

# ENGINEERING EVALUATION

**Intertek** ETL SEMKO

**REPORT NUMBER: 3127027COQ-004**  
ORIGINAL ISSUE DATE: July 20, 2007  
REVISED DATE: July 20, 2007

**EVALUATION CENTER**  
Intertek Testing Services NA Ltd.  
1500 Brigantine Drive  
Coquitlam, BC V3K 7C1

**RENDERED TO**

**B.W. CREATIVE WOOD INDUSTRIES LTD.**  
**23282 RIVER ROAD**  
**MAPLE RIDGE, BC V2W 1B6**

PRODUCT EVALUATED: Creative Rail Series Railing Systems  
EVALUATION PROPERTY: Steel Balusters

**Engineering Evaluation of Steel Balusters on Creative Rail Series Railing Systems for compliance with the applicable requirements of the following criteria: ICC-ES AC273, Acceptance Criteria for Handrails and Guards**

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## 1 Introduction

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Intertek Testing Services NA (Intertek) has conducted an engineering evaluation for B.W. Creative Wood Industries Ltd., on Creative Rail Series Railing System, to evaluate the use of Q195 galvanized steel balusters. The evaluation was conducted to determine if the use of Q195 galvanized steel balusters will maintain compliance with the applicable requirements of the ICC-ES AC273, Acceptance Criteria for Handrails and Guards.

## 2 Sample and Assembly Description

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The following B.W. Creative Wood Industries Ltd. products are being assessed in this evaluation report:

- 6 ft Creative Rail Traditional Series Picket Railing System
- 6 ft Creative Rail Tuscany Series Picket Railing System
- 6 ft Creative Rail Craftsman Series Picket Railing System

The infill material for the Traditional, Tuscany and Craftsman Series currently consists of 6063-T5 extruded aluminum balusters, straight picket for Traditional and Craftsman and curved for Tuscany with a lock bar. Lock bar is also used for the Craftsman Series. Balusters are available in 8 colors: black, bronze, clay, green, pewter, silver, antique copper and white. The railings and posts are manufactured from either Western Red Cedar or Treated SPF. All components are mechanically fastened using stainless steel screws.

## 3 Reference Documents

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- ICC-ES AC273, Acceptance Criteria for Handrails and Guards (AC273)
- Intertek Test Report 3116527COQ-005B
- Intertek Engineering Evaluation 3116527COQ-004

## 4 Evaluation Method

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The Creative Rail Series Railing Systems described in Section 2 above have been qualified as meeting the requirements of AC273 through Intertek Test Report 3116527COQ-005B and Intertek Engineering Evaluation 3116527COQ-004 using aluminum balusters.

To qualify the use of steel balusters, Intertek conducted a confirmatory test program on an 8 ft Creative Rail Traditional Series Picket Railing System in accordance with Section 4.2.2 of the AC273 that included the following test:

- In-fill Load Test: A load consisting of 125 lbf (556 N) was applied over a 1-square-foot (0.09293 m<sup>2</sup>) area normal to the in-fill in a worst-case scenario

The railing system was constructed such that half of the balusters on one side were made of the currently approved 17.5 mm x 1.5 mm thick 6063-T5 aluminum balusters and the other half consisted of the new 17.4 mm x 0.65 mm thick Q195 galvanized steel balusters. Testing was done using safety factors of 2.5 over 2 balusters and is summarized in the table below.

**Table 1 – In-fill Load Test per 2005 NBC and 2006 OBC**

<b>Sample</b>	<b>Safety Factor</b>	<b>Design Load, (lbf)</b>	<b>Required Factored Load, (lbf)</b>	<b>Pass/Fail</b>
Al Baluster	2.5	50	125	Pass
Steel Baluster	2.5	50	125	Pass

These results can also be used to qualify the use of steel balusters in the 6 ft Creative Rail Tuscany Series Picket Railing System and the 6 ft Creative Rail Craftsman Series Picket Railing System, as the 6 ft Creative Rail Traditional Series Picket Railing System was considered the worst case scenario. The non-tested systems differ by the use of curved balusters with a lock bar (Tuscany), and straight balusters with a lock bar (Craftsman).

The qualification of the Creative Rail Craftsman Series Picket Railing System is justified based on it using the same type and shape of balusters, with the addition of a lock bar. In the case of the Creative Rail Tuscany Series Picket Railing System, past in-fill test results have confirmed that the change in shape of the balusters does not adversely affect its ability to withstand in-fill load requirements of Section 4.2.2 of the AC273. Refer to Intertek Test Report 3116527COQ-005B.

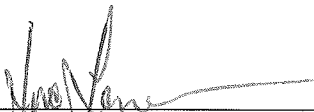
## 5 Conclusion

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Intertek has conducted an engineering evaluation for B.W. Creative Wood Industries Ltd., on Creative Rail Series Railing System, to determine if the use of Q195 galvanized steel balusters will maintain compliance with ICC-ES AC273, Acceptance Criteria for Handrails and Guards. Results showed that the Q195 galvanized steel balusters can be used in the following railing systems in place of aluminum balusters:

- 6 ft Creative Rail Traditional Series Picket Railing System
- 6 ft Creative Rail Tuscany Series Picket Railing System
- 6 ft Creative Rail Craftman Series Picket Railing System

### INTERTEK TESTING SERVICES NA LTD.

Reported by:   
Ivo Tanner  
**Manager, Physical Testing**

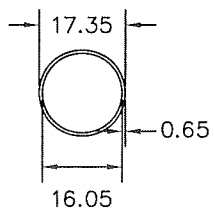
Reviewed by:   
Kal Kooner, EIT  
**Team Leader, Engineering Services CDN**

ATTACHMENTS: Drawings of Steel Balusters and Railing Systems

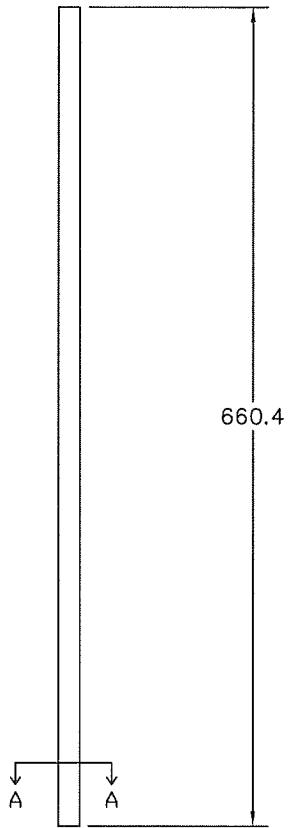
## ATTACHMENTS

Drawings of Steel Balusters and Railing Systems

ST930026



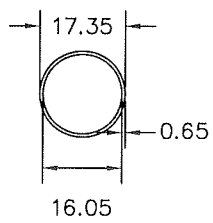
Section A-A



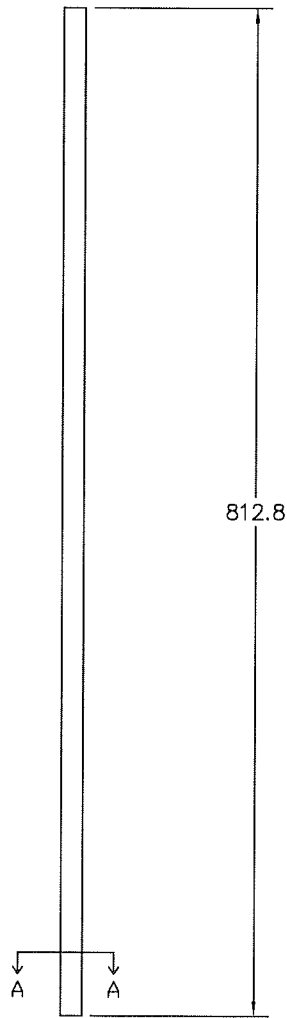
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Structure Steel

DIMENSIONS IN MM  
REVISION: JULY 4, 2007  
APPROVED: \_\_\_\_\_  
CAD FILE: ST9300-FULLDIM.DWG

ST930032



Section A-A

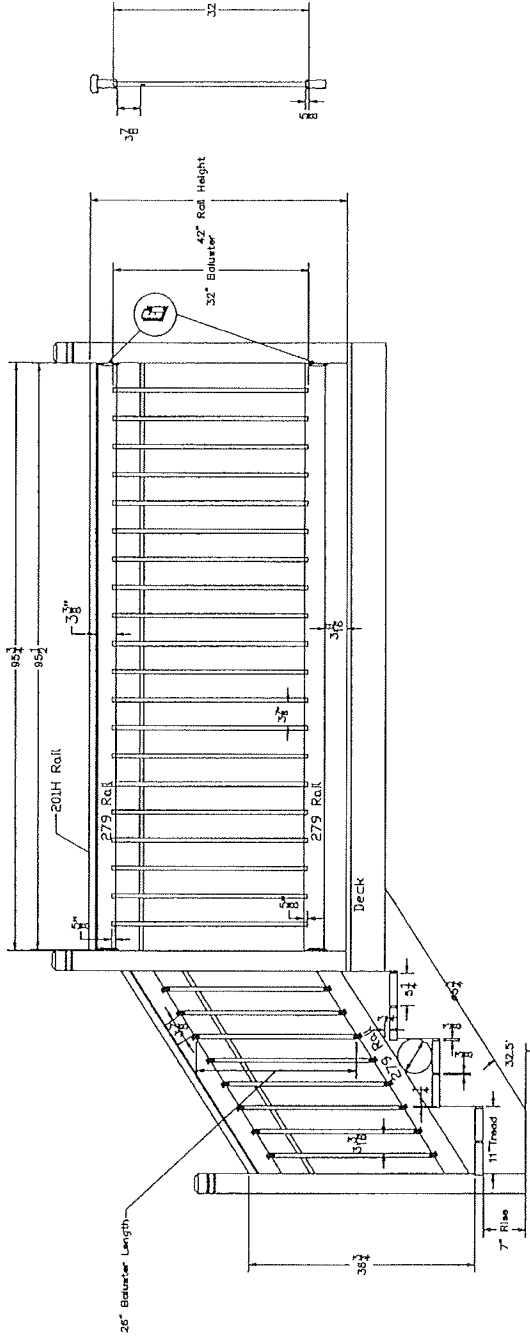


Material: Q195 Galvanized General  
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DIMENSIONS IN MM  
REVISION: JULY 4, 2007  
APPROVED: \_\_\_\_\_  
CAD FILE: ST9300-FULLDIM.DWG



# CRAFTSMAN BALUSTER

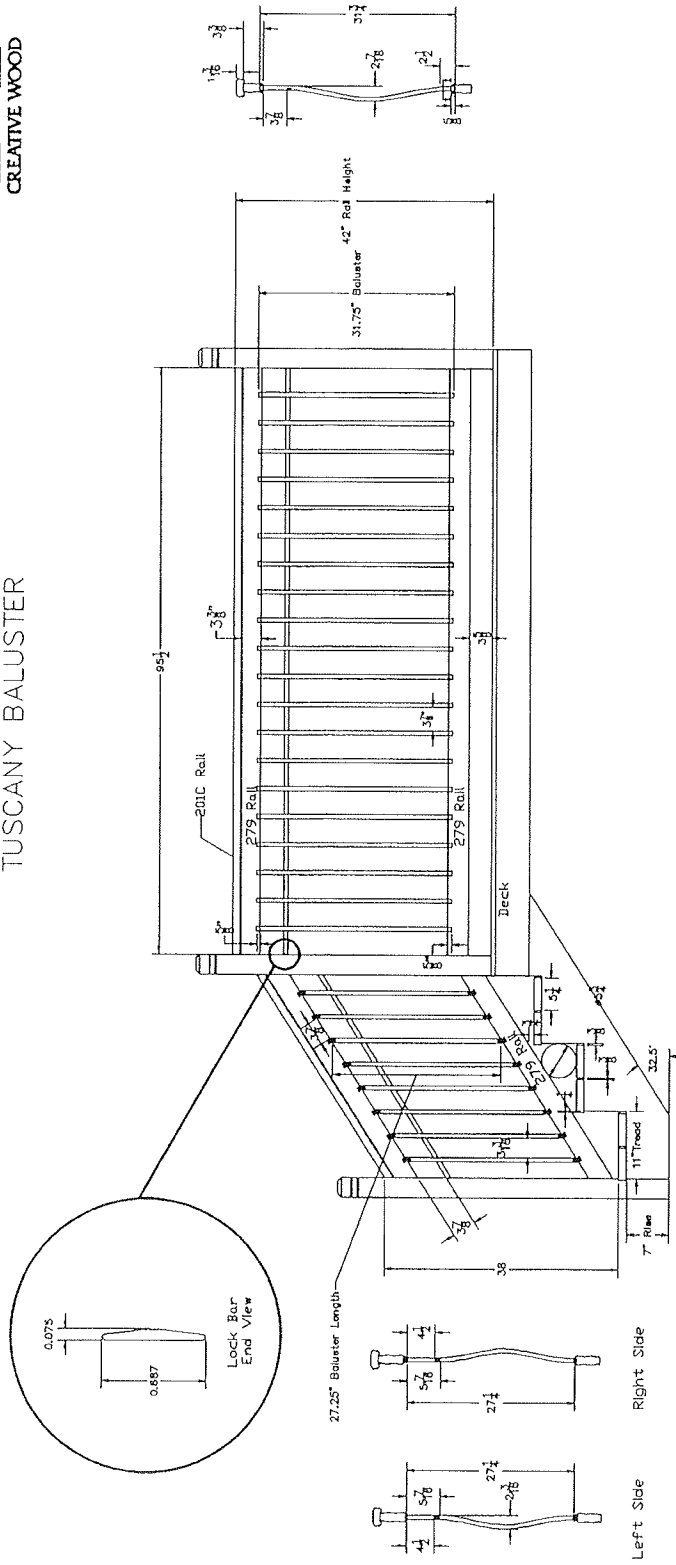


DIMENSIONS IN INCHES  
REVISION: SEPTEMBER 20, 2006  
APPROVED: \_\_\_\_\_  
CAD FILE: 279-FULLDDK.DWG





# TUSCANY BALUSTER



DIMENSIONS IN INCHES  
REVISION: FEBRUARY 6, 2006  
APPROVED:  
CAD FILE: 279-FULL.DWG

## REVISION SUMMARY

DATE	SUMMARY
July 20, 2007	EEV issued to client