

11/13/2015

R&B Wagner, Inc.
10600 W Brown Deer Rd
Milwaukee, WI 53224

Project: R14-06-051 Wagner Glass Rail Base Shoe – Compliance with Alberta Building Code 2014

Attn: Andrew Chatfield

Andrew,

We have reviewed the structural design of the Panel Grip 2 Base Shoe GR2457HCB for compliance with the Alberta Building Code 2014.

The system has been designed for the following loads:

- 1.) Lateral Point Load of 1.0 kN (225 lbf) at top of glass
- 2.) Lateral Line Load of 0.75 kN/m (51.4 lbf/ft) at top of glass
- 3.) Vertical Line Load of 1.5 kN/m (102.8 lbf/ft) at top of glass
- 4.) Wind load of 1.0 kPa (20.9 psf) was used for this analysis with anchors at 305 mm (12 in) o.c. Wind Load of 2.0 kPa (41.8 psf) was used for this analysis with concrete anchors at 153 mm (6 in) o.c. (*anchorage to steel can remain at 305 mm (12 in) o.c.*)
- 5.) None of the above live loads occur at the same time.
- 6.) Although not required by code, the base shoe has been designed for a load combination of $1.5L + 0.4W$ and $1.4W + 0.5L$
- 7.) Deflection is limited to 40 mm (1.57 in)

The system is designed as follows:

- 1.) Guardrails have a minimum height above finished floor of 1070 mm (42-1/8 in)
- 2.) Guardrails have a top rail or top cap and it is assumed that each alternate lite is broken per CAN/CGSB-12.20-M89 section A5.1
- 3.) Safety glazing complies with CAN/CGSB-12.20-M89, CAN/CGSB-12.1 and 12.2 (latest edition)
- 4.) Glass edges shall be protected per CAN/CGSB-12.20-M89 Section A5.2
- 5.) The base shoe is extruded from alloy 6005-T5 or better and complies with CAN3S157 (latest edition)
- 6.) Exterior anchors are to be 300 series stainless steel. Any anchor near a pool, spa, or any exterior anchors within 1 km of the ocean shall be 316 stainless steel.
- 7.) Concrete anchors are designed per CSA A23.3-14

- 8.) The glass height above the base shoe is 966 mm (38.03 in) and the heights from top of top rail to bottom of base shoe is 1070 mm (42.13 in).

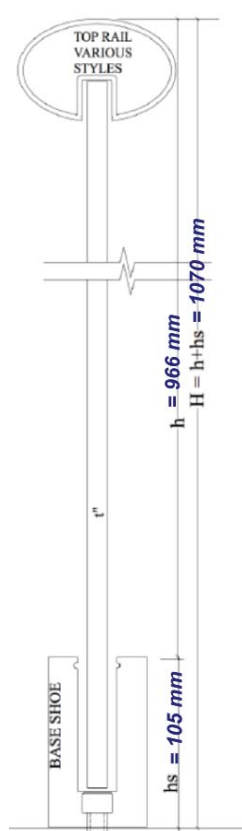


Figure 1: Glass Height

Limitations:

- 1.) This system is not intended to be used in “open viewing stands without fixed seats and for means of egress in grandstands, stadia, bleachers, and arenas”.
- 2.) The contractor is responsible for addressing any climb-ability issues with the local building department.
- 3.) The contractor is responsible for verifying that calculations were done to check the glass and the top rail.
- 4.) Concrete anchors have been designed for 28 N/mm² (4000 psi) N.W. cracked concrete with a minimum slab thickness of 200 mm (8 in) and an edge distance of 108 mm (4-1/4”). The contractor is responsible for verifying the anchoring conditions per the manufacturer’s test data. Calculations will need to be done if the substrate conditions do not match or exceed what was used in this report.
- 5.) The contractor is responsible for obtaining calculations for wind loads higher than 2.0 kPa (41.8 psf)
- 6.) The contractor is responsible for obtaining calculations for glass heights above the base shoe greater than 966 mm (38.03 in) or heights from top of top rail to bottom of base shoe greater than 1070 mm (42.13 in).

- 7.) The contractor is responsible for using the correct fasteners in the base shoe and complying with manufacturer and code requirements.
- 8.) The contractor is responsible for verifying that the substrate is structurally adequate for the guardrail loads.
- 9.) Railing installation inspections shall be done as required per the local building department.

This letter certifies that the R&B Wagner Panel Grip 2 Base Shoe GR2457HCB is compliant with the Alberta Building Code 2014. Calculations will still need to be done by a professional engineer on exterior projects to verify the wind load does not exceed 2.0 kPa (41.8 psf). Calculations will also need to be done to verify that the top rail, glass, anchorage, and substrate are adequate to meet the project specific loads, project specific specifications, and local building code.

These are standard system calculations and are not project specific. It is the duty of the engineer of record sealing and taking responsibility for the project documents to ensure that these standard calculations meet the contract requirements and local building code requirements for specific projects. Rice Engineering takes no liability for the use of these standard calculations for any project specific applications.

Feel free to contact us with any questions.

Sincerely,



Bradley Kuehl

2015.11.13 14:14:43 -06'00'

Brad Kuehl, P. Eng.

Vice President– Rice Engineering Inc.

11/13/2015

R&B Wagner, Inc.
10600 W Brown Deer Rd
Milwaukee, WI 53224

Project: R14-06-051 Wagner Glass Rail Base Shoe – Compliance with 2012 OBC

Attn: Andrew Chatfield

Andrew,

We have reviewed the structural design of the Panel Grip 2 Base Shoe GR2457HCB for compliance with the 2012 Ontario Building Code (OBC).

The system has been designed for the following loads:

- 1.) Lateral Point Load of 1.0 kN (225 lbf) at top of glass
- 2.) Lateral Line Load of 0.75 kN/m (51.4 lbf/ft) at top of glass
- 3.) Vertical Line Load of 1.5 kN/m (102.8 lbf/ft) at top of glass
- 4.) Wind load of 1.0 kPa (20.9 psf) was used for this analysis with anchors at 305 mm (12 in) o.c. Wind Load of 2.0 kPa (41.8 psf) was used for this analysis with concrete anchors at 153 mm (6 in) o.c. (*anchorage to steel can remain at 305 mm (12 in) o.c.*)
- 5.) None of the above live loads occur at the same time, however the OBC requires a load combination of 1.5L + 0.4W and 1.4W + 0.5L
- 6.) Deflection is limited to 40 mm (1.57 in)

The system is designed as follows:

- 1.) Guardrails have a minimum height above finished floor of 1070 mm (42-1/8 in)
- 2.) Guardrails have a top rail or top cap and it is assumed that each alternate lite is broken per CAN/CGSB-12.20-M89 section A5.1
- 3.) Heat soaked tempered and heat strengthened laminated glass complies with CAN/CGSB-12.20-M89, CAN/CGSB-12.1 and 12.2 (latest edition) and building code SB-13
- 4.) Heat soaking per DIN EN 14179-1
- 5.) Glass edges shall be protected per CAN/CGSB-12.20-M89 Section A5.2
- 6.) The base shoe is extruded from alloy 6005-T5 or better and complies with CAN3S157 (latest edition)
- 7.) Exterior anchors are to be 300 series stainless steel. Any anchor near a pool, spa, or any exterior anchors within 1 km of the ocean shall be 316 stainless steel.
- 8.) Concrete anchors are designed per CSA A23.3-14

- 9.) The glass height above the base shoe is 966 mm (38.03 in) and the heights from top of top rail to bottom of base shoe is 1070 mm (42.13 in).

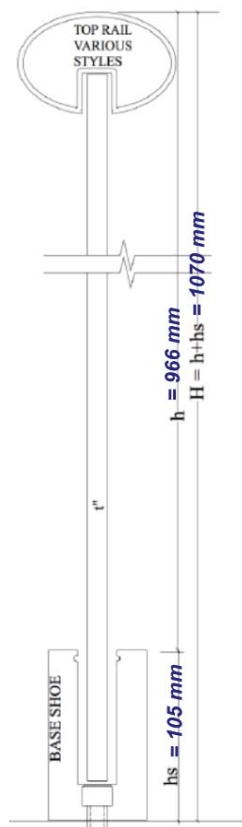


Figure 1: Glass Height

Glass selection is per Table 2.1.1.1 of SB-13:

Table 2.1.1.1.
Selection of Glass in a Guard
Forming Part of Sentence 2.1.1.1.(2)

Location of Glass in a <i>Guard</i>	Type of Glass Required
Glass located beyond the edge of a floor or within 50 mm of the edge of a floor	Heat strengthened laminated glass
Glass located more than 50 mm inward from the edge of a floor	Heat strengthened laminated glass
	Heat soaked tempered glass
Glass located more than 150 mm inward from the edge of a floor	Heat strengthened laminated glass
	Heat soaked tempered glass
	Tempered glass not more than 6 mm thick
Column 1	2

Limitations:


- 1.) This system is not intended to be used in “open viewing stands without fixed seats and for means of egress in grandstands, stadia, bleachers, and arenas”.
- 2.) The contractor is responsible for addressing any climb-ability issues with the local building department.
- 3.) The contractor is responsible for verifying that calculations were done to check the glass and the top rail.
- 4.) Concrete anchors have been designed for 28 N/mm² (4000 psi) N.W. cracked concrete with a minimum slab thickness of 200 mm (8 in) and an edge distance of 108 mm (4-1/4”). The contractor is responsible for verifying the anchoring conditions per the manufacturer’s test data. Calculations will need to be done if the substrate conditions do not match or exceed what was used in this report.
- 5.) The contractor is responsible for obtaining calculations for wind loads higher than 2.0 kPa (41.8 psf)
- 6.) The contractor is responsible for obtaining calculations for glass heights above the base shoe greater than 966 mm (38.03 in) or heights from top of top rail to bottom of base shoe greater than 1070 mm (42.13 in).
- 7.) The contractor is responsible for using the correct fasteners in the base shoe and complying with manufacturer and code requirements.
- 8.) The contractor is responsible for verifying that the substrate is structurally adequate for the guardrail loads.
- 9.) Railing installation inspections shall be done as required per the local building department.

This letter certifies that the R&B Wagner Panel Grip 2 Base Shoe GR2457HCB is compliant with the 2012 Ontario Building Code. Calculations will still need to be done by a professional engineer on exterior projects to verify the wind load does not exceed 2.0 kPa (41.8 psf). Calculations will also need to be done to verify that the top rail, glass, anchorage, and substrate are adequate to meet the project specific loads, project specific specifications, and local building code.

These are standard system calculations and are not project specific. It is the duty of the engineer of record sealing and taking responsibility for the project documents to ensure that these standard calculations meet the contract requirements and local building code requirements for specific projects. Rice Engineering takes no liability for the use of these standard calculations for any project specific applications.

Feel free to contact us with any questions.

Sincerely,

 Bradley Kuehl
2015.11.13 14:14:11 -06'00'

Brad Kuehl, P. Eng.
Vice President– Rice Engineering Inc.

11/13/2015

R&B Wagner, Inc.
10600 W Brown Deer Rd
Milwaukee, WI 53224

Project: R14-06-051 Wagner Glass Rail Base Shoe – Compliance with 2010 National Building Code of Canada

Attn: Andrew Chatfield

Andrew,

We have reviewed the structural design of the Panel Grip 2 Base Shoe GR2457HCB for compliance with the National Building Code of Canada 2010.

The system has been designed for the following loads:

- 1.) Lateral Point Load of 1.0 kN (225 lbf) at top of glass
- 2.) Lateral Line Load of 0.75 kN/m (51.4 lbf/ft) at top of glass
- 3.) Vertical Line Load of 1.5 kN/m (102.8 lbf/ft) at top of glass
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- 4.) Glass edges shall be protected per CAN/CGSB-12.20-M89 Section A5.2
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- 6.) Exterior anchors are to be 300 series stainless steel. Any anchor near a pool, spa, or any exterior anchors within 1 km of the ocean shall be 316 stainless steel.
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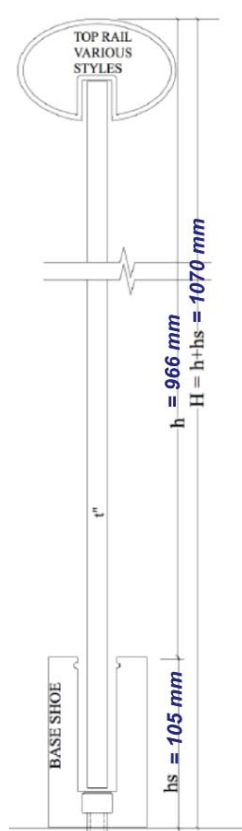


Figure 1: Glass Height

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- 9.) Railing installation inspections shall be done as required per the local building department.

This letter certifies that the R&B Wagner Panel Grip 2 Base Shoe GR2457HCB is compliant with the National Building Code of Canada 2010. Calculations will still need to be done by a professional engineer on exterior projects to verify the wind load does not exceed 2.0 kPa (41.8 psf). Calculations will also need to be done to verify that the top rail, glass, anchorage, and substrate are adequate to meet the project specific loads, project specific specifications, and local building code.

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Feel free to contact us with any questions.

Sincerely,



Bradley Kuehl

2015.11.13 14:15:18 -06'00'

Brad Kuehl, P. Eng.

Vice President– Rice Engineering Inc.