Escalator installations in retail operations

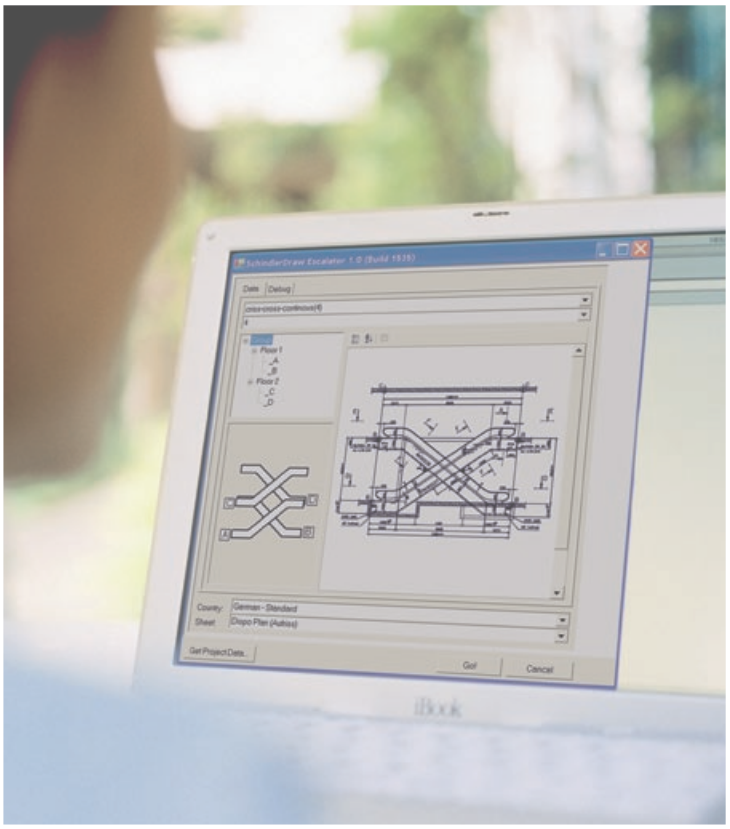
Retail owners demand equipment reliability — and this is particularly true with escalators. Escalator downtime or poor performance can translate into lost sales for the retail owner and a frustrated shopper. However, taking time to properly specify, install and maintain escalators will help ensure long-term, reliable performance for years to come. In addition, by partnering early with the escalator manufacturer, the design team can deliver a well-executed project that meets the design 'aesthetics' without compromising safety. Finally some escalator manufacturers are committed to environmental responsibility in their manufacturing operations, as well as providing eco-friendly equipment options.

The market for escalators in retail environments is growing. Not only are new buildings being constructed daily, but many existing retail locations are being modernized to meet competitive demands. An industry rule of thumb is that with proper care and maintenance, an escalator life of 35 – 40 years is realistic before extensive modernization or complete replacement is required. For escalator manufacturers, approximately 75 – 80% of the market demand is for new escalators with the remaining split between modernization and replacement of existing escalators.

Design cycle: start early

Consider involving the escalator manufacturer as part of the retail design 'team' of architects, contractors, interior designers and other parties early in the planning stages. Constant communication between the 'team' members throughout the entire project is key to project success. Because of the complexity and costs of escalator equipment, time spent in the early stages of the design process will yield significant benefits later in the installation phase.

Some escalator manufacturers have invested resources in online tools to support the design community. For example, architects and spec writers can create job-specific scale drawings and ready-to-use specifications. Not only can this save on engineering costs, the drawings are readily available anytime and anywhere. Available in a range of formats, these detail drawings can be incorporated easily into the final drawings.



Drawing software can save hours of drawing time.

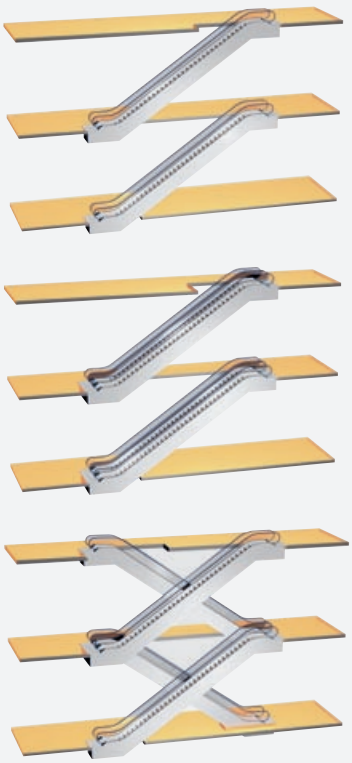
Traffic handling studies are used to determine the optimal escalator configuration required in retail operation. Again, partnering early with the escalator manufacturer can provide invaluable input on optimal layouts, such as parallel or crisscross arrangements. (See Figure 1.)

Unlike elevators, escalators require additional structural support elements in the concrete and/or steel. In addition, depending on the building location and building code requirements, seismic elements might also be necessary to address lateral movement and story drift. See Figure 2 for typical top plate details for escalators in seismic and non-seismic areas.

Electrical requirements, such as power and lighting, must also be considered early in the design process. If remote monitoring is required for future maintenance, dedicated phone lines may be needed.

The project plan and schedule also should include the many escalator tasks and milestones. This includes such tasks as the escalator manufacturing, shipping to the jobsite, installation and final commissioning and start-up. To help support the project manager, some escalator manufacturers have online tools that provide dynamic, up-to-date status reports on the escalator construction milestones to help ensure that the installation sequencing goes as smoothly as possible. The shipping logistics may also be problematic, especially with escalators manufactured offshore. Just getting the large escalators to the jobsite can be complicated: low height underpasses, tunnels, roadway weight restrictions and other considerations. Most experienced escalator manufacturers will help coordinate the shipping logistics so that the equipment arrives onsite just when it is needed and access is optimal, and not before. Once the equipment arrives onsite, it should be

Figure 1: Escalator arrangement can impact sales.



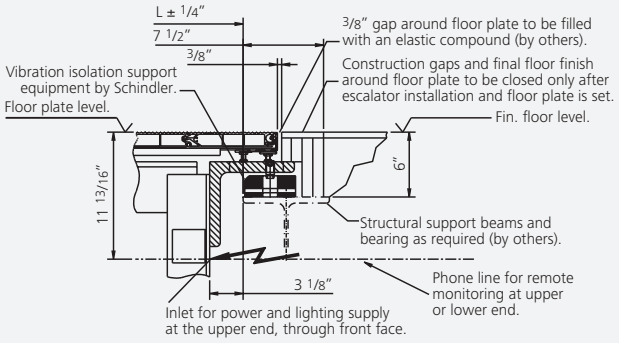
Interrupted arrangement maximizes revenue

Parallel arrangement for heavy traffic volumes

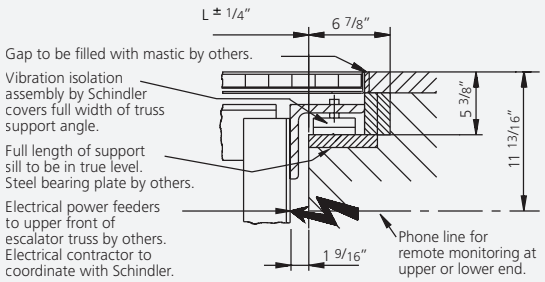
Crisscross arrangement minimizes transportation time

Figure 2: Seismic and non-seismic escalator connection details.

Escalator seismic connection



Escalator non-seismic connection



installed by an experienced crew to minimize disruption to the rest of the construction trades. Again, planning is critical to avoid any issues. For example, something as simple as having the escalator manufacturer visit the worksite before the equipment arrives may identify a potential issue. Pre-installation checklists are often available from the escalator manufacturer. (See Pre-Installation Escalator Checklist.) Once installed and tested by the escalator manufacturer and inspected by the governing code authority, the equipment is handed over to the building owner. Many escalator manufacturers offer a range of maintenance options tailored to the retail owner's specific requirements and needs.

Design 'aesthetics'

An escalator is more than a way of moving people from one floor to another. Incorporating the escalators into the overall 'aesthetics' of the retail environment can contribute to the shopping experience and encourage sales. After the basic design elements (e.g., capacity, structural, layout and electrical) have been addressed, the escalators can easily fit into the architectural 'look' of the retail environment. Color options for balustrades, steps and handrails offer limitless possibilities. Some escalator manufacturers offer a wide range of standard colors, lighting and exterior cladding finishes and will also deliver on custom requests.

As part of the traffic handling studies, the escalators also can be positioned within the retail space to entice shoppers to move to different areas within the store or mall. Depending on the layout, escalators can be installed outside the retail space to move shoppers indoors quickly.

Safety

Regardless of the architectural beauty of the escalator, passenger safety is paramount. All escalator manufacturers provide equipment to meet minimum safety standards (for example, American Society of Mechanical Engineers (ASME) — ASME A17.1 Safety Code for Elevators

Color can be used to support store branding.

and Escalators) and to meet building code requirements. Some of the many safety devices may include:

- Guide pads: Low-friction guide pads installed on the sides of each step help to minimize and control the skirt-to-step gap.
- Type of braking: Direction-sensitive braking provides a more gradual deceleration in an emergency stop.
- Breakage sensors: Sensing devices detect step chain or drive chain breaks and initiate safety brake application.
- Obstruction sensors: Skirt panel and combplate sensors detect obstructions and stop the escalator.
- Handrail entry device: Handrail entry device senses objects in danger of becoming wedged between the handrail and the entry point, and a safety switch automatically stops the escalator.
- Lighting: Step demarcation lights define the periphery of the steps.
- Emergency stop buttons: Red emergency stop buttons with audible warning signals are located at the top and bottom landings to automatically stop the escalator if needed.

Contact the escalator manufacturers for a complete list of safety devices as these may vary from manufacturer to manufacturer.

Environmental responsibility

The environmental impact of escalators increasingly is being considered in the selection process, starting from the 'cradle to grave' or 'manufacturing to disposal'. Some escalator manufacturers have taken steps to become leaders in environmental excellence by achieving certification to the Environmental Management System Standard ISO 14001:2004, as well as receiving local recognition for reducing environmental impact.

Some escalator manufacturers now offer energy-saving packages. For example, energy consumption can be reduced by up to 30% and peak current by up to 80% by installing equipment that automatically reduces escalator speed to a crawl when the escalator is running empty. Other options available can reduce energy usage by up to 30% with almost no speed reduction by switching to an energy-saving mode when traffic is light.

Depending on the percentage of recycled material being used, escalators may also contribute to LEED® points, an initiative offered by the U.S. Green Building Council (USGBC). Contact the escalator manufacturer for additional support and information on how the escalator can meet the various criteria.

Looking to modernize?

Even the best-maintained escalator may require modernization to improve performance and reliability after years of operation. Retail owners and designers typically choose between two options: renovate or replace.

Renovating can involve replacing components and adding a wide range of equipment and features. Some escalator manufacturers offer modernization kits that can help make older units safer, more reliable and more attractive.

However, renovation may not be a viable option on older, less energy efficient or poorly maintained models. For example, if the escalator truss has been exposed to water resulting in rust damage, renovating is probably out of the question.

The preferred method is to 'replace' the old escalator stock with new equipment that has been designed to fit into the existing structure.

This approach means not only that additional safety and energy features are included, but the 'aesthetics' mesh with the store modernization, with color options for balustrades, handrails and steps.

A common question that an escalator manufacturer hears from a retailer is "Are you going to disrupt my store?" The answer is "Yes… BUT". The escalator manufacturer and general contractor can plan around store hours, preparing the site in advance of the actual installation. This might mean coordinating the new replacement equipment to arrive by truck just before the store closes. Then, with proper planning, the new equipment can be installed by the time the store opens the next day. Completing the installation during opening hours will then involve only minimal disruption.

Time spent evaluating traffic patterns can make the difference in a successful installation. For example, place greeters or signs at the base of a non-operational escalator to point to alternate ways up using stairs or an elevator. And if the solution involves increased use of elevators, make sure to have them fully serviced well in advance. This can be quite easy if the current maintenance agreement covers both escalators and elevators.

Partnerships work

By partnering with escalator manufacturers early in the design cycle, not only can costs be managed and timelines maintained, but the reliability and safety of the escalators can be maximized. The design community should use and build upon the experience and tools that most escalator manufacturers offer to help deliver reliable performance over the entire life-cycle of the escalator.

Pre-installation escalator checklist*

The general contractor s hould confirm the following:

- Building dimensions and conditions provided and/ or adjusted to match escalator manufacturer's requirements.
- Truss supports of reinforced concrete or structural steel level and smooth.
- Top of support beams free of bolts and splices.
- 3/8" (10 mm) gap between the escalator floor frame and building structure (to be filled with elastic material or suitable caulking after installation complete).
- No fireproofing of support beams (to be completed after escalator installation).
- No walls or building components (other than exterior truss claddings) butted or fixed onto or supported by the escalator.
- No walls or gypsum board structures adjacent to outer deck of escalator (to be completed after escalator installation and testing).
- Hosting beams over upper and lower truss supports, including any intermediate support structures (if required) in accordance with escalator manufacturer's instructions.
- Adequately fused power supply located in the upper head of the escalator truss in accordance with escalator manufacturer's instructions.
- Where heaters are required, separate circuit of adequate size provided in accordance with escalator manufacturer's instructions.
- 110v duplex receptacles and lighting in upper and lower head of escalator truss in accordance with applicable codes.
- Ceilings, walls, soffits, guard rails, intersection guards provided and installed in accordance with prevailing local building codes.
- Clear access into building for escalator.
- Suitable floor surface and protection for escalator.
- Clean and dry pits, including adequate protective barriers, during escalator installation.

* These are guidelines only. Contact the escalator manufacturer for a complete list of installation requirements.

For further information including location of the Schindler office nearest you, please visit:
www.us.schindler.com

North American Headquarters
Morristown, New Jersey 07962-1935
Tel. 973.397.6500

Schindler