

TO: Mary Rupp, Interim City Manager

FROM: Terry Floyd, Development Coordinator

DATE: February 13, 2019

SUBJECT: Change Order #13 – Norman Public Library Central

City Council Resolution R-1112-55 grants administrative authority to the City Manager to approve change order requests up to \$40,000 or 10% of contract amount, whichever is less, and subsequently report those approvals to the City Council. Due to the ongoing Norman Public Library Central Project, a change order is being requested by Flintco, LLC in the amount of \$39,746. This change order has been reviewed and is being recommended by the project architect, Meyers, Scherer and Rockcastle, Ltd. (MSR), and has been further reviewed and recommended by the NORMAN FORWARD program management firm, ADG.

Attached is a Change Order Summary and quote for additional work and materials for the Central Library project that includes modifications to project areas for changes related to the fire safety of the glass decorative railing around the the central monument stair. In multiple consultations with City Development Services staff, this change is required accommodate code safety elements deemed necessary by the code official and building inspector. Sections of half-inch laminated glass will replace originally specified half-inch solid tempered glass.

We have reviewed the change order with both MSR and ADG to confirm that the items listed therein are acceptable. At this time, we recommend approval of the change order from Flintco, LLC in the amount of \$39,746. Funding is available in account number 51-9507-455.6101 - Project NFB 016.

Reviewed by: Kathryn Walker, Assistant City Attorney KW

Anthony Francisco, Finance Director A. Francisco

_ Date: 2/14/2019

Mary Rupp, Interim City Manager

Approved by:



Change Order

PROJECT: (Name and address) Norman Public Library Central 103 West Acres Street Norman, OK 73069

OWNER: (Name and address) City of Norman 201 W. Gray Street Norman, OK 73069 CONTRACT INFORMATION: Contract For: General Construction Date: June 12, 2017

....

ARCHITECT: (Name and address) MSR Design 710 S. 2nd Street, 8th Floor Minneapolis, MN 55401 CHANGE ORDER INFORMATION: Change Order Number: 013 Date: 02/12/2019

CONTRACTOR: (Name and address) Flinteo, LLC 2303 S. Prospect Oklahoma City, 73129

THE CONTRACT IS CHANGED AS FOLLOWS:

(Insert a detailed description of the change and, if applicable, attach or reference specific exhibits. Also include agreed upon adjustments attributable to executed Construction Change Directives.)

Delay Days: #38(01/03), #39(01/04), #40(01/11).

PCO-87 - Glazed Decorative Railing Lamination (RFI #358 R1) - \$39,746.00

The original Contract Sum was

The net change by previously authorized Change Orders

The Contract Sum prior to this Change Order was

The Contract Sum will be increased by this Change Order in the amount of

The new Contract Sum including this Change Order will be

\$ 25.858.000.00

\$ 25.858.000.00

\$ 26.421.747.00

\$ 39,746.00

The new Contract Sum including this Change Order will be

The Contract Time will be increased by three (3) days.
The new date of Substantial Completion will be August 05, 2019

NOTE: This Change Order does not include adjustments to the Contract Sum or Guaranteed Maximum Price, or the Contract Time, that have been authorized by Construction Change Directive until the cost and time have been agreed upon by both the Owner and Contractor, in which case a Change Order is executed to supersede the Construction Change Directive.

NOT VALID UNTIL SIGNED BY THE ARCHITECT, CONTRACTOR AND OWNER.

ARCHITECT (Firm name)

SIGNATURE

THOMAS HALLER (MGR)

PRINTED NAME AND TITLE

DATE

CONTRACTOR (Firm name)

CRISTINE WINCHESTER

PRINTED NAME AND TITLE

DATE

SIGNATURE

PRINTED NAME AND TITLE

DATE



ADG. PC 920 W Main Oklahoma City. OK 73106 405.232.5700 • www.adgokc.com

MEMO

DATE:

2/12/2018

TO:

Terry Floyd

FROM:

ADG Team

SUBJECT: NORMAN FORWARD - Central Library - Change Order #013

PROJECT:

NORMAN FORWARD - Central Library

PROJECT NO: 16-003

PHASE NO: Construction

ADG has reviewed the summary of the referenced Change Order #013 provided by MSR along with their explanation and estimate of cost for each item. ADG is in agreement with MSR's recommendations.



ADG, PC 920 W Main Oklahoma City, OK 73106 405.232.5700

Change Order No. 13 to Contract K-1617-83

MEMORANDUM

Date:

2/12/2019

Project Name:

Norman Central Branch Library

Project No:

2016005.00

To:

CO #013

From:

Thomas Haller (MSR)

Cc:

N/A

Re: NORMAN CENTRAL LIBRARY CO #013 EXPLANATIONS

MSR

Architecture Interiors and Urban Design

The description below is intended to explain the reasons for the change in C0 #013, and the associated costs for each change. Reference CO #013 for the formalized and signed document outlining these changes. Reference the potential change orders produced by Flintco Construction for the origination of stated costs.

PCO-87 – Glazed Decorative Railing Lamination (RFI #358 RI) - \$39,746.00

Explanation: Per code requirements, portions of the glass decoractive railing around the centralized monumental stair will need to be upgraded to half inch laminated glass in lieu of half inch solid tempered glass. Based on conversations between the general contractor, the glass subcontractor, the architect, and the city code official; it was deemed necessary to provide the glass type that would best ensure public safety in potential falling glass zones. The additional cost applied in this PCO is only for the upgrade to the premium glass type. The cost for the upgrade in material is fair and will provide the CON with improved value in a more durable product, MSR recommended.

CO #013 Total Cost: \$39.746.00

Thomas Haller, Associate

612.375.8708 T tom@msrdesign.com E



CHANGE ORDER REQUEST:

PCO

87

Project Name Flintco Job#	nan Contract number K-161	7-83			
ro:	Terry Floyd Norman Municipal Authority 201 West Gray Norman, Ok 73070	Subject: . RFI#	RFI #358r1		
n Accordance w	rith our contract agreement, for y	our review and acceptance, we submit this cost proposal	NTP DATE:		
SUMMARY	COR Date: Costs per RFI #358r1 to resolve code discrepancy for glazed decorative rails quoted as monolithic under GL-04 that should have be laminated under GL-13 to meet IBC 2015 code requirements for rails above walkways. Costs are for blended monolithic and laminate entirety of the rails should need to change to laminated, these costs will increase.				
ABOR, LABOR	BURDEN, MATERIALS, SUBCON	TRACTS		2-0-0-0	
	Direct Labor		\$		
	Labor Burden	(58% *Sum of all Flintco Labor)	\$	-	
	Direct Materials		\$		
	Direct Subcontracts		\$	35,409	
SUBTOTAL 1			\$	35,409	
EXPENSES ON I	LABOR AND MATERIALS				
	Consumables	(5.0% of Labor)		-	
	Small Tools	(5.0% of Labor)			
SUBTOTAL 2			\$	-	
EXPENSES ON I	LABOR, LABOR BURDEN, MATE	RIALS			
	Data Processing	(0.25% of labor, burden, and materials)		-	
	Safety	(1.0% of labor, burden, and materials)		-	
	Warranty	(1.0% of labor, burden, and materials)			
SUBTOTAL 3			\$	*	
SUBCONTRACT	OR INSURANCE, OVERHEAD AN	ID FEE			
	Bonding	(1.5% of Subcontracts and Self Performed)	\$	531.14	
	Builders Risk Insurance	(.08% of Subcontracts)		28	
	Overhead on Subcontracts Fee on Subcontracts	(10% of Subcontracts) (10% of Subcontracts)		3,541 VOID	
	Leed Dumpster	(1% of Subcontracts and Self Performed)		VOID	
SUBTOTAL 4		(1.00)	\$	4,100	
SELF PERFORM	MED WORK INSURANCE, OVERH	FAD AND FEE			
	Bldrs Risk Insurance	(.6 % of Subs and Self Performed work)	\$	237	
	Overhead on Flintco Work	(10% of Self Performed work+ Bond / Ins)		VOID	
	Fee on Flintco Work	(10% of Self Performed work+ Bond / Ins)		VOID	
SUBTOTAL 5			\$	237	
			TOTAL \$	39,746	
FLINTCO		OWNER			
(A tenda	at .				
Cristine Winches	ster	Terry Floyd			
4/20/2040					
1/28/2019		Poto			



87

Oklahoma City, OK Job Number 17039 - Norman Central Library WORKSHEET

				LABOR		MATI	ERIAL	TOTAL
DESCRIPTION	AREA	UNIT	MHRS	RATE	COST	QTY	COST	U.P.
Viva								\$35,409
					-		-	
	D. Owner		-		-		-	
			-		-		-	
					-			

Flintco Self-Perform Total Subcontractor Total \$0 \$35,409

Printed: 1/28/2019 Page: 1 of 1





Inspection Record

City of Norman Development Service Division 201 W. Gray St., Bldg. A Norman, OK 73069 Tel. (405) 366-5339 Fax. (405) 366-5445 Web: www.normanok.gov

Permit Application #: 17-00000173

Permit Type: COMMERCIAL, NEW CONSTRUCTION-2

Address: 103 W ACRES ST Inspector: GREG CLARK

Inspection Type

Inspection Result

BLDG, OTHER

DISAPPROVED WITH PENALTY

Result Notes:

Performed a Walk thorugh to review the Glass Railings for consideration of means and materials.

Work is permited under the 2015 IBC.

Refrencing the General Contractors RFI #358.

The Blue areas on the plans do not appear to have Foot Traffic that will pass "Beneath" them and we could support the proposal of using the exception with the film. Consult with Terry Floyd regarding any potential credits if warranted by the contract documents.

The Red and Green areas in the RFI both have foot traffic that will pass beneath them and the exception to 2407.1 would not be applicable.

IBC 2015:

2407.1 Materials. Glass used in a handrail or a guard shall be laminated glass constructed of fully tempered or heat strengthened glass and shall comply with Category II or CPSC 16 CFR Part 1201 or Class A of ANSI Z97.1. Glazing in railing in-fill panels shall be of an approved safety glazing material that conforms to the provisions of Section 2406.1.1. For all glazing types, the minimum nominal thickness shall be 1/4 inch (6.4 mm).

The proposed film product as submitted does not evidence to be an equal to the glass required by 2407.1.

Signed 1/24/2019 10:56:19AM by GREG CLARK

They Clark

1 of 5





Cristine Winchester

Flintco

Quote#:

17-062

OCO#:

3 1/28/19

Date: VS:

Υ

ZΤ

Project:

NORMAN PUBLIC LIBRARY

Norman, OK

We respectfully submit the following proposal for your consideration, thank you for the opportunity

Quote is based on the following documents provided

RFI #358 R1

JTEM 1

RED & GREEN MARKED AREAS

In-fill:

UPGRADE FROM 1/2" LOW IRON TEMP MONDLITHIC TO

1/4" LOW IRON TEMP + .060 PVB + 1/4" LOW IRON TEMP GLASS O/R

WITH DECORATIVE GRADIENT FILM

Item	Description:	
1	Monumental Stair Underside	
2	Bridge Underside	
3	Monumental Stair Bridge West Rail Elevation	
4	Monumental Stair Lower South Rail Elevation	
5	Deduct Base Bid Monolithic Glass (\$40,580)	
	THIS IS A LIPGRADE ADDITIVE COST ONLY	\$ 35 409

LEAD TIME: Shop Drawings: TBD at the time of order placement

Material: 12-14 weeks from field measurements & complete approvals (custom fab time may vary)



BASE BID INCLUSIONS/EXCLUSIONS		П
Furnish material as above		Included
Shop Drawings		Included
Shipping		Included
Sales Tax*		Excluded
SS-316 alloy (standard stainless steel alloy 304 is included)		Excluded
Standard #6 Brushed Stainless Steel Finish		Included
Embeds		Excluded
Full size mock-up		Excluded
Any railing scope beyond listed above		Excluded
Any supporting structural steel (adequate support steel required per engineering)		Excluded
Temporary Railing		Excluded
Temporary protection or protection of installed material		Excluded
Caulking or Silicone Sealant		Excluded
Cladding or break metal		Excluded
Coring		Excluded
Developing stair or structure CAD drawings or converting from paper to CAD		Excluded
Painting or wood staining (any wood provided is unstained)	Excluded	
Deviation from approved shop drawings	Excluded	
Time or cost impact due to changes in structure or site conditions from approved sho	Excluded	
Bent Glass (UON) with limited radius set-ups as indicated above, any additional set-up	ps would be at	
extra cost		Excluded
Indemnification for "gross" or "sole" negligence		Excluded
Structural Steel tolerances (deviations) of beyond 1/8" over 10' in long direction (can	nber & sweep);	
and 1/8" in the vertical direction along the cross section.		Excluded
Concrete slab tolerances (deviations) of beyond 1/4" over 10' in direction.		Excluded
Billing services fees (Textura etc)		Excluded
Wrap Project		No
GL Insurance		Included
WCInsurance		Included
Payment and Performance Bond		Excluded
	Material	
	Only	Material w/ Install Alt
Field Measurements		Included
Hoisting equipment and crane time		Included
Installation Tools, Equipment, Swaging Machine, injection guns or dispensers	Included	
Union Labor	Excluded	
Prevailing Wage	Excluded	

CONFIDENTIAL DOCUMENT



QUALIFICATIONS:

- 1 Payment Terms:
 - Material Furnish only: 50% Advance and balance on material ready and before shipping Furnish & Install: Progress billing per established schedule of values
- Quote, railing design or mounting details is based exclusively on information available on the supplied documents listed above, any deviation due to engineering, site conditions or changes may have a time and cost impact.
- 3 This quote excludes delegated design or performance specifications, quote based on design documents provided any deviation in material or services upon engineering may require adjustment in time and cost
- 4 Rails furnished in stocklengths, installer to cut and fit to size per shop drawings
- *Sales Tax Excluded (UON above under inclusions/exclusions), Tax applicable in all States unless Tax exempt certificate provided
- 6 Standard "Order Acknowledgement Tems & Conditions" apply, see below
- 7 Quote valid for 3 months from quote date above
- 8 VIVA Railings reserves the right to review, edit and request changes to customers contract
- 9 This quote is contingent upon the parties' successfully negotiated mutually acceptable contract terms.
- 10 Buyer to confirm Building Code for the Project. If the job is per IBC 2015, Laminated glass is required
- 11 Any products supplied or installed by VIVA are not intended to be waterproof
- 12 IBC does not specify deflection criteria, unless otherwise specified VIVA engineering allows +/- 1.5" of deflection

Respectfully Submitted - VIVA Railings, LLC

If acceptable, please sign and return. Thank you for choosing VIVA Railings!

Company:	
Name:	
Date	

Signature:

CONFIDENTIAL DOCUMENT



TERMS & CONDITIONS

- Terms and Acceptance. If not signed by Buyer, Seller shall have no obligations under this agreement. Any provision in any
 previous or contemporaneous purchase order or writing issued by Buyer which is inconsistent or in addition to the terms
 and conditions herein or which alters this contract shall have no force or effect and shall not constitute any part of this
 contract.
- 2. Payment Terms. Terms of payment can be found in the Order Acknowledgment and also in the provided Quote.
 3. Delays. This contract is subject to Seller's ability to obtain some or all of the Materials from remote manufacturers or suppliers within the time estimated on the first page of this Acknowledgment. Seller shall endeavor to meet the schedule and shall diligently undertake its own tasks within its own offices but shall not be liable for any delay in delivery or shipment of the Materials or any part or portion thereof arising from any cause wholly or partly beyond Seller's control.
 Seller will not be responsible for any costs incurred for delays caused by Buyer, Owner, Architect, inclement weather, site accessibility or any conditions beyond the control of Seller. Agreed upon Installation date is based on site availability and receiving all necessary approved drawings.
- 4. Warranties. Seller's only warranty is that the Materials shall be free from workmanship and fabrication detects for a period of one year after acceptance of delivery, all other warranties of merchantability or fitness for any particular use or purpose being disclaimed. Seller shall not be liable for any loss or damage directly or indirectly arising from the everyday use of the Materials, failing to properly maintain, improper installation or modifications to materials or for any consequential or any other type of damages
- 5. Price Escalation. Buyer understands that Seller is acquiring some or all of the Materials from foreign suppliers, and that Seller's costs of acquiring such Materials may increase due to causes beyond Seller's control. Seller's pricing is based on Buyer's signing this agreement within 30 days, and Seller's receipt of Buyer's approval of shop drawings, instruction to commence fabrication, and acceptance of delivery of the Materials all within reasonable times thereafter. Buyer agrees to expedite its approval process, and to act to minimize the chances of such cost increases. In the event of an increase in Seller's costs of acquiring the Materials, Seller has the right to seek an equitable adjustment for this agreement.

 6. Special Terms. In the event of defects or claims concerning the Materials, Seller's liability is limited to the cost of replacing or repairing the Materials in question, at Seller's sole option. Seller shall not be liable for special, direct, consequential, or any other damages other than the cost of replacing or repairing such Materials. Seller has no liability if the Materials have been modified or altered after arrival at the Project. Seller has no responsibility for the compatibility or suitability of the Materials with whatever system, device, product, mechanism, or use that Buyer intends for such Materials, or the adequacy of the Project's plans and specifications concerning the Materials.
- 7. Suspension and Cancellation of Performance. Buyer acknowledges and agrees that Seller shall be entitled to suspend or cancel its performance in whole or part in the event that any payment due and owing to Seller is not timely and fully paid within 30 days from the date of submission, unless another period is otherwise agreed to by the parties hereto; or in the event that Buyer becomes a debtor in bankruptcy, has a receiver appointed or becomes otherwise insolvent or financially impaired; or if Buyer substantially changes the scope of the original order so much as to render the original order abandoned; or if Seller's performance is substantially impaired, thwarted or otherwise impossible or impracticable by Acts of God, war, embargo, strike, labor disturbance, riot, public disorder, terrorism, catastrophes of fire or explosion, local or foreign laws or regulations changed since the execution of or notice in existence of this Order Acknowledgement, inability to secure any material or component or the transportation of such items, or the unforeseen intervention of any governmental authority, or any unforeseen extreme weather (collectively "Force Majeure Event"), of for Seller's convenience. In the event it is necessary for Subcontractor to suspend its performance, Seller shall provide Buyer with written notice of the event justifying the suspension and, if due to any act(s) or event(s) of Buyer, allow Buyer forty-eight (48) hours in which to cure the deticiency; and it Buyer is not able to cure the deticiency, or it suspension is the result of an Act of God or other Force Majeure event, Seller shall be entitled to cancel the order(s) and terminate its performance, and in such event, or in the event of cancellation for convenience, Buyer shall remain liable for payment of all properly performed services or materials prior to the date of suspension/cancellation plus Seller's general conditions and lost profit, and Seller shall be absolved of any liability to Buyer thereafter including claims for damages or other financial claims. The rights under this Section 7 are in addition to any other right or remedy to which Seller is entitled under law or equity. Buyer acknowledges and agrees that the terms and conditions of this Section 7 shall supersede any other agreement between Buyer and Seller thereafter
- 8. Tolerances, Variations & Standards. All goods shall be subject to tolerances and variations consistent with usual industry practices regarding dimensions, straightness, section, composition and mechanical properties, normal variations in surface and internal conditions and quality, and also deviations from tolerances and variations consistent with practical testing and inspection methods. Seller is not responsible for compliance with any standards not specifically denoted in Quote.
 9. Claims. Buyer shall inspect the Materials upon delivery. If any of the Materials are damaged, or if the quantities do not agree with quantities indicated on the shipping document, and Buyer intends to assert any claim against Seller on this account, Buyer shall mark an exception on the carrier delivery ticket and shall within titteen (15) days after receipt of such goods turnish Seller with detailed written information as to any damage or shortage. Buyer shall advise Seller in writing promptly after receipt of any goods, and in no event not later than innety (90) days after such receipt, of any claim Buyer may have against Seller with respect to such goods. For any Buyer claims against Seller concerning any goods, Buyer shall afford Seller a reasonable opportunity to inspect such goods. Any action by Buyer for breach of this contract must be commenced within two (2) years and one day after the cause of action accrues, and no such action may be maintained which is not commenced within such period. Any and all disputes concerning the Materials, or this transaction shall be decided by binding ARBITRATION under the then current Construction Industry Rules of the American Arbitration

Change Order No. 13 to Contract K-1617-83

CONFIDENTIAL DOCUMENT



by Texas law, with venue in Dallas County, Texas.

Association, with no joinder of or consolidation with claims concerning any other parties. Such arbitration shall be governed

10. Miscellaneous. Seller has no responsibility, direct or indirect, for damages resulting from improper installation or from Buyer's choice of what materials to order.

11. Installation Liability. Buyer is aware that careful and proper installation of the Materials is a critical factor in the success of any project. Installation includes and follows all specifications set forth in the Quote. Buyer warrants to Seller that Buyer has undertaken appropriate and proper measurements for Buyer's order of the Materials.

12. Risk of Loss. The risk of loss of the Materials shall pass to Buyer as soon as the Materials are delivered to Buyer or at the place designated for pickup or delivery on the first page of this order, and if no such address appears, then the risk of loss shall pass to Buyer as soon as the goods are ready for delivery, without regard to any notice thereof.

13. Returns. No goods may be returned without Seller's prior permission. If Seller authorizes a return, Buyer is responsible for return freight, and a 15% restocking charge.

14. Interest. If payment is not made as and when due, interest shall automatically be due and payable at the rate of 1 1/2% per month or 18% per year on the unpaid principal balance. It such interest rate is greater than the maximum rate permitted by law, it shall be reduced to and deemed to be the maximum rate permitted by law on an annualized basis.

15. Attorney Fees and Costs. If either party detaults in performance of any obligation in this contract, then in addition to any other damages, the non-detaulting party is entitled to reasonable attorney's fees and costs, and expert and consultant tees, in enforcing the terms of this contract.

16. Existing Railing or Railing Systems. Seller will not be responsible for the dismantling or removal of any temporary, or existing railing systems. Seller will also not install any temporary railing systems.

17. Protection of Work. Seller's responsibility to protect work ends after Project Manager or Superintendent approves the final completion of all installed systems.

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Submittal Transmittal

Package No. 0310-057313-0

E-mail

Norman Public Library Central 103 West Acres Street Norman, OK 73069	Project # 17039	Flintco, LLC
Package No. 0310-057313-0	Blended Glazed Railing Plan	Date: 1/29/2019 Importance: High
Transmitted By	For Review	Due Date
Cristine Winchester Flintco, LLC 2302 South Prospect Avenue Oklahoma City, OK 73129	Thomas Haller MSR Architects 710 S. 2nd Street 8th Floor Minneapolis, MN 55416q	2/2/2019
	Courtesy Copy	

Flintco,	LLC			Cristine Winchester	cristine.win	chester@flintco.com
Items						
Item	Reg. No	Rev	Spec Sec	Description	Туре	Action
0001	230792	0	057313	Film Mock-up Panels	Action Submittal	Submitted
0002	230793	0	057313	Lami Laminated Glass Locations	Approval Package	Submitted
0003	230794	0	057313	Lintec Polyester Film Test Data	Test Reports	Submitted

Contact

Contractor's Stamp

Author Company

This submittal has been reviewed for conformance with the contract documents and observed deviations from the documents have been noted. This review does not relieve the issuing entity of the responsibility for dimensions, quantity or conformity with the contract documents, nor is it intended to relieve the Architect/Engineer of responsibility for review of compliance with the design requirements.

By:	Cristine Winchester	
Date:	1/28/2019	
Date Ret'd by Ard	chitect:	

The purpose of this submittal is:

- confirm mock-up areas of the gradient film (page 2) *note that these will be horizontally arrayed for visual comparison and not installed in place
- 2) confirm laminated glass locations per RFI #358 but based on actual panels from shops (pages 3-29)
- provide the test data on the Lintec surface film for record per code official's request. Again, this surface film is being used at all locations (laminated and monolithic) (pages 30-31).

Engineer's Stamp

	UBMIT SPECIFIED ITEM
ance w project inform ments, the rec ficatio Dimen be con site; fa niques his wo	ing is only for general conform- rith the design concept of the t and general compliance with the lation given in the Contract Docu- Any action shown is subject to quirements of the plans and speci- ns. Contractor is responsible for: lisions and quantities which shall firmed and correlated at the job brication processes and tech- of construction; coordination of ork with that of all other trades e satisfactory performance of his
Date	2/4/2019
Ву	Tom Haller
M	ever Coheses & Deckessele Led

NO EXCEPTIONS TAKEN

MAKE CORRECTIONS NOTED

MSR

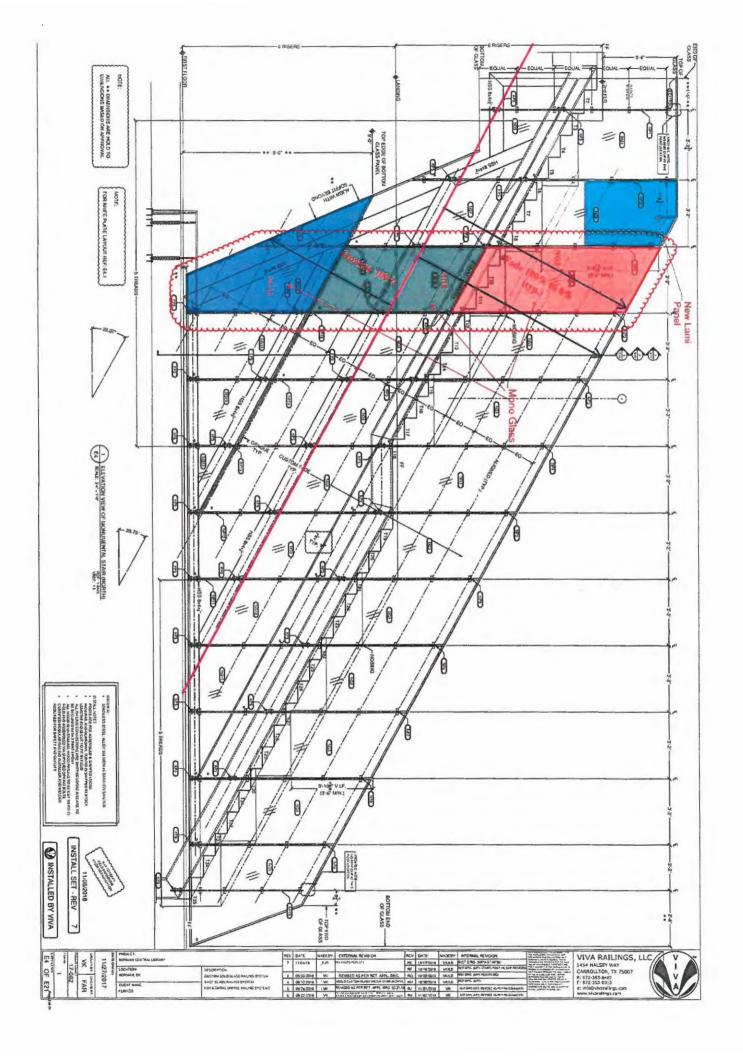
NO EXCEPTIONS TAKEN

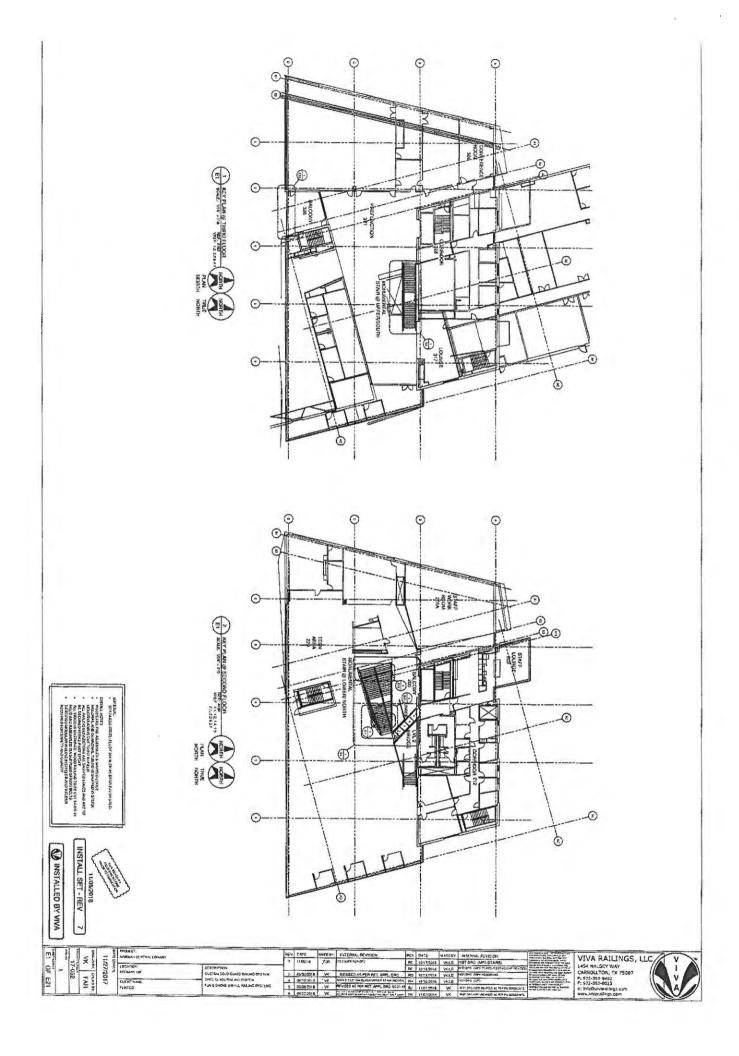
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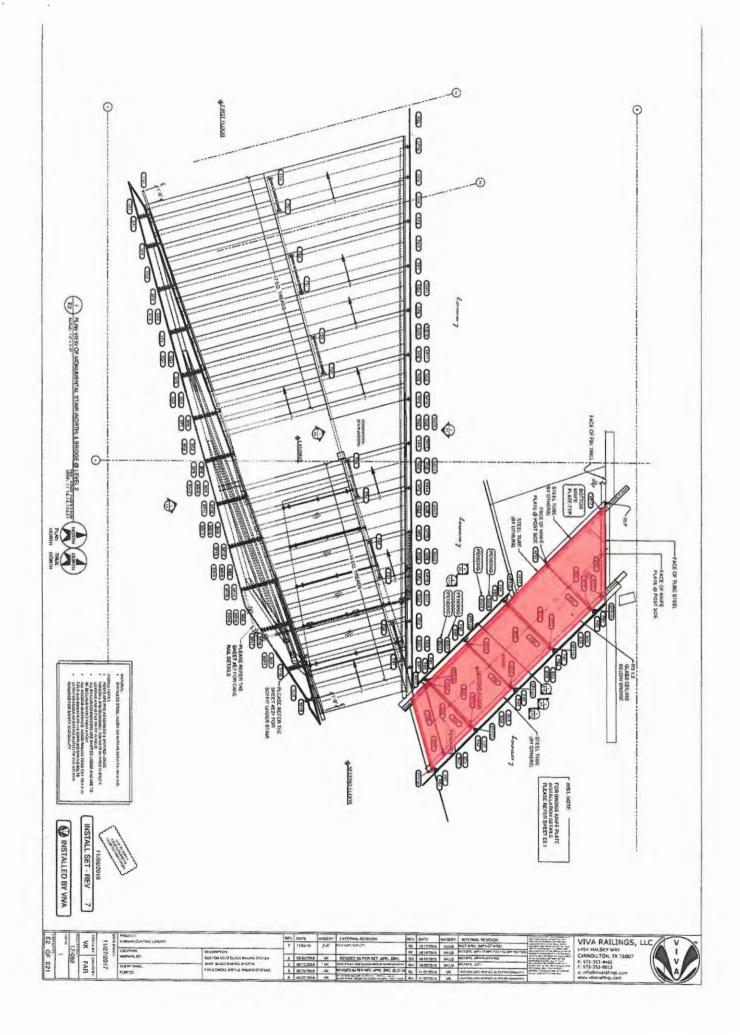
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FINAL APPROVAL PENDING PHYSICAL REVIEW.

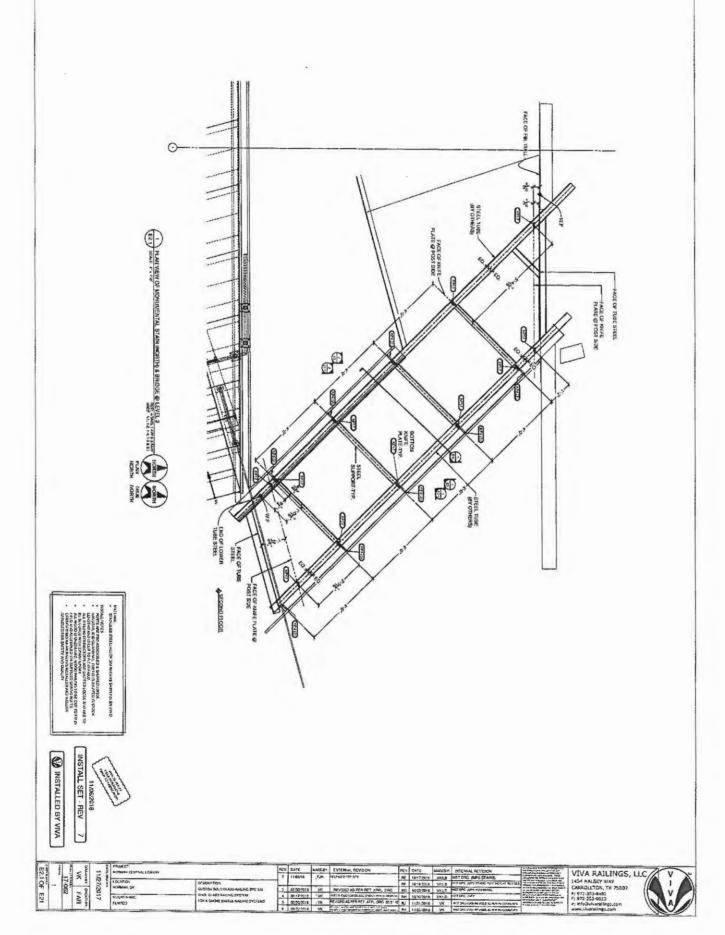
2. LAMINATED GLASS LOCATIONS SEEM APPROPRIATE. AH) TO OFFER

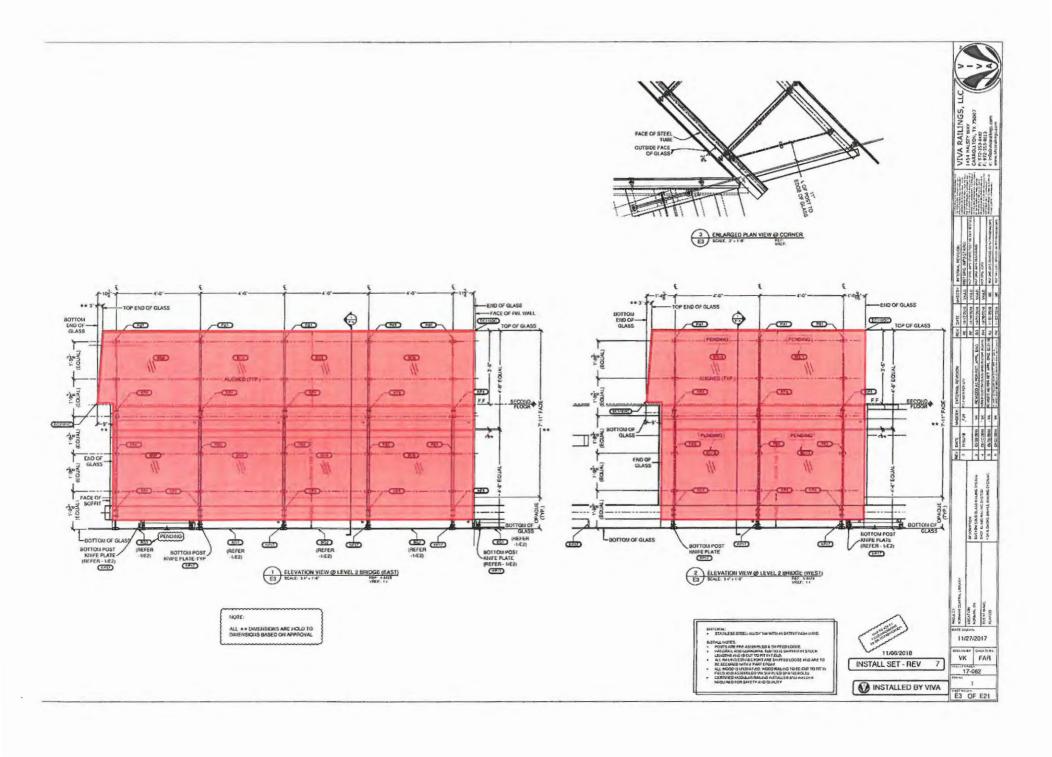
ULTIMATE APPROVAL.

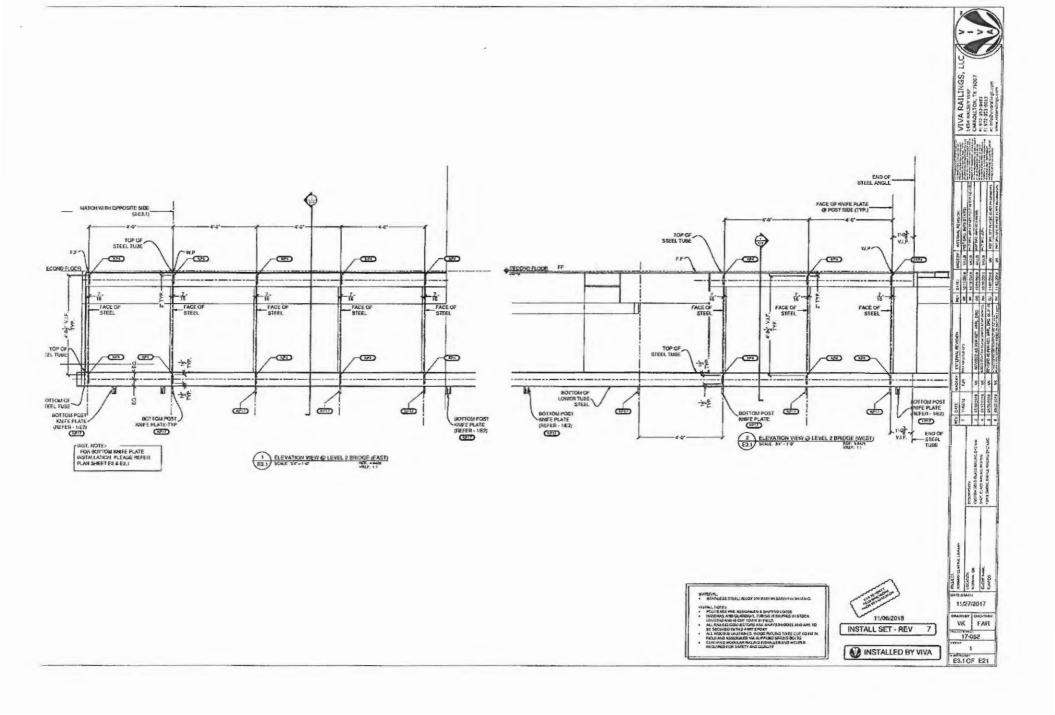


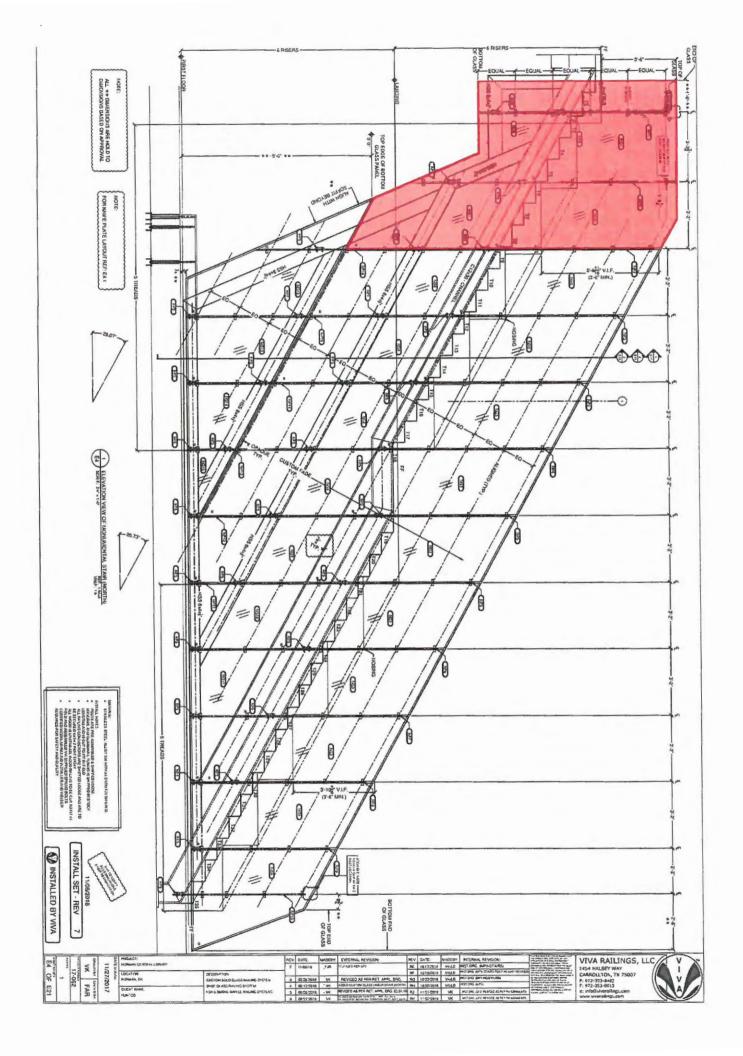


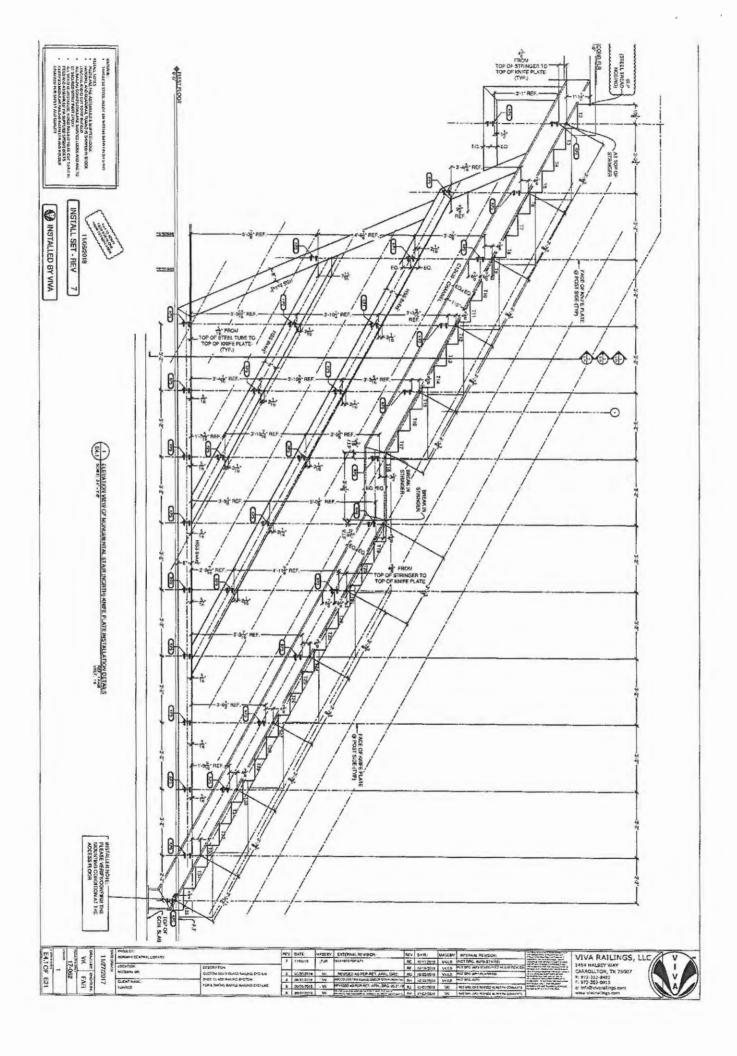


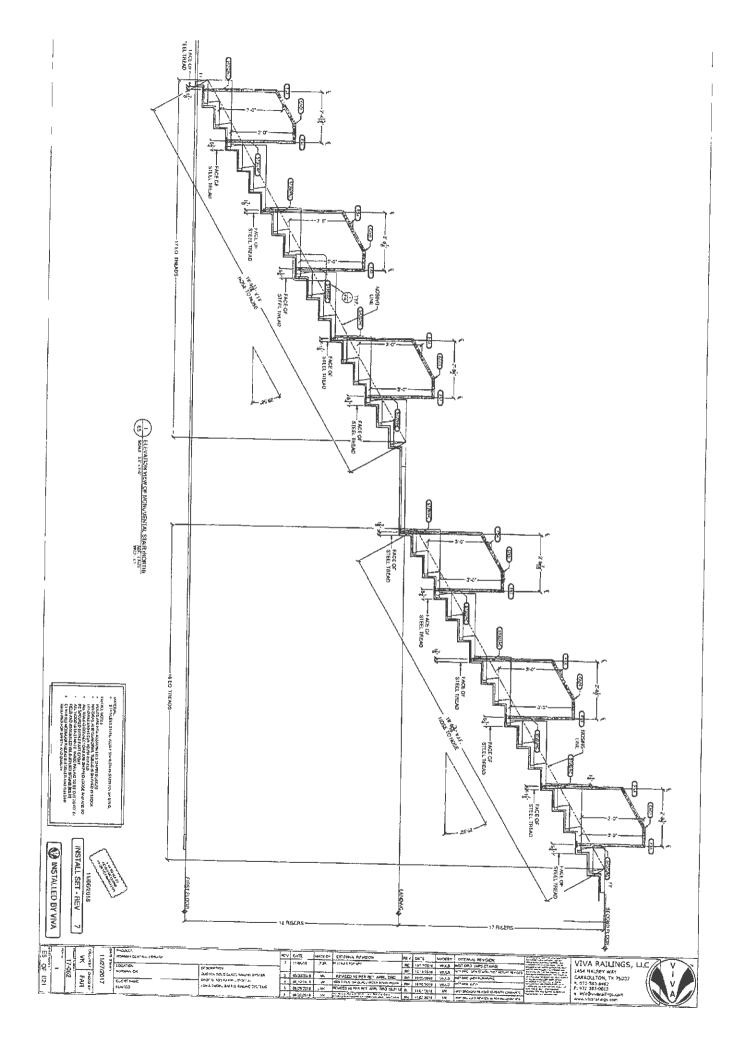


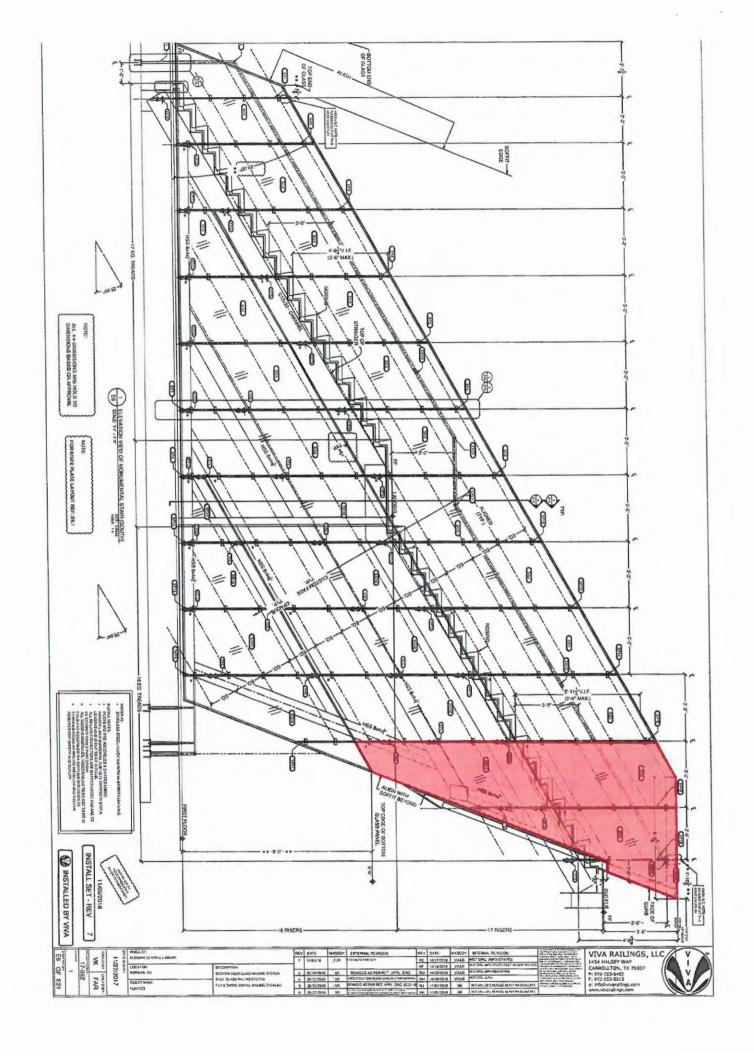


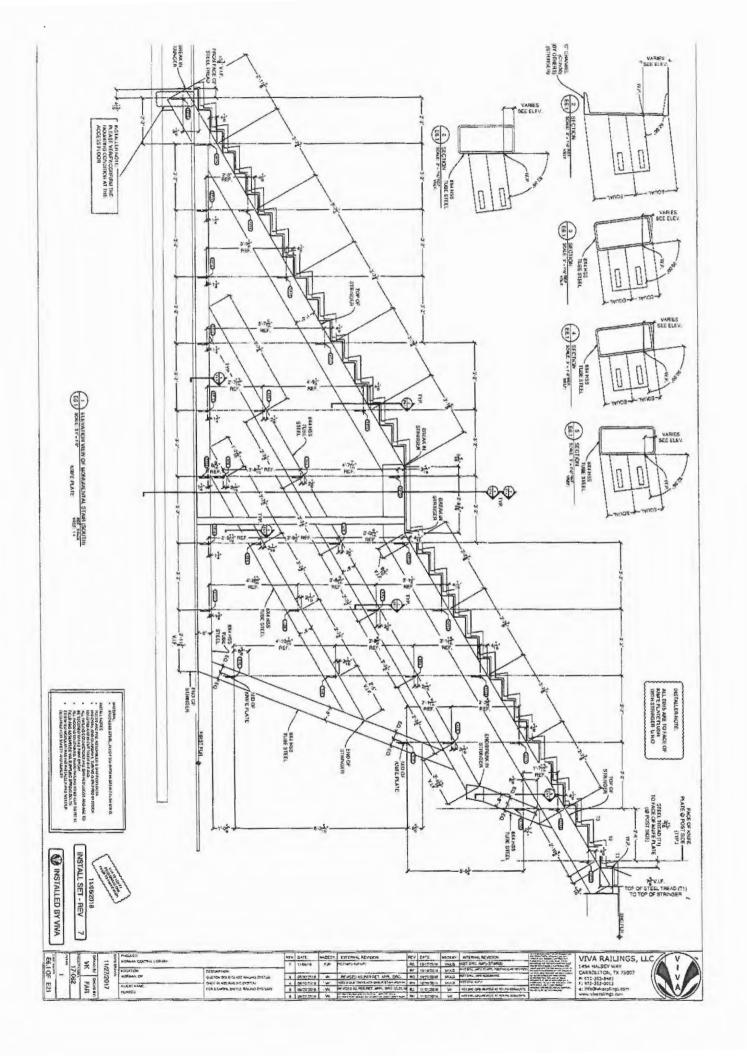


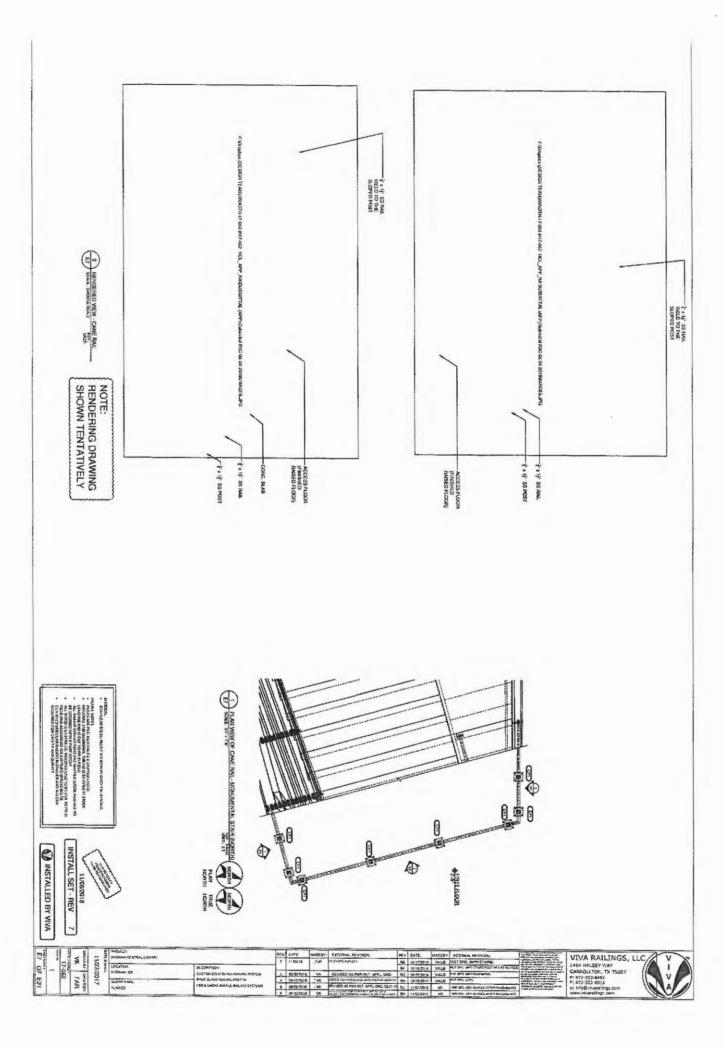


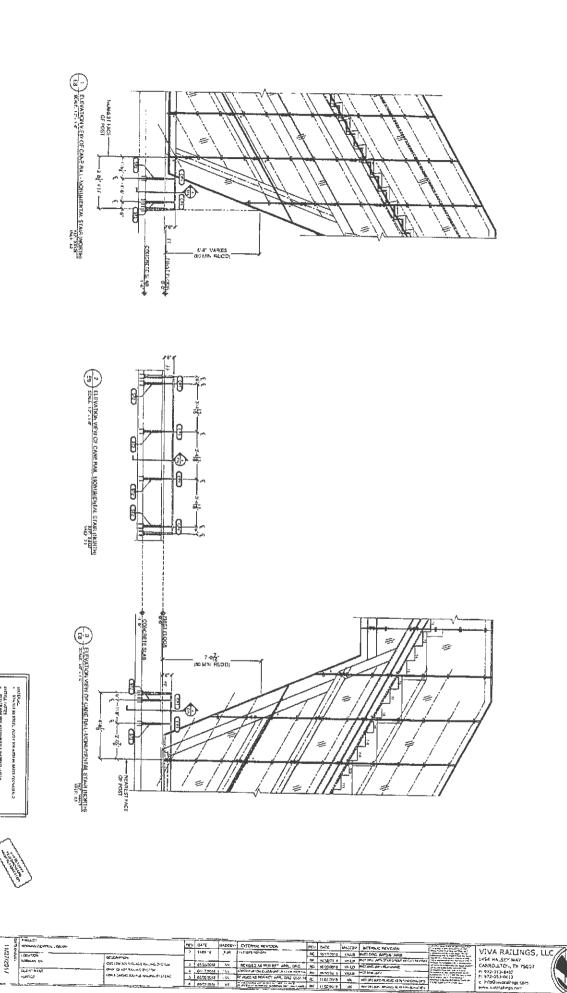












COMMENTATES

- TOUS FACING THE ASSUMPTION OF THE

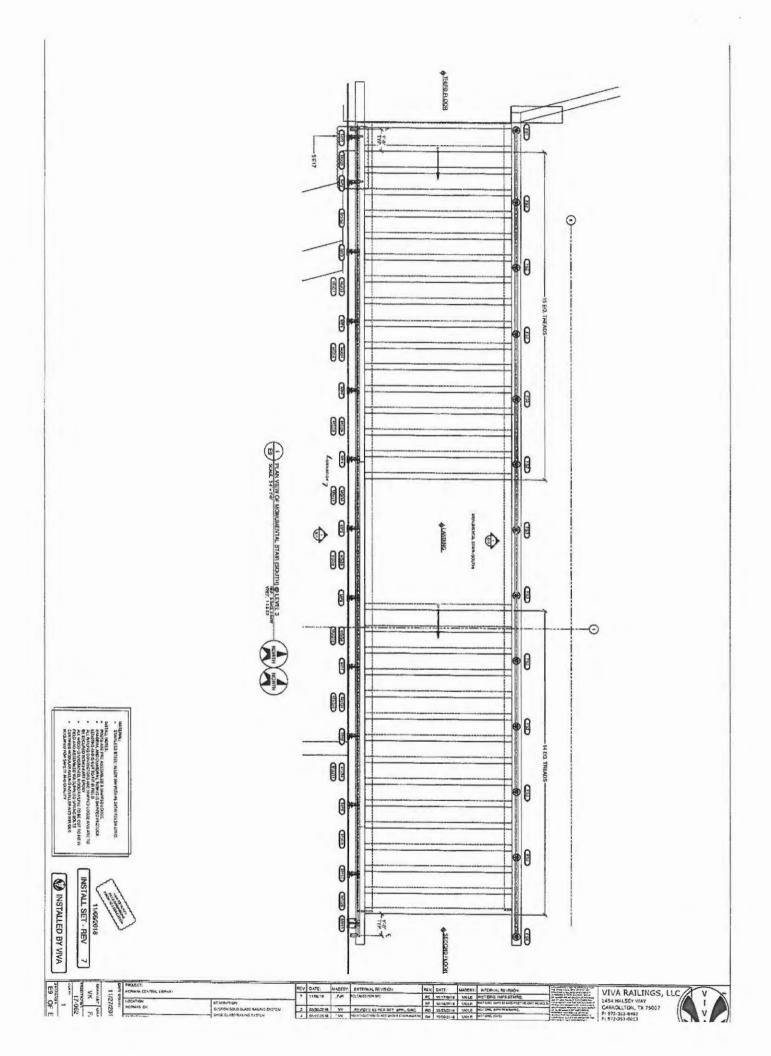
INSTALL SET - REV

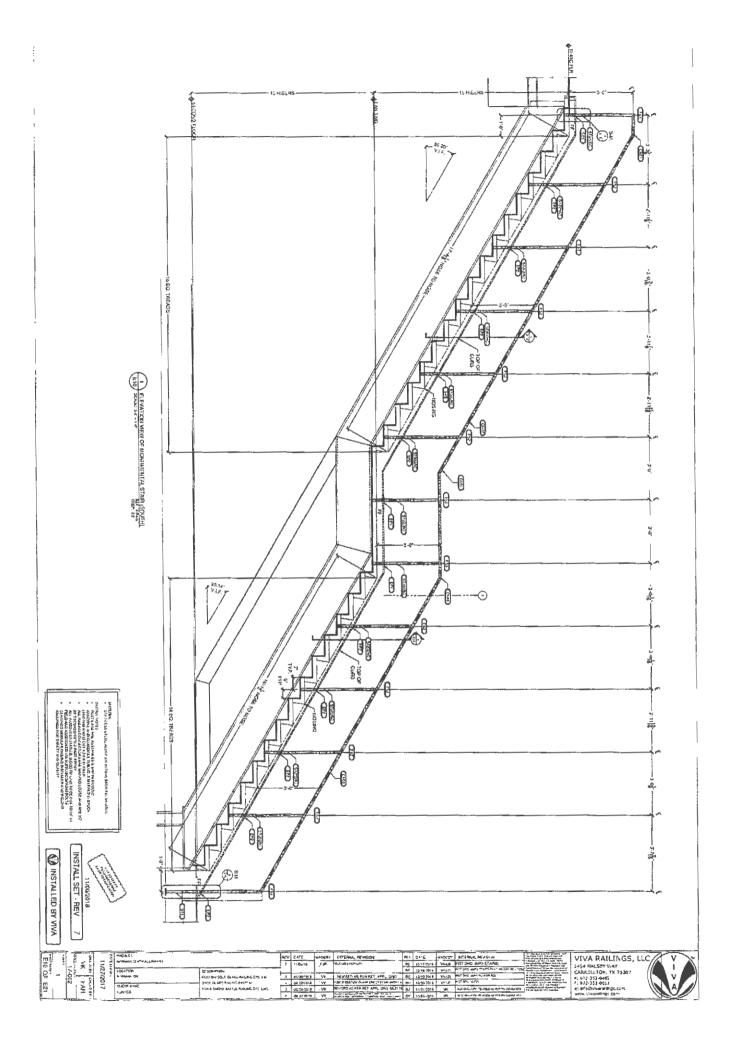
VK FAR

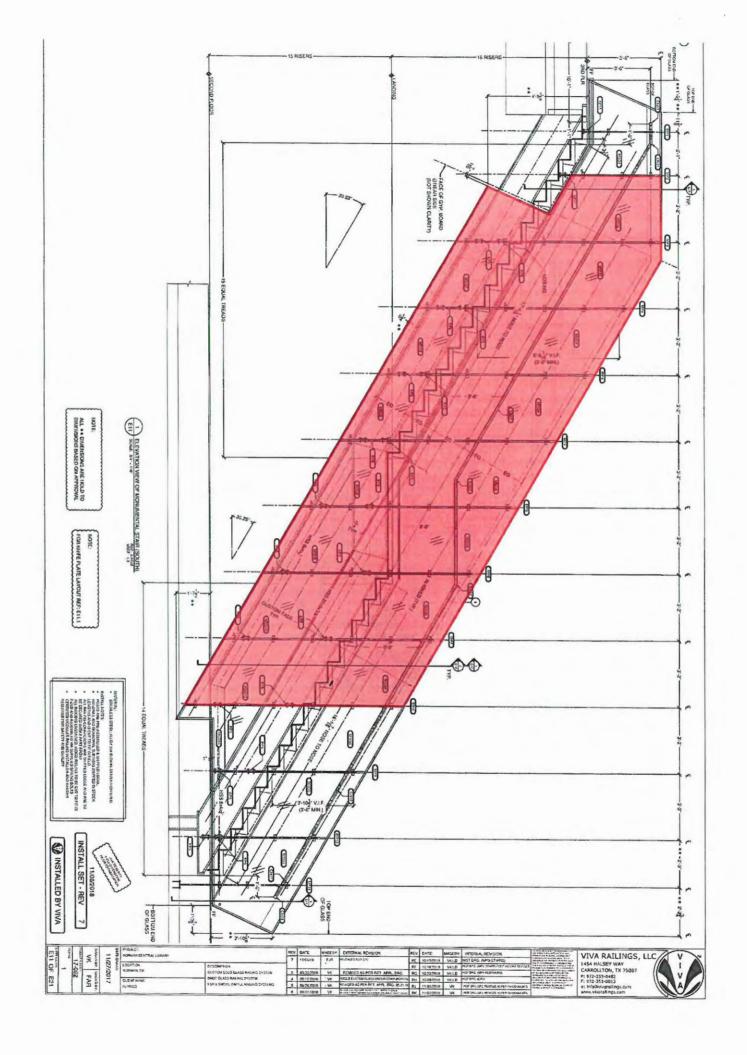
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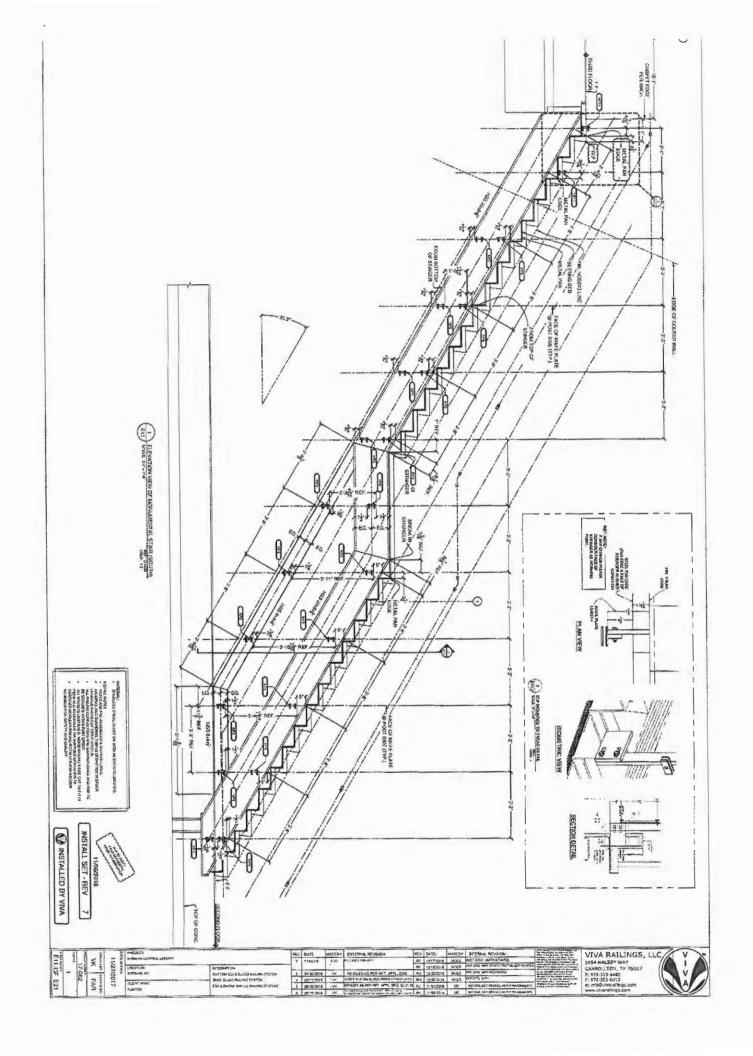
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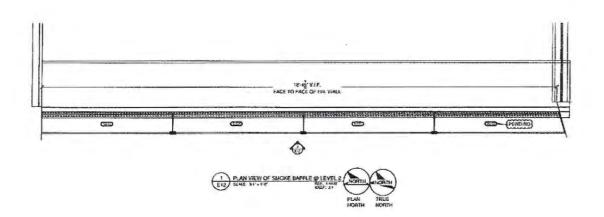
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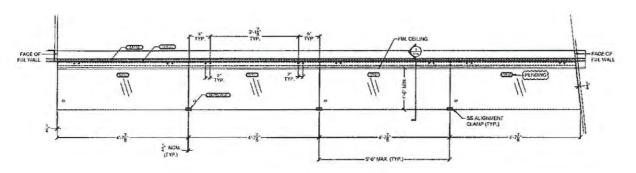












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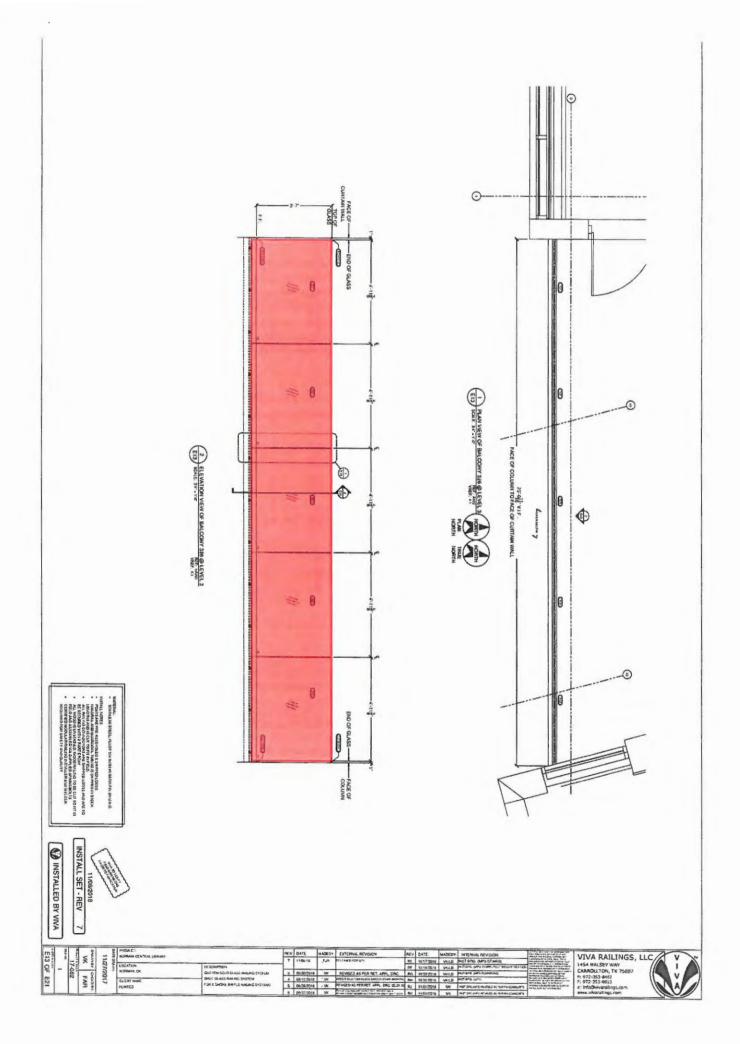
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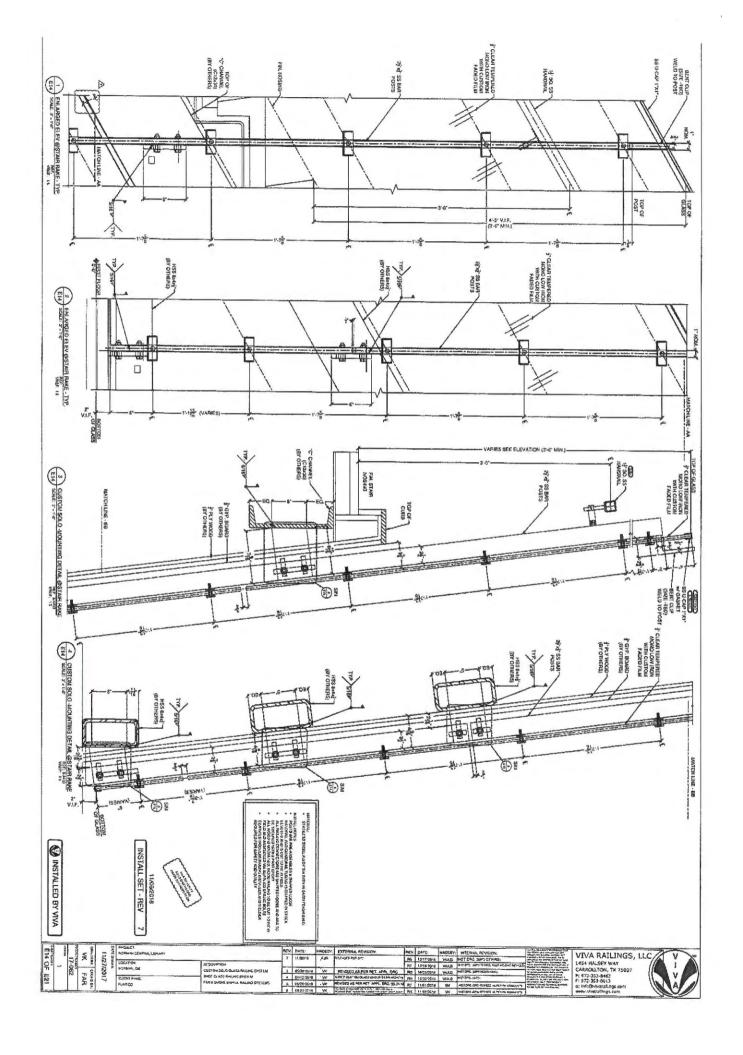


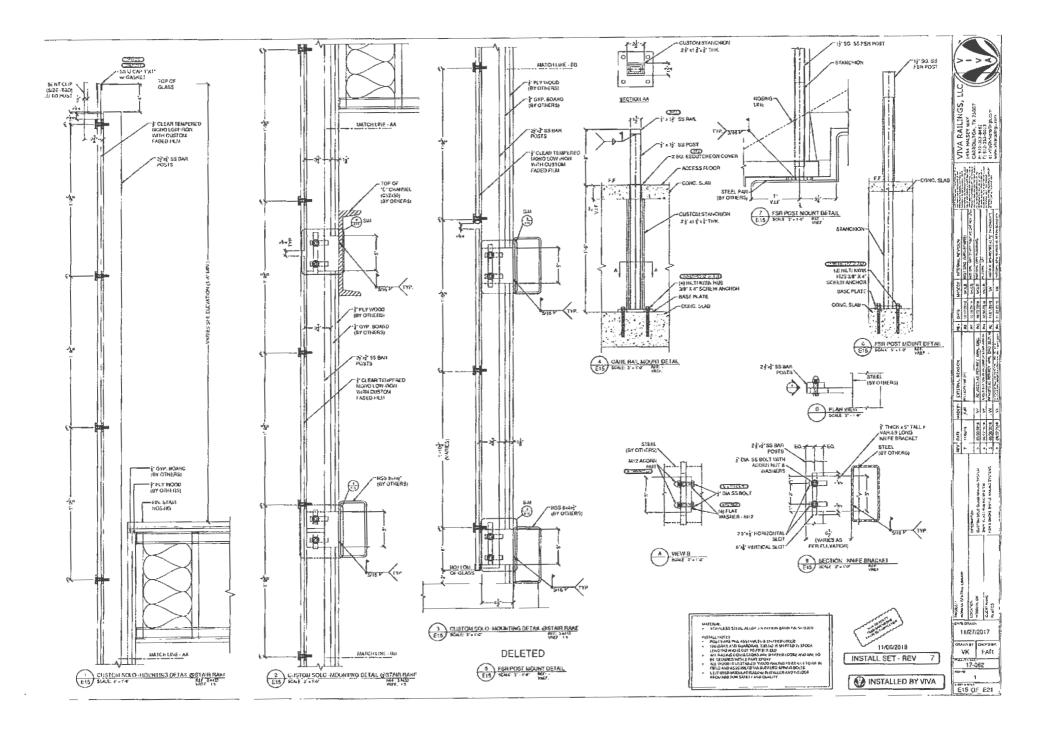
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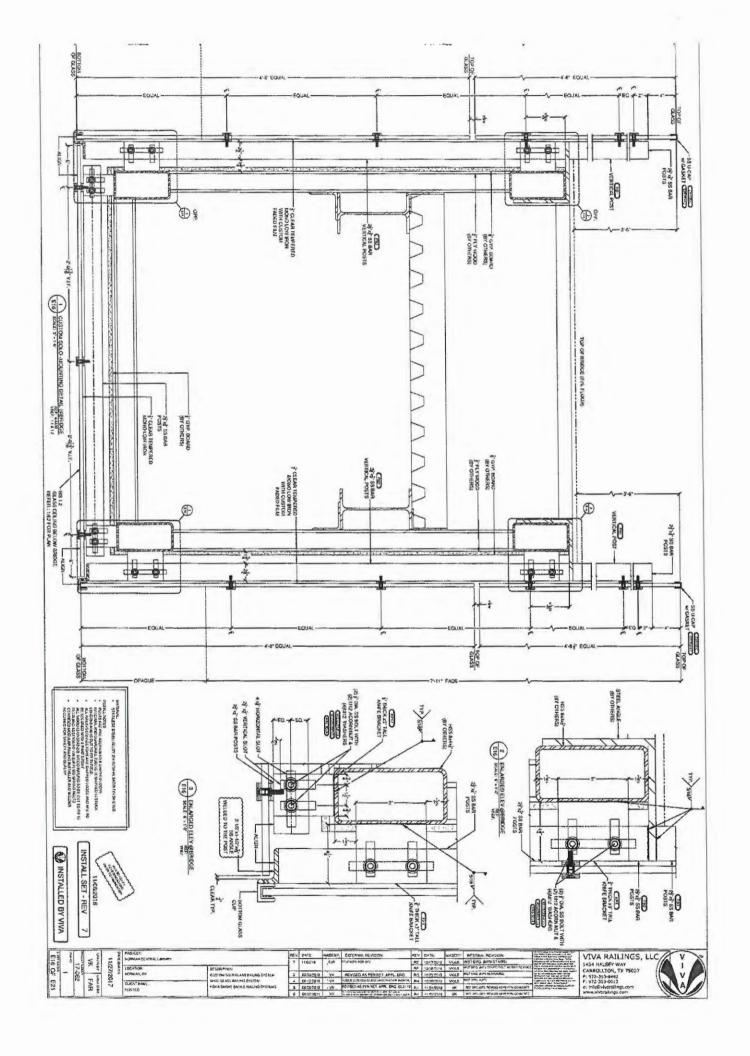
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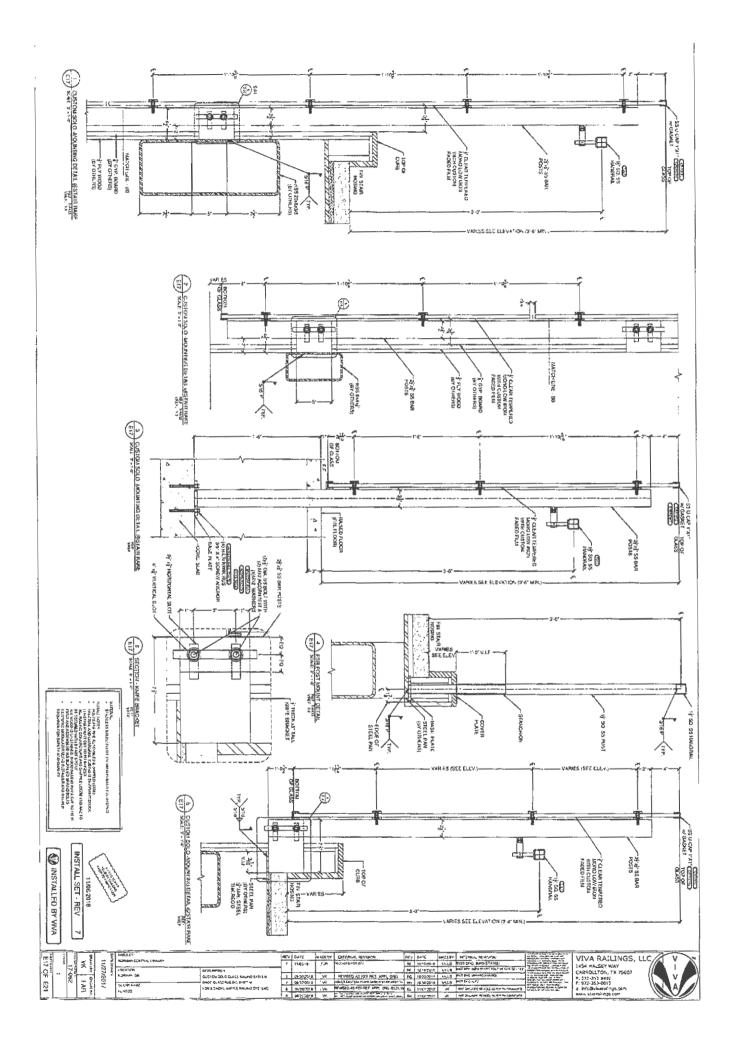
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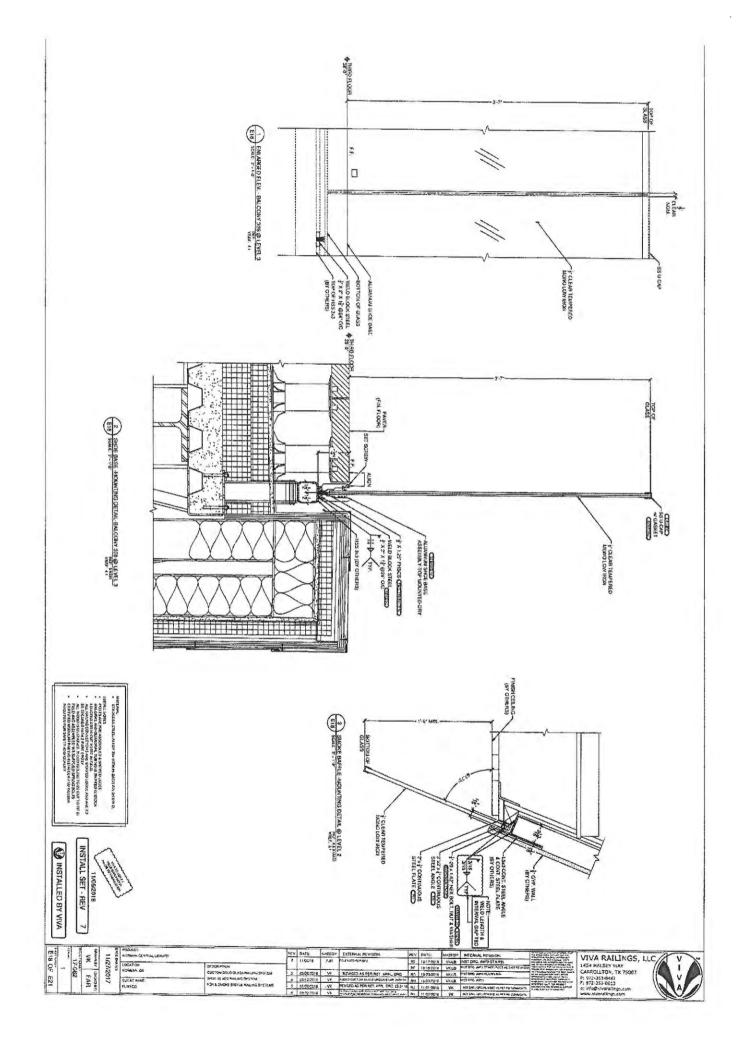




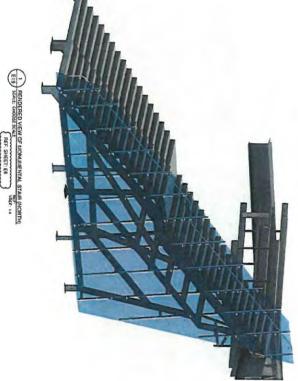














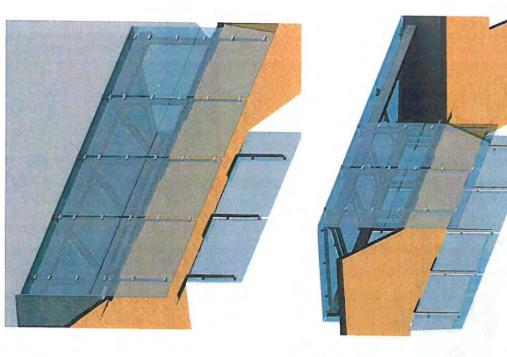


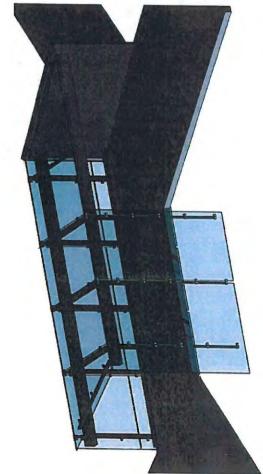




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VIVA RAILINGS, LLC
1454 HALSEY WAY
CARROLLTON, TX 75007
P: 972-353-842;
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e: infolivioratings.com

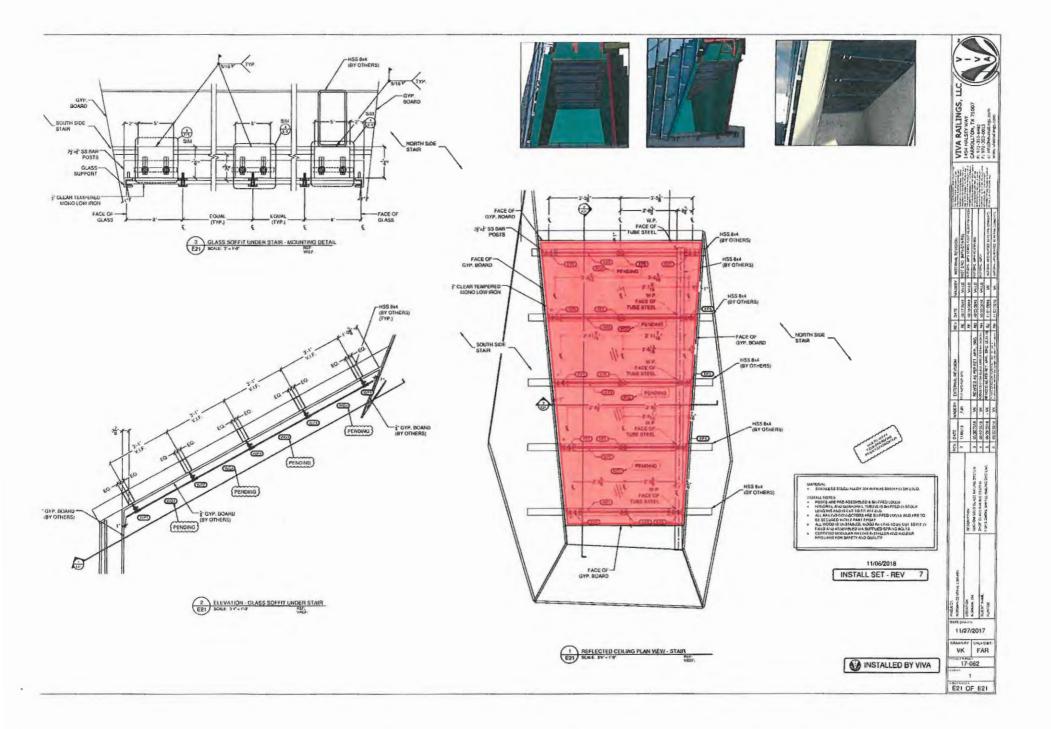


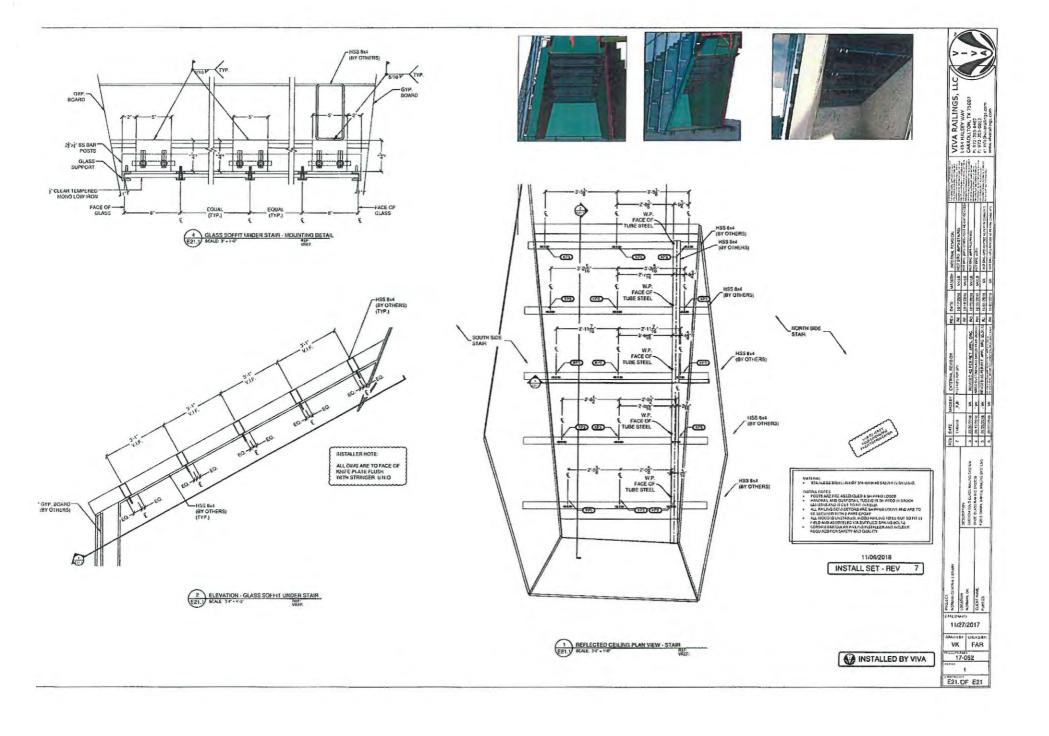


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Lintec E-2200ZC test result for JIS A-5759 Glass Shatter Resistance

Test items for Glass Shatter Resistant film based on JIS A-5759

- 1) Adhesive strength (PDF A)
- 2) Tensile strength (PDF A)
- 3) Elongation (PDF A)
- 4) Weather resistance (PDF A)
- 5) Glass shatter resistance (PDF B)

1) Adhesive strength

Shall exceed 4N/25mm

Test #	1	2	3	Average
Load when 20 mm peeling (N)	19	19	17	_
Load when 40 mm peeling (N)	19	17	17	_
Load when 60 mm peeling (N)	17	16	15	
Load when 80 mm peeling (N)	18	18	16	_
Adhesive strength N/25mm width (N) (Average of above)	18	18	16	17

2) Tensile strength

Shall exceed 100N/25mm

Test #	1	2	3	Average
Tensile Strength N25mm width	264	266	260	263

3) Elongation

Shall exceed 60%

Test #	1	2	3	Average
Initial distance between gauge lines (mm)	100	100	100	_
Distance between gauge lines when cutting (mm)	197	198	194	_
Elongation (%)	97	98	94	96

4) Weather resistance

Shall satisfy the following

^{*1} The film shall be free from abnormalities such as blister, cracks, peeling on the end.

^{*2} The adhesive strength of a film shall exceed 4N/25mm after weather resistant test.

Appearance

Test #	Result
1	There was no abnormality such as blister, crack, edge peeling
2	There was no abnormality such as blister, crack, edge peeling
3	There was no abnormality such as blister, crack, edge peeling

Adhesive Strength

Test #	1	2	3	Average
Load when 20 mm peeling (N)	23	20	21	
Load when 40 mm peeling (N)	22	19	18	_
Load when 60 mm peeling (N)	20	17	16	_
Load when 80 mm peeling (N)	19	17	16	-
Adhesive power N/25mm width (N) (Average of above)	21	18	18	19

5) Glass shatter resistance

Shall meet the following.

When the shot back test is performed, the total mass of 10 test pieces of large fragments shattered glass selected shall be 80g or less and the mass of the largest fragment shall be 55g or less.

Test	l	Drop	loomaat	Mass of sh	nattered glass		
#	Impact side	Height (mm)	lmpact	Total mass of 10 pieces (g)	The largest fragment (g)	Appearance	Photo
A-1	Film	300	1	1.2	0.3	Damaged glass sheets and film breakage	1,2
A-2	Side	300	1	0.8	0.2	Damaged glass sheets and film breakage	3,4
A-3	Glass	300	1	16.4	2.5	Damaged glass sheets and film breakage	5,6
A-4	Side	300	1	24.7	3.7	Damaged glass sheets and film breakage	7,8

Any tested pieces are less than standard size.

E-2200ZC passed all of the tests required. The item has proved to have Glass Shatter resistant performance.