



IRRIGATION CONSTRUCTION DETAILS

GIDDINGS GOLF COURSE

**Giddings, Texas
23 July 2023**



A handwritten signature in black ink that reads "Kyle Larson".

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TABLE OF CONTENTS

I. PROJECT CONTACT INFORMATION

II. CONSTRUCTION DETAILS

1. Mainline and Common Trench Profile
2. Valve-In-Head Sprinkler
3. Quick Coupler
4. Air / Vacuum Release Valve
5. Remote Control Electric Valve with Isolation Valve
6. Mainline Gate Valve
7. Lateral Isolation Valve
8. 3" Sub-Main Isolation Valve
9. Drain Valve
10. Sub-Main Lat POC PVC
11. Pipe Routing and Fittings
12. PVC Pipe Curvature / Radius
13. Field Controller
14. Electric Junction Box
15. Grounding
16. Greens Loop and Dual Green Heads Placement
17. Leemco Joint Restraint Distance Chart
18. Leemco Joint Restraint Installation Chart

I. CONTACT INFORMATION

PHYSICAL PROJECT ADDRESSES

Giddings Municipal Golf Course
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Giddings, Texas 78942

Giddings City Hall
118 E Richmond St.
Giddings, Texas 78942

OWNER'S REPRESENTATIVES

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TORO DISTRIBUTOR'S REPRESENTATIVE

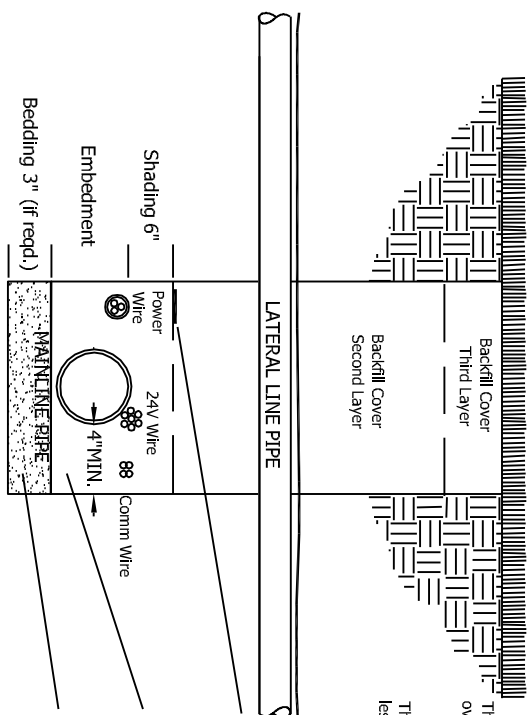
Mr. Johnny Skinner
Professional Turf Products (PTP)
(C) (281) 300-2306
(E-Mail) skinnerj@proturf.com

All mainline piping four inches (4") and larger shall have a minimum of thirty inches (30") and a maximum of thirty-six inches (36") of cover to finished construction grade or as otherwise recommended by the pipe manufacturer. Under certain extraordinary circumstances, the minimum depth of cover may be shallower than thirty inches (30"), but in no case shall be shallower than twenty inches (20"), with prior written approval of Bowlin Consulting. Controller power wire, communication cable and 24 V wire shall be installed level with the top of the mainline.

All lateral piping two and one-half (2 1/2") and smaller shall have a minimum of eighteen inches (18") and a maximum of twenty-four inches (24") of cover to finished construction grade unless otherwise called out on the mechanical legend.

Any special exceptions to the minimum or maximum depth of cover must be approved by the Bowlin Consulting.

The CONTRACTOR shall tamp all trenches with multiple lifts (minimum of three (3) layers) not to exceed twelve inches (12") per lift with vibratory tamping or equivalent applied at each lift and the last layer shall be smoothly into existing grade. The CONTRACTOR shall provide ninety (90%) - ninety-five percent (95%) compaction on all backfilled material.



The third layer of backfill, the top six inches (6"), material shall be free of rocks over one inch (1") in size.
The second layer of backfill material shall be one and one-half inch (1 1/2") or less in size.

Red Electrical Warning Tape "CAUTION ELECTRIC LINE BELOW"

Embedment material around the pipe and six inches (6") shading over the pipe and around swing joints, fittings and sprinklers shall be acceptable excavated material, fill dirt or sand one-half inch (1/2") or less in size.

In rock excavation areas, it may be necessary to bed the pipe in a suitable clean backfill material to insure that the bottom of the trench and bedding on which the pipe shall be placed, will be free of all rocks, clods, debris, other sharp edges and unsuitable materials larger than one-half inch (1/2") in diameter. In this instance, the CONTRACTOR shall excavate the trench an additional three inches (3") in depth and then provide a minimum of three inches (3") of suitable clean backfill material for bedding of the pipe.

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Not to Scale

CONSTRUCTION DETAILS

MAINLINE AND COMMON TRENCH PROFILE

CONSTRUCTION DRAWINGS

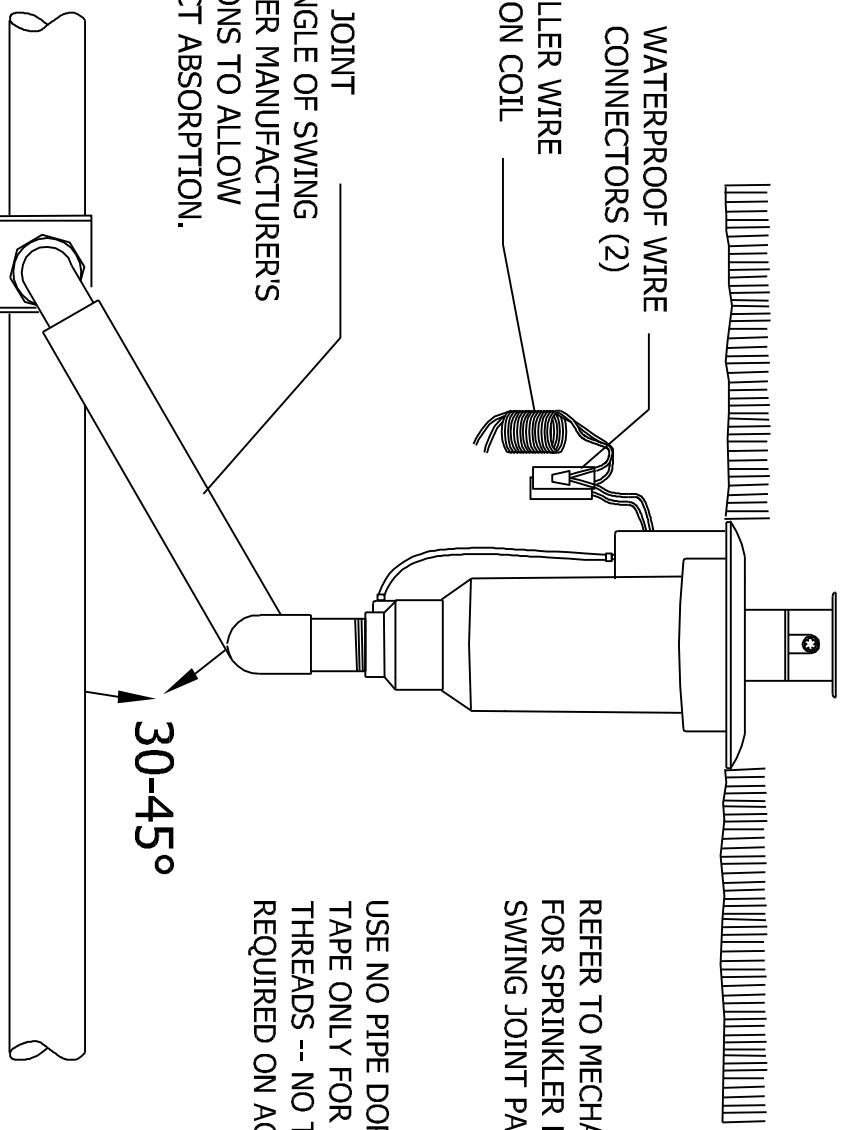
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1/11/10



WATERPROOF WIRE
CONNECTORS (2)
CONTROLLER WIRE
EXPANSION COIL



UNITIZED SWING JOINT
NOTE: ADJUST ANGLE OF SWING
JOINT LAY ARM PER MANUFACTURER'S
RECOMMENDATIONS TO ALLOW
ADEQUATE IMPACT ABSORPTION.

SLIP X SLIP X ACME THREADED
SWING JOINT SERVICE TEE

REFER TO MECHANICAL PLAN LEGEND
FOR SPRINKLER MODEL NUMBER AND
SWING JOINT PART NUMBER

USE NO PIPE DOPE -- USE TEFLON
TAPE ONLY FOR NPT AND BSP
THREADS -- NO TEFLON TAPE IS
REQUIRED ON ACME THREADS

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CONSTRUCTION DETAILS

TURF ROTOR

CONSTRUCTION DRAWINGS

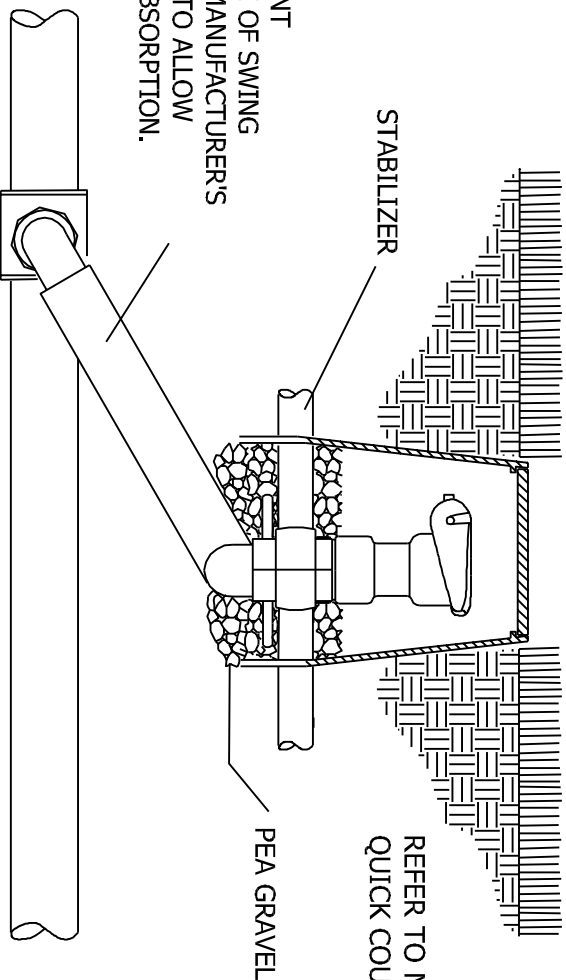
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8/29/19



CARSON-BROOKS VALVE BOX
MODEL #708 BODY WITH
#708-4-T COVER



REFER TO MECHANICAL PLAN LEGEND FOR
QUICK COUPLER MODEL NUMBER

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CONSTRUCTION DETAILS

QUICK COUPLER

CONSTRUCTION DRAWINGS

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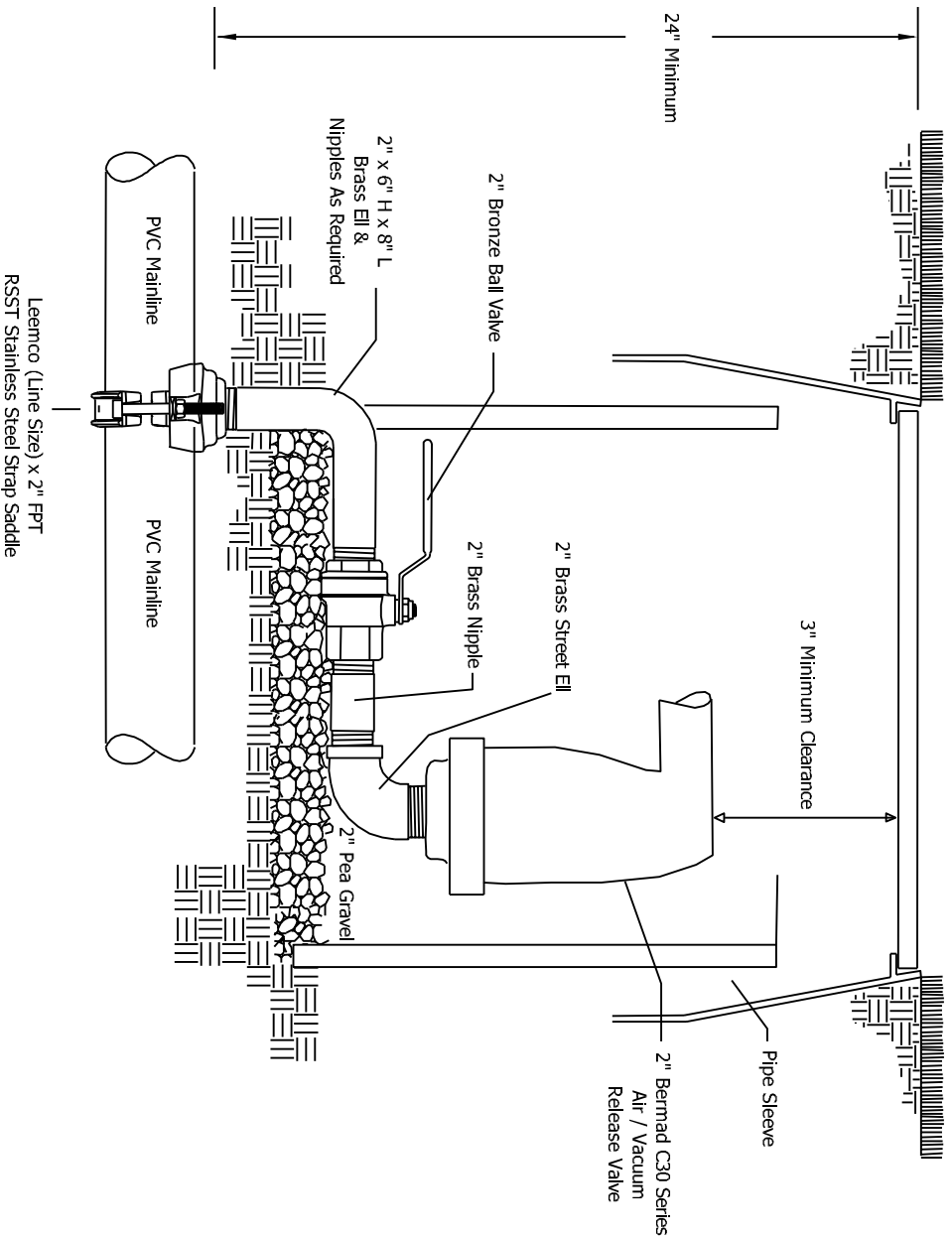


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6/25/10



VALVE BOX LID SHALL BE GREEN IN COLOR

JUMBO VALVE BOX MARKED "IRRIGATION VALVE"
CARSON-BROOKS #1324-12 WITH #1324-4 T-COVER OR EQUAL



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CONSTRUCTION DETAILS

PVC AIR / VACUUM RELEASE VALVE

CONSTRUCTION DRAWINGS

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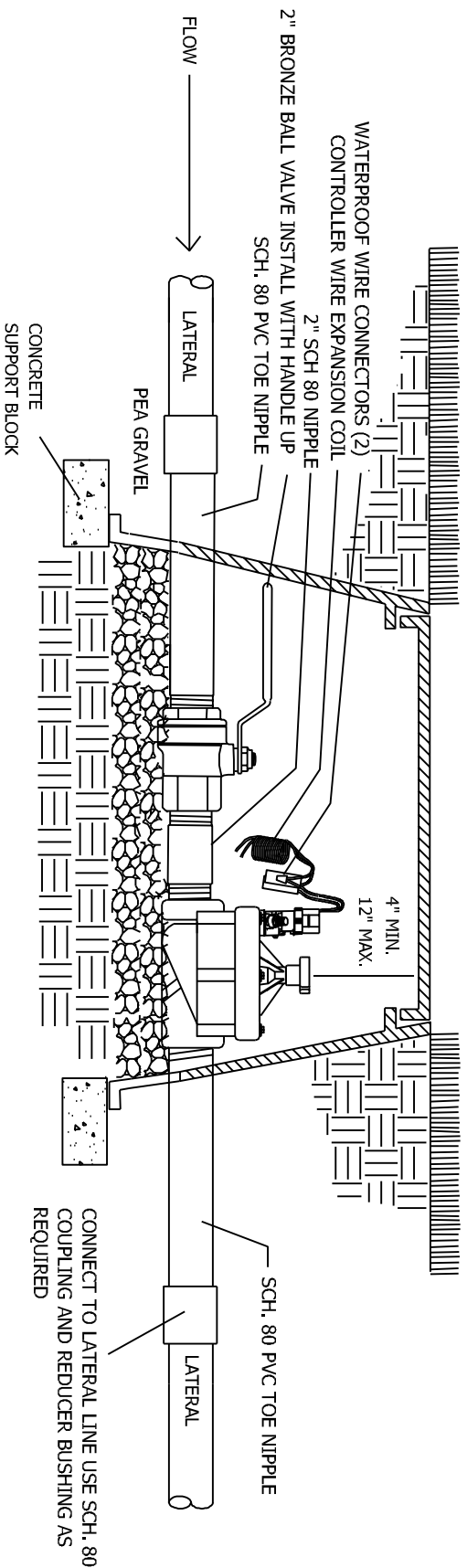


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7/20/17



VALVE BOX LID SHALL BE GREEN IN COLOR.
 VALVE BOX LID SHALL BE PURPLE IN COLOR FOR RECLAIMED WATER SYSTEMS, ATTACH RECLAIMED WATER WARNING TAG TO VALVE STEM

RECTANGULAR VALVE BOX MARKED "IRRIGATION VALVE"
 CARSON-BROOKS 1220-12 W/ 1220-4 T-COVER OR APPROVED EQUAL



SCH. 80 PVC TOE NIPPLE
 LATERAL
 CONNECT TO LATERAL LINE USE SCH. 80 COUPLING AND REDUCER BUSHING AS REQUIRED

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CONSTRUCTION DETAILS

REMOTE CONTROL BLOCK VALVE

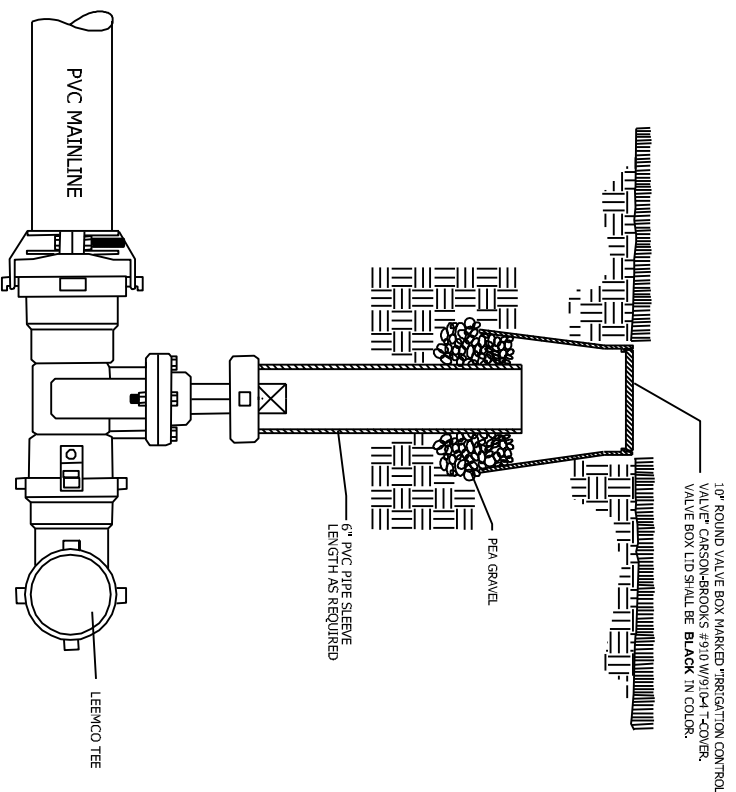
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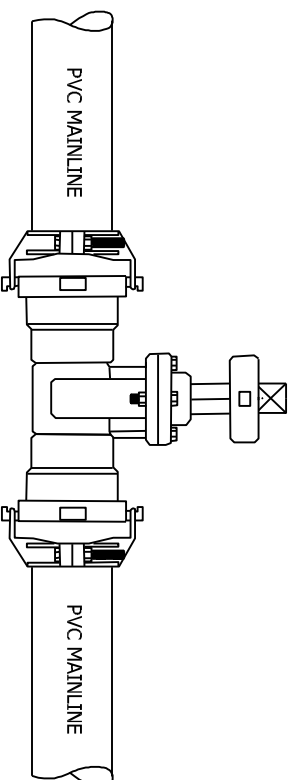
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LEEMCO MAINLINE GATE VALVE LMV-XXSB
SPIGOT X BELL (SHOWN CONNECTED TO TEE)

REFER TO LEEMCO LITERATURE FOR MINIMUM RESTRAINED LENGTH OF MAINLINE BEFORE AND AFTER JOINT



LEEMCO DEEP SLANT BELL
SELF-RESTRAINED

LEEMCO MAINLINE GATE VALVE LMV-XXBB
BELL X BELL (SHOWN CONNECTED TO PVC MAINLINE)

NOTE: WHEN ATTACHING NEW MAINLINE PIPE TO EXISTING MAINLINE GATE VALVES, AS MAY BE REQUIRED WITH EXISTING BRIDGE OR ROAD CROSSINGS, USE AN APPROPRIATE LEEMCO JOINT RESTRAINT AS REQUIRED THAT WILL WORK WITH THE MAKE AND MODEL OF THE EXISTING MAINLINE GATE VALVE

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CONSTRUCTION DETAILS

**LEEMCO MAINLINE GATE VALVE (MGV)
SELF-RESTRAINED DEEP SLANT BELL**

CONSTRUCTION DRAWINGS

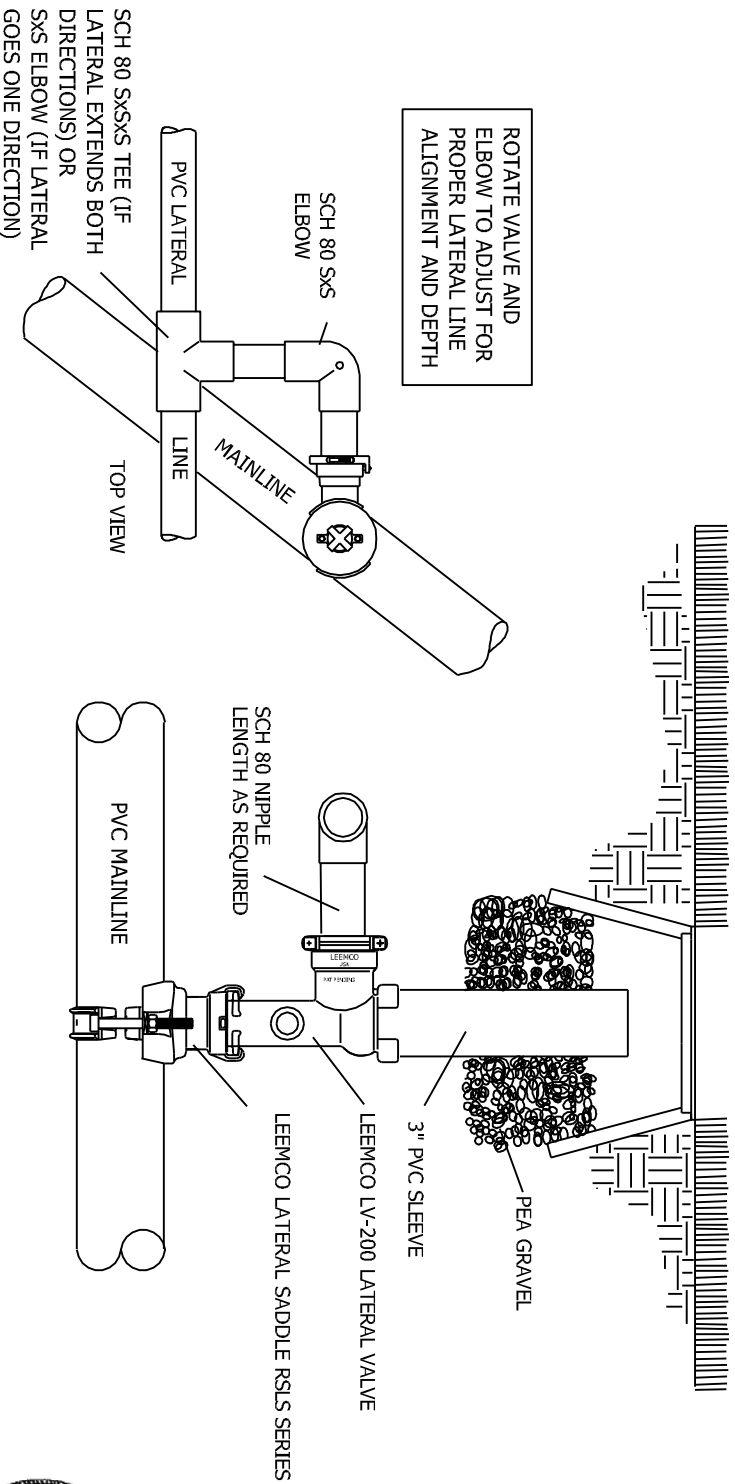
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VALVE BOX LID SHALL BE GREEN IN COLOR.

VALVE BOX LID SHALL BE PURPLE IN COLOR FOR RECLAIMED WATER SYSTEMS, ATTACH RECLAIMED WATER WARNING TAG TO VALVE STEM

10" ROUND VALVE BOX MARKED "IRRIGATION VALVE"
CARSON-BROOKS #910 W/910-4 T-COVER OR
APPROVED EQUAL



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CONSTRUCTION DETAILS

PVC LATERAL ISOLATION VALVE

CONSTRUCTION DRAWINGS

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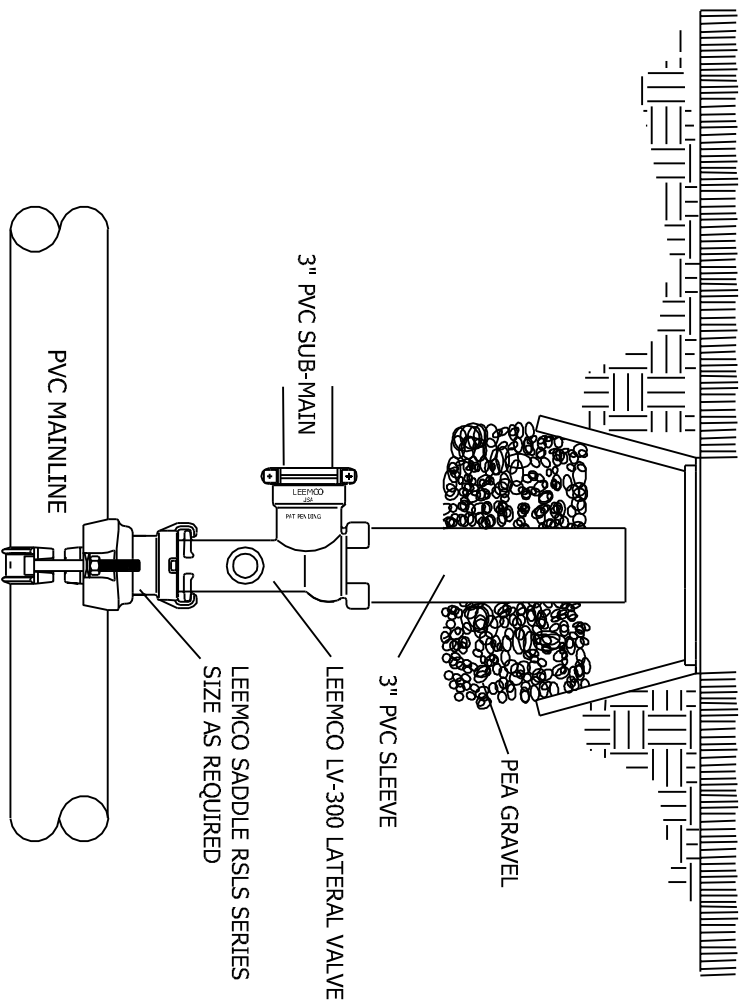
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8/29/19



VALVE BOX LID SHALL BE GREEN IN COLOR.

VALVE BOX LID SHALL BE PURPLE IN COLOR FOR RECLAIMED WATER SYSTEMS, ATTACH RECLAIMED WATER WARNING TAG TO VALVE STEM

10" ROUND VALVE BOX MARKED "IRRIGATION VALVE"
CARSON-BROOKS #910 W/910-4 T-COVER OR
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CONSTRUCTION DETAILS

PVC SUB-MAIN ISOLATION VALVE

CONSTRUCTION DRAWINGS

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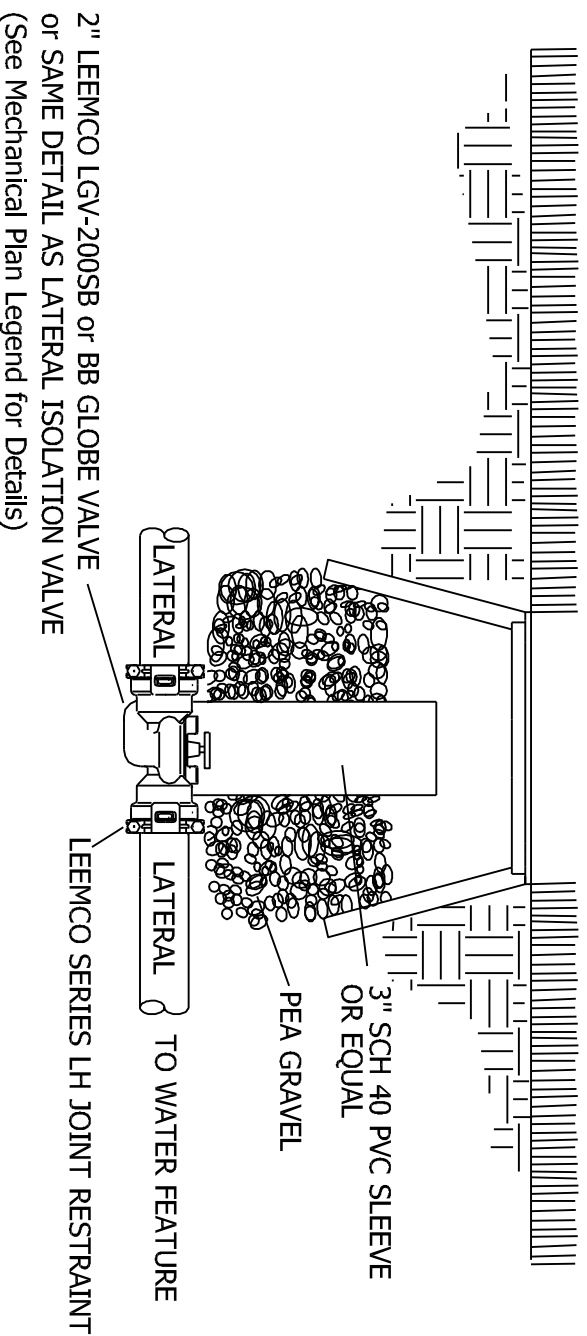
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VALVE BOX LID SHALL BE GREEN IN COLOR.

VALVE BOX LID SHALL BE PURPLE IN COLOR FOR RECLAIMED WATER SYSTEMS, ATTACH RECLAIMED WATER WARNING TAG TO VALVE STEM

10" ROUND VALVE BOX MARKED "IRRIGATION VALVE"
CARSON-BROOKS #910 W/910-4 T-COVER OR
APPROVED EQUAL



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CONSTRUCTION DETAILS

**LAKE FILL / DRAIN VALVE
(MANUAL)**

CONSTRUCTION DRAWINGS

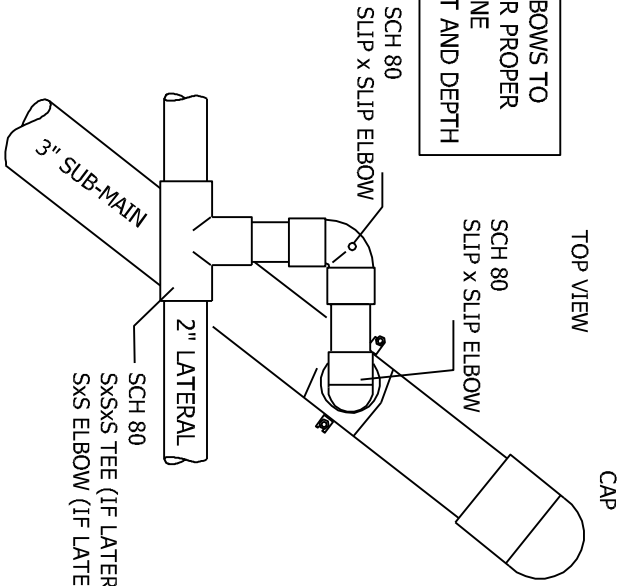
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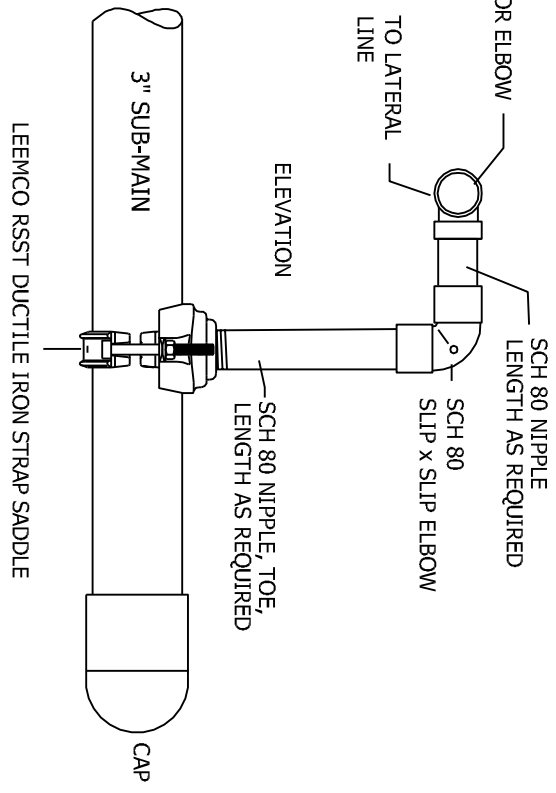


ROTATE ELBOWS TO ADJUST FOR PROPER LATERAL LINE ALIGNMENT AND DEPTH



TOP VIEW

CAP



TO LATERAL LINE

ELEVATION

3" SUB-MAIN

LEEMCO RSST DUCTILE IRON STRAP SADDLE

SCH 80 NIPPLE, TEE, LENGTH AS REQUIRED

SCH 80 SLIP X SLIP ELBOW

SCH 80 NIPPLE LENGTH AS REQUIRED

CAP

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CONSTRUCTION DETAILS

PVC SUB-MAIN / LATERAL CONNECTION

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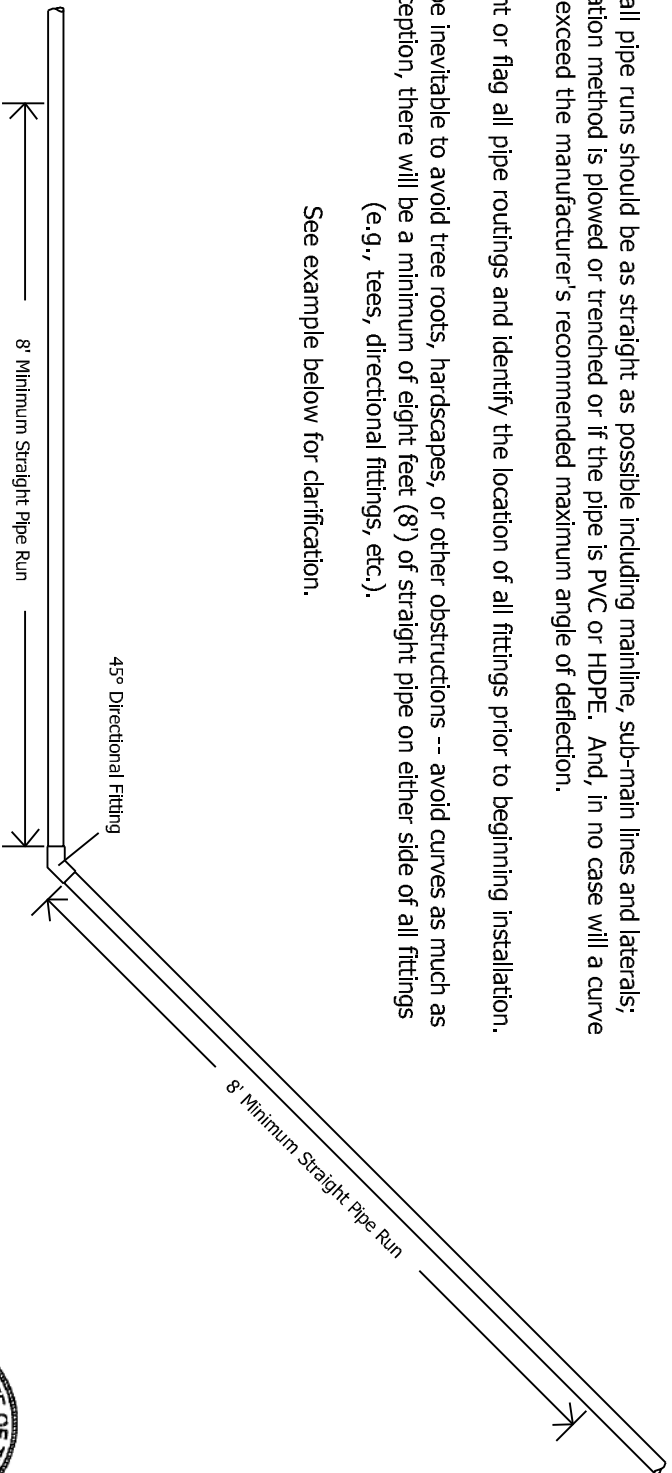
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 9/2/19

Generally speaking, all pipe runs should be as straight as possible including mainline, sub-main lines and laterals; regardless if the installation method is plowed or trenched or if the pipe is PVC or HDPE. And, in no case will a curve exceed the manufacturer's recommended maximum angle of deflection.

The contractor will paint or flag all pipe routings and identify the location of all fittings prior to beginning installation.

Some curvature may be inevitable to avoid tree roots, hardscapes, or other obstructions -- avoid curves as much as possible. Without exception, there will be a minimum of eight feet (8') of straight pipe on either side of all fittings (e.g., tees, directional fittings, etc.).

See example below for clarification.



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CONSTRUCTION DETAILS

PIPE ROUTING AND FITTINGS

CONSTRUCTION DRAWINGS

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6/27/13



PVC PIPE CURVATURE / RADIUS

Theoretically, PVC mainlines or laterals may be curved to change the alignment to avoid obstructions. When an instance occurs that the straight-line pipe path has to be altered, the offset shall not be offset to a tighter radius than shown below.

Before considering bending pipe, consider these manufacturer's words of caution:

- 1) all longitudinal bending of the pipe must occur in the length of the pipe and the gasketed joint must be stabilized with a maximum of 1° of deflection between the bell of one pipe and the spigot end of the other;
- 2) it is difficult to bend pipe longitudinally without exceeding the 1° maximum deflection at the gasketed joint, period;
- 3) if after bending the pipe longitudinally successfully without exceeding the maximum deflection at the gasketed joint, if the pipe is under any undue stress that would prohibit making future repairs (e.g., cutting the pipe and installing a repair coupler without the pipe springing back into a straight line), install the appropriate directional fitting.

All measurements below are made with the assumption that a 20' section of gasketed pipe is being used.

<u>Pipe Diameter (In.)</u>	<u>Minimum Radius (Ft.)</u>	<u>Maximum Offset (In.)</u>
1.5"	48	50"
2"	59	40"
2.5"	72	33"
3"	88	27"
4"	100	24"
6"	150	16"
8"	200	12"
10"	250	10"
12"	300	8"
16"	400	6"
24"	600	4"

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CONSTRUCTION DETAILS

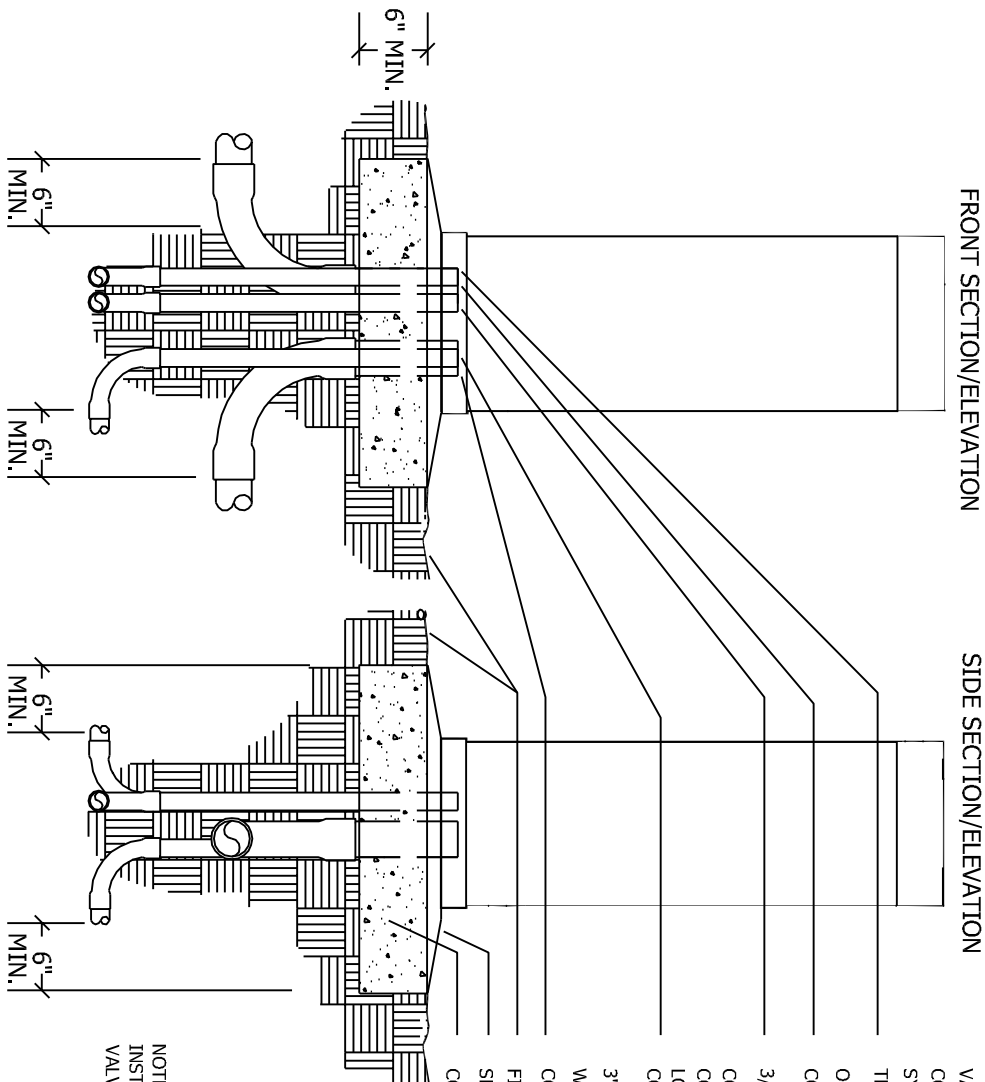
PVC PIPE CURVATURE / RADIUS

CONSTRUCTION DRAWINGS

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IRRIGATION CONTROLLER
 SEE PLAN FOR MODEL AND
 NUMBER OF STATIONS.



- OPTIONAL 3" CONDUIT FOR VALVE WIRES OR HYDRAULIC CONTROL TUBES (FOR SYSTEMS WITH GREATER THAN 32 STATIONS)
- OPTIONAL 3/4" CONDUIT FOR COMM CABLE IF APPLICABLE
- 3/4" CONDUIT FOR GROUND CONDUIT WITH INPUT POWER CONDUCTORS PER PLAN & LOCAL & NATIONAL ELECTRICAL CODES.
- 3" CONDUIT FOR VALVE WIRES OR HYDRAULIC CONTROL TUBES
- FINISHED SURFACE
- SLOPE TO DRAIN
- CONCRETE FOOTING

NOTE: GROUND RODS SHALL BE INSTALLED IN CARSON-BROOKS VALVE BOX # 708 w/ 708-4 T-COVER

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CONSTRUCTION DETAILS

FIELD CONTROLLER

CONSTRUCTION DRAWINGS

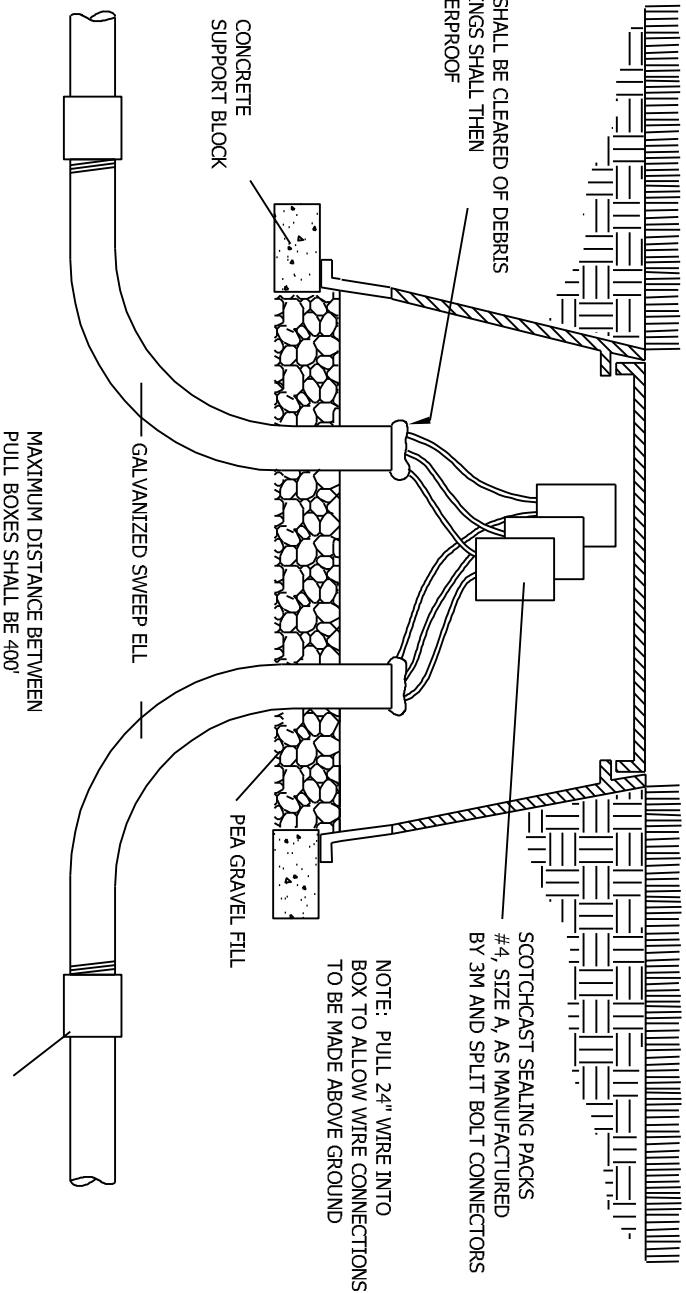
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 1/11/10



JUNCTION BOX MARKED "ELECTRIC"
 CARSON-BROOKS # 1220-12 w/T-COVER
 T-COVER SHALL BE **GRAY** IN COLOR



NOTE: CONDUIT AND ELLS SHALL BE CLEARED OF DEBRIS AND MOISTURE, ALL OPENINGS SHALL THEN BE SEALED AND MADE WATERPROOF

NOTE: PULL 24" WIRE INTO BOX TO ALLOW WIRE CONNECTIONS TO BE MADE ABOVE GROUND

PVC CONDUIT AND SCH 80 FEMALE ADAPTER (IF REQD)

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CONSTRUCTION DETAILS

ELECTRIC JUNCTION BOX

CONSTRUCTION DRAWINGS

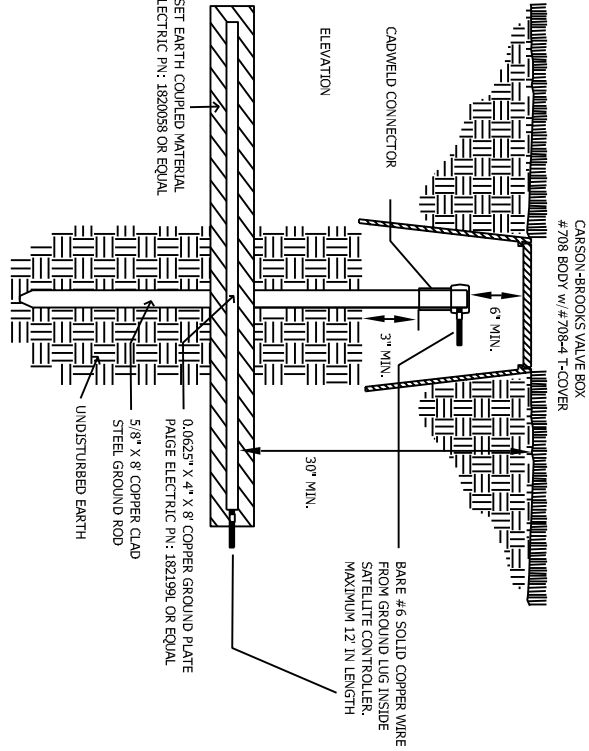
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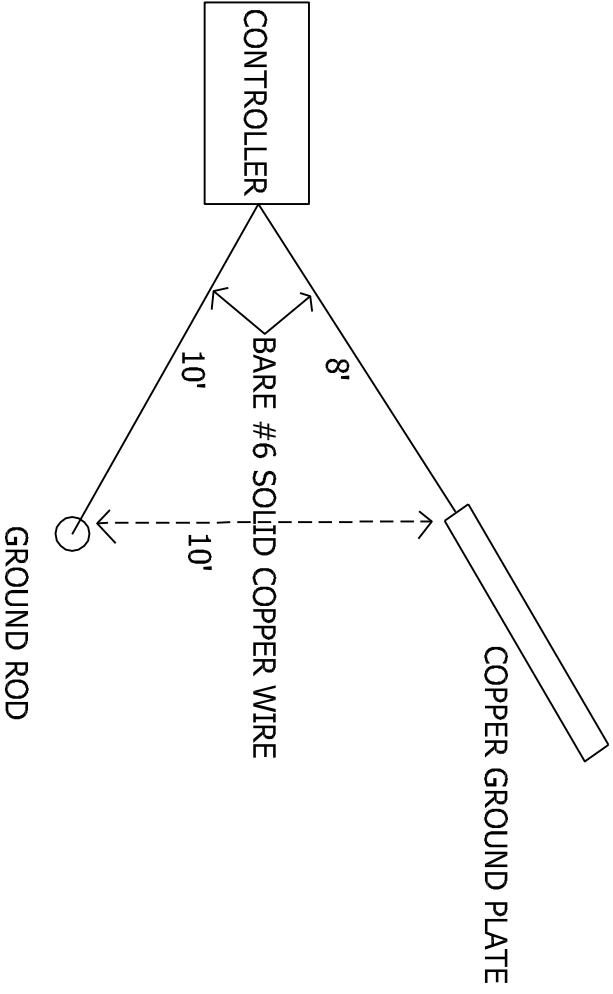
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FOLLOW SATELLITE MANUFACTURER'S RECOMMENDATIONS FOR NUMBER AND SPACING OF GROUND RODS AND GROUNDING PLATES



TOP VIEW



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CONSTRUCTION DETAILS

GROUNDING ROD w/ GROUNDING PLATE

CONSTRUCTION DRAWINGS

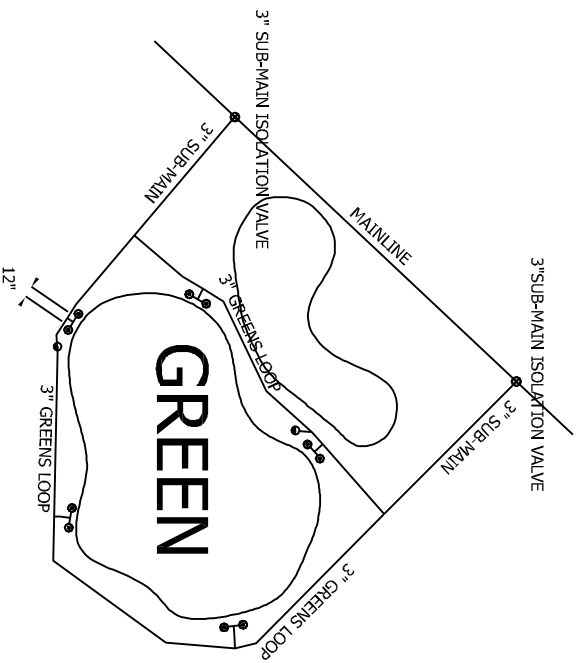
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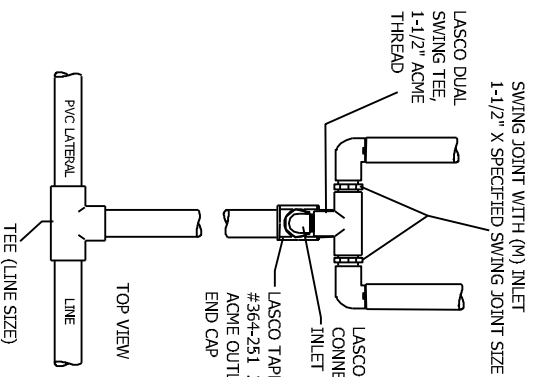


INSTALL SPRINKLERS AND QUICK COUPLERS SIDE BY SIDE ON A LINE PARALLEL TO THE EDGE OF THE GREEN -- PROVIDE 12" OF SEPARATION BETWEEN EACH SPRINKLER AND BETWEEN QUICK COUPLER AND ADJACENT SPRINKLER

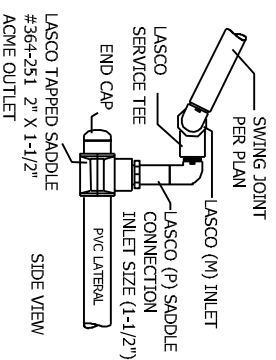
INSTALL SPRINKLERS OUTSIDE MOWED COLLAR OF GREEN ON EXISTING GREENS (UNLESS OTHERWISE DIRECTED BY GOLF COURSE SUPERINTENDENT) -- ON NEW CONSTRUCTION, INSTALL SPRINKLERS NO CLOSER THAN 18" FROM CAVITY OF GREEN

ALL PIPE RUNS SHOULD BE AS STRAIGHT AS POSSIBLE. INSTALL APPROPRIATE FITTINGS WHEN ANY CURVE WILL EXCEED THE MANUFACTURER'S ALLOWABLE ANGLE OF DEFLECTION. REFER TO PIPE ROUTING AND FITTINGS DETAIL.

AS YOU ARE STANDING BEHIND THE SPRINKLERS LOOKING AT THE GREEN, THE SPRINKLER ON THE LEFT IS THE INBOARD (ARC SET TO WATER THE GREEN) AND THE SPRINKLER ON THE RIGHT IS THE OUTBOARD (ARC SET TO WATER THE SURROUNDS AND APPROACH)



ROTATE (P) CONNECTOR TO ORIENT SPRINKLERS PARALLEL TO EDGE OF GREEN



CONSTRUCTION DETAILS

PVC DUAL HEAD PLACEMENT AROUND GREENS

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CONSTRUCTION DRAWINGS

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REFER TO THE FOLLOWING TABLE THAT LISTS THE LENGTH (IN FEET) FOR EACH SIZE/TYPE FITTING WITHIN WHICH ALL JOINTS JUST BE RESTRAINED. ALL FITTINGS AND JOINT RESTRAINTS SHALL BE INSTALLED PER MANUFACTURERS RECOMMENDATIONS & SPECIFICATIONS.

AS AN EXAMPLE, IF YOU ARE INSTALLING A 3" MAINLINE WITH A DIRECTIONAL CHANGE OF 90°, REFER TO CHART UNDER PIPE SIZE TO 3" AND UNDER BENDS 90 YOU WILL SEE THE DISTANCE OF 11'. IF THERE IS ANY JOINT (VALVE, BELL, ETC.) YOU MUST INSTALL A JOINT RESTRAINT WITHIN 11' OF THE 90° MAINLINE DIRECTIONAL CHANGE.

PIPE SIZE	BENDS				REDUCERS			DEAD END	
	11°	22°	45°	90°	1 STEP	2 STEP	3 STEP	BLIND	SERV. B.
2"	1'	1'	2'	6'	-	-	-	19'	6'
2.5"	1'	2'	4'	9'	4'	-	-	23'	10'
3"	2'	3'	6'	11'	8'	10'	-	30'	15'
4"	2'	4'	9'	20'	14'	20'	31'	45'	25'
6"	3'	6'	13'	29'	30'	40'	53'	63'	40'
8"	4'	8'	15'	38'	33'	55'	63'	75'	70'
10"	5'	9'	19'	45'	36'	56'	75'	96'	90'
12"	5'	10'	21'	53'	38'	60'	83'	112'	110'

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CONSTRUCTION DETAILS

LEEMCO JOINT RESTRAINT DISTANCE CHART

CONSTRUCTION DRAWINGS

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REFER TO THE FOLLOWING TABLE WHICH LISTS THE NUMBER OF BOLTS, SIZE, AND TORQUE FOR EACH BOLT IN REFERENCE TO THE SIZE OF PIPE WHICH IS BEING RESTRAINED.

AS AN EXAMPLE, IF YOU HAVE A 3" PIPE, YOU WILL NEED 2 BOLTS THAT ARE 3/8" X 2.5" AND TIGHTEN THEM WITH A TORQUE WRENCH TO 20 FT-LBS.

PIPE SIZE	NO. BOLTS	BOLT SIZE	TORQUE FT-LBS.
2"	2	3/8" X 2.5"	20
2.5"	2	3/8" X 2.5"	20
3"	2	3/8" X 2.5"	20
4"	2	1/2" X 3"	50
6"	2	1/2" X 3.5"	50
8"	4	1/2" X 4"	50
10"	4	5/8" X 5.5"	100
12"	4	5/8" X 5.5"	100

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CONSTRUCTION DETAILS

**LEEMCO JOINT RESTRAINT
INSTALLATION CHART**

CONSTRUCTION DRAWINGS

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