



SECTION 08360

SECTIONAL OVERHEAD DOORS

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PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Insulated Sectional Overhead Doors.
- B. Steel Sectional Overhead Doors.
- C. Glazed Aluminum Sectional Overhead Doors
- D. Electric Operators and Controls.
- E. Operating Hardware, tracks, and support.

1.2 RELATED SECTIONS

- A. Section 03300 - Cast-In-Place Concrete: Prepared opening in concrete. Execution requirements for placement of anchors in concrete wall construction.
- B. Section 04810 - Unit Masonry Assemblies: Prepared opening in masonry. Execution requirements for placement of anchors in masonry wall construction.
- C. Section 05500 - Metal Fabrications: Steel frame and supports.
- D. Section 06114 - Wood Blocking and Curbing: Rough wood framing and blocking for door opening.
- E. Section 07900 - Joint Sealers: Perimeter sealant and backup materials.
- F. Section 08710 - Door Hardware: Cylinder locks.
- G. Section 09900 - Paints and Coatings: Field painting.
- H. Section 11150 - Parking Control Equipment: Remote door control.
- I. Section 16130 - Raceway and Boxes: Empty conduit from control station to door operator.
- J. Section 16150 - Wiring Connections: Electrical service to door operator.

1.3 REFERENCES

- A. ANSI/DASMA 102 - American National Standard Specifications for Sectional Overhead Type Doors.
- B. ASTM A 123 – Zinc hot-dipped galvanized coatings on iron and steel products.
- C. ASTM A 216 - Specifications for sectional overhead type doors.
- D. ASTM A 229 - Steel wire, oil-tempered for mechanical springs.
- E. ASTM A 653 - Steel sheet, zinc-coated galvanized by the hot-dipped process, commercial quality.
- F. ASTM D 1929 - Ignition temperature test to determine flash and ignition temperature of foamed plastics.
- G. ASTM E 84 - Tunnel test for flame spread and smoke developed index.
- H. ASTM E 330 - Structural performance of exterior windows, curtain walls, and doors by uniform static air pressure difference.
- I. ASTM E 413 - Classification for Rating Sound Insulation
- J. ASTM E 1332 - Standard Classification for Rating Outdoor-Indoor Sound Attenuation.
- K. ASTM E 283 - Standard Test Method for Determining Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen

1.4 DESIGN / PERFORMANCE REQUIREMENTS

- A. Wind Loads: Design and size components to withstand loads caused by pressure and suction of wind acting normal to plane of wall as calculated in accordance with applicable code.
 - 1. Design pressure of _____ lb/sq ft (_____ kPa).
- B. Wiring Connections: Requirements for electrical characteristics.
 - 1. 115 volts, single phase, 60 Hz.
 - 2. 230 volts, single phase, 60 Hz.
 - 3. 230 volts, three phase, 60 Hz.
 - 4. 460 volts, three phase, 60 Hz.
- C. Single-Source Responsibility: Provide doors, tracks, motors, and accessories from one manufacturer for each type of door. Provide secondary components from source acceptable to manufacturer of primary components.

1.5 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. Shop Drawings: Indicate plans and elevations including opening dimensions and required tolerances, connection details, anchorage spacing, hardware locations, and installation details.

- D. Manufacturer's Certificates: Certify products meet or exceed specified requirements.

- E. Operation and Maintenance Data.

1.6 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section with minimum five years documented experience.

- B. Installer Qualifications: Authorized representative of the manufacturer with minimum five years documented experience.

- C. Products Requiring Electrical Connection: Listed and classified by Underwriters Laboratories, Inc. acceptable to authority having jurisdiction as suitable for purpose specified.

1.7 DELIVERY, STORAGE, AND HANDLING

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

- B. Protect materials from exposure to moisture until ready for installation.

- C. Store materials in a dry, ventilated weathertight location.

1.8 PROJECT CONDITIONS

- A. Pre-Installation Conference: Convene a pre-installation conference just prior to commencement of field operations, to establish procedures to maintain optimum working conditions and to coordinate this work with related and adjacent work.

1.9 WARRANTY

- A. Warranty: Manufacturer's limited door and operators System warranty for 10 years against cracking, splitting or deterioration of steel skin due to rust.

- B. Warranty: Manufacturer's limited door and operators System warranty for 8 years against cracking, splitting or deterioration due to rust-through.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Acceptable Manufacturer: Wayne Dalton; 2501 S. State Highway 121 Business, Suite 200, Lewisville, TX 75067. ASD. Phone: (800) 827-3667; Web Site: www.wayne-dalton.com. Email: info@wayne-dalton.com.
- B. Substitutions: Not permitted.
- C. Requests for substitutions will be considered in accordance with provisions of Section 01600.

2.2 INSULATED SECTIONAL OVERHEAD DOORS

- A. Insulated Steel Sectional Overhead Doors: Wayne Dalton Thermospan 200-20 insulated sectional overhead steel doors. Units shall have the following characteristics:
 - 1. Door Sections: Shall be of steel/polyurethane/steel sandwich type construction with thermal break. Sections roll formed with two 1-3/4 inch integral struts sealed with polypropylene rib caps per section.
 - a. Panel Thickness: 2 inches (51 mm).
 - b. Exterior Surface: Flush smooth.
 - c. Exterior Steel: 20 gauge, hot-dipped galvanized.
 - d. Thermal Values: R-value of 17.50; U-value of 0.057.
 - e. Air Infiltration: 0.07 cfm at 15 mph.
 - f. Sound transmission class 22 when tested in accordance with ASTM E 413.
 - g. Outdoor-indoor transmission class 19 when tested in accordance with ASTM E 1332.
 - h. Insulation: CFC-free and HCFC-free polyurethane, fully encapsulated.
 - 1) Insulated sections tested in accordance with ASTM E 84 and achieve a flame spread Index of 75 or less, and a Smoke Developed Index of 450 or less.
 - 2) Insulation material tested in accordance with ASTM D 1929 and achieve a minimum Flash Ignition temperature of 698 degrees F, and a minimum Self Ignition temperature of 950 degrees F.
 - i. Ends: Hot-dipped galvanized steel, full height with end caps.
 - 1) 20 gauge.
 - 2) 18 gauge.
 - 3) 16 gauge.
 - 4) 14 gauge.
 - j. Spring Counterbalance: Sized to weight of the door, with a helically wound, oil tempered torsion spring mounted on a steel shaft; cable drum of die cast aluminum with high strength galvanized aircraft cable. Sized with a minimum 5 to 1 safety factor.
 - 1) Standard cycle spring: 10,000 cycles.
 - 2) High cycle spring: 25,000 cycles.
 - 3) High cycle spring: 50,000 cycles.
 - 4) High cycle spring: 75,000 cycles.
 - 5) High cycle spring: 100,000 cycles
 - k. Pass-Door:
 - 1) Provide with optional pass door.
 - l. Full View Aluminum Glazing Sections:
 - 1) 1/8 inch (3 mm) Double Strength glass.
 - 2) 1/8 inch (3 mm) Acrylic (Plexiglass) glazing.
 - 3) 1/8 inch (3 mm) Tempered glass.
 - 4) 1/8 inch (3 mm) Polycarbonate (Lexan) glazing.

- 5) 1/4 inch (6 mm) Tempered glass.
 - 6) 1/4 inch (6 mm) Acrylic (Plexiglass) glazing.
 - 7) 1/4 inch (6 mm) Polycarbonate (Lexan) glazing.
 - 8) 1/2 inch (12.5 mm) Double Insulating glass.
 - 9) 1/2 inch (12.5 mm) Tempered Double Insulating glass.
 - 10) 1/4 inch (6 mm) Plate glass.
 - 11) 1/4 inch (6 mm) Polished wire glass.
 - 12) 1/4 inch (6 mm) Twin-Wall Polycarbonate (clear, bronze, white).
 - 13) 3/8 inch (9.5 mm) Twin-Wall Polycarbonate (clear, bronze, white).
 - 14) 5/8 inch (15.87 mm) Triple-Wall Polycarbonate (clear, bronze, white).
- m. Partial Glazing of Steel Panels set in 2-piece high-impact black polymer frame:
- 1) 1/2 inch (12.5 mm) Thermolite Insulated DSB Glass
 - 2) 1/2 inch (12.5 mm) Thermolite Insulated Tempered Glass
 - 3) 1/4 inch (6 mm) Acrylic (Plexiglass) glazing.
 - 4) 1/4 inch (6 mm) Polycarbonate (Lexan) glazing.
 - 5) 1/4 inch (6 mm) Polished wire glass.
2. Finish and Color:
 - a. Two coat baked-on polyester:
 - 1) Interior color, white.
 - 2) Exterior color, white.
 3. Windload Design: Provide to meet the Design/Performance requirements specified.
 4. Hardware: Galvanized steel hinges and fixtures. Ball bearing rollers with hardened steel races.
 5. Lock:
 - a. Interior mounted slide lock.
 - b. Interior mounted slide lock with interlock switch for automatic operator.
 - c. Keyed lock.
 - d. Keyed lock with interlock switch for automatic operator.
 6. Weatherstripping:
 - a. Flexible bulb-type strip at bottom section.
 - b. Flexible Jamb seals.
 - c. Flexible Header seal.
 7. Track: Provide track as recommended by manufacturer to suit loading required and clearances available.
 - a. Size:
 - 1) 2 inch (51 mm).
 - 2) 3 inch (76 mm).
 - b. Type:
 - 1) Standard lift.
 - 2) Vertical lift.
 - 3) High lift.
 - 4) Low headroom.
 - 5) Follow roof slope.
 - c. Horizontal track shall be reinforced with continuous angle of adequate length and gauge to minimize deflection.
 - d. Vertical track shall be graduated to provide wedge type weathertight closing with continuous angle mounting for steel or wood jambs, and shall be fully adjustable to seal door at jambs.
 8. Manual Operation: Push-up.
 9. Manual Operation: Chain hoist.

10. Electric Motor Operation: Provide UL listed electric operator, equal to Genie Commercial Operators, size and type as recommended by manufacturer to move door in either direction at not less than 2/3 foot nor more than 1 foot per second.
 - a. Medium Duty
 - 1) Model MH – hoist
 - 2) Model MT – trolley
 - 3) Model MJ - jackshaft
 - b. Standard Duty
 - 1) Model H – hoist
 - 2) Model T – trolley
 - 3) Model J – jackshaft
 - c. Heavy Duty
 - 1) Model GH – hoist
 - 2) Model GT - trolley
 11. Operator shall meet UL325/2010 requirements for continuous monitoring of safety devices.
 - a. Entrapment Protection: Required for momentary contact, includes radio control operation.
 - 1) Pneumatic sensing edge up to 18 feet (5.5 m) wide. Constant contact only complying with UL 325/2010.
 - 2) Electric sensing edge monitored to meet UL 325/2010 equal to Miller Edge.
 - 3) Photoelectric sensors monitored to meet UL 325/2010.
 - b. Operator Controls:
 - 1) Push-button operated control stations with open, close, and stop buttons.
 - 2) Key operated control stations with open, close, and stop buttons.
 - 3) Push-button and key operated control stations with open, close, and stop buttons.
 - 4) Flush mounting.
 - 5) Surface mounting.
 - 6) Interior location.
 - 7) Exterior location.
 - 8) Both interior and exterior location.
 - c. Special Operation:
 - 1) Pull switch.
 - 2) Vehicle detector operation.
 - 3) Radio control operation.
 - 4) Card reader control.
 - 5) Photocell operation.
 - 6) Door timer operation.
 - 7) Commercial light package.
 - 8) Explosion and dust ignition proof control wiring.
- B. Insulated Steel Sectional Overhead Doors: Wayne Dalton Thermospan 200 insulated sectional overhead steel doors. Units shall have the following characteristics:
1. Door Sections: Shall be of steel/polyurethane/steel sandwich type construction with thermal break.
 - a. Panel Thickness: 2 inches (51 mm).
 - b. Exterior Surface: Flush non-repeating random stucco texture and 1/4 inch wide pinstriping.
 - c. Exterior Steel: .015 inch (0.38 mm), hot-dipped galvanized.

- d. Sections roll formed with two 1-3/4 inch integral struts sealed with polypropylene rib caps per section.
- e. Thermal Values: R-value of 17.50; U-value of 0.057.
- f. Air Infiltration: 0.07 cfm at 15 mph.
- g. Sound transmission class 22 when tested in accordance with ASTM E 413.
- h. Outdoor-indoor transmission class 19 when tested in accordance with ASTM E 1332.
- i. Insulation: CFC-free and HCFC-free polyurethane, fully encapsulated.
 - 1) Insulated sections tested in accordance with ASTM E 84 and achieve a Flame spread Index of 10 or less, and a Smoke Developed Index of 210 or less.
 - 2) Insulation material tested in accordance with ASTM D 1929 and achieve a minimum Flash Ignition temperature of 734 degrees F, and a minimum Self Ignition temperature of 950 degrees F.
 - 3) Insulated sections shall meet all requirements of the UBC 17-5 corner burn.
- j. Ends: Hot-dipped galvanized steel, full height with end caps.
 - 1) 18 gauge.
 - 2) 16 gauge.
 - 3) 14 gauge.
- k. Spring Counterbalance: Sized to weight of the door, with a helically wound, oil tempered torsion spring mounted on a steel shaft; cable drum of die cast aluminum with high strength galvanized aircraft cable. Sized with a minimum 5 to 1 safety factor.
 - 1) Standard cycle spring: 10,000 cycles.
 - 2) High cycle spring: 25,000 cycles.
 - 3) High cycle spring: 50,000 cycles.
 - 4) High cycle spring: 75,000 cycles.
 - 5) High cycle spring: 100,000 cycles.
- l. Pass-Door:
 - 1) Provide with optional pass door.
- m. Full View Aluminum Glazing Sections:
 - 1) 1/8 inch (3 mm) Double Strength glass.
 - 2) 1/8 inch (3 mm) Acrylic (Plexiglass) glazing.
 - 3) 1/8 inch (3 mm) Tempered glass.
 - 4) 1/8 inch (3 mm) Polycarbonate (Lexan) glazing.
 - 5) 1/4 inch (6 mm) Tempered glass.
 - 6) 1/4 inch (6 mm) Acrylic (Plexiglass) glazing.
 - 7) 1/4 inch (6 mm) Polycarbonate (Lexan) glazing.
 - 8) 1/2 inch (12.5 mm) Double Insulating glass.
 - 9) 1/2 inch (12.5 mm) Tempered Double Insulating glass.
 - 10) 1/4 inch (6 mm) Plate glass.
 - 11) 1/4 inch (6 mm) Polished wire glass.
 - 12) 1/4 inch (6 mm) Twin-Wall Polycarbonate (clear, bronze, white).
 - 13) 3/8 inch (9.5 mm) Twin-Wall Polycarbonate (clear, bronze, white).
 - 14) 5/8 inch (15.87 mm) Triple-Wall Polycarbonate (clear, bronze, white).
- n. Partial Glazing of Steel Panels set in 2-piece high-impact black polymer frame:
 - 1) 1/2 inch (12.5 mm) Thermolite Insulated DSB Glass
 - 2) 1/2 inch (12.5 mm) Thermolite Insulated Tempered Glass
 - 3) 1/4 inch (6 mm) Acrylic (Plexiglass) glazing.
 - 4) 1/4 inch (6 mm) Polycarbonate (Lexan) glazing.

- 5) 1/4 inch (6 mm) Polished wire glass.
2. Finish and Color:
 - a. Two coat baked-on polyester:
 - 1) Interior color, white.
 - 1) Exterior color, white.
 - 2) Exterior color, brown.
 - 3) Exterior color, tan.
3. Windload Design: Provide to meet the Design/Performance requirements specified.
4. Hardware: Galvanized steel hinges and fixtures. Ball bearing rollers with hardened steel races.
5. Lock:
 - a. Interior mounted slide lock.
 - b. Interior mounted slide lock with interlock switch for automatic operator.
 - c. Keyed lock.
 - d. Keyed lock with interlock switch for automatic operator.
6. Weatherstripping:
 - a. Flexible bulb-type strip at bottom section.
 - b. Flexible Jamb seals.
 - c. Flexible Header seal.
7. Track: Provide track as recommended by manufacturer to suit loading required and clearances available.
 - a. Size:
 - 1) 2 inch (51 mm).
 - 2) 3 inch (76 mm).
 - b. Type:
 - 1) Standard lift.
 - 2) Vertical lift.
 - 3) High lift.
 - 4) Low headroom.
 - 5) Follow roof slope.
 - c. Horizontal track shall be reinforced with continuous angle of adequate length and gauge to minimize deflection.
 - d. Vertical track shall be graduated to provide wedge type weathertight closing with continuous angle mounting for steel or wood jambs, and shall be fully adjustable to seal door at jambs.
8. Manual Operation: Push-up.
9. Manual Operation: Chain hoist.
10. Electric Motor Operation: Provide UL listed electric operator, equal to Genie Commercial Operators, size and type as recommended by manufacturer to move door in either direction at not less than 2/3 foot nor more than 1 foot per second.
 - a. Medium Duty
 - 1) Model MH – hoist
 - 2) Model MT – trolley
 - 3) Model MJ - jackshaft
 - b. Standard Duty
 - 1) Model H – hoist
 - 2) Model T – trolley
 - 3) Model J – jackshaft
 - c. Heavy Duty
 - 1) Model GH – hoist
 - 2) Model GT - trolley
 - d. Entrapment Protection: Required for momentary contact, includes radio control operation.

- 1) Pneumatic sensing edge up to 18 feet (5.5 m) wide. Constant contact only complying with UL 325/2010.
 - 2) Electric sensing edge monitored to meet UL 325/2010 equal to Miller Edge.
 - 3) Photoelectric sensors monitored to meet UL 325/2010.
 - e. Operator Controls:
 - 1) Push-button operated control stations with open, close, and stop buttons.
 - 2) Key operated control stations with open, close, and stop buttons.
 - 3) Push-button and key operated control stations with open, close, and stop buttons.
 - 4) Flush mounting.
 - 5) Surface mounting.
 - 6) Interior location.
 - 7) Exterior location.
 - 8) Both interior and exterior location.
 - f. Special Operation:
 - 1) Pull switch.
 - 2) Vehicle detector operation.
 - 3) Radio control operation.
 - 4) Card reader control.
 - 5) Photocell operation.
 - 6) Door timer operation.
 - 7) Commercial light package.
 - 8) Explosion and dust ignition proof control wiring.
- C. Insulated Steel Sectional Overhead Doors: Wayne Dalton Thermospan 150 insulated sectional overhead steel doors. Units shall have the following characteristics:
1. Door Sections: Shall be of steel/polyurethane/steel sandwich type construction with thermal break.
 - a. Panel Thickness: 1-3/8 inches (34.92 mm).
 - b. Exterior Surface: Stucco texture and 1/4 inch wide pinstriping.
 - c. Exterior Steel: .009 inch (0.228 mm), hot-dipped galvanized.
 - d. Sections roll formed with two 1-3/4 inch integral struts sealed with polypropylene rib caps per section.
 - e. Thermal Values: R-value of 14.16; U-value of 0.071.
 - f. Air Infiltration: 0.23 cfm at 15 mph.
 - g. Sound transmission class 22 when tested in accordance with ASTM E 413.
 - h. Outdoor-indoor transmission class 19 when tested in accordance with ASTM E 1332.
 - i. Insulation: CFC-free and HCFC-free polyurethane, fully encapsulated.
 - 1) Insulated sections tested in accordance with ASTM E 84 and achieve a Flame spread Index of 10 or less, and a Smoke Developed Index of 210 or less.
 - 2) Insulation material tested in accordance with ASTM D 1929 and achieve a minimum Flash Ignition temperature of 734 degrees F, and a minimum Self Ignition temperature of 950 degrees F.
 - 3) Insulated sections shall meet all requirements of the UBC 17-5 corner burn.
 - j. Ends: Hot-dipped galvanized steel, full height with end caps.
 - 1) 18 gauge.
 - 2) 16 gauge.

- k. Spring Counterbalance: Sized to weight of the door, with a helically wound, oil tempered torsion spring mounted on a steel shaft; cable drum of die cast aluminum with high strength galvanized aircraft cable. Sized with a minimum 5 to 1 safety factor.
 - 1) Standard cycle spring: 10,000 cycles
 - 2) High cycle spring: 25,000 cycles.
 - 3) High cycle spring: 50,000 cycles.
 - 4) High cycle spring: 75,000 cycles.
 - 5) High cycle spring: 100,000 cycles.
- l. Pass-Door:
 - 1) Provide with optional pass door.
- m. Full View Aluminum Glazing Sections:
 - 1) 1/8 inch (3 mm) Double Strength glass.
 - 2) 1/8 inch (3 mm) Acrylic (Plexiglass) glazing.
 - 3) 1/8 inch (3 mm) Tempered glass.
 - 4) 1/8 inch (3 mm) Polycarbonate (Lexan) glazing.
 - 5) 1/4 inch (6 mm) Tempered glass.
 - 6) 1/4 inch (6 mm) Acrylic (Plexiglass) glazing.
 - 7) 1/4 inch (6 mm) Polycarbonate (Lexan) glazing.
 - 8) 1/2 inch (12.5 mm) Double Insulating glass.
 - 9) 1/2 inch (12.5 mm) Tempered Double Insulating glass.
 - 10) 1/4 inch (6 mm) Plate glass.
 - 11) 1/4 inch (6 mm) Polished wire glass.
 - 12) 1/4 inch (6 mm) Twin-Wall Polycarbonate (clear, bronze, white).
 - 13) 3/8 inch (9.5 mm) Twin-Wall Polycarbonate (clear, bronze, white).
 - 14) 5/8 inch (15.87 mm) Triple-Wall Polycarbonate (clear, bronze, white).
- n. Partial Glazing of Steel Panels set in 2-piece high-impact black polymer frame:
 - 1) 1/2 inch (12.5 mm) Thermolite Insulated DSB Glass
 - 2) 1/2 inch (12.5 mm) Thermolite Insulated Tempered Glass
 - 3) 1/4 inch (6 mm) Acrylic (Plexiglass) glazing.
 - 4) 1/4 inch (6 mm) Polycarbonate (Lexan) glazing.
 - 5) 1/4 inch (6 mm) Polished wire glass.
- 2. Finish and Color:
 - a. Two coat baked-on polyester:
 - 1) Interior color, white.
 - 2) Exterior color, white.
 - 3) Exterior color, brown.
 - 4) Exterior color, tan.
 - 5) Exterior color, gray.
 - b. Kynar:
 - 1) Interior color, white.
 - 2) Exterior color, white.
 - 3) Exterior color, brown.
 - 4) Exterior color, tan.
- 3. Windload Design: Provide to meet the Design/Performance requirements specified.
- 4. Hardware: Galvanized steel hinges and fixtures. Ball bearing rollers with hardened steel races.
- 5. Lock:
 - a. Interior mounted slide lock.
 - b. Interior mounted slide lock with interlock switch for automatic operator.
 - c. Keyed lock.

- d. Keyed lock with interlock switch for automatic operator.
- 6. Weatherstripping:
 - a. Flexible bulb-type strip at bottom section.
 - b. Flexible Jamb seals.
 - c. Flexible Header seal.
- 7. Track: Provide track as recommended by manufacturer to suit loading required and clearances available.
 - a. Size:
 - 1) 2 inch (51 mm).
 - 2) 3 inch (76 mm).
 - b. Type:
 - 1) Standard lift.
 - 2) Vertical lift.
 - 3) High lift.
 - 4) Low headroom.
 - 5) Follow roof slope.
 - c. Horizontal track shall be reinforced with continuous angle of adequate length and gauge to minimize deflection.
 - d. Vertical track shall be graduated to provide wedge type weathertight closing with continuous angle mounting for steel or wood jambs, and shall be fully adjustable to seal door at jambs.
- 8. Manual Operation: Push-up.
- 9. Manual Operation: Chain hoist.
- 10. Electric Motor Operation: Provide UL listed electric operator, equal to Genie Commercial Operators, size and type as recommended by manufacturer to move door in either direction at not less than 2/3 foot nor more than 1 foot per second.
 - a. Medium Duty
 - 1) Model MH – hoist
 - 2) Model MT – trolley
 - 3) Model MJ - jackshaft
 - b. Standard Duty
 - 1) Model H – hoist
 - 2) Model T – trolley
 - 3) Model J – jackshaft
 - c. Heavy Duty
 - 1) Model GH – hoist
 - 2) Model GT - trolley
 - d. Entrapment Protection: Required for momentary contact, includes radio control operation.
 - 1) Pneumatic sensing edge up to 18 feet (5.5 m) wide. Constant contact only complying with UL 325/2010.
 - 2) Electric sensing edge monitored to meet UL 325/2010 equal to Miller Edge.
 - 3) Photoelectric sensors monitored to meet UL 325/2010.
 - e. Operator Controls:
 - 1) Push-button operated control stations with open, close, and stop buttons.
 - 2) Key operated control stations with open, close, and stop buttons.
 - 3) Push-button and key operated control stations with open, close, and stop buttons.
 - 4) Flush mounting.
 - 5) Surface mounting.
 - 6) Interior location.
 - 7) Exterior location.

- 8) Both interior and exterior location.
 - f. Special Operation:
 - 1) Pull switch.
 - 2) Vehicle detector operation.
 - 3) Radio control operation.
 - 4) Card reader control.
 - 5) Photocell operation.
 - 6) Door timer operation.
 - 7) Commercial light package.
 - 8) Explosion and dust ignition proof control wiring.
- D. Insulated Steel Sectional Overhead Doors: Wayne Dalton Thermospan 125 insulated sectional overhead steel doors. Units shall have the following characteristics:
- 1. Door Sections: Shall be of steel/polyurethane/steel sandwich type construction with thermal break.
 - a. Panel Thickness: 7/8 inches (22.23 mm).
 - b. Exterior Surface: Flush non-repeating random stucco texture and 1/4 inch wide pinstriping.
 - c. Exterior Steel: .009 inch (0.228 mm), hot-dipped galvanized.
 - d. Sections roll formed with two 1-3/4 inch integral struts sealed with polypropylene rib caps per section.
 - e. Thermal Values: R-value of 10.79; U-value of 0.093.
 - f. Sound transmission class 21 when tested in accordance with ASTM E 413.
 - g. Outdoor-indoor transmission class 18 when tested in accordance with ASTM E 1332.
 - h. Insulation: CFC-free and HCFC-free polyurethane, fully encapsulated.
 - 1) Insulated sections tested in accordance with ASTM E 84 and achieve a Flame spread Index of 10 or less, and a Smoke Developed Index of 210 or less.
 - 2) Insulation material tested in accordance with ASTM D 1929 and achieve a minimum Flash Ignition temperature of 734 degrees F, and a minimum Self Ignition temperature of 950 degrees F.
 - 3) Insulated sections shall meet all requirements of the UBC 17-5 corner burn.
 - i. Ends: Hot-dipped galvanized steel, full height with end caps.
 - 1) 18 gauge.
 - 2) 16 gauge.
 - j. Spring Counterbalance: Sized to weight of the door, with a helically wound, oil tempered torsion spring mounted on a steel shaft; cable drum of die cast aluminum with high strength galvanized aircraft cable. Sized with a minimum 5 to 1 safety factor.
 - 1) Standard cycle spring: 10,000 cycles
 - 2) High cycle spring: 25,000 cycles.
 - 3) High cycle spring: 50,000 cycles.
 - 4) High cycle spring: 75,000 cycles.
 - 5) High cycle spring: 100,000 cycles.
 - k. Partial Glazing of Steel Panels set in 2-piece high-impact black polymer frame:
 - 1) 1/8 inch (3 mm) Single Strength glass.
 - 2) 1/8 inch (3 mm) Double Strength glass.
 - 3) 1/8 inch (3 mm) Acrylic (Plexiglass) glazing.
 - 2. Finish and Color:
 - a. Two coat baked-on polyester:

- 1) Interior color, white.
 - 2) Exterior color, white.
3. Windload Design: Provide to meet the Design/Performance requirements specified.
4. Hardware: Galvanized steel hinges and fixtures. Ball bearing rollers with hardened steel races.
5. Lock:
 - a. Interior mounted slide lock.
 - b. Interior mounted slide lock with interlock switch for automatic operator.
 - c. Keyed lock.
 - d. Keyed lock with interlock switch for automatic operator.
6. Weatherstripping:
 - a. Flexible bulb-type strip at bottom section.
 - b. Flexible Jamb seals.
 - c. Flexible Header seal.
7. Track: Provide track as recommended by manufacturer to suit loading required and clearances available.
 - a. Size:
 - 1) 2 inch (51 mm).
 - 2) 3 inch (76 mm).
 - b. Type:
 - 1) Standard lift.
 - 2) Vertical lift.
 - 3) High lift.
 - 4) Low headroom.
 - 5) Follow roof slope.
 - a. Horizontal track shall be reinforced with continuous angle of adequate length and gauge to minimize deflection.
 - b. Vertical track shall be graduated to provide wedge type weathertight closing with continuous angle mounting for steel or wood jambs, and shall be fully adjustable to seal door at jambs.
8. Manual Operation: Push-up.
9. Manual Operation: Chain hoist.
10. Electric Motor Operation: Provide UL listed electric operator, equal to Genie Commercial Operators, size and type as recommended by manufacturer to move door in either direction at not less than 2/3 foot nor more than 1 foot per second.
 - a. Medium Duty
 - 1) Model MH – hoist
 - 2) Model MT – trolley
 - 3) Model MJ - jackshaft
 - b. Standard Duty
 - 1) Model H – hoist
 - 2) Model T – trolley
 - 3) Model J – jackshaft
 - c. Heavy Duty
 - 1) Model GH – hoist
 - 2) Model GT - trolley
 - d. Entrapment Protection: Required for momentary contact, includes radio control operation.
 - 1) Pneumatic sensing edge up to 18 feet (5.5 m) wide. Constant contact only complying with UL 325/2010.
 - 2) Electric sensing edge monitored to meet UL 325/2010 equal to Miller Edge.
 - 3) Photoelectric sensors monitored to meet UL 325/2010.

- e. Operator Controls:
 - 1) Push-button operated control stations with open, close, and stop buttons.
 - 2) Key operated control stations with open, close, and stop buttons.
 - 3) Push-button and key operated control stations with open, close, and stop buttons.
 - 4) Flush mounting.
 - 5) Surface mounting.
 - 6) Interior location.
 - 7) Exterior location.
 - 8) Both interior and exterior location.
 - f. Special Operation:
 - 1) Pull switch.
 - 2) Vehicle detector operation.
 - 3) Radio control operation.
 - 4) Card reader control.
 - 5) Photocell operation.
 - 6) Door timer operation.
 - 7) Commercial light package.
 - 8) Explosion and dust ignition proof control wiring.
- E. Insulated Steel Commercial Sectional Overhead Doors: ThermoMark 530 Insulated Steel Doors by Wayne Dalton. Units shall have the following characteristics:
- 1. Door Assembly: Metal/foam/metal sandwich panel construction, with 1-3/4 inch wide PVC thermal break and weather-tight Dual Barrier tongue-in-groove meeting joints.
 - a. Panel Thickness: 3 inches (76.2 mm).
 - b. Exterior Surface: Embossed stucco texture with pinstripes.
 - c. Exterior Steel: .015 inch (.38 mm), hot-dipped galvanized.
 - d. End Stiles: 14 or 16 gauge with thermal break to prevent heat/cold transfer.
 - e. Spring Counterbalance: Sized to weight of the door, with a helically wound, oil tempered torsion spring mounted on a steel shaft; cable drum of die cast aluminum with high strength galvanized aircraft cable. Sized with a minimum 7 to 1 safety factor.
 - 1) Standard cycle spring: 10,000 cycles
 - 2) High cycle spring: 25,000 cycles.
 - 3) High cycle spring: 50,000 cycles.
 - 4) High cycle spring: 75,000 cycles.
 - 5) High cycle spring: 100,000 cycles.
 - f. Insulation: CFC-free and HCFC-free polyurethane, fully encapsulated.
 - g. Thermal Values: Calculated R-value of 26.
 - h. Installed U-factor: 0.14 BTU/hr*ft²*F Provide Test Report Validating Compliance to NFRC 102
 - i. Air Infiltration: .09 cfm at 15 mph Provide Test Report Validating Compliance to ASTM E-283
 - j. Sound Transmission Rating: STC 22 Provide Test Report Validating Compliance to ASTM E 90
 - k. High-Usage Package: Provide with optional high-usage package (springs, rollers, bearings, and 11 gauge hinges).
 - 1) 50,000 Cycle
 - 2) 100,000 cycle
 - l. Partial Glazing of Steel Panels:
 - 1) Standard with black frame:
 - (a) 1/2 inch (12.5 mm) Insulated.

- (b) 1/2 inch Tempered Insulated.
 - (c) 5/8 inch (15.87 mm) Triple-Wall Polycarbonate (clear, bronze, white).
- 2) Color matched frame: white, brown, almond, taupe.
- 2. Finish and Color:
 - a. Two coat baked-on polyester:
 - 1) Interior color, white.
 - 2) Exterior color, white.
 - 3) Exterior color, brown.
 - 4) Exterior color, almond
 - 5) Exterior color, taupe
- 3. Hardware: Galvanized steel hinges and fixtures. Ball bearing rollers with hardened steel races.
- 4. Lock:
 - a. Interior mounted slide lock.
- 5. Weatherstripping:
 - a. PVC retainer and dual durometer PVC bulb seal or optional EPDM bulb seal at bottom section.
 - b. Exclusive Advanced Performance Jamb seals (optional).
 - c. Factory installed Flexible Header seal.
- 6. Track: Provide track as recommended by manufacturer to suit loading required and clearances available.
 - a. Size:
 - 1) 2 inch (51 mm).
 - 2) 3 inch (76 mm).
 - b. Type:
 - 1) Standard lift.
 - 2) Vertical lift.
 - 3) High lift.
 - 4) Low headroom.
 - 5) Follow roof slope.
- 7. Manual Operation: Pull rope.
- 8. Manual Operation: Chain hoist.
- 9. Electric Motor Operation: Provide UL listed electric operator, equal to Genie Commercial Operators, size and type as recommended by manufacturer to move door in either direction at not less than 2/3 foot nor more than 1 foot per second.
 - a. Medium Duty
 - 1) Model MH – hoist
 - 2) Model MT – trolley
 - 3) Model MJ - jackshaft
 - b. Standard Duty
 - 1) Model H – hoist
 - 2) Model T – trolley
 - 3) Model J – jackshaft
 - c. Heavy Duty
 - 1) Model GH – hoist
 - 2) Model GT - trolley
 - d. Entrapment Protection: Required for momentary contact, includes radio control operation.
 - 1) Pneumatic sensing edge up to 18 feet (5.5 m) wide. Constant contact only complying with UL 325/2010.
 - 2) Electric sensing edge monitored to meet UL 325/2010 equal to Miller Edge.
 - 3) Photoelectric sensors monitored to meet UL 325/2010.

- e. Operator Controls:
 - 1) Push-button operated control stations with open, close, and stop buttons.
 - 2) Key operated control stations with open, close, and stop buttons.
 - 3) Push-button and key operated control stations with open, close, and stop buttons.
 - 4) Flush mounting.
 - 5) Surface mounting.
 - 6) Interior location.
 - 7) Exterior location.
 - 8) Both interior and exterior location.
 - f. Special Operation:
 - 1) Pull switch.
 - 2) Vehicle detector operation.
 - 3) Radio control operation.
 - 4) Card reader control.
 - 5) Photocell operation.
 - 6) Door timer operation.
 - 7) Commercial light package.
 - 8) Explosion and dust ignition proof control wiring.
- F. Insulated Steel Sectional Overhead Doors: Wayne Dalton ThermoMark 5150 insulated sectional overhead steel doors. Units shall have the following characteristics:
- 1. Door Sections: Shall be of steel/polyurethane/steel sandwich type construction with thermal break.
 - a. Panel Thickness: 1-3/8 inches (34.92 mm).
 - b. Exterior Surface:
 - 1) Flush with non-repeating wood grain texture.
 - 2) Raised panel with non-repeating wood grain texture.
 - c. Exterior Steel: .015 inch (0.38 mm), hot-dipped galvanized.
 - d. Thermal Values: R-value of 12.12; U-value of 0.0825.
 - e. Air Infiltration: 0.23 cfm at 15 mph.
 - f. Sound transmission class 20 when tested in accordance with ASTM E 413.
 - g. Outdoor-indoor transmission class 20 when tested in accordance with ASTM E 1332.
 - h. Insulation: CFC-free and HCFC-free polyurethane, fully encapsulated.
 - 1) Insulated sections tested in accordance with ASTM E 84 and achieve a Flame spread Index of 10 or less, and a Smoke Developed Index of 210 or less.
 - 2) Insulation material tested in accordance with ASTM D 1929 and achieve a minimum Flash Ignition temperature of 734 degrees F, and a minimum Self Ignition temperature of 950 degrees F.
 - 3) Insulated sections shall meet all requirements of the UBC 17-5 corner burn.
 - i. Ends: Hot-dipped galvanized steel, full height with end caps.
 - 1) 18 gauge.
 - 2) 16 gauge.
 - j. Spring Counterbalance: Sized to weight of the door, with a helically wound, oil tempered torsion spring mounted on a steel shaft; cable drum of die cast aluminum with high strength galvanized aircraft cable. Sized with a minimum 5 to 1 safety factor.
 - 1) Standard cycle spring: 10,000 cycles
 - 2) High cycle spring: 25,000 cycles.

- 3) High cycle spring: 50,000 cycles.
- 4) High cycle spring: 75,000 cycles.
- 5) High cycle spring: 100,000 cycles.
- k. Pass-Door:
 - 1) Provide with optional pass door.
- l. Full View Aluminum Glazing Sections:
 - 1) 1/8 inch (3 mm) Double Strength glass.
 - 2) 1/8 inch (3 mm) Acrylic (Plexiglass) glazing.
 - 3) 1/8 inch (3 mm) Tempered glass.
 - 4) 1/8 inch (3 mm) Polycarbonate (Lexan) glazing.
 - 5) 1/4 inch (6 mm) Tempered glass.
 - 6) 1/4 inch (6 mm) Acrylic (Plexiglass) glazing.
 - 7) 1/4 inch (6 mm) Polycarbonate (Lexan) glazing.
 - 8) 1/2 inch (12.5 mm) Double Insulating glass.
 - 9) 1/2 inch (12.5 mm) Tempered Double Insulating glass.
 - 10) 1/4 inch (6 mm) Plate glass.
 - 11) 1/4 inch (6 mm) Polished wire glass.
 - 12) 1/4 inch (6 mm) Twin-Wall Polycarbonate (clear, bronze, white).
 - 13) 3/8 inch (9.5 mm) Twin-Wall Polycarbonate (clear, bronze, white).
 - 14) 5/8 inch (15.87 mm) Triple-Wall Polycarbonate (clear, bronze, white).
- m. Partial Glazing of Steel Panels set in 2-piece high-impact black polymer frame:
 - 1) 1/2 inch (12.5 mm) Thermolite Insulated DSB Glass
 - 2) 1/2 inch (12.5 mm) Thermolite Insulated Tempered Glass
 - 3) 1/4 inch (6 mm) Acrylic (Plexiglass) glazing.
 - 4) 1/4 inch (6 mm) Polycarbonate (Lexan) glazing.
 - 5) 1/4 inch (6 mm) Polished wire glass.
- n. Colonial Style Partial Glazing of Steel Panels set in 2-piece high-impact polymer frame: (Frames match the color of the door)
 - 1) 1/8 inch (3mm) SSB Glass.
 - 2) 1/2 inch (12.5 mm) Insulated Glass.
2. Finish and Color:
 - a. Two coat baked-on polyester:
 - 1) Interior color, white.
 - 2) Exterior color, white.
 - 3) Exterior color, taupe.
 - 4) Exterior color, almond.
 - 5) Exterior color, brown.
 - 6) Exterior color, black.
 - b. Exterior Bi-Directional Woodgrain Pattern:
 - 1) Exterior color, Oak.
 - 2) Exterior color, Dark brown.
3. Windload Design: Provide to meet the Design/Performance requirements specified.
4. Hardware: Galvanized steel hinges and fixtures. Ball bearing rollers with hardened steel races.
5. Lock:
 - a. Interior mounted slide lock.
 - b. Interior mounted slide lock with interlock switch for automatic operator.
 - c. Keyed lock.
 - d. Keyed lock with interlock switch for automatic operator.
6. Weatherstripping:
 - a. Flexible bulb-type strip at bottom section.

- b. Flexible Jamb seals.
- c. Flexible Header seal.
- 7. Track: Provide track as recommended by manufacturer to suit loading required and clearances available.
 - a. Size:
 - 1) 2 inch (51 mm).
 - 2) 3 inch (76 mm).
 - b. Type:
 - 1) Standard lift.
 - 2) Vertical lift.
 - 3) High lift.
 - 4) Low headroom.
 - 5) Follow roof slope.
 - c. Horizontal track shall be reinforced with continuous angle of adequate length and gauge to minimize deflection.
 - d. Vertical track shall be graduated to provide wedge type weathertight closing with continuous angle mounting for steel or wood jambs, and shall be fully adjustable to seal door at jambs.
- 8. Manual Operation: Push-up.
- 9. Manual Operation: Chain hoist.
- 10. Electric Motor Operation: Provide UL listed electric operator, equal to Genie Commercial Operators, size and type as recommended by manufacturer to move door in either direction at not less than 2/3 foot nor more than 1 foot per second.
 - a. Medium Duty
 - 1) Model MH – hoist
 - 2) Model MT – trolley
 - 3) Model MJ - jackshaft
 - b. Standard Duty
 - 1) Model H – hoist
 - 2) Model T – trolley
 - 3) Model J – jackshaft
 - c. Heavy Duty
 - 1) Model GH – hoist
 - 2) Model GT - trolley
 - d. Entrapment Protection: Required for momentary contact, includes radio control operation.
 - 1) Pneumatic sensing edge up to 18 feet (5.5 m) wide. Constant contact only complying with UL 325/2010.
 - 2) Electric sensing edge monitored to meet UL 325/2010 equal to Miller Edge.
 - 3) Photoelectric sensors monitored to meet UL 325/2010.
 - e. Operator Controls:
 - 1) Push-button operated control stations with open, close, and stop buttons.
 - 2) Key operated control stations with open, close, and stop buttons.
 - 3) Push-button and key operated control stations with open, close, and stop buttons.
 - 4) Flush mounting.
 - 5) Surface mounting.
 - 6) Interior location.
 - 7) Exterior location.
 - 8) Both interior and exterior location.
 - f. Special Operation:
 - 1) Pull switch.

- 2) Vehicle detector operation.
- 3) Radio control operation.
- 4) Card reader control.
- 5) Photocell operation.
- 6) Door timer operation.
- 7) Commercial light package.
- 8) Explosion and dust ignition proof control wiring.

G. Insulated Steel Sectional Overhead Doors: Wayne Dalton ThermoMark 5155 insulated sectional overhead steel doors. Units shall have the following characteristics:

1. Door Sections: Shall be of steel/polyurethane/steel sandwich type construction with thermal break.
 - a. Panel Thickness: 1-3/8 inches (34.92 mm).
 - b. Exterior Surface: Stucco texture and 1/4 inch wide pinstriping.
 - c. Exterior Steel: .015 inch (0.38 mm), hot-dipped galvanized.
 - d. Interior: Continuous horizontal steel strips for hinge placement and cut down capability.
 - e. Thermal Values: R-value of 12.12; U-value of 0.0825.
 - f. Air Infiltration: 0.23 cfm at 15 mph.
 - g. Sound transmission class 20 when tested in accordance with ASTM E 413.
 - h. Outdoor-indoor transmission class 20 when tested in accordance with ASTM E 1332.
 - i. Insulation: CFC-free and HCFC-free polyurethane, fully encapsulated.
 - 1) Insulated sections tested in accordance with ASTM E 84 and achieve a Flame spread Index of 10 or less, and a Smoke Developed Index of 210 or less.
 - 2) Insulation material tested in accordance with ASTM D 1929 and achieve a minimum Flash Ignition temperature of 734 degrees F, and a minimum Self Ignition temperature of 950 degrees F.
 - 3) Insulated sections shall meet all requirements of the UBC 17-5 corner burn.
 - j. Ends: Hot-dipped galvanized steel, full height with end caps.
 - 1) 18 gauge.
 - 2) 16 gauge.
 - k. Spring Counterbalance: Sized to weight of the door, with a helically wound, oil tempered torsion spring mounted on a steel shaft; cable drum of die cast aluminum with high strength galvanized aircraft cable. Sized with a minimum 5 to 1 safety factor.
 - 1) Standard cycle spring: 10,000 cycles.
 - 2) High cycle spring: 25,000 cycles.
 - 3) High cycle spring: 50,000 cycles.
 - 4) High cycle spring: 75,000 cycles.
 - 5) High cycle spring: 100,000 cycles.
 - l. Full View Aluminum Glazing Sections:
 - 1) 1/8 inch (3 mm) Double Strength glass.
 - 2) 1/8 inch (3 mm) Acrylic (Plexiglass) glazing.
 - 3) 1/8 inch (3 mm) Tempered glass.
 - 4) 1/8 inch (3 mm) Polycarbonate (Lexan) glazing.
 - 5) 1/4 inch (6 mm) Tempered glass.
 - 6) 1/4 inch (6 mm) Acrylic (Plexiglass) glazing.
 - 7) 1/4 inch (6 mm) Polycarbonate (Lexan) glazing.
 - 8) 1/2 inch (12.5 mm) Double Insulating glass.
 - 9) 1/2 inch (12.5 mm) Tempered Double Insulating glass.

- 10) 1/4 inch (6 mm) Plate glass.
- 11) 1/4 inch (6 mm) Polished wire glass.
- 12) 1/4 inch (6 mm) Twin-Wall Polycarbonate (clear, bronze, white).
- 13) 3/8 inch (9.5 mm) Twin-Wall Polycarbonate (clear, bronze, white).
- 14) 5/8 inch (15.87 mm) Triple-Wall Polycarbonate (clear, bronze, white).
- m. Partial Glazing of Steel Panels set in 2-piece high-impact black polymer frame:
 - 1) 1/2 inch (12.5 mm) Thermolite Insulated DSB Glass
 - 2) 1/2 inch (12.5 mm) Thermolite Insulated Tempered Glass
 - 3) 1/4 inch (6 mm) Acrylic (Plexiglass) glazing.
 - 4) 1/4 inch (6 mm) Polycarbonate (Lexan) glazing.
 - 5) 1/4 inch (6 mm) Polished wire glass.
- n. Colonial Style Partial Glazing of Steel Panels set in 2-piece high-impact polymer frame: (Frames match the color of the door)
 - 1) 1/8 inch (3mm) SSB Glass.
 - 2) 1/2 inch (12.5 mm) Insulated Glass.
2. Finish and Color:
 - a. Two coat baked-on polyester:
 - 1) Interior color, white.
 - 2) Exterior color, white.
 - 3) Exterior color, taupe.
 - 4) Exterior color, almond.
 - 5) Exterior color, brown.
3. Windload Design: Provide to meet the Design/Performance requirements specified.
4. Hardware: Galvanized steel hinges and fixtures. Ball bearing rollers with hardened steel races.
5. Lock:
 - a. Interior mounted slide lock.
 - b. Interior mounted slide lock with interlock switch for automatic operator.
 - c. Keyed lock.
 - d. Keyed lock with interlock switch for automatic operator.
6. Weatherstripping:
 - a. Flexible bulb-type strip at bottom section.
 - b. Flexible Jamb seals.
 - c. Flexible Header seal.
7. Track: Provide track as recommended by manufacturer to suit loading required and clearances available.
 - a. Size:
 - 1) 2 inch (51 mm).
 - 2) 3 inch (76 mm).
 - b. Type:
 - 1) Standard lift.
 - 2) Vertical lift.
 - 3) High lift.
 - 4) Low headroom.
 - 5) Follow roof slope.
 - c. Horizontal track shall be reinforced with continuous angle of adequate length and gauge to minimize deflection.
 - d. Vertical track shall be graduated to provide wedge type weathertight closing with continuous angle mounting for steel or wood jambs, and shall be fully adjustable to seal door at jambs.
8. Manual Operation: Push-up.

9. Manual Operation: Chain hoist.
 10. Electric Motor Operation: Provide UL listed electric operator, equal to Genie Commercial Operators, size and type as recommended by manufacturer to move door in either direction at not less than 2/3 foot nor more than 1 foot per second.
 - a. Medium Duty
 - 1) Model MH – hoist
 - 2) Model MT – trolley
 - 3) Model MJ - jackshaft
 - b. Standard Duty
 - 1) Model H – hoist
 - 2) Model T – trolley
 - 3) Model J – jackshaft
 - c. Heavy Duty
 - 1) Model GH – hoist
 - 2) Model GT - trolley
 - d. Entrapment Protection: Required for momentary contact, includes radio control operation.
 - 1) Pneumatic sensing edge up to 18 feet (5.5 m) wide. Constant contact only complying with UL 325/2010.
 - 2) Electric sensing edge monitored to meet UL 325/2010 equal to Miller Edge.
 - 3) Photoelectric sensors monitored to meet UL 325/2010.
 - e. Operator Controls:
 - 1) Push-button operated control stations with open, close, and stop buttons.
 - 2) Key operated control stations with open, close, and stop buttons.
 - 3) Push-button and key operated control stations with open, close, and stop buttons.
 - 4) Flush mounting.
 - 5) Surface mounting.
 - 6) Interior location.
 - 7) Exterior location.
 - 8) Both interior and exterior location.
 - f. Special Operation:
 - 1) Pull switch.
 - 2) Vehicle detector operation.
 - 3) Radio control operation.
 - 4) Card reader control.
 - 5) Photocell operation.
 - 6) Door timer operation.
 - 7) Commercial light package.
 - 8) Explosion and dust ignition proof control wiring.
- H. Insulated Steel Sectional Overhead Doors: Wayne Dalton ThermoMark 5200 insulated sectional overhead steel doors. Units shall have the following characteristics:
1. Door Sections: Shall be of steel/polyurethane/steel sandwich type construction with thermal break.
 - a. Panel Thickness: 1-7/8 inches (47.63 mm).
 - b. Exterior Surface:
 - 1) Flush with non-repeating wood grain texture.
 - 2) Raised panel with non-repeating wood grain texture.
 - c. Exterior Steel: .015 inch (0.38 mm), hot-dipped galvanized.
 - d. Thermal Values: R-value of 16.22; U-value of 0.0616.

- e. Air Infiltration: 0.07 cfm at 15 mph.
- f. Sound transmission class 20 when tested in accordance with ASTM E 413.
- g. Outdoor-indoor transmission class 20 when tested in accordance with ASTM E 1332.
- h. Insulation: CFC-free and HCFC-free polyurethane, fully encapsulated.
 - 1) Insulated sections tested in accordance with ASTM E 84 and achieve a Flame spread Index of 10 or less, and a Smoke Developed Index of 210 or less.
 - 2) Insulation material tested in accordance with ASTM D 1929 and achieve a minimum Flash Ignition temperature of 734 degrees F, and a minimum Self Ignition temperature of 950 degrees F.
 - 3) Insulated sections shall meet all requirements of the UBC 17-5 corner burn.
- i. Ends: Hot-dipped galvanized steel, full height with end caps.
 - 1) 18 gauge.
 - 2) 16 gauge.
- j. Spring Counterbalance: Sized to weight of the door, with a helically wound, oil tempered torsion spring mounted on a steel shaft; cable drum of die cast aluminum with high strength galvanized aircraft cable. Sized with a minimum 5 to 1 safety factor.
 - 1) Standard cycle spring: 10,000 cycles
 - 2) High cycle spring: 25,000 cycles.
 - 3) High cycle spring: 50,000 cycles.
 - 4) High cycle spring: 75,000 cycles.
 - 5) High cycle spring: 100,000 cycles.
- k. Pass-Door:
 - 1) Provide with optional pass door.
- l. Full View Aluminum Glazing Sections:
 - 1) 1/8 inch (3 mm) Double Strength glass.
 - 2) 1/8 inch (3 mm) Acrylic (Plexiglass) glazing.
 - 3) 1/8 inch (3 mm) Tempered glass.
 - 4) 1/8 inch (3 mm) Polycarbonate (Lexan) glazing.
 - 5) 1/4 inch (6 mm) Tempered glass.
 - 6) 1/4 inch (6 mm) Acrylic (Plexiglass) glazing.
 - 7) 1/4 inch (6 mm) Polycarbonate (Lexan) glazing.
 - 8) 1/2 inch (12.5 mm) Double Insulating glass.
 - 9) 1/2 inch (12.5 mm) Tempered Double Insulating glass.
 - 10) 1/4 inch (6 mm) Plate glass.
 - 11) 1/4 inch (6 mm) Polished wire glass.
 - 12) 1/4 inch (6 mm) Twin-Wall Polycarbonate (clear, bronze, white).
 - 13) 3/8 inch (9.5 mm) Twin-Wall Polycarbonate (clear, bronze, white).
 - 14) 5/8 inch (15.87 mm) Triple-Wall Polycarbonate (clear, bronze, white).
- m. Partial Glazing of Steel Panels set in 2-piece high-impact black polymer frame:
 - 1) 1/2 inch (12.5 mm) Thermolite Insulated DSB Glass
 - 2) 1/2 inch (12.5 mm) Thermolite Insulated Tempered Glass
 - 3) 1/4 inch (6 mm) Acrylic (Plexiglass) glazing.
 - 4) 1/4 inch (6 mm) Polycarbonate (Lexan) glazing.
 - 5) 1/4 inch (6 mm) Polished wire glass.
- n. Colonial Style Partial Glazing of Steel Panels set in 2-piece high-impact polymer frame: (Frames match the color of the door)
 - 1) 1/8 inch (3mm) SSB Glass.

- 2) 1/2 inch (12.5 mm) Insulated Glass.
2. Finish and Color:
 - a. Two coat baked-on polyester:
 - 1) Interior color, white.
 - 2) Exterior color, white.
 - 3) Exterior color, taupe.
 - 4) Exterior color, almond.
 - 5) Exterior color, brown.
3. Windload Design: Provide to meet the Design/Performance requirements specified.
4. Hardware: Galvanized steel hinges and fixtures. Ball bearing rollers with hardened steel races.
5. Lock:
 - a. Interior mounted slide lock.
 - b. Interior mounted slide lock with interlock switch for automatic operator.
 - c. Keyed lock.
 - d. Keyed lock with interlock switch for automatic operator.
6. Weatherstripping:
 - a. Flexible bulb-type strip at bottom section.
 - b. Flexible Jamb seals.
 - c. Flexible Header seal.
7. Track: Provide track as recommended by manufacturer to suit loading required and clearances available.
 - a. Size:
 - 1) 2 inch (51 mm).
 - 2) 3 inch (76 mm).
 - b. Type:
 - 1) Standard lift.
 - 2) Vertical lift.
 - 3) High lift.
 - 4) Low headroom.
 - 5) Follow roof slope.
 - c. Horizontal track shall be reinforced with continuous angle of adequate length and gauge to minimize deflection.
 - d. Vertical track shall be graduated to provide wedge type weathertight closing with continuous angle mounting for steel or wood jambs, and shall be fully adjustable to seal door at jambs.
8. Manual Operation: Push-up.
9. Manual Operation: Chain hoist.
10. Electric Motor Operation: Provide UL listed electric operator, equal to Genie Commercial Operators, size and type as recommended by manufacturer to move door in either direction at not less than 2/3 foot nor more than 1 foot per second.
 - a. Medium Duty
 - 1) Model MH – hoist
 - 2) Model MT – trolley
 - 3) Model MJ - jackshaft
 - b. Standard Duty
 - 1) Model H – hoist
 - 2) Model T – trolley
 - 3) Model J – jackshaft
 - c. Heavy Duty
 - 1) Model GH – hoist
 - 2) Model GT - trolley

- d. Entrapment Protection: Required for momentary contact, includes radio control operation.
 - 1) Pneumatic sensing edge up to 18 feet (5.5 m) wide. Constant contact only complying with UL 325/2010.
 - 2) Electric sensing edge monitored to meet UL 325/2010 equal to Miller Edge.
 - 3) Photoelectric sensors monitored to meet UL 325/2010.
 - e. Operator Controls:
 - 1) Push-button operated control stations with open, close, and stop buttons.
 - 2) Key operated control stations with open, close, and stop buttons.
 - 3) Push-button and key operated control stations with open, close, and stop buttons.
 - 4) Flush mounting.
 - 5) Surface mounting.
 - 6) Interior location.
 - 7) Exterior location.
 - 8) Both interior and exterior location.
 - f. Special Operation:
 - 1) Pull switch.
 - 2) Vehicle detector operation.
 - 3) Radio control operation.
 - 4) Card reader control.
 - 5) Photocell operation.
 - 6) Door timer operation.
 - 7) Commercial light package.
 - 8) Explosion and dust ignition proof control wiring.
- I. Insulated Steel Sectional Overhead Doors: Wayne Dalton ThermoMark 5255 insulated sectional overhead steel doors. Units shall have the following characteristics:
- 1. Door Sections: Shall be of steel/polyurethane/steel sandwich type construction with thermal break.
 - a. Panel Thickness: 1-7/8 inches (47.63 mm).
 - b. Exterior Surface: Stucco with 1/4 inch wide pinstripes.
 - c. Exterior Steel: .022 inch (.56 mm), hot-dipped galvanized.
 - d. Thermal Values: R-value of 16.22; U-value of 0.0616.
 - e. Air Infiltration: 0.07 cfm at 15 mph.
 - f. Sound transmission class 20 when tested in accordance with ASTM E 413.
 - g. Outdoor-indoor transmission class 20 when tested in accordance with ASTM E 1332.
 - h. Insulation: CFC-free and HCFC-free polyurethane, fully encapsulated.
 - 1) Insulated sections tested in accordance with ASTM E 84 and achieve a Flame spread Index of 10 or less, and a Smoke Developed Index of 210 or less.
 - 2) Insulation material tested in accordance with ASTM D 1929 and achieve a minimum Flash Ignition temperature of 734 degrees F, and a minimum Self Ignition temperature of 950 degrees F.
 - 3) Insulated sections shall meet all requirements of the UBC 17-5 corner burn.
 - i. Ends: Hot-dipped galvanized steel, full height with end caps.
 - 1) 18 gauge.
 - 2) 16 gauge.

- j. Spring Counterbalance: Sized to weight of the door, with a helically wound, oil tempered torsion spring mounted on a steel shaft; cable drum of die cast aluminum with high strength galvanized aircraft cable. Sized with a minimum 5 to 1 safety factor.
 - 1) Standard cycle spring: 10,000 cycles
 - 2) High cycle spring: 25,000 cycles.
 - 3) High cycle spring: 50,000 cycles.
 - 4) High cycle spring: 75,000 cycles.
 - 5) High cycle spring: 100,000 cycles.
- k. Pass-Door:
 - 1) Provide with optional pass door.
- l. Full View Aluminum Glazing Sections:
 - 1) 1/8 inch (3 mm) Double Strength glass.
 - 2) 1/8 inch (3 mm) Acrylic (Plexiglass) glazing.
 - 3) 1/8 inch (3 mm) Tempered glass.
 - 4) 1/8 inch (3 mm) Polycarbonate (Lexan) glazing.
 - 5) 1/4 inch (6 mm) Tempered glass.
 - 6) 1/4 inch (6 mm) Acrylic (Plexiglass) glazing.
 - 7) 1/4 inch (6 mm) Polycarbonate (Lexan) glazing.
 - 8) 1/2 inch (12.5 mm) Double Insulating glass.
 - 9) 1/2 inch (12.5 mm) Tempered Double Insulating glass.
 - 10) 1/4 inch (6 mm) Plate glass.
 - 11) 1/4 inch (6 mm) Polished wire glass.
 - 12) 1/4 inch (6 mm) Twin-Wall Polycarbonate (clear, bronze, white).
 - 13) 3/8 inch (9.5 mm) Twin-Wall Polycarbonate (clear, bronze, white).
 - 14) 5/8 inch (15.87 mm) Triple-Wall Polycarbonate (clear, bronze, white).
- m. Partial Glazing of Steel Panels set in 2-piece high-impact black polymer frame:
 - 1) 1/2 inch (12.5 mm) Thermolite Insulated DSB Glass
 - 2) 1/2 inch (12.5 mm) Thermolite Insulated Tempered Glass
 - 3) 1/4 inch (6 mm) Acrylic (Plexiglass) glazing.
 - 4) 1/4 inch (6 mm) Polycarbonate (Lexan) glazing.
 - 5) 1/4 inch (6 mm) Polished wire glass.
- n. Colonial Style Partial Glazing of Steel Panels set in 2-piece high-impact polymer frame: (Frames match the color of the door)
 - 1) 1/8 inch (3mm) SSB Glass.
 - 2) 1/2 inch (12.5 mm) Insulated Glass.
- 2. Finish and Color:
 - a. Two coat baked-on polyester:
 - 1) Interior color, white.
 - 2) Exterior color, white.
 - 3) Exterior color, taupe.
 - 4) Exterior color, almond.
 - 5) Exterior color, brown.
- 3. Windload Design: Provide to meet the Design/Performance requirements specified.
- 4. Hardware: Galvanized steel hinges and fixtures. Ball bearing rollers with hardened steel races.
- 5. Lock:
 - a. Interior mounted slide lock.
 - b. Interior mounted slide lock with interlock switch for automatic operator.
 - c. Keyed lock.
 - d. Keyed lock with interlock switch for automatic operator.

6. Weatherstripping:
 - a. Flexible bulb-type strip at bottom section.
 - b. Flexible Jamb seals.
 - c. Flexible Header seal.
7. Track: Provide track as recommended by manufacturer to suit loading required and clearances available.
 - a. Size:
 - 1) 2 inch (51 mm).
 - 2) 3 inch (76 mm).
 - b. Type:
 - 1) Standard lift.
 - 2) Vertical lift.
 - 3) High lift.
 - 4) Low headroom.
 - 5) Follow roof slope.
 - c. Horizontal track shall be reinforced with continuous angle of adequate length and gauge to minimize deflection.
 - d. Vertical track shall be graduated to provide wedge type weathertight closing with continuous angle mounting for steel or wood jambs, and shall be fully adjustable to seal door at jambs.
8. Manual Operation: Push-up.
9. Manual Operation: Chain hoist.
10. Electric Motor Operation: Provide UL listed electric operator, equal to Genie Commercial Operators, size and type as recommended by manufacturer to move door in either direction at not less than 2/3 foot nor more than 1 foot per second.
 - a. Medium Duty
 - 1) Model MH – hoist
 - 2) Model MT – trolley
 - 3) Model MJ - jackshaft
 - b. Standard Duty
 - 1) Model H – hoist
 - 2) Model T – trolley
 - 3) Model J – jackshaft
 - c. Heavy Duty
 - 1) Model GH – hoist
 - 2) Model GT - trolley
 - d. Entrapment Protection: Required for momentary contact, includes radio control operation.
 - 1) Pneumatic sensing edge up to 18 feet (5.5 m) wide. Constant contact only complying with UL 325/2010.
 - 2) Electric sensing edge monitored to meet UL 325/2010 equal to Miller Edge.
 - 3) Photoelectric sensors monitored to meet UL 325/2010.
 - e. Operator Controls:
 - 1) Push-button operated control stations with open, close, and stop buttons.
 - 2) Key operated control stations with open, close, and stop buttons.
 - 3) Push-button and key operated control stations with open, close, and stop buttons.
 - 4) Flush mounting.
 - 5) Surface mounting.
 - 6) Interior location.
 - 7) Exterior location.
 - 8) Both interior and exterior location.

- f. Special Operation:
 - 1) Pull switch.
 - 2) Vehicle detector operation.
 - 3) Radio control operation.
 - 4) Card reader control.
 - 5) Photocell operation.
 - 6) Door timer operation.
 - 7) Commercial light package.
 - 8) Explosion and dust ignition proof control wiring.

2.3 STEEL SECTIONAL OVERHEAD DOORS

A. Sectional Overhead Steel Doors: Wayne Dalton 216 Series Steel Doors. Units shall have the following characteristics:

- 1. Door Assembly: Steel door assembly of roll formed steel type with ship lap meeting rails and box shaped 16 gauge stile construction.
 - a. Panel Thickness: 2 inches (51 mm).
 - b. Exterior Surface: Flush, smooth.
 - c. Section Material: 16 gauge, galvanized steel.
 - d. Insulation: Insulation held in place with polymer clips. Provides an R-value up to 7.64
 - 1) 1-9/16 inch expanded polystyrene.
 - 2) Insulation covered with vinyl.
 - 3) Insulation covered with .022 inch minimum embossed pre-painted white steel.
 - e. Center and End Stiles: 16 gauge steel.
 - f. Springs:
 - 1) Standard cycle spring: 10,000 cycles
 - 2) High cycle spring: 25,000 cycles.
 - 3) High cycle spring: 50,000 cycles.
 - 4) High cycle spring: 75,000 cycles.
 - 5) High cycle spring: 100,000 cycles.
 - g. Partial Glazing of Non-Insulated Steel Panels:
 - 1) 1/8 inch (3 mm) DSB glass.
 - 2) 1/8 inch (3 mm) Acrylic (Plexiglass) glazing.
 - 3) 1/8 inch (3 mm) Tempered glass.
 - 4) 1/8 inch (3 mm) Polycarbonate (Lexan) glazing.
 - 5) 1/4 inch (6 mm) Wire glass.
 - 6) 1/4 inch (6 mm) Acrylic (Plexiglass) glazing.
 - 7) 1/4 inch (6 mm) Polycarbonate (Lexan) glazing.
 - h. Partial Glazing of Insulated Steel Panels:
 - 1) 1/2 inch (12.5 mm) Thermolite Insulated DSB Glass
 - 2) 1/2 inch (12.5 mm) Thermolite Insulated Tempered Glass
 - 3) 1/4 inch (6 mm) Wire glass.
 - 4) 1/4 inch (6 mm) Acrylic (Plexiglass) glazing.
 - 5) 1/4 inch (6 mm) Polycarbonate (Lexan) glazing.
 - i. Full View Aluminum Glazing Section:
 - 1) 1/8 inch (3 mm) Double Strength glass.
 - 2) 1/8 inch (3 mm) Acrylic (Plexiglass) glazing.
 - 3) 1/8 inch (3 mm) Tempered glass.
 - 4) 1/8 inch (3 mm) Polycarbonate (Lexan) glazing.
 - 5) 1/4 inch (6 mm) Tempered glass.
 - 6) 1/4 inch (6 mm) Acrylic (Plexiglass) glazing.
 - 7) 1/4 inch (6 mm) Polycarbonate (Lexan) glazing.
 - 8) 1/2 inch (12.5 mm) Double Insulating glass.

- 9) 1/2 inch (12.5 mm) Tempered Double Insulating glass.
 - 10) 1/4 inch (6 mm) Plate glass.
 - 11) 1/4 inch (6 mm) Polished wire glass.
2. Finish and Color: Two coat baked-on polyester, white color.
 3. Windload Design: Provide to meet the Design/Performance requirements specified.
 4. Hardware: Galvanized steel hinges and fixtures. Ball bearing rollers with hardened steel races.
 5. Lock:
 - a. Interior mounted slide lock.
 - b. Interior mounted slide lock with interlock switch for automatic operator.
 - c. Keyed lock.
 - d. Keyed lock with interlock switch for automatic operator.
 6. Weatherstripping:
 - a. Flexible bulb-type strip at bottom section.
 - b. Flexible Jamb seals.
 - c. Flexible Header seal.
 7. Track: Provide track as recommended by manufacturer to suit loading required and clearances available.
 - a. Size:
 - 1) 2 inch (51 mm).
 - 2) 3 inch (76 mm).
 - b. Type:
 - 1) Standard lift.
 - 2) Vertical lift.
 - 3) High lift.
 - 4) Low headroom.
 - 5) Follow roof slope.
 - c. Horizontal track shall be reinforced with continuous angle of adequate length and gauge to minimize deflection.
 - d. Vertical track shall be graduated to provide wedge type weathertight closing with continuous angle mounting for steel or wood jambs, and shall be fully adjustable to seal door at jambs.
 8. Manual Operation: Pull rope.
 9. Manual Operation: Chain hoist.
 10. Electric Motor Operation: Provide UL listed electric operator, equal to Genie Commercial Operators, size and type as recommended by manufacturer to move door in either direction at not less than 2/3 foot nor more than 1 foot per second.
 - a. Medium Duty
 - 1) Model MH – hoist
 - 2) Model MT – trolley
 - 3) Model MJ - jackshaft
 - b. Standard Duty
 - 1) Model H – hoist
 - 2) Model T – trolley
 - 3) Model J – jackshaft
 - c. Heavy Duty
 - 1) Model GH – hoist
 - 2) Model GT - trolley
 - d. Entrapment Protection: Required for momentary contact, includes radio control operation.
 - 1) Pneumatic sensing edge up to 18 feet (5.5 m) wide. Constant contact only complying with UL 325/2010.

- 2) Electric sensing edge monitored to meet UL 325/2010 equal to Miller Edge.
 - 3) Photoelectric sensors monitored to meet UL 325/2010.
 - e. Operator Controls:
 - 1) Push-button operated control stations with open, close, and stop buttons.
 - 2) Key operated control stations with open, close, and stop buttons.
 - 3) Push-button and key operated control stations with open, close, and stop buttons.
 - 4) Flush mounting.
 - 5) Surface mounting.
 - 6) Interior location.
 - 7) Exterior location.
 - 8) Both interior and exterior location.
 - f. Special Operation:
 - 1) Pull switch.
 - 2) Vehicle detector operation.
 - 3) Radio control operation.
 - 4) Card reader control.
 - 5) Photocell operation.
 - 6) Door timer operation.
 - 7) Commercial light package.
 - 8) Explosion and dust ignition proof control wiring.
- B. Sectional Overhead Steel Doors: Wayne Dalton 220 Series Steel Doors. Units shall have the following characteristics:
- 1. Door Assembly: Steel door assembly of roll formed steel type with ship lap meeting rails and box shaped 20 gauge stile construction.
 - a. Panel Thickness: 2 inches (51 mm).
 - b. Exterior Surface:
 - 1) Flush.
 - 2) Pinstriped.
 - c. Section Material: 20 gauge, galvanized steel.
 - d. Insulation: Insulation held in place with polymer clips. Provides an R-value up to 7.64
 - 1) 1-9/16 inch expanded polystyrene.
 - 2) Insulation covered with vinyl.
 - 3) Insulation covered with .022 inch minimum embossed pre-painted white steel.
 - e. Center and End Stiles:
 - 1) 16 gauge steel end stiles.
 - 2) 20 gauge steel center stiles.
 - 3) 16 gauge steel center stiles.
 - f. Springs:
 - 1) Standard cycle spring: 10,000 cycles
 - 2) High cycle spring: 25,000 cycles.
 - 3) High cycle spring: 50,000 cycles.
 - 4) High cycle spring: 75,000 cycles.
 - 5) High cycle spring: 100,000 cycles.
 - g. Partial Glazing of Non-Insulated Steel Panels:
 - 1) 1/8 inch (3 mm) DSB glass.
 - 2) 1/8 inch (3 mm) Acrylic (Plexiglass) glazing.
 - 3) 1/8 inch (3 mm) Tempered glass.
 - 4) 1/8 inch (3 mm) Polycarbonate (Lexan) glazing.
 - 5) 1/4 inch (6 mm) Wire glass.

- 6) 1/4 inch (6 mm) Acrylic (Plexiglass) glazing.
- 7) 1/4 inch (6 mm) Polycarbonate (Lexan) glazing.
- h. Partial Glazing of Insulated Steel Panels:
 - 1) 1/2 inch (12.5 mm) Thermolite Insulated DSB Glass
 - 2) 1/2 inch (12.5 mm) Thermolite Insulated Tempered Glass
 - 3) 1/4 inch (6 mm) Wire glass.
 - 4) 1/4 inch (6 mm) Acrylic (Plexiglass) glazing.
 - 5) 1/4 inch (6 mm) Polycarbonate (Lexan) glazing.
- i. Full View Aluminum Glazing Section:
 - 1) 1/8 inch (3 mm) Double Strength glass.
 - 2) 1/8 inch (3 mm) Acrylic (Plexiglass) glazing.
 - 3) 1/8 inch (3 mm) Tempered glass.
 - 4) 1/8 inch (3 mm) Polycarbonate (Lexan) glazing.
 - 5) 1/4 inch (6 mm) Tempered glass.
 - 6) 1/4 inch (6 mm) Acrylic (Plexiglass) glazing.
 - 7) 1/4 inch (6 mm) Polycarbonate (Lexan) glazing.
 - 8) 1/2 inch (12.5 mm) Double Insulating glass.
 - 9) 1/2 inch (12.5 mm) Tempered Double Insulating glass.
 - 10) 1/4 inch (6 mm) Plate glass.
 - 11) 1/4 inch (6 mm) Polished wire glass.
- 2. Finish and Color: Two coat baked-on polyester, white color.
- 3. Windload Design: Provide to meet the Design/Performance requirements specified.
- 4. Hardware: Galvanized steel hinges and fixtures. Ball bearing rollers with hardened steel races.
- 5. Lock:
 - a. Interior mounted slide lock.
 - b. Interior mounted slide lock with interlock switch for automatic operator.
 - c. Keyed lock.
 - d. Keyed lock with interlock switch for automatic operator.
- 6. Weatherstripping:
 - a. Flexible bulb-type strip at bottom section.
 - b. Flexible Jamb seals.
 - c. Flexible Header seal.
- 7. Track: Provide track as recommended by manufacturer to suit loading required and clearances available.
 - a. Size:
 - 1) 2 inch (51 mm).
 - 2) 3 inch (76 mm).
 - b. Type:
 - 1) Standard lift.
 - 2) Vertical lift.
 - 3) High lift.
 - 4) Low headroom.
 - 5) Follow roof slope.
 - c. Horizontal track shall be reinforced with continuous angle of adequate length and gauge to minimize deflection.
 - d. Vertical track shall be graduated to provide wedge type weathertight closing with continuous angle mounting for steel or wood jambs, and shall be fully adjustable to seal door at jambs.
- 8. Manual Operation: Pull rope.
- 9. Manual Operation: Chain hoist.
- 10. Electric Motor Operation: Provide UL listed electric operator, equal to Genie Commercial Operators, size and type as recommended by manufacturer to

move door in either direction at not less than 2/3 foot nor more than 1 foot per second.

- a. Medium Duty
 - 1) Model MH – hoist
 - 2) Model MT – trolley
 - 3) Model MJ - jackshaft
 - b. Standard Duty
 - 1) Model H – hoist
 - 2) Model T – trolley
 - 3) Model J – jackshaft
 - c. Heavy Duty
 - 1) Model GH – hoist
 - 2) Model GT - trolley
 - d. Entrapment Protection: Required for momentary contact, includes radio control operation.
 - 1) Pneumatic sensing edge up to 18 feet (5.5 m) wide. Constant contact only complying with UL 325/2010.
 - 2) Electric sensing edge monitored to meet UL 325/2010 equal to Miller Edge.
 - 3) Photoelectric sensors monitored to meet UL 325/2010.
 - e. Operator Controls:
 - 1) Push-button operated control stations with open, close, and stop buttons.
 - 2) Key operated control stations with open, close, and stop buttons.
 - 3) Push-button and key operated control stations with open, close, and stop buttons.
 - 4) Flush mounting.
 - 5) Surface mounting.
 - 6) Interior location.
 - 7) Exterior location.
 - 8) Both interior and exterior location.
 - f. Special Operation:
 - 1) Pull switch.
 - 2) Vehicle detector operation.
 - 3) Radio control operation.
 - 4) Card reader control.
 - 5) Photocell operation.
 - 6) Door timer operation.
 - 7) Commercial light package.
 - 8) Explosion and dust ignition proof control wiring.
- C. Sectional Overhead Steel Doors: Wayne Dalton 2415 Series Steel Doors. Units shall have the following characteristics:
- 1. Door Assembly: Steel door assembly of roll formed steel type with ship lap meeting rails and box shaped 20 gauge stile construction.
 - a. Panel Thickness: 2 inches (51 mm).
 - b. Exterior Surface: Ribbed.
 - c. Section Material: 24 gauge, galvanized steel.
 - d. Insulation: Insulation held in place with polymer clips. Provides an R-value up to 7.64
 - 1) 1-9/16 inch expanded polystyrene.
 - 2) 1-9/16 inch polyurethane.
 - 3) Insulation covered with vinyl.
 - 4) Insulation covered with .022 inch minimum embossed pre-painted white steel.

- e. Center and End Stiles:
 - 1) "C" shaped 16 gauge steel end stiles.
 - 2) 20 gauge steel center stiles.
 - 3) 16 gauge steel center stiles.
- f. Springs:
 - 1) Standard cycle spring: 10,000 cycles
 - 2) High cycle spring: 25,000 cycles.
 - 3) High cycle spring: 50,000 cycles.
 - 4) High cycle spring: 75,000 cycles.
 - 5) High cycle spring: 100,000 cycles.
- g. Partial Glazing of Non-Insulated Steel Panels:
 - 1) 1/8 inch (3 mm) DSB glass.
 - 2) 1/8 inch (3 mm) Acrylic (Plexiglass) glazing.
 - 3) 1/8 inch (3 mm) Tempered glass.
 - 4) 1/8 inch (3 mm) Polycarbonate (Lexan) glazing.
 - 5) 1/4 inch (6 mm) Wire glass.
 - 6) 1/4 inch (6 mm) Acrylic (Plexiglass) glazing.
 - 7) 1/4 inch (6 mm) Polycarbonate (Lexan) glazing.
- h. Partial Glazing of Insulated Steel Panels:
 - 1) 1/2 inch (12.5 mm) Thermolite Insulated DSB Glass
 - 2) 1/2 inch (12.5 mm) Thermolite Insulated Tempered Glass
 - 3) 1/4 inch (6 mm) Wire glass.
 - 4) 1/4 inch (6 mm) Acrylic (Plexiglass) glazing.
 - 5) 1/4 inch (6 mm) Polycarbonate (Lexan) glazing.
- i. Full View Aluminum Glazing Section:
 - 1) 1/8 inch (3 mm) Double Strength glass.
 - 2) 1/8 inch (3 mm) Acrylic (Plexiglass) glazing.
 - 3) 1/8 inch (3 mm) Tempered glass.
 - 4) 1/8 inch (3 mm) Polycarbonate (Lexan) glazing.
 - 5) 1/4 inch (6 mm) Tempered glass.
 - 6) 1/4 inch (6 mm) Acrylic (Plexiglass) glazing.
 - 7) 1/4 inch (6 mm) Polycarbonate (Lexan) glazing.
 - 8) 1/2 inch (12.5 mm) Double Insulating glass.
 - 9) 1/2 inch (12.5 mm) Tempered Double Insulating glass.
 - 10) 1/4 inch (6 mm) Plate glass.
 - 11) 1/4 inch (6 mm) Polished wire glass.
- 2. Finish and Color: Two coat baked-on polyester:
 - a. White color.
 - b. Brown color.
- 3. Windload Design: Provide to meet the Design/Performance requirements specified.
- 4. Hardware: Galvanized steel hinges and fixtures. Ball bearing rollers with hardened steel races.
- 5. Lock:
 - a. Interior mounted slide lock.
 - b. Interior mounted slide lock with interlock switch for automatic operator.
 - c. Keyed lock.
 - d. Keyed lock with interlock switch for automatic operator.
- 6. Weatherstripping:
 - a. Flexible bulb-type strip at bottom section.
 - b. Flexible Jamb seals.
 - c. Flexible Header seal.
- 7. Track: Provide track as recommended by manufacturer to suit loading required and clearances available.
 - a. Size:

- 1) 2 inch (51 mm).
- 2) 3 inch (76 mm).
- b. Type:
 - 1) Standard lift.
 - 2) Vertical lift.
 - 3) High lift.
 - 4) Low headroom.
 - 5) Follow roof slope.
- a. Horizontal track shall be reinforced with continuous angle of adequate length and gauge to minimize deflection.
- b. Vertical track shall be graduated to provide wedge type weathertight closing with continuous angle mounting for steel or wood jambs, and shall be fully adjustable to seal door at jambs.
8. Manual Operation: Pull rope.
9. Manual Operation: Chain hoist.
10. Electric Motor Operation: Provide UL listed electric operator, equal to Genie Commercial Operators, size and type as recommended by manufacturer to move door in either direction at not less than 2/3 foot nor more than 1 foot per second.
 - a. Medium Duty
 - 1) Model MH – hoist
 - 2) Model MT – trolley
 - 3) Model MJ - jackshaft
 - b. Standard Duty
 - 1) Model H – hoist
 - 2) Model T – trolley
 - 3) Model J – jackshaft
 - c. Heavy Duty
 - 1) Model GH – hoist
 - 2) Model GT - trolley
 - d. Entrapment Protection: Required for momentary contact, includes radio control operation.
 - 1) Pneumatic sensing edge up to 18 feet (5.5 m) wide. Constant contact only complying with UL 325/2010.
 - 2) Electric sensing edge monitored to meet UL 325/2010 equal to Miller Edge.
 - 3) Photoelectric sensors monitored to meet UL 325/2010.
 - e. Operator Controls:
 - 1) Push-button operated control stations with open, close, and stop buttons.
 - 2) Key operated control stations with open, close, and stop buttons.
 - 3) Push-button and key operated control stations with open, close, and stop buttons.
 - 4) Flush mounting.
 - 5) Surface mounting.
 - 6) Interior location.
 - 7) Exterior location.
 - 8) Both interior and exterior location.
 - f. Special Operation:
 - 1) Pull switch.
 - 2) Vehicle detector operation.
 - 3) Radio control operation.
 - 4) Card reader control.
 - 5) Photocell operation.
 - 6) Door timer operation.

- 7) Commercial light package.
- 8) Explosion and dust ignition proof control wiring.

D. Sectional Overhead Steel Doors: Wayne Dalton 2411 Series Steel Doors. Units shall have the following characteristics:

- 1. Door Assembly: Steel door assembly of roll formed steel type with ship lap meeting rails.
 - a. Panel Thickness: 2 inches (51 mm).
 - b. Exterior Surface: Ribbed.
 - c. Section Material: Nominal 24 gauge, galvanized steel.
 - d. Insulation: Insulation held in place with polymer clips. Provides an R-value up to 7.64
 - 1) 1-9/16 inch expanded polystyrene.
 - 2) 1-9/16 inch polyurethane.
 - 3) Insulation covered with vinyl.
 - 4) Insulation covered with .022 inch minimum embossed pre-painted white steel.
 - e. Center and End Stiles:
 - 1) "C" shaped 16 gauge steel end stiles.
 - 2) 20 gauge steel center stiles.
 - 3) 16 gauge steel center stiles.
 - f. Springs:
 - 1) Standard cycle spring: 10,000 cycles
 - 2) High cycle spring: 25,000 cycles.
 - 3) High cycle spring: 50,000 cycles.
 - 4) High cycle spring: 75,000 cycles.
 - 5) High cycle spring: 100,000 cycles.
 - g. Partial Glazing of Non-Insulated Steel Panels:
 - 1) 1/8 inch (3 mm) DSB glass.
 - 2) 1/8 inch (3 mm) Acrylic (Plexiglass) glazing.
 - 3) 1/8 inch (3 mm) Tempered glass.
 - 4) 1/8 inch (3 mm) Polycarbonate (Lexan) glazing.
 - 5) 1/4 inch (6 mm) Wire glass.
 - 6) 1/4 inch (6 mm) Acrylic (Plexiglass) glazing.
 - 7) 1/4 inch (6 mm) Polycarbonate (Lexan) glazing.
 - h. Partial Glazing of Insulated Steel Panels:
 - 1) 1/2 inch (12.5 mm) Thermolite Insulated DSB Glass
 - 2) 1/2 inch (12.5 mm) Thermolite Insulated Tempered Glass
 - 3) 1/4 inch (6 mm) Wire glass.
 - 4) 1/4 inch (6 mm) Acrylic (Plexiglass) glazing.
 - 5) 1/4 inch (6 mm) Polycarbonate (Lexan) glazing.
 - i. Full View Aluminum Glazing Section:
 - 1) 1/8 inch (3 mm) Double Strength glass.
 - 2) 1/8 inch (3 mm) Acrylic (Plexiglass) glazing.
 - 3) 1/8 inch (3 mm) Tempered glass.
 - 4) 1/8 inch (3 mm) Polycarbonate (Lexan) glazing.
 - 5) 1/4 inch (6 mm) Tempered glass.
 - 6) 1/4 inch (6 mm) Acrylic (Plexiglass) glazing.
 - 7) 1/4 inch (6 mm) Polycarbonate (Lexan) glazing.
 - 8) 1/2 inch (12.5 mm) Double Insulating glass.
 - 9) 1/2 inch (12.5 mm) Tempered Double Insulating glass.
 - 10) 1/4 inch (6 mm) Plate glass.
 - 11) 1/4 inch (6 mm) Polished wire glass.
- 2. Finish and Color: Two coat baked-on polyester:
 - a. White color.

- b. Brown color.
- 3. Windload Design: Provide to meet the Design/Performance requirements specified.
- 4. Hardware: Galvanized steel hinges and fixtures. Ball bearing rollers with hardened steel races.
- 5. Lock:
 - a. Interior mounted slide lock.
 - b. Interior mounted slide lock with interlock switch for automatic operator.
 - c. Keyed lock.
 - d. Keyed lock with interlock switch for automatic operator.
- 6. Weatherstripping:
 - a. Flexible bulb-type strip at bottom section.
 - b. Flexible Jamb seals.
 - c. Flexible Header seal.
- 7. Track: Provide track as recommended by manufacturer to suit loading required and clearances available.
 - a. Size:
 - 1) 2 inch (51 mm).
 - 2) 3 inch (76 mm).
 - b. Type:
 - 1) Standard lift.
 - 2) Vertical lift.
 - 3) High lift.
 - 4) Low headroom.
 - 5) Follow roof slope.
 - c. Horizontal track shall be reinforced with continuous angle of adequate length and gauge to minimize deflection.
 - d. Vertical track shall be graduated to provide wedge type weathertight closing with continuous angle mounting for steel or wood jambs, and shall be fully adjustable to seal door at jambs.
- 8. Manual Operation: Pull rope.
- 9. Manual Operation: Chain hoist.
- 10. Electric Motor Operation: Provide UL listed electric operator, equal to Genie Commercial Operators, size and type as recommended by manufacturer to move door in either direction at not less than 2/3 foot nor more than 1 foot per second.
 - a. Medium Duty
 - 1) Model MH – hoist
 - 2) Model MT – trolley
 - 3) Model MJ - jackshaft
 - b. Standard Duty
 - 1) Model H – hoist
 - 2) Model T – trolley
 - 3) Model J – jackshaft
 - c. Heavy Duty
 - 1) Model GH – hoist
 - 2) Model GT - trolley
 - d. Entrapment Protection: Required for momentary contact, includes radio control operation.
 - 1) Pneumatic sensing edge up to 18 feet (5.5 m) wide. Constant contact only complying with UL 325/2010.
 - 2) Electric sensing edge monitored to meet UL 325/2010 equal to Miller Edge.
 - 3) Photoelectric sensors monitored to meet UL 325/2010.
 - e. Operator Controls:

- 1) Push-button operated control stations with open, close, and stop buttons.
 - 2) Key operated control stations with open, close, and stop buttons.
 - 3) Push-button and key operated control stations with open, close, and stop buttons.
 - 4) Flush mounting.
 - 5) Surface mounting.
 - 6) Interior location.
 - 7) Exterior location.
 - 8) Both interior and exterior location.
- f. Special Operation:
- 1) Pull switch.
 - 2) Vehicle detector operation.
 - 3) Radio control operation.
 - 4) Card reader control.
 - 5) Photocell operation.
 - 6) Door timer operation.
 - 7) Commercial light package.
 - 8) Explosion and dust ignition proof control wiring.

E. Sectional Overhead Steel Doors: Wayne Dalton C-20 Series Steel Doors. Units shall have the following characteristics:

1. Door Assembly: Steel door assembly of roll formed steel type with ship lap meeting rails and box shaped 20 gauge stile construction.
 - a. Panel Thickness: 2 inches (51 mm).
 - b. Exterior Surface: Ribbed.
 - c. Section Material: 20 gauge, galvanized steel.
 - d. Insulation: Insulation held in place with polymer clips. Provides an R-value up to 7.64
 - 1) 1-9/16 inch expanded polystyrene.
 - 2) Insulation covered with vinyl.
 - 3) Insulation covered with .022 inch minimum embossed pre-painted white steel.
 - e. Center and End Stiles: 20 gauge steel.
 - f. Springs:
 - 1) Standard cycle spring: 10,000 cycles
 - 2) High cycle spring: 25,000 cycles.
 - 3) High cycle spring: 50,000 cycles.
 - 4) High cycle spring: 75,000 cycles.
 - 5) High cycle spring: 100,000 cycles.
 - g. Partial Glazing of Non-Insulated Steel Panels:
 - 1) 1/8 inch (3 mm) DSB glass.
 - 2) 1/8 inch (3 mm) Acrylic (Plexiglass) glazing.
 - 3) 1/8 inch (3 mm) Tempered glass.
 - 4) 1/8 inch (3 mm) Polycarbonate (Lexan) glazing.
 - 5) 1/4 inch (6 mm) Wire glass.
 - 6) 1/4 inch (6 mm) Acrylic (Plexiglass) glazing.
 - 7) 1/4 inch (6 mm) Polycarbonate (Lexan) glazing.
 - h. Partial Glazing of Insulated Steel Panels:
 - 1) 1/2 inch (12.5 mm) Thermolite Insulated DSB Glass
 - 2) 1/2 inch (12.5 mm) Thermolite Insulated Tempered Glass
 - 3) 1/4 inch (6 mm) Wire glass.
 - 4) 1/4 inch (6 mm) Acrylic (Plexiglass) glazing.
 - 5) 1/4 inch (6 mm) Polycarbonate (Lexan) glazing.
 - i. Full View Aluminum Glazing Section:

- 1) 1/8 inch (3 mm) Double Strength glass.
 - 2) 1/8 inch (3 mm) Acrylic (Plexiglass) glazing.
 - 3) 1/8 inch (3 mm) Tempered glass.
 - 4) 1/8 inch (3 mm) Polycarbonate (Lexan) glazing.
 - 5) 1/4 inch (6 mm) Tempered glass.
 - 6) 1/4 inch (6 mm) Acrylic (Plexiglass) glazing.
 - 7) 1/4 inch (6 mm) Polycarbonate (Lexan) glazing.
 - 8) 1/2 inch (12.5 mm) Double Insulating glass.
 - 9) 1/2 inch (12.5 mm) Tempered Double Insulating glass.
 - 10) 1/4 inch (6 mm) Plate glass.
 - 11) 1/4 inch (6 mm) Polished wire glass.
2. Finish and Color: Two coat baked-on polyester:
 - a. White color.
 - b. Brown color.
 3. Windload Design: Provide to meet the Design/Performance requirements specified.
 4. Hardware: Galvanized steel hinges and fixtures. Ball bearing rollers with hardened steel races.
 5. Lock:
 - a. Interior mounted slide lock.
 - b. Interior mounted slide lock with interlock switch for automatic operator.
 - c. Keyed lock.
 - d. Keyed lock with interlock switch for automatic operator.
 6. Weatherstripping:
 - a. Flexible bulb-type strip at bottom section.
 - b. Flexible Jamb seals.
 - c. Flexible Header seal.
 7. Track: Provide track as recommended by manufacturer to suit loading required and clearances available.
 - a. Size:
 - 1) 2 inch (51 mm).
 - 2) 3 inch (76 mm).
 - b. Type:
 - 1) Standard lift.
 - 2) Vertical lift.
 - 3) High lift.
 - 4) Low headroom.
 - 5) Follow roof slope.
 - c. Horizontal track shall be reinforced with continuous angle of adequate length and gauge to minimize deflection.
 - d. Vertical track shall be graduated to provide wedge type weathertight closing with continuous angle mounting for steel or wood jambs, and shall be fully adjustable to seal door at jambs.
 8. Manual Operation: Pull rope.
 9. Manual Operation: Chain hoist.
 10. Electric Motor Operation: Provide UL listed electric operator, equal to Genie Commercial Operators, size and type as recommended by manufacturer to move door in either direction at not less than 2/3 foot nor more than 1 foot per second.
 - a. Medium Duty
 - 1) Model MH – hoist
 - 2) Model MT – trolley
 - 3) Model MJ - jackshaft
 - b. Standard Duty
 - 1) Model H – hoist

- 2) Model T – trolley
- 3) Model J – jackshaft
- c. Heavy Duty
 - 1) Model GH – hoist
 - 2) Model GT - trolley
- d. Entrapment Protection: Required for momentary contact, includes radio control operation.
 - 1) Pneumatic sensing edge up to 18 feet (5.5 m) wide. Constant contact only complying with UL 325/2010.
 - 2) Electric sensing edge monitored to meet UL 325/2010 equal to Miller Edge.
 - 3) Photoelectric sensors monitored to meet UL 325/2010.
- e. Operator Controls:
 - 1) Push-button operated control stations with open, close, and stop buttons.
 - 2) Key operated control stations with open, close, and stop buttons.
 - 3) Push-button and key operated control stations with open, close, and stop buttons.
 - 4) Flush mounting.
 - 5) Surface mounting.
 - 6) Interior location.
 - 7) Exterior location.
 - 8) Both interior and exterior location.
- f. Special Operation:
 - 1) Pull switch.
 - 2) Vehicle detector operation.
 - 3) Radio control operation.
 - 4) Card reader control.
 - 5) Photocell operation.
 - 6) Door timer operation.
 - 7) Commercial light package.
 - 8) Explosion and dust ignition proof control wiring.

F. Sectional Overhead Steel Doors: Wayne Dalton C-24 Series Steel Doors. Units shall have the following characteristics:

- 1. Door Assembly: Steel door assembly of roll formed steel type with ship lap meeting rails and box shaped 20 gauge stile construction.
 - a. Panel Thickness: 2 inches (51 mm).
 - b. Exterior Surface: Ribbed.
 - c. Section Material: 24 gauge, galvanized steel.
 - d. Insulation: Insulation held in place with polymer clips. Provides an R-value up to 7.64
 - 1) 1-9/16 inch expanded polystyrene.
 - 2) Insulation covered with vinyl.
 - 3) Insulation covered with .022 inch minimum embossed pre-painted white steel.
 - e. Center and End Stiles:
 - 1) "C" shaped 16 gauge steel end stiles.
 - 2) 20 gauge steel center stiles.
 - 3) 16 gauge steel center stiles.
 - f. Springs:
 - 1) Standard cycle spring: 10,000 cycles
 - 2) High cycle spring: 25,000 cycles.
 - 3) High cycle spring: 50,000 cycles.
 - 4) High cycle spring: 75,000 cycles.

- 5) High cycle spring: 100,000 cycles.
- g. Partial Glazing of Non-Insulated Steel Panels:
 - 1) 1/8 inch (3 mm) DSB glass.
 - 2) 1/8 inch (3 mm) Acrylic (Plexiglass) glazing.
 - 3) 1/8 inch (3 mm) Tempered glass.
 - 4) 1/8 inch (3 mm) Polycarbonate (Lexan) glazing.
 - 5) 1/4 inch (6 mm) Wire glass.
 - 6) 1/4 inch (6 mm) Acrylic (Plexiglass) glazing.
 - 7) 1/4 inch (6 mm) Polycarbonate (Lexan) glazing.
- h. Partial Glazing of Insulated Steel Panels:
 - 1) 1/2 inch (12.5 mm) Thermolite Insulated DSB Glass
 - 2) 1/2 inch (12.5 mm) Thermolite Insulated Tempered Glass
 - 3) 1/4 inch (6 mm) Wire glass.
 - 4) 1/4 inch (6 mm) Acrylic (Plexiglass) glazing.
 - 5) 1/4 inch (6 mm) Polycarbonate (Lexan) glazing.
- i. Full View Aluminum Glazing Section:
 - 1) 1/8 inch (3 mm) Double Strength glass.
 - 2) 1/8 inch (3 mm) Acrylic (Plexiglass) glazing.
 - 3) 1/8 inch (3 mm) Tempered glass.
 - 4) 1/8 inch (3 mm) Polycarbonate (Lexan) glazing.
 - 5) 1/4 inch (6 mm) Tempered glass.
 - 6) 1/4 inch (6 mm) Acrylic (Plexiglass) glazing.
 - 7) 1/4 inch (6 mm) Polycarbonate (Lexan) glazing.
 - 8) 1/2 inch (12.5 mm) Double Insulating glass.
 - 9) 1/2 inch (12.5 mm) Tempered Double Insulating glass.
 - 10) 1/4 inch (6 mm) Plate glass.
 - 11) 1/4 inch (6 mm) Polished wire glass.
2. Finish and Color: Two coat baked-on polyester:
 - a. White color.
 - b. Brown color.
3. Windload Design: Provide to meet the Design/Performance requirements specified.
4. Hardware: Galvanized steel hinges and fixtures. Ball bearing rollers with hardened steel races.
5. Lock:
 - a. Interior mounted slide lock.
 - b. Interior mounted slide lock with interlock switch for automatic operator.
 - c. Keyed lock.
 - d. Keyed lock with interlock switch for automatic operator.
6. Weatherstripping:
 - a. Flexible bulb-type strip at bottom section.
 - b. Flexible Jamb seals.
 - c. Flexible Header seal.
7. Track: Provide track as recommended by manufacturer to suit loading required and clearances available.
 - a. Size:
 - 1) 2 inch (51 mm).
 - 2) 3 inch (76 mm).
 - b. Type:
 - 1) Standard lift.
 - 2) Vertical lift.
 - 3) High lift.
 - 4) Low headroom.
 - 5) Follow roof slope.

- c. Horizontal track shall be reinforced with continuous angle of adequate length and gauge to minimize deflection.
 - d. Vertical track shall be graduated to provide wedge type weathertight closing with continuous angle mounting for steel or wood jambs, and shall be fully adjustable to seal door at jambs.
8. Manual Operation: Pull rope.
9. Manual Operation: Chain hoist.
10. Electric Motor Operation: Provide UL listed electric operator, equal to Genie Commercial Operators, size and type as recommended by manufacturer to move door in either direction at not less than 2/3 foot nor more than 1 foot per second.
- a. Medium Duty
 - 1) Model MH – hoist
 - 2) Model MT – trolley
 - 3) Model MJ - jackshaft
 - b. Standard Duty
 - 1) Model H – hoist
 - 2) Model T – trolley
 - 3) Model J – jackshaft
 - c. Heavy Duty
 - 1) Model GH – hoist
 - 2) Model GT - trolley
 - d. Entrapment Protection: Required for momentary contact, includes radio control operation.
 - 1) Pneumatic sensing edge up to 18 feet (5.5 m) wide. Constant contact only complying with UL 325/2010.
 - 2) Electric sensing edge monitored to meet UL 325/2010 equal to Miller Edge.
 - 3) Photoelectric sensors monitored to meet UL 325/2010.
 - e. Operator Controls:
 - 1) Push-button operated control stations with open, close, and stop buttons.
 - 2) Key operated control stations with open, close, and stop buttons.
 - 3) Push-button and key operated control stations with open, close, and stop buttons.
 - 4) Flush mounting.
 - 5) Surface mounting.
 - 6) Interior location.
 - 7) Exterior location.
 - 8) Both interior and exterior location.
 - f. Special Operation:
 - 1) Pull switch.
 - 2) Vehicle detector operation.
 - 3) Radio control operation.
 - 4) Card reader control.
 - 5) Photocell operation.
 - 6) Door timer operation.
 - 7) Commercial light package.
 - 8) Explosion and dust ignition proof control wiring.
- G. Sectional Overhead Steel Doors: Wayne Dalton C-2400 Series Steel Doors. Units shall have the following characteristics:
- 1. Door Assembly: Steel door assembly of roll formed steel type with ship lap meeting rails and box shaped 20 gauge stile construction.
 - a. Panel Thickness: 2 inches (51 mm).

- b. Exterior Surface: Ribbed.
- c. Section Material: Nominal 24 gauge, galvanized steel.
- d. Insulation: Insulation held in place with polymer clips. Provides an R-value up to 7.64
 - 1) 1-9/16 inch expanded polystyrene.
 - 2) Insulation covered with vinyl.
 - 3) Insulation covered with .022 inch minimum embossed pre-painted white steel.
- e. Center and End Stiles: 20 gauge steel.
- f. Springs:
 - 1) Standard cycle spring: 10,000 cycles
 - 2) High cycle spring: 25,000 cycles.
 - 3) High cycle spring: 50,000 cycles.
 - 4) High cycle spring: 75,000 cycles.
 - 5) High cycle spring: 100,000 cycles.
- g. Partial Glazing of Non-Insulated Steel Panels:
 - 1) 1/8 inch (3 mm) DSB glass.
 - 2) 1/8 inch (3 mm) Acrylic (Plexiglass) glazing.
 - 3) 1/8 inch (3 mm) Tempered glass.
 - 4) 1/8 inch (3 mm) Polycarbonate (Lexan) glazing.
 - 5) 1/4 inch (6 mm) Wire glass.
 - 6) 1/4 inch (6 mm) Acrylic (Plexiglass) glazing.
 - 7) 1/4 inch (6 mm) Polycarbonate (Lexan) glazing.
- h. Partial Glazing of Insulated Steel Panels:
 - 1) 1/2 inch (12.5 mm) Thermolite Insulated DSB Glass
 - 2) 1/2 inch (12.5 mm) Thermolite Insulated Tempered Glass
 - 3) 1/4 inch (6 mm) Wire glass.
 - 4) 1/4 inch (6 mm) Acrylic (Plexiglass) glazing.
 - 5) 1/4 inch (6 mm) Polycarbonate (Lexan) glazing.
- i. Full View Aluminum Glazing Section:
 - 1) 1/8 inch (3 mm) Double Strength glass.
 - 2) 1/8 inch (3 mm) Acrylic (Plexiglass) glazing.
 - 3) 1/8 inch (3 mm) Tempered glass.
 - 4) 1/8 inch (3 mm) Polycarbonate (Lexan) glazing.
 - 5) 1/4 inch (6 mm) Tempered glass.
 - 6) 1/4 inch (6 mm) Acrylic (Plexiglass) glazing.
 - 7) 1/4 inch (6 mm) Polycarbonate (Lexan) glazing.
 - 8) 1/2 inch (12.5 mm) Double Insulating glass.
 - 9) 1/2 inch (12.5 mm) Tempered Double Insulating glass.
 - 10) 1/4 inch (6 mm) Plate glass.
 - 11) 1/4 inch (6 mm) Polished wire glass.
- 2. Finish and Color: Two coat baked-on polyester:
 - a. White color.
 - b. Brown color.
- 3. Windload Design: Provide to meet the Design/Performance requirements specified.
- 4. Hardware: Galvanized steel hinges and fixtures. Ball bearing rollers with hardened steel races.
- 5. Lock:
 - a. Interior mounted slide lock.
 - b. Interior mounted slide lock with interlock switch for automatic operator.
 - c. Keyed lock.
 - d. Keyed lock with interlock switch for automatic operator.
- 6. Weatherstripping:
 - a. Flexible bulb-type strip at bottom section.

- b. Flexible Jamb seals.
- c. Flexible Header seal.
- 7. Track: Provide track as recommended by manufacturer to suit loading required and clearances available.
 - a. Size:
 - 1) 2 inch (51 mm).
 - 2) 3 inch (76 mm).
 - b. Type:
 - 1) Standard lift.
 - 2) Vertical lift.
 - 3) High lift.
 - 4) Low headroom.
 - 5) Follow roof slope.
 - c. Horizontal track shall be reinforced with continuous angle of adequate length and gauge to minimize deflection.
 - d. Vertical track shall be graduated to provide wedge type weathertight closing with continuous angle mounting for steel or wood jambs, and shall be fully adjustable to seal door at jambs.
- 8. Manual Operation: Pull rope.
- 9. Manual Operation: Chain hoist.
- 10. Electric Motor Operation: Provide UL listed electric operator, equal to Genie Commercial Operators, size and type as recommended by manufacturer to move door in either direction at not less than 2/3 foot nor more than 1 foot per second.
 - a. Medium Duty
 - 1) Model MH – hoist
 - 2) Model MT – trolley
 - 3) Model MJ - jackshaft
 - b. Standard Duty
 - 1) Model H – hoist
 - 2) Model T – trolley
 - 3) Model J – jackshaft
 - c. Heavy Duty
 - 1) Model GH – hoist
 - 2) Model GT - trolley
 - d. Entrapment Protection: Required for momentary contact, includes radio control operation.
 - 1) Pneumatic sensing edge up to 18 feet (5.5 m) wide. Constant contact only complying with UL 325/2010.
 - 2) Electric sensing edge monitored to meet UL 325/2010 equal to Miller Edge.
 - 3) Photoelectric sensors monitored to meet UL 325/2010.
 - e. Operator Controls:
 - 1) Push-button operated control stations with open, close, and stop buttons.
 - 2) Key operated control stations with open, close, and stop buttons.
 - 3) Push-button and key operated control stations with open, close, and stop buttons.
 - 4) Flush mounting.
 - 5) Surface mounting.
 - 6) Interior location.
 - 7) Exterior location.
 - 8) Both interior and exterior location.
 - f. Special Operation:
 - 1) Pull switch.

- 2) Vehicle detector operation.
- 3) Radio control operation.
- 4) Card reader control.
- 5) Photocell operation.
- 6) Door timer operation.
- 7) Commercial light package.
- 8) Explosion and dust ignition proof control wiring.

2.4 GLAZED ALUMINUM SECTIONAL OVERHEAD DOORS

- A. Glazed Sectional Overhead Doors: Wayne Dalton 451 Series Aluminum Doors. Units shall have the following characteristics:
1. Door Assembly: Stile and rail assembly of aluminum alloy 6063-T6, 1-3/8 inch thick stiles and rails, joined with self tapping screws.
 - a. Rails: Top and bottom rails with 3-1/2 inches wide, lower intermediate rail 1-3/8 inches, upper rail 1-5/8 inches, minimum wall thickness 0.062 inch.
 - b. Stiles: Top, bottom, and end stiles are 3-1/2 inches wide, center stile 3 inches wide, minimum wall thickness 0.062 inch.
 - c. Springs:
 - 1) Standard cycle spring: 10,000 cycles
 - 2) High cycle spring: 25,000 cycles.
 - 3) High cycle spring: 50,000 cycles.
 - 4) High cycle spring: 75,000 cycles.
 - 5) High cycle spring: 100,000 cycles.
 - d. Glazing:
 - 1) 1/8 inch (3 mm) Clear annealed glazing.
 - 2) 1/8 inch (3 mm) Acrylic (Plexiglass) glazing.
 - 3) 1/8 inch (3 mm) Polycarbonate (Lexan) glazing.
 - 4) 1/8 inch (3 mm) Gray annealed glazing.
 - 5) 1/8 inch (3 mm) Bronze annealed glazing.
 - 6) 1/8 inch (3 mm) Clear Tempered glass.
 - 7) 1/8 inch (3 mm) Gray Tempered glass.
 - 8) 1/8 inch (3 mm) Bronze Tempered glass.
 - 9) 1/8 inch (3 mm) Solex Green Tempered glass.
 - 10) 1/4 inch (6 mm) Acrylic (Plexiglass) glazing.
 - 11) 1/4 inch (6 mm) Polycarbonate (Lexan) glazing.
 - 12) 1/4 inch (6 mm) Clear Multi-Wall Polycarbonate
 - 13) 1/4 inch (6 mm) White Multi-Wall Polycarbonate
 - 14) 1/4 inch (6 mm) Bronze Multi-Wall Polycarbonate
 - 15) 5/8 inch (16 mm) Clear Multi-Wall Polycarbonate
 - 16) 5/8 inch (16 mm) White Multi-Wall Polycarbonate
 - 17) 5/8 inch (16 mm) Bronze Multi-Wall Polycarbonate
 2. Finish and Color:
 - a. Anodized Finish: Clear anodized.
 - b. Anodized Finish: Bronze anodized.
 - c. Anodized Finish: Black anodized.
 - d. Painted finish: White.
 - e. Painted finish: Brown.
 - f. Powder Coating Finish: Color as selected by Architect from manufacturer's standard colors.
 3. Windload Design: Provide to meet the Design/Performance requirements specified.
 4. Hardware: Galvanized steel hinges and fixtures. Ball bearing rollers with hardened steel races.

5. Lock:
 - a. Interior mounted slide lock.
 - b. Interior mounted slide lock with interlock switch for automatic operator.
 - c. Keyed lock.
 - d. Keyed lock with interlock switch for automatic operator.
6. Weatherstripping:
 - a. Flexible bulb-type strip at bottom section.
 - b. Flexible Jamb seals.
 - c. Flexible Header seal.
7. Track: Provide track as recommended by manufacturer to suit loading required and clearances available.
 - a. Size:
 - 1) 2 inch (51 mm).
 - 2) 3 inch (76 mm).
 - b. Type:
 - 1) Standard lift.
 - 2) Vertical lift.
 - 3) High lift.
 - 4) Low headroom.
 - 5) Follow roof slope.
 - c. Horizontal track shall be reinforced with continuous angle of adequate length and gauge to minimize deflection.
 - d. Vertical track shall be graduated to provide wedge type weathertight closing with continuous angle mounting for steel or wood jambs, and shall be fully adjustable to seal door at jambs.
8. Manual Operation: Pull rope.
9. Manual Operation: Chain hoist.
10. Electric Motor Operation: Provide UL listed electric operator, equal to Genie Commercial Operators, size and type as recommended by manufacturer to move door in either direction at not less than 2/3 foot nor more than 1 foot per second.
 - a. Medium Duty
 - 1) Model MH – hoist
 - 2) Model MT – trolley
 - 3) Model MJ - jackshaft
 - b. Standard Duty
 - 1) Model H – hoist
 - 2) Model T – trolley
 - 3) Model J – jackshaft
 - c. Heavy Duty
 - 1) Model GH – hoist
 - 2) Model GT - trolley
 - d. Entrapment Protection: Required for momentary contact, includes radio control operation.
 - 1) Pneumatic sensing edge up to 18 feet (5.5 m) wide. Constant contact only complying with UL 325/2010.
 - 2) Electric sensing edge monitored to meet UL 325/2010 equal to Miller Edge.
 - 3) Photoelectric sensors monitored to meet UL 325/2010.
 - e. Operator Controls:
 - 1) Push-button operated control stations with open, close, and stop buttons.
 - 2) Key operated control stations with open, close, and stop buttons.
 - 3) Push-button and key operated control stations with open, close, and stop buttons.

- 4) Flush mounting.
 - 5) Surface mounting.
 - 6) Interior location.
 - 7) Exterior location.
 - 8) Both interior and exterior location.
- f. Special Operation:
- 1) Pull switch.
 - 2) Vehicle detector operation.
 - 3) Radio control operation.
 - 4) Card reader control.
 - 5) Photocell operation.
 - 6) Door timer operation.
 - 7) Commercial light package.
 - 8) Explosion and dust ignition proof control wiring.

B. Glazed Sectional Overhead Doors: Wayne Dalton 452 Series Aluminum Doors.
Units shall have the following characteristics:

1. Door Assembly: Stile and rail assembly of aluminum alloy 6063-T6, 1-3/8 inch thick stiles and rails, joined with self tapping screws.
 - a. Rails: Top and bottom rails with 3-1/2 inches wide, lower intermediate rail 1-3/8 inches, upper rail 1-5/8 inches, minimum wall thickness 0.062 inch.
 - 1) Provide with polyurethane filled rails and stiles with R-values up to 3.91.
 - b. Stiles: Top, bottom, and end stiles are 3-1/2 inches wide, center stile 3 inches wide, minimum wall thickness 0.062 inch.
 - c. Springs:
 - 1) Standard cycle spring: 10,000 cycles
 - 2) High cycle spring: 25,000 cycles.
 - 3) High cycle spring: 50,000 cycles.
 - 4) High cycle spring: 75,000 cycles.
 - 5) High cycle spring: 100,000 cycles.
 - d. Glazing:
 - 1) 1/8 inch (3 mm) Clear annealed glazing.
 - 2) 1/8 inch (3 mm) Acrylic (Plexiglass) glazing.
 - 3) 1/8 inch (3 mm) Polycarbonate (Lexan) glazing.
 - 4) 1/8 inch (3 mm) Gray annealed glazing.
 - 5) 1/8 inch (3 mm) Bronze annealed glazing.
 - 6) 1/8 inch (3 mm) Clear Tempered glass.
 - 7) 1/8 inch (3 mm) Gray Tempered glass.
 - 8) 1/8 inch (3 mm) Bronze Tempered glass.
 - 9) 1/8 inch (3 mm) Solex Green Tempered glass.
 - 10) 1/4 inch (6 mm) Acrylic (Plexiglass) glazing.
 - 11) 1/4 inch (6 mm) Polycarbonate (Lexan) glazing.
 - 12) 1/4 inch (6 mm) Clear Multi-Wall Polycarbonate
 - 13) 1/4 inch (6 mm) White Multi-Wall Polycarbonate
 - 14) 1/4 inch (6 mm) Bronze Multi-Wall Polycarbonate
 - 15) 5/8 inch (16 mm) Clear Multi-Wall Polycarbonate
 - 16) 5/8 inch (16 mm) White Multi-Wall Polycarbonate
 - 17) 5/8 inch (16 mm) Bronze Multi-Wall Polycarbonate
2. Finish and Color:
 - a. Anodized Finish: Clear anodized.
 - b. Anodized Finish: Bronze anodized.
 - c. Anodized Finish: Black anodized.
 - d. Painted finish: White.

- e. Painted finish: Brown.
 - f. Powder Coating Finish: Color as selected by Architect from manufacturer's standard colors.
3. Windload Design: Provide to meet the Design/Performance requirements specified.
 4. Hardware: Galvanized steel hinges and fixtures. Ball bearing rollers with hardened steel races.
 5. Lock:
 - a. Interior mounted slide lock.
 - b. Interior mounted slide lock with interlock switch for automatic operator.
 - c. Keyed lock.
 - d. Keyed lock with interlock switch for automatic operator.
 6. Weatherstripping:
 - a. Flexible bulb-type strip at bottom section.
 - b. Flexible Jamb seals.
 - c. Flexible Header seal.
 7. Track: Provide track as recommended by manufacturer to suit loading required and clearances available.
 - a. Size:
 - 1) 2 inch (51 mm).
 - 2) 3 inch (76 mm).
 - b. Type:
 - 1) Standard lift.
 - 2) Vertical lift.
 - 3) High lift.
 - 4) Low headroom.
 - 5) Follow roof slope.
 - c. Horizontal track shall be reinforced with continuous angle of adequate length and gauge to minimize deflection.
 - d. Vertical track shall be graduated to provide wedge type weathertight closing with continuous angle mounting for steel or wood jambs, and shall be fully adjustable to seal door at jambs.
 8. Manual Operation: Pull rope.
 9. Manual Operation: Chain hoist.
 10. Electric Motor Operation: Provide UL listed electric operator, equal to Genie Commercial Operators, size and type as recommended by manufacturer to move door in either direction at not less than 2/3 foot nor more than 1 foot per second.
 - a. Medium Duty
 - 1) Model MH – hoist
 - 2) Model MT – trolley
 - 3) Model MJ - jackshaft
 - b. Standard Duty
 - 1) Model H – hoist
 - 2) Model T – trolley
 - 3) Model J – jackshaft
 - c. Heavy Duty
 - 1) Model GH – hoist
 - 2) Model GT - trolley
 - d. Entrapment Protection: Required for momentary contact, includes radio control operation.
 - 1) Pneumatic sensing edge up to 18 feet (5.5 m) wide. Constant contact only complying with UL 325/2010.
 - 2) Electric sensing edge monitored to meet UL 325/2010 equal to Miller Edge.

- 3) Photoelectric sensors monitored to meet UL 325/2010.
- e. Operator Controls:
 - 1) Push-button operated control stations with open, close, and stop buttons.
 - 2) Key operated control stations with open, close, and stop buttons.
 - 3) Push-button and key operated control stations with open, close, and stop buttons.
 - 4) Flush mounting.
 - 5) Surface mounting.
 - 6) Interior location.
 - 7) Exterior location.
 - 8) Both interior and exterior location.
- f. Special Operation:
 - 1) Pull switch.
 - 2) Vehicle detector operation.
 - 3) Radio control operation.
 - 4) Card reader control.
 - 5) Photocell operation.
 - 6) Door timer operation.
 - 7) Commercial light package.
 - 8) Explosion and dust ignition proof control wiring.

C. Glazed Sectional Overhead Doors: Wayne Dalton K-AL Series Aluminum Doors.

Units shall have the following characteristics:

- 1. Door Assembly: Stile and rail assembly of aluminum alloy 6063-T6, 2 inch thick stiles and rails. Top and intermediate sections have stiles and rails joined with screws. Bottom section are through bolted vertically through the section for extra strength where bottom corner brackets pick up the door.
 - a. Rails: Top and bottom rails for doors up to 16 feet 2 inches high are 3 inches wide, Top and bottom rails for doors up to 16 feet 3 inches high and wider are 6 inches wide
 - 1) Provide with polyurethane filled rails and stiles with R-values up to 4.25.
 - b. Stiles: Center and end stiles are 3 inches wide.
 - c. Springs:
 - 1) Standard cycle spring: 10,000 cycles
 - 2) High cycle spring: 25,000 cycles.
 - 3) High cycle spring: 50,000 cycles.
 - 4) High cycle spring: 75,000 cycles.
 - 5) High cycle spring: 100,000 cycles.
 - d. Glazing:
 - 1) 1/8 inch (3.2 mm) Tempered glass.
 - 2) 1/8 inch (3.2 mm) Clear Lexan glazing.
 - 3) 1/4 inch (6 mm) Tempered glass.
 - 4) 1/4 inch (6 mm) Acrylic glazing.
 - 5) 1/4 inch (6 mm) Wire glass.
 - 6) 1/2 inch (12.5 mm) Double Strength Insulating glass.
 - 7) 1/2 inch (12.5 mm) Low E Insulated glazing.
 - 8) 1/4 inch (6 mm) multi-wall polycarbonate.
- 2. Finish and Color:
 - a. Anodized Finish: Clear anodized.
 - b. Anodized Finish: Bronze anodized.
 - c. Anodized Finish: Black anodized.
 - d. Anodized Finish: Bronze light anodized.
 - e. Anodized Finish: Bronze medium anodized

- f. Anodized Finish: Bronze dark anodized
 - g. Powder Coating Finish: Color as selected by Architect from manufacturer's standard colors.
3. Windload Design: Provide to meet the Design/Performance requirements specified.
 4. Hardware: Galvanized steel hinges and fixtures. Ball bearing rollers with hardened steel races.
 5. Lock:
 - a. Interior mounted slide lock.
 - b. Interior mounted slide lock with interlock switch for automatic operator.
 - c. Keyed lock.
 - d. Keyed lock with interlock switch for automatic operator.
 6. Weatherstripping:
 - a. Flexible bulb-type strip at bottom section.
 - b. Flexible Jamb seals.
 - c. Flexible Header seal.
 7. Track: Provide track as recommended by manufacturer to suit loading required and clearances available.
 - a. Size:
 - 1) 2 inch (51 mm).
 - 2) 3 inch (76 mm).
 - b. Type:
 - 1) Standard lift.
 - 2) Vertical lift.
 - 3) High lift.
 - 4) Low headroom.
 - 5) Follow roof slope.
 - c. Horizontal track shall be reinforced with continuous angle of adequate length and gauge to minimize deflection.
 - d. Vertical track shall be graduated to provide wedge type weathertight closing with continuous angle mounting for steel or wood jambs, and shall be fully adjustable to seal door at jambs.
 8. Manual Operation: Pull rope.
 9. Manual Operation: Chain hoist.
 10. Electric Motor Operation: Provide UL listed electric operator, equal to Genie Commercial Operators, size and type as recommended by manufacturer to move door in either direction at not less than 2/3 foot nor more than 1 foot per second.
 - a. Medium Duty
 - 1) Model MH – hoist
 - 2) Model MT – trolley
 - 3) Model MJ - jackshaft
 - b. Standard Duty
 - 1) Model H – hoist
 - 2) Model T – trolley
 - 3) Model J – jackshaft
 - c. Heavy Duty
 - 1) Model GH – hoist
 - 2) Model GT - trolley
 - d. Entrapment Protection: Required for momentary contact, includes radio control operation.
 - 1) Pneumatic sensing edge up to 18 feet (5.5 m) wide. Constant contact only complying with UL 325/2010.
 - 2) Electric sensing edge monitored to meet UL 325/2010 equal to Miller Edge.

- 3) Photoelectric sensors monitored to meet UL 325/2010.
 - e. Operator Controls:
 - 1) Push-button operated control stations with open, close, and stop buttons.
 - 2) Key operated control stations with open, close, and stop buttons.
 - 3) Push-button and key operated control stations with open, close, and stop buttons.
 - 4) Flush mounting.
 - 5) Surface mounting.
 - 6) Interior location.
 - 7) Exterior location.
 - 8) Both interior and exterior location.
 - f. Special Operation:
 - 1) Pull switch.
 - 2) Vehicle detector operation.
 - 3) Radio control operation.
 - 4) Card reader control.
 - 5) Photocell operation.
 - 6) Door timer operation.
 - 7) Commercial light package.
 - 8) Explosion and dust ignition proof control wiring.
- D. Glazed Sectional Overhead Doors: Wayne Dalton 464 Series Aluminum Doors.
Units shall have the following characteristics:
1. Door Assembly: Stile and rail assembly of aluminum alloy 6063-T6, 1-3/8 inch thick stiles and rails, 1/4" tempered glass secured with industrial high bond tape
 - a. Rails: Top and bottom rails with 3-1/2 inches wide, lower intermediate rail 1-3/8 inches, upper rail 1-5/8 inches, minimum wall thickness 0.062 inch, bottom and lower intermediate rails with glass ledge
 - b. Stiles: Top, bottom, and end stiles are 3-1/2 inches wide, center stile 3 inches wide, minimum wall thickness 0.062 inch.
 - c. Springs:
 - 1) Standard cycle spring: 10,000 cycles.
 - 2) High cycle spring: 25,000 cycles.
 - 3) High cycle spring: 50,000 cycles.
 - 4) High cycle spring: 75,000 cycles.
 - 5) High cycle spring: 100,000 cycles.
 - d. Glazing:
 - 1) 1/4 inch (6 mm) White Opaque Tempered glass
 - 2) 1/4 inch (6 mm) Black Opaque Tempered glass
 - 3) 1/4 inch (6 mm) Mirrored Gray Tempered glass
 - 4) 1/4 inch (6 mm) Mirrored Bronze Tempered glass
 - 5) 1/4 inch (6 mm) Translucent Black Tempered glass
 2. Finish and Color:
 - a. Anodized Finish: Black anodized
 - b. Anodized Finish: Bronze anodized
 - c. Powder Coating Finish: White powder coat
 - d. Powder Coating Finish: Black powder coat
 - e. Powder Coating Finish: Bronze powder coat
 3. Hardware: Black and white powder coated steel hinges and fixtures. Ball bearing rollers with hardened steel races.
 4. Lock:
 - a. Interior mounted slide lock.
 - b. Interior mounted slide lock with interlock switch for automatic operator.

5. Weatherstripping:
 - a. Flexible bulb-type strip at bottom section.
 - b. Flexible Jamb seals.
 - c. Flexible Header seal.
6. Track: Provide track as recommended by manufacturer to suit loading required and clearances available.
 - a. Size:
 - 1) 2 inch (51 mm).
 - 2) 3 inch (76 mm).
 - b. Type:
 - 1) Standard lift.
 - 2) Vertical lift.
 - 3) High lift.
 - 4) Low headroom.
 - 5) Follow roof slope.
 - c. Horizontal track shall be reinforced with continuous angle of adequate length and gauge to minimize deflection.
 - d. Vertical track shall be graduated to provide wedge type weathertight closing with continuous angle mounting for steel or wood jambs, and shall be fully adjustable to seal door at jambs.
7. Manual Operation: Pull rope.
8. Manual Operation: Chain hoist.
9. Electric Motor Operation: Provide UL listed electric operator, equal to Genie Commercial Operators, size and type as recommended by manufacturer to move door in either direction at not less than 2/3 foot nor more than 1 foot per second.
 - a. Medium Duty
 - 1) Model MH – hoist
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 - 3) Model J – jackshaft
 - c. Heavy Duty
 - 1) Model GH – hoist
 - 2) Model GT - trolley
 - d. Entrapment Protection: Required for momentary contact, includes radio control operation.
 - 1) Pneumatic sensing edge up to 18 feet (5.5 m) wide. Constant contact only complying with UL 325/2010.
 - 2) Electric sensing edge monitored to meet UL 325/2010 equal to Miller Edge.
 - 3) Photoelectric sensors monitored to meet UL 325/2010.
 - e. Operator Controls:
 - 1) Push-button operated control stations with open, close, and stop buttons.
 - 2) Key operated control stations with open, close, and stop buttons.
 - 3) Push-button and key operated control stations with open, close, and stop buttons.
 - 4) Flush mounting.
 - 5) Surface mounting.
 - 6) Interior location.
 - 7) Exterior location.
 - 8) Both interior and exterior location.

- f. Special Operation:
 - 1) Pull switch.
 - 2) Vehicle detector operation.
 - 3) Radio control operation.
 - 4) Card reader control.
 - 5) Photocell operation.
 - 6) Door timer operation.
 - 7) Commercial light package.
 - 8) Explosion and dust ignition proof control wiring.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Do not begin installation until openings have been properly prepared.
- B. Verify wall openings are ready to receive work and opening dimensions and tolerances are within specified limits.
- C. Verify electric power is available and of correct characteristics.
- D. If 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. Install overhead doors and track in accordance with approved shop drawings and the manufacturer's printed instructions.
- B. Coordinate installation with adjacent work to ensure proper clearances and allow for maintenance.
- C. Anchor assembly to wall construction and building framing without distortion or stress.
- D. Securely brace door tracks suspended from structure. Secure tracks to structural members only.
- E. Fit and align door assembly including hardware.
- F. Coordinate installation of electrical service. Complete power and control wiring from disconnect to unit components.
- G. Instruct Owner's personnel in proper operating procedures and maintenance schedule.

3.4 ADJUSTING

- A. Test for proper operation and adjust as necessary to provide proper operation without binding or distortion
- B. Adjust hardware and operating assemblies for smooth and noiseless operation.

3.5 CLEANING

- A. Clean doors, frames and glass using non-abrasive materials and methods recommended by manufacturer.
- B. Remove labels and visible markings.
- C. Touch-up, repair or replace damaged products before Substantial Completion.

3.6 PROTECTION

- A. Do not permit construction traffic through overhead door openings after adjustment and cleaning.
- B. Protect installed products until completion of project.

END OF SECTION