20D -1/2" GLASS
LOW PROFILE SQUARE BASE SHOE
DRILLED AT 12" ON CENTER



B5S20F
½" GLASS SQUARE FASCIA BASE SHOE
DRILLED AT 12" ON CENTER
Samples A-4, A-7

← Not able to Webster

C.R.LAURENCE CO.
ARCHITECTURAL PRODUCTS
PH: 800-421-6144 FX: 800-262-3299
WWW.CRLAURENCE.COM

DESCRIPTION:

CAT. NO:	GRS	DATE:	4/28/08
FILE NAME:	GRS_1	SCALE:	
DRAWN BY:	C.O	SHT	1 OF 5

FENESTRATION TESTING LAB, INC

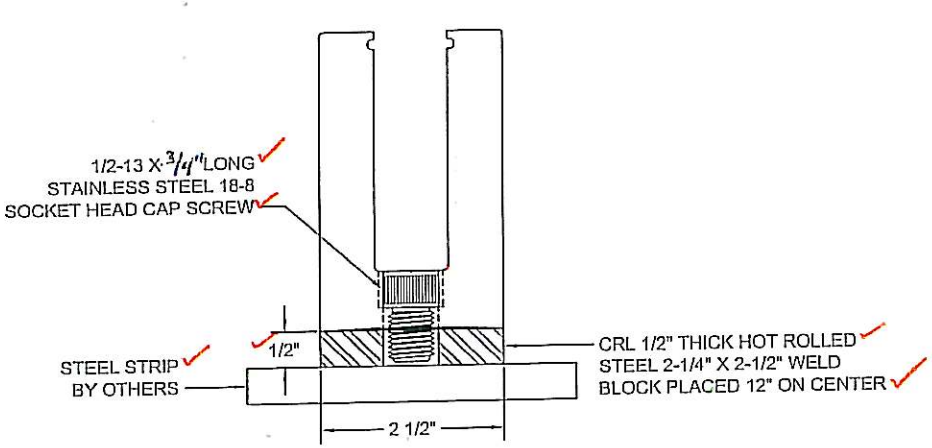
LAB # 5926

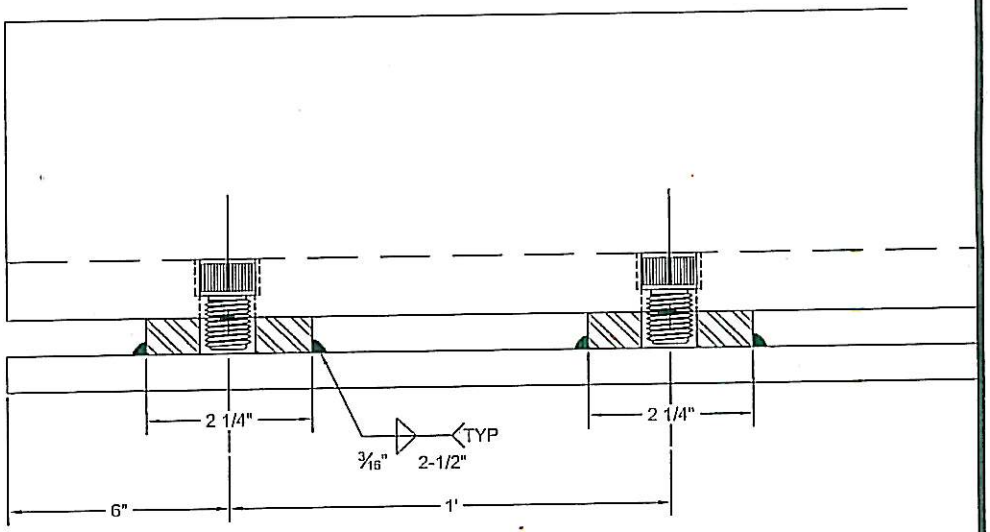
DATE: 2/10/09

DRAWING VERIFIED BY: VMP

Samples A-1 & A-3

TYPICAL WELD BLOCK DETAILS





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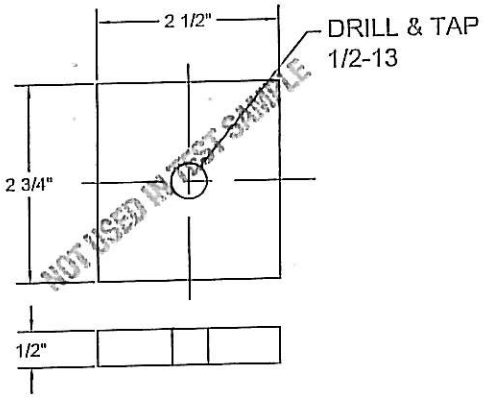
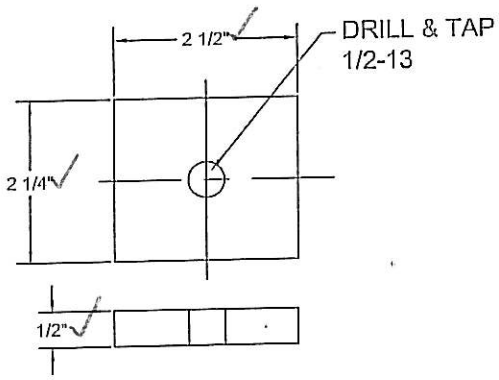
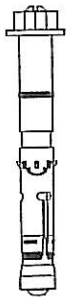


BSWB7
HOT ROLLED STEEL WELD BLOCK
FOR ¾" GLASS BASE SHOE

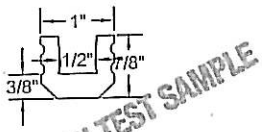


BSWB5
HOT ROLLED STEEL WELD BLOCK
FOR ½" GLASS SQUARE, TAPERED AND
LOW PROFILE BASE SHOE
Samples A-1 & A-3

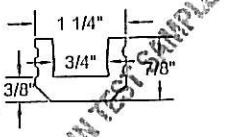


EBA334
HLTI EXPANSION BOLT
Samples A-2, A-4

SHCS12X34
SOCKET HEAD CAP SCREW



GR5UB4
½" GLASS RUBBER
SETTING BLOCK



GR7UB4
¾" GLASS RUBBER
SETTING BLOCK

PENESTRATION TESTING LAB, INC

LAB # 5926

DATE: 2/10/09

DRAWING VERIFIED BY: mp

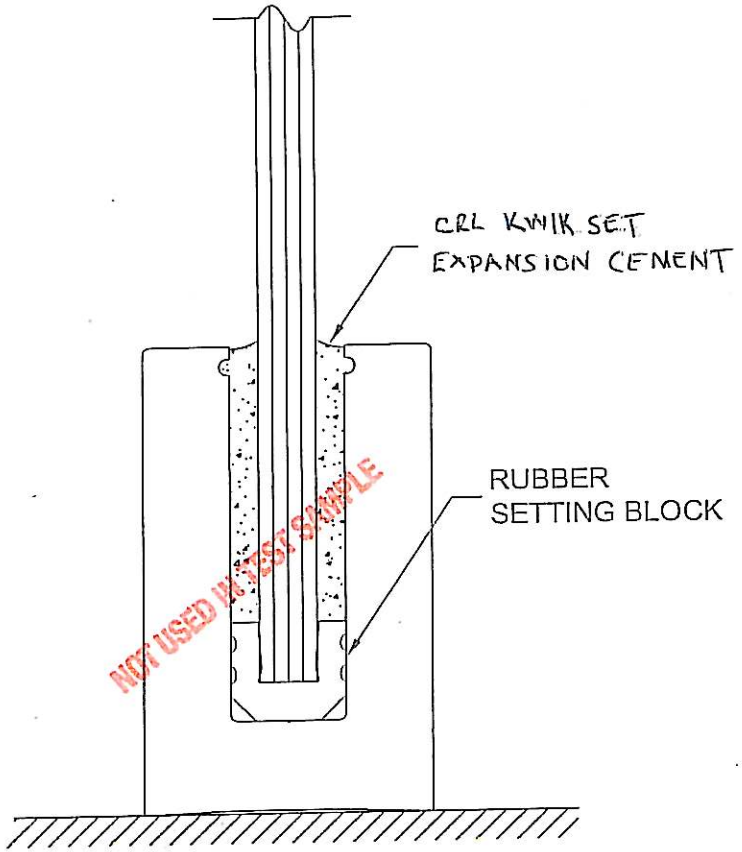
Only items checked in red have been verified by laboratory

FENESTRATION TESTING LAB, INC

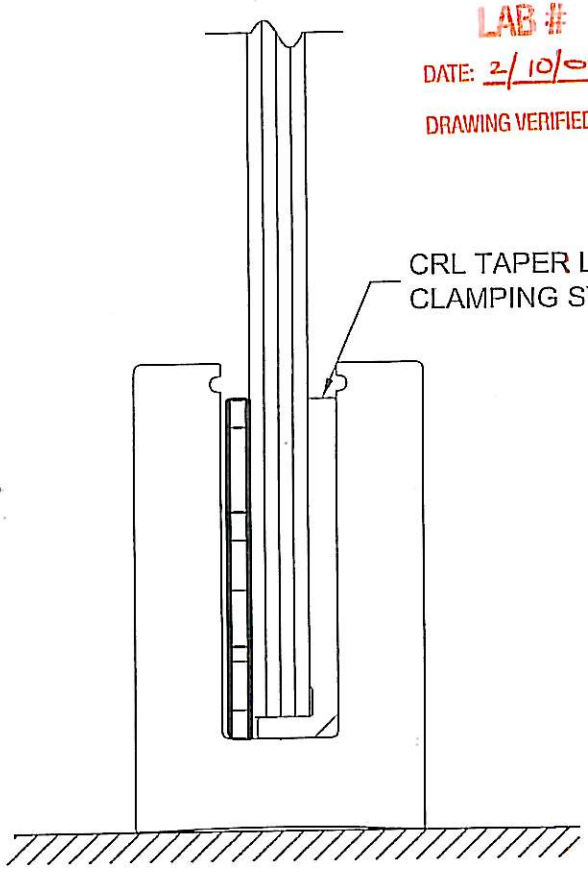
LAB # 59260

DATE: 2/10/09

DRAWING VERIFIED BY: JMR



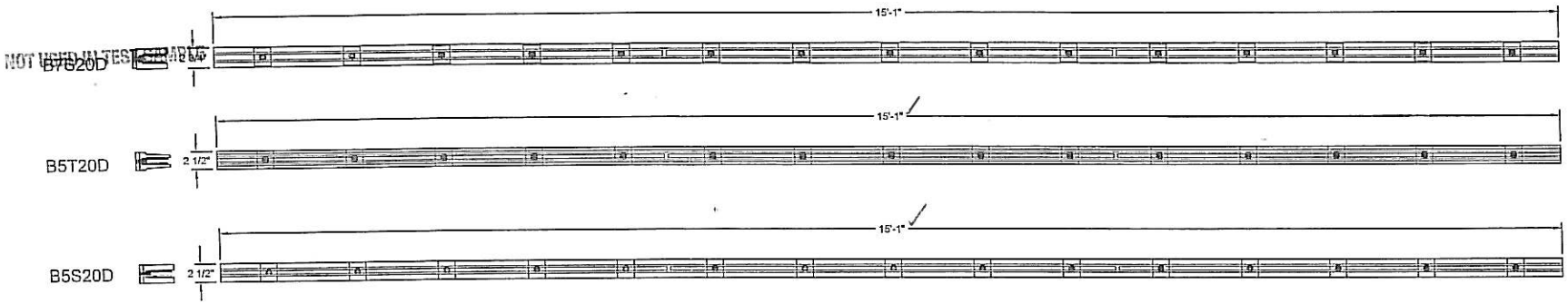
WET SET APPLICATION

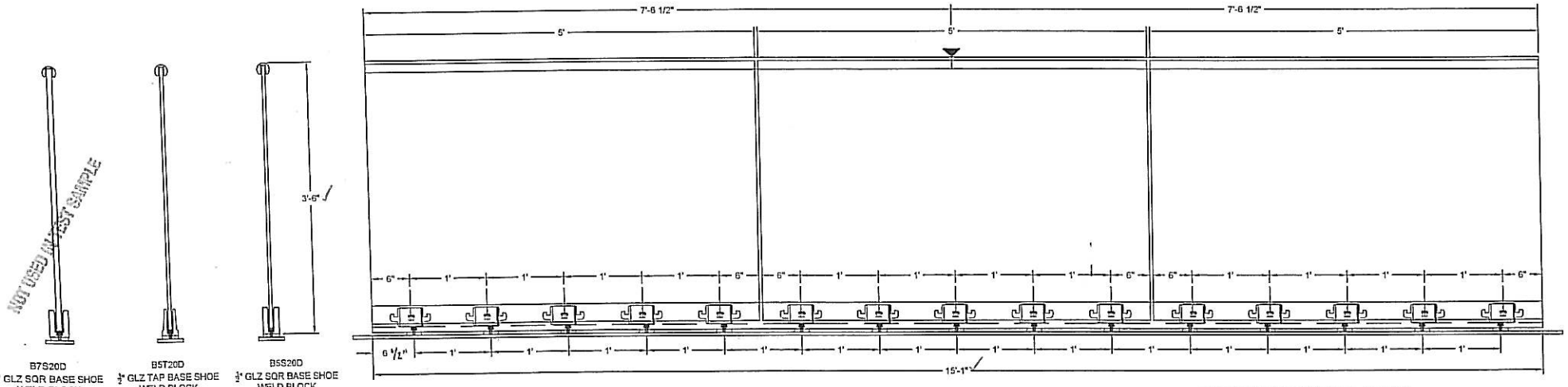


DRY GLAZE APPLICATION

C.R.LAURENCE CO.
ARCHITECTURAL PRODUCTS
PH: 800-421-6144 FX: 800-262-3299
WWW.CRLAURENCE.COM

DESCRIPTION:		CAT. NO: GRS	DATE: 4/28/08
		FILE NAME: GRS_1	SCALE:
		DRAWN BY: C.O	SHT 2 OF 5





B7S20D
¾" GLZ SQR BASE SHOE
WELD BLOCK

B5T20D
¾" GLZ TAP BASE SHOE
WELD BLOCK
Sample A-3

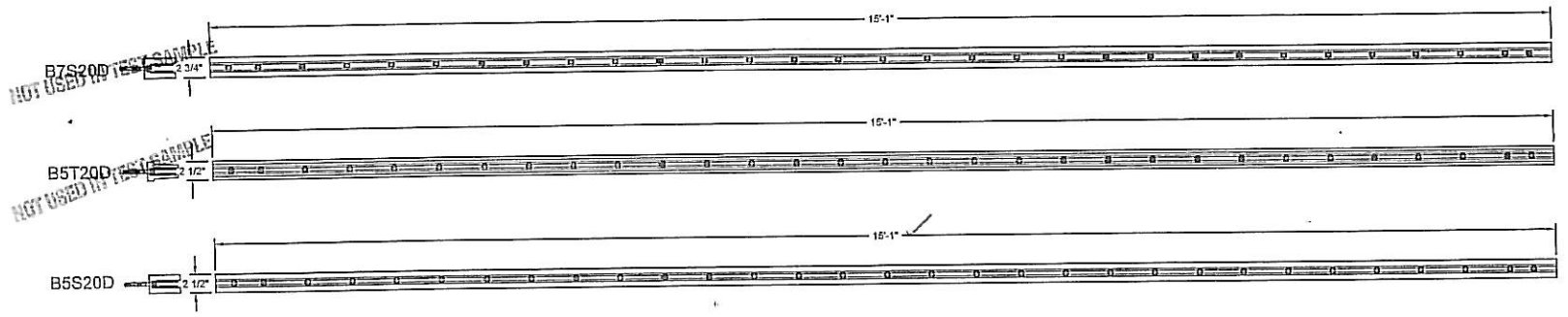
B5S20D
¾" GLZ SQR BASE SHOE
WELD BLOCK
Sample A-1

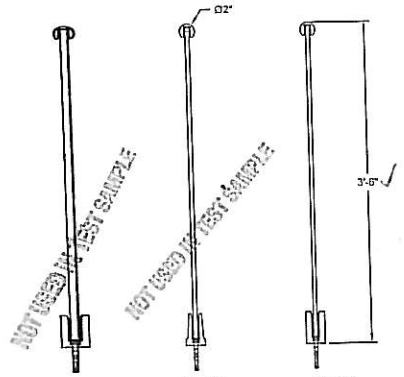
FENESTRATION TESTING LAB, INC

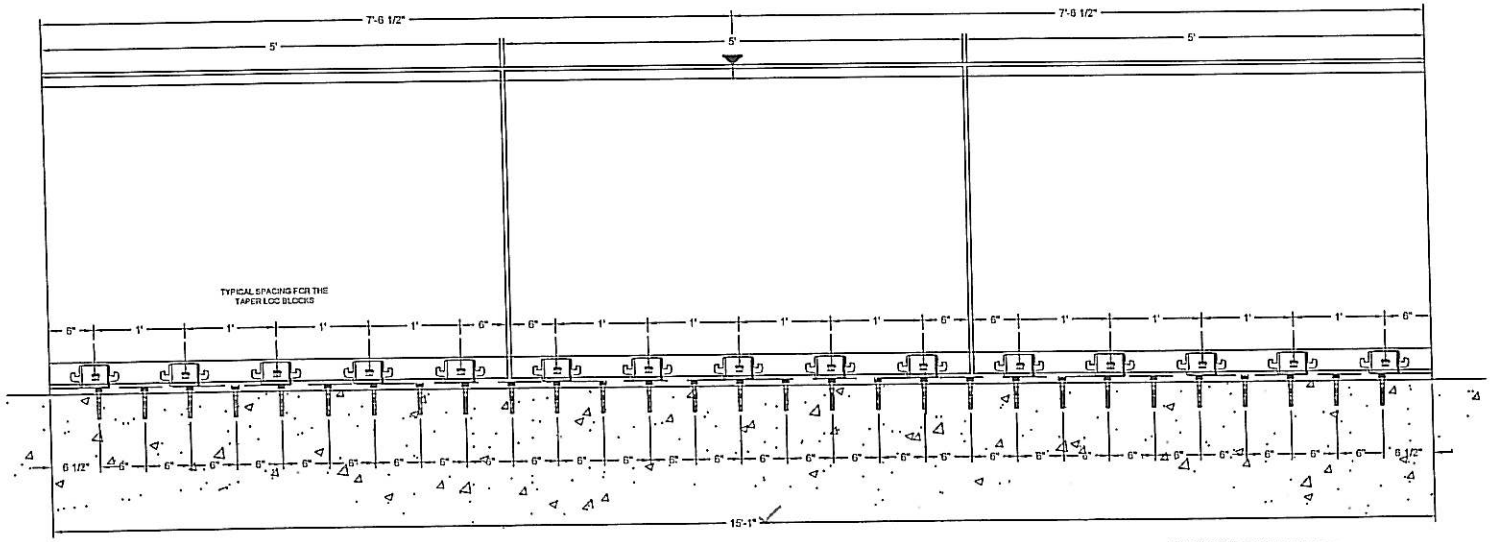
LAB # 5926
DATE: 2/10/09
DRAWING VERIFIED BY: MR

Only items checked in red have been verified by laboratory

CRL ARCHITECTURAL PRODUCTS LOS ANGELES, CA 90058 PH: 800.421.6144 FX: 800.262.3299	DESCRIPTION: TEST 1 - DRY GLAZE TAPER-LOC SYSTEM	CAT. NO: TEST 1	DATE: 10/15/08
		PART NO:	SCALE: N.T.S.







FENESTRATION TESTING LAB, INC

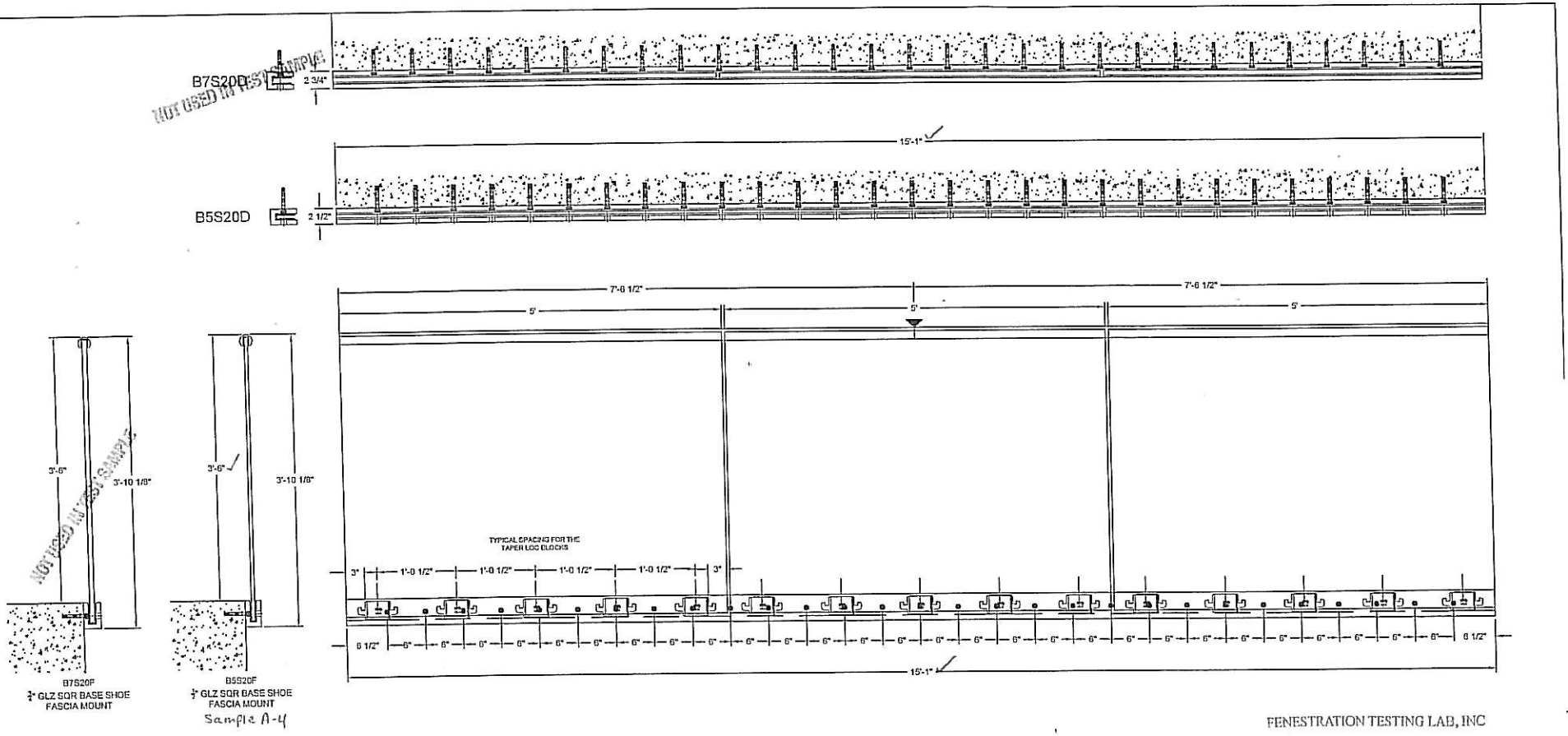
Only items checked in red have been verified by laboratory

LAB # 5912a

DATE: 2/10/09

DRAWING VERIFIED BY: VMR

CRL ISO9000 ARCHITECTURAL PRODUCTS LOS ANGELES, CA 90058 PH: 800-421-6144 FX: 800-262-3299	DESCRIPTION: TEST 2 - DRY GLAZE TAPER-LOC SYSTEM ANCHOR BOLTS @ 6" ON CENTER ATTACHED TO CONCRETE	CAT. NO: TEST 2 PART NO: DRAWN BY:	DATE: 10/15/08 SCALE: N.T.S.



FENESTRATION TESTING LAB, INC

LAB # 5926

DATE: 2/10/09

DRAWING VERIFIED BY: Mark

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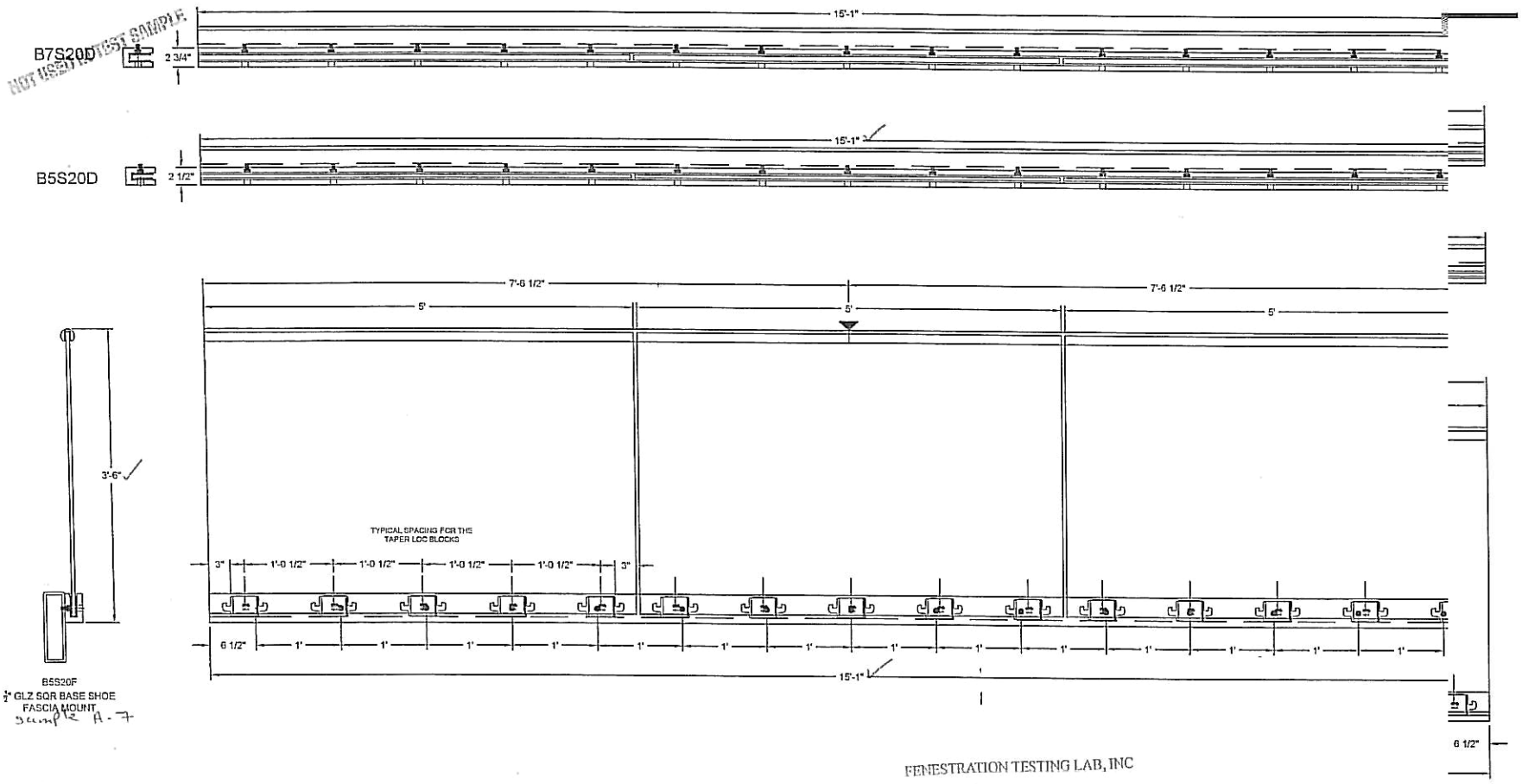


NOT USED IN TEST SAMPLE

NOT USED IN TEST SAMPLE

FENESTRATION TESTING LAB, INC

LAB # 5912c

DATE: 2/10/09

DRAWING VERIFIED BY: JMK

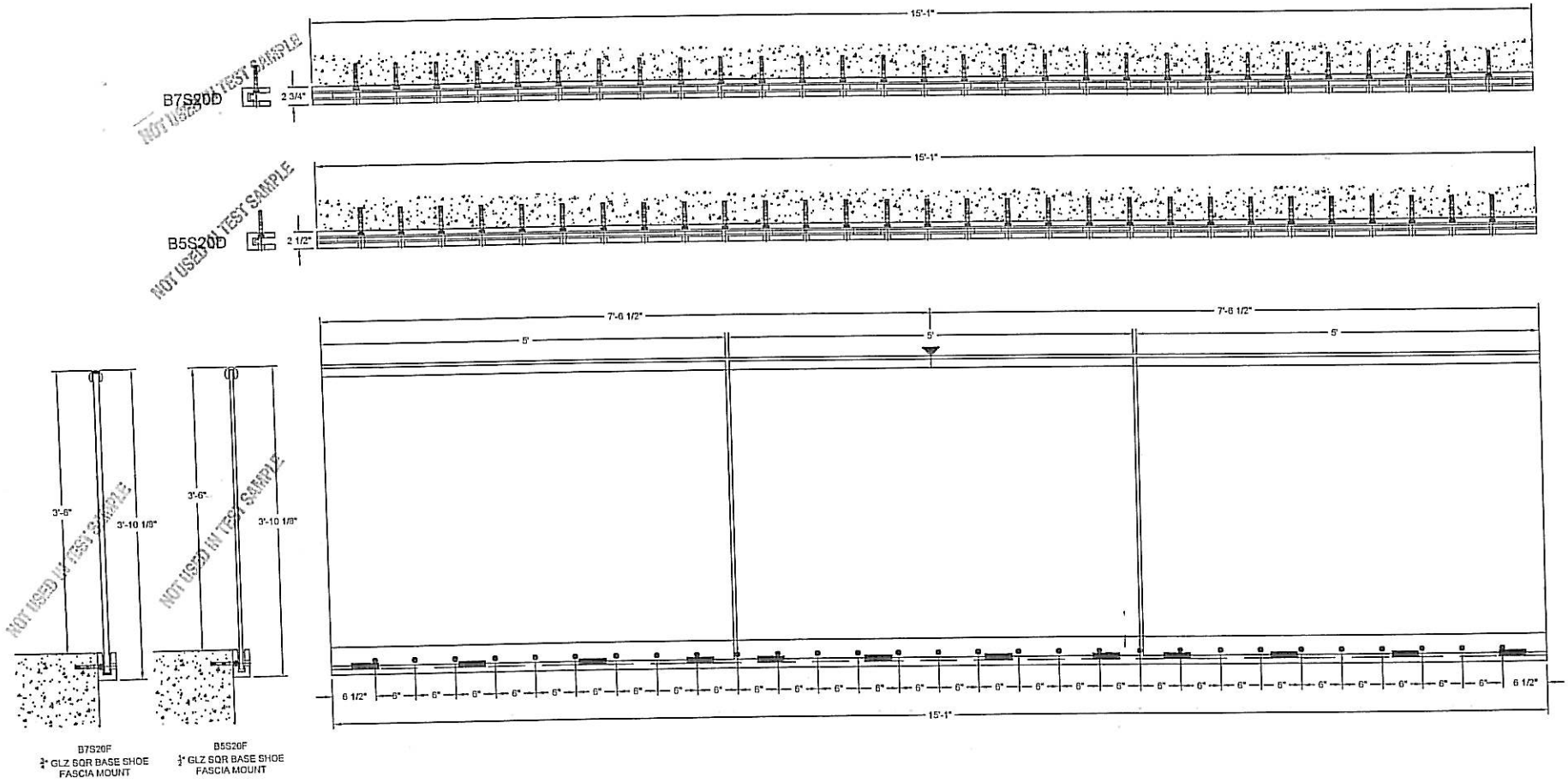
Only items checked in red have been verified by laboratory

CRL C.R. LAURENCE CO.

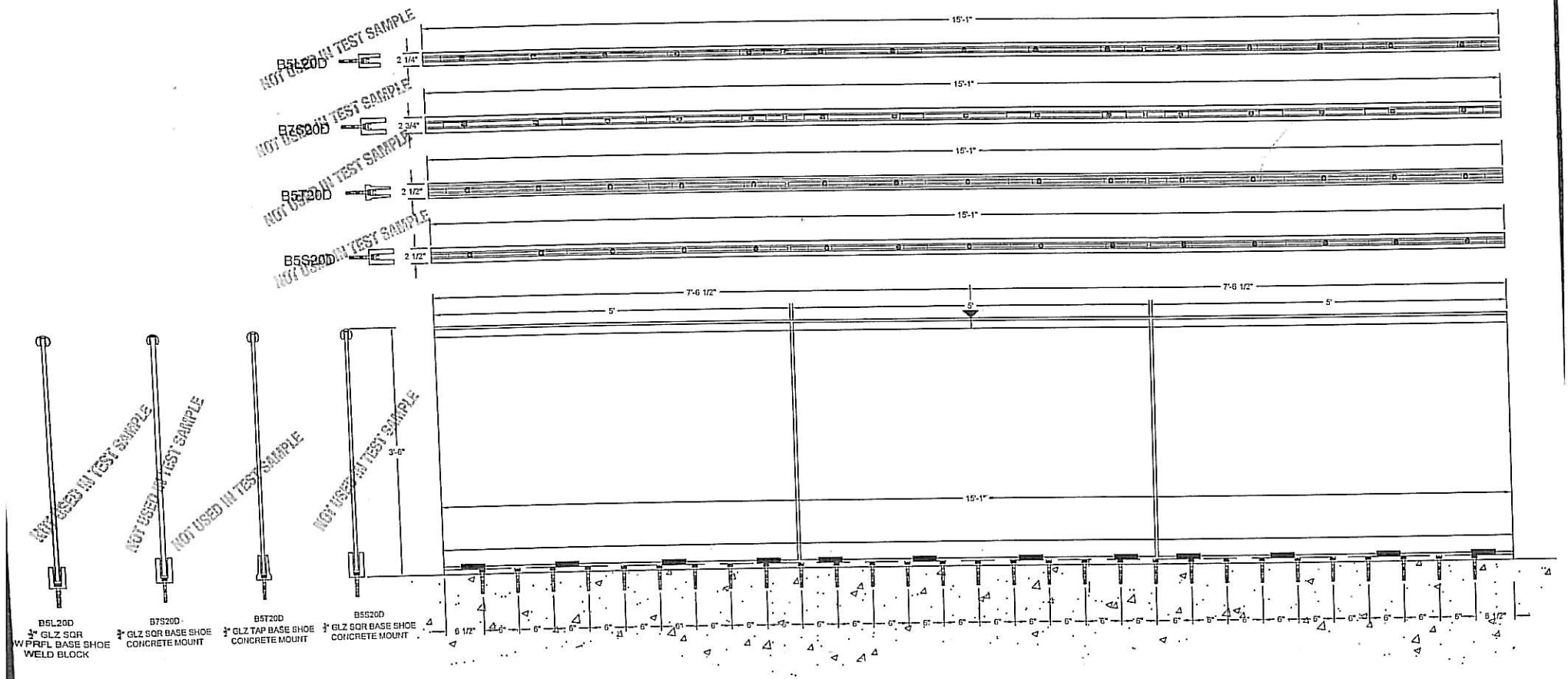
ARCHITECTURAL PRODUCTS
LOS ANGELES, CA 90058
PH: 800-421-6144 FX: 800-262-3299
WWW.CRLAURENCE.COM

DESCRIPTION:
TEST 3 - DRY GLAZE TAPER-LOC SYSTEM
CAP SCREWS @ 12" ON CENTER, FASCIA MOUNTED TO STEEL SUBSTRATE

CAT. NO: TEST 3	DATE: 10/15/08
PART NO:	SCALE: N.T.S.
DRAWN BY:	



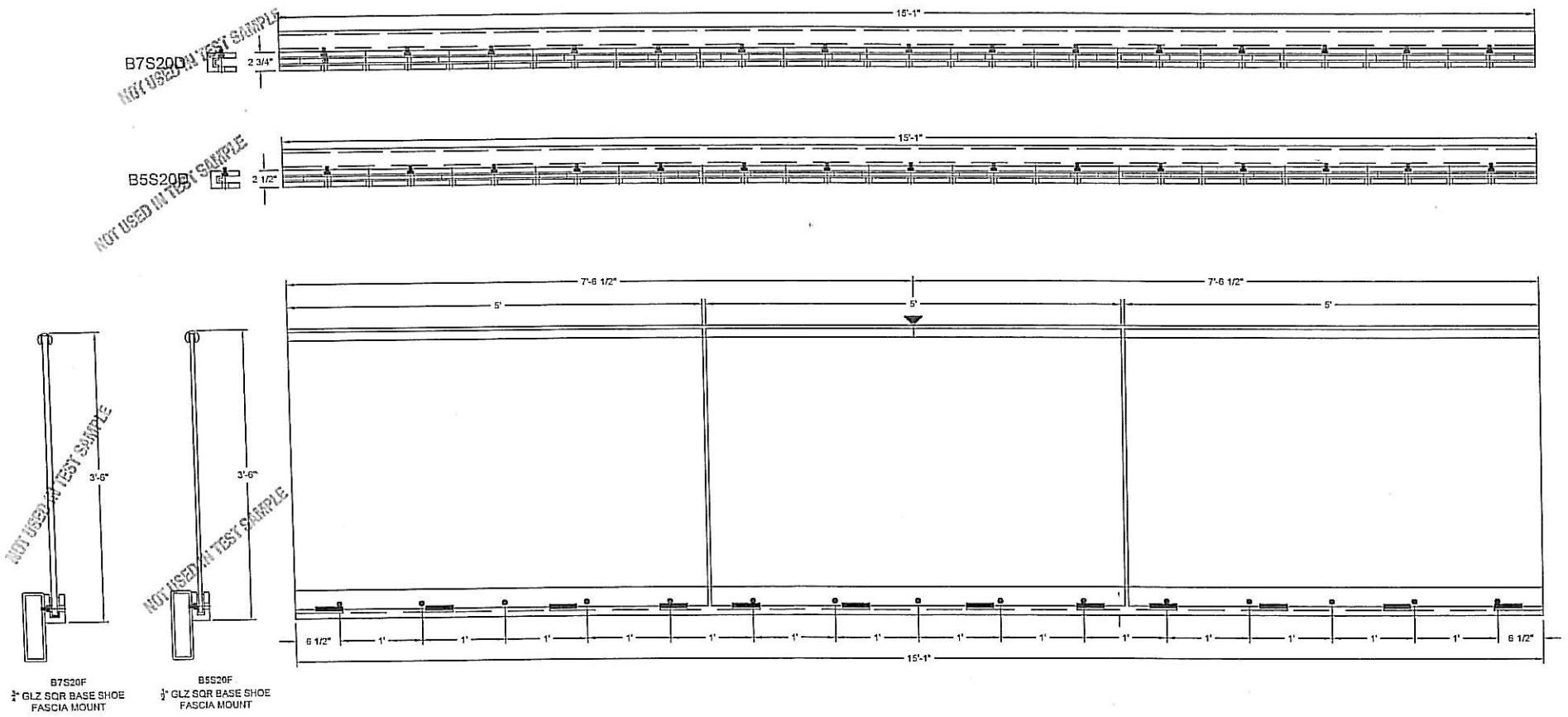
CRL ISO9000 ARCHITECTURAL PRODUCTS LOS ANGELES, CA 90058	DESCRIPTION: TEST 8 - DRY GLAZE TAPER-LOC SYSTEM	CAT. NO: TEST 8	DATE: 10/15/08
		PART NO:	SCALE: N.T.S.



CRL ARCHITECTURAL PRODUCTS
LOS ANGELES, CA 90058

DESCRIPTION: TEST 6 - WET GLAZE SYSTEM

CAT. NO: TEST 6	DATE: 10/15/08
PART NO:	SCALE: N.T.S.



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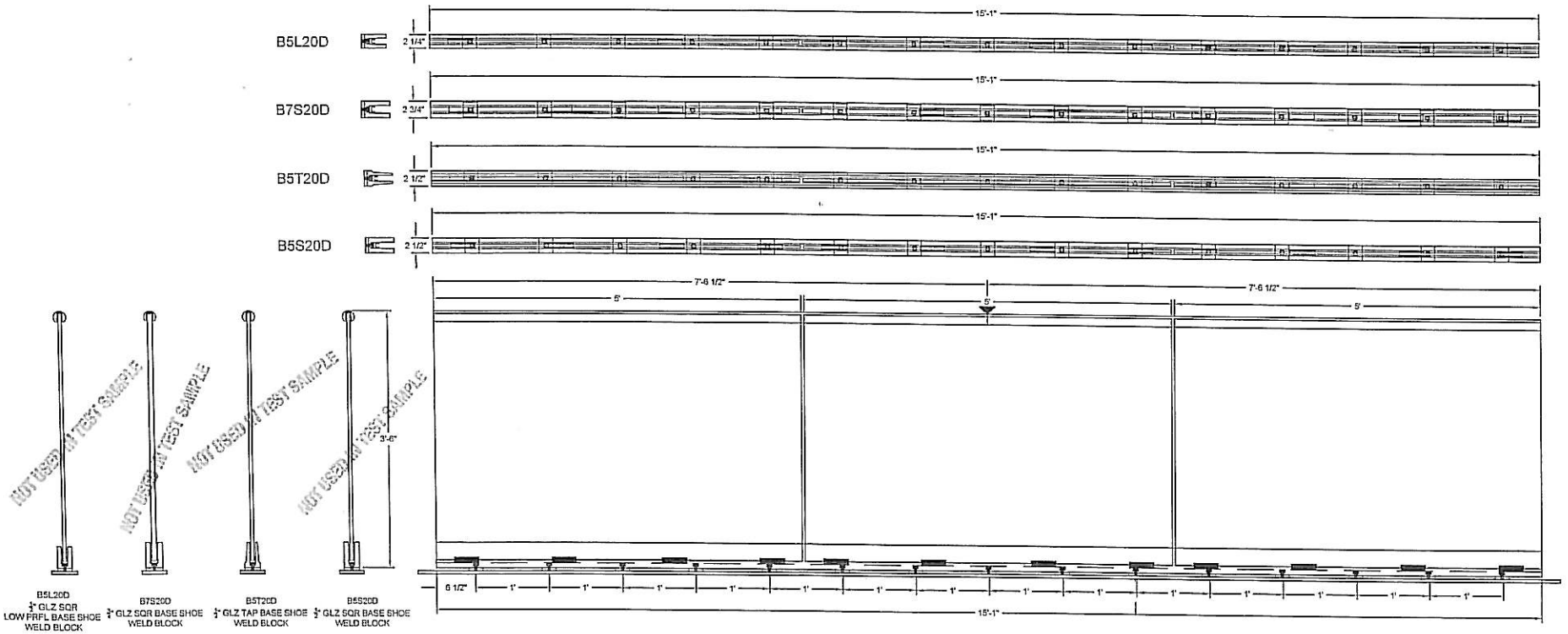
LOS ANGELES, CA 90058

DESCRIPTION:
TEST 7 - WET GLAZE SYSTEM

CAT. NO: TEST 7
PART NO:

DATE: 10/15/08
SCALE: N.T.S.



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DESCRIPTION: TEST 5 - WET-GLAZE SYSTEM

CAP SCREWS @ 12" ON CENTER ATTACHED TO WELD BLOCKS ON STEEL SUBSTRATE

CAT. NO: TEST 5	DATE: 10/15/08
PART NO:	SCALE: N.T.S.