SECTION 08 33 00

COILING AND ROLLING DOORS

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\*\* NOTE TO SPECIFIER \*\* Raynor; commercial coiling and rolling doors.  
This section is based on the products of Raynor, which is located at:1101 East River Rd., P. O. Box 448Dixon, IL 61021-0448Toll Free Tel: 800-4-RAYNORTel: 815-288-1431Fax: 888-598-4790Email: [request info (architectsupport@raynor.com)](https://arcat.com/rfi?action=email&company=Raynor&message=RE%253A%2520Spec%2520Question%2520(08330rgd)%253A%2520&coid=35092&spec=08330rgd&rep=&fax=888-598-4790)  
Web: <http://www.raynor.com>   
 [ [Click Here](https://arcat.com/company/raynor-35092) ] for additional information.  
For more than 60 years, architects and construction specifiers have counted on Raynor for doors and electric operators that meet the harshest environment and application demands. For your convenience, additional Raynor commercial specifications and drawings can be downloaded from [www.raynor.com](http://www.raynor.com) and are available on CD-ROM.  
 Raynor has more than 600 professional installing distributors in the United States and throughout 54 nations around the world. They pride themselves in excellent product knowledge, installation, and service after the sale. Earn CE units and receive valuable knowledge about commercial doors by participating in an AIA/CES course. If you would like a Raynor Representative to contact you about presenting an AIA/CES course to your company, fill out an online form at [www.raynor.com](http://www.raynor.com) , or contact us at 1-800-4-RAYNOR.   
Refer to specifications in this section for the following types of Raynor Overhead Doors: Coiling and rolling doors including DuraCoil, DuraShutter, DuraGrille, FireCoil, FireShutter, FabriCoil and RapidCoil. ArmorBrite is a trademark of Tiger Drylac.

1. GENERAL
   1. SECTION INCLUDES
      1. Rolling service doors.
      2. High performance rolling service doors.
      3. Rolling counter shutters.
      4. Rolling security grille doors.
      5. Rolling fire doors.
      6. Coiling fire shutter doors.
      7. Electric operators.
   2. RELATED SECTIONS

\*\* NOTE TO SPECIFIER \*\* Delete any sections below not relevant to this project; add others as required.

* + 1. Section 05 50 00 - Metal Fabrications.
    2. Section 06 10 00 - Rough Carpentry.
    3. Section 08 71 00 - Door Hardware.
    4. Section 09 90 00 - Painting and Coating.
    5. Section 11 12 26.13 - Parking Fee Coin Collection Equipment.
    6. Section 26 05 00 - Common Work Results for Electrical.
  1. REFERENCES

\*\* NOTE TO SPECIFIER \*\* Delete references from the list below that are not actually required by the text of the edited section.

* + 1. American National Standards Institute (ANSI):
       1. ANSI/DASMA 105 - American National Standard Institute Test Method for Thermal Transmittance and Air Infiltration of Garage Doors.
       2. ANSI/DASMA 108 - American National Standards Institute Standard Method for Testing Sectional Garage Doors and Rolling Doors: Determination of Structural Performance Under Uniform Static Air Pressure Difference.
       3. ANSI/DASMA 203 - American National Standards Institute Specifications for non-rated fire rolling doors published by Door and Access Systems Manufacturers Association International.
    2. ASTM International (ASTM):
       1. ASTM A123 - Standard Specification for Zinc (hot-dipped galvanized) coatings on iron and steel products.
       2. ASTM A229 - Steel wire, oil-tempered for mechanical springs.
       3. ASTM A240 - Standard Specification for Chromium and Chromium-Nickel Stainless Steel Plate, Sheet and Strips.
       4. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
       5. ASTM A 924 - Standard Specification for General Requirements for Steel Sheet, Metallic-Coated by the Hot-Dip Process.
       6. ASTM B209 - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate.
       7. ASTM B221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles and Tubes.
       8. ASTM E90 - Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Element.
       9. ASTM E330 - Structural performance of exterior windows, curtain walls, and doors by uniform static air pressure difference.
       10. ASTM E413 - Classification for Rating Sound Insulation.
    3. British Standards (BS):
       1. BS 476 - Fire Tests on Building Materials and Structures.
    4. Door and Access Systems Manufacturers Association (DASMA).
    5. Factory Mutual Research Corporation (FM):
       1. FM4100 - Fire Door Assemblies.
    6. International Standards Organization (ISO):
       1. ISO 3008 - Fire Resistance Tests - Door and Shutter Assemblies.
    7. National Fire Protection Association (NFPA):
       1. NFPA-80 - Standard for Fire Doors and Fire Windows.
       2. NFPA 252 - Fire Tests of Fire Door Assemblies.
    8. Standards Council of Canada (CAN):
       1. CAN/ULC-S104-10 - Standard Method for Fire Tests of Door Assemblies.
    9. Underwriters Laboratories (UL):
       1. UL 10B - Fire Tests of Fire Door Assemblies
       2. UL 325 - Standard for Door, Drapery, Gate, Louver, and Window Operators and Systems Current Edition, Including All Revisions.
  1. SUBMITTALS
     1. Submit under provisions of Section 01 30 00 - Administrative Requirements.
     2. Product Data: Manufacturer's data sheets on each product to be used, including:
        1. Preparation instructions and recommendations.
        2. Storage and handling requirements and recommendations.
        3. Installation methods.
     3. Shop Drawings:
        1. Provide drawings indicating guide details, head and jamb conditions, anchorage, accessories, finish colors, patterns and textures, operator mounts and other related information.
        2. Regulatory Requirements and Approvals: Provide shop drawings in compliance with local Authority Having Jurisdiction (AHJ).
     4. Certifications:
        1. Submit manufacturer's certificate that products meet or exceed specified requirements.
        2. Submit installer qualifications.

\*\* NOTE TO SPECIFIER \*\* Delete selection samples if colors have already been selected.

* + 1. Selection Samples: For each finish product specified, two complete sets of color chips representing manufacturer's full range of available colors and patterns.
    2. Verification Samples: For each finish product specified, two samples, minimum size 6 inches (150 mm) square, representing actual product, color, and patterns.
  1. QUALITY ASSURANCE
     1. Installer Qualifications: Utilize an authorized installer of door manufacturer who has demonstrated experience on projects of similar size and complexity.
     2. Manufacturer Qualifications: Company with a minimum of five-year experience in producing the specified type of doors.
  2. DELIVERY, STORAGE, AND HANDLING
     1. Store products in manufacturer's unopened packaging until ready for installation.
     2. Store and dispose of solvent-based materials, and materials used with solvent-based materials, in accordance with requirements of local authorities having jurisdiction.
  3. PROJECT CONDITIONS
     1. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's absolute limits.
  4. WARRANTY
     1. Raynor warrants the door and its component parts for one (1) year against defects in material and workmanship.
     2. Raynor warrants the electrical operator and its component parts for two (2) years against defects in material and workmanship.
     3. Raynor warrants the electrical operator and its component parts for three (3) years against defects in material and workmanship, on the operator only, when purchased with any model of Raynor rolling service door.
     4. Raynor warrants ArmorBrite powder coat finish against cracking or peeling for three (3) years.

1. PRODUCTS
   1. MANUFACTURERS
      1. Acceptable Manufacturer: Raynor, which is located at:1101 East River Rd., P. O. Box 448Dixon, IL 61021-0448Toll Free Tel: 800-4-RAYNORTel: 815-288-1431Fax: 888-598-4790Email: [request info (architectsupport@raynor.com)](https://arcat.com/rfi?action=email&company=Raynor&message=RE%253A%2520Spec%2520Question%2520(08330rgd)%253A%2520&coid=35092&spec=08330rgd&rep=&fax=888-598-4790);Web: <http://www.raynor.com>

\*\* NOTE TO SPECIFIER \*\* Delete one of the following two paragraphs; coordinate with requirements of Division 1 section on product options and substitutions.

* + 1. Substitutions: Not permitted.
    2. Requests for substitutions will be considered in accordance with provisions of Section 01 60 00 - Product Requirements.

\*\* NOTE TO SPECIFIER \*\* Delete article if not required.

* 1. ROLLING SERVICE DOORS

\*\* NOTE TO SPECIFIER \*\* DuraCoil is for interior or exterior applications up to 40 ft in width and 30 ft in height with slat restrictions.

* + 1. DuraCoil Rolling Service Doors as manufactured by Raynor Garage Doors:

\*\* NOTE TO SPECIFIER \*\* Delete door operation not required. There are restrictions on size of door for push-up and hand chain operation.

* + - 1. Operation: Push-up.
      2. Operation: Hand chain.
      3. Operation: Electric motor.
      4. Door Guide Mounting Configuration:

\*\* NOTE TO SPECIFIER \*\* Delete mounting not required. Interior face of wall mounting is standard.

* + - * 1. Interior face of wall on each side of door opening.
        2. Exterior face of wall on each side of door opening.
        3. Between jamb of wall opening.
      1. Structural Performance Requirements:

\*\* NOTE TO SPECIFIER \*\* Delete wind load (p.s.f.) option not required. Standard is 20 psf.

* + - * 1. Wind Load Uniform Pressure: 20 psf.
        2. Wind Load Uniform Pressure: \_\_\_\_ psf.
        3. International Energy Conservation Code (IECC) Requirements:

\*\* NOTE TO SPECIFIER \*\* Delete this section if not relevant to this project. The required slat type must be an insulated slat with header weatherseal.

Air Infiltration: Maximum air leakage of 1.00 cfm per sq ft is required. Testing to be in accordance with DASMA 105 test procedure.

Raynor provides an air leakage rating of 0.47 cfm per sq ft.

Maximum U-Factor of 0.90 is required and tested to DASMA 105.

\*\* NOTE TO SPECIFIER \*\* Delete this section if not relevant to this project. The required slat type must be an insulated slat with header weatherseal.

* + - * 1. Sound Transmission Class (STC) Rating:

STC rating of 22 required on an insulated door.

STC rating of 23 required on an insulated door with header seal.

* + - 1. Curtain: Interlocking roll-formed slats as specified below. Endlocks shall be attached to each of alternate slat to prevent lateral movement.

\*\* NOTE TO SPECIFIER \*\* Delete slat types not required. Slat type and gauge is dependent on size of door. Contact manufacturer for more information. Standard gauge is 22.

* + - * 1. Flat Slats: Steel 18 gauge (0.047 inch minimum thickness).
        2. Flat Slats: Steel 20 gauge (0.036 inch minimum thickness).
        3. Flat Slats: Steel 22 gauge (0.030 inch minimum thickness).
        4. Flat Slats: Steel 24 gauge (0.023 inch minimum thickness).
        5. Flat Slats: Stainless steel 20 gauge (0.036 inch minimum thickness).
        6. Flat Slats: Stainless steel 22 gauge (0.030 inch minimum thickness).
        7. Flat Slats: Aluminum 16 gauge (0.050 inch minimum thickness).
        8. Flat Slats: Aluminum 18 gauge (0.040 inch minimum thickness).
        9. Flat Slats: Light-duty 24 gauge steel (0.023 inch minimum thickness).
        10. Large Curved Slats: Steel 18 gauge (0.047 inch minimum thickness).
        11. Large Curved Slats: Steel 20 gauge (0.036 inch minimum thickness).
        12. Large Curved Slats: Steel 22 gauge (0.030 inch minimum thickness).
        13. Small Curved Slats: Steel 20 gauge (0.036 inch minimum thickness).
        14. Small Curved Slats: Steel 22 gauge (0.030 inch minimum thickness).
        15. Perforated flat slats punched with 1/16 inch (1.6mm) diameter holes staggered on 3/32 inch (2.4 mm) centers across entire length.

Steel 20 gauge (0.036 inch minimum thickness).

Steel 22 gauge (0.030 inch minimum thickness.

Aluminum 16 gauge (0.050 inch minimum thickness).

Aluminum 18 gauge (0.040 inch minimum thickness).

* + - * 1. Insulated flat slats with 24 gauge backer (22 gauge optional). Insulation: Polyisocyanurate. R-Value: 8.0.

Steel 18 gauge (0.047 inch minimum thickness).

Steel 20 gauge (0.036 inch minimum thickness).

Steel 22 gauge (0.030 inch minimum thickness).

Steel 24 gauge (0.023 inch minimum thickness).

Stainless Steel 20 gauge (0.036 inch minimum thickness).

Stainless Steel 22 gauge (0.030 inch minimum thickness).

Aluminum 16 gauge (0.050 inch minimum thickness).

Aluminum 18 gauge (0.040 inch minimum thickness).

\*\* NOTE TO SPECIFIER \*\* Delete material not required. Note: stainless steel is not available on Small Curve, Large Curve, and Perforated Flat slats. Aluminum is not available on Small Curve and Large Curve slats.

* + - * 1. Material: Commercial quality hot-dipped galvanized (G-90) steel in accordance with ASTM A-653.
        2. Material: Stainless steel in accordance with ASTM A-240, type 304.
        3. Material: Aluminum in accordance with ASTM B-209, alloy 5005, temper H34.

\*\* NOTE TO SPECIFIER \*\* Delete color/finish not required. Note: Small and Large curve slats available with gray and ArmorBrite finishes only. Perforated slats available with gray, clear anodize, and ArmorBrite finishes only.

* + - * 1. Color and Finish: 1 finish coat of gray polyester paint over 1 coat of primer.
        2. Color and Finish: 1 finish coat of tan polyester paint over 1 coat of primer.
        3. Color and Finish: 1 finish coat of white polyester paint over 1 coat of primer.
        4. Color and Finish: Galvanized.
        5. Color and Finish: Stainless steel No. 4.
        6. Color and Finish: Clear anodized.
        7. Color and Finish: Bronze anodized.
        8. Color and Finish: ArmorBrite Powdercoat finish. Color: \_\_\_\_\_\_\_\_.
      1. Endlocks: Zinc-plated malleable cast iron fastened with two zinc-plated steel rivets.
      2. Bottom Bar: Two angles, minimum 1-1/2 x 1-1/2 x 1/8 inch (38 x 38 x 3 mm) with single-contact type bottom astragal.

\*\* NOTE TO SPECIFIER \*\* Delete material not required. Note: Roll-formed galvanized steel angles available on doors 20 ft (6.096 m) wide or less. Break-formed stainless steel angles available on doors 12 ft (3.658 m) wide or less.

* + - * 1. Material: Roll-formed galvanized steel angles.
        2. Material: Structural steel angles.
        3. Material: Structural aluminum angles.
        4. Material: Break-formed stainless steel angles.
        5. Material: Structural stainless steel angles.

\*\* NOTE TO SPECIFIER \*\* Delete color and finish not required.

* + - * 1. Color and Finish: Structural angle bottom bar to receive one coat of black rust-inhibitive primer.
        2. Color and Finish: Roll-formed steel angles to be galvanized.
        3. Color and Finish: Break-formed stainless steel angles No. 4.
        4. Color and Finish: Structural stainless steel angles mill finish.
        5. Color and Finish: Structural aluminum angles to be clear anodized.
        6. Color and Finish: Structural aluminum angles to be bronze anodized.
        7. Color and Finish: ArmorBrite Powdercoat. Color: \_\_\_\_\_\_\_\_.

\*\* NOTE TO SPECIFIER \*\* Delete the following paragraph if no vision panels or retain only vision panel types required for the project. Number and locations of vision panels to comply with door elevation drawings.

* + - 1. Vision Panels: 4 x 1 inch (102 x 25 mm):
         1. Acrylic Glass: 1/8 inch (3 mm) thick for flat slats.
         2. Acrylic Glass: 5/8 inch (16 mm) thick for insulated slats.
         3. Fenestrated (open slots).
      2. Guide Assemblies: Three structural angles, minimum 3 x 2 x 3/16 inch (76 x 51 x 5 mm) and fitted with removable curtain stops.

\*\* NOTE TO SPECIFIER \*\* Delete material and finish not required. Standard is primer.

* + - * 1. Material and Finish: Structural steel. 1 coat of black rust-inhibitive primer.
        2. Material and Finish: Structural steel. 1 coat of hot-dipped galvanized.
        3. Material and Finish: Structural stainless steel. Mill finish.
        4. Material and Finish: Structural steel. ArmorBrite Powdercoat finish. Color: \_\_\_.

\*\* NOTE TO SPECIFIER \*\* Delete guide weatherseal if not required.

* + - 1. Guide Weatherseal: To inhibit air infiltration between the guide and the curtain.

\*\* NOTE TO SPECIFIER \*\* Delete one of the following. Brushseal recommended for small and large curve slats.

* + - * 1. Snap-on dual durometer vinyl seal.
        2. Brushseal with an aluminum retainer.
        3. EDPM rubber with an aluminum retainer.
      1. Counterbalance:
         1. Barrel: Minimum 4-1/2 inches (114 mm) OD and 0.120 inch (3 mm) wall thickness structural steel pipe. Deflection of pipe under full load shall not exceed 0.03 inch (0.8 mm) per foot of span.
         2. Counterbalance: Mechanism with helical torsion springs, grease packed and mounted on a continuous steel torsion shaft.

\*\* NOTE TO SPECIFIER \*\* Delete one of the following two paragraphs. For high cycle fill-in the cycle life (20,000 - 200,000),

Standard 15,000 cycles.

High \_\_\_\_\_\_\_\_ cycles.

* + - 1. Brackets: 3/16 inch (5 mm), minimum, steel plate, attached to wall angle of guide assembly with 1/2 inch (13 mm) diameter Grade 5 bolts. Inside of drive bracket fitted with sealed ball bearing.

\*\* NOTE TO SPECIFIER \*\* Delete finish not required. Standard is primer.

* + - * 1. Finish: 1 coat of rust-inhibitive primer.
        2. Finish: 1 coat of hot-dipped galvanized.
        3. Finish: 1 coat of ArmorBrite Powdercoat. Color: \_\_\_\_\_\_\_\_.
      1. Enclosures:

\*\* NOTE TO SPECIFIER \*\* Delete hood type not required. Round hood is standard and recommended for strength.

* + - * 1. Hood Type: Round.
        2. Hood Type: Square.

\*\* NOTE TO SPECIFIER \*\* Delete bracket covers if not required. Covers are recommended for outside mounted doors.

* + - * 1. Bracket Covers: To enclose door mechanisms.

\*\* NOTE TO SPECIFIER \*\* Delete material not required.

* + - * 1. Material: 24 gauge steel (0.022 inch minimum thickness) commercial quality hot-dipped galvanized steel in accordance with ASTM A-653.
        2. Material: 24 gauge stainless steel (0.024 inch minimum thickness) in accordance with ASTM A-240, type 304.
        3. Material: 18 gauge aluminum (0.040 inch minimum thickness) in accordance with ASTM B-209, alloy 5005, temper H34.

\*\* NOTE TO SPECIFIER \*\* Delete color/finish not required.

* + - * 1. Color and Finish: Gray polyester paint to match curtain.
        2. Color and Finish: Tan polyester paint to match curtain.
        3. Color and Finish: White polyester paint to match curtain.
        4. Color and Finish: Galvanized to match curtain.
        5. Color and Finish: Stainless steel No. 4.
        6. Color and Finish: Clear anodized.
        7. Color and Finish: ArmorBrite Powdercoat. Color: \_\_\_\_\_\_\_\_.

\*\* NOTE TO SPECIFIER \*\* Delete hood baffle if not required.

* + - * 1. Hood Baffle: With rubber seal to inhibit air infiltration through hood cavity.

\*\* NOTE TO SPECIFIER \*\* Delete header weatherseal if not required.

* + - 1. Header Seal: "Z" shape aluminum retainer with EDPM rubber to inhibit air infiltration between the header and the curtain.
      2. Locks: Furnish door system with the following:

\*\* NOTE TO SPECIFIER \*\* Retain or delete paragraphs below to suit project requirements.

* + - * 1. Locking Bar: For push-up doors and doors operated with hand chain to receive padlock provided by Owner.
        2. Locking Bar for Motor Operated Doors: Interlock switch with locking bar.
        3. Hand Chain Lock: To receive padlock provided by Owner; for doors operated with hand chain.
        4. Cylinder Lock: For use with push-up and hand chain operated doors.
        5. Cylinder Lock for Motor Operated Doors: Interlock switch with cylinder lock.

\*\* NOTE TO SPECIFIER \*\* Delete article if not required.

* 1. HIGH PERFORMANCE ROLLING SERVICE DOORS

\*\* NOTE TO SPECIFIER \*\* DuraCoil is for interior or exterior applications up to 40 ft in width and 30 ft in height with slat restrictions.

* + 1. DuraCoil HP as manufactured by Raynor Garage Doors:
       1. Doors:
          1. Operation: Electric motor.
          2. Designed for high cycle use of up to 300,000 cycles for the full life of the product.
          3. Maximum Opening Speed: 24 inches per second
          4. Maximum Closing Speed: 12 inches per second to close.
          5. Mounting: Door guide mounting configuration.

\*\* NOTE TO SPECIFIER \*\* Delete configuration not required. Interior face of wall mounting is standard.

Interior face of wall on each side of door opening.

Exterior face of wall on each side of door opening.

Between jamb of wall opening.

* + - * 1. Structural Performance Requirements:

Wind Loads: Operational Load: 10 psf.

Wind Loads: Static Wind Load: 20 psf.

\*\* NOTE TO SPECIFIER \*\* Insert required wind load (p.s.f.) Standard is 20 psf.

Wind Loads: Uniform pressure: \_\_\_\_\_\_\_\_ psf.

\*\* NOTE TO SPECIFIER \*\* Delete this section if not relevant to this project. The required slat type must be an insulated slat with header weatherseal.

* + - * 1. International Energy Conservation Code (IECC) Requirements:

Air Infiltration: Maximum air leakage of 1.00 cfm per sq ft.

Test in accordance with DASMA 105 test procedure.

Raynor Air Leakage Rating: 0.47 cfm per sq ft.

Maximum U-Factor: 0.90. Tested to DASMA 105.

\*\* NOTE TO SPECIFIER \*\* Delete Sound Transmission Paragraph if not relevant to the Project. The required slat type must be an insulated slat with header weatherseal.

* + - 1. Sound Transmission Class (STC) Rating:
         1. STC rating of 22 required on an insulated door.
         2. STC rating of 23 required on an insulated door with header seal.
      2. Curtain: Interlocking roll-formed slats as specified below. Endlocks are attached to each alternate slat to prevent lateral movement.

\*\* NOTE TO SPECIFIER \*\* Delete slat type option and steel gauge options not required. Slat type and gauge is dependent on size of door. Contact the manufacturer for more information. Standard gauge is 22.

* + - * 1. Slat Type: Flat Slats:

Steel 18 gauge (0.047 inch minimum thickness).

Steel 20 gauge (0.036 inch minimum thickness).

Steel 22 gauge (0.030 inch minimum thickness).

Steel 24 gauge (0.023 inch minimum thickness).

Stainless steel 20 gauge (0.036 inch minimum thickness).

Stainless steel 22 gauge (0.030 inch minimum thickness).

* + - * 1. Slat Type: Insulated flat slats with 24 gauge backer (22 gauge optional) R-value 8.0.

Steel 18 gauge (0.047 inch minimum thickness).

Steel 20 gauge (0.036 inch minimum thickness)

Steel 22 gauge (0.030 inch minimum thickness).

Steel 24 gauge (0.023 inch minimum thickness).

Stainless Steel 20 gauge (0.036 inch minimum thickness).

Stainless Steel 22 gauge (0.030 inch minimum thickness).

\*\* NOTE TO SPECIFIER \*\* Delete material option not required.

* + - * 1. Material: Commercial quality hot-dipped galvanized (G-90) steel in accordance with ASTM A-653.
        2. Material: Stainless steel in accordance with ASTM A-240, type 304.

\*\* NOTE TO SPECIFIER \*\* Delete color and finish options not required.

* + - * 1. Color and Finish: One finish coat of tan polyester paint applied over one coat of primer.
        2. Color and Finish: One finish coat of white polyester paint applied over one coat of primer.
        3. Color and Finish: Galvanized.
        4. Color and Finish: Stainless steel No. 4 finish.
        5. Color and Finish: ArmorBrite Powdercoat finish. Color: \_\_\_\_\_\_\_\_\_\_.
      1. Endlocks: Zinc-plated malleable cast iron fastened with two zinc-plated steel rivets.
      2. Bottom Bar: Two angles, minimum 1-1/2 x 1-1/2 x 1/8 inch (38 x 38 x 3 mm) with single-contact type bottom astragal. High cycle UHMW anti-wear strips are applied to the ends of the bottom bar.

\*\* NOTE TO SPECIFIER \*\* Delete material options not required. Roll-formed galvanized steel angles available on doors 20 ft wide or less. Break-formed stainless steel angles available on doors 12 ft wide or less.

* + - * 1. Material: Roll-formed galvanized steel angles.
        2. Material: Structural steel angles.
        3. Material: Break-formed stainless steel angles.
        4. Material: Structural stainless steel angles.

\*\* NOTE TO SPECIFIER \*\* Delete color and finish options not required.

* + - * 1. Color and Finish: Structural angle bottom bar to receive one coat of black rust-inhibitive primer.
        2. Color and Finish: Roll-formed steel angles to be galvanized.
        3. Color and Finish: Break-formed stainless steel angles No. 4 finish.
        4. Color and Finish: Structural stainless steel angles mill finish.
        5. Color and Finish: ArmorBrite Powdercoat finish. Color: \_\_\_\_\_\_\_\_\_\_.
      1. Guide Assemblies: Three structural angles, minimum 3 x 2 x 3/16 inch (76 x 51 x 5 mm) and fitted with removable curtain stops. High cycle UHMW anti-wear strips are applied inside the front and middle guides.

\*\* NOTE TO SPECIFIER \*\* Delete material and finish options not required. Standard is primer.

* + - * 1. Material and Finish: Structural steel to receive one coat of black rust-inhibitive primer.
        2. Material and Finish: Structural steel to receive one coat of hot-dipped galvanized.
        3. Material and Finish: Structural stainless steel with a mill finish.
        4. Material and Finish: Structural steel to receive ArmorBrite Powdercoat finish. Color: \_\_\_\_\_\_\_\_\_\_\_\_.
      1. Weatherseal: Seals to inhibit air infiltration between the guide and the curtain.

\*\* NOTE TO SPECIFIER \*\* Delete one of the following. Brushseal recommended for small and large curve slats.

* + - * 1. Snap-on dual durometer vinyl seal.
        2. Brushseal with an aluminum retainer.
        3. EDPM rubber with an aluminum retainer
      1. Brackets: 3/16 inch (5 mm), minimum, steel plate, attached to wall angle of guide assembly with 1/2 inch (13 mm) diameter Grade 5 bolts. Inside of drive bracket fitted with sealed ball bearing.

\*\* NOTE TO SPECIFIER \*\* Delete finish not required. Standard is primer.

* + - * 1. Finish: One coat of rust-inhibitive primer.
        2. Finish: One coat of hot-dipped galvanized.
        3. Finish: One coat of ArmorBrite Powdercoat finish. Color: \_\_\_\_\_\_\_\_\_.
      1. Enclosures:

\*\* NOTE TO SPECIFIER \*\* Delete hood type not required. Round hood is standard and recommended for strength.

* + - * 1. Hood Type: Round Hood.
        2. Hood Type: Square Hood.

\*\* NOTE TO SPECIFIER \*\* Delete bracket covers if not required. Covers are recommended for outside mounted doors.

* + - * 1. Bracket Covers: Covers to enclose door mechanisms.

\*\* NOTE TO SPECIFIER \*\* Delete material not required and delete colors and finishes not required.

* + - * 1. Material: 24 gauge steel (0.022 inch minimum thickness) commercial quality hot-dipped galvanized steel in accordance with ASTM A-653.

\*\* NOTE TO SPECIFIER \*\* Delete color/finish not required.

Color and Finish: Gray polyester paint to match curtain finish.

Color and Finish: Tan polyester paint to match curtain finish.

Color and Finish: White polyester paint to match curtain finish.

Color and Finish: Galvanized to match curtain finish.

Color and Finish: Stainless steel No. 4 finish.

Color and Finish: ArmorBrite Powdercoat finish. Color: \_\_\_\_\_\_.

* + - * 1. Material: 24 gauge stainless steel (0.024 inch minimum thickness) in accordance with ASTM A-240, type 304.

\*\* NOTE TO SPECIFIER \*\* Delete color/finish not required.

Color and Finish: Gray polyester paint to match curtain finish.

Color and Finish: Tan polyester paint to match curtain finish.

Color and Finish: White polyester paint to match curtain finish.

Color and Finish: Galvanized to match curtain finish.

Color and Finish: Stainless steel No. 4 finish.

Color and Finish: ArmorBrite Powdercoat finish. Color: \_\_\_\_\_\_.

\*\* NOTE TO SPECIFIER \*\* Delete hood baffle if not required.

* + - * 1. Hood Baffle with Rubber Seal: To inhibit air infiltration through hood cavity.

\*\* NOTE TO SPECIFIER \*\* Delete header weatherseal if not required.

* + - 1. Header Seal: A "Z" shape aluminum retainer with EDPM rubber to inhibit air infiltration between the header and the curtain.
      2. Locks: Furnish door system with the following:

\*\* NOTE TO SPECIFIER \*\* Delete lock option not required.

* + - * 1. Locking Bar for Motor Operated Doors: Provide interlock switch with locking bar.
        2. Cylinder Lock for Motor Operated Doors: Provide interlock switch with cylinder lock.
    1. Electric Operator:
       1. ControlHoist CDD by Raynor Garage Doors:
          1. Model: Raynor ControlHoist CDD Operator.

Type: High cycle direct drive operator with control panel. Motor operator and control panel are designed for continuous duty cycle with a direct drive motor. Sprocket and roller chain are not accepted.

\*\* NOTE TO SPECIFIER \*\* Horespower rating and voltage is dependent on size of door. Contact manufacturer for more information.

Motor Horsepower Rating: Per the manufacturer's recommended size for door.

Motor Horsepower Rating: Continuous 1/2 HP.

Motor Horsepower Rating: Continuous 2 HP.

Motor Horsepower Rating: Continuous 3 HP.

Motor Horsepower Rating: Continuous 5 HP.

Motor Horsepower Rating: Continuous 7.5 HP.

Electrical Requirements: 120-volt single phase.

Electrical Requirements: 208-volt single phase.

Electrical Requirements: 240-volt single phase.

Electrical Requirements: 208-volt three phase.

Electrical Requirements: 230-volt three phase.

Electrical Requirements: 480-volt three phase.

Electrical Requirements: 600-volt three phase.

High performance motor brake - Power electronic dynamic braking with timing optimized solenoid mechanical brake

Electrically interlocked chain hoist for emergency manual operation.

Overload protection.

* + - * 1. Model: Raynor Control Hoist CDD Control Panel.

Type: PCB and PLC controllers with adjustable variable frequency drives; soft-start and soft-stop on both ends of the limit travel.

Detachable Control Enclosure with one-step error proof connections ("Plug and Play") to connect:

Motor.

Control panel.

Over-current and short-circuit protected Class II Control Circuits.

NEMA 4X Wall Mounted Control Panel with an operational 3-button w/ mushroom stop. Initial setup, control adjustments, and error reporting accessible inside the control panel.

Control panel shall include:

Circuit for activation of warning annunciator when closing.

Non-resettable Cycle Counter.

Over-current and short-circuit protected Class II Control Circuits.

Door position is monitored with mechanical limit switches in the operator.

Control Wiring: Solid state circuitry with provisions for connection of a monitored reversing device, external radio control hook-up and maximum run timer. Provisions for timers to close and mid stop and lock bar sensor capability.

\*\* NOTE TO SPECIFIER \*\* Delete if custom wiring not required. For custom wiring contact manufacturer.

Provide three button momentary contact "open-stop", constant pressure on close (can be changed to momentary to close).

Custom wiring.

\*\* NOTE TO SPECIFIER \*\* Delete one of the monitored reversing devices. A monitored reversing device is required unless constant pressure to close is acceptable then both devices can be deleted.

Monitored electric reversing edge on door.

Monitored photo electric eyes mounted on jambs.

* + - * 1. Control and Drive System Options:

Activation devices (motion detector, induction loop, additional photo eyes).

Sensing devices (wireless sensing edges, presence sensor, additional photo eyes).

Annunciators (strobe, Beacon).

Two door interlocks.

Long distance wiring.

Additional monitoring controls.

\*\* NOTE TO SPECIFIER \*\* Delete article if not required.

* 1. ROLLING COUNTER SHUTTERS

\*\* NOTE TO SPECIFIER \*\* DuraShutter is for interior or exterior applications up to 20 ft in width and 10 ft in height and max. 120 sq. ft.

* + 1. DuraShutter Rolling Counter Shutters as manufactured by Raynor Garage Doors:

\*\* NOTE TO SPECIFIER \*\* Delete door operation not required. There are restrictions on size of door for push-up operation.

* + - 1. Operation: Push-up.
      2. Operation: Hand crank.
      3. Operation: Tube motor.
      4. Operation: Electric motor.

\*\* NOTE TO SPECIFIER \*\* Delete mounting not required. Door guide mounting is standard.

* + - 1. Mounting: Door guide mounting configuration.
         1. To face of wall on each side of door opening.
         2. Between jamb of wall opening.
      2. Mounting: Integral frame as follows:

\*\* NOTE TO SPECIFIER \*\* Delete integral frame type if not required. This is selected when curtain, frame, guide, sill, hood comes pre-assembled. This is only available in small size opening.

* + - * 1. Painted Slip-in Frame: For pre-existing finished opening. Color and finish to match guides and curtain.
        2. Painted Build-in Frame: For masonry wall construction. Color and finish to match guides and curtain.
        3. Stainless Steel Slip-in Frame: For pre-existing finished opening. Finish: No. 4.
        4. Stainless Steel Build-in Frame: For masonry wall construction. Finish: No. 4.
      1. Curtain: Interlocking slats as specified below. Endlocks to be attached to each of alternate slat to prevent lateral movement.

\*\* NOTE TO SPECIFIER \*\* Delete slat types not required.

* + - * 1. Slat Type: Roll-formed flat slat 22 gauge steel (0.030 inch minimum thickness).
        2. Slat Type: Roll-formed flat slat 22 gauge stainless steel (0.030 inch minimum thickness).
        3. Slat Type: Extruded aluminum flat slat (0.050 inch minimum thickness).
        4. Slat Type: Roll-formed perforated flat slat 22 gauge steel (0.030 inch minimum thickness) punched with 1/16 inch (1.6 mm) diameter holes staggered on 3/32 inch (2.4 mm) centers across entire length.

\*\* NOTE TO SPECIFIER \*\* Delete material not required.

* + - * 1. Material: Commercial quality hot-dipped galvanized (G-90) steel in accordance with ASTM A-653.
        2. Material: Stainless steel in accordance with ASTM A-240, type 304.
        3. Material: Aluminum in accordance with ASTM B-221, alloy 6063, temper T6.

\*\* NOTE TO SPECIFIER \*\* Delete color/finish not required.

* + - * 1. Color and Finish: 1 finish coat of gray polyester paint over 1 coat of primer.
        2. Color and Finish: 1 finish coat of tan polyester paint over 1 coat of primer.
        3. Color and Finish: 1 finish coat of white polyester paint over 1 coat of primer.
        4. Color and Finish: Stainless steel No. 4.
        5. Color and Finish: Clear anodized.
        6. Color and Finish: Bronze anodized.
        7. Color and Finish: ArmorBrite Powdercoat. Color: \_\_\_\_\_\_\_\_.
      1. Endlocks: Zinc-plated stamped steel fastened with zinc-plated steel rivets.
      2. Bottom Bar: Tubular type, with 1/4 inch (6 mm) thick protective strip to cushion impact of bottom bar on countertop.

\*\* NOTE TO SPECIFIER \*\* Delete material and color options not required.

* + - * 1. Material: Roll-formed 14 gauge galvanized steel (0.071 inch thickness).

Color and Finish: 1 finish coat of gray paint to match curtain.

Color and Finish: 1 finish coat of tan paint to match curtain.

Color and Finish: 1 finish coat of white paint to match curtain.

Color and Finish: ArmorBrite Powdercoat. Color: \_\_\_\_\_\_\_\_.

* + - * 1. Material: Roll-formed 14 gauge stainless steel (0.075 inch thickness).

Color and Finish: No. 4 finish to match curtain.

* + - * 1. Material: Extruded aluminum (0.078 inch minimum thickness).

Color and Finish: Clear anodizes to match curtain.

Color and Finish: Bronze anodized to match curtain.

* + - 1. Guide Assemblies: Same material and finish as curtain and fitted with removable curtain stops.

\*\* NOTE TO SPECIFIER \*\* Delete material and finish not required.

* + - * 1. Material and Finish: 13 gauge galvanized steel (0.086 inch minimum thickness) to receive one finish coat of gray paint to match curtain.
        2. Material and Finish: 13 gauge galvanized steel (0.086 inch minimum thickness) to receive one finish coat of tan paint to match curtain.
        3. Material and Finish: 13 gauge galvanized steel (0.086 inch minimum thickness) to receive one finish coat of white paint to match curtain.
        4. Material and Finish: 13 gauge stainless steel (0.090 inch minimum thickness) to have a No. 4 finish to match curtain.
        5. Material and Finish: Extruded aluminum (0.050 inch minimum thickness) to have clear anodize finish to match curtain.
        6. Material and Finish: Extruded aluminum (0.050 inch minimum thickness) to have bronze anodize finish to match curtain.
        7. Material and Finish: 13 gauge galvanized steel (0.086 inch minimum thickness) to receive ArmorBrite Powdercoat finish. Color: \_\_\_\_\_\_\_\_.
        8. Wear strips: PVC to be attached to inside of aluminum guides to reduce wear and noise.

\*\* NOTE TO SPECIFIER \*\* Delete guide weatherseals if not required.

* + - 1. Guide Weatherseals: Seals to inhibit air infiltration between the guide and the curtain.
         1. Brushseal with an aluminum retainer attached to the guide assembly.
      2. Counterbalance:
         1. Barrel: Minimum 4-1/2 inches (114 mm) OD and 0.120 inch (3 mm) wall thickness structural steel pipe. Deflection of pipe under full load shall not exceed 0.03 inch (0.8 mm) per foot of span.

\*\* NOTE TO SPECIFIER \*\* Delete counterbalance if Eclipse tube motor is required. Note tube motor replaces the spring assembly inside the pipe.

* + - * 1. Counterbalance: Mechanism with helical torsion springs, grease packed and mounted on a continuous steel torsion shaft.

\*\* NOTE TO SPECIFIER \*\* Delete one of the following two paragraphs. For high cycle fill-in the cycle life (10,000 - 200,000).

Standard 7,500 cycles.

High \_\_\_\_\_\_\_\_ cycles.

* + - * 1. Eclipse Tube Motor as provided by Raynor Garage Doors: 115 volt, single phase with toggle switch for constant pressure open-close operation.
      1. Mounting Brackets: 10 gauge galvanized steel (0.130 inch minimum thickness) attached to guide assembly.
      2. Enclosures:
         1. Hood Type: Hood to be a square type and to be attached to the brackets.
         2. Bracket Side Covers: Covers to enclose door mechanisms.

\*\* NOTE TO SPECIFIER \*\* Delete material not required.

* + - * 1. Material: 24 gauge steel (0.022 inch minimum thickness) commercial quality hot-dipped galvanized steel in accordance with ASTM A-653.
        2. Material: 24 gauge stainless steel (0.024 inch minimum thickness) in accordance with ASTM A-240, type 304.
        3. Material: 18 gauge aluminum (0.040 inch minimum thickness) in accordance with ASTM B-209, alloy 5005, temper H34.

\*\* NOTE TO SPECIFIER \*\* Delete color/finish not required.

* + - * 1. Color and Finish: Gray polyester paint to match curtain.
        2. Color and Finish: Tan polyester paint to match curtain.
        3. Color and Finish: White polyester paint to match curtain.
        4. Color and Finish: Stainless steel No. 4.
        5. Color and Finish: Clear anodized.
        6. Color and Finish: Bronze anodized.
        7. Color and Finish: ArmorBrite Powdercoat. Color: \_\_\_\_\_\_\_\_.

\*\* NOTE TO SPECIFIER \*\* Delete header weatherseal if not required.

* + - 1. Header Weatherseal: A brush seal to inhibit air infiltration between header and curtain.

\*\* NOTE TO SPECIFIER \*\* Retain or delete paragraphs below to suit project requirements.

* + - 1. Locking Bar: For push-up doors and doors operated with hand crank, locks to be thumb turn cylinders and bars to engage both guides.
      2. Cylinder Lock: For push-up doors and doors operated with hand crank, locks to be keyed cylinders and bars to engage both guides.

\*\* NOTE TO SPECIFIER \*\* Delete article if not required.

* 1. ROLLING SECURITY GRILLE DOORS

\*\* NOTE TO SPECIFIER \*\* DuraGrille is for interior or exterior applications up to 35 ft in width and 24 ft in height.

* + 1. DuraGrille Rolling Security Grille Doors as manufactured by Raynor Garage Doors:

\*\* NOTE TO SPECIFIER \*\* Delete door operation not required. There are restrictions on size of door for push-up, hand chain or crank operation.

* + - 1. Operation: Push-up.
      2. Operation: Hand chain.
      3. Operation: Hand crank.
      4. Operation: Electric motor.
      5. Mounting: Door guide mounting configuration.

\*\* NOTE TO SPECIFIER \*\* Delete mounting not required. Interior face of wall mounting is standard.

* + - * 1. Interior face of wall on each side of door opening.
        2. Exterior face of wall on each side of door opening.
        3. Between jamb of wall opening.
      1. Curtain: Horizontal diameter rods with vertically interlocking links to form a pattern. Bottom bar extruded aluminum tubular shape.

\*\* NOTE TO SPECIFIER \*\* Delete pattern type not required. Standard is links on 9 inch (229 mm) centers.

* + - * 1. Pattern Type: Straight. Horizontal aluminum rods 5/16 inch (8 mm) spaced vertically 2 inches (51 mm) OC with vertical link assemblies spaced horizontally 6 inches (152 mm) OC. Lateral movement of vertical link assemblies contained by C-clips. Vertical link assemblies held together by brass eyelets.
        2. Pattern Type: Straight. Horizontal aluminum rods 5/16 inch (8 mm) spaced vertically 2 inches (51 mm) OC with vertical link assemblies spaced horizontally 9 inches (229 mm) OC. Lateral movement of vertical link assemblies contained by C-clips. Vertical link assemblies held together by brass eyelets.
        3. Pattern Type: Brick. Horizontal aluminum rods 5/16 inch (8 mm) spaced vertically 2 inches (51 mm) OC, with links spaced horizontally 6 inches (152 mm) OC to form a brick pattern with aluminum spacers at top and bottom of each link.
        4. Pattern Type: Brick: Horizontal aluminum rods 5/16 inch (8 mm) spaced vertically 2 inches (51 mm) OC, with links spaced horizontally 9 inches (229 mm) OC to form a brick pattern with aluminum spacers at top and bottom of each link.

\*\* NOTE TO SPECIFIER \*\* Delete material and finish not required.

* + - * 1. Curtain Material and Finish: Aluminum mill finish.
        2. Curtain Material and Finish: Aluminum clear anodized.
        3. Curtain Material and Finish: Aluminum bronze anodized.
        4. Bottom Bar: Bottom of curtain reinforced with extruded aluminum tubular bottom bar.

\*\* NOTE TO SPECIFIER \*\* Delete material and finish not required.

Material and Finish: Aluminum clear anodized.

Material and Finish: Aluminum bronze anodized.

* + - 1. Guides: Extruded aluminum shapes with retainer grooves and continuous PVC strip inserts to reduce wear and noise. Guides provided with removable curtain stops.

\*\* NOTE TO SPECIFIER \*\* Delete material and finish not required. Standard is clear anodize.

* + - * 1. Material and Finish: Aluminum clear anodized.
        2. Material and Finish: Aluminum bronze anodized.

\*\* NOTE TO SPECIFIER \*\* Delete guide mounting not required. Standard is structural steel angles.

* + - * 1. Guide Mounting: Attached to structural steel angles.
        2. Guide Mounting: Attached to structural steel support tubes.
        3. Guide Mounting: Attached directly to the jambs.
      1. Counterbalance:
         1. Barrel: Minimum 4-1/2 inches (114 mm) OD and 0.120 inch (3 mm) wall thickness structural steel pipe. Deflection of pipe under full load shall not exceed 0.03 inch (0.8 mm) per foot of span.
         2. Counterbalance: Helical torsion springs, grease packed and mounted on a continuous steel torsion shaft.

\*\* NOTE TO SPECIFIER \*\* Delete one of the following two paragraphs. For high cycle fill-in the cycle life (20,000 - 200,000).

Standard 15,000 cycles.

High \_\_\_\_\_\_\_\_ cycles.

* + - 1. Brackets: 3/16 inch (5 mm), steel plate, attached to wall angle of guide assembly with 1/2 inch (13 mm) diameter Grade 5 bolts. Inside of drive bracket fitted with sealed ball bearings.

\*\* NOTE TO SPECIFIER \*\* Delete finish not required. Standard is primer.

* + - * 1. Finish: 1 coat of rust-inhibitive primer.
        2. Finish: 1 coat of hot-dipped galvanized.
        3. Finish: 1 coat of ArmorBrite Powdercoat. Color: \_\_\_\_\_\_\_\_.
      1. Enclosures:

\*\* NOTE TO SPECIFIER \*\* Delete hood type not required. Round hood is standard and recommended for strength.

* + - * 1. Hood Type: Round Hood.
        2. Hood Type: Square Hood.

\*\* NOTE TO SPECIFIER \*\* Delete bracket covers if not required. Covers are recommended for outside mounted doors.

* + - * 1. Bracket Covers: Covers to enclose door mechanisms.

\*\* NOTE TO SPECIFIER \*\* Delete material not required.

* + - * 1. Material: 24 gauge steel (0.022 inch minimum thickness) commercial quality hot-dipped galvanized steel in accordance with ASTM A-653.
        2. Material: 24 gauge stainless steel (0.024 inch minimum thickness) in accordance with ASTM A-240, type 304.
        3. Material: 18 gauge aluminum (0.040 inch minimum thickness) in accordance with ASTM B-209, alloy 5005, temper H34.

\*\* NOTE TO SPECIFIER \*\* Delete color/finish not required.

* + - * 1. Color and Finish: Gray polyester paint.
        2. Color and Finish: Tan polyester paint.
        3. Color and Finish: Galvanized.
        4. Color and Finish: Stainless steel No. 4 finish.
        5. Color and Finish: Clear anodize finish.
        6. Color and Finish: ArmorBrite Powdercoat. Color: \_\_\_\_\_\_\_\_.

\*\* NOTE TO SPECIFIER \*\* Retain or delete paragraphs below to suit project requirements. Auto-Lock is required for the Emergency Egress Grille and operator model LGE.

* + - 1. Hand Chain Lock: To receive padlock provided by Owner; for doors operated with hand chain.
      2. Cylinder Lock: For push-up doors and doors operated with hand chain or hand crank, locks to be keyed cylinders and bars to engage both guides.
      3. Cylinder Lock for Motor Operated Doors: Provide interlock switch with cylinder lock.
      4. Auto-Lock: For doors operated with hand chain, crank, or motor operated.

\*\* NOTE TO SPECIFIER \*\* Delete article if not required.

* 1. ROLLING FIRE DOORS

\*\* NOTE TO SPECIFIER \*\* FireCoil is for interior or exterior applications up to 30 ft in width and 24 ft in height with slat restrictions.

* + 1. Fire Coil, Rolling Fire Doors as manufactured by Raynor Garage Doors:

\*\* NOTE TO SPECIFIER \*\* Delete door operation not required. There are restrictions on size of door for push-up, hand chain or crank operation. Note: Hand chain, crank, and electric operation available for insulated slat only.

* + - 1. Operation: Push-up operation.
      2. Operation: Hand chain operation.
      3. Operation: Hand crank operation.
      4. Operation: Electric motor operation.

\*\* NOTE TO SPECIFIER \*\* Delete ratings not required. Indicate fire rating on Door Schedule in drawings. Note: Insulated slats are only available with UL, CSFM, MEA.

* + - 1. Fire Resistance Rating: 3 hour, listed by Factory Mutual (FM).
      2. Fire Resistance Rating: 1-1/2-hour, listed by Factory Mutual (FM).
      3. Fire Resistance Rating: 3/4 hour, listed by Factory Mutual (FM).
      4. Fire Resistance Rating: 4 hour, listed by Underwriters Laboratories (UL).
      5. Fire Resistance Rating: 1-1/2-hour, listed by Underwriters Laboratories (UL).
      6. Fire Resistance Rating: 3/4 hour, listed by Underwriters Laboratories (UL).
      7. Fire Resistance Rating: 4 hour, approved by California State Fire Marshal (CSFM).
      8. Fire Resistance Rating: 1-1/2-hour, approved by California State Fire Marshal (CSFM).
      9. Fire Resistance Rating: 3/4 hour, approved by California State Fire Marshal (CSFM).
      10. Fire Resistance Rating: 4 hour, approved by City of New York Material and Equipment Acceptance (MEA).
      11. Fire Resistance Rating: 1-1/2 hour, approved by City of New York Material and Equipment Acceptance (MEA).
      12. Fire Resistance Rating: 3/4 hour, approved by City of New York Material and Equipment Acceptance (MEA).
      13. Fire Resistance Rating: 4 hour, listed by International Standards Organization (ISO 3008).
      14. Fire Resistance Rating: 4 hour, listed by British Standards (BS476).
      15. Smoke Control Label: "S" label, air leakage rating not greater than 3.0 cfm per sq ft.
      16. Curtain: Interlocking roll-formed slats as specified below. Endlocks attached to each of alternate slat to prevent lateral movement.

\*\* NOTE TO SPECIFIER \*\* Delete slat types and materials not required. Slat type and gauge is dependent on size of door. Contact manufacturer for more information.

* + - * 1. Flat Slats: Steel 18 gauge (0.047 inch minimum thickness).
        2. Flat Slats: Steel 20 gauge (0.036 inch minimum thickness).
        3. Flat Slats: Steel 22 gauge (0.030 inch minimum thickness).
        4. Flat Slats: Stainless steel 20 gauge (0.036 inch minimum thickness).
        5. Flat Slats: Stainless steel 22 gauge (0.030 inch minimum thickness).
        6. Flat Slats: Light-duty 24 gauge steel (0.023 inch minimum thickness).
        7. Large Curved Slats: Steel 18 gauge (0.047 inch minimum thickness).
        8. Large Curved Slats: Steel 20 gauge (0.036 inch minimum thickness).
        9. Large Curved Slats: Steel 22 gauge (0.030 inch minimum thickness).
        10. Small Curved Slats: Steel 20 gauge (0.036 inch minimum thickness).
        11. Small Curved Slats: Steel 22 gauge (0.030 inch minimum thickness).
        12. Insulated flat slats with 24 gauge backer: Insulation: Mineral wool with R-value 4.0 and U-value 0.250.

Steel 18 gauge (0.047 inch minimum thickness)

Steel 20 gauge (0.036 inch minimum thickness)

Steel 22 gauge (0.030 inch minimum thickness).

Steel 24 gauge (0.023 inch minimum thickness).

\*\* NOTE TO SPECIFIER \*\* Delete material not required. Stainless steel is available on flat slat only.

* + - * 1. Material: Commercial quality hot-dipped galvanized (G-90) steel in accordance with ASTM A-653.
        2. Material: Stainless steel in accordance with ASTM A-240, type 304.

\*\* NOTE TO SPECIFIER \*\* Delete color and finish options not required. Note: Small and Large curve slats available in gray and ArmorBrite finishes only. Insulated flat slat available in gray, tan, white, galv. And ArmorBrite finishes only.

* + - * 1. Color and Finish: 1 finish coat of gray polyester paint over 1 coat of primer.
        2. Color and Finish: 1 finish coat of tan polyester paint over 1 coat of primer.
        3. Color and Finish: 1 finish coat of white polyester paint over 1 coat of primer.
        4. Color and Finish: Galvanized.
        5. Color and Finish: Stainless steel No. 4.
        6. Color and Finish: ArmorBrite Powdercoat. Color: \_\_\_\_\_\_\_\_.
      1. Endlocks: Zinc-plated malleable cast iron fastened with two zinc-plated steel rivets.
      2. Bottom Bar: Two structural angles, 2 x 2 x 3/16 inches (51 x 51 x 5 mm).

\*\* NOTE TO SPECIFIER \*\* Delete material and finish not required. Note: stainless steel not available with insulated slats.

* + - * 1. Material and Finish: Structural steel angle bottom bar to receive one coat of black rust-inhibitive primer.
        2. Material and Finish: Structural stainless steel angles. Mill finish.
        3. Material and Finish: Structural steel angle bottom bar to receive one coat of ArmorBrite Powdercoat. Color: \_\_\_\_\_\_\_\_.
      1. Guide Assemblies: Three structural angles, 3 x 2 x 3/16 inches (76 x 51 x 5 mm) and fitted with removable curtain stops.

\*\* NOTE TO SPECIFIER \*\* Delete material and finish not required. Note: stainless steel not available with insulated slats.

* + - * 1. Material and Finish: Structural steel. 1 coat of black rust-inhibitive primer.
        2. Material and Finish: Structural steel. 1 coat of hot-dipped galvanized.
        3. Material and Finish: Structural stainless steel. Mill finish.
        4. Material and Finish: Structural steel. ArmorBrite Powdercoat. Color: \_\_\_\_\_\_.

\*\* NOTE TO SPECIFIER \*\* Delete guide smoke seals if not required.

* + - 1. Guide Smoke Seals: Seals to inhibit smoke infiltration between guide and curtain.
         1. Brush seal with an aluminum retainer attached to guide assembly.
      2. Counterbalance:
         1. Barrel: Minimum 4-1/2 inch (114 mm) OD and 0.120 inch (3 mm) wall thickness structural steel pipe. Deflection of pipe under full load shall not exceed 0.03 inch (0.8 mm) per foot of span.
         2. Counterbalance: Mechanism with helical torsion springs, grease packed and mounted on a continuous steel torsion shaft.

\*\* NOTE TO SPECIFIER \*\* Delete one of the following two paragraphs. For high cycle fill-in the cycle life (15,000 - 200,000).

* + - * 1. Standard 10,000 cycles.
        2. High \_\_\_\_\_\_\_\_ cycles.
      1. Brackets: 3/16 inch (5 mm), minimum, steel plate, attached to wall angle of guide assembly with 1/2 inch (13 mm) diameter Grade 5 bolts. Inside of drive bracket fitted with sealed ball bearing.

\*\* NOTE TO SPECIFIER \*\* Delete finish not required. Standard is primer.

* + - * 1. Finish: 1 coat of rust-inhibitive primer.
        2. Finish: 1 coat of hot-dipped galvanized.
        3. Finish: 1 coat of ArmorBrite Powdercoat. Color: \_\_\_\_\_\_\_\_.
      1. Enclosures:

\*\* NOTE TO SPECIFIER \*\* Delete hood type not required. Round hood is standard and recommended for strength.

* + - * 1. Hood Type: Round Hood.
        2. Hood Type: Square Hood.
        3. Bracket Covers: Covers to enclose door mechanisms as required.

\*\* NOTE TO SPECIFIER \*\* Delete material not required. Note: stainless steel not available for insulated slat.

* + - * 1. Material: 24 gauge steel (0.022 inch minimum thickness) commercial quality hot-dipped galvanized steel in accordance with ASTM A-653.
        2. Material: 24 gauge stainless steel (0.024 inch minimum thickness) in accordance with ASTM A-240, type 304.

\*\* NOTE TO SPECIFIER \*\* Delete color/finish not required. Note: stainless steel not available for insulated slat. Small and Large curve slats available with gray and ArmorBrite finishes only.

* + - * 1. Color and Finish: Gray polyester paint to match curtain.
        2. Color and Finish: Tan polyester paint to match curtain.
        3. Color and Finish: White polyester paint to match curtain.
        4. Color and Finish: Galvanized to match curtain.
        5. Color and Finish: Stainless steel No. 4.
        6. Color and Finish: ArmorBrite Powdercoat. Color: \_\_\_\_\_\_\_\_.

\*\* NOTE TO SPECIFIER \*\* Delete flame baffle if not required. Note: Flame baffle required for Factory Mutual listing.

* + - 1. Flame Baffle: To comply with listing agency.
      2. Automatic Closing Device: Closing rolling fire door under a fire condition to be initiated by the following:

\*\* NOTE TO SPECIFIER \*\* Delete automatic closing device not required. Fusible links are standard. ETM's and LM21's can be wired to a smoke detector or fire alarm control panel. XP is used if the door needs to close in a power loss condition. XPBB and AFCB are used if the door needs to close after 72 hr. power loss. AFCB is used on motor operated doors only - a signal from the detector or alarm will cause the door to close electrically.

* + - * 1. Fusible links.
        2. Electro-Thermal-Manual links (ETM) with junction box.
        3. Electro-Thermal-Manual links (ETM) without junction box.
        4. Solid State Release Device Units LM21 Model XP.
        5. Solid State Release Device Units LM21 Model XPBB.
        6. Solid State Release Device Units LM21 Model AFCB.

\*\* NOTE TO SPECIFIER \*\* Delete detection type if not required.

* + - 1. Detection Type: Smoke detector used in conjunction with automatic closing device type to initiate automatic closing of a rolling fire door to be the following:
         1. Photoelectronic with heat sensor detector.

\*\* NOTE TO SPECIFIER \*\* Delete header smoke seal if not required.

* + - 1. Header Smoke Seal: "Z" shape brush seal to inhibit smoke infiltration between header and curtain.

\*\* NOTE TO SPECIFIER \*\* Delete lock options not required.

* + - 1. Locking Bar: For push-up doors and doors operated with hand chain or hand crank, to receive padlock provided by Owner.
      2. Locking Bar for Motor Operated Doors: Interlock switch with locking bar.
      3. Hand Chain Lock: To receive padlock provided by Owner; for doors operated with hand chain.
      4. Cylinder Lock: For push-up doors and doors operated with hand chain and hand crank operated doors.
      5. Cylinder Lock for Motor Operated Doors: Interlock switch with cylinder lock.

\*\* NOTE TO SPECIFIER \*\* Delete article if not required.

* 1. COILING FIRE SHUTTER DOORS

\*\* NOTE TO SPECIFIER \*\* FireCurtain is for interior or exterior applications up to 12 ft in width and 8 ft in height.

* + 1. FireCurtain, Coiling Fire Shutter Doors as manufactured by Raynor Garage Doors:

\*\* NOTE TO SPECIFIER \*\* Delete door operation not required. There are restrictions on size of door for push-up operation.

* + - 1. Operation: Push-up.
      2. Operation: Hand crank.
      3. Operation: Tube motor.

\*\* NOTE TO SPECIFIER \*\* Delete mounting not required. This type of door mounting is standard.

* + - 1. Mounting: Door guide mounting configuration.
         1. To face of wall on each side of door opening.
         2. Between jamb of wall opening.
      2. Mounting: Integral frame as follows.

\*\* NOTE TO SPECIFIER \*\* Delete integral frame type if not required. This is selected when curtain, frame, guide, sill, hood comes pre-assembled. This is only available in small size opening.

* + - * 1. Painted Slip-in Frame: For pre-existing finished opening. Color and finish to match guides and curtain.
        2. Painted Build-in Frame: For masonry wall construction. Color and finish to match guides and curtain.
        3. Stainless Steel Slip-in Frame: For pre-existing finished opening. Finish: No. 4.
        4. Stainless Steel Build-in Frame: For masonry wall construction. Finish: No. 4.

\*\* NOTE TO SPECIFIER \*\* Delete ratings not required. Indicate fire rating on Door Schedule in drawings.

* + - * 1. Fire Resistance Rating: 3 hour, listed by Factory Mutual (FM).
        2. Fire Resistance Rating: 1-1/2-hour, listed by Factory Mutual (FM).
        3. Fire Resistance Rating: 3/4 hour, listed by Factory Mutual (FM).
        4. Fire Resistance Rating: 3 hour, listed by Underwriters Laboratories (UL).
        5. Fire Resistance Rating: 1-1/2 hour, listed by Underwriters Laboratories (UL).
        6. Fire Resistance Rating: 3/4 hour, listed by Underwriters Laboratories (UL).
        7. Fire Resistance Rating: 3 hour, approved by California State Fire Marshal (CSFM).
        8. Fire Resistance Rating: 1-1/2 hour, approved by California State Fire Marshal (CSFM).
        9. Fire Resistance Rating: 3/4 hour, approved by California State Fire Marshal (CSFM).
        10. Fire Resistance Rating: 3 hour, approved by City of New York Material and Equipment Acceptance (MEA).
        11. Fire Resistance Rating: 1-1/2 hour, approved by City of New York Material and Equipment Acceptance (MEA).
        12. Fire Resistance Rating: 3/4 hour, approved by City of New York Material and Equipment Acceptance (MEA).

\*\* NOTE TO SPECIFIER \*\* Delete smoke control door if not required. Note: Smoke control doors are available on 1-1/2 and 3/4-hour ratings only.

* + - * 1. Smoke Control Label: "S" label, air leakage rating not greater than 3.0 cfm per sq ft.
      1. Curtain: Interlocking slats as specified below. Endlocks to be attached to each of alternate slat to prevent lateral movement.

\*\* NOTE TO SPECIFIER \*\* Delete slat type option not required.

* + - * 1. Slat Type: Roll-formed flat slat 22 gauge steel (0.030 inch minimum thickness).
        2. Slat Type: Roll-formed flat slat 22 gauge stainless steel (0.030 inch minimum thickness).

\*\* NOTE TO SPECIFIER \*\* Delete material not required.

* + - * 1. Material: Commercial quality hot-dipped galvanized (G-90) steel in accordance with ASTM A-653.
        2. Material: Stainless steel in accordance with ASTM A-240, type 304.

\*\* NOTE TO SPECIFIER \*\* Delete color and finish options not required.

* + - * 1. Color and Finish: 1 finish coat of gray polyester paint over 1 coat of primer.
        2. Color and Finish: 1 finish coat of tan polyester paint over 1 coat of primer.
        3. Color and Finish: 1 finish coat of white polyester paint over 1 coat of primer.
        4. Color and Finish: Stainless steel No. 4.
        5. Color and Finish: ArmorBrite Powdercoat. Color: \_\_\_\_\_\_\_\_.
      1. Endlocks: Zinc-plated stamped steel fastened with zinc-plated steel rivets.
      2. Bottom Bar: Tubular type, with 1/4 inch (6 mm) thick protective strip to cushion impact of bottom bar on countertop.

\*\* NOTE TO SPECIFIER \*\* Delete material not required.

* + - * 1. Material: Roll-formed 14 gauge galvanized steel (0.071 inch minimum thickness).
        2. Material: Roll-formed 14 gauge stainless steel (0.075 inch minimum thickness).

\*\* NOTE TO SPECIFIER \*\* Delete color and finish not required.

* + - * 1. Color and Finish: Steel. 1 finish coat of gray paint to match curtain.
        2. Color and Finish: Steel. 1 finish coat of tan paint to match curtain.
        3. Color and Finish: Steel. 1 finish coat of white paint to match curtain.
        4. Color and Finish: Stainless steel. No. 4 finish to match curtain.
        5. Color and Finish: Steel. ArmorBrite Powdercoat. Color: \_\_\_\_\_\_\_\_.
      1. Guide Assemblies: Guides shall be provided in the same material and finish as the curtain and fitted with removable curtain stops.

\*\* NOTE TO SPECIFIER \*\* Delete material and finish not required.

* + - * 1. Material and Finish: 13 gauge galvanized steel (0.086 inch minimum thickness) to receive one finish coat of gray paint to match curtain.
        2. Material and Finish: 13 gauge galvanized steel (0.086 inch minimum thickness) to receive one finish coat of tan paint to match curtain.
        3. Material and Finish: 13 gauge galvanized steel (0.086 inch minimum thickness) to receive one finish coat of white paint to match curtain.
        4. Material and Finish: 13 gauge stainless steel (0.090 inch minimum thickness) to have a No. 4 finish to match curtain.
        5. Material and Finish: 13 gauge galvanized steel (0.086 inch minimum thickness) to receive ArmorBrite Powdercoat finish. Color: \_\_\_\_\_\_\_\_\_.

\*\* NOTE TO SPECIFIER \*\* Delete guide smoke seals if not required.

* + - * 1. Guide Smoke Seals: To inhibit smoke infiltration between guide and curtain.

Brushseal with an aluminum retainer attached to guide assembly.

* + - 1. Counterbalance:
         1. Barrel: Minimum 4-1/2 inches (114 mm) OD and 0.120 inch (3 mm) wall thickness structural steel pipe. Deflection of pipe under full load to not exceed 0.03 inch (0.8 mm) per foot of span.

\*\* NOTE TO SPECIFIER \*\* Delete counterbalance if FireEclipse tube motor is required. Note tube motor replaces the spring assembly inside the pipe.

* + - * 1. Counterbalance: Mechanism with helical torsion springs, grease packed and mounted on a continuous steel torsion shaft.

\*\* NOTE TO SPECIFIER \*\* Delete one of the following two paragraphs. For high cycle fill-in the cycle life (10,000 - 200,000).

Standard 7,500 cycles.

High \_\_\_\_\_\_\_\_ cycles.

\*\* NOTE TO SPECIFIER \*\* Delete FireEclipse tube motor if not required.

* + - * 1. FireEclipse Tube Motor as provided by Raynor Garage Doors: 115 volt, single phase with toggle switch for constant pressure open-close operation.
      1. Mounting Brackets: 10 gauge galvanized steel (0.130 inch minimum thickness) attached to guide assembly.
      2. Enclosures:
         1. Hood Type: Hood to be a square type and to be attached to the brackets.
         2. Bracket Side Covers: Covers to enclose door mechanisms.

\*\* NOTE TO SPECIFIER \*\* Delete material not required.

* + - * 1. Material: 24 gauge steel (0.022 inch minimum thickness) commercial quality hot-dipped galvanized steel in accordance with ASTM A-653.
        2. Material: 24 gauge stainless steel (0.024 inch minimum thickness) in accordance with ASTM A-240, type 304.

\*\* NOTE TO SPECIFIER \*\* Delete color/finish not required.

* + - * 1. Color and Finish: Gray polyester paint to match curtain.
        2. Color and Finish: Tan polyester paint to match curtain.
        3. Color and Finish: White polyester paint to match curtain.
        4. Color and Finish: Stainless steel No. 4.
        5. Color and Finish: ArmorBrite Powdercoat. Color: \_\_\_\_\_\_\_\_.
      1. Automatic Closing Device: For closing of rolling fire shutter door under a fire condition to be initiated by the following:

\*\* NOTE TO SPECIFIER \*\* Delete automatic closing device not required. Fusible links are standard. ETM's, LM21's, and FireShield can be wired to a smoke detector or fire alarm control panel. XP is used if the door needs to close in a power loss condition. XPBB is used if the door needs to close after 72 hr. power loss.

* + - * 1. Fusible links.
        2. Electro-Thermal-Manual links (ETM) with junction box.
        3. Electro-Thermal-Manual links (ETM) without junction box.
        4. FireShield (for use with FireEclipse tube motor only).
        5. Solid State Release Device Units LM21 Model XP.
        6. Solid State Release Device Units LM21 Model XPBB.

\*\* NOTE TO SPECIFIER \*\* Delete detection type if not required.

* + - 1. Detection Type: Photoelectronic with heat sensor. Smoke detection used in conjunction with automatic closing device to initiate automatic closing of a rolling fire shutter door.

\*\* NOTE TO SPECIFIER \*\* Delete smoke seal if not required.

* + - 1. Header Smoke Seal: Brush seal to inhibit smoke infiltration between the header and the curtain.

\*\* NOTE TO SPECIFIER \*\* Delete Locking option not required.

* + - 1. Locking Bar: For push-up doors and doors operated with hand crank. Locks to be thumb turn cylinders and bars to engage both guides.
      2. Cylinder Lock: For push-up doors and doors operated with hand crank. Locks to be keyed cylinders and bars to engage both guides.

\*\* NOTE TO SPECIFIER \*\* Delete article if not required.

* 1. ELECTRIC OPERATORS
     1. ControlHoist (UL Listed) as manufactured by Raynor Garage Doors:

\*\* NOTE TO SPECIFIER \*\* ControlHoist Optima operators (solid state) feature a heavy-duty gear drive running in oil for high reliability and efficient operation. They are designed for larger rolling steel doors and higher cycle applications. Delete if not required.

* + - 1. Model: Raynor ControlHoist Optima: Type: Jackshaft with manual chain hoist.

\*\* NOTE TO SPECIFIER \*\* Delete rating not required.

* + - * 1. Motor Horsepower Rating: Manufacturer's recommended size for door.
        2. Motor Horsepower Rating: Continuous 1/2 HP.
        3. Motor Horsepower Rating: Continuous 3/4 HP.
        4. Motor Horsepower Rating: Continuous 1 HP.
        5. Motor Horsepower Rating: Continuous 1-1/2 HP.
        6. Motor Horsepower Rating: Continuous 2 HP.

\*\* NOTE TO SPECIFIER \*\* Delete electrical not required.

* + - * 1. Electrical Requirements: 115 volt single phase.
        2. Electrical Requirements: 230 volt single phase.
        3. Electrical Requirements: 208-230 volt three phase.
        4. Electrical Requirements: 460 volt three phase.
        5. Duty Cycle: 30 cycles/hour or 300 cycles/day.
        6. Control Wiring: Solid state circuitry with provisions for connection of a monitored reversing device, external radio control hook-up and maximum run timer. Provisions for timers to close and mid stop and lock bar sensor capability.

\*\* NOTE TO SPECIFIER \*\* Delete if custom wiring not required. For custom wiring contact manufacturer.

Three button momentary contact "open-stop", constant pressure on close (can be changed to momentary to close).

Custom wiring.

\*\* NOTE TO SPECIFIER \*\* Delete one of the monitored reversing devices. A monitored reversing device is required unless constant pressure to close is acceptable then both devices can be deleted.

Monitored electric reversing edge on door.

Monitored photo electric eyes mounted on jambs.

\*\* NOTE TO SPECIFIER \*\* ControlHoist Standard belt-drive operators are designed for medium- to high-cycle applications and for normal- to large-size rolling steel doors. Delete if not required.

* + - 1. Model: Raynor ControlHoist Standard:

\*\* NOTE TO SPECIFIER \*\* Delete types not required.

* + - * 1. Type: Jackshaft.
        2. Type: Jackshaft with manual chain hoist.

\*\* NOTE TO SPECIFIER \*\* Delete rating not required.

* + - * 1. Motor Horsepower Rating: Manufacturer's recommended size for door.
        2. Motor Horsepower Rating: Continuous 1/3 HP.
        3. Motor Horsepower Rating: Continuous 1/2 HP.
        4. Motor Horsepower Rating: Continuous 3/4 HP.
        5. Electrical Requirements: 115 volt single phase.
        6. Electrical Requirements: 230 volt single phase.
        7. Electrical Requirements: 208-230 volt three phase.
        8. Electrical Requirements: 460 volt three phase.
        9. Duty Cycle: 30 cycles/hour or 300 cycles/day.
        10. Control Wiring: Solid state circuitry with provisions for connection of a monitored reversing device, external radio control hook-up and maximum run timer. Provisions for timers to close and mid stop and lock bar sensor capability.

Provide three button momentary contact "open-stop", constant pressure on close (can be changed to momentary to close).

\*\* NOTE TO SPECIFIER \*\* Delete if custom wiring not required. For custom wiring contact manufacturer.

Custom wiring.

\*\* NOTE TO SPECIFIER \*\* Delete one of the monitored reversing devices. A monitored reversing device is required unless constant pressure to close is acceptable then both devices can be deleted.

Monitored electric reversing edge on door.

Monitored photo electric eyes mounted on jambs.

\*\* NOTE TO SPECIFIER \*\* ControlHoist Basic belt drive operators are designed for operating rolling steel doors up to 14 feet high in light duty applications. Delete if not required.

* + - 1. Raynor ControlHoist Basic:

\*\* NOTE TO SPECIFIER\*\* Delete type not required.

* + - * 1. Type: Jackshaft.
        2. Type: Jackshaft with manual chain hoist.
        3. Motor Horsepower Rating: Intermittent 1/2 HP.
        4. Electrical Requirements: 115 volt single phase.
        5. Duty Cycle: 14 cycles/hour.
        6. Control Wiring: Solid state circuitry with provisions for connection of a monitored reversing device, external radio control hook-up and maximum run timer. Provisions for timers to close and mid stop and lock bar sensor capability.

Three button momentary contact "open-stop", constant pressure on close (can be changed to momentary to close).

\*\* NOTE TO SPECIFIER \*\* Delete one of the monitored reversing devices. A monitored reversing device is required unless constant pressure to close is acceptable then both devices can be deleted.

Monitored electric reversing edge on door.

Monitored photo electric eyes mounted on jambs.

* + 1. FireHoist as provided by Raynor Garage Doors:

\*\* NOTE TO SPECIFIER \*\* FireHoist model FSEP AND FGH feature a centrifugal clutch to control the descent of the door and model FDC has a pulsating brake to control the door. The FSEP and FGH are designed for small and larger rolling fire door applications. Delete if not required. FGH model has an auxiliary hand chain except for 3 hp all other models do not have an auxiliary hand chain.

* + - 1. Model: Raynor FSEP model:
         1. Type: Jackshaft with automatic closure by fusible link, detector, or fire alarm system. Allows automatic closing without loss of door spring tension thus allowing for ease of resetting of door after testing or alarm. Operates as a standard rolling door operator when not in a fire situation.

\*\* NOTE TO SPECIFIER \*\* Delete rating not required.

* + - * 1. Motor Horsepower Rating: Manufacturer's recommended size for door.
        2. Motor Horsepower Rating: Continuous 1/3 HP.
        3. Motor Horsepower Rating: Continuous 1/2 HP.
        4. Motor Horsepower Rating: Continuous 3/4 HP.
        5. Motor Horsepower Rating: Continuous 1-1/2 HP.
        6. Motor Horsepower Rating: Continuous 2 HP.

\*\* NOTE TO SPECIFIER \*\* Delete electrical not required.

* + - * 1. Electrical Requirements: 115 volt single phase.
        2. Electrical Requirements: 230 volt single phase.
        3. Electrical Requirements: 208-230 volt three phase.
        4. Electrical Requirements: 460 volt three phase.
        5. Duty Cycle: Restricted duty cycles.
        6. Control Wiring: 24 volt control with provisions for connection of a monitored reversing device.

Three button momentary contact "open-stop", constant pressure close, with provisions for momentary pressure to close.

\*\* NOTE TO SPECIFIER \*\* A monitored reversing device is required unless constant pressure to close is acceptable then both devices can be deleted.

Monitored electric reversing edge on door.

Monitored photo electric eyes mounted on jambs.

* + - 1. Model: Raynor FGH model:
         1. Type: Jackshaft with automatic closure by fusible link. Allows automatic closing without loss of door spring tension thus allowing for "Easy-Reset" of door after testing.

\*\* NOTE TO SPECIFIER \*\* Delete rating not required.

* + - * 1. Motor Horsepower Rating: Manufacturer's recommended size for door.
        2. Motor Horsepower Rating: Continuous 1/2 HP.
        3. Motor Horsepower Rating: Continuous 1 HP.
        4. Motor Horsepower Rating: Continuous 1-1/2 HP.
        5. Motor Horsepower Rating: Continuous 2 HP.
        6. Motor Horsepower Rating: Continuous 3 HP.

\*\* NOTE TO SPECIFIER \*\* Delete electrical not required. 2 HP and 3 HP available only in three phase.

* + - * 1. Electrical Requirements: 115 volt single phase.
        2. Electrical Requirements: 230 volt single phase.
        3. Electrical Requirements: 208-230 volt three phase.
        4. Electrical Requirements: 460 volt three phase.
        5. Electrical Requirements: 575 volt three phase.
        6. Duty Cycle: Restricted duty cycles.
        7. Control Wiring: 24 volt control with provisions for connection of a monitored reversing device.

Three button momentary contact "open-stop", constant pressure close, with provisions for momentary pressure to close.

\*\* NOTE TO SPECIFIER \*\* A monitored reversing device is required unless constant pressure to close is acceptable then both devices can be deleted.

Monitored electric reversing edge on door.

Monitored photo electric eyes mounted on jambs.

1. EXECUTION
   1. EXAMINATION
      1. Do not begin installation until substrates have been properly prepared. Verify that site conditions are acceptable for installation of doors, operators, controls, and accessories. Ensure that openings are square, flush, and plumb.
      2. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.
   2. PREPARATION
      1. Clean surfaces thoroughly prior to installation.
      2. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

\*\* NOTE TO SPECIFIER \*\* Coordinate article below with manufacturer's recommended installation requirements. All door installations should be performed by an authorized Raynor Dealer. Consult Raynor to obtain local dealer contact information. Preparation of door openings should comply with submitted Raynor requirements.

* 1. INSTALLATION
     1. General: Install door, guides and operating equipment complete with all necessary accessories and hardware according to shop drawings, manufacturer's instructions.
     2. Lubricate bearings and sliding parts and adjust doors for proper operation, balance, clearance, and similar requirements.
  2. PROTECTION
     1. Clean installed products in accordance with manufacturer's instructions prior to Owner's acceptance. Remove and legally dispose of construction debris from project site.
     2. Remove temporary coverings and protection of adjacent work areas. Repair or replace installed products damaged prior to or during installation.
     3. Protect installed products until completion of project.
     4. Touch-up, repair or replace damaged products before Substantial Completion.

END OF SECTION