

## **Garrett County Department of Public Works Utilities Division**

### **Sewage Grinder Pump Installation and Inspection Requirements**

Questions regarding sewage grinder pump installations or to schedule inspections or pump connections, are to be directed to the Utilities Division (DPU) at 301-334-6976. Please insure that the following requirements are satisfied prior to scheduling the inspection and/or connection. DPU personnel cannot enter dwellings for any reason.

#### **PLUMBING REQUIREMENTS**

1. All pipe and fittings should be purchased from the DPU Warehouse @ 200 Francis Sanders Drive, Oakland, to insure uniformity of all specifications and installations.
2. The grinder basin must be at least 10-feet from the building structure. The top of the basin must be at least 2-feet below any floor with plumbing (unless otherwise approved by DPU). The minimum slope is 2% (1/4" per foot). The bottom of the basin must be anchored in 1-yard of concrete in order to keep the basin from floating.
3. The top of the grinder basin must be level.
4. If a riser is installed, an extended rail assembly and junction box pipe extension must be added and the float bracket moved up. The materials are available at the DPU Warehouse.
5. The inlet from the building connection must be cut in away from the floats and rail assembly.
6. All discharge piping must be installed with a minimum of 3-feet of cover.
7. All discharge piping must be a minimum of 3-feet away from any other utility.
8. All discharge piping must be installed with the bell-end facing the basin.
9. Absolutely no DWV (draining waste and vent) fittings or glue joints can be used on the discharge piping (must be SDR-21 or 13.5).
10. A brass check valve must be installed on the discharge piping at the connection point to the main sewer line or when connecting to an existing discharge line via slip-tee.
11. All discharge piping must have a minimum of 6-inches of #10 stone (dust) under and 6-inches of #10 stone (dust) over the pipe.
12. All discharge piping must be marked with sewer line detection tape no deeper than 12-inches from finished grade.

13. All discharge piping must be inspected by a DPU employee prior to backfilling. The property owner/contractor must call 301-334-6976 in order to schedule an inspection. There are no exceptions to this requirement. If backfilling occurs prior to an inspection by DPU, the property owner/contractor will be required to excavate the piping for inspection by DPU at the property owner's/contractor's expense. Installations will not be accepted and/or allowed to connect to the main sewer system until the piping is inspected and accepted.
14. The grinder basin must be backfilled to finished grade before the pump can be installed and wired. The basin lid must be at least 2 to 3-inches above the finished grade so that surface water cannot enter the basin. IN NO INSTANCES CAN THE BASIN BE BELOW GROUND LEVEL AND FINISHED GRADE MUST BE SLOPED TO DIVERT SURFACE WATER AWAY FROM THE BASIN.
15. The grinder basin must be easily accessible at all times. Items including, but not limited to, decks, walkways, pavement, heavy objects, or any other type of structure cannot be constructed over or located on top of the basin or impede upon the operation and maintenance easement area. If access to the grinder basin is impeded, removal of the object is the full responsibility of the property owner. Maintenance on the system will not occur until the obstructing object is removed by the property owner.
16. For instances where a duplex grinder system is installed, a roadway must be constructed to the basin to allow for access by DPU utilizing a truck equipped with a lifting hoist for operation and maintenance purposes.

#### ELECTRICAL REQUIREMENTS

1. All electrical components should be purchased from the DPU Warehouse to insure uniformity of all specifications and installations.
2. All conduit and fittings must be rated for electrical use. Water piping cannot be substituted for electrical conduit.
3. All conduit installed must be a minimum of 1-inch in diameter for simplex grinder systems and a minimum of 1½ inches for duplex grinder systems. It is the responsibility of the contractor to size the conduit for the proper installation.
4. Conduit installed from the control panel to the basin must be buried in the ground and cannot be installed under crawl spaces or basements. Conduits that run between the control panel and basin must have an expansion joint coupling within 12-inches of the control panel.
5. All efforts should be taken to avoid crossing over or under the gravity sewer line from the structure to the grinder basin with the electrical conduit installed from the control panel to the basin. Conduit cannot cross over or under the discharge piping from the grinder basin to the main sewer line.
6. All conduit must be a minimum of 18-inches deep and have a minimum of 4-inches of #10 stone (dust) under and a minimum of 4-inches of #10 stone (dust) over the conduit.

7. All conduit must be marked with electrical marking tape no deeper than 12-inches from finished grade.
8. **All conduit must be inspected by a DPU employee prior to backfilling. The property owner/contractor must call 301-334-6976 in order to schedule an inspection. There are no exceptions to this requirement. If backfilling occurs prior to an inspection by DPU, the property owner/contractor will be required to excavate the conduit for inspection by DPU at the property owner's/contractor's expense. Installations will not be accepted and/or allowed to connect to the main sewer system until the conduit is inspected and accepted.**
9. The control panel must be mounted in plain view and located as close as possible to the grinder basin with a minimum of 6-inches clear around all sides of panel. If a control panel will be post-mounted, the entire supporting structure must be constructed of treated lumber or welded stainless steel unistrut. The minimum size allowable for supporting posts is 4-inches by 4-inches.
10. The voltage for 2hp simplex and 2hp duplex grinder pumps is 240 volt single phase. Where commercial voltage of 208 is present, the property owner/contractor is required to install a buck boost transformer in order to supply the correct voltage.
11. The wiring harness must be purchased from the DPU Warehouse and be installed by the contractor from the control panel to the grinder basin. It is the responsibility of the contractor to inform Warehouse personnel whether the wiring harness is for a simplex or duplex installation. DPU personnel will complete the connections.
12. Wiring from the load center in the building to the disconnect and from the disconnect to the control panel must be complete and energized. Electrical breakers in the disconnect box and control panel must be turned off prior to final inspection by DPU personnel.
13. A lightening arrestor must be wired to the top terminals of the disconnect breaker.
14. The disconnect must be grounded with green wires from the feed and control panel. The white wires from the lightening arrestor must be mounted to a bar and ground screw installed. The disconnect must be a Square D brand.
15. The neutral wire from the building and the neutral wire from the control panel must be connected with wire nuts. This isolates the neutral wire from the ground wire.
16. Install electrical potting in conduit to basin to keep out gases.
17. Flooded junction boxes in grinder basins will not be accepted. Flooding causes the liquid to enter the wiring harness which in turn allows moisture to enter the pump windings when the motor is connected and energized. This causes the pump to malfunction and burn up. In order to avoid flooding of the junction boxes the following precautions are recommended:
  - a. If the liquid level in the basin is within 36-inches from the top of the basin, the liquid must be removed by the property owner/contractor.
  - b. If the junction box becomes flooded, a new wiring harness must be installed.

- c. The electrician should complete installation of the disconnect and control panel, contact DPU at 301-334-6976 to schedule the connection, and then pull the wiring harness the same day prior to the pump installation.
18. The pump will be installed and connected by DPU personnel. A \$100.00 fee per return trip will be assessed to the property owner/contractor if all requirements are not satisfied and a return trip(s) is required by DPU personnel.

### **INSPECTION REQUIREMENTS**

1. Water must be available to the grinder basin.
2. There cannot be more than 2-feet of liquid in the basin.
3. Installation of the disconnect, control panel and wiring harness must be complete with power to the disconnect and breaker turned off in the control panel.
4. The road valve must be marked with a wooden stake or orange flag.
5. The grinder lid must be exposed.
6. The grinder basin must be backfilled to finished grade.
7. A fee of \$100.00 must be paid prior to any return trips by DPU that are required due to incomplete installations.

### **Example Installation Diagrams Attached**

Revised 7/31/17

**SECTION 02505**  
**TRACE WIRE FOR NONMETALLIC PIPE INSTALLATION**

**PART 1 - GENERAL**

**1.01 SUMMARY OF WORK**

Work performed under this section shall include but is not limited to furnishing all labor, materials, equipment, and incidentals as necessary for installing trace wire during the installation of nonmetallic water distribution pipelines and sanitary sewer piping. It will be used for locating the pipelines, laterals, services and appurtenances with an electronic pipe locator after installation.

**1.02 QUALITY CONTROL**

All materials and installation shall be in accordance with the GARRETT COUNTY WATER AND SEWER SPECIFICATIONS. All materials incorporated into the work shall be new and handled in accordance with manufacturer's recommendations. Inspect all materials for defects prior to incorporating into the work. No damaged materials will be permitted to be installed. Completed work shall be inspected and tested prior to acceptance by the Owner.

**1.03 SUBMITTALS**

Submit manufacturer's technical data and installation instructions for the following items:

1. Trace wire
2. Connectors
3. Grounding anodes

**1.04 MEASUREMENT AND PAYMENT**

There will be no separate payment for the supply and installation of trace wire. The Contractor shall consider the supply and installation of trace wire to be incidental to construction of the pipeline.

**PART 2 - PRODUCTS**

## **2.01 TRACE WIRE**

### **A. General**

All trace wire and trace wire products shall be domestically manufactured in the U.S.A. All trace wire shall have HDPE (High Density Polyethylene) or HMWPE (High Molecular Weight Polyethylene) insulation intended for direct bury, color coated per APWA (American Public Works Association) standard for the specific utility being marked, as follows:

Blue	Potable Water
Green	Sewer

### **B. Open Trench Trace Wire**

Trace wire shall be #12 AWG Copper Clad Steel, High Strength with minimum 450 lb. break load, with minimum 30 mil HDPE or HMWPE insulation thickness.

### **C. Trace Wire for Directional Drilling and Boring**

Trace wire shall be #12 AWG Copper Clad Steel, Extra High Strength with minimum 1,150 lb. break load, with minimum 30 mil HDPE or HMWPE insulation thickness.

### **D. Trace Wire for Pipe Bursting and Slip Lining**

Trace wire shall be 7 x 7 Stranded Copper Clad Steel, Extreme Strength with 4,700 lb. break load, with minimum 50 mil HDPE or HMWPE insulation thickness.

## **2.02 CONNECTORS**

- A. Splices along the continuous run of trace wire or for repair of a wire break or replacement of a failed segment of wire shall use 3M Brand DBR Direct Bury Splice Kit or approved equal. Approved alternatives must securely connect two or more wires, effectively moisture seal by means of a dielectric non-hardening silicone sealant, manufacturer approved for direct burial and rated for a minimum of 50 volts.**
- B. Branch connections for laterals, turnouts, services and appurtenances shall use DryConn Direct Bury Lug Aqua, or approved equal. Approved alternatives must**

securely connect one or two wires to the main trace wire without cutting the main trace wire, effectively moisture seal by means of a dielectric non-hardening silicone sealant, manufacturer approved for direct burial and rated for a minimum of 50 volts.

### **PART 3 - EXECUTION**

Trace wire shall be installed on all water lines, sewer lines and appurtenances. The wire shall be installed in such a manner as to be able to properly trace all pipelines and services without loss or deterioration of signal or without the transmitted signal migrating off the tracer wire.

#### **3.01 INSTALLATION**

- A. Trace wire shall be installed in the same trench and inside bored holes and casing with pipe during pipe installation. It shall be secured to the pipe as required to insure that the wire remains adjacent to the pipe. The trace wire shall be securely bonded together at all wire joints with an approved watertight connector to provide electrical continuity, and it shall be accessible at all trace wire access points.
- B. Except for approved spliced-in repair or replacement connections, tracer wire shall be continuous and without splices from each trace wire access point.
- C. Trace wire access points shall be accessible at all new valve boxes, meter boxes, blowoffs, ARV's, fire hydrants and access manholes. Concentrations of multiple proposed valves near pipe intersections, i.e. tees or crosses, may require more than one access point assembly in each valve box. Trace wire access points shall be within public right-of-way or public utility easements.

If the spacing of access points will exceed one-half (1/2) mile, the trace wire shall be looped up in a 2-inch PVC pipe to be located at a right-of-way line fence or at a cross fence, as applicable, for protection. A PVC cap shall be placed on the 2-inch pipe, but it shall not be solvent welded onto the pipe.

- D. At the point of connection between a ductile iron pipe and any non-iron pipe, the tracer wire shall be properly connected to the iron pipe with a cad weld or approved equivalent. Tracer wire welds shall be completely sealed with the use of an approved mastic type sealer specifically manufactured for underground use. Mastic shall be applied in a thick coat a minimum of one-quarter inch (1/4) thick and shall be protected from contamination by the backfill material with the use of a plastic membrane.

- E. Tracer wire shall be laid flat and securely taped to the side of the pipe at 8 to 10 foot intervals. The wire shall be protected from damage during the execution of the work. No breaks or cuts in the tracer wire or tracer wire insulation shall be permitted. At service saddles, the tracer wire shall not be allowed to be placed between the saddle and the main.
- F. At all end caps, a minimum of 6-feet of tracer wire shall be extended beyond the end of the pipe, coiled and taped to the cap for future connections. The end of tracer wire shall be spliced to the wire of a six-pound zinc anode, the anode to be buried at the same elevation as the main.

### **3.02 BRANCHED CONNECTION**

- A. Connections between the main line tracer wire and branch connection tracer wire shall only be allowed at services, ARV's, blowoffs, and laterals.
- B. The branch connection tracer wire shall be a single tracer wire properly spliced to the main line tracer wire. DryConn Direct Bury Lug Aqua water tight connectors, or approved equal, shall be used for electrical continuity.

### **3.03 DIRECTIONAL BORING**

- A. For directional boring installations, two #12 AVG tracer wires, listed above, shall be installed with the pipe and connected to the tracer wire at both ends, or cad welded to the existing iron pipe at both ends.
- B. Tracer wires shall be laid flat and securely affixed to the top and side of the pipeline at five-foot (5') intervals to insure its placement during the boring operation.

### **3.04 TESTING REQUIREMENTS**

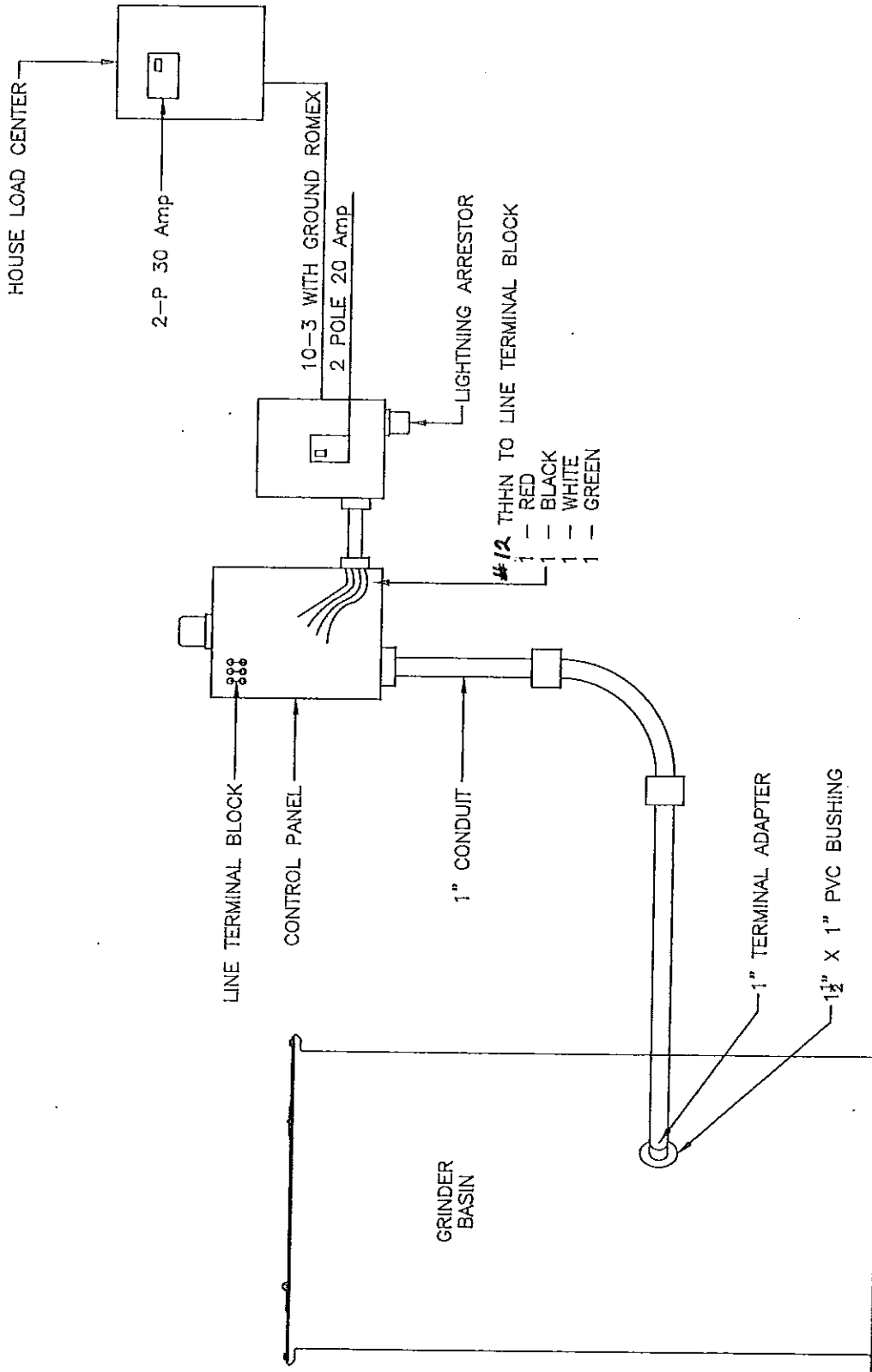
The Contractor shall perform a continuity test on all wire in the presence of the Inspector or Owner's representative. If the trace wire is found to be not continuous after testing, the Contractor shall repair or replace the failed segment of the wire.

### **3.05 REPAIR OR RESTORATION**

At all repair locations where there is existing tracer wire, the tracer wire shall be properly reconnected and spliced as outlined above.

**END OF SECTION**

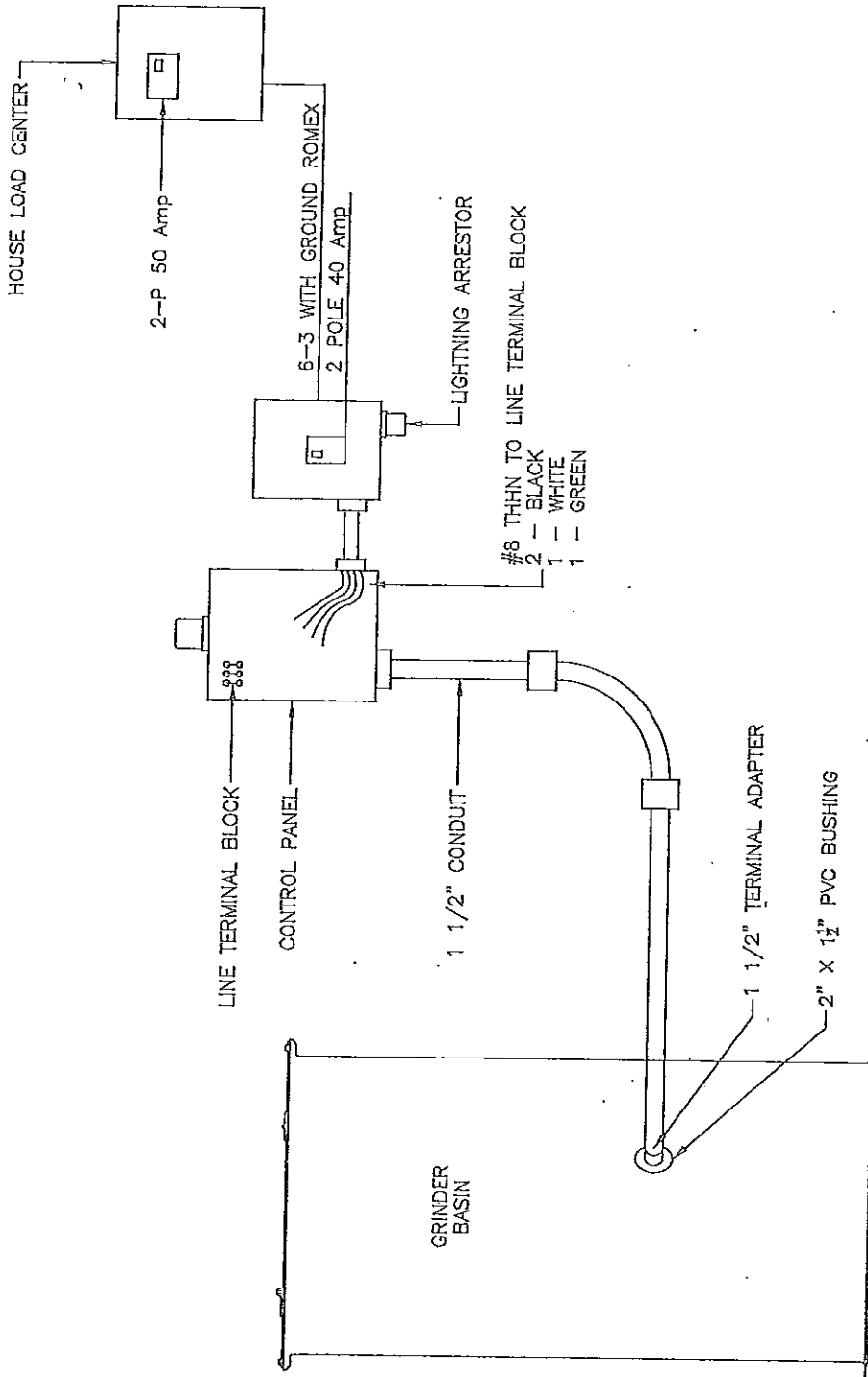




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2HP SIMPLEX GRINDER  
 APPLICATION

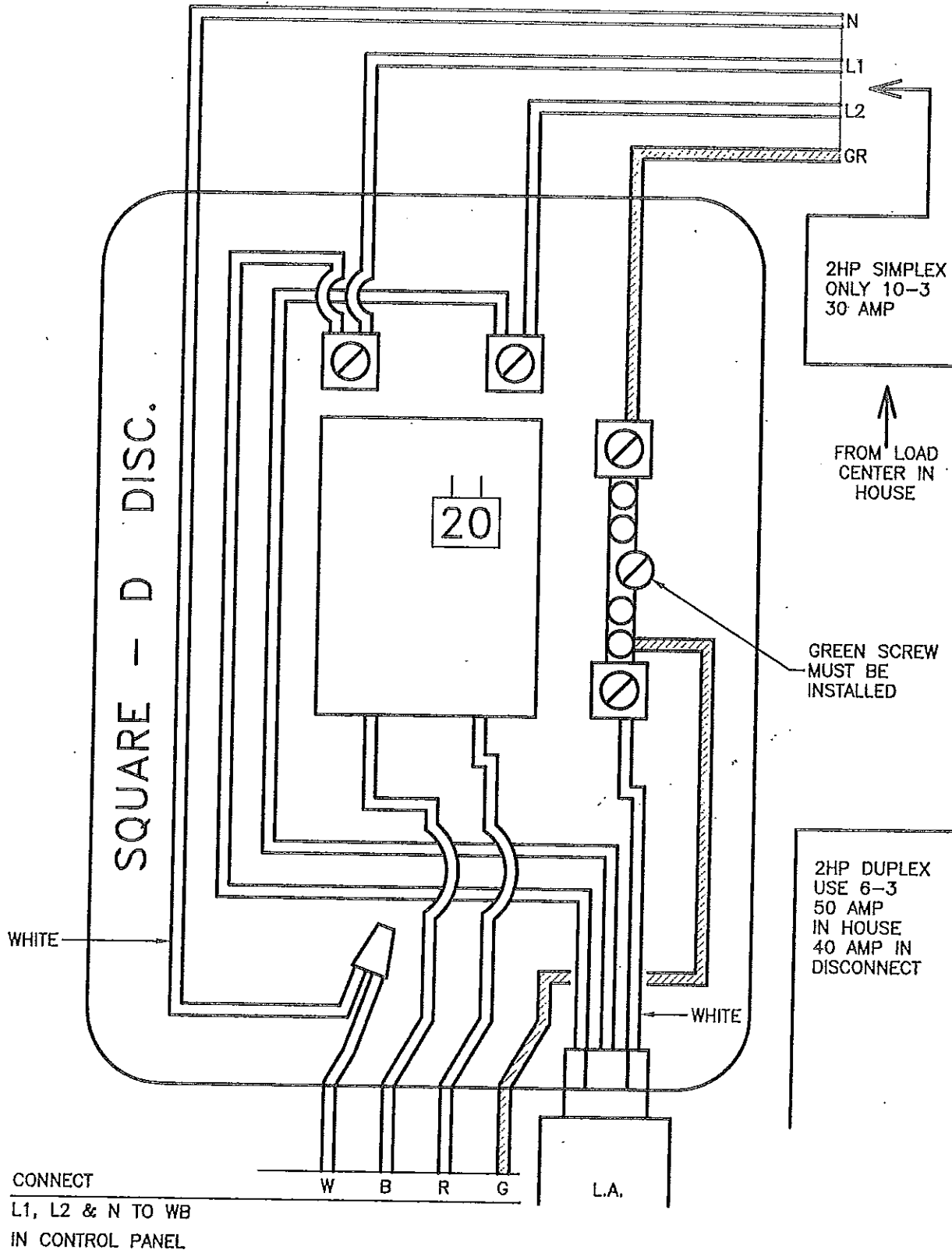
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 NOT TO SCALE  
 SEPTEMBER 2010



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Standard Detail No.  
**STD.-13**  
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 SEPTEMBER 2010

**2HP DUPLEX GRINDER  
 APPLICATION**



SQUARE - D DISC.

2HP SIMPLEX  
ONLY 10-3  
30 AMP

FROM LOAD  
CENTER IN  
HOUSE

GREEN SCREW  
MUST BE  
INSTALLED

2HP DUPLEX  
USE 6-3  
50 AMP  
IN HOUSE  
40 AMP IN  
DISCONNECT

WHITE

WHITE

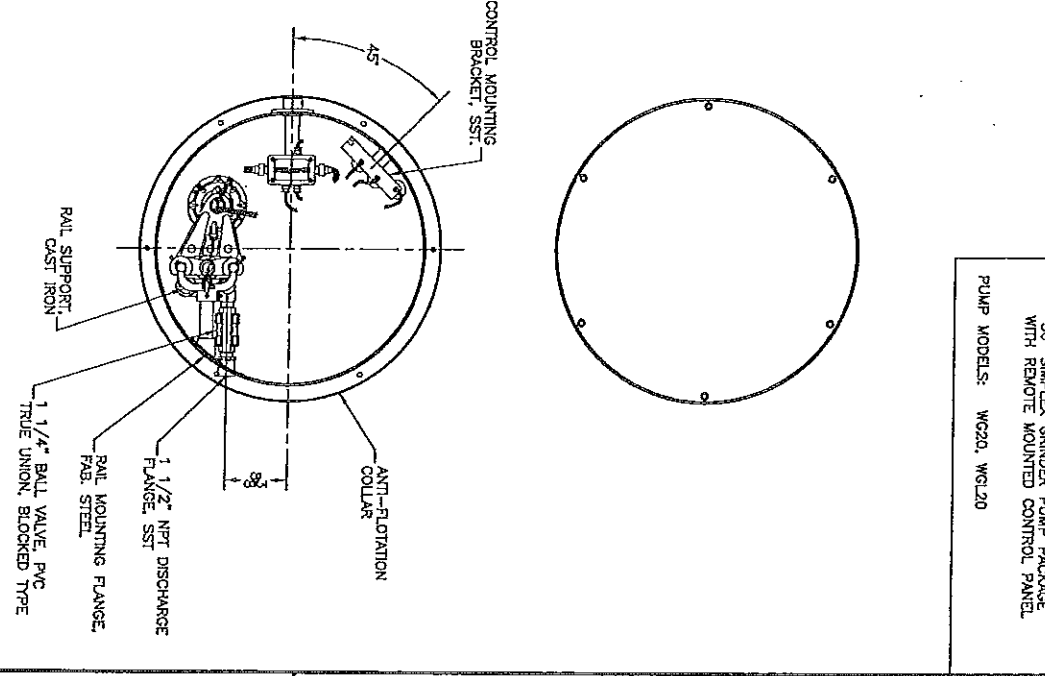
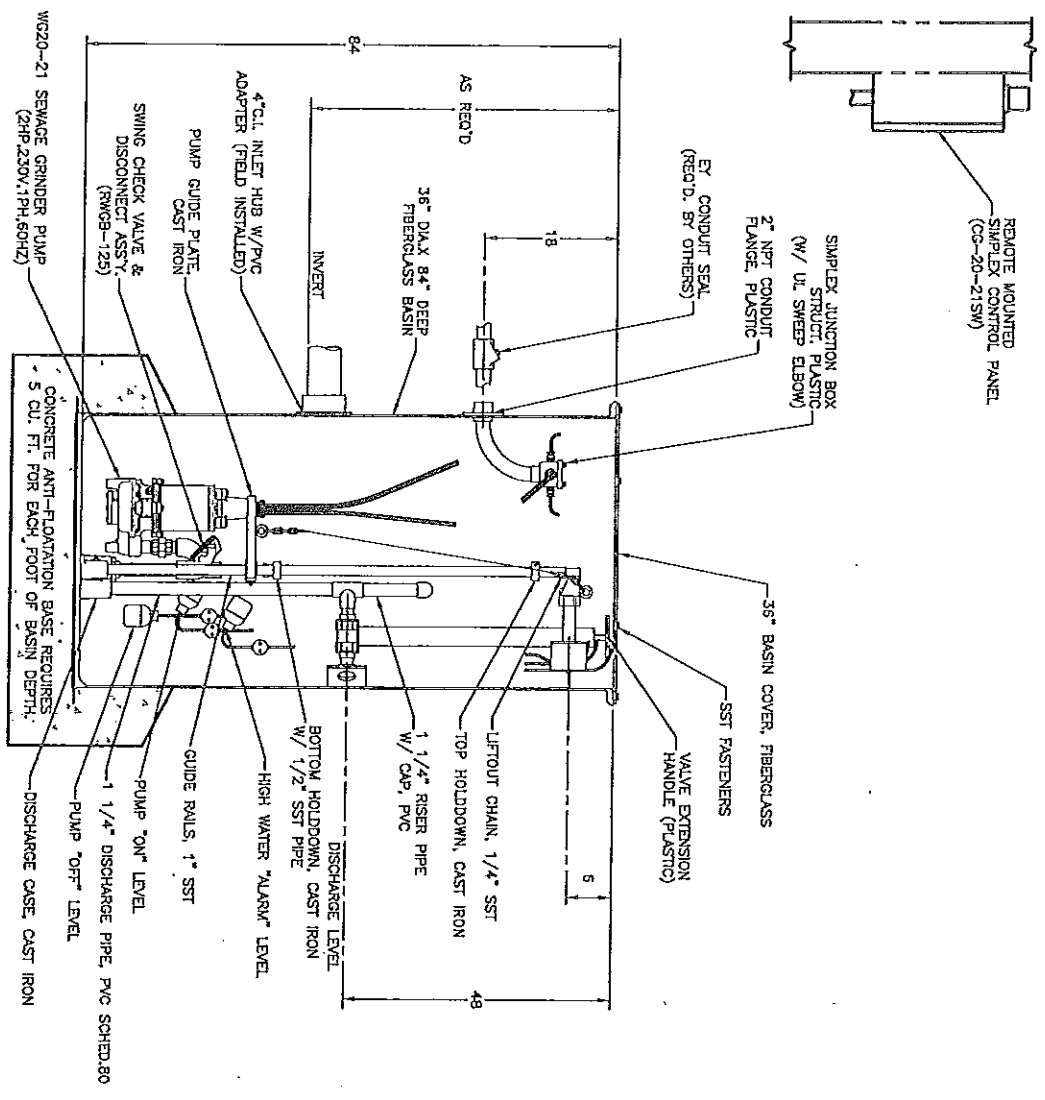
CONNECT  
L1, L2 & N TO WB  
IN CONTROL PANEL

W B R G L.A.

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CONTROL  
PANEL

Standard Detail No.  
**STD.-14**  
NOT TO SCALE  
SEPTEMBER 2010



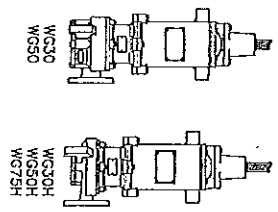
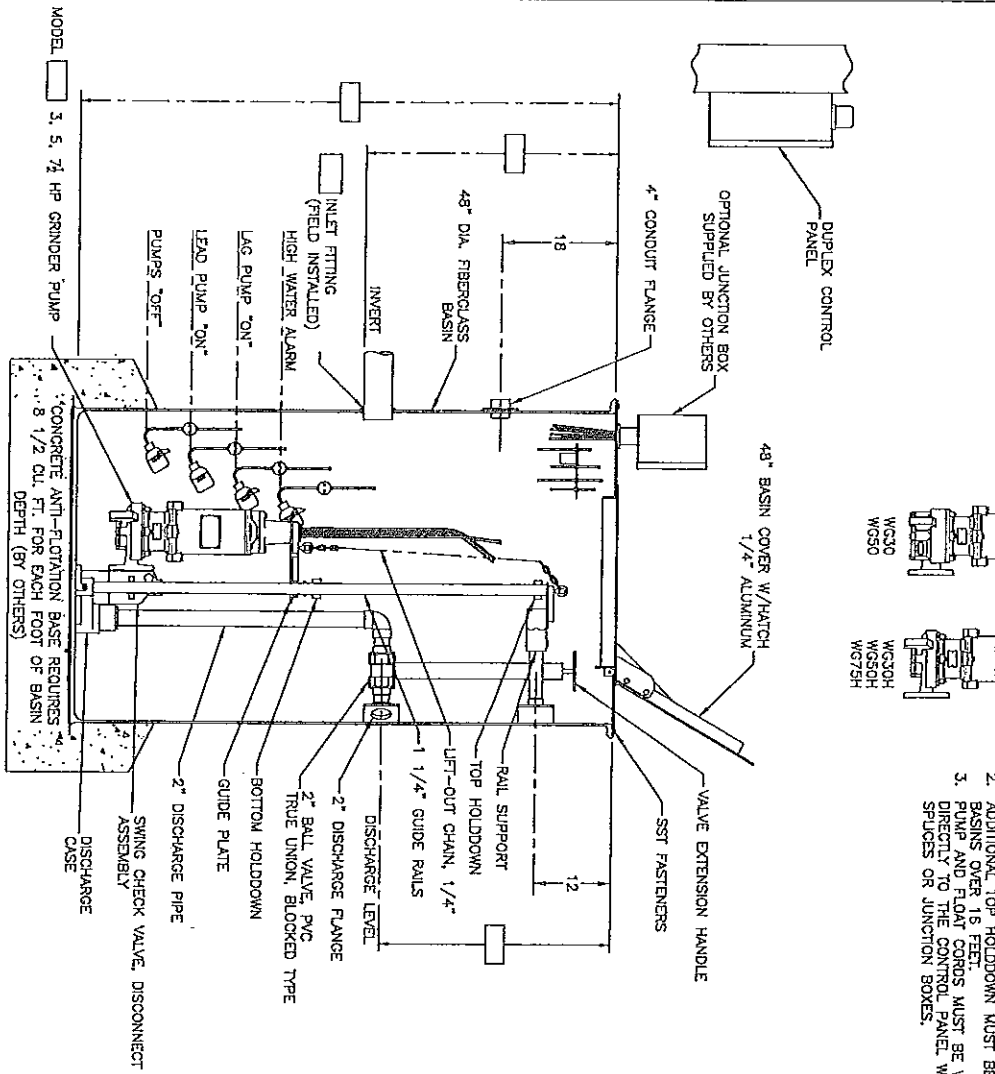
TYPICAL INSTALLATION  
 36" SIMPLEX GRINDER PUMP PACKAGE  
 WITH REMOTE MOUNTED CONTROL PANEL  
 PUMP MODELS: WC20, WC120

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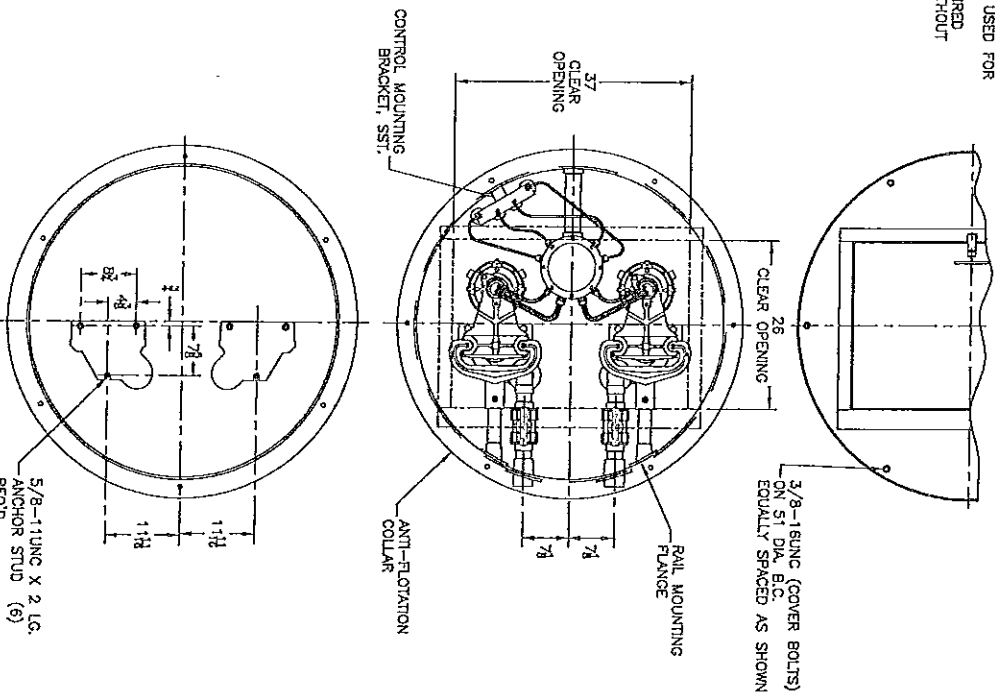
36" SIMPLEX GRINDER PUMP  
 INSTALLATION DETAIL

Standard Detail No.  
**STD.-15**  
 NOT TO SCALE  
 SEPTEMBER 2010

TYPICAL INSTALLATION  
 48" DUPLEX GRINDER PUMP PACKAGE  
 WITH REMOTE MOUNTED CONTROL PANEL  
 (MODELS BZ0R0-4872 THRU BZ0R0-4819Z)  
 PUMP MODELS: W630, W650,  
 W630H, W650H, W675H,  
 W675H



- NOTE:
1. INTERMEDIATE RAIL SUPPORT REQUIRED FOR BASINS OVER 16 FEET.
  2. ADDITIONAL TOP HOLDDOWN MUST BE USED FOR BASINS OVER 16 FEET.
  3. PUMP AND FLOAT CORDS MUST BE WIRED DIRECTLY TO THE CONTROL PANEL WITHOUT SPLICES OR JUNCTION BOXES.



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48" DUPLEX GRINDER PUMP PACKAGE 3-7.5hp  
 INSTALLATION DETAIL

Standard Detail No.	STD.-16
	NOT TO SCALE
	SEPTEMBER 2010