Inline Design

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Seattle, WA 98108
425 405 5505
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EVALUATION SERVICE REPORT (ESR)

SUBJECT: **GLASS RAILING ROUND FASCIA MOUNT POST FOR HANDRAIL SYSTEMS**
SKU: **GLS.RND.FSC.HND**

1.0 Identification

This report evaluates the Inline Design round stainless steel surface-mount post system used for supporting glass infill panels in guardrail applications.

2.0 Applicable Codes

This product has been evaluated for compliance with the following model building codes:

- 2021 & 2018 International Building Code (IBC)
- 2021 & 2018 International Residential Code (IRC)
- ASTM E2358-17: Standard Test Method for Determining Load Resistance of Glass Railings and Balustrade Systems

3.0 Product Description

- Post Type: Surface-mount round post with welded base plate
- Material: Type 316 stainless steel conforming to ASTM A554 (for welded tubing) and ASTM A240 (for plate components)
- Post Dimensions: 42.4mm OD (1.67"), 2.6mm wall thickness
- Post Height: 42" above finished floor
- Fascia Plate: 5-1/2” x 3-1/2” x 3/8”
- Glass Type: 9/16” laminated tempered glass (1/4” glass plies with Sentry Glas+™ 0.06” interlayer)
- Glass Panel Height: 35.58”
- Glass Panel Width: Up to 44.84” max
- Post center to center width up to 48” max
- Anchorage: Four Hilti HAS-R 3/8" x 5-1/8" 316 stainless steel anchor rods (Part No. 2045001) installed with Hilti HIT-HY 200-R V3 adhesive, embedded a minimum of 4" into concrete with a compressive strength of at least 4,000 psi, per manufacturer's technical data and applicable evaluation reports.

4.0 Performance Characteristics

4.1 Load Testing

- 200 lbf Concentrated Load: Applied horizontally & vertically to the top of the handrail across 12" segment – PASSED
- 50 lbf Infill Load: Applied over a 12" x 12" glass area – PASSED
- 50 plf Uniform Load: Distributed along the top rail (simulated) – PASSED

4.2 Structural Safety

- Factor of Safety (FoS) for Stainless Steel Components: 2.5 under IBC Section 1607.8 and ASTM E2358-17.
- Factor of Safety (FoS) for Laminated Glass Infill Panels: 3.0 per ASTM E2358-17 Section 7.5.2.
- Maximum von Mises Stress: 240 MPa (under 600 MPa yield for cold-rolled SS316, 87 ksi, FoS = 2.5).
- Maximum von Mises Stress: 130 MPa (under 400 MPa yield for hot-rolled or cast SS316, 58 ksi, FoS = 2.5).
- Deflection Limits: Within IRC/IBC thresholds (L/240 or 0.5”).

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4.3 Glass Compliance

- Laminated tempered glass complies with ASTM C1172, CPSC 16 CFR 1201, and ANSI Z97.1 Category II
- Interlayer is ionoplast (SentryGlas or equivalent), non-PVB, with minimum shear modulus G > 11 MPa

5.0 Conditions of Use

- Product must be installed per Inline Design specifications
- Glass must be supported at both vertical edges by posts or structural walls
- The top rail must be secured at both ends to a post or structural wall to ensure stability and load path continuity
- Handrail must be terminated at structural elements (posts or adjacent walls) to meet IRC/IBC stability requirements
- Maximum center-to-center post spacing shall not exceed 48" unless additional structural justification is provided
- Anchorage shall be into concrete with compressive strength ≥ 4,000 psi
- No substitution of glass type or interlayer without reevaluation
- All M8x1.25mm holes used by the glass clamps and fascia flanges are flow drilled
- Handrail to be welded to handrail bracket saddles

6.0 Basis of Evaluation

Finite Element Analysis (FEA) conducted.

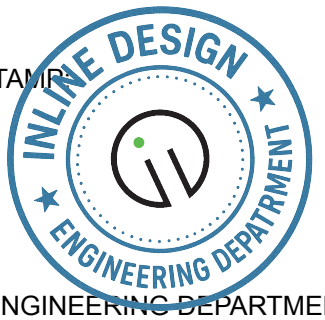
Evaluation in accordance with:

- ASTM E2358-17
- IBC 2018 & 2021 Section 1607.8 (Guard Loads)
- IRC 2018 & 2021 Table R301.5 (Minimum Uniformly Distributed Live Loads)

7.0 Findings

Based on the results of structural analysis and glass performance review, the Inline Design GLS.RND.FSC.HND.42” stainless steel surface post glass railing system is found to comply with the structural requirements of the IBC, IRC, and ASTM E2358 for guardrail systems when installed as described in this report.

ENGINEERING STAMP:



INLINE DESIGN ENGINEERING DEPARTMENT PROFESSIONAL ENGINEER

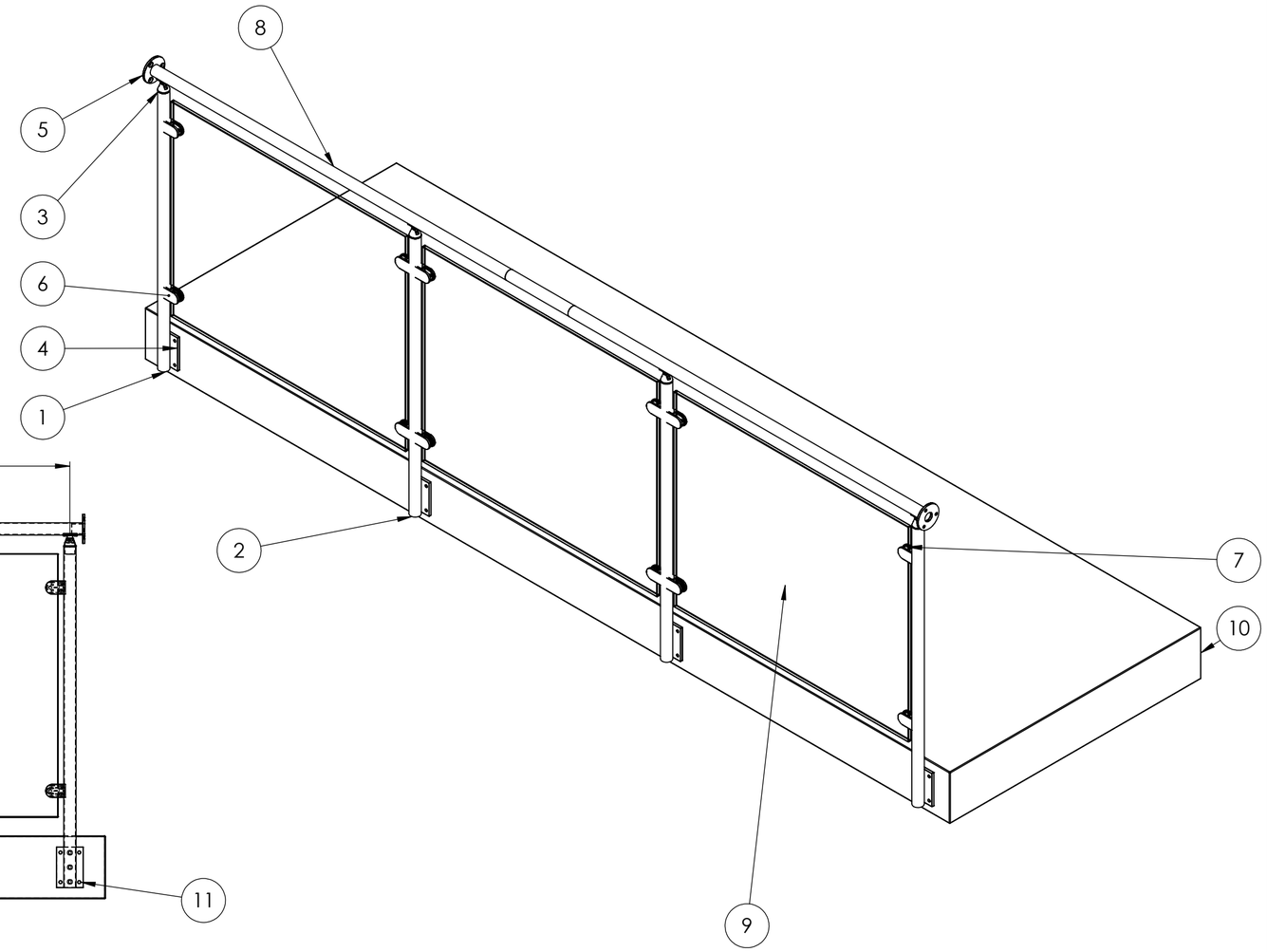
REPORT: ESR-GLS-RND-FSC-SUR-HND-IBC-IRC-ASTM.1.0 ISSUED

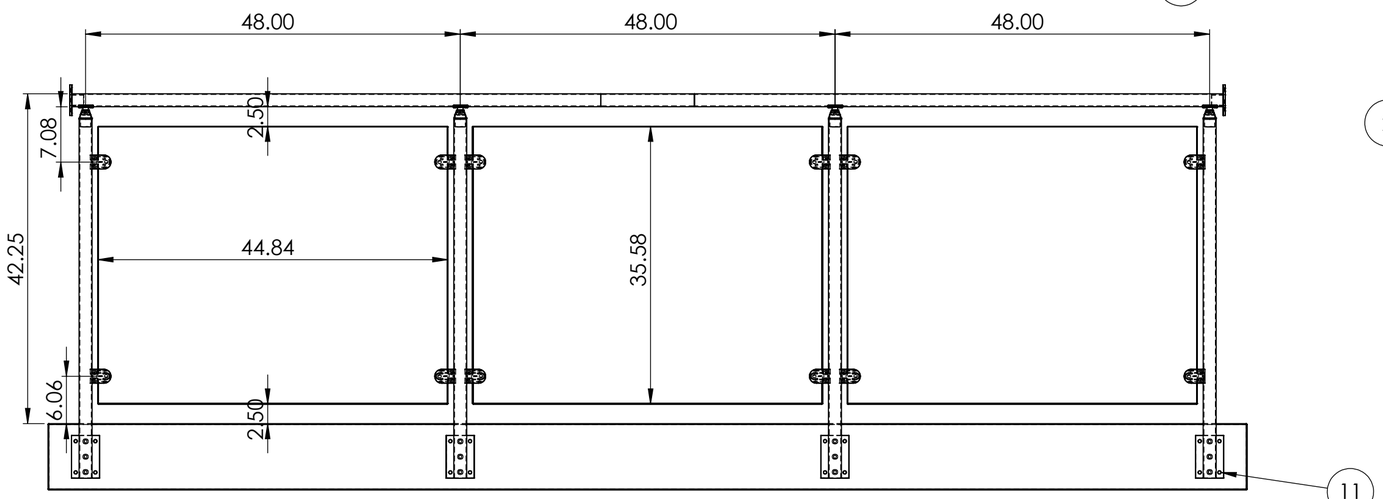
BY: INLINE DESIGN ENGINEERING DEPARTMENT 6335 1ST AVE SOUTH UNIT MAIN, SEATTLE, WA 98108

DATE: MAY 1 2025

This evaluation is subject to revisions as additional compliance testing (e.g., FBC, HVHZ, missile impact) is conducted.

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.	MATERIAL	MANUFACTURER
1	GLS.RND.FSC.HND.42.END	ROUND FASCIA MOUNT END POST FOR HANDRAIL 1.67" X 0.102"	2	SS AISI 316	INLINE DESIGN
2	GLS.RND.FSC.HND.42.MID	ROUND FASCIA MOUNT MIDDLE POST FOR HANDRAIL 1.67" X 0.102"	2	SS AISI 316	INLINE DESIGN
3	HBR.CNE.026	HANDRAIL BRACKET CONE FOR ROUND POST	4	SS AISI 316	INLINE DESIGN
4	PLT.FSC.FLT	FASCIA MOUNTING PLATE	4	SS AISI 316	INLINE DESIGN
5	BFS.RND.026	STAINLESS STEEL ROUND BASE FLANGE SLEEVE	2	SS AISI 316	INLINE DESIGN
6	GCL.RND.FLT	GLASS CLAMP ROUND FOR FLAT SURFACE	12	SS AISI 316	INLINE DESIGN
7	RUB.SQU.916	GLASS CLAMP RUBBER INLAYGLASS CLAMP RUBBER INLAY	24	RUBBER (EDPM) 80° A	INLINE DESIGN
8	TBE.RND.26M	ROUND HANDRAIL TUBE 1.67" x 0.102"	1	SS AISI 316	INLINE DESIGN
9	GLASS^GLS.RND.FSC.HND	9/16" LAMINATED TEMPERED GLASS (1/4" GLASS PLIES WITH SENTRY GLAS+™ 0.06" INTERLAYER)	3	GLASS	
10	CONCRETE^GLS.RND.FSC.HND	CONCRETE WITH COMPRESSIVE STRENGTH ≥ 4,000 PSI	1	CONCRETE	
11	2045001 + HIT-HY 200-R V3	HAS-R 316 SS ANCHOR ROD + HILTI HIT-HY 200-R V3 ADHESIVE	16	SS AISI 316	HILTI





TYPICAL EXTERIOR ELEVATION

Inline Design

GLASS RAILING ROUND FASCIA MOUNT POST FOR HANDRAIL

SKU: GLS.RND.FSC.HND

UNITS: INCHES

REVISION: 1.0