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Planning & Development Services
Building Division Policy

Title: Cable Guard Policy

Code Name: 2018 *International Building Code* (IBC)
2018 *International Residential Code* (IRC)

Code Sections: IBC Section 1607.8.1.2 Intermediate rails
IBC Section 1604.3.1 Deflections
IBC Section 1015.4 Opening limitations
ASCE 7-16 Section 4.5.1.2 Guardrail System Component Loads
IRC Table R301.5 Minimum Uniformly Distributed Live Loads, Footnote F

Code Language:

1607.8.1.2 Intermediate rails. Intermediate rails (all those except the handrail), balusters and panel fillers shall be designed to resist a concentrated load of 50 pounds in accordance with Section 4.5.1.2 of ASCE 7.

1604.3.1 Deflections. The deflections of structural members shall not exceed the more restrictive of the limitations of Sections 1604.3.2 through 1604.3.5 or that permitted by Table 1604.3.

Building Division Commentary – The deflection criterion for exterior walls and interior partitions with flexible finishes (l/120) is selected as the standard. Since such walls are allowed to function as guards (i.e., enclose floor openings), this criterion is believed to be sufficient.

1015.4 Opening limitations. Required guards shall not have openings that allow passage of a sphere 4 inches in diameter from the walking surface to the required guard height.

ASCE 7-16 4.5.1.2 Guardrail System Component Loads. Balusters, panel fillers, and guardrail infill components, including all rails except the handrail and the top rail, shall be designed to resist a horizontally applied normal load of 50 lb. on an area not to exceed 12 in. by 12 in., including openings and space between rails and located so as to produce the maximum load effects. Reactions due to this loading are not required to be superimposed with the loads specified in Sections 4.5.1 and 4.5.1.1.

IRC Table R301.5 Minimum Uniformly Distributed Live Loads, Footnote F. Guard in-fill components (all those except the handrail), balusters and panel fillers shall be designed to withstand a horizontally applied normal load of 50 pounds on an area equal to 1 square foot. This load need not be assumed to act concurrently with any other live load requirement.

Building Division Commentary – Cables forming a guard component shall comply. With the cables spaced to meet the 4" sphere provision, a load of 50 pounds on an area equal to 1 square foot will always be resisted by at least 3 cables. This loading criterion requires each cable to resist a live load of at least 16.67 pounds applied to a one-foot length located in the center of the cable span (i.e., the location where the force will cause the greatest deflection).

Scope of Policy: Both commercial and residential cable guard components shall be capable of withstanding the loads prescribed by the IBC. The deflection of guard components is limited by limiting the deflection of cables with some resistance to the passage of a 4" sphere. This policy applies to all cable guards whether installed in a building regulated by the IBC or installed in a building regulated by the IRC.

Policy: The permit applicant or designee shall provide the following design criteria and documentation for cable guard design at plan review and at inspection to obtain approval:

1) A structural design stamped and signed by an engineer licensed in the State of Idaho that describes the proposed materials, the spacing of supports, the spacing of cables, all attachments, etc.
2) Calculations that determine the tension required in each cable to meet the loading criterion (i.e., 16.67 pounds applied to a one-foot length located in the center of the cable span plus the weight of the cable) and the deflection criterion (i.e., l/120).
3) The engineered design will include calculations for the members that will resist the cable tension.
4) Calculations that determine a point load which, when applied at the center of a cable span, will produce the same deflection as the 16.67 pounds applied to a one-foot length located in the center of the cable span.

Prior to the Building Division final inspection approval, the following will need to be provided regarding the installed cable guard:

1) The Idaho licensed design engineer shall verify the cable guard is installed per the specifications and engineered design.
2) A signed letter, which includes the engineer stamp and signature, approving the installation of the cable guard shall be provided to the Building Inspector to verify and include into the permit record.

Intent: To provide clarity on the design and approval of cable guards. Based on the allowable deflection of the cable being l/120 and the live load being 16.67 pounds applied to a one-foot length located in the center of the cable span (the dead load of the cable, if significant, must also be included), the required tension in the cables can be determined. With the required cable tension known, vertical flexural members and horizontal compression members can be designed to resist the applied tensile loads. Acceptance of the cable guard is dependent on the actual stresses in the cable and the actual deflection of the cable not exceeding the amount allowed. Verification of adequacy from the design engineer also assists in ensuring a safe installation.

This policy replaces a previous version of this policy dated 3/16/18 on this subject with some minor language update changes.

Jason Blais
Building Official

4/6/23
Effective Date

Date Retired