



CIVIL CONSTRUCTORS
FABRICATORS
CONSTRUCTION MANAGERS

May 14, 2010

EXHIBIT A

Sent Via: Email/US Mail
Ken_Halloran@tempe.gov

Mr. Ken Halloran, P.E.
Senior Civil Engineer
City of Tempe
Public Works/Engineering
31 East 5th Street
Tempe, AZ 85281

RE: Miscellaneous Horizontal Construction and Minor Water and Wastewater Treatment Plant Improvements, Contract C2008-250
Ken McDonald Recharge Well

SUBJECT: **PROPOSAL -- REVISION NO. 1**

Dear Mr. Halloran,

Quest Civil Constructors, Inc. (Quest) proposes to perform improvements outlined below for the Ken McDonald Recharge Well Job Order.

Job Order Scope of Work:

Base Bid Items

Furnish, install and test recharge well per attached City of Tempe (COT) specifications and drawings.

Job Order Schedule:

Job Order is to be completed ninety (90) calendar days after mutually agreed upon Notice to Proceed, but in any event no temporary piping will be left in place beyond September 30, 2010.

Job Order Payment:

Quest proposes to perform the Job Order for the following amounts:

Description		Amount
Base Bid	Drill and test recharge well	\$ 225,321.00

Job Order Proposal Clarifications:

- Construction will be in accordance with MAG standards as applicable.
- Work will be accomplished with one (1) mobilization and one (1) demobilization.
- Work will take place during normal working hours. Material and equipment will be staged on site during non-working hours in a location to be determined during the preconstruction meeting with the COT.
- Quest will obtain a water hydrant meter to be used for construction water.
- Disposal of all water produced by the drilling and testing operation shall be disposed of on site in the existing canal.
- Development equipment shall be removed from the well prior to installing the test equipment and flow control boxes.

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- Costs associated with the following items are NOT included in this Job Order Proposal:
 - Special inspections, permits, third party testing and other fees with the exception of the Maricopa County Dust Control Permit.
 - SRP right of way permits or any additional special requirements for temporary piping on SPR property, other than those requirements included in Figure 1 and the original specifications as provided by the COT.
 - Noise dampening equipment.
 - Removal, handling or disposal of any hazardous or regulated material.
 - Construction engineering services or engineering drawings.
 - Site survey, layout or certified as-built documents.
 - Damage to unmarked/unknown existing utilities.
 - Traffic control
 - Administrative fees associated with obtaining a Discharge Permit.

This proposal is valid for thirty (30) calendar days. If you have any questions or require additional information, please do not hesitate to contact our office.

Sincerely,
QUEST CIVIL CONSTRUCTORS, INC.


Mike Bejarano

Attachments: Job Order Proposal Cost Summary (1 page)
 Job Order Estimate Detail (5 pages)
 Price Quote Weber Group (2 pages)
 Recharge Well Specifications (6 pages)
 Recharge Well Drawing (1 page)

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**City Of Tempe
Ken McDonald Recharge Well**

Bid Item	Job Order	Proposal Cost Summary	Quantity	Unit	Unit Cost	Profit%	Taxes%	Bonds%	Insurance%	Unit Price	Total
<u>Base Bid (refer to attached estimate)</u>											
0		General Conditions	1	LS	\$ 18,697	8.00%	5.265%	1.25%	1.50%	\$ 21,691	\$ 21,691
1		Mobilize / Demobilize Cable Tool Rig	1	LS	\$ 6,000	8.00%	5.265%	1.25%	1.50%	\$ 6,961	\$ 6,961
2		Install Conductor Casing	1	LS	\$ 11,750	8.00%	5.265%	1.25%	1.50%	\$ 13,632	\$ 13,632
3		Drill 20" Well	130	LF	\$ 225	8.00%	5.265%	1.25%	1.50%	\$ 261	\$ 33,934
4		20" x .312 Wall 304 SS Blank Well Casing	110	LF	\$ 462	8.00%	5.265%	1.25%	1.50%	\$ 536	\$ 58,959
5		20" x .312 Wall 304 SS Perforated Well Casing	60	LF	\$ 513	8.00%	5.265%	1.25%	1.50%	\$ 595	\$ 35,709
6		20" Drive Shoe and Starter	1	LS	\$ 3,120	8.00%	5.265%	1.25%	1.50%	\$ 3,620	\$ 3,620
7		Swab and Airlift Development	20	HR	\$ 300	8.00%	5.265%	1.25%	1.50%	\$ 348	\$ 6,961
8		Furnish, Install and Remove Turbine Test Pump and Pump Discharge Line	1	LS	\$ 14,700	8.00%	5.265%	1.25%	1.50%	\$ 17,054	\$ 17,054
9		Pump Development	8	HR	\$ 215	8.00%	5.265%	1.25%	1.50%	\$ 249	\$ 1,995
10		Step Testing	8	HR	\$ 215	8.00%	5.265%	1.25%	1.50%	\$ 249	\$ 1,995
11		Install Injection piping	1	LS	\$ 7,000	8.00%	5.265%	1.25%	1.50%	\$ 8,121	\$ 8,121
13		Furnish Flow Control orifice Boxes	1	LS	\$ 6,170	8.00%	5.265%	1.25%	1.50%	\$ 7,158	\$ 7,158
14		Surface Equipment	1	LS	\$ 2,120	8.00%	5.265%	1.25%	1.50%	\$ 2,460	\$ 2,460
15		Reverse Step Test	8	HR	\$ 110	8.00%	5.265%	1.25%	1.50%	\$ 128	\$ 1,021
16		Constant Injection Test	24	HR	\$ 110	8.00%	5.265%	1.25%	1.50%	\$ 128	\$ 3,063
17		Video Inspection	1	LS	\$ 850	8.00%	5.265%	1.25%	1.50%	\$ 986	\$ 986
Total Direct Cost Of The Work =											\$ 225,321



Insurance, taxes, bond and profit Included in the unit prices

Team Quest
Bid-Item Detail for:
Ken McDonald Recharge Well

Bid-Item	Description	Quantity	UM	Unit Cost	Total Cost
00	General Conditions Work Comp: 6306 7.50%	1.00	LS	18,696.8000	18,696.80

00	General Conditions	1.00	LS	18,696.8000	18,696.80		
Unit Cost	Material	Labor	Equipment	Other	Subcontractor	Plug	Truck
Total Cost	13,272.60	1,924.20	3,500.00				

00	Staff	1.00	LS	15,196.8000	15,196.80				
Prod. per Hr:	0.01	Day Lgh:	8.00	Hrs Req:	120.00	Lbr Typ:	Standard	Man Hrs:	240.00
Work Comp:	6306	7.50%		Days Req:	10.00			Man Hrs Per LS:	240.000000
Unit Cost	Material	Labor	Equipment	Other	Subcontractor	Plug	Truck		
Total Cost	13,272.60	1,924.20							

Description	Quantity/Hours	UM	Unit Cost	Total Cost
L Project Leader	0.50 / 120.00	HR	92.3900	5,643.40
E 1/2 Ton Pickup	0.50 / 120.00	HR	10.6900	641.40
L Engineer	1.00 / 120.00	HR	51.0600	6,127.20
E 1/2 Ton Pickup	1.00 / 120.00	HR	10.6900	1,282.80
L Administrative Assistant	0.50 / 120.00	HR	26.7000	1,602.00

00A	Site Facilities	1.00	LS	2,500.0000	2,500.00				
Prod. per Hr:		Day Lgh:	8.00	Hrs Req:		Lbr Typ:	Standard	Man Hrs:	
Work Comp:	6306	7.50%		Days Req:				Man Hrs Per LS:	0.000000
Unit Cost	Material	Labor	Equipment	Other	Subcontractor	Plug	Truck		
Total Cost				2,500.00					

Description	Quantity/Hours	UM	Unit Cost	Total Cost
O Construction Water	1,000.00	MG	2.5000	2,500.00

00B	Permits	1.00	LS	1,000.0000	1,000.00				
Prod. per Hr:		Day Lgh:	8.00	Hrs Req:		Lbr Typ:	Standard	Man Hrs:	
Work Comp:	6306	7.50%		Days Req:				Man Hrs Per LS:	0.000000
Unit Cost	Material	Labor	Equipment	Other	Subcontractor	Plug	Truck		
Total Cost				1,000.00					

Description	Quantity/Hours	UM	Unit Cost	Total Cost
O Permits	1.00	AL	1,000.0000	1,000.00

01	Mobilize Cable Tool Rig	1.00	LS	6,000.0000	6,000.00				
Prod. per Hr:		Day Lgh:	8.00	Hrs Req:		Lbr Typ:	Standard	Man Hrs:	
Work Comp:	6306	7.50%		Days Req:				Man Hrs Per LS:	0.000000
Unit Cost	Material	Labor	Equipment	Other	Subcontractor	Plug	Truck		
Total Cost				6,000.00					

Description	Quantity/Hours	UM	Unit Cost	Total Cost
S Weber Group	1.00	LS	6,000.0000	6,000.00

Estimator: Mike Bejarano
For Job: 56-10 - Ken McDonald Recharge Well

(Crew/Assembly) (Zero Total Cost Warning)



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Team Quest
Bid-Item Detail for:
Ken McDonald Recharge Well

Bid-Item	Description	Quantity	UM	Unit Cost	Total Cost
02	Install Conductor Casing Cemented In Place Work Comp: 6306 7.50%	1.00	LS	11,750.0000	11,750.00

02	Install Conductor Casing Cemented In Place	1.00	LS	11,750.0000	11,750.00
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Prod. per Hr.	Day Lgth: 8.00	Hrs Req.	Lbr Typ: Standard	Man Hrs.			
Work Comp: 6306 7.50%		Days Req		Man Hrs Per LS 0.000000			
Unit Cost	Material	Labor	Equipment	Other	Subcontractor	Plug	Truck
Total Cost					11,750.00		
					11,750.00		

Description	Quantity/Hours	UM	Unit Cost	Total Cost
S Weber Group	1.00	LS	11,750.0000	11,750.00

03	Drill 20" Well	130.00	LF	225.0000	29,250.00		
Prod. per Hr.	Day Lgth: 8.00	Hrs Req.	Lbr Typ: Standard	Man Hrs.			
Work Comp: 6306 7.50%		Days Req		Man Hrs Per LF 0.000000			
Unit Cost	Material	Labor	Equipment	Other	Subcontractor	Plug	Truck
Total Cost					225.00		
					29,250.00		

Description	Quantity/Hours	UM	Unit Cost	Total Cost
S Weber Group	130.00	LF	225.0000	29,250.00

04	20" X 312 Wall 304 SS Blank Well Casing	110.00	LF	462.0000	50,820.00		
Prod. per Hr.	Day Lgth: 8.00	Hrs Req.	Lbr Typ: Standard	Man Hrs.			
Work Comp: 6306 7.50%		Days Req		Man Hrs Per LF 0.000000			
Unit Cost	Material	Labor	Equipment	Other	Subcontractor	Plug	Truck
Total Cost					462.00		
					50,820.00		

Description	Quantity/Hours	UM	Unit Cost	Total Cost
S Weber Group	110.00	LF	462.0000	50,820.00

05	SUB - 20" X 312 Wall 304 SS Perforated Well Casing	60.00	LF	513.0000	30,780.00
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Prod. per Hr.	Day Lgth: 8.00	Hrs Req.	Lbr Typ: Standard	Man Hrs.			
Work Comp: 6306 7.50%		Days Req		Man Hrs Per LF 0.000000			
Unit Cost	Material	Labor	Equipment	Other	Subcontractor	Plug	Truck
Total Cost					513.00		
					30,780.00		

Description	Quantity/Hours	UM	Unit Cost	Total Cost
S Weber Group	60.00	LF	513.0000	30,780.00

Estimator: Mike Bejarano
For Job: 58-10 - Ken McDonald Recharge Well

(Crew/Assembly) (Zero Total Cost Warning)



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Team Quest
Bid-Item Detail for:
Ken McDonald Recharge Well

Bid-Item	Description	Quantity	UM	Unit Cost	Total Cost
06	20" Drive Shoe And Starter Work Comp: 6306 7.50%	1.00	LS	3,120.0000	3,120.00

Prod. per Hr	Day Lgth	Hrs Req	Lbr Typ	Man Hrs			
Work Comp: 6306 7.50%	8.00	Days Req:	Standard	Per LS			
0.000000				0.000000			
Unit Cost	Material	Labor	Equipment	Other	Subcontractor	Plug	Truck
Total Cost					3,120.00		
					3,120.00		

Description	Quantity/Hours	UM	Unit Cost	Total Cost
S Weber Group	1.00	LS	3,120.0000	3,120.00

Bid-Item	Description	Quantity	UM	Unit Cost	Total Cost
07	Swab And Airlift Development Work Comp: 6306 7.50%	20.00	HR	300.0000	6,000.00

Prod. per Hr	Day Lgth	Hrs Req	Lbr Typ	Man Hrs			
Work Comp: 6306 7.50%	8.00	Days Req:	Standard	Per HR			
0.000000				0.000000			
Unit Cost	Material	Labor	Equipment	Other	Subcontractor	Plug	Truck
Total Cost					300.00		
					6,000.00		

Description	Quantity/Hours	UM	Unit Cost	Total Cost
S Weber Group	20.00	HR	300.0000	6,000.00

Bid-Item	Description	Quantity	UM	Unit Cost	Total Cost
08	Furnish Install And Remove Turbine Test Pump Discharge Lin Work Comp: 6306 7.50%	1.00	LS	14,700.0000	14,700.00

Prod. per Hr	Day Lgth	Hrs Req	Lbr Typ	Man Hrs			
Work Comp: 6306 7.50%	8.00	Days Req:	Standard	Per LS			
0.000000				0.000000			
Unit Cost	Material	Labor	Equipment	Other	Subcontractor	Plug	Truck
Total Cost					14,700.00		
					14,700.00		

Description	Quantity/Hours	UM	Unit Cost	Total Cost
S Weber Group	1.00	LS	14,700.0000	14,700.00

Bid-Item	Description	Quantity	UM	Unit Cost	Total Cost
09	Pump Development Work Comp: 6306 7.50%	8.00	HR	215.0000	1,720.00

Prod. per Hr	Day Lgth	Hrs Req	Lbr Typ	Man Hrs			
Work Comp: 6306 7.50%	8.00	Days Req:	Standard	Per HR			
0.000000				0.000000			
Unit Cost	Material	Labor	Equipment	Other	Subcontractor	Plug	Truck
Total Cost					215.00		
					1,720.00		

Description	Quantity/Hours	UM	Unit Cost	Total Cost
S Weber Group	8.00	HR	215.0000	1,720.00

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Team Quest
Bid-Item Detail for:
Ken McDonald Recharge Well

Bid-Item	Description	Quantity	UM	Unit Cost	Total Cost
10	Step Testing Work Comp: 6306 7.50%	8.00	HR	215.0000	1,720.00

Prod. per Hr.	Day Lgh	Hrs Req	Lbr Typ	Man Hrs		
6306	8.00		Standard			
Work Comp: 6306	7.50%	Days Req:		Man Hrs Per HR: 0.000000		
Unit Cost	Material	Labor	Equipment	Other Subcontractor	Plug	Truck
Total Cost				215.00		1,720.00

Description	Quantity/Hours	UM	Unit Cost	Total Cost
S Weber Group	8.00	HR	215.0000	1,720.00

Bid-Item	Description	Quantity	UM	Unit Cost	Total Cost
11	Install Injection Piping Work Comp: 6306 7.50%	1.00	LS	7,000.0000	7,000.00

Prod. per Hr.	Day Lgh	Hrs Req	Lbr Typ	Man Hrs		
6306	8.00		Standard			
Work Comp: 6306	7.50%	Days Req:		Man Hrs Per LS: 0.000000		
Unit Cost	Material	Labor	Equipment	Other Subcontractor	Plug	Truck
Total Cost				7,000.00		7,000.00

Description	Quantity/Hours	UM	Unit Cost	Total Cost
S Weber Group	1.00	LS	7,000.0000	7,000.00

Bid-Item	Description	Quantity	UM	Unit Cost	Total Cost
12	Install Piping From East Hydrant Work Comp: 6306 7.50%	1.00	LS	5,160.0000	5,160.00

Prod. per Hr.	Day Lgh	Hrs Req	Lbr Typ	Man Hrs		
6306	8.00		Standard			
Work Comp: 6306	7.50%	Days Req:		Man Hrs Per LS: 0.000000		
Unit Cost	Material	Labor	Equipment	Other Subcontractor	Plug	Truck
Total Cost				5,160.00		5,160.00

Description	Quantity/Hours	UM	Unit Cost	Total Cost
S Weber Group	1.00	LS	5,160.0000	5,160.00

Bid-Item	Description	Quantity	UM	Unit Cost	Total Cost
13	Furnish Flow Meter And Orifice Boxes Work Comp: 6306 7.50%	1.00	LS	6,170.0000	6,170.00

Prod. per Hr.	Day Lgh	Hrs Req	Lbr Typ	Man Hrs		
6306	8.00		Standard			
Work Comp: 6306	7.50%	Days Req:		Man Hrs Per LS: 0.000000		
Unit Cost	Material	Labor	Equipment	Other Subcontractor	Plug	Truck
Total Cost				6,170.00		6,170.00

Description	Quantity/Hours	UM	Unit Cost	Total Cost
S Weber Group	1.00	LS	6,170.0000	6,170.00

Estimator: Mike Bejarano

(Crew/Assembly) (Zero Total Cost Warning)

For Job: 56-10 - Ken McDonald Recharge Well



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Team Quest
Bid-Item Detail for:
Ken McDonald Recharge Well

Bid Item	Description	Quantity	UM	Unit Cost	Total Cost
15	Reverse Step Test Work Comp 6306 7.50%	8.00	HR	110.0000	880.00

Prod. per Hr	Day Lgh	Hrs Req	Lib Typ	Standard	Man Hrs		
Work Comp 6306 7.50%	8.00	Days Req			0.000000		
Unit Cost	Material	Labor	Equipment	Other	Subcontractor	Plug	Truck
Total Cost					110.00		880.00

Description	Quantity/Hours	UM	Unit Cost	Total Cost
S Weber Group	8.00	HR	110.0000	880.00

Bid Item	Description	Quantity	UM	Unit Cost	Total Cost
16	Constant Injection Test Work Comp 6306 7.50%	24.00	HR	110.0000	2,640.00

Prod. per Hr	Day Lgh	Hrs Req	Lib Typ	Standard	Man Hrs		
Work Comp 6306 7.50%	8.00	Days Req			0.000000		
Unit Cost	Material	Labor	Equipment	Other	Subcontractor	Plug	Truck
Total Cost					110.00		2,640.00

Description	Quantity/Hours	UM	Unit Cost	Total Cost
S Weber Group	24.00	HR	110.0000	2,640.00

Bid Item	Description	Quantity	UM	Unit Cost	Total Cost
17	Video Well Inspection Work Comp 6306 7.50%	1.00	LS	850.0000	850.00

Prod. per Hr	Day Lgh	Hrs Req	Lib Typ	Standard	Man Hrs		
Work Comp 6306 7.50%	8.00	Days Req			0.000000		
Unit Cost	Material	Labor	Equipment	Other	Subcontractor	Plug	Truck
Total Cost					850.00		850.00

Description	Quantity/Hours	UM	Unit Cost	Total Cost
S CCTV - Video Inspection	1.00	LF	850.0000	850.00



KW

Weber Group L.C.

- 16825 S. Weber Drive • Chandler, Arizona 85326-4112 • 480/961.1141 • FAX 480/961.0290
- 18403 W. McDowell Road • Goodyear, Arizona 85338-5613 • 623/937.9901 • FAX 623/857.9902
- 2838 W. Kuthrauff Road • Tucson, Arizona 85705-1860 • 520/887.1170 • FAX 520/408.0033

FAX TRANSMISSION

SENT TO:

Attention: Mike Bejano
 Company: Quest Ventures
 Fax Number: 623-581-9710

SENT FROM:

Name: Fred Hegaske
 Date: 4-28-10

NOTES:

Proposal revision on
Tempe Recharge Well

Number of pages including this sheet 2

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Weber Group L.C.

16825 South Weber Drive, Chandler, Arizona 85226, Office (480) 961-1141, Fax (480) 961-0290
 18403 W. McDowell Road, Goodyear, Arizona, 85338, Office (623) 853-9901, Fax (623) 853-9902
 2838 W. Ruthrauff Road, Tucson, Arizona 85705, Office (520) 887-2170, Fax (520) 408-0832

Quotation

Customer: Quest Ventures	From: Fred Tragaske
Attn: Mike Bejano	Date: 4/27/2010
Phone: 623-238-7147	Quote No.:
Fax: 623-581-9710	Project: Tempe Ken McDonald Recharge Well Revised
	Job No.:

Weber Group is pleased to offer the following quotation for your review and consideration:

ITEM NO.	QTY.	DESCRIPTION	UNIT PRICE	UNIT	TOTAL
	1 LS	Mobilize/demobilize cable tool rig and equipment	\$6,000.00	1 LS	\$6,000.00
	1 LS	Install conductor casing in place, 30" x .375 wall, 40 feet deep	\$11,750.00	1 LS	\$11,750.00
	130 FT	Drill 20 inch well to about 170 feet	\$225.00	130 LF	\$29,250.00
	110 FT	20" x .312 wall 304 SS blank well casing	\$462.00	110 FT	\$50,820.00
	60 FT	20" x .312 wall 304 SS perforated well casing	\$513.00	60 FT	\$30,780.00
	1 LS	20' drive shoe and starter	\$3,120.00	1 LS	\$3,120.00
	20 HR	Swab and airlift development, hours are estimated	\$300.00	20 HR	\$6,000.00
	1 LS	Furnish, install and remove turbine test pump, discharge line to canal, designed for about 1200 GPM	\$14,700.00	1 LS	\$14,700.00
	8 HR	Pump development, hours may vary	\$215.00	8 HR	\$1,720.00
	8 HR	Step testing, hours may vary	\$215.00	8 HR	\$1,720.00
	1 LS	Install injection piping and equipment, pipeline from north hydrant	\$7,000.00	1 LS	\$7,000.00
	1 LS	Install piping from east hydrant if needed	\$5,160.00	1 LS	\$5,160.00
	1 LS	Furnish flow control orifice boxes, adapt to column pipe	\$6,170.00	1 LS	\$6,170.00
	1 LS	Surface equipment, flowmeter, valves at well head	\$2,120.00	1 LS	\$2,120.00
	8 HR	Reverse step test	\$110.00	8 HR	\$880.00
	24 HR	Constant rate injection test	\$110.00	24 HR	\$2,640.00
		TOTAL			\$179,830.00
	110 FT	Optional 20" x .312 high strength low alloy blank casing	\$162.00	110 FT	\$17,820.00
	60 FT	Optional 20" x .312 HSLA perforated casing	\$201.00	60 FT	\$12,060.00
Water to be supplied by Tempe. Permits, fees, barricades excluded. Injection piping to be installed after well testing has been completed.					
Subtotal					

TERMS AND CONDITIONS:

- 1. Payment terms: Net 30 days
- 2. Validity of quotation: 30 days
- 3. Warranty: Standard 1 year from start-up date
- 4. Delivery: Pending NTP
- 5. Freight: F.O.B. Jobsite
- 6. Tax: All quotes are plus any applicable tax
- 7. Quantities Listed: Customer will only be invoice for Qty. consumed.

**EQUIPMENT AND LABOR
TOTAL AMOUNT**

Thank you for the opportunity to be of service. Please sign, date and return with P.O. number and we will proceed with project.

Best Regards,
Fred Tragaske

resident

AUTHORIZED BY: _____ DATE: _____ P.O. NO.: _____

TITLE: _____

H

**SPECIFICATIONS FOR A CITY OF TEMPE RECHARGE WELL AT THE KEN
MCDONALD GOLF COURSE**

GENERAL

The City of Tempe is planning a groundwater recharge project at its Ken McDonald Golf Course using water from the nearby Kyrene Water Reclamation Plant. The first phase of this project is drilling and testing one recharge well on the golf course. The location of this well is shown on the attached map. The City drilled an exploration boring at this site in February 2010 and used information from this boring to design the recharge well. The drillers log from that boring is attached. City of Tempe's Water Resources Hydrologist will provide drilling oversight.

Contractor's Qualifications

The drilling contractor must have a minimum of five years local experience (within the alluvial basins of Central Arizona) with drilling and installing water production wells by the cable tool drilling method.

The contractor shall hold both a valid Arizona Department of Water Resources Well Driller License and an Arizona Registrar of Contractor's license, both in the appropriate category for drilling and constructing a water production well by the cable tool drilling method.

The contractor must provide copies of their Arizona Well Driller's License and Arizona Contractors License and three references (with phone numbers) for which they have done similar work, with their bid submittal.

Contractor's Responsibilities

If the well is lost during drilling and installation due negligence on the part of the contractor or a subcontractor, then the well will be abandoned, according to Arizona Department Water Resources Rules, at no cost to the City of Tempe. A replacement well will be drilled in the immediate vicinity and drilled and constructed in accordance with the specifications listed here. The contractor will credit the City of Tempe for any costs associated with the lost well and this credit will be applied to the costs of drilling the replacement well.

If the loss of the well is not due to negligence on the part of the Contractor or subcontractor then a replacement well will be drilled in the immediate vicinity and the City of Tempe will reimburse the contractor at the same unit costs as outlined in the original bid schedule.

If a work delay or a deficiency of work or materials is caused by the Contractor or subcontractor failing to comply with the specifications then the Contractor will bear the

burden of any additional expenses. This includes equipment failure if the failure is due to a lack of proper maintenance.

Drilling Method

The well will be drilled by the cable tool method using a drill and drive approach and using well screen and well casing provided by the City of Tempe. The Contractor is responsible for designing and executing a drilling and well installation program based on this approach.

Noise Control

The Contractor will meet all ordinances regarding noise and noise control during drilling, well installation and testing.

Site Safety Plan

The Contractor shall provide the City with a Site Safety Plan for this project, in accordance with all Occupational Safety and Health Administration (OSHA) requirements. In addition to the usual hazards associated with well drilling and installation, the contractor will have to shall be aware of the safety risks associated with working on an operating golf course and be prepared to protect equipment and personnel from stray golf balls.

Protection of Site

The drilling site is on a Golf Course and should be protected from entrance by the public both during work hours and overnight. Drill cutting cannot be disposed of on site. All cuttings should be contained in a roll off, to be provided by the Contractor and hauled off site for disposal. Likewise, all trash and debris generated during drilling, well construction and testing will be contained in a roll off or similar container and hauled off site by the contractor.

Water Generated During Drilling and Testing

Small amounts of water generated during drilling and development may be disposed of in a manhole located about 50 feet south of the site. This pipe empties into a golf course pond. Larger volumes of water generated during testing will be piped approximately 1,700 feet north of the drilling site and disposed of in a Salt River Project (SRP) canal.

Drillers Report/Drillers Log

During drilling and well installation a daily drillers report will be prepared by the Contractor and made available to the City of Tempe. The report will include number such items as feet drilled, number of hours on the job, length and type of casing driven, materials used and shutdown time due to breakdown. The Contractor will also prepare a

drillers log describing the lithologic formations encountered and the specific depths at which they were encountered.

WELL DRILLING AND INSTALLATION

Surface Casing

A surface casing borehole will be drilled to a minimum of 36 inches in diameter and to a depth of 40 feet. The surface casing will be 30-inch diameter with a minimum 0.375-inch wall thickness. The casing will be at least 41 feet long to allow a 1-foot stickup above land surface. The surface casing will be constructed of ASTM Specification A53 or A139 grade B Steel. The surface casing will be grouted in place with cement grout slurry in accordance with ADWR standards

Well Drilling/Installation

The well is to be drilled and installed with a cable-tool drilling rig using the "drill and drive" method. The casing and screen will be provided by the City of Tempe. The City will provide the Contractor with 180 feet of 24-inch O.D. type 316 stainless steel well casing with a 0.250 wall thickness. The City has several hundred feet of this casing, in 20-foot sections, stored at its South Tempe Water Treatment Plant.

The contractor will be responsible for having 60-feet of this casing saw-cut with a 3/16th inch slot to serve as well screen. The City will seek the Contractors input on the appropriate number and density of slots that may be cut into the casing and still retain sufficient wall strength to be driven. The Contractor should specify in the bid the number and density of slots they recommend. The cost of shipping and cutting the screen should be reflected in the Contractors bid price. A proposed well design drawing is attached.

Joints in the well casing will be field welded in accordance with AWWA standards for welded joints. All well casing joints will be water tight and all welding will be performed by an experienced welder.

We do not expect to hit bedrock at this site. The contractor should anticipate drilling through unconsolidated gravel, sand, silt and clay with a water table at about 100 feet below ground surface. A drillers log from the exploration boring done at this site is attached.

Well Development

The Contractor will develop the well by simultaneously swabbing and airlift pumping. Well development will proceed from the bottom of the screen to the top of screen, with each discrete interval swabbed and airlifted until the water produced is clear and free of sediment.

This will be followed by approximately 8 pump and surge development. The contractor will provide a pump capable of producing approximately 1200 gallons per minute (gpm) of water. The well will be pumped at successively higher rates with periods of recovery between each pumping step. This will proceed for approximately 8 hours.

If the City of Tempe judges that the well is not adequately developed, one or both of the steps outlined above may be repeated until the well is completely developed.

Plumbness and Alignment

The contractor shall guarantee that the well is straight and plumb enough to allow the installation of a submersible pump in the bottom of the well, below the well screen.

Surface Completion

The well will be completed with 3-feet of stickup above ground level (2-feet above the surface casing).

Video Survey

After the well is completed, and developed, the Contractor will provide a color video survey of the well. This should include both downward looking and side view. The clarity and quality must be adequate to assess the condition of the well.

Cover and Access Port

After all work at the site is complete the Contractor will temporarily cover the well with a steel covering plate. The plate will be secured by a watertight weld. The covering plate will include a 1-inch diameter access port with a watertight threaded port for measuring water levels.

WELL TESTING

Well testing will consist of an 8-hour step discharge test, an 8-hour reverse step test (injecting water into the well at varying rates), and a 24-hour constant rate injection test.

Pumping Equipment

For the step test, the Contractor will provide a pump capable of producing 1,200 gallons per minute and enough temporary piping to discharge water to the SRP canal approximately 1,700 feet north of the drilling site. The test pump will be placed at the bottom of the well, at approximately 165 feet below ground surface. Static water level is anticipated to be about 100 feet below ground surface.

The Contractor will provide a means of accurately measuring flow within the ranges specified for well testing during both step discharge test and the reverse step tests.

Reverse Step Test

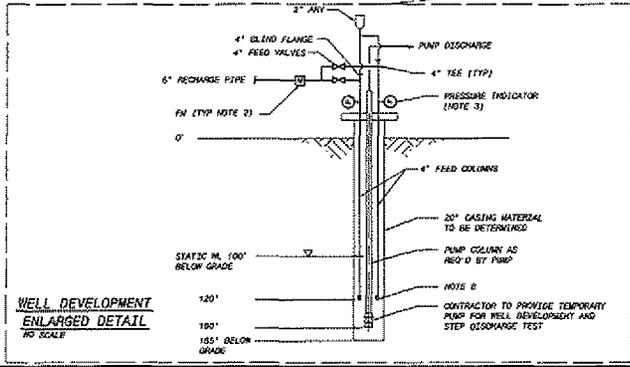
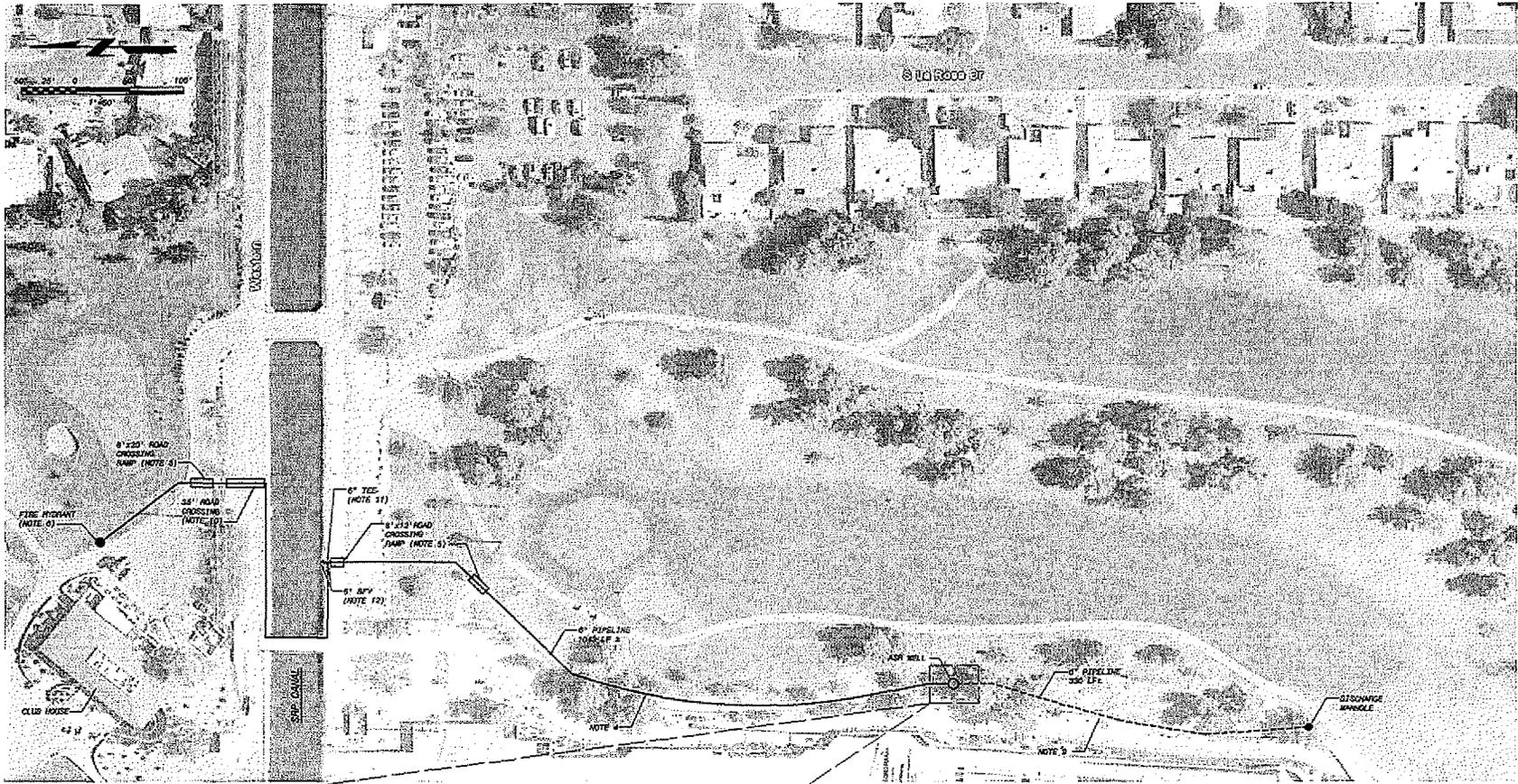
For the reverse step test, the contractor will provide approximately 1,800 feet of 8" piping. This piping will be connected to two municipal hydrants as shown in the attached Figure 1. A flow meter capable of handling a flow range of 200 gpm to 1000 gpm will be provided. The 8" pipe will split into two 4" feed pipes at the well head. Each feed pipe will have a 4" shutoff valve, pressure indicator, and a 4" tee positioned at the top of the feed columns as shown in Figure 1. A blind flange or threaded connection will be provided on each 4" tee to allow easy access to the interior of the feed column. A 2" Air Release Valve (ARV) shall be provided and connected near the top of both feed columns. The feed column piping shall be strapped to the pump column for support. PVC is acceptable for this piping.

Potable water will be directed into the well via the 4" feed columns. The bottom of each feed column (approximately 120' below grade) will be fitted with an orifice box designed to allow a change of orifice plates while the feed columns remain installed within the well. The orifice boxes will be purchased by Contractor from ASR Resources. City will retain ownership after the well testing.

The contractor will be responsible for fabricating the pump column and feed columns with all associated valves, orifice boxes, and meter. Contractor shall coordinate the fabrication of the feed columns with orifice box dimensions from ASR Resources. The reverse step test (recharge test) will be observed and directed by an Engineer's representative. Specific flow rates and orifice plates will be adjusted during the test period. Contractor shall provide support service to the Engineer's representative during the testing period.

Site Cleanup

Once all drilling and testing is completed at the site. All wastes and drill cuttings will be removed from the site. The site should be returned to as close to original condition as is reasonable.



NOTES:

1. TEMPORARY PIPING FOR WELL DEVELOPMENT TEST TO BE RELOCATED FOR WELL RECHARGE TEST.
2. FLOW METER RANGE 0-1400 GPM.
3. PRESSURE GAGE TO RANGE FROM 0-120 PSI.
4. PIPE TO RUN ALONG THE EAST SIDE OF THE FENCE SEPARATING GOLF COURSE AND SIDEWALK.
5. "FLUSH-THROUGH" ROAD CROSSING FROM RAMP FOR HWT, ON EQUAL.
6. CONTRACTOR TO PROVIDE SHUT OFF VALVE AT FIRE HYDRANT CONNECTION, PIPE FLOW TEST PROVIDED 880 GPM AT 60 PSI RESTRICTION.
7. TEMPORARY PIPING SYSTEM SHALL BE SUITABLE FOR PRESSURE UP TO 60 PSI.
8. CONTRACTOR TO PURCHASE AND SUPPLY TO CITY ADDITIONAL ORIFICE BOX (CITY 2) AS MANUFACTURED BY AER RESOURCES. CONTRACTOR TO INSTALL ORIFICE BOX ON EACH 4" FEED COLUMN PER MANUFACTURER RECOMMENDATIONS. COMBINED FLOW RANGE OF ORIFICE BOXES 300-1000 GPM.
9. DURING DRILLING OPERATIONS, CONTRACTOR TO DISCHARGE TO GOLF COURSE LAKE FEED. DURING WELL DEVELOPMENT AND PUMPING TEST, CONTRACTOR TO DISCHARGE WATER TO SSP CANAL.
10. CONTRACTOR MAY PROVIDE ROAD CROSSING RAMP OF SUFFICIENT WIDTH AND LENGTH TO MINIMIZE PEDESTRIAN HAZARD OR CHECK AS FILL TO CREATE GENTLE SLOPE OVER PIPE.
11. USE TEE CONNECTION TO DISCHARGE WATER TO SSP CANAL DURING WELL DEVELOPMENT.
12. CONTRACTOR TO PROVIDE 8" 80% FOR ISOLATION.

DATE	REVISION AND REVISION NO.	DATE
08/11/2011	01	08/11/2011
08/11/2011	02	08/11/2011
08/11/2011	03	08/11/2011
08/11/2011	04	08/11/2011
08/11/2011	05	08/11/2011



CITY OF TEMPE
KYRENE WRF RECHARGE WELL
 WELL DEVELOPMENT AND RECHARGE TEST
 SCHEMATIC

DESIGNED:
 DRAWN:
 CHECKED:
 DATE:

PROJECT NO.
165661

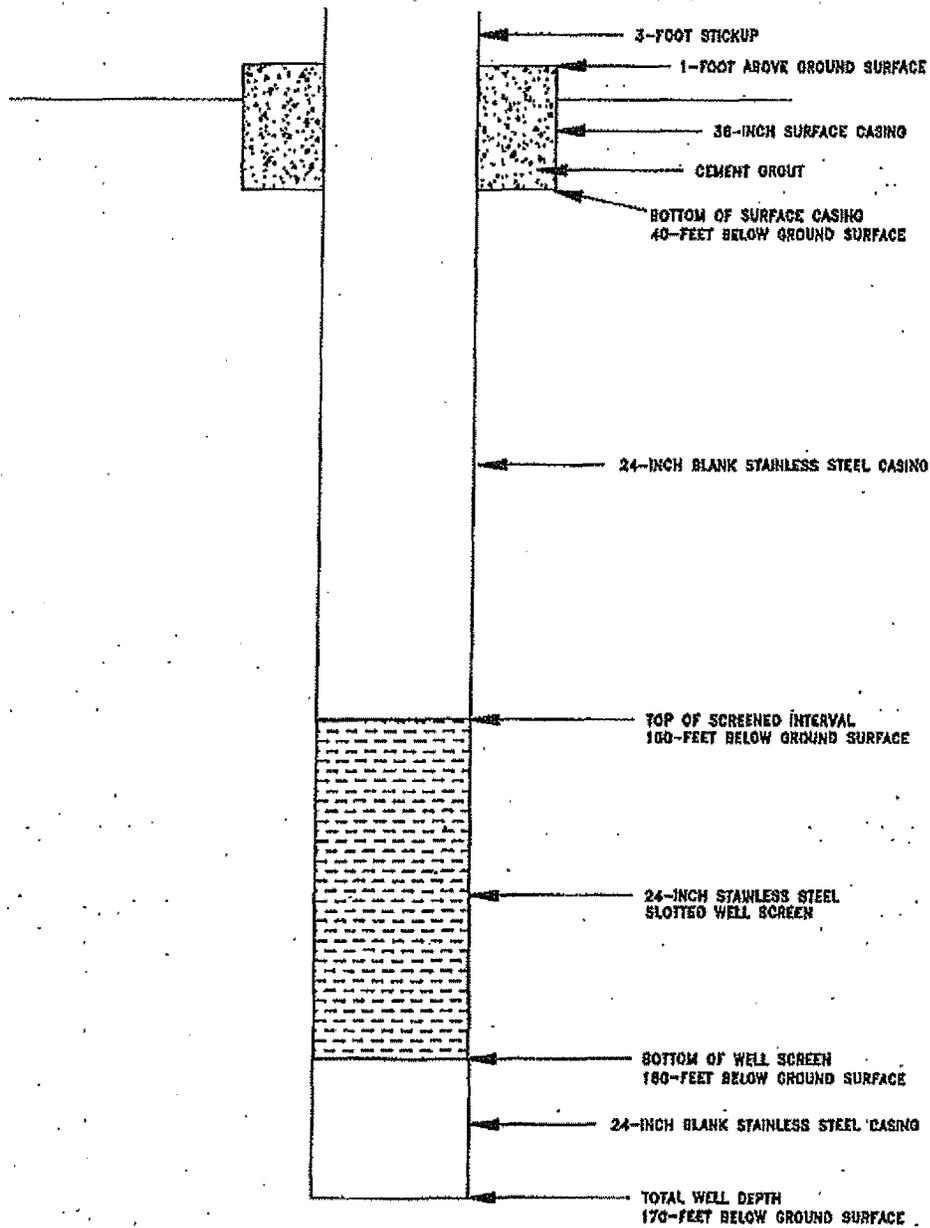
FIGURE 1

SHEET
 1 OF 1

ADDITIONAL SHEET

Handwritten initials or mark.

PROPOSED DESIGN FOR RECHARGE WELL



NOT TO SCALE

KV