GENERAL DESCRIPTION

THE IRRIGATION DESIGN INCLUDES A FULLY AUTOMATED DRIP IRRIGATION SYSTEM THAT IRRIGATES SHRUB BEDS.

THE WATER SOURCE IS A DEDICATED NON-POTABLE TAP. IT IS ASSUMED THAT PURPLE MARKINGS ARE NOT REQUIRED ON PIPE, VALVE BOX LIDS, TAGS, SPRINKLER TOPS, DRIP TUBING, ETC. PER DIRECTION OF GRAND JUNCTION NO BACKFLOW PREVENTION IS REQUIRED.

A STAND ALONE, TRADITIONALLY WIRED IRRIGATION CONTROLLER IS REQUIRED. DUE TO WIRE RUN LENGTHS, BOTH THE CONTROL AND COMMON WIRE ARE SIZED APPROPRIATELY. THE WIRE SIZING IS INDICATED ON THE PLANS.

ISOLATION GATE VALVES PERMIT THE ISOLATION OF SECTIONS OF THE SYSTEM FOR REPAIRS OR MAINTENANCE.

QUICK COUPLING VALVES HAVE BEEN PROVIDED THROUGHOUT THE SITE FOR WINTERIZATION PURPOSES.

AIR VACUUM RELIEF VALVES ARE REQUIRED TO PROTECT THE MAINLINE DURING START UP AND DRAINING.

A GRAVITY DRAIN IS PROVIDED TO ASSIST WITH WINTERIZATION.

IT IS THE CONTRACTOR'S RESPONSIBILITY TO INSTALL THE IRRIGATION SYSTEM IN ACCORDANCE WITH GRAND JUNCTION'S IRRIGATION GUIDELINES.

GENERAL NOTES

1. THE SYSTEM DESIGN ASSUMES A MINIMUM PRESSURE AND MAXIMUM FLOW DEMAND AS SHOWN ON THE PLANS FOR THE POINT-OF-CONNECTION (P.O.C.). THE CONTRACTOR IS RESPONSIBLE FOR VERIFYING PRESSURE AND FLOW ON SITE PRIOR TO CONSTRUCTION AND REPORT ANY DISCREPANCIES TO THE OWNER'S REPRESENTATIVE.
2. READ THOROUGHLY AND BECOME FAMILIAR WITH GRAND JUNCTION IRRIGATION GUIDELINES FOR THIS AND RELATED WORK PRIOR TO CONSTRUCTION.
3. COORDINATE UTILITY LOCATES ("CALL BEFORE YOU DIG") OF UNDERGROUND UTILITIES PRIOR TO CONSTRUCTION.
4. DO NOT PROCEED WITH THE INSTALLATION OF THE IRRIGATION SYSTEM WHEN IT IS OBVIOUS IN THE FIELD THAT OBSTRUCTIONS OR GRADE DIFFERENCES EXIST THAT MIGHT NOT HAVE BEEN CONSIDERED IN THE ENGINEERING, OR IF DISCREPANCIES IN CONSTRUCTION DETAILS, LEGEND, NOTES, OR SPECIFICATIONS ARE DISCOVERED. BRING ALL SUCH OBSTRUCTIONS OR DISCREPANCIES TO THE ATTENTION OF THE OWNER'S REPRESENTATIVE.
5. THE DRAWINGS ARE DIAGRAMMATIC. THEREFORE, THE FOLLOWING SHOULD BE NOTED:

   A. IRRIGATION COMPONENTS MAY BE SHOWN OUTSIDE PLANTING AREAS FOR CLARITY. AVOID CONFLICTS BETWEEN THE IRRIGATION SYSTEM, PLANTING MATERIALS, AND ARCHITECTURAL FEATURES. INSTALL IRRIGATION PIPE AND WIRING IN LANDSCAPED AREAS WHEREVER POSSIBLE.

   B. USE ONLY STANDARD TEES AND ELBOW FITTINGS. USE OF CROSS TYPE FITTINGS IS NOT PERMITTED.
6. PROVIDE THE FOLLOWING COMPONENTS TO THE OWNER PRIOR TO THE COMPLETION OF THE PROJECT:

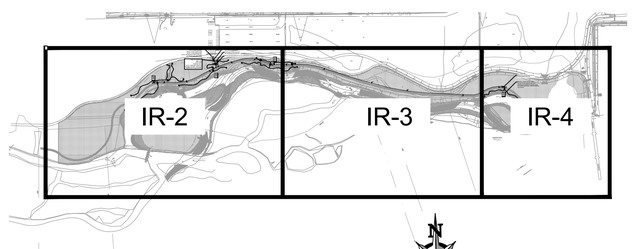
   A. TWO OPERATING KEYS FOR EACH TYPE OF MANUALLY OPERATED VALVE.

   B. TWO OF EACH SERVICING WRENCH OR TOOL NEEDED FOR COMPLETE ACCESS, ADJUSTMENT, AND REPAIR OF ALL ROTARY SPRINKLERS.
7. SELECT NOZZLES FOR SPRINKLERS WITH ARCS WHICH PROVIDE COMPLETE AND UNIFORM COVERAGE WITH MINIMUM OVERSPRAY FOR THE SITE CONDITIONS. CAREFULLY ADJUST THE RADIUS OF THROW AND ARC OF EACH SPRINKLER TO PROVIDE THE BEST PERFORMANCE.
8. THE IRRIGATION CONTRACTOR IS RESPONSIBLE FOR THE INSTALLATION OF IRRIGATION SLEEVING. SLEEVES ARE TO BE INSTALLED FOR BOTH PIPING AND ELECTRICAL WIRING AT EACH HARDSCAPE CROSSING. COORDINATE INSTALLATION OF SLEEVING WITH OTHER TRADES. ANY PIPE OR WIRE WHICH PASSES BENEATH EXISTING HARDSCAPE WHERE SLEEVING WAS NOT INSTALLED REQUIRES HORIZONTAL BORING BY THE IRRIGATION CONTRACTOR.
9. CONNECT ELECTRICAL POWER TO THE IRRIGATION CONTROL SYSTEM IN ACCORDANCE WITH THE NATIONAL ELECTRIC CODE AND ALL APPLICABLE LOCAL ELECTRIC UTILITY CODES.
10. WITH REGARD TO PIPE SIZING, THE FOLLOWING SHOULD BE NOTED:

    A. IF A SECTION OF UNSIZED PIPE IS LOCATED BETWEEN TWO IDENTICALLY SIZED SECTIONS, THE UNSIZED PIPE IS THE SAME NOMINAL SIZE AS THE TWO SIZED SECTIONS. THE UNSIZED PIPE SHOULD NOT BE CONFUSED WITH THE DEFAULT PIPE SIZE NOTED IN THE LEGEND.
11. INSTALL VAN NOZZLES WHERE SPRAY ANGLES ARE LESS OR GREATER THAN WHAT A FIXED SPRAY NOZZLE CAN IRRIGATE WITHOUT EXCESSIVE OVERSPRAY.

LEGEND

- (A) IRRIGATION CONTROLLER – RAIN BIRD LX OR EQUAL. INSTALL WITHIN LOCKING CABINET OR PEDESTAL (STRONG BOX OR EQUAL).
- IRRIGATION WIRING – REFER TO PLAN
- SLEEVING – CLASS 200 PVC
- POINT-OF-CONNECTION (P.O.C.)
- UNCONNECTED PIPE CROSSING
- MAINLINE PIPE
  *TYPE: CLASS 200 PVC
  *REFER TO PLANS FOR SIZING CRITERIA
- DRIP LATERAL PIPE – ¾" POLYETHYLENE DRIP TUBING
  *EMITTERS: RAIN BIRD XERI-BUG OR EQUAL
  *FOR TREES, INSTALL A LOOPS OF DRIP TUBING WITH 4 EMITTERS PER TREE
- QUICK COUPLING VALVE
  *RAIN BIRD 5LRC OR EQUAL
- ISOLATION GATE VALVE
  *MODEL: NIBCO T113 K
  *NOMINAL SIZE OF GATE VALVE TO MATCH NOMINAL MAINLINE SIZE
- (D) DRAIN VALVE
  *REFER TO DETAIL
- AIR VACUUM RELIEF VALVE
  *MODEL: WATERMAN AV-150 (SIZE: 1.5-INCH) OR EQUAL
- DRIP REMOTE CONTROL VALVE KIT
  *(0.2-5 GPM): RAIN BIRD XCZ-075-PRF OR EQUAL
  *5.1-10 GPM): RAIN BIRD XCZ-100-PRF OR EQUAL
  *BALL VALVE: SPEARS PVC COMPACT
- DRIP FLUSH CAP
  *RAIN BIRD COMPRESSION STYLE OR EQUAL
- A-1 / 15 / 1" / - INDICATES CONTROLLER AND STATION NUMBER
  INDICATES LATERAL DISCHARGE IN GPM
  INDICATES REMOTE CONTROL VALVE SIZE IN INCHES
- VALVE BOXES: RAIN BIRD PVB WITH GREEN LIDS OR EQUAL



COLORADO REGISTERED JEFFREY WAYNE BECKER 23206 PROFESSIONAL ENGINEER
05-23-2019

Aqua Engineering Inc.
Innovative Water Solutions

LAS COLONIAS RIVER PARK
IRRIGATION PLANS
GRAND JUNCTION, CO

IRRIGATION COVER SHEET

DATE	April 15, 2019
DESIGNED BY	JHK
DRAWN BY	JHK
CHECKED BY	CBK

REVISIONS
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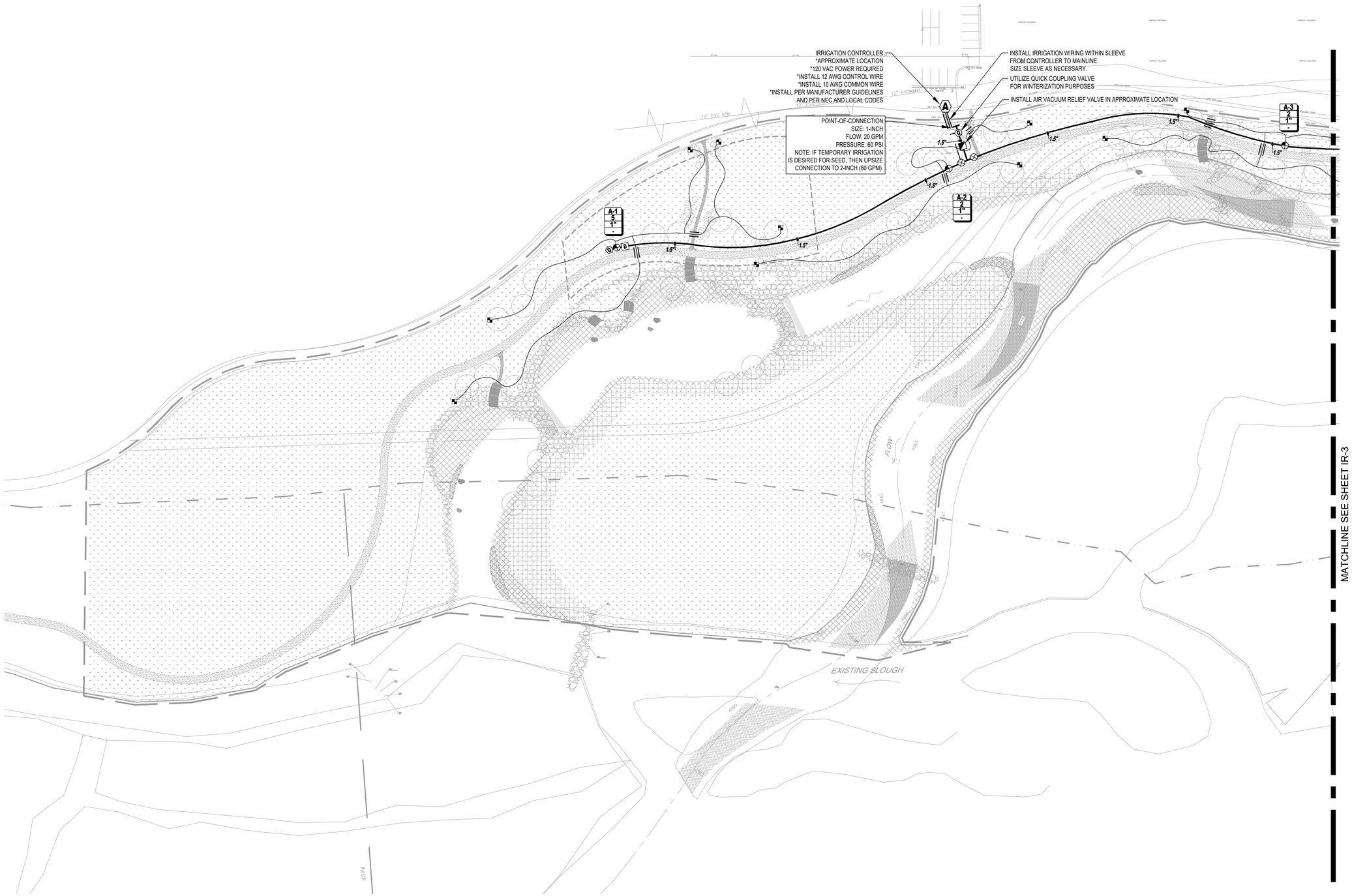
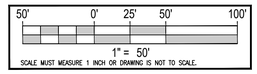
SHEET NO.
IR-1





05-23-2019

Aqua Engineering Inc.
Innovative Water Solutions

LAS COLONIAS RIVER PARK
IRRIGATION PLANS
GRAND JUNCTION, CO

IRRIGATION PLAN

DATE	April 15, 2019
DESIGNED BY	JHK
DRAWN BY	JHK
CHECKED BY	CBK

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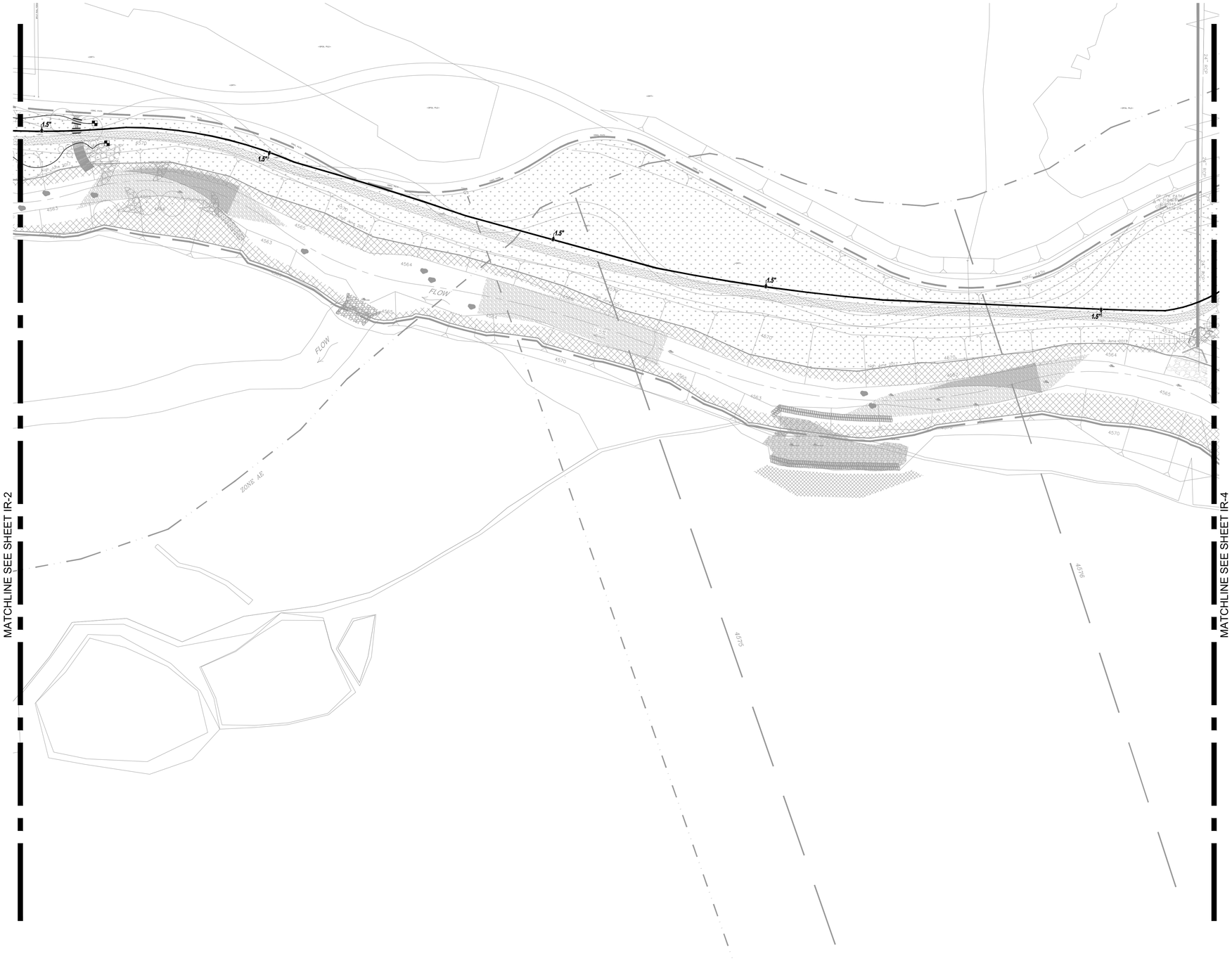
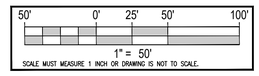
SHEET NO.
IR-2





05-23-2019

Aqua Engineering Inc.
Innovative Water Solutions

LAS COLONIAS RIVER PARK
IRRIGATION PLANS
GRAND JUNCTION, CO

IRRIGATION PLAN

DATE	April 15, 2019
DESIGNED BY	JHK
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CHECKED BY	CBK

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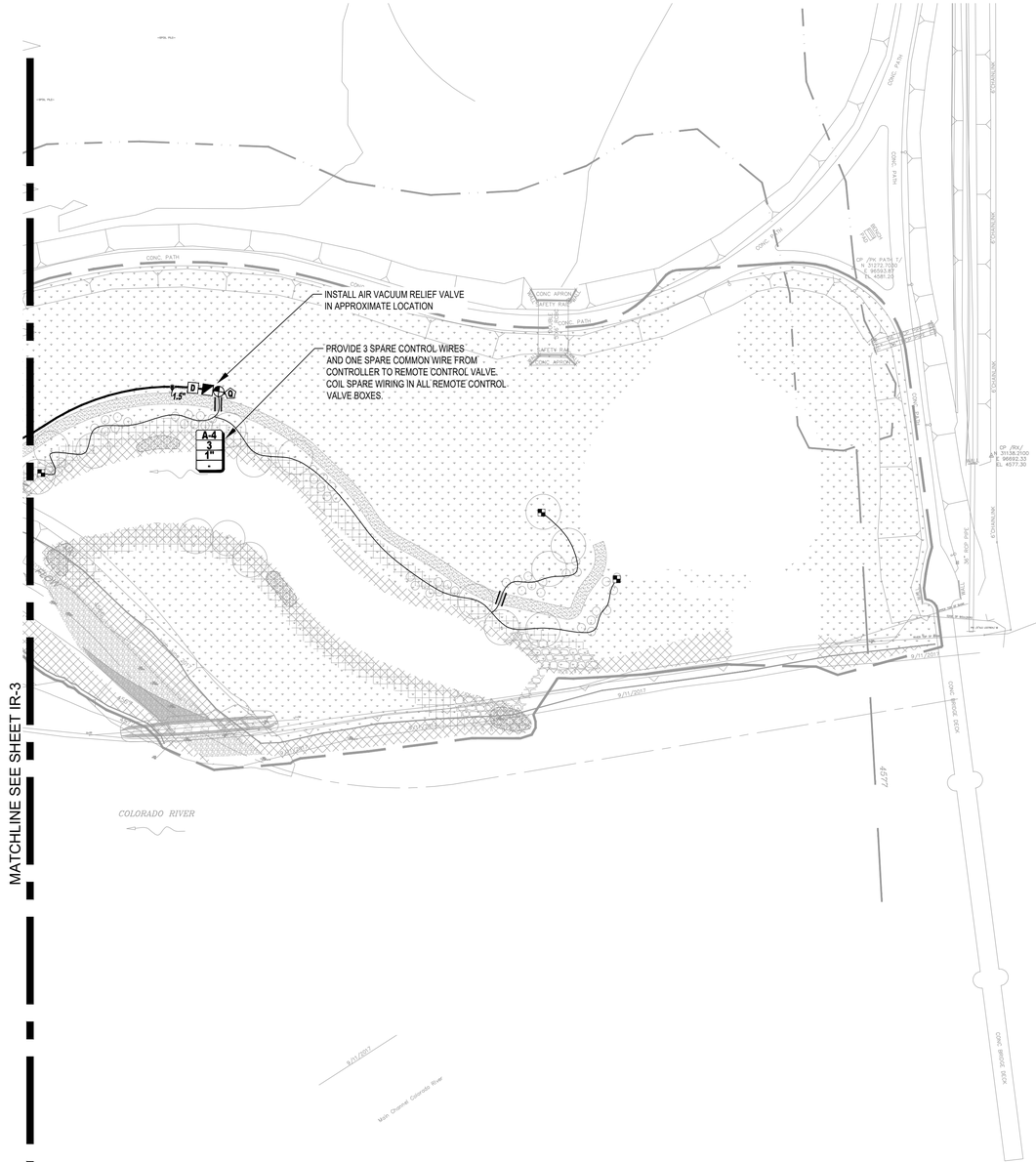
SHEET NO.
IR-3



50' 0' 25' 50' 100'

1" = 50'

SCALE MUST MEASURE 1 INCH OR DRAWING IS NOT TO SCALE.

05-23-2019

Aqua Engineering Inc.
Innovative Water Solutions

LAS COLONIAS RIVER PARK
IRRIGATION PLANS
GRAND JUNCTION, CO

IRRIGATION PLAN

DATE	April 15, 2019
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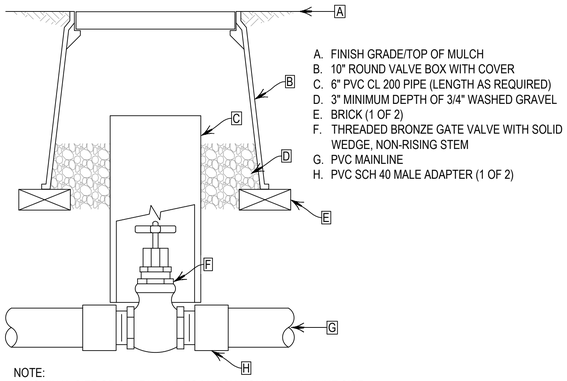
SHEET NO.
IR-4

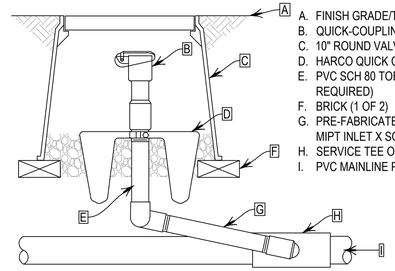


A. FINISH GRADE/TOP OF MULCH
B. 10" ROUND VALVE BOX WITH COVER
C. 6" PVC CL 200 PIPE (LENGTH AS REQUIRED)
D. 3" MINIMUM DEPTH OF 3/4" WASHED GRAVEL
E. BRICK (1 OF 2)
F. THREADED BRONZE GATE VALVE WITH SOLID WEDGE, NON-RISING STEM
G. PVC MAINLINE
H. PVC SCH 40 MALE ADAPTER (1 OF 2)

NOTE:
1. NOMINAL SIZE OF GATE VALVE TO MATCH NOMINAL MAINLINE SIZE.

1 ISOLATION GATE VALVE

N.T.S.

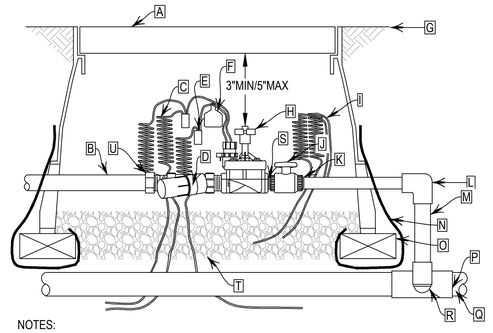


A. FINISH GRADE/TOP OF MULCH
B. QUICK-COUPLING VALVE
C. 10" ROUND VALVE BOX WITH COVER
D. HARCO QUICK COUPLER ANCHOR
E. PVC SCH 80 TOE NIPPLE (LENGTH AS REQUIRED)
F. BRICK (1 OF 2)
G. PRE-FABRICATED UNITIZED SWING JOINT 1" MIPT INLET X SOC OUTLET
H. SERVICE TEE OR SERVICE EL
I. PVC MAINLINE PIPE

NOTES:
1. FURNISH FITTINGS AND PIPING NOMINALLY SIZED IDENTICAL TO NOMINAL QUICK COUPLING VALVE INLET SIZE.
2. INSTALLATION HEIGHT OF QUICK COUPLER VALVE IN VALVE BOX MUST ALLOW PROPER OPERATION OF QUICK COUPLER KEY.
3. INSTALL SWING JOINT LAY ARM BETWEEN 30° AND 45° OF LATERAL PIPE IN ORDER TO ABSORB DOWNWARD IMPACT.

2 QUICK COUPLING VALVE

N.T.S.

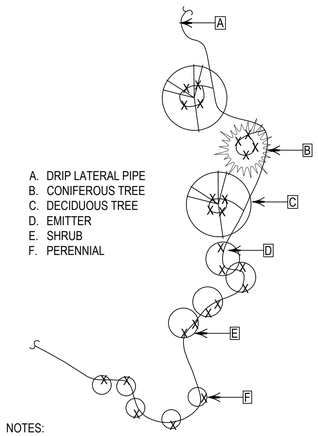


A. JUMBO VALVE BOX WITH COVER
B. PVC MANIFOLD PIPE
C. 30" LENGTH OF COILED WIRE
D. FILTRATION/PRESSURE REGULATION DEVICE
E. WATERPROOF CONNECTION (1 OF 2)
F. CHRISTY ID TAG
G. FINISH GRADE/TOP OF MULCH
H. REMOTE CONTROL VALVE
I. SPARE WIRE
J. PVC BALL VALVE
K. PVC SCH 80 TOE NIPPLE (LENGTH AS REQUIRED)
L. PVC SCH 40 EL
M. PVC SCH 40 PIPE (LENGTH AS REQUIRED)
N. FILTER FABRIC
O. BRICK (1 OF 4)
P. SERVICE TEE OR SERVICE EL
Q. PVC MAINLINE
R. PVC SCH 80 TOE NIPPLE (LENGTH AS REQUIRED, HIDDEN) AND PVC SCH 40 EL
S. PVC SCH 80 CLOSE NIPPLE
T. 3" MINIMUM DEPTH OF WASHED PEA GRAVEL
U. PVC SCH 40 FEMALE ADAPTER

NOTES:
1. USE VALVE BOX EXTENSION AS NECESSARY TO ACHIEVE MINIMUM DIMENSIONS ABOVE ASSEMBLY.
2. NOMINAL SIZE OF ALL COMPONENTS ARE TO BE THE SAME NOMINAL SIZE AS THE SOLENOID VALVE (SIZED AS SHOWN).
3. INSTALL FILTER FABRIC AROUND EXTERIOR OF VALVE BOX. USE DUCT TAPE TO SECURE FABRIC TO PIPE AND VALVE BOX.
4. TRANSITION TO PROPER LATERAL PIPE BURIAL DEPTH USING 45° ELBOW FITTINGS DOWNSTREAM OF REMOTE CONTROL VALVE ASSEMBLY.
5. DO NOT CUT OUT ENDS OF VALVE BOX UNNECESSARILY.
6. POSITION VALVE BOX OVER VALVE TO ALLOW ACCESS TO SOLENOID AND PROPER OPERATION OF BALL VALVE.

3 DRIP REMOTE CONTROL VALVE

N.T.S.

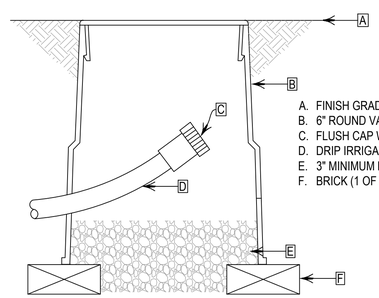


A. DRIP LATERAL PIPE
B. CONIFEROUS TREE
C. DECIDUOUS TREE
D. EMITTER
E. SHRUB
F. PERENNIAL

NOTES:
1. EMITTERS SHALL BE LOCATED IMMEDIATELY ADJACENT TO PERENNIALS AND AT THE OUTSIDE PERIMETER OF THE PLANTING PIT OF ALL SHRUBS AND TREES.
2. INSTALL FOUR 1 GPH EMITTERS PER TREE. LOOP DRIP LATERAL PIPE AROUND TREE ROOTBALL.
3. INSTALL TWO 1 GPH EMITTERS PER SHRUB.
4. INSTALL ONE 1 GPH EMITTER PER PERENNIAL.

4 DRIP PLACEMENT

N.T.S.

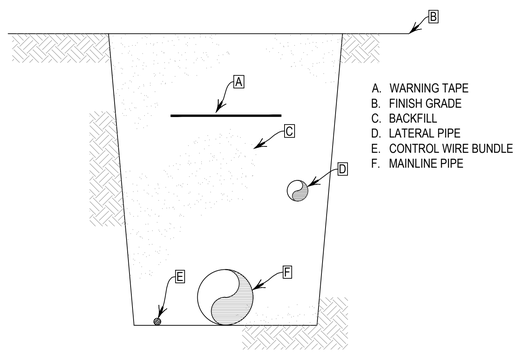


A. FINISH GRADE/TOP OF MULCH
B. 6" ROUND VALVE BOX WITH COVER
C. FLUSH CAP WITH HOSE THREAD CAP
D. DRIP IRRIGATION LATERAL
E. 3" MINIMUM DEPTH OF 3/4" WASHED GRAVEL
F. BRICK (1 OF 2)

NOTE:
1. INSTALL FLUSH CAP ASSEMBLY AT THE END OF EACH DRIP LATERAL SEGMENT.

5 DRIP FLUSH CAP

N.T.S.



A. WARNING TAPE
B. FINISH GRADE
C. BACKFILL
D. LATERAL PIPE
E. CONTROL WIRE BUNDLE
F. MAINLINE PIPE

6 TRENCH

N.T.S.

Aqua Engineering Inc.
Innovative Water Solutions

LAS COLONIAS RIVER PARK
IRRIGATION PLANS
GRAND JUNCTION, CO

IRRIGATION DETAILS

DATE	April 15, 2019
DESIGNED BY	JHK
DRAWN BY	JHK
CHECKED BY	CBK

REVISIONS
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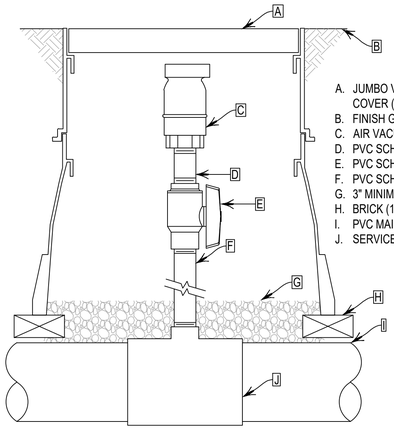
SHEET NO.
IR-5

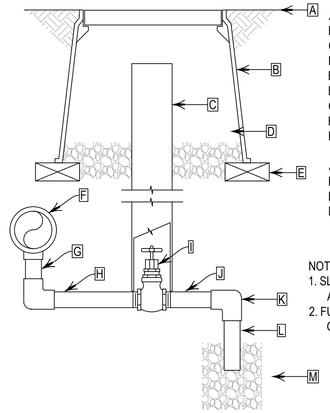
COLORADO REGISTERED PROFESSIONAL ENGINEER JEFFREY WAYNE BECKER 23206 05-23-2019



A. JUMBO VALVE BOX WITH EXTENSION AND COVER (HEIGHT AS REQUIRED)
B. FINISH GRADE/TOP OF MULCH
C. AIR VACUUM RELIEF VALVE
D. PVC SCH 80 NIPPLE (LENGTH AS REQUIRED)
E. PVC SCH 40 BALL VALVE (SIZE 1.5")
F. PVC SCH 80 NIPPLE (LENGTH AS REQUIRED)
G. 3" MINIMUM DEPTH OF 3/4" WASHED GRAVEL
H. BRICK (1 OF 4)
I. PVC MAINLINE PIPE
J. SERVICE TEE

1 AIR VACUUM RELIEF VALVE

N.T.S.



A. FINISH GRADE
B. 10" ROUND VALVE BOX WITH COVER
C. 4" PVC CL 200 PIPE (LENGTH AS REQUIRED)
D. 6" MINIMUM DEPTH OF 3/4" WASHED GRAVEL
E. BRICK (1 OF 4)
F. TEE OR EL ON PVC MAINLINE
G. PVC SCH 40 PIPE (LENGTH AS REQUIRED)
H. PVC SCH 80 TOE NIPPLE (LENGTH AS REQUIRED)
I. 1" THREADED BRONZE GATE VALVE WITH CROSS HANDLE, SOLID WEDGE
J. PVC SCH 80 TOE NIPPLE (4" LENGTH)
K. PVC SCH 80 EL (1 OF 2)
L. PVC SCH 40 PIPE (4" LENGTH)
M. SUMP OF 3 CUBIC FEET OF 3/4" WASHED GRAVEL

NOTES:
1. SLEEVE TO BE SET SQUARE OVER GATE VALVE TO ALLOW FOR OPERATION OF VALVE WITHOUT BINDING.
2. FURNISH APPROPRIATE HANDLE AND KEY TO MATCH GATE VALVE.

2 DRAIN VALVE

N.T.S.

Hydraulic Calculation Worksheet

By: JHK
Project Name: Las Colonias
Hw y Segment: Drip Only

System Parameters:

Static PSI @ POC:	60	Max. System Flow :	20
POC Elevation	4570	Max RCV Flow	10
		Concurrent RCV's:	possible

Calculation notes:

COMPONENT FEATURES:

	COMPONENT		Flow (GPM)	SIZE (ID) inch	LENGTH or HEIGHT(+/-)	H_f/unit		Calc. H_f (PSI)	
A.	Drip				1	20		20	A.
B.	Lateral				1	5.00%		1	B.
C.	Drip RCV		20	1	1	3		3	C.
D.	Mainline Segment 1	1.5"	20	1.72	1800	0.78	/100'	14.05	
		3"	0	3.23	1	0.00	/100'	0.00	
		4"	0	4.154	1	0.00	/100'	0.00	
	Mainline Segment 2	2"	0	2.193	1	0.00		0.00	
		2.5"	0	2.655	1	0.00		0.00	
		3"	0	3.23	1	0.00		0.00	
					Subtotal D. Mainline Losses =			14.05	D.
E.	Master Valve		NA	0		2.4		0.00	E.
F.	Flow Sensor		NA	0	1	0.00	/100'	0.00	F.
G.	Water Meter		NA	1	1	0.00		0.00	G.
H.	Backflow		NA	1.5	1	0.00		0	H.
I.	Elevation @ Lateral				4580	0.433	PSI/FT	4.33	I.
J.	Service Pipe		20	1	30	10.93		3.28	J.
K.	Misc Losses					5.00%		1.07	K.
						Total Pressure Required		46.73	
						Total Pressure Available		60	
						Excess/-Deficiet Pressure		13.27	

3 HYDRAULIC ESTIMATE
DRIP SYSTEM

N.T.S.

Aqua Engineering Inc.
Innovative Water Solutions

LAS COLONIAS RIVER PARK
IRRIGATION PLANS
GRAND JUNCTION, CO

IRRIGATION DETAILS

DATE	April 15, 2019
DESIGNED BY	JHK
DRAWN BY	JHK
CHECKED BY	CBK

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05-23-2019

SHEET NO.
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