SECTION 08 33 00

Thermiser Max® - Low U

ASHRAE® 90.1 and IECC® 2021 Compliant Insulated rolling service Door

**GENERAL NOTES TO SPECIFIER:**

This specification section has been prepared to assist design professionals in the preparation of project or office master specifications. It follows guidelines established by the construction specifications institute, and therefore may be used with most master specification systems with minor editing.

Edit carefully to suit project requirements. Modify as necessary and delete items that are not applicable. Verify that referenced section numbers and titles are correct. (numbers and titles referenced are based on MasterFormat®, 2004 edition).

This section assumes the project manual will contain complete division 01 documents including sections 01 33 00 submittal procedures, 01 62 00 product options, 01 25 13 product substitution procedures, 01 66 00 product storage and handling requirements, 01 77 00 closeout procedures, and 01 78 00 closeout submittals. If the project manual does not contain these sections, additional information should be included under the appropriate articles.

This is an open proprietary specification allowing users the option of approving other manufacturers which comply with the criteria specified herein.

**\*\* NOTES TO SPECIFIER \*\*** are highlighted in red text and should be deleted from final copy.

Optional items requiring selection by the specifier are enclosed within brackets and highlighted, e.g.: [35] [40] [45]. In cases where one of the optional items is a standard feature of the door model, it is listed in the first position. Make appropriate selection and delete others.

Items requiring additional information are underlined and highlighted, e.g.: \_\_\_\_\_\_\_\_\_\_\_\_.

**PART 1** GENERAL

1.1 SUMMARY

A. **Section Includes:** [Manual] [and] [electric operated] overhead insulated rolling doors.

B. **Related Sections:**

1. 05 50 00 Metal Fabrications. Door opening jamb and head members.

 2. 06 10 00 Rough Carpentry. Door opening jamb and head members.

 3. 08 31 00 Access Doors and Panels. Access doors.

 4. 08 70 00 Hardware. Padlocks. Masterkeyed cylinder.

 5. 09 91 00 Painting. Field painting.

 6. Division 26. Electrical wiring and conduit, fuses, disconnect switches, connection of operator to power supply, and installation of control station and wiring.

C. **Products That May Be Supplied, But Are Not Installed Under This Section:**

1. **Control Station**

1.2 SYSTEM DESCRIPTION

A. **Design Requirements:**

1. **Air Infiltration to Comply With:**

a. **ASHRAE®** (American Society of Heating, Refrigeration, and Air-Conditioning Engineers) Standard 90.1-2007, 2010 & 2013 requirements of less than .3 CFM/FT2

b. **IECC®** (International Energy Conservation Code) 2021 requirements of less than 0.9 CFM/FT2

c. **California Title 24** requirements of less than 0.9 CFM/FT2

2. **Wind Loading:**

a. Supply doors to withstand up to [\_\_] psf (\_\_\_ Pa) design wind load

3. **Cycle Life:**

a. Design doors of standard construction for normal use of up to 20 cycles per day maximum, and an overall maximum of 50,000 operating cycles for the life of the door

\*\* **NOTE TO SPECIFIER**\*\* For doors over 50,000 cycles, select the 1024 High-Speed, High-Cycle Insulated Door.

4. **Seismic Performance:**

a. Provide manufacturer’s seismic calculations confirming ASCE7-10

5. **Insulated Door Slat Material Requirements:**

a. Flame Spread Index of 35 and a Smoke Developed Index of 400 as tested per ASTM E84

b. Sound Transmission Class (STC) rating up to 27 for the entire assembly. All configurations are evaluated per ASTM E90 and based on testing a complete, operable assembly

d. U-factor listing of 0.532 for entire door assembly per DASMA-105

e. Insulation to be CFC Free with an Ozone Depletion Potential (ODP) rating of zero

6. **Safety:**

a.Chain operated doors shall be designed so that the door immediately stops upward or downward travel and is maintained in a stationary position when the hand chain is released by user.

\*\*NOTE TO SPECIFIER\*\* If your project does not involve a custom layout or custom product modifications, please delete 7 and 8. If you are unsure, please contact Architectural Design Support at 833-958-1273.

7. **Custom Layout:**

a. Product has been reconfigured for a custom layout, refer to drawings by CornellCookson.

8. **Customized Product:**

a. This product has custom modifications designed by CornellCookson. Contact Manufacturer for details.

1.3 SUBMITTALS

A. Reference Section 01 33 00 Submittal Procedures; submit the following items:

1. **Product Data**

2. **Shop Drawings:** Include special conditions not detailed in Product Data. Show interface with adjacent work.

3. **Quality Assurance/Control Submittals:**

a. Provide manufacturer ISO 9001:2015 registration

b. Provide manufacturer and installer qualifications - see below

c. Provide manufacturer's installation instruction

d. **Manufacturer must provide independent testing lab results proving .3 CFM/FT2 or less air infiltration**

4. **Closeout Submittals:**

a. Operation and Maintenance Manual

b. Certificate stating that installed materials comply with this specification

1.4 QUALITY ASSURANCE

A. **Qualifications:**

1. **Manufacturer Qualifications:** ISO 9001:2015 registered and a minimum of five years experience in producing doors of the type specified

2. **Installer Qualifications:** Manufacturer's approval

1.5 DELIVERY STORAGE AND HANDLING

1. Reference Section 01 66 00 Product Storage and Handling Requirements

B. Follow manufacturer's instructions

1.6 WARRANTY

A. **Standard Warranty:** Two years from date of shipment against defects in material and workmanship

B. **Maintenance:** Submit for owner’s consideration and acceptance of a maintenance service agreement for installed products

**PART 2** PRODUCT

2.1 MANUFACTURER

A. **Manufacturer:**

\*\* **NOTE TO SPECIFIER** \*\* Select one of the following.

1. **Cornell:** 24 Elmwood Avenue, Mountain Top, PA 18707.

Telephone: (800) 233-8366

2. **Cookson**

3. **Clopay**

2.2 PRODUCT INFORMATON

A. **Model:** ESD40

2.3 MATERIALS

A. **Curtain:** Thermally broken; Air infiltration rate of 0.29 CFM/FT2, as tested per ASTM E283 validated by an independent testing agency. **Test report upon asking.**

1. **Fabrication:**

\*\* **NOTE TO SPECIFIER** \*\* Select one of the following.

a. **Slat Material:** No. 6B

1) **Galvanized Steel with Finish as Described Below:** Manufacturer recommended gauge based on performance requirements. Minimum 24 gauge, Grade 40, ASTM A 653 galvanized steel zinc coating. Gray CPVC backer slat

1) **Stainless Steel with Finish as Described Below:** Minimum 22 gauge AISI type 316 series stainless steel,Grade 40, ASTM A 653 galvanized steel zinc coating. Gray CPVC backer slat

1) **Stainless Steel with Finish as Described Below:** Minimum 22 gauge AISI type 304 series stainless steel,Grade 40, ASTM A 653 galvanized steel zinc coating. Gray CPVC backer slat

b. **Insulation:** 7/8 inch (22 mm) thick fire retardant mineral wool, ASTM C665-95 or ASTM C612-93

c. **Total Slat Thickness:** 15/16 inch (24 mm)

d. **Flame Spread Index** of 35 and a **Smoke Developed Index** of 400 as tested per ASTM E84

2. **Finish (Front slat only):**

\*\* **NOTE TO SPECIFIER** \*\* Select one of the following.

a. **GalvaNex™ Coating System (Stock Colors):**

1) **GalvaNex™** - ASTM A 653 galvanized base coating treated with dual process rinsing agents in preparation for chemical bonding baked-on base coat and [gray] [tan] [white] [brown] [black] baked-on polyester enamel finish coat

2) **GalvaNex™Ultra**- Ultra Powder Coat to be applied as a protective top coat over GalvaNex finish. Top coat is a polyester based structured wear resistant clear powder coat of 2.5-3.5 mils cured film thickness. ASTM D-3363 pencil hardness: 2H or better. Tested per ASTM B117. Base coating of GalvaNex to be ASTM A 653 galvanized base coating treated with dual process rising agents in preparation for chemical bonding baked-on base coat and [gray] [tan] [white] [brown] baked-on polyester enamel finish coat.

a. **SpectraShield® Coating System (Color Selected by Architect):**

1a) **SpectraShield** color as selected by Architect from manufacturer's color range, more than 180 colors

1b) **SpectraShield Ultra** – Ultra Powder Coat to be applied as a protective top coat over SpectraShield finish. Top coat is a polyester based structured wear resistant clear powder coat of 2.5-3.5 mils cured film thickness. ASTM D-3363 pencil hardness: 2H or better. Tested per ASTM B117. Base coating of SpectraShield color as selected by Architect from manufacturer’s color range, more than 180 colors.

1. **Stainless Steel:** type 316 #4 finish

a. **Stainless Steel:** type 304 #4 finish

B. **Endlocks:** Fabricate interlocking sections with high strength [nylon] [galvanized cast iron] endlocks on alternate slats each secured with two ¼” (6.35 mm) rivets. Provide windlocks as required to meet specified wind load.

\*\* **NOTE TO SPECIFIER** \*\* Select one of the following.

1. **Nylon:** Required up to 21’-0” width (DBG - Distance Between Guides)

1. **Galvanized cast iron:** Required if above 21’-0” width (DBG - Distance Between Guides), applicable for smaller configurations requiring windload.

C. **Bottom Bar**

\*\* **NOTE TO SPECIFIER** \*\* Select one of the following.

C. **Bottom Bar**

1. **Configuration:**

a. **Extruded Aluminum** (Standard on doors 21.5’ DBG and smaller): Extruded aluminum alloy 6063-T5, min height 3 3/8” min base thickness 3/16”, min width 4”

a. **Structural Steel Angles** (Standard on doors larger than 21.5’ DBG): 2 structural steel angles minimum 2”x2”x1/8”

a. **Aluminum Angle**: Two 2x2x1/8” minimum (50x50x3.2mm) aluminum angle

2. **Finish:**

a. **Aluminum:** [Mill finish] [Clear anodized] [Medium bronze anodized] [Dark bronze anodized] [Black anodized]

a. **SpectraShield®** **Coat System (Color Selected by Architect):**

1) Zirconium pre-treatment followed by baked-on polyester powder coat, with [color as selected by Architect from manufacturer's standard color range, over 180 colors] [custom color as selected by Architect]; minimum 2.5 mils (0.065 mm) cured film thickness; ASTM D-3363 pencil hardness: H or better

a. **AtmoShield Powder Coat (Color Selected by Architect):**

1) Zirconium pre-treatment followed by baked-on polyester powder coat, [Weathered iron] [Weathered brown] [Earth] [Weathered bronze] [Terra cotta] [Stucco] [Platinum] [Olde copper] [Rust] [Dark roast] [Weathered copper]; minimum 2.5 mils (0.065 mm) cured film thickness; ASTM D-3363 pencil hardness: H or better

a. **Corrosion Inhibitive:** Zirconium treatment followed by a corrosion inhibitive baked-on zinc enriched gray polyester powder coat; minimum 2.5 mils (0.065 mm) cured film thickness

a. **Hot-dip Galvanized:** ASTM A 123, Grade 85 zinc coating, hot-dip galvanized after fabrication

a. **Stainless Steel:** type 316 #4 finish

a. **Stainless Steel:** type 304 #4 finish

2. **Finish:**

**\*\* NOTE TO SPECIFIER** \*\* Select one of the following.

a. **Exterior:** Match slats

a. **Interior:** [Mill finish] [Clear anodized] [Medium bronze anodized] [Dark bronze anodized] [Black anodized] [Powder coat to match slats]

3. **Air** **Infiltration Certification Label:** Must be affixed to bottom bar

D. **Guides:**

1. **Fabrication:**

a. Minimum 3/16 inch (4.76 mm) [structural steel] [stainless steel] angles. Provide windlock bars of same material when windlocks are required to meet specified wind load. Top of inner and outer guide angles to be flared outwards to form bellmouth for smooth entry of curtain into guides. Provide removable guide stoppers to prevent over travel of curtain and bottom bar.

\*\* **NOTE TO SPECIFIER** \*\* If structural steel guides are selected above, add the following sentence below regarding removable top section. Delete if selecting stainless steel or aluminum guide angles.

Top 16 ½” (419.10 mm) of coil side guide angles to be removable for ease of curtain installation and as needed for future curtain service

\*\* **NOTE TO SPECIFIER** \*\* Mill finish structural stainless steel guide angles are used for stainless steel guide components over 12’-0” (3.66 m) high and on units wider than 21’-4” (6.50 m).

2. **Finish:**

\*\* **NOTE TO SPECIFIER** \*\* Select one of the following.

a. **Powder Coat (Stock Colors):** Zirconium treatment followed by a [gray] [tan] [white] baked-on polyester powder coat; minimum 2.5 mils (0.065 mm) cured film thickness

a. **SpectraShield® Coating System (Color Selected by Architect):** Zirconium treatment followed by baked-on polyester powder coat, [color as selected by Architect from manufacturer's standard color range, over 180 colors] [custom color as selected by Architect]; minimum 2.5 mils (0.065 mm) cured film thickness; ASTM D-3363 pencil hardness: H or better

a. **Atmoshield®** **Powder Coating System (Color Selected by Architect):**

1) ASTM A 653 galvanized base coating treated with dual process rinsing agents in preparation for chemical bonding, gray baked-on base coat and gray baked-on polyester finish coat

2) Zirconium pre-treatment followed by baked-on polyester powder coat, with [Weathered iron] [Weathered brown] [Earth] [Weathered bronze] [Terra cotta] [Stucco] [Platinum] [Olde copper] [Rust] [Dark roast] [Weathered copper]; minimum 2.5 mils (0.065 mm) cured film thickness; ASTM D-3363 pencil hardness: H or better

a. **Corrosion Inhibitive:** Zirconium treatment followed by a corrosion inhibitive baked-on zinc enriched gray polyester powder coat; minimum 2.5 mils (0.065 mm) cured film thickness

a. **Hot-dip Galvanized:** ASTM A 123, Grade 85 zinc coating, hot-dip galvanized after fabrication

a. **Stainless Steel:** #4 type 316 finish

a. **Stainless Steel:** [#4 type 304 finish] [Mill finish]

E. **Counterbalance Shaft Assembly:**

1. **Barrel:** Steel pipe capable of supporting curtain load with maximum deflection of 0.03 inches per foot (2.5 mm per meter) of width

2. **Spring Balance:** Oil-tempered, heat-treated steel helical torsion spring assembly designed for proper balance of door to ensure that maximum effort to operate will not exceed 25 lbs (110 N). Provide wheel for applying and adjusting spring torque.

F. **Brackets:**

Fabricate from minimum 3/16 inch (5 mm) steel plate with permanently lubricated ball or roller bearings at rotating support points to support counterbalance shaft assembly and form end closures

1. **Finish:**

\*\* **NOTE TO SPECIFIER** \*\* Select one of the following.

a. **Powder Coat (Stock Colors):** Zirconium treatment followed by a [gray] [tan] [white] baked-on polyester powder coat; minimum 2.5 mils (0.065 mm) cured film thickness

a. **AtmoShield Powder Coat (Color Selected by Architect):** Zirconium pre-treatment followed by baked-on polyester powder coat, [Weathered iron] [Weathered brown] [Earth] [Weathered bronze] [Terra cotta] [Stucco] [Platinum] [Olde copper] [Rust] [Dark roast] [Weathered copper]; minimum 2.5 mils (0.065 mm) cured film thickness; ASTM D-3363 pencil hardness: H or better

a. **SpectraShield® Coating System (Color Selected by Architect):** Zirconium treatment followed by baked-on polyester powder coat, [color as selected by Architect from manufacturer's standard color range, over 180 colors] [custom color as selected by Architect]; minimum 2.5 mils (0.065 mm) cured film thickness; ASTM D-3363 pencil hardness: H or better

a. **Atmoshield®** **Powder Coating System (Color Selected by Architect):**

1) ASTM A 653 galvanized base coating treated with dual process rinsing agents in preparation for chemical bonding, gray baked-on base coat and gray baked-on polyester finish coat

2) Zirconium pre-treatment followed by baked-on polyester powder coat, with [Weathered iron] [Weathered brown] [Earth] [Weathered bronze] [Terra cotta] [Stucco] [Platinum] [Olde copper] [Rust] [Dark roast] [Weathered copper]; minimum 2.5 mils (0.065 mm) cured film thickness; ASTM D-3363 pencil hardness: H or better

a. **Corrosion Inhibitive:** Zirconium treatment followed by a corrosion inhibitive baked-on zinc-rich gray polyester powder coat; minimum 2.5 mils (0.065 mm) cured film thickness

a. **Hot-dip Galvanized:** ASTM A 123, Grade 85 zinc coating, hot-dip galvanized after fabrication

G. **Hood:**

Minimum [24 gauge galvanized steel] [24 gauge stainless steel] [0.040 inch (1.016 mm) aluminum] with reinforced top and bottom edges. Provide minimum 1/4 inch (6.35 mm) steel intermediate support brackets as required to prevent excessive sag.

1. **Finish:**

\*\* **NOTE TO SPECIFIER** \*\* Select one of the following.

a. **GalvaNex™ Coating System (Stock Colors):**

1) ASTM A 653 galvanized base coating treated with dual process rinsing agents in preparation for chemical bonding baked-on base coat and [gray] [white] [tan] baked-on polyester finish coat

a. **SpectraShield® Coating System (Color Selected by Architect):**

1) ASTM A 653 galvanized base coating treated with dual process rinsing agents in preparation for chemical bonding, gray baked-on base coat and gray baked-on polyester finish coat

2) Zirconium treatment followed by baked-on polyester powder coat, with [color as selected by Architect from manufacturer's standard color range, over 180 colors] [custom color as selected by Architect]; minimum 2.5 mils (0.065 mm) cured film thickness; ASTM D-3363 pencil hardness: H or better

a. **Atmoshield®** **Powder Coating System (Color Selected by Architect):**

1) ASTM A 653 galvanized base coating treated with dual process rinsing agents in preparation for chemical bonding, gray baked-on base coat and gray baked-on polyester finish coat

2) Zirconium pre-treatment followed by baked-on polyester powder coat, with [Weathered iron] [Weathered brown] [Earth] [Weathered bronze] [Terra cotta] [Stucco] [Platinum] [Olde copper] [Rust] [Dark roast] [Weathered copper]; minimum 2.5 mils (0.065 mm) cured film thickness; ASTM D-3363 pencil hardness: H or better

a. **Stainless steel:** type 316 #4 finish

a. **Stainless steel:** type 304 #4 finish

a. **Aluminum:** [Mill finish] [Clear anodized] [Medium bronze anodized] [Dark bronze anodized] [Black anodized]

H. **Weatherstripping:**

\*\* **NOTE TO SPECIFIER** \*\* Select one of the following.

1. **Bottom Bar:**

a. **Manually Operated Doors:** Replaceable, bulb-style, compressible EDPM gasket extending into guides

a. **Motor Operated Doors:** Sensing/weather edge with neoprene astragal extending full width of door bottom bar

2. **Guides:** Replaceable vinyl strip on guides sealing against [fascia side] [both sides] of curtain

3. **Lintel Seal:** Double brush seal with EPDM sandwiched between the two brush seals at door header to impede air flow.

4. **Hood:** Neoprene/rayon baffle to impede air flow above coil

5. **Guide Seal:** For face of wall applications, a foam block will be supplied for the area between the inner guide angle and wall construction. For between jambs applications, silicone around each angle joint will be required.

* 1. OPERATION

A. **Manual ControlGard Chain Hoist:** Provide chain hoist operator with endless steel chain, chain pocket wheel and guard, geared reduction unit, and chain keeper secured to guide. Chain hoist to include integral brake mechanism that will immediately stop upward or downward travel and maintain the door in a stationary position when the hand chain is released by the user

\*\* **NOTE TO SPECIFIER \*\*** Select model MG operators for units that will routinely cycle less than 20 times per day and require no more than 3/4 HP. Select SG operators for units that will cycle more than 20 times per day and for large size units that will require greater than 3/4 HP.

A. **Motor – Standard Use – Model MG (Industrial Duty Gear Head) Operator:** The operator must not extend above or below the door coil when mounted front-of-coil. Rated for a maximum of 20 cycles per hour (not to be used for consecutive hours) cULus listed (to comply with UL requirements in The United States and Canada), Totally Enclosed Non Ventilated gear head operator(s) rated (1/3) (1/2) or (3/4) hp as recommended by door manufacture for size and type of door, \_\_\_\_Volts, \_\_\_\_Phase. Provide complete with electric motor and factory pre-wired motor control terminals, maintenance free solenoid actuated brake, [emergency manual chain hoist] [provisions for auxiliary push-up operation] and control station(s). Motor shall be high starting torque, industrial type, protected against overload with an auto-reset thermal sensing device. Primary speed reduction shall be heavy-duty, lubricated gears with mechanical braking to hold the door in any position. Operator shall be equipped with [an emergency manual chain hoist assembly that safely cuts operator power when engaged. A disconnect chain shall not be required to engage or release the manual chain hoist.] [a disconnect cable for auxiliary push-up operation.] Operator drive and door driven sprockets shall be provided with #50 roller chain. [Provide an integral Motor Mounted Interlock system to prevent damage to door and operator when mechanical door locking devices are provided.] Operator drive and door driven sprockets shall be provided with minimum #50 roller chain. Operator shall be capable of driving the door at a speed of up to 9” per second or as recommended for door size. Fully adjustable, driven linear screw type cam limit switch mechanism shall synchronize the operator with the door. The electrical contractor shall mount the control station(s) and supply the appropriate disconnect switch, all conduit and wiring per the overhead door wiring instructions.

1. **Motor** **- Continuous Use - Model SG (Super Duty Gear Head) Operator:** The operator must not extend above or below the door coil when mounted front-of-coil. cULus listed (to comply with UL requirements in The United States and Canada). Totally Enclosed Fan Cooled gear head operator(s) rated (1/2) to (7 1/2) hp as recommended by door manufacture for size and type of door, \_\_\_\_Volts, \_\_\_\_Phase. Provide complete with electric motor and factory pre-wired motor control terminals, maintenance free solenoid actuated brake, emergency manual chain hoist provided up to 2 hp and control station(s). Motor shall be high starting torque, industrial type, with overload protection. Primary speed reduction shall be heavy-duty gears running in grease or oil bath with mechanical braking to hold the door in any position. When equipped, the emergency manual chain hoist assembly is automatically disengaged when motor is energized. A disconnect chain shall not be required to engage or release the manual chain hoist. Operator drive and door driven sprockets shall be provided with minimum #50 roller chain. Operator drive and door driven sprockets shall be provided with minimum #50 roller chain. Operator shall be capable of driving the door at a speed of up to 9” per second or as recommended for door size. Fully adjustable, driven linear screw type cam limit switch mechanism shall synchronize the operator with the door. The motor shall be removable without affecting the limit switch settings. The electrical contractor shall mount the control station(s) and supply the appropriate disconnect switch, all conduit and wiring per the overhead door wiring instructions.

**\*\*NOTE TO SPECIFIER\*\*** Select SHN79/SGN79 NEMA 7/9 Explosion & Dust-Ignition Proof rated operators for units that have potential to be exposed to flammable gases, vapors, mists & dusts that are considered flammable

1. **Motor** **- Continuous Use - Model SHN79/SGN79 (Super Duty Gear Head NEMA 7/9) Operator:**
	1. UL Listed NEMA 7/9 explosion proof & Dust-Ignition Proof (UL1203) rated
		1. Only operators UL 1203 listed are accepted; operators manufactured from components as compliant per UL 1203 are not permitted
		2. Rated for explosion proof classifications:
			1. Class I, Division 1, Groups C & D
			2. Class II, Division 1, Groups E, F, & G
	2. Only operators UL 325 listed are permitted
	3. Built-in intrinsically safe circuits for control station and sensing edge as entrapment device protection are required
	4. Integrated explosion-proof control box with motor and control circuits pre-wired to the control box
	5. Dual isolated circuit design is required
	6. Totally Enclosed Fan Cooled (TEFC) gear head operator(s) rated (1/2) to (7-1/2) hp as recommended by door manufacture for size and type of door, \_\_\_\_Volts, \_\_\_\_Phase.
	7. Provide complete with electric motor and factory pre-wired motor control terminals, maintenance free solenoid actuated brake, emergency manual chain hoist provided up to 2 hp and control station(s).
	8. Motor shall be high starting torque, industrial type, with overload protection.
	9. Primary speed reduction shall be heavy-duty gears running in grease or oil bath with mechanical braking to hold the door in any position.
	10. When equipped, the emergency manual chain hoist assembly is automatically disengaged when motor is energized. A disconnect chain shall not be required to engage or release the manual chain hoist.
	11. Operator drive and door driven sprockets shall be provided with minimum #50 roller chain.
	12. Operator shall be capable of driving the door at a speed of up to 9” per second or as recommended for door size.
	13. Fully adjustable, driven linear screw type cam limit switch mechanism shall synchronize the operator with the door. The motor shall be removable without affecting the limit switch settings.
	14. The electrical contractor shall mount the control station(s) and supply the appropriate disconnect switch, all conduit and wiring per the overhead door wiring instructions.

A. **Supply Model EverGard Electric Motor Operator with back-up power control box**, Limited Duty (up to 10 cycles per hour), cULus listed, TENV gear head operator, 24DVC. Horsepower as recommended by manufacturer. Provide complete with electric motor and factory pre-wired motor control terminals, maintenance free solenoid actuated brake, emergency manual chain hoist and control station(s). Motor shall be high starting torque, industrial type, with overload protection. Primary speed reduction shall be heavy-duty gears running in maintenance free, sealed gear box with mechanical braking to hold the door in any position. The emergency manual chain hoist assembly is automatically disengaged when motor is energized. A disconnect chain shall not be required to engage or release the manual chain hoist. Operator drive and door driven sprockets shall be provided with minimum #50 roller chain. Operator shall be capable of driving the door at a speed of up to 9” per second or as recommended for door size. Fully adjustable, driven linear screw type cam limit switch mechanism shall synchronize the operator with the door. The motor shall be removable without affecting the limit switch settings. The electrical contractor shall mount the control stations and supply the appropriate disconnect switch, all conduit and wiring per the overhead door wiring instructions.

1. Supply model **EverGard with programmable logic board** and back-up power supply. 120v AC input power with auto switch to 24v DC back-up power. Back-up power to provide minimum 10 open/close cycles and 48 hr stand-by.

a. (2) 12v rechargeable lead sealed batteries.

b. Programmable battery load testing

c. Monitoring points for open/close position, AC power loss and battery low voltage

d. 12’-0” (standard) wiring whip to connect control box and motor

i. Up to 120’-0” available.

e. Emergency Push Button (EPB): Flush mounted, single red push button station wired for emergency OPEN function only. If grille is at full open (normal business hours), depressing EPB will not affect the grille’s position.

f. Door power indicator: Flush mounted voltage monitor for battery back-up system. Flashing red light indicates low battery power and maintenance check-up. Can be located up to 150 ft. away from motor control box.

g. Non-resettable cycle counter

h. UL325 & UL864 compliant system.

\*\* **NOTE TO SPECIFIER** \*\* Most common control stations are listed below; consult the Architectural Design Support at (800) 233-8366 ext. 4551 for other options. **Delete sections B through C for manual push-up or crank /hoist operation.**

B. **Control Station:**

**\*\* NOTE TO SPECIFIER** \*\* Select one of the following.

1. **Surface mounted:** "Open/Close/Stop" push buttons; NEMA 1

1. **Surface mounted:** "Open/Close" key switch with "Stop" push button; NEMA 3R

1. **Surface mounted**: "Open/Close/Stop," push buttons with keyed lock-out, not masterkeyable; NEMA 4

1. **Flush mounted:** "Open/Close/Stop" push buttons; NEMA 1B

1. **Flush mounted:** "Open/Close" key switch with "Stop" push button; NEMA 1B

1. **Flush mounted:** "Open/Close" key switch with ["Stop" push button and] [small format Best type 7-pin cylinder] [Schlage 6-pin cylinder] [#5 U-Change cylinder]; NEMA 1B

C. **Control Operation:**

\*\* **NOTE TO SPECIFIER** \*\* Select one of the following.

1. **Constant Pressure to Close:**

a. **No sensing device required**

a. **2-wire, electric sensing edge** seal extending full width of door bottom bar. Contact before door fully closes shall cause door to immediately stop downward travel and reverse direction to the fully opened position. Provide a [retracting safety cord and reel] [self-coiling cable] connection to control circuit.

\*\* **NOTE TO SPECIFIER** \*\* If momentary contact to close is desired, one of the following safety devices must be selected. For a non-contact solution that provides the most coverage in the opening, SafetyGard UL325 Light Curtain with Dynamic Sequential Blanking must be selected. The following options are available individually or in conjunction; please select as desired.

1. **Momentary Contact to Close:**

Fail-safe, UL325-2010 Compliant Entrapment Protection for Motor Operation

a. **SafetyGard UL325 Light Curtain with Dynamic Sequential Blanking:** Provide monitored, non-contact light curtain consisting of a transmitter and a receiver to be mounted to the guide assembly of the door in the provided mounting channel, projecting a thru beam across the width of the door for the height of the light curtain (3ft or 6ft depending on opening size of the door). Interruption of beam before door fully closes shall cause door to immediately stop downward travel and reverse direction to the fully opened position

a. **2-wire, E.L.R. electric sensing/weather edge seal** extending full width of door bottom bar. Provide a [retracting safety cord and reel] [self-coiling cable] connection to control circuit.

a. **NEMA 4X photo eye sensors** consisting of a transmitter and receiver that are to be mounted within 6” (152.4 mm) of the floor, projecting an IR beam across the entire width of the door. Electrical contractor to provide low voltage wiring from the transmitter and receiver to the door operator.

a. **NEMA 1 photo eye sensors** consisting of a transmitter and receiver that are to be mounted within 6” (152.4 mm) of the floor, projecting an IR beam across the entire width of the door. Electrical contractor to provide low voltage wiring from the transmitter and receiver to the door operator.

2. **Sensing/Weather Edge:** Automatic reversing control by an automatic sensing switch within neoprene or rubber astragal extending full width of door bottom bar

\*\* **NOTE TO SPECIFIER** \*\* Select one or both of the following.

a. **Electric sensing edge device.** Provide a wireless sensing edge connection to motor operator eliminating the need for a physical traveling electric cord connection between bottom bar sensing edge device and motor operator.

b. **Pneumatic sensing edge device.** Provide [self-coiling cable] [retracting safety cord and reel] connection to control circuit.

2.5 ACCESSORIES

\*\* **NOTE TO SPECIFIER** \*\* Standard locking is based on door operation. Locking is not recommended for motor operated units.

A. **Locking:**

1. **None**

1. **Padlockable slide bolt** on [coil] [fascia] side of bottom bar at each jamb extending into slots in guides. Provide interlock switches on Motor operated units.

1. **Padlockable chain keeper** on guide. (Manual Chain operated.)

1. **Masterkeyable cylinder** operable from [coil] [fascia] [both] side[s] of bottom bar, options for all types of operation. Provide interlock switches on Motor operated units.

a. Standard Mortise Cylinder

a. BEST 7-Pin

a. U-Change

a. Schlage

\*\* **NOTE TO SPECIFIER \*\*** Vision panels are available in slat 6F only. Show number and placement on drawings. Minimum spacing is 1-1/2 inches (40 mm) apart, 12” (305 mm) in from guides. Delete below if not required.

B. **Vision Panels:** 10 x 1-1/2 x 3/4 inch thick (254 x 38 x 19 mm) oval acrylic panes set with double-sided foam glazing tape and fully contained within slat assembly. Refer to drawings for number and placement. Smaller vision panels are not acceptable.

\*\* **NOTE TO SPECIFIER \*\*** Exposed moving operator components lower than 8 feet above floor level that create possible pinch points are required to be covered per UL 325. Specify an operator cover whenever this field condition exists.

C. **Operator [and Bracket Mechanism] Cover:** Minimum [24 gauge galvanized steel] [24 gauge stainless steel] [0.040 inch (1.016 mm) aluminum] sheet metal cover [to provide weather resistance] [to enclose exposed moving operating components] at coil area of unit. Finish to match door hood.

\*\* **NOTE TO SPECIFIER** \*\* A Trim Package is custom-made to hide visible bolts, fasteners and other exposed hardware.

D. **Trim Package:** Minimum 16 gauge [powder coated steel to match guides] [#4 type 304 finish stainless steel].

E. **Strip Door Bracket**:  Assembly integral to coiling door to hang strip door on interior of building.  Contact factory for sizes greater than 12’-0” x 12-0”.  Powder coated finish to match coiling door.

**\*\* NOTE TO SPECIFIER \*\*** Vibration isolators not available for units requiring wind load or seismic validation. Delete below if not required.

1. **Vibration Isolators:**
	1. Include continuous vibration isolators pre-installed on both guides to reduce vibration transferred from the door to the structure. Vibration isolators should be expected to reduce vibration by up to 14%. Dampening pads are to be manufactured from nitrile oil-resistant rubber, durometer 50A.

**\*\* NOTE TO SPECIFIER \*\*** LED-illuminated light kit is a guide mounted LED light strip to provide an additional visible color coded notification on the door opening status. Delete below if not required.

1. **LED Light Kit :**
	1. Include LED Light Kit in [5ft] [10ft] [15ft] length. IP68 rated LED light kit to include guide mounting channel, power supply, controller and signal wire. LED lights to be solid red when door is closed, flash red when door is in motion and solid green when door is fully open.

**PART 3** EXECUTION

3.1 EXAMINATION

A. Examine substrates upon which work will be installed and verify conditions are in accordance with approved shop drawings

B. Coordinate with responsible entity to perform corrective work on unsatisfactory substrates

C. Commencement of work by installer is acceptance of substrate

3.2 INSTALLATION

A. General: Install door and operating equipment with necessary hardware, anchors, inserts, hangers and supports

B. Follow manufacturer's installation instructions

3.3 ADJUSTING

A. Following completion of installation, including related work by others, lubricate, test, and adjust doors for ease of operation, free from warp, twist, or distortion

3.4 CLEANING

A. Clean surfaces soiled by work as recommended by manufacturer.

B. Remove surplus materials and debris from the site

3.5 DEMONSTRATION

A. Demonstrate proper operation to Owner's Representative

B. Instruct Owner's Representative in maintenance procedures

**END OF SECTION**