SECTION 08 33 23

HIGH SPEED OVERHEAD COILING AND SECURITY DOORS

Display hidden notes to specifier. (Don't know how? [Click Here](https://www.arcat.com/sd/display_hidden_notes.shtml))

*Copyright 2015 - 2023 ARCAT, Inc. - All rights reserved*

\*\* NOTE TO SPECIFIER \*\* DYNACO; security doors.  
This section is based on the products of DYNACO, which is located at:  
13850 101 St. Suite B  
Kenosha, WI 53142  
Toll Free Tel: 866-557-1075  
Fax: 847-562 4917  
Email: [request info (Tony.desalvo@4frontes.com)](https://admin.arcat.com/users.pl?action=UserEmail&company=DYNACO&coid=43992&rep=&fax=847-562)  
Web: <https://www.dynacodoor.us/en-us>   
 [ [Click Here](https://www.arcat.com/arcatcos/cos43/arc43992.html) ] for additional information.  
Our company's nearly 200 years of joint experience includes well-known European brands such as Normstahl, EM and Ditec, and US brands of Amarr, Dynaco, Serco and Kelley.  
DYNACO is a powerful partner in some 25 countries with about 2,800 employees worldwide, all striving to ensure the efficiency and safety of your operations. To do that, the DYNACO business of designing, manufacturing, and installing entrance automation solutions relies on a highly dedicated and trained network of distributors and installers in some 80 countries worldwide.  
Throughout the years we have responded to customer needs with a growing product portfolio that solves specialized safety, security, and environmental conditions. Our products range from industrial doors and docking, to high performance doors, residential garage doors, pedestrian door automation, gate automation and warehouse solutions.  
We understand the everyday challenges you face. DYNACO products are designed to work when you need them. Dynaco is part of the global 4Front Engineered Solutions business in entrance automation. 4Front North America is a complete business partner in entrance automation, combining long-established brands Kelley, Serco, and Dynaco. 4Front products are sold through an extensive network of trained dealers who provide superior installation and service. In North America the distributor network extends throughout the US, Canada, and Mexico.

1. GENERAL
   1. SECTION INCLUDES

\*\* NOTE TO SPECIFIER \*\* Delete items below not required for project.

* + 1. Flexible high-speed overhead coiling doors (up to 12 feet wide) of the following types:
       1. Interior food processing environments. (D-311 SLIMLINE STAINLESS)
       2. Interior high-tech environments. (D-311 SLIMLINE)
       3. Interior high-performance environments. (D-313 STREAMLINE)
       4. Interior cleanroom environments. (D-313 CLEANROOM)
    2. Flexible, high-speed overhead coiling doors (up to 14 feet wide) of the following type:
       1. Interior environments. (D-411)
       2. Interior / sheltered exterior environments. (D-421)
    3. Flexible high-speed overhead coiling doors (up to 15 feet wide) of the following type:
       1. Interior / sheltered exterior environments. (N-211)
    4. Flexible high-speed overhead coiling doors (up to 18 feet wide) of the following types:
       1. Interior environments. (Jackshaft Operator. M2 BASIC)
       2. Interior/exterior environments. (POWER M2)
       3. Exterior environments. (ALL WEATHER M2)
       4. Interior wash-down environments. (STAINLESS STEEL M2)
       5. Interior cold-chain environments. (FREEZER M2)
       6. Interior environments. (D-501)
       7. Exterior environments. (D-651 ALL WEATHER HIGH PERFORMANCE)
    5. Flexible high-speed overhead coiling doors (over 18 feet wide) of the following types:
       1. Interior environments. (POWER M3)
       2. Exterior environments. (ALL WEATHER M3)
    6. Security/fire doors of the following types:
       1. Interior/exterior security doors. (DYNAGRID S-631)
    7. Rubber Doors:
       1. External rubber doors. (S-741)
  1. RELATED SECTIONS

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

* + 1. 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. ASTM: American Society for Testing and Materials
    2. NEMA: National Electrical Manufacturer's Association
    3. UL: Underwriters Laboratories, Inc.
  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: Provide scaled drawings including electrical power and controls schematics.

\*\* 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. Manufacturer Qualifications: Minimum 5 year experience manufacturing similar products.
     2. Installer Qualifications: Minimum 2 year experience installing similar products.

\*\* NOTE TO SPECIFIER \*\* Include a mock-up if the project size and/or quality warrant taking such a precaution. The following is one example of how a mock-up on a large project might be specified. When deciding on the extent of the mock-up, consider all the major different types of work on the project.

* + 1. Mock-Up: Provide a mock-up for evaluation of surface preparation techniques and application workmanship.
       1. Finish openings designated by Architect.
       2. Do not proceed with remaining work until workmanship is approved by Architect.
       3. Rework mock-up installations as required to produce acceptable work.
  1. PRE-INSTALLATION MEETINGS
     1. Convene minimum two weeks prior to starting work of this section.
  2. DELIVERY, STORAGE, AND HANDLING
     1. Deliver and store products in manufacturer's unopened packaging bearing the brand name and manufacturer's identification until ready for installation.
     2. Handling: Handle materials to avoid damage.
  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 recommended limits.
  4. SEQUENCING
     1. Ensure that products of this section are supplied to affected trades in time to prevent interruption of construction progress.
  5. WARRANTY
     1. Provide manufacturer's standard limited warranty.

1. PRODUCTS
   1. MANUFACTURERS
      1. Acceptable Manufacturer: DYNACO, which is located at: 13850 101 St. Suite B; Kenosha, WI 53142; Toll Free Tel: 866-557-1075; Fax: 847-562 4917; Email: [request info (Tony.desalvo@4frontes.com)](https://admin.arcat.com/users.pl?action=UserEmail&company=DYNACO&coid=43992&rep=&fax=847-562); Web: <https://www.dynacodoor.us/en-us>

\*\* NOTE TO SPECIFIER \*\* Delete one of the following two paragraphs; coordinate with requirements of Division 1 section on product options and substitutions. Delete if not required.

* + 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 if not required.

* 1. INTERIOR FLEXIBLE DOORS UP TO 12 FEET WIDE

\*\* NOTE TO SPECIFIER \*\* The Slimline door is designed for interior environments, incorporating ultra-tight sealing bead technology, with ultra-clean side frame and head designs. Delete if not required.

* + 1. Flexible High-Speed Overhead Coiling Doors: D-311 SLIMLINE STAINLESS by DYNACO DOORS.
       1. The D-311 Slimline Stainless door shall be designed for interior environments, incorporating ultra-tight sealing bead technology, with ultra-clean side frame and head designs. This food-specific design will facilitate easy and efficient cleaning, while providing sealing and safety. The construction shall provide reliable, high cycle operation in harsh, and wet applications. The D-311 Slimline Stainless combines proven control and drive system with specially modified bead sealing technology, for smooth, quiet operation. Incorporating DYNACO's exclusive DYNALOGIX II controls, with a variable frequency drive, provides maximum performance, flexibility and self-diagnostic capabilities. The D-311 Slimline Stainless shall operate with a difference in pressure of up to 0.82 lbs/sq ft (0.04 kPa) winds of 10 MPH (16 kph) indicative, not including any multiplication coefficients, and taking into account the configuration of the building).
       2. Standard Dimensions: 12 feet W x 12 feet H (3658 mm x 3658 mm).
       3. Opening Speed: 48 in/s (1219 mm/s).
       4. Closing Speed: 24 in/s (610 mm/s).
       5. Door Operation: Gravity driven with flexible soft bottom edge.
       6. Side Guide: Made of structural channels of 2-1/16 x 1-1/2 x 1/8 inches (52 x 38 x 3 mm).

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

* + - 1. Side Guide Material: Stainless steel.
      2. Inner Side Guide: Polyethylene (PE-UHMW 1000); outer section 9/16 inch x 9/16 inch (14 mm x 14 mm).
      3. Side Guide Covers: Stainless Steel 304.
      4. Drum: In stainless steel, diameter 4 x 0.078 inch (102 x 2 mm), shafts in stainless steel.
      5. Door Curtain: Reinforced PVC and continuous sealing bead, with flexible weighted soft bottom edge design.

\*\* NOTE TO SPECIFIER \*\* Available in different colors. Insert color required.

* + - 1. Color: \_\_\_\_\_.

\*\* NOTE TO SPECIFIER \*\* Vision banner is standard. Delete window if not required.

* + - 1. Vision Banner Window: One vision banner 15 inches (381 mm) x door width.
      2. Individual Windows: 24 x 24 inches (1219 x 1219 mm).
      3. Motor: Standard 1 HP at 208V, 230V or 460V. Motor is VFD driven, NEMA 4, 2 poles without brake.
      4. Gearbox: Size 80 for a motor of 1 HP and gear reduction ratio 1/28.
      5. Door Positioning: Absolute encoder mounted within the drive unit.

\*\* NOTE TO SPECIFIER \*\* Delete power supply not required.

* + - 1. Power Supply: Standard single phase 208-230 VAC.
      2. Power Supply: Three phase 208-230 VAC.
      3. Power Supply: Three phase 460 VAC.
      4. Power Supply: Three Phase 575 VAC.
      5. Frequency: 50-60 Hz. Circuit breakers to be provided by the customer: 10-20 A for 1 HP.
      6. Detector: An infrared photocell installed inside the side guide and detects the presence of a pedestrian or a vehicle. Upon activation, it opens the door immediately and keeps it open as long as the presence is detected.

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

* + - * 1. Height of photocell: 12 inches (305 mm) from the floor.
        2. Height of photocell: Up to maximum 24 inches (610 mm) from the floor.
      1. Detector: A bottom edge detector reverses the door when it hits an obstacle during the closing cycle. This detector is positioned at the bottom part of the curtain.
         1. The bottom edge is referred to as a WDD or Wireless DYNACO Detector: A wireless detection system consisting of a transmitter in the bottom bag of the door and a receiver in the control box. The system operates according to the "open loop" principle: when the sensor encounters an obstacle, the transmitter leaves the standby mode and sends a signal to the receiver that immediately opens the door.
      2. Space Requirements: All indicated dimensions are net: The additional space necessary for mounting and maintenance must be considered. Reduced dimensions upon request. Refer to drawings.

\*\* NOTE TO SPECIFIER \*\* The Slimline door is designed for interior environments, providing a high tech, safe, and aesthetically pleasing door for even most demanding customers. Delete if not required.

* + 1. Flexible High-Speed Doors: D-311 SLIMLINE by DYNACO DOORS.
       1. The Slimline Door shall be designed for interior environments, providing a high-tech, safe, and aesthetical pleasing door.
       2. Standard Dimensions: 12 feet W x 12 feet H (3658 mm x 3658 mm).
       3. Opening Speed: 48 in/s (1219 mm/s).
       4. Closing Speed: 24 in/s (610 mm/s).
       5. Door Operation: Gravity driven with flexible soft bottom edge.
       6. Side Guide: Made of structural channels of 2-1/16 inches x 1-1/2 inches x 1/8 inch (52 mm x 38 mm x 3 mm) in galvanized steel.
       7. Inner Side Guide: Polyethylene (PE-UHMW 1000); outer section 9/16 inch x 9/16 inch (14 mm x 14 mm).
       8. Side Guide Covers: Galvanized steel.

\*\* NOTE TO SPECIFIER \*\* Steel is standard. Delete drum material not required.

* + - 1. Drum: In steel, diameter 4 inches x 0.078 inch (102 mm x 2 mm), shafts in steel.
      2. Door Curtain: Reinforced PVC and continuous sealing bead, with flexible weighted soft bottom edge design. .

\*\* NOTE TO SPECIFIER \*\* Available in different colors. Insert color required.

* + - 1. Color: \_\_\_\_\_.

\*\* NOTE TO SPECIFIER \*\* Vision banner is standard. Delete window if not required.

* + - 1. Vision Window: One vision banner 15 inches (381 mm) x door width.
      2. Individual Windows: 24 inches x 24 inches (1219 mm x 1219 mm).
      3. Motor: Standard 1 HP at 208V, 230V or 460V. Motor is VFD driven, NEMA 4, 2 poles without brake.
      4. Gearbox: Size 80 for a motor of 1 HP and gear reduction ratio 1/28.
      5. Door Positioning: Absolute encoder mounted within the drive unit.

\*\* NOTE TO SPECIFIER \*\* Delete power supply not required.

* + - 1. Power Supply: Standard single phase 208-230 VAC.
      2. Power Supply: Three phase 208-230 VAC.
      3. Power Supply: Three phase 460 VAC.
      4. Power Supply: Three Phase 575 VAC.
      5. Frequency: 50-60 Hz. Circuit breakers to be provided by the customer: 10-20 A for 1 HP.
      6. Detector: An infrared photocell installed inside the side guide and detects the presence of a pedestrian or a vehicle. Upon activation, it opens the door immediately and keeps it open as long as the presence is detected.

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

* + - * 1. Height of photocell: 12 inches (305 mm) from the floor.
        2. Height of photocell: Up to maximum 24 inches (610 mm) from the floor.
      1. Detector: A bottom edge detector reverses the door when it hits an obstacle during the closing cycle. This detector is positioned at the bottom part of the curtain.
         1. The bottom edge is referred to as a WDD or Wireless DYNACO Detector: A wireless detection system consisting of a transmitter in the bottom bag of the door and a receiver in the control box. The system operates according to the "open loop" principle: when the sensor encounters an obstacle, the transmitter leaves the standby mode and sends a signal to the receiver that immediately opens the door.
      2. Space Requirements: All indicated dimensions are net: the additional space necessary for mounting and maintenance must be taken into account. Reduced dimensions upon request. Refer to drawings.

\*\* NOTE TO SPECIFIER \*\* The Streamline Door provides outstanding environmental control using state of the art technology. Delete if not required.

* + 1. Flexible High-Speed Doors: D-313 STREAMLINE by DYNACO DOORS.
       1. The D-313 Streamline Door shall be designed for interior environments, providing a high-tech, safe, and aesthetical pleasing door.
       2. Standard Dimensions: 12 feet W x 12 feet H (3658 mm x 3658 mm).
       3. Opening Speed: Up to 120 in/s (3048 mm/s).
       4. Closing Speed: 24 in/s (610 mm/s).
       5. Door Operation: Gravity driven with flexible soft bottom edge.
       6. Side Guide: Made of structural channels of 2-1/16 inches x 1-1/2 inches x 1/8 inch (52 mm x 38 mm x 3 mm) in galvanized steel.
       7. Inner Side Guide: Polyethylene (PE-UHMW 1000); outer section 9/16 inch x 9/16 inch (14 mm x 14 mm).
       8. Side Guide Covers: Composite
       9. Drum: In steel, diameter 4 inches x 0.078 inch (102 mm x 2 mm), shafts in steel.
       10. Door Curtain: Reinforced PVC and continuous sealing bead, with flexible weighted soft bottom edge design.

\*\* NOTE TO SPECIFIER \*\* Available in different colors. Insert color required.

* + - 1. Color: \_\_\_\_\_.

\*\* NOTE TO SPECIFIER \*\* Vision banner window is standard. Delete window not required.

* + - 1. Vision Banner Window: One vision banner 15 inches (381 mm) x door width.
      2. Individual Windows: 24 inches x 24 inches (1219 mm x 1219 mm).
      3. Motor: Standard 1 HP at 208V, 230V or 460V. Motor is VFD driven, Nema 4, 2 poles without brake.
      4. Gearbox: Size 80 for a motor of 1 HP and gear reduction ratio 1/28.
      5. Door Positioning: Absolute encoder mounted within the drive unit.

\*\* NOTE TO SPECIFIER \*\* Delete power supply not required.

* + - 1. Power Supply: Standard single phase 208-230 VAC.
      2. Power Supply: Three phase 208-230 VAC.
      3. Power Supply: Three phase 460 VAC.
      4. Frequency: 50-60 Hz. Circuit breakers to be provided by the customer: 10-20 A for 1 HP.
      5. Detector: An infrared photocell installed inside the side guide and detects the presence of a pedestrian or a vehicle. Upon activation, it opens the door immediately and keeps it open as long as the presence is detected.

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

* + - * 1. Height of photocell: 12 inches (305 mm) from the floor.
        2. Height of photocell: Up to maximum 24 inches (610 mm) from the floor.
      1. Detector: A bottom edge detector reverses the door when it hits an obstacle during the closing cycle. This detector is positioned at the bottom part of the curtain.
         1. The bottom edge is referred to as a WDD or Wireless DYNACO Detector: A wireless detection system consisting of a transmitter in the bottom bag of the door and a receiver in the control box. The system operates according to the "open loop" principle: when the sensor encounters an obstacle, the transmitter leaves the standby mode and sends a signal to the receiver that immediately opens the door.
      2. Space Requirements: All indicated dimensions are net: the additional space necessary for mounting and maintenance must be taken into account. Reduced dimensions upon request. Refer to drawings.

\*\* NOTE TO SPECIFIER \*\* The DYNACO D-311 CLEANROOM flexible high speed roll up door is ideal to seal off cleanrooms. It keeps pressure levels stable, contaminants out and limits air consumption. Delete if not required.

* + 1. Flexible High-Speed Doors: D-313 CLEANROOM by DYNACO DOORS.
       1. The D-313 Cleanroom Door shall be designed for interior cleanroom environments, rated to the ISO-6 level of ISO specification 14644-1.
       2. Integral sealing gaskets: in drum cover, reinsertion guides and side guides
       3. Standard Dimensions: 12 feet W x 12 feet H (3658 mm x 3658 mm).
       4. Opening Speed: Up to 120 in/s (3048 mm/s).
       5. Closing Speed: 24 in/s (610 mm/s).
       6. Door Operation: Gravity driven with flexible soft bottom edge.
       7. Side Guide: Made of structural channels of 2-1/16 inches x 1-1/2 inches x 1/8 inch (52 mm x 38 mm x 3 mm) in galvanized steel.
       8. Inner Side Guide: Polyethylene (PE-UHMW 1000); outer section 9/16 inch x 9/16 inch (14 mm x 14 mm).
       9. Side Guide Covers: Composite
       10. Drum: In steel, diameter 4 inches x 0.078 inch (102 mm x 2 mm), shafts in steel.
       11. Door Curtain: Reinforced PVC and continuous sealing bead, with flexible weighted soft bottom edge design.

\*\* NOTE TO SPECIFIER \*\* Available in different colors. Insert color required.

* + - 1. Color: \_\_\_\_\_.

\*\* NOTE TO SPECIFIER \*\* Vision banner window is standard. Delete window not required.

* + - 1. Vision Banner Window: One vision banner 15 inches (381 mm) x door width.
      2. Individual Windows: 24 inches x 24 inches (1219 mm x 1219 mm).
      3. Motor: Standard 1 HP at 208V, 230V or 460V. Motor is VFD driven, Nema 4, 2 poles without brake.
      4. Gearbox: Size 80 for a motor of 1 HP and gear reduction ratio 1/28.
      5. Door Positioning: Absolute encoder mounted within the drive unit.

\*\* NOTE TO SPECIFIER \*\* Delete power supply not required.

* + - 1. Power Supply: Standard single phase 208-230 VAC.
      2. Power Supply: Three phase 208-230 VAC.
      3. Power Supply: Three phase 460 VAC.
      4. Frequency: 50-60 Hz. Circuit breakers to be provided by the customer: 10-20 A for 1 HP.
      5. Detector: An infrared photocell installed inside the side guide and detects the presence of a pedestrian or a vehicle. Upon activation, it opens the door immediately and keeps it open as long as the presence is detected.

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

* + - * 1. Height of photocell: 12 inches (305 mm) from the floor.
        2. Height of photocell: Up to maximum 24 inches (610 mm) from the floor.
      1. Detector: A bottom edge detector reverses the door when it hits an obstacle during the closing cycle. This detector is positioned at the bottom part of the curtain.
         1. The bottom edge is referred to as a WDD or Wireless DYNACO Detector: A wireless detection system consisting of a transmitter in the bottom bag of the door and a receiver in the control box. The system operates according to the "open loop" principle: when the sensor encounters an obstacle, the transmitter leaves the standby mode and sends a signal to the receiver that immediately opens the door.
      2. Space Requirements: All indicated dimensions are net: The additional space necessary for mounting and maintenance must be considered. Reduced dimensions upon request. Refer to drawings.

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

* 1. INTERIOR FLEXIBLE DOORS UP TO 14 FEET WIDE
     1. Flexible, high speed overhead coiling door for interior environments: Dynaco D-411 as manufactured by DYNACO:
        1. The D-411 high speed fabric roll-up door shall be a gravity type system, using a motor to pull the door open and the weight of the door to pull it closed. The fabric door panel shall be free of horizontal or vertical bars and/or stiffeners and be constructed of an appropriate weight and material thickness to mold to the shape of any object or person it may contact with little or no impact.
        2. Wind/Pressure Resistance: Spring-loaded side-guides shall enable the curtain to withstand and operate at negative or positive wind pressures up to 6.3 psf, not including any multiplication coefficients or the configuration of the building.
        3. Standard Dimensions: maximum 14 feet wide x 14 feet high (4267 mm x 4267 mm).
        4. Opening Speed: 78 inches per second (1981 mm per second).
        5. Closing Speed: 24 inches per second (610 mm per second).
        6. Side Guides: Constructed of structural channels of galvanized steel.
        7. Inner Side Guide: Constructed of polyethylene (PE-UHMW 1000). The inner side guide shall form a tight air seal when accommodating the curtain.
        8. Side Guide Covers: Galvanized steel, other finishes available.
        9. Seal: The seal of the door panel shall be accomplished by a spring loaded UHMW inner guide and shall perfectly encapsulate the curtain drive locks thereby forming the inner side guide assembly. The seal of the curtain also shall include soft conforming material edges in both the top and bottom of the panel. Side guides shall be free of wearable blade or brush type weather strip systems.
        10. Door Curtain: The door panel shall be constructed of a reinforced PVC fabric at a minimum weight of 27 oz./sq. yd.
        11. Self-Reinserting: Door shall release immediately upon impact from the side guides. After a break-away impact and upon activation, the door fabric panel shall re-insert itself into the side guides and assume the closed position without assistance. This self-reinserting feature shall be fully operational in all stages of the door's opening and closing cycle irrespective of the driving direction of the impact device.
        12. Motor shall be of design, type, size, and capacity as determined by and furnished by door manufacturer to sufficiently operate the entire door assembly. Standard single phase 208-230VAC; three phase 208-230VAC; three phase 480VAC; three phase 575VAC. Frequency: 50-60 Hz. Circuit breakers by others: a minimum of 16A for 1HP.
        13. Standard motor shall be IP65 shaft and gear driven assembly suitable for wash down environment.
        14. Motor operator shall incorporate soft start and stop technology, dynamic braking, and an absolute encoder for door positioning. Operators using mechanical components including stopping brake, limit switches and clutches are not allowed.
        15. Electric control panel to be a steel NEMA 4 rated enclosure, fully assembled and ready for connection. All components and their configuration shall be UL listed. Control panel shall have on front for easy access, emergency stop button, and an open/close reset push button.
        16. Control panel to contain a variable frequency drive, Solid State electronic programmable controller, emergency stop button, photo eye module, wireless reversing edge receiver, and a rotary disconnect with lock and tag out capability.
        17. Impact sensor: Wireless reversing edge to accommodate both lateral and bottom edge impact. The detector shall reverse the door immediately upon impact and shall be located in the bottom bag of the door. The detector shall be a continuous wireless electronic activated rubber conductor that transmits a signal to the receiver in the controller.
        18. Infrared photocell detection: A thru-beam infrared photo detection system shall be installed in the side guides to detect the presence of a pedestrian, vehicle, or other obstacle. Upon activation, it shall open the door immediately a keep it open as long as the presence is detected. The standard mounting height for the photocell shall be 12 inches (305 mm) from finish floor. (Up to maximum of 24 inches 610 mm where indicated or required) from finish floor.)
        19. Window: Full width, 15 inches (381 mm) high
        20. Space Requirements: All indicated dimensions are net: the additional space necessary for mounting and maintenance has to be taken into account. Reduced dimensions upon request. Refer to drawings.
     2. Flexible, high speed overhead coiling door for interior / sheltered exterior environments: Dynaco D-421 as manufactured by DYNACO:
        1. The D-421 high speed fabric roll-up door shall be a gravity type system, using a motor to pull the door open and the weight of the door to pull it closed. The fabric door panel shall be free of horizontal or vertical bars and/or stiffeners and be constructed of an appropriate weight and material thickness to mold to the shape of any object or person it may contact with little or no impact.
        2. Wind/Pressure Resistance: Spring-loaded side-guides shall enable the curtain to withstand and operate at negative or positive wind pressures up to 9.4 psf, not including any multiplication coefficients or the configuration of the building.
        3. Standard Dimensions: maximum 14 feet wide x 14 feet high (4267 mm x 4267 mm).
        4. Opening Speed: 78 inches per second (1981 mm per second).
        5. Closing Speed: 24 inches per second (610 mm per second).
        6. Side Guides: Constructed of structural channels of galvanized steel.
        7. Inner Side Guide: Constructed of polyethylene (PE-UHMW 1000). The inner side guide shall form a tight air seal when accommodating the curtain.
        8. Side Guide Covers: Galvanized steel, other finishes available.
        9. Seal: The seal of the door panel shall be accomplished by a spring loaded UHMW inner guide and shall perfectly encapsulate the curtain drive locks thereby forming the inner side guide assembly. The seal of the curtain also shall include soft conforming material edges in both the top and bottom of the panel. The D-421 includes enhanced sealing along the header unit. Side guides shall be free of wearable blade or brush type weather strip systems.
        10. Door Curtain: The door panel shall be constructed of a reinforced PVC fabric at a minimum weight of 27 oz./sq. yd.
        11. Self-Reinserting: Door shall release immediately upon impact from the side guides. After a break-away impact and upon activation, the door fabric panel shall re-insert itself into the side guides and assume the closed position without assistance. This self-reinserting feature shall be fully operational in all stages of the door's opening and closing cycle irrespective of the driving direction of the impact device.
        12. Motor shall be of design, type, size, and capacity as determined by and furnished by door manufacturer to sufficiently operate the entire door assembly. Standard single phase 208-230VAC; three phase 208-230VAC; three phase 480VAC; three phase 575VAC. Frequency: 50-60 Hz. Circuit breakers by others: a minimum of 16A for 2HP.
        13. Standard motor shall be IP65 shaft and gear driven assembly suitable for wash down environment.
        14. Motor operator shall incorporate soft start and stop technology, dynamic braking, and an absolute encoder for door positioning. Operators using mechanical components including stopping brake, limit switches and clutches are not allowed.
        15. Electric control panel to be a steel NEMA 4 rated enclosure, fully assembled and ready for connection. All components and their configuration shall be UL listed. Control panel shall have on front for easy access, emergency stop button, and an open/close reset push button.
        16. Control panel to contain a variable frequency drive, Solid State electronic programmable controller, emergency stop button, photo eye module, wireless reversing edge receiver, and a rotary disconnect with lock and tag out capability.
        17. Impact sensor: Wireless reversing edge to accommodate both lateral and bottom edge impact. The detector shall reverse the door immediately upon impact and shall be located in the bottom bag of the door. The detector shall be a continuous wireless electronic activated rubber conductor that transmits a signal to the receiver in the controller.
        18. Infrared photocell detection: A thru-beam infrared photo detection system shall be installed in the side guides to detect the presence of a pedestrian, vehicle, or other obstacle. Upon activation, it shall open the door immediately a keep it open as long as the presence is detected. The standard mounting height for the photocell shall be 12 inches (305 mm) from finish floor. (Up to maximum of 24 inches (610 mm) from finish floor where indicated or required).

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

* + - 1. Window: Window panels.
      2. Space Requirements: All indicated dimensions are net: The additional space necessary for mounting and maintenance must be considered. Reduced dimensions upon request. Refer to drawings.
  1. INTERIOR FLEXIBLE DOORS UP TO 15 FEET WIDE
     1. N-211 TekRoll:
        1. Maximum Size: 14 feet W by 15 feet H (4.267 m W by 4.572 m H).
        2. Speed: Standard door, depending on curtain dimensions.
           1. Opening: up to 50 inches/s (1270 mm/s).
           2. Closing: up to 24 inches/s (610 mm/s).
        3. Door Operation: Gravity driven with flexible soft bottom edge.
        4. Curtain:

\*\* NOTE TO SPECIFIER \*\* Select one of the following two paragraphs and delete the one not required. Stiffeners at 30 inches are Standard.

* + - * 1. Size: 144 inches W by 144 inches H (3658 mm W by 3658 mm H) Stiffeners every 30 inches (762 mm).
        2. Size: 144 inches W by 144 inches H (3658 mm W by 3658 mm H) Stiffeners every 20 inches (508 mm).
        3. Material: 27 oz. Reinforced PVC with flexible weighted soft bottom edge design.
        4. Curtain Colors:

\*\* NOTE TO SPECIFIER \*\* Select one of the following paragraphs and delete those not required.

Yellow RAL 1003.

Orange RAL 2004.

Red RAL 3001.

Blue RAL 5002.

Green RAL 6005.

Grey RAL 7038.

Brown RAL 8017.

White RAL 9010.

Black RAL 9005.

* + - * 1. Windows: Panoramic transparent windows.

\*\* NOTE TO SPECIFIER \*\* Select one of the following three paragraphs and delete those not required.

One Row.

Two Rows.

Maxi-Vision.

* + - 1. Structure: Multi-composite structure including side guides, fixing junction brackets, rolling rod, half open crossbeam cover. Color gray.
      2. Door Operator:
         1. Motor: Standard 1 HP at 208V, 230V or 460V. Motor is VFD driven, NEMA 4, 2 poles without brake.
         2. Gearbox: Size 80 for a motor of 1 HP and gear reduction ratio 1/28.
         3. Power Requirements: UL compliant.

\*\* NOTE TO SPECIFIER \*\* Select one of the following three paragraphs and delete the one not required.

3 Phase motor options: 208V /230V /460V /575V 60Hz.

Single-phase motor options: 110V (size dependent) /208V /230V /460V /575V 60 Hz.

Frequency: 50-60 Hz. Circuit breakers to be provided by the customer: 10-20 A for 1 HP.

* + - 1. Powerless Opening:

\*\* NOTE TO SPECIFIER \*\* Select one of the following two paragraphs for auxiliary manual operation and delete the one not required.

* + - * 1. Manual Ratchet.
        2. Crank handle.
      1. Control Box: NEMA 4X control panel to contain a variable frequency drive, Solid State electronic programmable controller, emergency stop button, photo eye module, and a wireless reversing edge receiver.
      2. Windows: Panoramic transparent windows

\*\* NOTE TO SPECIFIER \*\* Select one of the following three paragraphs and delete those not required.

* + - * 1. One Row.
        2. Two Rows.
        3. Maxi-Vision.
      1. Safety Features:
         1. Detector: A bottom edge detector reverses the door when it hits an obstacle during the closing cycle. This detector is positioned at the bottom part of the curtain. The bottom edge is referred to as a WRE or Wireless Reversing Edge: A wireless detection system consisting of a transmitter in the bottom bag of the door and a receiver in the control box. The system operates according to the "open loop" principle: when the sensor encounters an obstacle, the transmitter leaves the standby mode and sends a signal to the receiver that immediately opens the door.
         2. Infrared photocell detection: A thru-beam infrared photo detection system shall be installed in the side guides to detect the presence of a pedestrian, vehicle or other obstacle. Upon activation, it shall open the door immediately a keep it open as long as the presence is detected. The standard mounting height for the photocell shall be 12 inches (305 mm) from finish floor.
         3. Soft bottom edge.
      2. Options:

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

* + - * 1. Additional Photo Cells 24VDC PNP XX inches from floor (Safety)
        2. Wash Down: One half drum cover and over-roll feature allow access to fully wash the curtain and drum after the wash down button on the control box is activated (allows curtain to unwrap for access to the drum).
        3. Steel Control box with Disconnect: 22 x 13 x 7 inch (559 x 330 x 178 mm).
        4. Control Box, 304 Stainless Steel: 22 x 13 x 7 inch (559 x 330 x 178 mm) NEMA 4x.
        5. Horn: 24 Vac. Remote. NEMA 4x. Specify Function.
        6. Strobe Light: 24 Vac. Remote. Amber.
        7. Orange Flashing Light: 24 V. Remote. Amber. Orange flashing light, NEMA 12, which activates during the opening and closing of the door.

Provide a warning before closing: Two orange lights activate when the door opens, after the opening of the door the orange lights cut off; the lights re-activate for plus or minus two seconds (adjustable) before the door opens and remain active without interruption until the door is completely closed.

* + - * 1. Traffic Lights: 24 Vac LED Green/Red. Set.
        2. SafePass LED Signaling System: As an accessory for any Dynaco door. Available with 2 or 4 light bars.
        3. Airlock Function: Only between multiple Dynaco doors.

Each door will have its own control box and opening commands.

Either door will only open when the companion door is closed.

Any two doors used in the airlock function do not accommodate equal control boxes. One is a slave to the other and programmed differently.

During the submittal process the door and control box that takes priority must be designated.

* + - * 1. Labo Curtain and Seal Package: Additional seal at top of drum and curtain limit air leakage for room operating pressures up to 40 Pa.
        2. Sealing Kit on header; rear side only.
        3. Sealing Kit on header; front side only).
        4. 27 oz Curtain with extra stiffeners spaced plus or minus 20 inches (standard is plus or minus 30 inches).

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

* 1. INTERIOR/EXTERIOR FLEXIBLE DOORS UP TO 18 FEET WIDE

\*\* NOTE TO SPECIFIER \*\* M2 BASIC Designed for up to 100 cycles per day in an interior or exterior environment. Delete if not required.

* + 1. Flexible High-Speed Interior Doors: Jackshaft Operator. M2 BASIC by DYNACO.
       1. Standard Dimensions: 12 feet W x 12 feet H (3658 mm x 3658 mm).
       2. Standard Operating Speed: 24 in/s (610 mm/s).
       3. Operating Type: Gear driven, push-pull movement.
       4. Side Guide: Made of structural channels of 3-5/16 inches x 2 inches x 1/8 inch (84 mm x 51 mm by 3 mm) in galvanized steel.
       5. Inner Side Guide: Polyethylene (PE-UHMW 1000); outer section 1/2 inch x 13/16 inch (13 mm x 21 mm), fixed at the base of the structural channels with springs. The door curtain shall be stretched between the side guides.
       6. Drum: In steel, diameter 4 inches x 0.078 inch, (102 mm x 2 mm) shafts in steel.
       7. Door Curtain: Very resistant PVC. Provided with side sealing zippers; soft bottom edge design.

\*\* NOTE TO SPECIFIER \*\* Available in different colors. Insert color required.

* + - 1. Color: \_\_\_\_\_.
      2. Motor: 1/2 HP-60 Hz Jackshaft Motor Operator. (HP may vary with door size).

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

* + - 1. Provide Motor Cover.
      2. Control Circuit; Electronic control board with 5V logic. 24VAC Output Logic Provided.

\*\* NOTE TO SPECIFIER \*\* Options included:

* + - 1. B2, E2 wiring, timer to close, mid-stop, delay on reverse, maximum run timer. Refer to drawings.
      2. Operator: Manufactured by MANARAS: Opera-H-Jackshaft Operator with industrial duty motor for up to 25 cycles/hour or 100 cycles/day. Electronic control board supplied with floor level disconnect for manual operation.

\*\* NOTE TO SPECIFIER \*\* Delete power supply not required.

* + - 1. Power Supply: Standard: Single phase 115 VAC.
      2. Power Supply: Single phase 208-230 VAC.
      3. Power Supply: Three phase 208 VAC.
      4. Power Supply: Three phase 460 VAC.
      5. Power Supply: Three phase 575 VAC.
      6. Frequency: 60 Hz. The customer shall provide circuit protection. 8A for 115/1/60, 4A for 230/1/60, 2.1A for 208/3/60, 1A for 460/3/60 and 0.8A for 575/3/60.
      7. Detectors:
         1. An infrared photocell, detecting the presence of a pedestrian or a vehicle, immediately opens the door and keeps it open as long as the presence is detected.

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

* + - * 1. Height of photocell: 12 inches (305 mm) from the floor.
        2. Height of photocell: Up to maximum 24 inches (610 mm) from the floor.
        3. A bottom edge detector opens the door when it hits an obstacle during the closing cycle. This detector is positioned in the bottom part of the curtain.
      1. Space Requirements: All indicated dimensions are net: the space necessary for mounting and maintenance must be provided. Reduced dimensions: upon request. Refer to drawings.

\*\* NOTE TO SPECIFIER \*\* POWER M2 Designed for interior and exterior environments. Delete if not required.

* + 1. Flexible High-Speed Interior/Exterior Doors: POWER M2 by DYNACO. For outside environments exposed to high winds and other weather extremes. Moderate to High Wind Load or Pressure.
       1. Wind Resistance: 60 mph 9.29 lbs/sq ft for an 18 feet (5486 mm) wide door.
       2. Standard Dimensions: 18 feet W x 18 feet H (5486 mm x 5486 mm).

\*\* NOTE TO SPECIFIER \*\* 48 in/s is standard. Delete operating speed not required.

* + - 1. Operating Speed: 48 in/s (1219 mm/s).
      2. Operating Speed: 96 in/s (2438 mm/s).
      3. Operating Type: Gear driven, push-pull movement.
      4. Side Guide: Made of structural channels of 3-1/8 inches x 1-5/8 inches x 1/8 inch (79 mm x 41 mm x 3 mm) in galvanized steel.
      5. Inner Side Guide: Polyethylene (PE-UHMW 1000); outer section 7/8 inch x 1-9/16 inches (22 mm x 40 mm), on springs. Galvanized side covers included.
      6. Drum: In steel, diameter 4 inches x 0.078 inch, (102 mm x 2 mm) shafts in steel.
      7. Door Curtain: Very resistant PVC. Provided with side sealing zippers; soft bottom edge design.

\*\* NOTE TO SPECIFIER \*\* Available in different colors. Insert color required.

* + - 1. Color: \_\_\_\_\_.
      2. Motor: Without brake, with 4 poles, controlled by a variable speed drive. Power: 1 HP for a door surface up to 18 sq yds (15 sq m); 2 HP (larger surface). Protection degree NEMA 4.
      3. Gearbox: Size 80 for a motor of 1 HP and gear reduction ratio 1/7; size 90 for 2 HP.
      4. Door Positioning: Absolute encoder mounted within the drive unit.

\*\* NOTE TO SPECIFIER \*\* Delete power supply not required.

* + - 1. Power Supply: Standard. Single phase 208-230 VAC.
      2. Power Supply: Three phase 208 VAC.
      3. Power Supply: Three phase 460 VAC.
      4. Power Supply: Three phase 575 VAC.
      5. Frequency: 50-60 Hz. Circuit breakers to be provided by the customer: 10 A for a motor of 1 HP and 16 A for 2 HP.
      6. Detectors:
         1. An infrared photocell installed inside the side guide and detecting the presence of a pedestrian or a vehicle. Upon activation, it opens the door immediately and keeps it open as long as the presence is detected.

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

* + - * 1. Height of photocell: 12 inches (305 mm) from the floor.
        2. Height of photocell: Up to maximum 24 inches (610 mm) from the floor.
        3. A bottom edge detector opens the door when it hits an obstacle during the closing cycle. This detector is positioned at the bottom part of the curtain.
      1. Space Requirements: All indicated dimensions are net: the additional space necessary for mounting and maintenance must be taken into account. Reduced dimensions upon request. Refer to drawings.

\*\* NOTE TO SPECIFIER \*\* ALL WEATHER M2 Designed for exterior environments exposed to high winds and other weather extremes. Delete if not required.

* + 1. Flexible High-Speed Security Exterior Doors: ALL WEATHER M2 by DYNACO.
       1. For Extreme Wind and Pressure up to 185 mph (298 kph) - no wind bars shall be required.
       2. Wind Resistance: 115 mph (185 kph) 34.52 lbs/sq ft for an 18 feet (5486 mm) wide door.
       3. Standard Dimensions: 18 feet W x 18 feet H (5486 mm x 5486 mm).

\*\* NOTE TO SPECIFIER \*\* 48 inches/second is standard. Delete operating speed not required.

* + - 1. Operating Speed: 48 in/s (1219 mm/s).
      2. Operating Speed: 96 in/s (2438 mm/s).
      3. Operating Type: Gear driven, push-pull movement.
      4. Side Guide: Made of structural channels of 3-1/8 inches x 1-5/8 inches x 1/8 inch (79 mm x 41 mm x 3 mm) in galvanized steel.
      5. Inner Side Guide: Polyethylene (PE-UHMW 1000); outer section 7/8 inch x 1-9/16 inches (22 mm x 40 mm), on springs. Galvanized side covers included.
      6. Drum: In steel, diameter 4 inches x 0.078 inch (102 mm x 2 mm), shafts in steel.
      7. Door Curtain: Very resistant PVC. Provided with side sealing zippers; soft bottom edge design.

\*\* NOTE TO SPECIFIER \*\* Available in different colors. Insert color required.

* + - 1. Color: \_\_\_\_\_.
      2. Motor: Without brake, with 4 poles, controlled by a variable speed drive. Power: 1 HP for a door surface up to 18 sq yds (15 sq m); 2 HP (larger surface). Protection degree NEMA 4.
      3. Gearbox: Size 80 for a motor of 1 HP and gear reduction ratio 1/7; size 90 for 2 HP.
      4. Door Positioning: Absolute encoder mounted within the drive unit.

\*\* NOTE TO SPECIFIER \*\* Delete power supply not required.

* + - 1. Power Supply: Standard. Single phase 208-230 VAC.
      2. Power Supply: Three phase 208 VAC.
      3. Power Supply: Three phase 460 VAC.
      4. Power Supply: Three phase 575 VAC.
      5. Frequency: 50-60 Hz. Circuit breakers to be provided by the customer: 10 A for a motor of 1 HP and 16 A for 2 HP.
      6. Detectors:
         1. An infrared photocell installed inside the side guide and detecting the presence of a pedestrian or a vehicle. Upon activation, it opens the door immediately and keeps it open as long as the presence is detected.

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

* + - * 1. Height of photocell: 12 inches (305 mm) from the floor.
        2. Height of photocell: Up to maximum 24 inches (610 mm) from the floor.
        3. A bottom edge detector opens the door when it hits an obstacle during the closing cycle. This detector is positioned at the bottom part of the curtain.
      1. Space Requirements: All indicated dimensions are net: the additional space necessary for mounting and maintenance must be taken into account. Reduced dimensions upon request. Refer to drawings.

\*\* NOTE TO SPECIFIER \*\* Designed for interior and exterior environments such as agriculture or food, or for similar industries where a high degree of hygiene, frequent cleaning, excellent sealing and/or corrosive conditions are present. Delete if not required.

* + 1. Flexible High-Speed Security Interior Doors: STAINLESS STEEL M2 by DYNACO.
       1. For moderate to high wind loads or pressure.
       2. Wind Resistance: 60 MPH (97 kph) 9.29 lbs/sq ft for an 18 feet (5486 mm) wide door.
       3. Standard Dimensions: 18 feet W x 18 feet H (5486 mm x 5486 mm).

\*\* NOTE TO SPECIFIER \*\* 48 in/s is standard. Delete operating speed not required.

* + - 1. Operating Speed: 48 in/s (1219 mm/s).
      2. Operating Speed: 96 in/s (2438 mm/s).
      3. Operating Type: Gear driven, push-pull movement.
      4. Side Guide: Made of structural channels or 3-1/8 inches x 1-5/8 inches x 0.078 inch (79 mm x 41 mm x 2 mm) in stainless steel.
      5. Inner Side Guide: Polyethylene (PE-UHMW 1000); outer section 7/8 inch x 1-9/16 inches (22 mm x 40 mm), on springs.
      6. Side Guide Covers: Stainless Steel.
      7. Drum: In stainless steel, diameter 4 inches x 0.078 inch (102 mm x 2 mm), shafts in stainless steel. Shafts and flanges are welded interior and exterior of the drum.
      8. Door Curtain: Reinforced PVC. Provided with stainless steel side sealing zippers (Section 5/8 inch x 1/2 inch (16 mm x 13 mm)); soft bottom edge design.

\*\* NOTE TO SPECIFIER \*\* Available in different colors. Insert color required.

* + - 1. Color: \_\_\_\_\_.
      2. Motor: Without brake, with 4 poles, controlled by a variable speed drive. Power: 1 HP for a door surface up to 25 sq yds (21 sq m); 2 HP (larger surface). Protection degree NEMA 4.
      3. Motor Cover: Stainless Steel.
      4. Gearbox: Size 50 for a motor of 1 HP and gear reduction ratio 1/7; size 63 for 2 HP.
      5. Door Positioning: Absolute encoder mounted within the drive unit.

\*\* NOTE TO SPECIFIER \*\* Delete power supply not required.

* + - 1. Power Supply: Standard. Single phase 208-230 VAC.
      2. Power Supply: Three phase 208 VAC.
      3. Power Supply: Three phase 460 VAC.
      4. Power Supply: Three phase 575 VAC.
      5. Frequency: 50-60 Hz. Fuses to be provided by the customer: 10 A for a motor of 1 HP and 16 A for 2 HP.
      6. Detectors:
         1. An infrared photocell installed inside the side guide and detecting the presence of a pedestrian or a vehicle. Upon activation, it opens the door immediately and keeps it open as long as the presence is detected.

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

* + - * 1. Height of photocell: 12 inches (305 mm) from the floor.
        2. Height of photocell: Up to maximum 24 inches (610 mm) from the floor.
        3. A bottom edge detector opens the door when it hits an obstacle during the closing cycle. This detector is positioned at the bottom part of the curtain.
      1. Space Requirements: All indicated dimensions are net: The additional space necessary for mounting and maintenance must be considered. Reduced dimensions upon request. Refer to drawings.

\*\* NOTE TO SPECIFIER \*\* Designed for interior and exterior environments where cold storage with negative temperatures to as low as -22 degrees F -28 degrees C) are required. Delete if not required.

* + 1. Flexible High-Speed Security Interior Doors: FREEZER M2 by DYNACO.
       1. Designed for interior environments where cold storage with negative temperatures as low as -22 degrees F (-28 degrees C) are required. The door shall have an automatic cycle mode to maintain door operation in freezer applications. The control box shall be mounted on the warm side, with optional cold side mounting available. Refer to drawings.
       2. For inside environments with extremely cold temperatures not exposed to winds.
       3. Standard Dimensions: 15 feet W x 15 feet H (4572 mm x 4572 mm).
       4. Opening Speed: 96 in/s (2438 mm/s).Standard
       5. Closing Speed: 48 in/s (1219 mm/s). Standard
       6. Operating Type: Gear driven, push-pull movement.
       7. Side Guide: Made of structural channels of 3-1/8 inches x 1-5/8 inches x 0.078 inch (79 mm x 41 mm x 2 mm) in galvanized steel. Protected by a layer of polyethylene to create a thermal barrier between the door frame and the structure of the building. Provided with heating-cables which prevent ice formation and assures the proper functioning of the door.
       8. Warning: In spite of the presence of heating cables, in some applications an accumulation of ice may occur. For safety reasons, removal of the ice on the door and the floor may be required.

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

* + - 1. Air Circulation Unit: Shall be mounted within the head unit to reduce frost and ice formation.
      2. Inner Side Guide: Polyethylene (PE-UHMW 1000); outer section 7/8 inch x 1-9/16 inches (22 mm x 40 mm), spring loaded, includes heating-cables which prevent ice formation within the side guides.

\*\* NOTE TO SPECIFIER \*\* Galvanized steel is standard. Delete side guide covers not required.

* + - 1. Side Guide Covers: Galvanized Steel.
      2. Side Guide Covers: Stainless Steel.

\*\* NOTE TO SPECIFIER \*\* Steel is standard. Delete drum not required.

* + - 1. Drum: In steel, diameter 4 inches x 0.078 inch (102 mm x 2 mm), shafts in steel.
      2. Drum: In stainless steel, diameter 4 inches x 0.078 inch (102 mm x 2 mm), shafts in stainless steel.
      3. Door Curtain: Reinforced PVC. Provided with stainless steel side sealing zippers (Section 5/8 inch x 1/2 inch (16 mm x 13 mm)); soft bottom edge design.
      4. Motor: Without brake, with 4 poles, controlled by a variable speed drive. Power: 2 HP. Protection degree NEMA 4.

\*\* NOTE TO SPECIFIER \*\* Galvanized steel is standard. Delete motor cover not required.

* + - 1. Motor Cover: Galvanized Steel.
      2. Motor Cover: Stainless Steel.
      3. Gearbox: Size 90 for a motor of 2 HP and gear reduction ratio 1/7.
      4. Door Positioning: Absolute encoder mounted within the drive unit.

\*\* NOTE TO SPECIFIER \*\* Delete power supply not required.

* + - 1. Power Supply: Standard. Single phase 208-230 VAC.
      2. Power Supply: Three phase 208 VAC.
      3. Power Supply: Three phase 460 VAC.
      4. Power Supply: Three phase 575 VAC.
      5. Frequency: 50-60 Hz. Fuses to be provided by the customer: 25 A for a motor of 2 HP.
      6. Detectors:
         1. An infrared photocell installed inside the side guide and detecting the presence of a pedestrian or a vehicle. Upon activation, it opens the door immediately and keeps it open as long as the presence is detected.

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

* + - * 1. Height of photocell: 12 inches (305 mm) from the floor.
        2. Height of photocell: Up to maximum 24 inches (610 mm) from the floor.
        3. A detector within the side guides reverses the door when it hits an obstacle during the closing cycle.
      1. Space Requirements: All indicated dimensions are net: the additional space necessary for mounting and maintenance has to be taken into account. Reduced dimensions upon request. Refer to drawings.
    1. Flexible, high speed overhead coiling door for interior environments with quiet operation: Dynaco D-501 as manufactured by DYNACO.
       1. The D-501 high speed fabric roll-up door shall be a gear driven "Push-Pull" system positively driving the curtain both directions. The curtain is to withstand and operate at negative or positive wind pressures up to 14.62 psf, not including any multiplication coefficients or the configuration of the building. The fabric door panel shall be free of horizontal or vertical bars and/or stiffeners and be constructed of an appropriate weight and material thickness to mold to the shape of any object or person it may contact with little or no impact.
       2. Standard Dimensions: maximum 18 feet wide x 18 feet high (5486 mm x 5486 mm).
       3. Opening Speed: 96 inches per second (2438 mm per second) as determined by the size of the curtain.
       4. Closing Speed: 48 inches per second (1219 mm per second) as determined by the size of the curtain.
       5. Door Operation: Gear driven, push-pull movement with 1-piece belt.
       6. Side Guides: Constructed of structural channels of 3-1/8 inches x 1-5/8 inches x 1/8 inch (79 mm x 41 mm x 3 mm) galvanized steel.
       7. Inner Side Guide: Constructed of polyethylene (PE-UHMW 1000); outer section 7/8 inch x 1 - 9/16 inches (22 mm x 40 mm). The inner side guide shall form a tight air seal when accommodating the curtain.
       8. Side Guide Covers: Galvanized steel, other finishes available.
       9. Seal: The seal of the door panel shall be accomplished by a spring loaded UHMW inner guide and shall perfectly encapsulate the curtain drive locks thereby forming the inner side guide assembly. The seal of the curtain also shall include soft conforming material edges in both the top and bottom of the panel. Side guides shall be free of wearable blade or brush type weather strip systems.
       10. Door Curtain: The door panel shall be constructed of a reinforced PVC fabric at a minimum weight of 27 oz./sq. yd.
       11. Self-Reinserting: Door shall release immediately upon impact from the side guides. After a break-away impact and upon activation, the door fabric panel shall re-insert itself into the side guides and assume the closed position without assistance. This self-reinserting feature shall be fully operational in all stages of the door's opening and closing cycle irrespective of the driving direction of the impact device.
       12. Motor shall be of design, type, size, and capacity as determined by and furnished by door manufacturer to sufficiently operate the entire door assembly. Standard single phase 208-230VAC; three phase 208-230VAC; three phase 460VAC; three phase 575VAC. Frequency: 50-60 Hz. Circuit breakers by others: a minimum of 16A for 2HP.
       13. Standard motor shall be IP65 shaft and gear driven assembly suitable for wash down environment.
       14. Motor operator shall incorporate soft start and stop technology, dynamic braking, and an absolute encoder for door positioning. Operators using mechanical components including stopping brake, limit switches and clutches are not allowed.
       15. Electric control panel to be a steel NEMA 4 rated enclosure, fully assembled and ready for connection. All components and their configuration shall be UL listed. Control panel shall have on front for easy access, emergency stop button, and an open/close reset push button.
       16. Control panel to contain a variable frequency drive, Solid State electronic programmable controller, emergency stop button, photo eye module, wireless reversing edge receiver, and a rotary disconnect with lock and tag out capability.
       17. Impact sensor: Wireless reversing edge to accommodate both lateral and bottom edge impact. The detector shall reverse the door immediately upon impact and shall be located in the bottom bag of the door. The detector shall be a continuous wireless electronic activated rubber conductor that transmits a signal to the receiver in the controller.
       18. Infrared photocell detection: A thru-beam infrared photo detection system shall be installed in the side guides to detect the presence of a pedestrian, vehicle or other obstacle. Upon activation, it shall open the door immediately a keep it open as long as the presence is detected. The standard mounting height for the photocell shall be 12 inches (305 mm) from finish floor. (Up to maximum of 24 inches (^10 mm) from finish floor where scheduled or required.)

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

* + - 1. Window: For all push-pull doors.
      2. Space Requirements: All indicated dimensions are net: the additional space necessary for mounting and maintenance must be taken into account. Reduced dimensions upon request. Refer to drawings.
    1. Flexible, All weather high performance overhead coiling door for exterior environments: Dynaco D-651 as manufactured by DYNACO.
       1. The DYNACO D-651 All Weather is for medium sized outside applications with intensive use and subjected to extreme wind loads. Protects against wind, rain, snow, dirt, and extreme temperatures. Operating speed and perfect sealing improve traffic flows and provide employee comfort, environmental control, and savings on energy costs. Will automatically reinsert itself in its side guides when curtain is accidentally hit. Small footprint allows maximum use of available space. Driving system and reintroduction block reduce operating noise, creating a quieter environment.
       2. Standard Dimensions (WxH):
          1. Minimum: 3 x 4 ft (917 to 1219 mm).
          2. Maximum: 18 x 18 ft (5486 x 5486 mm).
       3. Opening Speed: 142 inches per second (3607 mm per second) as determined by the size of curtain.
       4. Closing Speed: 48 inches per second (1219 mm per second) as determined by the size of curtain.
       5. Door Operation: Gear driven, push-pull movement with 1-piece belt.
       6. Side Guides: Structural "U" Channels of 3.937 x 1.575 x 0.118 inch (100 x 40 x 3 mm) galvanized steel.
       7. Inner Side Guide: Constructed of polyethylene (PE-UHMW 1000); outer section 7/8 x 1-9/16 inches (22 x 40 mm). The inner side guide shall form a tight air seal when accommodating the curtain.
       8. Side Guide Covers: Galvanized steel, other finishes available.
       9. Seal: The seal of the door panel shall be accomplished by a spring loaded UHMW inner guide and shall perfectly encapsulate the curtain drive locks thereby forming the inner side guide assembly. The seal of the curtain also shall include soft conforming material edges in both the top and bottom of the panel. Side guides shall be free of wearable blade or brush type weather strip systems.
       10. Door Curtain: The door panel shall be constructed of a reinforced PVC fabric at a minimum weight of 27 oz per sq yd. Available in different colors and provided with side sealing zippers.
       11. Self-Reinserting: Door shall release immediately upon impact from the side guides. After a break-away impact and upon activation, the door fabric panel shall re-insert itself into the side guides and assume the closed position without assistance. This self-reinserting feature shall be fully operational in all stages of the door's opening and closing cycle irrespective of the driving direction of the impact device.
       12. Motor shall be of design, type, size and capacity as determined by and furnished by door manufacturer to sufficiently operate the entire door assembly. Standard single phase 230 VAC; three phase 230 VAC. Frequency: 50 to 60 Hz. Circuit breakers by others: a minimum of 18 A for 2 HP.
       13. Standard motor shall be IP65 shaft and gear driven assembly suitable for wash down environment.
       14. Motor operator shall incorporate soft start and stop technology, dynamic braking, and an absolute encoder for door positioning. Operators using mechanical components including stopping brake, limit switches and clutches are not allowed.
       15. Electric control panel to be a steel NEMA 4 rated enclosure, fully assembled and ready for connection. All components and their configuration shall be UL listed. Control panel shall have on front for easy access, emergency stop button, and an open/close reset push button.
       16. Control panel to contain a variable frequency drive, Solid State electronic programmable controller, emergency stop button, photo eye module, wireless reversing edge receiver, and a rotary disconnect with lock and tag out capability.
       17. Impact sensor: Wireless reversing edge to accommodate both lateral and bottom edge impact. The detector shall reverse the door immediately upon impact and shall be located in the bottom bag of the door. The detector shall be a continuous wireless electronic activated rubber conductor that transmits a signal to the receiver in the controller.
       18. Infrared photocell detection: A thru-beam infrared photo detection system installed in side guides to detect presence of a pedestrian, vehicle or other obstacle. Upon activation, door opens immediately stays open as long as presence is detected. The standard mounting height for the photocell shall be 12 inches (305 mm) from finish floor.
       19. Temperature Range: 5 to 122 degrees F (minus 15 to 252 degrees C) not for Freezer applications)

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

* + - 1. Window: For all push-pull doors.
      2. Space Requirements: All indicated dimensions are net. The additional space necessary for mounting and maintenance must be taken into account. Reduced dimensions upon request. Refer to drawings.

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

* 1. INTERIOR/EXTERIOR FLEXIBLE DOORS OVER 18 FEET WIDE

\*\* NOTE TO SPECIFIER \*\* Designed for interior and exterior environments. Delete if not required.

* + 1. Flexible High-Speed Security interior Doors: POWER M3 by DYNACO Doors.
       1. Wind Resistance: 40 mph (64 kph) 4.29 lbs/sq ft for a 39 feet (11887 mm) wide door.
       2. Standard Dimensions: 39 feet W x 18 feet H (11887 mm x 5486 mm).
       3. Standard Operating Speed: 31.2 in/s (792 mm/s).
       4. Operating Type: Gear driven, push-pull movement.
       5. Side Guide: Made of structural channels of 3-15/16 inches x 2 inches x 1/8 inch (100 mm x 51 mm x 3 mm) in galvanized steel.
       6. Inner Side Guide: Polyethylene (PE-UHMW 1000); outer section 7/8 inch x 1-9/16 inches (22 mm x 40 mm), on springs. Galvanized side guide covers included.
       7. Drum: In steel, diameter 5-1/2 inches x 1/8 inch (140 mm x 3 mm), shafts in steel.
       8. Door Curtain: Reinforced PVC. Provided with side sealing zippers; soft bottom edge design.

\*\* NOTE TO SPECIFIER \*\* Available in different colors. Insert color required.

* + - 1. Color: \_\_\_\_\_.
      2. Motor: Without brake, with 4 poles, controlled by a variable speed drive. Power: 2 HP for a door surface up to 61 sq yds (51 sq m); 3 HP (larger surface). Protection degree NEMA 4.
      3. Gearbox: Size 90 for a motor of 2 HP and gear reduction ratio 1/15; size 100 for 3 HP.
      4. Door Positioning: Absolute encoder mounted within the drive unit.

\*\* NOTE TO SPECIFIER \*\* Delete power supply not required.

* + - 1. Power Supply: Standard. Single phase 208-230 VAC.
      2. Power Supply: Three phase 208 VAC.
      3. Power Supply: Three phase 460 VAC.
      4. Power Supply: Three phase 575 VAC.
      5. Frequency: 50-60 Hz. Circuit breakers to be provided by the customer: 16A for a motor of 2 HP; 25 A for 3 HP.
      6. Detectors:
         1. An infrared photocell installed inside the side guide and detecting the presence of a pedestrian or a vehicle. Upon activation, it opens the door immediately and keeps it open as long as the presence is detected.

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

* + - * 1. Height of photocell: 12 inches (305 mm) from the floor.
        2. Height of photocell: Up to maximum 24 inches (610 mm) from the floor.
        3. A bottom edge detector opens the door when it hits an obstacle during the closing cycle. This detector is positioned at the bottom part of the curtain.
      1. Space Requirements: All indicated dimensions are net: the additional space necessary for mounting and maintenance must be taken into account. Reduced dimensions upon request. Refer to drawings.

\*\* NOTE TO SPECIFIER \*\* For outside environments exposed to high winds and other weather extremes. Delete if not required.

* + 1. Flexible High-Speed Exterior Doors: ALL WEATHER M3 by DYNACO.
       1. Wind Resistance: 77 mph (124 kph) 15.93 lbs/sq ft for a 39 feet (11887 mm) wide door.
       2. Standard Dimensions: 39 feet W x 18 feet H (11887 mm x 5486 mm).
       3. Standard Operating Speed: 31.2 in/sec (792 mm/sec).
       4. Operating Type: Gear driven, push-pull movement.
       5. Side Guide: Made of structural channels of 3-15/16 inches x 2 inches x 1/8 inch (100 mm x 51 mm x 3 mm) in galvanized steel.
       6. Inner Side Guide: Polyethylene (PE-UHMW 1000); outer section 7/8 inch x 1-9/16 inches (22 mm x 40 mm), on springs. Galvanized side guide covers included.
       7. Drum: In steel, diameter 5-1/2 inches x 1/8 inch (140 mm x 3 mm), shafts in steel.
       8. Door Curtain: Reinforced PVC. Provided with side sealing zippers; soft bottom edge design.

\*\* NOTE TO SPECIFIER \*\* Available in different colors. Insert color required.

* + - 1. Color: \_\_\_\_\_.
      2. Fore Frame: Painted Fore frame included.
      3. Motor: Without brake, with 4 poles, controlled by a variable speed drive. Power: 2 HP for a door surface up to 44 sq yds (37 sq m); 3 HP (larger surface). Protection degree NEMA 4.
      4. Gearbox: Size 90 for a motor of 2 HP and gear reduction ratio 1/15; size 100 for 3 HP.
      5. Door Positioning: Absolute encoder mounted within the drive unit.

\*\* NOTE TO SPECIFIER \*\* Delete power supply not required.

* + - 1. Power Supply: Standard. Single phase 208-230 VAC.
      2. Power Supply: Three phase 208 VAC.
      3. Power Supply: Three phase 460 VAC.
      4. Power Supply: Three phase 575 VAC.
      5. Frequency: 50-60 Hz. Circuit breakers to be provided by the customer: 16 A for a motor of 2 HP and 25 A for 3 HP.
      6. Detectors:
         1. An infrared photocell installed inside the side guide and detecting the presence of a pedestrian or a vehicle. Upon activation, it opens the door immediately and keeps it open as long as the presence is detected.

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

* + - * 1. Height of photocell: 12 inches (305 mm) from the floor.
        2. Height of photocell: Up to maximum 24 inches (610 mm) from the floor.
        3. A bottom edge detector opens the door when it hits an obstacle during the closing cycle. This detector is positioned at the bottom part of the curtain.
      1. Space Requirements: All indicated dimensions are net: The additional space necessary for mounting and maintenance must be taken into account. Reduced dimensions upon request. Refer to drawings.

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

* 1. INTERIOR/EXTERIOR SECURITY/FIRE DOORS
     1. Security Doors: S-631 RIGID DOOR by DYNACO.
        1. Wind resistance up to 90 mph (145 kph).
        2. Minimum Dimensions: W 4 feet x H 8 feet (1219 mm x 2438 mm ).
        3. Maximum Standard Dimensions: W 17 feet x H 16 feet (5182 mm x 4877 mm).
        4. Door Curtain Construction:
           1. Anodized Aluminum Slats. EPDM rubber connection
           2. Polyurethane belt with 10 steel stranded wires: Individual slats are mounted to a high-strength belt.Hinges or rollers on the slats will not be accepted. Door continues to operate when slat is missing. Slats can be replaced quickly and easily while the door remains operational.
           3. Counterbalanced.
        5. Door Components:
           1. Side Frames: 11 gauge galvanized steel.
           2. Manual release.
           3. Patented Disc Drive, utilizing adapter plates, so the curtain never rolls on itself. Disc Drive reduces wear, vibration, and noise.
           4. Top Roll: Powder coated steel.
        6. Speeds:
           1. Opening Speed: Up to 96 inches (2438 mm) per sec.
           2. Closing Speed: Approximately 24 inches (610 mm) per sec.
        7. Control and Drive System:
           1. Control Panel: Dynalogix Controller
           2. Motor: 1.5 Hp, 3 phase, 50/60 Hz
           3. Limits Adjustments: At keypad interface.
           4. Protection: NEMA-4.

\*\* NOTE TO SPECIFIER \*\* Door blade window slates are optional. Delete if not required.

* + - 1. Motor: 4 poles, with parking brake - power: 1.1 kW.
      2. Control Box Type: Includes DYNALOGIX II door controller, fused rotary disconnect, 24 VAC control transformer, and variable frequency drive.
      3. Bottom Edge Detector: Wireless DYNACO detector (WDD).
      4. Safety Device: Standard light curtain integrated in the side frame. Active height = 72 inches (1829 mm).

\*\* NOTE TO SPECIFIER \*\* Delete power supply not required.

* + - 1. Power Supply:
         1. Standard. Single phase 208-230 VAC.20 A.
         2. Three phase 208 VAC.20 A.
         3. Three phase 460 VAC.10 A.
         4. Three phase 575 VAC. 6 A.
      2. Water Permeability: Ref: EN 12425 Test acc: EN 12489 Result: Class 1.
      3. Options:
         1. Powder coat spring boxes and guides (excludes inner guide cover).
         2. Cover Package (Galvanized steel).
         3. Cover Package (Powder coat painted).
         4. Windows:

Window Lamella: 4.92 inches(125 mm).

Perforated Lamella: 4.92 inches (125 mm).

Window Lamella: 4.92 inches (125 mm) 4 pack position 11-14.

Full Vision Door: First 2 and last 4 standard lamella.

Requires just over 22 inches above the lintel.

\*\* NOTE TO SPECIFIER \*\* DYNAGRID Door Designed for interior and exterior environments. Delete if not required.

* + - 1. Wind resistance up to 90 mph (145 kph).
      2. Minimum Dimensions: W 6 feet - 0 inches (1828 mm) x H 6 feet 2 inches (1878 m).
      3. Maximum Standard Dimensions: W 20 feet (6096 mm) x H 10 feet (3048 mm).

\*\* NOTE TO SPECIFIER \*\* Door blade window slates are optional. Delete if not required.

* + - 1. Door Curtain Construction:
         1. Anodized Aluminum Slats. EPDM rubber connection.
         2. Polyurethane belt with 10 steel stranded wires : Individual slats are mounted to a high-strength belt. Hinges or rollers on the slats will not be accepted. Door continues to operate when slat is missing. Slats can be replaced quickly and easily while the door remains operational.
         3. Counterbalanced.
      2. Door Components:
         1. Side Frames: 11 gauge galvanized steel.
         2. Manual release.
         3. Disc Drive: Reduces wear, vibration, and noise.
         4. Top Roll: Powder coated steel.
      3. Speeds:
         1. Opening Speed: Up to 96 inches (2438 mm) per sec.
         2. Closing Speed: Approximately 24 inches (610 mm) per sec.
      4. Control and Drive System:
         1. Control Panel: Dynalogix II Controller
         2. Motor: 1.5 Hp, 3 phase, 50/60 Hz
         3. Fused rotary disconnect, 24 VAC control transformer, and variable frequency drive.
         4. Limits Adjustments: At keypad interface.
         5. Protection: NEMA-4.
      5. Motor: 4 poles, with parking brake - power: 1.1 kW.
      6. Bottom Edge Detector: Wireless DYNACO detector (WDD).
      7. Safety Device: Standard light curtain integrated in the side frame. Active height = 72 inches (1829 mm).
      8. Power Supply:
         1. Standard. Single phase 208-230 VAC.20A
         2. Three phase 208 VAC.20A
         3. Three phase 460 VAC.10A
         4. Three phase 575 VAC. 6A
      9. Water Permeability: Ref: EN 12425 Test acc: EN 12489 Result: Class 1.

\*\* NOTE TO SPECIFIER \*\* DYNAGRID Door Designed for interior and exterior environments. Delete if not required.

* 1. EXTERIOR SECURITY RUBBER DOORS
     1. An extremely durable high performance door with refined and improved side guides for enhanced rubber panel retention in high winds. It can take a hit and hold up in the most rugged industrial applications, unlike flimsy conventional doors that buckle under conditions)
     2. Basis of Design: S-741 Rubber by DYNACO.
        1. Opening Speeds (Springless System)
           1. Opening to 60 inches (1524 mm) per second; size dependent.
           2. Closing to 24 inches (610 mm) per second.
        2. Door Dimensions:
           1. Minimum Dimensions: W 8 feet x H 8 feet (2438 to 2438 mm).
           2. Maximum Dimensions: W 8 feet x H 24 feet (2438 to 7315 mm).
        3. Safety Features:
           1. Photo eye.
           2. Wireless bottom edge sensors, no coil cords. Light curtain optional.

\*\* NOTE TO SPECIFIER \*\* Delete door panel options not required. SBR is standard.

* + - 1. Door Panel: Two layers Styrene Butadiene Rubber (SBR) with polyester cord center.
         1. Breaking strength 1100lbs/in/ply. Available in black color.
         2. Warranty: Lifetime.
      2. Door Panel: EPDM.
         1. Optionally available in blue or gray color.
      3. Door Panel: MSHA.
         1. Flame resistant panel optionally available in black.
      4. Static Wind Resistance:
         1. Windlock and Guide System: 20 psf (0.96 kPa) at 88 mph (141.6 kph).

Continuous Windlok handles high wind loads, positive and negative air pressures, and can compress during accidental impact without damage.

A near airtight seal for climate control and energy savings in harsh environments.

* + - * 1. Wind Gussets 30 psf (1.44 kPa) at 110 mph (177 kph).
        2. Wind Bar Rollers Available
      1. Door Components:
         1. Springless System: Direct drive unit.
         2. Side Frames: Self-supporting, heavy-duty painted steel.
         3. Idler Tube: 4.5 inch (114 mm) diameter. Length: 134 inch (3404 mm).
         4. Door Roll: 8-5/8 inch (219 mm) diameter. Tube thickness: 0.188 inch (4.77 mm).
      2. Comply with ASTM A513.
         1. Bottom Bar: Steel construction.
         2. Manual Egress: Chain hoist.
      3. Control and Drive System:

\*\* NOTE TO SPECIFIER \*\* Delete input voltage options not required.

* + - * 1. Input Voltage: 208-240 V, 3 phase.
        2. Input Voltage: 480 V, 3 phase.
        3. Input Voltage: 575 V, 3 phase.
        4. Motor: Up to 3.35 Hp, 3 phase, 60 Hz.
      1. Controller: UL approved industrial grade, modular design DYNALOGIX II control system (with fully sealed, high resolution absolute encoder and variable frequency drive), providing a smooth, consistent operation where productivity, reliability and safety are paramount. Control system housed in NEMA 4/12 enclosure.
      2. Warranty:
         1. Mechanical and Electrical Components: Two years.
         2. Labor: One year.

1. EXECUTION
   1. EXAMINATION
      1. Do not begin installation until substrates have been properly prepared.
      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.
   3. INSTALLATION
      1. Install in accordance with manufacturer's instructions and in proper relationship with adjacent construction. Test for proper operation and adjust until satisfactory results are obtained.
   4. PROTECTION
      1. Protect installed products until completion of project.
      2. Touch-up, repair or replace damaged products before Substantial Completion.

END OF SECTION