

ADDENDUM NO 04

CITY OF FAIRHOPE

to

**BID NUMBER 014-15, Fairhope Soccer Complex 2015
GRASSING and IRRIGATION
PROJECT NO. REC 001-15,
New Fairhope Soccer Complex Project 2015**

The bid documents for this Bid shall be amended, revised, and changed in the following particulars: Questions received to date are listed with answers.

1. SPECIFICATIONS FOR IRRIGATION FOR THIS PROJECT SHALL AS ATTACHED TO THIS DOCUMENT LISTED AS **ADDENDUM 4 IRRIGATION SPECIFICATIONS.**
2. THE IRRIGATION PLANS WITHIN THE BID SET SHALL BE REPLACED WITH THE ATTACHED IRRIGATION PLANS LISTED AS **ADDENDUM 4 IRRIGATION PLANS LI1-LI4**
3. THE UNIT PRICE BID SCHEDULE HAS BEEN REVISED AND IS ATTACHED IS **ADDENDUM 4 REVISED UNIT PRICE BID SCHEDULE.**

Submitted by:

PREBLE-RISH, LLC



Andrew N. Bobe, P.E.

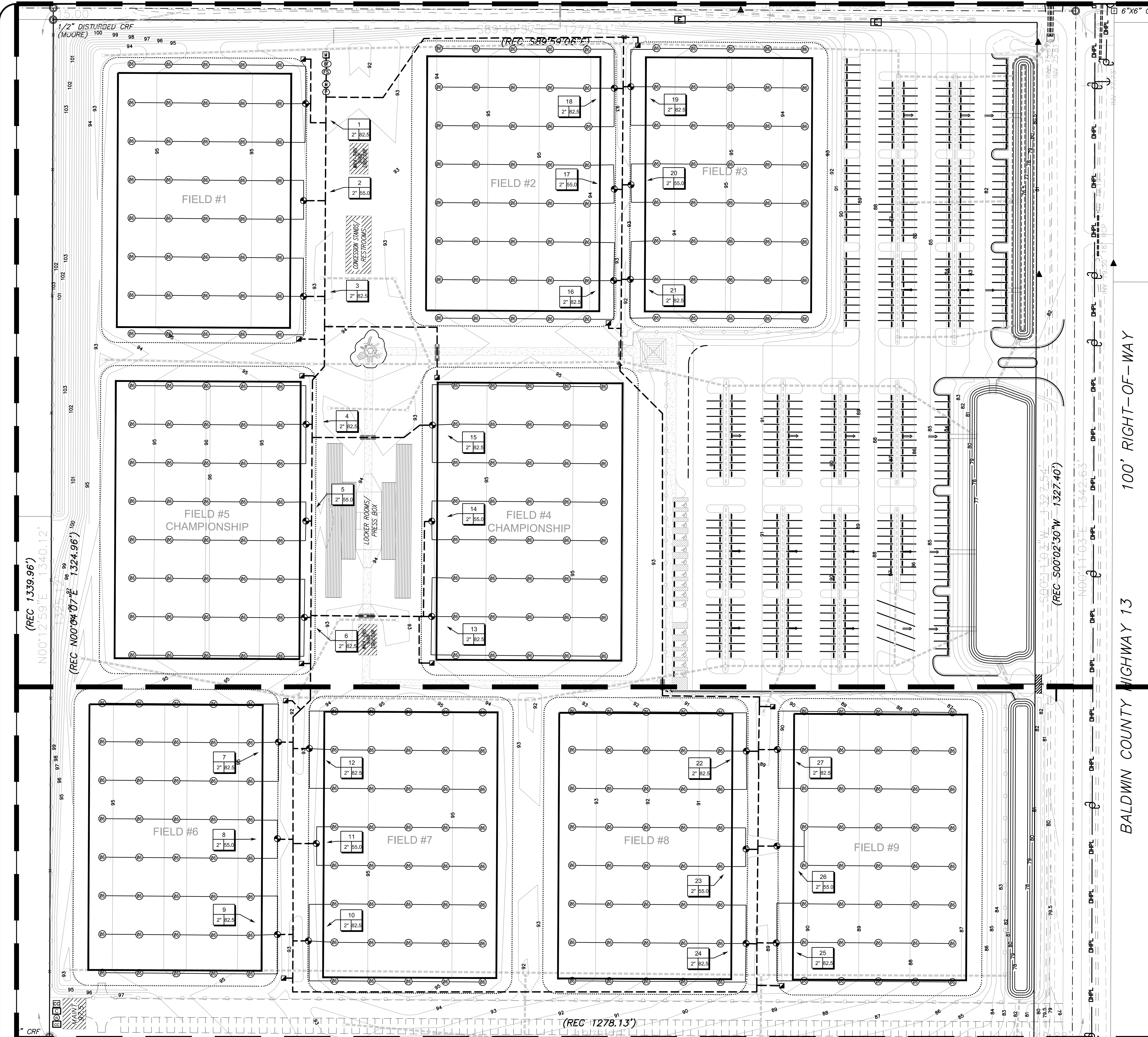
Responders are to **sign and include signed Addendum No. 4 with submitted bid documents.**

Acknowledged:

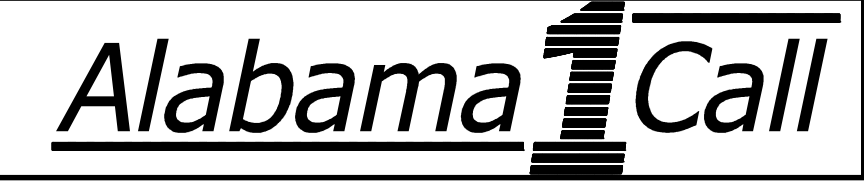
_____ Company

_____ By

_____ Date

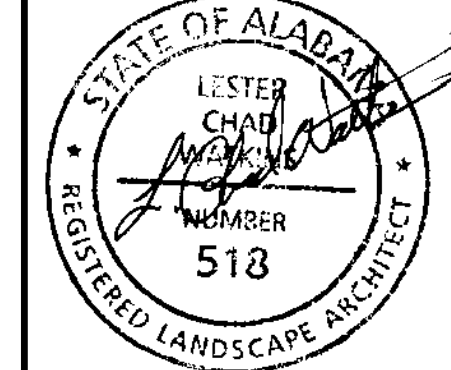


800-292-8525
 #DIG (Cellular)
 Dig Safely.



- GENERAL NOTES**
- THIS DESIGN IS BASED ON SPECIFIC BRAND EQUIPMENT AS INDICATED IN PLANS AND SPECIFICATION. ALL ALTERNATIVE MANUFACTURES AND/OR BRANDS MUST BE EQUAL TO OR BETTER THAN REQUIREMENTS LISTED IN CONTRACT DOCUMENTS.
 - MAIN LINE AND HEAD LAYOUT IS TO BE FIELD STAKED AND APPROVED BY OWNER'S REPRESENTATIVE AND LANDSCAPE ARCHITECT BEFORE CONSTRUCTION.
 - ALL PIPE USED FOR IRRIGATION MAINLINE IS TO BE: GASKETED-JOINT WHITE RING TITE PIPE CLASS 200 PVC GASKETED.
 - ALL PIPE FITTINGS 3" AND BELOW CAN BE HARCO PVC AND ANY 4" AND ABOVE ARE TO BE HARCO DUCTILE IRON.

NO.	DATE	APPL.
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 CONSULTING ENGINEERS
 CIVIL • SURVEYING • SITE PLANNING

9848 BELLARON AVENUE
 FAYETTEVILLE, AL 36824
 (256) 846-9910
 www.preble-rish.com

SCALE: 1"=60'
 DESIGNED: ANB/CCJ
 DRAWN: CCJ
 CHECKED: ANB
 DATE: APRIL 2014

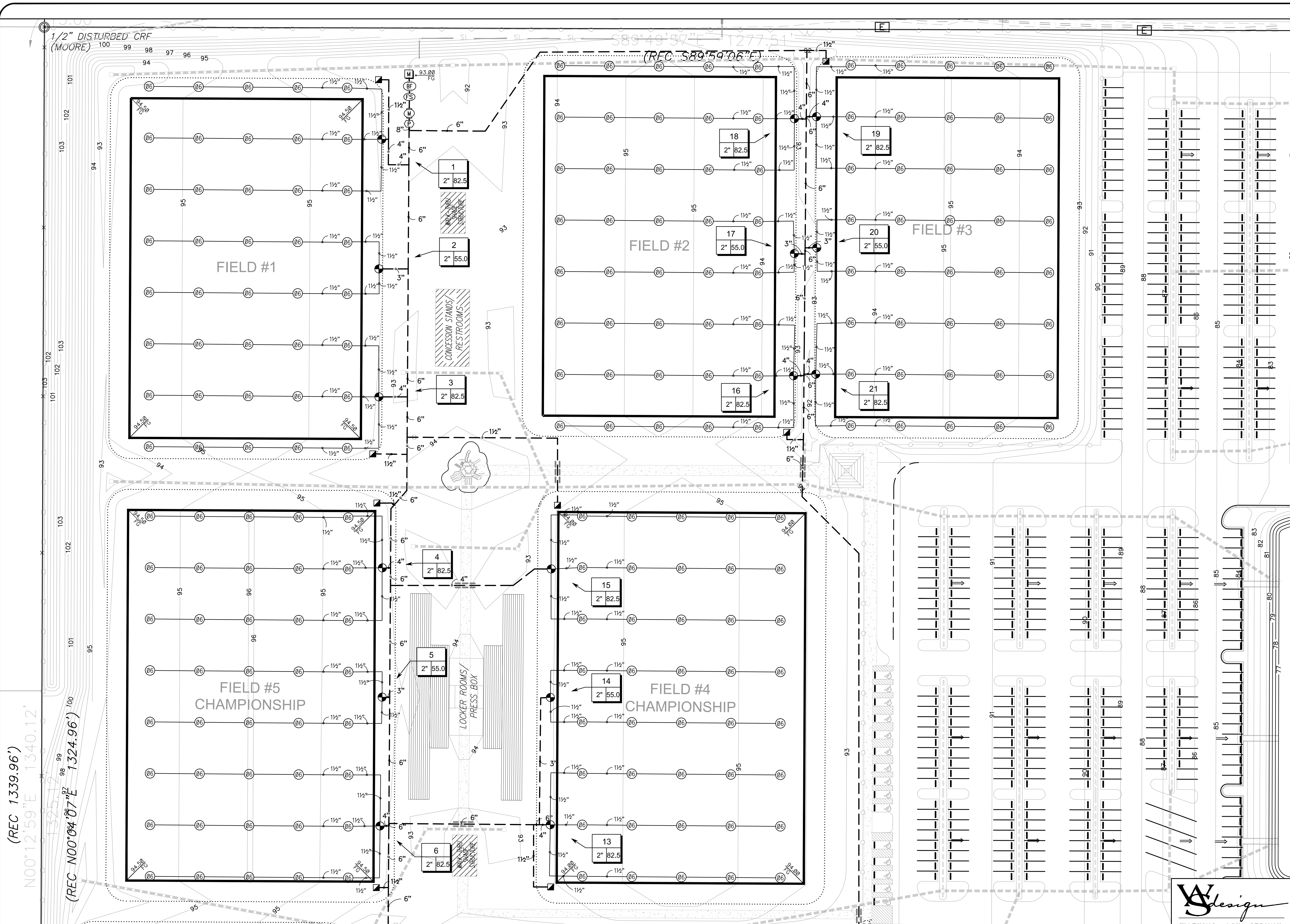
UTILITY & IRRIGATION PLAN
FAIRHOPE SOCCER FIELDS
CITY OF FAIRHOPE
FAIRHOPE, ALABAMA

PROJECT NO: 385.0003
 SHEET: LI1

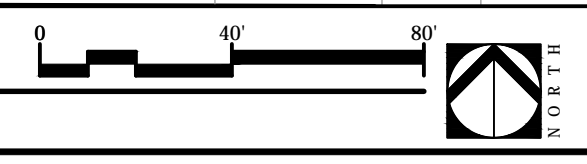


1 OVERALL IRRIGATION PLAN
 Scale: 1"= 60'

BALDWIN COUNTY HIGHWAY 13
 100' RIGHT-OF-WAY



1 IRRIGATION PLAN ENLARGEMENT
Scale: 1" = 40'



PROJECT NO:		SHEET:	
385.0003		LI2	

NO.	DATE	APPROVAL
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STATE OF ALABAMA
LESTER CHAD WATKINS
REGISTERED LANDSCAPE ARCHITECT
NUMBER 518

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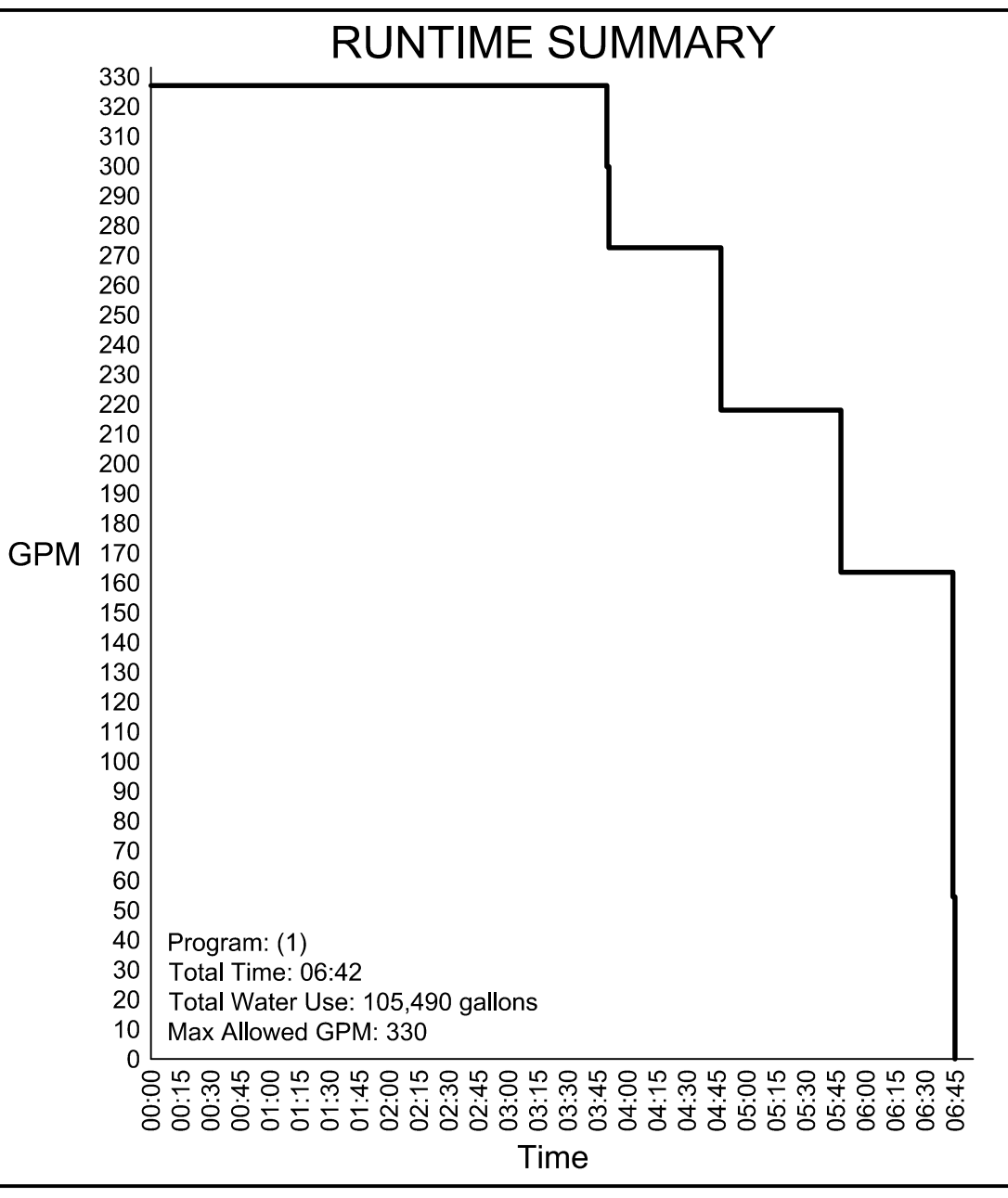
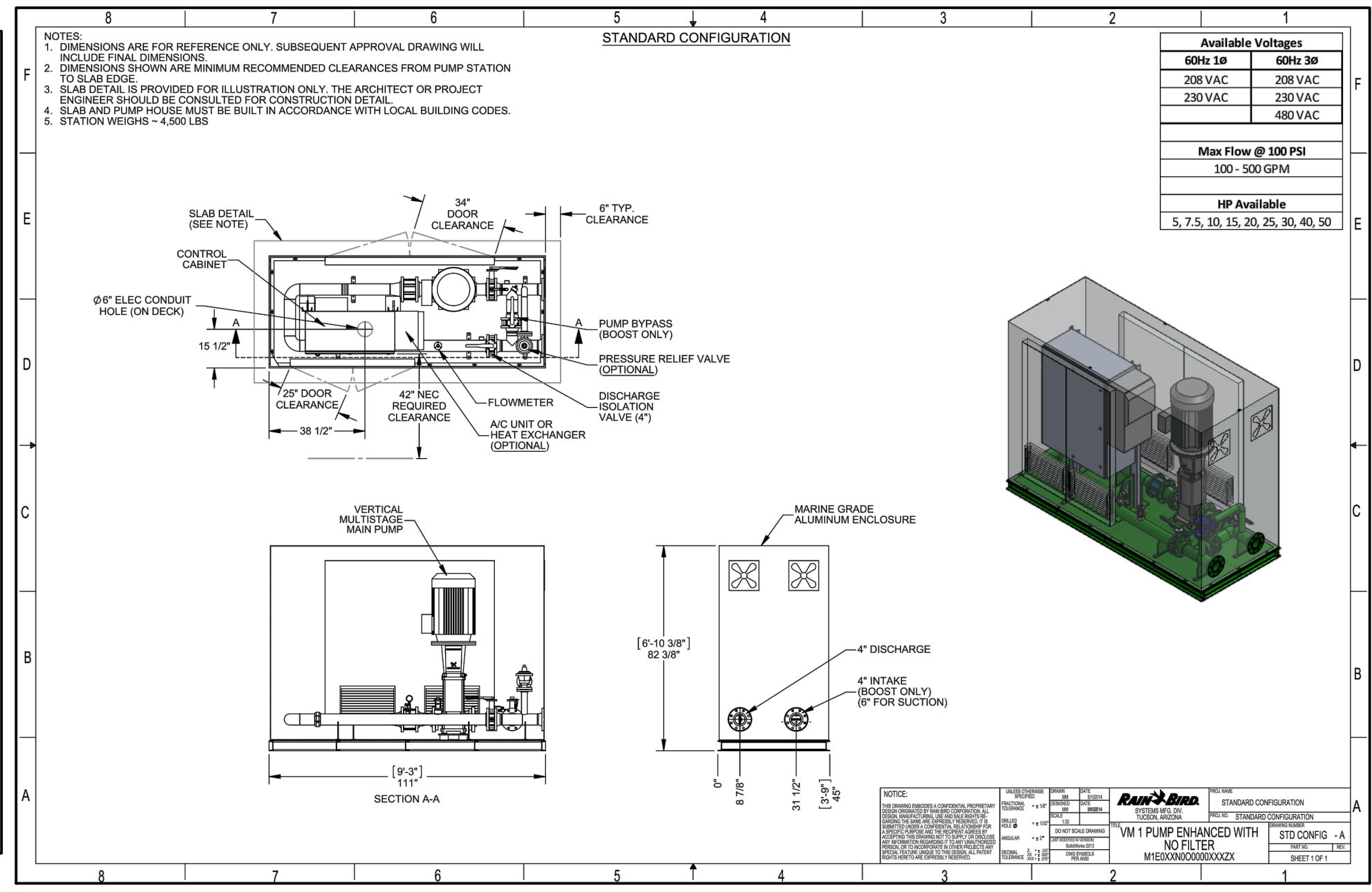
9048 BELLARON AVENUE
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(205) 566-0910
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DESIGNED:	ANB/CCJ	DRAWN:	CCJ	CHECKED:	ANB	DATE:	APRIL 2014
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UTILITY & IRRIGATION PLAN
FAIRHOPE SOCCER FIELDS
CITY OF FAIRHOPE
FAIRHOPE, ALABAMA

WATERING SCHEDULE

NUMBER	MODEL	TYPE	PRECIP	SUN	MON	TUE	WED	THU	FRI	SAT	IN/WEEK	MIN./WEEK	GAL./WEEK	GAL./DAY
1	Rain Bird PEB-PRS-D	Turf Rotor	0.22 in/h	59 min	59 min	59 min	59 min	59 min	59 min	59 min	1.50	410	33,825	4,832
2	Rain Bird PEB-PRS-D	Turf Rotor	0.22 in/h	59 min	59 min	59 min	59 min	59 min	59 min	59 min	1.50	412	22,660	3,237
3	Rain Bird PEB-PRS-D	Turf Rotor	0.22 in/h	59 min	59 min	59 min	59 min	59 min	59 min	59 min	1.50	410	33,825	4,832
4	Rain Bird PEB-PRS-D	Turf Rotor	0.22 in/h	59 min	59 min	59 min	59 min	59 min	59 min	59 min	1.50	410	33,825	4,832
5	Rain Bird PEB-PRS-D	Turf Rotor	0.22 in/h	59 min	59 min	59 min	59 min	59 min	59 min	59 min	1.50	412	22,660	3,237
6	Rain Bird PEB-PRS-D	Turf Rotor	0.22 in/h	59 min	59 min	59 min	59 min	59 min	59 min	59 min	1.50	410	33,825	4,832
7	Rain Bird PEB-PRS-D	Turf Rotor	0.22 in/h	59 min	59 min	59 min	59 min	59 min	59 min	59 min	1.50	410	33,825	4,832
8	Rain Bird PEB-PRS-D	Turf Rotor	0.22 in/h	59 min	59 min	59 min	59 min	59 min	59 min	59 min	1.50	412	22,660	3,237
9	Rain Bird PEB-PRS-D	Turf Rotor	0.22 in/h	59 min	59 min	59 min	59 min	59 min	59 min	59 min	1.50	410	33,825	4,832
10	Rain Bird PEB-PRS-D	Turf Rotor	0.22 in/h	59 min	59 min	59 min	59 min	59 min	59 min	59 min	1.50	410	33,825	4,832
11	Rain Bird PEB-PRS-D	Turf Rotor	0.22 in/h	59 min	59 min	59 min	59 min	59 min	59 min	59 min	1.50	412	22,660	3,237
12	Rain Bird PEB-PRS-D	Turf Rotor	0.22 in/h	59 min	59 min	59 min	59 min	59 min	59 min	59 min	1.50	410	33,825	4,832
13	Rain Bird PEB-PRS-D	Turf Rotor	0.22 in/h	59 min	59 min	59 min	59 min	59 min	59 min	59 min	1.50	410	33,825	4,832
14	Rain Bird PEB-PRS-D	Turf Rotor	0.22 in/h	59 min	59 min	59 min	59 min	59 min	59 min	59 min	1.50	412	22,660	3,237
15	Rain Bird PEB-PRS-D	Turf Rotor	0.22 in/h	59 min	59 min	59 min	59 min	59 min	59 min	59 min	1.50	410	33,825	4,832
16	Rain Bird PEB-PRS-D	Turf Rotor	0.22 in/h	59 min	59 min	59 min	59 min	59 min	59 min	59 min	1.50	410	33,825	4,832
17	Rain Bird PEB-PRS-D	Turf Rotor	0.22 in/h	59 min	59 min	59 min	59 min	59 min	59 min	59 min	1.50	412	22,660	3,237
18	Rain Bird PEB-PRS-D	Turf Rotor	0.22 in/h	59 min	59 min	59 min	59 min	59 min	59 min	59 min	1.50	411	33,908	4,844
19	Rain Bird PEB-PRS-D	Turf Rotor	0.22 in/h	59 min	59 min	59 min	59 min	59 min	59 min	59 min	1.50	410	33,825	4,832
20	Rain Bird PEB-PRS-D	Turf Rotor	0.22 in/h	59 min	59 min	59 min	59 min	59 min	59 min	59 min	1.50	412	22,660	3,237
21	Rain Bird PEB-PRS-D	Turf Rotor	0.22 in/h	59 min	59 min	59 min	59 min	59 min	59 min	59 min	1.50	410	33,825	4,832
22	Rain Bird PEB-PRS-D	Turf Rotor	0.22 in/h	59 min	59 min	59 min	59 min	59 min	59 min	59 min	1.50	410	33,825	4,832
23	Rain Bird PEB-PRS-D	Turf Rotor	0.22 in/h	59 min	59 min	59 min	59 min	59 min	59 min	59 min	1.50	412	22,660	3,237
24	Rain Bird PEB-PRS-D	Turf Rotor	0.22 in/h	59 min	59 min	59 min	59 min	59 min	59 min	59 min	1.50	410	33,825	4,832
25	Rain Bird PEB-PRS-D	Turf Rotor	0.22 in/h	59 min	59 min	59 min	59 min	59 min	59 min	59 min	1.50	410	33,825	4,832
26	Rain Bird PEB-PRS-D	Turf Rotor	0.22 in/h	59 min	59 min	59 min	59 min	59 min	59 min	59 min	1.50	412	22,660	3,237
27	Rain Bird PEB-PRS-D	Turf Rotor	0.22 in/h	59 min	59 min	59 min	59 min	59 min	59 min	59 min	1.50	410	33,825	4,832
TOTALS:				1,593	1,593	1,593	1,593	1,593	1,593	1,593	11,089		812,873	116,125



CRITICAL ANALYSIS

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P.O.C. NUMBER: 01
 Water Source Information:

FLOW AVAILABLE
 Water Meter Size: 4"
 Flow Available: 375.00 gpm

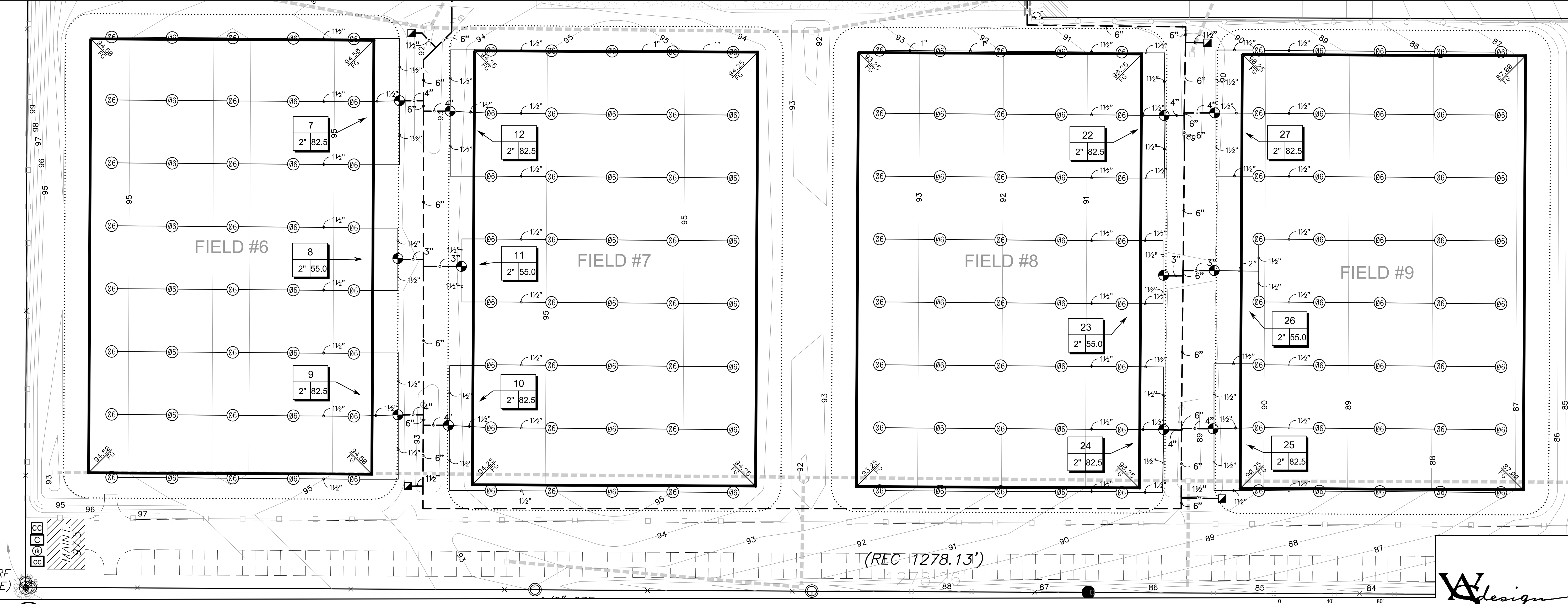
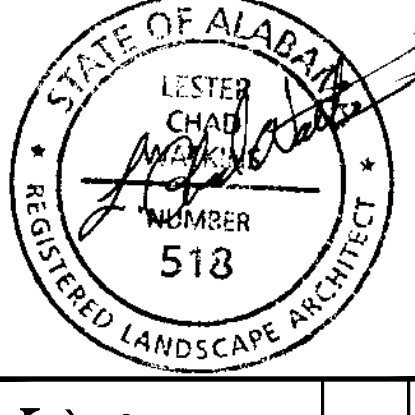
PRESSURE AVAILABLE
 Static Pressure at POC: 65.00 psi
 Elevation Change: 0.00 ft
 Service Line Size: 6"
 Length of Service Line: 60.00 ft
 Booster Pump pressure provided: 25.00 psi
 Pressure Available: 90.00 psi

DESIGN ANALYSIS
 Maximum Multi-valve Flow: 335.00 gpm
 Flow Available at POC: 375.00 gpm
 Residual Flow Available: 40.00 gpm

Pressure Req. at Critical Station: 60.64 psi
 Loss for Fittings: 0.20 psi
 Loss for Main Line: 1.96 psi
 Loss for POC to Valve Elevation: 0.65 psi
 Loss for Backflow: 5.75 psi
 Loss for Master Valve: 4.90 psi
 Loss for Water Meter: 9.16 psi
 Critical Station Pressure at POC: 83.26 psi
 Pressure Available: 90.00 psi
 Residual Pressure Available: 6.74 psi

REVISION:

NO.	DATE	APPR.
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1 IRRIGATION PLAN ENLARGEMENT

Scale: 1" = 40'



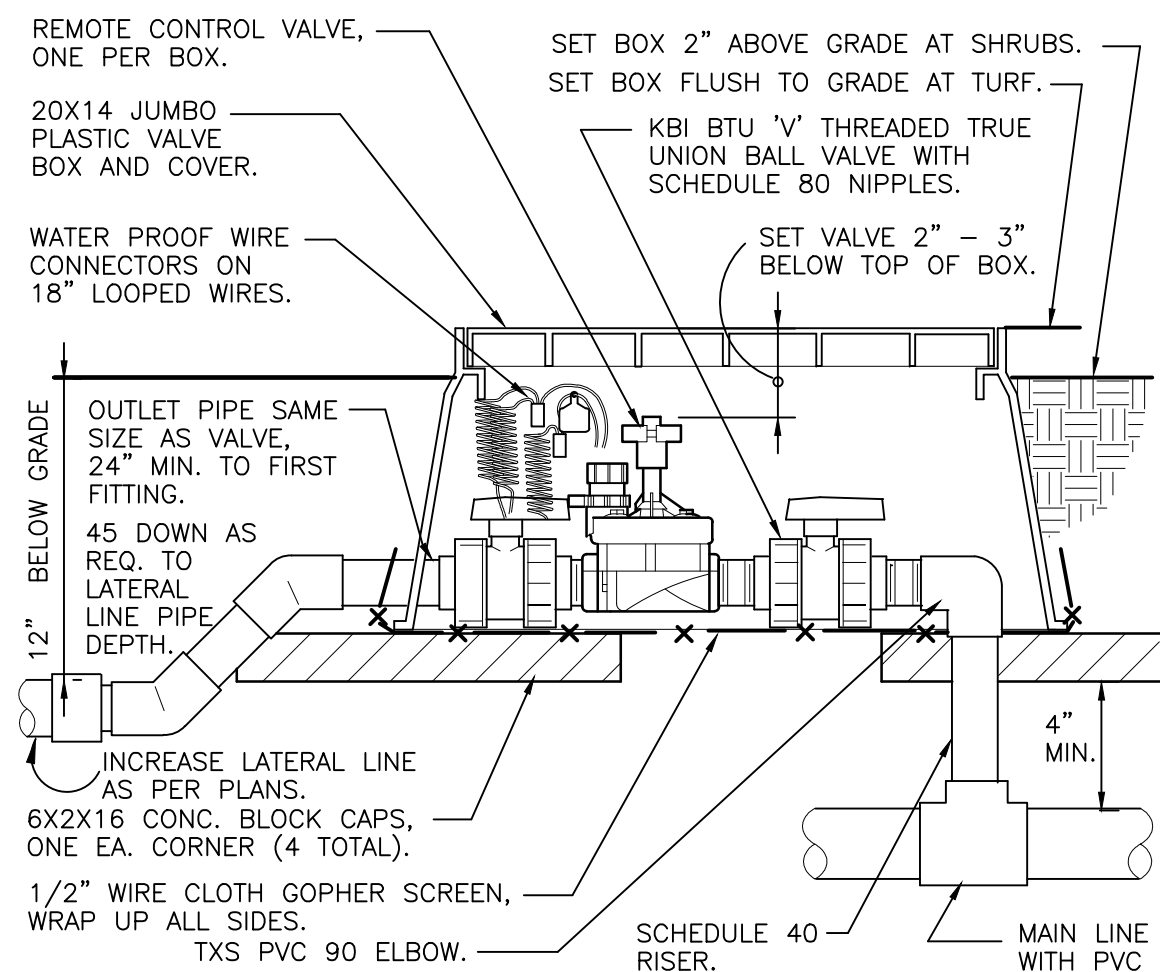
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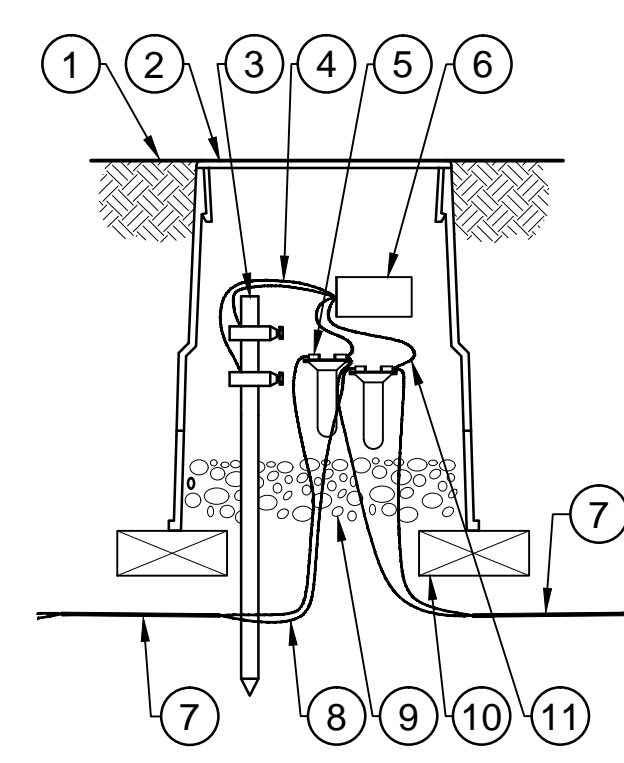
CHECKED: ANB
 DRAWN: CCJ
 DESIGNED: ANB/CCJ
 DATE: APRIL 2014

UTILITY & IRRIGATION PLAN
FAIRHOPE SOCCER FIELDS
CITY OF FAIRHOPE
FAIRHOPE, ALABAMA

PROJECT NO: 385.0003
 SHEET: LI3



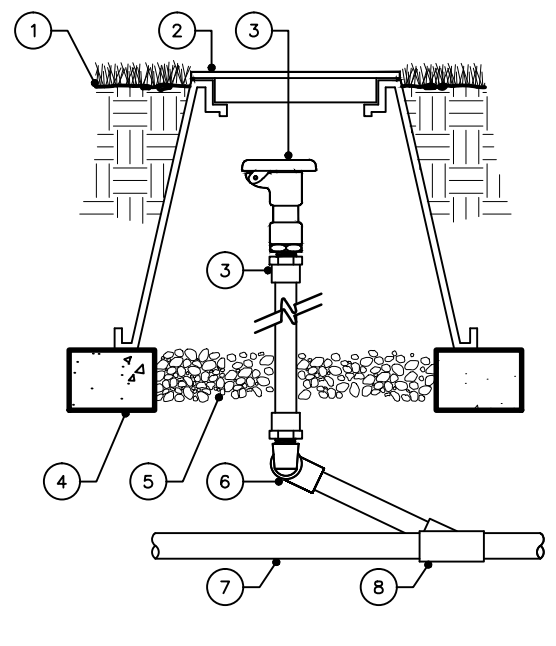
1 RCV WITH UNION S.O.V.
1 1/2" = 1'-0"
328406.13-04



2 RAINBIRD 2-WIRE GROUNDING DETAIL
1 1/2" = 1'-0"

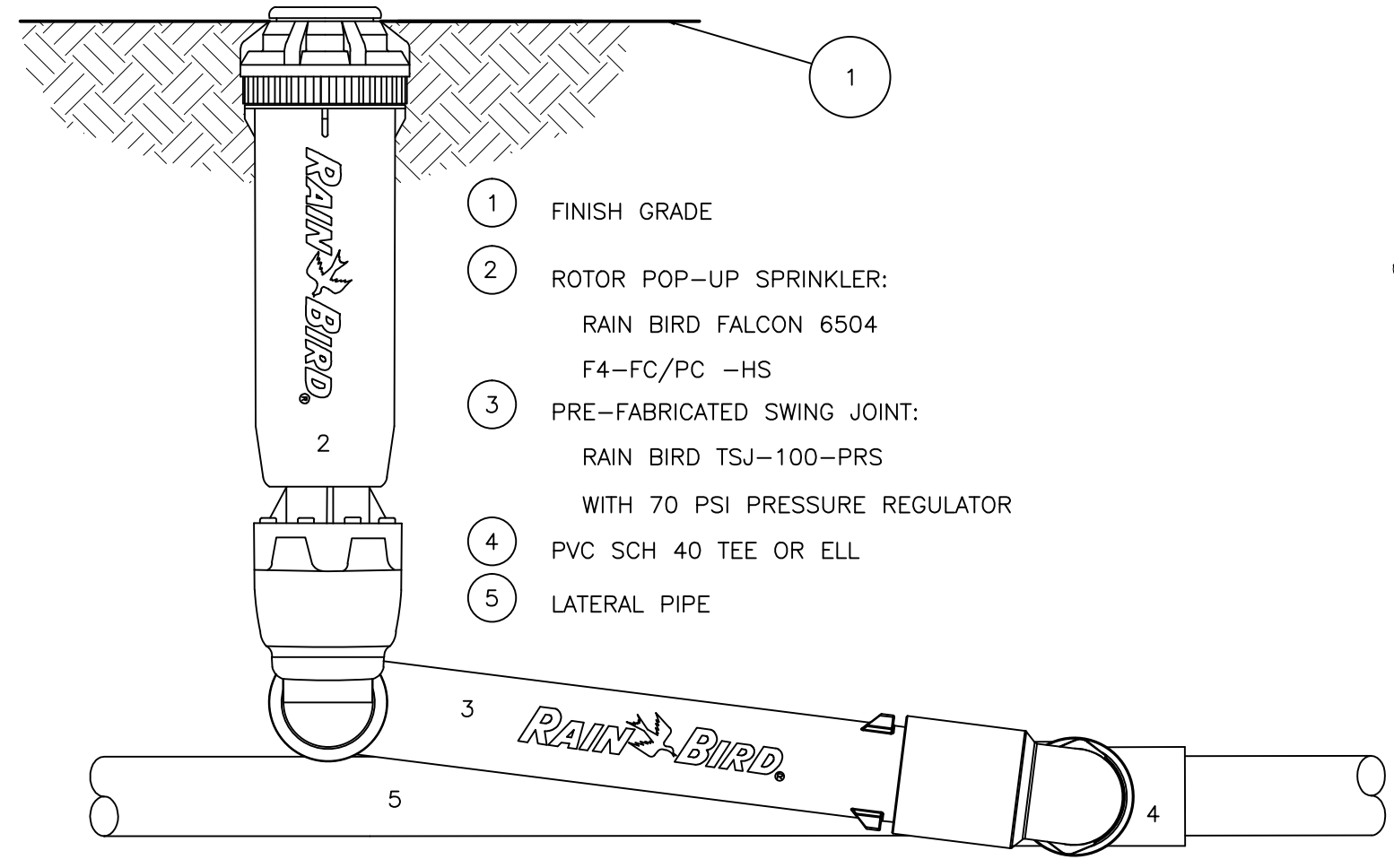
NOTES:
1. LSP-1TURF SHOULD BE INSTALLED EVERY 500- FEET OR FOR EVERY EIGHT DECODERS ON TWO-WIRE PATH.
2. LSP-1TURF TO BE INSTALLED AT END OF WIRE RUN THAT TERMINATES IN THE FIELD (STAR CONFIGURATION).
3. RAIN BIRD FD-401TURF AND FD-601TURF FIELD DECODERS COME WITH LSP-1TURF'S BUILT-IN FD-101TURF, FD-102TURF AND FD-202TURF REQUIRE SEPARATE LSP-1TURF PROTECTION.

- ① FINISH GRADE OR TOP OF MULCH
- ② 10-INCH VALVE BOX WITH COVER: RAIN BIRD VB-10RND
- ③ GROUNDING ROD: 10 OHMS OR LESS
- ④ GREEN/YELLOW WIRE FROM LSP-1TURFTURF TO GROUNDING ROD BRASS CLAMPS (1 OF 2)
- ⑤ DB SERIES WIRE CONNECTOR: RAIN BIRD DBTWC25 (1 OF 2)
- ⑥ LINE SURGE PROTECTOR: RAIN BIRD LSP-1TURF M10008
- ⑦ TWO-WIRE CABLE TO NEXT DEVICE (FIELD DECODER, SENSOR DECODER, LINE SURGE PROTECTOR OR ESP-LXD CONTROLLER)
- ⑧ COMMUNICATION WIRE TO NEXT DEVICE (FIELD DECODER, SENSOR DECODER, LINE SURGE PROTECTOR OR ESP-LXD CONTROLLER)
- ⑨ 3-INCH MINIMUM DEPTH OF 3/4-INCH WASHED GRAVEL
- ⑩ BRICK (1 OF 2)
- ⑪ BLUE WIRE FROM LSP-1TURF TO DB SERIES WIRE CONNECTOR

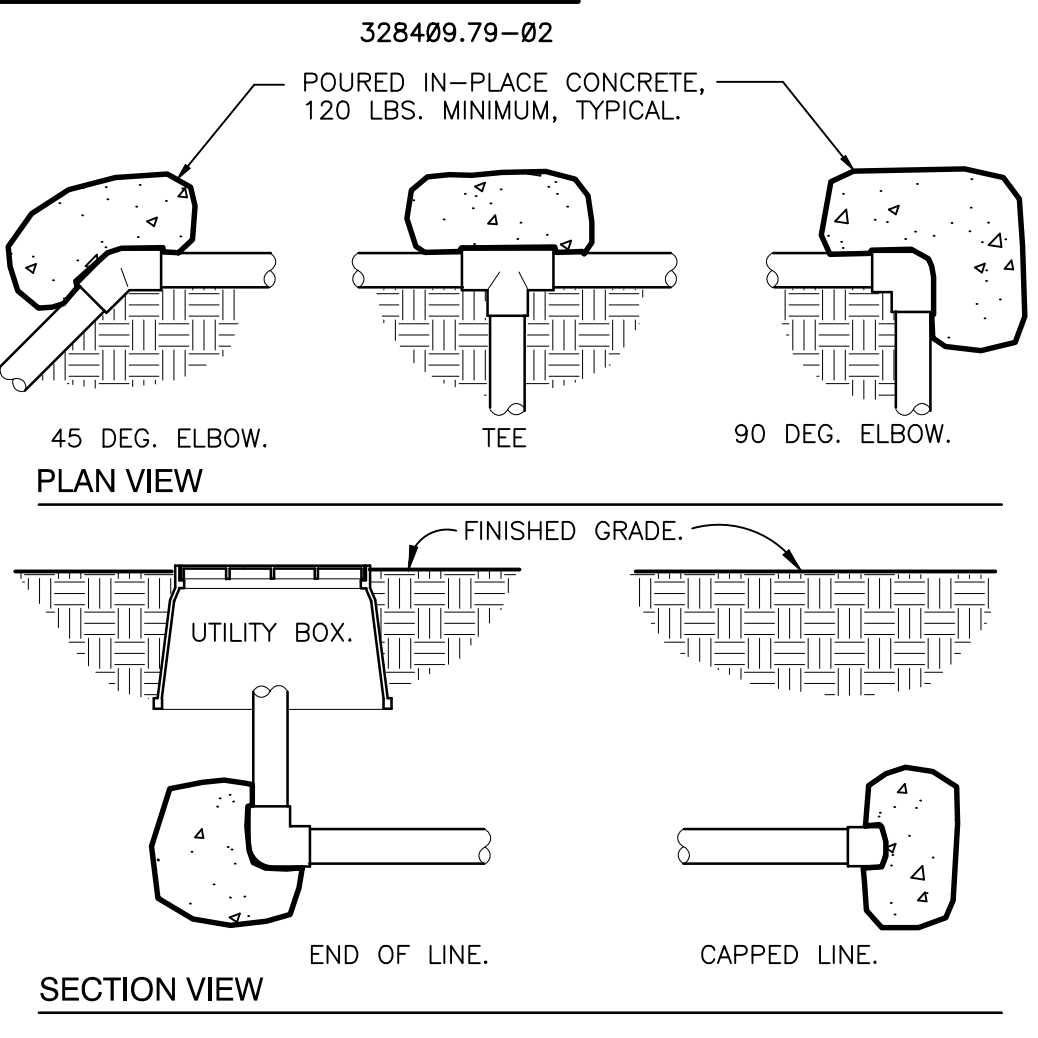


3 QUICK COUPLER VALVE
6" = 1'-0"
328406.43-05

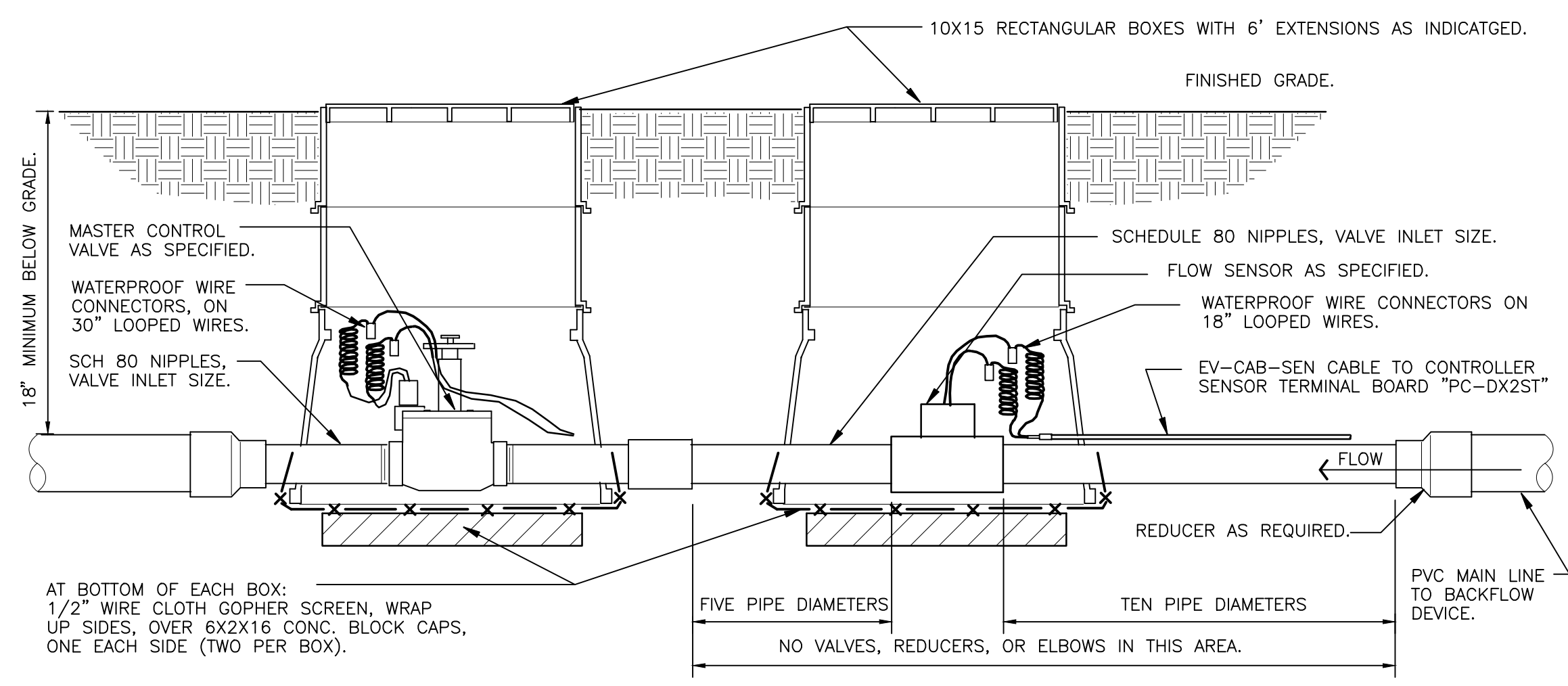
- ① FINISHED GRADE
 - ② VALVE BOX & COVER
 - ③ QUICK COUPLER SEE SPECS. & LEGEND
 - ④ CONTINUOUS BRICK SUPPORTS
 - ⑤ GRAVEL (1 CU. FT.)
 - ⑥ 18" SWING JOINT, QUICK COUPLER, ACME UNI-BODY, 1" ACME x 1" QUICK COUPLER
 - ⑦ PVC MAIN LINE SEE SPECS. FOR DEPTH
 - ⑧ PVC TEE OR ELBOW (TYP.)
- NOTES:**
SEE PLANS, LEGEND AND SPECIFICATIONS FOR ADDITIONAL INSTALLATION NOTES.



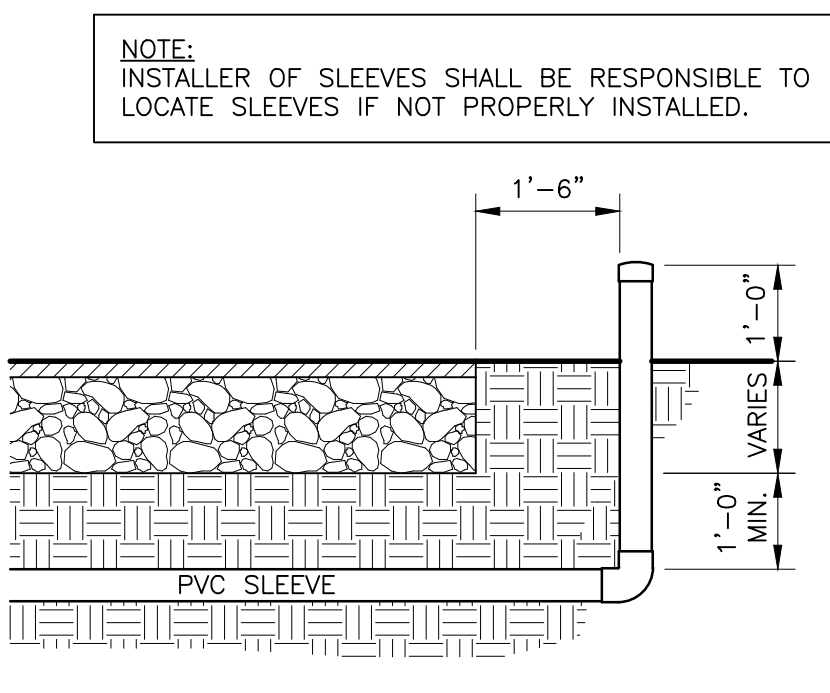
4 FALCON 6504 ASSEMBLY
3" = 12"
328403.16-01



5 THRUST BLOCKING
3/4" = 1'-0"
328409.76-01



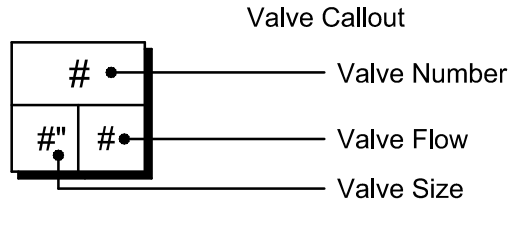
6 MASTER VALVE/FLOW SENSOR ASSEMBLY
1 1/2" = 1'-0"
328406.23-02



7 SLEEVING DETAIL
1/2" = 1'-0"
328409.76-05

IRRIGATION SCHEDULE

SYMBOL	MANUFACTURER/MODEL/DESCRIPTION	QTY	PSI	GPM	RADIUS
⊗	Rain Bird F4-PC, FC Turf Rotor, 4.0" Pop-Up, Plastic Riser, Adjustable and Full Circle, With Removable Seal-A-Matic Check Valve, 1" Female Threaded Inlet.	360	50	5.50	49'
⊙	Rain Bird PEB-PRS-D 2" 1", 1-1/2", 2" Plastic Industrial Valves, Low Flow Operating Capability, Globe Configuration, With Pressure Regulator Module.	27			
■	Rain Bird 5-LRC 1" 1" Brass Quick-Coupling Valve, with Corrosion-Resistant Stainless Steel Spring, Locking Thermoplastic Rubber Cover, and 1-Piece Body.	12			
Ⓜ	Rain Bird 300-BPE-PRS-D Globe 3" 3" Brass Master Valve, with Globe Configuration, With PRS-Dial Pressure Regulator Module.	1			
Ⓛ	Watts 709 3" Double Check Detector Assemblies	1			
Ⓢ	Rain Bird ESP-LXD Two-Wire Decoder Commercial Controller, 50 Stations, UV-Resistant, Outdoor-Rated, Plastic Locking Wall-Mountable Case. Available in the US market, International, European, or Australian Markets.	1			
Ⓚ	Rain Bird LIMRKIT Landscape Irrigation and Maintenance Remote. Maintains Rain Bird system operation and head alignment. Operates with all ESP and STP Rain Bird Controllers. Kit comes with batteries and a durable plastic carrying case.	1			
Ⓢ	Rain Bird IQADVCDSD Modular Multi-Site 5-Satellite Central Control System. Provides remote programming, management, and monitoring of ESP-LX Series Controllers from the computer. Includes all feature packs	1			
Ⓢ	Rain Bird FS-400-P 4" Flow Sensor for use with Rain Bird Maxicom, SiteControl, and ESP-LXD Central Control Systems. Plastic (PVC) Model. Suggested Operating Range of 40.0 GPM to 500.0 GPM. Sensors should be sized for flow rather than pipe size.	1			
Ⓟ	Rain Bird Pump Station Vertical Multi-Stage - 1 Pump Enhanced - Aluminum Enclosure Part #CVM032315802A Contact Donn Mann (520) 904-1146 Dmann@rainbird.com	1			
Ⓢ	Communication Cartridge To be selected by Owner	1			
Ⓜ	Water Meter 4"	1			
---	Irrigation Lateral Line: PVC Class 200 SDR 21 1"	10,395 l.f.			
---	Irrigation Lateral Line: PVC Class 200 SDR 21 1 1/2"	8,024 l.f.			
---	Irrigation Lateral Line: PVC Class 200 SDR 21 2"	35.4 l.f.			
---	Irrigation Mainline: PVC Class 200 SDR 21 1 1/2"	556.7 l.f.			
---	Irrigation Mainline: PVC Class 200 SDR 21 3"	280.8 l.f.			
---	Irrigation Mainline: PVC Class 200 SDR 21 4"	470.5 l.f.			
---	Irrigation Mainline: PVC Class 200 SDR 21 6"	3,742 l.f.			
---	Irrigation Mainline: PVC Class 200 SDR 21 8"	55.0 l.f.			
---	Pipe Sleeve: PVC Class 200 SDR 21 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.	88.8 l.f.			



REVISION:

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STATE OF ALABAMA
LESTER CHAD
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UTILITY & IRRIGATION PLAN
FAIRHOPE SOCCER FIELDS
CITY OF FAIRHOPE
FAIRHOPE, ALABAMA

W Design
WATKINS • ACY • STRUNK
landscape architecture • land planning • placemaking
218 N. Alton Street, Foley, Alabama 36535
Telephone 251.983.3331 • Facsimile 251.981.6722
www.wdesign.com

PROJECT NO: 385.0003
SHEET: LI4

SECTION 328400 - PLANTING IRRIGATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Piping.
 - 2. Manual valves.
 - 3. Automatic control valves.
 - 4. Transition fittings.
 - 5. Sprinklers.
 - 6. Quick couplers.
 - 7. Controllers.
 - 8. Boxes for automatic control valves.

1.3 DEFINITIONS

- A. Circuit Piping: Downstream from control valves to sprinklers, specialties, and drain valves. Piping is under pressure during flow.
- B. Main Piping: Downstream from point of connection to water distribution piping to, and including, control valves. Piping is under water-distribution-system pressure.
- C. Low Voltage: As defined in NFPA 70 for circuits and equipment operating at less than 50 V or for remote-control, signaling power-limited circuits.

1.4 PERFORMANCE REQUIREMENTS

- A. Irrigation zone control shall be automatic operation with controller and automatic control valves.
- B. Location of Sprinklers and Specialties: Design location is approximate. Make minor adjustments necessary to avoid plantings and obstructions such as signs and light standards. Maintain 100 percent irrigation coverage of areas indicated.

Fairhope Soccer Complex

- C. Minimum Working Pressures: The following are minimum pressure requirements for piping, valves, and specialties unless otherwise indicated:
 - 1. Irrigation Main Piping: 200 psig .
 - 2. Circuit Piping: 150 psig .

1.5 ACTION SUBMITTALS

- A. Product Data: For each type of product indicated. Include rated capacities, operating characteristics, electrical characteristics, and furnished specialties and accessories.

1.6 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For qualified Installer.
- B. Zoning Chart: Show each irrigation zone and its control valve.
- C. Controller Timing Schedule: Indicate timing settings for each automatic controller zone.
- D. Field quality-control reports.

1.7 CLOSEOUT SUBMITTALS

- A. Operation and Maintenance Data: For sprinklers and controllers to include in operation and maintenance manuals.

1.8 QUALITY ASSURANCE

- A. Installer Qualifications: A company that has completed at least 5 projects of a similar size and scope in the last 5 years. A list of projects, project addresses, work value, and current project references are required with bid submittal..
- B. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

1.9 DELIVERY, STORAGE, AND HANDLING

- A. Deliver piping with factory-applied end caps. Maintain end caps through shipping, storage, and handling to prevent pipe-end damage and to prevent entrance of dirt, debris, and moisture.
- B. Store plastic piping protected from direct sunlight. Support to prevent sagging and bending.

1.10 PROJECT CONDITIONS

- A. Interruption of Existing Water Service: Do not interrupt water service to facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary water service according to requirements indicated:
 - 1. Notify Construction Manager no fewer than two days in advance of proposed interruption of water service.
 - 2. Do not proceed with interruption of water service without Owner's written permission.

PART 2 - PRODUCTS

2.1 PIPES, TUBES, AND FITTINGS

- A. Comply with requirements in the piping schedule for applications of pipe, tube, and fitting materials, and for joining methods for specific services, service locations, and pipe sizes.
- B. PVC Pipe, gasketed-joint, ring-tite, white; Pressure Rated: ASTM D 2241, PVC 1120 compound,
 - 1. Ductile Iron Fittings, for gasketed-joint pipe.

2.2 PIPING JOINING MATERIALS

- A. Solvent Cements for Joining PVC Piping: ASTM D 2564. Include primer according to ASTM F 656.
- B. Plastic, Pipe-Flange Gasket, Bolts, and Nuts: Type and material recommended by piping system manufacturer unless otherwise indicated.

2.3 MANUAL VALVES

- A. Iron Ball Valves:
 - 1. Basis-of-Design Product: Subject to compliance with requirements, provide product indicated on Drawings or comparable product by one of the following:
 - a. American Valve, Inc.
 - b. Watts; a Watts Water Technologies company.
 - c. Zurn Industries, LLC; Model 850.
 - 2. Description:
 - a. Standard: MSS SP-72.
 - b. CWP Rating: 200 psig .
 - c. Body Design: Split body.
 - d. Body Material: ASTM A 126, gray iron.
 - e. Ends: Flanged.
 - f. Seats: PTFE or TFE.

Fairhope Soccer Complex

- g. Stem: Stainless steel.
- h. Ball: Stainless steel.
- i. Port: Full.

B. Plastic Ball Valves:

1. **Manufacturers:** Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

- a. [American Valve, Inc.](#)
- b. [Hayward Flow Control; a division of Hayward Industries, Inc.](#)
- c. [IPEX USA LLC.](#)
- d. [KBI \(King Bros. Industries\).](#)
- e. [NIBCO INC.](#)
- f. [Spears Manufacturing Company.](#)
- g. [Thermoplastic Valves, Inc.](#)
- h. [Watts; a Watts Water Technologies company.](#)

2. Description:

- a. Standard: MSS SP-122.
- b. Pressure Rating: 150 psig .
- c. Body Material: PVC.
- d. Type: Union.
- e. End Connections: Socket or threaded.
- f. Port: Full.

2.4 AUTOMATIC CONTROL VALVES

A. Plastic, Automatic Control Valves:

1. **Basis-of-Design Product:** Subject to compliance with requirements, provide product indicated on Drawings or comparable product by one of the following:
 - a. Rain Bird, Inc.
2. Description: Molded-plastic body, normally closed, diaphragm type with manual-flow adjustment, and operated by 24-V ac solenoid.

2.5 TRANSITION FITTINGS

- ### A. General Requirements: Same size as, and with pressure rating at least equal to and with ends compatible with, piping to be joined.

B. Transition Couplings:

1. Description: AWWA C219, metal sleeve-type coupling for underground pressure piping.

2.6 SPRINKLERS

- A. General Requirements: Designed for uniform coverage over entire spray area indicated at available water pressure.
- B. Plastic, Pop-up, Gear-Drive Rotary Sprinklers:
 - 1. **Basis-of-Design Product:** Subject to compliance with requirements, provide product indicated on Drawings or comparable product by one of the following:
 - a. **Rain Bird Corporation.**
 - 2. Description:
 - a. Body Material: ABS.
 - b. Nozzle: ABS.
 - c. Retraction Spring: Stainless steel.
 - d. Internal Parts: Corrosion resistant.
- C. Plastic, Pop-up Spray Sprinklers:
 - 1. **Basis-of-Design Product:** Subject to compliance with requirements, provide product indicated on Drawings or comparable product by one of the following:
 - a. **Rain Bird Corporation.**
 - 2. Description:
 - a. Body Material: ABS.
 - b. Nozzle: ABS.
 - c. Retraction Spring: Stainless steel.
 - d. Internal Parts: Corrosion resistant.
 - e. Pattern: Fixed, with flow adjustment.

2.7 QUICK COUPLERS

- A. **Basis-of-Design Product:** Subject to compliance with requirements, provide product indicated on Drawings or comparable product by one of the following:
 - 1. **Rain Bird Corporation.**
- B. Description: Factory-fabricated, bronze or brass, two-piece assembly. Include coupler water-seal valve; removable upper body with spring-loaded or weighted, rubber-covered cap; hose swivel with ASME B1.20.7, 3/4-11.5NH threads for garden hose on outlet; and operating key.
 - 1. Locking-Top Option: Vandal-resistant locking feature. Include two matching key(s).

2.8 CONTROLLERS

- A. **Basis-of-Design Product:** Subject to compliance with requirements, provide product indicated on Drawings or comparable product by one of the following:

1. **Rain Bird Corporation.**

- B. Description:

1. Controller Stations for Automatic Control Valves: Each station is variable from approximately 5 to 120 minutes. Include switch for manual or automatic operation of each station.
2. Control Transformer: 24-V secondary, with primary fuse.
3. Moisture Sensor: As indicated on Drawings.
4. Flow Sensor: As indicated on Drawings.
5. Wiring: UL 493, Type UF multiconductor, with solid-copper conductors; insulated cable; suitable for direct burial.
 - a. Feeder-Circuit Cables: Between building and controllers, as indicated on Drawings.
 - b. Two-wire and sensor cables: No. 14 AWG minimum, in a loop pattern that follows the mainline with branch loops wherever possible.
 - c. Splicing Materials: Rainbird DB Series wire connector, or as required by manufacturer
 - d. Surge Protectors: Rainbird LSP-1 Line Surge protectors, or as required by manufacturer.
 - e. Two-Wire Decoders: Rainbird FD Series Field Decoders. Multi-address decoders are acceptable. Where multi-address decoders are used, note on decoder ID tag which valve numbers are controlled.
 - f. Flow-Sensor Decoders: Rainbird SP-201-TURF, install with Rainbird FSSURKIT as recommended by manufacturer.
6. Concrete Base: Reinforced precast concrete not less than 36 by 24 by 4 inches thick, and 6 inches greater in each direction than overall dimensions of controller. Include opening for wiring.

2.9 BOXES FOR ISOLATION VALVES

- A. Plastic Boxes:

1. Description: Box and cover, with open bottom and openings for piping; designed for installing flush with grade.
 - a. Size: As required for valves and service. No box smaller than 10" round shall be used.
 - b. Shape: RoundRectangular or Rectangular.
 - c. Sidewall Material: PE, ABS, or FRP.
 - d. Cover Material: PE, ABS, or FRP.

- 1) Lettering: " IRRIGATION."

PART 3 - EXECUTION

3.1 EARTHWORK

- A. Excavating, trenching, and backfilling are specified in Section 312000 "Earth Moving."
- B. Install warning tape directly above pressure piping, 12 inches below finished grades, except 6 inches below subgrade under pavement and slabs.
- C. Drain Pockets: Excavate to sizes indicated. Backfill with cleaned gravel or crushed stone, graded from 3/4 to 3 inches, to 12 inches below grade. Cover gravel or crushed stone with sheet of asphalt-saturated felt and backfill remainder with excavated material.
- D. Provide minimum cover over top of underground piping according to the following:
 1. Irrigation Main Piping: Minimum depth of 24-inches below finished grade, or not less than 18 inches below average local frost depth, whichever is deeper.
 2. Circuit Piping: 12 inches.
 3. Drain Piping: 12 inches.
 4. Sleeves: 24 inches.

3.2 PREPARATION

- A. Set stakes to identify locations of proposed irrigation system. Obtain Architect's approval before excavation.

3.3 PIPING INSTALLATION

- A. Location and Arrangement: Drawings indicate location and arrangement of piping systems. Install piping as indicated unless deviations are approved on Coordination Drawings.
- B. Install piping at minimum uniform slope of 0.5 percent down toward drain valves.
- C. Install piping free of sags and bends.
- D. Install groups of pipes parallel to each other, spaced to permit valve servicing.
- E. Install fittings for changes in direction and branch connections.
- F. Install flanges adjacent to valves and to final connections to other components with NPS 2-1/2 or larger pipe connection.
- G. Install underground thermoplastic piping according to ASTM D 2774.
- H. Install expansion loops in control-valve boxes for plastic piping.

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- I. Lay piping on solid subbase, uniformly sloped without humps or depressions.
- J. Install PVC piping in dry weather when temperature is above 40 deg F . Allow joints to cure at least 24 hours at temperatures above 40 deg F before testing.
- K. Install piping in sleeves under parking lots, roadways, and sidewalks.

3.4 JOINT CONSTRUCTION

- A. Ream ends of pipes and tubes and remove burrs. Bevel plain ends of steel pipe.
- B. Remove scale, slag, dirt, and debris from inside and outside of pipe and fittings before assembly.
- C. Flanged Joints: Select rubber gasket material, size, type, and thickness for service application. Install gasket concentrically positioned. Use suitable lubricants on bolt threads.
- D. PVC Piping Solvent-Cemented Joints: Clean and dry joining surfaces. Join pipe and fittings according to the following:
 - 1. Comply with ASTM F 402 for safe-handling practice of cleaners, primers, and solvent cements.
 - 2. PVC Pressure Piping: Join schedule number, ASTM D 1785, PVC pipe and PVC socket fittings according to ASTM D 2672. Join other-than-schedule-number PVC pipe and socket fittings according to ASTM D 2855.
 - 3. PVC Nonpressure Piping: Join according to ASTM D 2855.

3.5 VALVE INSTALLATION

- A. Aboveground Valves: Install as components of connected piping system.
- B. Throttling Valves: Install in underground piping in boxes for automatic control valves.

3.6 SPRINKLER INSTALLATION

- A. Install sprinklers after hydrostatic test is completed.
- B. Install sprinklers at manufacturer's recommended heights.
- C. Locate part-circle sprinklers to maintain a minimum distance of 4 inches from walls and edges of paving and 2 inches from other boundaries unless otherwise indicated.

3.7 AUTOMATIC IRRIGATION-CONTROL SYSTEM INSTALLATION

- A. Equipment Mounting: Install exterior freestanding controllers on precast concrete bases.

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1. Place and secure anchorage devices. Use setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.
 2. Install anchor bolts to elevations required for proper attachment to supported equipment.
- B. Install control cable in same trench as irrigation piping and at least 2 inches below or beside piping. Provide conductors of size not smaller than recommended by controller manufacturer. Install cable in separate sleeve under paved areas.

3.8 CONNECTIONS

- A. Comply with requirements for piping specified in Section 221113 "Facility Water Distribution Piping" for water supply from exterior water service piping, water meters, protective enclosures, and backflow preventers. Drawings indicate general arrangement of piping, fittings, and specialties.
- B. Install piping adjacent to equipment, valves, and devices to allow service and maintenance.
- C. Connect wiring between controllers and automatic control valves.

3.9 IDENTIFICATION

- A. Equipment Nameplates and Signs: Install engraved plastic-laminate equipment nameplates and signs on each automatic controller.
1. Text: In addition to identifying unit, distinguish between multiple units, inform operator of operational requirements, indicate safety and emergency precautions, and warn of hazards and improper operations.

3.10 FIELD QUALITY CONTROL

- A. Manufacturer's Field Service: Engage a factory-authorized service representative to inspect, test, and adjust components, assemblies, and equipment installations, including connections.
- B. Tests and Inspections:
1. Leak/Hydrostatic Test: After installation, charge system at 150% of operating pressure continuously for 2 hours with open trenches and observe for leaks. Repair leaks and retest until no leaks exist.
 2. Operational Test: After electrical circuitry has been energized, operate controllers and automatic control valves to confirm proper system operation.
 3. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.
- C. Any irrigation product will be considered defective if it does not pass tests and inspections.
- D. Prepare test and inspection reports.

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3.11 STARTUP SERVICE

- A. Perform startup service.
 - 1. Complete installation and startup checks according to manufacturer's written instructions.
 - 2. Verify that controllers are installed and connected according to the Contract Documents.
 - 3. Verify that electrical wiring installation complies with manufacturer's submittal.

3.12 ADJUSTING

- A. Adjust settings of controllers.
- B. Adjust automatic control valves to provide flow rate at rated operating pressure required for each sprinkler circuit.
- C. Adjust sprinklers and devices, except those intended to be mounted aboveground, so they will be flush with, or not more than 1/2 inch above, finish grade.

3.13 CLEANING

- A. Flush dirt and debris from piping before installing sprinklers and other devices.

3.14 DEMONSTRATION

- A. Train Owner's maintenance personnel to adjust, operate, and maintain automatic control valves and controllers.

END OF SECTION 328400