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SECTION 101 - MOBILIZATION	RT	3
SECTION 102 - MAINTENANCE OF TRAFFIC	RT	1
SECTION 104 - PREVENTION, CONTROL, AND ABATEMENT OF EROSION AND WATER POLLUTION	RT	2
SECTION 110 - CLEARING AND GRUBBING	RT	2
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Project: **Commons Parking Lot Expansion**  
Project No.: **PR1602**

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711-RPB-1	Thermoplastic Striping on Asphalt	1	LS		
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**TOTAL BASE BID: \$** \_\_\_\_\_

\_\_\_\_\_ Dollars

(Amount written in words has precedence)

**TOTAL NUMBER OF DAYS:** \_\_\_\_\_ **Days**

\_\_\_\_\_ Days

Date: \_\_\_\_\_

The contractor's signature below provides assurance that Addenda #1 through \_\_\_\_ have been received and are included in the estimate in the above bid.

CONTRACTOR: \_\_\_\_\_

PR1602  
BF-19

Addendum 5  
9/30/2020



Addendum 5  
9/30/2020



Designed: TH  
Drawn: TH  
Checked: TH

No.	Revisions	By	Date
	BID SET	TAH	02.23.08

RPBP1  
AQUA TURF INTERNATIONAL  
5500 Military Trail, Suite 22-316, Palm Beach, FL 33448  
Phone: (561) 627-0464 Fax: (561) 627-0421  
www.aquaturf.com

ROYAL PALM BEACH COMMONS  
ROYAL PALM BEACH  
PARK IRRIGATION DESIGN  
KEY PLAN

EN-PR0701  
Sheet Reference Number  
IP 1.00  
Sheet \_\_\_ of \_\_\_

PARK IRRIGATION LEGEND

SYMBOL	MODEL / DESCRIPTION	QTY	PSI
[Symbol]	8P-COM-PC 4' STRIP SPRAY TURF SPRAY, 6" POPUP WITH CHECK VALVE, PRESSURE COMPENSATION NOZZLE	103	30
[Symbol]	8P-COM-PC 8' RADIUS TURF SPRAY, 6" POPUP WITH CHECK VALVE, PRESSURE COMPENSATION NOZZLE	286	30
[Symbol]	8P-COM-PC 10' RADIUS TURF SPRAY, 6" POPUP WITH CHECK VALVE, PRESSURE COMPENSATION NOZZLE	131	30
[Symbol]	8P-COM-PC 12' RADIUS TURF SPRAY, 6" POPUP WITH CHECK VALVE, PRESSURE COMPENSATION NOZZLE	204	30
[Symbol]	8P-COM-PC 15' RADIUS TURF SPRAY, 6" POPUP WITH CHECK VALVE, PRESSURE COMPENSATION NOZZLE	617	30
[Symbol]	8P-COM-PC ADJ TURF SPRAY, 6" POPUP WITH CHECK VALVE, PRESSURE COMPENSATION NOZZLE	45	30
[Symbol]	2P-COM-PC 2' STRIP SPRAY PRESSURE COMPENSATION NOZZLE.	2	30
[Symbol]	12P-COM-PC 4' STRIP SPRAY PRESSURE COMPENSATION NOZZLE.	43	30
[Symbol]	12P-COM-PC 8' RADIUS PRESSURE COMPENSATION NOZZLE.	137	30
[Symbol]	12P-COM-PC 10' RADIUS PRESSURE COMPENSATION NOZZLE.	95	30
[Symbol]	12P-COM-PC 12' RADIUS PRESSURE COMPENSATION NOZZLE.	120	30
[Symbol]	12P-COM-PC 15' RADIUS PRESSURE COMPENSATION NOZZLE.	171	30
[Symbol]	12P-COM-PC ADJ PRESSURE COMPENSATION NOZZLE.	15	30
[Symbol]	SB-PC BUBBLER ON FIXED RISER	832	30

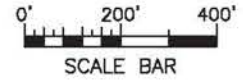
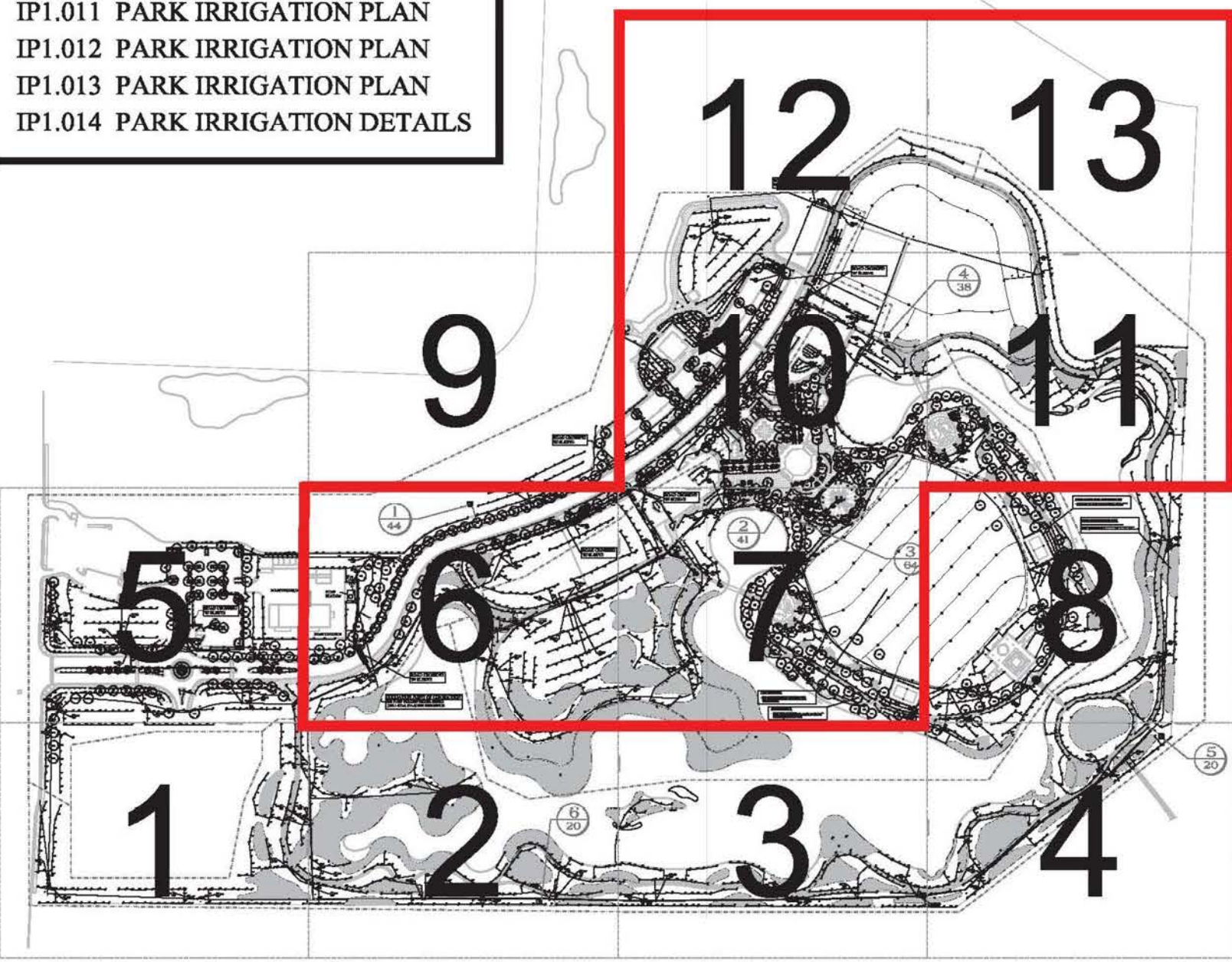
SYMBOL	MODEL / DESCRIPTION	QTY	PSI	GPM	RADIUS
[Symbol]	TURF ROTOR, 5" LAWN POPUP, WITH CHECK VALVE, ADJUSTABLE 40-360 ARC.	641	30	1.3	30'
[Symbol]	TURF ROTOR, 5" LAWN POPUP, WITH CHECK VALVE, ADJUSTABLE 40-360 ARC.	130	30	2.4	35'
[Symbol]	TURF ROTOR, 5" LAWN POPUP, WITH CHECK VALVE, ADJUSTABLE 40-360 ARC.	258	30	3.6	36'
[Symbol]	TURF ROTOR, 5" LAWN POPUP, WITH CHECK VALVE, ADJUSTABLE 40-360 ARC.	55	30	4.4	40'
[Symbol]	TURF ROTOR, 5" LAWN POPUP, WITH CHECK VALVE, ADJUSTABLE 40-360 ARC.	12	30	5.9	42'
[Symbol]	TURF ROTOR, 5" LAWN POPUP, WITH CHECK VALVE, ADJUSTABLE 40-360 ARC.	660	30	8.0	39'
[Symbol]	SHRUB ROTOR, 12" POPUP, ADJUSTABLE AND FULL CIRCLE	32	30	1.2	36'
[Symbol]	FULL CIRCLE TURF ROTOR, ELECTRIC VALVE IN HEAD.	11	80	24.7	67'
[Symbol]	FULL CIRCLE TURF ROTOR, ELECTRIC VALVE IN HEAD.	43	80	37.1	77'
[Symbol]	FULL CIRCLE TURF ROTOR, ELECTRIC VALVE IN HEAD.	4	80	43.5	80'
[Symbol]	PART CIRCLE TURF ROTOR, ADJUSTABLE 40-345 ARC.	41	80		79'
[Symbol]	PART CIRCLE TURF ROTOR, ADJUSTABLE 40-345 ARC, ELECTRIC VALVE IN HEAD.	2	80		81'
[Symbol]	PART CIRCLE TURF ROTOR, ADJUSTABLE 40-345 ARC, ELECTRIC VALVE IN HEAD.	3	80		80'

SYMBOL	MODEL / DESCRIPTION	QTY
[Symbol]	2" LATERAL 90 DEGREE VALVE WITH 2" ELECTRIC REMOTE CONTROL VALVE, PRESSURE REGULATOR, 50 HZ SOLENOID, IN-LINE.	124
[Symbol]	4" LATERAL ISOLATION VALVE FOR LARGE VALVE IN HEAD ROTORS	6
[Symbol]	CJ. MAINLINE VALVE	29
[Symbol]	1" QUICK COUPLER VALVE, ONE PIECE, ACME THREAD, EFFLUENT LOCKING COVER, STABILIZATION SUPPORT BAR	76
[Symbol]	4" CL 200 PVC GASKETED PIPE	7,300 LF.
[Symbol]	6" CL 200 PVC GASKETED PIPE	3,500 LF.
[Symbol]	8" CL 200 PVC GASKETED PIPE	7,300 LF.
[Symbol]	10" CL 200 PVC GASKETED PIPE	300 LF.
[Symbol]	IRRIGATION LATERAL LINE: PVC CLASS 200 SDR 21 SOLVENT WELD 3/4" THRU 3"	68,092 LF.
[Symbol]	PIPE SLEEVE: PVC SCHEDULE 40 TYPICAL PIPE SLEEVE FOR IRRIGATION PIPE. PIPE SLEEVE SIZE SHALL ALLOW FOR IRRIGATION PIPING AND THEIR RELATED COUPLINGS TO EASILY SLIDE THROUGH SLEEVING MATERIAL. EXTEND SLEEVES 18 INCHES BEYOND EDGES OF PAVING OR CONSTRUCTION.	2,036 LF.



PAGE INDEX

- IP0.00 COVER
- IP1.00 KEY PLAN
- IP1.01 PARK IRRIGATION PLAN
- IP1.02 PARK IRRIGATION PLAN
- IP1.03 PARK IRRIGATION PLAN
- IP1.04 PARK IRRIGATION PLAN
- IP1.05 PARK IRRIGATION PLAN
- IP1.06 PARK IRRIGATION PLAN
- IP1.07 PARK IRRIGATION PLAN
- IP1.08 PARK IRRIGATION PLAN
- IP1.09 PARK IRRIGATION PLAN
- IP1.010 PARK IRRIGATION PLAN
- IP1.011 PARK IRRIGATION PLAN
- IP1.012 PARK IRRIGATION PLAN
- IP1.013 PARK IRRIGATION PLAN
- IP1.014 PARK IRRIGATION DETAILS





SEE SHEET: IP 1.09  
MATCHLINE

Addendum 5  
9/30/2020



By: TH  
Designed: TH  
Drawn: TH  
Checked: TH

No.	Date	By	Revisions
	02.23.09	TAH	BID SET

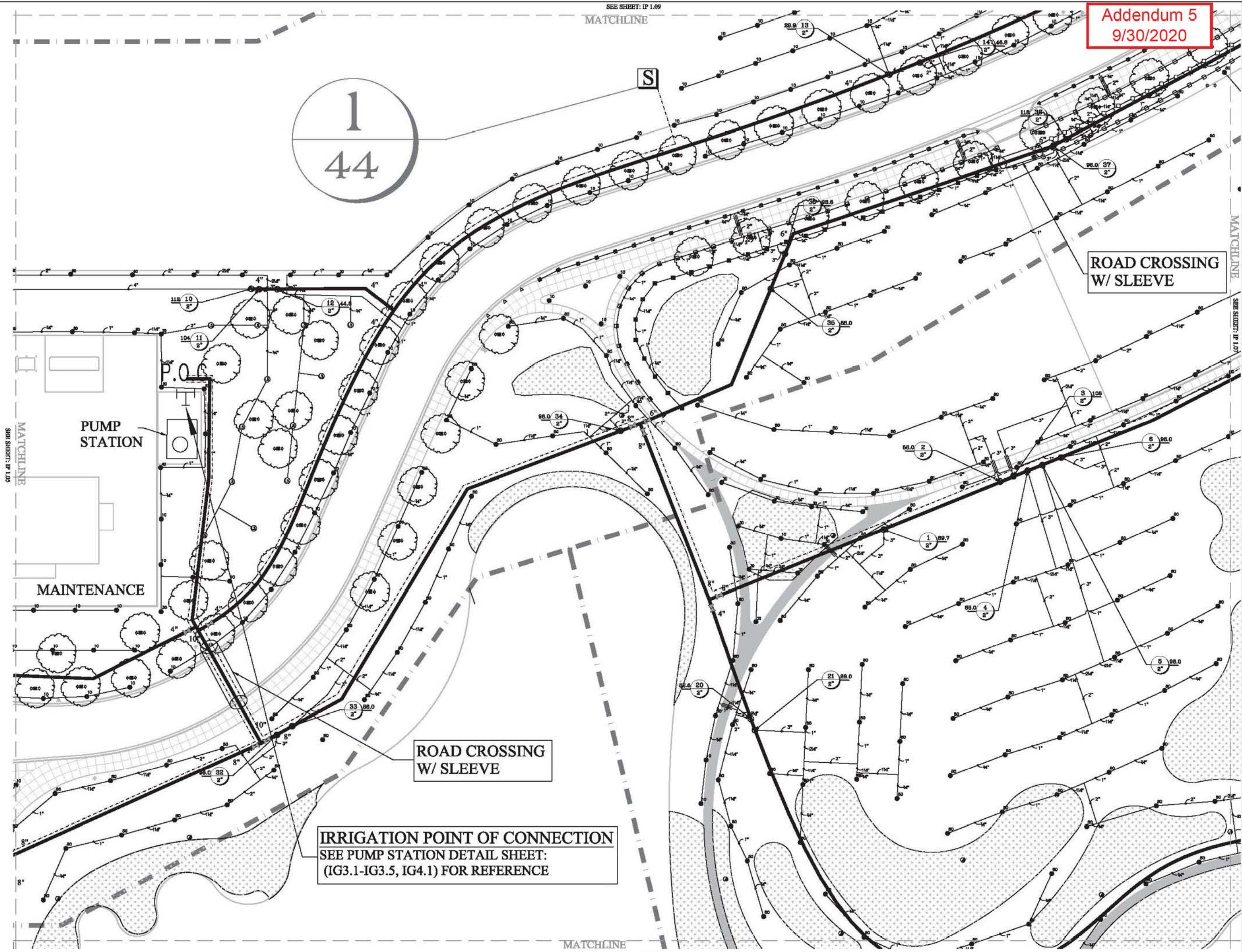
RPBP1  
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www.aquaturf.com

ROYAL PALM BEACH COMMONS  
ROYAL PALM BEACH  
PARK IRRIGATION DESIGN  
PLAN

EN-PR0701  
Sheet Reference  
Number  
IP 1.06  
Sheet \_\_\_ of \_\_\_



1  
44



MATCHLINE  
SEE SHEET: IP 1.05

PUMP  
STATION

MAINTENANCE

ROAD CROSSING  
W/ SLEEVE

ROAD CROSSING  
W/ SLEEVE

IRRIGATION POINT OF CONNECTION  
SEE PUMP STATION DETAIL SHEET:  
(IG3.1-IG3.5, IG4.1) FOR REFERENCE

MATCHLINE

SEE SHEET: IP 1.02































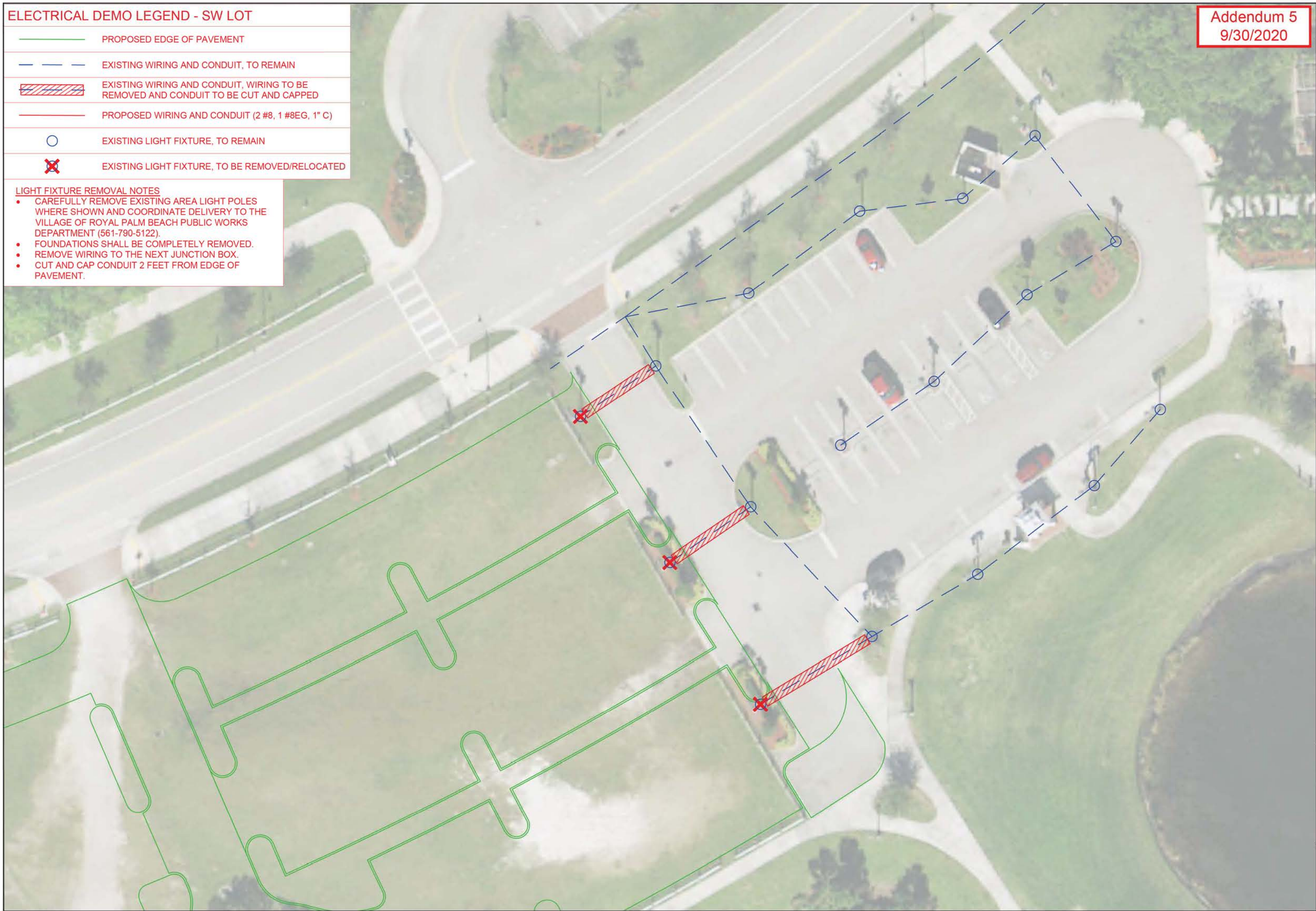
**ELECTRICAL DEMO LEGEND - SW LOT**

	PROPOSED EDGE OF PAVEMENT
	EXISTING WIRING AND CONDUIT, TO REMAIN
	EXISTING WIRING AND CONDUIT, WIRING TO BE REMOVED AND CONDUIT TO BE CUT AND CAPPED
	PROPOSED WIRING AND CONDUIT (2 #8, 1 #8EG, 1" C)
	EXISTING LIGHT FIXTURE, TO REMAIN
	EXISTING LIGHT FIXTURE, TO BE REMOVED/RELOCATED

**LIGHT FIXTURE REMOVAL NOTES**

- CAREFULLY REMOVE EXISTING AREA LIGHT POLES WHERE SHOWN AND COORDINATE DELIVERY TO THE VILLAGE OF ROYAL PALM BEACH PUBLIC WORKS DEPARTMENT (561-790-5122).
- FOUNDATIONS SHALL BE COMPLETELY REMOVED.
- REMOVE WIRING TO THE NEXT JUNCTION BOX.
- CUT AND CAP CONDUIT 2 FEET FROM EDGE OF PAVEMENT.








**Addendum 5**  
9/30/2020



SEAL Village of Royal Palm Beach Planning & Engineering 1600 Royal Palm Beach Boulevard Royal Palm Beach, FL 33411 Phone: (561) 790-2995	COMMONS PARKING LOT EXPANSION PR 1602 ELECTRICAL DEMO - SW LOT DRAWINGS\PROJECTS\COMMONS PARKING LOT EXPANSION\PR-1602\DRAWINGS\ELECTRICAL DEMO PLANS.DWG 9/30/2020	DESIGNED BY: AD DRAWN BY: AD REVIEWED BY: DM	DATE: SEPT 2020 SHEET: E-1 OF 2	
	By Date Revision Description	0 10 20 Feet	FORMATED FOR: 12" x 18"	



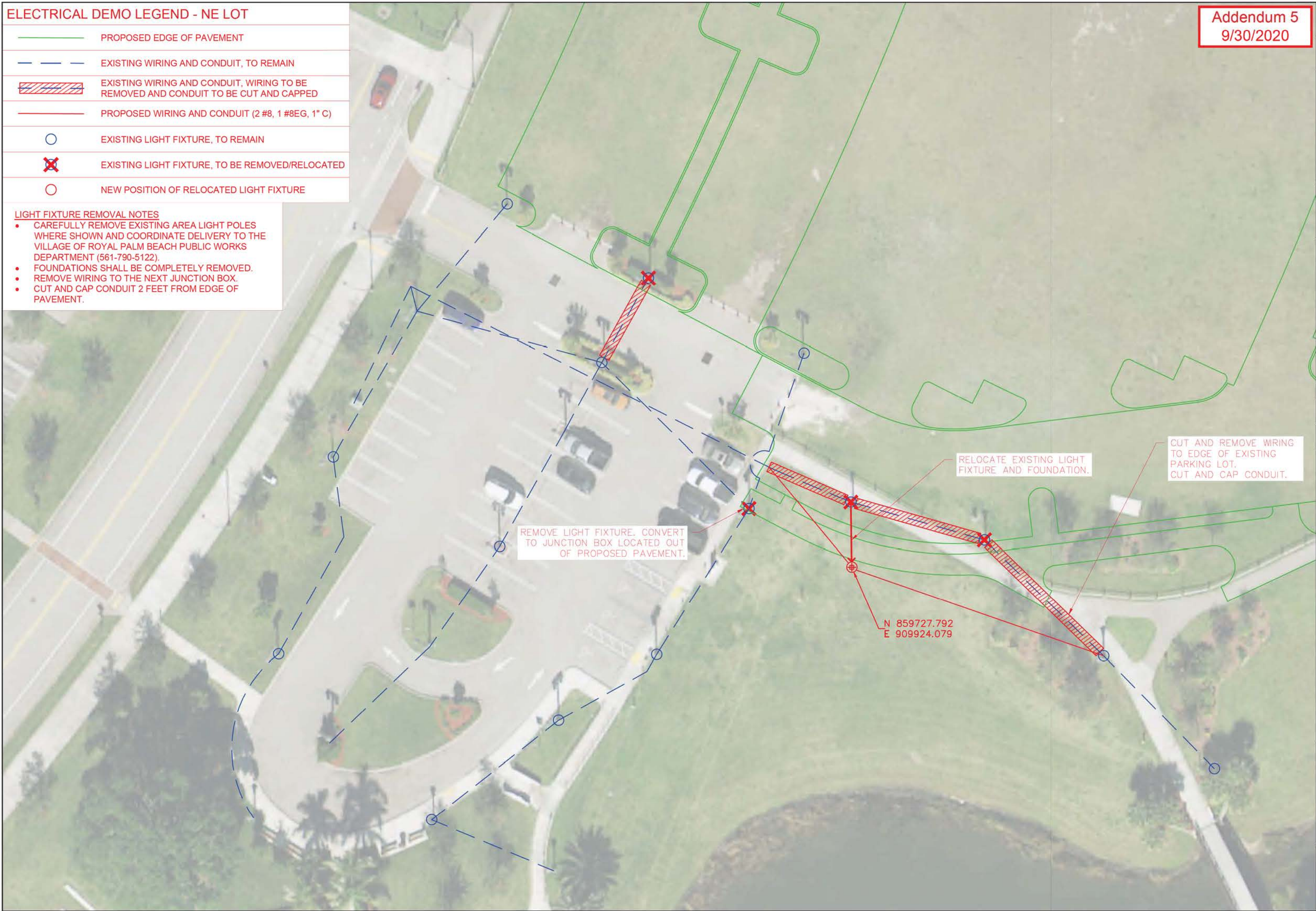
**ELECTRICAL DEMO LEGEND - NE LOT**


	PROPOSED EDGE OF PAVEMENT
	EXISTING WIRING AND CONDUIT, TO REMAIN
	EXISTING WIRING AND CONDUIT, WIRING TO BE REMOVED AND CONDUIT TO BE CUT AND CAPPED
	PROPOSED WIRING AND CONDUIT (2 #8, 1 #8EG, 1" C)
	EXISTING LIGHT FIXTURE, TO REMAIN
	EXISTING LIGHT FIXTURE, TO BE REMOVED/RELOCATED
	NEW POSITION OF RELOCATED LIGHT FIXTURE

**LIGHT FIXTURE REMOVAL NOTES**

- CAREFULLY REMOVE EXISTING AREA LIGHT POLES WHERE SHOWN AND COORDINATE DELIVERY TO THE VILLAGE OF ROYAL PALM BEACH PUBLIC WORKS DEPARTMENT (561-790-5122).
- FOUNDATIONS SHALL BE COMPLETELY REMOVED.
- REMOVE WIRING TO THE NEXT JUNCTION BOX.
- CUT AND CAP CONDUIT 2 FEET FROM EDGE OF PAVEMENT.

**Addendum 5**  
9/30/2020



 DESIGNED BY: AD DRAWN BY: AD REVIEWED BY: CM	DATE: SEPT 2020 SHEET: E-2 OF 2
	REVISION DESCRIPTION By Date
	COMMONS PARKING LOT EXPANSION PR 1602 ELECTRICAL DEMO - NE LOT DRAWINGS/ELECTRICAL DEMO PLANS.DWG 9/30/2020
SEAL Village of Royal Palm Beach Planning & Engineering 1000 Royal Palm Beach Boulevard Royal Palm Beach, FL 33411 Phone: (561) 790-5122	PROJECT: COMMONS PARKING LOT EXPANSION



**LEGEND**  
 PROPOSED EDGE OF PAVEMENT  
 REMOVE IRRIGATION PIPE AND HEADS

**Addendum 5**  
 9/30/2020



SEAL	Village of Royal Palm Beach Planning & Engineering Christopher A. Marsh, P.E., C2560 3050 Royal Palm Beach Boulevard Royal Palm Beach, FL 33411 Phone (561) 790-5131 Fax (561) 791-7095	COMMONS PARKING LOT EXPANSION PR 1602 IRRIGATION DEMO - SW LOT	By	Date	Revision Description	DESIGNED BY: AD	15 30 Feet DATE: SEPT 2020 SHEET: IR-1 OF 6	
			Drawn	Checked	Reviewed	DRAWN BY: AD		



# IRRIGATION SCHEDULE: SW LOT

## SPRINKLERS

GRAPHIC SYMBOL	NAME	SPACING	PSI	GPM	RADIUS	TOTAL COUNT ON THIS SHEET
■	TORO 570Z XF 6" POP-UP (12" IN SHRUBS)	10'	30	3.0	10'	225
●	TORO T5P ROTOR	40'	30	8.0	40'	22
⊙	TORO 514-20 500	AT EACH PROPOSED TREE	30	2.4		19

## PIPING

LINETYPE	PIPE	TOTAL LENGTH ON THIS SHEET (FT)
—	NEW PVC IRRIGATION	2544
▭	PVC SLEEVE	192
- - -	REPLACE EXISTING ROTOR HEADS WITH TORO DT55-51. CUT IN ADDITIONAL HEADS @ 10' ON CENTER	430

## SYSTEM DESIGN CRITERIA FOR LATERAL PIPE SIZES

GPM	PIPE SIZE
0 - 8	3/4"
8 - 15	1"
15 - 22	1-1/4"
22 - 32	1-1/2"
32 - 50	2"
50 - 68	3"

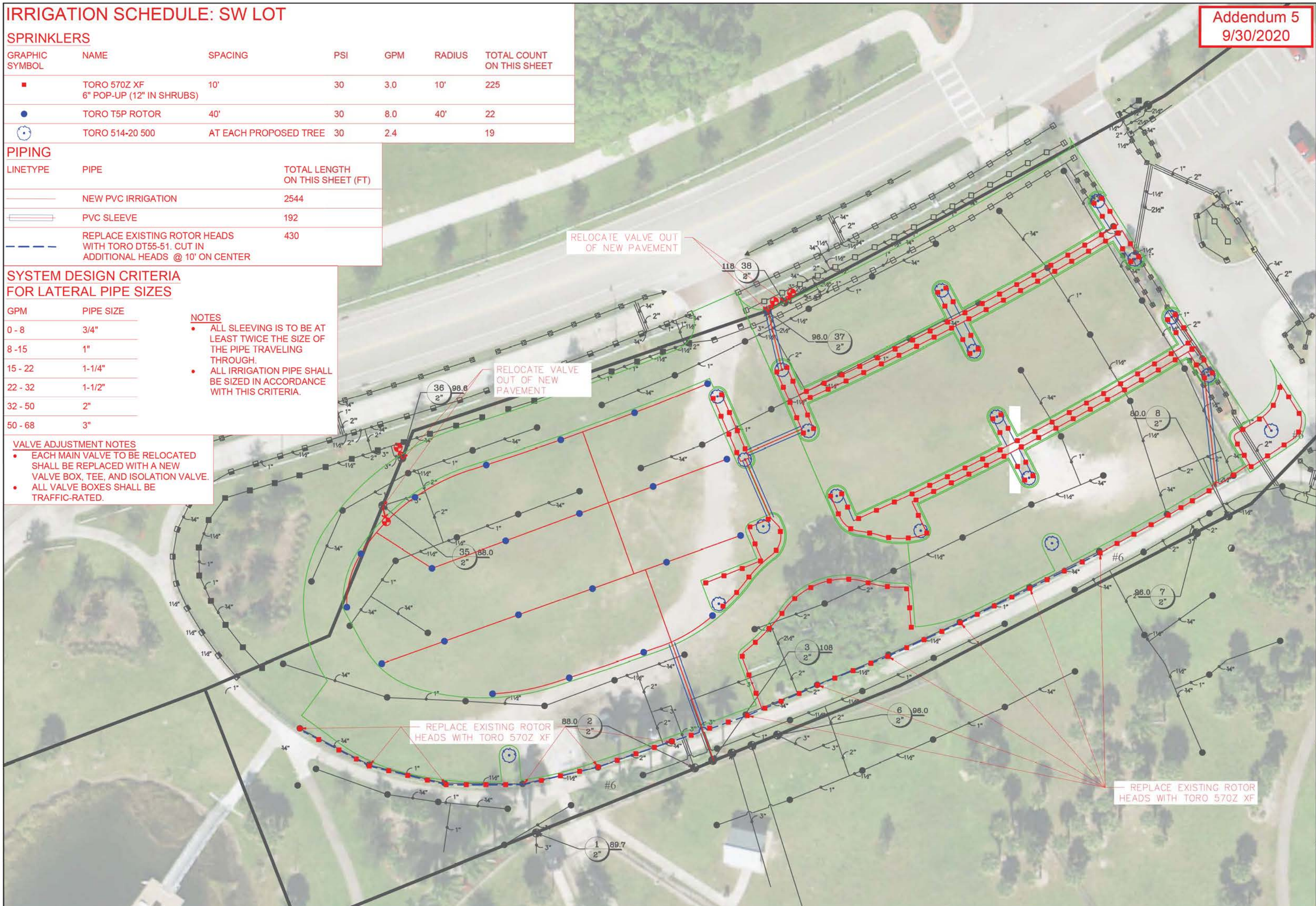
### NOTES

- ALL SLEEVING IS TO BE AT LEAST TWICE THE SIZE OF THE PIPE TRAVELING THROUGH.
- ALL IRRIGATION PIPE SHALL BE SIZED IN ACCORDANCE WITH THIS CRITERIA.

### VALVE ADJUSTMENT NOTES

- EACH MAIN VALVE TO BE RELOCATED SHALL BE REPLACED WITH A NEW VALVE BOX, TEE, AND ISOLATION VALVE.
- ALL VALVE BOXES SHALL BE TRAFFIC-RATED.

Addendum 5  
9/30/2020



DESIGNED BY: AD  
 DRAWN BY: AD  
 REVIEWED BY: CM  
 DATE: SEPT 2020  
 SHEET: IR-2 OF 6  
 COMMONS PARKING LOT EXPANSION  
 PR 1602  
 IRRIGATION - SW LOT  
 VILLAGE OF ROYAL PALM BEACH  
 PLANNING & ENGINEERING  
 1000 ROYAL PALM BEACH BOULEVARD  
 ROYAL PALM BEACH, FL 33411  
 PHONE: (561) 988-3333  
 FAX: (561) 988-3334  
 WWW.VILLAGEOFROYALPALMBEACH.COM



# IRRIGATION SCHEDULE: NE LOT

## SPRINKLERS

GRAPHIC SYMBOL	NAME	SPACING	PSI	GPM	RADIUS	TOTAL COUNT ON THIS SHEET
■	TORO 570Z XF 12" POP-UP	10'	30	3.0	10'	153
●	TORO T5P ROTOR	40'	30	8.0	40'	2
⊙	TORO 514-20 500	AT EACH PROPOSED TREE	30	2.4		26
○	NEW LOCATION FOR EXISTING LARGE HEAD					5
⊕	NEW LOCATION FOR EXISTING MAIN VALVE					5

## PIPING

LINETYPE	PIPE	TOTAL LENGTH ON THIS SHEET (FT)
—	NEW PVC IRRIGATION	2000
—	PVC SLEEVE	330
▨	REMOVE IRRIGATION PIPE AND HEADS	192

## SYSTEM DESIGN CRITERIA FOR LATERAL PIPE SIZES

GPM	PIPE SIZE
0 - 8	3/4"
8 - 15	1"
15 - 22	1-1/4"
22 - 32	1-1/2"
32 - 50	2"
50 - 68	3"

### NOTES

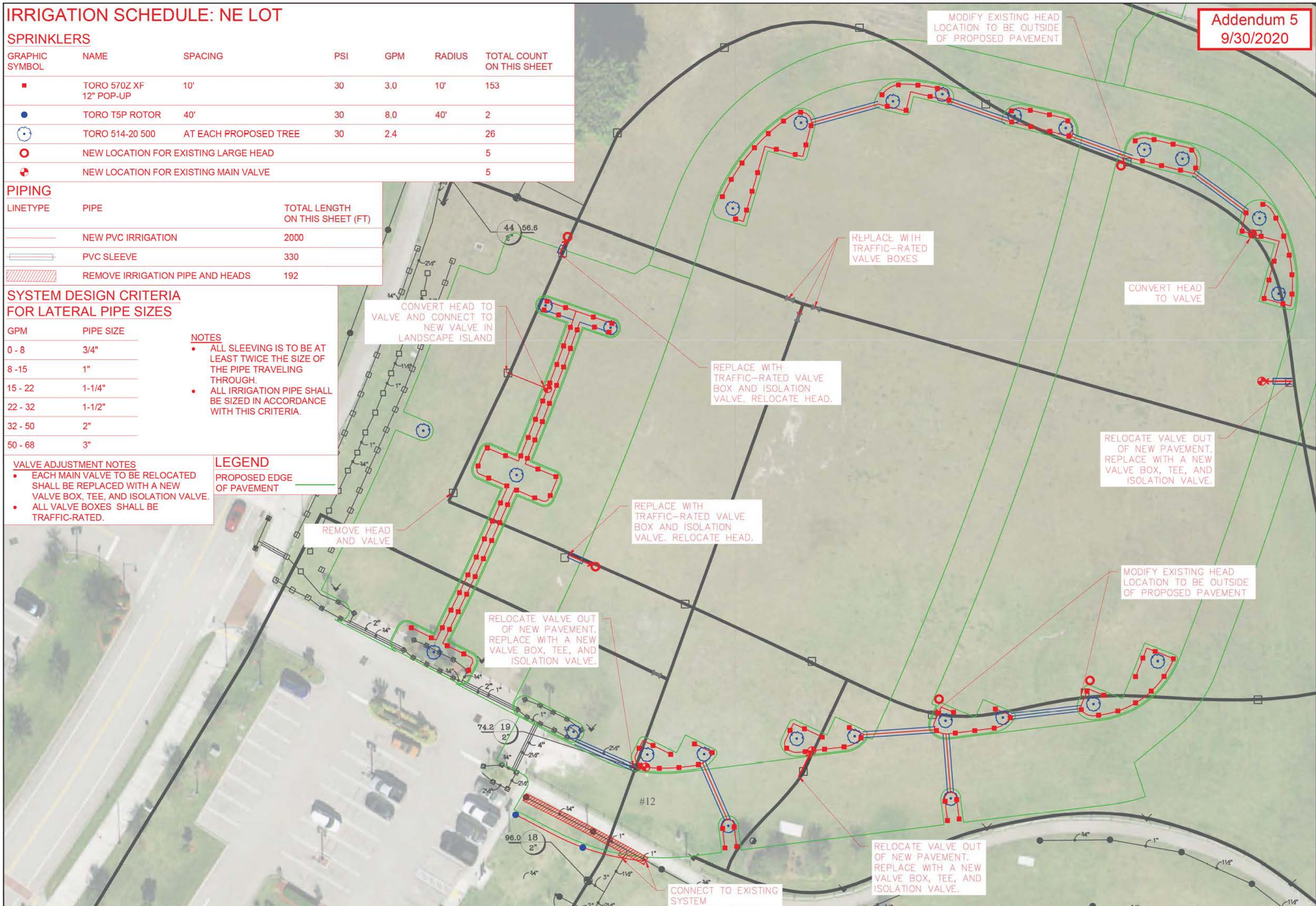
- ALL SLEEVING IS TO BE AT LEAST TWICE THE SIZE OF THE PIPE TRAVELING THROUGH.
- ALL IRRIGATION PIPE SHALL BE SIZED IN ACCORDANCE WITH THIS CRITERIA.

### VALVE ADJUSTMENT NOTES

- EACH MAIN VALVE TO BE RELOCATED SHALL BE REPLACED WITH A NEW VALVE BOX, TEE, AND ISOLATION VALVE.
- ALL VALVE BOXES SHALL BE TRAFFIC-RATED.

### LEGEND

PROPOSED EDGE OF PAVEMENT



**Addendum 5**  
9/30/2020

DESIGNED BY: AD  
DRAWN BY: AD  
REVIEWED BY: CM

DATE: SEPT 2020  
SHEET: IR-3 OF 6

FORMATED FOR 12" x 18"

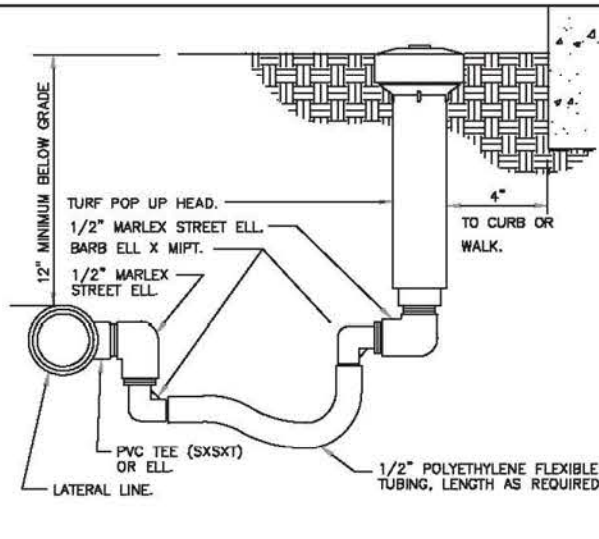
By	Date	Revision Description

COMMONS PARKING LOT EXPANSION  
PR 1602  
IRRIGATION - NE LOT

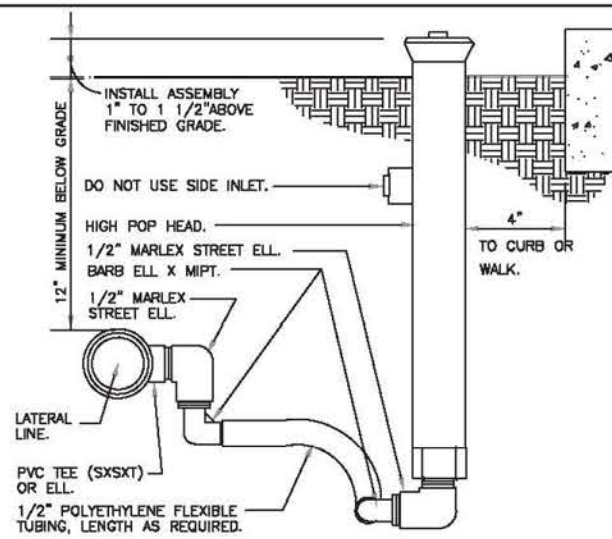
Village of Royal Palm Beach  
Planning & Engineering  
1000 Royal Palm Beach Boulevard  
Royal Palm Beach, FL 33411  
Phone: (561) 371-3333  
Fax: (561) 371-3334

SEAL

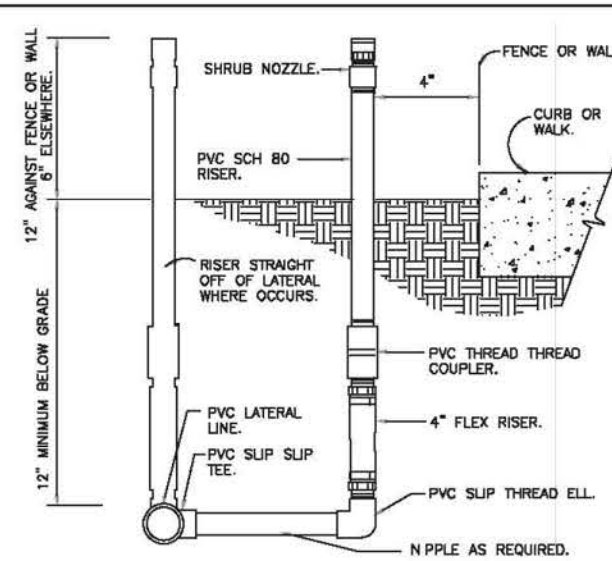




1 TURF SPRAY FLEX ASSEMBLY  
3" = 1'-0"

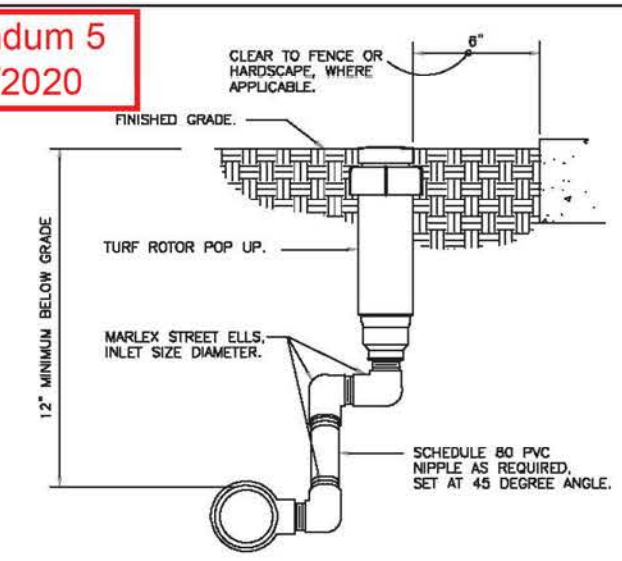


2 SHRUB SPRAY HIGHPOP W/FLEX ASSEMBLY  
3" = 1'-0"

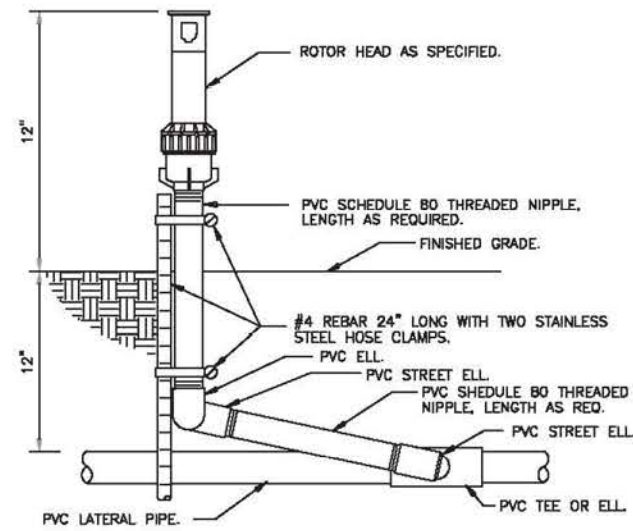


3 SHRUB SPRAY KBI FIXED RISER  
3" = 1'-0"

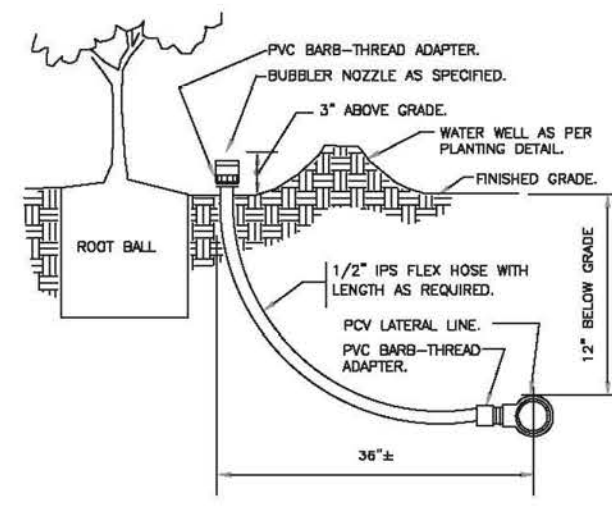
Addendum 5  
9/30/2020



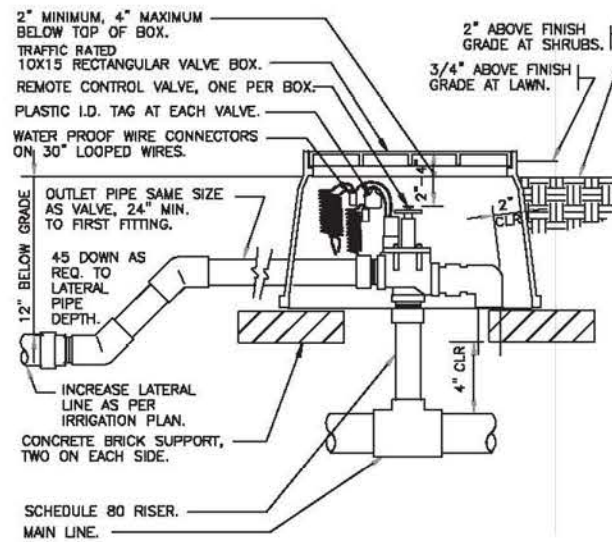
4 TURN ROTOR MARLEX ASSEMBLY  
3" = 1'-0"



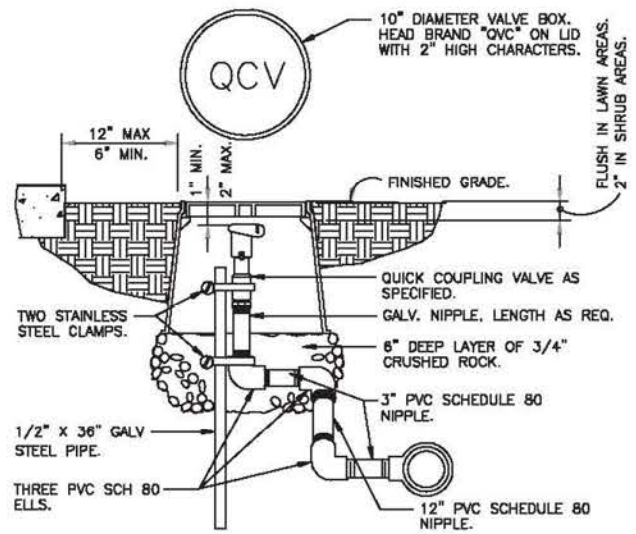
5 SHRUB ROTOR ON FIXED RISER  
3" = 1'-0"



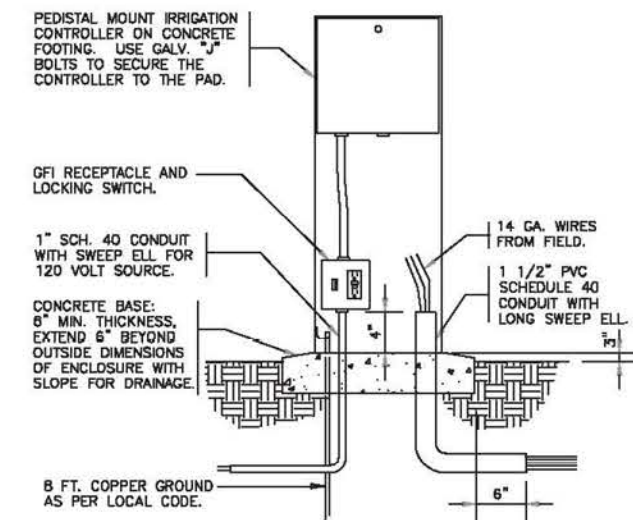
6 BUBBLER ON FLEX HOSE RISER  
3" = 1'-0"



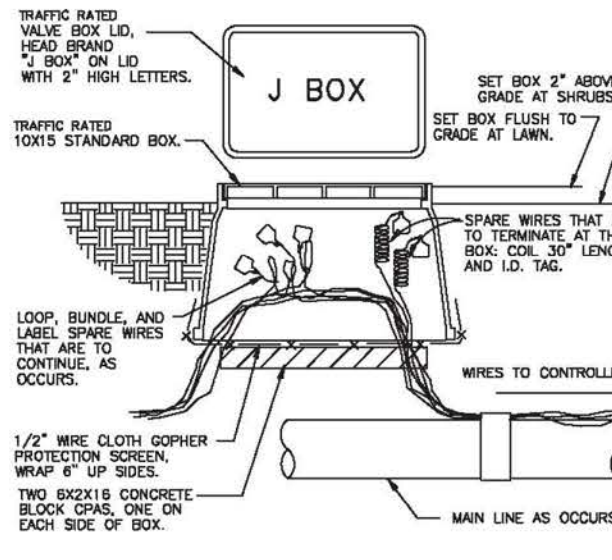
7 ELECTRIC REMOTE CONTROL VALVE  
1 1/2" = 1'-0"



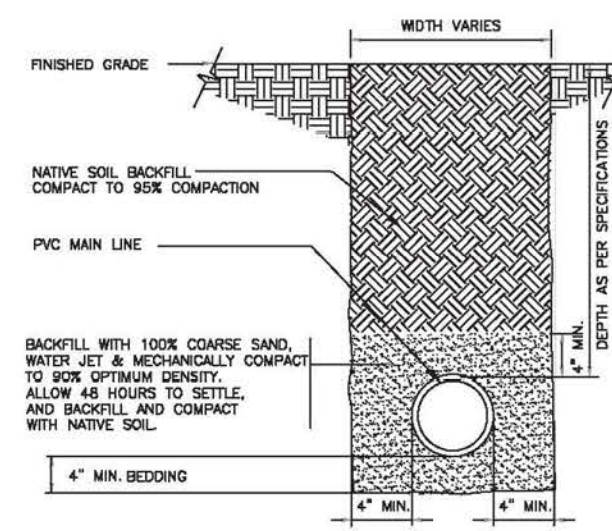
8 QUICK COUPLING VALVE IN BOX  
1 1/2" = 1'-0"



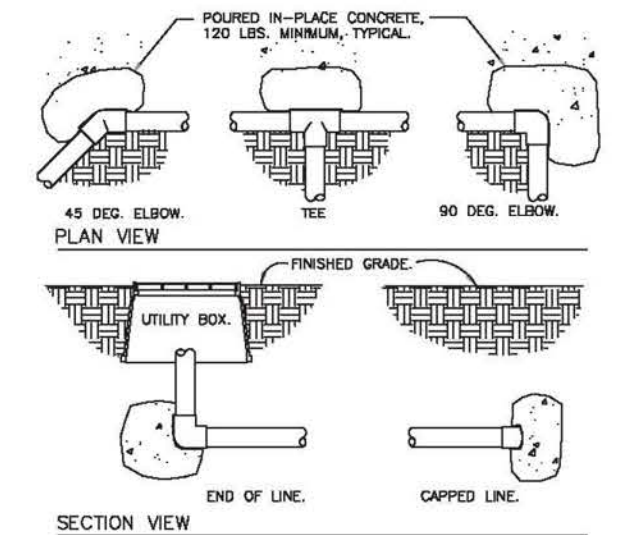
9 PEDESTAL MOUNT CONTROLLER  
1" = 1'-0"



10 WIRE BUNDLE JUNCTION BOX  
1 1/2" = 1'-0"

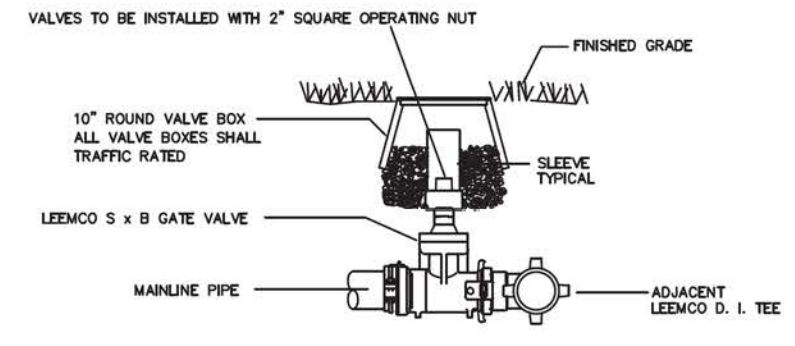


11 SLEEVE AT ROAD  
1 1/2" = 1'-0"

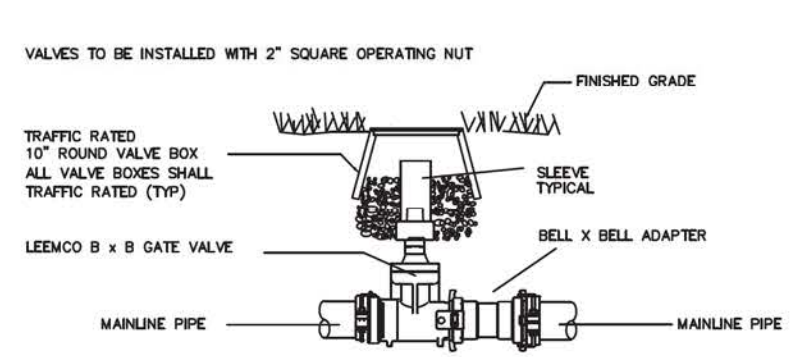


12 THRUST BLOCKING  
3/4" = 1'-0"

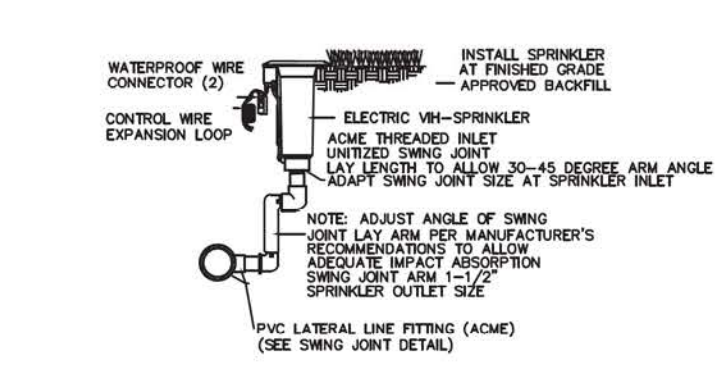




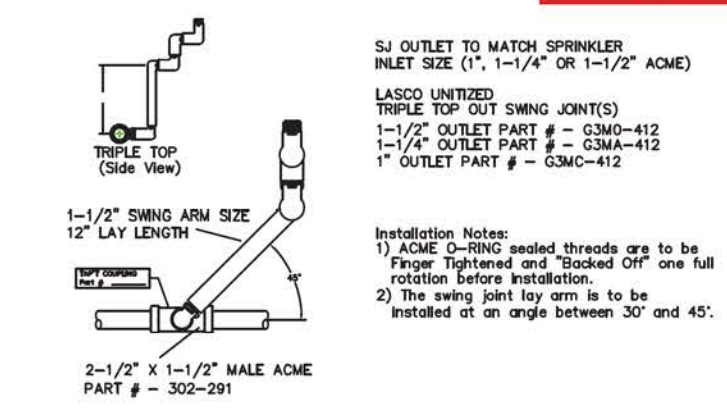
13 Mainline Isolation Valve Detail  
Installed Adjacent to D. I., Tee N.T.S.



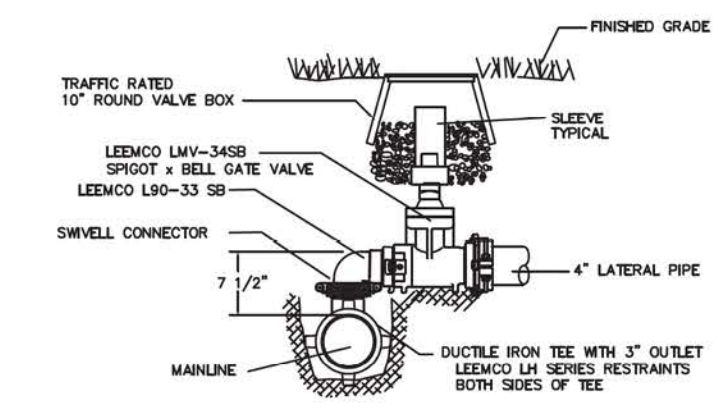
14 Mainline Isolation Valve Detail  
Installed In-line Mainline Pipe N.T.S.



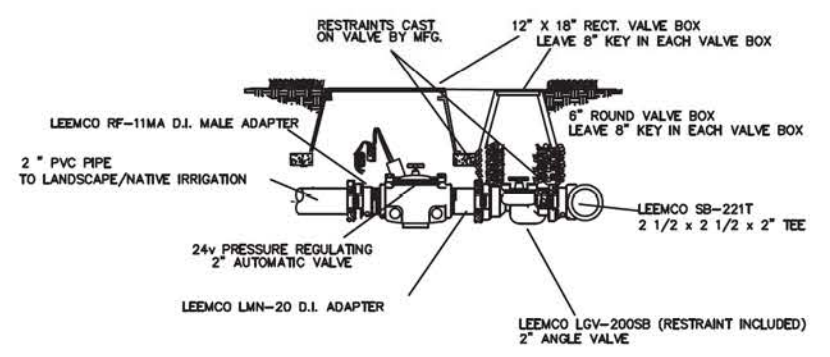
15 Sprinkler Detail N.T.S.



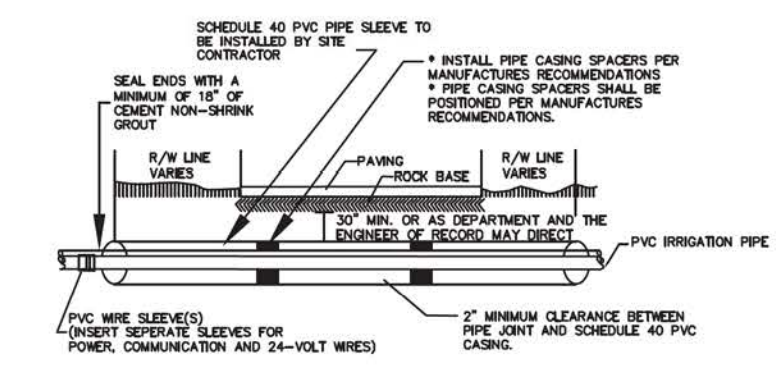
16 Swing Joint Detail N.T.S.



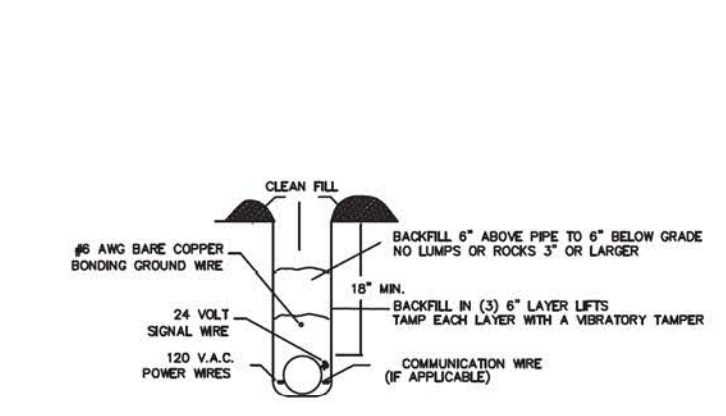
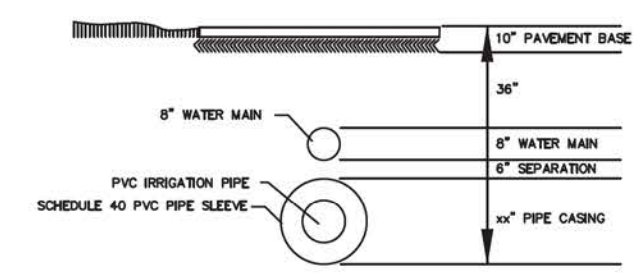
17 Lateral 90/Valve Detail N.T.S.



18 2" Automatic Control Valve N.T.S.



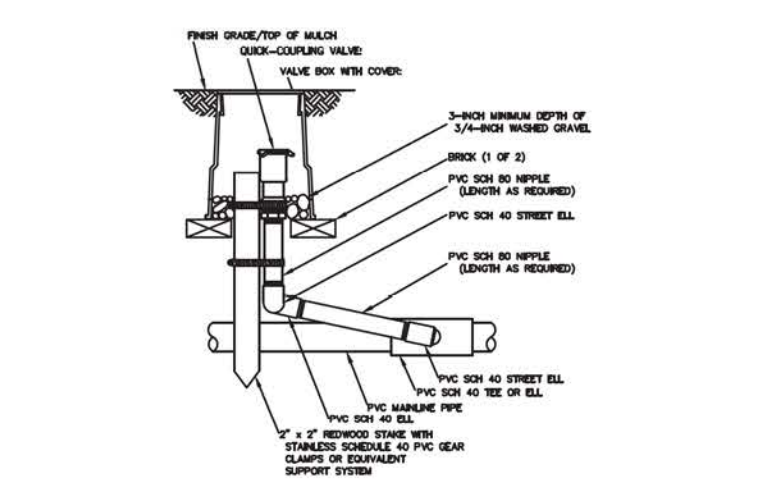
19 Road Crossing Detail N.T.S.



20 Trench Detail N.T.S.

MINIMUM PIPE RADIUS	
PIPE SIZE	MINIMUM RADIUS OF CURVATURE
2"	50'
2 1/2"	63'
3"	75'
4"	100'
6"	150'
8"	200'
10"	250'
12"	300'

21 Minimum PVC Pipe Radius Curvature  
NOTE: NO PIPE CURVATURE SHALL BE ALLOWED WITHIN 24 INCHES ON EITHER SIDE OF A FITTING, SADDLE, OR SERVICE TEE.



22 1 1/2" Quick Coupler Detail N.T.S.

GPM	PIPE SIZE
0 - 8	3/4"
8 - 15	1"
15 - 22	1-1/4"
22 - 32	1-1/2"
32 - 50	2"
50 - 68	3"

23 SYSTEM DESIGN CRITERIA FOR LATERAL PIPE AND SLEEVE SIZES

- NOTES**
- ALL SLEEVING IS TO BE AT LEAST TWICE THE SIZE OF THE PIPE TRAVELING THROUGH.
  - ALL IRRIGATION PIPE SHALL BE SIZED IN ACCORDANCE WITH THIS CRITERIA.



**CALCULATING THRUST BLOCK AREA:**

THE SIZE AND TYPE OF THRUST BLOCK DEPENDS ON PIPE SIZE, LINE PRESSURE, TYPE OF FITTING, DEGREE OF BEND AND SOIL TYPE. THE THRUST BLOCK SIZE MAY BE CALCULATED AS SHOWN IN THE FOLLOWING EXAMPLE.

**EXAMPLE:**

DETERMINE SIZE OF THRUST BLOCK FOR 8" CLASS 160 PIPE WITH A 90 DEGREE ELBOW AND AN OPERATING PRESSURE OF 100 PSI. THE SOIL IS MEDIUM CLAY WHICH CAN BE SPADED.

**STEP 1**

ADD 50 POUNDS OF PRESSURE FOR TESTING TO THE WORKING PRESSURE OF THE PIPE (100PSI + 50PSI = 150 PSI). MULTIPLY THIS FIGURE BY THE APPROPRIATE VALUE IN THE FOLLOWING TABLE.

PIPE SIZE	DEAD END TEE, VALVE	90 DEGREE ELBOW	45 DEGREE ELBOW	22.5 DEGREE ELBOW
1.5	3	4	2	1
2	4	6	3	2
2.5	6	9	5	3
3	10	14	7	4
4	16	22	12	6
6	34	49	26	13
8	58	83	45	23
10	91	128	69	35
12	128	181	98	50
14/16	184	260	141	72
18	275	388	210	107

USING THE TABLE, THE THRUST WOULD BE 12.450# (83 X 150= 12.450)

**STEP 2**

DETERMINE THE BEARING STRENGTH OF THE SOIL FROM THE TABLE BELOW:

**BEARING STRENGTH OF SOILS**

SOIL TYPE	BEARING STRENGTH (#/SQ. FT.)
SOUND SHALE	10,000
CEMENTED GRAVEL/SAND	4,000
COURSE AND FINE COMPACT SAND	3,000
MEDIUM CLAY (SPADED)	2,000
SOFT CALY	1,000
MUDDY SOIL	0

FROM THIS TABLE BEARING STRENGTH IS 2,000# PER SQUARE FOOT FOR MEDIUM CLAY.

**STEP 3**

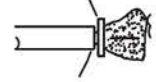
DIVIDE THE TOTAL THRUST IN STEP 1 BY THE BEARING STRENGTH OF THE SOIL IN STEP 2.

THE BEARING STRENGTH OF SOILS TABLE SHOWS THAT MEDIUM CLAY HAS A BEARING STRENGTH OF 2,000# PER SQUARE FOOT. DIVIDE THE TOTAL THRUST OF 12,450# BY 2,000# PER SQUARE FOOT SOIL BEARING STRENGTH. THIS GIVES THE SQUARE FEET OF THRUST BLOCK AREA NEEDED. IN THIS CASE IT IS 6.23 SQUARE FEET FOR WHICH AN APPROPRIATE AREA OF 2.5' X 2.5' CAN BE USED.

**SIDE THRUST ON CURVES**

AN OUTWARD PRESSURE EXISTS ON ALL DEFLECTIONS FROM THE STRAIGHT LINE. GOOD SOIL, PROPERLY TAMPED, IS SUFFICIENT TO HOLD SIDE THRUST ON GRADUAL CURVES, UNLESS SOIL CONDITIONS ARE UNSTABLE. IN THAT CASE, SOME ANCHORAGE MUST BE PROVIDED ON EACH SIDE OF THE JOINT, BUT DO NOT THRUST BLOCK THE JOINT ITSELF.

PROTECT PLUG FROM CONCRETE WITH WOOD PLANKING.



DEAD END

**INSTALLATION NOTES:**

1. WRAP ALL FITTINGS WITH POLYETHYLENE FILM BEFORE POURING THRUST BLOCK. MAKE CERTAIN TO KEEP CONCRETE AWAY FROM ALL BOLTS, FITTINGS AND JOINTS.
2. THRUST BLOCKS ARE TO BE POURED AGAINST UNDISTURBED EARTH. WHERE TRENCH WALL HAS BEEN DISTURBED, EXCAVATE ALL LOOSE MATERIAL AND EXTEND THRUST BLOCK TO UNDISTURBED MATERIAL.
3. REQUIRED BEARING AREAS TO BE AS SHOWN IN DETAIL. ADJUSTMENTS, IF NEEDED, WE BE ALLOWED TO CONFORM TO TEST PRESSURE AND ALLOWABLE SOIL BEARING STRESS.
4. BEARING AREA FOR TRANSIT BLOCKS ON HORIZONTAL BENDS IS BASED ON A TEST PRESSURE OF 150 PSI AND SOIL BEARING STRESS OF 2,000 PSF. THE DEPTH TO THE THRUST BLOCK BASE TO BE EQUAL TO OR GREATER THAN TWICE THE HEIGHT. (EXAMPLE: IF BLOCK IS 2' THICK, THE BASE IS TO BE NO GREATER THAN 4' BELOW GRADE.)
5. VERTICAL BEND THRUST BLOCK TO BE NOT LESS THAN ONE SQUARE FOOT.
6. BEARING AREA OF THRUST BLOCK TO BE NOT LESS THAN ONE SQUARE FOOT.
7. PLACE WOOD BLOCKING IN FRONT OF ALL PLUGS LIKELY TO BE COVERED BY CONCRETE.
8. ALL WOOD SHOULD BE CREOSOTED 12# EMPTY CELL PER LATEST REV. #TTW-556.
9. CONCRETE FOR THRUST BLOCKS SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH OF 2,500 PSI.
10. THRUST BLOCKS SHOULD BE CONSTRUCTED SO THAT THEIR BEARING SURFACE IS IN DIRECT LINE WITH THE MAJOR FORCE CREATED BY THE PIPE OR FITTING. THE EARTH BEARING SURFACE SHOULD BE UNDISTURBED. ONLY THE SIMPLEST OF FORMS IS REQUIRED. USE CONCRETE FLUID ENOUGH SO IT CAN BE WORKED UNDER AND AROUND THE FITTING. KEEP ALL JOINTS FREE FROM CONCRETE.
11. ANCHOR ALL VALVES AND VERTICAL BENDS TO RESIST OUTWARD THRUSTS.

**24 Thrust Block Detail & Notes**  
ONLY TO BE USED ON DEAD ENDS

**ELECTRICAL NOTES:**

1. ALL 240 V.A.C. POWER SPLICES SHALL BE MADE IN A VALVE BOX IN FRONT OF THE FIELD SATELLITES UNLESS OTHERWISE INDICATED ON THE PLANS.
2. ALL POWER WIRE CONNECTIONS SHALL CONFORM WITH/TO ALL NATIONAL, LOCAL AND STATE CODES AND PERFORMED BY LICENSED ELECTRICIANS(S).
3. A TWENTY-FOUR (24") INCH COIL OF WIRE SHALL BE INSTALLED BELOW EACH SPRINKLER.
4. ALL 24 V.A.C. SECONDARY WIRING SHALL BE #14 HOT AND #12 COMMON.
5. SEPARATE COLOR 24 V.A.C. HOT WIRES SHALL BE INSTALLED FOR TRACER AND SPARE WIRES. EACH WIRE SHALL BE CLEARLY NUMBERED WITH AN ADHESIVE LABEL IN THE SATELLITE TO MATCH THE STATION NUMBER.
6. ALL WIRE SHALL HAVE ENOUGH SLACK AS TO ACCOMMODATE FOR EXPANSION AND/OR CONTRACTION.
7. ALL WIRE TO BE UL APPROVED FOR DIRECT BURIAL.
8. ALL 240 V.A.C. PRIMARY, AND 24 V.A.C. SECONDARY POWER TO BE INSTALLED AS PER STATE AND LOCAL CODES. SIZED AS PER PLAN WITH GROUND WIRE, MEETING N.E.C. REQUIREMENTS.
9. REFER TO PLANS FOR INFORMATION ON POWER SOURCES, WIRE SIZES, ROUTINGS, ETC.
10. A SPARE COMMON AND (3) HOT WIRES SHALL BE DROPPED AT EACH GREEN QUICK COUPLER AND ONE (1) AT EACH ADDITIONAL QUICK COUPLER NOTED ON THE PLAN. THE LOCATION SHALL BE INDICATED ON THE AS-BUILT DRAWING.
11. INSTALL ALL 240 V.A.C. POWER WIRE IN MAIN TRENCH WHENEVER POSSIBLE.
12. ALL MAINLINE PIPE INSTALLED WITHOUT POWER WIRE SHALL BE INSTALLED TO INCLUDE A #14 BLUE TRACER WIRE.
13. ALL WIRES IN THE PEDESTAL SHALL BE CLEARLY NUMBERED WITH THE APPROPRIATE STATION NUMBER.
14. A #6 SOLID BARE COPPER BONDING GROUND SHALL BE INSTALLED WITH THE POWER WIRE PER THE GROUNDING SPECIFICATIONS. ANY SPLICES IN THE BONDED GROUND SHALL BE MADE IN A SPLICE KIT.
15. FINAL LOCATIONS OF FIELD SATELLITES WILL BE DETERMINED DURING CONSTRUCTION BY THE CONSULTANT OR OWNER'S REPRESENTATIVE.
16. ADEQUATELY IRRIGATE THE AREA OF THE GROUND GRID TO KEEP THE AREA MOIST AT ALL TIMES.
17. DO NOT INSTALL WIRES WITHIN THE GROUND GRID SPHERE OF INFLUENCE NOTED IN THE DETAIL.

**DESIGN NOTES:**

1. ALL PRODUCT APPLICATIONS AND INSTALLATIONS MUST MEET MANUFACTURER'S REQUIREMENTS.
2. FLOW RATES THROUGH PVC PIPING NOT TO EXCEED MANUFACTURER'S RECOMMENDATIONS.
3. NO MORE THAN THREE (3) SPRINKLERS SHOULD BE INSTALLED ON A DEAD-END LATERAL WITHOUT APPROVAL OF THE OWNER'S REPRESENTATIVE.
4. CONTRACTOR IS RESPONSIBLE FOR PROPER INSTALLATION OF MAINLINE SYSTEM. SYSTEM SHALL NOT EXCEED MANUFACTURER'S RECOMMENDATIONS. THE IRRIGATION PLAN IS INTENDED TO INCLUDE ALL COMPONENTS NECESSARY TO THE PROPER OPERATION OF SAID IRRIGATION SYSTEM. IF ADJUSTMENTS ARE REQUIRED, CONTRACTOR SHALL MAKE THE ADJUSTMENTS AT HIS EXPENSE.
5. ANY DISCREPANCIES BETWEEN THE IRRIGATION PLANS & THE SPECIFICATION DOCUMENTS MUST BE BROUGHT TO THE ATTENTION OF THE IRRIGATION CONSULTANT OR OWNER'S REPRESENTATIVE BEFORE INSTALLATION.
6. ARCS OF PART CIRCLE SPRINKLERS SHALL BE ADJUSTED TO PREVENT DIRECT OVER THROW OFF THE PROPERTY, ONTO BUILDINGS, ROADWAYS, AND/OR ENVIRONMENTALLY SENSITIVE AREAS.
7. THE SPACINGS AS INDICATED IN THE LEGEND SHALL NOT BE EXCEEDED WITHOUT PRIOR APPROVAL OF THE OWNER'S REPRESENTATIVE.
8. ALL EASEMENT CROSSINGS SHALL CARRY WARNING TAPE BURIED TWELVE (12") INCHES FROM GRADE AND ALL WIRE SHALL BE CARRIED IN CONDUIT.
9. DO NOT OPERATE MORE STATIONS SIMULTANEOUSLY THAN THE FLOW CAPACITY OF THE ZONE BASED ON THE LATERAL TAP SIZE.
10. CONTROL ZONES WITH MULTIPLE SATELLITES FOR THE ZONE SHALL NOT OPERATE MORE SIMULTANEOUS SPRINKLERS THAN THE CAPACITY OF A SINGLE CONTROLLER.
11. THE CONTRACTOR MAY BE REQUIRED AT NO CHARGE TO THE OWNER TO REPLACE NOZZLES SUPPLIED BY THE DISTRIBUTOR AT NO CHARGE. THIS IS TO ALLOW FOR ADJUSTMENT IN THE SPACINGS FROM THE DESIGN TO THE FIELD.
12. PART CIRCLE SPRINKLERS NOT STAKED ON PROPERTY LINE AROUND LANDSCAPE AREAS OR BAHLAGRASS SHALL BE INSTALLED AND SET TO ITS LARGEST RADIUS WITH A TAIL NOZZLE WITHIN THE PROPERTY LINE EXCEPT GREEN SIDE IN/OUT SPRINKLERS.
13. PART CIRCLE SPRINKLERS AROUND WASTE AREAS SHALL BE INSTALLED WITHOUT A TAIL NOZZLE.
14. FULL CIRCLE SPRINKLERS STAKED INSIDE LANDSCAPE AREAS TO BE USED TO ESTABLISH ONLY OR IN CASE OF EMERGENCIES.
15. PART CIRCLE SPRINKLERS SHALL BE INSTALLED ONE FOOT OFF CART PATHS.

**CONTROL ZONE NOTES:**

1. ALL SPRINKLERS SHALL BE INDIVIDUALLY WIRED TO THE SATELLITE FOR THAT ZONE.
2. ALL SPRINKLERS SHALL BE WIRED FOR INDIVIDUAL OPERATION.

**PIPING NOTES:**

1. PIPING AS SHOWN ON THE PLANS IS DIAGRAMMATIC IN NATURE DUE TO SCALE. FIELD ADJUSTMENTS FROM THE PLANS MAY BE REQUIRED IN THE FIELD AT THE CONTRACTORS EXPENSE.
2. ALL PIPING TO BE LOCATED WITHIN OWNERS PROPERTY LINES.
3. ALL PIPE FITTINGS SHALL UTILIZE STANDARD ANGLES AND CONNECTIONS.
4. ALL FITTINGS ON MAIN LINES 4" AND LARGER SHALL BE EPOXY COATED LEEMCO DUCTILE IRON OR APPROVED EQUAL WITH GASKET CONNECTIONS. ALL DUCTILE IRON REDUCING TEES, ELLS, FITTINGS, CONNECTIONS, ETC SHALL UTILIZE CONNECTOR RINGS.
5. ALL DIRECTIONAL FITTINGS 1 1/2" OR LARGER SHALL BE EPOXY COATED LEEMCO DUCTILE IRON OR APPROVED EQUAL. UTILIZE LASCO OR APPROVED EQUAL THRUST PLUGS FOR LATERAL DEAD ENDS. ALL SPRINKLERS SHALL BE MOUNTED ON LASCO PR15, 1 1/2" SERVICE TEES AND 1 1/2" SWING JOINTS. THE SWING JOINT SHALL BE ADAPTED AT THE SWING JOINT OUTLET TO MATCH THE SIZE OF THE SPRINKLER INLET IF NEEDED.
6. ALL PIPE CROSSING ROADWAYS SHALL BE HIGH DENSITY POLYETHYLENE AND INSTALLED IN PVC SLEEVE AS CALLED FOR IN THE DETAILS.
7. ALL LOCATIONS OF AIR RELIEF VALVES AND SYSTEM DRAIN VALVES WILL BE DETERMINED IN FIELD BASED ON SITE ELEVATIONS DURING CONSTRUCTION. LOCATE AIR RELIEF VALVES AT THE HIGHEST POINT IN THE AREA AND DRAIN VALVES AT THE LOW POINT IN THE MAINLINE NEAR A WATER RELIEF POINT (LAKE, CREEK, DRAIN BASIN, ETC.). ESTIMATED LOCATIONS ARE LOCATED ON THE PLANS.
8. LOCATIONS OF QUICK COUPLER VALVES SHALL BE IN THE REAR OR SIDE OF GREENS AND FINALIZED IN FIELD DURING CONSTRUCTION BY THE OWNER'S REPRESENTATIVE. ALL QUICK COUPLER VALVES LOCATED ON GREENS SHALL BE INSTALLED WITHIN THREE FEET (3') OF A SPRINKLER UNLESS OTHERWISE DIRECTED BY THE OWNER'S REPRESENTATIVE.
9. ALL FITTINGS 2 1/2" - 16" SHALL BE RESTRAINED UTILIZING LEEMCO OR APPROVED EQUAL JOINT RESTRAINTS PER THE SPECIFICATIONS. ALL 2 1/2" DIRECTIONAL FITTINGS SHALL BE RESTRAINED AND END CAPS SHALL BE SECURED BY THRUST BLOCKS.
10. ALL FITTING CONNECTIONS FOR GREEN AND TEE SPRINKLERS SHALL BE DIRECTED AWAY FROM PUTTING OR TEE SURFACES WHERE PRACTICAL.
11. PIPING TO THE SPRINKLERS WITHIN THE TEE SURFACES SHALL BE KEPT TO A MINIMUM.
12. IRRIGATION CONTRACTOR SHALL THOROUGHLY COMPACT ALL TRENCHES IN LIFTS NOT TO EXCEED TWELVE INCHES (12") WITH A VERMEER TRENCH COMPACTING MACHINE OR EQUIVALENT. FINAL ACCEPTANCE OF TRENCH BACKFILL SHALL REST WITH OWNER'S REPRESENTATIVE.
13. ROUTES OF MAIN LINE PIPES MAY REQUIRE ADDITIONAL FITTINGS TO AVOID EXISTING TREES OR VEGETATION, LAKES AND/OR STREAMS, FEATURES CONSTRUCTION OR UTILITIES WHICH MAY NOT BE CLEARLY IDENTIFIED UNTIL CONSTRUCTION HAS BEGUN. CONTRACTOR SHALL PROVIDE ALL FITTINGS, CONNECTORS, JOINT RESTRAINTS, ETC. AS MAY BE REQUIRED TO SO AS TO NOT EXCEED RECOMMENDED PIPE CURVATURE.
14. MAXIMUM DEFLECTION OF PVC PIPE SECTIONS IN PIPE JOINTS SHALL BE KEPT TO FIVE DEGREES OR LESS, OR AS DESIGNATED BY PIPE MANUFACTURER, WHICHEVER IS LESS.
15. ALL TRENCH LINES SHALL BE KEPT OUT OF DRIP LINES OF TREES EXCEPT AS DIRECTED AND APPROVED BY THE OWNER'S REPRESENTATIVE.
16. ALL TRENCHES LOCATED IN ROCK OR OTHERWISE UNSUITABLE SOILS SHALL BE OVER-EXCAVATED TO A MINIMUM OF THREE INCHES (3") AND ALL TRENCH SPOILS REMOVED AND DISPOSED OF PROPERLY. A MINIMUM THREE INCHES (3") OF SAND SHALL BE PLACED BELOW ALL PIPING AND WIRING, AND A MINIMUM OF SIX INCHES (6") PLACED ABOVE ALL PIPING AND WIRING. THE REMAINING MATERIAL FOR TRENCH BACKFILL SHALL BE CLEAN AND FREE OF ORGANIC DEBRIS AND ROCKS AND APPROVED BY EITHER THE CONSULTANT OR OWNER'S REPRESENTATIVE BEFORE PLACEMENT IN TRENCH.
17. CONTRACTOR SHALL PROVIDE PERMANENT MARKERS FOR ENDS OF ALL PIPE SLEEVES AND ENDS OF ALL PIPES BURIED ACROSS STREAMS, DRAINAGE CHANNELS AND/OR EASEMENTS.
18. ALL PIPING CONNECTIONS TO GREENS PIPE LOOPS SHALL BE MADE WITH EPOXY COATED LEEMCO DUCTILE IRON FITTINGS OR APPROVED EQUAL.
19. CONTRACTOR SHALL COORDINATE INSTALLATION OF ALL PIPING TO BE SUPPORTED OR SUSPENDED ON BRIDGES WITH OWNER'S REPRESENTATIVE DURING CONSTRUCTION.
20. ROUTING OF MAIN LINE PIPING AROUND CLUBHOUSE AREA, ROADWAYS AND/OR EXISTING STRUCTURES AND UTILITIES SHALL BE COORDINATED WITH OWNER'S REPRESENTATIVE(S) PRIOR TO EXCAVATION OF TRENCHES.
21. ALL QUICK COUPLER VALVES SHALL BE INSTALLED OUTSIDE OF GREEN SURFACES AND INSTALLED AS CALLED FOR IN THE DETAILS.
22. ALL MAINLINE STUB-OUTS ARE TO BE PLUGGED AT THE TEE AND THRUST BLOCKED. THE LOCATION SHALL BE MARKED BY A 10" ROUND VALVE BOX.
23. ALL END CAPS SHALL BE SECURED USING LASCO THRUST PLUG OR APPROVED EQUAL.
24. ALL MAINLINE GATE VALVES 12" AND BELOW SHALL BE LEEMCO LMV SERIE OR APPROVED EQUAL. WHEN LOCATED ADJACENT TO DIRECTIONAL TEE, THE VALVE SHALL BE INSTALLED RESTRAINED TO THE TEE.
25. ALL STREAM CROSSINGS SHALL BE MADE WITH HDPE DR11 PIPE.