



BarrierGate[®]

PRODUCT MANUAL



BarrierGate®

The BarrierGate® system has been tested pursuant to National Cooperative Highway Research Program (“NCHRP”) Report 350 specifications. The BarrierGate® system has been deemed eligible for federal-aid reimbursement on the National Highway System by the Federal Highway Administration (“FHWA”).

Product Manual



15601 Dallas Parkway
Suite 525
Addison, Texas 75001



Warning: The local highway authority, distributors, owners, contractors, lessors, and lessees are responsible for the assembly, maintenance, and repair of the BarrierGate® system. Failure to fulfill these **RESPONSIBILITIES** with respect to the assembly, maintenance, and repair of the BarrierGate® system could result in serious injury or death.



Important: These instructions are for standard assemblies specified by the appropriate highway authority. In the event the specified system assembly, maintenance, or repair would result in a deviation from these assembly instructions, contact the appropriate highway authority engineer.

This manual must be available to the worker overseeing and/or assembling the product at all times. For additional copies, contact Valtir directly at (888) 323-6374.

The instructions contained in this manual supersede all previous information and manuals. All information, illustrations, and specifications in this manual are based on the latest BarrierGate® system information available to Valtir at the time of printing. We reserve the right to make changes at any time. Please contact Valtir to confirm that you are referring to the most current instructions.

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Customer Service Contacts

Valtir is committed to the highest level of customer service. Feedback regarding the BarrierGate® system, its assembly procedures, supporting documentation, and performance is always welcome. Additional information can be obtained from the contact information below:

Valtir:

Telephone:	(888) 323-6374 (USA) +1 312 467-6750 (International)
Contact Link:	www.Valtir.com/Contact
Website:	www.Valtir.com

Important Introductory Notes

Proper assembly of the BarrierGate® is critical to achieve performance that has been evaluated and deemed eligible by the FHWA per NCHRP Report 350. These instructions should be read in their entirety and understood before assembling the BarrierGate®. These instructions are to be used only in conjunction with the assembly of the BarrierGate® and are for standard assemblies only as specified by the applicable highway authority. If you need additional information, or have questions about the BarrierGate® system, please contact the highway authority that has planned and specified this assembly and, if needed, contact Valtir's Customer Service Department. This product must be assembled in the location specified by the appropriate highway authority. If there are deviations, alterations, or departures from the assembly instructions specified in this manual, the device may not perform as tested.



Important: DO NOT use any component part that has not been specifically approved for this system during the assembly or repair of this system.

This product has been specified for use by the appropriate highway authority and has been provided to that user who has unique knowledge of how this system is to be assembled. No person should be permitted to assemble, maintain, or repair this system that does not possess the unique knowledge described above. These instructions are intended for an individual qualified to both read and accurately interpret them as written. These instructions are intended only for an individual experienced and skilled in the assembly of highway products that are specified and selected by the highway authority.

A manufacturer's drawing package will be supplied by Valtir upon request. Each system will be supplied with a specific drawing package unique to that system. Such drawings take precedence over information in this manual and shall be studied thoroughly by a qualified individual who is skilled in interpreting them before the start of any product assembly.

Safety Symbols

This section describes the safety symbols that appear in this BarrierGate® manual. Read the manual for complete safety and assembly information.

Symbol Meaning



Safety Alert Symbol: Indicates Danger, Warning, or Caution. Failure to read and follow the Danger, Warning, Safety, or Caution indicators could result in serious injury or death to the workers and/or bystanders.



Warning: Read safety instructions thoroughly and follow the assembly directions and suggested safe practices before assembling, maintaining, or repairing the BarrierGate® system. Failure to comply with these warnings could result in increased risk of serious injury or death in the event of a vehicle impact with a system.



Important: Please keep up-to-date instructions for later use and reference by anyone involved in the assembly of the product.

Safety Rules for Assembly

*** Important Safety Instructions ***

This manual must be kept in a location where it is readily available to persons who are skilled and experienced in the assembly, maintenance, or repair of the BarrierGate® system. Additional copies of this manual are available from Valtir by calling (888) 323-6374 or at www.Valtir.com. Please contact Valtir if you have any questions concerning the information in this manual or about the BarrierGate® system.

Always use appropriate safety precautions when operating power equipment, mixing chemicals, and when moving heavy equipment or BarrierGate® components. Safety articles including but not necessarily limited to work gloves, apron, eye/ear protection, safety-toe shoes, and back support should be used.



Warning: Safety measures incorporating appropriate traffic control devices specified by the highway authority must be used to protect all personnel while at the assembly, maintenance, or repair site.



Warning: Ensure that the BarrierGate® system and delineation used meet all federal, state, specifying agency, and local specifications.



Warning: Ensure that your assembly meets all appropriate Manual on Uniform Traffic Control Devices (MUTCD) and local standards.

Limitations and Warnings

Valtir contracts with FHWA approved testing facilities to perform crash tests, evaluate test results, and submit results to the FHWA for review.

The BarrierGate® system has been deemed eligible for reimbursement by FHWA as meeting the requirements and guidelines of NCHRP Report 350. NCHRP Report 350 tests are designed to evaluate product performance involving a range of vehicles on roadways, from lightweight cars (approx. 1800 lb. [820kg]) to full size pickup trucks (approx. 4400 lb. [2000 kg]) to single-unit van trucks (approx. 17,600lb. [8000 kg]) as specified by the FHWA. A product can be certified for multiple Test Levels. The BarrierGate® is certified to the Test Level(s) as shown below:

Test Level 3: 4400 lb [2000 kg], 62 mph [100 km/h], 25 degrees

Test Level 4: 17,600 lb [8000 kg], 50 mph [80 km/h], 15 degrees

These FHWA directed tests are not intended to represent the performance of systems when impacted by every vehicle type or every impact condition existing on the roadway. This system is tested only to the test matrix criteria of NCHRP 350 as approved by FHWA.

Valtir expressly disclaims any warranty or liability for injury or damage to persons or property resulting from any impact, collision or harmful contact with products, other vehicles, or nearby hazards or objects by any vehicle, object or person, whether or not the products were assembled in consultation with Valtir or by third parties.

The BarrierGate® system is intended to be assembled, delineated, and maintained in accordance with specific state and federal guidelines. The appropriate highway authority approved engineer should be careful to properly select, assemble, and maintain the product. Site lay out, vehicle population type; speed, traffic direction and visibility are important elements that require evaluation in the selection of a highway product.

After an impact occurs, the debris from the impact should be removed from the area immediately and the specified highway product should be evaluated and restored to its original specified condition or replaced as the highway authority determines as soon as possible. If the system is not repairable, a complete system replacement is required.

Valtir Approved Adhesive Anchoring System

A Valtir approved adhesive anchoring system is required to securely anchor the BarrierGate® system. Each approved adhesive kit contains adhesive, studs, nuts and washers. Both vertical and horizontal assemblies are possible using an approved anchoring system.

Vertical Assemblies

Note: Read all Valtir approved adhesive instructions before starting.

1) Prepare the Concrete Foundation



Warning: Do not allow anchoring adhesive to contact skin or eyes. See material safety data sheet supplied with adhesive kit for first-aid procedures. Apply adhesive only in well-ventilated areas. Do not use near open flame.



Warning: Wear ear/eye protection, apron, and gloves during application.

The studs that anchor the BarrierGate® system to the concrete foundation must be those shipped in the kit or of high strength steel (120,000 psi [830 MPa] min. tensile strength). These studs must be set in minimum 4000 psi [28 MPa] concrete. Allow the concrete to cure a minimum of seven days before drilling and anchoring studs.

2) Drill Boreholes



Caution: Consult OSHA silica respiratory standard 29 CFR 1910.134 for debris removal from borehole(s) and use Valtir approved adhesive to achieve optimum tensile strength. Do not use diamond drill bits for drilling boreholes.

Use anchoring part(s) as drilling template(s). Use a rotary hammer drill to drill the boreholes 7/8" diameter to the recommended depth. See the approved adhesive instructions provided with adhesive kit. Ensure each borehole is drilled to the proper depth and aligned with the part to be anchored per Anchoring Information.

Anchoring Information				
Stud Size:	Orientation	Concrete Bit Size	Minimum Depth	Recommended Torque
3/4" x 6 1/2"	Horizontal & Vertical	7/8"	5 1/4"	Manufacturer Spec
3/4" x 10"	Vertical	7/8"	9"	Manufacturer Spec

3) Clean the Boreholes

Blow the concrete dust from the borehole using oil-free compressed air. Thoroughly brush it with a 7/8" diameter steel bristle tube brush and then blow it out again. If the borehole is wet, completely flush it with water while brushing and then blow it clean to remove all water using oil-free compressed air.

4) Apply Approved Adhesive

Fill the borehole 100% full with adhesive material.



Caution: Fill borehole 100% full so it is even with the pavement surface per adhesive manufacturer's instructions.

5) Add the Washers and Nuts

Place a flat washer onto the stud then thread a nut on until the end of the stud is flush with the nut (Figure 1).

6) Insert Studs in Boreholes and Wait for Adhesive to Cure.

Push the stud down through the part to be anchored and into the borehole.



Caution: Do not disturb or load the stud until the approved adhesive material has hardened (refer to instructions supplied with the approved adhesive kit).

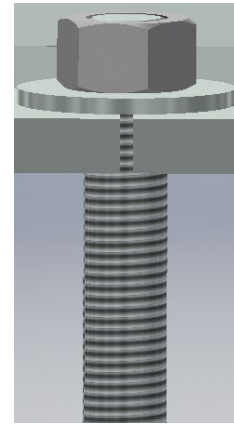


Figure 1
Vertical Application
(Before Applied Torque)

7) Torque the Nuts

Once the adhesive has fully cured, torque the nut to the adhesive manufacturer's recommended values.

Assembly Cautions

1) Steel rebar

If steel rebar is encountered while drilling an anchor bolt borehole, apply one of the following solutions:

- A) Using a diamond core drill bit or rebar drilling tool, drill through the rebar only, then switch back to the concrete bit and drill into the underlying concrete until the proper borehole depth is reached.



Caution: Do not drill through rebar without first obtaining permission to do so from the project engineer.

- B) Drill a new borehole down at an angle past the rebar to the proper depth. Anchor the stud by completely filling both boreholes with an approved adhesive.

Horizontal Assemblies

The horizontal approved adhesive kit is the same as the vertical kit.



Caution: Fill borehole 100% full so it is even with the concrete surface per manufacturer's instructions.

1) Follow the instructions supplied with your approved adhesive kit

Apply approved adhesive to each anchor per instructions.

2) Add Washers and Nuts

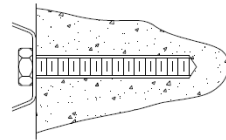
Put washer and nut on stud, leaving nut flush with end of stud (Figure 2).

3) Insert each Stud with Washer and Nut into Borehole

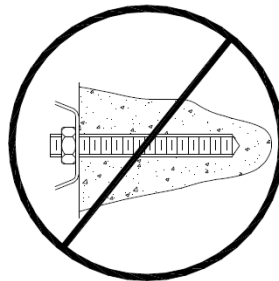
Push stud through part to be anchored and into borehole.



Important: The stud should be flush with the top of the nut in both **vertical** and **horizontal** applications prior to tightening.



CORRECT



INCORRECT

Figure 2
Horizontal Application



Caution: Do not disturb or load the stud until the approved adhesive material has hardened (refer to approved adhesive kit instructions for hardening times).

4) Torque the nuts

Once the adhesive has fully cured, torque the nut(s) to the approved adhesive manufacturer specification.

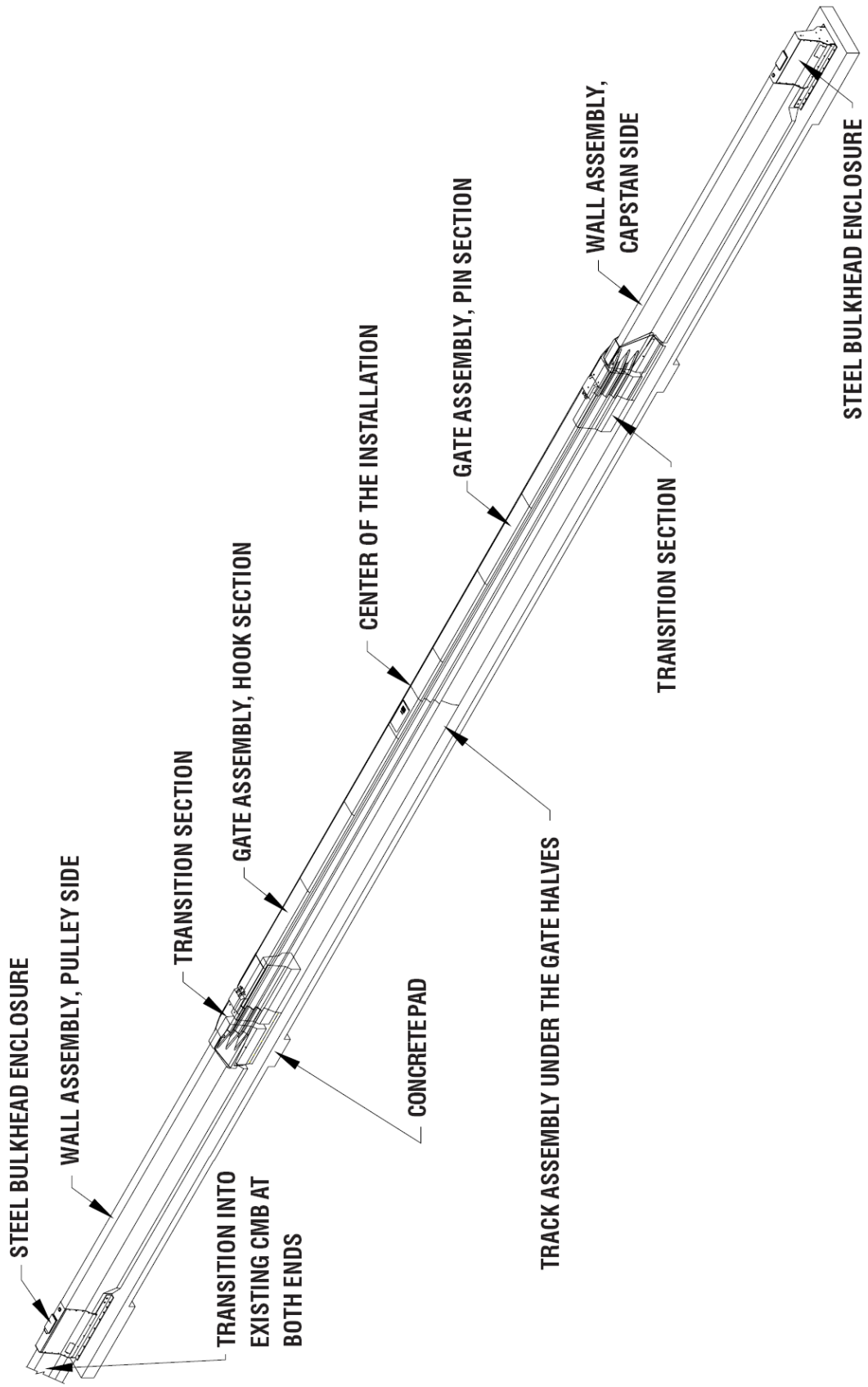


Figure 3

Assembly

Site Considerations

1. What is the existing concrete barrier shape at the site? BarrierGate® is designed to attach to concrete median barrier (CMB) with an 8" [203 mm] top width and the shape of a standard New Jersey median barrier. Other shapes require transitions to the BarrierGate®. Transitions are to be supplied by the customer and must be properly designed to prevent unintended vehicle interaction. See System Concrete Profile Section A-A on page 40.
2. What type of foundation exists at the site? The BarrierGate® must be anchored to a concrete foundation meeting the dimensions and construction specifications given in Concrete Pad Drawing.
3. What is the prevailing grade and cross slope at the site? The maximum recommended foundation cross slope is 4% and the maximum grade 8%. The area surrounding the assembly should be cleared of all debris. Drainage should be provided to avert runoff and prevent ponding on the foundation.
4. Is electrical power available at the site? The electrically powered BarrierGate® model requires a 240 VAC 50A single phase incoming power supply (480 VAC requires optional 4 KVA 480 X 240 transformer). Electrical power, local earth ground, and grounding conductors (per local requirements) must be routed to the proper location in the Concrete Pad (p. 40). Access to the control panel, disconnect (electrical power end), and drive system must be considered. The position of the incoming power determines the orientation of the gate and access to the controls. Position the system with the access side facing the widest shoulder.

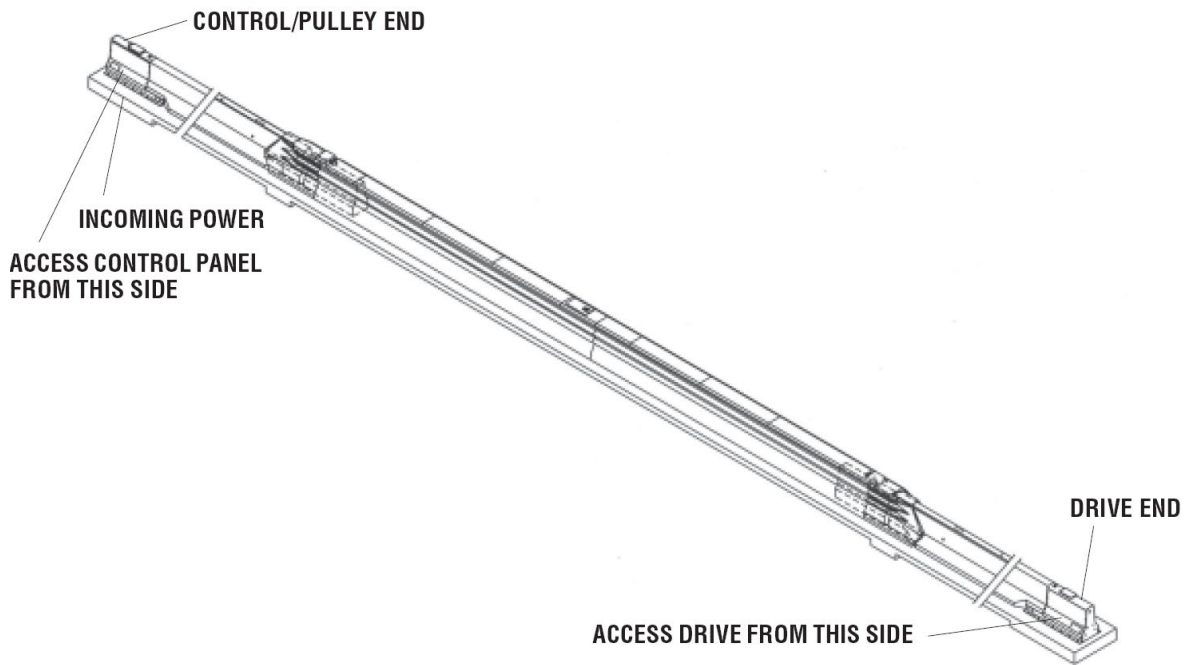


Figure 4

Recommended Tools

- BarrierGate® and optional accessories as ordered
- Manufacturer's Product Manual & Drawing Package
- Applicable location, layout, orientation, and construction plans
- Traffic control equipment (as required)
- Crane and/or fork lift, CMB lifting slings and chains (20,000 lb. [9090 kg] minimum vertical lift capacity)
- PCMB lifting pins (optional)
- Rotary hammer or similar tool for concrete; 7/8" concrete drill bit (**Double Fluted**)



Important: Valtir recommends using double-fluted drill bits to achieve optimum tensile strength when applying an approved adhesive anchoring system.

- Socket and combination wrenches; 1/2", 9/16", 3/4", 1 1/8", and 1 1/4"
- Extensions and ratchets for sockets
- Digging or pry bar; 5' [1.5m] length
- Pliers
- 12" [305 mm] Adjustable wrench and 24" [610 mm] length pipe wrench
- Air compressor with impact wrench and concrete hole blowout tool
- Come-along; 1000 lb. [455 kg] minimum capacity
- Allen Wrenches: 5/32", 3/8", 1/2"
- Chalk line and Concrete Marking Pencil
- Sledge and Claw Hammers
- Standard caulking gun
- Tape measures; 25' and 100' [7.6 m and 30.5 m]
- Safety Glasses, Gloves, and Safety Toe Shoes
- 50' [15 m] electrical fish tape
- Flat and Phillips screwdrivers
- Cold chisel or wire rope cable cutter
- Wooden blocks (at least 4)
- Torque wrench
- Waterproof strain relief
- Service junction box
- 240 VAC 50A power (480 VAC 25A optional)
- Local earth ground

Note: The above list of tools is a general recommendation and should not be considered an exhaustive list. Depending on specific site conditions and the complexity of the assembly specified by the appropriate highway authority the required tools may vary. Decisions as to what tools are needed to perform the assembly properly are the sole discretion of the specifying highway authority and the authority's selected contractor performing the assembly of the system at the authority's specified assembly site.

Site Preparation

Assemble the BarrierGate® in a 120' ± 2" [36.58 m ± 50 mm] long opening in existing permanent or portable Concrete Median Barrier. The BarrierGate® must be assembled on an existing or freshly placed and cured concrete foundation conforming to the specifications contained in the Concrete Pad Drawing (p. 40).

Wall Assembly Anchoring

1. Mark the centerline and the mid-point of the assembly (Figure 5).

Begin by finding the center of the existing longitudinal barrier ends and place chalk marks on the foundation at these points. The distance between barrier or transition ends must be 120' ± 2" [36.58 m ± 50 mm]. Extend a chalk line between the center points and snap a line to mark the centerline of the assembly. Next find and mark the exact midpoint of the assembly centerline. Snap two more construction lines parallel to the centerline and offset 15" [380 mm] to either side.

2. Position the wall assemblies (Figure 6).

On assemblies where the existing barrier or transitions are freestanding and unanchored, they must be doweled to the BarrierGate® Steel Wall Assembly Enclosures. If dowels are required, use a drilling template which matches the pattern of holes in the enclosure ends to ensure the dowel rods will line up. Drill holes before positioning the Wall Assemblies.

Remove the shipping tie downs that hold the gate and wall assemblies together. Lift the Gate Assemblies (refer to the checklist drawing) off the Wall Assemblies and set them down to the side of the assembly and the proper orientation. Carefully place the gate halves on wood blocks to avoid damage.

Note: The Hook Section Gate Assembly is positioned on the Pulley Wall Assembly (located on the side of the assembly with incoming power).

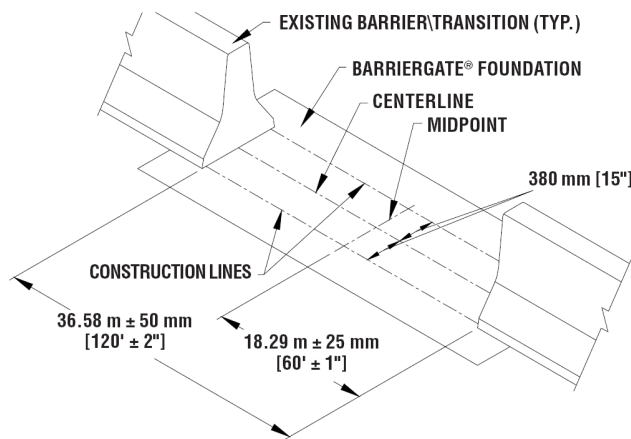


Figure 5
Layout Midpoint (not to scale)

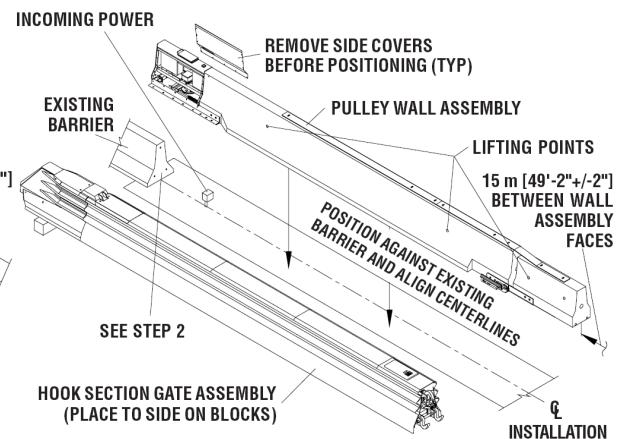


Figure 6
Position Wall and Gate Assemblies
(Pulley Side shown)

Next temporarily remove the side covers from both enclosure assemblies and set them out of the way.



Important: On electrically operated gates the Pulley Wall Assembly must be on the same side as the incoming power. Care must be taken to avoid damaging the electrical power supply when positioning the Pulley Side Wall Assembly.



Caution: Crane or forklift and lifting slings must have a minimum rated vertical lift capacity of 20,000 lb. [9090 kg] to lift each wall assembly. Lift barrier by placing chain through lifting holes in the barrier.

Align the centerline of both wall assemblies with the assembly centerline. Position the wall assemblies an equal distance apart from the assembly centerline. The distance between faces of the wall assemblies must be 49' - 2" ± 2" [15 m ± 50 mm] (**Figure 7**).

3. Anchor the wall assemblies to the foundation (Figure 8).

The ends of freestanding existing barrier or transition must either be doweled to the BarrierGate® Wall Assembly Enclosures or anchored to the foundation. If the existing barrier ends are not anchored to the foundation the enclosure must be doweled into the barrier ends using the anchors supplied with the system.

Drill 7/8" diameter by 9" deep concrete anchor bolt holes through the anchoring brackets in the wall assemblies (typical 26 places on each wall assembly.) Follow the directions supplied with the Valtir Approved Adhesive and anchor the wall assemblies to the foundation.

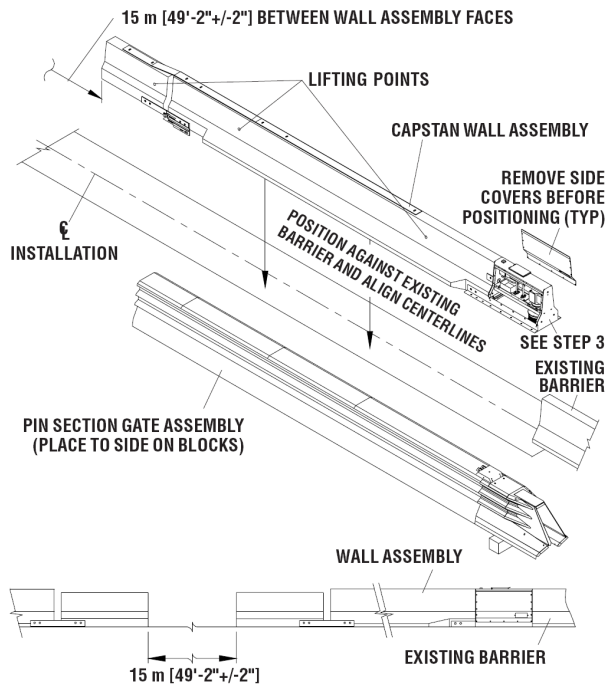


Figure 7
Position Wall and Gate Assemblies (Capstan Side)

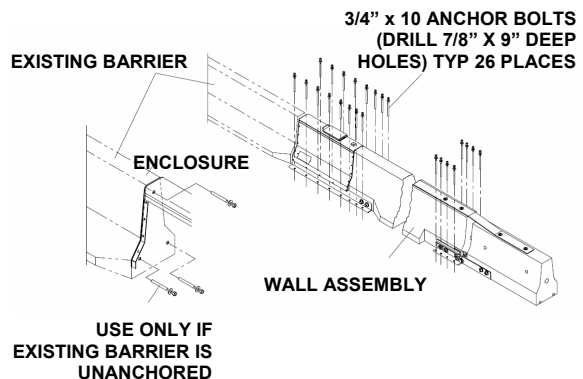


Figure 8
Doweling (Typ. both sides)

Track Assembly Placement

1) Position and assemble the track on the foundation (Figure 9 & p. 47).

Begin by moving two sections of the track to the midpoint of the assembly. Completely interlock the pins and inverted angles on the sections. Next position the midpoint of the engaged sections at the exact midpoint of the assembly, taking care to align the outside track edges with the construction lines made earlier. Finally, interlock the remaining track sections with those already positioned.



Important: For proper BarrierGate® operation the track sections must be completely engaged, aligned with the system centerline, and centered on the foundation.

2) Assemble the cable covers and anchor the track sections (Figure 10).

Using the holes in the tracks as template, drill (6) six holes 5 1/4" deep in the foundation for each track section, align the anchor holes, and check to make sure that there is a smooth transition from section to section where the ends touch. Place the longer track covers with rubber bumpers toward the ends closest to the existing barrier. Anchor the cable cover and track sections with approved adhesive and consult manufacturer's instructions for cure times before tightening nuts.

Note: Do not tighten the nuts until the electric wiring is complete.

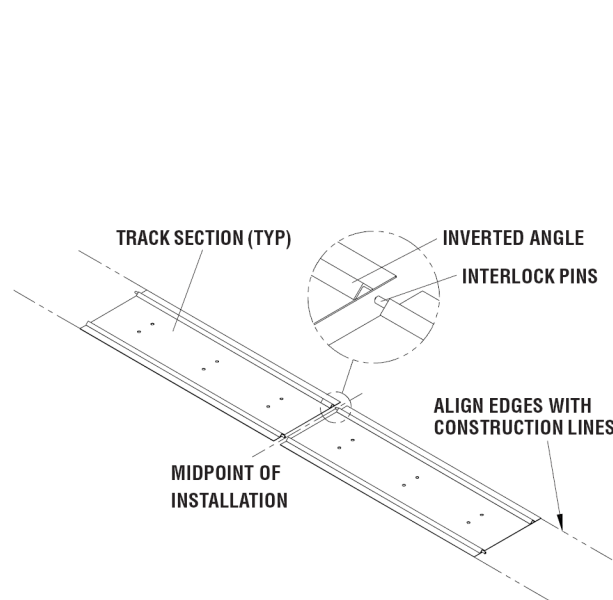


Figure 9
Position Track

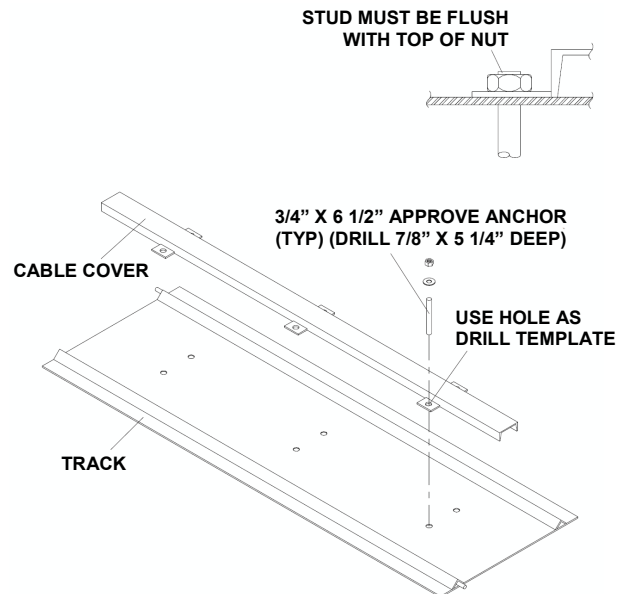


Figure 10
Assemble Covers and Anchor

Electrical wiring

(Electrically powered model only)



Warning: Connecting the BarrierGate® to incoming power involves the risk of electrical shock and should be made by a qualified electrician.

1) String the electrical control cables between the wall assemblies (Figure 11 & p. 48).

Remove the Track Cable Covers and move them to one side once the approved adhesive has set up. Untie the bundle of electrical cables at the end of the Capstan Wall Assembly and string the wires across the center of the track to the opposite side. Now use an electrical fish tape to pull the wires through the upper 3" conduit in the pulley wall assembly and into the control enclosure. Depending on the optional accessories present, some electrical components may have to be temporarily removed for easier access.

Place a cable cover over each track section, align the anchor holes, and check to make sure that there is a smooth transition from section to section where the ends touch. Place the long cable covers with rubber bumpers toward the end closest to the existing barrier. Attach the washers and then torque the nuts to 100 ft-lb [135 N-m].



Important: All approved adhesive anchored studs must be flush with top of nuts to prevent interference with BarrierGate® operation.



Warning: Use extreme care when covering cables with the track covers to prevent damage to the electrical cables and a potential fire or shock hazard.

If necessary, cut studs after they are torqued and touch up with cold galvanizing compound.

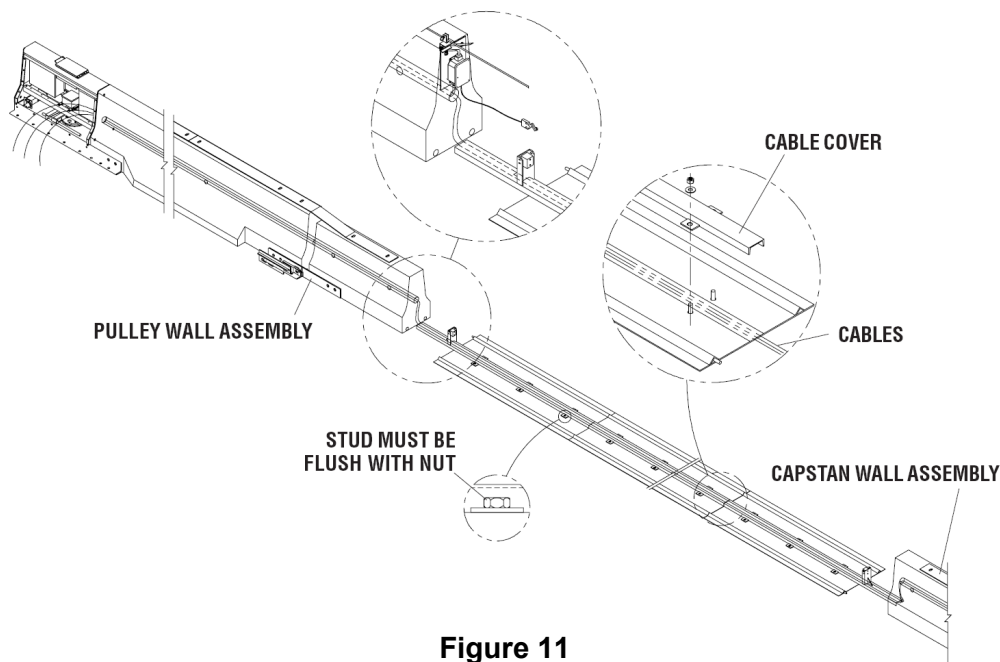


Figure 11
String Electrical Cables

2) Connect the control cables to the main control (Figure 12).

Loosen retaining clips and open the main control box. Make the wire connections shown. First remove the shell and bushing from the spare cord grips on the side of the enclosure. Thread the control cables coming from the far side of the assembly through the appropriately sized shell and bushing then through the cord grip and into the enclosure. If necessary remove cable slack then cut the cables to the appropriate length and strip the jacket down to expose the lead wires. Make the lead wire connections then secure the strain reliefs tightly against the cables.

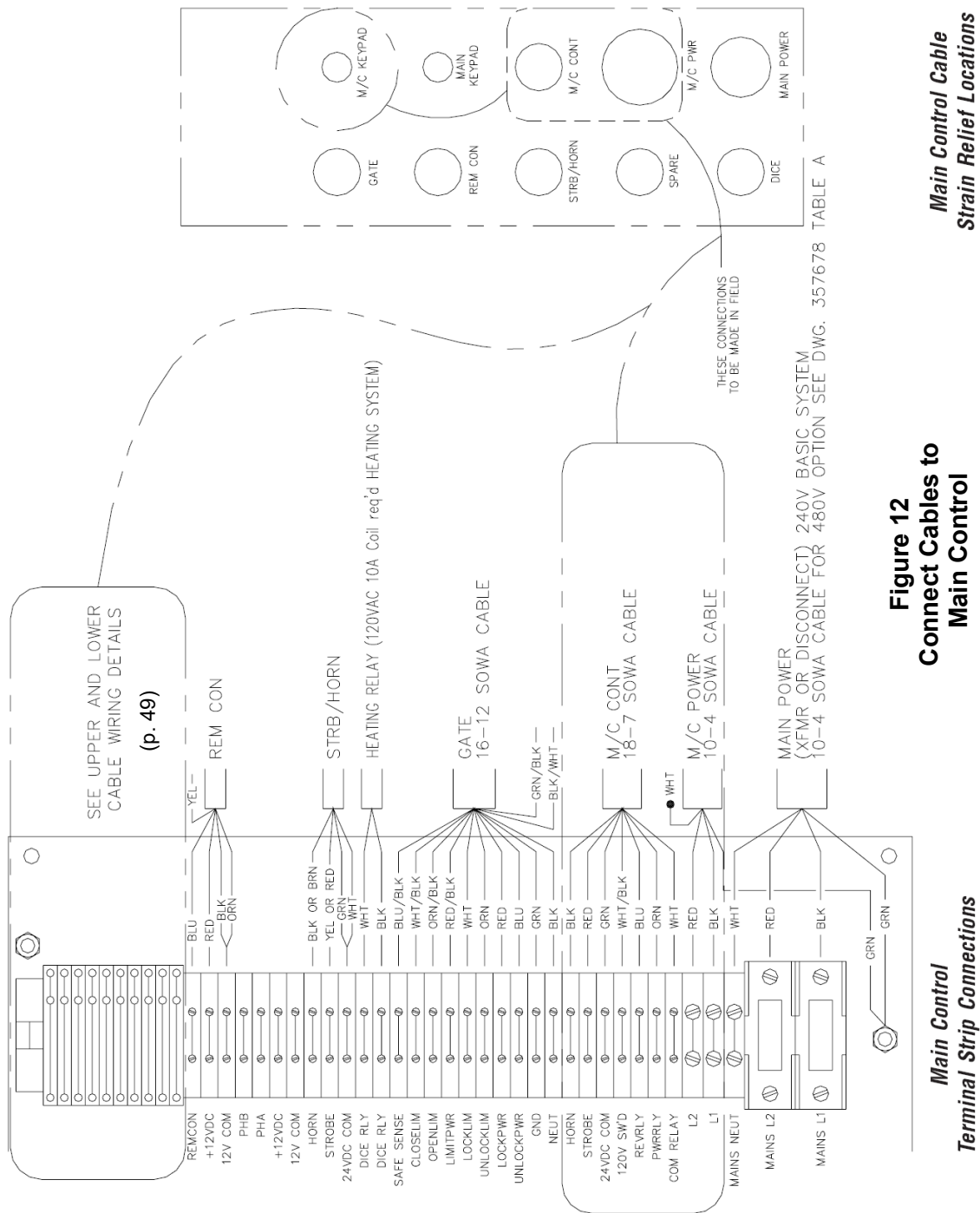


Figure 12
Connect Cables to
Main Control

*Main Control Cable
Strain Relief Locations*

*Main Control
Terminal Strip Connections*

3) Attach the open limit switch to the track cover (Figure 13).

Remove the open limit switch from its temporary mounting at the end of the Pulley Wall Assembly. Attach the limit switch to the Track Cover Mount with the screws provided. Route the cable along the center of the cover and hold it in place with a wire tie through the small hole provided.

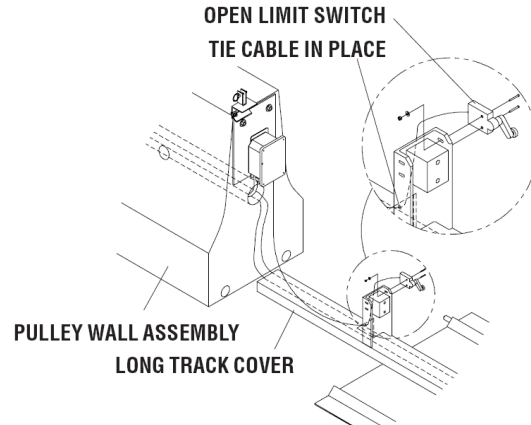


Figure 13
Attach Open Limit Switch

4) Connect the incoming power to the disconnect (Figure 14).

Turn site power off before making the wire connections shown. Route the loose cable from the electrical disconnect to the service junction box. Use a waterproof strain relief (customer supplied) to make connections. Make sure the supply is connected to a customer supplied local earth ground rod and disconnect is switched off before restoring site power.

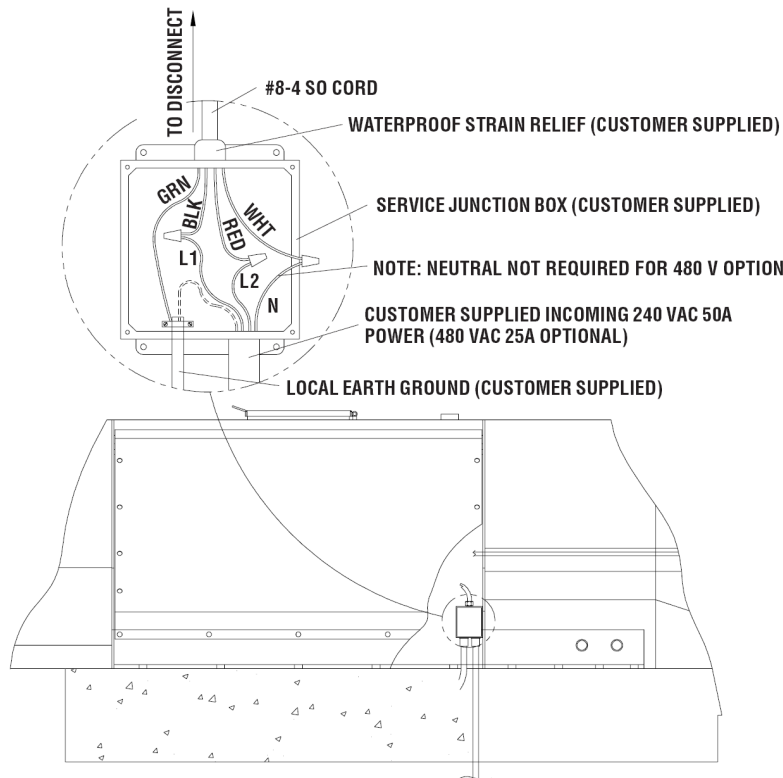


Figure 14
Connect to Service Power

Drive Cable Attachment

1) Locate and attach return pulley (Figure 15).

Place return pulley inside steel bulkhead enclosure at the Pulley Wall Assembly. Attach the return pulley cable to the pulley take-up. Turn pulley take-up a partial turn as shown to hold cable in place.

2) String the drive cable (wire rope) between the capstan drive and the return pulley (Figures 15-16).

Untie the wire rope bundle at the end of the Capstan Wall Assembly. The retainer is a cable clamp used for shipping. Standing near the drum and looking toward the pulley, the wire rope leaves the left side of the drum at the top and returns to the right side on the bottom. The drum is threaded or “grooved” and the wire rope **must** be properly positioned for proper operation. Initially the wraps on the drum should be positioned within one groove of the bottom of the drum. Spread the wire rope coming from the left side of the drive drum through the concrete walls along the left side of the assembly to remove any twists in the wire rope. Do the same for the right side. The left side should be much longer than the right side.

Drag the longer wire rope across the track and continue feeding it through the conduit in the left side of the Pulley Wall Assembly. Wrap the cable around the return pulley and bring it back to meet the other end at the track section nearest the end of the Capstan Wall Assembly. Release the ratchet on the pulley take-up, if necessary, and move the return pulley in the enclosure as far away from the ratchet as possible.

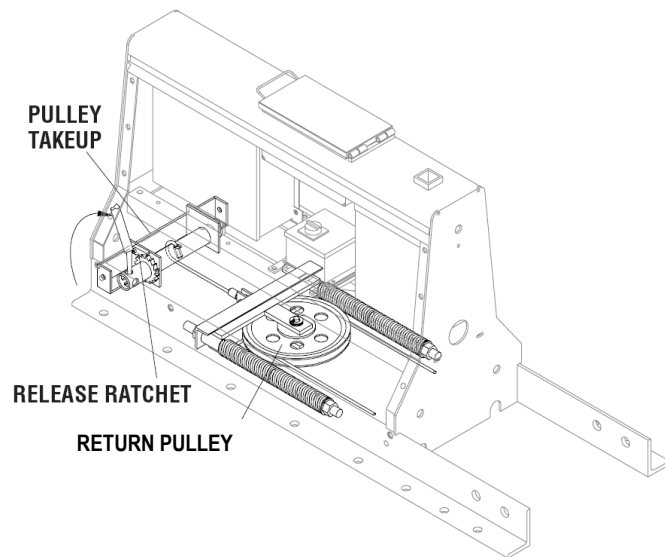


Figure 15
Release Return Pulley

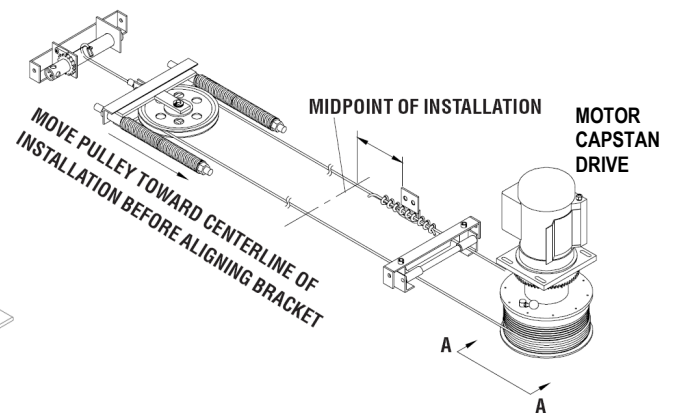
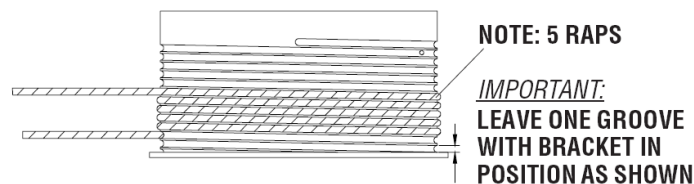


Figure 16
Drive Cable Attachment



View A-A

3) Fasten the drive cable attachment brackets to the drive cable (Figure 17).

Remove the Drive Cable Attachment Brackets from the Hook and Pin Gate Assemblies. Attach one Cable Attachment Bracket 20 to 30" from end of the long cable returning from the tension pulley (step 1, Figure 17). While maintaining some tension on the loose ends of the wire rope, release the retainer at the end of the Capstan Wall Assembly. Take out as much slack as possible, and splice the free ends together using the cable clips (Step 2, Figure 17).

4) Tension the drive cable (Figure 18).

Use a pry bar or similar lever to turn the ratcheting take-up on the return pulley. Remove the slack in the drive cable and tension it until the springs on the return pulley are compressed to 13" [330 mm] or less.

Attach the other bracket an equal distance from assembly centerline (Step 3, Figure 17).

Note: Maintain 5 wraps on cable on drive drum and position bottom wrap 1 groove from drum bottom when attachment bracket is 21'-3" ± 1" [6.48 m ± 25 mm] from assembly centerline. Orient the cable clips toward the outside.

Note: For proper gate operation, the tension pulley springs must be compressed to 13" [330 mm] or less.

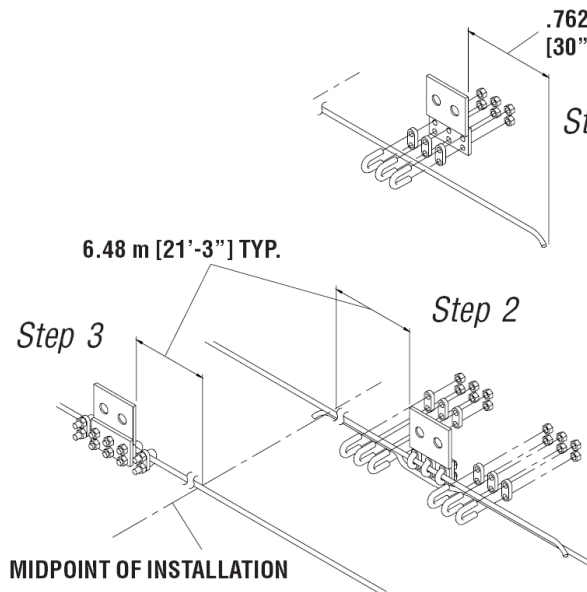


Figure 17
Fasten Drive Cable Brackets

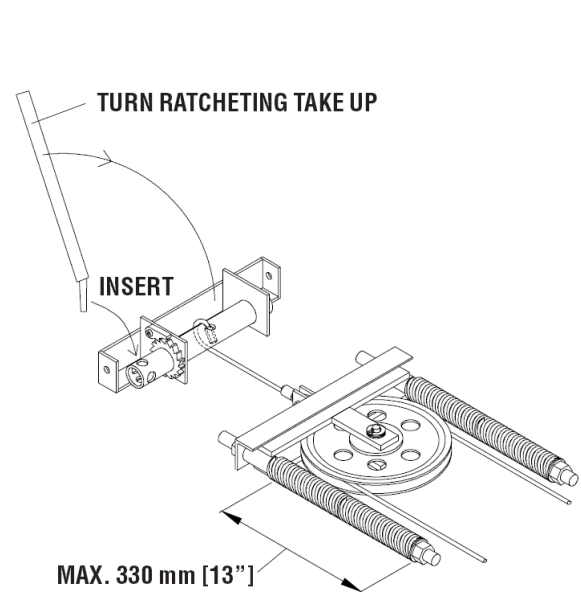


Figure 18
Tension Drive Cable

Positioning Gate Assembly

1) Temporarily remove the transition skirts and short top covers on the transition assembly (Figure 19).

Also remove the covers over the Hook and Pin Bulkheads to eliminate interference with the lifting cables (Figure 20).

Use a 3/8" Allen wrench to remove the 5/8" diameter bolts holding each Skirt and cover in position.

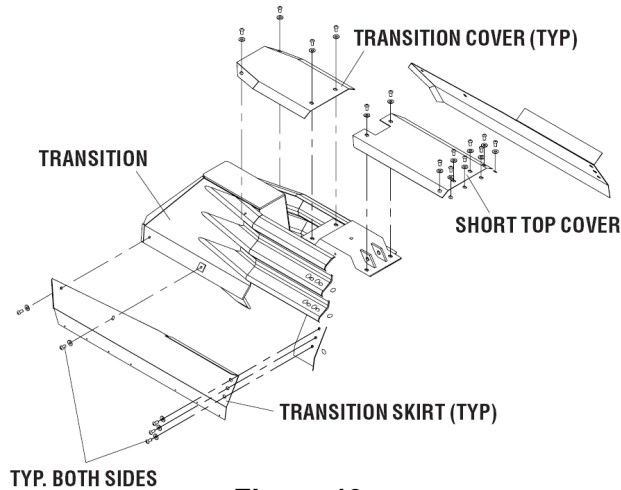


Figure 19
Remove Covers

The following warnings must be observed until the assembly is complete:



Warning: Crane or forklift, hoist, and lifting chains must have a minimum rated vertical lift capacity of 3000 lb. [1360 kg] in order to lift the Pin and Hook Section Gate Assemblies.



Warning: To avoid risk of serious injury, block or otherwise secure the gate assemblies so they cannot roll down the ramps.



Caution: Make sure all persons and objects in gate opening are clear before proceeding with the next operation. Failure to comply could result in serious injury.

- 2) Use a crane or forklift to lift the Pin Section Gate Assembly over the Capstan Wall Assembly and the Hook Section Gate Assembly over the Pulley Wall Assembly (Figure 20).

Look in through the Top Cover opening of each gate half and properly engage the Cast Iron Wheels with the Guide Rail. Look in from the front and properly engage the V-Guide Rollers with the V-Guide.

Roll each Gate Assembly to the fully open position (a come-along may be helpful).

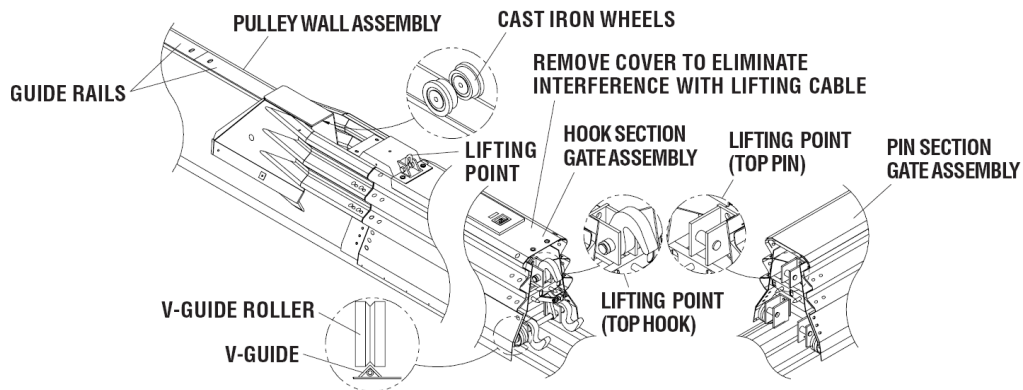


Figure 20
Lift the Gates

3) Connect the flat ribbon electrical cable in the Hook Gate Assembly to the J-box at the end of the Pulley Wall Assembly (Figure 21).

Locate the Flat Ribbon Cable and Connector on the Hook Gate Assembly. Attach the connector plug to the end of the Pulley Wall Assembly. Place the Flat Ribbon Cable between the plastic Strain Relief Clamp and the J-box mounting bracket and secure it in place with the bolts provided. Position the 3/16" diameter wire rope in the retaining tab on the bracket and hold it in position with the Quick Release Pin provided.



Caution: Check to be sure the Ribbon Cable is properly hanging from cable Trolleys and not wrapped around the 3/16" diameter wire rope.

4) Fasten the Cable Attachment Brackets to the Gate Assemblies (Figure 22 and 23).

Following the Manual Operation instructions (p. 24), disengage the Capstan Drive and crank the cable assembly by hand to line up the Cable Attachment Bracket with the connection point on the gate. Lift a Cable Attachment Bracket up to its mounting point and secure it with provided fasteners.

If power is not available at the time of assembly, follow the manual unlock procedure before manually closing the gate.

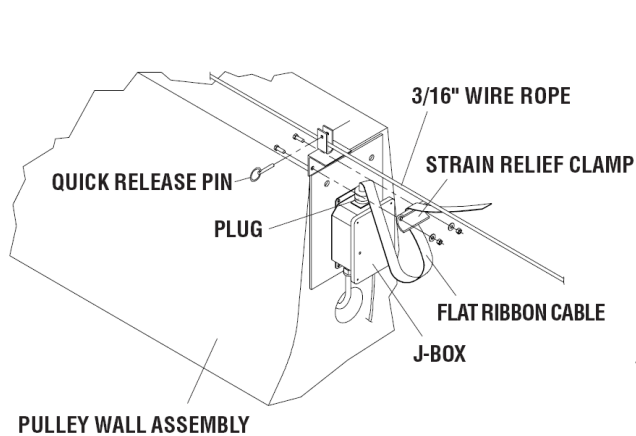


Figure 21
Attach Ribbon Cable

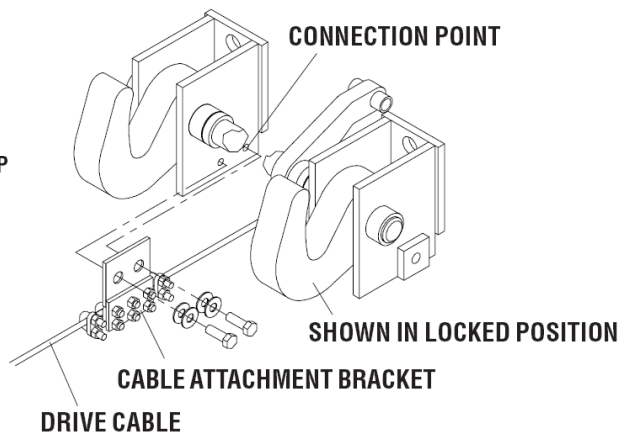


Figure 22
Attach Drive Cable (Hook Side)

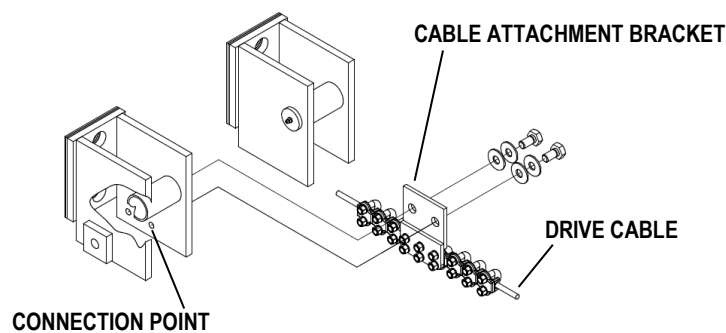


Figure 23
Attach Drive Cable (Pin Side)

Anchor Plate Adjustment

- 1) Verify that the Gate Assemblies meet within 1/2" [13 mm] of the exact midpoint of the assembly.



Warning: Stay clear while operating BarrierGate® or serious injury to hands and feet could occur.

Use the Manual Drive system (Manual Operation section, p. 24) to completely close the gate. The Gate Assemblies must be within 1/2" [13 mm] of the assembly midpoint. If not, open the gate and loosen the cable clips on Cable Attachment Bracket. Adjust as necessary and tighten the cable clips.

- 2) Close the gate and inspect the Anchor Plate fit with the gate Transitions (Figure 24).

Inspect the fit of the four Anchor Plates where they meet the gate Transition. Proper fit is obtained when there is a 1/2" [13 mm] gap or less between the Plate and the Transition with the gate fully closed. If the gap is excessive then the Transition Adjuster must be used to decrease the gap. Loosen the bolts that retain the Anchor Plate and remove the Adjuster. Reassemble the Adjuster in the orientation that reduces the gap to 1/2" [13 mm] or less then tighten the Anchor Plate bolts to 150 ft-lb [200 N-m].

Final Attachments

- 1) Replace the Top and Transition covers and then close the Bulkhead Access Covers.

Reengage Capstan Drive (Manual Operation Section, p. 24) and stow manual drive crank. Replace the top and transition covers and close the bulkhead access covers. Inspect the system to make sure all shipped components are assembled and/or accounted for. Turn on Main Electrical Disconnect Switch and open and close gate several times to assure smooth operation (Operation section, p. 23).

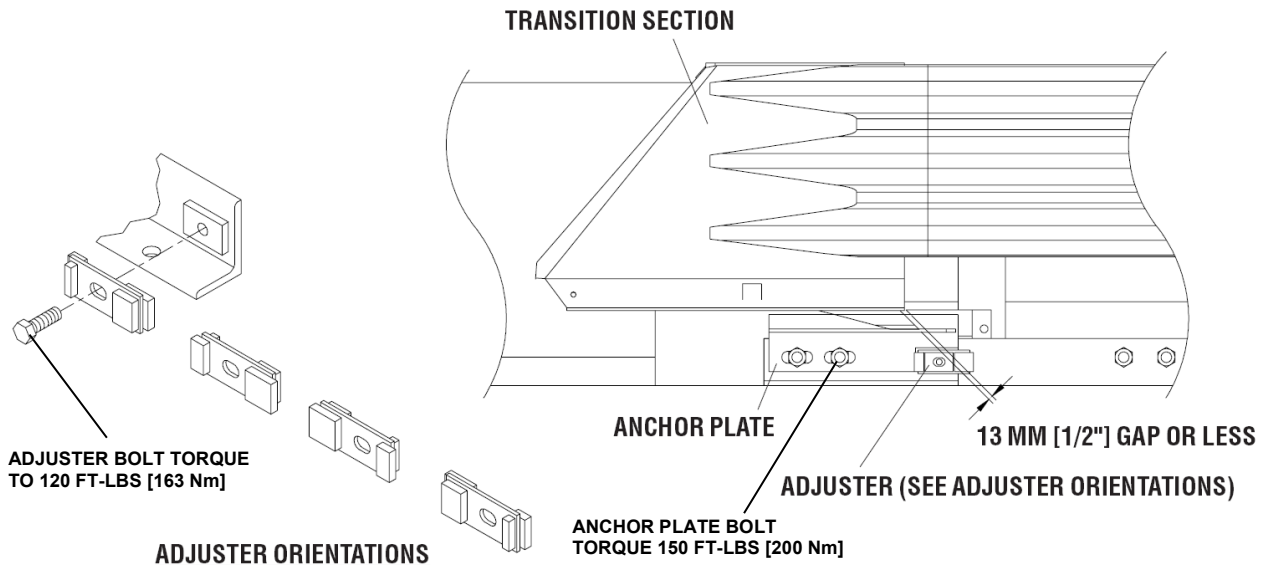


Figure 24
Adjust Anchor Plate Fit
(Transition Skirt Removed for Clarity)

Operation

Electromechanical Operation

(Electrically Powered Model Only)



Warning: Thoroughly check to ensure the BarrierGate® is clear of people, debris or obstructions before operating.

Note: If the BarrierGate® will not operate, refer to the detailed troubleshooting guide in this manual or contact our Customer Service Department for more information (p. 3).

Note: If the BarrierGate® must be manually opened, refer to the Manual Operation section.

Activate

Turn the Main Electrical Disconnect switch “on” (p. 29, Figure 31). Access a numeric Keypad and enter the correct 4 digit combination (Figure 25).

The red LED will begin blinking with the first key press and the green LED and buzzer will activate with each key press. When the correct combination has been entered, the red LED will light up continuously.



Warning: To stop BarrierGate® at any time or in case of emergencies press the **STOP** button.

Open

Press the number 1 to unlock and open the system. The green LED will flash and buzzer will sound when the gate is moving.

Stop

To stop the BarrierGate® at any time or in case of emergency, press the STOP button. If left unattended for more than 10 minutes, the BarrierGate® will automatically shut off and must be reactivated. The controls are deactivated by holding the STOP button down continuously for two seconds.

Close

Press the number 9 to close and lock the system. Deactivate the controls by holding the STOP button down for two seconds.

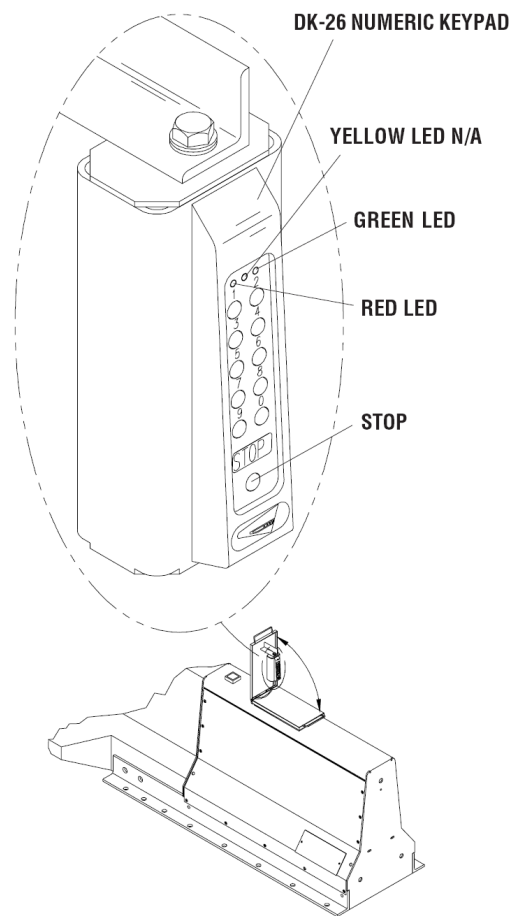


Figure 25
Numeric Keypad

Manual Operation

Note: The manually operated drive system is included with the electrically powered model.

1) Unlock the gate (Figure 26).

Open the manual jack access cover located at the middle of the gate and remove the attached handle. Remove the top safety retaining pin from the rear of the manual Jack Support. Insert the handle onto the jack nut and crank the Jack (clockwise) fully open to unlock the gate.

2) Release the Capstan Drive (electrically powered gate only) (Figure 27).

If the gate is electrically powered then remove the small covers on both sides of the Capstan Drive Enclosure. Locate the lever on top of the Capstan Drive drum and rotate it 180 degrees to disengage the Capstan Drive. Do not force lever. Rotate manual handle until lever engages.

3) Crank the gate open (Figure 28).

Open the keypad cover on the Capstan Drive Enclosure, release the catch on the lid, and lay the lid back. Remove the guard on the manual drive crank. Insert the manual jack handle onto the low speed (outermost) drive and crank counter-clockwise to open. The high speed (innermost) drive can be used when the gate is opened 10' [3 m] or more.

4) Reverse order to close and lock gate. Return lever to its original position (Figure 27).

IMPORTANT: Gate must be closed and locked manually before reengaging electrical.



Caution: The weight of the gate may cause the manual crank handle to want to spin. Hold the handle tightly to maintain control. Low speed operation is recommended at first until operator gains manual operational experience.

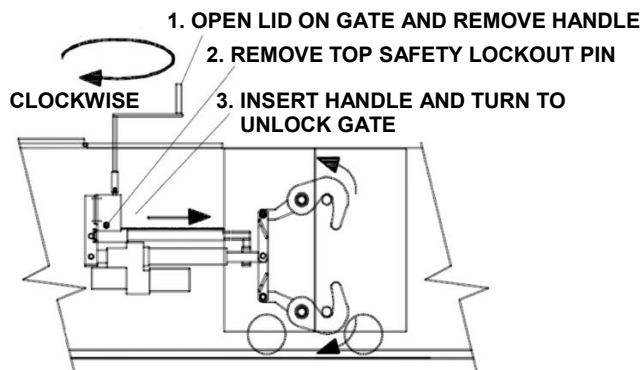


Figure 26
Unlock Gate

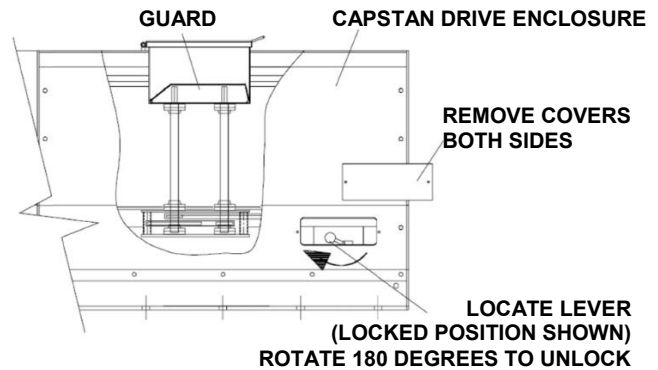


Figure 27
Release Capstan Drive

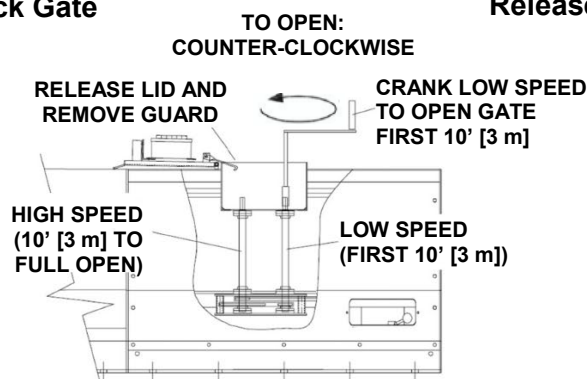


Figure 28
Crank Open Fully

BarrierGate® Final Inspection Checklist

Site Location: _____

Date: _____

Inspector: _____

Refer to the BarrierGate® manual and / or drawing package.

- System properly assembled per Product Description Assembly Manual
 - Wall Assemblies are properly positioned and anchored (p. 13)
 - Track Assembly is properly positioned and anchored (p. 14)
 - All field wiring properly routed and connections complete (p. 15, 16)
 - Open Limit Switch is properly positioned and attached (p. 17)
 - Drive cable is properly attached and tensioned (p. 18, 19)
 - Gate Half Assemblies are properly positioned (p. 19, 20)
 - Flat Ribbon Cable is properly connected and secured (p. 21)
 - Drive Cable properly attached to the Gate Half Assemblies (p. 21)
 - Verify proper Anchor Plate Adjustment (p. 22)

System Testing

- Manual operation successfully tested (p. 24)
- Powered operation successfully tested (p. 23).
 - System operated successfully from both keypads
 - Safety Sensor functions properly (if applicable)
 - Timed closure set and operating properly (if applicable)

Maintenance

Periodic and thorough maintenance is essential for dependable BarrierGate® operation. Take a moment to review the product limitations, assembly cautions, and maintenance instructions before performing any necessary work.

Maintenance intervals between inspections depend a great deal upon specific site conditions. Valtir recommends a once a month inspection until it is determined less frequent inspections are necessary.

Drive-By Inspection

A slow drive-by inspection of the BarrierGate® is often all that is required to spot damage which requires maintenance. Some inspection considerations are:

1. Are the sides of the Gate Assemblies and Steel Enclosures straight and aligned properly? If the sides are not straight or aligned then there is likely structural damage from a vehicle impact. **A Walk-Up Inspection is required.**
2. Are the Bulkhead Assemblies completely closed and locked? If there is any visible gap between the Bulkheads, then the system is not properly closed and latched. **A walk-up inspection is required.**
3. Is there an accumulation of dirt, debris, ice or snow around the BarrierGate®? Clean Guide Rail and Track Sections are critical for proper operation. **If dirt and debris is present, maintenance and cleaning is required.**
4. Are the covers on the manual drive access fully closed? **If not, a walk-up inspection should be made to investigate further and secure the covers if possible.**

Walk-Up Inspection

If the drive-by visual inspection indicates maintenance is required then a walk-up inspection is necessary. Some of the most common maintenance concerns and their corresponding repair techniques are:

Pin and Hook Section Gate Assemblies

1. Inspect the Debris Skirt for tears and replace sections as necessary.
2. Inspect for and replace any bent or damaged Side Panels, Top Covers, Transitions, etc.
3. Inspect for and replace damaged or frayed Actuator Electrical Cables.
4. Inspect for and tighten loose wire rope on Actuator Cable Support.
5. Lubricate all Bulkhead Assembly grease fittings every 6 months, or 750 cycles, whichever comes first (Figure 29).

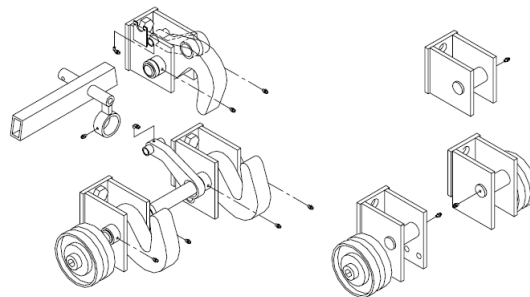


Figure 29
Grease Points

6. Inspect and repaint any scratched painted surfaces.
7. Inspect for any signs of animals nesting in, chewing on or otherwise damaging the system.

Capstan Drive Assembly

1. Inspect for and replace damaged or frayed wires.
2. Lubricate all Capstan Drive grease fittings (do not allow grease to spill on drive or driven drums) every 6 months, or 750 cycles, whichever comes first.
3. Apply (spray) light oil on Capstan Drive release knob pivot point.
4. Inspect and repaint any scratched painted surfaces.
5. Clean out any debris accumulation.
6. Inspect for excessive drum or wire rope wear.

Tension Pulley Assembly

1. Inspect for and replace damaged or frayed wires.
2. Inspect and adjust for excessive Capstan Drive Cable slack.
3. Inspect and repaint any scratched painted surfaces.
4. Clean out any debris accumulation.

Track Assembly

1. Clean out any debris accumulation.
2. Inspect and tighten any loose nuts.

Anchor Plate Assembly

1. Inspect gap between Anchor Plate and Gate Transition. Clean out any debris accumulation (p. 22).
2. Inspect and tighten any loose hardware.

Misaligned Gate Assemblies

The Gate Assemblies must be properly aligned with and riding on the Guide and Track for proper operation. Open the Bulkhead and Short Transition Covers and inspect to make sure the Guide Wheels and V-Guide Rollers are riding properly. If not, adjust them until they move smoothly.

Inspect and replace any Skirt, Side, and Top Cover Panels that may have been damaged from vehicle impacts.

Unlocked Gate Assemblies

If the Bulkhead Assemblies are not completely closed and locked, open the Top Covers to inspect for the cause. There may be debris under the system preventing the Gate Assemblies from completely closing and locking. The system may have been inadvertently left in this position by improper use of the Keypad Control (p. 23).



Warning: Use only Valtir parts that are specified herein for the BarrierGate® for assembling, maintaining, or repairing the BarrierGate®. Do not utilize or otherwise comeingle parts from other systems, even if systems are other Valtir systems. Such configurations have not been tested, nor have they been accepted for use.



Warning: Do NOT modify the BarrierGate® system in any way.

Troubleshooting and Repair

The BarrierGate® is designed to operate simply and reliably even in adverse highway environments. Most operational problems can usually be traced to improper assembly or maintenance. If operational problems are encountered, begin preparing for the necessary repair by thoroughly reviewing these instructions and all applicable location, layout, orientation, and construction plans.

It is critical to become familiar with BarrierGate® construction, assembly, maintenance, and basic operating instructions before attempting any repairs. Follow the BarrierGate® Repair Guidelines to help diagnose the operational problem then carry out the indicated inspection and repair step (p. 28). If these suggestions do not restore BarrierGate® operations, contact the Valtir Customer Service Department (p. 3).



Important: A traffic control plan appropriate to the complexity of the repair project should be prepared and understood by all parties before moving to the BarrierGate® repair site. Deploy the appropriate work zone safety devices prior to beginning the repair and keep them present through all operational phases.

The internal components of the BarrierGate® can be inspected for necessary repairs without lifting and removing gate halves. Access for inspection and repair can be made through one or more Enclosure Covers, Top Covers, Transition Skirts, Half Skirts, and Bulkhead Covers (Figure 30 & Drawings in the back). The Enclosure Covers can be removed to gain access to the Capstan Drive system. The Top Covers can be removed to provide a wide open area for inspection and a way of reaching or climbing down into the BarrierGate® for repairs.



Caution: Before attempting any repairs, the BarrierGate® must be blocked from moving to avoid injuring maintenance personnel.

The Transition and Half Skirts can be removed to gain access at the extreme ends of the gate.

Some gate inspections and repairs may require the gate halves to be lifted and removed. In this case, follow the reverse of the steps in the Positioning Gate Assembly section (p. 19). Take special care to disconnect all necessary mechanical connections before lifting the gates.

It may not be practical to complete some repairs in the field. Some breakdowns may require components to be removed and replaced.

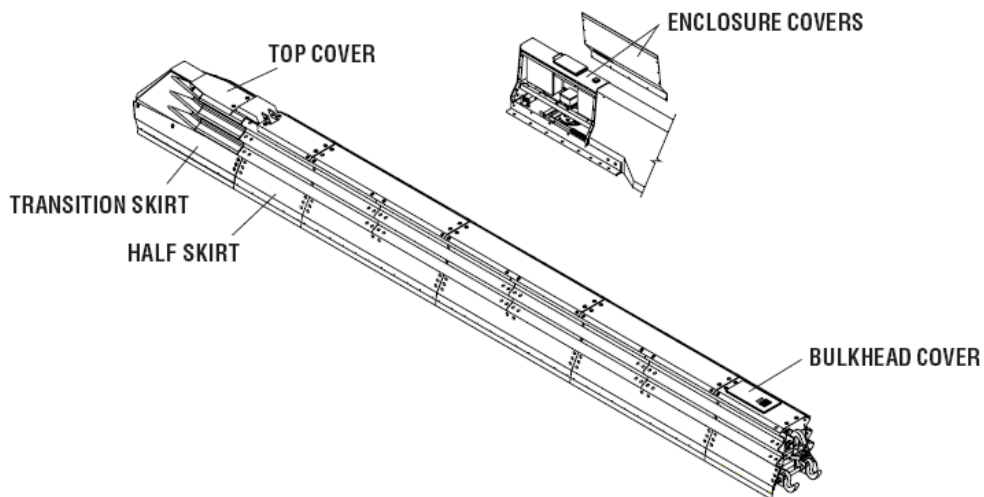


Figure 30



Warning: To avoid fire or shock hazard, disconnect the BarrierGate® power supply (lockout/tag out) before attempting troubleshooting or repair on electrical components.

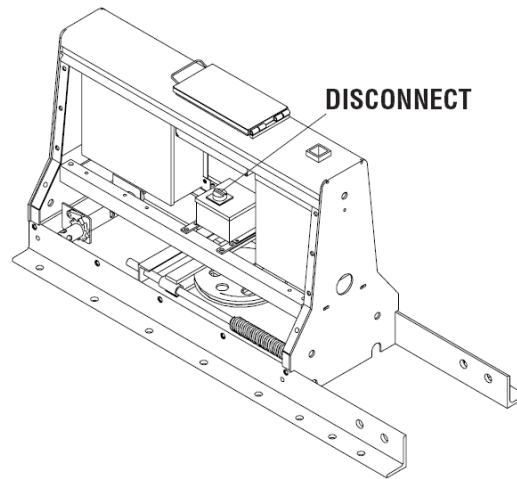


Figure 31



Warning: To avoid risk of serious injury, proper precautions must be taken to prevent the Gate Assemblies from rolling on slopes.

R1: Check for and remove internal obstructions to Gate movement.

Troubleshooting indicates something **inside** the gate may be obstructing free opening or closing movement. Do not operate Gate or damage to components may result. Remove Top Covers and inspect the inside of the Gate for possible obstructions. Check for and remove excessive debris from under the Gate. Check to make sure the V-Guide Rollers in the Bulkheads are properly engaging the inverted angle iron Tracks and that the Transition Rollers are properly riding on the Guide Rail. If not, reposition the Gate to bring Rollers back on track.

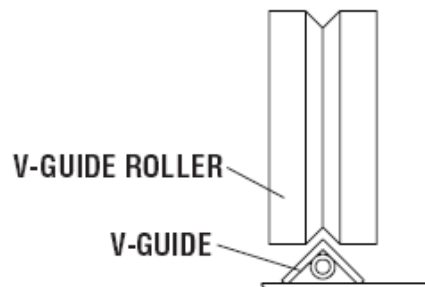


Figure 32

R2: Check that the gate has been properly restored following manual operation.

Troubleshooting indicates that the gate may not have been properly restored after manual operation. Open the Bulkhead Cover and check to make sure the Manual Jack is all the way rearward (furthest from the midpoint of the gate assembly) and that the Safety Retaining Pin is in place. Make sure the Capstan Drive Cable is attached to the bulkheads and the cable clamps tightened. The Capstan Lock Lever must be in the locked position (Figure 27).

R3: Check and re-tension the Capstan Drive Cable.

Troubleshooting indicates that the Capstan Drive Cable is not adequately tensioned. Do not operate gate or damage to components may result. Start by removing the appropriate Enclosure Cover then inspect the Tension Pulley assembly. The extended length of the springs must not exceed 13" (330 mm). If the springs exceed this length it may be due to a damaged or worn Capstan Drive Cable or loose wire rope clamps. Inspect for and correct the cause of the loose cable by tensioning the Drive Cable (p. 18).

R4: Check for and repair damaged Capstan Drive.

Troubleshooting indicates that the Capstan Drive is damaged. Only the simplest Capstan Drive repairs are likely to be made in the field. Inspect the Capstan Drive for obvious problems such as a bound Drive Cable. If no field adjustments can be made, detach the Drive Cable and remove the Capstan Drive for replacement.

R5: Check for and repair damaged motor control electrical cables or connections.

Troubleshooting indicates the drive motor control Cables or connections may be damaged. Inspect inside the Motor and Main Control Enclosures. Look for obvious damage such as cables that may have shorted out and loose or damaged connections. Replace worn or severed cables or repair with a strain and moisture resistant low profile electrical cable splice. Repair damaged connections with new parts taking care to make sound connections, provide complete wire insulation, and maintain the waterproof rating of the strain reliefs. Check the cables and connectors for end to end continuity using a digital multimeter or similar device. If damaged wires or electrical connections are found they may have caused a short circuit. In this case carry out Repair Steps R16 and R26.

R6: Check for and repair/replace Drive Motor or Motor Control.

Troubleshooting indicated the Drive Motor or motor control may be damaged. First carry out inspection and repairs in step R5 to eliminate cables and connections as the source of the problem. Remove the Capstan Enclosure Covers to gain access to the Motor, Motor Control, and cables. Remove the Motor and temporarily connect it to a 240 VAC power source following the wiring connections on the motor faceplate. The motor must properly start and turn in both directions. If the motor does not operate it must be replaced. If the motor operates properly then the problem lies in the motor control and it must be replaced.

R7: Check for and remove obstructions to gate movement.

Troubleshooting indicates something external to the gate is obstructing movement. Inspect for and remove excessive buildups of debris, snow, ice, etc. along both sides of the gate, Long and Short CMB's, and the exposed portions of the Guide Rail. Also inspect and remove any buildups that may have occurred around the Anchor Plates, Transitions and Drive Cable system. Check for even clearance on both sides of the gate at transition.

R8: Check for and repair the locking linkage in the Bulkheads.

Troubleshooting indicates something may be wrong with the Locking Linkage in the Bulkhead. Inspect the linkage for loose components. Make sure that all clevis pins are in place and secured by retainer pins. The Hooks must fully engage the Pins in the locked position and be fully disengaged in the unlocked position. Replace damaged or excessively worn parts.

R9: Check for and adjust the Electromechanical Actuator limit switches.

Troubleshooting indicates the stroke of the Electromechanical Actuator in the Hook Side Bulkhead may need adjustment. The stroke is pre-adjusted at the factory to accommodate the recommended grade, cross slope, and levelness of the foundation and CMB sections. The stroke should not require readjustment if the assembly conforms to the recommendations and there are no other problems with the system. You must first rule out any problems with the locking linkage by following Repair Step R8.

If no problems are found with the locking linkage then begin the adjustment procedure by noting which desired movement, unlock or lock is not completing, then deactivate the controls in this position. Open the Bulkhead Cover then locate and remove the limit switch cover plate located on top of the actuator. Underneath the cover plate are two round notched plastic “nuts” that ride on a small fine threaded “shaft”. The edge of the forward nut (that closest to the midpoint of the gate assembly) engages the arm of the forward limit switch that controls the amount of gate “Unlock” movement. The edge of the rear nut engages the arm of the rear limit switch that controls the amount of gate “Lock” movement. Above the nuts is a long thin metal “nut restrainer” that engages the notches in the nuts and restrains them from turning with the shaft.

If there is no “Unlock” linkage movement then the forward nut has not fully actuated the forward limit switch in the actuator. Carefully lift the restrainer until it disengages the notches in the nuts. Rotate the forward nut until it actuates the forward limit switch (the switch will “click” when actuated).

If there is no “Lock” linkage movement then the rear nut has not fully actuated the rear limit switch in the actuator. Carefully lift the restrainer until it disengages the notches in the nuts. Rotate the rear nut until it actuates the rear limit switch. The switch will “click” when activated.

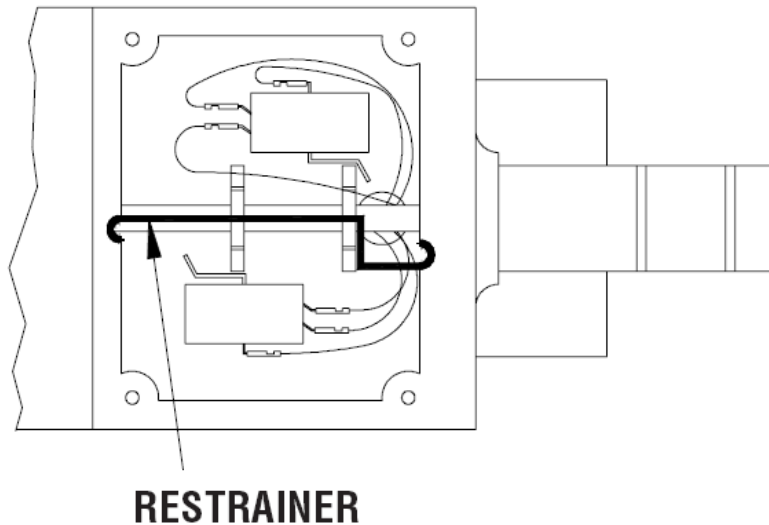


Figure 33

After adjusting the limit switch nut replace the nut restrainer. Operate the actuator and readjust the limit switch nut as necessary so that the desired movement is completed. When the limit switch adjustment is complete, replace the limit switch cover. Be sure gasket provides a water tight seal.

R10: Check for and repair/replace the Electromechanical Actuator.

Troubleshooting indicates the Electromechanical Actuator that locks and unlocks the gate may need repair or replacement. Inspect the actuator through the Bulkhead Top Cover. Listen or feel to see if the actuator drive motor is humming or vibrating when either the 1 or 2 (for open) or 9 or 0 (for close) gate buttons are selected on the keypad. If so, it may simply be jammed or struck in position due to ice or debris buildup, corrosion, or lack of lubrication. If the actuator seems to be stuck try turning the motor over manually to break it free. To do this, remove the plug from the front of the motor (the end closest the midpoint of the gate assembly) and use a screwdriver to rotate the tip of the motor shaft. Recheck to see if the actuator now moves freely. If the actuator will not turn freely it must be removed for shop repair or replacement. Carefully reattach the plug to achieve a water tight seal.

R11: Check for thermal overload condition on Capstan Drive Motor.

Troubleshooting indicates the Capstan Drive Motor may have overheated due to continuous operation in extremely hot weather. Wait until the motor cools sufficiently then reset the thermal overload switch on the side of the drive motor before operating the gate. Reduce the gate duty cycle as required to avoid overheating the Capstan Drive Motor again.

R12: Check for and repair/replace damaged Electromechanical Actuator control cable or connectors.

Troubleshooting indicates the Electromechanical Actuator control cable or connection may be damaged. Inspect inside the Bulkhead Top Covers for a worn or severed cable that may have shorted out or is loose, or a damaged connector that may have lost contact. Remove all the top covers and inspect the entire actuator cable length including the connections at the Main Control and Motor Control Enclosures. Replace worn or severed cables or repair with a strain and moisture resistant low profile electrical cable splice. Disassemble and repair damaged connectors with new parts taking care to make sound solder connections, provide complete wire insulation, and maintain the waterproof rating of the connector. Check the cable and connectors for end-to-end continuity using a digital multimeter or similar device. If damaged wires or electrical connections are found they may have caused a short circuit. In this case, carry out Repair Steps R16 and R26.

R13: Check and repair/replace damaged Keypad.

Troubleshooting indicates that one or more Keypads may be damaged. First carry out Repair Step R14 to check for and repair any damaged control cables or connections. If the gate still can't be operated then remove the keypad for replacement.

R14: Check for and repair damaged Keypad Control Cables or connections.

Troubleshooting indicates that one or more Keypad control cables or connections may be damaged. Try accessing both keypads to see if one will work. If the gate can be operated by one Keypad then isolate the damaged one and inspect inside the Control and Capstan enclosures for worn or severed cables that may have shorted out. Replace worn or severed cables or repair with a strain and moisture resistant low profile electrical cable splice. If damaged wires or electrical connections are found, they may have caused a short circuit. In this case it may be necessary to carry out Repair Steps R16 and R26. If the source of the cable or connection problem can't be found, carry out Repair Step R13.

R15: Check for and repair/replace Main Control.

Troubleshooting indicates the Main Control may be faulty. Only the simplest Main Control repairs are likely to be made in the field. First access the Main Control by removing the Control Enclosure cover. Inspect for and repair loose or damaged wires or connections. Inspect for moisture, condensation, or contact corrosion and correct accordingly. Although wires and connections may look good, slight and almost invisible corrosion on wire contacts may still prevent continuity. Clean all contacts with an electrical contact cleaner approved for this purpose. Check for blown fuses. If the source of the problem can't be repaired in the field, disconnect the Main Control enclosure and remove it for shop or factory repair or replacement.

R16: Check for and replace blown fuses in the Main disconnect enclosure.

Troubleshooting indicates the Main Disconnect fuses may be blown. Gain access to the Main Disconnect by removing a cover from the Main Control Enclosure. With the fuses in place and the incoming power shut off, check to see if there is continuity on both ends of the fuses by using a digital multimeter or similar device. If the fuses are blown then replace them. Blown fuses are an indication that there may have been a short circuit. In this case it will be necessary to locate and correct the source of the short (Repair Steps R5, R12, R14, R20 and R23).

R17: Check and restore site power to Main Disconnect.

Troubleshooting indicates the site power may be off to the Main Disconnect enclosure. Shut off the Main Disconnect then loosen the cover screws and remove the cover. Check to see if there is power to the supply side of the disconnect switch by using a digital multimeter or similar device. If no power is available in the enclosure then the site power is off and must be restored.

R18: Turn on the Main Disconnect.

Troubleshooting indicates the Main Disconnect is turned off. Reach in through an appropriate access cover and turn disconnect on (p. 29, Figure 31).

R19: Enter the correct four digit access code.

Troubleshooting indicates the wrong four digit access code has been entered or the correct code has been entered improperly. Contact the local or state office having jurisdiction over the gate to obtain the correct code. Refer to the "Electromechanical Operation" section for instructions on proper Keypad operation (p. 23).

R20: Check for and repair damaged Closed Limit Switch cable or connections.

Troubleshooting indicates the Closed Limit Switch cables or connections may be damaged. Inspect inside the Bulkhead Top Cover and look for obvious damage such as a worn or severed cable that may have shorted out. Remove the Bulkhead J-Box Cover and check the terminal strip for continuity using a digital multimeter or similar device. When the Close Limit Switch is depressed pin G and Pin J should have continuity (p. 35). Inspect for loose or faulty connections inside the junction box in the bulkhead. Replace worn or severed cables or repair with a strain and moisture resistant low profile electrical cable splice. If damaged wires or electrical connections are found, they may have caused a short circuit. In this case carry out Repair Steps R16 and R26. If damaged wires or electrical connection are not found then follow Repair Step R21 on the Closed Limit Switch.

R21: Check for and replace damaged Close Limit Switch.

Troubleshooting indicates the Closed Limit Switch is damaged. First carry out Repair Step R20 to eliminate cable and connections as the problem. Disconnect the limit switch solderless connections in the J-Box. Loosen the cable strain relief and remove the cable. Remove the screws that hold the closed Limit Switch to the Bulkhead and take it out. Replace the Limit Switch with a new one. The roller arm on the new switch must be adjusted to engage the alignment pin on the pin side gate assembly when the gate is closed.

R22: Check for and adjust the Closed Limit Switch setting.

Troubleshooting indicates the closed Limit Switch is not properly engaging the alignment pin on the Pin Side Bulkhead. The switch is adjusted at the factory; however, they may have been damaged or come loose. Open the gate enough to examine the switch and support bracket. If they have been bent or damaged, repair or replace them. If not, readjust them so the pin contacts the roller arm and activates the switch (switch will “click”) when the gate closes.

R23: Check for and repair damaged Open Limit Switch cable or connections.

Troubleshooting indicates the Open Limit Switch cable or connections may be damaged. Inspect the limit switch located on the Track Section nearest the Control Enclosure by removing top covers. Look for obvious damage such as worn or severed cables that may have shorted out. Remove the appropriate Access Cover and Top cover if necessary and inspect the entire cable length including the connections at the bulkhead J-Box. Remove the J-Box cover and check the terminals for continuity using a digital multimeter or similar device. When the Open Limit Switch is depressed Pin G and Pin I should have continuity (p. 35). Replace worn or severed cables or repair with a strain and moisture resistant low profile electrical cable splice. Tighten all loose connectors and connections. If damaged wires or electrical connections are found, they may have caused a short circuit. In this case carry out Repair Steps R16 and R26. If damaged wires or electrical connections are not found, follow Repair Step R24 on the Open Limit Switch.

R24: Check for and replace damaged Open Limit Switch.

Troubleshooting indicates the Open Limit Switch is damaged. First carry out Repair Step R23 to eliminate the cable and connections as the problem, then disconnect the switch and take it out. Replace the limit switch with a new one. Carry out Repair Step R25 to check for and adjust the limit switch setting.

R25: Check for and adjust the Open Limit Switch setting.

Troubleshooting indicates the Open Limit Switch is not properly engaging the Hook side Bulkhead assembly. If the assembly has been completed properly, then the Bulkhead Crosstube contacts the roller arm and activates the switch before it hits the rubber bumper (switch will “click”). If not, the switch may have been incorrectly assembled, damaged or come loose. Remove the appropriate top cover then examine the switch through the opening. If the arm has been bent or damaged, repair or replace it. If not, readjust the limit switch support bracket so the cross tube contacts the roller and the switch “clicks” just before the tube comes up against the rubber bumper.

R26: Replace the Main Control Fuses.

Troubleshooting indicates the Main Control fuses may have blown. Damaged wires or electrical connections may have caused a short circuit somewhere in the electrical system. If the fuses continue to blow then carry out Repair Steps R5, R12, R14, R20, and R23 to locate faulty cables or connections that may have shorted out. To access the control, remove a side cover to the Main Control Enclosure. Remove the cover on the right as you face the center of the gate. Loosen the screw clamps retaining the control cover and open the enclosure. Locate the fuse holder and check and replace fuses as necessary (R16).

PIN COLOR CODES		
A(1)	BLK	NEUTRAL
B(2)	RED	LOCK POWER
C(3)	BLU	UNLOCK POWER
D(4)	ORN	UNLOCK LIMIT
E(5)	YEL	LOCK LIMIT
F(6)	BRN	GROUND
G(7)	RED/BLK	AUX POWER
H(8)	BLU/BLK	PHOTO SENSE
I(9)	ORN/BLK	CLOSE LIMIT
J(10)	YEL/BLK	CLOSE LIMIT
K(11)	BRN/BLK	SPARE
L(12)	BLK/RED	SPARE

R27: Check for and repair gate structural damage.

Troubleshooting indicates the Gate has structural damage that must be replaced for proper gate operation. Assess the degree of structural damage. Minor structural damage to a small number of Side Panels, Panel Splices, Top Covers, etc. can be easily repaired by removing and replacing the damaged components. Major structural damage requires full replacement.

R28: Consult Valtir

If the Repair Guidelines did not restore BarrierGate® operations, call the Valtir Customer Service Department for additional suggestions (p. 3).

PARTS LIST

ITEM	STOCK NO.	DESCRIPTION	QTY
** 1	SEE TABLE	GATE ASSY, HOOK SECTION, BG1.5	1
** 2	609958	GATE ASSY, PIN SECTION, BG1.5	1
** 3	603582	ANCHOR ASSY, BG1.5	1
** 4	615989	TRACK ASSY, BG1.5	1
** 5	SEE TABLE	WALL ASSY, PULLEY, 240, BG1.5	1
** 6	SEE TABLE	WALL ASSY, CAPSTAN, BG1.5	1
** 7	618617	MANUAL BARRIER GATE ASSEMBLY	1
** 8	115674	MSDS, BARRIER GATE	1
** 9	SEE TABLE	ELECTRICAL ASSY	1
** 11	606739	DECAL ASSY, BG1.5E	1

OPTIONAL PARTS LIST

ITEM	STOCK NO.	DESCRIPTION	QTY
10	609004	ELECTRIC EYE ASSY, BG1.5(OPT.)	REF
12	614866	STROBE & HORN ASSY, BG1.5(OPT.)	REF
13	626233	HARD WIRE REMOTE, (CUST. SUPPLY)	REF
14	604197	ANTENNA REMOTE ASSY, BG1.5(OPT.)	REF
15	604404	AUTO TIMED CLOSURE, EYE(OPT.)	REF

TABLE

ASSEMBLY	SYSTEM MODEL	ITEM 1	ITEM 5	ITEM 6	ITEM 9
604916	240V 60HZ	609957	616989	616987	625578
616843	240V 50HZ	616846	626021	616986	616845
604918	480V 60HZ	609957	616990	616987	625578

NOTES:

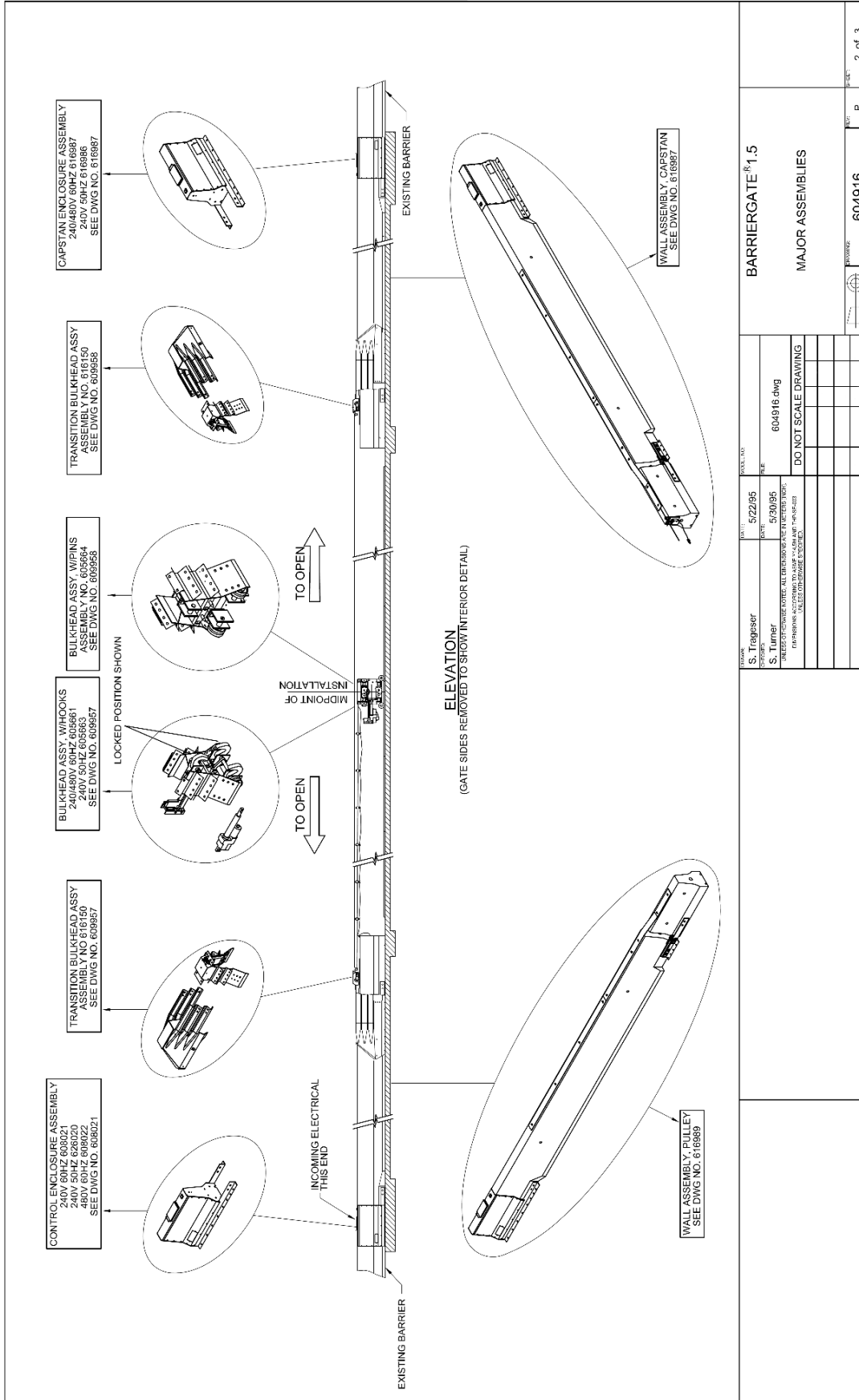
- IN COMPLIANCE WITH AASHTO 2011 MANUAL, THE USER RECOMMENDS REMOVAL OF ALL CURBS AND ISLANDS TO ENSURE PROPER IMPACT PERFORMANCE.
- SEE THE BARRIERGATE PRODUCT DESCRIPTION ASSEMBLY MANUAL FOR A DESCRIPTION OF ITS IMPACT PERFORMANCE CHARACTERISTICS AND DESIGN LIMITATIONS. SEE THE PACKAGING AND ADDITIONAL COPIES OF ABOVE MANUAL ARE AVAILABLE BY CALLING CUSTOMER SERVICE DEPARTMENT AT (888) 323-6374.
- CUSTOMER SHALL TRANSITION EXISTING BARRIER SHAPE TO CONFORM TO SHAPE OF BIG BARRIER SECTIONS. SEE "SECTION 1.1" OF THE BARRIERGATE MANUAL. ITEMS MARKED WITH "REF" ARE SHIPPED PREASSEMBLED FROM THE ELECTRICALLY GATE SHIPPED IN THE ELECTRICALLY LOCKED POSITION. SYSTEM WILL UNLOCK AUTOMATICALLY AFTER ENTERING THE ACCESS CODE AND PRESSING THE FIRST FUNCTION BUTTON. IF POWER IS NOT AVAILABLE, THE SYSTEM WILL LOCK. THEN MANUALLY CLOSE AND LOCK THE SYSTEM BEFORE EXPOSING THE SYSTEM TO TRAFFIC.
- POSITION SYSTEM SO THAT THIS SIDE IS TO THE WIDEST SHOULDER.

REFERENCES

SERIAL NO.	ELECTRICAL HOOKUP
SALES ORDER	CONCRETE PAD
EH PROJECT	ANCHOR ASSY,
DESIGN SPEED	WALL ASSY, PULLEY
NO. OF UNITS	TRACK ASSY,
	ELECTRICAL ASSY, 60 HZ
	ELECTRICAL ASSY, 50 HZ
	GATE ASSY, HOOK SECTION
	GATE ASSY, PIN SECTION

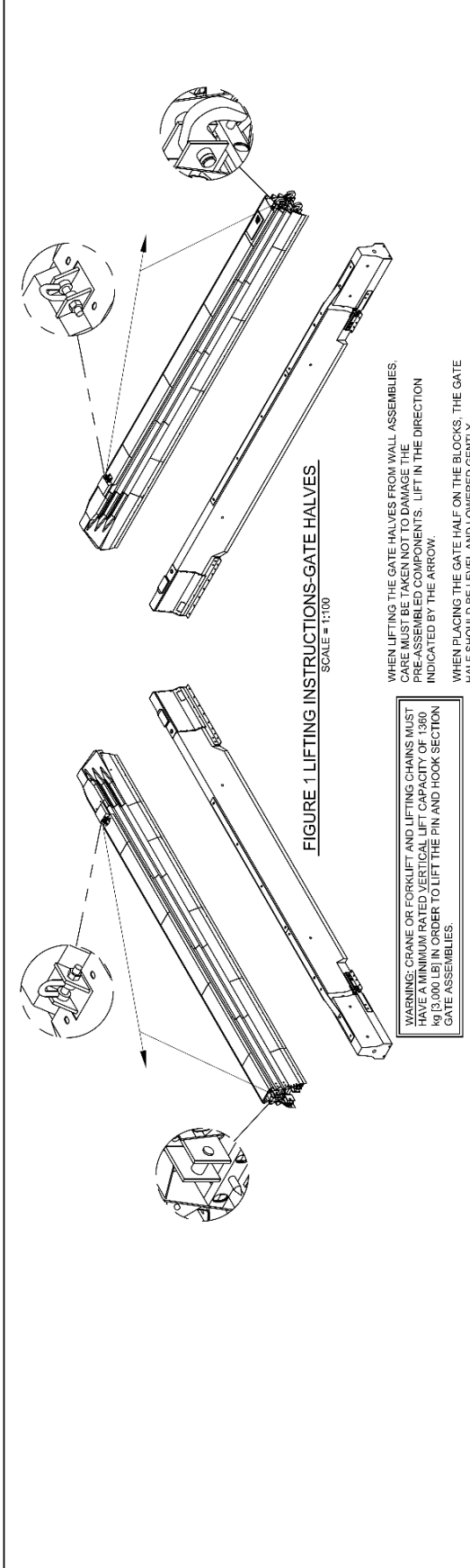
DRAWN: S. Lewis CHECKED: J. L. Duffner DATE: 3/1/04 FILE: 604916.dwg DO NOT SCALE DRAWING	DATE: 3/9/95 DATE: 3/1/04 FILE: 604916.dwg DO NOT SCALE DRAWING	BARRIERGATE® 1.5 MOTOR OPERATED
SCALE: 1" = 1'-0" (AS SHOWN) SCALE: 1" = 1'-0" (AS SHOWN)		PART NO. 604916 REV. 1 of 3

604916 2 of 3

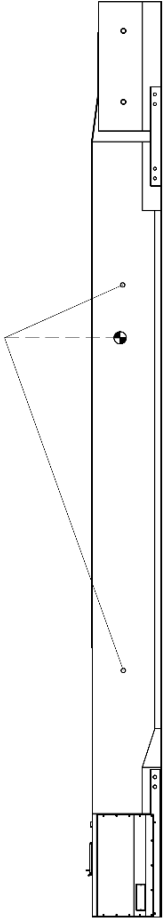


DRAWN: S. Trajeser DATE: 5/22/95 CHECKED: S. Turner DATE: 5/30/95 FILE NO: 604916.dwg DO NOT SCALE DRAWING UNLESS OTHERWISE NOTED, ALL DIMENSIONS ARE IN INCHES UNLESS OTHERWISE SPECIFIED.		BARRIERGATE® 1.5 MAJOR ASSEMBLIES	
PROJECT NO: 604916 SHEET NO: 2 of 3		PART NO: 604916 P	

BarrierGate® Major Assemblies



- THE FOLLOWING ITEMS MUST BE HANDLED PRIOR TO ASSEMBLING A BARRIERGATE:**
- 1. HAS TRAFFIC CONTROL BEEN ARRANGED? BE SURE TO ARRANGE FOR APPROPRIATE TRAFFIC CONTROL. APPROXIMATELY 7.3m [24 FT.] (OR 2 LANES WIDTH) ON ONE SIDE OF THE BARRIER & 3.7m [12 FT.] (OR 1 LANE WIDTH) ON THE OTHER SIDE IS RECOMMENDED WHEN USING A STANDARD CRANE FOR UNLOADING AND ASSEMBLING THE BARRIERGATE.
 - 2. HAVE YOU REVIEWED THE MANUAL? DO NOT ATTEMPT TO INSTALL THE BARRIERGATE WITHOUT THE BARRIERGATE PRODUCT MANUAL. TAKE TIME TO REVIEW THE MANUAL THOROUGHLY BEFORE PERFORMING THE NECESSARY WORK.
 - 3. DO YOU HAVE ALL OF THE NECESSARY TOOLS & EQUIPMENT? THE TOOLS & EQUIPMENT REQUIRED FOR INSTALLING THE BARRIERGATE ARE LISTED IN THE MANUAL.
 - 4. HAS THE PAD REACHED ADEQUATE CURE? THE PAD MUST BE POURED AT LEAST SEVEN DAYS PRIOR TO THE SYSTEM INSTALLATION TO ACHIEVE ADEQUATE CURE.
 - 5. DOES THE PAD MEET THE DIMENSIONS & REQUIREMENTS SHOWN ON DRAWING 628232?
 - 6. HAS THE ELECTRICAL POWER BEEN INSTALLED ACCORDING TO DRAWING 628231?
 - 7. IF POWER IS NOT YET AVAILABLE AT THE SITE, HAVE ARRANGEMENTS BEEN MADE TO SUPPLY A PORTABLE GENERATOR?

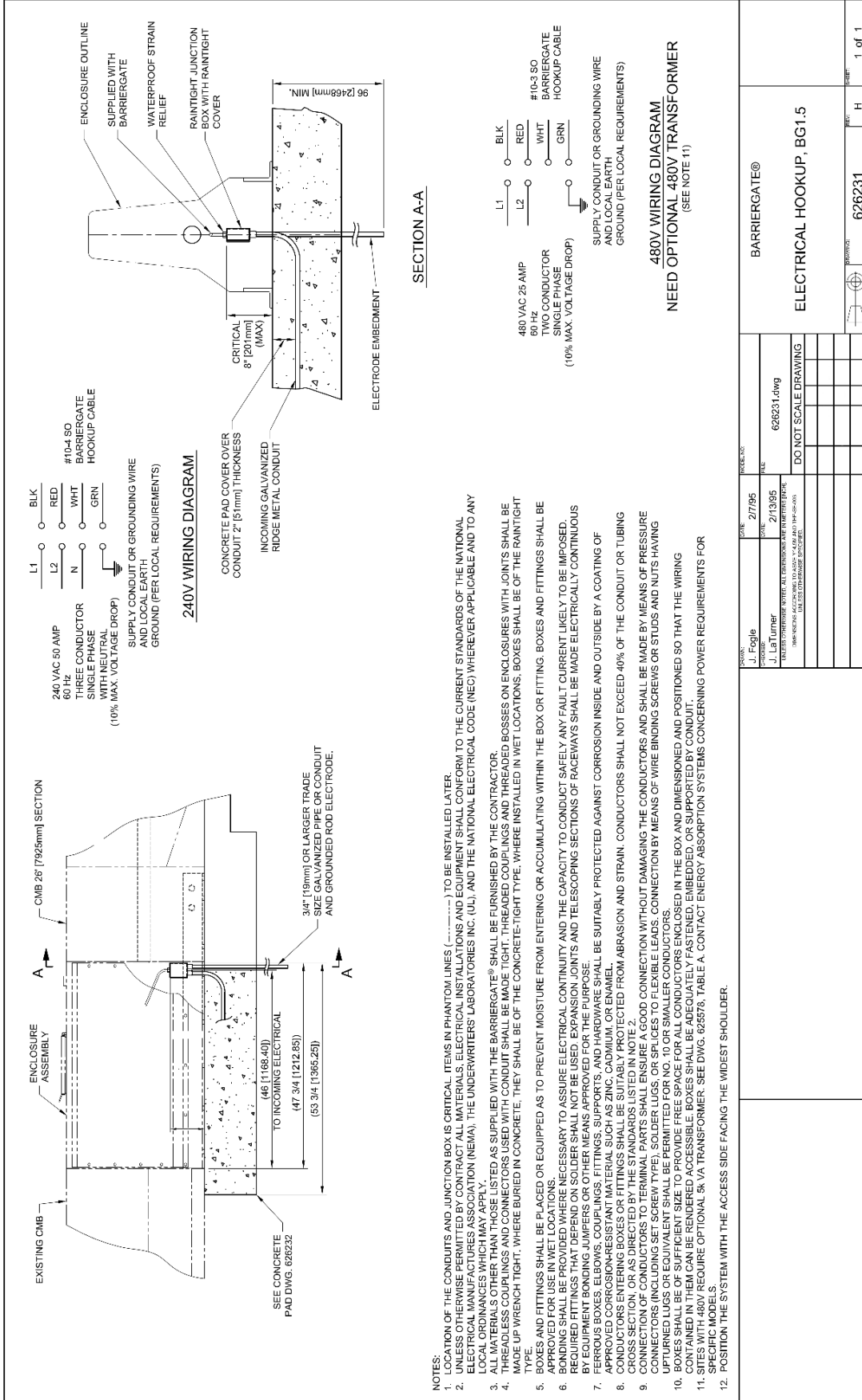


- FIGURE 2 LIFTING INSTRUCTIONS-CMBS**
SCALE = 1:50
1. PLACE CHAIN THROUGH LIFTING POINT, OR PLACE SHACKLE THROUGH LIFTING POINT.
 2. ADJUST RIGGING SUCH THAT THE WALL ASSEMBLY IS BEING LIFTED DIRECTLY ABOVE THE CENTER OF GRAVITY TARGET LOCATED ON THE WALL ASSEMBLY.

WARNING: CRANE OR FORKLIFT AND LIFTING SLINGS MUST HAVE A MINIMUM RATED VERTICAL LIFT CAPACITY OF 9000 kg (20000 LB) TO LIFT EACH WALL ASSEMBLY. LIFT BARRIER BY PLACING CHAIN THROUGH LIFTING HOLES IN THE BARRIER.

DRAWN BY: 4/29/96		BARRIERGATE® 1.5
DESIGNER: D. Sibus	DATE: 4/29/96	
CHECKED BY: 4/10/96		CHECKLIST
APPROVED BY: [Signature]		
PROJECT: 604916.dwg		DRAWING: 604916
DESCRIPTION: BARRIERGATE 1.5 WALL ASSEMBLY PARTS LIST		
DO NOT SCALE DRAWING		SHEET: 3 of 3
UNLESS OTHERWISE SPECIFIED, ALL DIMENSIONS ARE IN MILLIMETERS (INCHES)		

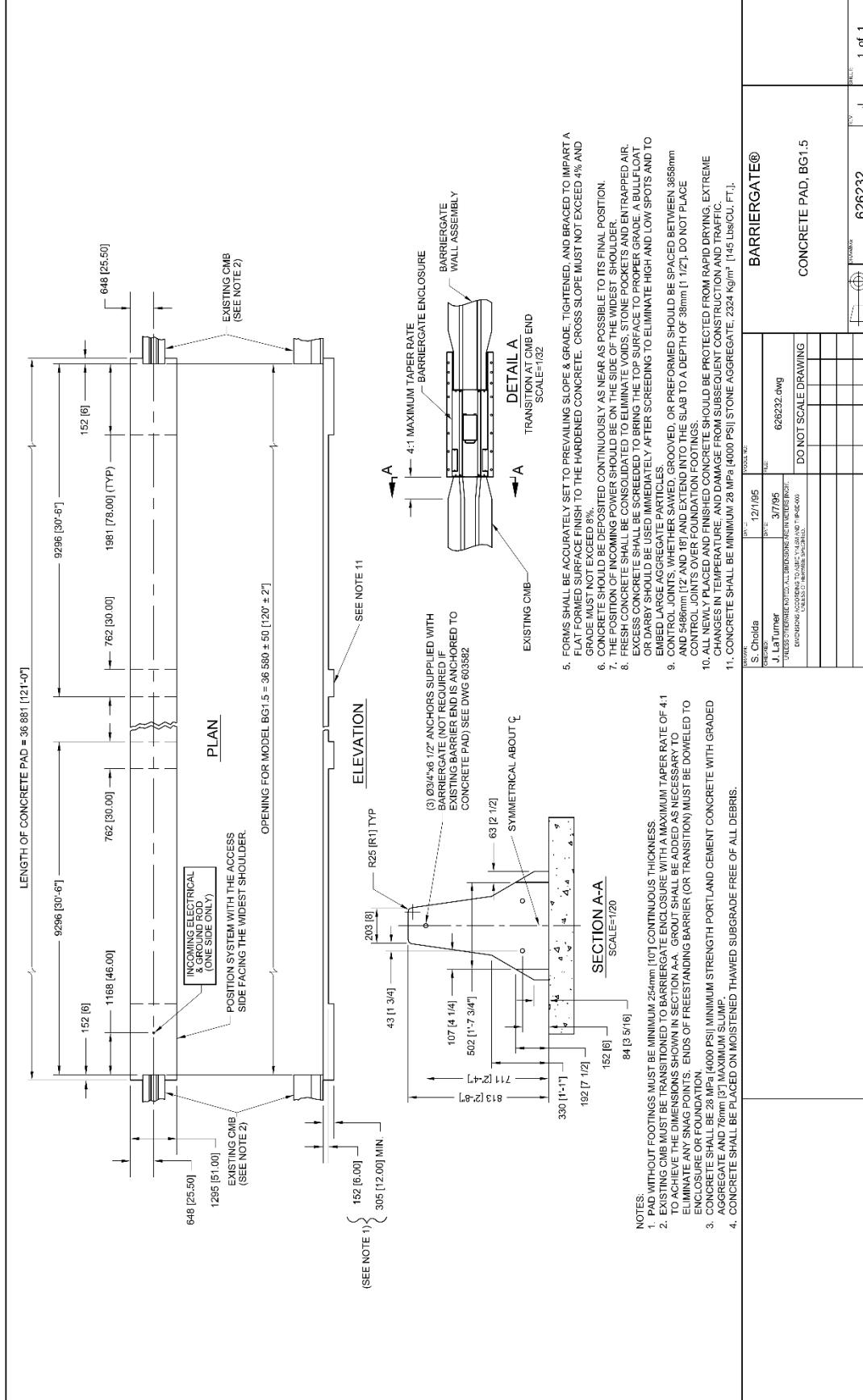
626231



Electrical Hookup, BG 1.5

BARRIERGATE® ELECTRICAL HOOKUP, BG1.5	PROJECT NO. 626231.dwg DO NOT SCALE DRAWING	DATE 2/7/85 DESIGNED BY J. LaTurner DRAWN BY J. LaTurner CHECKED BY J. LaTurner SCALE AS SHOWN (SEE OTHER SHEETS)	SHEET NO. 1 of 1
	PART NO. 626231	H	1 of 1

626232

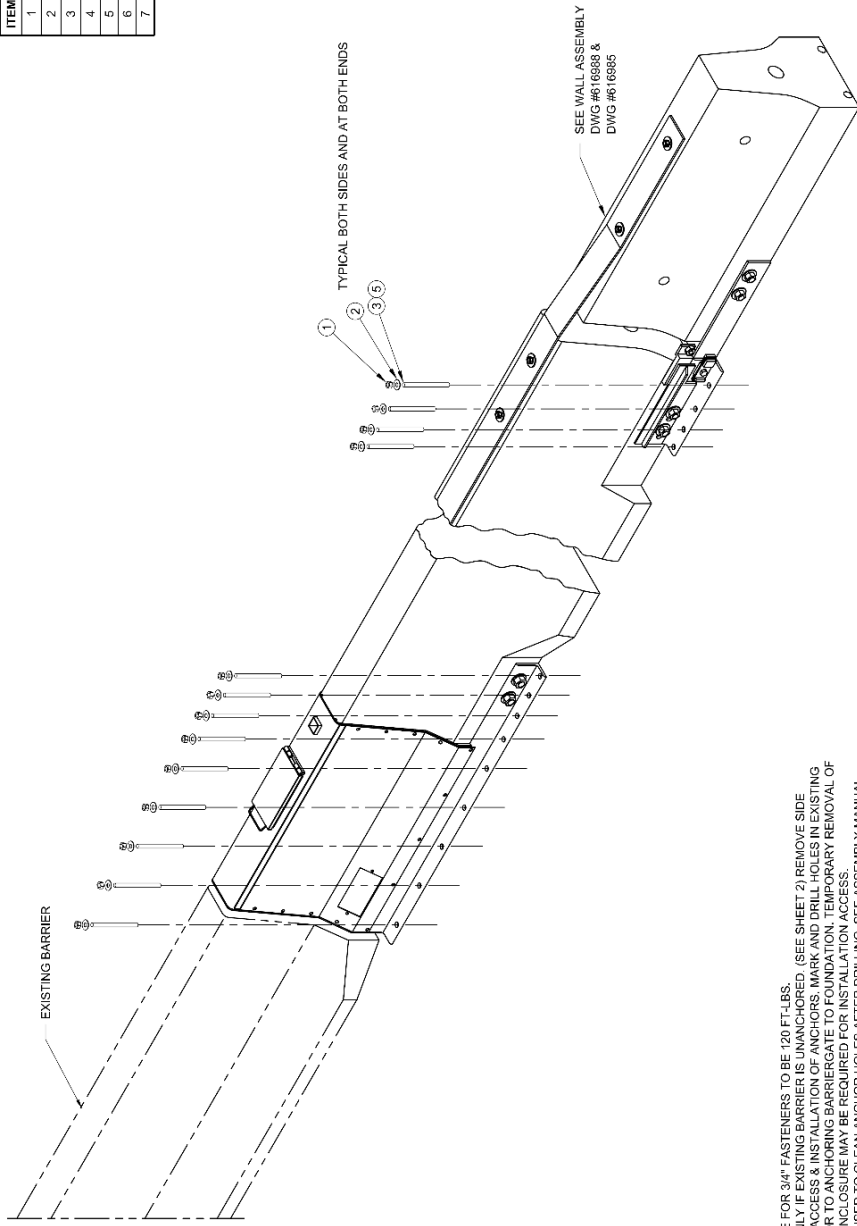


Concrete Pad, BG 1.5

PROJECT NO: 121/195 DATE: 3/7/95 DRAWN BY: J. LaTurner CHECKED BY: S. Cholda SCALE: AS SHOWN PROJECT: 626232.dwg DO NOT SCALE DRAWING		SHEET NO: 626232 OF: 1 of 1	
TITLE: BARRIERGATE® DESCRIPTION: CONCRETE PAD, BG1.5		REVISIONS:	
NO.	DESCRIPTION	DATE	BY
1	ISSUED FOR CONSTRUCTION	3/7/95	JL
2	REVISED TO REFLECT FIELD CHANGES	3/7/95	JL
3	REVISED TO REFLECT FIELD CHANGES	3/7/95	JL
4	REVISED TO REFLECT FIELD CHANGES	3/7/95	JL
5	REVISED TO REFLECT FIELD CHANGES	3/7/95	JL
6	REVISED TO REFLECT FIELD CHANGES	3/7/95	JL
7	REVISED TO REFLECT FIELD CHANGES	3/7/95	JL
8	REVISED TO REFLECT FIELD CHANGES	3/7/95	JL
9	REVISED TO REFLECT FIELD CHANGES	3/7/95	JL
10	REVISED TO REFLECT FIELD CHANGES	3/7/95	JL
11	REVISED TO REFLECT FIELD CHANGES	3/7/95	JL

603582 1 of 2

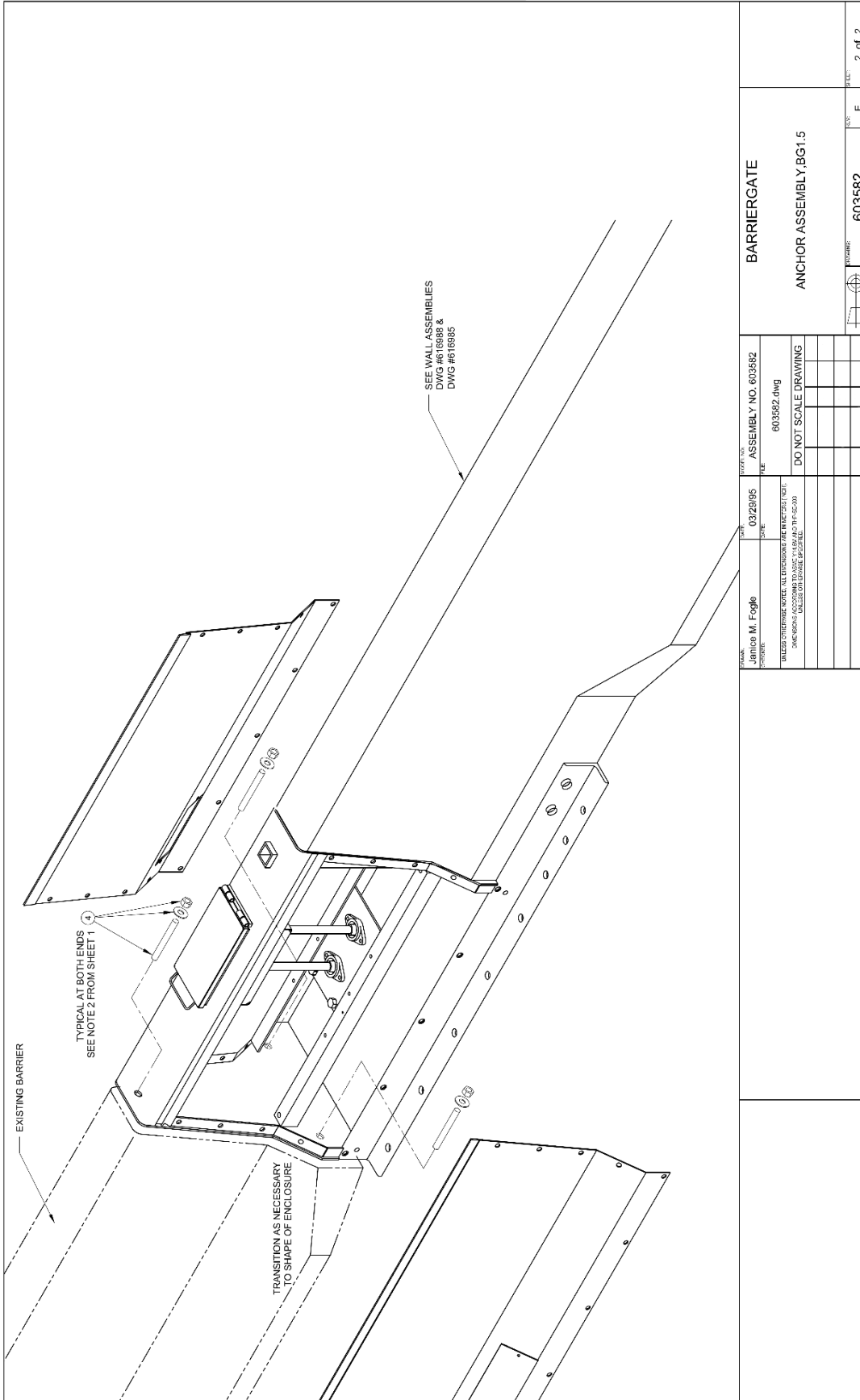
PARTS LIST			
ITEM	STOCK NO.	DESCRIPTION	QTY
1	003704	NUT, HK, 3/4" G	52
2	118027	WASHER, FLAT, 3/4X2, HVY, G	52
3	118796	ROD, THREADED, 3/4X10, G5, G	52
4	619315	ANCH, KIT, HIL, 3/4X6 1/2(6)	1
5	118710	ADHESIVE, HY200, 300, HIL, I	14
6	118711	DISPENSER, HDM 500, HIL, I	1
7	113787	HIT-RB 7/8" KIT	1



- NOTES:
1. FINAL TORQUE FOR 3/4" FASTENERS TO BE 120 FT.-LBS.
 2. USE ITEM 4 ONLY IF EXISTING BARRIER IS UNANCHORED. (SEE SHEET 2) REMOVE SIDE COVERS FOR ACCESS & INSTALLATION OF ANCHORS. MARK AND DRILL HOLES IN EXISTING BARRIER PRIOR TO ANCHORING BARRIERGATE TO FOUNDATION. TEMPORARY REMOVAL OF ELECTRIC BARRIERGATE MAY BE REQUIRED FOR INSTALLATION. FOR INFORMATION SEE ASSEMBLY MANUAL.
 3. ITEM 7 TO BE USED TO CLEAN ANCHOR HOLES AFTER DRILLING. SEE ASSEMBLY MANUAL.

DESIGNER: Janice M. Fogle		DATE: 3/29/95	PROJECT: 603582
CHECKER: J.F. LaTurner		DATE: 3/30/95	ASSY. NO. 603582
TITLE: ANCHOR ASSEMBLY, BG 1.5		FILE: 603582.dwg	
DESCRIPTION: ANCHOR ASSEMBLY, BG 1.5		DO NOT SCALE DRAWING	
REVISIONS:			
REV	DATE	DESCRIPTION	
E		603582	
SHEET 1 of 2			PROJECT: 603582

Anchor Assembly, BG 1.5

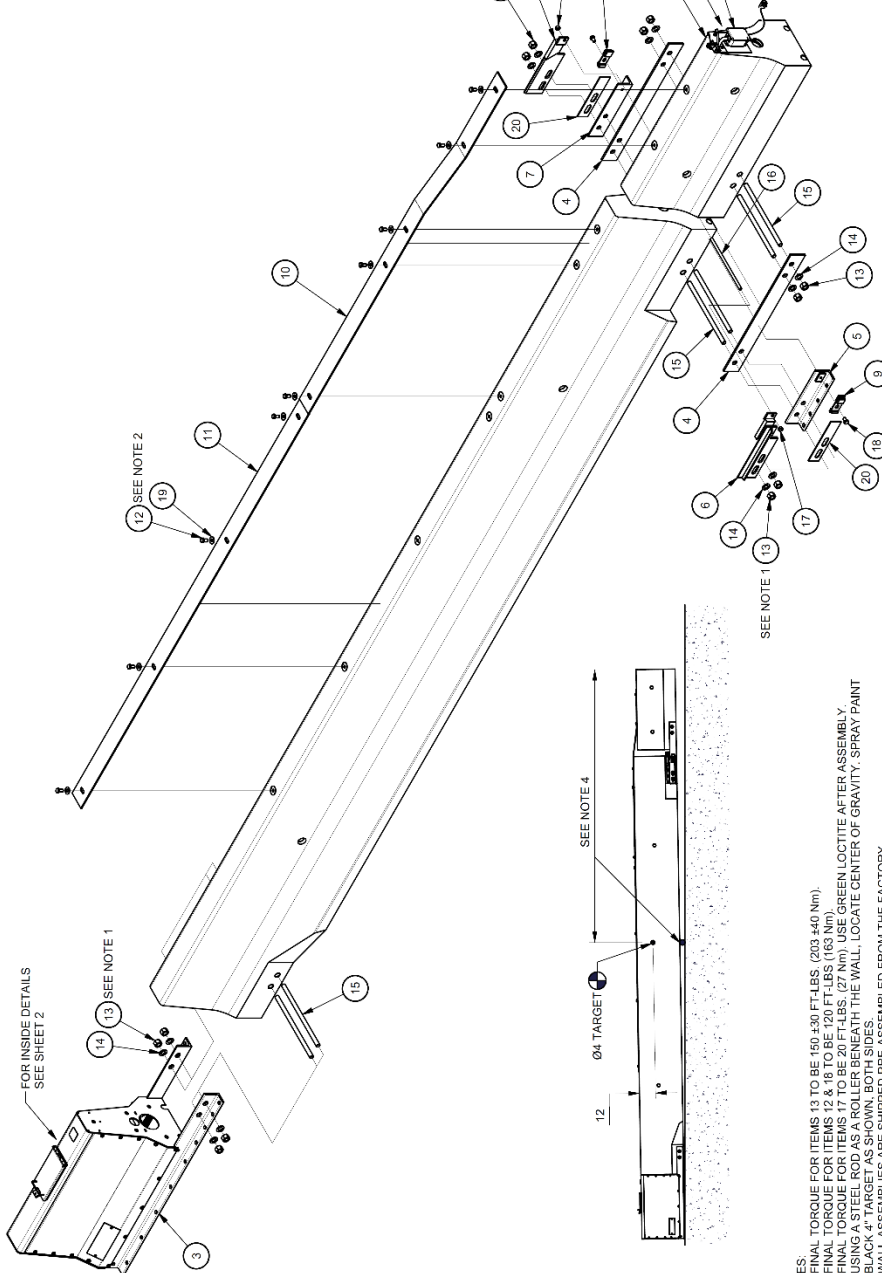


DESIGNED BY Janice M. Fogle	DATE 03/29/95	ASSEMBLY NO. 603582	FILE 603582.dwg	PROJECT BARRIERGATE	SHEET NO. 2 of 2												
						DRAWING TITLE ANCHOR ASSEMBLY, BG1.5											
						NOTES DO NOT SCALE DRAWING											
REVISIONS <table border="1"><thead><tr><th>NO.</th><th>DATE</th><th>DESCRIPTION</th></tr></thead><tbody><tr><td> </td><td> </td><td> </td></tr><tr><td> </td><td> </td><td> </td></tr><tr><td> </td><td> </td><td> </td></tr></tbody></table>						NO.	DATE	DESCRIPTION									
NO.	DATE	DESCRIPTION															
SCALE E																	

616989 1 of 2

PARTS LIST			
ITEM	STOCK NO.	DESCRIPTION	QTY.
1	606335	CMB,26 FT SECTION,BG1.5	1
2	606336	CMB,5 FT SECTION,BG1.5	1
3	*	ENCLOSURE ASSY,CONTROL,BG1.5	1
4	614596	SPLICE,1/2X3/4X6,WHOLE,S,G	2
5	605407	BRACKET,BARRIER,L,BG1.5,G	1
6	603611	ANCHOR PLATE,L,BG1.5,G	1
7	605408	BRACKET,BARRIER,R,BG1.5,G	1
8	603612	ANCHOR PLATE,R,BG1.5,G	1
9	603542	ADJUSTER,TRANSITION,BG1.5,G	2
10	613555	RAMP,GUIDE RAIL,BG1.5,G	2
11	610021	GUIDE RAIL,BARRIER,TOP,BG,G	1
12	113547	BOLT,HX,3/4X1 1/2,G,5,G	12
13	118928	NUT,HX,1 1/8,GR,DH,G	12
14	118903	WASHER,FLAT,1 1/8X2 1/4,I,G	12
15	116775	ROD,THREADED,1 1/8X24,G5,G	6
16	116801	ROD,THREADED,3/4X20,G2,G	1
17	003704	3/4" HWY HEX NUT,A563,DH	2
18	113548	BOLT,HX,3/4X1 1/4,G,5,G	2
19	118027	WASHER,FLAT,3/4X2,HVY,G	12
20	614495	SPACER,1/4X3 1/2X15 1/2,G	2
21	611038	JUNCTION BOX ASSY,CMB,BG1	1

* 608021 FOR 240V ELECTRICAL OPERATION - BG1.5E
 * 608022 FOR 480V ELECTRICAL OPERATION - BG1.5E
 * 626020 FOR 50Hz ELECTRICAL OPERATION - BG1.5E



SEE ELECTRICAL DWGS
 625578 611038 (60Hz)
 618845 611042 (50Hz)

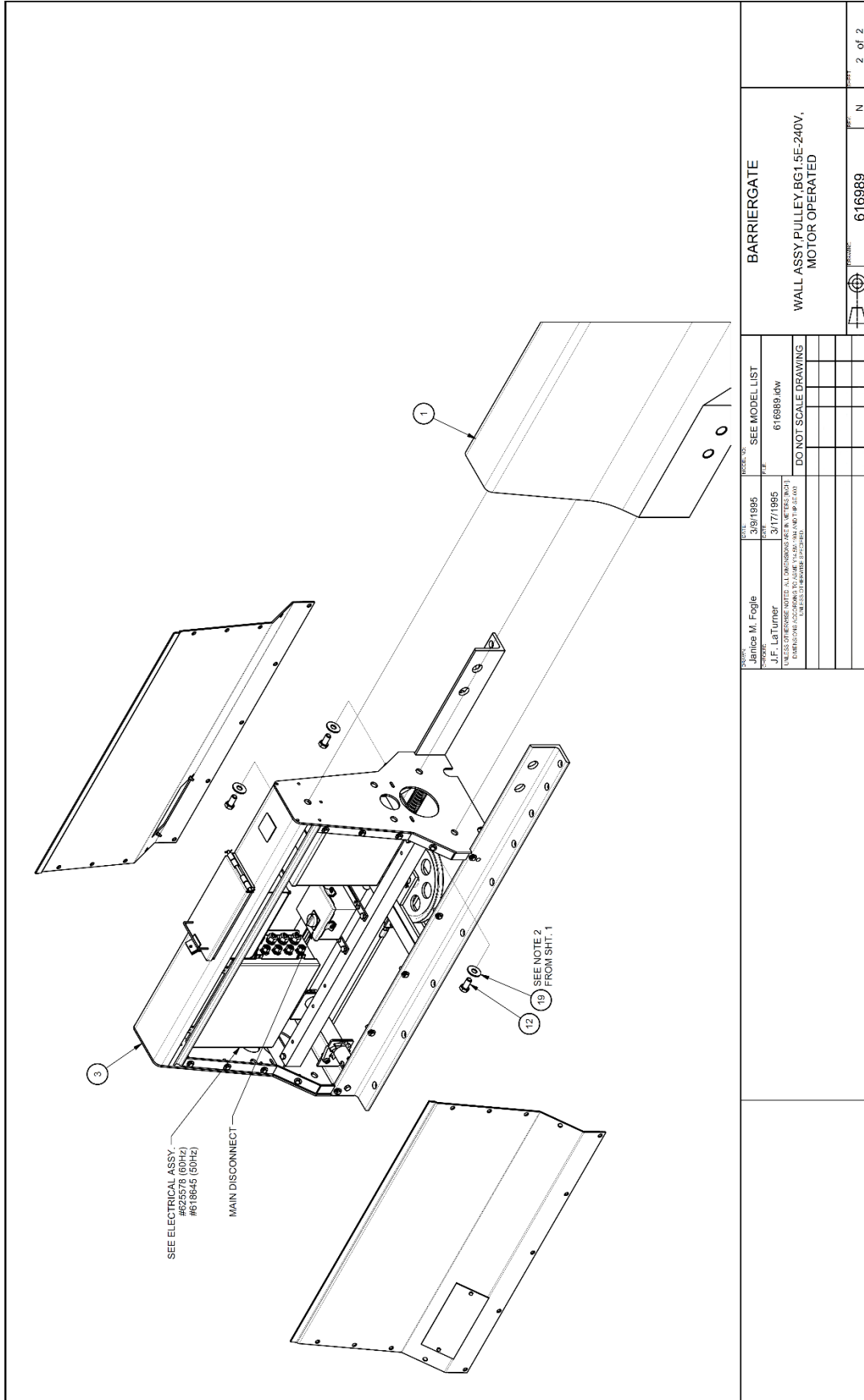
ELECTRICAL ASSEMBLY		DATE	BY
SERIAL NO.	625578 (60Hz) 618845 (50Hz)	3/9/1995	Janice M. Foglie
SALES ORDER	611038 (60Hz) 611042 (50Hz)	3/17/1995	FILE L3 Turner
EH PROJECT	UNLESS OTHERWISE NOTED, ALL DIMENSIONS ARE IN INCHES AND DECIMALS THEREOF. DIMENSIONS ARE ACCORDING TO ASME Y14.5M-1994 AND Y14.5-2013 UNLESS OTHERWISE SPECIFIED.		
DESIGN SPEED	DO NOT SCALE DRAWING		
NOSE TYPE			
NO. OF UNITS			

SEE MODEL LIST	
FORM NO.	616989.dwg
BARRIERGATE	
WALL ASSY,PULLEY,BG1.5E-240V, MOTOR OPERATED	
REV	DATE
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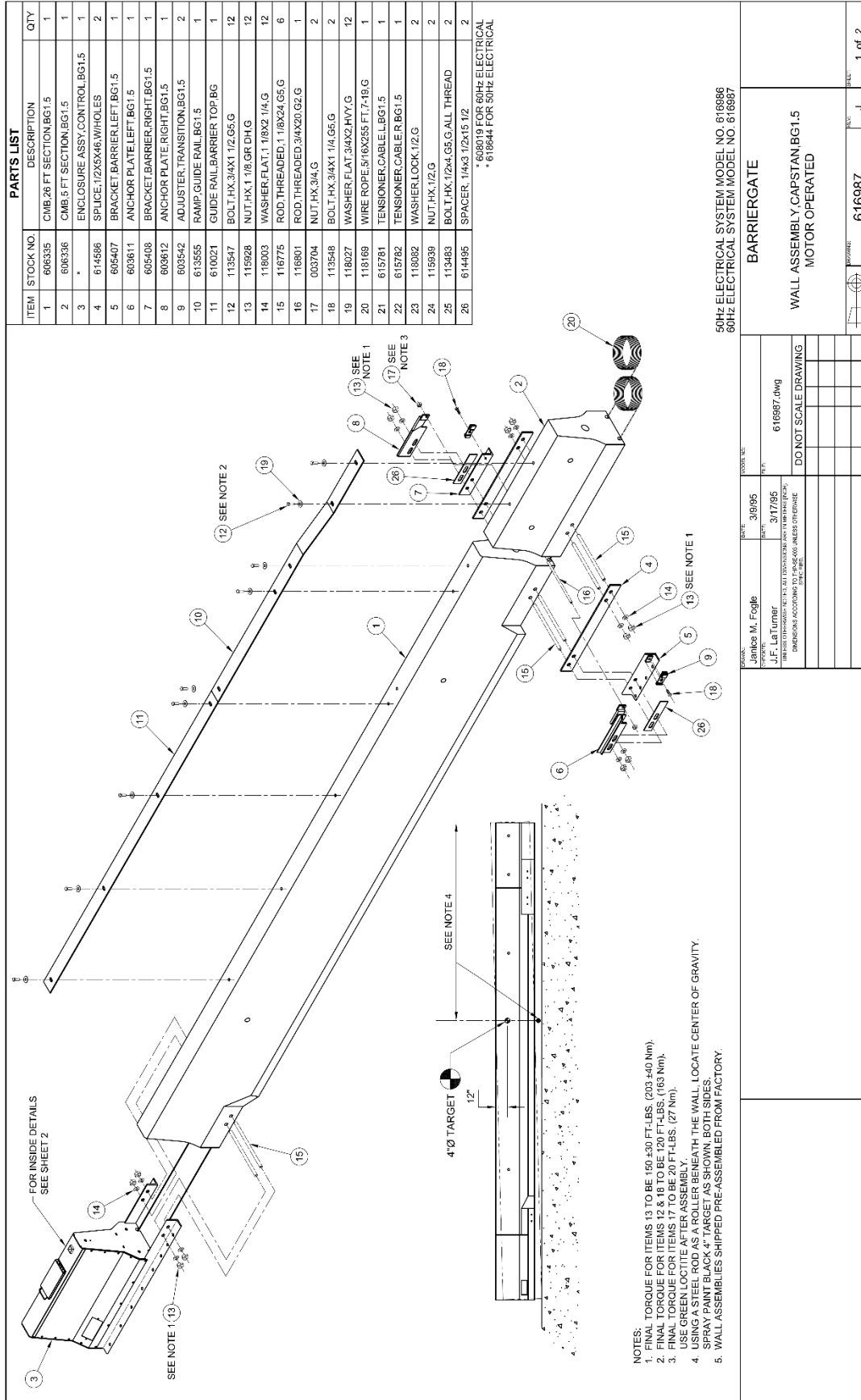
REFERENCES	
SERIAL NO.	
SALES ORDER	
EH PROJECT	
DESIGN SPEED	
NOSE TYPE	
NO. OF UNITS	

1 of 2

Wall Assembly, Pulley, BG 1.5E 240V, Motor Operated

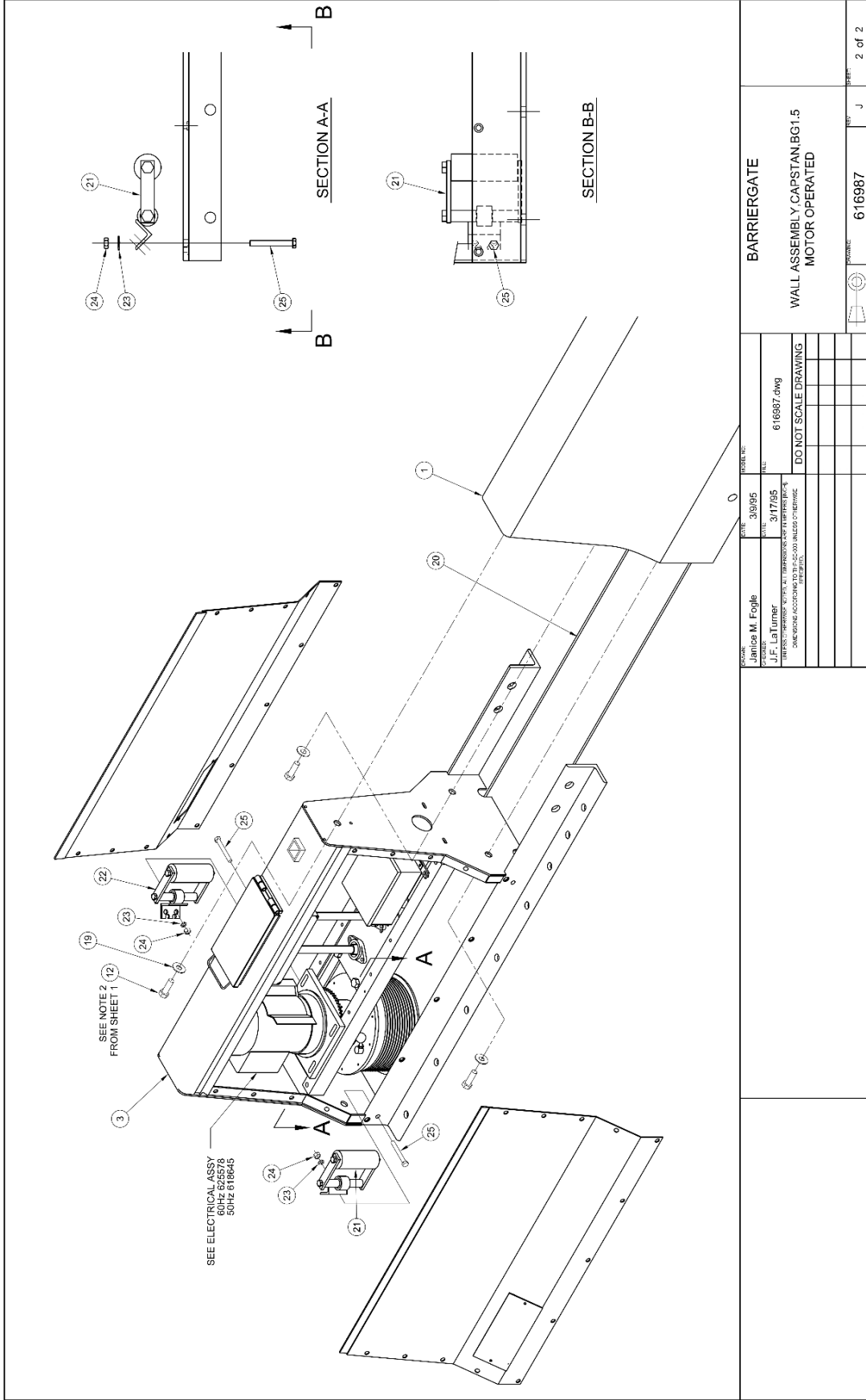


DESIGN: Janice M. Fogle CHECKED: J.F. LaTurner DATE: 3/9/1995 DATE: 3/17/1995 ALL DIMENSIONS TO FACE UNLESS OTHERWISE SPECIFIED. DIMENSIONS IN PARENTHESES INDICATED.		MODEL NO: SEE MODEL LIST P/N: 616989.i0w DO NOT SCALE DRAWING	PART: BARRIERGATE WALL ASSY,PULLEY,BG1.5E-240V, MOTOR OPERATED	QUANTITY: 2 of 2 UNIT: N PART NO: 616989
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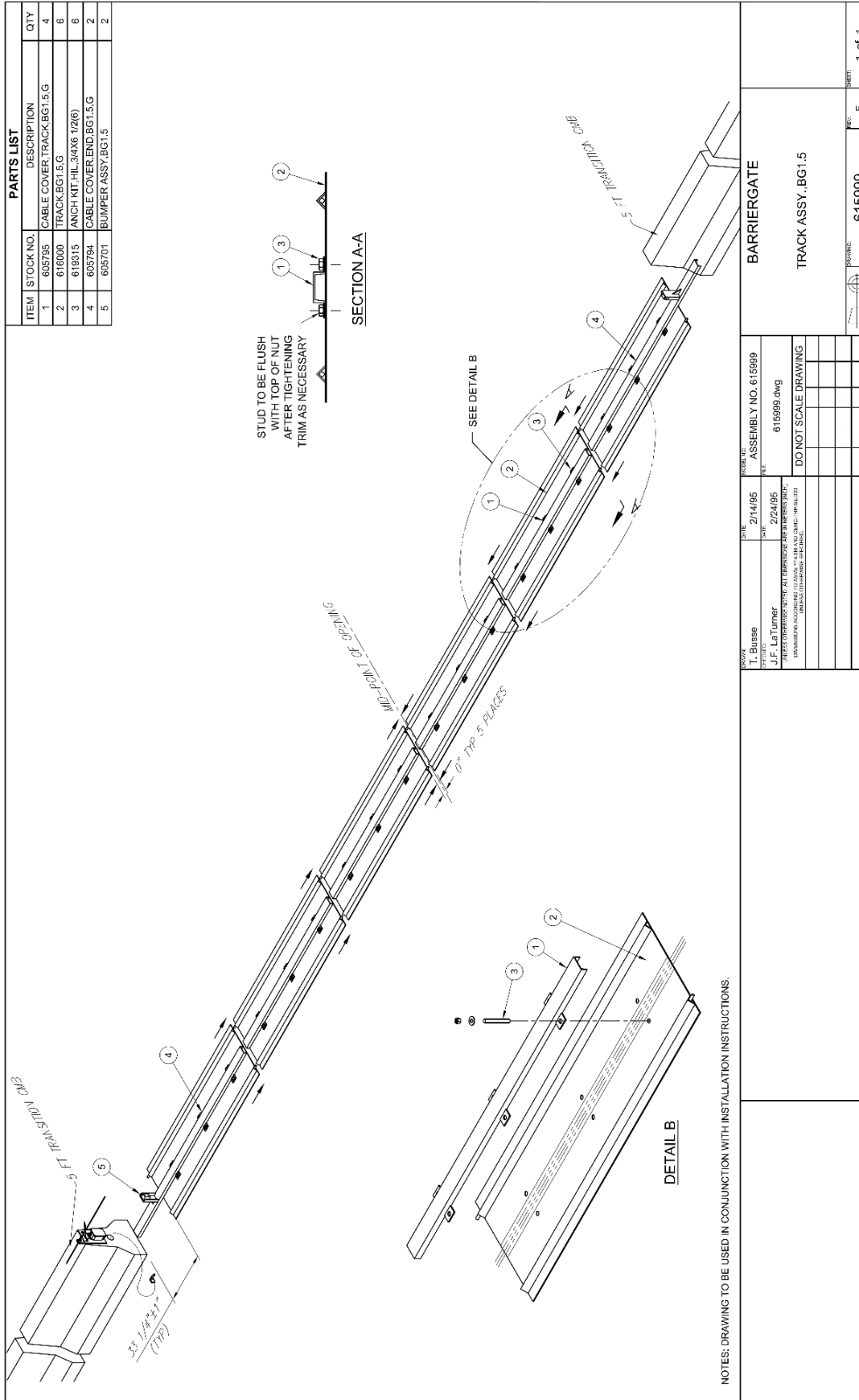
Wall Assembly, Capstan, BG 1.5

616987 2 of 2



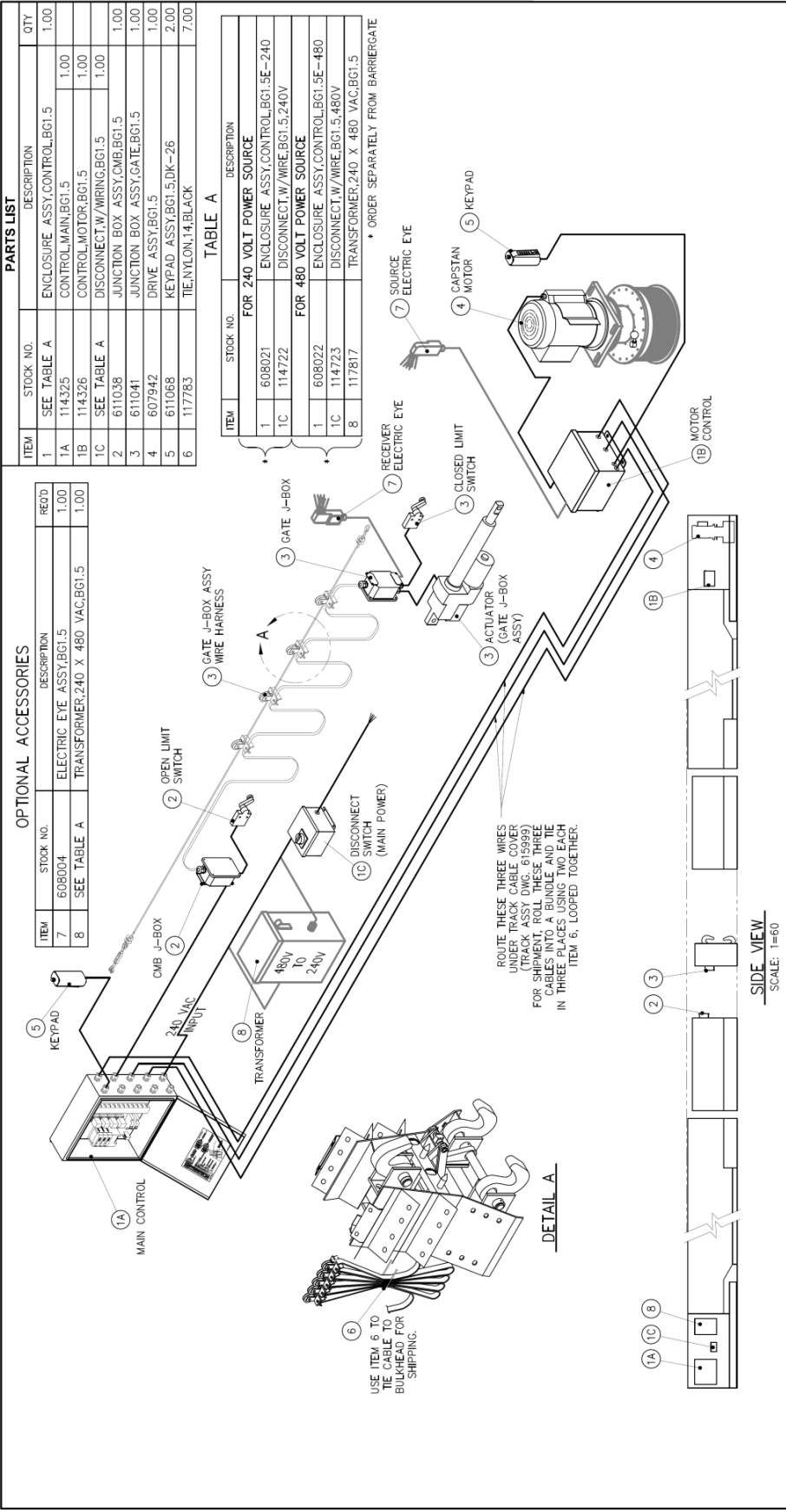
BARRIERGATE WALL ASSEMBLY, CAPSTAN, BG1.5 MOTOR OPERATED			616987	J	2 of 2
DESIGNER Janiise M. Foglie	DATE 3/9/95	MODEL NO. 616987	FILE 616987.dwg		
CHECKED L. Turner	DATE 3/17/95	DO NOT SCALE DRAWING			
DIMENSIONS ARE TO UNLESS OTHERWISE SPECIFIED. DIMENSIONS ACCORDING TO JEDEC-001 UNLESS OTHERWISE SPECIFIED.					
DIMENSIONS ACCORDING TO JEDEC-001 UNLESS OTHERWISE SPECIFIED.					
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DIMENSIONS ACCORDING TO JEDEC-001 UNLESS OTHERWISE SPECIFIED.					

615999



Track Assembly, BG 1.5

625578 1 of 5



PARTS LIST

ITEM	STOCK NO.	DESCRIPTION	QTY.
1	SEE TABLE A	ENCLOSURE ASSY, CONTROL, BG1.5	1.00
1A	114325	CONTROL, MAIN, BG1.5	1.00
1B	114326	CONTROL, MOTOR, BG1.5	1.00
2	SEE TABLE A	DISCONNECT W/ WIRING, BG1.5	1.00
3	611038	JUNCTION BOX ASSY, CMB, BG1.5	1.00
4	611041	JUNCTION BOX ASSY, GATE, BG1.5	1.00
5	607942	DRIVE ASSY, BG1.5	1.00
6	611068	KEYPAD ASSY, BG1.5, DK-26	2.00
7	117783	TIE, NYLON, 14, BLACK	7.00

TABLE A

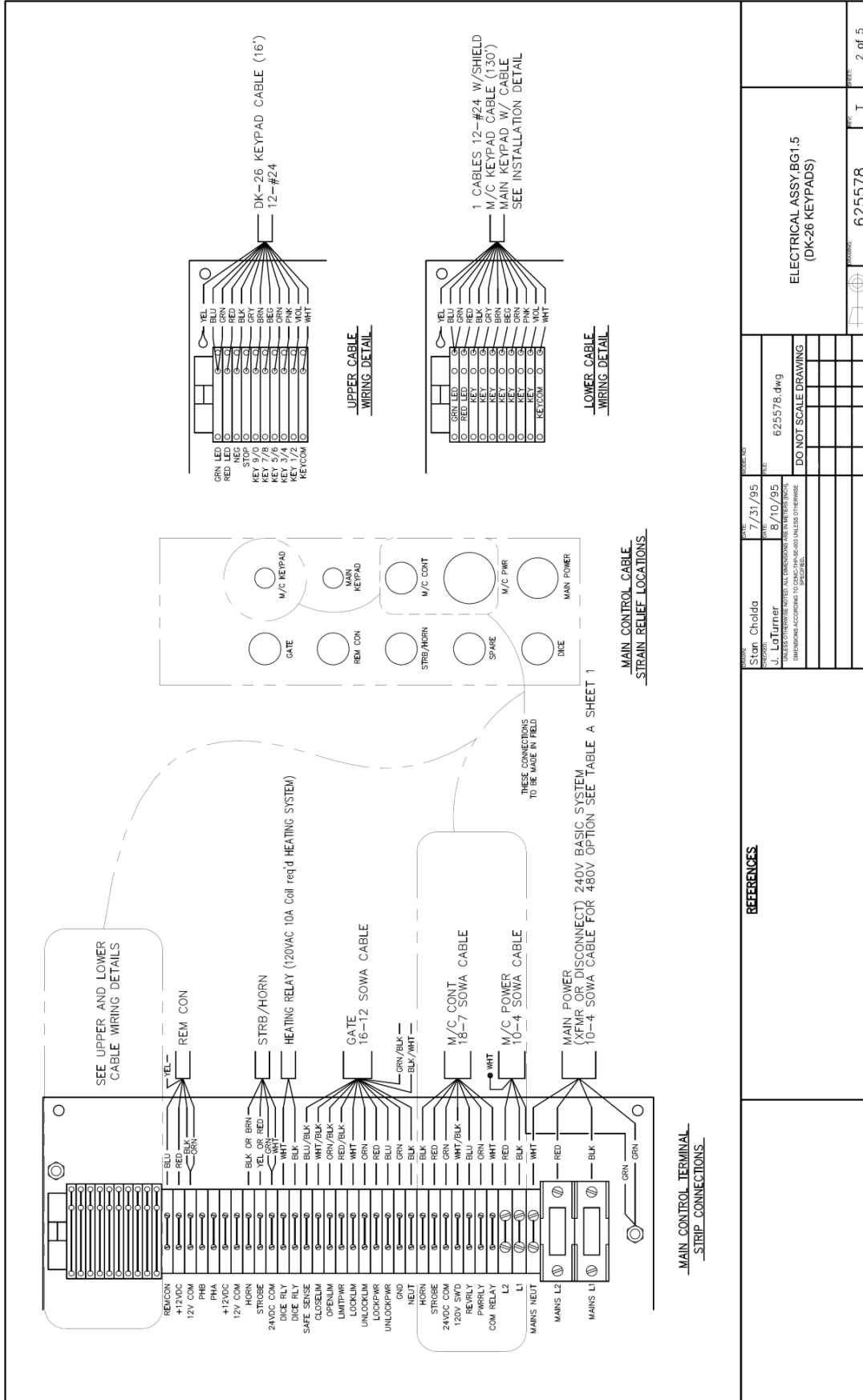
ITEM	STOCK NO.	DESCRIPTION
FOR 240 VOLT POWER SOURCE		
1	608021	ENCLOSURE ASSY, CONTROL, BG1.5E-240
1C	114722	DISCONNECT W/ WIRE, BG1.5, 240V
FOR 480 VOLT POWER SOURCE		
1	608022	ENCLOSURE ASSY, CONTROL, BG1.5E-480
1C	114723	DISCONNECT W/ WIRE, BG1.5, 480V
8	117817	TRANSFORMER, 240 X 480 VAC, BG1.5

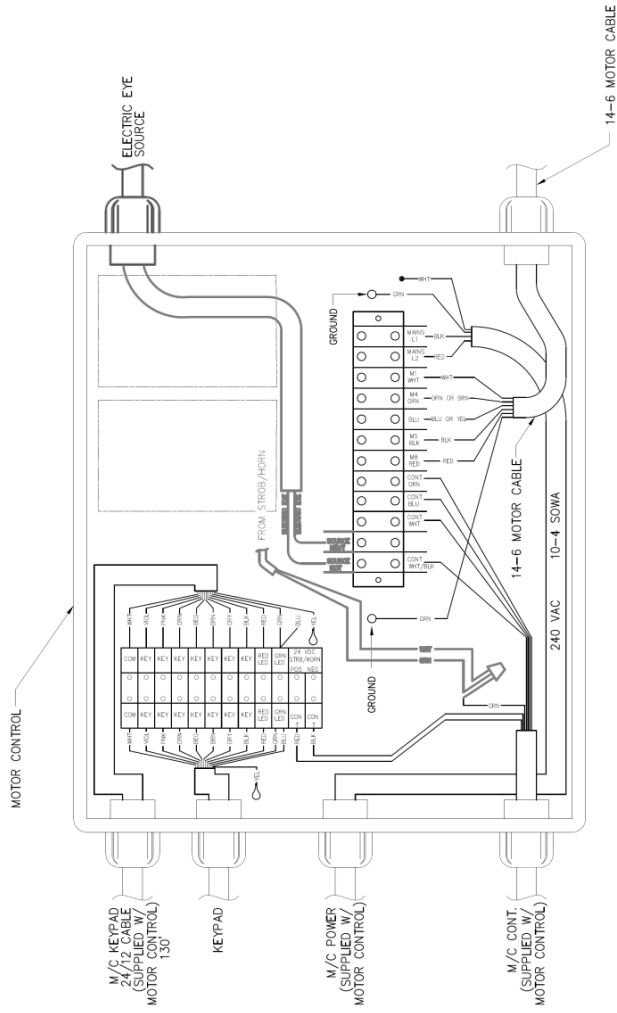
* ORDER SEPARATELY FROM BARRIERGATE

REFERENCES		SHOP ONLY	
SERIAL NO.	114321	DATE	3/10/95
SALES ORDER		BY	3/10/95
EH PROJECT	611038	FILE	625578.dwg
DESIGN SPEED	611041	DO NOT SCALE DRAWING	
NOSE TYPE	607942		
NO. OF UNITS	611068		

DESIGNER	Janice M. Fogle	DATE	3/10/95
CHECKED	J. Lotzner	DATE	3/10/95
DIMENSIONS ACCORDING TO DIM-TIP-48-00 UNLESS OTHERWISE SPECIFIED.			
REV		DESCRIPTION	
1		ELECTRICAL ASSY, BG1.5 (DK-26 KEYPADS)	
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Electrical Assembly, BG 1.5 (DK-26 Keypads)



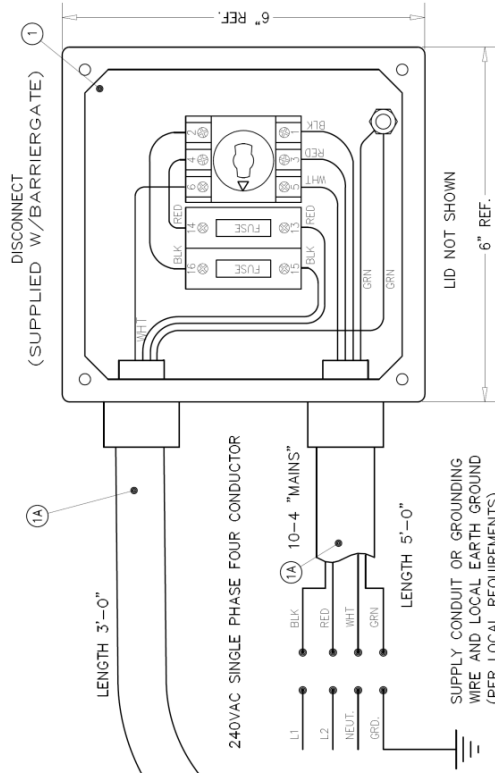


MOTOR CONTROL TERMINAL STRIP LOCATIONS AND SCHEMATIC (ITEM 1B)

REFERENCES		DATE: 8/8/95 DRAWN BY: Stan Cholda CHECKED BY: [Blank] FILE: 625578.dwg DO NOT SCALE DRAWING	SHEET: 3 of 5 OF: 5
DIMENSIONS ARE IN INCHES UNLESS OTHERWISE SPECIFIED. DIMENSIONS ACCORDING TO DIM-31H-82-001 UNLESS OTHERWISE SPECIFIED.		PART NO: 625578 REV: T	TITLE: ELECTRICAL ASSY.BG1.5 (DK-26 KEYPADS)

625578 4 of 5

PARTS LIST			
ITEM	STOCK NO.	DESCRIPTION	QTY
1	114722	DISCONNECT, W/ WIRE, BG, 1.5, 240V	1.00
1A		WIRE, 10-4 SOWA	8.00

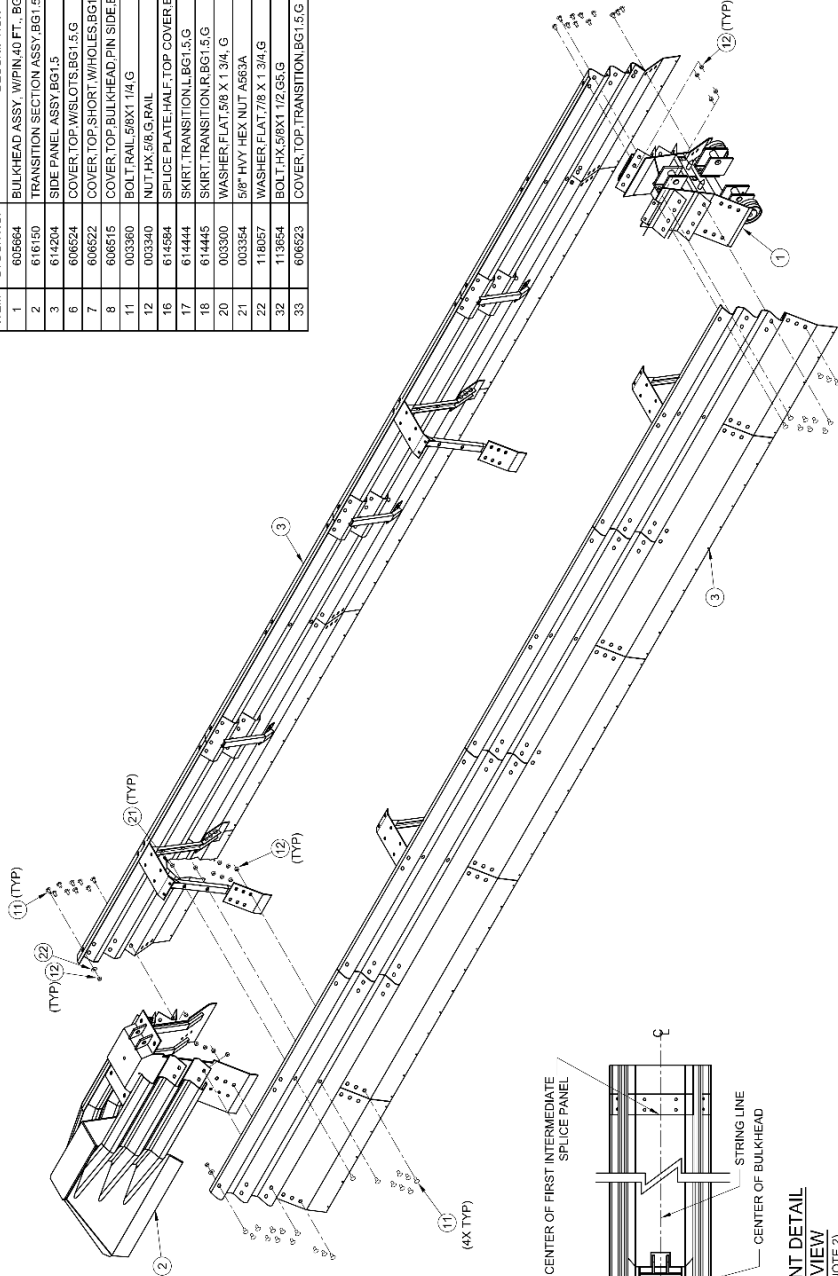


MAIN CONTROL TERMINAL STRIP CONNECTIONS

DISCONNECT & MAIN POWER CONNECTIONS (ITEM 1C-240VAC)

REFERENCES		DATE	BY	FILE
DESIGNED BY	J. Espinoza	8/20/97		
DRAWN BY	J. Espinoza	8/20/97		
CHECKED BY				
DATE				
FILE				
625578.dwg				
DO NOT SCALE DRAWING				
DIMENSIONS ACCORDING TO LEGEND UNLESS OTHERWISE SPECIFIED.				
ELECTRICAL ASSY. BG 1.5 (DK-26 KEYPADS)				
PART NO. 625578				REV. T
SHEET 4 of 5				

ITEM	STOCK NO.	DESCRIPTION	REQ'D
1	606864	BULKHEAD ASSY, W/PIN, 40 FT., BG1.5	1
2	616150	TRANSITION SECTION ASSY, BG1.5	1
3	614204	SIDE PANEL ASSY, BG1.5	2
6	606524	COVER, TOP, W/SLOTS, BG1.5, G	3
7	606522	COVER, TOP, SHORT, WHOLES, BG1.5, G	1
8	606515	COVER, TOP, BULKHEAD, PIN SIDE, BG1.5, G	1
11	003360	BOLT, TRAIL, 5/8X1 1/4, G	80
12	003340	NUT, HX, 5/8, G, RAIL	72
16	614584	SPLICE PLATE, HALF, TOP, COVER, BG, G	1
17	614444	SKIRT, TRANSITION, L, BG1.5, G	1
18	614445	SKIRT, TRANSITION, R, BG1.5, G	1
20	003300	WASHER, FLAT, 5/8 X 1 3/4, G	62
21	003354	5/8" HXY HEX NUT, A663A	8
22	118057	WASHER, FLAT, 7/8 X 1 3/4, G	2
32	113654	BOLT, HX, 5/8X1 1/2, G5, G	62
33	606523	COVER, TOP, TRANSITION, BG1.5, G	1

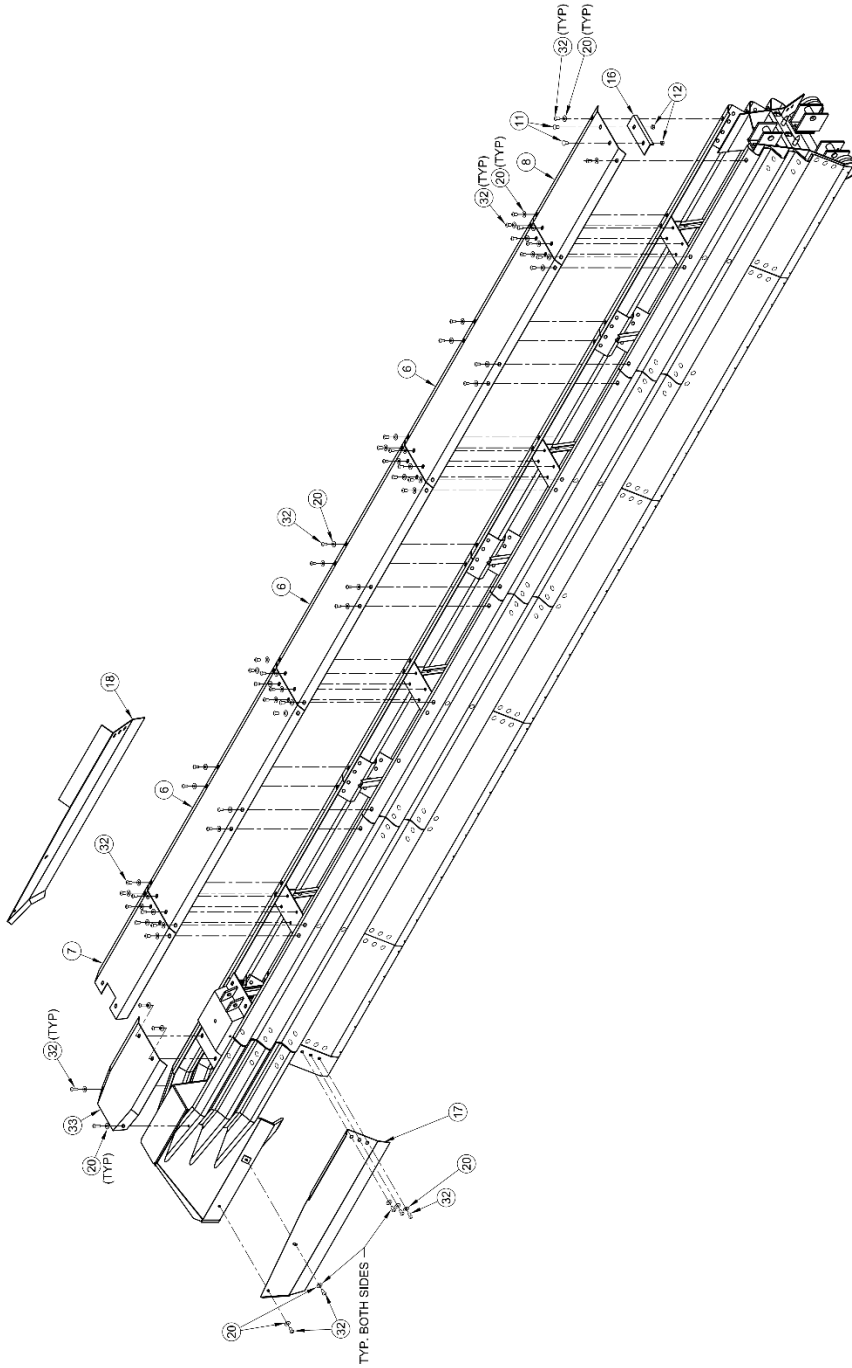


REVISION: SEE PARTS LIST DATE: 2/22/85 DRAWN: J. F. LaTurner CHECKED: J. F. LaTurner DIMENSIONS ACCORDING TO ASME Y14.5M (1993) UNLESS OTHERWISE SPECIFIED UNLESS OTHERWISE SPECIFIED, DIMENSIONS ARE IN INCHES TOLERANCES PER THE FOLLOWING:	TOLERANCES PER THE FOLLOWING: UNLESS OTHERWISE SPECIFIED DO NOT SCALE DRAWING	GATE ASSY, PIN SECTION, BG1.5	PART: 1 of 2 SHEET: 1 of 2 DRAWING NO.: 609958 REV: 1
EST UNFINISHED WT.: N/A			

- NOTES:
- TORQUE FASTENERS, (ITEMS 12, 21 & 22) TO 60 FT. LBS. MIN.
 - ALIGN THE TRANSITION SECTION ASSEMBLY TO BE CENTERED WITH GATE HALF. THE STRING ALIGNMENT METHOD MAY BE USED TO CHECK. A CLAMPING DEVICE MAY BE NECESSARY TO HOLD THE TRANSITION IN PLACE WHILE TIGHTENING THE BOLTS.
 - GATE ASSEMBLY SHIPPED PRE-ASSEMBLED FROM FACTORY.

Gate Assembly, Pin Section, BG 1.5

609958 2 of 2



DRAWN: T. Busse DESIGNED: J. F. LaTurner <small>ALL DIMENSIONS ARE IN MILLIMETERS AND DECIMALS THEREOF. UNLESS OTHERWISE SPECIFIED.</small>	DATE: 2/22/95 ISSUE: 3/3/95	TOLERANCES PER THP-SF-001, UNLESS OTHERWISE SPECIFIED. DO NOT SCALE DRAWING.	PART NO: 609958	REV: 1	SHEET NO: 2 of 2
REFERENCE: SEE PARTS LIST	EST UNFINISHED WT: N/A				

Notes:

Notes:



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