



**Photoluminescent
Safety Systems**

- Luna Glow Safety Products
- Luna Glow Light Sleeves
- Stair Nosing
- Safety Photoluminescent Signage
- Way Finding System

ENGINEERING GUIDELINES

PHOTOLUMINESCENT WAYFINDING SYSTEM



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APPLICATION ENGINEERING GUIDELINES AND DESCRIPTION

It is a generally accepted fact that the physiology of the human eye permits different people to adapt to darkness at various rates and varying degrees. Normally, after 20 to 30 minutes, the eyes will increase in their ability to see by a factor of 10,000 x, with the optimum reached around 30 to 40 minutes. It is a further known fact that at any low light level condition, the eye is totally colour blind.

It is with the above in mind, there is no way to guarantee that an emergency will never occur in a building but preparation in case it does can reduce people panic type injuries and the loss of life can be greatly mitigated. Typical current emergency and disaster type signage programs, that rely upon mains power and or batteries, are vulnerable to that particular event that causes the disaster.

The commonality of most public facilities permit an orderly and systematic approach to providing a 100% reliable HPPL emergency egress program to be implemented at cost effective levels and without disruptions. The identity of common features include the following:

EXIT DOORS

EXIT SIGNS

EVACUATION ROUTE DIRECTIONAL
SIGNAGE

PATH LINES

OPEN PLAN AREAS

STAIRWELLS AND OTHER FLOOR
LEVEL CHANGES

HAZARDS

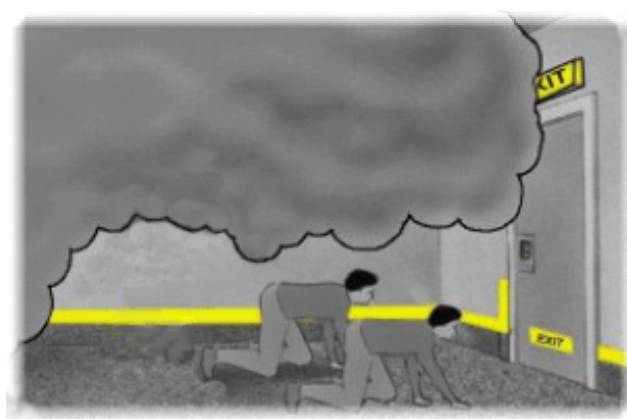
FIRE ALARM PULL STATIONS AND FIRE
FIGHTING EQUIPMENT

ESCAPE ROUTE PLANS OR
SCHEMATICS

CONTROL EQUIPMENT

EMERGENCY LIGHTING

GENERAL CONDITIONS



Exit doors - all exit and emergency doors need to be identified by markings and signs. It is equally important that all doors, not leading to safety be clearly marked as **"NOT AN EXIT"**. In critically dependent areas, the doorframe should be outlined in HPPL as well as identifying the push bar and door handles.

Exit signs – need to be mounted on or adjacent to the exit door, preferably at both eye level and less than .5 meter above the floor. Currently, **LUNA GLOW** lettering size and symbols will provide for a viewing distance up to 25 meters as certified by ETL to the UL 924 standard.



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Evacuation route directional signage - In a perfect world, all exit doors would be clearly visible to all and wide enough for multiple people passage. However not all exits are visible and in the line of sight. Being around corners, long distances, and located up, right or left, the egress route must have continuous information located along the path to safely and most importantly, in places where there is a directional change.

Directional signs and arrowed HPPL products should be incorporated into any egress path lines to eliminate any visual conflict areas and permit rapid identification. Symbols may be used on an HPPL background producing a cameo effect since colour coding is meaningless. The preferred mounting height should be around 30 to 35 centimetres above the floor. If arrows are used for directional indicators, they should be spaced on 20 cm centres. Tape, rigid board, or HPPL inserted into plastic or, aluminium extrusions should be wall mounted in a permanent fashion.



Path lines - attention is needed in hallways of varying widths and lengths. Typically speaking, the more HPPL material, the better the installation. In some hallways, you will need HPPL wall marking widths of 10cms while narrower spaces can be done with 5 to 7 cm's. Areas that require particular markings include spots near a change of direction, at the change of direction, near an intersection and at each change of floor level. In addition, signage should be placed near each fire alarm call point and near fire fighting equipment. All standpipes and obstruction columns also need to be clearly marked. Markings and symbols cannot be ambiguous and should be of sufficient size to permit rapid identification for instant life saving decision-making ability across a wide range of human physical abilities.

Large open plan areas - require that people be directed to main exit doors or stairwells. Human conflicts and panic develops here due to the random nature of an open plan and the physical ability of escapees to run for safety. It is recommended that floor visual indicators be used here as arrows, continuous painted path lines and bottom partitions markers. Oversized signage incorporated in these areas will reduce panic and permit an easy to identify safe escape route. Often times these areas are totally ignored in any escape plans.

Stairs and landings - are unique in that most every escape plan routes people into these areas as elevators and escalators are not part of to evacuation solution. Unfortunately, these areas are poorly illuminated, steps are painted dark colours, stairwells become storage locations, people rarely use them and are in unfamiliar places, too often are not wide enough and escapees going up or down to safety clash with fire brigade and rescuers heading in the opposite direction. HPPL applications should not be cut here. Every essential element must be highlighted from the riser to the nose to the treads. People need to know the stair depth easily as all depth perception is lost in darkness. The stair edge has to be visible along with the handrail. Walls should be continuously and clearly marked as most stairwells are built with directorial differences. The landing area should contain information



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as to the floor number and the escape route direction with the number of floors remaining. Typical symbols should be located within that consist of man running, stair directions, arrows etc.

It is highly recommended that the destination street or parking garage final building exit be prominently marked with evacuation directions to a street level or other designated site. The use of large, 1meter square, HPPL sheet material, wall mounted should be generously employed to eliminate any hesitation and crowding of this vital escape route.

Hazards - being exposed pipes, building columns, ductwork, protrusions as in water fountains, sinks, recesses, fire extinguishers, and valves can all disrupt an orderly evacuation process if someone is injured and falls. Take the time to clearly delineate these obstructions.

Fire fighting equipment - should be marked with the appropriate symbols as to use and location. In some large areas it is advisable to employ a large HPPL sheet mounted behind the proper safety equipment to produce a fully illuminated cameo effect. In the event that the facility has disabled people equipment such as masks, stretchers or wheel chairs, the locations need to be identified as well as the handle locations for each piece of rescue apparatus.

Evacuation route plans - the “YOU ARE HERE” boards may be useful but experience has found that these are typically designed with an interior decorator mindset. Unless they are of sufficient size, they become nothing more than an orientation device in darkness but rather insignificant for emergencies. You must insist on a large board with large legends.

Control equipment - reference here is to those critical items that need immediate attention at the start of any emergency. With threats now of bio-terrorism any ventilation device or exhaust control must be prominently marked and the staff instructed as to procedures. Gas, power, backup valves, shut off's etc, are included for consideration.

Emergency lighting – is too dependent upon mains power and batteries, the Luna Glow light sleeve augments the designed system. A logical application approach would be to sleeve every existing light in all stairwells and hallways. In an open plan area, place sleeves over approximately 20% of the existing fluorescent lamps, paying attention to the areas that may need to be highlighted, if they lie in an escape path egress site. Use sleeves on 100% of the fluorescent lamps in all toilets, gathering areas, cafeterias, and all mechanical plant and control room areas and secure room type spaces. Obviously underground car parks and tunnels should be done completely with the Luna Glow sleeve.

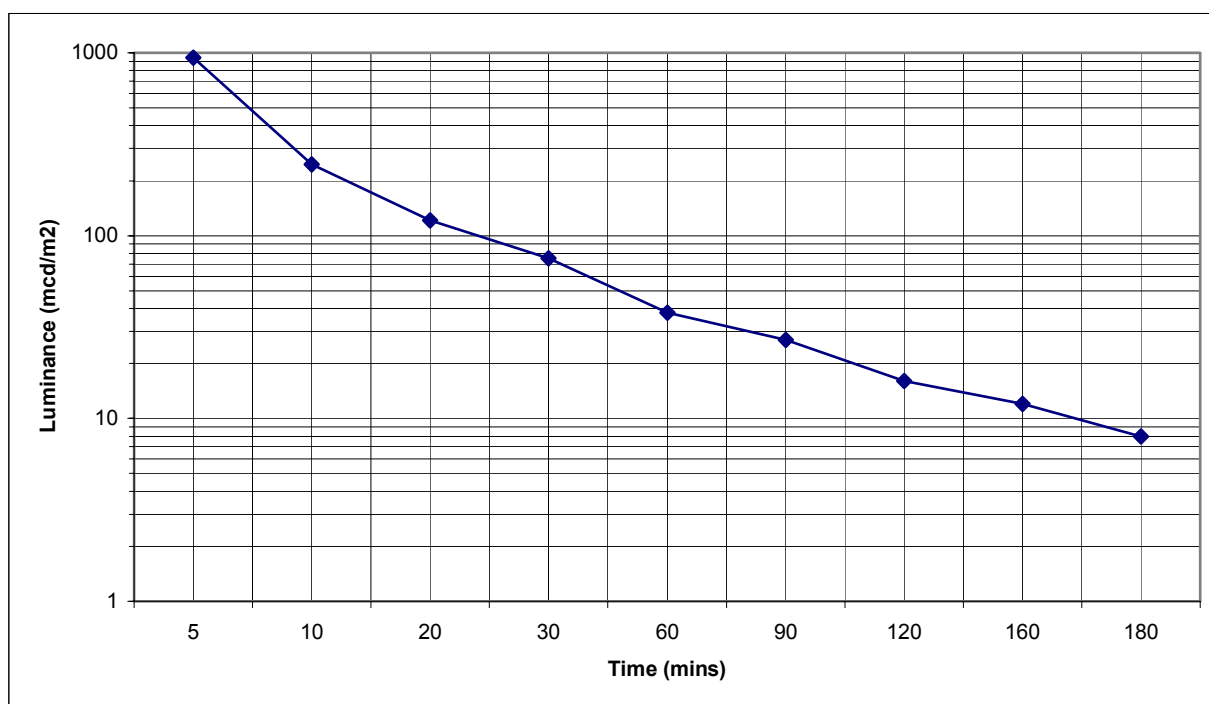
General conditions - many applications of 100% reliable HPPL are site specific. Each location will have common features but will also have certain peculiar areas. Look for the out of the ordinary items as very narrow hallways and stairs, congestion points, no handrails, long hallways and poorly illuminated areas. Further problem areas can be found when hallways, stairs, and floors have barriers, boxes, carts and cabinets located in an exit route. A quick glimpse at the ceiling lighting will give you some indication if routine maintenance is practiced. When addressed, all of these peculiar items need to be considered to guarantee the safety of people. Sometimes just a good housekeeping will suffice but most of the time the lack of building floor space will force you to mark and identify the items as visually photoluminescent.



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As we know all of the rules have changed since 9/11. Future terrorist attacks probably cannot be prevented but the implementation of a 100% reliable HPPL building evacuation safety system can prevent a crippling blow In terms of lost lives and injuries. Doing a facility vulnerability assessment will determine where the critical infrastructure is most at risk. No future disaster or emergency will be simply a test. It will be real. Installation of low-tech HPPL products augments the high tech but prone to failure emergency lighting program. Once completed, people safety will have risen to the highest level of realistic building performance levels.



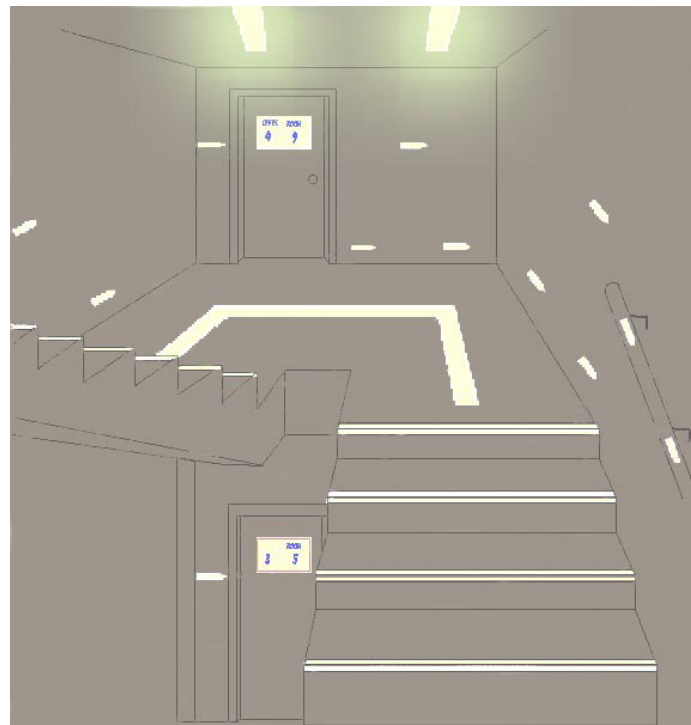
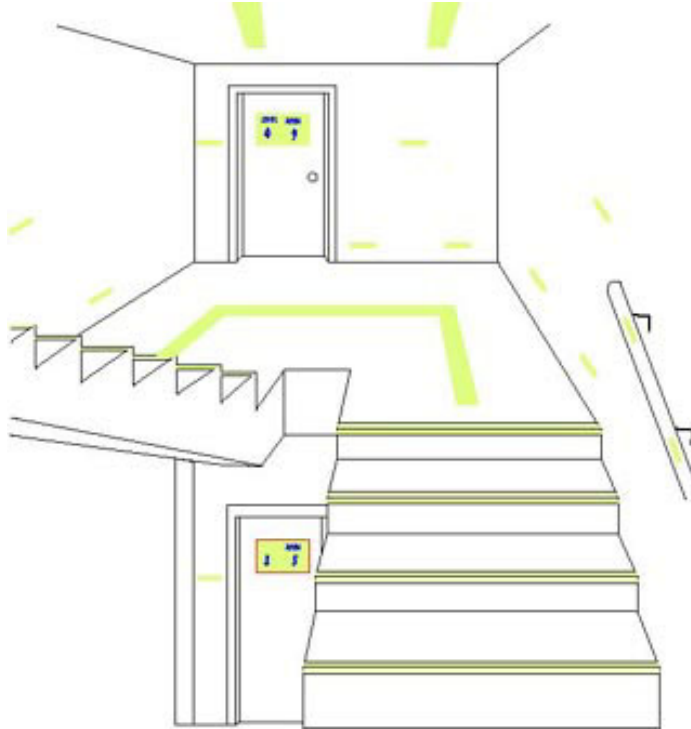
The graph shows the decay trend for Lumenite[®]. The time taken to reach a visibility level of 0.32mcd/m² (lowest human perception) is approximately 50 hours.

During the period of darkness, the eye of an average person will adapt to the darkness at a rate roughly matching the decrease in luminous intensity.



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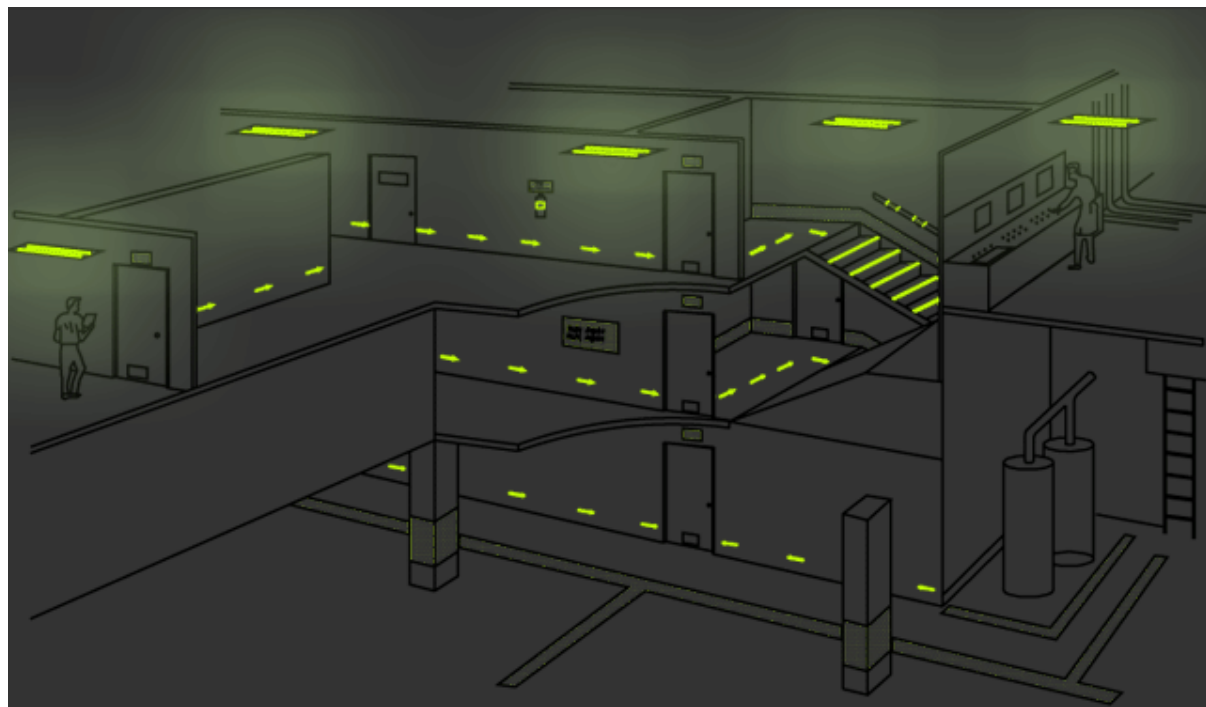
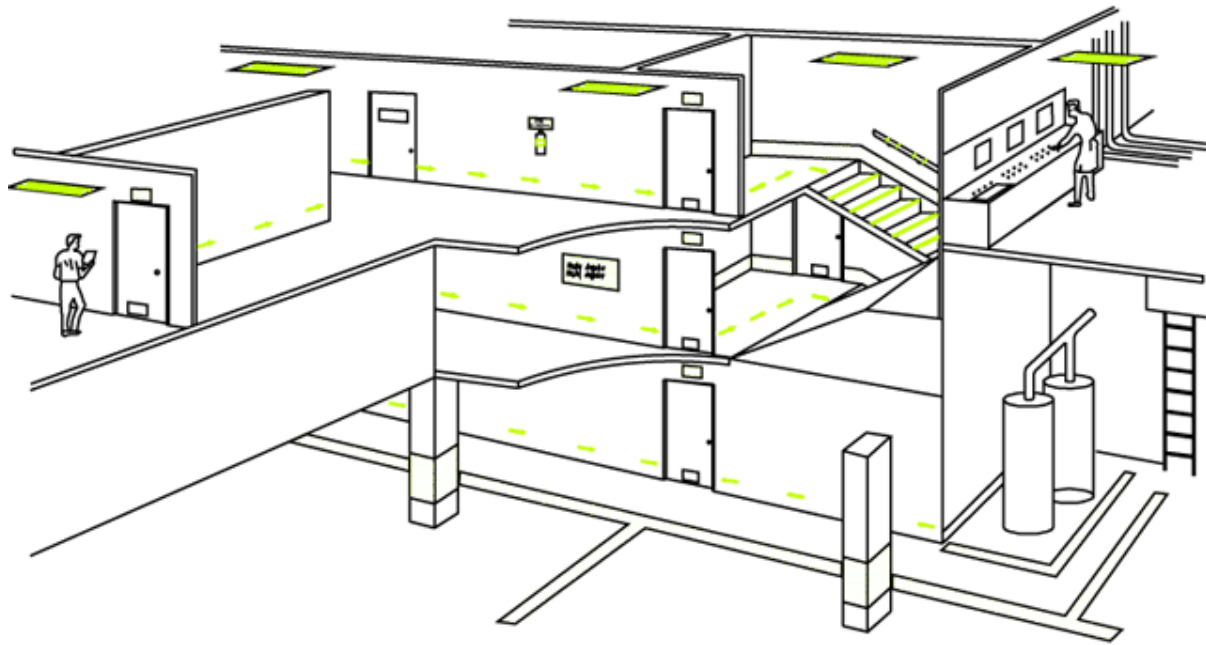


Stairwell layout with lights ON/OFF



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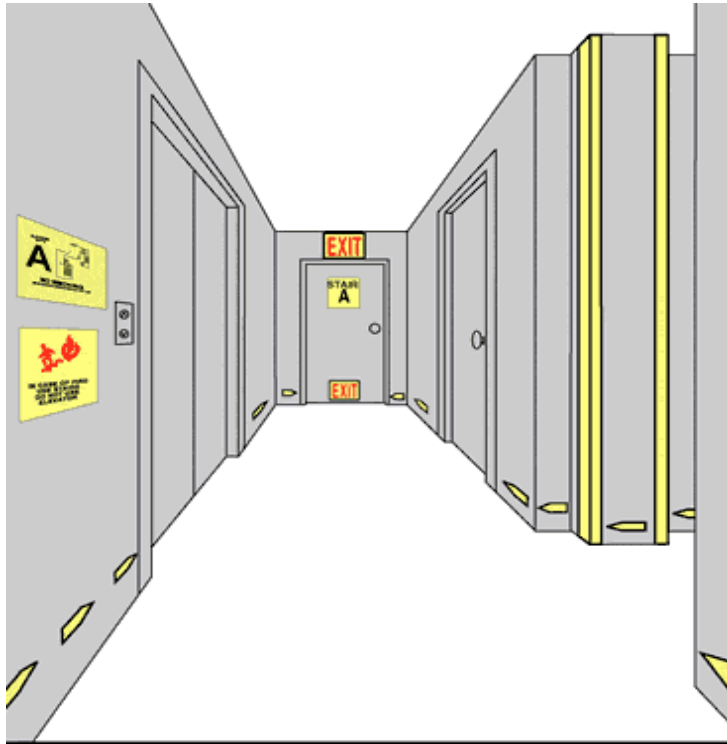


Lights ON/OFF Simulation



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Hotel Room and Hallway

