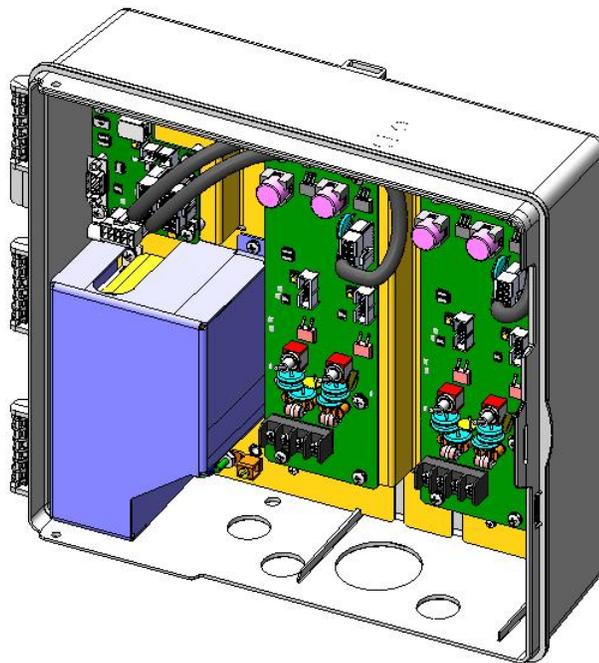




IC System™

Installation Guide



July 2009

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IC System Installation

Following are recommendations and requirements for the proper design and installation of an IC™ system so that the specified system operation is assured.

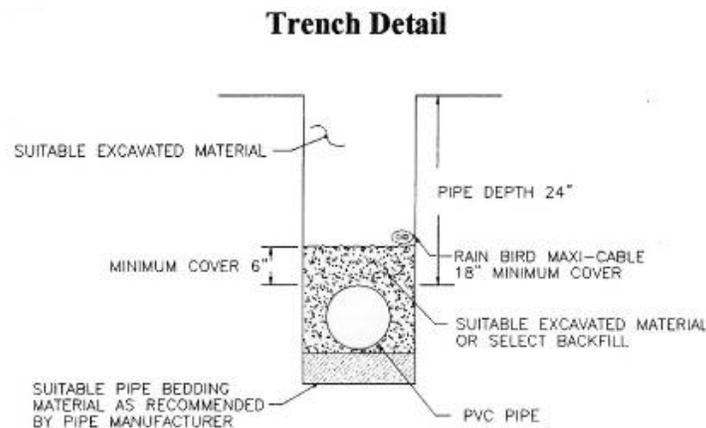
It is important to follow the system designer's electrical wire path design for the system. Adherence to wire sizing, layout, and number of ICMs per wire path is required. Please refer to the IC System™ Design Manual for detailed descriptions and definitions of trunk line wire path and branch wire paths and system capacities.

Wire Requirements

The IC System™ specifications call for Rain Bird Maxi™ Cable to be used in trunk line and branch wire paths. Wire manufacturers produce cable with a variety of outer jacket colors. The system design drawings should identify different color-coded wire paths for each wire path. There should be no deviation from the specified wire coloring scheme. The branch wire paths should be of the same color as the respective trunk wire path. These color requirements will ensure more efficient trouble-shooting and quicker service in the future if needed.

Installation

Follow the system designer's specifications for wire installation. Rain Bird recommends that for installations where mainline pipe is being installed in trenches, the wire is installed at the same time as the new pipe. The wire path should be laid on top of a 6" (15 cm) layer of clean fill or sand that covers the pipe. In rocky conditions, the pipe should be bedded according to the pipe manufacturer's or designer's recommendation. The wire should have a minimum of 18" (45 cm) of cover after backfilling.



At changes in direction in the mainline routing, the wire should have a loop or coil that is 36" (1 meter) in length to allow for thermal expansion and contraction.

At locations where future wire connections will be made, typically where lateral isolation valves or splices will be installed, during the installation allow a 36" (1 meter) loop of wire. This should be done in a manner that allows sufficient extra wire to lift the wire splice at least 18" (45 cm) above final grade to allow for future service access.

When the two-wire communication cable is being installed using a vibratory plow, the wire sleeve on the plow must be of sufficient size to prevent damage to the outer jacket. The wire shall be "laid" and must never be literally "pulled" in. In addition, proper use of the vibratory plow so that stretching of wire does not occur is very important.

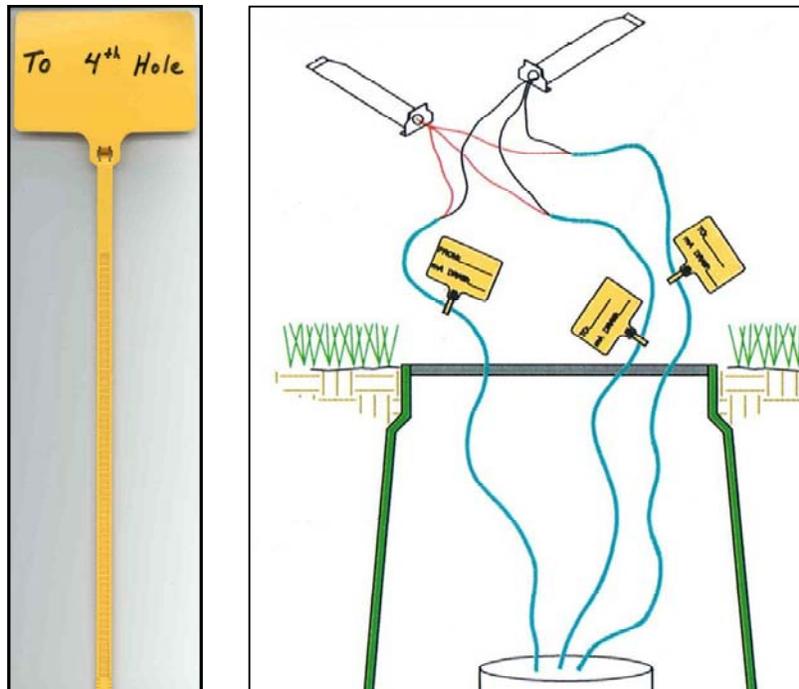
Wire Splices

All splices in the two-wire path, except at the valve-in-head rotor, must be placed in valve boxes to facilitate future troubleshooting. All three - way and four – way splices must have sufficient slack to lift the splice 24" (60 cm) above grade for ease of access. Rain Bird recommends the use of 10" (25 cm) round valve box for splices. Where possible, valve boxes should be avoided in high profile areas like fairways. In the case where a three or four – way splice is made at a rotor in a high profile area like a fairway, the splice can be located in a 6" (15 cm) round valve box and buried a few inches below grade. The round valve box can be located in future by probing with a long screwdriver or rod as long as the location is known.

Splice locations must be recorded on construction "as built" plans so that they may located in the future.

Wire Splice Marking

All wires in a valve box should be permanently identified with a permanent marking pen on a suitable permanent tag to identify where the wire is coming from and where it going to. Tags such as those shown can be ordered from Rain Bird's GSP Production and Service Center at (520) 434 – 6208 using part number GSP 700402. Wire labels aid in troubleshooting should it be necessary in the future. If a switching device is used to isolate outgoing legs of the two wire path during troubleshooting wire marking tags should be used on all legs of the wire paths.



Wire Handling and Outer Jacket Removal

It is very important that the wire is handled so that the copper conductors are not exposed after installation. The following tool is recommended to remove the outer Maxi cable jacket without damaging the inner insulation: King UF Safety Stripper.



This tool is available from the Rain Bird GSP Production and Service Center at (520) 434-6208 using part number GSP 700404. Tools such as utility, pocket, carpet, and box cutter knives should not be used nor should Romex strippers. Damage to the inner insulation will invariably occur with these tools and could negatively impact system performance.

Follow are the instructions for jacket removal included with the UF Safety Stripper.



When completing the wire splice, the polarity of the wire paths must be maintained. The wire colors must be paired red to red and black to black. Remove approximately 1" (25.4 mm) of inner insulation from the wire using properly sized wire strippers. Using linesman's pliers, twist the ends of the matched bare conductors of the Maxi cable together three to four times. Remove the pre-cut insulation from the ends of the color coded wires on the ICM. Matching red to red and black to black, wind the stranded ICM wire into the twisted solid wires as shown below.



Use Rain Bird DB splice kits to ensure waterproof splices and provide strain relief. Trim the twisted bare ends of the wires to 5/8" (15.9 mm) in length before inserting in the DB splice kit. The DB splice kit has a wire length gauge on the underside of the flange to assure proper wire length.

Do not use tape to hold the wires and splices to the rotor body. Locate the completed wire splices under the selector assembly on the rotor so that they can

be easily located in the future. Wire splices should be located in the same place under every rotor for easy and consistent access in future.

Surge Protection

The IC system uses the Rain Bird Integrated Control Surge Device (ICSD) to provide surge protection for the system wire paths in the field. Refer to the system designer's electrical plans for the number and location of ICSDs. The system requires an ICSD at every wire dead end on the trunk line wire path, and at every 500' (150 meters) or 15 ICMs on the wire path, whichever is less. The ICSD ground wires shall be connected to an 8 or 10 foot (3 meter) 5/8" (15 mm) UL listed copper clad ground rod with an acorn clamp.

The ICSD may also be connected to a ground plate using a # 6 (16 mm²) bare wire welded to a ground plate. The ICSD shall be connected to the #6 bare (16 mm²) wire with a split bolt connector as shown in the detailed drawings.

The maximum resistance to ground as measured with a fall of potential meter at an ICSD grounding location, is 45 Ohms. If a bonding and shielding wire is being used, a ground rod or plate shall still be installed every 500' (150 meters) or 15 ICMs and at every trunk line dead end. The bonding and shielding wire may be exothermically welded with Cadwelds to each ground rod or plate. At each ICSD location the ground wires from the ICSD should be connected to the bonding wire with a split bolt connector.

Address Recording

The ICM has a bar code label that contains addressing information to aid in database creation.

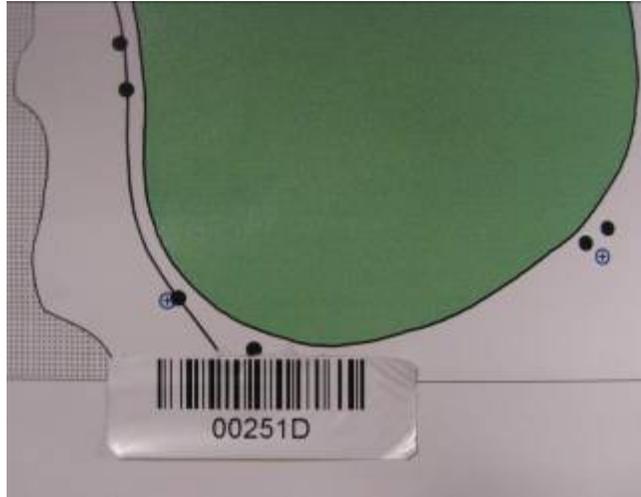
The label is perforated and has a secondary tag that can be removed and temporarily affixed to the top of the rotor case flange. This will allow the rotor to be backfilled and the information can be recorded or scanned shortly afterward. The secondary label is not designed to be permanently mounted on the rotor.



In addition, the label can be scanned prior to the rotor being backfilled using a Rain Bird scanner.



The secondary address label can also be placed on an “as built” plan, an individual hole view, or on field drawings that show the location of the rotor relative to other rotors and hole features. This will also allow the label to be scanned after installation.



Central Equipment Installation

The Integrated Central Interface (ICI) is available in 1500, and 3000 ICM configurations. With Stratus LT and GO software, only the first wire path will be active on the ICI-1500, limiting system capacity to 750 stations. The ICI-1500 and ICI-3000 have two and four wire path outputs respectively. Each wire path can have a maximum of 750 ICMs per wire path. The ICI controller should be mounted on an interior wall as close to the incoming wire paths as possible and within 25 feet of the central control computer.

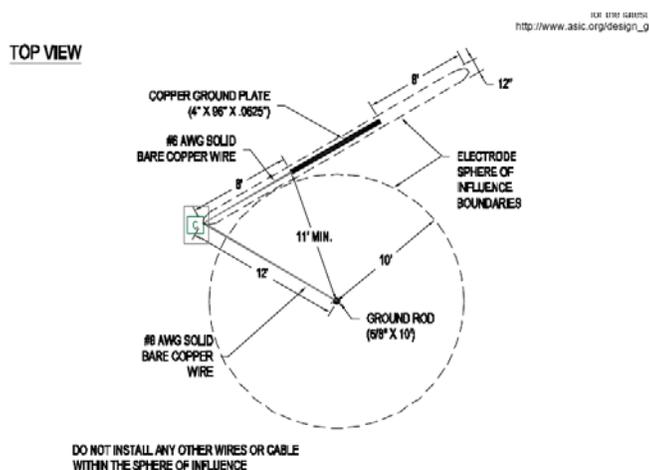
The Central Equipment Ground Grid

The incoming Maxi cables must be routed through Rain Bird MSP-1, Maxi Surge Pipes, mounted in a Rain Bird MGP-1, Maxi Ground Plate as shown on the attached detail.

The ground grid should consist of at least one 5/8" copper clad, UL listed rod and one 4" x 96" x 0.125" grounding plate.

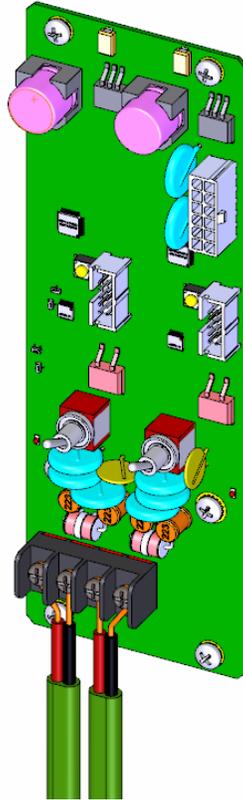
A plate with no rod may be used if conditions prevent the installation of a rod but the plate must be installed at a depth of 30" to center with two bags of ground enhancement material, one above and one below the plate.

If an additional rod or plate is required, they must be installed so that they are not within the sphere of influence of any of the other grounding electrodes in the grid.

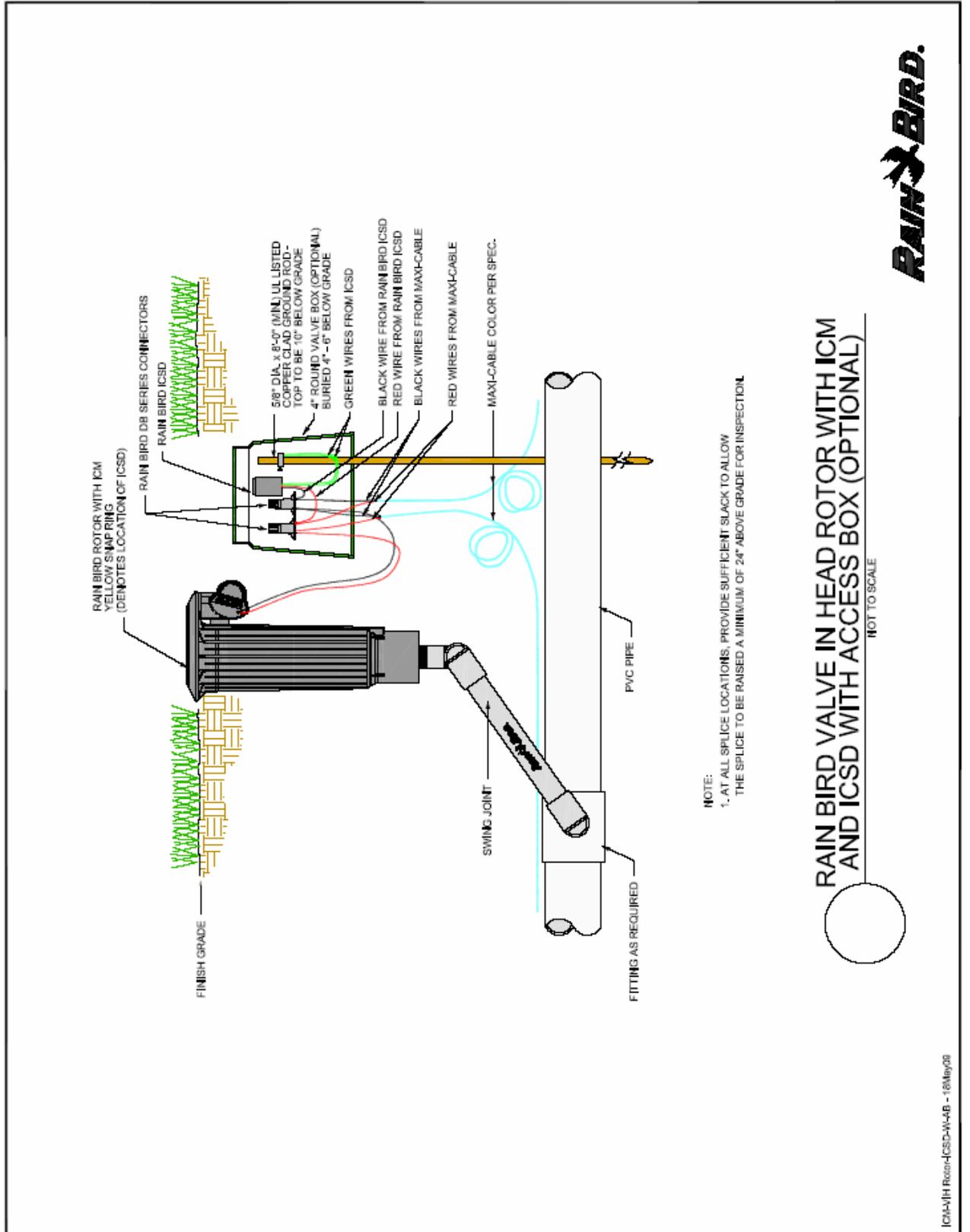


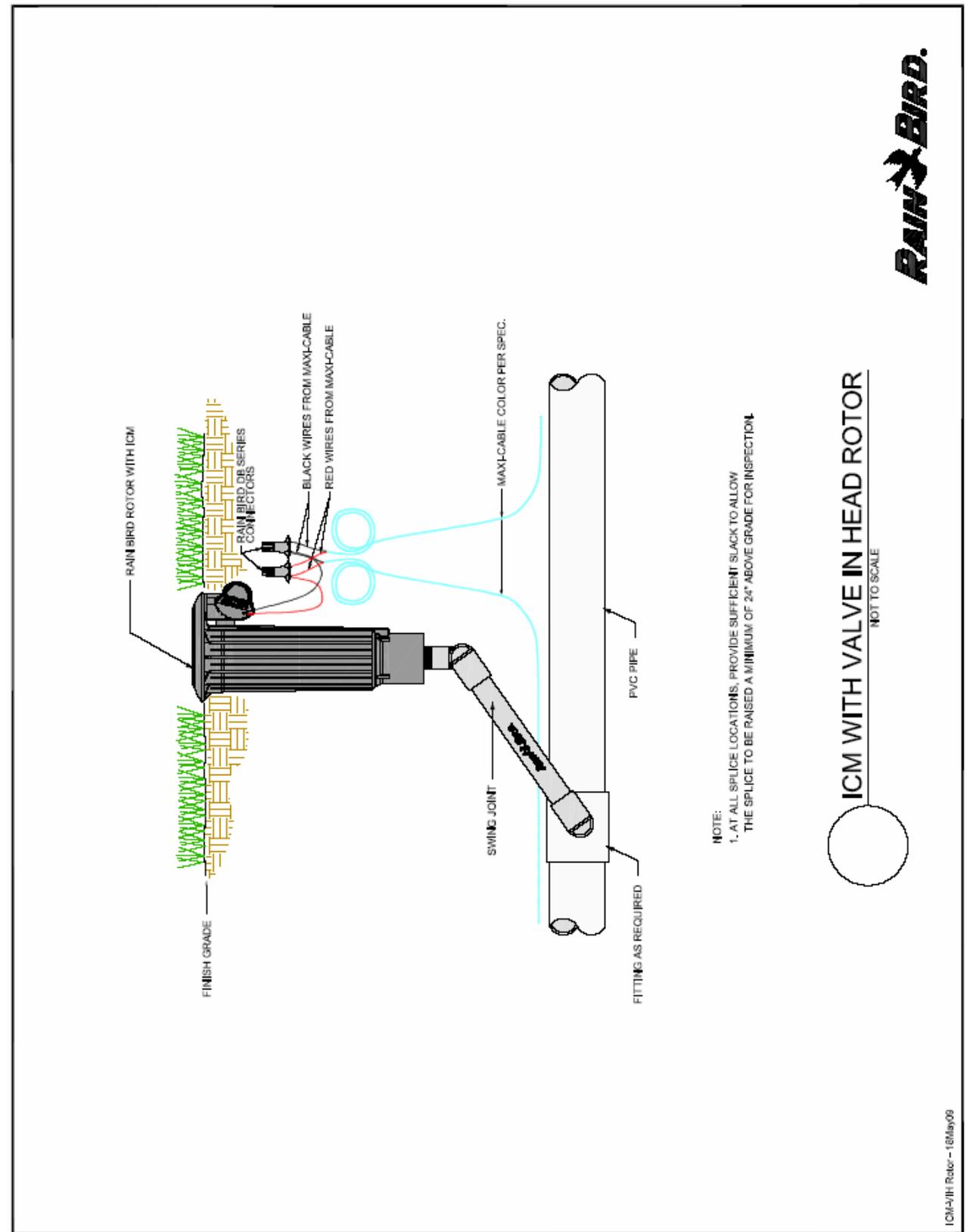
If the FREEDOM System is installed, the ground wires from the Polyphaser and antenna mast should be routed as straight as possible to the first rod in the ground grid as shown in the FREEDOM installation manual.

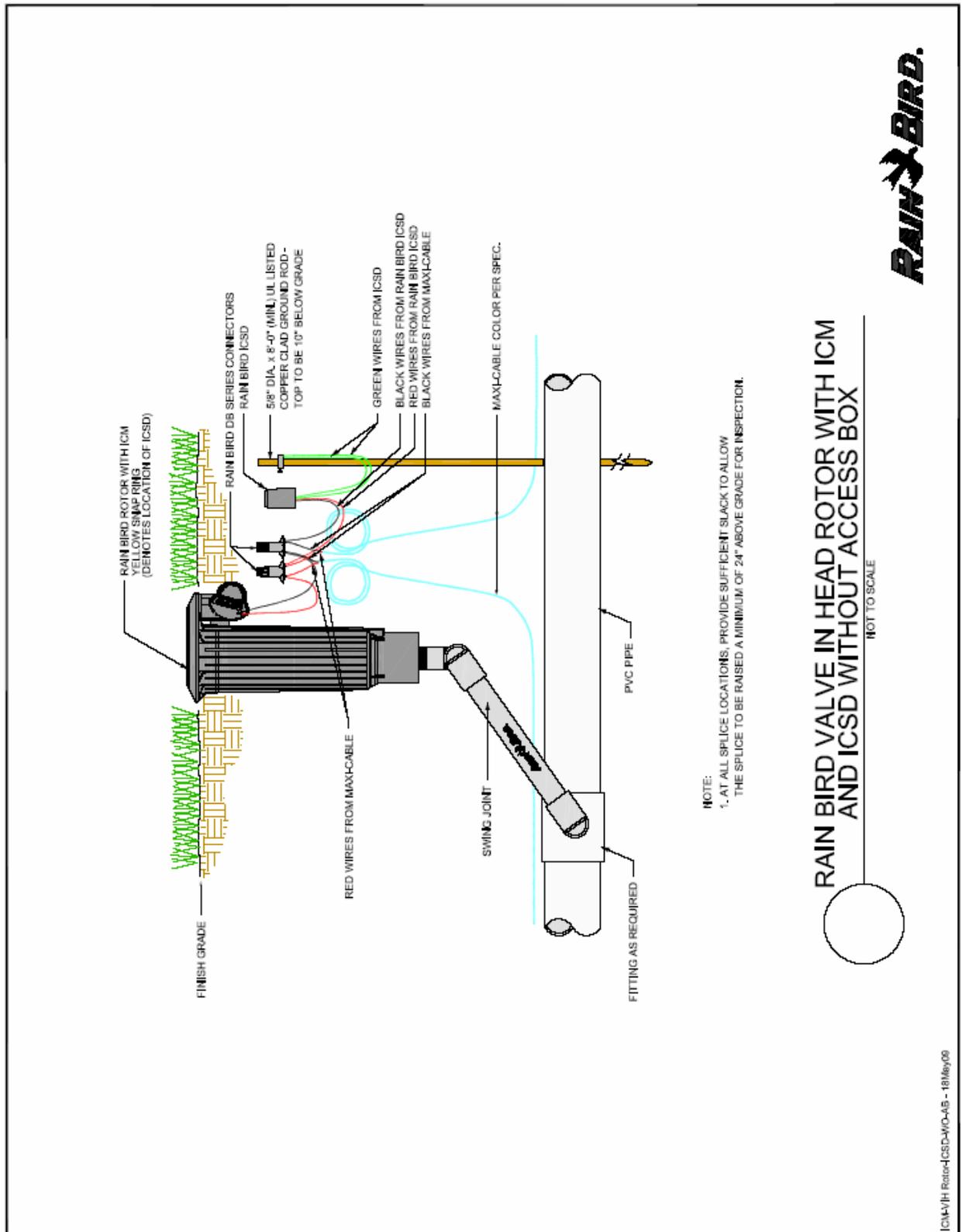
The incoming Maxi cables should be routed into the building through appropriately sized electrical conduit. The wire should be routed to the bottom of the ICI cabinet and each wire path connected to the terminal screws on the wire path outputs as shown below.

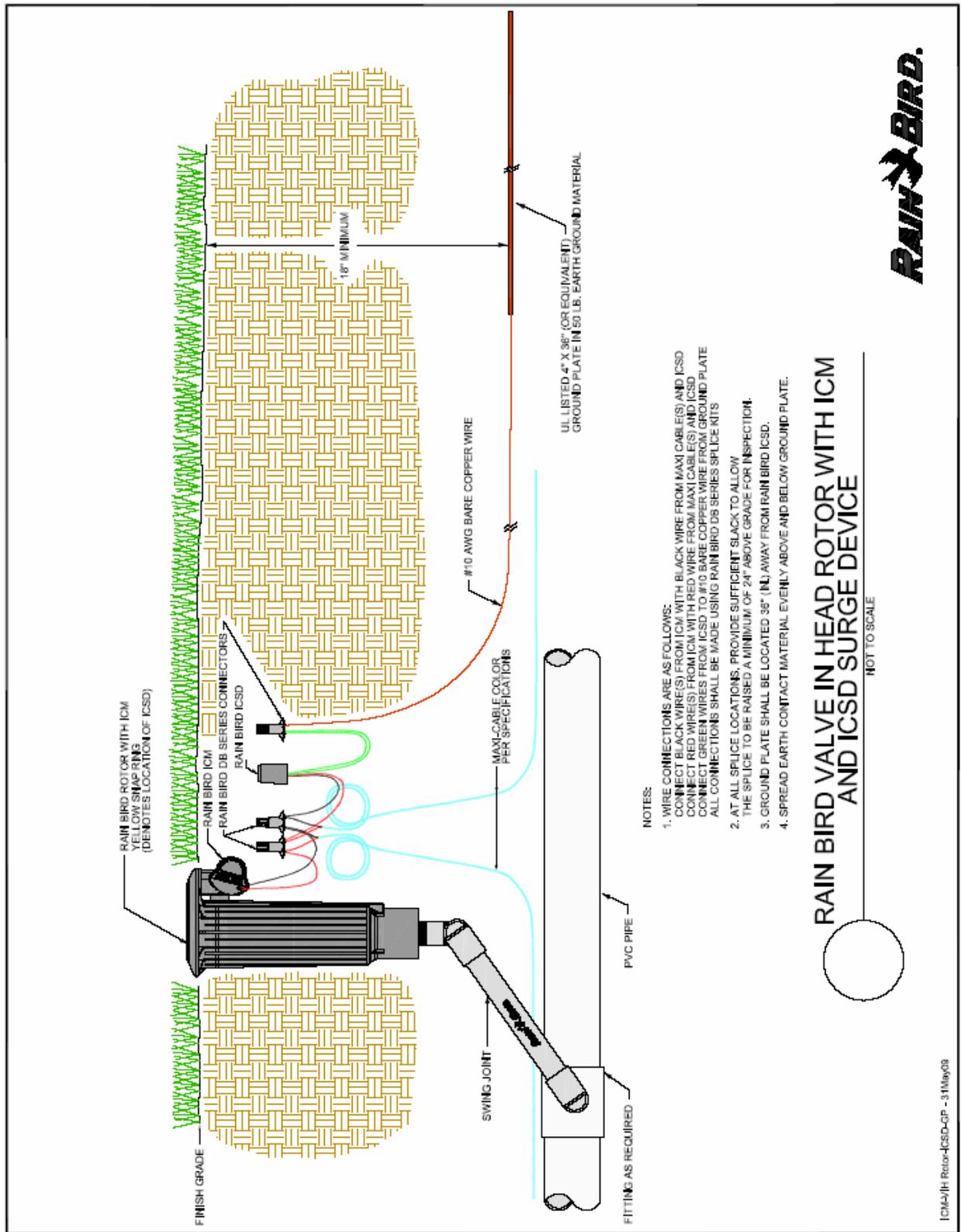


A #6 (16 mm²) gauge ground wire should be installed in a separate conduit between the ICI and the ground grid. A conduit not less than 1-½" (40 mm) in diameter shall be installed through the wall to the valve box that contains the first rod in the ground grid. The ground wire may be connected to the ground rod with a four way Cad Weld exothermic weld that also shares the ground wires from the FREEDOM antenna, Polyphaser, ground grid, and bonding and shielding wire when present.



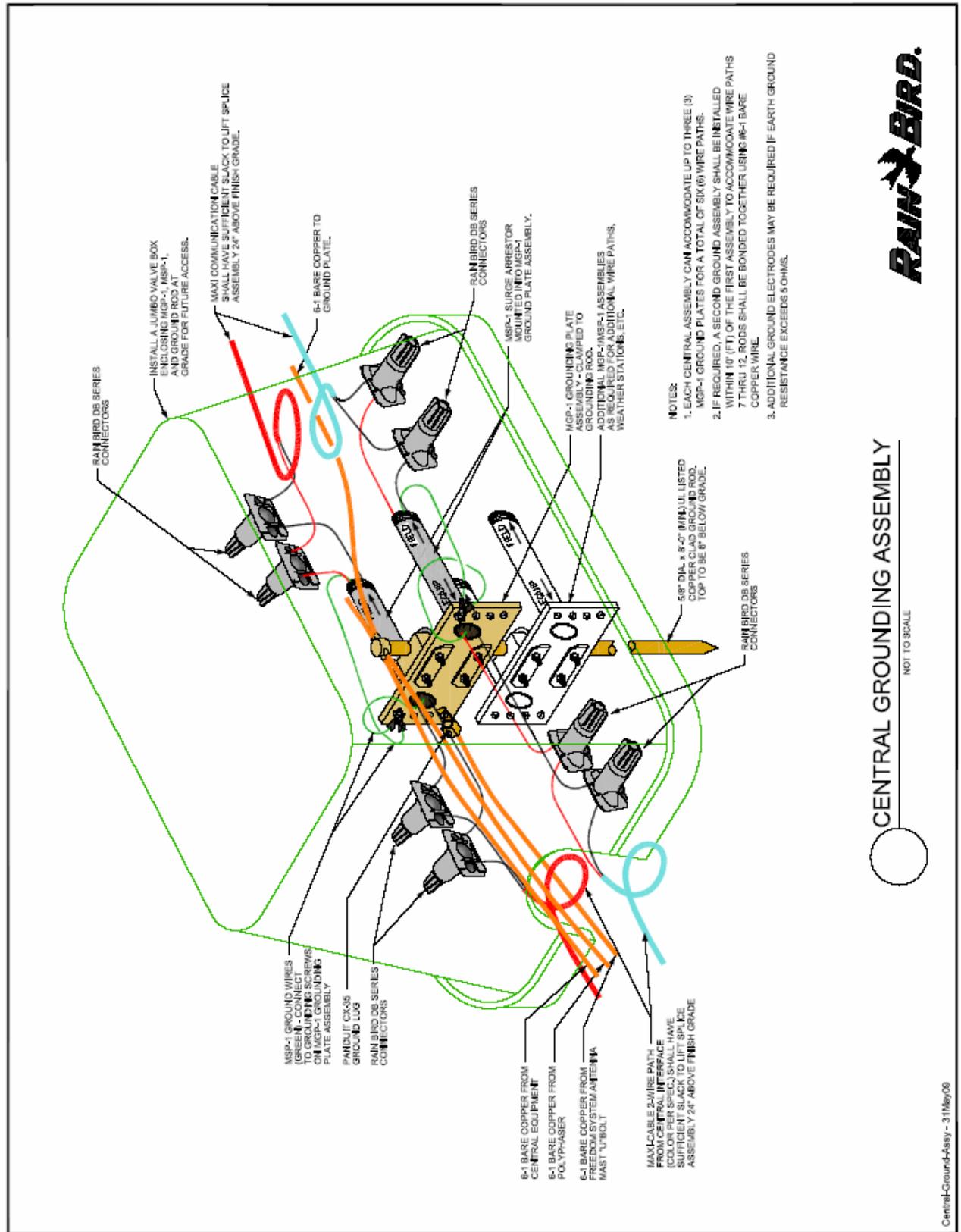






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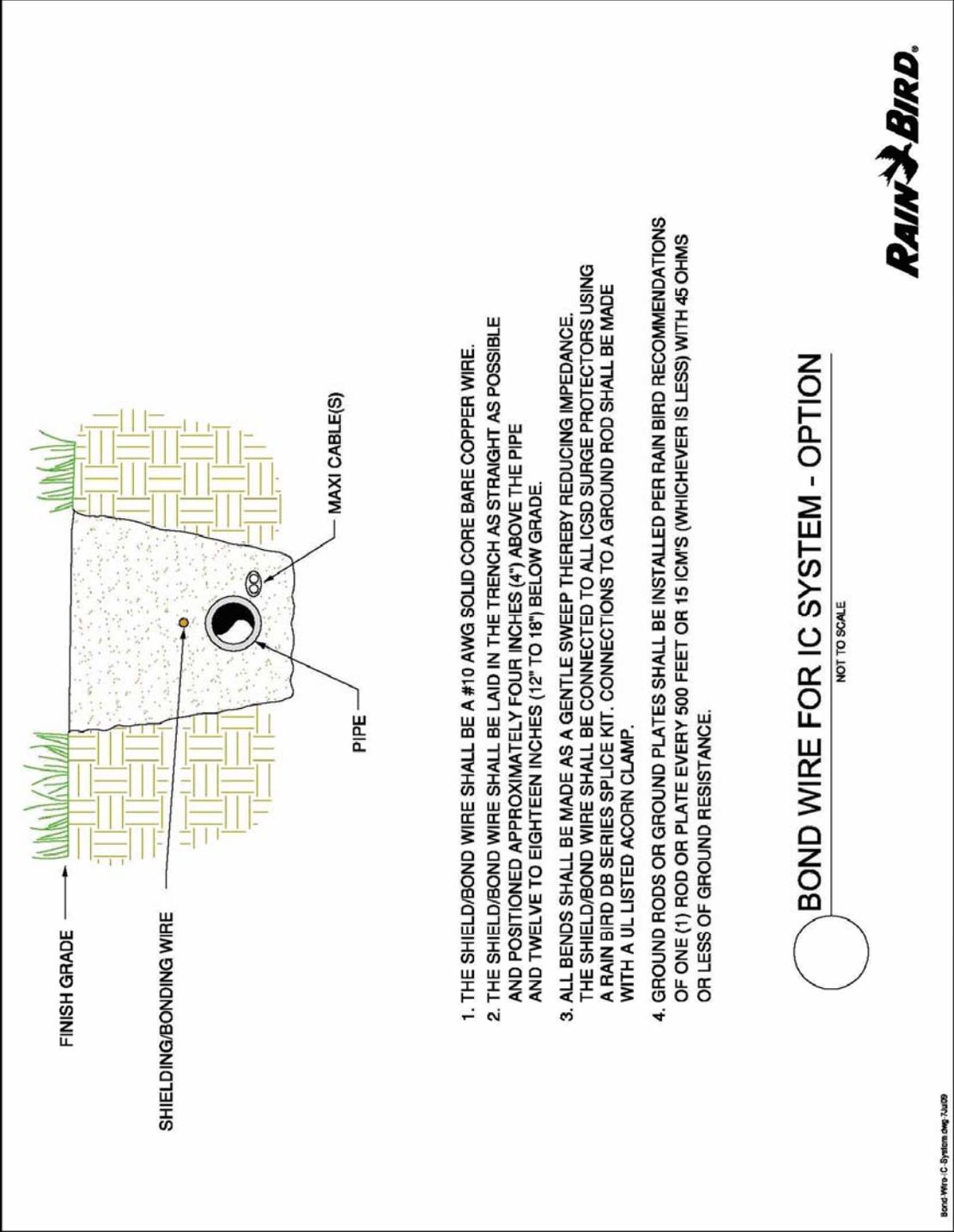
1. WIRE CONNECTIONS ARE AS FOLLOWS:
CONNECT BLACK WIRE(S) FROM ICM WITH BLACK WIRE FROM MAXI CABLE(S) AND ICSD TO RAIN BIRD DB SERIES CONNECTORS. CONNECT RED WIRE FROM MAXI CABLE(S) TO RAIN BIRD DB SERIES CONNECTORS. CONNECT GREEN WIRE(S) FROM ICM TO #10 BARE COPPER WIRE FROM GROUND PLATE. ALL CONNECTIONS SHALL BE MADE USING RAIN BIRD DB SERIES SPLICE KITS.
2. AT ALL SPLICE LOCATIONS, PROVIDE SUFFICIENT SLACK TO ALLOW THE SPLICE TO BE RAISED A MINIMUM OF 24" ABOVE GRADE FOR INSPECTION.
3. GROUND PLATE SHALL BE LOCATED 36" (N) AWAY FROM RAIN BIRD ICSD.
4. SPREAD EARTH CONTACT MATERIAL EVENLY ABOVE AND BELOW GROUND PLATE.



CENTRAL GROUNDING ASSEMBLY

NOT TO SCALE





BOND WIRE FOR IC SYSTEM - OPTION



NOT TO SCALE



Bond Wire, IC System, Aug. 2019