MODEL G-2020

**POLYURETHANE-INJECTED**

**GARAGE DOOR**

**20/20-gauge galvanized STEEL**,door thickness 1 3/4" (45 mm)

 GARAGA INC. SECTION: 08 36 13

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**OVERHEAD RETRACTABLE DOORS**

**WITH METAL SECTIONS ON HINGES**

**PART 1: OVERVIEW**

**1.1 RELATED WORK**

*The author shall give all the necessary references.*

**1.1.1** Electrical connections, water tightness of openings, and so on. Remember**:** all electrical connections and installations must be done by a qualified electrician as recommended by the manufacturer of the electric garage door operators. (Section 16,150)

**1.1.2** Preparation of the opening of the garage door (Section 05 500 or 06 100).

**1.1.3** These construction specifications and shop drawings are applicable to **Garaga Inc.** products only.

**1.2 SHOP DRAWINGS**

**1.2.1** Submit the shop drawings as per the instructions outlined in Section 01 300.

**1.2.2** The shop drawings shall include all the following information: the type of materials, the type of opening mechanism, the required tolerances, the electrical connections, the structural fastenings executed by the general contractor, and the suitable matching with neighboring materials.

**1.3 MAINTENANCE RECORDS**

**1.3.1** Provide the necessary instructions to ensure proper operation and maintenance of all the hardware components for the doors as well as the electric garage door operators, and include these instructions with the manual on use and maintenance described in Section 01 300.

**1.4 QUALIFICATIONS**

**1.4.1** The manufacturer of the specified products must be a sectional garage door manufacturer with at least 5 years of experience.

**1.4.2** The installation must be executed by a company approved by the garage door manufacturer as an installer, using skilled installers experienced in this work.

**PART 2: GARAGE DOORS**

**2.1 CALCULATION CRITERIA**

**2.1.1** The doors and the hardware system must be designed to meet standard ANSI/DASMA 102 (American National Standard Specifications for Sectional Overhead-Type Doors; DASMA: Door & Access Systems Manufacturer Association).

*(Note: for doors wider than 18’ (5.5 m), or high wind situations, consult our engineering department).*

**2.1.2** The doors shall have a thermal resistance factor of R-16 or RSI 2.8 (k = 0.357 W/m2K).

**2.1.3** The doors, the tracks, and the springs shall be designed to withstand at least \_\_\_\_\_\_\_\_operation cycles per year and \_\_\_\_\_\_\_\_\_total cycles over their lifespan.

***Note:*** *the number of spring cycles can vary from 10,000 to 100,000 cycles. However, you must realize that you cannot get 100,000 cycles for every size of door. If you want the best operating system, with the highest cycles possible, please specify “springs shall be designed for the maximum operation cycles”.*

**2.2 MATERIALS**

**2.2.1 Enameled steel (20-gauge exterior and interior surfaces)**

Galvanized steel sheet in accordance with ASTM A653 and ASTM A653M, has G60 coating with a thickness of 20-gauge, exterior and interior, in the manufacturer’s standard color. The galvanized steel sheet has a zinc coating with a minimum thickness of 0.04 lb./in2 (180 g/m2). The polyester paint finish, 2 coats, conforms to standard ASTM A924 and ASTM A924M and has a thickness of 1.0 mil. The surface of the steel sheet is smooth with 2 or 4 horizontal grooves.

**2.2.2 Insulation**

High-pressure, CFC-free, polyurethane foam has been injected between the walls of each section. Its density is 2.5 lb. /ft3 (40.4 kg/m3) with a thermal resistance factor of RSI 1.6 per 1” (25 mm) of thickness. The total insulation factor is R-16 (RSI 2.8) (k = 0.357 W/m2K).

**2.2.3 Reinforcement plates**

Steel reinforcement plates, with a minimum thickness of 14-gauge (0.07” or 1.8 mm) are inserted within the door sections to provide proper fastening for the hinges and plates of an electric garage door operator with central trolley.

**2.2.4 Section ends**

A block of grade 4 dry pine, guaranteed against cracking and rot, is inserted at both ends of each insulated garage door section for superior strength in the fastening of the lateral hinges. These wood end blocks ensure a thermal break with the door’s exterior.

**2.2.5 Assembly joints**

Galvanized steel sheets of each door section will be assembled with a mechanically-embedded, triple-contact weatherstripping, known as Interlok™, ensuring a thermal break, and the integrity and strength of the assembly.

**2.2.6 Regular windows *(if applicable)***

Windows have clear, double thermo panes with a total thickness of 3/4” (19 mm). The 1/8” (3 mm) panes are sealed in stainless steel extrusions using the Intercept™ system with a 1/2” (13 mm) air space. The windows are inserted in an expanded PVC frame and factory installed by the manufacturer.

**or Panoramic windows *(if applicable)***

Windows have clear, double thermo panes with a total thickness of 7/8” (22 mm). The 1/8” (3 mm) panes are sealed in stainless steel extrusions using the Intercept™ system with a 5/8” (16 mm) air space. The windows are inserted aluminum tubular extrusions. The windows are secured with rigid PVC moldings. They are factory installed by the manufacturer.

**2.3 DOORS**

**2.3.1** The garage doors shall be the model G-2020 as made by Garaga Inc. The sections are shaped with 23-gauge steel, interior and exterior, on a roll forming machine, and electronically injected with high-pressure polyurethane for a total minimum thickness of 1 ¾" (44.5 mm).

**2.3.2** The doors shall have the following sizes and features:

**LOCATION SIZES # OF SECTIONS # OF PANES**

**OF DOORS (W. by H.) WITH PANES PER SECTION**

\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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**2.4 WEATHER TIGHTNESS**

**2.4.1** Provide and install continuous weatherstripping at the bottom of the lower section. The weatherstripping shall be made of a U-shaped PVC extrusion as well as semi-circular TPE (thermoplastic elastomeric) tubing.

**2.4.2** Interlok™ joints, which aretriple-contact inset weatherstripping of flexible and rigid PVC, shall be found at the intersection of each section. This type of weatherstripping will ensure an efficient thermal barrier as well as double weather tightness in accordance with the following standards: when submitted to a pressure of 0.075 kPa, which is equivalent to winds of 25 mph (40 km/h), the air infiltration rating as measured using standard ASTM E-283 shall be 0.033 liter/second per meter of joint between the door sections.

**2.4.3** At the head of the door, provide the top of the section with continuous weatherstripping made up of a reinforced aluminum extrusion and a strip of flexible PVC 3” (76 mm) wide.

**2.4.4** Provide and install, on the exterior side of the door jambs and lintel, weatherstripping made up of an aluminum extrusion as well as a double-edged strip of arctic vinyl.

**2.5 OPTIONS (*TO choose from*)**

**2.5.1** Steel end caps: made of 16-gauge galvanized steel are installed at the end of each section where the hinges are to be fastened, for car/truck washes or to meet Agriculture Canada requirements.

**2.5.2** Exhaust ports, 3” (76.2 mm) in diameter, are factory installed on each door in order to place flexible hoses for venting exhaust gases.

**PART 3: HARDWARE WITH TORSION SPRINGS**

**3.1 PRODUCTS**

**3.1.1 Tracks**

The tracks are made of 12-gauge (0.1” (2.6 mm)) galvanized steel 3” (76 mm) wide. The horizontal track is reinforced with a 2" X 2” (50 x 50 mm) steel angle.

**3.1.2 Hardware**

The hinges are made of 13-gauge galvanized steel. Industrial rollers 3” (76 mm) long with 10 ball bearings are used.

**3.1.3 Struts for large doors(*if applicable*)**

Doors **12' 4" (3759 mm)** wideor wider will come with 22-gauge galvanized steel horizontal struts, and 13-gauge double hinges at each end.

**3.1.4 Type of movement**

The movement of the hardware will allow for the most space possible available underneath the door when it is in the open position.

 **LOCATION TYPE OF MOVEMENT AVAILABLE SPACE
 OF DOORS (FLOOR/CEILING)**

\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**3.1.5 Torsion-type springs**

The torsion spring lifting system will consist of all the parts and accessories needed for its installation. All doors weighing more than 1000 lb. (454 kg), hardware parts included, must be approved by a professional in installation in regard to the choice of pieces of hardware (drums, galvanized cables, springs, anchor plate, 1" (25 mm) solid shaft)).

**3.2 OPTIONS (*to choose from*)**

**3.2.1 3"-long (76 mm) rubber rollers, in UHMW (*for apartment buildings only)***

Garage door rollers for 3” (76 mm) tracks will have a UHMV head (nylon). They also include a sealed 6202 precision ball bearing and are mounted on a galvanized zinc-plated steel rod.

**3.2.2 3"-long (76 mm) rollers, NB SS (*for car or truck washes)***

Garage door rollers for 3” (76 mm) tracks will have UHMV head (nylon) on a stainless steel rod.

**3.2.3 3"-long (76 mm) precision rollers, machined steel (*for doors weighing over 770 lb./350 kg, or in dusty locations*)**

Garage door rollers for 3” (76 mm) tracks will have a machined steel head. They also include a sealed 6202 precision ball bearing and are mounted on a steel rod.

**3.2.4 Track guards, L-shaped**

The vertical tracks are protected by non-galvanized, L-shaped track guards 5’ x 0.3” (1524 mm x 6.4 mm), in order to avoid accidental breaking. Track guards should be painted with a bright color after installation.

**3.2.5 Track guards, Z-shaped**

The vertical tracks are protected non-galvanized, Z-shaped track guards 5’ x 0.2” (1524 mm x 5.0 mm) in order to avoid accidental breaking. Track guards should be painted with a bright color after installation.

 **3.2.6** **Chain hoist**

Doors of over 10’ (3 m) high with manual operation will come equipped with a chain hoist mounted on the wall.

***Note:*** *If an electric door opener is included, this option is unnecessary. Consult specs in the next section.*

**3.2.7 Pull chain**

Manual operation doors less than 10’ (3 m) high will come with a pull chain to assist the lowering of the door.

 ***Note:*** *If an electric door opener is included, this option is unnecessary. Consult specs in the next section.*

**3.2.8 Pusher springs**

For doors exceeding 161 ft2 (15 m2), standard movement or low headroom hardware will come with pusher springs at the end of the horizontal tracks in order to prevent the cables from falling off the drums.

**3.2.9 "C" bumper springs**

 For dock doors (ex: 8’ x 8’ (2438 mm x 2438 mm)), the vertical lift movement hardware will come with “C” bumper springs at the end of the horizontal tracks.

**3.2.10 Flanged bearing**

The end bearing plates will come equipped with flanged bearings for doors weighing more than **660 lb. (300 kg)**. Center plate (football bearings) will also be included with doors exceeding this weight.

**3.2.11 Tension bridge reinforcements**

Doors that are 18' 3" (5563 mm) wide and over will come equipped with tension bridge reinforcements. They will be mounted at each end of the top section and held in the center by a support whose height is adjusted according to the width of the door. These reinforcements must be installed according to Garaga’s exact specifications.

***Note:*** *all doors weighing more than* ***1000 lb.******(454 kg),*** *including hardware parts attached to the door, must be designed according to manufacturer’s specifications, in order to assure the proper choice of hardware Consult the Garaga technical service department.*

***CHOOSE FROM:*** *- Trolley-type operators for commercial use*

 *- Jackshaft-type operators*

 *- Trolley-type operators for apartment buildings*

**PART 4: TROLLEY-TYPE OPERATORS FOR COMMERCIAL USE**

**4.1 PRODUCTS**

**4.1.1** These are trolley-type electric operators that come equipped with a quick-release device which instantly disconnects the door from the operator to enable manual operation in the event of a power failure. The system consists of a carriage that slides between dual galvanized steel angle tracks.

 *Note: that 4” (100 mm) of free space is required between the highest point of the door and the ceiling.*

**4.1.2** The electric motors, control mechanisms, relays, and electrical devices of the operator shall be approved according to CSA and UL standards.

**4.1.3** The electrical power supply is of \_\_\_\_\_\_\_\_\_\_\_\_ volts, \_\_\_\_\_\_\_ phase(s) and 60 Hz. The model and horsepower of the door openers will be as follows:

 **LOCATION MODEL HORSEPOWER \* TYPE OF**

 **OF DOORS MOVEMENT**

\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_

 *\* Standard lift hardware only*

**4.1.4** The operators come equipped with an automatic reversible motor which has built-in thermal protection mechanism. The electrical control circuit shall be 24 volts.

**4.1.5** The door shall travel at approximately 7.9 to 11 in/sec (200 to 280 mm/sec).

**4.1.6** The control panel for the door operator shall be the push-button type for Up/Stop/Down control and surface mounted on the inside wall.

**4.1.7** A safety mechanism with photocells shall be added to each operator in order to stop and reverse the movement of the door in the event an object cuts off the light beam.

**4.2 OPTIONS** **(*to choose from***)

**4.2.1** The door operators identified by the numbers \_\_\_\_\_ come with a remote control system.

**4.2.2** A control station with a key switch for Up/Stop/Down shall be surface mounted on the outside of the building.

 **4.2.3** All side latches will be equipped with an electrical interlock switch to prevent use of the electric operator when the door is locked.

**4.2.4** An electro-pneumatic safety device with an instant reverse feature will be added to each operator. It consists of a rubber hose concealed within the weatherstripping located at the bottom of the door, combined with the electric switches. This device makes the door stop and go back up as soon as it comes into contact with an object.

 **4.2.5** The MyQ technology is available, to enable monitoring and control of the facility operators through a mobile app.

**PART 4: JACKSHAFT-TYPE OPERATORS**

**4.1 PRODUCTS**

**4.1.1** The electric operators shall be the Jackshaft type and shall come equipped with a built-in chain hoist assembly and with a quick release mechanism to allow for manual operation of the door in the event of a power failure.

**4.1.2** The electric motors, control mechanisms, relays, and electrical devices of the operator shall be approved according to CSA and UL standards.

**4.1.3** The electrical power supply is of \_\_\_\_\_\_\_\_\_\_\_\_ volts, \_\_\_\_\_\_\_ phase(s) and 60 Hz. The model and horsepower of the door openers will be as follows:

 **LOCATION MODEL HORSEPOWER \* TYPE OF**

 **OF DOORS MOVEMENT**

\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_

**4.1.4** The operators shall feature a positive lock mechanical brake, a reversible motor, and a thermal protection device against power surges. The electric control circuit is of 24 volts.

**4.1.5** The door shall travel at a speed of 7.9 to 11 in/sec (200 to 280 mm/sec).

**4.1.6** The control panel for the door operator shall be the push-button type for Up/Down/Stop control and surface mounted on the inside wall.

**4.1.7** A safety mechanism with photocells shall be added to each operator in order to stop and reverse the movement of the door in the event an object cuts off the light beam.

**4.2 OPTIONS (*to choose from*)**

**4.2.1** The door operators identified by the numbers \_\_\_\_\_ come with a remote control system.

**4.2.2** A control station with a key switch for Up/Stop/Down shall be surface mounted on the outside of the building.

**4.2.3** All side latches will be equipped with an electrical interlock switch to prevent use of the electric operator when the door is locked.

**4.2.4** An electro-pneumatic safety device with an instant reverse feature will be added to each operator. It consists of a rubber hose concealed within the weatherstripping located at the bottom of the door, combined with the electric switches. This device makes the door stop and go back up as soon as it comes into contact with an object.

 **4.2.5** The MyQ technology is available, to enable monitoring and control of the facility operators through a mobile app.

**PART 4: TROLLEY-TYPE OPERATORS FOR APARTMENT BUILDINGS**

**4.1 PRODUCTS**

**4.1.1** These are trolley-type electric operators that come equipped with a quick-release device, which instantly disconnects the door from the operator to enable manual operation in the event of a power failure. The system consists of a carriage that slides between dual galvanized steel angle tracks.

*Note: 4” (100 mm) of free space is required between the highest point of the door and the ceiling.*

**4.1.2** The electric motors, control mechanisms, relays, and electrical devices of the operator shall be approved according to CSA and UL standards.

**4.1.3** The electrical power supply is of \_\_\_\_\_\_\_\_\_\_\_\_ volts, \_\_\_\_\_\_\_ phase(s) and 60 Hz. The model and horsepower of the door openers will be as follows:

 **LOCATION MODEL HORSEPOWER \* TYPE OF**

 **OF DOORS MOVEMENT**

\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_

*\* Standard lift hardware only*

**4.1.4** The electrical control circuit shall be 24 volts.

**4.1.5** The door shall travel at a speed of 6 to 7.1 in./sec (150 to 180 mm/sec).

**4.1.6** The control panel for the operator comes with a single button for opening, closing, and reversing the movement of the door. This control panel is surface mounted on the inside wall.

**4.1.7** A safety mechanism with photocells shall be added to each operator in order to stop and reverse the movement of the door in the event an object cuts off the light beam.

**4.1.8** A mechanism consisting of green and red warning lights as well as automatic closing feature control the operation of the door. After the door reaches its fully open position, it will remain open for an adjustable preset time. Then it will close automatically. The warning lights will ensure control of vehicular traffic.

* 1. **OPTIONS** **(*to choose from*)**

**4.2.1** The door operators identified by the numbers \_\_\_\_\_ come with a remote control system. The total number of transmitters required is \_\_\_\_\_\_ units.

**4.2.2** A control station with a key switch for opening the door or a wireless keypad entry system shall be mounted on a steel post outside the apartment building. It shall be placed in such a way as to be accessible to the users from their vehicle.

**4.2.3** A control station for use of a card scanner shall be mounted on a steel post outside the apartment building. It shall be placed in such a way as to be accessible to the users from their vehicles. \_\_\_\_\_\_ cards shall be provided with the operator.

**4.2.4** A pull cord switch shall be mounted near the opening of the door. It will enable manual opening and closing of the door. It will also reset the timer for automatic closing *(Note: if the motor comes with this option)*.

**4.2.5** A magnetic loop detector shall be installed in the floor. When a vehicle or a metal object approaches the inductive loop, the detector sends a signal to the electric operator to signal the presence of a vehicle. The signal of the magnetic detector can be coupled with the card scanner control station (4.2.3). In this way, the presence of a vehicle will be necessary for the card scanner to open the garage door.

**4.2.6** An electro-pneumatic safety device with an instant reverse feature will be added to each operator. It consists of a rubber hose concealed within the weatherstripping located at the bottom of the door, combined with the electric switches. This device makes the door stop and go back up as soon as it comes into contact with an object.

 **4.2.7** The MyQ technology is available, to enable monitoring and control of the facility operators through a mobile app.

**PART 5: INSTALLATION**

**5.1** Before starting, make sure that the frames and the fixtures prepared by the general contractor are square.

**5.2** Install the doors and the related hardware.

**5.3** Apply some touch-up paint to areas where the finish might have been damaged during the mounting.

**5.4** Install the electric motors, control devices, push-button control stations, relays, and other electrical equipment needed for operating the door.

**5.5** All electrical connections must be done by a certified electrician.

**5.6** Adjust all movable parts and weatherstripping with the exterior jambs in order to get proper weather tightness under all conditions.

* 1. Make sure all of the mechanisms that have been installed work properly.
	2. Clean doors as recommended by the manufacturer, and get rid of all leftover materials and debris found near the openings and the hardware.