

Stairs – Design for Increased Use

Overview

The US Department of Health and Human Services' Physical Activity Guidelines for Americans cites increased physical activity as an important component of promoting public health and reducing the risk of chronic disease.¹ The Guideline specifically highlights stair climbing at work as a prime opportunity for people to incorporate physical activity into their daily routines. Stair climbing can be part of normal 'baseline' activity that is fundamental for basic fitness. Stair climbing is an activity that can be incorporated into the regular workday of most people and for which the infrastructure is readily available and no special skill is required. The potential health benefits of stair climbing are far-reaching, and include improved functional ability, weight loss and decreased risk of cardiovascular disease².

Vertical Transport Choices

Vertical transport within most building is a conscious choice between stairs and elevators made by people upon entering a building. For trips of one or two stories, aspects of building design can influence this choice and present stair use as an attractive alternative to elevators. Stairs are more likely to be used if they are located in direct line-of-sight of building entrances, and are as prominently and conveniently located as elevators. Stairs will also be more likely to be used if wide, attractive and along the intended path of travel.³

Feature Stairs

In many buildings, high-occupancy and visitor-oriented functions, including retail, classrooms and conference rooms are located within one or two levels of the main entrance. Prominent lobby feature stairs, located in view of the building entrance and augmented with clear signage, can present a viable alternative to elevators. Such stairs can be an attractive building feature, can enliven a space and reduce elevator wait times.

Fire Stairs

Most stairs in buildings are not feature stairs, but functional fire stairs. Fire stairs are required vertical means of egress, with fire-rated construction that protects the stair from fire and smoke in the event of a building fire. Stairs have to be designed in accordance with applicable national codes, including the National Fire Protection Association (NFPA) and the International Building Code (IBC) for NIH). Design must also be approved by the local jurisdiction having authority (AHJ). These codes include requirements governing construction detailing, railings, width, tread and riser geometry and other aspects relating to safety and capacity. These requirements are minimums, however, and do not preclude a stair from being wider, more attractively finished and better lit. The goal of a building designer should be the design of a stair that is multi-purpose: a fully-functional and code compliant means of egress which is also convenient and attractive for daily use as a communicating stair between floors.

A fire-rated separation is required between the building and the stair, which limits the amount of glass allowable in doors and internal windows. Exterior windows, however, can generally be incorporated without limit in fire stairs, and allow stairs to be light and visually appealing.

Codes also place limits on the location of stairs within a building to insure proximity and adequate stair capacity for building occupants, and to insure that stairs discharge in safe locations. Within these requirements, the designers generally have leeway to locate stairs conveniently relative to lobbies and entrances, primary corridors, high-volume functions and other areas within a building that generate high amounts of traffic, and which would be most convenient and visible for potential stair users.

Energy Savings

Another benefit of stair climbing is reduced energy usage. It is estimated that a typical short trip by hydraulic elevator can use the equivalent energy as burning a 100 watt light bulb for about 2 hours. Although this may not be a lot as in individual energy savings, the cumulative total of the occupants of a large building can be substantial.

Signage

Signage and information conveying the health benefits of stair climbing are effective methods of increasing stair use.⁴ Directional and way-finding signage can influence decision making by illustrating the most direct routes to destinations via stairs. Informational signage and posters can educate people to the health benefits of stair climbing.

Conclusion

Stairs are common features that are readily available to most people during the course of their workdays. By designing stairs that are attractive and conveniently located, a designer can encourage their use by people as a part of their daily routines, thereby increasing physical activity and promoting health.

Reference:

- (1) Physical Activity Guidelines for Americans (2008), US HHS
- (2) Stairs instead of elevators at workplace: Cardioprotective effects of a pragmatic intervention European Journal of Cardiovascular Prevention & Rehabilitation, 17 (2010)
- (3) Spatial measures associated with stair use, American Journal of Health Promotion, 21 (2007)
- (4) Cost and effectiveness of two stair-climbing interventions – less is more. American Journal of Health Promotion, 25, 231–23.(2007)