

Ponderosa Golf Course Irrigation Project

Project Overview

Replacement of the current manual irrigation system to an automated system, and replace old pump station at Ponderosa Golf Course. The District has already paid for construction drawings and the project is "shovel ready".

Project Description

The irrigation system at Ponderosa Golf Course was installed in 1960. The Ponderosa Golf irrigation system is a manual system whereby staff moves around the course at night connecting sprinklers to the quick couplers for irrigation. This is very labor intensive as it takes 12 to 14 hours per day to water the course using manual labor. Additionally the system is almost 60 years old and in failure mode.

The proposed project will replace the current manual system with an automated system which can be programmed and operated without manual labor.

Project Implementation

The District has been working with the irrigation consulting firm Russell D Mitchell Associates. Plans and specification are completed and ready to be constructed. The firm has provided estimates and working drawings for the project.

Project Funding

The District has applied, and has project approval for a grant from Tahoe Sierra IRWM in cooperation with Truckee Donner Public Utility District in the amount of \$225,000 for the irrigation project. Proceeds from the grant will be released in Spring, 2020.

Project Cost Estimate

Automated Irrigation System	1,010,000
Pump Station	140,493
Sub Total	1,150,496
10% Contingency	115,050
Project Cost	\$1,265,546
Grand from IRWM	225,000
Balance for Project Funding	\$1,040,546

The remaining balance for the project of \$1,038,546 will be secured by applying for a loan from the California Infrastructure Economic Development Bank (CIEDB). The District has a history with the CIEDB as it acquired funding for Riverview Sports Park in 2000 for \$2 million. That loan was retired in 2017. The District has also received a quote from Government Financial Strategies (GFS) for Certificates of Participation. The District worked with GFS to secure funding for the Community Recreation Center constructed in 2009.

Current Loan Interest Rates and Term

CIEDB – as of April, 2019 – 3.3% for 20 years

GFS Certificates of Participation – 4.65% for 20 years

Loan Proceeds

All loan proceeds will be used to pay project costs.

Debt Service Amount - \$1,000,000 Loan

CIEDB - \$68,364 per year

GFS Certificates of Participation - \$75,882

Funding Request From TTAD

\$50,000/year for 20 years towards debt service

TDRPD will pay balance of debt service each year

Project Need

Ponderosa Golf Course currently operates at a deficit each year because it is a public golf course and needs to be affordable for the general public. The course caters to a large following of senior citizens and kids. A new automated irrigation system will reduce the manpower necessary to run the course, thus providing for a better break even possibility. Golf course revenues are dependent on weather and the amount of days of operation.

Attachments

1. CIEDB loan quote
2. CIEDB program information
3. GFS certificates of participation loan quote
4. TDRPD profit and loss statement for Ponderosa Golf Course
5. Pump Station Quote from Sierra Pacific Turf Supply
6. Project quote from Russell Mitchell Associates
7. Irrigation mechanical design plans from Russell Mitchell Associates

April, 2019

California Infrastructure Economic Bank

\$1 million	3.3%	30 years	\$52,560/yr	\$1,576,639
\$1.5 million	3.3%	30 years	\$78,828/yr	\$2,364,958
\$1 million	3.3%	25 years	\$58,800/yr	\$1,469,885
\$1.5 million	3.3%	25 years	\$88,188/yr	\$2,204,827
\$1 million	3.3%	20 years	\$68,364/yr	\$1,367,365
\$1.5 million	3.3%	20 years	\$102,552/yr	\$2,051,047

Applicant/Borrower:	Truckee Recreational Park District
Type of Entity:	District
General Project Location	Truckee
Project Description:	Various, including ice rink
"Facility" Completed and Operational	
Useful Life:	
Total Project Cost:	Estimated \$1-3 million.
Financing Amount:	\$1-3 million.
Source(s) of Other Funding:	
Loan Term:	20, 25, or 30 years
Estimated Start Date:	Spring of 2020
Estimated Completion Date:	Within 2 years of start of construction
Repayment Source:	General Fund
Current Rating/Rating Agency:	A
Leased Asset:	TBD

IBank	
Loan amount:	\$25 million maximum
Loan Term:	Useful life of the Project up to 30 years
Origination Fee:	The greater of \$10,000 or 1% of the loan amount
Annual Fee:	0.30% of the outstanding principal balance
Interest Rate:	TBD, based upon market, median household income, unemployment rate, disaster area, repayment source, existing debt rating (your indicative rate is 3.0%)
Payments:	Interest begins on the date of execution of the legal agreement; annual principal payments on August 1, and semi-annual interest payments on February 1 and August 1
Disbursement of Loan Proceeds:	The total amount of loan proceeds are placed into an account at our Trustee (US Bank), and disbursements are made from the account upon receipt of invoices.



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Infrastructure State Revolving Fund (ISRF) Program



The ISRF Program provides financing to public agencies and non-profit corporations, sponsored by public agencies, for a wide variety of infrastructure and economic development projects (excluding housing). ISRF Program funding is available in amounts ranging from \$50,000 to \$25 million with loan terms for the useful life of the project up to a maximum of 30 years.

Board Approved ISRF Financings

[Preview our recent financings.](#)



Who Can Apply

Eligible Applicants

Include, but are not limited to any subdivision of a local government, including cities, counties, special districts, assessment districts, joint powers authorities and non-profit corporations (as deemed eligible).

- [Criteria, Priorities and Guidelines for the Selection of Projects](#)
- [Criteria for eligible nonprofit applicants](#)

Eligible Projects Include, but are not limited to:
City streets

Sources of Financing Repayment:

Why Choose ISRF?

- Cost-effective: below-market interest rates.
- Easy, on-line, fillable applications continuously accepted.
- No competitive rating and ranking of applications.
- Technical assistance available
- No matching funds requirement. May serve as matching funds for other financings.
- No federal overlays

How to Apply

Applications are accepted continuously and are available below. We encourage you to call us before applying. IBank representatives provide technical assistance and work with you throughout the process. IBank's Board of Directors normally meets each month to consider approval of applications received prior to the meeting date. Check here for [board meeting deadlines](#).

*In order to use this version of the application, you will need to have Adobe Acrobat Reader. The latest version of Acrobat Reader is available to download free from [Adobe's website](#). Submit completed applications, or questions, via email to or by mail to P.O. Box 2830 Sacramento, CA 95812-2830. Please be sure to download and save the application PRIOR to entering any data.

ISRF Financing Application

[Special Funds Addendum](#) [Land Secured Addendum](#) [Charter City Questionnaire](#)
[General Fund Addendum](#) [Compliant Charter Cities](#)

For more information contact:

California Infrastructure and Economic Development Bank (IBank)

Office Address: 1325 J Street, Suite 1823, Sacramento, CA 95814

Mailing Address: P.O. Box 2830, Sacramento, CA 95812-2830

E-mail: LoanProgram@ibank.ca.gov

Telephone: (916) 341-6600

County highways	Water, sewer and other enterprise revenues
State highways	General fund revenues
Drainage, water supply and flood control	Property assessments
Educational, cultural and social facilities	Mello-Roos
Environmental mitigation measures	Special taxes
Goods movement-related infrastructure	Other recurring revenues acceptable to IBank
Parks and recreational facilities	
Port facilities, public transit	
Power and communications facilities	
Public Transit	
Sewage collection and treatment	
Solid waste collection and disposal	
Water treatment and distribution	
Defense conversion	
Public safety facilities	
Military infrastructure	
Industrial, utility and commercial	

Eligible costs for financing include:

- All or any part of the cost of construction, renovation, and acquisition of all lands, structures, real or personal property.
- Rights, rights of way, franchises, licenses, easements, and interests acquired or used for a project.
- The cost of demolishing or removing any buildings or structures on land so acquired, including the cost of acquiring any lands to which the buildings or structures may be moved.
- The cost of machinery, and equipment.
- Provisions for working capital.
- Other expenses necessary or incidental to determining the feasibility of any project or incidental to the construction, acquisition, or financing of any project.
- The cost of architectural, engineering, financial and legal services, plans, specifications, estimates, and administrative expenses.
- Interest prior to, during, and for a period after, completion of construction, renovation, or acquisition, as determined by the IBank.
- Reserves for principal and interest and for extensions, enlargements, additions, replacement, renovations, and improvements.

ISRF Project Map

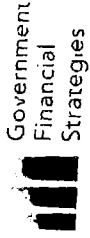
Locate ISRF projects with our searchable map.



[Advanced search of infrastructure loan projects by category, county, city, and/or borrower.](#)

May, 2018

Truckee Donner Recreation and Park District



Summary of Financing Scenarios (Sorted Left to Right from Lowest to Highest Total Annual Payment)

Component	30-Year		20-Year		15-Year		10-Year	
	Certificates of Participation	Lease-Purchase	Certificates of Participation	Lease-Purchase	Lease-Purchase	Lease-Purchase	Lease-Purchase	Lease-Purchase
Assumed Underlying Rating:	A	n/a	A	n/a	n/a	n/a	n/a	n/a
Bond Insured Rating:	AA	n/a	AA	n/a	n/a	n/a	n/a	n/a
Net Proceeds for Projects:	\$800,000	\$800,000	\$800,000	\$800,000	\$800,000	\$800,000	\$800,000	\$800,000
Costs of Issuance:	\$130,000	\$90,000	\$130,000	\$90,000	\$90,000	\$90,000	\$90,000	\$90,000
Underwriter's Discount:	\$8,447	n/a	\$7,210	n/a	n/a	n/a	n/a	n/a
Bond Insurance:	\$11,938	n/a	\$11,938	n/a	n/a	n/a	n/a	n/a
Surety Bond:	\$1,766	n/a	\$2,227	n/a	n/a	n/a	n/a	n/a
Rounding:	\$2,849	n/a	\$3,625	n/a	n/a	n/a	n/a	n/a
Total Issued:	\$955,000	\$890,000	\$955,000	\$890,000	\$890,000	\$890,000	\$890,000	\$890,000
Average Annual Debt Service:	\$56,315	\$69,312	\$73,382	\$82,303	\$82,303	\$82,303	\$82,303	\$82,303
Annual Debt Administration:	\$2,500	n/a	\$2,500	n/a	n/a	n/a	n/a	n/a
Total Annual Payment:	\$58,815	\$69,312	\$75,882	\$82,303	\$82,303	\$82,303	\$82,303	\$82,303
Total Payments Over Term of Financing:	\$1,764,448	\$1,386,239	\$1,492,045	\$1,234,538	\$1,234,538	\$1,234,538	\$1,234,538	\$1,234,538

[1] Please note, the amount to be financed is relatively small for a borrowing of more than 15 years. This may impact the feasibility of obtaining such financing, depending on market conditions at the time the financing is undertaken.

4.65% 4.65% 4.65% 4.41% 4.15%

**TRUCKEE DONNER RECREATION AND PARK DISTRICT
FY 2019-2020 BUDGET**

GOLF COURSE ROLLUP SUMMARY

GL Number	Category Of Service	Budgeted	Prelim Act	Actual						
		FY 19-20	FY 18-19	FY 17-18	FY 16-17	FY 15-16	FY 14-15	FY 13-14	FY 12-13	
REVENUE										
240650	Golf Course - Recreation	395,750	296,847	374,413	361,420	368,623	382,263	378,354		
284160	Junior Golf	3,220	2,242	0	0	0	0	0		
320650	Golf Course - Parks	0	500	0	0	0	0	0		
	TOTAL REVENUE	398,970	299,589	374,413	361,420	368,623	382,263	378,354		379,355
EXPENDITURES										
240650	Golf Course - Recreation Staff & Materials	117,662	74,909	109,748	67,279	71,312	90,069	86,381		72,114
240650	* Recreation Administration - Staff Oversight	27,615	0	0	0	0	0	0		0
284160	Junior Golf	2,843	2,195	0	0	0	0	0		0
320650	Golf Course - Park Staff & Materials	317,177	309,339	298,283	270,229	228,465	263,082	279,972		309,395
	TOTAL EXPENDITURES	465,298	386,443	408,031	337,508	299,777	353,151	366,353		381,509
GOLF COURSE NET		(66,328)	(86,854)	(33,618)	23,912	68,846	29,112	12,001		(2,154)

* Recreation Administration Staff for the Golf Course had been allocated to Recreation Administration and not shown as a golf course expense in the past

Note: This is a rollup summary of all expenditures and revenues for the Golf Course. See following budgets for individual program area detail.



Product Performance Promise

RAIN BIRD PUMP STATION QUOTE

HES 2 Pump

Quote #: GVC082517 401J

Project Information

Job Name:	Ponderosa Golf Course	Date:	8/21/2019 Revised
Job Country:	USA	Distributor Name:	Sierra Pacific Turf Supply
Job State/Province:	CA	Distributor Contact:	Tim Teixeira
Job City:	Truckee	Distributor Phone:	916-276-1492
Rain Bird Rep.:	Andrew Barna	Distributor Email:	ttexeira@sierrapacificturf.com

Station Details

Pump Platform:	H2C050Y1A0005230X8	Power Requirement:	230/3/60
Dyn. Inlet Pressure (PSI):		Pump Scenario:	Boost
Lift Height (ft.):	5	Max Flow Rate (GPM)	800
Boost Pressure (PSI):	115	Min Flow Rate (GPM)	250
Discharge Pressure (PSI):	115	Full Load Amps:	306

Site Conditions

Water Source:	Lake	Site Elevation:	5001-6600
Water Type:	Fresh	Intake Pipe Dia.:	8 in.
Wet Well Diameter:	N/A	Discharge Pipe Dia.:	8 in.
Wet Well Depth:	N/A	Slab Dimensions:	Recommended: 144" x 138"

Pump Station Pricing

Base Price:	\$76,542	The GRAND TOTAL includes the base pump station price, the total price of all selected options, one day of Authorized Service Provider start-up and training assistance, and freight to the job site.
Option Pricing:	\$41,762	
Freight:	Included	
ASP Startup Assistance :	\$1,250	
TOTAL:	\$119,554	

8.25% Sales Tax \$9,760
 Labor/Installation \$11,179

Grand Total \$140,493

Lead Time to Shipment

**** Prices valid for thirty (30) days**

9 weeks	From receipt of all documents below:	Pump Stations are included in Rain Bird's Pump Station Professional Customer Satisfaction Policy.
	Purchase Order	
	Signed Quote	
	Signed Approval Drawing	

All reasonable efforts will be made to meet the requested shipment date after the receipt of a signed contract however, Rain Bird Corporation will not be liable for delays in shipment or delivery.

Steve Randall

From: John Shaffer
Sent: Friday, October 25, 2019 11:36 AM
To: Steve Randall
Subject: FW: Ponderosa

Here's a start!

John Shaffer
Park Superintendent

From: Russell Mitchell <rmitchell@rmairrigation.com>
Sent: Wednesday, [REDACTED] 12:28 PM
To: John Shaffer <jshaffer@tdrpd.org>
Subject: RE: Ponderosa

Hi John,

I can't seem to find the e-mail that had the estimated construction cost shown. I have the following noted in our files and these date back about a year and a half.

Estimated cost 5-14-2018 was \$650,000.00 and would suggest using \$710,000.00 today with a \$300,000.00 add on to each for the prevailing wages. [REDACTED]. Don't forget we will need a rock clause because there are some scary boulders sticking their heads up on the course.

Russ

Russell Mitchell, FASIC

Principal

---RMA-----
Russell D Mitchell & Associates
Irrigation Design-Consultation-Supervision-Evaluation

2760 Camino Diablo
Walnut Creek, CA 94597
Tel: (925) 939-3985 Ext. #2
Fax: (925) 932-5671
Web Site: www.rmairrigation.com
Email: rmitchell@rmairrigation.com

From: John Shaffer [<mailto:jshaffer@tdrpd.org>]
Sent: Wednesday, September 18, 2019 11:38 AM
To: Russell Mitchell <rmitchell@rmairrigation.com>
Subject: Ponderosa

Hi Russ. Thanks for coming up and looking at our irrigation situation. I like your design. It makes sense! Appreciate that! On another topic, I know you and I have talked ballpark numbers on the Ponderosa irrigation system and I'm hoping you can refresh my memory. We're trying to get a \$250K grant from our local PUD and I'm meeting with them today to go

RUSSELL D MITCHELL ASSOCIATES, INC.

2760 Camino Diablo
Walnut Creek, California 94597

Phone (925) 939-3985
Fax (925) 932-5671

RMA

June 13, 2018

Ponderosa Golf Course
Truckee, CA
Attn: Mr. John Shaffer jshaffer@tdrpd.org

Dear Mr. Shaffer,

We have an irrigation design that was prepared in 2012. The layout and hydraulics of the irrigation system are still sound and will not change.

We have prepared a rough design to delete the satellite controllers in the field, eliminate the high voltage electrical service to these controllers, eliminate all of the 400,000 feet of low voltage control wire and in its place change the system to a two wire (decoder) system.

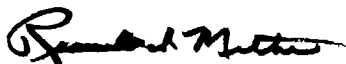
The two wire system will be operated from the central computer and when in the field the irrigation can be operated from a cell phone or I-pad. The as-builts of the irrigation will be loaded into the hand held device so the layout in the field will be displayed. We have prepared a preliminary cost estimate for the equipment and installation of the irrigation system which will include prevailing wages.

Our estimate is \$950,000.00 not including the pump station. In addition to this estimate we will need to update the plans and some of the details and equipment specifications, field stake the equipment during construction and prepare an as-staked plan for the contractor to install from, GPS survey the installed equipment and prepare the as-built documents, program the central irrigation computer and provide the yardage distances for each sprinkler.

These services were covered in our original fee proposal dated July, 2008 but the fees structure has increased over the last 10 years. The services listed will come to a total of \$25,000.00.

Please let me know if you have questions or if you are looking to bid the project so the updated plans and bid documents can be prepared.

Sincerely,
Russell D. Mitchell & Associates, Inc.



Russell D. Mitchell, FASIC

IRRIGATION DESIGN • CONSULTATION • SUPERVISION • EVALUATION



RUSSELL D. MITCHELL & ASSOC., INC.
 IRRIGATION CONSULTANTS
 WALKUT CREEK, CALIFORNIA 94596
 TELEPHONE: 925-939-2885
 FAX: 925-937-0871

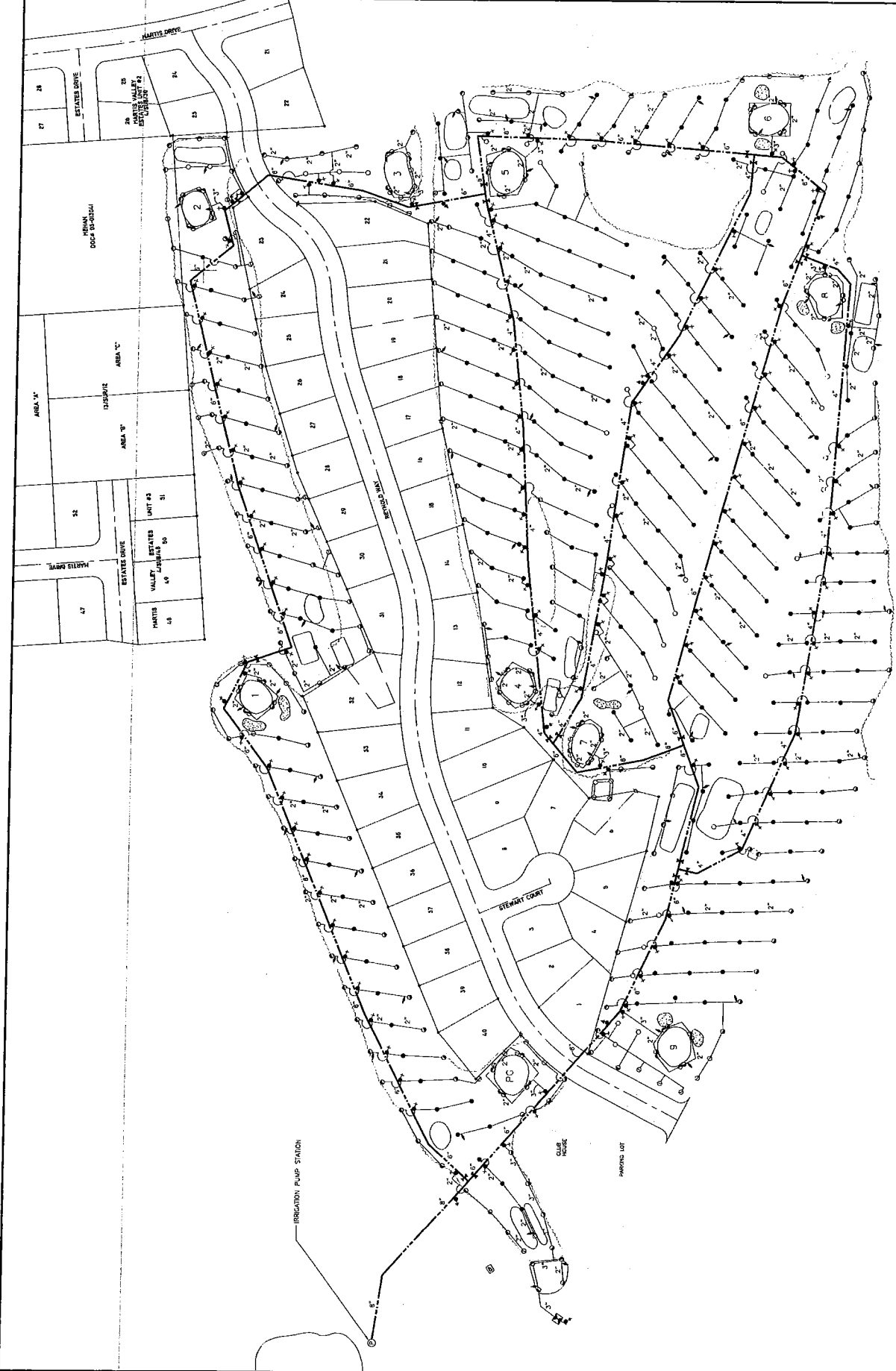
PONDEROSA GOLF COURSE
 10040 REYNOLD WAY
 TRUCKEE, CALIFORNIA

IRRIGATION
 MECHANICAL

DESIGN: RHM
 DRAWN: LB
 CHECK: RHM
 DATE: 7-20-12
 REVISED: 10-16-18
 SCALE: 1"=40'

SHEET: IR-1 of 3

PRELIMINARY
 OCTOBER 16, 2018



NOTE TO CONTRACTOR
 1. ALL IRRIGATION EQUIPMENT SHALL BE INSTALLED IN ACCORDANCE WITH THE IRRIGATION CONTRACT DOCUMENTS AND THE IRRIGATION CONTRACT DOCUMENTS SHALL BE USED TO DETERMINE THE LOCATION AND DEPTH OF ALL IRRIGATION EQUIPMENT.

DISCLAIMER NOTE
 THE IRRIGATION CONTRACT DOCUMENTS ARE THE PROPERTY OF RUSSELL D. MITCHELL & ASSOC., INC. AND ARE NOT TO BE REPRODUCED OR TRANSMITTED IN ANY FORM OR BY ANY MEANS, ELECTRONIC OR MECHANICAL, INCLUDING PHOTOCOPYING, RECORDING, OR BY ANY INFORMATION STORAGE AND RETRIEVAL SYSTEM, WITHOUT THE WRITTEN PERMISSION OF RUSSELL D. MITCHELL & ASSOC., INC.

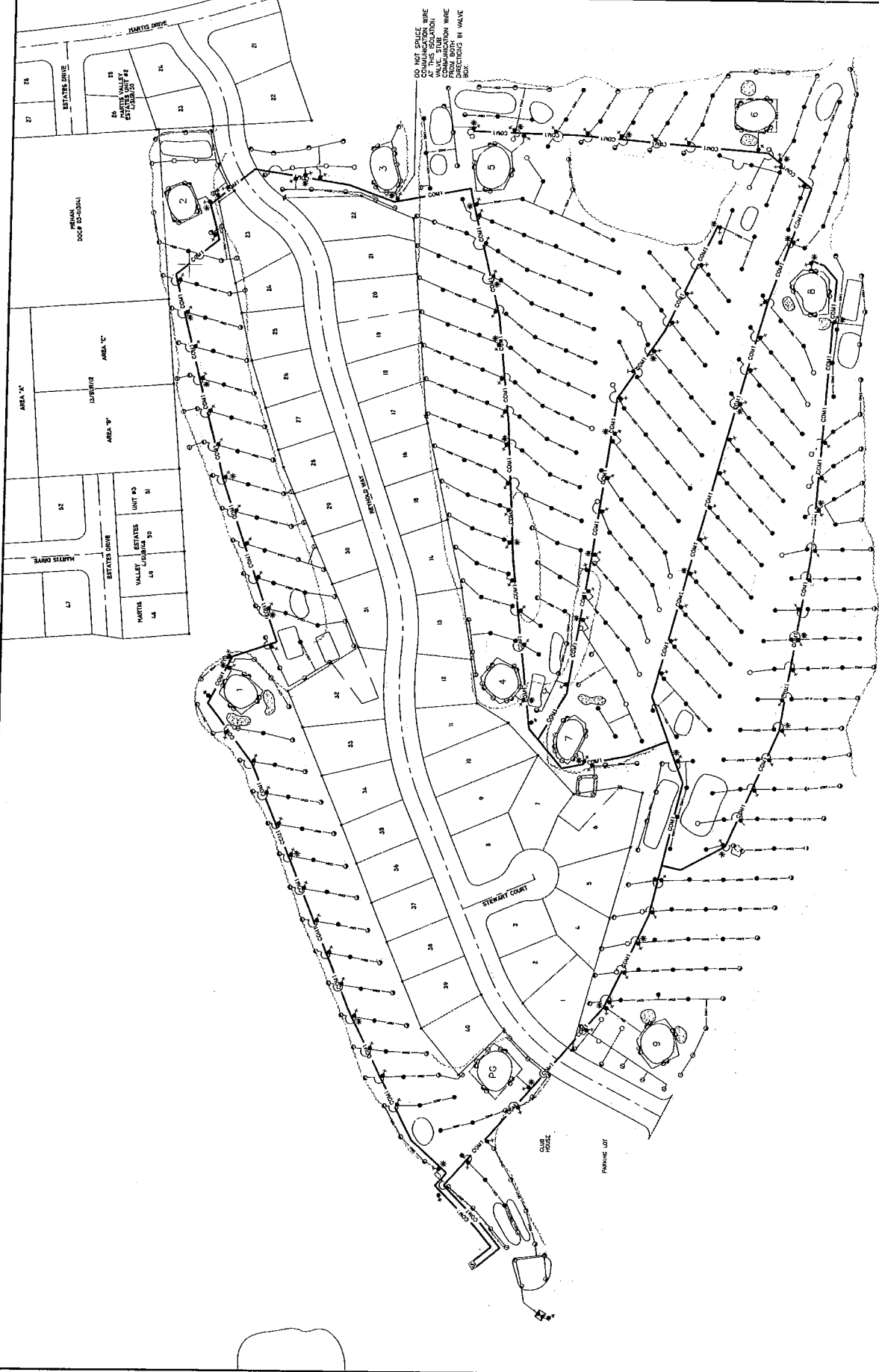
RUSSELL D. MITCHELL & ASSOC., INC.
 IRRIGATION CONSULTANTS
 2760 CARMO DRIVE
 WALTON CREEK, CALIFORNIA 94598
 TELEPHONE: 925-933-1945
 FAX: 925-933-5671

PONDEROSA GOLF COURSE
 10040 REYNOLD WAY
 TRUCKEE, CALIFORNIA

IRRIGATION WIRE PATH
 COMMUNICATION WIRE PATH

DESIGN: RDK
 DRAWN: LB
 CHECK: RDM
 DATE: 7-30-12
 REVISIONS: 10-16-15
 SCALE: 1"=40'

SHEET: IR-2 OF 3



NOTE TO CONTRACTOR
 1. ALL WIRE SHALL BE INSTALLED IN ACCORDANCE WITH THE IRRIGATION WIRE PATHS SHOWN ON THIS PLAN. THE CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING THE LOCATION OF ALL WIRE AND VALVES IN THE FIELD PRIOR TO CONSTRUCTION.

DISCLAIMER NOTE
 THE CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING THE LOCATION OF ALL WIRE AND VALVES IN THE FIELD PRIOR TO CONSTRUCTION. THE CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING THE LOCATION OF ALL WIRE AND VALVES IN THE FIELD PRIOR TO CONSTRUCTION.

PRELIMINARY
 NOT FOR CONSTRUCTION
 OCTOBER 16, 2015

PONDEROSA GOLF COURSE IRRIGATION SYSTEM

PART 1.00 - GENERAL

1.01 DESCRIPTION

- A. Work included:
Order and furnish all labor, materials, supplies, tools, and transportation and perform all operations in connection with and reasonably incidental to complete the installation of the automatic sprinkler irrigation systems as shown on the drawings. Items hereinafter are included as an aid to take off, and are not necessarily a complete list of work items.
1. Trenching, stockpiling, excavation, materials, and refilling trenches.
 2. Furnishing materials and installation for complete system including piping, valves, fittings, sprinkler heads, communication wire, automatic controls, and final adjustment of heads to insure complete coverage.
 3. Installation of central control system.
 4. Replacement of unsatisfactory materials.
 5. Clean-up, inspection, and approval.
 6. All work of every description mentioned in the specification and/or addenda thereto, all other labor, and materials reasonably incidental to the satisfactory completion of the work, including clean-up of the site, as directed by the Owner.
 7. Tests.
 8. Record drawings.

1.02 GENERAL REQUIREMENTS

- A. O.S.H.A. Compliance:
All articles and services covered by this specification shall meet or exceed the safety standards established under the Federal Occupational Safety and Health Act of 1970, together with all amendments in effect as of the date of this specification.
- B. Codes and Standards:
Comply with all applicable codes and standards.
1. All work and materials shall be in full accordance with the latest rules and regulations of the National Electric Code; the Uniform Plumbing Code, published by the Western Plumbing Officials Association; and other State or local laws or regulations. Nothing in these drawings or specifications is to be construed as to permit work not conforming to these codes.
 2. When the specifications call for materials or construction of a better quality or larger size than required by the above mentioned rules and regulations, the provision of the specifications shall take precedence over the requirements of

- said rules and regulations.
3. Contractor shall furnish, without extra charge, any additional material and labor when required by the compliance with these rules and regulations, though the work be not mentioned in these particular specifications or shown on the drawings.
 4. The Contractor shall erect and maintain barricades, guards, warning signs, and lights as necessary or required by O.S.H.A. regulations for the protection of the public or workmen.
 5. Any existing buildings, equipment, piping, pipe covering sewers, etc., damaged by the Contractor during the course of his work shall be replaced or repaired by the Contractor in a manner satisfactory to the Owner and at Contractor's own expense, before final payment is made. The Contractor shall be responsible for damage caused by leaks in the piping systems being installed or having been installed under this contract. He/She shall repair, at his/her own expense, all damage so caused, in a manner satisfactory to the Owner.
 6. The Contractor shall pay for all permits, licenses, and fees required.

1.03 SUPERVISION AND WORKMANSHIP

The Contractor, personally or through an authorized and competent representative, shall supervise the work constantly, and shall as far as possible keep the same foreman and workmen on the job from commencement to completion. The workmanship of the entire job must in every way be first class, and only experienced and competent workmen will be allowed on the job.

1.04 LAYOUT OF WORK

The Irrigation Consultant will stake out the irrigation system. Changes from the drawings will be made at this time to accommodate field conditions. Contractor shall provide one laborer to assist with staking. The Owner will pay for the Irrigation Consultant's field staking service. Upon locating each sprinkler the Contractor shall permanently mark the location until the sprinkler is installed. Restaking of lost sprinkler locations due to Contractor's operations shall be at the Contractor's expense.

1.05 INSTRUCTION

- A. It shall be the Consultant's responsibility to program the central control system so that the input of the irrigation database will allow the hydraulic piping system to be used to its fullest potential without exceeding the hydraulic limitations calculated by the irrigation consultant. This process shall include:
 - Gathering of field satellite data
 - Type of Sprinkler and Nozzle Size
 - Satellite Assignment

- Station Location Identification
- Number of Sprinklers per Station
- Station Flow Zone Assignment
- Special Station Considerations (Shade, Slope, etc.)
- Determination of Station Run Time
- Determination of Cycle Time per Station
- Determination of Soak Time per Station
- Flow zone Determination
- Hydraulic Node Calculations to Insure Structural Integrity of Irrigation Piping
- Flow Zone Capacity Calculations to Protect System Hydraulics
- One Half Day Training Session on Data Setup and System Operation (In Addition to Distributor Training on Software)

The Owner will pay for the irrigation consultant's programming services.

1.06 SUBMITTALS

A. Record Drawings:

1. The Contractor shall maintain in good order in the field office, one complete set of black line prints of all sprinkler drawings which form a part of the contract, showing all water lines, electrical, sprinklers, valves, controllers, stub-outs and wires for future.
2. The irrigation as-staked plans shall be used to document the piping and electrical as it is installed. These as-staked drawings showing the current status of the installed piping and wire shall be submitted with each pay request. Progress payments may be delayed pending receipt of as-built information.
3. The consultant shall complete as-built drawings on an AutoCAD file. All sprinklers and valves shall have three dimensional coordinates in AutoCAD format. The procedures used to obtain the field data (including tees, greens, bunkers and cart paths) shall be the GPS process with survey grade GPS equipment and an aerial photograph imaged on the autocad file of the GPS data. All sprinklers, QCV, valves, electrical, and piping shall be shown with the appropriate sizing. Provide the following:
 - a. (2) 1"=100' colored prints of the Mechanical Plan.
 - b. (2) 1"=100' colored prints of the Measurement Plan (For all valve and splice boxes).
 - c. (2) 1"=100' colored prints of the Communication wire Plan.
 - d. (2) Sets of laminated plans showing station numbering.
 - e. (2) 11"x17" set of laminated plans showing mechanical and measurement per hole
 - f. (1) Component quantities of all sprinklers and valves. Square footage calculations of Green, Tee and Fairway areas.

The Owner will pay for the irrigation consultant's record drawing services.

- B. Owner's Manuals:
Submit three (3) manuals including all parts lists and local supplier of system components.
- C. Catalogue:
The Contractor shall submit two (2) catalogue cuts on all equipment to be installed on the project. Any equipment installed which does not match approved list of equipment shall be removed and replaced at the Contractor's expense.
- D. The Contractor shall flag all sprinklers, valves and main line change of direction fittings prior to the Irrigation Consultant's GPS surveying of the irrigation equipment for record drawings.

1.07 CONSTRUCTION SCHEDULING

- A. Prior to start of construction, the Contractor shall submit a complete schedule of construction.
- B. During the course of construction the course will remain open to play except that the Contractor may take one fairway out of play at any given time. The course shall remain entirely open to play during weekends and holidays. The course shall be readied for weekend play or holiday play by 4:30 p.m. the day prior by presenting a full nine (9) holes, without trenches, excavations, or other impediments to golf.

1.08 EXISTING IRRIGATION SYSTEM

- A. This contract requires that the existing irrigation system be kept intact on all areas of the golf course not yet worked on to permit normal watering during construction. On holes that have been installed according to these plans and specifications, irrigation shall be possible through the central computer. On holes being worked on, the Contractor shall afford the Owner every opportunity to hand water during the period of shut-down with particular emphasis on tees and greens.
- B. All existing sprinklers and quick coupling valves will be removed by the irrigation contractor after the new system is operating.

1.09 GOLF COURSE SUPERINTENDENT

The day-to-day full time supervision of construction will be under the direction of the Golf Course Superintendent. Any questions regarding day-to-day interpretation of the specifications or working drawings which the Contractor may have, are to be directed only to the Golf Course Superintendent. Only the Golf Course Superintendent shall be authorized by the Consultant to approve the necessary day-to-day adjustments or modifications which from time to time may arise during the term of construction. All employees of the Contractor shall be subordinate to the Golf Course Superintendent. Disputes which may arise between the Golf Course Superintendent and the Contractor or the Contractor's

supervisors or foremen shall be arbitrated by the Consultant, and as necessary, by the Owner. In any disputes relating to the golf course irrigation system design, or the implementation of that design, only the Consultant shall make the final and binding decisions.

1.10 WORKMEN'S COMPENSATION

The Contractor shall maintain employer's and workmen's compensation insurance that will protect him against any and all claims resulting from injuries to, and deaths of, workmen engaged in work under this contract. In case any class of employees is not protected under the Workmen's Compensation statute, the Contractor shall provide, and shall cause each subcontractor to provide, adequate employer's liability coverage that will protect him against any claims resulting from injuries to, and death of, workmen engaged in work under this contract.

1.11 CONTRACTOR'S STORAGE AREA

Space will be provided for the Contractor to erect a fence for a storage yard on / or adjacent to the golf course.

1.12 CHANGE ORDERS

Increase or decrease in the scope of work will become a change order to the original contract. The dollar amount of the change order will be based on the unit prices submitted with the original bid.

1.13 CONTRACTOR QUALIFICATIONS

The irrigation contractor performing this work shall have completed a minimum of three 18 hole golf course irrigation installation projects in the last 10 years. Each project shall have consisted of a computerized control system, a minimum of 1200 sprinklers and work must have been on an existing golf course. Provide project list and contact person with address and telephone number.

PART 2.00 - MATERIALS

2.01 PIPE AND FITTINGS

- A. Plastic pipe shall be polyvinylchloride, semi-rigid, Type 1, Grade 1, with a Classification of 1120, and shall conform to ASTM D2241 and ASTM D1785. Pipe shall be supplied in lengths of 20 feet. Each length of pipe shall be marked as follows: Manufacturer's name, Class of pipe, Type and Grade, and NSF seal. Pipe having extrusion marks, scratches, blisters, rough finish, or other damage will not be permitted on the project site. J-M or approved equal.
- B. Main lines (constant pressure) 4" through 8" shall be polyvinylchloride (PVC) 1120-200 PSI with ring-tite connections.

1. Join lengths of pipe by means of integrally formed bell end on pipe using rubber ring seal.
 2. At isolation valve location use a single strap stainless steel saddle. Harco with epoxy coating or approved equal. Use double strap saddle on 4" main line.
 3. At changes in direction or branch mains, use appropriate deep bell ductile iron fitting which is compatible with IPS size PVC plastic pipe. Harco or approved equal.
- C. Lateral (sub-main) lines shall be 1120-Schedule 40 PVC plastic pipe with Lasco surge guard PVC solvent weld fittings. At sprinkler location use Lasco Models 302-251 and 307-251 2"x1 1/2" solvent weld PVC service tee or elbow with female acme threads.
- D. Connections between main lines and isolation valves shall be Harco ductile iron swivel fittings.
- E. Risers shall be Lasco 360 acme thread 1 1/4" PVC riser as detailed or approved equal.

2.02 QUICK COUPLING VALVES

Quick coupling valves shall be as listed on the drawings.

2.03 MASTER CONTROL SYSTEM

Automatic sprinkler system controls shall be Rain Bird Nimbus II with mapping upgrade computer control system which contain the following equipment or approved equal.

2.04 GATE VALVES

4" and larger shall be cast iron with operating nut (2" square), "O"-ring connections for PVC plastic pipe resilient seat and fused epoxy coated inside and outside. All bolts, nuts and washers shall be stainless steel. Nibco or approved equal. Install in 10" diameter plastic valve box as detailed. NDS pro series with "T" cover or approved equal.

2.05 WIRE

- A. Communication wire shall be double jacketed, two conductor cable. Conductors shall be tin coated, soft annealed, solid copper with 4/64" thick, high density polyethylene. Paige electric model No. P-7072-D cable or approved equal. No splicing of signal wire permitted except in isolation valve boxes and at each sprinkler.

2.06 SPRINKLER HEADS

All sprinkler heads shall be as listed on the drawings. Rain Bird A-700 IC-70-40 and A-751 IC-70-40 electrical valve-in-head rotors or approved equal.

2.07 ISOLATION VALVES

Harco stainless steel 8411122 PQ/80081 valve with female swivel saddle. Install in 10" diameter plastic valve box as detailed NDS pro series with "T" cover or approved equal.

2.08 DUCTILE IRON FITTING ENCASEMENT

Encase all ductile iron fittings and gate valves with a 4-Mil high density, cross-laminated (HDCL) polyethylene plastic sheeting (AWWA C105). Wrap and fold around fittings to prevent contact with thrust block and soil tape after wrapping to hold plastic tight around fitting.

2.09 MISCELLANEOUS INSTALLATION MATERIALS

- A. Solvent cement and primer for solvent weld joints shall be of make and type approved by manufacturer(s) of pipe and fittings. Cement shall be maintained at proper consistency throughout use.
- B. Lubricant for assembling rubber ring seal joints shall be of make and type approved by manufacturer of pipe.
- C. Pipe joint compound shall be non-hardening, non-toxic materials designed specifically for use on threaded connections in water carrying PVC plastic pipe. Rector seal T+2 or approved equal.

PART 3.00 – INSTALLATION

3.01 PREPARATION

Schedule and coordinate placement of materials and equipment in a manner to effect the earliest completion of work in conformance with construction and progress schedule.

3.02 HANDLING AND STORAGE

- A. Protect work and materials from damage during construction and storage as directed by Owner.
- B. Handle plastic pipe carefully; especially protect it from prolonged exposure to sunlight.

3.03 EXCAVATING AND TRENCHING

- A. Excavation shall be in all cases ample in size to permit the pipes to be laid at the elevations intended and to permit ample space for joining. Prior to trenching, remove sod with sod cutter. Roll and set aside. Replace immediately after installing main line (three (3) days maximum).
- B. Make trenches for pipelines deep enough to provide minimum cover from finish grade as indicated on drawings.
- C. Restore surfaces, existing underground installations, etc., damaged or cut

- as a result of excavations, to original conditions in a manner approved by the Owner.
- D. Where other utilities interfere with irrigation trenching and pipe work, adjust the trench depth as instructed by the Owner.
 - E. Contractor is responsible for watering of reinstalled sod until which time it can be watered with the new automatic system.
 - F. Cart Paths:
 1. For main line installation, saw cut cart paths prior to trenching.
 2. For lateral lines and wire, jack or bore as required. No cutting permitted.
 - G. Remove and dispose of all rock and other unsuitable material unearthed by a backhoe/trencher type machine encountered during trenching process. Locations for burial will be identified on site by the Owner.

3.04 ASSEMBLING PIPELINES

- A. All pipe shall be assembled free from dirt and pipe scale. Field cut ends shall be reamed only to full pipe diameter with rough edges and burrs removed.
- B. Rubber ring seal joint:
 1. Use factory made male end or prepare field-cut male end to exact specifications of factory made end.
 2. Carefully clean bell or coupling and insert rubber ring without lubricant. Position ring carefully according to manufacturer's instructions.
 3. Lubricate male end according to manufacturer's instructions and insert male end to specified depth.
 4. Thrust blocks shall be provided where necessary to resist system pressure on ring-tite pipe and fittings. Blocks shall be concrete and the size shall be based on an average soil safe bearing load of 700# per square foot.
 5. Form any thrust blocks in such a manner that concrete comes in contact only with the fittings. Thrust blocks shall be between solid soil and the fittings. See sizing chart on the drawings.
- C. Solvent weld joint:
 1. Prepare joint by first making sure the pipe end is square. Then, debur the pipe end, and clean pipe and fitting of dirt, dust and moisture.
 2. Dry insert pipe into fitting to check for missizing. Pipe should enter fitting 1/3 to 2/3 depth of socket.
 3. Coat the inside socket surface of the fitting and the male end of the pipe with P-70 primer (manufactured by Weld-On). Then without delay, apply Weld-On 711 cement liberally to the male end of the pipe and also apply 711 cement lightly to the inside of the socket. At this time, apply a second coat of cement to the pipe end.
 4. Insert pipe immediately into fitting and turn 1/4 turn to

distribute cement and remove air bubbles. The pipe must seat to the bottom of the socket and fitting. Check alignment of the fitting. Pipe and fitting shall be aligned properly without strain to either.

5. Hold joint still for approximately thirty (30) seconds and then wipe the excess cement from the pipe and fitting.
 6. Cure joint a minimum of thirty (30) minutes before handling, at least twelve (12) hours before allowing water in the pipe and twenty-four (24) hours before installation with vibratory plow.
- D. Threaded joint:
1. Field threading of plastic pipe or fittings is not permitted. Only factory formed threads will be permitted.
 2. All threaded joints shall be made up with pipe joint compound. Apply compound to male threads only.
 3. Where assembling plastic pipe, use strap type friction wrench only; do not use metal-jawed wrench.
- E. Cap or plug openings as pipeline is assembled to prevent entrance of dirt or obstructions. Remove caps or plugs only when necessary to continue assembly.
- F. Flush main line pipe in maximum length sections of one (1) fairway. Flush water out end of pipe with full pipe line of water.
- G. Where pipes or control wires pass through sleeves, provide removable non-decaying plug at ends of sleeve to prevent entrance of earth.

3.05 MECHANICAL PIPE PULLING

Lateral line (sub-main) 3" and smaller shall be installed by use of an approved mechanical vibratory plow. After plowing, the remaining hump shall be rolled with a heavy mechanical roller to flatten flush with finish grade. Install wire while pulling lateral lines. Control wire shall be fed (not pulled) along sub-main as pipe is pulled into ground.

3.06 ISOLATION VALVES

Install where shown on the drawings and as detailed. Limit one valve per box. Install valves no closer than 6 feet on center along the main line.

3.07 DUCTILE IRON FITTINGS ENCASEMENT

Wrap valves, tees, elbows, etc. with a flat sheet or split length of polyethylene tube by passing the sheet under and then over the appurtenance and bringing it together around the body of the appurtenance. Make seams by bringing the edges of the polyethylene together, folding over twice and taping them down. Carefully pour thrust blocks so as not to damage polyethylene material.

3.08 COMMUNICATION WIRING

- A. Locate under shoulder of main line pipe.

- B. Loop a minimum of 3 feet of extra wire at each valve-in-head sprinkler; and at approximately 100 feet O.C. along main line.
- C. Connections shall be made by using a wire nut and sealing with waterproof sealer packs.
- D. Splicing will be permitted only at sprinkler locations and in isolation valve boxes. Keep wire clear of thrust blocks.
- E. Where control lines pass under streets, they shall pass through Schedule 40 electrical PVC conduit.
- F. Depth of cover: Along main lines locate under shoulder of pipe. Along lateral lines provide a minimum of 16" cover over wire.

3.09 CENTRAL COMPUTER

The manufacturer and supplier of the computer control system shall provide a minimum of 4 - 4 hour training sessions on using the central computer.

3.10 BACKFILLING

- A. Backfill only after piping and wire has been inspected and approved.
- B. Backfill material shall be the earth excavated from the trenches, free from rocks, concrete chunks, and other foreign or coarse materials. Carefully select backfill that is to be placed next to plastic pipe to avoid any sharp objects which may damage the pipe.
- C. All pipe under asphalt paving shall be backfilled with 4" of clean sand on all sides of pipe.
- D. Place backfill materials and compact by jetting and mechanical tamping to a minimum compaction of 85% relative compaction. The Owner may, at his expense, order compaction tests to verify the trench meets the 85% relative compaction standards. If the test fails, the first test and all other tests ordered to verify corrected compaction of the trench tested will be at the expense of the contractor.
- E. Dress off areas to finish grade and remove excess soil, rocks, or debris remaining after backfill is completed.
- F. Repair cart paths to match existing conditions. Repair A.C. paths with hot asphalt mix.
- G. Existing turf that is damaged or sod that does not reestablish itself must be resodded to match, as closely as possible, the existing turf.
- H. If settlement occurs along trenches, and adjustments in pipes, valves, and sprinkler heads, soil, sod, or paving are necessary to bring the system, soil, sod, or paving to the proper level or the permanent grade, the Contractor, as part of the work under this contract, shall make all adjustments without extra cost to the Owner.

3.11 SPRINKLER HEADS AND QUICK COUPLING VALVES

- A. Thoroughly flush lines before installing sprinklers or QCV's.
- B. Locate sprinklers and QCV's as shown in the drawings and details.
- C. Adjust sprinkler heads for proper distribution and trim.

- D. Install sprinklers and QCV's flush with and perpendicular to finish grade at time of installation.

3.12 TESTS

Contractor shall:

- A. Notify the Owner at least three (3) days in advance of testing.
- B. Perform testing at his/hers own expense.
- C. Apply the following tests after welded plastic pipe joints have cured at least twenty-four (24) hours.
 - 1a. Test main (constant pressure) lines hydrostatically at 150 PSI minimum. The test pressure is to be maintained for two (2) hours. The amount of water required to keep the pressure at 150 PSI shall be measured. Approved tables of allowable losses will be consulted, and the lines will be approved or not approved as such results may indicate. Contractor shall make tests and repairs as necessary until test conditions are met.
 - 1b. Allowable leakage for PVC plastic pipe with elastomeric joints in U.S. gallons per hour at a test pressure of 150 PSI.
 - 4" - .33 gallons per 1000 ft. or 50 joints
 - 6" - .50 gallons per 1000 ft. or 50 joints
 - 8" - .66 gallons per 1000 ft. or 50 joints
 - 2. Test lateral lines with water at line pressure and visually inspect for leaks. Retest after correcting defects.
 - 3. The Contractor is responsible for operating the system automatically for five (5) days with a minimum of two (2) - five (5) minute waterings per day prior to final acceptance of that portion of the irrigation system.

3.13 GUARANTEE

- A. It shall be the responsibility of the Irrigation Contractor to fill and repair all depressions and replace all necessary turf and planting due to the settlement of irrigation trenches for one (1) year following completion and acceptance of the job.
- B. The Contractor shall guarantee all materials, equipment, and workmanship furnished to be free of defects of workmanship and materials, and shall agree to replace at his/hers expense, at any time within one (1) year after installation is accepted, any and all defective parts and damaged trees, plants and turf that may be found.
- C. If the Contractor does not respond to the Owner's request for repairs covered under this guarantee, the Owner will make said repairs and back charge the Contractor for the cost of the work.

3.14 WINTERIZATION OF IRRIGATION SYSTEM

- A. The Contractor shall be responsible for draining irrigation system in preparation for the first winter after construction has been completed. Instruct Owner's representatives in proper procedures.

- B. Winterization shall proceed as follows:
1. Close gate valve in irrigation main line located at the pump station.
 2. Open all drain valves located along main line.
 3. Insert quick coupling quill, connected to air compressor, into quick coupling valve located at water source.
 4. Following start of air compressor, program irrigation system through three (3) complete cycles or until all water has been forced out of the system.
 5. Insert quick coupling quill into QCV at dead end runs of main line to force out all remaining trapped water.
 6. Remove compressor, leaving gate valve to irrigation system closed.

3.15 CLEAN-UP

When work of this section has been completed and at such other times as may be directed, remove all trash, debris, surplus materials, and equipment from site.

END OF SECTION