

# DELAWARE ELEVATOR

MANUFACTURING

## PRODUCT PLANNING GUIDE

-2019-



# DELAWARE ELEVATOR MANUFACTURING

Delaware Elevator, Inc is a family owned full service elevator company that was established in 1946 with roots dating back to early 1930's. Our corporate office is based in Salisbury, Maryland with other branch offices and representatives in Delaware, Virginia, Colorado, Minnesota, North Carolina and Florida. Our wide spread locations make it convenient to reach both our national and international clients.

Our continued commitment to providing the best quality of products and services has made us one of the largest independent elevator companies in the nation. Today, Delaware Elevator, Inc., proudly serves the new construction, modernization, residential and handicap lifts, marine / vessel elevators and the service and maintenance industries, while being supported by an in-house manufacturing facility, Delaware Elevator Manufacturing.

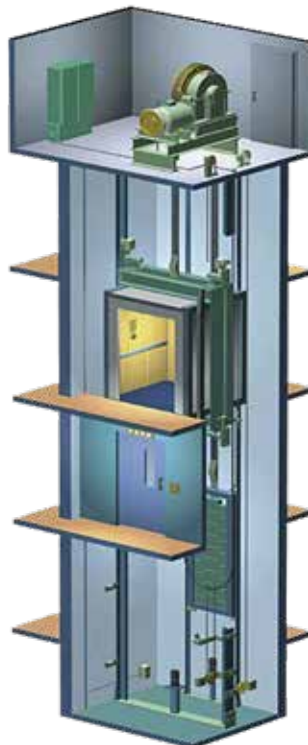
The goal of Delaware Elevator is to provide responsive service tailored to meet the individual needs of our valued clients. We can confidently affirm that we are large enough to solve your problems and small enough to provide personal care. We attribute over 70 years of success to our highly skilled employees who promote safety and quality which provides the utmost value to our customers. We welcome the opportunity to work with you on any and all of your vertical transportation needs.

## RESIDENTIAL



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## OVERHEAD TRACTION



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## IN-GROUND



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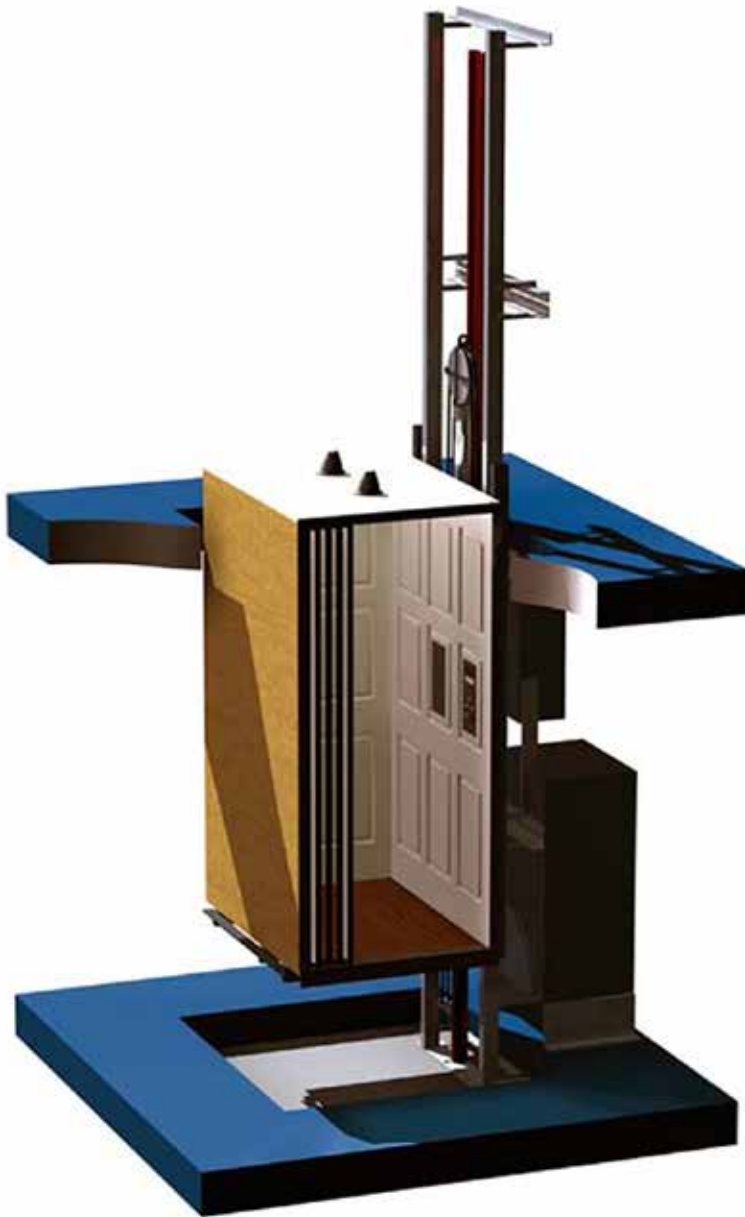
## MRL



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# RESIDENTIAL ELEVATORS



## OPTIONS

- Cabs available in a wide variety of finishes and other options
- Accordion cab doors in hardwoods, custom stain & lacquer finish aluminum, clear or bronze acrylic panels
- Recessed telephone cabinet
- Automatic car door operator
- Polished stainless steel, brushed brass, or polished brass pushbutton faceplate & handrail finishes

## CHARACTERISTICS

- Up to 950 lb capacity (750 lb standard)
- 40 FPM nominal car speed
- Up to 6 stops with 50 feet of floor to floor travel
- Minimum pit depth of 10 inches required (12" recommended)
- Minimum overhead clearance of 8'-0" required (9'-6" recommended)
- Up to 15 square feet interiors cab sizes available (12 ft standard)

## EQUIPMENT

- 1:2 Roped hydraulic drive
- (2) 3/8" diameter hoist cables
- 1-Stage hydraulic piston & cylinder w/self-adjusting seal
- Heavy duty cantilevered designed car sling w/roller guide shoes
- 8 lb/ft steel tee guide rail system
- 220 volt single phase power supply
- Vibration free submersible pump/motor assembly (3 or 5 HP motor)
- 2-Speed control valve and constant down speed regulation

## SAFETY DEVICES

- Type "A" instantaneous broken rope car safety
- Pipe rupture valve
- Upper and lower terminal limit switches
- Top final limit switch
- Slack cable switch
- Emergency car lighting in cab
- Emergency stop switch in cab
- Emergency push button alarm in cab
- Automatic car re-leveling device
- Battery lowering device
- Emergency manual lowering valve
- Emergency telephone in cab
- Solid panel cab doors with approved safety switch
- Approved electro mechanical hoistway door interlocks
- Rubber impact bumper below elevator car
- UL and/or CSA certified electrical and hydraulic devices
- Manufactured in accordance with ASME A17.1 safety code

## CONTROLS / PUSH BUTTON FIXTURES

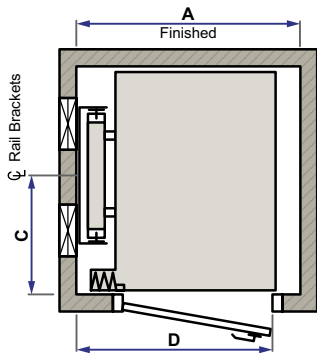
- Automatic pushbutton control
- Microprocessor based control system w/battery back up
- Light-up push buttons in car and hall
- Digital floor position indicator in car
- Automatic in car light with override switch in cab
- Automatic indicator light time-out feature
- Automatic "Home Park" feature to designated floor
- "Car Here" indicators in hall
- Low oil protection timer circuit

## CAB FINISHES & ACCESSORIES

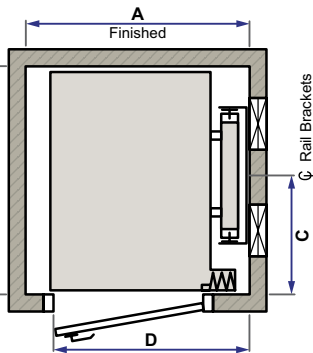
- Cabs available in a wide variety of plastic laminate choices and other options
- Solid panel accordion cab door available in a wide variety of vinyl laminate choices
- 36" x 48" x 80" high clear interior cab size with a variety of cab opening configurations
- Brushed stainless steel handrail on one side wall
- Brushed stainless steel cab control panel

# RESIDENTIAL ELEVATORS

**Plan A**



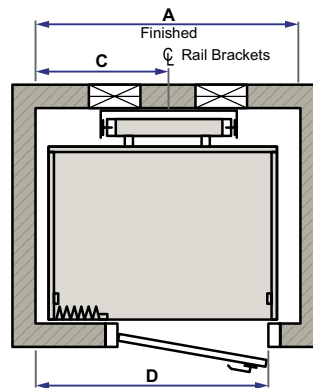
**Plan B**



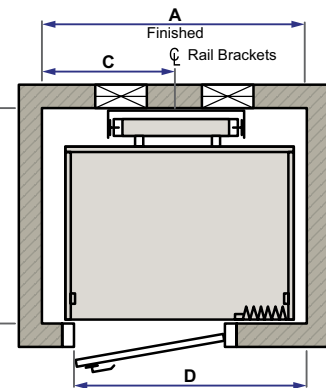
Capacity	A	B	C	D
750 lbs.	4'-6"	4'-8"	2'-4½"	3'-11"
950 lbs.	4'-5"	5'-8"	2'-10½"	3'-11"

Capacity	A	B	C	D
750 lbs.	4'-10"	4'-5"	2'-3"	4'-3"
950 lbs.	5'-10"	4'-5"	2'-9"	5'-3"

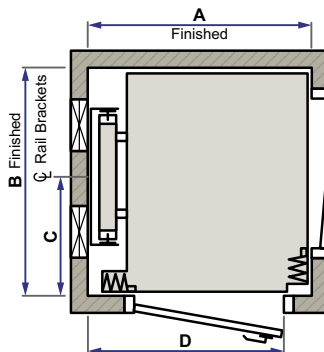
**Plan C**



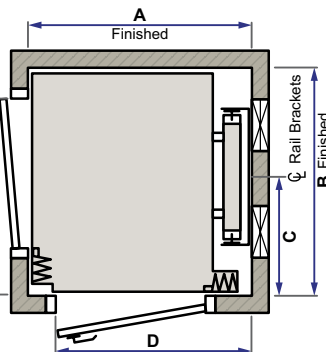
**Plan D**



**Plan E**



**Plan F**



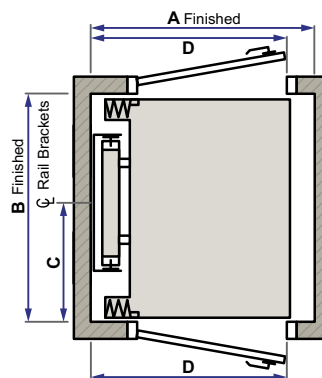
Capacity	A	B	C	D	E
750 lbs.	4'-6"	4'-11"	2'-4½"	4'-0"	4'-4"
950 lbs.	4'-6"	5'-11"	2'-10½"	4'-0"	5'-4"

Capacity	A	B	C	D
750 lbs.	4'-6"	4'-10"	2'-5"	3'-11"
950 lbs.	4'-6"	5'-10"	2'-11"	3'-11"

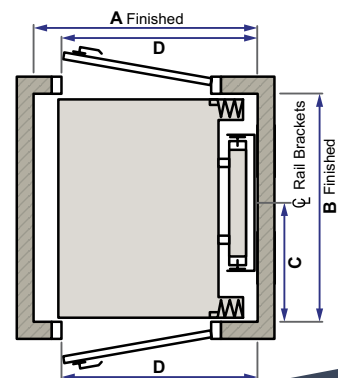
## Home elevator 3/4" x 3" rule

ASME 5.3.1.7.2 "The clearance between the hoistway doors or gates and the hoistway edge of the landing sill shall not exceed 3/4" (19mm). The distance between the hoistway face of the landing door or gate and the car door or gate shall not exceed 3" (76mm)."

**Plan G**



**Plan H**



# OVERHEAD TRACTION / GEARED / PASSENGER

## OHT CAR TYPE SUMMARY

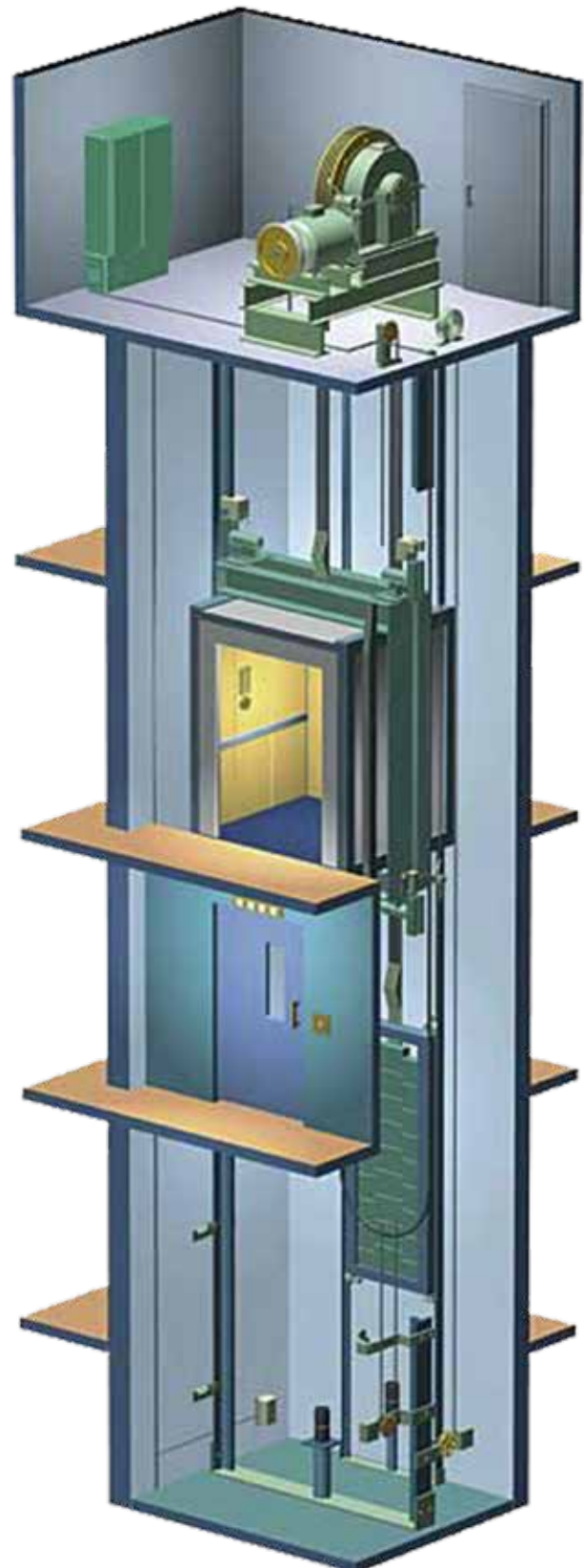
This design utilizes a geared traction machine, along with the controller and governor, mounted in a penthouse machine room directly over (above) the hoistway. This application uses hoist ropes and counterweights, to move the car, in lieu of a hydraulic jack. The counterweights can be positioned at the rear of the car (front open only), or at the side of the car. In addition to the main rails, a set of counterweight frame rails are also required.

**Advantages** to using this design include a much faster speed capability, an unlimited travel range, as well as a higher power efficiency than hydraulic car types. In addition, there is no hydraulic oil being used.

**Disadvantages** include a substantially higher material cost than hydraulic car types, along with a higher field installation cost. In addition, a higher OH is required (typically 16ft) along with a penthouse machine room located over the hoistway.

The penthouse machine room can be eliminated by positioning the geared machine next to the side of the hoistway at one of the landings. This arrangement is referred to as a basement machine application, also requiring additional hoistway sheaves and machine beam support at the landing location of the machine.

Hoistway dimensions are not for final construction purposes. National & local code years & variations may affect sizes shown. All dimensions should be verified with Delaware Elevator prior to construction.



# OVERHEAD TRACTION / GEARED / PASSENGER

Low Capacity Standard Dimension & Specification Chart

Capacity (lbs.)	Openings F=Front R=Rear	Door Type and Width	Platform Size W x D (min)	Max Speed FPM	Hoistway Size W x D (min)	Clear Inside W x D (min)	Minimum Overhead	Minimum Pit Depth
<b>Counterweight at REAR</b>								
2100	F	1SP 36"	6'-0" x 5'-1"	350	7'-4" x 6'-8"	5'-8" x 4'-3"	16'-0"	5'-2"
2500	F	1SP 42"	7'-0" x 5'-1"	350	8'-4" x 6'-8"	6'-8" x 4'-3"	16'-0"	5'-2"
3000	F	1SP 42"	7'-0" x 5'-6"	350	8'-4" x 7'-1"	6'-8" x 4'-8"	16'-0"	5'-2"
3500	F	1SP 42"	7'-0" x 6'-3"	350	8'-4" x 7'-10"	6'-8" x 5'-5"	16'-0"	5'-2"
4000	F	1SP 48"	8'-0" x 6'-3"	350	9'-4" x 7'-10"	7'-8" x 5'-5"	16'-0"	5'-2"
<b>Counterweight at SIDE</b>								
2100	F	1SP 36"	6'-0" x 5'-1"	350	8'-4" x 5'-10"	5'-8" x 4'-3"	16'-0"	5'-2"
2500	F	1SP 42"	7'-0" x 5'-1"	350	9'-4" x 5'-10"	6'-8" x 4'-3"	16'-0"	5'-2"
3000	F	1SP 42"	7'-0" x 5'-6"	350	9'-4" x 6'-3"	6'-8" x 4'-8"	16'-0"	5'-2"
3500	F	1SP 42"	7'-0" x 6'-3"	350	9'-4" x 7'-0"	6'-8" x 5'-5"	16'-0"	5'-2"
3500	F&R	1SP 42"	7'-0" x 6'-9"	350	9'-4" x 7'-9 ½"	6'-8" x 5'-5"	16'-0"	5'-2"
4000	F	1SP 48"	8'-0" x 6'-3"	350	10'-4" x 7'-0"	7'-8" x 5'-5"	16'-0"	5'-2"
4000	F&R	1SP 48"	8'-0" x 6'-9"	350	10'-4" x 6'-9 ½"	7'-8" x 5'-5"	16'-0"	5'-2"
3500H	F	2SP 42"	5'-4" x 8'-4"	350	7'-2" x 9'-2"	5'-0" x 7'-4"	16'-0"	5'-2"
3500H	F&R	2SP 42"	5'-4" x 9'-0"	350	7'-2" x 10'-3 ½"	5'-0" x 7'-4"	16'-0"	5'-2"
4000H	F	2SP 48"	6'-0" x 8'-5"	350	7'-10" x 9'-3"	5'-8" x 7'-5"	16'-0"	5'-2"
4000H	F&R	2SP 48"	6'-0" x 9'-1"	350	7'-10" x 10'-4 ½"	5'-8" x 7'-5"	16'-0"	5'-2"
4500H	F	2SP 48"	6'-0" x 8'-9"	350	7'-10" x 9'-7"	5'-8" x 7'-9"	16'-0"	5'-2"
4500H	F&R	2SP 48"	6'-0" x 9'-6"	350	7'-10" x 10'-9 ½"	5'-8" x 7'-10"	16'-0"	5'-2"
5000H	F	2SP 48"	6'-0" x 9'-8"	350	7'-10" x 10'-7"	5'-8" x 8'-8"	16'-6"	5'-2"
5000H	F&R	2SP 48"	6'-0" x 10'-4"	350	7'-10" x 11'-7 ½"	5'-8" x 8'-8"	16'-6"	5'-2"

Maximum\* Inside Net Platform Areas for the Various Rated Loads

Rated Load (lbs.)	Inside Net Platform Area (ft²)	Rated Load (lbs.)	Inside Net Platform Area (ft²)
500	7.0	5,000	50.0
600	8.3	6,000	57.7
700	9.6	7,000	65.3
1,000	13.25	8,000	72.9
1,200	15.6	9,000	80.5
1,500	18.9	10,000	88.0
1,800	22.1	12,000	103.0
2,000	24.2	15,000	125.1
2,500	29.1	18,000	146.9
3,000	33.7	20,000	161.2
3,500	38.0	25,000	196.5
4,000	42.2	30,000	231.0
4,500	46.2		

\*To allow for variations in cab designs, and increase in the maximum inside net platform areas not exceeding 5% shall be permitted for the various rated loads. General Note: 1 lb. = 0.454 kg - 1 ft² = 0.0929 m²

Based on car speed of 200 FPM

Cab Height = 8'-0"

For seismic applications add 3" to hoistway width.

Speeds exceeding 200 FPM require additional overhead and pit depth. Minimum pit depth is based on the use of spring buffers. Add 5" to pit depth if oil buffers are required or car speed exceeds 200 FPM.

**225 FPM** = add 6" of overhead and 5" of pit depth

**250 FPM** = add 7" of overhead and 5" of pit depth

**300 FPM** = add 8" of overhead and 5" of pit depth

**350 FPM** = add 10" of overhead and 5" of pit depth

# IN-GROUND PASSENGER ELEVATOR

## IN-GROUND CAR TYPE SUMMARY

This is the traditional elevator application that has been used for many years. The jack is located in the ground directly under the platform. The jack is protected from the ground using a PVC liner.

**Advantages** to using this car type is that the material cost for the package is less expensive than all other car types. The package is the easiest to install and is available in low capacity as well as high capacity applications. Heavy freight cars are typically always in-ground. The pit depth and overhead dimensions are typically always standard, not requiring any extended dimensions, even though the travel can be upwards to several landings.

**Disadvantages** are that the jack is located underground and oil contamination is remotely possible, though the PVC liner is providing protection between the cylinder and the actual soil. Geographic areas which experience seismic activity will present the greatest risk of oil contamination. The jack (single stage) must go down into the ground the same distance as the travel. Drilling a jack hole can be expensive, depending upon the ground conditions.





# IN-GROUND PASSENGER ELEVATOR

Low Capacity Standard Dimension & Specification Chart

Capacity (lbs.)	Openings F=Front R=Rear	Door Type and Width	Platform Size W x D (min)	Hoistway Depth Platform Plus	Hoistway Size W x D (min)	Clear Inside W x D (min)	Running Clearance Sill/Plat	Sill Depth Req'd
2100	F	1SP 36"	6'-0" x 5'-1"	9"	7'-4" x 5'-10"	5'-8" x 4'-3"	1"	5"
2100	F&R	1SP 36"	6'-0" x 5'-8"	12"	7'-4" x 6'-8"	5'-8" x 4'-4"	1"	5"
2500	F	1SP 42"	7'-0" x 5'-1"	9"	8'-4" x 5'-10"	6'-8" x 4'-3"	1"	5"
2500	F&R	1SP 42"	7'-0" x 5'-8"	12"	8'-4" x 6'-8"	6'-8" x 4'-4"	1"	5"
3000	F	1SP 42"	7'-0" x 5'-6"	9"	8'-4" x 6'-3"	6'-8" x 4'-8"	1"	5"
3000	F&R	1SP 42"	7'-0" x 5'-11"	12"	8'-4" x 6'-11"	6'-8" x 4'-7"	1"	5"
3500	F	1SP 42"	7'-0" x 6'-3"	9"	8'-4" x 7'-0"	6'-8" x 5'-5"	1"	5"
3500	F&R	1SP 42"	7'-0" x 6'-9"	12"	8'-4" x 7'-9"	6'-8" x 5'-5"	1"	5"
3500H	F	2SP 42"	5'-4" x 8'-4"	11"	6'-8" x 9'-3"	5'-0" x 7'-4"	1"	6 ½"
3500H	F&R	2SP 42"	5'-4" x 9'-0"	15"	6'-8" x 10'-3"	5'-0" x 7'-4"	1"	6 ½"
4000	F	1SP 48"	8'-0" x 6'-3"	9"	9'-4" x 7'-0"	7'-8" x 5'-5"	1"	5"
4000	F&R	1SP 48"	8'-0" x 6'-9"	12"	9'-4" x 7'-9"	7'-8" x 5'-5"	1"	5"
4000H	F	2SP 48"	6'-0" x 8'-5"	11"	7'-4" x 9'-3"	5'-8" x 7'-5"	1"	6 ½"
4000H	F&R	2SP 48"	6'-0" x 9'-1"	15"	7'-4" x 10'-4"	5'-8" x 7'-5"	1"	6 ½"
4500H	F	2SP 48"	6'-0" x 8'-9"	11"	7'-4" x 9'-7"	5'-8" x 7'-9"	1"	6 ½"
4500H	F&R	2SP 48"	6'-0" x 9'-6"	15"	7'-4" x 10'-9"	5'-8" x 7'-10"	1"	6 ½"
5000H	F	2SP 48"	6'-0" x 9'-8"	11"	7'-6" x 10'-7"	5'-8" x 8'-8"	1"	6 ½"
5000H	F&R	2SP 48"	6'-0" x 10'-4"	15"	7'-6" x 11'-7"	5'-8" x 8'-8"	1"	6 ½"

## OVERHEAD REQUIRED QUICK CALCULATION

- Regardless of what the travel is, the standard minimum overhead is 12'-6". Consult your Delaware Elevator representative if your overhead is less than 12'-6".
- For seismic zone 2 or greater application - increase hoistway width 2"
- For 1¼" running clearance, increase hoistway depth ½"

Pit Depth	4'-0"
Piston Bottom Undertravel	12"
Car Speed	Up To 150 FPM
Cab Height	8'-0"
Piston Top Overtravel	5"

## APPROXIMATE CLEAR INSIDE DIMENSIONS OF CAB

**Width** = Platform Width less 4"

### Depth = Front Open Only

SSSO & CO Doors = Platform Depth Less 10"  
2SSO Doors = Platform Depth less 12"

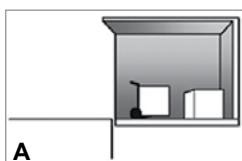
### Depth = Front & Rear Open

SSSO & CO Doors = Platform Depth Less 16"  
2SSO Doors = Platform Depth less 20"

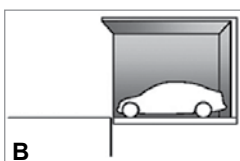
### D.B.G. (Distance Between Guides)

Platform Width plus 3 ¼" 12# / 15# rail depth= 3 ½"

# IN-GROUND FREIGHT ELEVATOR



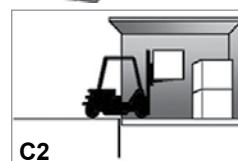
**Class A: General Freight Loading**  
Where no item including loaded truck weighs more than 1/4 rated capacity.  
Rating not less than 50 lb/ft<sup>2</sup> (240 kg/m<sup>2</sup>)



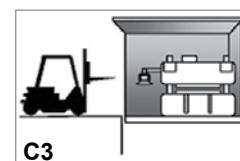
**Class B: Motor Vehicle Loading**  
Automobiles, trucks, buses.  
Rating not less than 30 lb/ft<sup>2</sup> (145 kg/m<sup>2</sup>)



**Class C1: Industrial Truck Loading**  
Where truck is carried. This loading applies where concentrated load including truck is more than 1/4 rated capacity but carried load does not exceed rated capacity.  
Rating not less than 50 lb/ft<sup>2</sup> (240 kg/m<sup>2</sup>)



**Class C2: Industrial Truck Loading**  
Where truck is not carried, but is used for loading and unloading. This loading applies where concentrated load including truck is more than 1/4 rated capacity but carried load does not exceed rated capacity. This loading also applies where increment loading is used, but maximum load on car platform during loading or unloading does not exceed 150% of rated load. Rating not less than 50 lb/ft<sup>2</sup> (240 kg/m<sup>2</sup>)



**Class C3: Concentrated Loading**  
No truck used, but load increments are more than 1/4 rated capacity. Carried load must not exceed rated capacity.  
Rating not less than 50 lb/ft<sup>2</sup> (240 kg/m<sup>2</sup>)

## CUSTOM SIZES:

Freight elevators are typically designed to meet specific building/operation needs. The “standard” sizes are for general reference as a help with planning. Delaware Elevator can easily custom design your freight elevator to your specific size requirements. Contact your Delaware Elevator representative to discuss your specific requirements.

# IN-GROUND FREIGHT ELEVATOR

Standard Dimension & Specification Chart Using Regular Bi-Parting Power Doors

Capacity (lbs.)	Openings F=Front R=Rear	Clear Door Width	Platform Size W x D (min)	Hoistway Depth Platform Plus	Hoistway Size W x D (min)	Clear Inside W x D (min)	Minimum Platform to Side Wall
<b>Class A &amp; C Loading</b>							
4000	F	5'-8"	6'-0" x 8'-0"	8"	7'-8" x 8'-8"	5'-8" x 7'-5"	10"
4000	F&R	5'-8"	6'-0" x 8'-0"	10"	7'-8" x 8'-10"	5'-8" x 7'-4"	10"
5000	F	6'-8"	7'-0" x 10'-0"	8"	8'-10" x 10'-8"	6'-8" x 9'-5"	11"
5000	F&R	6'-8"	7'-0" x 10'-0"	10"	8'-10" x 10'-10"	6'-8" x 9'-4"	11"
6000	F	8'-0"	8'-4" x 10'-0"	8"	10'-2" x 10'-8"	8'-0" x 9'-5"	11"
6000	F&R	8'-0"	8'-4" x 10'-0"	10"	10'-2" x 10'-10"	8'-0" x 9'-4"	11"
8000	F	8'-0"	8'-4" x 12'-0"	8"	10'-2" x 12'-8"	8'-0" x 11'-5"	11"
8000	F&R	8'-0"	8'-4" x 12'-0"	10"	10'-2" x 12'-10"	8'-0" x 11'-4"	11"
10000	F	10'-0"	10'-4" x 14'-0"	8"	12'-2" x 14'-8"	10'-0" x 13'-5"	11"
10000	F&R	10'-0"	10'-4" x 14'-0"	10"	12'-2" x 14'-10"	10'-0" x 13'-4"	11"
12000	F	12'-0"	12'-4" x 16'-0"	8"	14'-4" x 16'-8"	12'-0" x 15'-5"	12"
12000	F&R	12'-0"	12'-4" x 16'-0"	10"	14'-4" x 16'-10"	12'-0" x 15'-4"	12"
15000	F	12'-0"	12'-4" x 18'-0"	8"	14'-4" x 18'-8"	12'-0" x 17'-5"	12"
15000	F&R	12'-0"	12'-4" x 18'-0"	10"	14'-4" x 18'-10"	12'-0" x 17'-4"	12"
<b>Class B Motor Vehicle Loading</b>							
8000	F	9'-0"	9'-4" x 22'-0"	8"	11'-2" x 22'-8"	9'-0" x 21'-5"	11"
8000	F&R	9'-0"	9'-4" x 22'-0"	10"	11'-2" x 22'-10"	9'-0" x 21'-4"	11"
10000	F	10'-0"	10'-4" x 24'-0"	8"	12'-2" x 24'-8"	9'-0" x 23'-5"	11"
10000	F&R	10'-0"	10'-4" x 24'-0"	10"	12'-2" x 24'-10"	10'-0" x 23'-4"	11"

## DOOR, CAB AND CAR GATE HEIGHTS

The freight car door height is the same height as the clear inside cab height (typically minimum of 8'-0"). The standard (typical) vertical car gate is 1-section 6'-0" high, sliding straight up to clear the cab height.

## OVERHEAD AND PIT DEPTH QUICK CALCULATION

- Minimum overhead using single-section car gate = Cab height + (car gate height of 6'-0") + 6"
- Minimum pit depth using vertical bi-parting freight doors = ½ door height + 6"

- For seismic zone 2 or greater application - increase hoistway width 2"
- For 1¼" running clearance, increase hoistway depth ½"

## APPROXIMATE CLEAR INSIDE DIMENSIONS OF CAB

**Width** = Platform less 4"

### Depth = Front Open Only

Single-section gate = Platform Less 6 ½"

Two-section gate = Platform less 8 ½"

### Depth = Front & Rear Open

Single-section gate = Platform Less 8 ½"

Two-section gate = Platform less 13"

### D.B.G. (Distance Between Guides)

Platform width plus 4"



# TWIN JACK HOLELESS ELEVATOR

## TWIN JACK HOLELESS CAR TYPE SUMMARY

This design uses (2) jacks, one on each side of the car, positioned between the platform and the hoistway wall. Single stage jacks are used for low travel, typically on 2 stop cars up to 14 ft. Two stage jacks are used for travel up to 28 to 30 feet (typically 3 to 4 stops).

**Advantages** to using this car type is that the jacks are located above ground, thereby eliminating the need to drill a jack hole and eliminating the risk of oil contamination. This car type will also accommodate low and high capacity cars.

**Disadvantages** are that the travel is typically restricted to a 2 to 4 stop application. Depending upon the travel, an extended overhead may be required to fit the jacks into the hoistway elevation. The hoistway width requirement may also be a little greater than an in-ground car type for high capacity applications.

For seismic zone 2 or greater application, increase hoistway width 2".

For 1 ¼" running clearance, increase hoistway depth ½".

Contact a Delaware Elevator representative for required hoistway width for two stage telescopic arrangements.



# TWIN JACK HOLELESS ELEVATOR

Capacity (lbs.)	Openings F=Front R=Rear	Door Type and Width	Platform Size W x D (min)	Hoistway Depth Platform Plus	Hoistway Size W x D (min)	Clear Inside W x D (min)	Running Clearance Sill/Plat	Sill Depth Req'd'
2100	F	1SP 36"	6'-0" x 5'-1"	9"	7'-4" x 5'-10"	5'-8" x 4'-3"	1"	5"
2100	F&R	1SP 36"	6'-0" x 5'-8"	12"	7'-4" x 6'-8"	5'-8" x 4'-4"	1"	5"
2500	F	1SP 42"	7'-0" x 5'-1"	9"	8'-4" x 5'-10"	6'-8" x 4'-3"	1"	5"
2500	F&R	1SP 42"	7'-0" x 5'-8"	12"	8'-4" x 6'-8"	6'-8" x 4'-4"	1"	5"
3000	F	1SP 42"	7'-0" x 5'-6"	9"	8'-4" x 6'-3"	6'-8" x 4'-8"	1"	5"
3000	F&R	1SP 42"	7'-0" x 5'-11"	12"	8'-4" x 6'-11"	6'-8" x 4'-7"	1"	5"
3500	F	1SP 42"	7'-0" x 6'-3"	9"	8'-4" x 7'-0"	6'-8" x 5'-5"	1"	5"
3500	F&R	1SP 42"	7'-0" x 6'-9"	12"	8'-4" x 7'-9"	6'-8" x 5'-5"	1"	5"
3500H	F	2SP 42"	5'-4" x 8'-4"	11"	6'-8" x 9'-3"	5'-0" x 7'-4"	1"	6 1/2"
3500H	F&R	2SP 42"	5'-4" x 9'-0"	15"	6'-8" x 10'-3"	5'-0" x 7'-4"	1"	6 1/2"
4000	F	1SP 48"	8'-0" x 6'-3"	9"	9'-4" x 6'-11"	7'-8" x 5'-4"	1"	5"
4000	F&R	1SP 48"	8'-0" x 6'-8"	12"	9'-4" x 7'-8"	7'-8" x 5'-4"	1"	5"
4000H	F	2SP 48"	6'-0" x 8'-5"	11"	7'-4" x 9'-3"	5'-8" x 7'-5"	1"	6 1/2"
4000H	F&R	2SP 48"	6'-0" x 9'-1"	15"	7'-4" x 10'-4"	5'-8" x 7'-5"	1"	6 1/2"
4500H	F	2SP 48"	6'-0" x 8'-9"	11"	7'-4" x 9'-7"	5'-8" x 7'-9"	1"	6 1/2"
4500H	F&R	2SP 48"	6'-0" x 9'-6"	15"	7'-4" x 10'-9"	5'-8" x 7'-10"	1"	6 1/2"
5000H	F	2SP 48"	6'-0" x 9'-8"	11"	7'-6" x 10'-7"	5'-8" x 8'-8"	1"	6 1/2"
5000H	F&R	2SP 48"	6'-0" x 10'-4"	15"	7'-6" x 11'-7"	5'-8" x 8'-8"	1"	6 1/2"

## OVERHEAD REQUIRED - QUICK CALCULATIONS

### SINGLE STAGE JACKS

UP to 100 FPM:

Pit Depth = 4'-0"

Overhead = 12'-6"

Top Over Travel = 3.5"

Bottom Over Travel = 5.0"

Max. Travel = 13'-10"

Max. "Overall" Cab Height = 8'-6"

### 101-125 FPM:

Pit Depth = 4'-0"

Overhead = 12'-6"

Top Over Travel = 4.25"

Bottom Over Travel = 7.25"

Max. Travel = 13'-4"

Max. "Overall" Cab Height = 8'-6"

### TWO STAGE JACKS

UP to 100 FPM:

Pit Depth = 4'-0"

Overhead = 12'-6"

Top Over Travel = 7.5"

Bottom Over Travel = 5.5"

Max. Travel = 24'-4"

Max. "Overall" Cab Height = 8'-2"

### 101-125 FPM:

Pit Depth = 4'-0"

Overhead = 12'-6"

Top Over Travel = 9.0"

Bottom Over Travel = 7.0"

Max. Travel = 24'-4"

Max. "Overall" Cab Height = 8'-2"

## APPROXIMATE CLEAR INSIDE DIMENSIONS OF CAB

Width = Platform Width less 4"

### Depth = Front Open Only

SSSO & CO Doors = Platform Depth Less 10"

2SSO Doors = Platform Depth less 12"

### Depth = Front & Rear Open

SSSO & CO Doors = Platform Depth Less 16"

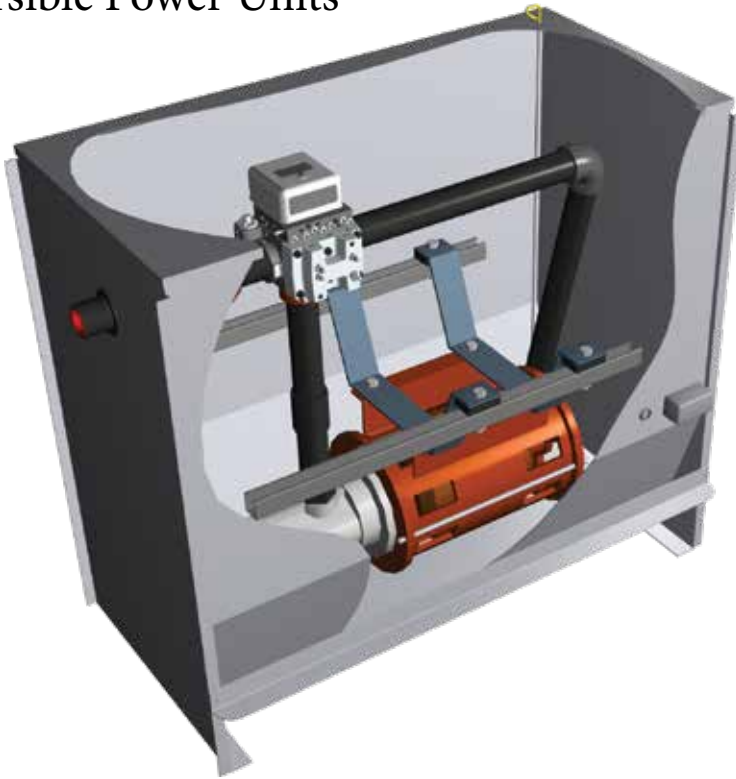
2SSO Doors = Platform Depth less 20"

### D.B.G. (Distance Between Guides) =

Platform Width plus 3 1/4" 12# / 15# rail depth = 3 1/2"

# POWER UNITS

## Submersible Power Units



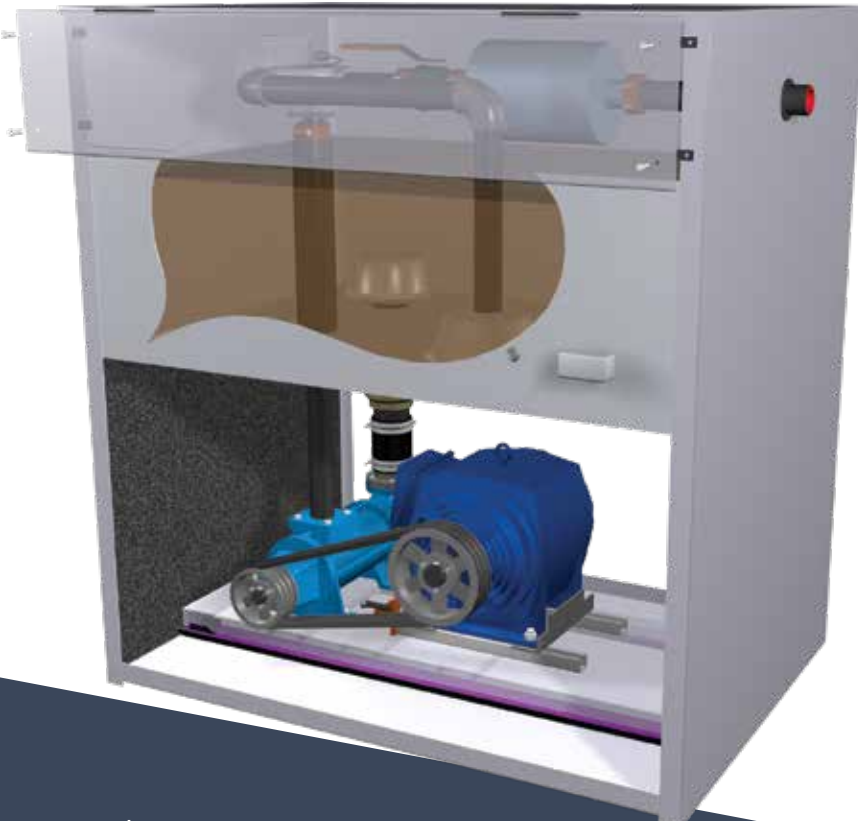
### STANDARD EQUIPMENT:

- Motors: 15-50HP 3PH
- IMO Pumps: 24-253 GPM
- Maxton Valve Standard (Mounted Inside the Tank)
- 12 ga. Enamel Tank
- Isolated Anchoring Feet
- Noise Reducing Muffler
- Oil Level Dip Stick
- Isolated Pump/Motor Suspension for Easy Removal & Quiet Operation
- Protective Packaging on a Pallet
- Standard Size: 51" W x 42" H x 22" D

### OPTIONS:

- EECO Valve
- Constant Down Speed Valves
- Custom Tank Sizes
- Low Pressure Switch
- Low Oil Switch
- Tank Heater
- Oil Cooler
- Oil Level Sight Gauge
- Shut Off (Ball) Valve
- Oil Return Pump
- DEM can meet your custom needs, call if requested options are not listed above.

## Belt Drive Power Units

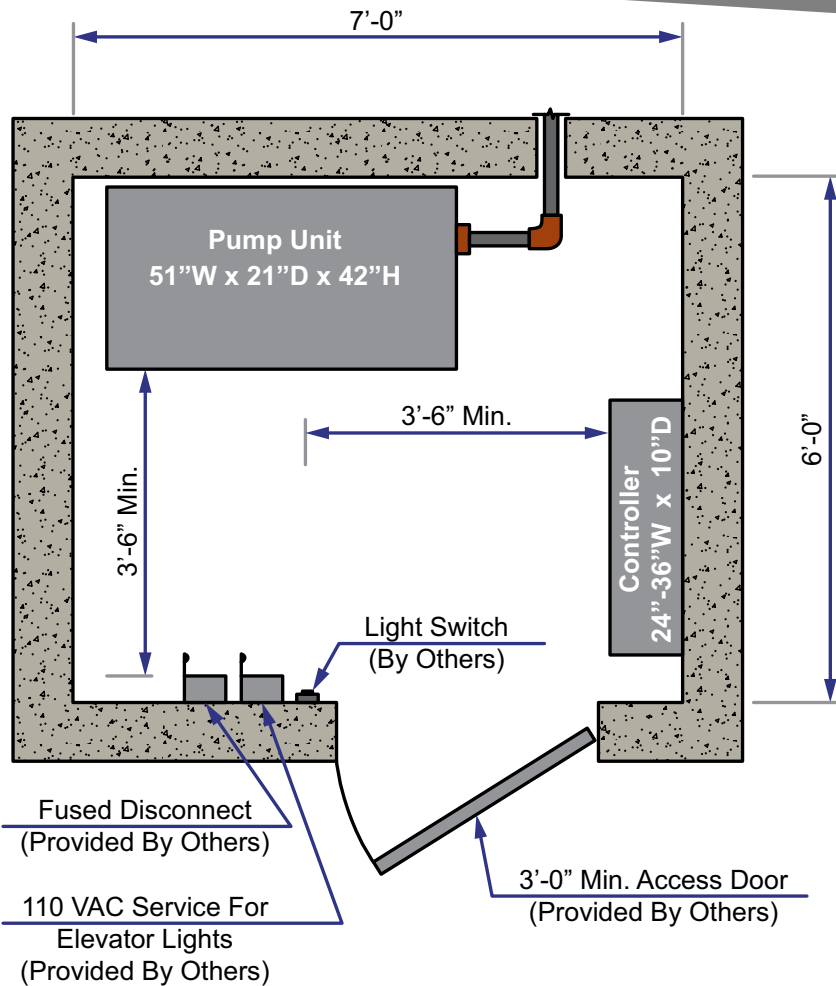


### STANDARD EQUIPMENT:

- Motors: 15-100HP 3PH
- IMO Pumps: 43-425 GPM Single Pump. Transferable Oil up to 250 Gal.
- Tandem Pumps/Motors up to 200HP/850GPM
- Maxton Valve Standard
- Valve Mounted in the Tank for Easy Stand-up Adjusting
- 12 ga. Formed Tank & Body
- Effective Easy Belt Adjustment
- Noise Reducing Muffler
- Isolated Pump/Motor Bedplate
- Protective Packaging
- Shut Off (Ball) Valve in the Tank
- Oil Level Sight Gauge



# MINIMUM MACHINE ROOM HYDRAULIC



Electrical Data for Hydraulic 3 Phase Motors (80 Starts Per Hour) in a Submersible Power Unit			
HP	VOLT	Full Load Amps	Locked Rotor Amps (Wye-Delta)
15	208	51	82
15	230/460	45/22.5	68/34
20	208	66	104
20	230/460	56/28	90/45
25	208	78	130
25	230/460	68/34	113/57
30	208	90	157
30	230/460	78/39	136/68
40	208	120	224
40	230/460	104/52	195/97
50	208	142	307
50	230/460	123/62	268/133

## Notes:

- Provide a legally constructed and enclosed machine room, adequately lighted, and conditioned to maintain temperature between 65° to 95° Fahrenheit, relative humidity is not to exceed 95% non-condensing.
- Machine room must be of adequate size to provide clearances around and between equipment as required by code.
- Provide a fused disconnect switch for each elevator in the machine room, located in a position based on local code and within sight of elevator equipment, and arranged to be locked in the off position.
- Provide 110 VAC service for elevator light and accessories connected to the car light service terminal on the elevator controller. A single disconnecting means for the car light and accessories shall be located in the machine room and arranged to be locked in the open position.
- Provide light, switch and 110 VAC GFI outlet in the machine room, with switch located adjacent to the machine room door.
- Only elevator related equipment is allowed in machine room.

Locked Rotor AMPS are given for Wye-Delta starting. Starting AMPS are 3 times Locked Rotor AMPS when starting across the line.

Machine room size as shown is minimum, other sizes and shapes can be accommodated.

# MRL – RAIL SUPPORTED

## MRL CAR TYPE SUMMARY

The group one “Machine Room Less” is an engineered package design that utilizes an efficient, gearless, permanent magnet machine. This machine, with all the related traction components, is installed inside the hoistway eliminating the need for a machine room.

- Engineering support and service
- Shop drawings and group one installation drawings
- Consolidated shipment when complete package is ordered

### Advantages for the building owner:

- Saves on valuable floor space
- No contamination to the ground such as on hydraulic applications.
- Greater power efficiency
- Superior performance and ride quality
- Reduction on the elevator power feeder

### Equipment Included:

- Gearless MRL PM Torin machine
- Governor and tail sheave
- Factory pre-assembled overhead machine frame
- Counterweight frame and weights
- Car & cwt roller guides with mounting plates
- Sling including: Crosshead, stiles, bolsters, brace rods, strike plates
- Platform with toe guard
- Buffer stands, spring or oil buffers
- Safeties
- Underslung assembly with deflector sheaves
- Guide rails, rail brackets with spreader plates, clips and fasteners
- Car & cwt ropes and wedge sockets
- Limit switches, mounting brackets & cam
- All hardware included in labeled bags

### Equipment Capabilities:

- Passenger & service cars
- Capacities from 2,100 lbs up to 3,500 lbs
- Speeds from 100 FPM up to 350 FPM
- Travel up to 50'-0"

**For custom dimensions, contact a Delaware Elevator representative.**



# MRL – RAIL SUPPORTED

## MRL Front Opening Dimensions

Capacity (lbs.)	Platform W x D (min)	Hoistway W x D (min)	Clear Opening	Clear Inside W x D (min)	SSSO Door	SSCO Door	2SSO Door
P2100-FO	6'-0" x 5'-1"	7'-8" x 5'-10"	3'-0"	5'-8" x 4'-3"	X		
P2500-FO	7'-0" x 5'-1"	8'-8" x 5'-10"	3'-6"	6'-8" x 4'-3"	X	X	
P3000-FO	7'-0" x 5'-6"	8'-8" x 6'-3"	3'-6"	6'-8" x 4'-8"	X	X	
P3500-FO	7'-0" x 6'-3"	8'-8" x 7'-0"	3'-6"	6'-8" x 5'-5"	X	X	

## MRL Front & Rear Opening Dimensions

Capacity (lbs.)	Platform W x D (min)	Hoistway W x D (min)	Clear Opening	Clear Inside W x D (min)	SSSO Door	SSCO Door	2SSO Door
P2100-FR	6'-0" x 5'-8"	7'-8" x 6'-8 ½"	3'-0"	5'-8" x 4'-4"	X		
P2500-FR	7'-0" x 5'-8"	8'-8" x 6'-8 ½"	3'-6"	6'-8" x 4'-4"	X	X	
P3000-FR	7'-0" x 5'-11"	8'-8" x 6'-11½"	3'-6"	6'-8" x 4'-7"	X	X	
P3500-FR	7'-0" x 6'-9"	8'-8" x 7'-9 ½"	3'-6"	6'-8" x 5'-5"	X	X	

- Hoistway dimensions are minimum clear inside requirements. Shorter installation times can be obtained by increasing these dimensions by up to 2". For seismic zone 2 and up, add 2" to hoistway width to comply with Code requirements. Due of space limitations Rail Supported Elevator use compensation chain to avoid use of the counterweight guard.
- Use of 8mm and 10mm ropes for traction elevator was approved by ASME A17.6 - effective 1st July 2010.
- New York City Building Department has issued new rules governing the overhead requirements for MRL's. Please contact a Delaware Elevator representative.

## Pit and Overhead Minimum Requirements For Cars With 8'-0 Cab Height

Speed	P2100		P2500		P3000		P3500	
	Pit	O.H.	Pit	O.H.	Pit	O.H.	Pit	O.H.
100 FPM*	5'-0"	14'-6"/14'-0"	5'-0"	14'-6"/14'-0"	5'-0"	14'-6"/14'-0"	5'-0"	14'-6"/14'-0"
150 FPM*	5'-0"	14'-6"/14'-1"	5'-0"	14'-6"/14'-1"	5'-0"	14'-6"/14'-1"	5'-0"	14'-6"/14'-1"
200 FPM*	5'-0"	14'-9"/14'-3"	5'-0"	14'-9"/14'-3"	5'-0"	14'-9"/14'-3"	5'-0"	14'-9"/14'-3"
250 FPM**	5'-6"	15'-0"/14'-6"	5'-6"	15'-0"/14'-6"	5'-6"	15'-0"/14'-6"	5'-6"	15'-0"/14'-6"
300 FPM**	5'-6"	15'-1"/14'-7"	5'-6"	15'-1"/14'-7"	5'-6"	15'-1"/14'-7"	5'-6"	15'-1"/14'-7"
350 FPM**	5'-6"	15'-4"/14'-10"	5'-6"	15'-4"/14'-10"	5'-6"	15'-4"/14'-10"	5'-6"	15'-4"/14'-10"

Rail Supported MRL designed with Torin TPM series machine.

\*Spring buffers for car and counterweight / \*\*Oil buffers for car and counterweight. Based on ASME A17.1

O.H. Left column has spring or oil buffers with 6" Runby / Right Column has all oil buffers with 0" Runby.

Note: For cars with tall cabs add 1" to O.H. for every inch of cab height added.



# MRL – FRAME BUILDING SUPPORTED

## MRL CAR TYPE SUMMARY

The group one “Machine Room Less” is an engineered package design that utilizes an efficient, gearless, permanent magnet machine. This machine, with all the related traction components, is installed inside the hoistway eliminating the need for a machine room.

- Engineering support and service
- Shop drawings and group one installation drawings
- Consolidated shipment when complete package is ordered

### Advantages for the building owner:

- Saves on valuable floor space
- No contamination to the ground such as on hydraulic applications.
- Greater power efficiency
- Superior performance and ride quality
- Reduction on the elevator power feeder

### Equipment Included:

- Gearless MRL PM Torin machine
- Governor and tail sheave
- Overhead beams, machine bedplate, hitch plates, governor plate
- Factory pre-assembled overhead machine frame
- Counterweight frame and weights
- Car & cwt roller guides with mounting plates
- Sling including: Crosshead, stiles, bolsters, brace rods, strike plates
- Platform with toe guard
- Buffer stands, spring or oil buffers
- Safeties
- Underslung assembly with deflector sheaves
- Guide rails, rail brackets with spreader plates, clips and fasteners
- Car & cwt ropes and wedge sockets
- Limit switches, mounting brackets & cam
- All hardware included in labeled bags

### Equipment Capabilities:

- Passenger & service cars
- Capacities from 2,100 lbs up to 3,500 lbs
- Speeds from 100 FPM up to 350 FPM
- Travels up to 200 Ft.
- For Frame Building Supported design machine beam pockets are required in the hoistway walls.

**For custom dimensions, contact a Delaware Elevator representative.**



# MRL – FRAME BUILDING SUPPORTED

## MRL Front Opening Dimensions

Capacity (lbs.)	Platform W x D (min)	Hoistway W x D (min)	Clear Opening	Clear Inside W x D (min)	SSSO Door	SSCO Door	2SSO Door
P2100-FO	6'-0" x 5'-1"	7'-8" x 5'-10"	3'-0"	5'-8" x 4'-3"	X		
P2500-FO	7'-0" x 5'-1"	8'-8" x 5'-10"	3'-6"	6'-8" x 4'-3"	X	X	
P3000-FO	7'-0" x 5'-6"	8'-8" x 6'-3"	3'-6"	6'-8" x 4'-8"	X	X	
P3500-FO	7'-0" x 6'-3"	8'-8" x 7'-0"	3'-6"	6'-8" x 5'-5"	X	X	

## MRL Front & Rear Opening Dimensions

Capacity (lbs.)	Platform W x D (min)	Hoistway W x D (min)	Clear Opening	Clear Inside W x D (min)	SSSO Door	SSCO Door	2SSO Door
P2100-FR	6'-0" x 5'-8"	7'-8" x 6'-8 ½"	3'-0"	5'-8" x 4'-4"	X		
P2500-FR	7'-0" x 5'-8"	8'-8" x 6'-8 ½"	3'-6"	6'-8" x 4'-4"	X	X	
P3000-FR	7'-0" x 5'-11"	8'-8" x 6'-11 ½"	3'-6"	6'-8" x 4'-7"	X	X	
P3500-FR	7'-0" x 6'-9"	8'-8" x 7'-9 ½"	3'-6"	6'-8" x 5'-5"	X	X	

- Hoistway dimensions are minimum clear inside requirements. Shorter installation times can be obtained by increasing these dimensions by up to 2". For seismic zone 2 and up, add 4" to hoistway width to comply with Code requirements. Due of space limitations, Frame BLDG Supported Elevator use compensation chain to avoid use of the counterweight guard.
- Use of 8mm and 10mm ropes for traction elevator was approved by ASME A17.6 - effective 1st July 2010.
- New York City Building Department has issued new rules governing the overhead requirements for MRLs. Please contact a Delaware Elevator representative.

## Pit and Overhead Minimum Requirements For Cars With 8'-0 Cab Height

Speed	P2100		P2500		P3000		P3500	
	Pit	O.H.	Pit	O.H.	Pit	O.H.	Pit	O.H.
100 FPM*	5'-0"	14'-5"/14'-0"	5'-0"	14'-5"/14'-0"	5'-0"	14'-5"/14'-0"	5'-0"	14'-5"/14'-0"
150 FPM*	5'-0"	14'-6"/14'-0"	5'-0"	14'-6"/14'-0"	5'-0"	14'-6"/14'-0"	5'-0"	14'-6"/14'-0"
200 FPM*	5'-0"	14'-8"/14'-1"	5'-0"	14'-8"/14'-1"	5'-0"	14'-8"/14'-1"	5'-0"	14'-8"/14'-1"
250 FPM**	5'-6"	14'-11"/14'-5"	5'-6"	14'-11"/14'-5"	5'-6"	14'-11"/14'-5"	5'-6"	14'-11"/14'-5"
300 FPM**	5'-6"	15'-0"/14'-6"	5'-6"	15'-0"/14'-6"	5'-6"	15'-0"/14'-6"	5'-6"	15'-0"/14'-6"
350 FPM**	5'-6"	15'-3"/14'-9"	5'-6"	15'-3"/14'-9"	5'-6"	15'-3"/14'-9"	5'-6"	15'-3"/14'-9"

Frame Building Supported MRL design with Torin TPM series machine.

\*Spring buffers for car and counterweight / \*\*Oil buffers for car and counterweight. Based on ASME A17.1

O.H. Left column has spring or oil buffers with 6" Runby / Right Column has all oil buffers with 0" Runby.

Note: For cars with tall cabs add 1" to O.H. for every inch of cab height added.

# MRL – BUILDING SUPPORTED

## MRL CAR TYPE SUMMARY

The group one “Machine Room Less” is an engineered package design that utilizes an efficient, gearless, permanent magnet machine. This machine, with all the related traction components, is installed inside the hoistway eliminating the need for a machine room.

- Engineering support and service
- Shop drawings and group one installation drawings
- Consolidated shipment when complete package is ordered

### Advantages for the building owner:

- Saves on valuable floor space
- No contamination to the ground such as on hydraulic applications.
- Greater power efficiency
- Superior performance and ride quality
- Reduction on the elevator power feeder

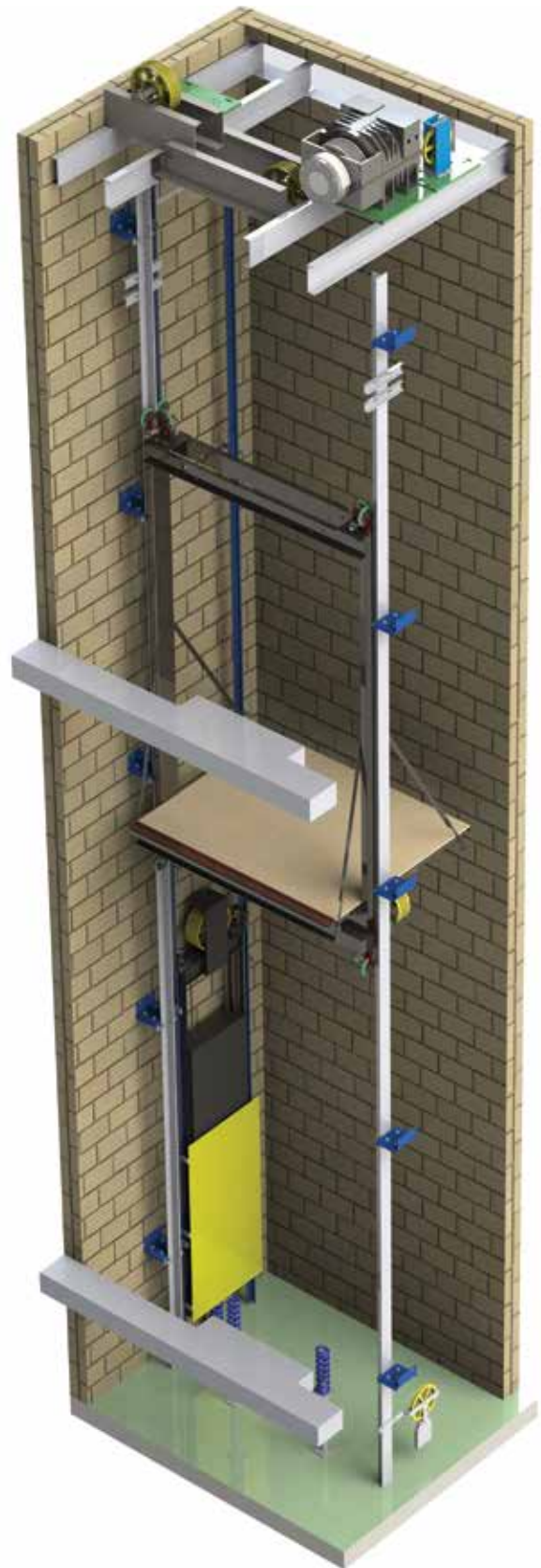
### Equipment Included:

- Gearless MRL PM Torin machine
- Governor and tail sheave
- Overhead beams, machine bedplate, hitch plates, governor plate
- Factory pre-assembled overhead machine frame
- Counterweight frame and weights
- Car & cwt roller guides with mounting plates
- Sling including: Crosshead, stiles, bolsters, brace rods, strike plates
- Platform with toe guard
- Buffer stands, spring or oil buffers
- Safeties
- Underslung assembly with deflector sheaves
- Guide rails, rail brackets with spreader plates, clips and fasteners
- Car & cwt ropes and wedge sockets
- Limit switches, mounting brackets & cam
- All hardware included in labeled bags

### Equipment Capabilities:

- Passenger & service cars
- Capacities from 2,100 lbs up to 5,000 lbs
- Speeds from 100 FPM up to 500 FPM
- Travels up to 300 Ft.
- For Building Supported design machine beam pockets are required in the hoistway walls.

**For custom dimensions, contact a Delaware Elevator representative.**





# MRL – BUILDING SUPPORTED

## MRL Front Opening Dimensions

Capacity (lbs.)	Platform W x D (min)	Hoistway W x D (min)	Clear Opening	Clear Inside W x D (min)	SSSO Door	SSCO Door	2SSO Door
P2100-FO	6'-0" x 5'-1"	7'-6" x 6'-5"	3'-0"	5'-8" x 4'-3"	X		
P2500-FO	7'-0" x 5'-1"	8'-6" x 6'-5 ½"	3'-6"	6'-8" x 4'-3"	X	X	
P3000-FO	7'-0" x 5'-6"	8'-6" x 6'-8"	3'-6"	6'-8" x 4'-8"	X	X	
P3500-FO	7'-0" x 6'-3"	8'-6" x 7'-0"	3'-6"	6'-8" x 5'-5"	X	X	
P4000-FO	8'-0" x 6'-3"	9'-7" x 7'-0"	3'-0"   4'-0"	7'-8" x 5'-5"	X	X   X	
S3500-FO	5'-4" x 8'-4"	6'-10" x 9'-3"	3'-6"	5'-0" x 7'-4"			X
S4000-FO	6'-0" x 8'-5"	7'-6" x 9'-3"	4'-0"	5'-8" x 7'-5"			X
S4500-FO	6'-0" x 8'-9"	7'-6" x 9'-7"	4'-0"	5'-8" x 7'-9"			X
S5000-FO	6'-0" x 9'-8"	7'-6" x 10'-6"	4'-0"	5'-8" x 8'-8"			X

## MRL Front & Rear Opening Dimensions

Capacity (lbs.)	Platform W x D (min)	Hoistway W x D (min)	Clear Opening	Clear Inside W x D (min)	SSSO Door	SSCO Door	2SSO Door
P2100-FR	6'-0" x 5'-8"	7'-6" x 6'-8 ½"	3'-0"	5'-8" x 4'-4"	X		
P2500-FR	7'-0" x 5'-8"	8'-6" x 6'-8 ½"	3'-6"	6'-8" x 4'-4"	X	X	
P3000-FR	7'-0" x 6'-5"	8'-6" x 7'-5 ½"	3'-6"	6'-8" x 5'-1"	X	X	
P3500-FR	7'-0" x 6'-9"	8'-6" x 7'-9 ½"	3'-6"	6'-8" x 5'-5"	X	X	
P4000-FR	8'-0" x 6'-9"	9'-7" x 7'-9 ½"	3'-0"   4'-0"	7'-8" x 5'-5"	X	X   X	
S3500-FR	5'-4" x 9'-0"	6'-10" x 10'-3 ½"	3'-6"	5'-0" x 7'-4"			X
S4000-FR	6'-0" x 9'-1"	7'-6" x 10'-4 ½"	4'-0"	5'-8" x 7'-5"			X
S4500-FR	6'-0" x 9'-6"	7'-6" x 10'-9 ½"	4'-0"	5'-8" x 7'-10"			X
S5000-FR	6'-0" x 10'-4"	7'-6" x 11'-7 ½"	4'-0"	5'-8" x 8'-8"			X

- Hoistway dimensions are minimum clear inside requirements. Shorter installation times can be obtained by increasing these dimensions by up to 2". For seismic zone 2 and up, add 4" to hoistway width to comply with Code requirements.
- Use of 8mm and 10mm ropes for traction elevator was approved by ASME A17.6 - effective 1st July 2010.
- New York City Building Department has issued new rules governing the overhead requirements for MRL's. Please contact a Delaware Elevator representative.

## Pit and Overhead Minimum Requirements For Cars With 8'-0 Cab Height

Speed	P2100		P2500		P3000		P3500		P4000, S4000, S4500, S5000	
	Pit	O.H.	Pit	O.H.	Pit	O.H.	Pit	O.H.	Pit	O.H.
100 FPM*	5'-0"	16'-1"/15'-8"	5'-0"	16'-1"/15'-8"	5'-0"	16'-1"/15'-8"	5'-0"	16'-1"/15'-8"	5'-0"	15'-7"/15'-2"
150 FPM*	5'-0"	16'-2"/15'-8"	5'-0"	16'-2"/15'-8"	5'-0"	16'-2"/15'-8"	5'-0"	16'-2"/15'-8"	5'-0"	15'-8"/15'-2"
200 FPM*	5'-0"	16'-4"/15'-9"	5'-0"	16'-4"/15'-9"	5'-0"	16'-4"/15'-9"	5'-0"	16'-4"/15'-9"	5'-0"	15'-10"/15'-3"
250 FPM**	5'-6"	16'-8"/16'-2"	5'-6"	16'-8"/16'-2"	5'-6"	16'-8"/16'-2"	5'-6"	16'-8"/16'-2"	5'-6"	16'-2"/15'-8"
300 FPM**	5'-6"	16'-8"/16'-2"	5'-6"	16'-8"/16'-2"	5'-6"	16'-8"/16'-2"	5'-6"	16'-8"/16'-2"	5'-6"	16'-2"/15'-8"
350 FPM**	5'-6"	17'-0"/16'-6"	5'-6"	17'-0"/16'-6"	5'-6"	17'-0"/16'-6"	5'-6"	17'-0"/16'-6"	5'-6"	16'-6"/16'-0"
400 FPM**	5'-9"	16'-9"/16'-3"	5'-9"	16'-9"/16'-3"	5'-9"	16'-9"/16'-3"	5'-9"	16'-9"/16'-3"	6'-0"	16'-9"/16'-3"
450 FPM**	6'-3"	17'-4"/16'-10"	6'-3"	17'-4"/16'-10"	6'-3"	17'-4"/16'-10"	6'-3"	17'-4"/16'-10"	6'-6"	17'-4"/16'-10"
500 FPM**	6'-3"	17'-6"/17'-0"	6'-3"	17'-6"/17'-0"	6'-3"	17'-6"/17'-0"	6'-3"	17'-6"/17'-0"	6'-6"	17'-6"/17'-0"

Building Supported MRL design with Torin TPM / TSM series machine.

\*Spring buffers for car and counterweight / \*\*Oil buffers for car and counterweight. Based on ASME A17.1

Note: For cars with tall cabs add 1" to O.H. for every inch of cab height added.

O.H. Left column has spring or oil buffers with 6" Runby

/ Right Column has all oil buffers with 0" Runby.

# MRL – OVERSLUNG / CORNERPOST

## MRL CAR TYPE SUMMARY

The group one “Machine Room Less” is an engineered package design that utilizes an efficient, gearless, permanent magnet machine. This machine, with all the related traction components, is installed inside the hoistway eliminating the need for a machine room.

- Engineering support and service
- Shop drawings and group one installation drawings
- Consolidated shipment when complete package is ordered

### Advantages for the building owner:

- Saves on valuable floor space
- No contamination to the ground such as on hydraulic applications.
- Greater power efficiency
- Superior performance and ride quality
- Reduction on the elevator power feeder

### Equipment Included:

- Gearless MRL PM Torin machine
- Governor and tail sheave
- Overhead beams, machine bedplate, hitch plates, governor plate
- Factory pre-assembled overhead machine frame
- Counterweight frame and weights
- Car & cwt roller guides with mounting plates
- Sling including: Crosshead, stiles, bolsters, brace rods, strike plates
- Platform with toe guard
- Buffer stands, spring or oil buffers
- Safeties
- Underslung assembly with deflector sheaves
- Guide rails, rail brackets with spreader plates, clips and fasteners
- Car & cwt ropes and wedge sockets
- Limit switches, mounting brackets & cam
- All hardware included in labeled bags

### Equipment Capabilities:

- Passenger & service cars
- Capacities from 2,100 lbs up to 3,500 lbs
- Speeds from 100 FPM up to 350 FPM
- Travels up to 300 Ft.
- For Corner posts and Overhead Traction designs, machine beam pockets are required in the hoistway walls.

**Contact a Delaware Elevator representative for a full review of requirements.**



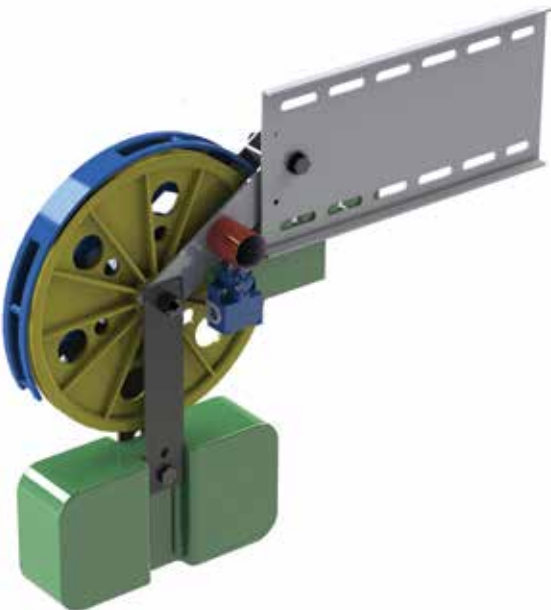
# GOVERNORS & SHEAVES



Overspeed Governor



Idle Governor Sheaves for  
Pit Mounted Governor



Governor Tension Sheaves

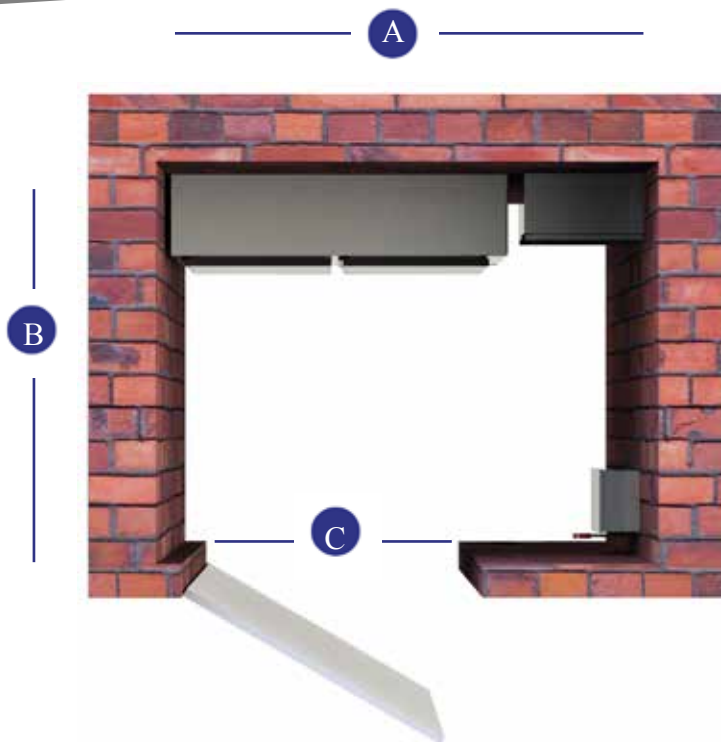


Deflector Sheaves 10 & 8 mm  
w/ Rope Guard



Pit Mounted Governor

# MINIMUM CONTROL ROOM – MRL



	A	B	C
Small	5'-6"	6'-4"	3'-0"
Large	5'-0"	5'-11"	3'-0"
(INSIDE MINIMUM DIMENSIONS)			

## Notes:

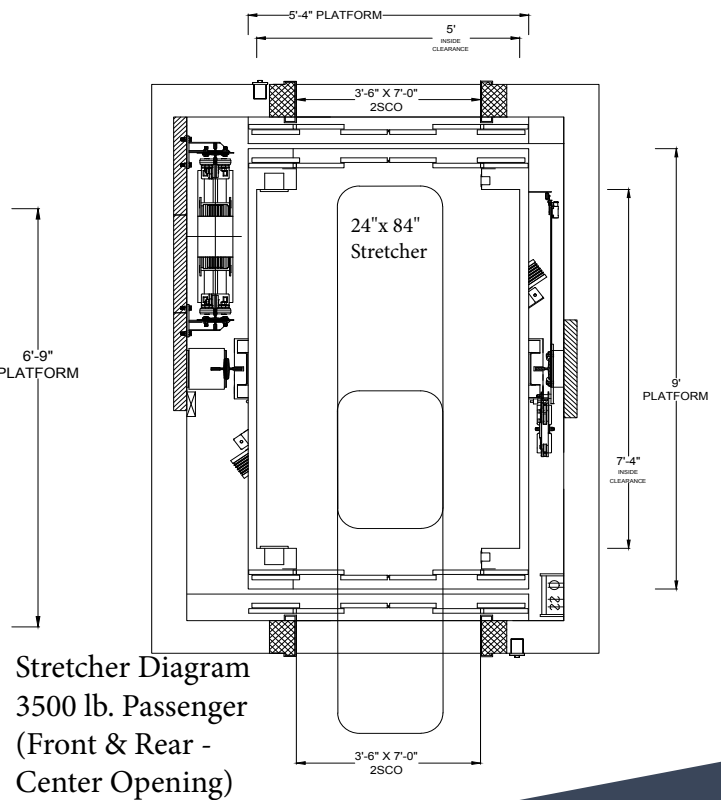
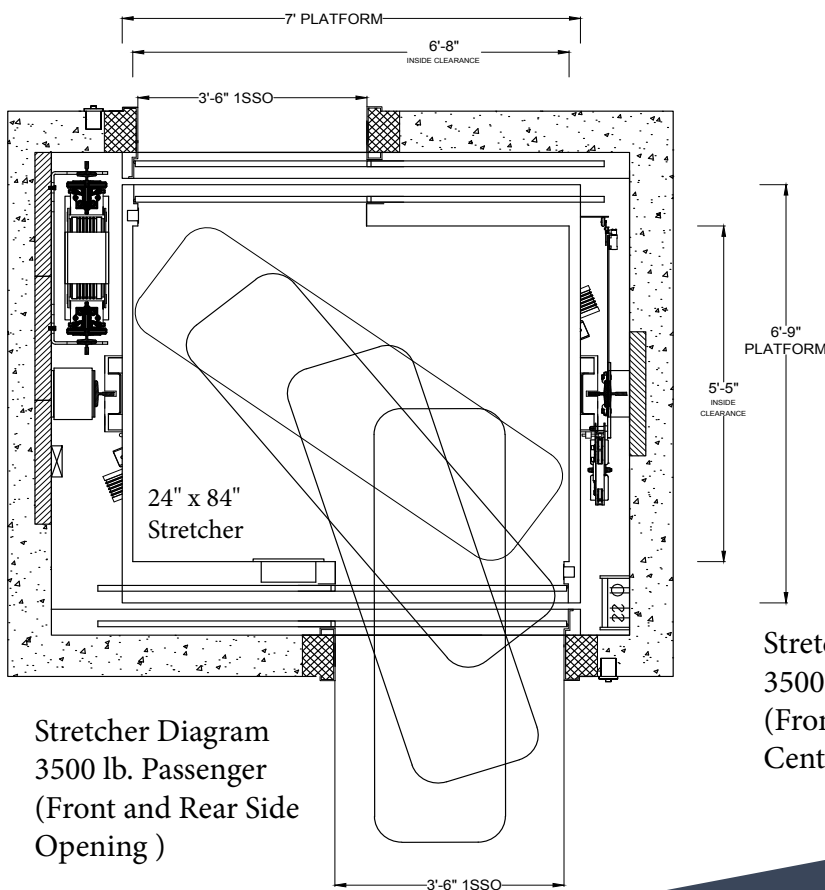
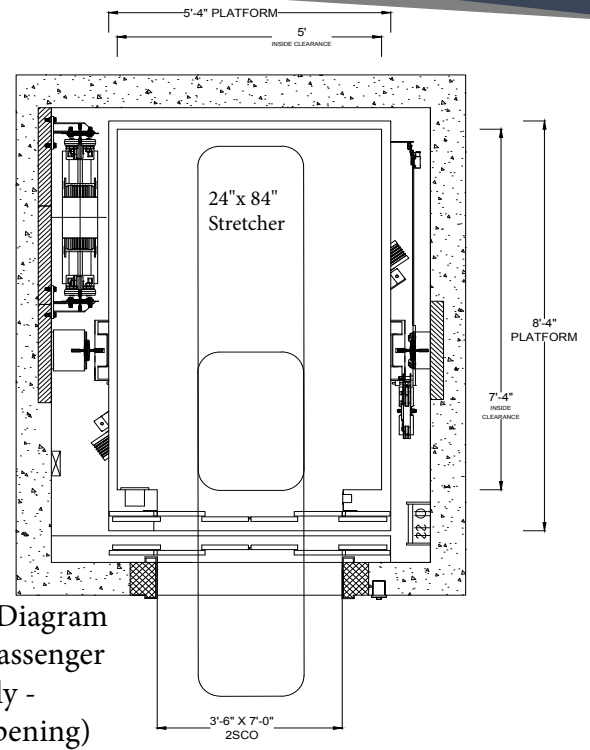
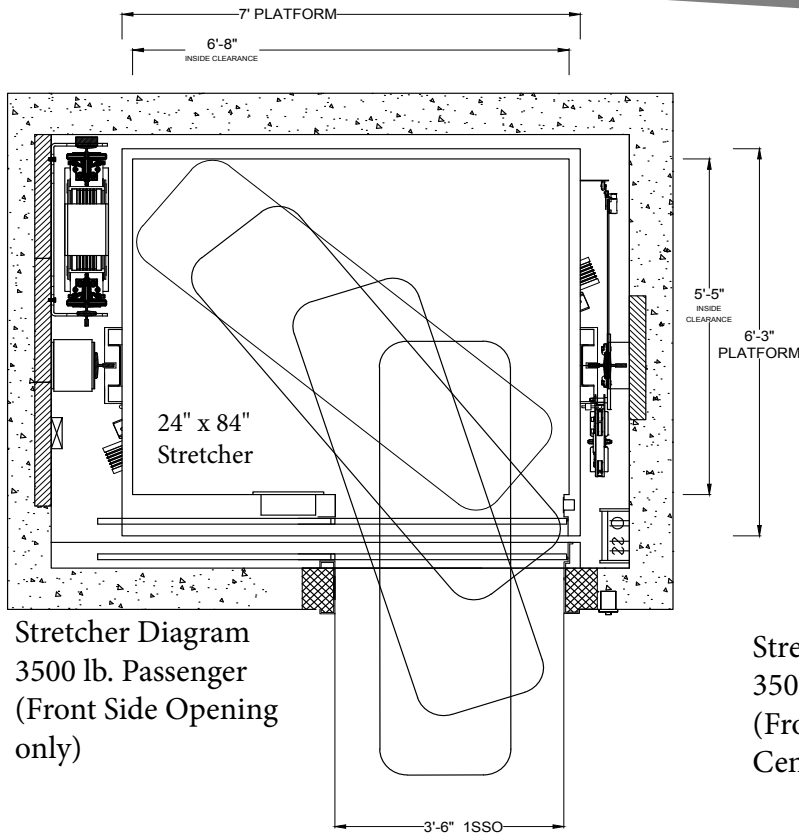
- Provide a legally constructed and enclosed control room, adequately lighted, and conditioned to maintain temperature between 32° to 104° Fahrenheit, relative humidity is not to exceed 95% non-condensing.
- Control room must be of adequate size to provide clearances around and between equipment as required by code.
- Provide a fused disconnect switch for each elevator in the control room, located in a position based on local code and within sight of elevator equipment, and arranged to be locked in the off position.
- Provide 110 VAC service for elevator light and accessories connected to the car light service terminal on the elevator controller.  
A single disconnecting means for the car light and accessories shall be located in the control room and arranged to be locked in the open position.
- Provide light, switch and 110 VAC GFI outlet in the control room, with switch located adjacent to the door.
- Only elevator related equipment is allowed inside the control room.
- Dimensional data shown above may vary from National Codes to Local Codes.
- For Duplex or Triplex applications control rooms will have different dimensions. Consult your sales representative.
- When special equipment is required, as transformers, brake resistors, etc sizes of control room will increase to accommodate the equipment and have the required clearances. This factor determines the Small / Large size of the Control Room.
- Transformers, resistor boxes and similar equipment are required to have 6" clearances on all sides.
- NEC work space minimum clear distances vary from 3 to 4 feet depending on nominal voltage and mounted electrical equipment condition, consult your AHJ.
- The preferred location of the Control Room is adjacent to the hoist way on the top floor, but other locations could be used.  
The linear maximum run of the encoder communication cable is 160 ft., from the machine to the controller.

## Governor Access:

- Determine if your local code allows remote reset governor, if not an access up on the overhead must be provided to inspect and reset the governor. If it is not possible to provide an access up on the overhead, an option will be the use of a Delaware pit mounted governor.



# MINIMUM STRETCHER SIZE REQUIREMENTS



# CUSTOM PROJECTS

Though our standard products are defined inside this guide, DEM is highly capable of adapting our products to a non-standard and custom requirements. DEM can easily provide custom packages that fit the customers' needs and desires.

## Examples of custom projects that DEM has done:

- Training towers for traction and/or hydraulic elevators
- Special tandem power units for high capacity hydraulic elevators.
- Very high capacity Hydraulic elevators, 20,000 lbs of capacity and over.
- Transit stations
- Glass-walled elevators

## Examples of custom projects with DEM supplied equipment:

- NASA
- Lego Land
- University of Georgia, Alabama, Eastern Washington, Carnegie Mellon, Massachusetts, Louisville
- University stadiums - Arizona Sun Devil , University of Louisiana Lamson Park
- Smithsonian Udvar- Hazy Center
- Major Hotel chains -Marriott, Residence Inn, Spring Hill Suites, Hilton, Hyatt, Ritz-Carlton
- Ellis Island
- Government & military facilities
- Ball park at the Palms Beaches - Nationals spring training



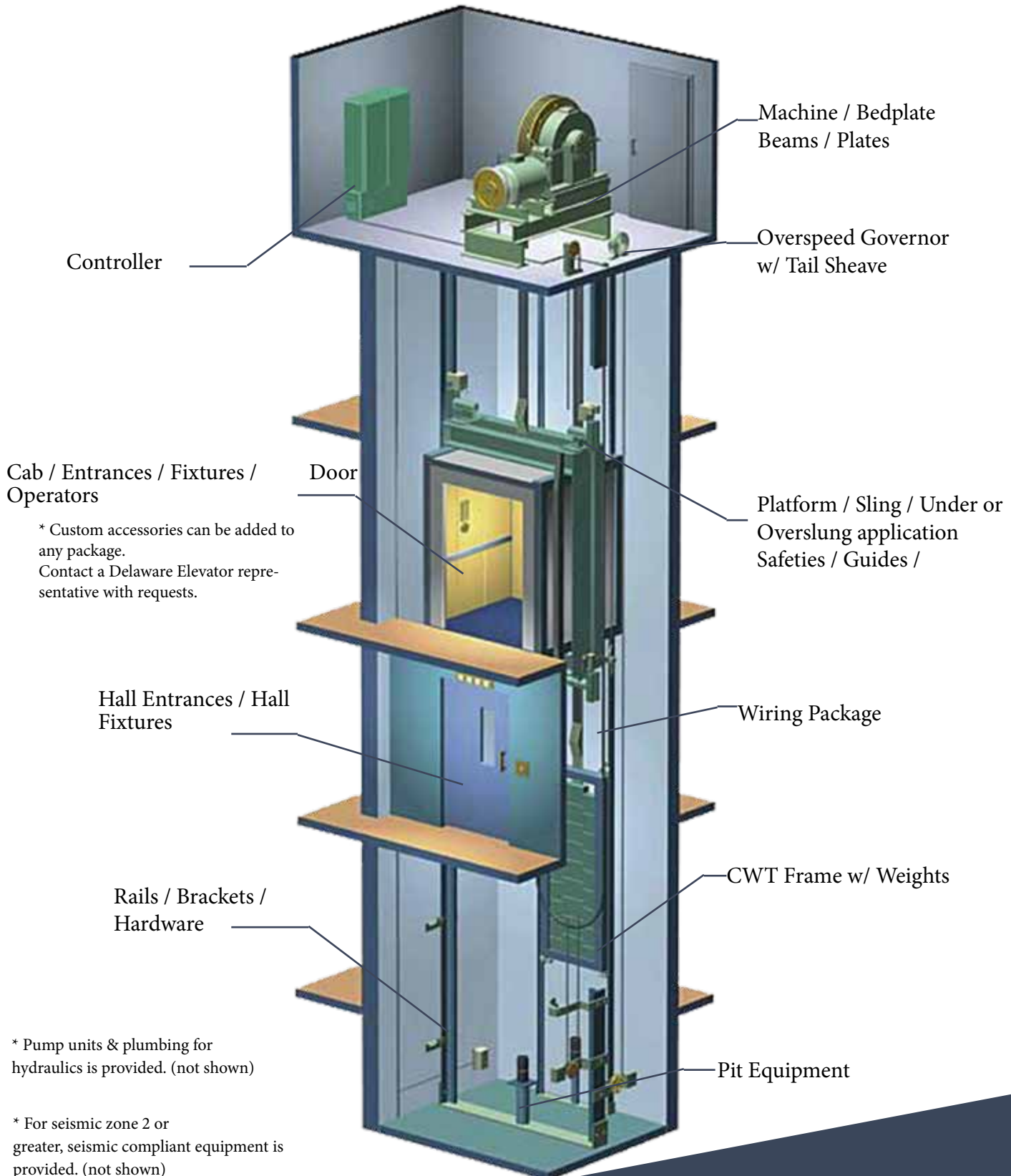
ASU - Sun Devil Stadium



Udvar-Hazy Center

# COMPLETE PACKAGE

When ordering a complete Hydraulic, MRL, or OHT package from DEM, the following is what is included:



# STANDARD PASSENGER CABS

STEEL SHELL CAB WITH RAISED PANELS



## STANDARD SPECIFICATIONS

**Canopy** - Steel with white enamel finish, emergency exit with contact switch, 2 speed fan

**Ceiling / Lighting** - Drop aluminum frame with diffuser panels with fluorescent tubes mounted to the underside of the canopy.

**Cab Front** - #4 satin stainless steel with cutouts for stationary car station and car lantern

**Cab Door** - #4 satin stainless steel, 7'-0" high with aluminum sill included

**Handrails** - #4 satin stainless steel, (1) at rear wall for front opening, (2) at side walls for front & rear openings

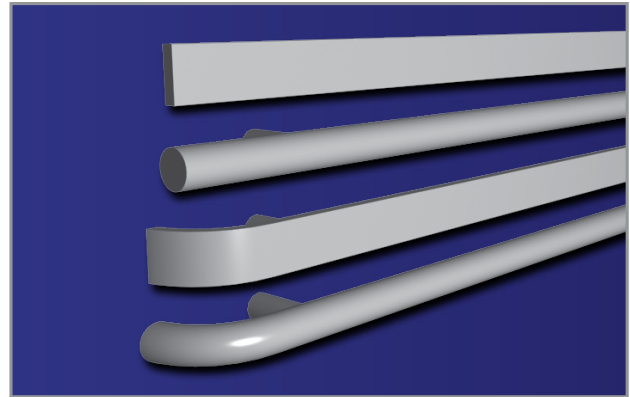
**Walls** - Standard 8'-0" high with vents along base, steel shell with black powder coat enamel finish



# STANDARD CAB OPTIONS

## HANDRAIL OPTIONS

Handrails are available in both flat and round shapes in various sizes, and are available in stainless steel or bronze, satin or mirror finishes.



## CEILING OPTIONS

### Disc Light

Metal ceiling panels with circular cutouts with translucent diffusers for the fluorescent lighting. The panels and frames are available in powder coat, stainless steel, or bronze finishes.



### Incandescent Downlight

Metal pan downlight ceiling with multiple low voltage lights mounted in powder coat, stainless steel, or bronze finish ceiling panels.



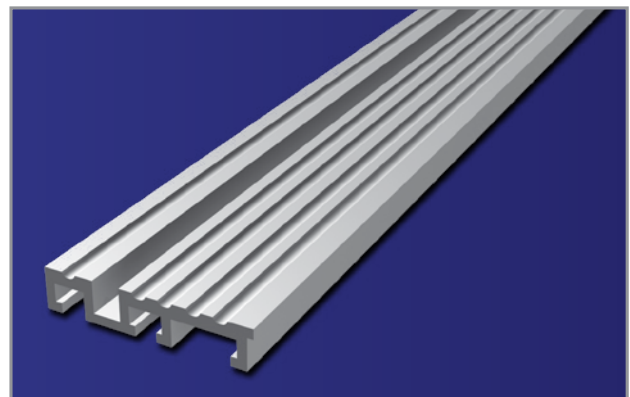
### Halogen or LED Downlight

Metal pan downlight ceiling with halogen or LED lighting that illuminates cab using fewer bulbs than incandescent. The standard number of downlights is 6 or 9, depending on platform size. Lights are mounted in powder coat, stainless steel or bronze finish ceiling panels.



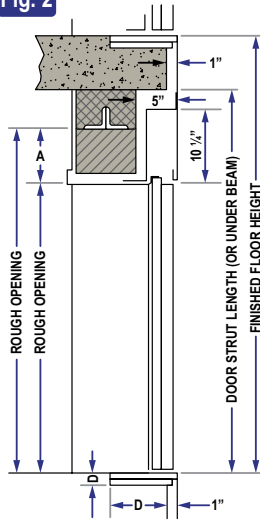
## SILL OPTIONS

Sill are available in standard aluminum, nickel silver (nickel bronze), yellow bronze, or stainless steel.



# ENTRANCES

Fig. 2



## Single Slide Doors

Single Slide Doors provide a sliding entrance at a moderate cost.

Fig. 1 - Plan  
Fig. 2 - Elevation

Max. Door Opening Width:  
1/2 hatch width minus 7"

Dimensions:  
B - door opening width plus 1 1/2"  
C - 3 1/2" for power operated doors  
D - 2" deep x 8" wide recess, full width of hatch, for installation of door sill.

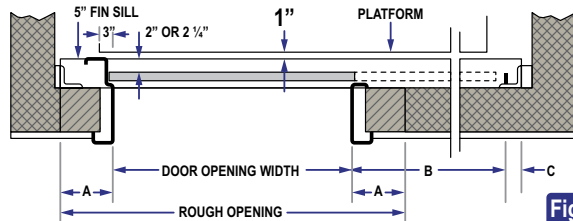
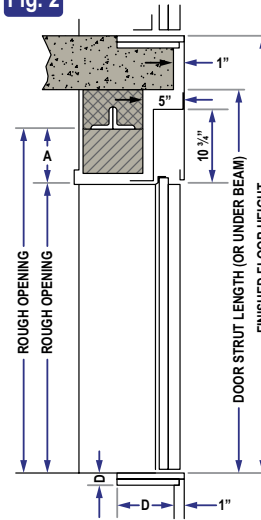


Fig. 1

Fig. 2



## Center Parting Doors

Center Parting Doors, with their symmetrical design, provide an attractive architectural appearance. Simultaneous opening of each door panel reduces opening time to 1/2 of that required for single slide doors.

Fig. 1 - Plan  
Fig. 2 - Elevation

Max. Door Opening Width:  
1/2 hatch width minus 5"

Dimensions:  
B - 1/2 door opening width plus 3/4"  
C - 4 1/4" for power operated doors  
D - 2" deep x 8" wide recess, full width of hatch.

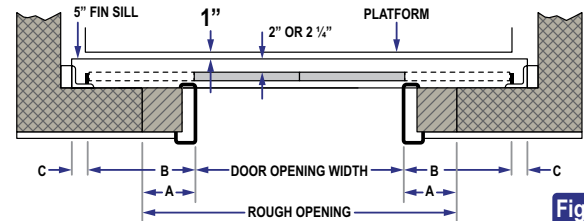
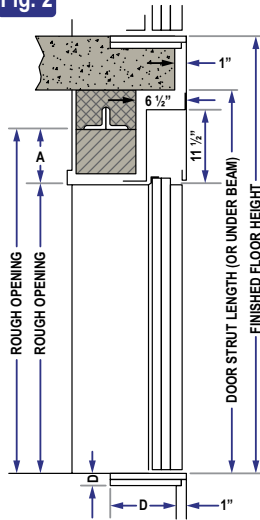


Fig. 1

Fig. 2



## Two Speed Doors

Two Speed Doors provide a wider opening for a given hatch width. Three speed (and two speed, center parting) doors are available, where an even greater opening width is required.

Fig. 1 - Plan  
Fig. 2 - Elevation

Max. Door Opening Width:  
2/3 hatch width minus 10"

Dimensions:  
B - door opening width plus 1 1/2"  
C - 3 1/2" for power operated doors  
D - 2" deep x 10" wide recess, full width of hatch.

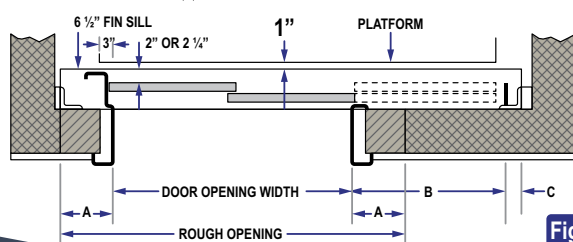


Fig. 1

## Dimension A

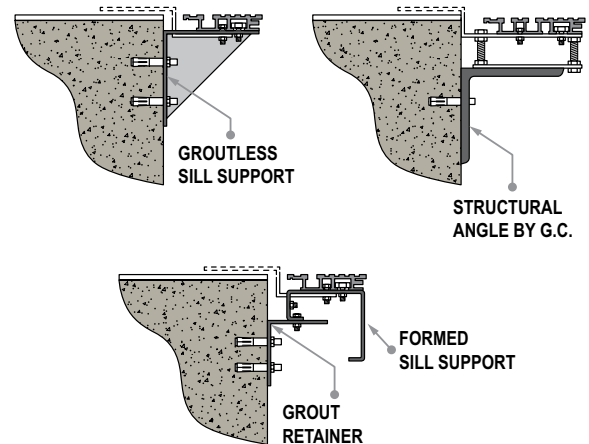
When possible, front hatch walls are to be erected AFTER door frames and sills are installed. If rough openings are to be used then:

Rough opening width - door opening plus 8" on each side.

Rough opening height - door opening height plus 8" above.

Others to fill areas around frames and sills after they are set.

## Sill Support Options:



## NOTES:

This image shows a blank sheet of white paper with horizontal ruling lines. The lines are evenly spaced and run across the width of the page. There are no margins, text, or other markings on the paper.

# DELAWARE ELEVATOR

MANUFACTURING

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