

## **COST CALCULATIONS on Non MRL-related provisions of DOSH Elevator Code updates**

*NOTE: NEII is providing this information to DOSH to assist them in the development of the cost analysis required under the CA Administrative Procedures Act. The numbers are good faith estimates and subject to change as more information is gathered and considerations refined.*

**June 10, 2015**

### **Hoistway recess - 3147.2201(a)**

\$25 per stop to build out hoistway. Drywall, labor

2700 new traction units in 2013, excluding LA. Average of four landings = **\$270,000 annually**  
(Refer to CA database for accurate number)

### **Access to underside of car – 3147.2202(e)**

Impacts traction cars over 500 ft per minute, estimate of 1-3% of 2700 new units (refer to CA database for accurate number) = 27-81 units

Platform design and construction = two people @ \$125 = \$250 per hour with 4-8 hour installation = \$1000-\$2000 + material fabrication. 1-3% of 2700 new units  
= **\$27,000 - \$162,000 annually**

May also increase pit depth to accommodate permanent working (inspection) platform. Costs should include/consider all construction costs to alter pits.

### **Horizontal Car and Counterweight clearances – 3147.2205**

\$50 per ft of hoistway to be covered – approx 5 ft per floor in between the header and sill on each floor with opening doors = \$250 per floor.

Blind hoistways or expressways \$25 per ft. because there is nothing in the way – no leveling devices, doors, etc. x 12 ft per (standard) floor covered = \$300 per floor.

### **Machinery and Sheave Beams, Supports and Foundations – 3147.2209(a)**

2700 new traction installations in CA in 2013 excluding LA. (Refer to CA database for accurate number)

- architect costs, complete redesign, delay for development of new products designs
  - 3+ years and 30+ staff (average of \$100,000 per year) = \$3M for product development PER COMPANY
  - Plus costs associated with state review and approval process
  - Unable to estimate product cost

### **Guarding of Equipt and Standard Railing**

**3147.2210(a):** Very difficult to cost out because it is very product specific. Metal guarding must be designed, purchased and installed. Also note that the guarding has to be removed during expansions/modernizations.

\$500 is a decent estimate for design and purchase per unit x 2700 new units(Refer to CA database for accurate number) = **\$1.35M annually.**

Installation costs variable, depending on complexity of situation and amount of time needed.

**3147.2210(b):** costs unique to job site and equipment.

General estimates = Redesign in field \$125 per hour, material \$200-\$300, installation 2hr @ \$125 per/hr = \$250 + \$475-\$575 per elevator.

Assuming 750 traction elevators (refer to CA database for accurate number)

= **\$356,250 - \$431,250 annually**

### **Speed Governors**

**3147.2218(b):** In most cases, a model number/part number is already on the speed governor. Any requirement for a new plate or different number, the state requires the companies to go back through the approval process. This will have global impact since companies purchase inventory for all products and the universe is not limited to CA. Will restrict moderations/alteration and trigger a permit and inspection upon model change, resulting in additional costs in this regard as well.

\$25 per plate + \$62.40 (1/2 hr labor) applies new traction elevators only. (Refer to CA database for accurate number). If applied to 1000 units = **\$87,400 annually**

### **Suspension Means- 3147.2220(c)**

This requirement is cost prohibitive, but really unable to quantify. One device approved, but cannot be replicated. And, there are some thoughts that the approved device would not meet the new requirements either. Other companies would have to invest millions into R&D, patents, etc. And, even then, there is no certainty of approval.

- 3+ years and 30+ staff (average of \$100,000 per year) = \$3M for product development  
PER COMPANY
- Plus costs associated with state review and approval process
- Unable to estimate product cost

### **Buffers and Bumpers**

**3147.2222(a):** Will require a variance on every job to transition from hydro to traction. Estimated 40 hours of burden per variance per company x \$150 per hour = \$6000 x 20 variances per year = **\$120,000 annually.**

**2222(b):** Costs = \$50k-\$100k on man hours, delays and secondary visits. Lack of adequate communication on approvals results in repeat problems and companies have to answer questions over and over. Additional costs for staff time wasted.

**2222(d):** Increased labor costs for installation (piping, wiring, etc.) of two because no one will use just one person.

2 hours x 2 people = 4 man hours @ \$125 = \$500 + additional maintenance at one hour per year @ \$125 = \$625 per unit per year.

562 traction cars installed in 2013 without LA. 400 of those were 350 feet per minute or better. **TOTAL = \$250,000**

Modification of design and engineering costs additional.

### **Car and Counterweight guide rails, guide rail supports and fastenings - 3147.2223**

5 stop car = 24 brackets, 1/4 man hour to drill each @ \$31.25 = \$750 + \$0.50 per bolt = \$12

**TOTAL: \$762 = per 5 stop unit.** If applied to 1000 units for estimate = **\$762,000 annually**

This calculated for buildings of 4 stories. Additional stories add costs.

### **Emergency Operations and Signaling Devices**

**3147.2227(a):** extra button, wiring, bell design = \$1000 + bell @ \$50 + 1 man hour @ \$125 if in hoistway\* = \$1,175 x 1000 units for estimate = **\$1.175M annually**

Additional costs include: potential need to upsize traveling cable resulting in hundreds of \$\$ for the installation. Exponential cost increases if located in remote area, such as a fire control room or security room located in another area of the building or complex.

**3147.2227(c):** costs related to redesign = additional costs

### **Maintenance, Repair, Replacement and Testing – Eliminating Alternative Testing**

**3147.2806(a):** Overall loss of alternative testing = 10,000 traction inspections per year (refer to CA database for accurate number) x \$1000 per day (2nd mechanic needed to carry weights) = **\$10M per yr.**

**3147.2806(c):** Eliminating the Alternative Testing here will cost 1/2 hr labor @ \$125 per hour = \$62.50 x 1000 new units for estimate = **\$62,500 in first year, then cumulative going forward.**

### **Requiring CCCM to undertake FEO (and other requirements) 3147.2806(l):**

79,729 hydros + 30,000 est. number of traction units = 119,729 total elevators in CA (refer to CA database for accurate number). Estimate that 75% require firefighters' emergency monthly operation (FEO) nets out to a universe of 89,800 units for this calculation.

Cost per hour for mechanic = \$125 x 3 additional times CCCM must do work needing 1/2-1 hour each time = 1.5-3 hours incremental additional hours per year = \$187.5 - \$375 per unit. **TOTAL \$16.84M - \$33.675M for current portfolio, then cumulative going forward.**