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June 6, 2008

Mr. Mark Sparrow
Design Components
115 Water Way
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TESTING REPORT NUMBER:
28129

DATE OF TESTING
6/2/2008

MANUFACTURE PLANT
N/A

SCOPE OF TESTING
Handrail Load Testing

PRODUCT IDENTIFICATION
Design Components Metal Walkway System
24ga, 24in. wide Snap Lock Panels
Snap Lock Clips with 1in. Stand Off
SDST, Fine Thread, Self Tapping Screws

PROCEDURE

The roof panels were constructed on test apparatus, CI-UAC-01. The clips were spaced 5ft on center and were secured to 14ga metal roof purlins using two (2) SDST screws. The seams of the roof system were snapped together, as per the manufacturer's instructions. This particular roof system did not require that the seams be mechanically fastened. For testing the panels were 10ft. long. Four (4) full panels were used for the test and an additional panel was trimmed at both ends to be used on the test chamber.

The total roof specimen was 120in. long x 104in. wide

Two (2) metal walkway S-5 clips were placed 6ft apart on a roof seam near the center of the specimen. An additional two (2) S-5 clips were placed on the adjacent seam at the same spacing. The S-5 clips were secured by torquing the set screw to 200 in-lbs, while ensuring that the flange of the clip was below the roof seam. The walkway support was placed on top of the S-5 clips, perpendicular to the seams of the panel, and secured using hex head bolts and washers supplied with the system. The bolts were torqued to 40 in-lbs. The vertical post base plates of the handrail system were secured using four (4) hex head bolts and four (4) nylon locking nuts thru the pre-drilled holes in the walkway support. The base plate bolts were torqued to 200 in-lbs. The vertical posts were pre-cut by the manufacturer to be 43in. long. The spacing of the vertical posts was 6ft. apart corresponding to the walkway support/S-5 clip locations. An intermediate railing was placed 19in. from the top of the posts and secured with the manufacturers supplied fittings. A top rail was placed on top of the posts using the manufacturers supplied elbows and tees. All base plates, tees, elbows and other fittings were secured using the provided set screws torqued to 130 in-lbs.

The handrail system was setup parallel to the panel seams. This is considered to be the more severe condition.



Two (2) interlocking grates were placed on the walkway support. Each grate was measured to be 12in. wide, totaling a 24in. wide walkway. The grating was offset from center, so that it would not sit on the hex head bolts used to secure the walkway support to the S-5 clips. The grating was secured to walkway support using the manufacturer's clips. Clips were placed at the walkway support in the center of each grate, totaling four (4) clips used for testing. The clips were secured with two (2) SDST screws.

The system was tested based on the requirements of the 2006 International Building Code.

A uniform load was applied to the system using pneumatic cylinders spaced at 1ft. intervals along the top rail. The load was applied at a 45 degree angle downward, to create an equal horizontal and vertical component of force. The magnitude of the force was calculated, so that there was a 50 lb/lf vertical component and a 50 lb/lf horizontal component.

A concentrated load was applied to the center of the top rail. The force was pulled horizontally using pneumatic cylinders. A 300 lb force was used for testing.

All pressure readings for the cylinders were done using calibrated pressure gauge, CI-PG-01.

RESULTS

The 2006 International Building Code, Section 1607.7 requires the following forces for handrails.

Uniform Load – 50 lbs/lf (2006 IBC, Section 1607.7.1)

Concentrated Load – 200 lbs (2006 IBC, Section 1607.7.1.1)

The following loads were applied the Design Components Metal Walkway System handrails as detailed above

Uniform Load – 50 lbs/lf vertical, 50lbs/lf horizontal simultaneously

Concentrated Load – 300 lbs.

CONCLUSION

The handrail did not experience any failure including cracking or disengagement of any component. The handrail did experience some deflection, which was transmitted through the walkway support. Minimal stress was transmitted to the roof system. Since minimal stress was transmitted to the walkway support the test results were not dependent on the orientation of the roof panels and the results can be applied to both conditions. All loads were applied to meet or exceed the 2006 International Building Code requirements.

Respectfully submitted,

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