APPENDIX K

Design/Layout Considerations for Ceiling/Overhead Lift Tracks

At present, not all clinical units or areas require 100 percent ceiling lift coverage (Table I-1), but with expansion in ceiling lift and sling technology, this is expected to change. In the near future, full coverage may be warranted for most patient rooms. Therefore, some patient handling experts recommend installing tracks in every room during new construction or renovation to accommodate future installation of a ceiling lift system. Installing the track during construction (new or renovation) may decrease the ultimate cost for installation of a ceiling lift system.

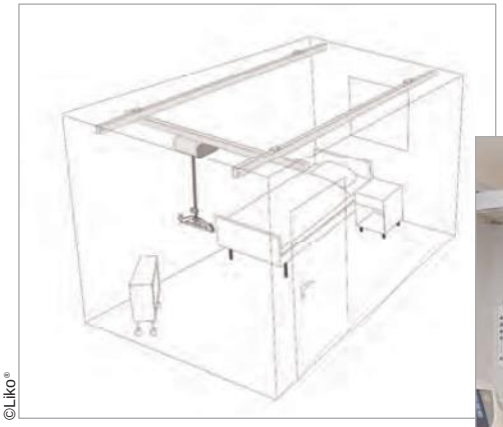
The information in this appendix is intended to assist in selection of the best ceiling lift track design and installation options, and to ensure consideration is made for other decisions that impact ceiling lift design. These include ceiling lift charging options, options for the physical movement of ceiling lifts, track design options, track design suggestions for various clinical areas, track support and fastening options, and other track design/layout options for consideration.

Ceiling Lift Motor Charging Options

Stationary charging system. A charging/docking station is attached to the track, and for charging to take place, the lift must be brought to and docked at the charging station. Usually, the charging station is located away from traffic areas.

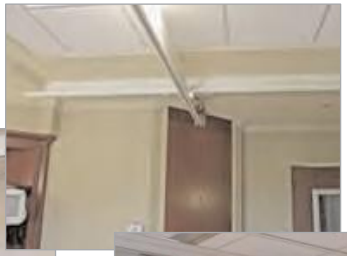
Electronic (continuous) charging system (ECS). The track contains copper stripping that enables charging of the lift motor throughout the

Figure K-1: Traverse Track Design

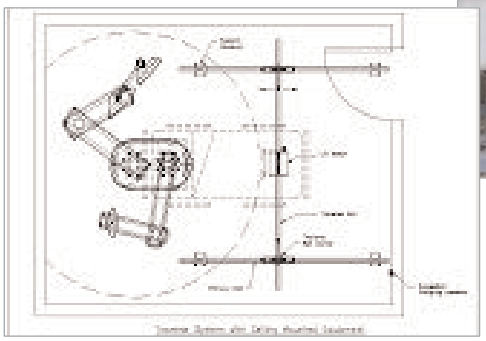


a. In single-bed patient room

b. In semi-private patient room



c. Into toilet room



d. In room with other ceiling-mounted equipment

e. In x-ray room

length of the track at all times. Continuous charging occurs along the entire length of the track not just in one specific location.

Ceiling Lift Movement

All ceiling lifts enable a patient to be lifted up and lowered vertically. However, some lifts offer options for side to side, horizontal movement. A ceiling lift can be moved horizontally by the caregiver either manually using a non-motorized track or with a hand-held (remote) device using a motorized track.

Non-motorized track. Most caregivers prefer to pull the lift horizontally by hand rather than press a button and wait for the lift to move to the desired location. Movement is quite smooth and easy with this design. However, caregivers must pull the lift manually, although easily, to the recharging area if there is a charging/docking station. With an ECS, the lift can be charged at any location along the track.

Motorized track. A motorization component enables the caregiver to use a hand-held (remote) device to move the lift horizontally along the track as well as to move the patient up and down (vertically). If the lift has a charging/docking station and is motorized, a "return-to-charge' function moves the lift to the charging/docking station after a patient has been moved or lifted. With an ECS, the lift can be charged at any location along the track.

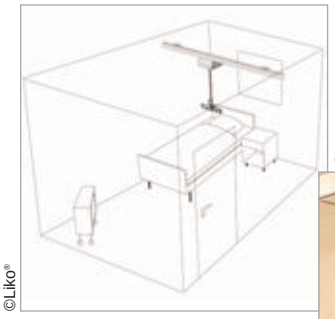
Track Design Options

Three track design options are commonly used.

Traverse (room covering) track. In most rooms, a traverse track (Figure K-1) gives staff more options for transfers and performance of patient handling activities. This design also offers the patient more opportunity for rehabilitation and more timely patient handling assistance. However, traverse track designs may affect the use of privacy curtains. When including a traverse track, room design specifications must incorporate solutions that ensure patient privacy. (See below for more information on privacy curtains/screens.)

Straight track. A straight track configuration (Figure K-2) is only recommended when a room is small and the straight track can reach all areas where patient handling and placement will occur (when the sink is in line with the bed, the chairs have easy access to the bed, etc.).

Figure K-2: Straight Track Design

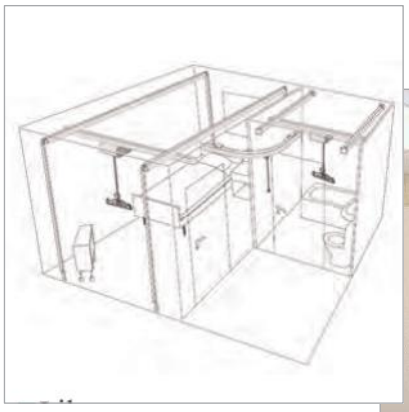


f. Over bed

h. Over parallel bars in PT clinic

i. In dialysis clinic

Figure K-3: Curved Track Design



a. In patient room

c. In patient room

b. In patient room/toilet room

Figure K-4: Integrated Track Design

d. In intensive care unit

Curved track. Curved tracks (Figure K-3) are used for turns/transitions from one room into another; when ceiling obstructions such as lights, sprinklers, or other objects hang too low to accommodate a straight track; and to enhance the appearance of the lift system.

Integrated track. A fourth option is a track system integrated into a headwall or utility column (Figure K-4).

Track Designs for Clinical Areas

Following are track design recommendations for specific clinical areas. (Please note that track extension into the toilet room is highly recommended for all patient rooms. However, it is not universally included below as it is not always feasible.)

Standard patient room

- Preferred layout: Traverse track covering patient/resident room (Figure K-1)
- Alternate layout: Straight rail/track over patient bed (limits room coverage) (Figure K-2)

Spinal cord injury (SCI) patient room

- Traverse track covering patient room extending into toilet room (Figure K-5)

CCU/ICU patient room

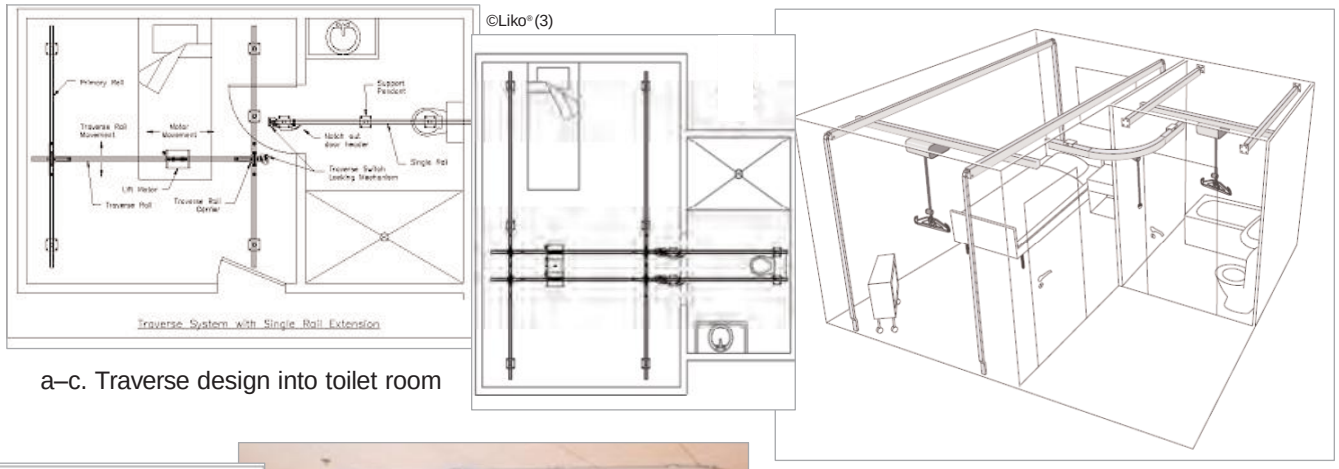
- Preferred layout: Traverse track covering patient room (Figure K-1)
- Alternate layouts:
  - Straight rail/track over patient bed (Figure K-2)
  - Integrated track system (Figure K-4)

Nursing home care unit (NHCU) patient room

- Preferred layout: Traverse track covering patient room extending into toilet room (Figure K-5)
- Alternate layout: Traverse track covering patient room (Figure K-1)

Bariatric patient room

- Preferred layout: Traverse track covering patient room extending into toilet room (Figure K-5)
- Alternate layout: Traverse track covering patient room extending into toilet/shower



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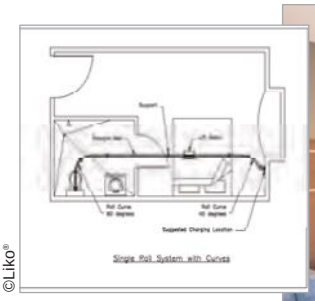
a–c. Traverse design into toilet room

K-5: Ceiling-Lift Tracks Extending from Patient Room into Toilet Room



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d–e. Straight track design with curve into toilet room

Figure K-7: Suspended Track

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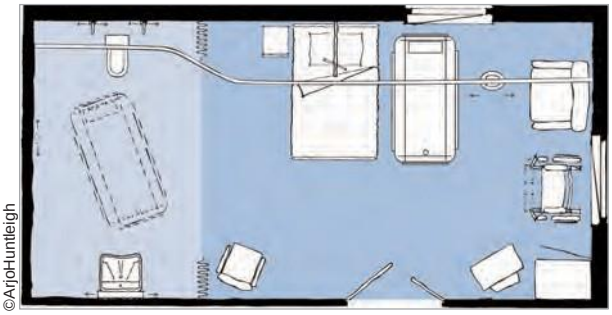

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Figure K-6: Toilet Room Incorporated into Bariatric Patient Room

area with open room/toilet room design (Figure K-6)

Alternate designs for clinical areas. A few alternative track design options are suitable for SCI, bariatric, nursing home, and other patient rooms that require or allow coverage into toilet rooms.

- Ceiling lift tracks into toilet room through doorway (Figure K-4)
- Bariatric room design that incorporates the toilet/shower area into the bariatric patient room, using screens/privacy curtains rather than doors, making it easier to run track and transport bariatric patients from one area to the next (Figure K-6)

Other Track Design Options

Tracks may be suspended (Figure K-7) or recessed (Figure K-8). The recessed option is preferred, as this style diminishes the aesthetic impact in patient rooms; however, suspended tracks allow clearance for sprinkler heads, lights, curtain tracks, and other obstacles. When installing recessed tracks, ensure that the dropped ceiling grid is butted up against the track.

Track Support/Fastening Options

The structural capacity of the building element to which the lift is anchored must be capable of supporting the combined weight capacity of the lift, weight of the lifting equipment, and all other

Figure K-8: Recessed Track

Figure K-9: Wall-Mounted Tracks

a. Bracket support

b. Upright support

c. Wall channel track

Figure K-10: Pendant Attachment

Figure K-11: Threaded Rod Mount

superimposed loads. Both static and dynamic loads must be considered. This capacity should be evaluated by a structural engineer.

Three types of attachment options are described here; others may be available. Consult with ceiling lift manufacturers for options specific for their tracks. Be aware that the interstitial space dictates the amount of lateral bracing required. In addition, the type of attachment method (rod or pendant) needed to achieve a stable system varies.

- **Wall mount:** Attached to wall with a wall bracket and/or uses an upright support. For a traverse track, suspended in a wall channel track. Economical, appropriate for renovations (Figures K-9).
- **Pendant:** Steel plate bolted to an engineered metal framing system and anchored to the supporting structure. Lateral support is normally used when interstitial space is greater than 19.5 in. See manufacturer's specification and instructions. Tracks can be fully or partially recessed into the ceiling (Figure K-10).
- **Threaded rod:** Threaded rods can be mounted using an engineered metal framing system attached to spanning beams or trusses. Tracks can be fully or partially recessed into the ceiling (Figure K-11).

Other Ceiling and Wall-Mounted Track Design and Layout Considerations

The following should be considered in determining track layout:

- **Items in ceiling:** Light fixtures, AC diffusers, fire sprinkler heads, televisions, X-ray equipment, OR lights, and other fixtures.
- **Items above ceiling:** Other ceiling-mounted equipment (e.g., radiology equipment), HVAC ducts, electrical conduits, plumbing, etc.
- **Wall-mounted barriers:** TVs, light fixtures, cabinets, and door swing radius.
- **Structural materials in building frame:** Building elements such as joists, beams, etc.
- **Building system elements:** Mechanical and electrical system features such as air ducts and electrical conduits.
- **Unique architecture:** Multi-level ceiling heights, vaulted ceilings, soffits, non-structural or radius walls.

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a–b. Curtain track running through lift track

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c. Privacy curtains for private room

Figure K-12: Privacy Curtains

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Privacy curtains for semi-private rooms.

d. Separate tracks over each bed

e. Wall-mounted curtains

- **Doors and door walls (structural and non- structural walls):** The use of tracking through structural walls creates more challenges in room-to-room tracking.
- **Fire/life safety code requirements**
- **Ceiling height:** Ceiling height must allow the minimum lifting range required for use of lifting equipment.
- **Motor maintenance:** Allow enough space between the track-end and wall for removal of the motor.
- **Motor charging:** Provide a code-compliant recharging location for the lift motor.
- **Storage space:** Provide storage space that allows immediate accessibility for the motor and hanger bar when they are not in use but keeps the lift system away from areas of foot travel.
- **Headwall design:** Some designs prevent installation of tracks and thus use of ceiling lifts, especially in ICU areas.

- **Location/design of privacy curtains:** The use of privacy curtains is affected by the installation of traverse track designs. Use of privacy screens, curtains attached to booms, and other unique designs may be a suitable alternative to curtains hung from the ceiling. In some situations, privacy curtains can be split and then fastened together with Velcro or buttons. (See Figure K-12.)