



SECTION 08360 (08 36 16)

SECTIONAL OVERHEAD DOORS

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**** NOTE TO SPECIFIER **** Raynor; commercial sectional overhead doors.

This section is based on the products of Raynor, which is located at:

1101 East River Rd. P. O. Box 448
Dixon, IL 61021-0448
Toll Free Tel: 800-4-RAYNOR
Tel: 815-288-1431
Fax: 888-598-4790
Email: [request info \(thegarage@raynor.com\)](mailto:request info (thegarage@raynor.com))
Web: www.raynor.com
[Click Here] 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 .

Raynor has more than 800 professional installing distributors in the United States and throughout 54 nations around the world. They pride themselves in excellent product knowledge, installations 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, or contact us at 1-800-4-RAYNOR.

Refer to specifications in this section for the following types of Raynor Overhead Doors:
Commercial Sectional Doors: TC200, ThermaSeal, SteelForm, AlumaView, and DesignForm, StyleForm.

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Commercial sectional doors.

1.2 RELATED SECTIONS

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

- A. Section 05500 - Metal Fabrications: Miscellaneous for steel supports.
- B. Section 08710 - Door Hardware: Hardware, locks, access panels.

- C. Section 09900 - Painting: Field painting.
- D. Section 11150 - Parking Control Equipment: Parking control equipment for remote door controls.
- E. Section 16050 - Basic Electrical Materials and Methods: Electrical connections and service for powered door operators.

1.3 REFERENCES

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

- A. ASTM International (ASTM):
 - 1. ASTM A 653/A 653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
 - 2. ASTM C 518 - Standard Test Method for Steady-State Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus.
 - 3. ASTM E 283 - Standard Test Method for Determining the Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen.

1.4 SUBMITTALS

- A. Submit under provisions of Section 01300.
- B. 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.
- C. Performance Standards: Provide test data validating the following:
 - 1. Door Section: Gloss retention, fade resistance, FDA compliance, cold crack performance, load to rebound, dent resistance impact.
 - 2. Drive Train: Spring cycle life, track, hinges, rollers, cable assembly, cable strength.
 - 3. Door Assembly: Thermal performance, deflection, wind load.
- D. Shop Drawings:
 - 1. Provide drawings indicating track details, head and jamb conditions, spring shafts, 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).
- E. 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.**

- F. Selection Samples: For each finish product specified, two complete sets of color chips representing manufacturer's full range of available colors and patterns.

- G. Verification Samples: For each finish product specified, two samples, minimum size 6 inches (150 mm) square, representing actual product, color, and patterns.

1.5 QUALITY ASSURANCE

- A. Installer Qualifications: Utilize an installer having demonstrated experience on projects of similar size and complexity, and trained and authorized by the door manufacturer to perform the work of this section.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Store products in manufacturer's unopened packaging until ready for installation.

1.7 PROJECT CONDITIONS

- A. 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.

1.8 WARRANTY

- A. Provide manufacturer's standard warranty against defects in material and workmanship, as further described with each model in Part 2 of this Section.

**** NOTE TO SPECIFIER ** Warranty for ControlHoist 2.0 commercial operators, operator only. Delete if not required.**

- B. Manufacturer's Warranty for ControlHoist 2.0 Commercial Operators: Provide manufacturer's standard warranty.
 - 1. Raynor warrants the electrical operator and component parts for two (2) years against defects in material and workmanship when purchased as operator only.

**** NOTE TO SPECIFIER ** Warranty for ControlHoist 2.0 commercial operators, door and operator. Delete if not required.**

- C. Manufacturer's Warranty for ControlHoist 2.0 Commercial Operators Door and Operator Warranty Package: Provide manufacturer's standard warranty.
 - 1. Raynor warrants the electrical operator and component parts against defects in material and workmanship for three (3) years, on the operator only, when purchased with any model of Raynor commercial sectional door.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Acceptable Manufacturer: Raynor, which is located at: 1101 East River Rd. P. O. Box 448; Dixon, IL 61021-0448; Toll Free Tel: 800-4-RAYNOR; Tel: 815-288-1431; Fax: 888-598-4790; Email: request info (thegarage@raynor.com); Web: 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.**

- B. Substitutions: Not permitted.

- C. Requests for substitutions will be considered in accordance with provisions of Section 01600.

**** NOTE TO SPECIFIER **** Revise paragraph below to suit project requirements. If a reader of this section could reasonably expect to find a product or component specified in this section, but it is actually specified elsewhere, then the related section number(s) should be listed in the paragraph below. Delete door product if not required.

2.2 SECTIONAL THERMAL SANDWICH DOOR (POLYSTYRENE OR POLYURETHANE INSULATION)

**** NOTE TO SPECIFIER **** Delete TC Series if not required.

- A. TC Series as manufactured by Raynor Garage Doors:

1. Doors:
a. Operation:

**** NOTE TO SPECIFIER **** Delete door operation not required. There are restrictions on size of door for manual or hand chain operation.

- 1) Provide doors designed for manual operation.
- 2) Provide doors designed for hand chain operation.
- 3) Provide doors designed for electric motor operation.

- b. Jamb Construction:

**** NOTE TO SPECIFIER **** Delete jamb not required.

- 1) Steel jambs with self-tapping fasteners.
- 2) Wood jambs with lag screw fasteners.
- 3) Masonry jambs with anchor bolt fasteners.

- c. Structural Performance Requirements:

**** NOTE TO SPECIFIER **** Insert required wind load p.s.f.

- 1) Wind Loads: Uniform pressure of: _____ psf.

2. Sections:

- a. TC200:

- 1) Sections shall be pressure bonded to a 1-7/8 inches (48 mm) thick expanded polystyrene core with interior and exterior skins separated by a continuous thermal break. Hinge reinforcement plates shall be 16 gauge edge plates and 16 gauge center plates, located within section interior at every hinge location. End stiles to be 18 gauge galvanized steel.
- 2) Material: Steel sandwich construction, 2 inches (50.8 mm) thick, roll formed from draw quality, hot-dipped galvanized (G40 exterior) steel complying with ASTM A 653. Exterior and interior skin to be constructed of 26 gauge steel embossed stucco texture.
- 3) Finish: Exterior skin to have two coats of paint, one primer coat and one finish coat.

**** NOTE TO SPECIFIER **** Delete color not required.

- a) Color: White polyester paint.
- b) Color: Almond polyester paint.
- c) Color: BronzeTone polyester paint.
- d) Color: ClayTone polyester paint.
- e) Color: Dark Brown Kynar paint.
- f) Color: Frost White Kynar paint.
- g) Color: Beige Kynar paint.
- h) Color: Sepia Brown Kynar paint.

- i) Color: Desert Tan polyester paint.
 - j) ArmorBrite Powdercoat finish, color as selected by Architect.
 - k) Color: _____.
 - l) Color: As detailed on the Drawings.
 - m) Color: As determined by Architect from Raynor's ColorWave post paint process featuring 1500 colors of Sherwin Williams Polane Enamel paint.
- 4) Insulation: Expanded polystyrene with R-value of 10.25.
- b. TC224:
- 1) Sections shall be pressure bonded to a 1-7/8 inches (48 mm) thick expanded polystyrene core with interior and exterior skins separated by a continuous thermal break. Hinge reinforcement plates shall be 16 gauge edge plates and 16 gauge center plates, located within section interior at every hinge location. End stiles to be 18 gauge galvanized steel.
 - 2) Material: Steel sandwich construction, 2 inches (50.8 mm) thick, roll formed from draw quality, hot-dipped galvanized (G40 exterior) steel complying with ASTM A 653. Exterior skin to be constructed of 24 gauge steel embossed stucco texture and interior skin to be constructed of 26 gauge steel embossed stucco texture.
 - 3) Finish: Exterior skin to have two coats of paint, one primer coat and one finish coat.

**** NOTE TO SPECIFIER ** Delete color not required.**

- a) Color: White polyester paint.
 - b) Color: Dark Brown Kynar paint.
 - c) Colorwave Finish: Color as selected by Architect.
 - d) ArmorBrite Powdercoat Finish: Color as selected by Architect.
- 4) Insulation: Expanded polystyrene with R-value of 10.25.
- c. Seals: Bottom of door to have flexible U-shaped vinyl seal retained in aluminum rail.

**** NOTE TO SPECIFIER ** Delete optional blade seal below if not required.**

- 1) Provide blade seal on top section to prevent airflow above header.
- d. Trussing: Doors designed to withstand specified windload. Deflection of door in horizontal position to be maximum of 1/120th of door width.

**** NOTE TO SPECIFIER ** Some restrictions may apply based on door height. Actual window width may vary slightly based on door width. Delete if not required.**

3. Windows: Locations to comply with door elevation drawings.

**** NOTE TO SPECIFIER ** Delete window not required.**

- a. 24 inches by 8 inches (610 mm by 203 mm) window in a rectangular two-piece black frame.
- b. 24 inches by 12 inches (610 mm by 305 mm) window in a rectangular two-piece black frame.
- c. 34 inches by 16 inches (864 mm by 406 mm) window in a rectangular two-piece black frame.
- d. Full-view window consisting of aluminum stile and rail construction and color matched to door exterior with powdercoat paint.

**** NOTE TO SPECIFIER ** Options below for TC200 only. Delete if not required.**

- e. 40 inches by 12 inches (1016 mm by 305 mm) full-view (square-edge) window encased in an extruded PVC frame.
- f. 46 inches by 12 inches (1168 mm by 305 mm) full-view (square-edge) window encased in an extruded PVC frame.

**** NOTE TO SPECIFIER ** Door sections are available glazed with insulating glass. Retain, edit or delete paragraphs below to suit project.**

- 4. Glazing: Windows to be provided with insulated glazing units as follows:
 - a. Glass consisting of two panes of 1/8 inch (3.2 mm) thick DSB glass.
 - b. Glass consisting of two panes of 3/16 inch (4.8 mm) thick glass.
 - c. Reinforced glass consisting of one pane of 1/4 inch (6.4 mm) thick wire-reinforced glass (exterior pane) and one pane of 1/8 inch (3.2 mm) DSB glass (interior pane).
- 5. Mounting: Sections mounted in door opening using:

**** NOTE TO SPECIFIER ** Delete mounting not required.**

- a. Between-Jamb Bracket Mounting: sections mounted between door jambs, seal against exterior perimeter seal installed along vertical and top horizontal edges of jambs.
- b. Lap Jamb Angle Mounting: section overlap door jambs by 1 inch (25 mm) on each side of door opening.
- 6. Track:
 - a. Material: Hot-dipped galvanized steel (ASTM A 653), fully adjustable for adequate sealing of door to jamb or weatherseal.

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

- b. Configuration Type: Normal Headroom.
- c. Configuration Type: Low Headroom.
- d. Configuration Type: Vertical Lift.
- e. Configuration Type: Lift-Clearance.
- f. Configuration Type: Incline.
- g. Configuration Type: Contour.

**** NOTE TO SPECIFIER ** The only mounting available on 3-inch lift-clearance is Floor-to-Shaft Angle-Mount and Clip-Angle. Refer to manufacturer's literature for other restrictions. Delete track size, jamb type and mounting options not required.**

- h. Track Size: 2 inches (51 mm).
 - 1) Jamb Type: Wood only.
 - a) Mounting: Adjustable track brackets.
 - 2) Jamb Type: Steel, wood, or masonry.
 - a) Mounting: Floor-to-header angles. Continuous angles from floor to door header. Angle Size: 2-5/16 x 4 x 3/32 inches (59 x 102 x 2.5 mm).
 - b) Mounting: Floor-to-shaft angles. Continuous angles from floor, past header, up to door shaft. Angle Size: 2-5/16 x 4 x 3/32 inch (59 x 102 x 2.5 mm).
 - c) Mounting: QuikClip. Clip-Angle brackets pre-assembled to continuous angle from floor to door header and continuous angle from door header to door shaft. Angle Size: 2-5/16 x 1-1/4 x 3/32 inches (59 x 32 x 2.5 mm).
- i. Track Size: 3 inches (76 mm).
 - 1) Jamb Type: Steel, wood, or masonry.
 - a) Mounting: Floor-to-header angles. Continuous angles from floor to door header. Angle Size: 3-1/2 x 5 x 3/32 inches (89 x 127 x 2.5 mm) on 3-inch track.

- b) Mounting: Floor-to-shaft angles. Continuous angles from floor, past header, up to door shaft. Angle Size: 3-1/2 x 5 x 3/32 inches (89 x 127 x 2.5 mm) on 3-inch track.
- c) Mounting: QuikClip. Clip-Angle brackets pre-assembled to continuous angle from floor to door header and continuous angle from door header to door shaft. Angle Size: 3-1/2 x 1-1/4 x 3/32 inches (89 x 32 x 2.5 mm) on 3-inch track.

j. Finish:

**** NOTE TO SPECIFIER ** Delete finish not required.**

- 1) Galvanized.
- 2) White Powdercoat.

7. Counterbalance:

- a. Counterbalance System: Provided with aircraft-type, galvanized steel lifting cables with minimum safety factor of 5. Torsion Springs consisting of heavy-duty oil-tempered wire torsion springs on a continuous ball-bearing cross-header shaft.

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

- 1) Spring Cycle Requirements: Standard 10,000 cycles.
- 2) Spring Cycle Requirements: High cycle: _____ cycles.

8. Hardware:

- a. Hinges and Brackets: Fabricated from galvanized steel.

**** NOTE TO SPECIFIER ** Delete track size not required.**

- b. Track Rollers: 2 inches (50.8 mm) diameter consistent with track size, with hardened steel ball bearings.
- c. Track Rollers: 3 inches (76.2 mm) diameter consistent with track size, with hardened steel ball bearings.

**** NOTE TO SPECIFIER ** Door may be provided with perimeter seal for jambs. Delete if not required.**

- d. Perimeter Seal: Provide complete weather stripping system to reduce air infiltration. Weather stripping shall be replaceable.
 - 1) For bracket mounted doors provide climate seal or vinyl seal with aluminum retainer.
 - 2) For angle mounted doors provide angle clip-on seal.

**** NOTE TO SPECIFIER ** Door may be provided with exterior or interior locking device. Retain or delete paragraph below to suit project.**

- e. Furnish door system with locks: Exterior lock with five-pin tumbler cylinder, night latch and steel bar engaging track.
 - f. Furnish door system with locks: Interior lock with dead bolt provided with hole to receive padlock provided by Owner.
9. TC Limited Warranty: Raynor warrants the door sections against defects in material and workmanship, and deterioration due to rust-through for ten years from date of delivery to the original purchaser. Raynor also warrants the door sections against delamination of the insulation from the steel skins for ten years from date of delivery to the original purchaser. Window components are warranted against defects in material and workmanship for one year from date of delivery to the original purchaser. Raynor warrants all hardware and spring components against defects in material and workmanship for one year (or cycle life of the springs) from date of delivery to the original purchaser.

Additional Limited Warranty requirements in accordance with manufacturer's full standard limited warranty documentation.

B. ThermaSeal as manufactured by Raynor Garage Doors:

1. Doors:

a. Operation:

**** NOTE TO SPECIFIER ** Delete door operation not required. There are restrictions on size of door for manual or hand chain operation.**

- 1) Provide doors designed for manual operation.
- 2) Provide doors designed for hand chain operation.
- 3) Provide doors designed for electric motor operation.

b. Jamb Construction:

**** NOTE TO SPECIFIER ** Delete jamb not required.**

- 1) Steel jambs with self-tapping fasteners.
- 2) Wood jambs with lag screw fasteners.
- 3) Masonry jambs with anchor bolt fasteners.

c. Structural Performance Requirements:

**** NOTE TO SPECIFIER ** Insert required wind load p.s.f.**

- 1) Wind Loads: Uniform pressure of: _____ psf.

d. International Energy Conservation Code (IECC) Requirements:

- 1) Air Infiltration – Maximum air leakage of 0.4 cfm/ft² is required. Testing shall be in accordance with DASMA 105 test procedure.
- 2) Raynor ThermaSeal TM200 and TM220 provide an air leakage rating of 0.12 cfm/ft² with optional IECC Compliance Package.
- 3) Raynor ThermaSeal TM175 provides an air leakage rating of 0.22 cfm/ft² with optional IECC Compliance Package.
- 4) Raynor ThermaSeal TM200 and TM220 provide an installed U-factor of 0.19.
- 5) Raynor ThermaSeal TM175 provides an installed U-factor of 0.21.

2. Sections:

**** NOTE TO SPECIFIER ** Delete door model TM300, TM320, TM200, TM220, TM200C or TM175 if not required.**

a. ThermaSeal TM320:

- 1) Sections shall be pressure bonded to injected polyurethane foam insulated core. Hinge reinforcement strips shall be 20 gauge galvanized steel, located within section interior. End stiles to be 16 gauge galvanized steel.
- 2) Material: Steel sandwich construction, 3 inches (76 mm) thick, roll formed from commercial quality, hot-dipped galvanized (G40 exterior) steel complying with ASTM A 653. Exterior skin shall be constructed of 20 gauge steel with flush, smooth texture and interior skin shall be 26 gauge steel with embossed stucco texture.
- 3) Finish: Exterior skin to have two coats of paint, one primer coat and one finish coat.
- 4) Color: White polyester paint.
- 5) Insulation: Expanded polyurethane with an R-value of 24.54.

b. ThermaSeal TM300:

- 1) Sections shall be pressure bonded to injected polyurethane foam insulated core. Hinge reinforcement strips shall be 20 gauge

galvanized steel, located within section interior. End stiles to be 16 gauge galvanized steel.

- 2) Material: Steel sandwich construction, 3 inches (76 mm) thick, roll formed from commercial quality, hot-dipped galvanized (G40 exterior) steel complying with ASTM A 653. Exterior skin shall be constructed of 26 gauge steel and interior skin shall be 26 gauge steel with embossed stucco texture.
- 3) Finish: Exterior skin to have two coats of paint, one primer coat and one finish coat.

**** NOTE TO SPECIFIER ** Delete colors not required.**

- a) Color: White polyester paint.
- b) Color: PVDF Coated Brown
- c) Color: PVDF Coated Sepia.
- d) Color: PVDF Coated Beige.
- e) Color: PVDF Coated Frost White.
- f) Color: _____.
- g) Color: As detailed on the Drawings.
- h) Color: As determined by Architect from Raynor's ColorWave post paint process featuring 1500 colors of Sherwin Williams Polane Enamel paint.

- 4) Insulation: Expanded polyurethane with R-value of 24.54.

c. ThermaSeal TM200:

- 1) Sections shall be pressure bonded to injected polyurethane foam insulated core. Hinge reinforcement strips shall be 20 gauge galvanized steel, located within section interior. End stiles to be 16 gauge galvanized steel.
- 2) Material: Steel sandwich construction, 2 inches (51 mm) thick, roll formed from commercial quality, hot-dipped galvanized (G40 exterior) steel complying with ASTM A 653. Exterior skin shall be constructed of 26 gauge steel and interior skin shall be 26 gauge steel with embossed stucco texture.
- 3) Finish: Exterior skin to have two coats of paint, one primer coat and one finish coat.
 - a) Color: White polyester paint.

- 4) Insulation: Expanded polyurethane with R-value of 18.3.

d. ThermaSeal TM200C:

- 1) Sections shall be pressure bonded to injected polyurethane foam insulated core. Hinge reinforcement strips shall be 20 gauge galvanized steel, located within section interior. End stiles to be 20 gauge galvanized steel.
- 2) Material: Steel sandwich construction, 2 inches (51 mm) thick, roll formed from commercial quality, hot-dipped galvanized (G40 exterior) steel complying with ASTM A 653. Exterior skin shall be constructed of 26 gauge steel and interior skin shall be 26 gauge steel with embossed stucco texture.
- 3) Finish: Exterior skin to have two coats of paint, one primer coat and one finish coat.

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

- a) Color: Almond
- b) Color: Frost White
- c) Color: Ivory

- d) Color: Desert Tan
 - e) Color: Sandstone
 - f) Color: Beige
 - g) Color: Bronzestone
 - h) Color: Brown
 - i) Color: Sepia
 - j) Color: Battleship Grey
 - k) Color: Charcoal
 - l) Color: Slate
 - m) Color: Black
- 4) Insulation: Expanded polyurethane with R-value of 18.
- e. ThermaSeal TM220:
- 1) Sections shall be pressure bonded to injected polyurethane foam insulated core. Hinge reinforcement strips shall be 20 gauge galvanized steel, located within section interior. End stiles to be 16 gauge galvanized steel.
 - 2) Material: Steel sandwich construction, 2 inches (51 mm) thick, roll formed from commercial quality, hot-dipped galvanized (G40 exterior) steel complying with ASTM A 653. Exterior skin shall be constructed of 20 gauge steel and interior skin shall be 26 gauge steel with embossed stucco texture.
 - 3) Finish: Exterior skin to have two coats of paint, one primer coat and one finish coat.
 - a) Color: White polyester paint.
 - 4) Insulation: Expanded polyurethane with R-value of 18.3.
- f. ThermaSeal TM175:
- 1) Sections shall be pressure bonded to injected polyurethane foam insulated core. Hinge reinforcement strips shall be 20 gauge galvanized steel, located within section interior. End stiles to be 16 gauge galvanized steel.
 - 2) Material: Steel sandwich construction, 1-3/4 inches (44 mm) thick, roll formed from commercial quality, hot-dipped galvanized (G40 exterior) steel complying with ASTM A 653. Exterior skin shall be constructed of 25 gauge steel and interior skin shall be 26 gauge steel with embossed stucco texture.
 - 3) Finish: Exterior skin to have two coats of paint, one primer coat and one finish coat.

**** NOTE TO SPECIFIER ** Delete color not required.**

- a) Color: White polyester paint.
 - b) Color: Dark Brown Kynar paint.
 - 4) Insulation: Expanded polyurethane with R-value of 16.4.
- g. Seals: Interior and exterior skins to be separated by a molded thermal break and weather seal along section joint. Bottom of door to have flexible U-shaped vinyl seal retained in aluminum rail. Optional dual-durometer vinyl blade seal on top section to prevent airflow above header/
- h. Trussing: Doors designed to withstand specified windload. Deflection of door in horizontal position to be maximum of 1/120th of door width.

**** NOTE TO SPECIFIER ** Some restrictions may apply based on door height. Actual window width may vary slightly based on door width. Delete sizes not required. Delete if windows not required.**

3. Windows: Locations to comply with door elevation drawings.
 - a. Window in Rectangular Two-Piece Black Frame:
 - 1) Size: 24 inches by 8 inches (610 mm by 203 mm).
 - a) Glazing: Two panes of 1/8 inch (3.2 mm) thick DSB glass.
 - b) Glazing: Two panes of 1/8 inch (3.2 mm) thick tempered glass.
 - c) Glazing: Two panes of 1/8 inch (3.2 mm) thick DSB glass with breather tube.
 - 2) Size: 24 inches by 12 inches (610 mm by 305 mm).
 - a) Glazing: Two panes of 1/8 inch (3.2 mm) thick DSB glass.
 - b) Glazing: Two panes of 1/8 inch (3.2 mm) thick tempered glass.
 - c) Glazing: Two panes of 1/8 inch (3.2 mm) thick DSB glass with breather tube.
 - 3) Size: 34 inches by 16 inches (864 mm by 406 mm) window in a rectangular two-piece black frame.
 - a) Glazing: Two panes of 1/8 inch (3.2 mm) thick DSB glass
 - b. Full-view window consisting of aluminum stile and rail construction and color matched to door exterior with powdercoat paint. Provide non-impact rated glazing as follows.
 - 1) Glazing: Clear glass. One pane of 1/8 inch (3.2 mm) DSB non-insulated glass.
 - 2) Glazing: Clear glass. One pane of 3/16 inch (4.8 mm) non-insulated glass.
 - 3) Glazing: Clear glass. One pane of 1/4 inch (6.4 mm) non-insulated glass.
 - 4) Glazing: Clear tempered glass. One pane of 1/8 inch (3.2 mm) non-insulated glass.
 - 5) Glazing: Clear tempered glass. One pane of 1/4 inch (6.4 mm) non-insulated glass.
 - 6) Glazing: Clear tempered glass. One pane of 3/16 inch (4.88 mm) non-insulated glass.
 - 7) Glazing: Clear laminated glass. One pane of 1/4 inch (6.4 mm) non-insulated glass.
 - 8) Glazing: Clear wire glass. One pane of 1/4 inch (6.4 mm) non-insulated glass.
 - 9) Glazing: Tinted bronze glass. One pane of 1/8 inch (3.2 mm) non-insulated glass.
 - 10) Glazing: Laminated bronze glass. One pane of 1/4 inch (6.4 mm) non-insulated glass.
 - 11) Glazing: Tinted bronze tempered glass. One pane of 1/8 inch (3.2 mm) non-insulated glass.
 - 12) Glazing: Tinted smoke grey laminated glass. One pane of 1/4 inch (6.4 mm) non-insulated glass.
 - 13) Glazing: 1/2 inch (12.7 mm) insulated clear glass. Two panes of 1/8 inch (3.2 mm) DSB insulated glass.
 - 14) Glazing: 1/2 inch (12.7 mm) insulated clear glass with breather tube. Two panes of 1/8 inch (3.2 mm) DSB insulated glass.
 - 15) Glazing: 1/2 inch (12.7 mm) insulated clear tempered glass. Two panes of 1/8 inch (3.2 mm) tempered insulated glass.
 - 16) Glazing: 1/2 inch (12.7 mm) insulated low E DSB glass. Two panes of 1/8 inch (3.2 mm) DSB insulated glass.

- 17) Glazing: 1/2 inch (12.7 mm) insulated low E tempered glass. Two panes of 1/8 inch (3.2 mm) tempered insulated glass.
- 18) Glazing: 1/2 inch (12.7 mm) insulated Solarban 60 low E tempered glass. Two panes of 1/8 inch (3.2 mm) tempered insulated glass.
- 19) Glazing: Clear acrylic. One pane of 1/8 inch (3.2 mm).
- 20) Glazing: Clear lexan. One pane of 1/8 inch (3.2 mm).
- 21) Glazing: Clear acrylic. One pane of 1/4 inch (6.4 mm).
- 22) Glazing: Clear lexan. One pane of 1/4 inch (6.4 mm).
- 23) Glazing: 1/8 inch (3.2 mm) satin annealed glass.
- 24) Glazing: 1/8 inch (3.2 mm) satin tempered glass.
- 25) Glazing: 1/2 inch (12.69 mm) insulated satin glass. Two panes of 1/8 inch (3.2 mm) DSB insulated glass.
- 26) Glazing: 1/2 inch (12.69 mm) insulated satin tempered glass. Two panes of 1/8 inch (3.2 mm) tempered insulated glass.
- 27) Glazing: 1/4 inch (6.4 mm) laminated white glass.
- 28) Glazing: 1/8 inch (3.2 mm) smoked gray glass.
- 29) Glazing: 1/8 inch (3.2 mm) smoked gray tempered glass.
- 30) Glazing: 1/2 inch (12.69 mm) insulated smoked gray glass. Two panes of 1/8 inch (3.2 mm) DSB insulated glass.
- 31) Glazing: 1/2 inch (12.69 mm) insulated smoked gray glass. Two panes of 1/8 inch (3.2 mm) tempered insulated glass.
- 32) Glazing: 1/8 inch (3.2 mm) lexan smoked gray glazing.
- 33) Glazing: 1/8 inch (3.2 mm) raised pattern obscure glass.
- 34) Glazing: 1/8 inch (3.2 mm) raised pattern obscure tempered glass.
- 35) Glazing: 1/2 inch (12.69 mm) insulated raised pattern obscure glass. Two panes of 1/8 inch (3.2 mm) DSB insulated glass.
- 36) Glazing: 1/2 inch (12.69 mm) insulated raised pattern obscure tempered glass. Two panes of 1/8 inch (3.2 mm) tempered insulated glass.
- 37) Glazing: 1/2 inch (12.69 mm) insulated tinted bronze glass. Two panes of 1/8 inch (3.2 mm) DSB insulated glass.
- 38) Glazing: 1/2 inch (12.69 mm) insulated tinted bronze glass. Two panes of 1/8 inch (3.2 mm) tempered insulated glass.
- 39) Glazing: 1/4 inch (6.4 mm) laminated frosted white glass.

**** NOTE TO SPECIFIER ** For TM300 models only. Delete if not required.**

- c. Full-view window consisting of aluminum stile and rail construction and color matched to door exterior with powder coat paint. Provide non-impact rated glazing as follows.
 - 1) Glazing: 1 inch (25.4 mm) Insulated Clear Glass. Two panes of 1/8 inch (3.2 mm) DSB insulated glass.
 - 2) Glazing: 1 inch (25.4 mm) Insulated Clear Tempered Glass. Two panes of 1/8 inch (3.2 mm) tempered insulated glass.
 - 3) Glazing: 1 inch (25.4 mm) Insulated Low E DSB Glass. Two panes of 1/8 inch (3.2 mm) DSB insulated glass.
 - 4) Glazing: 1 inch (25.4 mm) Insulated Low E Tempered Glass. Two panes of 1/8 inch (3.2 mm) Tempered insulated glass.
 - 5) Glazing: 1 inch (25.4 mm) Insulated Satin Tempered Glass. Two panes of 1/8 inch (3.2 mm) Tempered insulated glass.
4. Mounting: Sections mounted in door opening using:

**** NOTE TO SPECIFIER ** Delete mounting not required.**

- a. Between-Jamb Bracket Mounting: sections mounted between door jambs, seal against exterior perimeter seal installed along vertical and top horizontal edges of jambs.
 - b. Lap Jamb Angle Mounting: section overlap door jambs by 1 inch (25 mm) on each side of door opening.
5. Track:
- a. Material: Hot-dipped galvanized steel (ASTM A 653), fully adjustable for adequate sealing of door to jamb or weatherseal.

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

- b. Configuration Type: Normal Headroom.
- c. Configuration Type: Low Headroom.
- d. Configuration Type: Vertical Lift.
- e. Configuration Type: Lift-Clearance.
- f. Configuration Type: Incline.
- g. Configuration Type: Contour.

**** NOTE TO SPECIFIER ** The only mounting available on 3-inch lift-clearance is Floor-to-Shaft Angle-Mount and Clip-Angle. Refer to manufacturer's literature for other restrictions. Delete track size, jamb type and mounting options not required.**

- h. Track Size: 2 inches (51 mm).
 - 1) Jamb Type: Wood only.
 - a) Mounting: Adjustable track brackets.
 - 2) Jamb Type: Steel, wood, or masonry.
 - a) Mounting: Floor-to-header angles. Continuous angles from floor to door header. Angle Size: 2-5/16 x 4 x 3/32 inches (59 x 102 x 2.5 mm).
 - b) Mounting: Floor-to-shaft angles. Continuous angles from floor, past header, up to door shaft. Angle Size: 2-5/16 x 4 x 3/32 inch (59 x 102 x 2.5 mm).
 - c) Mounting: QuikClip. Clip-Angle brackets pre-assembled to continuous angle from floor to door header and continuous angle from door header to door shaft. Angle Size: 2-5/16 x 1-1/4 x 3/32 inches (59 x 32 x 2.5 mm).
- i. Track Size: 3 inches (76 mm).
 - 1) Jamb Type: Steel, wood, or masonry.
 - a) Mounting: Floor-to-header angles. Continuous angles from floor to door header. Angle Size: 3-1/2 x 5 x 3/32 inches (89 x 127 x 2.5 mm) on 3-inch track.
 - b) Mounting: Floor-to-shaft angles. Continuous angles from floor, past header, up to door shaft. Angle Size: 3-1/2 x 5 x 3/32 inches (89 x 127 x 2.5 mm) on 3-inch track.
 - c) Mounting: QuikClip. Clip-Angle brackets pre-assembled to continuous angle from floor to door header and continuous angle from door header to door shaft. Angle Size: 3-1/2 x 1-1/4 x 3/32 inches (89 x 32 x 2.5 mm) on 3-inch track.
- j. Finish:

**** NOTE TO SPECIFIER ** Delete finish not required.**

- 1) Galvanized.
 - 2) White Powdercoat.
6. Counterbalance:

- a. Counterbalance System: Provided with aircraft-type, galvanized steel lifting cables with minimum safety factor of 5. Torsion Springs consisting of heavy-duty oil-tempered wire torsion springs on a continuous ball-bearing cross-header shaft.

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

- 1) Spring Cycle Requirements: Standard 10,000 cycles.
- 2) Spring Cycle Requirements: High cycle: _____ cycles.

7. Hardware:

- a. Hinges and Brackets: Fabricated from galvanized steel.

**** NOTE TO SPECIFIER ** Delete track size not required.**

- b. Track Rollers: 2 inches (50.8 mm) diameter consistent with track size, with hardened steel ball bearings.
- c. Track Rollers: 3 inches (76.2 mm) diameter consistent with track size, with hardened steel ball bearings.

**** NOTE TO SPECIFIER ** Door may be provided with perimeter seal for jambs. Delete if not required.**

- d. Perimeter Seal: Provide complete weather stripping system to reduce air infiltration. Weather stripping shall be replaceable.
 - 1) For bracket mounted doors provide climate seal or vinyl seal with aluminum retainer.
 - 2) For angle mounted doors provide angle clip-on seal.

**** NOTE TO SPECIFIER ** Door may be provided with exterior or interior locking device. Retain or delete paragraph below to suit project.**

- e. Furnish door system with locks: Exterior lock with five-pin tumbler cylinder, night latch and steel bar engaging track.
 - f. Furnish door system with locks: Interior lock with dead bolt provided with hole to receive padlock provided by Owner.
8. ThermaSeal Limited Warranty: Raynor warrants the door sections against defects in material and workmanship, and deterioration due to rust-through for ten years from date of delivery to the original purchaser. Raynor also warrants the door sections against delamination of the insulation from the steel skins for ten years from date of delivery to the original purchaser. Window components are warranted against defects in material and workmanship for one year from date of delivery to the original purchaser. Raynor warrants all hardware and spring components against defects in material and workmanship for one year (or cycle life of the springs) from date of delivery to the original purchaser. Additional Limited Warranty requirements in accordance with manufacturer's full standard limited warranty documentation.

C. TH Series as manufactured by Raynor Garage Doors:

1. Doors:

a. Operation:

**** NOTE TO SPECIFIER ** Delete door operation not required. There are restrictions on size of door for manual or hand chain operation.**

- 1) Provide doors designed for manual operation.
- 2) Provide doors designed for hand chain operation.
- 3) Provide doors designed for electric motor operation.

b. Jamb Construction:

**** NOTE TO SPECIFIER ** Delete jamb not required.**

- 1) Steel jambs with self-tapping fasteners.
 - 2) Wood jambs with lag screw fasteners.
 - 3) Masonry jambs with anchor bolt fasteners.
- c. Structural Performance Requirements:

**** NOTE TO SPECIFIER ** Insert required wind load p.s.f.**

- 1) Wind Loads: Uniform pressure of: _____ psf.
2. Sections:
- a. TH160:
 - 1) Sections shall be pressure bonded to injected polyurethane foam insulated core. Hinge reinforcement strips shall be 20 gauge galvanized steel, located within section interior. End stiles to be 16 gauge galvanized steel.
 - 2) Material: Steel sandwich construction, 1-5/8 inches (41 mm) thick, roll formed from commercial quality, hot-dipped galvanized (G40 exterior) steel complying with ASTM A 653. Exterior skin shall be constructed of .015 thick steel and interior skin shall be 0.015 inch thick with embossed stucco texture.
 - 3) Finish: Exterior skin to have two coats of paint, one primer coat and one finish coat.
 - a) Color: White polyester paint.
 - 4) Insulation: Expanded polyurethane with R-value of 14.8.
 - b. Seals: Interior and exterior skins to be separated by continuous hot melt to form thermal break and complete weatherseal along section joint. Bottom of door to have flexible U-shaped EPDM rubber seal retained in aluminum rail. Optional dual-durometer vinyl blade seal on top section to prevent airflow above header
 - c. Trussing: Doors designed to withstand specified windload. Deflection of door in horizontal position to be maximum of 1/120th of door width.

**** NOTE TO SPECIFIER ** Some restrictions may apply based on door height. Actual window width may vary slightly based on door width. Delete if not required.**

3. Windows: Locations to comply with door elevation drawings.

**** NOTE TO SPECIFIER ** Delete window not required.**

- a. 24 inches by 12 inches (610 mm by 305 mm) window in a rectangular two-piece black frame.

**** NOTE TO SPECIFIER ** Door sections are available glazed with insulating glass. Retain, edit or delete paragraphs below to suit project.**

4. Glazing: Windows to be provided with insulated glazing units as follows:
 - a. Glass consisting of two panes of 1/8 inch (3.2 mm) thick DSB glass.
 - b. Glass consisting of two panes of 1/8 inch (3.2 mm) thick acrylic.
5. Mounting: Sections mounted in door opening using:

**** NOTE TO SPECIFIER ** Delete mounting not required.**

- a. Between-Jamb Bracket Mounting: sections mounted between door jambs, seal against exterior perimeter seal installed along vertical and top horizontal edges of jambs.
 - b. Lap Jamb Angle Mounting: section overlap door jambs by 1 inch (25 mm) on each side of door opening.
6. Track:
- a. Material: Hot-dipped galvanized steel (ASTM A 653), fully adjustable for adequate sealing of door to jamb or weatherseal.

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

- b. Configuration Type: Normal Headroom.
- c. Configuration Type: Low Headroom.
- d. Configuration Type: Vertical Lift.
- e. Configuration Type: Lift-Clearance.
- f. Configuration Type: Incline.
- g. Configuration Type: Contour.

**** NOTE TO SPECIFIER ** The only mounting available on 3-inch lift-clearance is Floor-to-Shaft Angle-Mount and Clip-Angle. Refer to manufacturer's literature for other restrictions. Delete track size, jamb type and mounting options not required.**

- h. Track Size: 2 inches (51 mm).
 - 1) Jamb Type: Wood only.
 - a) Mounting: Adjustable track brackets.
 - 2) Jamb Type: Steel, wood, or masonry.
 - a) Mounting: Floor-to-header angles. Continuous angles from floor to door header. Angle Size: 2-5/16 x 4 x 3/32 inches (59 x 102 x 2.5 mm).
 - b) Mounting: Floor-to-shaft angles. Continuous angles from floor, past header, up to door shaft. Angle Size: 2-5/16 x 4 x 3/32 inch (59 x 102 x 2.5 mm).
 - c) Mounting: QuikClip. Clip-Angle brackets pre-assembled to continuous angle from floor to door header and continuous angle from door header to door shaft. Angle Size: 2-5/16 x 1-1/4 x 3/32 inches (59 x 32 x 2.5 mm).
- i. Track Size: 3 inches (76 mm).
 - 1) Jamb Type: Steel, wood, or masonry.
 - a) Mounting: Floor-to-header angles. Continuous angles from floor to door header. Angle Size: 3-1/2 x 5 x 3/32 inches (89 x 127 x 2.5 mm) on 3-inch track.
 - b) Mounting: Floor-to-shaft angles. Continuous angles from floor, past header, up to door shaft. Angle Size: 3-1/2 x 5 x 3/32 inches (89 x 127 x 2.5 mm) on 3-inch track.
 - c) Mounting: QuikClip. Clip-Angle brackets pre-assembled to continuous angle from floor to door header and continuous angle from door header to door shaft. Angle Size: 3-1/2 x 1-1/4 x 3/32 inches (89 x 32 x 2.5 mm) on 3-inch track.
- j. Finish:

**** NOTE TO SPECIFIER ** Delete finish not required.**

- 1) Galvanized.
 - 2) White Powdercoat.
7. Counterbalance:
- a. Counterbalance System: Provided with aircraft-type, galvanized steel lifting cables with minimum safety factor of 5. Torsion Springs consisting of heavy-duty oil-tempered wire torsion springs on a continuous ball-bearing cross-header shaft.

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

- 1) Spring Cycle Requirements: Standard 10,000 cycles.
 - 2) Spring Cycle Requirements: High cycle: _____ cycles.
8. Hardware:
- a. Hinges and Brackets: Fabricated from galvanized steel.

**** NOTE TO SPECIFIER ** Delete track size not required.**

- b. Track Rollers: 2 inches (50.8 mm) diameter consistent with track size, with hardened steel ball bearings.
- c. Track Rollers: 3 inches (76.2 mm) diameter consistent with track size, with hardened steel ball bearings.

**** NOTE TO SPECIFIER ** Door may be provided with perimeter seal for jambs. Delete if not required.**

- d. Perimeter Seal: Provide complete weather stripping system to reduce air infiltration. Weather stripping shall be replaceable.
 - 1) For bracket mounted doors provide climate seal or vinyl seal with aluminum retainer.
 - 2) For angle mounted doors provide angle clip-on seal.

**** NOTE TO SPECIFIER ** Door may be provided with exterior or interior locking device. Retain or delete paragraph below to suit project.**

- e. Furnish door system with locks: Exterior lock with five-pin tumbler cylinder, night latch and steel bar engaging track.
 - f. Furnish door system with locks: Interior lock with dead bolt provided with hole to receive padlock provided by Owner.
9. TH Series Limited Warranty: Raynor warrants the door sections against defects in material and workmanship, and deterioration due to rust-through for ten years from date of delivery to the original purchaser. Raynor also warrants the door sections against delamination of the insulation from the steel skins for ten years from date of delivery to the original purchaser. Window components are warranted against defects in material and workmanship for one year from date of delivery to the original purchaser. Raynor warrants all hardware and spring components against defects in material and workmanship for one year (or cycle life of the springs) from date of delivery to the original purchaser. Additional Limited Warranty requirements in accordance with manufacturer's full standard limited warranty documentation.

D. FlexFit Series as manufactured by Raynor Garage Doors:

- 1. Doors:
 - a. Operation:

**** NOTE TO SPECIFIER ** Delete door operation not required. There are restrictions on size of door for manual or hand chain operation.**

- 1) Provide doors designed for manual operation.
 - 2) Provide doors designed for hand chain operation.
 - 3) Provide doors designed for electric motor operation.
- b. Jamb Construction:

**** NOTE TO SPECIFIER ** Delete jamb not required.**

- 1) Steel jambs with self-tapping fasteners.
 - 2) Wood jambs with lag screw fasteners.
 - 3) Masonry jambs with anchor bolt fasteners.
- c. Structural Performance Requirements:

**** NOTE TO SPECIFIER ** Insert required wind load p.s.f.**

- 1) Wind Loads: Uniform pressure of: _____ psf.
- 2. Sections:
 - a. FF175:

- 1) Sections shall contain 1.44 inch expanded polystyrene insulation sandwiched between interior and exterior panels. End stiles to be 12-gauge galvanized steel.
- 2) Material: Sandwich construction, 1-3/4 inches (44 mm) thick. Exterior skin shall be constructed of 1/8 inch (3 mm) non-conductive, UV stabilized FgR pultruded fiberglass reinforced polymer (FRP) material with additional anti-yellowing UV protective coating. Interior skin shall be constructed of 1/8 inch IDS extruded HDPE and manufactured with materials in compliance with FDA regulation 21 CFR 177.1520. Skins will be bolted together around 1.5 inch (38 mm)x 1/8 inch (3 mm) FgS square tube framing constructed of pultruded fiberglass reinforced polymer (FRP). Bolts shall be carriage style heads on exterior and blind-head style on interior to reduce risk of injury.
 - a) Interior and exterior skins shall be one contiguous piece without splices up to 20 feet 2 inches (6146 mm) in length.
 - b) Square tube frame rails shall be one contiguous piece without splices up to 20 feet (6096 mm) in length.
- 3) Finish: Exterior and interior skins to have smooth finish.
 - a) Color: White.
- 4) Insulation: Expanded polystyrene with door R-value of 9.68.
- b. Seals: Intermediate sections will incorporate white, J-Flex fabric reinforced section joint seals. Bottom of door to have flexible cloth reinforced U-shaped EPDM rubber seal and 3 inch (76 mm) brush seal. Header shall have dual-durometer vinyl blade seal on top section to prevent airflow above header. Jambs shall have 1 inch (25 mm) brush seals to prevent airflow. Brush seals will be mounted into continuous (no splices) extruded aluminum retainers.
 - c. Trussing: Not applicable.
3. Windows: 12 x 4 inches (305 x 102 mm) window with 1/8 inch (3.1 mm) polycarbonate lite.
4. Mounting: Sections mounted in door opening using:

**** NOTE TO SPECIFIER ** Delete mounting not required.**

- a. Between-Jamb Bracket Mounting: sections mounted between door jambs, seal against exterior perimeter seal installed along vertical and top horizontal edges of jambs.
 - b. Lap Jamb Angle Mounting: section overlap door jambs by 1 inch (25 mm) on each side of door opening.
5. Track:
 - a. Material: Hot-dipped galvanized steel (ASTM A 653), fully adjustable for adequate sealing of door to jamb or weather seal.

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

- b. Configuration Type: Normal Headroom.
- c. Configuration Type: Vertical Lift.
- d. Configuration Type: Lift-Clearance.
- e. Track Size: 3 inches (76 mm).
 - 1) Jamb Type: Steel, wood, or masonry.

**** NOTE TO SPECIFIER ** The only mounting available on 3-inch lift-clearance is Floor-to-Shaft Angle-Mount. Refer to manufacturer's literature for other restrictions. Delete mounting not required.**

- a) Mounting: Floor-to-header angles. Continuous angles from floor to door header. Angle Size: 3-1/2 x 5 x 3/32 inches (89 x 127 x 2.5 mm) on 3-inch track.
- b) Mounting: Floor-to-shaft angles. Continuous angles from floor, past header, up to door shaft. Angle Size: 3-1/2 x 5 x 3/32 inches (89 x 127 x 2.5 mm) on 3-inch track.
- f. Finish:
 - 1) Galvanized.
- 6. Counterbalance:
 - a. Counterbalance System: Provided with aircraft-type, galvanized steel lifting cables with minimum safety factor of 5. Torsion Springs consisting of heavy-duty oil-tempered wire torsion springs on a continuous ball-bearing cross-header shaft.

**** NOTE TO SPECIFIER ** Delete one of the following two paragraphs. For extended cycle insert the required cycle life (50,000 - 200,000),**

- 1) Spring Cycle Requirements: Standard high cycle 25,000 cycles.
- 2) Spring Cycle Requirements: Extended cycle: _____ cycles.
- 7. Hardware:
 - a. End Stile Hinges and Brackets: Fabricated from galvanized steel.
 - b. Track Rollers: 3 inches (76.2 mm) diameter consistent with track size, with hardened steel ball bearings.
 - c. Locks: Door furnished with one spring-loaded interior lock with dead bolt provided with hole to receive padlock provided by Owner.
- 8. FlexFit Limited Warranty: Raynor warrants the door sections against defects in material and workmanship for one year from date of delivery to the original purchaser. Raynor warrants all hardware and spring components against defects in material and workmanship for one year (or cycle life of the springs) from date of delivery to the original purchaser. Additional Limited Warranty requirements in accordance with manufacturer's full standard limited warranty documentation.

E. Commercial BuildMark/TradeMark as manufactured by Raynor Garage Doors:

- 1. Doors:
 - a. Operation:

**** NOTE TO SPECIFIER ** Delete door operation not required. There are restrictions on size of door for manual or hand chain operation.**

- 1) Provide doors designed for manual operation.
- 2) Provide doors designed for hand chain operation.
- 3) Provide doors designed for electric motor operation.
- b. Jamb Construction:

**** NOTE TO SPECIFIER ** Delete jamb not required.**

- 1) Steel jambs with self-tapping fasteners.
- 2) Wood jambs with lag screw fasteners.
- 3) Masonry jambs with anchor bolt fasteners.
- c. Structural Performance Requirements:

**** NOTE TO SPECIFIER ** Insert required wind load p.s.f.**

- 1) Wind Loads: Uniform pressure of: _____ psf.
- 2. Sections:

**** NOTE TO SPECIFIER ** Delete door model Commercial TradeMark or Commercial S if not required.**

- a. Commercial TradeMark:
- 1) Section end stiles to be 18 gauge galvanized steel and center stiles to be 20 gauge galvanized steel. End stiles to be crimp-locked to the section skin. Center stiles to be glued and crimp-locked to section skin.
 - 2) Material: Steel pan construction, 2 inches (51 mm) thick, roll formed from 24 gauge draw quality, hot-dipped galvanized (G40 exterior) steel complying with ASTM A 653. Exterior surface of sections shall feature embossed Colonial Raised Panels or Ranch Raised Panels. Sections shall have tongue-and-groove joints for weather-tight closure.
 - 3) Finish: Exterior skin to have two coats of paint, one primer coat and one finish coat.

**** NOTE TO SPECIFIER ** Delete color not required.**

- a) Color: White polyester paint.
- b) Color: Almond polyester paint.
- c) Color: BronzeTone polyester paint.
- d) Color: Sandstone polyester paint.
- e) Color: Dark brown polyester paint.
- f) Color: _____.
- g) Color: As detailed on the Drawings.
- h) Color: As determined by Architect from Raynor's ColorWave post paint process featuring 1500 colors of Sherwin Williams Polane Enamel paint.

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

- 4) Insulation: Expanded polystyrene with R-value of 6.6 with white impact-resistant textured covers.

- b. Commercial BuildMark:
- 1) Section end stiles to be 18 gauge galvanized steel and center stiles to be 20 gauge galvanized steel. End stiles to be crimp-locked to the section skin. Center stiles to be glued and crimp-locked to section skin.
 - 2) Material: Steel pan construction, 2 inches (51 mm) thick, roll formed from 25 gauge draw quality, hot-dipped galvanized (G40 exterior) steel complying with ASTM A 653. Exterior surface of sections shall feature embossed Colonial Raised Panels, Ranch Raised Panels, or Flush Woodgrain Surface. Sections shall have tongue-and-groove joints for weather-tight closure.
 - 3) Finish: Exterior skin to have two coats of paint, one primer coat and one finish coat.

**** NOTE TO SPECIFIER ** Delete color not required.**

- a) Color: White polyester paint.
- b) Color: Almond polyester paint.
- c) Color: Sandstone polyester paint.
- d) Color: Desert tan polyester paint.
- e) Color: Black polyester paint.
- f) Color: Auburn woodtone polyester paint.
- g) Color: Mocha woodtone polyester paint.
- h) Color: Walnut woodtone polyester paint.
- i) Color: _____.
- j) Color: As detailed on the Drawings.

- k) Color: As determined by Architect from Raynor's ColorWave post paint process featuring 1500 colors of Sherwin Williams Polane Enamel paint.

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

- 4) Insulation: Expanded polystyrene with R-value of 6.6 with white impact-resistant textured covers.
- c. Seals: Bottom of door to have flexible U-shaped vinyl seal retained in aluminum rail. Optional blade seal on top section to prevent airflow above header
- d. Trussing: Doors designed to withstand specified windload. Deflection of door in horizontal position to be maximum of 1/120th of door width.

**** NOTE TO SPECIFIER ** Some restrictions may apply based on door height. Actual window width may vary slightly based on door width. Delete if not required.**

3. Windows: Locations to comply with door elevation drawings.

**** NOTE TO SPECIFIER ** Delete window not required.**

- a. Colonial style 18 inches by 13 inches (457 mm by 330 mm) minimum window encased in an injection molded polypropylene frame.
- b. Ranch style 41 inches by 13 inches (1041 mm by 330 mm) window minimum encased in an injection molded polypropylene frame.

**** NOTE TO SPECIFIER ** Delete window not required.**

4. Glazing: Windows to be provided with glazing units as follows:
- a. Single glass consisting of one pane of 1/8 inch (3.2 mm) thick DSB glass.
5. Mounting: Sections mounted in door opening using:

**** NOTE TO SPECIFIER ** Delete mounting not required.**

- a. Between-Jamb Bracket Mounting: sections mounted between door jambs, seal against exterior perimeter seal installed along vertical and top horizontal edges of jambs.
- b. Lap Jamb Angle Mounting: section overlap door jambs by 1 inch (25 mm) on each side of door opening.
6. Track:
- a. Material: Hot-dipped galvanized steel (ASTM A 653), fully adjustable for adequate sealing of door to jamb or weatherseal.

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

- b. Configuration Type: Normal Headroom.
- c. Configuration Type: Low Headroom.
- d. Configuration Type: Vertical Lift.
- e. Configuration Type: Lift-Clearance.
- f. Configuration Type: Incline.
- g. Configuration Type: Contour.

**** NOTE TO SPECIFIER ** The only mounting available on 3-inch lift-clearance is Floor-to-Shaft Angle-Mount and Clip-Angle. Refer to manufacturer's literature for other restrictions. Delete track size, jamb type and mounting options not required.**

- h. Track Size: 2 inches (51 mm).
- 1) Jamb Type: Wood only.
- a) Mounting: Adjustable track brackets.
- 2) Jamb Type: Steel, wood, or masonry.
- a) Mounting: Floor-to-header angles. Continuous angles from floor to door header. Angle Size: 2-5/16 x 4 x 3/32 inches (59 x 102 x 2.5 mm).

- b) Mounting: Floor-to-shaft angles. Continuous angles from floor, past header, up to door shaft. Angle Size: 2-5/16 x 4 x 3/32 inch (59 x 102 x 2.5 mm).
- c) Mounting: QuikClip. Clip-Angle brackets pre-assembled to continuous angle from floor to door header and continuous angle from door header to door shaft. Angle Size: 2-5/16 x 1-1/4 x 3/32 inches (59 x 32 x 2.5 mm).
- i. Track Size: 3 inches (76 mm).
 - 1) Jamb Type: Steel, wood, or masonry.
 - a) Mounting: Floor-to-header angles. Continuous angles from floor to door header. Angle Size: 3-1/2 x 5 x 3/32 inches (89 x 127 x 2.5 mm) on 3-inch track.
 - b) Mounting: Floor-to-shaft angles. Continuous angles from floor, past header, up to door shaft. Angle Size: 3-1/2 x 5 x 3/32 inches (89 x 127 x 2.5 mm) on 3-inch track.
 - c) Mounting: QuikClip. Clip-Angle brackets pre-assembled to continuous angle from floor to door header and continuous angle from door header to door shaft. Angle Size: 3-1/2 x 1-1/4 x 3/32 inches (89 x 32 x 2.5 mm) on 3-inch track.
- j. Finish:

**** NOTE TO SPECIFIER ** Delete finish not required.**

- 1) Galvanized.
- 2) White Powdercoat.

- 7. Counterbalance:
 - a. Counterbalance System: Provided with aircraft-type, galvanized steel lifting cables with minimum safety factor of 5. Torsion Springs consisting of heavy-duty oil-tempered wire torsion springs on a continuous ball-bearing cross-header shaft.

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

- 1) Spring Cycle Requirements: Standard 10,000 cycles.
- 2) Spring Cycle Requirements: High cycle: _____ cycles.

- 8. Hardware:
 - a. Hinges and Brackets: Fabricated from galvanized steel.

**** NOTE TO SPECIFIER ** Delete track size not required.**

- b. Track Rollers: 2 inches (50.8 mm) diameter consistent with track size, with hardened steel ball bearings.
- c. Track Rollers: 3 inches (76.2 mm) diameter consistent with track size, with hardened steel ball bearings.

**** NOTE TO SPECIFIER ** Door may be provided with perimeter seal for jambs. Delete if not required.**

- d. Perimeter Seal: Provide complete weather stripping system to reduce air infiltration. Weather stripping shall be replaceable.
 - 1) For bracket mounted doors provide climate seal or vinyl seal with aluminum retainer.
 - 2) For angle mounted doors provide angle clip-on seal.

**** NOTE TO SPECIFIER ** Door may be provided with exterior or interior locking device. Retain or delete paragraph below to suit project.**

- e. Furnish door system with locks: Exterior lock with five-pin tumbler cylinder, night latch and steel bar engaging track.

- f. Furnish door system with locks: Interior lock with dead bolt provided with hole to receive padlock provided by Owner.
- 9. Commercial BuildMark, Commercial TradeMark Series Limited Warranty: Raynor warrants the door sections against defects in material and workmanship, and deterioration due to rust-through for ten years from date of delivery to the original purchaser. Window components are warranted against defects in material and workmanship for one year from date of delivery to the original purchaser. Raynor warrants all hardware and spring components against defects in material and workmanship for one year (or cycle life of the springs) from date of delivery to the original purchaser. Additional Limited Warranty requirements in accordance with manufacturer's full standard limited warranty documentation.

**** NOTE TO SPECIFIER ** ControlHoist 2.0 (solid state) operators. Delete if not required.**

- F. ControlHoist 2.0 as manufactured by Raynor Garage Doors:
 - 1. Model:

**** NOTE TO SPECIFIER ** ControlHoist 2.0 Optima operators (solid state) feature a heavy-duty gear drive running in oil for high reliability and efficient operation. They are designed for larger sectional doors and higher cycle applications. Delete if not required.**

- a. Raynor ControlHoist 2.0 Optima:
 - 1) Type: Jackshaft with manual chain hoist.
 - 2) Type: Trolley.

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

- 3) Motor Horsepower Rating: Continuous 1/2 HP.
- 4) Motor Horsepower Rating: Continuous 3/4 HP.
- 5) Motor Horsepower Rating: Continuous 1 HP.
- 6) Motor Horsepower Rating: Continuous 1-1/2 HP.
- 7) Motor Horsepower Rating: Continuous 2 HP.

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

- 8) Electrical Requirements: 115 volt single phase.
- 9) Electrical Requirements: 230 volt single phase.
- 10) Electrical Requirements: 208-230 volt three phase.
- 11) Electrical Requirements: 460 volt three phase.
- 12) Duty Cycle: 30 cycles/hour or 300 cycles/day.
- 13) Control Wiring: Solid state circuitry with provisions for connection of safety edge to reverse, external radio control hook-up and maximum run timer. Provisions for timers to close, monitored reversing devices, mid stop and lock bar sensor capability.

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

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

**** NOTE TO SPECIFIER ** ControlHoist 2.0 Standard belt-drive operators are designed for medium- to high-cycle applications and for normal- to large-size sectional doors. Delete if not required.**

- b. Raynor ControlHoist 2.0 Standard:

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

- 1) Type: Jackshaft.
- 2) Type: Jackshaft with manual chain hoist.
- 3) Type: Trolley.

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

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

- b) Custom wiring.

**** NOTE TO SPECIFIER ** ControlHoist 2.0 Basic belt drive operators are designed for operating sectional doors up to 14 feet high in light duty applications. Delete if not required.**

- c. Raynor ControlHoist 2.0 Basic:

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

- 1) Type: Jackshaft.
- 2) Type: Jackshaft with manual chain hoist.
- 3) Type: Trolley.
- 4) Motor Horsepower Rating: Intermittent 1/2 HP.
- 5) Electrical Requirements: 115 volt single phase.
- 6) Duty Cycle: 10 cycles/hour.
- 7) Control Wiring: Solid state circuitry with provisions for connection of safety edge to reverse, external radio control hook-up and maximum run timer. Provisions for timers to close, monitored reversing devices, mid stop and lock bar sensor capability.
 - a) Provide three button momentary contact "open-stop", constant pressure on close (can be changed to momentary to close).

**** NOTE TO SPECIFIER ** Delete sectional ribbed pan doors if not required.**

2.3 SECTIONAL RIBBED PAN DOOR

A. SteelForm as manufactured by Raynor Garage Doors:

1. Doors:
 - a. Operation:

**** NOTE TO SPECIFIER ** Delete door operation not required. There are restrictions on size of door for manual or hand chain operation.**

- 1) Provide doors designed for manual operation.

- 2) Provide doors designed for hand chain operation.
 - 3) Provide doors designed for electric motor operation.
- b. Jamb Construction:

**** NOTE TO SPECIFIER ** Delete jamb not required.**

- 1) Steel jambs with self-tapping fasteners.
- 2) Wood jambs with lag screw fasteners.
- 3) Masonry jambs with anchor bolt fasteners.

- c. Structural Performance Requirements:

**** NOTE TO SPECIFIER ** Insert required wind load p.s.f.**

- 1) Wind Loads: Uniform pressure of: _____ psf.

2. Sections:

**** NOTE TO SPECIFIER ** Delete door model SteelForm Optima (S16), SteelForm Standard (S20), SteelForm Standard (S24) or SteelForm Basic (S24C) if not required.**

- a. SteelForm S16 (Optima):

- 1) Section end stiles to be 13 gauge galvanized steel. Center stiles to be a minimum 16 gauge thickness. End stiles and center stiles to be riveted to outside face with stainless steel rivets and resistance welded to interior rail.
- 2) Material: Steel pan construction, 2 inches (51 mm) thick, roll formed from 16 gauge draw-quality, hot-dipped galvanized (G90) steel complying with ASTM A 653. Exterior of door to have flush face and roll-formed tongue and groove joints for weathertight closure.
- 3) Finish: Exterior skin to have two coats of paint, one primer coat and one finish coat.
 - a) Color: White polyester paint.

- b. SteelForm S20 (Standard):

- 1) Section end stiles to be 13 gauge galvanized steel. Center stiles to be a minimum 16 gauge thickness. End stiles and center stiles to be riveted to outside face with stainless steel rivets and resistance welded to interior rail.
- 2) Material: Steel pan construction, 2 inches (51 mm) thick, roll-formed from 20 gauge commercial quality, hot-dipped galvanized (G90) steel complying with ASTM A 653. Exterior of door to have flush face and roll-formed tongue and groove joints for weathertight closure.
- 3) Finish: Exterior skin to have two coats of paint, one primer coat and one finish coat.
 - a) Color: White polyester paint.

- c. SteelForm S24 (Standard):

- 1) Section end stiles and center stiles to be minimum 16 gauge galvanized steel. End stiles and center stiles to be riveted to outside face with stainless steel rivets and resistance welded to interior rail.
- 2) Material: Steel pan construction, 2 inches (51 mm) thick, roll-formed from 24 gauge commercial quality, hot-dipped galvanized (G60) steel complying with ASTM A 653. Exterior of door to have two deep ribs, four pencil grooves, and roll-formed tongue-and-groove joints for weathertight closure.
- 3) Finish: Exterior skin to have two coats of paint, one primer coat and one finish coat.

**** NOTE TO SPECIFIER ** Delete color not required.**

- a) Color: White polyester paint.
 - b) Color: Dark Brown Kynar paint.
 - c) Color: Frost White Kynar paint.
 - d) Color: Beige Kynar paint.
 - e) Color: Sepia Brown Kynar paint.
 - f) Color: _____.
 - g) Color: As detailed on the Drawings.
 - h) Color: As determined by Architect from Raynor's ColorWave post paint process featuring 1500 colors of Sherwin Williams Polane Enamel paint.
- d. SteelForm S24C (Basic):
- 1) Section end stiles and center stiles to be a minimum 16 gauge galvanized steel. End stiles and center stiles to be riveted to outside face with stainless steel rivets and resistance welded to interior rail.
 - 2) Material: Steel pan construction, 2 inches (51 mm) thick, roll formed from 24 gauge embossed thickness, commercial quality, hot-dipped galvanized (G40) steel complying with ASTM A 653. Exterior of door to have two deep ribs, four pencil grooves, and roll-formed tongue-and-groove joints for weathertight closure.
 - 3) Finish: Exterior skin to have two coats of paint, one primer coat and one finish coat.
 - a) Color: White polyester paint.
- e. Insulation:

**** NOTE TO SPECIFIER ** Delete insulation and back covers not required.**

- 1) Expanded polystyrene with R-value of 7.70 with white impact-resistant textured covers.
 - 2) Expanded polystyrene with R-value of 7.70 with 26 gauge hot-dipped galvanized steel covers, stucco embossed and painted gray.
 - 3) Expanded polystyrene with R-value of 7.70 with 24 gauge hot-dipped galvanized steel covers, painted gray/white.
 - 4) Expanded polystyrene with R-value of 7.70 with 20 gauge hot-dipped galvanized steel covers, painted gray/white.
- f. Seals: Bottom of door to have flexible U-shaped vinyl seal retained in aluminum rail. Optional blade seal on top section to prevent airflow above header
- g. Trussing: Doors designed to withstand specified windload. Deflection of door in horizontal position to be maximum of 1/120th of door width.

**** NOTE TO SPECIFIER ** Some restrictions may apply based on door height. Actual window width may vary slightly based on door width. Delete if not required.**

3. Windows: Locations to comply with door elevation drawings.

**** NOTE TO SPECIFIER ** Delete window not required.**

- a. 24 inches by 8 inches (610 mm by 203 mm) rectangular window encased in a two-piece black frame.
- b. Full-view window consisting of aluminum stile and rail construction and color matched to door exterior with powdercoat paint.

**** NOTE TO SPECIFIER ** Door sections without insulation are only available with single pane glass. Retain, edit or delete paragraphs below to suit project.**

4. Glazing: Windows to be provided as follows:

- a. Glass consisting of one pane of 1/8 inch (3.2 mm) thick DSB glass.

**** NOTE TO SPECIFIER ** Door sections with insulation are available glazed with insulating glass. Retain, edit or delete paragraphs below to suit project.**

- 5. Glazing: Windows to be provided with insulated glazing units as follows:
 - a. Glass consisting of two panes of 1/8 inch (3.2 mm) thick DSB glass.
- 6. Glazing: Full View to be provided as follows:

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

- a. Impact Rated Glazing: 11/32 inch (8.37 mm) Clear Impact Glass.
- b. Impact Rated Glazing: 11/32 inch (8.37 mm) Tinted Bronzer Impact Glass
- c. Impact Rated Glazing: 11/32 inch (8.37 mm) Tinted Green Impact Glass
- d. Impact Rated Glazing: 11/32 inch (8.37 mm) White Interlayer Impact Glass.
- e. Non-Impact Rated Glazing: 1/8 inch (3.2 mm) Clear Glass consisting of one pane of 1/8 inch (3.2 mm) DSB non-insulated glass.
- f. Non-Impact Rated Glazing: 3/16 inch (4.8 mm) Clear Glass consisting of one pane of 3/16 inch (4.8 mm) non-insulated glass.
- g. Non-Impact Rated Glazing: 1/4 inch (6.4 mm) Clear Glass consisting of one pane of 1/4 inch (6.4 mm) non-insulated glass.
- h. Non-Impact Rated Glazing: 1/8 inch (3.2 mm) Clear Tempered Glass consisting of one pane of 1/8 inch (3.2 mm) non-insulated glass.
- i. Non-Impact Rated Glazing: 1/4 inch (6.4 mm) Clear Tempered Glass consisting of one pane of 1/4 inch (6.4 mm) non-insulated glass.
- j. Non-Impact Rated Glazing: 3/16 inch (4.88 mm) Clear Tempered Glass consisting of one pane of 3/16 inch (4.88 mm) non-insulated glass.
- k. Non-Impact Rated Glazing: 1/4 inch (6.4 mm) Clear Laminated Glass consisting of one pane of 1/4 inch (6.4 mm) non-insulated glass.
- l. Non-Impact Rated Glazing: 1/4 inch (6.4 mm) Clear Wire Glass consisting of one pane of 1/4 inch (6.4 mm) non-insulated glass.
- m. Non-Impact Rated Glazing: 1/8 inch (3.2 mm) Tinted Glass consisting of one pane of 1/8 inch (3.2 mm) non-insulated glass.
- n. Non-Impact Rated Glazing: 1/4 inch (6.4 mm) Tinted Glass consisting of one pane of 1/4 inch (6.4 mm) non-insulated glass.
- o. Non-Impact Rated Glazing: 1/8 inch (3.2 mm) Tinted Tempered Glass consisting of one pane of 1/8 inch (3.2 mm) non-insulated glass.
- p. Non-Impact Rated Glazing: 1/4 inch (6.4 mm) Tinted Tempered Glass consisting of one pane of 1/4 inch (6.4 mm) non-insulated glass.
- q. Non-Impact Rated Glazing: 1/2 inch (12.69 mm) Insulated Clear Glass consisting of two panes of 1/8 inch (3.2 mm) DSB insulated glass.
- r. Non-Impact Rated Glazing: 1/2 inch (12.69 mm) Insulated Clear Tempered Glass consisting of two panes of 1/8 inch (3.2 mm) Tempered insulated glass.
- s. Non-Impact Rated Glazing: 1/2 inch (12.69 mm) Insulated Low E DSB Glass consisting of two panes of 1/8 inch (3.2 mm) DSB insulated glass.
- t. Non-Impact Rated Glazing: 1/2 inch (12.69 mm) Insulated Low E Tempered Glass consisting of two panes of 1/8 inch (3.2 mm) Tempered insulated glass.

- u. Non-Impact Rated Glazing: 1/8 inch (3.2 mm) Clear Acrylic consisting of one pane of 1/8 inch (3.2 mm) Acrylic glazing.
- v. Non-Impact Rated Glazing: 1/8 inch (3.2 mm) Clear Lexan consisting of one pane of 1/8 inch (3.2 mm) Lexan glazing.
- w. Non-Impact Rated Glazing: 1/4 inch (6.4 mm) Clear Acrylic consisting of one pane of 1/4 inch (6.4 mm) Acrylic glazing.
- x. Non-Impact Rated Glazing: 1/4 inch (6.4 mm) Clear Lexan consisting of one pane of 1/4 inch (6.4 mm) Lexan glazing.

7. Mounting: Sections mounted in door opening using:

**** NOTE TO SPECIFIER ** Delete mounting not required.**

- a. Between-Jamb Bracket Mounting: sections mounted between door jambs, seal against exterior perimeter seal installed along vertical and top horizontal edges of jambs.
- b. Lap Jamb Angle Mounting: section overlap door jambs by 1 inch (25 mm) on each side of door opening.

8. Track:

- a. Material: Hot-dipped galvanized steel (ASTM A 653), fully adjustable for adequate sealing of door to jamb or weatherseal.

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

- b. Configuration Type: Normal Headroom.
- c. Configuration Type: Low Headroom.
- d. Configuration Type: Vertical Lift.
- e. Configuration Type: Lift-Clearance.
- f. Configuration Type: Incline.
- g. Configuration Type: Contour.

**** NOTE TO SPECIFIER ** The only mounting available on 3-inch lift-clearance is Floor-to-Shaft Angle-Mount and Clip-Angle. Refer to manufacturer's literature for other restrictions. Delete track size, jamb type and mounting options not required.**

- h. Track Size: 2 inches (51 mm).
 - 1) Jamb Type: Wood only.
 - a) Mounting: Adjustable track brackets.
 - 2) Jamb Type: Steel, wood, or masonry.
 - a) Mounting: Floor-to-header angles. Continuous angles from floor to door header. Angle Size: 2-5/16 x 4 x 3/32 inches (59 x 102 x 2.5 mm).
 - b) Mounting: Floor-to-shaft angles. Continuous angles from floor, past header, up to door shaft. Angle Size: 2-5/16 x 4 x 3/32 inch (59 x 102 x 2.5 mm).
 - c) Mounting: QuikClip. Clip-Angle brackets pre-assembled to continuous angle from floor to door header and continuous angle from door header to door shaft. Angle Size: 2-5/16 x 1-1/4 x 3/32 inches (59 x 32 x 2.5 mm).
- i. Track Size: 3 inches (76 mm).
 - 1) Jamb Type: Steel, wood, or masonry.
 - a) Mounting: Floor-to-header angles. Continuous angles from floor to door header. Angle Size: 3-1/2 x 5 x 3/32 inches (89 x 127 x 2.5 mm) on 3-inch track.
 - b) Mounting: Floor-to-shaft angles. Continuous angles from floor, past header, up to door shaft. Angle Size: 3-1/2 x 5 x 3/32 inches (89 x 127 x 2.5 mm) on 3-inch track.

- c) Mounting: QuikClip. Clip-Angle brackets pre-assembled to continuous angle from floor to door header and continuous angle from door header to door shaft. Angle Size: 3-1/2 x 1-1/4 x 3/32 inches (89 x 32 x 2.5 mm) on 3-inch track.

j. Finish:

**** NOTE TO SPECIFIER ** Delete finish not required.**

- 1) Galvanized.
- 2) White Powdercoat.

9. Counterbalance:

- a. Counterbalance System: Provided with aircraft-type, galvanized steel lifting cables with minimum safety factor of 5. Torsion Springs consisting of heavy-duty oil-tempered wire torsion springs on a continuous ball-bearing cross-header shaft.

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

- 1) Spring Cycle Requirements: Standard 10,000 cycles.
- 2) Spring Cycle Requirements: High cycle: _____ cycles.

10. Hardware:

- a. Hinges and Brackets: Fabricated from galvanized steel.

**** NOTE TO SPECIFIER ** Delete track size not required.**

- b. Track Rollers: 2 inches (50.8 mm) diameter consistent with track size, with hardened steel ball bearings.
- c. Track Rollers: 3 inches (76.2 mm) diameter consistent with track size, with hardened steel ball bearings.

**** NOTE TO SPECIFIER ** Door may be provided with perimeter seal for jambs. Delete if not required.**

- d. Perimeter Seal: Provide complete weather stripping system to reduce air infiltration. Weather stripping shall be replaceable.
 - 1) For bracket mounted doors provide climate seal or vinyl seal with aluminum retainer.
 - 2) For angle mounted doors provide angle clip-on seal.

**** NOTE TO SPECIFIER ** Door may be provided with exterior or interior locking device. Retain or delete paragraph below to suit project.**

- e. Furnish door system with locks: Exterior lock with five-pin tumbler cylinder, night latch and steel bar engaging track.
 - f. Furnish door system with locks: Interior lock with dead bolt provided with hole to receive padlock provided by Owner.
11. SteelForm Limited Warranty: Raynor warrants the door sections against defects in material and workmanship, and deterioration due to rust-through for ten years from date of delivery to the original purchaser. Window components are warranted against defects in material and workmanship for one year from date of delivery to the original purchaser. Raynor warrants all hardware and spring components against defects in material and workmanship for one year (or cycle life of the springs) from date of delivery to the original purchaser. Additional Limited Warranty requirements in accordance with manufacturer's full standard limited warranty documentation.

**** NOTE TO SPECIFIER ** ControlHoist 2.0 (solid state) operators. Delete if not required.**

- B. ControlHoist 2.0 as manufactured by Raynor Garage Doors:
 - 1. Model:

**** NOTE TO SPECIFIER ** ControlHoist 2.0 Optima operators (solid state) feature a heavy-duty gear drive running in oil for high reliability and efficient operation. They are designed for larger sectional doors and higher cycle applications. Delete if not required.**

- a. Raynor ControlHoist 2.0 Optima:
- 1) Type: Jackshaft with manual chain hoist.
 - 2) Type: Trolley.

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

- 3) Motor Horsepower Rating: Continuous 1/2 HP.
- 4) Motor Horsepower Rating: Continuous 3/4 HP.
- 5) Motor Horsepower Rating: Continuous 1 HP.
- 6) Motor Horsepower Rating: Continuous 1-1/2 HP.
- 7) Motor Horsepower Rating: Continuous 2 HP.

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

- 8) Electrical Requirements: 115 volt single phase.
- 9) Electrical Requirements: 230 volt single phase.
- 10) Electrical Requirements: 208-230 volt three phase.
- 11) Electrical Requirements: 460 volt three phase.
- 12) Duty Cycle: 30 cycles/hour or 300 cycles/day.
- 13) Control Wiring: Solid state circuitry with provisions for connection of safety edge to reverse, external radio control hook-up and maximum run timer. Provisions for timers to close, monitored reversing devices, mid stop and lock bar sensor capability.

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

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

**** NOTE TO SPECIFIER ** ControlHoist 2.0 Standard belt-drive operators are designed for medium- to high-cycle applications and for normal- to large-size sectional doors. Delete if not required.**

- b. Raynor ControlHoist 2.0 Standard:

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

- 1) Type: Jackshaft.
- 2) Type: Jackshaft with manual chain hoist.
- 3) Type: Trolley.

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

- 4) Motor Horsepower Rating: Continuous 1/3 HP.
- 5) Motor Horsepower Rating: Continuous 1/2 HP.
- 6) Motor Horsepower Rating: Continuous 3/4 HP.
- 7) Electrical Requirements: 115 volt single phase.
- 8) Electrical Requirements: 230 volt single phase.
- 9) Electrical Requirements: 208-230 volt three phase.
- 10) Electrical Requirements: 460 volt three phase.
- 11) Duty Cycle: 30 cycles/hour or 300 cycles/day.
- 12) Control Wiring: Solid state circuitry with provisions for connection of safety edge to reverse, external radio control hook-up and maximum run timer. Provisions for timers to close,

monitored reversing devices, mid stop and lock bar sensor capability.

- a) 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.**

- b) Custom wiring.

**** NOTE TO SPECIFIER ** ControlHoist 2.0 Basic belt drive operators are designed for operating sectional doors up to 14 feet high in light duty applications. Delete if not required.**

- c. Raynor ControlHoist 2.0 Basic:

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

- 1) Type: Jackshaft.
- 2) Type: Jackshaft with manual chain hoist.
- 3) Type: Trolley.
- 4) Motor Horsepower Rating: Intermittent 1/2 HP.
- 5) Electrical Requirements: 115 volt single phase.
- 6) Duty Cycle: 10 cycles/hour.
- 7) Control Wiring: Solid state circuitry with provisions for connection of safety edge to reverse, external radio control hook-up and maximum run timer. Provisions for timers to close, monitored reversing devices, mid stop and lock bar sensor capability.
 - a) Provide three button momentary contact "open-stop", constant pressure on close (can be changed to momentary to close).

**** NOTE TO SPECIFIER ** Delete sectional rail and style doors if not required.**

2.4 SECTIONAL RAIL AND STYLE ALUMINUM DOORS

A. AlumaView as manufactured by Raynor Garage Doors:

- 1. Doors:
 - a. Operation:

**** NOTE TO SPECIFIER ** Delete door operation not required. There are restrictions on size of door for manual or hand chain operation.**

- 1) Provide doors designed for manual operation.
 - 2) Provide doors designed for hand chain operation.
 - 3) Provide doors designed for electric motor operation.
- b. Jamb Construction:

**** NOTE TO SPECIFIER ** Delete jamb not required.**

- 1) Steel jambs with self-tapping fasteners.
 - 2) Wood jambs with lag screw fasteners.
 - 3) Masonry jambs with anchor bolt fasteners.
- c. Structural Performance Requirements:

**** NOTE TO SPECIFIER ** Delete options for wind load performance not required.**

- 1) Wind Load (Model AV 300 only): Florida Building Code Product Approval #FL16225 large missile impact.
- 2) Wind Load (Model AV 200 only): Florida Building Code Product Approval #FL15212 large missile impact.

- 3) Wind Load (Model AV 200 only): Florida Building Code Product Approval #FL114092 non-impact.
 - 4) Wind Load: Florida Building Code Product Approval _____.
 - 5) Wind Loads: Uniform pressure of: _____ psf.
- d. International Energy Conservation Code (IECC) Requirements:
- 1) Air Infiltration: Maximum air leakage of 0.4 cfm/ft2 is required. Testing shall be performed in accordance with DASMA 105 test procedure.
 - 2) AV200 with IG Low E Glass has a Tested U-Factor of 0.72.
 - 3) Raynor AV300 and AV200 provide an air leakage rating of 0.24 cfm/ft2 with optional IECC Compliance Package.

2. Sections:

**** NOTE TO SPECIFIER ** Delete door model AlumaView AV300, AlumaView AV200, or AlumaView AV175 if not required.**

- a. AlumaView AV300:
- 1) Material: 3 inches (76 mm) thick, 6063-T6 aluminum alloy stiles and rails joined together with 5/16 inch (8 mm) diameter screws. Aluminum panels 0.050 inch (1.3 mm) thick or glazing (when specified) fill the spaces between stiles and rails. Combined dimension of two adjoining intermediate meeting rails 5 inches (127 mm). Bottom rail height 6-1/2 inches (165 mm). Top rail height 6-1/2 inches (165 mm). End stiles 3-3/8 inches (86 mm) or 6-1/2 inches (165 mm) wide as determined by overall door width. Center stiles 3-5/8 inches (92 mm) wide.
 - 2) Finish: Aluminum frame extrusions and filler panels finish coated.

**** NOTE TO SPECIFIER ** Delete color not required.**

- a) Color: Clear anodized finish.
 - b) Color: Champagne anodized finish.
 - c) Color: Light Bronze anodized finish.
 - d) Color: Medium Bronze anodized finish.
 - e) Color: Dark Bronze anodized finish.
 - f) Color: Extra Dark Bronze anodized finish.
 - g) Color: Black anodized finish.
 - h) ArmorBrite Powdercoat finish, color as selected by Architect.
 - i) American Douglas powdercoat finish.
 - j) American Maple powdercoat finish.
 - k) Cherry powdercoat finish.
 - l) Cherry With Flame powdercoat finish.
 - m) Colony Maple powdercoat finish.
 - n) Dark Walnut powdercoat finish.
 - o) European Cherry powdercoat finish.
 - p) Golden Oak powdercoat finish.
 - q) Knotty Pine powdercoat finish.
 - r) National Walnut powdercoat finish.
 - s) Oak powdercoat finish.
 - t) Oregon Douglas powdercoat finish.
 - u) Table Cherry powdercoat finish.
 - v) Teak powdercoat finish.
- b. AlumaView AV200:

- 1) Material: 2 inches (51 mm) thick, 6063-T6 aluminum alloy stiles and rails joined together with 5/16 inch (8 mm) diameter screws. Aluminum panels 0.050 inch (1.3 mm) thick or glazing (when specified) fill the spaces between stiles and rails. Combined dimension of two adjoining intermediate meeting rails 3-13/16 inches (97 mm). Bottom rail height 5-1/4 inches (133 mm). Top rail height 3-1/4 inches (83 mm) or 5-1/4 inches (133 mm) as determined by overall door width. End stiles 3-3/8 inches (86 mm) or 6-1/2 inches (165 mm) wide as determined by overall door width. Center stiles 3-5/8 inches (92 mm) wide.
- 2) Optional Insulation: Extruded polystyrene provides an R-value of 4.31 when combined with double endstiles and 1/2 inch (13 mm) insulated Low-E Glass.
- 3) Finish: Aluminum frame extrusions and filler panels finish coated.

**** NOTE TO SPECIFIER ** Delete color not required.**

- a) Color: Clear anodized finish.
 - b) Color: Champagne anodized finish.
 - c) Color: Light Bronze anodized finish.
 - d) Color: Medium Bronze anodized finish.
 - e) Color: Dark Bronze anodized finish.
 - f) Color: Extra Dark Bronze anodized finish.
 - g) Color: Black anodized finish.
 - h) ArmorBrite Powdercoat finish, color as selected by Architect.
 - i) American Douglas powdercoat finish.
 - j) American Maple powdercoat finish.
 - k) Cherry powdercoat finish.
 - l) Cherry With Flame powdercoat finish.
 - m) Colony Maple powdercoat finish.
 - n) Dark Walnut powdercoat finish.
 - o) European Cherry powdercoat finish.
 - p) Golden Oak powdercoat finish.
 - q) Knotty Pine powdercoat finish.
 - r) National Walnut powdercoat finish.
 - s) Oak powdercoat finish.
 - t) Oregon Douglas powdercoat finish.
 - u) Table Cherry powdercoat finish.
 - v) Teak powdercoat finish.
- c. AlumaView AV175:
- 1) Material: 1-3/4 inches (44 mm) thick, 6063-T6 aluminum alloy stiles and rails joined together with 5/16 inch (8 mm) diameter screws. Aluminum panels 0.050 inch (1.3 mm) thick or glazing (when specified) fill the spaces between stiles and rails. Combined dimension of two adjoining intermediate meeting rails 3-1/4 inches (83 mm). Bottom rail and top rail height 5-3/16 inches (132 mm). End stiles 3-3/8 inches (86 mm) or 6-1/2 inches (165 mm) wide as determined by overall door width. Center stiles 1-7/16 inches (36 mm), 2 inches (51 mm), or 3-5/8 inches (92 mm) wide.
 - 2) Finish: Aluminum frame extrusions and filler panels finish coated.

**** NOTE TO SPECIFIER ** Delete color not required.**

- a) Color: Clear anodized finish.
 - b) Color: Champagne anodized finish.
 - c) Color: Light Bronze anodized finish.
 - d) Color: Medium Bronze anodized finish.
 - e) Color: Dark Bronze anodized finish.
 - f) Color: Extra Dark Bronze anodized finish.
 - g) Color: Black anodized finish.
 - h) ArmorBrite Powdercoat finish, color as selected by Architect.
 - i) American Douglas powdercoat finish.
 - j) American Maple powdercoat finish.
 - k) Cherry powdercoat finish.
 - l) Cherry With Flame powdercoat finish.
 - m) Colony Maple powdercoat finish.
 - n) Dark Walnut powdercoat finish.
 - o) European Cherry powdercoat finish.
 - p) Golden Oak powdercoat finish.
 - q) Knotty Pine powdercoat finish.
 - r) National Walnut powdercoat finish.
 - s) Oak powdercoat finish.
 - t) Oregon Douglas powdercoat finish.
 - u) Table Cherry powdercoat finish.
 - v) Teak powdercoat finish.
- d. Seals: Bottom of door to have flexible U-shaped vinyl seal retained in aluminum rail.

**** NOTE TO SPECIFIER ** Delete seals not required.**

- 1) Bulb-type joint seal between sections.
- 2) Blade seal on top section to prevent airflow above header.

**** NOTE TO SPECIFIER ** Doors wider than 14 feet-2 inches (4318 mm) may require reinforcing trusses that span across windows. Consult manufacturer for more information.**

- e. Trussing: Doors designed to withstand specified windload. Deflection of door in horizontal position to be maximum of 1/120th of door width.

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

3. Windows: Provide door sections with windows in lieu of 0.050 inch (1.3 mm) aluminum filler panels. Locations to comply with door elevation drawings.

**** NOTE TO SPECIFIER ** Door sections are available glazed with insulating glass, non-insulating glass, acrylic or polycarbonate. Impact rated and non-impact rated types are available. Impact rated glass available on AV200 and AV300 only. Delete products not required.**

4. Impact Rated Glazing: Provide as follows.
- a. 11/32 inch (8.7 mm) Clear Impact Glass
 - b. 11/32 inch (8.7 mm) Tinted Bronze Impact Glass
 - c. 11/32 inch (8.7 mm) Tinted Gray Impact Glass
 - d. 11/32 inch (8.7 mm) Tinted Green Impact Glass
 - e. 11/32 inch (8.7 mm) White Interlayer Impact Glass
5. Non-Impact Rated Glazing: Provide as follows:
- a. 1/8 inch (3.2 mm) Clear Glass consisting of one pane of 1/8 inch (3.2 mm) DSB non-insulated glass.
 - b. 3/16 inch (4.8 mm) Clear Glass consisting of one pane of 3/16 inch (4.8 mm) non-insulated glass.

- c. 1/4 inch (6.4 mm) Clear Glass consisting of one pane of 1/4 inch (6.4 mm) non-insulated glass.
- d. 1/8 inch (3.2 mm) Clear Tempered Glass consisting of one pane of 1/8 inch (3.2 mm) non-insulated glass.
- e. 1/4 inch (6.4 mm) Clear Tempered Glass consisting of one pane of 1/4 inch (6.4 mm) non-insulated glass.
- f. 3/16 inch (4.88 mm) Clear Tempered Glass consisting of one pane of 3/16 inch (4.88 mm) non-insulated glass.
- g. 1/4 inch (6.4 mm) Clear Laminated Glass consisting of one pane of 1/4 inch (6.4 mm) non-insulated glass.
- h. 1/4 inch (6.4 mm) Bronze Tinted Laminated Glass consisting of one pane of 1/4 inch (6.4 mm) non-insulated glass.
- i. 1/4 inch (6.4 mm) Smoked Grey Tinted Laminated Glass consisting of one pane of 1/4 inch (6.4 mm) non-insulated glass.
- j. 1/4 inch (6.4 mm) Satin Laminated Glass consisting of one pane of 1/4 inch (6.4 mm) non-insulated glass.
- k. 1/4 inch (6.4 mm) White Laminated Glass consisting of one pane of 1/4 inch (6.4 mm) non-insulated glass.
- l. 1/4 inch (6.4 mm) Clear Wire Glass consisting of one pane of 1/4 inch (6.4 mm) non-insulated glass.
- m. 1/8 inch (3.2 mm) Bronze Tinted Glass consisting of one pane of 1/8 inch (3.2 mm) non-insulated glass.
- n. 1/8 inch (3.2 mm) Smoked Grey Tinted Glass consisting of one pane of 1/8 inch (3.2 mm) non-insulated glass.
- o. 1/8 inch (3.2 mm) Black Privacy Glass consisting of one pane of 1/8 inch (3.2 mm) non-insulated glass.
- p. 1/8 inch (3.2 mm) Satin Glass consisting of one pane of 1/8 inch (3.2 mm) non-insulated glass.
- q. 1/8 inch (3.2 mm) Raised Obscure Glass consisting of one pane of 1/8 inch (3.2 mm) non-insulated glass.
- r. 1/8 inch (3.2 mm) Bronze Tinted Tempered Glass consisting of one pane of 1/8 inch (3.2 mm) non-insulated glass.
- s. 1/8 inch (3.2 mm) Smoked Grey Tinted Tempered Glass consisting of one pane of 1/8 inch (3.2 mm) non-insulated glass.
- t. 1/8 inch (3.2 mm) Black Privacy Tempered Glass consisting of one pane of 1/8 inch (3.2 mm) non-insulated glass.
- u. 1/8 inch (3.2 mm) Satin Tempered Glass consisting of one pane of 1/8 inch (3.2 mm) non-insulated glass.
- v. 1/8 inch (3.2 mm) Raised Obscure Glass consisting of one pane of 1/8 inch (3.2 mm) non-insulated glass.
- w. 1/2 inch (12.69 mm) Insulated Clear Glass consisting of two panes of 1/8 inch (3.2 mm) DSB insulated glass.
- x. 1/2 inch (12.69 mm) Insulated Clear Glass with Breather Tube consisting of two panes of 1/8 inch (3.2 mm) DSB insulated glass.
- y. 1/2 inch (12.69 mm) Insulated Clear Tempered Glass consisting of two panes of 1/8 inch (3.2 mm) Tempered insulated glass.
- z. 1/2 inch (12.69 mm) Insulated Clear Tempered Glass with Breather Tube consisting of two panes of 1/8 inch (3.2 mm) Tempered insulated glass.
- aa. 1/2 inch (12.69 mm) Insulated Bronze Tinted Glass consisting of two panes of 1/8 inch (3.2 mm) DSB insulated glass.

- bb. 1/2 inch (12.69 mm) Insulated Bronze Tinted Tempered Glass consisting of two panes of 1/8 inch (3.2 mm) Tempered insulated glass.
- cc. 1/2 inch (12.69 mm) Insulated Smoked Grey Tinted Glass consisting of two panes of 1/8 inch (3.2 mm) DSB insulated glass.
- dd. 1/2 inch (12.69 mm) Insulated Smoked Grey Tinted Tempered Glass consisting of two panes of 1/8 inch (3.2 mm) Tempered insulated glass.
- ee. 1/2 inch (12.69 mm) Insulated Satin Glass consisting of two panes of 1/8 inch (3.2 mm) DSB insulated glass.
- ff. 1/2 inch (12.69 mm) Insulated Satin Tempered Glass consisting of two panes of 1/8 inch (3.2 mm) Tempered insulated glass.
- gg. 1/2 inch (12.69 mm) Insulated Raised Obscure Glass consisting of two panes of 1/8 inch (3.2 mm) DSB insulated glass.
- hh. 1/2 inch (12.69 mm) Insulated Raised Obscure Tempered Glass consisting of two panes of 1/8 inch (3.2 mm) Tempered insulated glass.
- ii. 1/2 inch (12.69 mm) Insulated Low E DSB Glass consisting of two panes of 1/8 inch (3.2 mm) DSB insulated glass.
- jj. 1/2 inch (12.69 mm) Insulated Low E Tempered Glass consisting of two panes of 1/8 inch (3.2 mm) Tempered insulated glass.
- kk. 1/2 inch (12.69 mm) Insulated Solarban 60 Low E Tempered Glass consisting of two panes of 1/8 inch (3.2 mm) Tempered insulated glass.
- ll. 1/8 inch (3.2 mm) Clear Acrylic consisting of one pane of 1/8 inch (3.2 mm) Acrylic glazing.
- mm. 1/8 inch (3.2 mm) Clear Lexan consisting of one pane of 1/8 inch (3.2 mm) Lexan glazing.
- nn. 1/8 inch (3.2 mm) Smoked Grey Tinted Lexan consisting of one pane of 1/8 inch (3.2 mm) Lexan glazing.
- oo. 1/4 inch (6.4 mm) Clear Acrylic consisting of one pane of 1/4 inch (6.4 mm) Acrylic glazing.
- pp. 1/4 inch (6.4 mm) Clear Lexan consisting of one pane of 1/4 inch (6.4 mm) Lexan glazing.

**** NOTE TO SPECIFIER ** The following four paragraphs apply to Model AV300 only. Delete options not required.**

- qq. 1/2 inch (12.69 mm) Insulated Bronze Tinted Low E DSB Glass consisting of two panes of 1/8 inch (3.2 mm) DSB insulated glass.
- rr. 1/2 inch (12.69 mm) Insulated Smoked Grey Tinted Low E DSB Glass consisting of two panes of 1/8 inch (3.2 mm) DSB insulated glass.
- ss. 1/2 inch (12.69 mm) Insulated Bronze Tinted Low E Tempered Glass consisting of two panes of 1/8 inch (3.2 mm) Tempered insulated glass.
- tt. 1/2 inch (12.69 mm) Insulated Smoked Grey Tinted Low E Tempered Glass consisting of two panes of 1/8 inch (3.2 mm) Tempered insulated glass.
- uu. 1 inch (25.4 mm) Insulated Clear Glass consisting of two panes of 1/8 inch (3.2 mm) DSB insulated glass.
- vv. 1 inch (25.4 mm) Insulated Clear Tempered Glass consisting of two panes of 1/8 inch (3.2 mm) Tempered insulated glass.
- ww. 1 inch (25.4 mm) Insulated Low E DSB Glass consisting of two panes of 1/8 inch (3.2 mm) DSB insulated glass.
- xx. 1 inch (25.4 mm) Insulated Low E Tempered Glass consisting of two panes of 1/8 inch (3.2 mm) Tempered insulated glass.
- yy. 1 inch (25.4 mm) Insulated Satin Tempered Glass. Two panes of 1/8 inch (3.2 mm) Tempered insulated glass.

- zz. 1 inch (25.4 mm) Insulated Clear Glass with Breather Tube consisting of two panes of 1/8 inch (3.2 mm) DSB insulated glass.
- aaa. 1 inch (25.4 mm) Insulated Clear Tempered Glass with Breather Tube consisting of two panes of 1/8 inch (3.2 mm) Tempered insulated glass.
- 6. Mounting: Sections mounted in door opening using:

**** NOTE TO SPECIFIER ** Delete mounting not required.**

- a. Between-Jamb Bracket Mounting: sections mounted between door jambs, seal against exterior perimeter seal installed along vertical and top horizontal edges of jambs.
- b. Lap Jamb Angle Mounting: section overlap door jambs by 1 inch (25 mm) on each side of door opening.
- 7. Track:
 - a. Material: Hot-dipped galvanized steel (ASTM A 653), fully adjustable for adequate sealing of door to jamb or weatherseal.

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

- b. Configuration Type: Normal Headroom.
- c. Configuration Type: Low Headroom.
- d. Configuration Type: Vertical Lift.
- e. Configuration Type: Lift-Clearance.
- f. Configuration Type: Incline.
- g. Configuration Type: Contour.

**** NOTE TO SPECIFIER ** The only mounting available on 3-inch lift-clearance is Floor-to-Shaft Angle-Mount and Clip-Angle. Refer to manufacturer's literature for other restrictions. Delete track size, jamb type and mounting options not required.**

- h. Track Size: 2 inches (51 mm).
 - 1) Jamb Type: Wood only.
 - a) Mounting: Adjustable track brackets.
 - 2) Jamb Type: Steel, wood, or masonry.
 - a) Mounting: Floor-to-header angles. Continuous angles from floor to door header. Angle Size: 2-5/16 x 4 x 3/32 inches (59 x 102 x 2.5 mm).
 - b) Mounting: Floor-to-shaft angles. Continuous angles from floor, past header, up to door shaft. Angle Size: 2-5/16 x 4 x 3/32 inch (59 x 102 x 2.5 mm).
 - c) Mounting: QuikClip. Clip-Angle brackets pre-assembled to continuous angle from floor to door header and continuous angle from door header to door shaft. Angle Size: 2-5/16 x 1-1/4 x 3/32 inches (59 x 32 x 2.5 mm).
- i. Track Size: 3 inches (76 mm).
 - 1) Jamb Type: Steel, wood, or masonry.
 - a) Mounting: Floor-to-header angles. Continuous angles from floor to door header. Angle Size: 3-1/2 x 5 x 3/32 inches (89 x 127 x 2.5 mm) on 3-inch track.
 - b) Mounting: Floor-to-shaft angles. Continuous angles from floor, past header, up to door shaft. Angle Size: 3-1/2 x 5 x 3/32 inches (89 x 127 x 2.5 mm) on 3-inch track.
 - c) Mounting: QuikClip. Clip-Angle brackets pre-assembled to continuous angle from floor to door header and continuous angle from door header to door shaft. Angle Size: 3-1/2 x 1-1/4 x 3/32 inches (89 x 32 x 2.5 mm) on 3-inch track.

j. Finish:

**** NOTE TO SPECIFIER ** Delete finish not required.**

- 1) Galvanized.
- 2) White Powdercoat.

8. Counterbalance:

- a. Counterbalance System: Provided with aircraft-type, galvanized steel lifting cables with minimum safety factor of 5. Torsion Springs consisting of heavy-duty oil-tempered wire torsion springs on a continuous ball-bearing cross-header shaft.

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

- 1) Spring Cycle Requirements: Standard 10,000 cycles.
- 2) Spring Cycle Requirements: High cycle: _____ cycles.

9. Hardware:

- a. Hinges and Brackets: Fabricated from galvanized steel.

**** NOTE TO SPECIFIER ** Delete track size not required.**

- b. Track Rollers: 2 inches (50.8 mm) diameter consistent with track size, with hardened steel ball bearings.
- c. Track Rollers: 3 inches (76.2 mm) diameter consistent with track size, with hardened steel ball bearings.

**** NOTE TO SPECIFIER ** Door may be provided with perimeter seal for jambs. Delete if not required.**

- d. Perimeter Seal: Provide complete weather stripping system to reduce air infiltration. Weather stripping shall be replaceable.
 - 1) For bracket mounted doors provide climate seal or vinyl seal with aluminum retainer.
 - 2) For angle mounted doors provide angle clip-on seal.

**** NOTE TO SPECIFIER ** Door may be provided with exterior or interior locking device. Retain or delete paragraph below to suit project.**

- e. Furnish door system with locks: Exterior lock with five-pin tumbler cylinder, night latch and steel bar engaging track.
 - f. Furnish door system with locks: Interior lock with dead bolt provided with hole to receive padlock provided by Owner.
10. AlumaView Limited Warranty: Raynor warrants the door sections against defects in material and workmanship for five years from date of delivery to the original purchaser. Window components are warranted against defects in material and workmanship for three years from date of delivery to the original purchaser. Raynor warrants all hardware and spring components against defects in material and workmanship for one year (or cycle life of the springs) from date of delivery to the original purchaser. Additional Limited Warranty requirements in accordance with manufacturer's full standard limited warranty documentation.

**** NOTE TO SPECIFIER ** ControlHoist 2.0 (solid state) operators. Delete if not required.**

B. ControlHoist 2.0 as manufactured by Raynor Garage Doors:

1. Model:

**** NOTE TO SPECIFIER ** ControlHoist 2.0 Optima operators (solid state) feature a heavy-duty gear drive running in oil for high reliability and efficient operation. They are designed for larger sectional doors and higher cycle applications. Delete if not required.**

- a. Raynor ControlHoist 2.0 Optima:

- 1) Type: Jackshaft with manual chain hoist.
- 2) Type: Trolley.

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

- 3) Motor Horsepower Rating: Continuous 1/2 HP.
- 4) Motor Horsepower Rating: Continuous 3/4 HP.
- 5) Motor Horsepower Rating: Continuous 1 HP.
- 6) Motor Horsepower Rating: Continuous 1-1/2 HP.
- 7) Motor Horsepower Rating: Continuous 2 HP.

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

- 8) Electrical Requirements: 115 volt single phase.
- 9) Electrical Requirements: 230 volt single phase.
- 10) Electrical Requirements: 208-230 volt three phase.
- 11) Electrical Requirements: 460 volt three phase.
- 12) Duty Cycle: 30 cycles/hour or 300 cycles/day.
- 13) Control Wiring: Solid state circuitry with provisions for connection of safety edge to reverse, external radio control hook-up and maximum run timer. Provisions for timers to close, monitored reversing devices, mid stop and lock bar sensor capability.

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

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

**** NOTE TO SPECIFIER ** ControlHoist 2.0 Standard belt-drive operators are designed for medium- to high-cycle applications and for normal- to large-size sectional doors. Delete if not required.**

b. Raynor ControlHoist 2.0 Standard:

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

- 1) Type: Jackshaft.
- 2) Type: Jackshaft with manual chain hoist.
- 3) Type: Trolley.

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

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

b) Custom wiring.

**** NOTE TO SPECIFIER ** ControlHoist 2.0 Basic belt drive operators are designed for operating sectional doors up to 14 feet high in light duty applications. Delete if not required.**

c. Raynor ControlHoist 2.0 Basic:

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

- 1) Type: Jackshaft.
- 2) Type: Jackshaft with manual chain hoist.
- 3) Type: Trolley.
- 4) Motor Horsepower Rating: Intermittent 1/2 HP.
- 5) Electrical Requirements: 115 volt single phase.
- 6) Duty Cycle: 10 cycles/hour.
- 7) Control Wiring: Solid state circuitry with provisions for connection of safety edge to reverse, external radio control hook-up and maximum run timer. Provisions for timers to close, monitored reversing devices, mid stop and lock bar sensor capability.
 - a) Provide three button momentary contact "open-stop", constant pressure on close (can be changed to momentary to close).

**** NOTE TO SPECIFIER ** Delete commercial sectional raised panel doors if not required.**

2.5 COMMERCIAL SECTIONAL RAISED PANEL DOOR

A. Commercial Aspen as manufactured by Raynor Garage Doors:

1. Doors:

a. Operation:

**** NOTE TO SPECIFIER ** Delete door operation not required. There are restrictions on size of door for manual or hand chain operation.**

- 1) Provide doors designed for manual operation.
- 2) Provide doors designed for hand chain operation.
- 3) Provide doors designed for electric motor operation.

b. Jamb Construction:

**** NOTE TO SPECIFIER ** Delete jamb not required.**

- 1) Steel jambs with self-tapping fasteners.
- 2) Wood jambs with lag screw fasteners.
- 3) Masonry jambs with anchor bolt fasteners.

c. Structural Performance Requirements:

**** NOTE TO SPECIFIER ** Insert required wind load p.s.f.**

- 1) Wind Loads: Uniform pressure of: _____ psf.

2. Sections:

**** NOTE TO SPECIFIER ** Delete door model DesignForm Optima or DesignForm Standard if not required.**

a. Commercial Aspen AP200C:

- 1) Sections shall be pressure bonded to injected polyurethane foam insulated core with interior and exterior skins separated by continuous thermal break. Hinge reinforcement plates shall be 19 gauge edge plates and 19 gauge center plates, located within section interior at every hinge location. End stiles to be 20 gauge

galvanized steel for 18 inch and 21 inch section heights and 16 gauge for 24 inch section heights. Sections shall feature a tongue-and-groove joint for weather-tight closure between sections.

- 2) Material: Steel sandwich construction, 2 inches (51 mm) thick, roll formed from hot dipped galvanized (G40) steel complying with ASTM A 653. Exterior skin to be constructed of 26 gauge steel and interior skin to be constructed of 27 gauge steel. Exterior skin shall be woodgrain textured and interior skin shall be stucco textured. Exterior surface of sections shall feature embossed Colonial Raised Panels, Ranch Raised Panels, Recessed Grooved Colonial Panels, Recessed Grooved Ranch Panels, Plank or Flush Woodgrain Surface.
- 3) Finish: Exterior skin to have two coats of paint, one primer coat and one finish coat.

**** NOTE TO SPECIFIER ** Delete color not required.**

- a) Color: White polyester paint.
 - b) Color: Almond polyester paint.
 - c) Color: Brown polyester paint.
 - d) Color: Desert Tan polyester paint.
 - e) Color: BronzeTone polyester paint.
 - f) Color: Charcoal Kynar + Cool Chemistry paint.
 - g) Color: Sandstone polyester paint.
 - h) Color: Black Kynar + Cool Chemistry paint.
 - i) Color: Slate polyester paint.
 - j) Color: Walnut Woodgrain polyester paint.
 - k) Color: Auburn Woodgrain polyester paint.
 - l) Color: Mocha Woodgrain polyester paint.
 - m) Color: Driftwood Woodgrain polyester paint.
 - n) Color: _____.
 - o) Color: As detailed on the Drawings.
 - p) Color: As determined by Architect from Raynor's ColorWave post paint process featuring 1500 colors of Sherwin Williams Polane Enamel paint.
- 4) Insulation: Injected polyurethane with R-value of 18.0.
- b. Commercial Aspen AP138C:
- 1) Sections shall be pressure bonded to injected polyurethane foam insulated core with interior and exterior skins separated by continuous thermal break. Hinge reinforcement plates shall be 19 gauge edge plates and 19 gauge center plates, located within section interior at every hinge location. End stiles to be 20 gauge galvanized steel for 18 inch and 21 inch section heights and 16 gauge for 24 inch section heights. Sections shall feature a tongue-and-groove joint for weather-tight closure between sections.
 - 2) Material: Steel sandwich construction, 1-3/8 inches (35 mm) thick, roll formed from hot dipped galvanized steel complying with ASTM A 653. Exterior skin to be constructed of 26 gauge steel and interior skin to be constructed of 27 gauge steel. Exterior skin shall be woodgrain textured and interior skin shall be stucco textured. Exterior surface of sections shall feature embossed Colonial Raised Panels, Ranch Raised Panels,

Recessed Grooved Colonial Panels, Recessed Grooved Ranch Panels, Plank or Flush Woodgrain Surface.

- 3) Finish: Exterior skin to have two coats of paint, one primer coat and one finish coat.

**** NOTE TO SPECIFIER ** Delete color not required.**

- a) Color: White polyester paint.
 - b) Color: Almond polyester paint.
 - c) Color: Brown polyester paint.
 - d) Color: Desert Tan polyester paint.
 - e) Color: Bronze Tone polyester paint.
 - f) Color: Black Kynar + Cool Chemistry paint.
 - g) Color: Charcoal Kynar + Cool Chemistry paint.
 - h) Color: Sandstone polyester paint.
 - i) Color: Slate polyester paint.
 - j) Color: Walnut Woodgrain polyester paint.
 - k) Color: Auburn Woodgrain polyester paint.
 - l) Color: Mocha Woodgrain polyester paint.
 - m) Color: Driftwood Woodgrain polyester paint.
- 4) Insulation: Injected polyurethane with R-value of 13.0.
- c. Seals: Bottom of door to have flexible U-shaped vinyl seal retained in aluminum rail. Optional blade seal on top section to prevent airflow above header
- d. Trussing: Doors designed to withstand specified windload. Deflection of door in horizontal position to be maximum of 1/120th of door width.

**** NOTE TO SPECIFIER ** Some restrictions may apply based on door height. Actual window width may vary slightly based on door width. Delete if not required.**

3. Windows: Locations to comply with door elevation drawings.

**** NOTE TO SPECIFIER ** Delete window not required.**

- a. Colonial style 18 inches by 13 inches (457 mm by 330 mm) minimum window encased in an injection molded polypropylene frame.
- b. Ranch style 41 inches by 13 inches (1041 mm by 330 mm) window minimum encased in an injection molded polypropylene frame.

**** NOTE TO SPECIFIER ** Delete glass not required.**

4. Glazing: Windows to be provided with glazing units as follows:
- a. Single glass consisting of one pane of 1/8 inch (3.2 mm) thick DSB glass.
 - b. Insulated glass consisting of two panes of 1/8 inch (3.2 mm) thick glass.
5. Mounting: Sections mounted in door opening using:

**** NOTE TO SPECIFIER ** Delete mounting not required.**

- a. Between-Jamb Bracket Mounting: sections mounted between door jambs, seal against exterior perimeter seal installed along vertical and top horizontal edges of jambs.
 - b. Lap Jamb Angle Mounting: section overlap door jambs by 1 inch (25 mm) on each side of door opening.
6. Track:
- a. Material: Hot-dipped galvanized steel (ASTM A 653), fully adjustable for adequate sealing of door to jamb or weatherseal.

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

- b. Configuration Type: Normal Headroom.

- c. Configuration Type: Low Headroom.
- d. Configuration Type: Vertical Lift.
- e. Configuration Type: Lift-Clearance.
- f. Configuration Type: Incline.
- g. Configuration Type: Contour.

**** NOTE TO SPECIFIER ** The only mounting available on 3-inch lift-clearance is Floor-to-Shaft Angle-Mount and Clip-Angle. Refer to manufacturer's literature for other restrictions. Delete track size, jamb type and mounting options not required.**

- h. Track Size: 2 inches (51 mm).
 - 1) Jamb Type: Wood only.
 - a) Mounting: Adjustable track brackets.
 - 2) Jamb Type: Steel, wood, or masonry.
 - a) Mounting: Floor-to-header angles. Continuous angles from floor to door header. Angle Size: 2-5/16 x 4 x 3/32 inches (59 x 102 x 2.5 mm).
 - b) Mounting: Floor-to-shaft angles. Continuous angles from floor, past header, up to door shaft. Angle Size: 2-5/16 x 4 x 3/32 inch (59 x 102 x 2.5 mm).
 - c) Mounting: QuikClip. Clip-Angle brackets pre-assembled to continuous angle from floor to door header and continuous angle from door header to door shaft. Angle Size: 2-5/16 x 1-1/4 x 3/32 inches (59 x 32 x 2.5 mm).
- i. Track Size: 3 inches (76 mm).
 - 1) Jamb Type: Steel, wood, or masonry.
 - a) Mounting: Floor-to-header angles. Continuous angles from floor to door header. Angle Size: 3-1/2 x 5 x 3/32 inches (89 x 127 x 2.5 mm) on 3-inch track.
 - b) Mounting: Floor-to-shaft angles. Continuous angles from floor, past header, up to door shaft. Angle Size: 3-1/2 x 5 x 3/32 inches (89 x 127 x 2.5 mm) on 3-inch track.
 - c) Mounting: QuikClip. Clip-Angle brackets pre-assembled to continuous angle from floor to door header and continuous angle from door header to door shaft. Angle Size: 3-1/2 x 1-1/4 x 3/32 inches (89 x 32 x 2.5 mm) on 3-inch track.
- j. Finish:

**** NOTE TO SPECIFIER ** Delete finish not required.**

- 1) Galvanized.
 - 2) White Powdercoat.
7. Counterbalance:
- a. Counterbalance System: Provided with aircraft-type, galvanized steel lifting cables with minimum safety factor of 5. Torsion Springs consisting of heavy-duty oil-tempered wire torsion springs on a continuous ball-bearing cross-header shaft.

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

- 1) Spring Cycle Requirements: Standard 10,000 cycles.
 - 2) Spring Cycle Requirements: High cycle: _____ cycles.
8. Hardware:
- a. Hinges and Brackets: Fabricated from galvanized steel.

**** NOTE TO SPECIFIER ** Delete track size not required.**

- b. Track Rollers: 2 inches (50.8 mm) diameter consistent with track size, with hardened steel ball bearings.
- c. Track Rollers: 3 inches (76.2 mm) diameter consistent with track size, with hardened steel ball bearings.

**** NOTE TO SPECIFIER ** Door may be provided with perimeter seal for jambs. Delete if not required.**

- d. Perimeter Seal: Provide complete weather stripping system to reduce air infiltration. Weather stripping shall be replaceable.
 - 1) For bracket mounted doors provide climate seal or vinyl seal with aluminum retainer.
 - 2) For angle mounted doors provide angle clip-on seal.

**** NOTE TO SPECIFIER ** Door may be provided with exterior or interior locking device. Retain or delete paragraph below to suit project.**

- e. Furnish door system with locks: Exterior lock with five-pin tumbler cylinder, night latch and steel bar engaging track.
 - f. Furnish door system with locks: Interior lock with dead bolt provided with hole to receive padlock provided by Owner.
9. Commercial Aspen Limited Warranty: Raynor warrants the door sections against defects in material and workmanship, and deterioration due to rust-through for ten years from date of delivery to the original purchaser. Raynor also warrants the door sections against delamination of the insulation from the steel skins for ten years from date of delivery to the original purchaser. Window components are warranted against defects in material and workmanship for one year from date of delivery to the original purchaser. Raynor warrants all hardware and spring components against defects in material and workmanship for one year (or cycle life of the springs) from date of delivery to the original purchaser. Additional Limited Warranty requirements in accordance with manufacturer's full standard limited warranty documentation.

B. StyleForm (Commercial ShowCase) as manufactured by Raynor Garage Doors:

- 1. Doors:
 - a. Operation:

**** NOTE TO SPECIFIER ** Delete door operation not required. There are restrictions on size of door for manual or hand chain operation.**

- 1) Provide doors designed for manual operation.
- 2) Provide doors designed for hand chain operation.
- 3) Provide doors designed for electric motor operation.

- b. Jamb Construction:

**** NOTE TO SPECIFIER ** Delete jamb not required.**

- 1) Steel jambs with self-tapping fasteners.
- 2) Wood jambs with lag screw fasteners.
- 3) Masonry jambs with anchor bolt fasteners.

- c. Structural Performance Requirements:

**** NOTE TO SPECIFIER ** Insert required wind load p.s.f.**

- 1) Wind Loads: Uniform pressure of: _____ psf.

- 2. Sections:

- a. StyleForm Optima (Commercial ShowCase):

- 1) Sections shall be pressure bonded to a 1-7/8 inches (48 mm) thick expanded polystyrene foam core with interior and exterior skins separated by continuous thermal break. Hinge

reinforcement plates shall be 16 gauge edge plates and 16 gauge center plates, located within section interior at every hinge location. End stiles to be 18 gauge galvanized steel.

- 2) Material: Steel sandwich construction, 2 inches (51 mm) thick, roll formed from draw quality, hot dipped galvanized steel complying with ASTM A 653. Exterior and interior skin to be constructed of 26 gauge steel embossed woodgrain texture. Exterior surface of sections shall feature embossed Colonial Raised Panels, Ranch Raised Panels or Flush Woodgrain Surface.
- 3) Finish: Exterior skin to have two coats of paint, one primer coat and one finish coat.

**** NOTE TO SPECIFIER ** Delete color not required.**

- a) Color: White polyester paint.
 - b) Color: Almond polyester paint.
 - c) Color: Bronze Tone polyester paint.
 - d) Color: Clay Tone polyester paint.
 - e) Color: Dark Brown Kynar paint.
 - f) Color: Frost White Kynar paint.
 - g) Color: Beige Kynar paint.
 - h) Color: Sepia Brown Kynar paint.
 - i) Color: Desert Tan polyester paint.
 - j) ArmorBrite Powdercoat finish, color as selected by Architect.
- 4) Insulation: Expanded polystyrene with R-value of 10.25
 - b. Seals: Bottom of door to have flexible U-shaped vinyl seal retained in aluminum rail. Optional blade seal on top section to prevent airflow above header
 - c. Trussing: Doors designed to withstand specified windload. Deflection of door in horizontal position to be maximum of 1/120th of door width.

**** NOTE TO SPECIFIER ** Some restrictions may apply based on door height. Actual window width may vary slightly based on door width. Delete if not required.**

3. Windows: Locations to comply with door elevation drawings.

**** NOTE TO SPECIFIER ** Delete window not required.**

- a. Colonial style 17 inches by 12 inches (432 mm by 305 mm) minimum window encased in an extruded PVC frame.
- b. Ranch style 40 inches by 12 inches (1016 mm by 305 mm) window minimum encased in an extruded PVC frame.

**** NOTE TO SPECIFIER ** Delete window not required.**

4. Glazing: Windows to be provided with glazing units as follows:
 - a. Single glass consisting of one pane of 1/8 inch (3.2 mm) thick DSB glass.
 - b. Insulated glass consisting of two panes of 1/8 inch (3.2 mm) thick DSB glass.
5. Mounting: Sections mounted in door opening using:

**** NOTE TO SPECIFIER ** Delete mounting not required.**

- a. Between-Jamb Bracket Mounting: sections mounted between door jambs, seal against exterior perimeter seal installed along vertical and top horizontal edges of jambs.
- b. Lap Jamb Angle Mounting: section overlap door jambs by 1 inch (25 mm) on each side of door opening.

6. Track:
- a. Material: Hot-dipped galvanized steel (ASTM A 653), fully adjustable for adequate sealing of door to jamb or weatherseal.

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

- b. Configuration Type: Normal Headroom.
c. Configuration Type: Low Headroom.
d. Configuration Type: Vertical Lift.
e. Configuration Type: Lift-Clearance.
f. Configuration Type: Incline.
g. Configuration Type: Contour.

**** NOTE TO SPECIFIER ** The only mounting available on 3-inch lift-clearance is Floor-to-Shaft Angle-Mount and Clip-Angle. Refer to manufacturer's literature for other restrictions. Delete track size, jamb type and mounting options not required.**

- h. Track Size: 2 inches (51 mm).
1) Jamb Type: Wood only.
a) Mounting: Adjustable track brackets.
2) Jamb Type: Steel, wood, or masonry.
a) Mounting: Floor-to-header angles. Continuous angles from floor to door header. Angle Size: 2-5/16 x 4 x 3/32 inches (59 x 102 x 2.5 mm).
b) Mounting: Floor-to-shaft angles. Continuous angles from floor, past header, up to door shaft. Angle Size: 2-5/16 x 4 x 3/32 inch (59 x 102 x 2.5 mm).
c) Mounting: QuikClip. Clip-Angle brackets pre-assembled to continuous angle from floor to door header and continuous angle from door header to door shaft. Angle Size: 2-5/16 x 1-1/4 x 3/32 inches (59 x 32 x 2.5 mm).
i. Track Size: 3 inches (76 mm).
1) Jamb Type: Steel, wood, or masonry.
a) Mounting: Floor-to-header angles. Continuous angles from floor to door header. Angle Size: 3-1/2 x 5 x 3/32 inches (89 x 127 x 2.5 mm) on 3-inch track.
b) Mounting: Floor-to-shaft angles. Continuous angles from floor, past header, up to door shaft. Angle Size: 3-1/2 x 5 x 3/32 inches (89 x 127 x 2.5 mm) on 3-inch track.
c) Mounting: QuikClip. Clip-Angle brackets pre-assembled to continuous angle from floor to door header and continuous angle from door header to door shaft. Angle Size: 3-1/2 x 1-1/4 x 3/32 inches (89 x 32 x 2.5 mm) on 3-inch track.
j. Finish:

**** NOTE TO SPECIFIER ** Delete finish not required.**

- 1) Galvanized.
2) White Powdercoat.

7. Counterbalance:
- a. Counterbalance System: Provided with aircraft-type, galvanized steel lifting cables with minimum safety factor of 5. Torsion Springs consisting of heavy-duty oil-tempered wire torsion springs on a continuous ball-bearing cross-header shaft.

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

- 1) Spring Cycle Requirements: Standard 10,000 cycles.
 - 2) Spring Cycle Requirements: High cycle: _____ cycles.
8. Hardware:
- a. Hinges and Brackets: Fabricated from galvanized steel.

**** NOTE TO SPECIFIER ** Delete track size not required.**

- b. Track Rollers: 2 inches (50.8 mm) diameter consistent with track size, with hardened steel ball bearings.
- c. Track Rollers: 3 inches (76.2 mm) diameter consistent with track size, with hardened steel ball bearings.

**** NOTE TO SPECIFIER ** Door may be provided with perimeter seal for jambs. Delete if not required.**

- d. Perimeter Seal: Provide complete weather stripping system to reduce air infiltration. Weather stripping shall be replaceable.
 - 1) For bracket mounted doors provide climate seal or vinyl seal with aluminum retainer.
 - 2) For angle mounted doors provide angle clip-on seal.

**** NOTE TO SPECIFIER ** Door may be provided with exterior or interior locking device. Retain or delete paragraph below to suit project.**

- e. Furnish door system with locks: Exterior lock with five-pin tumbler cylinder, night latch and steel bar engaging track.
 - f. Furnish door system with locks: Interior lock with dead bolt provided with hole to receive padlock provided by Owner.
9. StyleForm (Commercial ShowCase) Limited Warranty: Raynor warrants the door sections against defects in material and workmanship, and deterioration due to rust-through for ten years from date of delivery to the original purchaser. Raynor also warrants the door sections against delamination of the insulation from the steel skins for ten years from date of delivery to the original purchaser. Window components are warranted against defects in material and workmanship for one year from date of delivery to the original purchaser. Raynor warrants all hardware and spring components against defects in material and workmanship for one year (or cycle life of the springs) from date of delivery to the original purchaser. Additional Limited Warranty requirements in accordance with manufacturer's full standard limited warranty documentation.

**** NOTE TO SPECIFIER ** ControlHoist 2.0 (solid state) operators. Delete if not required.**

- C. ControlHoist 2.0 as manufactured by Raynor Garage Doors:
1. Model:

**** NOTE TO SPECIFIER ** ControlHoist 2.0 Optima operators (solid state) feature a heavy-duty gear drive running in oil for high reliability and efficient operation. They are designed for larger sectional doors and higher cycle applications. Delete if not required.**

- a. Raynor ControlHoist 2.0 Optima:
 - 1) Type: Jackshaft with manual chain hoist.
 - 2) Type: Trolley.

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

- 3) Motor Horsepower Rating: Continuous 1/2 HP.
- 4) Motor Horsepower Rating: Continuous 3/4 HP.
- 5) Motor Horsepower Rating: Continuous 1 HP.
- 6) Motor Horsepower Rating: Continuous 1-1/2 HP.
- 7) Motor Horsepower Rating: Continuous 2 HP.

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

- 8) Electrical Requirements: 115 volt single phase.
- 9) Electrical Requirements: 230 volt single phase.
- 10) Electrical Requirements: 208-230 volt three phase.
- 11) Electrical Requirements: 460 volt three phase.
- 12) Duty Cycle: 30 cycles/hour or 300 cycles/day.
- 13) Control Wiring: Solid state circuitry with provisions for connection of safety edge to reverse, external radio control hook-up and maximum run timer. Provisions for timers to close, monitored reversing devices, mid stop and lock bar sensor capability.

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

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

**** NOTE TO SPECIFIER ** ControlHoist 2.0 Standard belt-drive operators are designed for medium- to high-cycle applications and for normal- to large-size sectional doors. Delete if not required.**

b. Raynor ControlHoist 2.0 Standard:

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

- 1) Type: Jackshaft.
- 2) Type: Jackshaft with manual chain hoist.
- 3) Type: Trolley.

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

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

b) Custom wiring.

**** NOTE TO SPECIFIER ** ControlHoist 2.0 Basic belt drive operators are designed for operating sectional doors up to 14 feet high in light duty applications. Delete if not required.**

c. Raynor ControlHoist 2.0 Basic:

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

- 1) Type: Jackshaft.

- 2) Type: Jackshaft with manual chain hoist.
- 3) Type: Trolley.
- 4) Motor Horsepower Rating: Intermittent 1/2 HP.
- 5) Electrical Requirements: 115 volt single phase.
- 6) Duty Cycle: 10 cycles/hour.
- 7) Control Wiring: Solid state circuitry with provisions for connection of safety edge to reverse, external radio control hook-up and maximum run timer. Provisions for timers to close, monitored reversing devices, mid stop and lock bar sensor capability.
 - a) Provide three button momentary contact "open-stop", constant pressure on close (can be changed to momentary to close).

PART 3 EXECUTION

3.1 EXAMINATION

- A. 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.
- B. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

3.2 PREPARATION

- A. Clean surfaces thoroughly prior to installation.
- B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

3.3 INSTALLATION

- A. General: Install door, track and operating equipment complete with all necessary accessories and hardware according to shop drawings, manufacturer's instructions.
- B. Lubricate bearings and sliding parts, and adjust doors for proper operation, balance, clearance and similar requirements.

3.4 PROTECTION

- A. Clean installed products in accordance with manufacturer's instructions prior to Owner's acceptance. Remove and legally dispose of construction debris from project site.
- B. Remove temporary coverings and protection of adjacent work areas. Repair or replace installed products damaged prior to or during installation.
- C. Lubricate bearings and sliding parts, assure weather tight fit around door perimeter and adjust doors for proper operation, balance, clearance and similar requirements. Protect installed products until completion of project.
- D. Touch-up, repair or replace damaged products before Substantial Completion.

END OF SECTION