



PURCHASING DEPARTMENT
REQUEST FOR PROPOSAL

RFP 20-002

IRON HORSE GOLF COURSE
IMPROVEMENTS

PROPOSALS DUE WEDNESDAY, SEPTEMBER 25, 2019

BY 2:00 P.M.

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INVITATION TO BID

The City of North Richland Hills is accepting sealed proposals from all interested parties for:

- Bid Number: 20-002
- Bid Type: REQUEST FOR PROPOSAL (COMPETITIVE SEALED PROPOSAL)
- Bid Name: IRON HORSE GOLF COURSE IMPROVEMENTS
- Bid Due Date: Wednesday September 25, 2019
- Bid Due Time: 2:00 P.M. Central Standard Time
- Pre-Bid Conference: 9:00A.M. (CST) Tuesday September 17, 2019
Iron Horse Golf Course Club House- 6200 Skylark Circle, North Richland Hills, Tx.
- Deadline for questions:
Date: Friday September 20, 2019 Time:
12:00 P.M. Central Standard Time

DOCUMENTS MAY BE SUBMITTED ELECTRONICALLY VIA:

www.publicpurchase.com Preferred Method

DOCUMENTS MAY BE DELIVERED TO:

City of North Richland Hills
Purchasing, Attn: 20-002 IRON HORSE GOLF COURSE IMPROVEMENTS
4301 City Point Drive
North Richland Hills, TX 76180

If delivering a bid packet please include ***One (1) hard copy and One (1) soft copy on Flash drive.***
Submit documents in a sealed envelope with the following information marked plainly on the front:

ATTN: PURCHASING DEPARTMENT RFP 20-002 IRON HORSE GOLF COURSE IMPROVEMENTS

No oral explanation in regard to the meaning of the specifications will be made, and no oral instructions will be given after the pre-bid meeting and before the award of the contract. Requests from interested vendors for additional information or interpretation of the information included in the specifications should be directed in writing as a question related to this bid on Public Purchase and the question will be answered on Public Purchase. All addendums will also be posted to Public Purchase. It will be the vendor's responsibility to check all information related to this bid on Public Purchase before submitting a response.

The City of North Richland Hills reserves the right to reject in part or in whole all bids submitted, and to waive any technicalities for the best interest of the City of North Richland Hills.

GENERAL CONDITIONS

In submitting this bid, the Bidder understands and agrees to be bound by the following terms and conditions. These terms and conditions shall become a part of the purchase order or contract and will consist of the invitation to bid, specifications, the responsive bid and the contract with attachments, together with any additional documents identified in the contract and any written change orders approved and signed by a city official with authority to do so. All shall have equal weight and be deemed a part of the entire contract. If there is a conflict between contract documents, the provision more favorable to the City shall prevail.

1. BID TIME

It shall be the responsibility of each Bidder to ensure his/her bid is turned in to the City of North Richland Hills on or before **2:00 p.m. Wednesday, September 25, 2019**. The official time shall be determined by the clock located at the switchboard in the North Richland Hills City Hall lobby. Bids received after the time stated above will be considered ineligible and returned unopened.

All attached bid documents are to be returned completely filled out, totaled, and signed. Envelopes containing bids must be *sealed*. The City of North Richland Hills will not accept any bid documents other than the attached.

2. WITHDRAWING BIDS/PROPOSALS/QUOTES

Bids may be withdrawn at any time prior to the official opening; request for non-consideration of bids must be made in writing to the Purchasing Manager and received prior to the time set for opening bids. The bidder warrants and guarantees that his/her bid has been carefully reviewed and checked and that it is in all things true and accurate and free of mistakes. Bidder agrees that a bid price may not be withdrawn or canceled by the bidder for a period of ninety (90) days following the date designated for the receipt of bids.

3. IRREGULAR BIDS/PROPOSALS/QUOTES

Bids will be considered irregular if they show any omissions, alterations of form, additions, or conditions not called for, unauthorized alternate bids, or irregularities of any kind. However, the City of North Richland Hills reserves the right to waive any irregularities and to make the award in the best interest of the City.

4. REJECTION/DISQUALIFICATION

Bidders will be disqualified and/or their bids rejected, among other reasons, for any of the specific reasons listed below:

- a) Bid received after the time set for receiving bids as stated in the advertisement;
- b) Reason for believing collusion exists among the Bidders;
- c) Bid containing unbalanced value of any item; bid offering used or reconditioned equipment;
- d) Where the bidder, sub-contractor or supplier is in litigation with the City of North Richland Hills or where such litigation is contemplated or imminent;
- e) Uncompleted work which in the judgment of the City will prevent or hinder the prompt completion of additional work, or having defaulted on a previous contract;
- f) Lack of competency as revealed by reference checks, financial statement, experience and equipment, questionnaires, or qualification statement;
- g) Bid containing special conditions, clauses, alterations, items not called for or irregularities of any kind, which in the Owner's opinion may disqualify the Bidder.

However, the City of North Richland Hills reserves the right to waive any irregularities and to make the award in the best interest of the City of North Richland Hills.

5. BID EVALUATION

Award of bid, if it be awarded, will be made to the lowest responsible bidder or may be awarded to the bidder that offers the goods and/or services at the *best value* for the City (Texas Local Government Code, 252.043). In determining the best value the City will consider the following:

- a) The purchase price; terms and discounts; delivery schedule;
- b) The reputation of the bidder and of the bidder's goods or services;
- c) The quality of the bidders' goods or services;
- d) The extent to which the bidder's goods or services meet the City specifications and needs;
- e) The bidder's past relationship with the City;
- f) Total long term cost to the city to acquire the bidder's goods or services;
- g) Any relevant criteria specifically listed in the specifications;
- h) Compliance with all State and local laws, general conditions and Specifications;
- i) Results of testing, if required;
- j) Warranty and/or guarantee, maintenance requirements and performance data of the product requested;
- k) City's evaluation of the bidder's ability to perform to specifications.

6. AWARD OF BID

The bid award will be made within sixty (60) days after the opening of bids. No award will be made until after investigations are made as to the responsibilities of the best bidder.

The City of North Richland Hills reserves the right to award bids whole or in part when deemed to be in the best interest of the City. Bidder shall state on bid form if their bid is "all or none", otherwise it shall be considered as agreeing to this section.

Information contained in submitted bid documents shall not be available for inspection until after the award has been made by the City Council. Requests for this information must be submitted in writing.

7. ASSIGNMENT

The successful bidder may not assign his/her rights and duties under an award without the written consent of the North Richland Hills City Manager. Such consent shall not relieve the assignor of liability in the event of default by his assignee.

8. SUBSTITUTIONS/EXCEPTIONS

Exceptions/variations from the specifications may be acceptable provided such variations, in each instance, is noted and fully explained in writing and submitted with bid. NO substitutions or changes in the specifications shall be permitted after award of bid without prior written approval by the Purchasing Manager.

9. DELIVERY/ACCEPTANCE

The delivery date is an important factor of this bid and shall be considered during the evaluation process. The City considers delivery time the period elapsing from the time the order is placed until the City receives the order at the specified delivery location.

All material shall be delivered F.O.B. City of North Richland Hills to the address specified at the time of order. Acceptance by the City of North Richland Hills of any delivery shall not relieve the Contractor of any guarantee or warranty, expressed or implied, nor shall it be considered an acceptance of material not in accordance with the specifications thereby waiving the City of North Richland Hills right to request replacement of defective material or material not meeting specifications.

10. NOTICE OF DELAYS

Whenever the contractor encounters any difficulty which is delaying or threatens to delay timely performance, written notice shall immediately be given to the Purchasing Manager, stating all relevant information. Such notice shall not in any way be construed as a waiver by the City of any rights or remedies to which it is entitled by law. Delays in performance and/or completion may result in cancellation of agreement.

11. SALES TAX

The City of North Richland Hills is exempt from Federal Excise and State sales tax; therefore tax must not be added to bid.

12. TIE BIDS

In the event of a tie bid, State Law provides the bid or contract shall be awarded to the local bidder. In cases where a local bidder is not involved, tie bids shall be awarded by drawing lots at the City Council meeting, or as otherwise directed by the Mayor.

13. BRAND NAME OR EQUAL

If items are identified by a "brand name" description, such identification is intended to be descriptive, not restrictive, and is to indicate the quality and characteristics of products that will be satisfactory. As used in this clause, the term "brand name" includes identification of products by make and model.

Such products must be clearly identified in the bid as an equal product and published specifications of the equal products offered must be included with the bid reply.

Bids offering equal products will be considered for award if determined by the Purchasing Manager and the user department to be equal in all material respects to the brand name products referenced. The decision of acceptable "equal" items or variations in the specifications will solely be the City of North Richland Hills. Unless the bidder clearly indicates in his/her bid that he is offering an "equal" product, his bid shall be considered as offering the brand name product referenced in the invitation for bids.

14. REFERENCES

A minimum of three (3) references, preferably located within the Dallas/Fort Worth Metroplex, must be submitted with each bid. Company name, contact and phone number must be included with each reference.

15. PROHIBITION AGAINST PERSONAL FINANCIAL INTEREST IN CONTRACTS

No employee of the City of North Richland Hills shall have a direct or indirect financial interest in any proposed or existing contract, purchase, work, sale or service to or by the City (CMA-074, Standards of Conduct, Section IV).

16. TERMINATION/NON PERFORMANCE

Continuing non-performance of the vendor in terms of Specifications shall be a basis for the termination of the contract by the City. The City of North Richland Hills reserves the right to enforce the performance of this contract in any manner prescribed by law or deemed to be in the best interest of the City in the event of breach or default of this contract. The City reserves the right to terminate the contract immediately in the event the successful bidder fails to 1.) Meet delivery schedules or, 2.) Otherwise not perform in accordance with these specifications.

Breach of contract or default authorizes the City to award to another bidder, and/or purchase elsewhere and charge the full increase in cost and handling to the defaulting successful bidder.

The contract may be terminated by either party upon written thirty (30) days' notice prior to cancellation without cause.

17. ATTORNEYS FEES

Neither party to this contract shall be entitled to attorney fees for any matter arising under this contract, whether for additional work, breach of contract, or other claim for goods, services, or compensation. All claims for attorney's fees are hereby WAIVED.

18. INDEMNITY

City shall not be liable or responsible for, and shall be saved and held harmless by Contractor from and against any and all suits, actions, losses, damages, claims, or liability of any character, type, or description, including claims for copyright and patent infringement, and including all expenses of litigation, court costs, and attorney's fees for injury or death to any person, or injury to any property, received or sustained by any person or persons or property, arising out of, or occasioned by, directly or

indirectly, the performance of Contractor under this agreement, including claims and damages arising in part from the negligence of City, without; however, waiving any governmental immunity available to the CITY under Texas law and without waiving any defenses of the parties under Texas law. The provisions of this indemnification are solely for the benefit of the parties hereto and not intended to create or grant any rights, contractual or otherwise, to any other person or entity.

It is the expressed intent of the parties to this Agreement that the indemnity provided for in this section is an indemnity extended by Contractor to indemnify and protect City from the consequences of City's own negligence, provided, however, that the indemnity provided for in this section shall apply only when the negligent act of City is a contributory cause of the resultant injury, death, or damage, and shall have no application when the negligent act of City is the sole cause of the resultant injury, death, or damage, unmixed with the legal fault of another person or entity. Contractor further agrees to defend, at its own expense, and on behalf of City and in the name of City, any claim or litigation brought in connection with any such injury, death, or damage.

The Contractor will secure and maintain Contractual Liability insurance to cover this indemnification agreement that will be primary and noncontributory as to any insurance maintained by the City for its own benefit, including self-insurance.

19. PERFORMANCE AND PAYMENT BONDS

In the event the total contract amount exceeds \$100,000, the Contractor shall be required to execute a performance bond in the amount of one hundred (100) percent of the total contract price; if the total contract amount exceeds \$50,000 the contractor shall be required to execute a payment bond in the amount of one hundred (100) percent of the total contract price, each in standard forms for this purpose, guaranteeing faithful performance of work and guaranteeing payment to all persons supply labor and materials or furnishing any equipment in the execution of the contract. It is agreed that this contract shall not be in effect until such performance and payment bonds are furnished and approved by the City of North Richland Hills. No exceptions to this provision allowed.

Unless otherwise approved in writing by the City of North Richland Hills, the surety company underwriting the bonds shall be acceptable according to the latest list of companies holding certificates of authority from the Secretary of the Treasury of the United States.

Attorneys-in-fact who sign bid bonds or contract bonds must file with each bond a certified and current copy of their power of attorney.

20. INTERLOCAL AGREEMENT

Successful bidder agrees to extend prices and terms to all entities who have entered into or will enter into joint purchasing interlocal cooperation agreements with the City of North Richland Hills.

21. ELECTRONIC PROCUREMENT

The City of North Richland Hills has adopted policies and procedures complying with Local Government Code Section 252.0415, Section 271.906 and Section 2155.062. The City of North Richland Hills may receive submittals in electronic form in response to procurement requests. However, a bid that is submitted non-electronically by the due date and time will be accepted and then entered electronically by Purchasing after the bid opening.

22. COMPLIANCE WITH SB 89:

Vendor agrees per HB 89 of the 85th Texas Legislative Session, and in accordance with Chapter 2270 of the Texas Government Code, vendor has not and shall not boycott Israel at any time while providing products or services to the City of North Richland Hills.

Yes, we agree

No, we do not agree

23. COMPLIANCE WITH SB 252:

Vendor agrees per SB 252 of the 85th Texas Legislative Session, and in accordance with Chapter 2252 of the Texas Government Code, vendor shall not do business with Iran, Sudan or a foreign terrorist organization while providing products or services to the City of North Richland Hills.

Yes, we agree

No, we do not agree *

* By selecting no, vendor certifies that it is affirmatively excluded from the federal sanctions regime by the United States government and is not subject to the contract prohibition under Section 2252.154 of the Texas Government Code. Vendor shall provide sufficient documentation to the City of such exclusion prior to award of any contract for goods or services.

24. DEPARTMENT OF TRANSPORTATION (TXDOT) RELATED BIDS

“The City of North Richland Hills, in accordance with the provisions of Title VI of the Civil Rights Act of 1964 (78 Stat. 252, 42 U.S.C. §§ 2000d to 2000d-4) and the Regulations, hereby notifies all bidders that it will affirmatively ensure that any contract entered into pursuant to this advertisement, disadvantaged business enterprises will be afforded full and fair opportunity to submit bids in response to this invitation and will not be discriminated against on the grounds of race, color, or national origin in consideration for an award.”

Due care and diligence has been used in preparation of this information, and it is believed to be substantially correct. However, the responsibility for determining the full extent of the exposure and the verification of all information presented herein shall rest solely with the bidder. The City of North Richland Hills and its representatives will not be responsible for any errors or omissions in these specifications, nor for the failure on the part of the proposer to determine the full extent of the exposures.

INSURANCE REQUIREMENTS

Contractors performing work on City property or public right-of-way for the City of North Richland Hills shall provide the City a certificate of insurance evidencing the coverages and coverage provisions identified herein. Contractors shall provide the City evidence that all subcontractors performing work on the project have the same types and amounts of coverages as required herein or that the subcontractors are included under the contractor’s policy. The City, at its own discretion, may require a certified copy of the policy.

All insurance companies and coverages must be authorized by the Texas Department of Insurance to transact business in the State of Texas and must be acceptable to the City of North Richland Hills.

Listed below are the types and amounts of insurance generally required. The City reserves the right to amend the insurance requirements or require additional types and amounts of coverages or provisions depending on the nature of the work or services to be performed.

Type of Insurance	Amount of Insurance	Provision
1. Commercial General Liability to include coverage for: <ul style="list-style-type: none"> a) Premises/Operations b) Products/Completed Operations c) Independent Contractors d) Personal Injury e) Contractual Liability f) Personal/Advertising Injury g) Medial Expense h) Fire Legal Liability i) Underground Hazard j) Explosion/Collapse Hazard k) Patent Infringement l) Copyright Law Violations 	\$1,000,000 each occurrence, \$1,000,000 general aggregate; Or \$1,000,000 combined single limits	City to be listed as additional insured and provided 30 day-notice of cancellation or material change in coverage City prefers that insurer be rated B+V1 or higher by A. M. Best or A or higher by Standard & Poors
2. Consultants, architects, engineers, Landscape design specialist, other professional services	\$500,000 Professional Liability with proof that aggregate is still available.	
3. Workers’ Compensation & Employers’ Liability	Statutory Limits \$500,000 each accident	Alternate employer endorsement required
4. Comprehensive Automobile Liability Insurance, including coverage for loading and unloading hazards, for <ul style="list-style-type: none"> a) Owned/Leased Vehicles b) Non-Owned Vehicles c) Hired Vehicles 	\$500,000 Combined single limit for bodily injury and property damage	

A PURCHASE ORDER WILL NOT BE ISSUED WITHOUT EVIDENCE OF INSURANCE.



CERTIFICATE OF LIABILITY INSURANCE

DATE (MM/DD/YYYY)

9/25/2019

THIS CERTIFICATE IS ISSUED AS A MATTER OF INFORMATION ONLY AND CONFERS NO RIGHTS UPON THE CERTIFICATE HOLDER. THIS CERTIFICATE DOES NOT AFFIRMATIVELY OR NEGATIVELY AMEND, EXTEND OR ALTER THE COVERAGE AFFORDED BY THE POLICIES BELOW. THIS CERTIFICATE OF INSURANCE DOES NOT CONSTITUTE A CONTRACT BETWEEN THE ISSUING INSURER(S), AUTHORIZED REPRESENTATIVE OR PRODUCER, AND THE CERTIFICATE HOLDER.

IMPORTANT: If the certificate holder is an ADDITIONAL INSURED, the policy(ies) must be endorsed. If SUBROGATION IS WAIVED, subject to the terms and conditions of the policy, certain policies may require an endorsement. A statement on this certificate does not confer rights to the certificate holder in lieu of such endorsement(s).

PRODUCER Contractors Direct Insurance Agency 1885 Los Altos Dr. San Mateo CA 94402		CONTACT NAME: Clayton A. Hatfield PHONE (A/C, No, Ext): 408-257-7456 E-MAIL ADDRESS: contractorsdir@att.net		FAX (A/C, No): 650-240-3838
INSURED Fleetwood Services, LLC. 4311 Willow St Dallas TX 75226		INSURER(S) AFFORDING COVERAGE		NAIC #
		INSURER A: United Specialty Insurance Company, Inc.		12537
		INSURER B: Texas Mutual Insurance Company		22945
		INSURER C: Liberty Mutual		23035
		INSURER D:		
		INSURER E:		
		INSURER F:		

COVERAGES**CERTIFICATE NUMBER:****REVISION NUMBER:**

THIS IS TO CERTIFY THAT THE POLICIES OF INSURANCE LISTED BELOW HAVE BEEN ISSUED TO THE INSURED NAMED ABOVE FOR THE POLICY PERIOD INDICATED. NOTWITHSTANDING ANY REQUIREMENT, TERM OR CONDITION OF ANY CONTRACT OR OTHER DOCUMENT WITH RESPECT TO WHICH THIS CERTIFICATE MAY BE ISSUED OR MAY PERTAIN, THE INSURANCE AFFORDED BY THE POLICIES DESCRIBED HEREIN IS SUBJECT TO ALL THE TERMS, EXCLUSIONS AND CONDITIONS OF SUCH POLICIES. LIMITS SHOWN MAY HAVE BEEN REDUCED BY PAID CLAIMS.

INSR LTR	TYPE OF INSURANCE	ADDL INSD	SUBR WVD	POLICY NUMBER	POLICY EFF (MM/DD/YYYY)	POLICY EXP (MM/DD/YYYY)	LIMITS
A	<input checked="" type="checkbox"/> COMMERCIAL GENERAL LIABILITY <input type="checkbox"/> CLAIMS-MADE <input checked="" type="checkbox"/> OCCUR GEN'L AGGREGATE LIMIT APPLIES PER: <input checked="" type="checkbox"/> POLICY <input type="checkbox"/> PRO-JECT <input type="checkbox"/> LOC OTHER:	Y		U18AC105479-00	5/19/2019	5/19/2020	EACH OCCURRENCE \$ 1,000,000 DAMAGE TO RENTED PREMISES (Ea occurrence) \$ 100,000 MED EXP (Any one person) \$ 5,000 PERSONAL & ADV INJURY \$ 1,000,000 GENERAL AGGREGATE \$ 2,000,000 PRODUCTS - COMP/OP AGG \$ 2,000,000 \$
	AUTOMOBILE LIABILITY <input type="checkbox"/> ANY AUTO <input type="checkbox"/> ALL OWNED AUTOS <input type="checkbox"/> HIRED AUTOS <input type="checkbox"/> SCHEDULED AUTOS <input type="checkbox"/> NON-OWNED AUTOS						COMBINED SINGLE LIMIT (Ea accident) \$ BODILY INJURY (Per person) \$ BODILY INJURY (Per accident) \$ PROPERTY DAMAGE (Per accident) \$ \$
A	<input checked="" type="checkbox"/> UMBRELLA LIAB <input checked="" type="checkbox"/> OCCUR <input checked="" type="checkbox"/> EXCESS LIAB <input type="checkbox"/> CLAIMS-MADE DED RETENTION \$			U18AC105479-00	5/19/2019	5/19/2020	EACH OCCURRENCE \$ 2,000,000 AGGREGATE \$ 2,000,000 \$
B	WORKERS COMPENSATION AND EMPLOYERS' LIABILITY ANY PROPRIETOR/PARTNER/EXECUTIVE OFFICER/MEMBER EXCLUDED? (Mandatory in NH) If yes, describe under DESCRIPTION OF OPERATIONS below	Y/N <input checked="" type="checkbox"/> Y	N/A	004157106	10/12/2018	10/12/2019	<input checked="" type="checkbox"/> PER STATUTE <input type="checkbox"/> OTH-ER E.L. EACH ACCIDENT \$ 1,000,000 E.L. DISEASE - EA EMPLOYEE \$ 1,000,000 E.L. DISEASE - POLICY LIMIT \$ 1,000,000
C	Scheduled Equipment			BMO58894161-01	7/1/2019	7/1/2020	Limit: \$1,263,650

DESCRIPTION OF OPERATIONS / LOCATIONS / VEHICLES (ACORD 101, Additional Remarks Schedule, may be attached if more space is required)

CERTIFICATE HOLDER**CANCELLATION**

SHOULD ANY OF THE ABOVE DESCRIBED POLICIES BE CANCELLED BEFORE THE EXPIRATION DATE THEREOF, NOTICE WILL BE DELIVERED IN ACCORDANCE WITH THE POLICY PROVISIONS.

AUTHORIZED REPRESENTATIVE

Clayton A. Hatfield

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NON-COLLUSION AFFIDAVIT OF BIDDER

State of Texas County of Dallas

Pam Fleetwood verifies that:
(Name)

- (1) He/She is owner, partner, officer, representative, or agent of Fleetwood Services LLC, has submitted the attached bid: (Company Name)
- (2) He/She is fully informed in respect to the preparation, contents and circumstances in regard to attached bid;
- (3) Neither said bidder nor any of its officers, partners, agents or employees has in any way colluded, conspired or agreed, directly or indirectly with any other bidder, firm or person to submit a collusive or sham bid in connection with attached bid and the price or prices quoted herein are fair and proper.

Pam Fleetwood
SIGNATURE

Pam Fleetwood
PRINTED NAME

Subscribed and sworn to before me this
19 Day of September 2019.

AKC 

NOTARY PUBLIC in and for
Dallas County, Texas.

My commission expires: 2/27/2023

THIS FORM MUST BE COMPLETED, NOTARIZED AND SUBMITTED WITH BID

BID CERTIFICATION

The Undersigned, in submitting this bid, represents and certifies:

- a. He/she is fully informed regarding the preparation, contents and circumstances of the attached bid;
- b. He/she proposes to furnish all equipment/service at the prices quoted herein and bid is in strict accordance with the conditions and specifications stated herein;
- c. There will be at no time a misunderstanding as to the intent of the specifications or conditions to be overcome or pleaded after the bids are opened;
- d. He/she is an equal opportunity employer, and will not discriminate with regard to race, color, national origin, age or sex in the performance of this contract.
- e. The undersigned hereby certifies that he/she has read, understands and agrees that acceptance by the City of North Richland Hills of the bidder's offer by issuance of a purchase order will create a binding contract. Further, he/she agrees to fully comply with documentary forms herewith made a part of this specific procurement.

COMPANY: Fleetwood Services LLC

ADDRESS: 4311 Willow Street

CITY, STATE & ZIP: Dallas, TX 75226

TELEPHONE: 972-707-8314

FAX: 972-707-8283

EMAIL: pam@fleetwoodservices.net

SIGNATURE: 

PRINTED NAME: Pam Fleetwood

DATE: September 19, 2019

COMPLIANCE WITH HOUSE BILL 1295

In 2015, the Texas Legislature adopted [House Bill 1295](#), which added section 2252.908 of the Government Code. The law states that a governmental entity may not enter into certain contracts with a business entity unless the business entity submits a disclosure of interested parties to the governmental entity at the time the business entity submits the signed contract to the governmental entity.

The law applies only to a contract of a governmental entity that either (1) requires an action or vote by the governing body of the entity or agency before the contract may be signed or (2) has a value of at least \$1 million. The disclosure requirement applies to a contract entered into on or after January 1, 2016.

The Texas Ethics Commission has adopted rules necessary to implement the law, prescribed the disclosure of interested parties form, and posted a copy of the form on the commission's website.

Filing Process:

The commission has made available on its website a new filing application that must be used to file Form 1295. A business entity must:

- 1) Use the application to enter the required information on Form 1295,
- 2) Print a copy of the completed form, which will include a certification of filing that will contain a unique certification number.
- 3) Sign the printed copy of the form (an authorized agent of the business entity must sign),
- 4) Have the form notarized,
- 5) File the completed Form 1295 with the certification of filing with the governmental body with which the business entity is entering into the contract.

The governmental entity must notify the commission, using the commission's filing application, of the receipt of the filed Form 1295 with the certification of filing not later than the 30th day after the date the contract binds all parties to the contract. The commission will post the completed Form 1295 to its website within seven business days after receiving notice from the governmental entity.

Information regarding how to use the filing application may be found at https://www.ethics.state.tx.us/whatsnew/elf_info_form1295.htm.

CERTIFICATE OF INTERESTED PARTIES

FORM 1295

1 of 1

Complete Nos. 1 - 4 and 6 if there are interested parties.
 Complete Nos. 1, 2, 3, 5, and 6 if there are no interested parties.

**OFFICE USE ONLY
 CERTIFICATION OF FILING**

Certificate Number:
 2019-540197

Date Filed:
 09/16/2019

Date Acknowledged:

1 Name of business entity filing form, and the city, state and country of the business entity's place of business.
 Fleetwood Services LLC
 Dallas, TX United States

2 Name of governmental entity or state agency that is a party to the contract for which the form is being filed.
 Iron Horse Golf Course Improvements

3 Provide the identification number used by the governmental entity or state agency to track or identify the contract, and provide a description of the services, goods, or other property to be provided under the contract.
 GC1901
 Iron Horse Golf Course Improvements

4	Name of Interested Party	City, State, Country (place of business)	Nature of interest (check applicable)	
			Controlling	Intermediary
	Fleetwood, Robert	Dallas, TX United States	X	
	Fleetwood, Pam	Dallas, TX United States	X	

5 Check only if there is NO Interested Party.

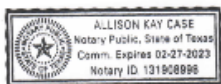
6 UNSWORN DECLARATION

My name is Allison Kay Case, and my date of birth is 2/17/1983.

My address is 1700 Cedar Springs Road, Dallas, TX, 75202, USA.
(street) (city) (state) (zip code) (country)

I declare under penalty of perjury that the foregoing is true and correct.

Executed in Dallas County, State of Texas, on the 24 day of September, 2019.
(month) (year)



Pam Fleetwood

Signature of authorized agent of contracting business entity
 (Declarant)

FOR DISADVANTAGED BUSINESS ENTERPRISES ONLY

Disadvantaged Business Enterprises (DBE) are encouraged to participate in the City of North Richland Hills bid process. Representatives from DBE Companies should identify themselves as such and submit a copy of their Certification.

The City of North Richland Hills recognizes the certifications of both the State of Texas Building and Procurement Commission HUB Program and the North Central Texas Regional Certification Agency. All companies seeking information concerning DBE certification are urged to contact:

**Texas Building and Procurement Commission
Statewide HUB Program
1711 San Jacinto Blvd., Austin TX 78701-1416
P O Box 13186, Austin, TX 78711-3186
(512) 463-5872
<http://www.window.state.tx.us/procurement/prog/hub/hub-certification/>**

**North Central Texas
Regional Certification Agency
624 Six Flags Drive, Suite 216
Arlington, Texas 76011
(817) 640-0606
<http://www.nctrca.org/certification.html>**

If your company is already certified, attach a copy of your certification to this form and return as part of your packet.

Company Names: Fleetwood Services LLC

Representative: Pam Fleetwood

Address: 4311 Willow Street

City, State, Zip: Dallas, TX 75226

Telephone No. 972-707-8314 **Fax No.** 972-707-8283

Email address: pam@fleetwoodservices.net

INDICATE ALL THAT APPLY:

- Minority-Owned Business Enterprise**
- Women-Owned Business Enterprise**
- Disadvantaged Business Enterprise**



GLENN HEGAR TEXAS COMPTROLLER OF PUBLIC ACCOUNTS

The Texas Comptroller of Public Accounts (CPA) administers the Statewide Historically Underutilized Business (HUB) Program for the State of Texas, which includes certifying minority, woman, and service disabled veteran-owned businesses as HUBs and facilitates the use of HUBs in state procurement and provides them with information on the state's procurement process.

We are pleased to inform you that your application for certification/re-certification as a HUB has been approved. Your company's profile is listed in the State of Texas HUB Directory and may be viewed online at <https://mycpa.cpa.state.tx.us/tpasscmlsearch/index.jsp>. Provided that your company continues to meet HUB eligibility requirements, the attached HUB certificate is valid for the time period specified.

You must notify the HUB Program in writing of any changes affecting your company's compliance with the HUB eligibility requirements, including changes in ownership, day-to-day management, control and/or principal place of business. *Note: Any changes made to your company's information may require the HUB Program to re-evaluate your company's eligibility.*

Please visit our website at <http://comptroller.texas.gov/procurement/prog/hub/> and reference our publications (i.e. Grow Your Business pamphlet, HUB Brochure and Vendor Guide) providing additional information on state procurement resources that can increase your company's chances of doing business with the state.

Thank you for your participation in the HUB Program! If you have any questions, you may contact a HUB Program representative at 512-463-5872 or toll-free in Texas at 1-888-863-5881.

Texas Historically Underutilized Business (HUB) Certificate



Certificate/VID Number:	1273054901600
File/Vendor Number:	484924
Approval Date:	05-APR-2018
Scheduled Expiration Date:	05-APR-2022

The Texas Comptroller of Public Accounts (CPA), hereby certifies that

FLEETWOOD SERVICES LLC

has successfully met the established requirements of the State of Texas Historically Underutilized Business (HUB) Program to be recognized as a HUB. This certificate printed 06-APR-2018, supersedes any registration and certificate previously issued by the HUB Program. If there are any changes regarding the information (i.e., business structure, ownership, day-to-day management, operational control, business location) provided in the submission of the business' application for registration/certification as a HUB, you must immediately (within 30 days of such changes) notify the HUB Program in writing. The CPA reserves the right to conduct a compliance review at any time to confirm HUB eligibility. HUB certification may be suspended or revoked upon findings of ineligibility.

*Laura Cagle-Hinojosa, Statewide HUB Program Manager
Statewide Support Services Division*

Note: In order for State agencies and institutions of higher education (universities) to be credited for utilizing this business as a HUB, they must award payment under the Certificate/VID Number identified above. Agencies, universities and prime contractors are encouraged to verify the company's HUB certification prior to issuing a notice of award by accessing the Internet (<https://mycpa.cpa.state.tx.us/tpasscmlsearch/index.jsp>) or by contacting the HUB Program at 512-463-5872 or toll-free in Texas at 1-888-863-5881.

CONFLICT OF INTEREST QUESTIONNAIRE

Pursuant to Chapter 176 of the Texas Local Government Code, a person, or agent of a person, who contracts or seeks to contract for the sale or purchase of property, goods, or services with the City of North Richland Hills must file a completed conflict of interest questionnaire. The conflict of interest questionnaire must be filed with the City Secretary of the City of North Richland Hills no later than the seventh business day after the person or agent begins contract discussions or negotiations with the City of North Richland Hills or submits to the City of North Richland Hills an application, response to a request for proposal or bid, correspondence, or another writing related to a potential agreement with the City of North Richland Hills. An updated conflict of interest questionnaire must be filed in accordance with Chapter 176 of the Local Government Code. An offense under Chapter 176 is a Class C misdemeanor.

The Conflict of Interest Questionnaire is included as part of this document and can be found at:

<https://www.ethics.state.tx.us/forms/CIO.pdf>

CONFLICT OF INTEREST QUESTIONNAIRE
For vendor doing business with local governmental entity

FORM CIQ

<p>This questionnaire reflects changes made to the law by H.B. 23, 84th Leg., Regular Session.</p> <p>This questionnaire is being filed in accordance with Chapter 176, Local Government Code, by a vendor who has a business relationship as defined by Section 176.001(1-a) with a local governmental entity and the vendor meets requirements under Section 176.006(a).</p> <p>By law this questionnaire must be filed with the records administrator of the local governmental entity not later than the 7th business day after the date the vendor becomes aware of facts that require the statement to be filed. See Section 176.006(a-1), Local Government Code.</p> <p>A vendor commits an offense if the vendor knowingly violates Section 176.006, Local Government Code. An offense under this section is a misdemeanor.</p>	<p>OFACEUSEONLY</p> <hr/> <p>Date Received</p>
<p>1.J Name of vendor who has a business relationship with local governmental entity.</p> <p style="margin-left: 40px;">Fleetwood Services LLC</p>	
<p>1.J <input type="checkbox"/> Check this box if you are filing an update to a previously filed questionnaire. (The law requires that you file an updated completed questionnaire with the appropriate filing authority not later than the 7th business day after the date on which you became aware that the originally filed questionnaire was incomplete or inaccurate.)</p>	
<p>1.1 Name of local government officer about whom the information is being disclosed.</p> <p style="margin-left: 40px;"><u>City of North Richland Hills</u></p> <p style="margin-left: 100px;">Name of Officer</p>	
<p>1.J Describe each employment or other business relationship with the local government officer, or a family member of the officer, as described by Section 176.003(a)(2)(A). Also describe any family relationship with the local government officer. Complete subparts A and B for each employment or business relationship described. Attach additional pages to this Form CIQ as necessary.</p> <p style="margin-left: 40px; margin-top: 20px;">A. Is the local government officer or a family member of the officer receiving or likely to receive taxable income, other than investment income, from the vendor?</p> <p style="margin-left: 80px;">Oves <input checked="" type="checkbox"/> No</p> <p style="margin-left: 40px; margin-top: 20px;">B. Is the vendor receiving or likely to receive taxable income, other than investment income, from or at the direction of the local government officer or a family member of the officer AND the taxable income is not received from the local governmental entity?</p> <p style="margin-left: 80px;">Oves <input checked="" type="checkbox"/> No</p>	
<p>2..1 Describe each employment or business relationship that the vendor named in Section 1 maintains with a corporation or other business entity with respect to which the local government officer serves as an officer or director, or holds an ownership interest of one percent or more.</p>	
<p>D Check this box if the vendor has given the local government officer or a family member of the officer one or more gifts as described in Section 176 003(a)(2)(B), excluding gifts described in Section 176 003(a-1).</p>	
<p>2..1</p> <p style="margin-left: 40px;"><u><i>Dan Fleetwood</i></u></p> <p style="margin-left: 40px;">Signature of vendor doing business with the governmental entity</p> <p style="text-align: right; margin-right: 40px;">Date September 19, 2019</p>	

CONFLICT OF INTEREST QUESTIONNAIRE
For vendor doing business with local governmental entity

A complete copy of Chapter 176 of the Local Government Code may be found at <http://www.statutes.legis.state.tx.us/Docs/LG/htm/LG.176.htm>. For easy reference, below are some of the sections cited on this form.

Local Government Code § 176.001(1-a): "Business relationship" means a connection between two or more parties based on commercial activity of one of the parties. The term does not include a connection based on:

- (A) a transaction that is subject to rate or fee regulation by a federal, state, or local governmental entity or an agency of a federal, state, or local governmental entity;
- (B) a transaction conducted at a price and subject to terms available to the public; or
- (C) a purchase or lease of goods or services from a person that is chartered by a state or federal agency and that is subject to regular examination by, and reporting to, that agency.

Local Government Code § 176.003(a)(2)(A) and (B):

(a) A local government officer shall file a conflicts disclosure statement with respect to a vendor if:

(2) the vendor:

(A) has an employment or other business relationship with the local government officer or a family member of the officer that results in the officer or family member receiving taxable income, other than investment income, that exceeds \$2,500 during the 12-month period preceding the date that the officer becomes aware that

- (i) a contract between the local governmental entity and vendor has been executed;
- or
- (ii) the local governmental entity is considering entering into a contract with the vendor;

(B) has given to the local government officer or a family member of the officer one or more gifts that have an aggregate value of more than \$100 in the 12-month period preceding the date the officer becomes aware that:

- (i) a contract between the local governmental entity and vendor has been executed; or
- (ii) the local governmental entity is considering entering into a contract with the vendor.

Local Government Code § 176.006(a) and (a-1)

(a) A vendor shall file a completed conflict of interest questionnaire if the vendor has a business relationship with a local governmental entity and:

- (1) has an employment or other business relationship with a local government officer of that local governmental entity, or a family member of the officer, described by Section 176.003(a)(2)(A);
- (2) has given a local government officer of that local governmental entity, or a family member of the officer, one or more gifts with the aggregate value specified by Section 176.003(a)(2)(B), excluding any gift described by Section 176.003(a-1); or
- (3) has a family relationship with a local government officer of that local governmental entity.

(a-1) The completed conflict of interest questionnaire must be filed with the appropriate records administrator not later than the seventh business day after the later of:

(1) the date that the vendor:

- (A) begins discussions or negotiations to enter into a contract with the local governmental entity; or
- (B) submits to the local governmental entity an application, response to a request for proposals or bids, correspondence, or another writing related to a potential contract with the local governmental entity; or

(2) the date the vendor becomes aware:

- (A) of an employment or other business relationship with a local government officer, or a family member of the officer, described by Subsection (a);
- (B) that the vendor has given one or more gifts described by Subsection (a); or
- (C) of a family relationship with a local government officer.

PROJECT GUIDELINES FOR COMPETITIVE SEALED PROPOSALS

REQUEST FOR COMPETITIVE SEALED PROPOSALS (CSP) TO CONSTRUCT RENOVATION IMPROVEMENTS TO IRON HORSE GOLF COURSE PER PLANS AND SPECIFICATIONS DEVELOPED BY GOLFSAPES, INC IN SEPTEMBER, 2019 6200 Skylark Circle | North Richland Hills | TX | 76180

The City of North Richland Hills (City) is requesting Competitive Sealed Proposals to construct renovation improvements to Iron Horse Golf Course per plans and specifications developed by GolfScapes, Inc. in September, 2019, Parks & Recreation Capital Project No. **GC1901**. The City will select one (1) contractor to provide renovation services for Iron Horse Golf Course as outlined in this request.

SCOPE OF PROJECT

This project consists of overall priorities to include irrigation renovation, constructing new forward tees, adding topsoil and turf to areas scoured by excessive erosion, improve surface drainage in areas prone to flooding, reducing the number of sand bunkers and adding liners to those that remain, leveling tees and reconstructing holes numbered 13 and 14.

PROJECT PROCUREMENT METHOD

The procurement method, “Competitive Sealed Proposal”, is a method by which the City requests proposals, ranks the submittals, negotiates as prescribed, and then enters into a contract with a general contractor for the renovation of Iron Horse Golf Course. The City shall select the contractor who submits the proposal that offers the best value for the City. The best value is based on published selection criteria, the weighted value of each criterion (in points earned) and the contractor’s subsequent ranking evaluation. The City shall first attempt to negotiate a contract with the selected contractor. The City and its consultant may discuss with the contractor options for scope modifications and any price change associated with the modifications. If the City is unable to negotiate a satisfactory contract with the selected contractor, the City shall, formally and in writing, end negotiations with that contractor and proceed to the next contractor in the order of the selection ranking until a contract agreement is reached or all proposals are rejected.

EVALUATION AND SELECTION PROCESS

Proposals will be evaluated by a selection committee based on the following criteria:

EVALUATION CRITERIA	Min Pts.	Max Pts.
Cost of base and alternate proposals within the available budget	0	+10
Qualifications of contractor’s firm and project manager	-8	+8
Quality of references for similar projects	-7	+7
Municipal golf course renovations	-6	+6
Member of Golf Course Builders Association of America	-5	+5
Average golf course construction contract dollar volume over the past 5 years	-5	+5
Number of previous substantial renovations with GolfScapes, Inc.	-4	+4

Following the review and evaluation of all CSP submittals, a **Selection Meeting** will be held **the week of October 1, 2019**. The selection committee will present their ranking based on the published criteria above, selection and justification at the selection meeting. The selection meeting will result in the selection of one proposal or an appropriate short list of proposals. An interview may also be requested to aid in the selection of a contractor. However, interviews may not be necessary.

The City shall select the contractor who submits the proposal that offers the best value for the City. Unsuccessful contractors will be notified in writing as soon as possible. This CSP and all construction documents will be available to all interested contractors at <https://www.publicpurchase.com/> beginning Friday, September 6, 2019.

COMPLIANCE

The Awarded contractor and any subcontractors doing work on this project will be required to obtain registration with the City's Planning and Inspections Division located on the first floor of City Hall (no associated fees required). The general contractor will be required to obtain a general permit also with the City's Planning and Inspection Division. However, all permit fees will be waived. Permitting will be required and coordinated by the contractor. The contractor will be responsible for scheduling all inspections required by the permit. All laborers and mechanics employed by the contractor and its subcontractors in performance of this construction work shall be paid wages at rates as may be required by law.

The contractor shall utilize the Tarrant County Davis-Bacon Wage Rates for Construction effective January 3, 2014 <http://www.wdol.gov/wdol/scafiles/davisbacon/TX49.dvb>.

PROPOSAL SUBMITTAL AND CONTENT

Sealed proposals must be submitted to the North Richland Hills Purchasing Department by **2:00 P.M. CST, September 25, 2019** and must be addressed as follows:

Electronically at <https://www.publicpurchase.com/>

If in person or by mail: (One hard copy and one soft copy by flash drive)

RFP #20-002
PURCHASING
City of North Richland Hills 4301 City Point Drive
North Richland Hills, TX 76180

Proposals must include all pages of the proposal form as found in this CSP. Proposals must include a proposal price on the form provided. Any price request not filled out could be subject to rejection as being presented incomplete. The City reserves the right to reject any and all proposals with or without cause, and to accept proposals which it considers most favorable.

Each proposal must be accompanied by a Certified Check, Cashier's Check, or Bid Bond payable to the City of North Richland Hills, Texas, in an amount not less than ten percent (10%) of the total bid amount. The successful contractor shall furnish approved Performance and Payment Bonds, each in the amount of one hundred percent (100%) of the bid amount. Workmen's Compensation, Comprehensive General Liability, and Transportation insurance and insurance certificates shall be provided by the successful Supplier.

PROPOSAL FORM FOR COMPETITIVE SEALED PROPOSAL:

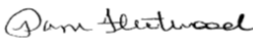
BIDDER’S DECLARATION

We, the undersigned have carefully examined the RFP and all addenda and herewith forming part of this proposal submission and have carefully examined the work sites and all requirements of this RFP. We, the undersigned understand and accept the said RFP, and, for the prices set forth in our proposal, hereby offer to perform all work with our own labor, equipment, tools, apparatus and other means of work, and to complete the work in strict accordance with this RFP;

And have submitted our proposal at rates that include all labor, materials, overhead and profit to comply with the RFP requirements and specifications and further agree that We, shall not be entitled to any payments, except by the prices as stated herein; and further agree to furnish the required Insurance documentation in accordance with this RFP and to properly complete the work within the time stated herein; and declare that no person, firm or corporation other than whose signature or signatures of whose proper officers and the seal is or are attached below, has any interest in this RFP or in the work proposed to be taken and that our proposal submission is made without any connection, knowledge, comparison of figures or arrangement with any other company, firm or person submitting a proposal for the same work and is all respects fair and without collusion or fraud;

And if our proposal submission is accepted by the City, we will complete whatever additional work that may be required at the prices stated herein, in strict conformity and in all respects with the requirements of this RFP in all respects. We further acknowledge that we have received Addendum/ Addenda No. 1 to 5 inclusive, and that all changes specified in the Addendum/ Addenda have been included in the prices submitted. We further agree to complete all of the work and services as specified in this RFP at the prices stated to the satisfaction of the City of North Richland Hills.

We further agree that our proposal submission is to continue open to acceptance and irrevocable until a Purchase order has been issued by the City for the said work, and that, within 90 (ninety) calendar days of closing date, the City may accept our proposal for the prices stated on the Proposal Form of this RFP, which is within the maximum budget provided.

Company Name	Fleetwood Services LLC
Address: Street & Number	4311 Willow Street
Address: City, Province, Postal Code	Dallas, TX 75226
Telephone & Fax Numbers	Tel: 972-707-8314 Fax: 972-707-8283
E-mail Address	pam@fleetwoodservices.net
Name of Signing Officer / Title	Name: Pam Fleetwood Title: Owner
Signature of Signing Officer <i>I have authority to bind the company</i>	
Date Signed	September 19, 2019

By Signing above, the Signing Officer authorizes that he / she has the authority to bind the company.

PROPOSAL FORM EVALUATION CRITERIA RESPONSE:

Member of Golf Course Builder's Association of America	Y or N (Please circle) If Y, how many years and indicate certified of regular membership? C or R (Please circle) 6 years, Charter Member since 2016
Quality of references for similar projects (<u>Persons to contact on your company's behalf that you have done business with</u>)	Quality of reference refers to accuracy of facts about reference, name of project, Project Manager's title and organization, contact information, reference's response and similarity to this project. (Fill out form on next page)
Municipal golf course renovations.	(Fill out form on subsequent pages)
Previous number of renovations with Jeff Brauer of GolfScapes or another Golf Course Architect.	Number of renovations with GolfScapes: 1 (Eagle's Bluff Country Club) Number of renovation with another Golf Course Architect: Name and No. John Colligan, 4
Average golf course construction contract dollar volume over the past 5 years	5 year average: \$ 2,500,000/contract, \$8,000,000 average/year
Cost of this proposal for the base and all alternates.	(This will be shown on the bid form, and is a very important factor in proposal evaluation)
Qualifications of Contractor's firm and Project Manager	(Fill out form on subsequent pages)

QUALITY OF REFERENCES FOR SIMILAR PROJECTS:

Provide references of other projects completed of a similar nature as the scope of this RFP.

Reference #1			
Client:	City of Garland	Location:	Firewheel Golf Park
Client Project Manager:	John Rowe	Client Project Manager Phone No. and email address:	(325)212-0146 jrowe@garlandtx.gov
Year of Completion:	2019	Approximate Value:	\$ 1,264,809
Renovation or new construction?	R or N	Approximate time to construct:	3 years
Provide any additional relevant information to describe project	54 Hole bunker remodel, driving range		

Reference #2			
Client:	City of Euless	Location:	Texas Star Golf Course
Client Project Manager:	Scott Boven	Client Project Manager Phone No. and email address	(817)996-2924 sboven@euless.tx.gov
Year of Completion:	2014	Approximate Value:	\$262,400
Renovation or new construction?	R or N	Approximate time to construct:	3 months
Provide any additional relevant information to describe project	18 Hole bunker reconstruction, intercirculating pond construction, tee box leveling		

Reference #3			
Client:	City of Rowlett	Location:	Waterview Golf Club
Client Project Manager:	Angela Smith	Client Project Manager Phone No. and email	(972)412-6147 asmith@rowlett.com
Year of Completion:	2019	Approximate Value:	\$1,058,000
Renovation or new construction?	R or N	Approximate time to construct:	4 months
Provide any additional relevant information to describe project	Greens and bunker construction		

MUNICIPAL GOLF COURSE RENOVATION:

This is work that your firm is particularly proud of and does not have to be from the list above. Contractors may include photographs to better explain the project. In doing so, please ensure that photographs are identified to the referenced project. (Please do not submit more than three projects)

Project 1 (Photographs may be included on additional page you can attach)

Project Name: River Crest Country Club

Project Location and project value: Fort Worth, TX \$1,374,000

Additional Information that you would like to share: 18 Hole course greens and bunker construction with Colligan Golf Design. New greens irrigation loop by EC Design.

Project 2 (Photographs may be included on additional page you attach)

Project Name: Heath Golf and Yacht Club

Project Location and project value: Heath, TX \$7,122,000

Additional Information that you would like to share: First new private golf course built in the state of Texas in the last 10 years. Designed by architect Roy Bechtol.

Project 3 (Photographs may be included on additional page you attach)

Project Name: Squaw Creek Golf Course

Project Location and project value: Willow Park, TX \$2,952,000

Additional Information that you would like to share: 18 Hole remodel with Colligan Golf Design.

QUALIFICATIONS OF CONTRACTOR'S FIRM AND PROJECT MANAGER:

Company Name: Fleetwood Services LLC
Address: 4311 Willow Street, Dallas, TX 75226
Telephone/ Email: 972-707-8314 pam@fleetwoodservices.net Years in business: 9
Contact/Title: Pam Fleetwood, Owner/Robert Fleetwood, Project Manager
Signature: *Pam Fleetwood*

Relevant Project History (Golf Course Preferred)

Project Name: Heath Golf and Yacht Club
Description: 18 Hole new construction
Company's Responsibilities: Build new golf course
Completion Date: 10/2019
Contract Amount: \$7,122,000 Proposer's Project Manager: Greg Smith

Project Name: White Bluff Resort
Description: 36 Hole greens and bunker remodel
Company's Responsibilities: Complete renovation of greens and bunkers
Completion Date: 8/2019
Contract Amount: \$1,500,000 Proposer's Project Manager: Walder Aguirre

Project Name: Maridoe Golf Course
Description: 18 Hole complete renovation (bunkers, tees, fairways, greens, new irrigation)
Company's Responsibilities: Complete renovations
Completion Date: 7/2016
Contract Amount: \$1,767,000 Proposer's Project Manager: Robert Fleetwood

Name of Proposed Project Manager for this CSP Greg Smith

Education: Texas A&M University graduate

Primary Responsibilities: To manage and facilitate all aspects of the renovations

Previous golf course experience: **Y** or N (Please circle)

Number of years with contractor's firm: 1 (over 9 years experience as a project manager)

Project Manager's experience if different from last page above:

Project Name: _____

Description: _____

Proposed Project Manager's Responsibilities: _____

Completion Date: _____

Contract Amount: _____ P.M for this CSP: _____

Project Name: _____

Description: _____

Company's Responsibilities: _____

Completion Date: _____

Project Owner/Phone: _____

Contract Amount: _____ P.M. for this CSP: _____

Project Name: _____

Description: _____

Company's Responsibilities: _____

Completion Date: _____

Contract Amount: _____ P.M. for this CSP: _____

Waterview Golf Club



Firewheel Golf Park











TECHNICAL SPECIFICATIONS

Schedule A - General Job Conditions

A – 100 Bonds and Permits

A – 200 Mobilization and Project Management

A – 300 Quality Control and Safety

A – 400 Feature Staking

A – 100 Permits

SCOPE OF WORK

The work to be covered in these specifications includes providing permits and related materials, all of which shall be selected by the Contractor, subject to approval of the Owner's Representative.

A. Permits

The following permits will be required:

- ◆ City Building Permit. However, no fee is required.
- ◆ The GC and all subs will have to register with Inspections department. No fee is required.
- ◆ NPDES General Permit for Storm Water Discharges from Construction Activities

1. General

Owner has attempted to identify all permits necessary, but failure to do so does not relieve the Contractor of his responsibility to thoroughly research the nature of permits required.

A 404 Permit will not be required, since planned disturbance of wetlands is less than 0.1 Acres.

2. Burning - Contractor may NOT perform on-site burning in accordance with city Code.

3. Erosion Control - It is the intent of the Owner and Federal Law that the Contractor be solely responsible for the project's storm water pollution plan implementation from the first day of mobilization until the final completion and acceptance of the Project by the Owner. A NPDES plan has been provided by Halff Engineering as a guide. However, both that plan and any regulations are minimum requirements, and not requirements in lieu of Contractor's best judgment. When Project conditions require, Contractor shall implement greater levels of care, as it deems necessary for the protection of streams and rivers that exist on the project.

EVALUATION AND ACCEPTANCE

All permits are subject to evaluation and acceptance by the Owner's legal counsel.

ADDITIONAL INFORMATION – None

END OF SECTION

A-200 Mobilization & Project Management

SCOPE OF WORK

The work covered in these specifications includes:

- ◆ Mobilization
- ◆ Staging Area
- ◆ Closing out the Project, including as-builts, training manuals, and production of project record
- ◆ Periodic meetings
- ◆ Reports to the Owner and Golf Course Architect on project progress
- ◆ All other types and quantities of materials and equipment not specifically described but required for proper completion of the work.

OPERATIONS

It is anticipated that Work for this project shall be managed such that 6 holes of golf play will remain open at all times to the extent possible. The least amount of work will take place in section A, so work beginning early in section A could result in the section A 6 holes being open during the more intense construction on the northern 2/3 of the course. Details will be negotiated with the winning contractor prior to work beginning."

A. Mobilization

Upon receipt of notice to proceed from the Owner, the Contractor shall begin, and with any licenses, permits and associated costs being the responsibility of and paid for by the Contractor:

- ◆ Bringing manpower, materials and equipment to the project site.
- ◆ Setting up and staging areas, as determined at pre-construction conference.
- ◆ Identify construction entrances and construct.
- ◆ Conform to any instructions of the Owner's Representative concerning conditions that may affect other contractors or the neighbors of the project.

During the Project, Contractor may, subject to the notification and approval of the Owner's Representative, move equipment on and off the project as it deems necessary.

B. Staging Area

Contractor shall supply any storage, security, and communications facilities it deems necessary to protect its materials and equipment. There are no specially mandated requirements for construction trailers, etc.

Contractor's Personnel will **NOT** be allowed use of facilities in the Owner's clubhouse and Maintenance Facility as the course will remain in operation for parts of the project.

Water and Electricity - The Contractor shall provide for temporary electric service for use by him or subcontractors during the process of the work and until final acceptance.

C. Documentation

1. Tests & Reports - No special reports are necessary. Contractor shall perform all tests required by these specifications, by field request or by law, and distribute results as directed.
2. Aerial Photography - **No aerial photo required or as built of grading required as these will be provided by Civil Engineer in charge of monitoring flood plain alterations.**
3. Photography - **Contractor must submit photos of all irrigation and drainage facilities that are buried between site visits including thrust blocks, catch basins, and progress photos of trench compaction (both irrigation and drainage)**
4. As Built Line Drawings - The Contractor shall maintain a set of Record Drawings, updated daily, accurately showing exact locations and actual dimensions of the Work installed or performed in the field. These drawings shall be kept safe from damage at all times. **Monthly Payment requests will be processed from these drawings. Failure to maintain such drawings may result in delayed payments.**

Within one (1) month of substantial completion, Contractor shall complete the final As Built Drawings in digital form (at a paper scale of 1"-100') in accordance to the requirements below and in a form acceptable to Owner, and furnish them to Owner, Irrigation Architect and Golf Course Architect. As-builts shall include, at a minimum:

A. Golf Course Features

Golf course layout with alignment of golf holes, including turf edges of Driving range, Fairways, Tees, Greens, Grass and Sand bunkers, water bodies, including drain outlets, shore protection, etc., Bridges, Dam(s), Golf cart paths, Culverts, Pump house, Shelters, and Environmentally Sensitive Areas.

B. Irrigation System

Line Drawings depicting the location of all sprinklers, with notations as to type and nozzle sizes, valves (air, isolation, reducing, relief, and drain), controllers, wire routing, wire splices, pipe routing, sizing of both, location of sprinkler heads, and field programming. Each component shall contain dimensions from two (2) fixed reference points, specific notes detailing unique installation information and any other data that will be required for a successful maintenance program.

C. Drainage System

Utilizing methodology above, Contractor shall supply accurate line drawings of the installed drainage system, indicating all drainage inlets, pipelines, and other drain system components.

D. Electrical Connections/Underground Utilities

Contractor shall note electrical connections to the pump stations, shelters or other locations, and easements, access points, splice boxes, etc.

E. Area Tabulations

Contractor shall submit in tabular form on the plan, area calculations for all of the above-named features to aid the superintendent in future.

5 Project Manuals/Training/Guarantees

Contractor shall supply, in a form acceptable to Owner, project and/or operations manuals for mechanical systems installed under this contract. The Irrigation Designer and Architect shall receive a copy of the project manual for all items pertaining to the Irrigation system.

6 Meetings

- A. Prior to start of work, at a time and place to be determined, a Pre-Construction Conference will be held to discuss provisions of the contract documents, explain administrative procedures and coordinate the work.

1. The following people are expected to attend:

- a) Owner's Representative
- b) Golf Course Architect and Irrigation Architect
- c) Contractor General Superintendent and Project Superintendent
- d) Representatives of major subcontractors

2. Agenda Items:

- a) Tentative construction schedule, with monthly updates
- b) Critical work sequencing
- c) Major equipment deliveries
- d) Designation of responsible personnel
- e) Procedures for field decisions, , submittals, change orders, and applications for payment
- f) Distribution of Contract Documents
- g) Procedures for maintaining Record documents
- h) Use of Premises: office, work, storage, staging areas; Owner's requirements
- i) Construction facilities, controls and construction aids
- j) Temporary utilities
- k) Safety and first aid procedures

- l) Security procedures
- m) Housekeeping procedures
- n) Other business

3. The Owner's Representative will preside over the meeting.

B. Progress meetings. It is intended to conduct a regularly scheduled construction meeting approximately every two weeks to review job progress. The Owner's Representative shall schedule meeting, provide a convenient, comfortable meeting place and notify in writing those concerned at least one week in advance of meeting and preside over the meeting. The following are expected to attend:

- a) Owner's Representatives to include Arcis staff.
- b) Golf Course Architect and Irrigation Architect
- c) Contractor General Superintendent and Project Superintendent
- d) Subcontractors having work in progress or starting soon.
- e) Others as requested by Owner, A/E, or Contractor

1. Agenda

- a) Review, approval of minutes or previous meeting
- b) Review of work progress since previous meeting
- c) Field observation, problems, conflicts
- d) Problems which impede construction schedule
- e) Review of off-site fabrication, and delivery schedules
- f) Corrective measures and procedures to regain projected schedule
- g) Revisions to construction schedules
- h) Progress schedules for succeeding period
- i) Schedule coordination
- j) Review proposed changes for effect on construction schedule, on completion date, and effect on other contracts or project
- k) Maintenance of quality standards
- l) Pending changes and substitutions
- m) Other business

C. Minutes of Meeting. The owner's representative shall take notes at preconstruction and progress meetings and distribute them to those concerned within four (4) calendar days after meeting.

D. Co-ordination with Owner's Other Contractors

At this time, the Owner anticipates these other Contractors may be on site during the construction of the golf course:

- ◆ **City of Fort Worth Sanitary Sewer Line will be reconstructed near #6 in section A concurrently with golf course construction, with the City of Fort Worth responsible for tree removal, grassing, repair of area and damages to golf course utilities.**

A – 300 Quality Control and Safety Program

SCOPE OF WORK

The work consists of performing all operations in connection with proper quality control for the project and providing safety and security for personnel, equipment and materials to be incorporated into the project. All other materials, not specifically described but required for proper completion of the work of this section, shall be as selected by the Contractor, subject to approval of the Owner's Representative.

EQUIPMENT

The Contractor shall maintain on the sufficient equipment and personnel of the types needed to complete the work in accordance with these specifications within the contract time.

OPERATIONS

A. Quality Control

Observation of the Contractor's work to determine compliance with the plans and specifications **may include testing by the Owner or its Golf Course Management Company** of material installed on the project. Contractor shall expect the following tests at a minimum, and more, if appropriate based on test results of initial testing specified below, which shall include, but not be limited to:

- ◆ Cart path Strength and Depth - (3 tests minimum)
- ◆ Greens Mix (2 tests minimum)
- ◆ Bunker Sand (2 tests minimum)
- ◆ Tee Sand (if different, 2 test minimum)
- ◆ Fairway Topsoil/Sand (3 tests minimum)
- ◆ Any pressure test of irrigation, or others as required by the irrigation designer.
- ◆ Any test which may be required by local, state, or Federal law.
- ◆ Any test required elsewhere in the technical specifications.

The Owner may require further information on any contractor's "Alternate Proposal" or "Shop Drawings" as required herein. If it asks for independent testing above and beyond what the Contractor has provided in the way of an adequacy test for such "Alternate Proposal" or "Shop Drawings" the Owner shall pay the cost thereof, and will not accept work under those proposals until those tests or evaluations are complete.

B. Safety and Security

1. General

The Contractor shall follow applicable safety laws and the safety provisions as outlined in **Section 17 and 18 of the Project Conditions Section**. However, both these specifications and any regulations are minimum requirements, and not requirements in lieu of its best judgment. The Contractor is solely responsible for the project's safety and security from the first day of mobilization until the final completion and acceptance of the Project by the Owner. It shall, when Project conditions require, implement greater levels of care, as it deems necessary for the protection of persons and property.

The Contractor's responsibility in providing safety for all persons on the Project Site and protecting its Work and the Owners property from damage, injury or loss arising from its operations is in place

The Contractor shall protect material, tools and equipment employed in the work, and the Owner shall not incur any liability for loss or damage to material, tools, and equipment of the Contractor, Sub-Contractors or others employed by him, by contract or otherwise.

2. Worker Safety

No work shall be performed under unsanitary, hazardous, or dangerous working conditions to the health and safety of employees. The Contractor shall make every reasonable effort to provide a safe and secure work site, and its operations shall comply with the applicable provisions of:

- a) The US Department of Labor, Safety and Health Regulations for Construction,
- b) Applicable Federal, State and Municipal occupational safety and health standards, construction codes, rules, regulations, and requirements
- c) The Manual of Accident Prevention in Construction, published by the Associated General Contractors of America,

3. Material Supply and Safety

- a) **Material Supply.** The Contractor shall use only new materials that meet the specifications requirements. When requested, the Contractor shall furnish at his own expense all necessary tests and documentation proving the origin, composition, and/or manufacturer of any materials proposed for the work prior to installation. All materials not conforming to the requirements of the specifications will be rejected.
- b) **Manufacturer's Instructions.** Contractor shall properly ship, store, use and apply all products in conformity with the manufacturers' instructions, and is responsible for any damage or injury resulting from failure to comply with such instructions.

Storage areas shall be located where they won't interfere with work, and the area shall be grassed and/or restored to its natural state. Should it become necessary during the construction to relocate storage **areas to facilitate the work, the Contractor shall relocate said material and implements to some new location without additional charge.**

4. Property Protection

A. Owner's Property

The Contractor shall replace or repair any damage incurred on the Project at its sole expense, as outlined in **Sections 20-21 in the Project Conditions.**

The Owner or its agents may provide some independent site security, but any protection provided by them shall not make them liable for damage or loss to work or materials from trespass or theft, or relieve the Contractor of its responsibility for Project security and safety.

The Contractor shall guard against fire hazards during the construction period, by regular project inspections for fire hazards, disposing of combustible materials as necessary, and providing and maintaining operable portable fire extinguishers, meeting applicable Codes.

B. Utility Protection

The plans depict the approximate location of known surface and subsurface structures. The Owner and Golf Course Architect assume no responsibility for failure to show any or all of these structures on the plan, or to show them in their exact location. It is mutually agreed that:

- ◆ The Contractor shall verify all surface and subsurface utilities before work proceeds. **Please consult with Golf Course Superintendent for assistance.**
- ◆ Failure shall not be considered a basis for claims for additional compensation
- ◆ If unknown underground utilities are found, Contractor shall work with Owner and Golf Course Architect to modify work as required. If any obstruction encountered necessitates substantial special work, Contractor may apply for additional payments.
- ◆ If and where contractor damages existing utilities, pipelines or service lines, Contractor shall replace them with the same type of original construction, or better, at his own expense, and shall be liable as required by law for any consequential damages.

C. Landscape Protection

Contractor shall preserve and protect existing vegetation and trees designated to remain, by:

- ◆ Avoid grading, trenching, equipment or material storage, or other operations under the drip line of trees designated to remain.
- ◆ Contractor is subject to penalty by Owner for the removal or death of any living tree designated to remain, assessed according to the following schedule:

Trunk Diameter (measured 5 feet above existing grade)	<u>Penalty</u>
6-8 inches	US \$ 4,500.00
8-10 inches	US \$ 6,000.00
10-20 inches	US \$ 7,500.00
20-30 inches	US \$12,000.00
30+ inches	US \$25,000.00

D. Patching and Repair –

The Contractor shall patch and repair any hard surface damaged by its operations and also to restore turf damage created by haul roads, etc.

EVALUATION AND ACCEPTANCE

The Owner's Representative will periodically monitor Quality Control Program compliance, reporting problems at regular construction progress meetings. The Owner's Representative's may request tests, if necessary, to fulfill the requirements of these specifications.

The Golf Course Architect, with limited construction observation responsibility, will also be interested in the results obtained from the quality control program. The Owner's Representative may relay questions concerning the quality control program to the Golf Course Architect. The Golf Course Architect may also request tests, uncovering of covered work, and other questions as allowed for in the general conditions to assure compliance with the quality control program.

ADDITIONAL INFORMATION - *None*

END OF SECTION

A – 400 Feature Staking

SCOPE OF WORK

The work covered in these specifications includes the establishment of benchmarks for reference, the location of lines and grades for all improvements (secondary staking), and the maintenance of such staking for reference and evaluation purposes by the Golf Course Architect.

The Contractor shall maintain sufficient materials, equipment and personnel to complete all work in accordance with the specification requirements, and within the contract time. All materials, not specifically described but required for proper completion of the work of this section, shall be selected by the Contractor, subject to approval of the Owner's Representative.

OPERATIONS

◆ Control Points, Property Lines and Benchmarks

Property Lines have **not** been marked by the **Owner** prior to construction but are presumed to be easily identifiable. If questions arise, consult with project manager/representative.

Engineer will supply at least one bench-mark tied to U.S.G.S. Datum for the contractor's use. **Grading must follow topographical maps carefully to preserve flood plain capacity!**

Contractor shall establish and maintain:

- ◆ Control points at the center of all greens, tees and main landing zones, marked for identity, (e.g., **3 Tee**) **The Golf Course Architect will review, and may direct Contractor to make minor adjustments to control points before construction starts.** The Contractor shall:
 - ◆ Continuously maintain control points and Property Line stakes until grassing is complete.
 - ◆ Replace/reset immediately or as necessary when knocked down, lost or loosened.
 - ◆ To aid replacement, Contractor shall use GPS staking or maintain straight line or triangulated reference points outside proposed work areas.
- ◆ Secondary benchmarks for vertical control throughout the job. All secondary staking shall be referenced to previously established benchmark(s), especially where greens, fairways or tees reside in a floodplain and exact grades are required to provide flood protection and/or maintain floodway capacity.
- ◆ Marking for Environmentally Sensitive and "Do Not Disturb" Areas – Before starting construction, the Contractor shall immediately mark off all wetlands and areas designated to remain natural and/or undisturbed using steel cable, marked with bright flags for protection, to be removed only at the end of the project.

- ◆ Local Benchmarks Outside of Floodplains - Outside floodplain areas, if topographic data is inconsistent, the Contractor may establish its own local benchmark, providing that it:
 - ◆ Accurately conveys the relationship of proposed improvements to existing conditions,
 - ◆ Best allows construction to follow the plan intent,
 - ◆ Doesn't impact drainage of surrounding properties and,
 - ◆ Allows for proposed pipe gradients to the outlet drainage elevation.
 - ◆ In establishing reference points, Contractor may consider the intended balance of cut and fills, but precedence shall be given to establishing drainage, general contours, and golfer's sight lines as indicated or intended on the plans.

- ◆ Grade Stakes - During rough grading, the Contractor shall accurately set grade stakes, measured (by tape or GPS) for accurate horizontal and vertical construction following plan intent for tees, greens, sand bunkers, cuts and fills, drainage swales and pond outlines, etc.

Enough stakes shall be set to depict the size and shapes of tees, greens, sand bunkers, fairways and cart paths, etc. Stakes shall also be set at all critical elevations, like mound tops and saddles, top and bottom of slope changes, toe of slopes, center of swales, etc., so bulldozer operators can assume a reasonably constant grade between any two stakes.

EVALUATION AND ACCEPTANCE

All staking shall be subject to review prior to construction. The Contractor shall furnish assistance that the Architect and Owner request for such review. Work constructed to incorrectly located or grade marked stakes, or where stakes have not been approved, may require reconstruction to correct problems at Contractor's expense.

MATERIALS

1. Control Points – Center of tee, center of the green, and turning point stakes shall be metal fence post stakes covered with 6" HDPE irrigation pipes. Pipe shall be spray-painted and marked by the Surveyor with waterproof paint according to a consistent color code:
2. Grade Stakes – Ordinary wooden building lath approximately 3'-4, long. When placed, each stake shall have a plastic colored ribbon attached near the top, using a consistent coloring system to differentiate various features, like greens, sand bunkers, etc.
3. Digital Level – The Contractor shall provide a digital level for use in various measurements.

ADDITIONAL INFORMATION

Property boundaries shall not be crossed without appropriate permission, and then must confine routes strictly to limit property damage to adjoining property.

Clean-Up – Contractor shall remove all tree clearing flagging before leaving the project.

END OF SECTION

Schedule B – Site Preparation

B– 100 - A Erosion Control

(Plan Provided by Halff Associates as Minimum Requirements)

B – 100 - B Environmental Mitigation – None Anticipated

B – 200 – Demolition and Disposal

B – 300 – Brushing, Clearing and Grubbing

B – 200 Demolition and Disposal

SCOPE OF WORK

The work includes performing all operations required to remove existing structures, roads, fences, fence posts, poles, debris, stone piles, boulders or other features, whether or not shown on plans. Hazardous waste shall be removed, if applicable, as described in these specifications.

All other materials, not specifically described but required for proper completion of the work of this section, shall be as selected by the Contractor, subject to approval of the Owner's Representative.

EQUIPMENT

The Contractor shall maintain on the job sufficient equipment of the types needed to complete all work in accordance with the requirements of these specifications within the contract time.

OPERATIONS

Structures - There are no known structures requiring removal. However, Contractor shall search the site (especially dense woods) for undesignated structures and miscellaneous items that must be removed to prosecute the work before submitting a bid. There shall be no additional payment allowed for demolition of unknown or unmarked structures or debris.

Paving Demolition - The project includes demolition of both concrete and asphalt cart paths. For Pavement Removal, Contractor shall:

- ◆ Prior to commencing this work, all required erosion control and tree protection measures shall be in place.
- ◆ Where adjacent pavement is to remain, make saw cut for a clean edge.
- ◆ Break into pieces not larger than 24 in.
- ◆ Avoiding contamination of and damage to adjacent areas.
- ◆ Repair any areas damaged by operations.

Disposal – **Neither Concrete nor Asphalt shall be buried on site.** For both materials, Contractor must haul materials to an offsite waste management receiving site, capable of accepting the material. Contractor shall follow all disposal regulations (especially regarding asphalt) in removing materials from site.

- ◆ When shown on the plans and as directed, stockpile materials for removal. Prepare stockpile site by removing vegetation and trash and by providing for proper drainage around.
- ◆ Dispose of materials not designated as salvageable Fence and Debris – There are no fences to be removed. Any miscellaneous debris shall be removed and buried.

Hazardous Waste Removal – None anticipated. If found, disposal requirements and additional payments will be negotiated.

MATERIALS - None

EVALUATION AND ACCEPTANCE - All work relating to demolition is subject to evaluation by the Owner's Representative.

END OF SECTION

B – 300 Brushing, Clearing and Grubbing

SCOPE OF WORK

The work includes performing all operations to remove existing trees, stumps, roots, shrubs, brush, or any other vegetation shown on the plans to be removed.

EQUIPMENT

The Contractor shall maintain on the job sufficient equipment of the types needed to complete all work in accordance with the requirements of these specifications within the contract time.

OPERATIONS

- A. **Grass Areas** - Contractor shall thoroughly disc existing turf areas that will receive topsoil and then new turf, and scraping/breaking up/dismantling all natural vegetation, existing turf and organics and haul to stockpiles before grading.

If sufficiently broken up, with no clumps that would hinder soil preparation work, the removed material may be spread in less critical area. If clumps remain, Contractor shall place grass in debris piles similar to clearing debris, bury them and cover with suitable soil, creating a small mound to account for settling.

- B. **Clearing and Grubbing** - The Contractor shall remove trees as shown on clearing plan, after field review with golf course architect.

During the Project, the Contractor shall be obligated to remove:

- ◆ Up to fifteen (15) trees and total of 150 caliper inches, without changing contract price, to meet field conditions.
- ◆ Were originally intended to be saved pending the final design of the hole, but which were subsequently determined to require removal.
- ◆ Dead or weakened material caused during construction, whether due to construction operations or natural causes.

Wetlands Clearing, when required, shall be done by hand, in accordance with federal law.

Contractor shall remove all tree and shrub stumps, roots branches and debris that cannot be cleared with normal seedbed preparation machinery. This generally includes all sticks, branches, etc., greater than 1" in diameter or 1' in length.

- C. **Brushing** - There is no brushing required.

D. **Trimming** There is no trimming required, other than damage repair.

E. **Cleanup**

After grubbing and/or brushing, Contractor shall restore smooth grade, free from debris, suitable for grassing operation. This may include hauling in additional topsoil to restore grade flush to tree's base in a condition exactly as it was before brushing, and backfilling and compacting with fill soil to within six (6) inches of surrounding grades and the top six (6) inches with topsoil to reestablish finished grades and positive drainage that existed before clearing.

All soil areas that have been disturbed with brushing shall be seeded with a shade mix designated in the grassing specifications.

F. **Disposal of Debris**

All trees and limbs that are a part of the demolition plan must be removed and disposed of at an appropriate off-site facility.

G. **Protection of Vegetation and Trees to Remain**

Contractor shall:

- Protect specimen trees with snow fencing or steel cable erected just outside the dripline of tree. When smaller trees are to be removed beneath a specimen to remain, they shall be removed by hand.
- Train every equipment operator in the importance of protecting trees from damage to either trunks or limbs.
- Fell trees to avoid breaking branches of adjoining trees
- Repair damaged trees with trimming, surgery and protective painting at his own expense and in a manner satisfactory to the Golf Course Architect.

H. **Maintenance of Cleared Areas.**

Contractor shall periodically remove weeds and vegetation from cleared areas. In no case shall the area become overgrown.

EVALUATION AND ACCEPTANCE

1. All work under this Section is subject to evaluation by Owner and/or Golf Course Architect.
2. Contractor shall maintain an accurate record of bury pits to include on as-built drawings.

ADDITIONAL INFORMATION - **No burning is allowed within City Limits of North Richland, Hills, TX.**

END OF SECTION

Schedule C Mass Grading

C – 100 Topsoil Management & Mass Grading

C – 200 Feature Shaping

C-100 Topsoil Management and Mass Grading

SCOPE OF WORK

The work consists of performing all operations in connection with the rough grading of greens, tees, bunkers, fairways, roughs, grass, bunkers, cart path, lakes or ponds, creeks or streams, and/or building sites shown on the plans including:

1. Topsoil management
2. Mass grading and Lake excavation
3. Other Project Conditions, including:
 - Weed and Dust Control
 - Stream Construction or Reconstruction
 - Subsurface water control, if required.
 - Clean up of any areas, haul roads disturbed in cut and fill operations.
4. Coordination with feature shaping of golf course features as described in section C – 200

EQUIPMENT

The Contractor shall maintain on the job sufficient earthwork equipment, including maintenance and fueling facilities complying with applicable environmental standards to complete all work in accordance with the requirements of these specifications within the contract time. The number, scheduling, operation and type of machines shall be determined by the Contractor.

The Contractor shall utilize equipment of the appropriate size (loaders, dump vehicles – 7 ton dumper or less) to successfully complete a renovation in a timely manner while minimizing haul roads, and damage to existing turf, trees and vegetation to remain.

OPERATIONS

Contractor shall prosecute excavation, transport, stockpile, grading and shaping operations in a coordinated and continuous sequence, and in logical and sequential order, considering protecting previous work from other operations, the schedule to begin irrigation, and the effect of rainy seasons on productivity and in damage to previous work.

Contractor shall determine its own most efficient cut and fill, including loading, transport, placing fill, and efficiently balancing cut and fills within individual portions of the site, limiting hauls to less than 1500 feet is contemplated.

A. Strip Vegetation

Existing turf and other low vegetation shall be removed from all areas to be graded, without removing the underlying topsoil. The material generated in this process may be buried under mounds or in pits as described in section B-200.

For both irrigation and drainage trenches through areas of turf to remain, the Contractor shall:

- ◆ Strip sod the width of the pipe trench with a mechanical sod stripper uniformly 1" to 1-½" thick with clean-cut edges.
- ◆ Roll and store sod in shaded location, hand other watering as required for preservation.
- ◆ Upon completing pipe laying:
 - Compact trench as per specifications or better
 - Add 1-2" of approved fairway topsoil to level and provide growing medium.
 - In fairway areas, replace stripped sod, laying as per sod specifications or better.
 - In rough areas, sprigs will be allowed to naturally cover
 - Water newly reinstalled sod by hand for at least five (5) days and thereafter, as necessary until irrigation system is placed in operation.
 - Roll at least three (3) times to level.
- ◆ Contractor shall be responsible for satisfactory sod recovery and growth. If any portion of the sod breaks up or is not reusable for any reason, Contractor shall provide new sod of the type originally removed, and satisfactory to Owner's Representative.

B. Topsoil Management

Contractor shall any available topsoil from areas to be graded. In many cases, this is limited, and plans call for importing new topsoil rather than stripping and replacing. Where stripping, Contractor may, where practical, place stripped topsoil on newly graded areas, already prepared for topsoil placement, rather than place in stockpiles for replacement in the same area as it was before.

1. Stripping Topsoil and Stockpiles

Topsoil shall be stripped to a minimum depth of six (6) inches, where available, and all available topsoil shall be taken from areas where greater amounts of topsoil are available. The golf course architect may direct stripping of additional areas so that the Contractor may provide adequate topsoil quantities at no additional cost to the Owner.

Where plans show wetlands or Lake construction, topsoil shall be stripped as an additional source, and distributed as directed by the Golf Course Architect in the following order of preference:

- A. Other project areas short of natural topsoil, including wooded areas where clearing operations denude the area of much of its topsoil.
- B. Increase topsoil depth on banks and shoulders of tees, greens and mound banks from 9" to 12".
- C. To create fairway grading features or to establish positive drainage without stripping topsoil in these areas.
- D. To spread topsoil in borrow areas.

Contractor shall keep topsoil reasonably free from sub-soil, sod, rubbish, stones, roots, dead trees, stumps, etc., removing such debris from the soil to the extent possible.

Stockpiles

Stockpiles shall not be located in areas that impair either site drainage or the Golf Course Architect's vision of the golf hole that hinder evaluation of design objectives. All stockpiles must be protected in accordance with the erosion control plan.

2. Replacing Topsoil

No placement of topsoil will be allowed on any area until sub-grade is approved by the Golf Course Architect. Upon approval of shaping, Contractor shall:

- In any rocky areas, Contractor shall:
 - rake the sub-soil to remove any large stones/boulders
 - Thoroughly compact the sub-grade using a roller until no remaining cobbles or boulders protrude above the established finished sub- grade more than an inch.
- For all sub soils, lightly disc and roughen the topsoil/subsoil interface
- Place good topsoil so that the finished grade, after mild compaction, shall be equal to the finished grade shown on the grading plan and to the following minimum depths of:
 - Six **(6) inches** on banks and shoulders
 - Four (4) inches in the fairway and, rough
 - Four (4) inches in outer areas and borrow areas
 - Sixteen (16) inches (or 12 inches for California Greens) on putting green surface,

3. **Importing Topsoil** - Where designated on plans, Contractor shall furnish and place 4" of imported topsoil/sand. Specified material for bidding is:

"Screened Topsoil" product from Texas Sports Sand. **Greg Hammerlun (972-276-5989)**

If Owner selects a different topsoil, Contractor will credit or be credited in a change order, with the exact price difference in the two materials.

A. Mass Grading

1. General

A. Establishing Sub-Grades

The Contractor shall establish grades as shown on the grading plan by cutting or filling to create a sub-grade uniformly graded, allowing for specified topsoil depths above. In general, the Contractor shall provide for at least four (4") inches of topsoil through the project, with at least six (6") inches on banks and shoulders. At green edges provide Sixteen (16) inches (12 inches if for California Greens) on putting green surface,

B. General Cuts and Fills Conditions –

- ◆ Earthmoving shall not occur when soil conditions are wet or waterlogged.
- ◆ Any "cut/fill" material being placed shall:
 - Consist of only "clean fill" reasonably free from rocks and clods.
 - Be suitable for subsequent shaping operations.
 - If placed on an unstable base, requires base stabilization first.
- ◆ Placement and Compaction of Fill Soil Layers (Lifts) - Contractor shall place deep fills in multiple layers (lifts) not exceeding 12 inches in depth. Lifts shall be spread evenly and compacted continuously by a large bulldozer concurrent with placement operations to maintain uniform consistency. Each layer shall consist of similar source of material as the previous layer. As a general rule all formations shall be compacted to 80% of their dry density as measured by the modified Proctor test but expected to be easily accomplished by proper golf course industry standard compaction.
- ◆ However, the top-most 3 inches of sub-grade shall be placed with minimum compaction, and shall be maintained in a looser condition to facilitate future grading and seedbed preparation works. This layer shall be roughened slightly before the placement of topsoil.
- ◆ **All excavation is bid as UNCLASSIFIED.** The Contractor shall determine to its satisfaction, prior to the submission of its Bid, the character, quality and quantities of materials to be encountered in earthmoving operations, and any groundwater or other conditions or matters which can affect the Work.

If ripping is required with a dozer larger than a D-8 (or equivalent) then the Contractor shall work with the Owner's Representative to measure such work and shall be paid for it in accordance with those measurements and the unit price agreed to for such work.

C. Minimum Drainage Slopes & Maximum Mowing Slopes

- ◆ All golf course turf planting areas shall have positive surface drainage with an absolute minimum slope of 1.75%. Areas shown as not being graded and designated to retain existing vegetation are not subject to this requirement.
- ◆ If necessary, the Contractor shall add catch basins and drain pipes of appropriate size, utilizing the drainage allowance, if required to attain minimum grade, but shall not use additional drain pipes in lieu of grading, where grading would accomplish drainage acceptable to the Golf Course Architect.
- ◆ Maximum Slopes for mounding, tee and green bank slopes, etc., shall not be steeper than 3 horizontal to 1 vertical, even in the faces of bunkers, which may be 1.5-2:1.
- ◆ Unless specifically required, all grades shall achieve a smooth, natural appearance, blending newly created surfaces into adjacent undisturbed and un-graded areas.

D. Earthwork Balance

- ◆ Contractor may make minor adjustments to balance cuts and fills, providing that minimum drainage slopes are created, and that changes meet the Golf Course Architect's design objectives, including, but not limited to, floodplain protection, artistry, playability and visibility issues, and ADA requirements are met.
- ◆ As construction progresses, Golf Course Architect may direct additional earthworks which were not originally indicated on the working drawings, providing they do not raise earthmoving quantities for the Contractor.

2. Lake Excavation – None Expected

3. Project Conditions

Weed Control - Contractor shall periodically remove weeds and vegetation from all cleared and brushed areas mechanically, using a tractor and rake and keep areas from becoming overgrown. Where weeds become persistent and pervasive, approximately one (1) month before grassing the Contractor shall apply at least two (2) applications of Roundup™ in accordance with manufacturer recommendations at approximately one week intervals, until weeds are dead.

Dust Control – As part of its bid, and throughout the entire construction period, the Contractor shall control dust in its work areas and haul roads using intermittent watering as necessary when conditions create a nuisance to neighboring residences. Contractor may use on site water from golf course ponds. Other sources require approval from Owner. In extreme conditions, the Contractor may request additional payment as a change to the scope of work.

MATERIALS

Imported Topsoil – “Fairway Topsoil” from Texas Sports Sands, Garland, Texas

EVALUATION AND ACCEPTANCE

Rough grading operations shall be subject to the following evaluations by Golf Course Architect: Mass Grading upon completion and before placement of topsoil.

- Topsoil is subject to random depth and quality checks by Owner and/or Golf Course Architect.
- Final grading is subject to evaluation directly after a rainstorm to check drainage. Contractor shall be responsible for re-grading slow draining areas

PAYMENTS - Payment for earthmoving shall be lump sum. If the Contractor is requested to move earth in larger quantities which are not offset by other earthmoving reductions, it should apply for additional payments as described in the project conditions.

Any additional payments shall be negotiated based on estimated quantities of various earthmoving classifications described above, and the appropriate cubic yard unit price for those classifications.

ADDITIONAL INFORMATION

Slope Stabilization - There is no slope stabilization anticipated in this work.

Flush, Salts, Toxin - It's not anticipated that flushing salts or toxins from the soil will be required.

END OF SECTION

C-200 Feature Shaping

SCOPE OF WORK

The work consists of performing all operations in connection with Feature Shaping of all golf course design features (i.e. greens, tees, mound complexes, fairways, sand or grass bunkers, cart paths, ponds, or streams,) according to the plans and additional instructions of the Golf Course Architect after mass grading operations have established rough sub-grades according to plans.

The Contractor acknowledges and agrees that the golf course architect shall enjoy the architectural freedom and authority (which may not be delegated or assigned to others) normally enjoyed by golf course architects when working with experienced golf course contractors to direct work in the field that varies from the details of the Drawings to adjust feature shaping and elevations for better playability, aesthetics, vision and otherwise adapt to site conditions. The Contractor will bear costs associated with such reasonable changes as part of contract amount, except as noted at the end of this section.

All materials, not specifically described but required for proper completion of the work of this section, shall be selected by the Contractor, subject to approval of the Owner's Representative.

EQUIPMENT AND PERSONELL

Contractor shall maintain on the job a sufficient number to complete all work according to these specifications within the contract time, including:

Experienced, competent Shapers, of its choosing, who shall be resident on-site throughout the Project, and specifically during finish shaping of golf course features. If the Golf Course Architect requests replacement of any shaping specialist for reasonable cause, the Contractor shall replace him with another shaping specialist of equal qualifications at Contractor's expense.

Equipment of the types Contractor chooses, generally including large and small bulldozers, grading tractors and **one small scraper for use until the final completion of shaping operations.**

Maintenance facilities for all earthwork equipment, complying with applicable laws.

OPERATIONS

1. General Shaping Process

Contractor shall coordinate shaping and Mass Grading, first rough Grading golf features by:

1. Closely following applicable original or revised grading plans,
2. Placing adequate earthwork material in place,
3. Interpreting the features using its best judgment, and
4. Following any subsequent verbal/sketched/ written Golf Course Architect's instructions,

2. Architects Review and Modifications

After completing generally satisfactory initial grading, Contractor shall revise shaping of any feature per direction of the Golf Course Architect up to three times, at no cost to the Owner.

The golf course architect shall endeavor to minimize repeated major changes not clearly necessitated by field condition, and/or Contractor misinterpretation, and in refining each feature to lesser extents on each subsequent visit. (Generally, changes measured in "up to" "yards" the first review, in "feet" the second review, and in "inches" at the third review.)

The Contractor and Golf Course Architect may use any communications methods necessary to achieve the desired results, including verbal instructions, sketches, or digital photos. Final shaping approval should be documented in writing, at least as part of progress meeting minutes.

No topsoil shall be spread over golf course features until they are approved by golf course architect. The Golf Course Architect may order removal of any topsoil placed on Feature Shaping prior to final approval in order to complete shaping operations.

B. Other Shaping Responsibilities

Tie In Operations - The Contractor shall tie together all shaping work, including the:

- ◆ Bottoms of slopes from all features must blend harmoniously with surrounding and undisturbed terrain.
- ◆ Spoils from clearing, irrigation and tile installation and seedbed preparation must be moved to an approved area of the main golf course play area, buried and covered back up, with a small mound in case the pile settles, to preserve drainage.
- ◆ Elimination of trench settling
- ◆ Reshaping of any areas damaged by weather or its own subsequent construction operations to establish properly functioning final grades, including:

Positive drainage of all areas (except those listed as preserved, undisturbed, not graded, or shown on Golf Course Architect's plans to be graded at less than 2% and areas where there is not suitable drainage outlet).

Providing both Minimum and Maximum slopes on green and tee surfaces, as called for in the Drawings or Technical Specifications.

Maintainability - Unless otherwise directed by the Golf Course Architect, construct all slopes to be mowable by conventional equipment, with blended transitional slopes to prevent mowers from scalping or missing areas.

Smooth harmonious grades like naturally varying shapes, concave and convex slopes, etc., which are impossible to draw accurately and more easily accomplished by an experienced shaper, working with the Golf Course Architect.

Maintenance of shot value and concepts as defined by the Golf Course Architect.

Shaping to meet ADA requirements.

The golf course architect has applied to the Texas Dept. of Licensing and Regulation (Architectural Barriers and Texas Accessibility Standards) (TAS) for a Project ADA permit. TAS will review the construction plans and the construction of the Project will be reviewed by TAS for ADA compliance before the Contractor attains Final Completion status.

During construction, the golf course architect will review the shaping for ADA guidelines compliance, but the Contractor shall be responsible for shaping the Project to meet ADA criteria of the Americans with Disabilities Guidelines (ADAAG) for golf courses and the TAS accessibility guidelines, but only in specific areas that they renovate, i.e., new greens on holes 13 and 14, all new forward tees, etc. Unaltered areas will not be required to adhere to ADA guidelines.

Wherever the shaping under this Project fails to pass the TAS evaluation and the TAS inspector requires changes for the Owner to obtain its certificate of compliance and occupancy, the Contractor shall make required changes at no cost to Owner.

The existing cart path is designated the accessible route throughout the golf course. An accessible route from the cart path to a newly renovated feature is a natural or graded turf area of that does not have:

- ◆ A lengthwise slope exceeding 1:20, i.e. 5% and
- ◆ A crosswise slope exceeding 1:50, i.e. a 2% slope
- ◆ Minimum width of less than 5 feet, clear of handrails or other impediments preventing ingress and egress from a forward moving golf cart
- ◆ With no vertical impediments greater than ¼" in the route.

Greens and Tees - At least one accessible route from the cart path or golf cart parking area to at least one point on the green, unless extreme safety and terrain issues or environmental issues, such as wetlands and protected areas, exist. There is no grade or cross slope regulation governing actual putting surface if they change to the fundamental nature of the game.

Fairways - We don't expect ADA issues from cart path to fairways, but Contractor shall provide a defined, level access points to 13 - 15 fairways, at a maximum distance of one per every 75 yards, starting at the beginning point of the fairway, terrain permitting

Sand and Grass Bunkers – Should have at least one access/entry point, unless too severe by reason of topography. This will also require ongoing maintenance by the Owner to effectively maintain the consistency of sand types, eliminating the bunkers (lips) in one area, to make it possible for persons who use wheelchairs to access most bunkers.

Water Hazards and Practice Areas - Not in this project, so no construction or access issues apply.

Other Amenities – Not in project. If added, all on course rest room and rain shelter facility must meet current ADAAG 4.1.2 (6) and must be located on an accessible route.

D. Other Shaping Conditions.

There shall be no change orders for shaping operations. The contractor may only apply for a shaping Change Order if he can tangibly demonstrate additional work was required, such as

(1) Shaping of New Areas, not shown on the plans as within the proposed limits of grading,
(2) The Contractor, after having put sufficient cut and fills in place and completed initial shaping to the plans and/or any field direction by the Golf course architect, is requested to:

- ◆ Relocate an entire feature, or
 - ◆ Add or remove completely more than 10% of the fill contemplated in the original plans,
 - ◆ Make changes after shaping approval by the Golf course architect:
 - ◆ Initiated by the Owner's representatives, including the Management Entity, or Golf Course Superintendent,
 - ◆ Requiring removing and rebuilding any subsequent operations, including top soil replacement, tile drainage, Irrigation, and top mix installation.
-

EVALUATION AND ACCEPTANCE

The Contractor shall endeavor to cooperate with Golf Course Architect to make shapers available during site visits and schedule the timing of site visits so that the Golf Course Architect may review as many features as possible, and allow reasonable time for architectural changes.

The Golf Course Architect shall endeavor to meet evaluation schedules requested by Contractor, within limits of it's agreed upon number of site visits.

Upon approval of feature shaping, the Specifications and Drawings shall be deemed to be amended to match the approved work, and such changes shall not be used to allege or conclude that the Contractor deviated or altered the Work, or to reduce the Contract Amount.

ADDITIONAL INFORMATION

END OF SECTION

D – 100 Drainage

SCOPE OF WORK

The Contractor shall select, furnish and install all labor, materials, tools, and equipment necessary for the golf course drainage system indicated on the Drawings, in accordance with the requirements of these specifications within the contract time, and so that the end result is complete and a functioning whole.

Any work items and other materials not specifically described but required for proper completion of the installation of drainage shall be considered incidental work and shall not entitle the Contractor any additional compensation as separate work items. The cost for any required incidental work shall be included in both the overall contract and unit prices of the contract, including but not limited to:

- ◆ Removing obstructions, trees, stumps, brush vegetation, debris;
- Earth and rock excavation and trenching, including supporting the sides and ends of the excavation as it deems necessary for safety of workers
- Replacing topsoil after trench backfilling;
- Furnishing, placing, maintaining and removing, sheeting, shoring and bracing necessary to protect work and adjacent properties,
- Pumping, bailing and draining necessary to keep the excavation free from seepage water, water from sewers, drains, ditches, creeks and other sources,
- Excavation in unstable soils that require deeper or wider trenching than the minimum required.
- Provide for the uninterrupted flow of sewers and surface waters during construction;
- Removal and satisfactory disposal of excess materials after completion of the work,
- Compacting and refilling after settlement of all excavated areas,

The Contractor shall plan and prosecute drainage installation:

- In logical and sequential order, considering:
 - Protecting previous work from other operations,
 - The schedule to begin irrigation, and
 - The effect of rainy seasons on productivity
- To fully complete each pipe run before the end of the work day.

OPERATIONS

A. Staking

The Contractor shall survey the line and grades of the drainage pipes, to the lines and grades provided by the plans, maintaining the minimum and maximum grades of all classes of drainage pipes, as any deviations may alter the designed conduit capacity or contribute to scouring or silting of pipe.

B. Excavation/Trenching

Generally, trenches shall be/have of the open cut surface type, with:

- o Width or depth no more than necessary for proper construction of the work
- o Standard maximum trench width shall be equal to the diameter of the pipe installed plus 24 inches. Surrounding materials undisturbed.
- o Excavated deep enough to allow specified depth of embedment below the pipe barrel (3")three inches minimum, ((6") six inches minimum in rock),
- o Dewatered During Excavation, with the Contractor removing water from any source that accumulates in the trench, through pumping, bailing and draining, under drains, ditches, etc., and with no embedment or pipe shall installed in water.
- o Foundation areas that area as firm, stable, and at uniform density as practicable.
- o Final cut immediately prior to the placing embedment materials or structures

Should the Contractor excavate a planned trench deeper or wider for any reason, it shall be considered as incidental work; with no additional compensation allowed, and Contractor must provide at his expense the next higher class of embedment, i.e. aggregate vs. native soil.

If the Contractor digs a trench deeper than required to create a stable base or under drain mechanism of gravel and/or drainpipes to drain the trench, it may backfill with approved aggregate.

C. Proper Safety Measures installed - When necessary to prevent caving or hazardous working conditions, or to comply with applicable laws, trench walls shall be of sufficient strength and rigidity to stabilize and maintain the sides of the excavation properly, using industry practice and the Contractor's best judgment. When no longer necessary, the Contractor shall remove all such sheeting, shoring and bracing without endangering or damaging surrounding properties, and completely fill and compact any holes or voids left by such removals with suitable materials.

D. Preparing the Bed - For all drainpipes, after the trench has been cut and prepared, a trough shall be scooped out to grade and the pipe laid and jointed as specified by manufacturer.

ADS HDPE Smooth Wall Drainpipes		
Minimum and Maximum Pipe Grades for Self-Cleansing and Non-Erosive Velocities		
Pipe Diameter	Minimum Slope % for 3 FPS	Max Slope% for < 5FPS velocity
4"	1.75 %	10%
6"	1.0 %	5 %
8"	0.75 %	3.5 %
10"	0.5 %	2.5 %
12"	0.4 %	2.0 %
15"	0.3 %	1.5 %
18"	0.25 %	1.0%
24"	0.2 %	0.75%
30"	0.15 %	0.6 %
36"	0.10 %	0.45 %
42"	0.09 %	0.4 %
48"	0.08 %	0.35 %
54"	0.07 %	0.3 %
60"	0.06 %	0.25 %

E. Laying Pipe - Generally, the Contractor shall lay pipe in a dry, firmly bedded trench prepared in accordance with the specifications above. Working starting from the outlet or downstream end, and proceeding upstream, with:

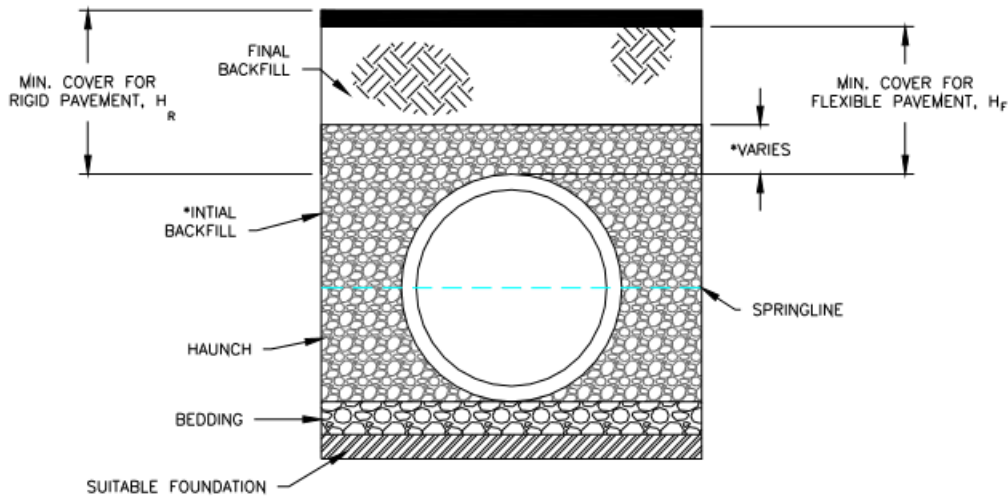
- ◆ Within Grades listed in table above
- ◆ Abutting pipe sections properly fitted and matched, forming smooth, uniform conduits.
- ◆ Undisturbed and true lines and grades.
- ◆ Pipe cleaned before it is placed in the trench.
- ◆ Open ends protected from entrance of earth or bedding material.
- ◆ All joints made in accordance with the guidelines of the manufacturer.

While plans depict straight drainage runs, ADS pipe can be laid on a curved alignment as a series of tangent (straight sections) deflected horizontally at each joint. However, the amount of joint articulation is dependent on the type of joint selected. See ADA design manual for allowable bend radii based on joint type.

F. Backfilling - Immediately after the pipe and/or structures have been properly placed and jointed, the Contractor shall thoroughly compact using small handheld mechanical tamping equipment, rock and debris free native soil beneath the haunches and up to the pipe's midline. Contractor shall "knife in" material to corrugations to provide stable base.

After compacting to the pipe's midline, Contractor shall carefully place the next lift of native soil backfill on both sides of the pipe, until it covers the top of the pipe by 3 inches, stabilizing the pipe to prevent movement during placement and compacting soils.

Typical Backfill Structure



H_{R, H_F} = 12" (0.15m) FOR PIPE DIAMETERS UP TO 48" (1200mm)
 = 24" (0.6m) FOR PIPE DIAMETERS 54" (1350mm) AND 60" (1500mm)

BEDDING = 4" (100mm) MIN

*INITIAL BACKFILL, TYPE AND AMOUNT ABOVE CROWN VARIES DEPENDING ON PRODUCT AND APPLICATION. SEE TABLE A-5-2 OF APPENDIX A-5 FOR DETAILS.

G. Trench Back Fill and Compaction - After the trench has been backfilled as described above, The Contractor shall compact the trench backfill, following the manufacturer's recommendations while using the Contractor's best judgment and:

- ◆ Avoiding damage or misalignment to the installed pipe.
- ◆ Using hand or mechanical tamping equipment selected by the Contractor, like tamping rollers, sheep foot rollers, pneumatic tire rollers, vibrating rollers or Hydraulic compaction by flooding the backfill with water for its full depth water.
- ◆ With the soil water content within 4% of optimum moisture for compaction.
- ◆ Using lifts of no greater than one foot.

Contractor shall be responsible for repairing any settling that occurs during the 1 year guarantee period to the full satisfaction of the Owner, at no cost to the Owner.

H. Installation and Protection of Drainage Inlet Structures - The Contractor shall install catch basins, drain inlets and other drainage appurtenances where indicated on the plans, or as directed by the golf course architect following the detail provided in the Construction Details. All inlets, including air vents, connection markers and bubblers, shall be constructed as T-Section type inlets as shown on the detail sheet, to allow grade flexibility.

All vertical risers used in Catch Basin Construction shall be Perforated at Factory and:

- 1) Minimum Height of 2 feet
- 2) Preferred Height of at least 2.5-3 feet (with 2' from rim to top of pipe)
- 3) Maximum height of 5 feet.
- 4) Equal in diameter to the catch basin rim, without bushings to downsize to smaller pipe.
- 5) Equal in diameter to twice maximum entry pipe size (i.e., 24" if multiple pipes of 12" enter)
- 6) Packed in an envelope of Class 1 Embedment (clean, free draining crushed stone) placed in lifts, with tamping to achieve 85% minimum proctor density, a minimum of a 4 - foot radius or around the Catch Basin to its invert grade. The top 6" of the surrounding backfill will be well draining sand to minimize or eliminate any standing water around the catch basin area.
- 7) Installed inlets shall be protected from silt with a silt log until grow in is complete, which shall be removed by Contractor if still on project, or Owner after Contractor leaves project.
- 8) If the catch basin is to be in a road or other heavy traffic area, a concrete collar must be installed to direct the load to the surrounding soil and not the vertical riser.

I. Pipe Exit Treatment - Where drain lines:

- Run into lakes below normal water level, a tie down is required for all pipes of this type to prevent flotation. (not typical)

- Daylight to slopes near creeks or lakes at/above normal water level, (typical) Contractor shall install rip rap protection at the outlet locations, with the size of the outlet area for each flared section shall be determined in accordance with the engineering on the construction detail.

- Rip Rap at Pipe Exit - The Contractor shall install the rip rap at pipe exits as follows, by:

1. Excavating the area to the dimension required for the rip rap outlet.
2. Placing a filter fabric on the excavated area following manufacturer's instructions.
3. Placing a 6" layer of pea gravel bedding
4. Placing the layer of rip rap
5. Keying the rip rap and bedding into surface such that the surface of the completed rip rap approximately coincides with that of the general ground surface.

The rip rap need not be compacted. It shall be placed to with the larger rock fragments are uniformly distributed and the smaller rock fragments serving to fill the spaces between the larger rock fragments that results in well-keyed, densely placed, uniform layers of rip rap of the specified thickness. Hand placing will be required only to the extent necessary to secure the results specified above.

EVALUATION AND ACCEPTANCE

All material and work used in installing the drainage system shall be subject to evaluation and approval by the Golf Course Architect and/or Owner. All drain lines and structures may be inspected for workmanship and flow grades before any backfilling occurs.

Any material that is rejected for failure to conform to the specification requirements shall be:

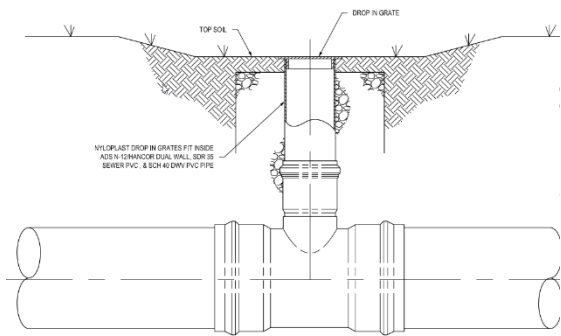
- o Immediately removed from the work site by the Contractor
- o Replaced by the Contractor with pipe which meets the requirements of these specifications.

MATERIALS

Golf Course Drain Lines - ADS N-12 ST IB pipe smooth wall interior drainpipe and fittings, or equal, meeting AASHTO Specification M-294-S.

Drain Inlets - All inlets, shall be constructed with **ADS Materials, including:**

Connection Fittings - Injection molded T Sections matching both largest horizontal drainpipe size entering or exiting catch basin, with vertical catch basin riser size equal to grate diameter of inlet – i.e., No stepdown bushings to 4, 6, or 8" pipe allowed on larger catch basins, for ease of maintenance.

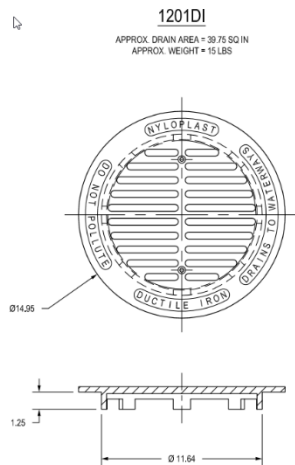


Please note – General diagram, which differs from requirements in the following areas:

- Gravel envelope will be minimum 48" radius of approved pea gravel or stone.
- Top 4" will be approved sand, not topsoil ADS sketch below.
- Vertical risers will be minimum 12" or actual diameter of larger catch basins.

Vertical Risers - ADS N-12 smooth wall interior drainpipe, Perforated and Pre-Drilled with holes to allow side drainage and grade flexibility. Riser shall be left at least one foot above grade until end of construction.

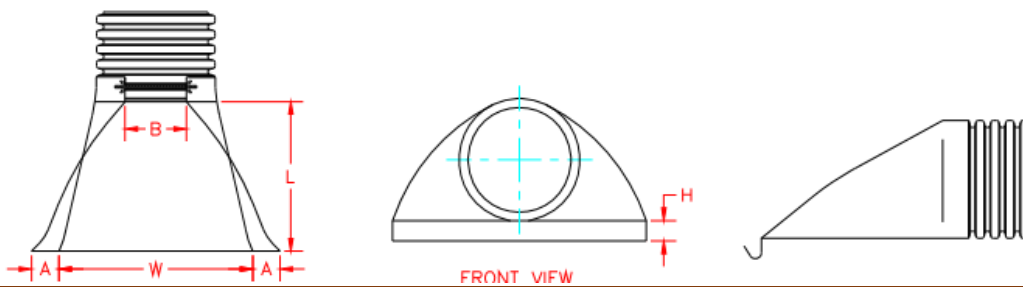
Drain Grates – Nyloplast Light Duty Drop In grates in the 7001-110-XXX series, 12" Diameter and above, designed to fit ADS N-12 Pipes used as vertical risers, or equal, as per above.



Flared End Sections - ADS plastic flared-end sections as shown on Construction Detail Sheet. The Above Drainage Materials are distributed by:

Advanced Drainage System, Inc.
 Corporate Office
 3300 Riverside Drive
 Columbus, Ohio 43221
 800.733.7473
 614.459.0169
www.ads-pipe.com

PIPE DIAMETER, in (mm)						
Diameter in (mm)	12 (300)	15 (375)	18 (450)	24 (600)	30 (750)	36 (900)
A	6.5 (165)	6.5 (165)	7.5 (191)	7.5 (191)	7.5 (191)	7.5 (191)
B (max)	10.0 (254)	10.0 (254)	15.0 (381)	18.0 (475)	22.0 (559)	25.0 (635)
H	6.5 (165)	6.5 (165)	6.5 (165)	6.5 (165)	8.6 (218)	8.6 (218)
L	25.0 (635)	25.0 (635)	32.0 (813)	36.0 (914)	58.0 (1473)	58.0 (1473)
W	29.0 (737)	29.0 (737)	35.0 (889)	45.0 (1143)	63.0 (1600)	63.0 (1600)



Gravel Rip Rap and Velocity Dissipators

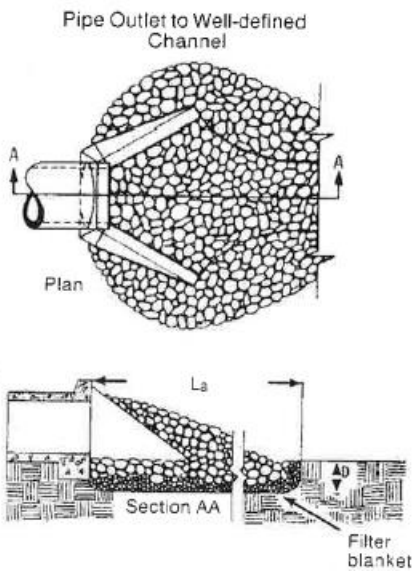
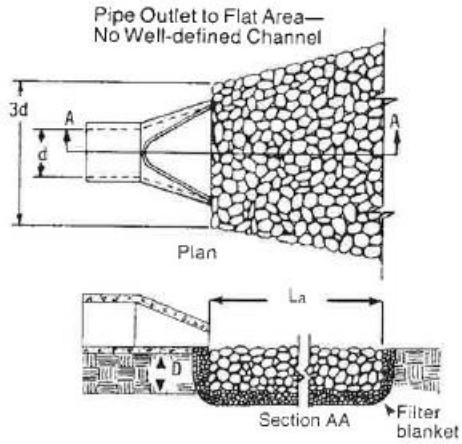
Filter Fabric – Mirafi Filterweave 700 Woven Geo-textile Fabric, or equal. Samples of the proposed Filter Fabric material will be furnished to the Golf Course Architect or Owner's Representative for approval.

Stone - shall be dense, sound and resistant to abrasion and shall be free from cracks, seams and other defects, and 12-18" in size, or as shown on the Drawings, and with no more of the total rip rap material than:

- o 20% of rock fragments by weight smaller than 6 inches (to fill voids in larger rock)
- o 5% of the material by weight passing the number 4 sieve (sand size or smaller), and
- o Free from clay, caked stone dust, or other objectionable materials,

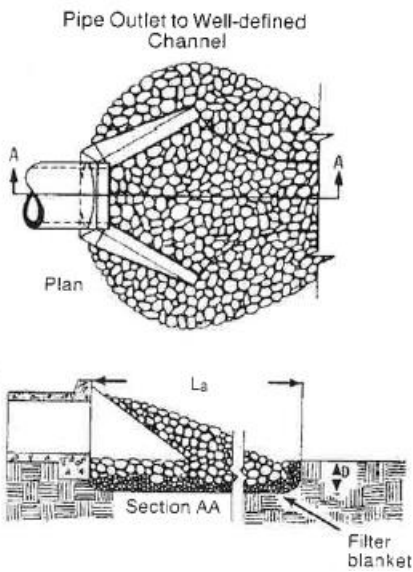
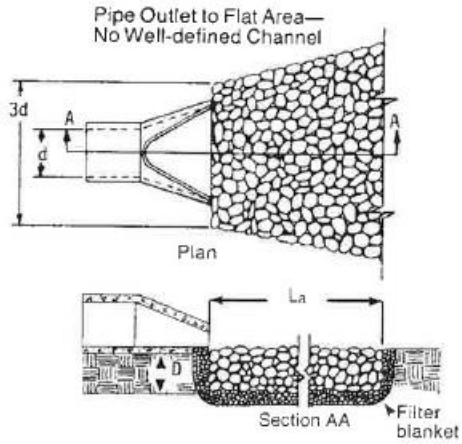
Samples of the proposed rip rap material will be furnished to the Owner's Representative for approval.

Rip Rap Filter Bedding - Crushed stone, well graded, meeting the requirements for ASTM D 448, No. 357 stone.



Notes

1. L_a is the length of the riprap apron.
2. $D = 1.5$ times the maximum stone diameter but not less than 6".
3. In a well-defined channel extend the apron up the channel banks to an elevation of 6" above the maximum tailwater depth or to the top of the bank, whichever is less.
4. A filter blanket or filter fabric should be installed between the riprap and soil foundation.



Notes

1. L_a is the length of the riprap apron.
2. $D = 1.5$ times the maximum stone diameter but not less than 6".
3. In a well-defined channel extend the apron up the channel banks to an elevation of 6" above the maximum tailwater depth or to the top of the bank, whichever is less.
4. A filter blanket or filter fabric should be installed between the riprap and soil foundation.

END OF SECTION

Schedule F Feature Construction

F – 100 Greens Construction

F – 200 Tee Construction

F – 300 Sand Bunkers

F – 400 Specialty Items

F-100 USGA Greens Construction

SCOPE OF WORK

The Contractor shall select, furnish and install all labor, materials, tools, and equipment necessary for constructing the golf course greens as indicated on the Drawings, to the USGA Recommended Method, in accordance with the requirements of these specifications within the contract time, and so that the end result is complete and a functioning whole.

Any work items and other materials not specifically described but required for proper completion of the installation shall be considered incidental work and shall not entitle the Contractor any additional compensation as separate work items. The cost for any required incidental work shall be included in both the overall contract and unit prices of the contract.

The Contractor shall prosecute greens construction in a coordinated and continuous sequence, and, plan operations to fully complete drain tile and mix placement by the end of the workday it is started.

OPERATIONS

Grading.

The grading of each green shall have been approved by the by Golf Course Architect as described in Section C-200 - Feature Shaping. The sub-grade of the green shall have been built to a uniform depth of 16" inches below the finished grade of the green surface itself, while all the remaining surrounding subgrade will be brought to a uniform depth of six (6) inches below the finished grades shown to allow for topsoil and for sand in the sand traps.

Sub-grade approval - To obtain approval of the sub-grade before placing top mix, the Contractor shall establish and mark a 10' grid on the sub-grade, and use GPS, transits or levels to survey spot grades at those locations for in person (or remote reviews after digital delivery) by Golf Course Architect. In addition to spot grades, golf course architect may also use digital level to check exact slopes.

After establishing finish grade, the Contractor shall:

- ◆ Trim the edge of the resulting green cavity as smoothly and vertically as possible.
- ◆ Remove all spoil from this operation from the green.
- ◆ Cut openings in green dish at low points as to drain outlets until tile drainage is in place.

Tile Drainage.

Staging and Layout - Contractor shall:

- ◆ Plan store pea gravel and other materials in locations that provide easy access to the green with no damage to green shoulders, irrigation system or other construction.

- ◆ Lay out the tile pattern utilizing;
 - Herringbone Pattern, modified to maximize water flow into tiles.
 - Parallel in-line spacing of laterals shall not exceed **20 feet**.

Trenching, cleanup and removal of spoil - Contractor shall, when the green floor is dry, stable, and smooth and free from ruts, tracks and depressions, trench for drain tile with:

- ◆ Trenches at a minimum Depth and width of 8"
- ◆ Minimum continuous slope of 1.75%, checking often with a level, with no humps or hollows in the trench profile which would impede flow.
- ◆ Spoils from the trenches shall be removed from the green
- ◆ **Trench edges shall be** restored to vertical edges, while removing the ridge of soil typically left by the trenchers so that water may flow freely into the drains.

Bedding and Backfill - With the trenches to final grade, the Contractor shall place:

- ◆ A minimum of 1" of clean, approved pea gravel as pipe bedding
- ◆ Lay 4" perforated ADS N-12 drain pipe, avoiding damage to pipe, on true grade
- ◆ After laying pipe, add gravel to the sides of the pipe (at least to midline) by hand and/or by stabilizing pipe to ensure that true grade, alignment and jointing is not disturbed.
- ◆ After pipe is secure in its location, a larger mechanical machine may lay additional gravel to the top of the trench, smoothing gravel to match sub-grade.
- ◆ These specifications have suggested a gravel and top mix for greens that meets bridging guidelines and with gravel particle size between ¼ and 3/8 inch. If Contractor proposed different materials, it will need to provide tests proving it meets project requirements.
- ◆ Contractor may presume Laying Pipe - Pipe shall be installed according to manufacturer's instructions for preparation, cleaning, laying and jointing of pipe, as a minimum level of care and:
 - ◆ Progressing from the low point of the green to the high point of the green.
 - ◆ Installing a red #14 direct burial UF/UL locator wire along all 4" tile. System on each green and bunker shall be a loop – beginning and ending at the "flush out" cap. The same wire shall be connected to wire surrounding the green perimeter.

Protection of Pipe - Contractor shall protect all drain tiles from dust or silt contamination and complete tile and pea gravel layer operations at each green before the end of the workday. Contractor shall heap additional gravel above pipe to be removed later if subsequent operations are to be delayed for any reason.

Installing the Interface Barrier - After tile installation, the Contractor shall trim the edge of the green cavity to eliminate protrusions and jagged edges. He shall then:

- ◆ Stake the perimeter of the green (collar inclusive)
- ◆ Install 1" x 1-1/2" x 16" stakes, spaced twenty-four inch (24") apart.
- ◆ Place and staple 30 mil HDPE to the inside of the stakes around the perimeter, leaving no plastic projecting above the top of each stake.
- ◆ Place a **14 gauge direct burial irrigation wire** around the perimeter and between the HDPE barrier and native soils, bringing both ends of the wire to just below the surface in a flush out marker

- ◆ Backfill with native soils behind the HDPE barrier, by hand if necessary, to maintain the integrity of plastic border, and then tamping with mechanical tampers to achieve full compaction and no settling.

Pea Gravel Layer - Contractor shall:

- ◆ Ensure that adequate quantities of approved and washed pea gravel, free from silt and other fines, generally meeting USGA Recommendations shall be available in timely manner. It should also provide a proper place for it to be stored without contamination.
- ◆ Transport, place and spread a smooth, even, four-inch (4") layer of pea gravel, over finished subgrade of the green dish. Work is to be accomplished by hand or with small machine such as "Bobcat", or equivalent, without damaging the subgrade or drainage to the 4" tiles because by causing/leaving ruts from machinery.
- ◆ The pea gravel layer must conform to the green subgrade exactly; (with a tolerance of +1/2"). Care must be taken not to fill in the valleys or to be shallower in the ridges.
- ◆ Contractor may establish 4" pea gravel depth by placing "blue top" grade stakes every 10-12', or by placing 4" boards on end (2 x 6 boards ripped to exact 4" width) as a guide.
- ◆ Continuous monitoring of depth to achieve accuracy is mandatory. Final grade shall be hand raked to a smooth harmonious grade.

Coarse Sand Layer – None Required.

Greens Mix – After tile and HDPE barrier operations are complete, the Contractor shall procure, test, place and fine grade approved top mix.

Procurement - Contractor shall ensure that adequate quantities of approved sand/top mix generally meeting USGA Recommendations shall be available in timely manner. It should also provide a proper place for all greens mix to be stored and mixed.

Testing - The contractor shall make sure Top Mix is pre-tested at supplier for general conformance and arrange for on-site testing of delivered samples at least one month prior to first scheduled placement.

If the contractor proposes materials other than currently specified that it believes meets specifications, it must provide adequate testing in timely fashion. Such materials are subject to approval of Owner and Golf Course Architect, based on recommendations of the lab.

The contractor shall submit the materials to a USGA approved testing laboratory of it's choosing, but subject to approval of Owner.

Laboratory Recommendations - The greens construction material testing laboratory shall:

- Examine samples provided by Contractor, considering unique site conditions including regional climate and site microclimates, water quantity and quality, proposed turf types, cost and availability of root zone material, ability to meet performance requirements like particle size, percolation rate, retained moisture, bulk density, porosity and other factors they deem applicable.
- Make a recommendation to the Owner based on the above factors of the most suitable sand or sand mixtures for Greens Construction on this Project.

- Prepare and provide to Contractor prototype samples of the recommended root zone material for comparison during the blending process.

Ongoing Testing by Contractor – The Contractor shall provide ongoing quality control by:

- ◆ Visually inspecting all sand/sand mixes at the plant and when delivered to the Project.
- ◆ Periodically field testing (at the rate of one sample per 300 tons of sand) sand delivered to the Project for conformance to the prototype sample. No important physical characteristic may exceed 5% from the prototype sample.
- ◆ If problems arise during the course of the project, and at request of Owner, direct an increase in testing as it may deem necessary to achieve desired results.
- ◆ Monitor tests for variation from the prototype sample. If variations are found in any of the evaluations, the Contractor shall immediately:
 - ◆ Order a stop to top mix production until determination of cause can be made.
 - ◆ Notify the Golf Course Architect and Owner's Representative immediately and communicates continuously until the problem is resolved.
 - ◆ Consult with testing laboratory to determine extent of problems and best remedy.

All costs for field and laboratory testing are considered incidental and included in the greens construction bid and unit prices. Testing lab must be accredited by USGA. Once selected, the same testing lab should be used throughout the project to assure better consistency.

Owner, Golf Course Manager, Testing Laboratory, Golf Course Architect and Contractor acknowledge and agree that the purpose of this testing is to install a root zone material that best meets the needs of the Project and/or applicable specifications at the time of installation. No party warrants that the root zone material will not vary in characteristics over time or conform to any changes to construction recommendations for putting greens that may occur after the Project is completed.

Top Mix Placement - Contractor, using equipment of his preference, and storage areas and/or routes of his choosing, shall fill the green cavity by:

- ◆ Avoiding any damage to the sub-grade and lower layers.
- ◆ Placing fourteen inches (14") of approved top mix,
- ◆ Track walking and water settling sand to form a compacted, firm, twelve (12) inch layer and confirm the tile system functions by observing through connection markers.
- ◆ Providing uniform layer thickness parallel to the sub-grade, within one inch tolerance.
- ◆ Blending green edges well to the surrounding banks
- ◆ After placement and smoothing, remove debris removal and re-shape green surrounds as necessary to repair damage caused in top mix placement operations.
- ◆ Water soaking to settle mix and
- ◆ Stockpiling 100 tons of Top Mix, for topdressing use, if called for in bid form, in an Owner approved location.

Establishment of Finished Grade - Before preparing green surfaces for seeding, the Contractor shall again check green surface grades of top mix on a 10' grid, and with digital level to re-check final grades for positive pitch. Final preparation includes:

- ◆ Lightly dampening the mix to assure it has settled completely and make it workable.
- ◆ Grading with a small tractor, sand pro with drag mat, or roller to remove pockets and depressions
- Blending the green edge to the surrounds by hand

F. Mix Protection

Wherever a surrounding bank drains on to the putting surface, the Contractor Shall protect the newly installed mix from erosion by installing at least one line of "Terra Tube" Fiber Filtration Tubes, or equal.

EVALUATION AND ACCEPTANCE

All phases of green construction are subject to evaluation by the Golf Course Architect and/or Owner's Representative. Owner's Representative shall randomly test mix depth and contour to ensure its conformity to specifications.

These specifications (and possible alternate bid items) call for possible modification of the root zone materials. If the Owner and golf course architect direct the contractor to eliminate, change or modify any aspect of recommended construction techniques, then upon approval of such changes:

- Applicable specifications listed herein are deleted, changed or modified, and
- The Specifications and Drawings shall be deemed to be altered and amended to match the approved work, and such changes shall not be used to allege or conclude that the Contractor deviated or altered the Work, or to reduce the Contract Amount.

MATERIALS

Drain Tile - 4" diameter perforated ADS N-12 smooth wall interior drain pipe, , or equal, meeting AASHTO Specification ASTM F-405, **Sizes, perforated or solid, as per plans,**

Fittings- as per manufacturer's recommendation.

Connection Markers/Air Vents/Clean-Outs - ADS "T" Sections and green NDS Plastic Grate

Pea Gravel for Drain Pipes - 1/4" clean, washed pea gravel, approved by Owner's Rep.

Pea Gravel Layer – N1/4" Pea Gravel, Clean and Washed.

Greens Mix - For Bid Purposes, Top Mix shall be 90-10 Bells Command Greens Mix from Texas Sports Sand. No On Site Blending allowed, only pre-blended materials.

Contract Price shall be equitably adjusted for any difference in material cost, if the Owner changes materials.

Amendments – None

Coarse Sand Layer - None

Erosion/Silt Protection for Green Mix – “Terra Tube” Fiber Filtration Tubing, Model TT 913P, or equal, as manufactured by **Profile Products, LLC.** <http://www.profileproducts.com/erosion>

Interface Barrier and Tracer Wire - 30 mil HDPE as supplied by:

Eagle Golf & Landscape
2761-G Saturn Street
Brea, CA 92621
714.524.8598
714.524.6195 fax

AWG #14 UL-UF Control Wire as manufactured by Paige Electric Co., L.P., or equal.

Nursery Areas – None.

END OF SECTION

F- 200 - Tee Construction

SCOPE OF WORK

After the evaluation and approval of the sub-grade by the golf course architect, the Contractor shall select, furnish and install all labor, materials, tools, and equipment necessary for constructing golf course tees as indicated on the Drawings and in accordance with these specifications within the contract time.

Any work items and other materials not specifically described but required for proper completion of the installation shall be considered incidental work and shall not entitle the Contractor any additional compensation as separate work items. The cost for any required incidental work shall be included in both the overall contract and unit prices of the contract. The Contractor shall prosecute tee construction in a coordinated and continuous sequence.

OPERATIONS

Grading - Tee grading shall conform to the grading plans or as directed in the field by the Golf Course Architect. Whether or not specifically depicted on the Drawings the final grading of each tee shall have:

- ◆ No undulations, depressions or other irregularities whatsoever.
- ◆ No upslope drainage flowing onto tee surfaces,
- ◆ On multi-tiered tees, a 6" deep swale between tees.
- ◆ If indicated on plans, a 4" perforated drain day lighting into a bubbler in the nearest possible native areas. (see green details for construction information)
- ◆ One percent (1%) surface drainage, preferably from front to back. If this is not attainable, then drainage may be side to side, draining away from cart paths or traffic.
- ◆ ADA access is required to the new forward tees, meeting TAS Accessible Route requirements, including a curb break and no other insurmountable wheelchair barrier
- ◆ Gentle (max. 4:1, 5 to 1 preferred) walk up slopes to all middle tees,
- ◆ Side slopes of each tee blended smoothly into adjacent grades, at no steeper than 25% (4:1) unless specifically required by Finish Grading Plan.
- ◆ With artistically varying side slope gradients from 4:1 up to 10:1 for natural appearance.

The adjacent cart path should be/have:

- ◆ **Raised** from surrounding existing grade, to promote drainage off the path to turf
- ◆ No upslope drainage flowing onto adjacent cart paths,
- ◆ Visible cross slope" – minimum 2.0% across the path and away from the tee
- ◆ Positive drainage away from the path on its low side, with small swales outside the path
- ◆ Diversion swales at the front and back of the tee complexes to prevent large watersheds do not cross or collect on the path in the tee area, and unless unavoidable, the cart path in the tee area should not act as a drainage conduit.
- ◆ Cart Path generally 25 feet from tee surface to distribute wear, and generally straight.
- ◆ A minimum diameter for all perimeter curves is 30 feet.

Sub-Grade Compaction - Tees constructed in fill are to be thoroughly compacted under optimum moisture conditions. The Contractor shall provide a water truck to moisten surfaces as needed. Finish grading shall not occur when soil is in either a powder dry or a muddy condition.

Tee Mix/Topsoil - For Golf Course Tees - After tee sub-grading is complete, the Contractor shall:

- ◆ Place 4" of topsoil on the tee surrounds as per other areas.
- ◆ Then,
 - Loosen sub soil under tee surface to avoid hard interface
 - Place 4" of tee sand cap to the top soiled tee.
- ◆ Establish finish grade.
- ◆ For Preparation of Soil and Grassing - Consult Grassing Specifications.

All costs for field and laboratory testing are considered incidental and included in the tee construction bid and unit prices. Testing lab must be accredited by USGA. Once selected, the same testing lab should be used throughout the project to assure better consistency.

EVALUATION AND ACCEPTANCE

All phases of tee construction are subject to evaluation by the Golf Course Architect and Owner's Representative, including visual evaluation of final grades and quality of tee sand cap.

MATERIALS - For Bid Purposes, Top Mix shall be 80-20 Bells Command Tee Mix from Texas Sports Sand. **Contract Price shall be equitably adjusted for any difference in material cost, if the Owner changes materials.**

ADDITIONAL INFORMATION - None

END OF SECTION

F- 300 - Sand Bunkers

The Contractor shall select, furnish and install all labor, materials, tools, and equipment necessary for constructing the golf course sand bunkers as indicated on the Drawings, in accordance with these specifications, in a coordinated and continuous sequence manner, within the contract time, and so that the end result is complete and a functioning whole.

Any work items and other materials not specifically described but required for proper completion of the installation shall be considered incidental work and shall not entitle the Contractor any additional compensation as separate work items. The cost for any required incidental work shall be included in both the overall contract and unit prices of the contract.

OPERATIONS

The plans depict an effort to reduce both the number of sand bunkers and the overall square footage. Some removed sand bunkers will be converted to grass slopes (either fairway or rough) and others will retain basically the same shape, with edges smoothed over for mowing ease, and then sodded. Some will receive drainage if they don't surface drain.

There is one new sand bunker at 14 green. For other sand bunkers to remain, all will get some re-shaping for better visibility, including:

- ◆ **Simplify front edge, remove any mounds**
- ◆ **Build base of sand bunker at upward slope throughout, at 3-6%.**
- ◆ **Soften Edge Slopes, but raise them up existing slope**
- ◆ **Maintain mower capabilities on outside edge.**
- ◆ **Minimize outside the bunker shaping but sod all banks.**

Bunker Staking and Preparation - During Rough Grading, the Contractor shall:

- ◆ Be present as golf course architect stakes/marks bunkers shapes, sizes, etc. If the bunker will not be edged immediately after painting, the Contractor shall re-paint the edge line periodically and/or use pin flags in numbers sufficient to preserve the markings.
- ◆ Remove any existing sand to be used as topsoil on re-graded areas around the bunker banks, and place aside in a convenient area.
- ◆ Upon approval of the rough grading, the Contractor shall begin final grading operations.

Spray Weeds - If bunkers are untended for a length of time during construction, the proposed sand area shall be sprayed with herbicide such as "Round-Up™", approved by the Owner's Representative, to rid area of weeds.

Final Grading General Guidelines - The Contractor shall, using equipment and methods of its selection, like small backhoes, shovels or pick axes, cut the bunker edge both to the shape painted by the golf course architect and as vertically as possible, to a depth of 8", to account for:

- ◆ Approximately 2" of a local gravel, approved by Owner.
- ◆ 4" of sand, "feathering" to a minimum of 2" at top of bunker lip.
- ◆ A 2" bunker lip.

Bunker grading shall provide that each bunker is/has/shall:

- ◆ A "gentle hollow" effect, rather than a flat bottom.
- ◆ One low point 1-1.5 feet below surrounding grade, for a "walk into the bunker" feeling.
- ◆ Hold water, with drainage to be accomplished by tile.
- ◆ A base sloping upward (with slope facing golfers normal line of play) at approximately 5-15% near the bottom, gradually increasing to a maximum of 20% on fairway bunkers, and 25% greenside bunkers, which shall occur only in the last few feet to kick balls back into the bunker.
- ◆ An inconspicuous, smoothly blended berm above the bunker, diverting runoff water away from sand, whether or not detailed in the Working Drawings
- ◆ Outside slopes tied into surrounding grades in a way that appears natural, with broader slopes and variety among bunkers.
- ◆ At least 1' of grass shall be left above the sand line
- ◆ With bank slopes as per golf course architect directions, including steep slopes on banks.

Spoil - Spoil shall be used within the bunker, if possible, to be placed and compacted within the bunker to adjust steepness of the bunker or its noses. What can't be properly compacted and used in bunker shaping shall be hauled away.

Compaction and Firming - The Contractor shall thoroughly compact the native soil throughout the entire bunker base, using equipment and methods of its selection, like mechanical hand tampers, adding moisture to the soil if necessary, to achieve optimum compaction conditions.

Drain Tile - Upon approval of final grade, the Contractor shall install a system of 4" drain tiles in accordance with specifications for green tiles in Section C – 100, taking care to locate tiles:

- **In a herringbone pattern with maximum lateral spacing of 25 feet.**
- **With a perforated trunk line in exact low swales of bunker**
- **Perpendicular to Flow, to best intercept surface flow within the bunker.**
- **Near the top of bunkers to intercept flow coming into bunkers from an upslope.**
- Projecting Drain Lines - Upon completion of bunker floor and tile operations, and until the placement of bunker liner and sand within the bunker, the Contractor shall:
 - Protect drain lines by methods of its choosing, such as covering them with plastic or heaping pea gravel above them to prevent clogging.
 - Immediately prior to the next construction operations, the Contractor shall remove such protection, and ensure that all bunker drains work properly
 - Drains that do not work shall be opened up, flushed out, or replaced

Bunker Liner – Better Billy Bunker

The Contractor shall be or retain a licensed Better Billy Bunker Installer, who shall follow the recommended installation methods, except as noted below. The Contractor shall:

- ◆ Completely smooth the base surface of the bunker
- ◆ Evenly apply 2" of approved clean ¼ to 3/8" pea gravel. Slightly deeper gravel may be used if required to properly shape the bottom of the bunker floor, but no less.
- ◆ Spray with manufacturers polymer at **1.5X** the recommended rate
- ◆ Allow to dry a minimum of 24 hours.

Bunker banks shall be sodded, as applicable, within the same time frame as above, or Contractor shall install a Fiber Filtration Tube on any slope that drains into the bunker

Sand Placement – No and no more than one month before grassing, Contractor, using equipment and methods of its selection, and in a continuous and logical manner, and planning haul routes and entry points taking care not to damage other work, shall:

- ◆ Remove all weeds, silt and erosion that has occurred in the bunkers
- ◆ Deliver Sand directly from storage area (or supplier) to bunkers, using machines small enough to prevent damage to existing turf along routes and near bunkers. Additional safeguards should be used, where necessary to prevent turf damage.
- ◆ Install and spread new bunker sand to specified depth.
- ◆ Gently compact the sand with machines/tools of contractor choosing.
- ◆ Contractor shall be responsible for having the proper depth of un-contaminated approved sand in the bunker at time of substantial completion.

Sod Banks – The Contractor shall sod all a minimum of 18" around the lip of the bunker, and any slopes that have been disturbed in grading operations.

EVALUATION AND ACCEPTANCE

All phases of bunker construction are subject to evaluation by the Golf Course Architect and Owner's Representative, including random depth checks. If requested, the contractor shall send a maximum of three (3) random samples to the agreed upon testing laboratory for conformance to specifications. Testing lab must be accredited by USGA. Once selected, the same testing lab should be used throughout the project to assure better consistency.

All costs for field and laboratory testing are considered incidental and included in the bunker construction bid and unit prices.

MATERIALS

Bunker Liner – Better Billy Bunker

Bunker Sand – For **Bid Purposes**, Bunker Sand shall be: Bell Savoy Golf Sand, as Supplied by Texas Sports Sand, or equal, if determined as acceptable for use by the agreed upon testing laboratory.

If Owner changes material specification from what is approved and stipulated in the bid, the Contract Price shall be equitably adjusted for the exact difference in material cost for this phase of the Project.

Drain Tile - As specified in Greens Construction section.

Sod - As specified in Greens Construction and Grassing.

Pea Gravel – ¼"-3/8" clean pea gravel.

END SECTION

Schedule G Grassing

G - 100 Soil Preparation, Fertilize and Grass

G - 200 Sodding

G - 300 Turf Protection

G – 100 - Soil Preparation, Fertilize, Grass

SCOPE OF WORK

The Contractor shall select, furnish and install all labor, materials, tools, and equipment necessary for grassing the golf course as indicated on the Drawings, in accordance with the specifications, including the times specified for grassing and the overall contract time, so that the end result is complete and a functioning whole.

Finish grading work shall be coordinated to provide contiguous and adjacent areas for planting. Teeing areas, including banks, greens and green surrounds etc., shall be prepared concurrently. Adjacent fairway and maintained roughs shall be similarly and concurrently prepared.

Any work items and other materials not specifically described but required for proper completion of the installation of drainage shall be considered incidental work and shall not entitle the Contractor any additional compensation as separate work items. The cost for any required incidental work including but not limited to shall be included in the Contractors bid.

OPERATIONS

General Preparation – After completion and approval of all required contouring and shaping, placement of topsoil, installation of drainage and irrigation systems (with trenches thoroughly compacted), features, cart paths and irrigation system (which shall have been **fully tested**) the Contractor may begin grassing.

In preparation for grassing, the Contractor shall clearly mark:

- ◆ Any areas to remain in a natural state.
- ◆ The position of every sprinkler head, valve box and catch basin with flagging.
- ◆ Set Irrigation heads, at its option, either flush with ground level or 2" above finished grade until turf has established sufficiently, at which time it shall lower all heads and restores turf.
- ◆ Set Irrigation valve boxes level and true to adjacent soil surface
- ◆ Plant landscape material, at its option, either in conjunction with finish grading, or later while protecting previously planted turf.
- ◆ Repair any seed bed damage from rainfall, wind, vehicular traffic, animals or vandalism, importing similar topsoil if necessary, to maintain at least 4" of topsoil in all planting areas.
- ◆ Eradicate germinated weeds and grass in planting areas mechanically, or where persistent apply **Round-Up™** (or equal) weed killer to affected areas at least two weeks prior to grassing. If needed, a second application shall be applied not less than five (5) days prior to seedbed preparation begins.
- ◆ Pursue seed bed and grassing operations only when work areas are not in wet or muddy condition, or during periods of rainfall.
- ◆ Dispose of all Debris in bury pits on the golf course, or in areas of the construction site not visible from any golf hole or surrounding housing.

Fairway, Roughs, Banks and Shoulders

Rock/Root Picking – Remove all sticks, roots, stones or other debris **1/2" and above in size** remaining on the ground surface using large or small mechanical rock pickers as appropriate to location, and/or by hand as necessary on steeper banks and smaller areas.

Finish Grading – Just after rock/root picking, the contractor shall finish grade the golf course, provide smooth contour, fill any depressions and (using surveyor's levels where necessary) to achieve positive drainage in all locations, with equipment of its selection, like:

- ◆ Wheeled tractors, box blades and harrows to rework large areas,
- ◆ Landscape rakes and shovels, for handwork to rework small feature areas around:
 - ◆ Steep Banks and Shoulders
 - ◆ Sand bunkers, which shall be prepared to the limits of proposed sand,
 - ◆ Tees,
 - ◆ Greens, especially the green edges
 - ◆ Beneath all trees in and tree canopies in turf areas, unless noted otherwise.
 - ◆ Adjacent to lakes, retaining walls and streams.

Seedbed Preparation – Following finish grading, but no more than a **few days** prior to the commencement of the turf planting, the Contractor shall loosen the soil in all areas to be grassed to a depth of one to two (1"-2") inches. In rocky areas, preparation depth may be shallower. Contractor shall create uniform texture to all seedbed areas, including extra cultivation of haul roads and other severely compacted areas where necessary.

Fertilizing – After Seedbed Preparation is complete, and **within two (2) days** before grassing, the contractor shall distribute fertilizer and amendments evenly over all areas using a mechanical spreader, and applying the specified rate in two applications, using approximately perpendicular runs to insure proper coverage. After application, Contractor shall evenly work the fertilizer into the soil profile at a depth not to exceed 1/2".

If a check of the quantities of any material used in the fertilizer operations indicates that the full rate of application has not been achieved, the Owner's Representative shall have the option of 1) requiring the Contractor to distribute the remaining quantities of these materials, or leave them with the Owner for its use.

Grassing - Apply grass using standard sprigging equipment of its own selection, preferably one that cuts planting rows, distributes sprigs evenly, and covers the sprigs in a single pass.

If a check of the quantities of any material used in grassing indicates that the full rate of application has not been achieved, the Owner's Representative shall have the option of 1) requiring the Contractor to distribute the remaining quantities of these materials, or leave them with the Owner for its use.

A. Greens

Finish Grading and Seed Bed Preparation – The Contractor shall:

- ◆ Settle the putting surface with water until properly firmed and compressed to a uniform consistency sufficient to support necessary machinery.

- ◆ Smooth and roll the putting surface to obtain a uniform seedbed.
- ◆ Create positive drainage with minimum putting surface and collars slope of 1.75%
- ◆ Loosen the top 1/2 inch of the seedbed for grassing.
- ◆ Create a 1" lowered lip on the perimeter of the green, if installing perimeter sod
- ◆ Probe top mix at green edges to determine true green edge.
- ◆ Accurately mark green edge using wire flags, approximately 10' to 15 feet apart.

Fertilizing – As per Fairway and Rough, but with smaller hand spreaders.

Grassing - Contractor shall apply grass evenly in two (2) directions at the specified rate by hand if sprigs, and using small mechanical spreaders if seed, applying seed half the specified seed rate in each direction. The putting surface should be fully covered with plant material.

C. Tee Surfaces

Seedbed Preparation – Specifications for greens preparation shall apply.

Fertilizer and Soil Amendments – Fairway Specifications shall apply, but with hand spreaders to avoid disturbance of tee grades.

D. Brushed Areas Around Removed Trees –

Fertilizer and amendment – Fairway and Rough specifications shall apply. Smaller spreaders and handwork may be necessary for adequate distribution.

Grassing - Fairway and Rough specifications shall apply. Smaller spreaders and handwork may be necessary for adequate distribution.

E. **Secondary/Far Rough** (outside cart paths) – Fairway and rough specifications shall apply.

F. **Haul Road Repair** - Contractor shall be responsible to repair and turf all haul roads it has created and used throughout the golf course. The Contractor shall:

- ◆ Eliminate compaction by ripping to a depth of 12", by using excavators or rippers on a dozer, in two directions. The excavator shall flip over the soils to depth of 12" and then slightly re-packed to avoid later settling. Once finished with the elimination of compaction the contractor shall:
 - ◆ Re-grade affected areas for drainage and tie in.
 - ◆ Recondition soil where necessary by hauling in prescribed fairway topsoil materials.
 - ◆ Prepare and grass seed bed to fairway/rough specifications depending on what turf type the haul road disrupted.
 - ◆ Grass with fairway/rough grass specification, or similar turf to existing.

GRASSING DATES AND SCHEDULE

Turf Grassing Schedule - The Contractor shall commence grassing in areas when:

- ◆ The irrigation system is complete and tested
- ◆ Within a day of when fine grading and fertilizing operations are complete.
- ◆ When the soil is of suitable moisture to accept turf material

- ◆ Temperatures are below 100 (F) and winds are under 20 MPH,

When conditions are likely to prevent satisfactory results, work shall be stopped and resumed only when conditions are favorable again or approved corrective measures have been authorized by the Golf Course Architect or Owner.

It is anticipated that Work for this project shall be managed such that 6 holes of golf play will remain open at all times to the extent possible. The least amount of work will take place in section A, so work beginning early in section A could result in the section A 6 holes being open during the more intense construction on the northern 2/3 of the course. Details will be negotiated with the winning contractor prior to work beginning."

The Contractor shall schedule grassing work so as to:

- ◆ Not exceed to irrigation limitations.
- ◆ Lay sod, seed, sprigs, and any erosion control measures simultaneously on each hole.
- ◆ Plant 3-6 holes at a time, approximately split among the three sections, and along major branches of the irrigation main line out from each pump station, starting planting:
 - Section C by approximately June 1, 2020
 - Section B by approximately June 15, 2020
 - Section A by approximately July 1, 2020
 - July 15, 2020, the last acceptable grassing date. After that, the Contractor shall be considered to be delayed, and liquidated damages may accrue.

EVALUATIONS AND ACCEPTANCE

The Owner and golf course architect shall evaluate plantings within the effective coverage of the irrigation system (generally 40 feet beyond the last upon completion and issue initial acceptance, subject to re-evaluation in 21 days, as described above, but only upon completion or entire holes or large partial hole areas with logical divisions. As each planted area is accepted, it will excuse the contractor from further responsibility for that area, except as described below.

Post Grassing Watering_–

Initial Watering – After completion of any given turf planting areas, the Contractor shall:

- ◆ Commence properly watering (with water provided by Owner) **all planted and sodded areas** immediately after grassing, through the sprinkler system if available, or by hose watering if not, for sufficient time to thoroughly soak the soil just to the point of creating runoff that might erode away turf material.
- ◆ Contractor shall be responsible for watering until the end of the day that grassing is complete.
- ◆ **Seeded or Sprigged areas** shall receive up to four (4) waterings from 6AM until 7PM, considering then existing weather conditions of heat, rain, etc., but generally using light, frequent watering to maintain the seedbeds in a continuously moist (not flooded) condition to a depth of 3- 4", and without ever letting seedbed dry out, or causing runoff and washouts.
- ◆ **Sodded** areas must be hand watered twice during the initial watering period in addition to any regular irrigation that hits it from the automated system.

- ◆ Notify Owner prior to any planting so it may assume its responsibility of all other grow in watering and maintenance, as watering and/or maintenance are not part of this Contract.

Maturation and Grow In Period - Beginning on the second day after acceptance of a grassing area, the Owner shall be responsible for all grow-in operations establishing turf, and shall bear the expense thereof. The Contractor is not responsible for and provides no guarantee of acceptable turf establishment.

However, for the first 21 days after acceptance, the Contractor shall be responsible for any unsatisfactory cover that exists within areas covered by irrigation, if it can reasonably be determined to result from its own actions, including:

- ◆ The quality or quantity of grass materials, or handling thereof, or incorrect seed bed preparation, initial fertilization and amendments.
- ◆ Damage Repair of eroded areas caused by failure of SWWWP Plan implementation.
- ◆ Gullies and washouts caused by negligence of its own workforce, or of any blowouts or leaks in the irrigation system.

If it is determined that the Contractor is responsible for any re-planting, it shall, at no additional cost to the Owner re-plant or re-sod the affected area as soon as practical, and not later than the last acceptable grassing date. The soil preparation and grassing specifications for any re-grassing shall be the same as for the initial planting specifications.

If it is determined that some or all of the non-satisfactory condition is due to the Owner's negligence, the costs of labor and materials for re-planting shall be equitably divided

Assisting Owner During the Maturation and Grow In Period - After planting until the final Project acceptance, and if contractor is still present on site, it shall assist the Owner in any repairs that become necessary, but shall be compensated by the Owner, using hourly machine and labor rates provided in the proposal, if applicable, and/or via negotiated amount, if not.

MATERIALS

All materials used in fine grading, fertilizing and grassing shall be new and without flaws or defects and of expected industry standard quality. The Golf Course Architect and/or Owner shall have the option to reject any sod seed, sprigs or fertilizer which fails to meet recommended specifications. The materials for fine grading, fertilizing and grassing shall include:

Fertilizers and Amendments. - Fertilizer shall be delivered to the site in bags or convenient containers, each fully labeled, conforming to applicable state fertilizer laws, and bearing the name, trade name or trademark, and the warranty of the producer, and then stored in a weatherproof storage area, until ready for use. Any material not used in the pre-plant shall be left for the Owner's use in turf establishment.

Green, Tee, Fairway and Rough Turf Areas	
Product	Application Rate
13-13-13 Starter From Lesco, Best, Andersons, Lebanon, or Locally Available Approved Equal	15 Lbs Per 1000 Sq. Ft./650 Lbs. Per Acre
Triple Super Phosphate as Locally Available	196 lbs of 0-45-0 per acre

Seed - All seed (if any) shall be furnished with a vendor's statement certifying that each container of seed delivered is fully labeled in accordance with the United States Department of Agriculture and Regulations under the Federal Seed Act and AOSA, in sealed standard containers, un-damaged in transit and properly stored on site. It shall also meet applicable standards for purity, etc.

Grass Types

Greens: Champions Bermuda hand planted at the rate of 20 Texas Bushel per 1000 SF.

Tees

- in full sun: - Tif 419 Bermuda if in full sun, hand planted at 20 Texas Bushels per 1000 S.F. (All forward tees, and main tees on holes 5, 14, 15)

- in Shade – Sod - Zeon or Emerald zoysia Sod (Tees 7, 8, 10, 11, new main tee on 17)

Rough including Green and Bunker Banks:

-Sprigs - Tif 419 Bermuda, mechanically planted at 650 Texas Bushels/ Acre

- Sod - Tif 419 Bermuda, meeting specs in next section.

Far Outer Roughs: Improved Common Bermuda Grass, Sahara, Savannah, or approved equal, mechanically seeded with Brillion Seeder or equal, at 88 lbs per Acre, in one pass.

Allowance for Shade Areas Mix – (Allow 2 Acre) - For seeding of brushed areas beneath heavy trees in, a Tall Fescue mixture of **50% Aztec and 50% Adobe** at a rate of 350 lbs/AC.

Erosion Control – Equal to “Wood Fiber Net Free Erosion Control Blanket Mix” **Item #:** 7059, as supplied by the same company.

ADDITIONAL INFORMATION

Reserve Seed – For all seeded turf areas, Contractor shall procure 110% of required quantities to have seed in reserve for reseeding according to the specifications. Should the Contractor not use that seed, it shall leave it for the Golf Course Superintendents Future Use.

Testing – An agronomist has developed fertilizer recommendations, and the Contractor shall base its bid on the types and quantities of materials listed above. Should the Owner change the fertilizer program, for any reason, the Contract Price shall be equitably adjusted for any difference in material cost. If application rates rise significantly over the rates initially specified, the Contractor may apply for a change order to cover this additional work.

END SECTION

G-200 Sodding

SCOPE OF WORK

The Contractor shall select, furnish and install all labor, materials, tools, and equipment necessary for golf course sodding as indicated on the Drawings, in accordance with these specifications, including the times specified for grassing and the overall contract time, so that the end result is complete and a functioning whole.

Any work items and other materials not specifically described but required for proper completion of the installation of drainage shall be considered incidental work and shall not entitle the Contractor any additional compensation as separate work items. The cost for any required incidental work including but not limited to shall be included in the Contractors bid.

OPERATIONS:

Finish grading work shall be as described previously in Section G-100. The Contractor shall pay special attention to areas where sod shall be laid adjacent to cart paths and greens surfaces, removing enough soil material so that after sod installation, the finish grade shall be flush to the adjacent surface with no drainage blocked.

The Contractor shall sod green edges, tee edges and bunker faces, **distributing the sod quantity given in the bid form to cover these areas as best as possible.** Before installing any sod, the Contractor shall:

- Make sure that the irrigation system is functioning and available for watering sod
- Prepare staging areas, select delivery routes to minimize damage to other areas,
- Prevent traffic across newly prepared or sodded areas.

Sod Delivery - Contractor and supplier shall deliver sod to the site in viable condition, including:

- Ship within 1-2 hours of cutting,
- Rolling in tight rolls, dampening slightly and using tarps for shipment.
- Using expedited trucking schedules, including night shipping for morning delivery
- Proper handling, including gentle loading and unloading from trucks, without dropping
- Other measures dictated by conditions.

The Owner's representative shall inspect sod as soon as practical after site delivery, rejecting any sod that is in obvious distress or doesn't meet specifications, including delivery specifications.

Required Delivery Condition - Sod shall be procured directly from one supplier and shall not be from a sub-contracted or secondary supplier unless previously approved by Owner. At the time of delivery, Sod shall be:

- Strongly rooted, in vigorous condition, dense and mature at the time of delivery, free of debris, weeds or undesirable grasses.
- Of the type designated under these specifications, and at least 99% pure
- Certified, with appropriate certification papers, if required.
- With Sub soil similar to site soils.

Sod Installation - The Contractor shall:

- Delineate areas to receive sod, gaining acceptance by Owner's Representative
- Lightly moisten prepared Sod bed prior to placement.
- Lay sod the same day of delivery. If weather conditions prevent this, sod shall be stored, protected from wind and rain until the earliest available time for laying. In no case shall sod remain in storage on site longer than two (2) days
- Place exactly the amount of sod required at each area, and carefully move excess to other areas. Sodding of additional areas for the sole convenience of the Contractor shall not result in additional payments.
- The Contractor shall lay sod:
 - With the first sod roll in a straight line
 - Tightly abutting subsequent rolls to adjacent strips, with staggered joints
 - Tightly abutting sod strips to allow for natural shrinkage, but with no overlap.
 - With any sod with exposed edges having a soil lip raked up to minimize air drying.
 - Replacing sod that is dead, stressed, off-color, dried out by neatly patching new areas of sod where required, and without damaging other sod already installed.
 - Rolling newly installed sod with a heavy-duty roller, when the soil and sod are stable enough to prevent slippage and damage.

Maintenance and Protection - The Contractor shall:

- Water all new sod within 15 minutes of laying.
- Monitor and water sod at signs of drying, stress or damage until accepted by Owner.
- Top dress sod joints that separate, due to shrinkage with a loose, friable soil material similar to the native soil.
- Neatly patch large gaps with new sod, using smooth and angular cuts and without jagged edges.

EVALUATION AND ACCEPTANCE

All materials used in sodding operations are subject to evaluation and approval by Owner's representative both during the procurement period and installation operations.

The Owner shall accept sod a minimum of one week after installation or at such time when it is clear that the sod is viable, and functioning as intended in these specifications, and is satisfactory to Owner.

GRASSING DATES:

Approved sodding dates are June 1, 2020 – July 15, 2020.

MATERIALS:

All materials used in sodding shall be new and without flaws or defects of any kind and the Owner's representative shall have the option to reject any materials which, in his opinion, fail to meet the recommended specifications or are otherwise unsatisfactory for the project. The materials for sodding shall include:

Fertilizer and Soil Amendments - Fairway and rough specifications apply.

Sod Type:

Fairways, Roughs and Banks - Tif 419, cut with 1.5-2 "minimum subsoil Depth, or as specified by Owner's Representative prior to Harvesting.

Tees

- in full sun: - Tif 419 Bermuda if in full sun, hand planted at 20 Texas Bushels per 1000 S.F. (All forward tees, and main tees on holes 5, 14, 15)

- in Shade – **Sod** - Zeon or Emerald zoysia Sod (Tees 7, 8, 10, 11, new main tee on 17)

Collars – Tif Tuff

Sod Quantities – 115% of that specified on bid form to account for waste, etc.

Certification - Certification of sod shall not be required as a part of this contract.

Contract Growing -Contract growing is not contemplated nor will any additional cost thereof be accepted as part of this contract.

Pricing - Contractor's bid sum and unit price shall remain in force for the duration of the job.

In the event that the Owner requests additional sod and/or rejects sufficient amounts of proposed sod pursuant to the above to necessitate an alternate sod supplier to supply such amounts, then the Contractor shall:

- Immediately procure an alternate sod supplier, and attempt to negotiate a price similar to that in the original Agreement.
- Be entitled to an adjustment for the unit price for those portions of sod procured from a different supplier exactly equal to the difference in material price differential (up or down) The Contractor must reasonably document the cost differences directly attributable to sod, including applicable taxes, delivery charges, etc.

Sod Evaluation by Owner - As soon as practical after signature of the Contractor, the Contractor shall provide the Owner the name of his potential sod supplier(s). Throughout the Project, the Owner's Representative retains the right, but not the obligation, to evaluate the proposed supplier's ability to perform under the specifications of this project. As a part of this evaluation, Owner's representative may visit source of sod proposed for project to:

- ◆ Periodically inspect proposed sod at site of its growth
- ◆ Specifically select and reserve sod from the designated supplier for the Project in quantities of at least 115% of the anticipated usage,
- ◆ Periodically monitor the quality of any reserved sod prior to harvesting and/or delivery,
- ◆ Confer with supplier regarding cultural and maintenance practices required making the sod acceptable to Owner.
- ◆ Reject any sod proposed or reserved for the Project that, based on these evaluations that:
 - Has been damaged by fire, freeze, flood, or disease
 - Has failed to mature sufficiently due to planting date or poor growing conditions
 - Fails to meet specifications
 - The Owner's representative is not completely satisfied with.
 - The Owner's representative reasonably believes will not be available in either sufficient quantities and/or in a in a timely manner,

In the event that the Owner's Representative rejects any portion of the sod on the Project, the Supplier and Contractor retain all rights regarding appeal as may be outlined in the General or Special Conditions of the Contract. However, the Sod Supplier and Contractor shall:

- Bear the burden of proof regarding compliance with these specifications.
- Provide such proof of ability to comply with specifications within a maximum of five (5) days from such rejection if sodding operations are imminent, and
- Have no claim against the Owner for any of its additional costs to make sod acceptable for the Project, including costs associated with or arising from:
 - Consequential damages and lost revenue or opportunity
 - Procuring from another of its own fields that require more trucking, or procuring secondary sod from another supplier.

PAYMENT

Payment for sod shall be a lump sum, but presume the quantities on the bid form.

Additional payments shall be made on the stipulated unit price in the proposal where the Owner's representative has designated additional areas for sodding and such areas:

- Have been duly noted by the Contractor prior to placement.
- The Contractor has not placed excess sod in any area for its sole convenience

END SECTION

G-300 - Turf Protection/Erosion Control

SCOPE OF WORK

The work shall commence immediately after grassing and consists of furnishing and placing hydro mulch and/or erosion control netting. The Contractor shall maintain on the job sufficient equipment of its selection to complete all work in accordance with these specifications within the contract time.

OPERATIONS/EXECUTION (For Large Pipe at 13th Hole and 16th Green)

Preparation – The installation site shall be prepared by clearing, grubbing and excavation or filling the area to the design grade.

The surface to receive the material shall be smooth and continuous, free from obstructions like rocks, roots, stumps, and depressions.

Erosion features such as rills, gullies, etc. must be graded out of the surface before TRM deployment. Smooth roll drum compaction will be required before deploying TRM to make sure the TRM makes immediate contact with the soil and to ensure that the soil has been compacted

PRODUCTS

As Manufactured by:

PROFILE Products LLC
750 Lake Cook Road—
Suite 440 Buffalo Grove, IL 60089
800-508-8681 (Fax 847-215-0577)
www.profileproducts.com

Product 1 – Channel Overflow Stabilization - Products “Green Armor™ System” consisting of 7010 Enkamat® TRM (Turf Reinforcement Mat), hydraulically in-filled with Flexterra® FGM™ (Flexible Growth Medium™)

Installation Product 1 – Green Armor

- A. TRM -Care shall be taken during installation to avoid damage occurring to the TRM as a result of the installation process. Should the TRM be damaged during installation, a TRM patch shall be placed over the damaged area extending 1 m (3.28 ft) beyond the perimeter of the damage.

Cut trenches for initial anchor trenches, termination trench and longitudinal anchor trenches (12 inches wide and 12 inches in depth) as shown on the drawings.

Install anchoring devices at a frequency of 2 1/2 pins/staples per square yard. Additional anchoring devices may be required depending on site conditions or alignment of the slope or channel. Always staple (1' centers) the seams between individual TRM rolls.

When overlapping successive TRM rolls, the rolls shall be overlapped upstream over downstream

and/or upslope over down slope. For channels, begin at the downstream end in the center of the channel. Inspect trenches for position accuracy and depth and re-dig to required dimensions. If trenches have approximately 10' of the TRM, positioning the roll face down (as it unrolls) over the initial anchor trench, extending several inches beyond the trench with the roll sitting on the downstream side of the anchor trench. Positioning roll in this manner permits backfilling and compaction of soil into the trench while allowing installer to proceed with proper deployment of TRM by unrolling upstream, over the anchor trench.

Position second TRM with a minimum 4-inch overlap of the previous TRM and secure it into the anchor trench. After entire width area is installed with the TRM, then backfill and compact the anchor trench.

Continue deploying TRM upstream to the next check slot. Overlay a minimum of 18 inches the ends of rolls with the next roll(s) being deployed, or position in bottom of check slot, anchor and backfill and compact check slots. Continue the processes until you reach the upstream starting point of the TRM.

For slopes, construct top anchor trench 1-3' beyond crest of slope, or as illustrated in drawings or shown in manufacturers recommended installation guidelines. Position TRM roll at crest of slope with sufficient material to line the entire anchor trench plus enough material left over to cover the trench.

Position adjacent rolls to facilitate 6" overlaps. Anchor TRM in trench with appropriate pins/staples at 1' centers. Once several rolls are anchored in trench, begin to backfill and compact trench to original elevation. The preferred method of deploying roll down slope is to stand in front of the roll and pin it as it rolls out down the slope, minimizing foot traffic on TRM, which will eliminate depressions under the mat. Always allow the mat to drape over the soil, never pulling it taut, to minimize tenting.

Place additional pins into any apparent depressions to maintain contact with the soil.

- B. Hydraulically fill the TRM with 0.35 inches of FGM, applied with hose at close range. Optimum application rate is 3500 lbs/acre or to the depth of where the tips of TRM are still exposed.

Strictly comply with FGM manufacturer's installation instructions and recommendations. For optimum FGM pumping and application performance, use approved mechanically agitated, hydraulic seeding/mulching machines, hose of sufficient length to reach the TRM, use of a 50 degree tip/nozzle is highly recommended. Apply FGM from hose positioned over shoulder with nozzle approximately at chest level (48-60") to achieve optimum TRM infill.

For optimum hydraulic performance and vegetative establishment, be careful not to overfill the TRM. The tips of the TRM shall be slightly exposed.

END SECTION

Schedule H Hardscape

SCOPE OF WORK

This specification covers construction of steel reinforced and synthetic fiber reinforced concrete that shall be delivered to the Owner uniformly mixed, so the concrete can be sampled and tested at the point of delivery. It also covers the placement, consolidation, curing, or protection of the concrete after delivery to the Owner.

All concrete pavement constructed shall conform to the provisions of Item 5.8 of the latest edition of the "Standard Specifications for Public Works Construction" published by the North Central Texas Council of Governments.

The Contractor shall select, furnish and install all labor, materials, tools, and equipment necessary for constructing golf course cart paths, as per the Drawings AND these specifications, and within the overall contract time, so that the end result is complete and a functioning whole.

Any work items and other materials not specifically described but required for proper completion of the installation of cart paths shall be considered incidental work and shall not entitle the Contractor any additional compensation as separate work items. The cost for any required incidental work including but not limited to shall be included in the Contractors bid.

Cart Path Dimensions –

Main Path – 7 feet wide

At Tees and Greens – 10 feet wide, some with curb (if shown) on outside of 10' path

Curb – 4" roll curb

Cul de Sacs – Min. 30 feet radius, curb (if shown) on outside

Minimum Radius at intersections turns – 55 feet

Minimum Radius (inside edge) of path – 110 feet.

Pavement Depth: 4.5"

MATERIALS

QUALITY ASSURANCE

Materials and methods of construction shall comply with the following standards:

1. American Society for Testing and Materials, (ASTM).
2. American Concrete Institute, (ACI).
3. Maintain field records of time, date of placing, curing and removal of forms of concrete in each portion of work.
4. Do not change source or brands of cement and aggregate materials during the course of the work.
5. Construct street and access driveway curb cuts, curbs and sidewalks subject to the standard specifications for Public Works Construction for North Central Texas requirements.

SUBMITTALS

Contractor shall submit concrete delivery tickets to Park Planner the day of the pour. Show the following:

- A. Batch number
- B. Mix by class or sack content with maximum size aggregate.
- C. Admixtures
- D. Air content
- E. Slump
- F. Time of loading

DELIVERY, STORAGE, AND HANDLING

- A. Deliver curing materials, admixtures and retarders in manufacturer's standard unopened containers with labels legible and intact. Store and protect from freezing and damage.
- B. Cleaning of concrete delivery vehicles is forbidden on project site.

PROJECT CONDITIONS

- A. Work notification: Notify Golf Course Architect and owner's representative at least 24 hours prior to installation of concrete.
- B. Formwork and steel rebar placement shall be inspected by the owner's representative prior to pouring concrete. Do not place formwork until the location has been confirmed by the owner's representative.
- C. Establish and maintain required lines and grade elevations.
- D. Do not install concrete work over wet, saturated, muddy, or frozen sub-grade.
- E. Do not install concrete when air temperature is below 40 degrees F. Use of calcium chloride, salt, or any other admixture to prevent concrete from freezing is prohibited.
- F. Protect adjacent work.
- G. Provide temporary barricades and warning lights as required for protection of project work and public safety.

MATERIALS

- A. Portland cement: ASTM C150, Type 1, natural color.
- B. Aggregate: Provide ASTM C33 normal weight aggregates, 1" maximum size, clean, uncoated crushed stone or gravel coarse aggregate free of materials which cause staining or rust spots; fine aggregate shall be clean natural sand.
- C. Water: Clean, fresh and potable.
- D. Air entraining admixture: ASTM C260.
- E. Water reducing admixture: ASTM C494.

MIXES

- A. Provide ASTM C94 ready-mixed concrete. Batch mixing at site is not acceptable.
- B. Strength: **4,000 psi** minimum at 28 days.
- C. Slump range: 2" to 4" maximum for curb and gutter concrete.
- D. Slump range: 4" to 5" maximum for concrete trail.
- E. Slump range: 3" to 4" maximum for transformer and panel box pad.
- F. Indicate water added to mix at job site on each delivery ticket. Show quantity of water added. Site water tempered mixes exceeding specified slump range will be rejected as not complying with specification requirements.

ACCESSORIES

- A. **Forms** - Provide forms that are:
- Wood or metal of sufficient strength to resist lateral displacement from concrete placement pressure and to maintain horizontal and vertical alignment during placement.
 - Straight, free of defects and distortion, with height equal to full depth of concrete.
 - 2" nominal thickness, surfaced plank wood forms for straight sections and sections with radius greater than 25'.
 - For radius less than 25', use flexible metal, 1" lumber, or plywood forms to form radius bends.

In all forming methods, irregularities in edges will not be permitted and will be cause for rejection of the affected area.

- B. **Joint filler:** Construction Grade Pressure treated pine 1/2" x 4", section to match concrete trail profile.
- C. **Curing compound:** ASTM C309, type 2, non-yellowing, non-staining liquid membrane forming type containing a fugitive dye.
- D. **Reinforcing steel:** ASTM A615, Grade 60 per ASTM A370, new domestic deformed steel bars.
- E. **Form release agent:** Non-staining chemical form release agent free of oils, waxes and other materials harmful to concrete.
- F. **Joint Dowel Bars:** #5 smooth, plain steel bars, ASTM A615, Grade 60. Cut bars true length with end cut square and free of burrs. Furnish metal or plastic expansion caps for end of each dowel in expansion joints. Design caps with one end closed and a minimum length of 3" to allow bar movement of not less than 2", unless otherwise indicated.
- G. **Accessories:** Provide spacers, chairs, ties and other devices necessary for properly spacing, placing, supporting and fastening reinforcement shall be of size and strength for the purpose intended. Accessories shall be plastic or galvanized as required.
- H. **Cleats:** Cleats shall be 2" x 4" wood 24" in length, for controlling the continuous alignment of the forms, where one form abuts against another form. Cleats shall be nailed behind the form with three (3) nails attaching the cleat to each form.
- I. **Expansion Joint:** 1/2" x 4" pressure treated pine, or redwood section to match profile.

OPERATIONS

Staking and Layout - New path areas shall be marked using the following guidelines to achieve:

- ◆ Smooth curves everywhere practical, favoring sound path alignment around trees
- ◆ A minimum curve radius of 55 ft Provide at intersections,
- ◆ Cul-de-sacs of 30' diameter.
- ◆ Wide, reasonably level access points in high traffic fairway areas
- ◆ Avoid sharp reverse curves, or other curves difficult to negotiate in vehicles at 15 mph.
- ◆ Maintain clearing as per clearing plans and specifications, including:
 - width of path, plus 4' on either side
 - (Where applicable) trees adjacent to path trimmed to head height.
- ◆ Meet ADA requirements

PREPARATION

Establish Sub grade - Contractor shall

- ◆ Examine sub-grades and installation conditions.
- ◆ If unsatisfactory, Notify Park Planner and correct.
- ◆ Do not start concrete work until unsatisfactory conditions are corrected.
- ◆ Establish the sub grade, which may require either cut or fill. Any fill shall be on site material, but free from foreign materials like stumps, roots, grass, or organic materials. The Contractor shall take care to achieve:
 - Sub-grade compaction shall of 95% minimum and compacted to depth of:
 - 6" base below finished grade under path
 - 12" below finished grade; under sections with curbing
 - A stable base, even in unstable sub soil, by excavating soil and filling with rock.
 - Positive drainage on, across, and beside the path.
 - Pavement slopes between 2% - 10%.
 - Grading shall drain path away from tees, greens, or bunker complexes if possible,
 - Where designated, grading shall allow sufficient depth for curb and drainage goes over the curb as shown on detail.
- ◆ No sand or gravel base is required.
- ◆ After compacting the sub-grade, set side forms to line and grade and securely fasten.
- ◆ Where the plans require drainage structures, forms and basins shall be installed in place before placing concrete.
- ◆ Obtain, at Contractor expense and subject to the approval of Park Planner, services of a recognized testing laboratory to perform at least three (3) soil compaction tests, working with Park planner to select representative locations.
- ◆ Install, align and level forms. Stake and brace forms in place. Maintain following grade and alignment tolerances:
 - ◆ Top of form: Maximum 1/8" in 10'-0".
 - ◆ Vertical face: Maximum 1/4" in 10'-0".
- D. Coat form surfaces in contact with concrete with form release agent as necessary to assure separation from concrete without damage.
- E. Locate, place and support rebar with reinforcement chairs necessary to elevate bars during pouring as follows:
 - Material: #3 Rebar
 - Spacing - Minimum of one chair 18" O.C. each way.
 - Height – Must be at least 2.5-3" off sub-base, i.e., in upper half of concrete, up to 1.5" from final surface elevation.
- F. Provide reinforcing bars at curbs, ramps and other locations indicated, adequately supported and secured to prevent displacement.
- G. Alignment of forms and joints shall not permit tangencies or angles. All alignments shall be made with gradual radius transitions.

Concrete Placement

- A. Concrete placement - Comply with ACI 304 "Recommended Practice for Measuring, Mixing, Transporting, and Placing Concrete" and as specified.
- B. Protect concrete from physical damage or reduced strength due to weather extremes during mixing, placing and curing. In cold weather comply with ACI 306,

"Recommended Practice for Cold Weather Concreting." In hot weather comply with ACI 305, "Recommended Practice for Hot Weather Concreting."

- C. Moisten base to provide a uniform dampened condition at the time concrete is placed. Verify structures are at required finish elevation and alignment before placing concrete.
- D. Place and spread concrete to the full depth of the forms. Use only square ended shovels or concrete rakes for hand spreading and consolidating concrete. Exercise care during spreading and consolidating operations to prevent segregation of aggregate and dislocation of reinforcement.
- E. Concrete shall be thoroughly compacted during and immediately after placing by vibrating the concrete internally by means of mechanical vibrating equipment or by spading. To secure even and dense surfaces against forms, vibration shall be supplemented by working or spading by hand along form surfaces while concrete is still plastic.
- F. Place concrete in a continuous operation between expansion joints. Provide construction joints when sections cannot be placed continuously.
- G. Place concrete in one course, monolithic construction, for the full width and depth of concrete work. Provide minimum 4" thick walks and thickness to match paving for ramps, except as otherwise indicated.
- H. Strike off and bull float concrete after consolidating. Level ridges and fill voids. Check surface with a 10'-0" straightedge. Fill depressions and re-float repaired areas. Darby the concrete surface to provide a smooth level surface that will be ready for finishing.
- I. Provide handicapped ramps where indicated.

Joints:

- ◆ Construct control, expansion, and construction joints properly aligned with face perpendicular to concrete surface.
- ◆ Provide tooled control joints, sectioning concrete into areas indicated. Tool joints to depths equal to not less than one fifth (1/5) of the concrete thickness. Hand tool control joints in pattern and at spacing indicated. When not indicated, provide spacing equal to slab width and not greater than 10'-0" on center.
- ◆ Provide doweled expansion joints at all concrete to concrete connections, unless directed otherwise using expansion joint filler.
- ◆ Provide doweled expansion joints in concrete trail with 1/2" x 4" pressure treated pine or Wolmanized pine.
- ◆ Locate doweled expansion joints as indicated on the plans (max. spacing along not to exceed 100' O.C.). Align expansion joints in abutting curbs and walks.
- ◆ Install wood joint-filler full width and depth of joint. Recess top edge 1/8" below finished grade.
- ◆ Protect the top edge of the joint filler during concrete placement.

Concrete finishing:

- ◆ Perform concrete finishing using mechanical or hand methods as required.
- ◆ Upon completion of floating and after bleed water has disappeared and concrete can sustain foot pressure with nominal indentation, cut concrete away from forms. Work edges with an edging tool. Round edges to 1/4" radius.

- ◆ Install control joints at indicated locations during edging operations.
- ◆ Complete surface finish as follows:
 - ◆ Provide cart path pavement surfaces with textured dry broom medium finish to match exactly to existing concrete.
 - ◆ Edge outside edges and all joints with a radius-edging tool.
 - ◆ Curbs and vertical wall faces: provide a smooth, hand rubbed finish.

Curing: Wet cure concrete by application of absorptive mats or fabric kept continuously wet or by application of waterproof sheet materials.

Joint sealants:

- ◆ Install joint sealants where indicated in accordance with manufacturer's installation instructions. Clean and prime joints. Remove all dirt and loose coatings.
- ◆ Apply sealants in continuous beads, without open joints, voids, or air pockets. Hand tool and finish all joints.
- ◆ Confine materials to joint areas with masking tape or other precautions.
- ◆ Remove excess compound promptly as work progresses and clean adjoining surfaces.
- ◆ In rough surfaces or joints of uneven widths, install joint sealant well back into joints.

PROTECTION -

Protect concrete work from damage due to construction and vehicular traffic until final acceptance. Exclude construction and vehicular traffic from concrete pavements for at least seven (7) days. Prevent vandalism to concrete from markings or bicycles. Markings or bicycle tracks in concrete will be cause for rejection and require reinstallation for the affected area.

CONCRETE TESTING AND QUALITY CONTROL

A. General

- ◆ Allow the testing agency and Owner free access to material stockpile facilities for batching, mixing and placing concrete and the work in progress. The testing agency is to meet requirements of ASTM E329 and have the equipment and materials necessary for sampling and testing required herein.
- ◆ Quality control is the Contractor's responsibility. Results of any testing performed by the testing agency will be made available to the Contractor and the Contractor may use such testing as part of the Contractor's Quality Control program.
- ◆ Furnish molds and concrete for all testing including testing performed by the Owner or the testing agency. Provide tools necessary for making test specimens, slump tests and yield tests. Furnish labor and equipment for obtaining and handling all test samples.
- ◆ At least 24 hours in advance of placing concrete in the structure, notify the Owner of the date, time and location in the structure and quantity of concrete to be placed.
- ◆ Each concrete mix type has specific performance requirements. Verify that requirements are met for each mix type by sampling and testing at least equal to that required herein.
- ◆ Verify that batch tickets from ready-mix supplier properly describe the mix for the work being performed prior to permitting the discharge of concrete from the supplier's truck.

- ◆ Ensure that the ready-mix transport trucks are equipped with a drum revolution counter and the drum turn rates are established prior to concrete placements with the approval of the Owner.

B. Sampling and Testing Fresh Concrete -

The Owner is responsible for all concrete testing. Fresh concrete used in the work shall be sampled and tested by the testing laboratory using technicians certified by the American Concrete Institute to determine its acceptability as required by ACI 318 and to demonstrate general conformance with specified properties as follows:

1. Sampling Fresh Concrete: ASTM C172.
2. Slump: ASTM C143; one test for each set of compressive strength test specimens.
 - a. When superplasticizers are added at site, make slump tests from each concrete load before adding superplasticizer and after superplasticizer has been properly mixed into the fresh concrete.
 - b. When liquid nitrogen is used to cool the concrete, make slump test before adding liquid nitrogen to the concrete mix.
3. Air Content: ASTM C173, volumetric method for lightweight concrete; ASTM C231 pressure method for normal weight concrete; one for each set of compressive strength specimens.
4. Concrete Temperature: ASTM C1064; test concrete hourly when air temperature is 40 deg. F (4 deg. C) and below, and when 80 deg. F (27 deg. C) and above; and when each set of compression test specimens is made.
5. Compressive Strength Specimens: ASTM C31; one set of four standard cylinders for each 100 cubic yards or fraction thereof, of each concrete type placed in any one day, or for each 5000 sq. ft. of surface area placed, unless otherwise directed. Mold and store cylinders for laboratory cured test specimens.
6. Compressive Strength Tests: ASTM C39; one specimen tested at every hole with path construction at seven (7) days, with a total of two at 28 days, and one retained in reserve for later testing if required.

CLEANING - Perform cleaning during installation of the work and upon completion of the work. Remove from site all excess materials, debris, and equipment. Repair damage resulting from concrete operations. Sweep concrete sidewalks and pavement, wash free of stain, discoloration, dirt and other foreign material prior to final acceptance.

INSPECTION AND ACCEPTANCE:

All phases of the cart path installation are subject to inspection by the Park Planner or Golf Course Designer

Required Submittals:

- Submit (1) copy of each batch delivery ticket indicating the trade name, manufacturer's name and amount of concrete delivered in each batch.

Procure and submit to qualified laboratory at its expense, and provide to Owner's Representative, a minimum of one (1) per hole from areas selected by Owner's representative to determine compliance with these specifications of:

- Sub grade proctor density tests at Contractor's
- Slump Tests
- Core samples per from random areas of completed path.

Materials specifications:

Pavement Depth: 4.5"

Concrete ASTM C 94 Alternate No. 2

4000 psi at 28 days

Minimum cement content is 564 lbs./CY

6 + 2% Entrained Air

Curing Materials ASTM C 309, M171, or M182

Preformed filler ASTM D 1751

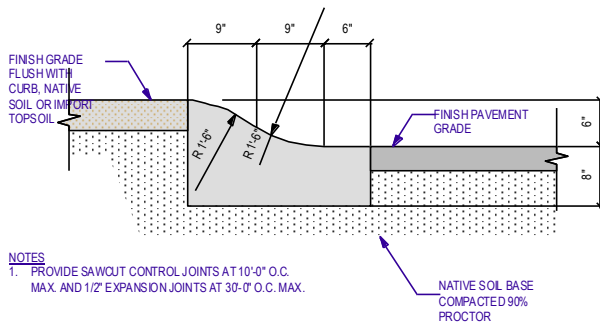
Curing Materials **ASTM C 309, M171, or M182**

Preformed filler **ASTM D 1751**

Testing - The Contractor shall determine in advance either by an approved testing laboratory or based on experience of an approved concrete supplier actual proportions of cement, fine aggregate, coarse aggregate, water and admixtures to be used for the concrete. If proposing unproven materials or mixes, Contractor shall submit samples to an approved testing laboratory in sufficient time to permit evaluation and testing for 28-day compressive strengths.

PAYMENT METHOD

The payment measurement will be Lump Sum for cart path shown on plans. Contractor shall provide a square feet of pavement unit price in case Owner requests cart path extensions.



END OF SECTION

Schedule I - Irrigation

I – 100 – Irrigation

IRRIGATION CONSULTANT:

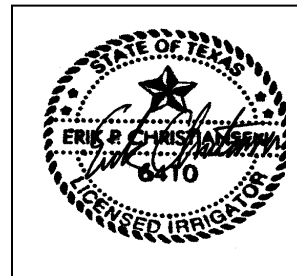


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I. General Conditions

The installation of the Irrigation System will have an Owner's Representative.

Owner's Representative:

The City of North Richland Hills
Joe Pack, PLA (#2284)
4301 City Point Drive
North Richland Hills, TX 76180
Phone: 214-244-4283 cell
Email: jpack@nrhtx.com

Irrigation Consultant:

Erik Christiansen – TCEQ (#6410), ASIC
EC Design Group, Ltd.
400 - 5TH Street
West Des Moines, IA 50265
Phone: 515-225-6365
Email: erik@ecdesigngroup.com

Contractor to be current TCEQ Certified as required by the State of Texas to participate in this bidding process. Furthermore, Certified TCEQ owner/employee to be at the site for the complete installation and is not a sub-contractor to the project.

The objective of these specifications is to provide an assembled and installed two-wire central control system w/smart/ICI control hubs, Qty. (2) maintenance Toro HRRRI/Rain Bird Freedom radios, sprinklers, Qty. (1) Apple iPad w/Life Proof case, RF/solar weather station, HDPE mains, laterals and all associated equipment for the proper operation of an automatic sprinkler system. This system, when finished, will efficiently and effectively operate. Said system shall prove to be satisfactory in all aspects to the Owner and Owner's Representative and Irrigation Consultant. These specifications are to be followed with due perseverance in all respects.

The diagrammatic Plans and Specifications contain a design build element and are intended to include everything obviously requested and necessary to do the proper installation of the work, whether each necessary item is mentioned herein or not, unless otherwise specified the contractor is expected to provide for the same.

Irrigation Plans with Specifications are intended to work together, and any item or feature called for in one and not the other shall be as binding as if called for in both. If a discrepancy exists between an item called for in the Plan and the Specifications, the Plan takes precedence, or the contractor can assume the more stringent as it applies to the best method of operation and installation.

All work specified herein or called for on the drawings shall comply in accordance with all governing ordinances, laws and regulations that apply to the project. If the contractor performs any work contrary to such codes, laws or regulations, they shall assume full responsibility and bear all costs necessary to correct the work, at no additional cost to the Owner or the Owner's Representative.

Bidders must study and compare the Drawings and Project Documents and shall be responsible for discovering and reporting to the Irrigation Consultant any error, omission, inconsistency or other defect that should be apparent to a reasonable prudent Contractor. The Irrigation Consultant will interpret, correct or otherwise clarify the Project Documents as

necessary, and will make any interpretation, correction or clarification in writing and issue it an addendum to all Bidders.

Any work undertaken by the Contractor containing possible errors or conflict without or before a written interpretation or instruction by the Owner's Representative and Irrigation Consultant is done so at the Bidders own risk.

The successful Contractor will be required to install the irrigation system under the following requirements:

1. All open trenches and excavations must be marked and protected on a daily basis. Protection will include barriers and plywood covers over excavations and other necessary procedures to protect the public and other Contractors from the danger of construction activities.
2. The entire site must be left in a clean and safe condition at the end of each workday. "Clean and safe" will be at the discretion of the Owner's Representative and the Irrigation Consultant. The Contractor shall appoint a supervisor who shall be responsible for all safety measures, as well as for compliance with all applicable governmental laws, ordinances, rules and regulations such as, for example, "OSHA" and "Right to Know" legislation and all city, county and state codes.
3. The order of work will be as agreed upon with the Irrigation Consultant and Owner's Representative. The resulting agreement shall become the basis for the irrigation part of the master project schedule.
4. Contractor shall keep the existing system up and operating each night to water the entire golf course (as required by Owner) and Contractor shall coordinate with Owner each day as to the status of the existing irrigation system. Furthermore, Contractor shall water all new and replaced turf until time of irrigation system acceptance by Owner and Irrigation Consultant.

The omission of any material from this Specification is not to be interpreted to the effect that omitted material will not be furnished by the Contractor. All material and labor, unless specifically indicated as being furnished by others, must be furnished and installed by the Contractor under the signed agreement.

The Irrigation Consultant shall stake or mark out the location of decoder cable, any mainline and wire paths in the immediate area to be worked on prior to starting installation. In the event there are any discrepancies from the work shown in the plan, the Contractor shall verify the dimensions with the Irrigation Consultant before work may begin in that area. **The Contractor shall have available a minimum of four persons, staking flags, four 100 ft. tapes and shall produce "as staked" drawings, all for use during all staking visits by the Irrigation Consultant.**

Routing of the pipe and cable are diagrammatic and the Contractor will be expected to make field adjustments. The Owner reserves the right to make pipe and/or cable routing changes from those shown in the plans in cases, but not limited to; where ledge, boulders or other obstacles impede the path. Minor changes of this nature shall not affect the cost or time limits of the work.

Valve boxes should be as indicated on the drawings. Communication cable shall not be run through bunkers or tees. No valve boxes shall be located within the fairway cut and shall not be installed in the walking path to or from the green.

Rock, shale, stones, organic matter or trash not suitable for use as backfill shall be dug and hauled to an accessible dumpsite on the property. The Contractor shall be responsible calling in all locates and will be responsible for all damage to underground utilities of which they are aware, including, but not limited to; gas, water, electricity, cable, telephone, under-drains and drain tiles. Coordinate with the Owner's Representative and responsible utility marking firms the locations of existing underground utilities and drains.

The Contractor shall not assign or subcontract any part of the work without the expressed written approval of the Owner prior to the start of said work to be subcontracted. Acceptance of a subcontractor does not relieve the Contractor of his responsibilities under the agreement.

The Contractor shall maintain a minimum of one 40-foot storage trailer on site for storage of materials other than piping. Location of trailer(s) shall be at the staging area. The Contractor shall be solely responsible for meeting deliveries and their off-loading. The Owner shall not be responsible for inventorying or off-loading any materials to be used in the irrigation system.

Bidding Instructions

Part 1 - General

1.1 QUALIFICATIONS AND INTERPRETATIONS

A. Construction schedules must fit within the overall project schedule detailed elsewhere, and approved by Owner's Representative:

Owner's Representative:

The City of North Richland Hills
Joe Pack, PLA (#2284)
4301 City Point Drive
North Richland Hills, TX 76180
Phone: 214-244-4283
Email: jpack@nrhtx.com

Irrigation Consultant:

Erik Christiansen – TCEQ (#6410), ASIC
EC Design Group, Ltd.
400 - 5TH Street
West Des Moines, IA 50265
Phone: 515-225-6365
Email: erik@ecdesigngroup.com

1. All proposals must meet requirements in the Quality Assurance Section IV item 1.30-A.
2. Irrigation said improvements must be completed in the time frame designated by the Owner and Owners Representative.
3. List all, if any, sub-contractors to be employed by the contractor on irrigation project.
4. Acknowledgment of receipt of addenda.
5. Completion of unit pricing.
6. Contract will be awarded, unless all bids are rejected, under normal circumstances, to the responsible Bidder whose bid and accepted alternative bids resulted in the lowest sum.
7. Owner reserves the right to reject any and all bids when such rejection is in the interest of Owner; to reject a bid or a Bidder who has previously failed to perform properly or complete on time contracts of similar nature; to reject bid or a Bidder who is not, in the opinion of the Irrigation Consultant or Owner, in a position to satisfactorily perform the contract. Owner also reserves the right to waive any informalities and technicalities in bidding. Owner may also accept or reject any alternatives.
8. All contractors must visit job site before submitting a bid.

1.2 CONTRACT SPECIFICATIONS

- A. The detailed specifications, which follow, shall govern the materials furnished and work performed in the construction of the work covered by this contract.
- B. No attempt has been made in the specifications to segregate work to be performed by and trade, subcontract or proposal item, under any one section of the specifications. Any segregation between trade or craft jurisdiction limits, and the establishment of subcontract limits, will be solely a matter of agreement between the Contractor and his employees and his Sub-contractors. The specifications will govern the construction of the entire work and the provisions thereof all govern each item and unit of work to which such provisions apply.

1.3 APPLICATIONS FOR PAYMENT – See Architects Section

- A. Each Application for Payment shall be consistent with previous applications and payments as certified by the Irrigation Consultant and Owner and paid for by the Owner.
- B. Application Preparation:
1. Payment will be based on the proportion of the total work completed during the period for which application for payment is being made. Contractor shall submit application for payment on the 9th of each month, for work completed from the 10th of the previous month.
 2. Include any contract revisions authorized by approved Change Orders issued prior to the last day of the construction period covered by the application. Payment for such authorized contract revisions will be computed based on the Unit Prices included on the Bid Form taken times the actual quantity of such materials installed as result of such change as measured by the Contractor and reviewed by Owner.
- C. Transmittal:
1. Submit three executed copies of each Application for Payment to the Owner including waivers of lien and similar attachments, when required.
 2. Transmit each copy with a transmittal form listing attachments, and recording appropriate information related to the application in a manner acceptable to the Owner.
- D. Final Payment Application:
1. Submittals, which must coincide, with submittal of the final payment Application for Payment include the following on forms, and executed in a manner acceptable to the Owner
 - a. Final waivers of liens from every entity involved with performance of Work.
 - b. Consent of Surety of Final Payment. (If applicable)
 - c. Itemized statements listing taxes, fees and similar obligations paid.
 - d. Owner shall retain 10% of services amount only until substantial completion has been performed.**

1.6 CONTRACTOR'S LIABILITY INSURANCE – See Owner's Representative for additional requirements

III. Project Close-out

1.1 SUBSTANTIAL COMPLETION

A. Preliminary Procedures: Before requesting inspection for certification of Substantial Completion, complete the following:

1. Remove temporary facilities from the site.
2. Complete final cleaning requirements as described below in this Section.
3. If 100 percent (100%) completion cannot be shown, prepare a list of incomplete items, the value of incomplete construction, and reasons the Work is not complete.

B. Inspection Procedures: On receipt of a request for inspection, the Irrigation Consultant will either proceed with inspection or advise the Contractor of unfulfilled requirements. The Irrigation Consultant will either prepare the Certificate of Substantial Completion following inspection or advise the Contractor of work that must be completed or corrected before the certificate will be issued.

1. If Irrigation Consultant indicates items to be completed before the Certificate of Substantial Completion can be issued, then the Irrigation Consultant will repeat inspection when requested and assured that the Work has been substantially completed. Total cost of re-inspections will be borne by the Contractor.

2. Results of the completed inspection will form the basis of requirements for final acceptance.

C. In accordance with any pertinent section under separate cover.

1.2 FINAL ACCEPTANCE

A. Re-inspection Procedure: The Irrigation Consultant will re-inspect the Work upon receipt of notice that the Work, including inspection list items from earlier inspections, has been completed.

B. Upon completion of re-inspection, the Irrigation Consultant will prepare a certificate of final acceptance, or advise the Contractor of Work that is incomplete or of obligations that have not been fulfilled but are required for final acceptance. If necessary, re-inspection will be repeated. Total cost of re-inspection will be borne by the Contractor.

C. In accordance with any pertinent section under separate cover.

1.3 FINAL PAYMENT REQUEST

A. Submit the final payment request with supporting documentation for final payment.

B. Submit an updated final statement accounting for final additional changes to the Contract Sum.

C. Final payment will be made after Owner approval.

D. In accordance with any pertinent section under separate cover.

IV. Irrigation System

Part 1 - General

1.1 RELATED DOCUMENTS

A. Drawings and General Provisions of Contract, including Bidding Requirements apply to work specified in this Section.

1.2 DESCRIPTION

A. Provide all labor, materials, equipment and supervision required to construct an underground irrigation system as shown and specified. The following work includes; but not limited to:

1. LSM/ICM decoder sprinklers.
2. Ground plate/rod testing and documentation – Paige Electric.
3. Sprinklers and swing joint assembly.
4. HDPE mains/laterals.
5. Pump station (Qty. 1) and drop z-pipe (Qty. 3).
6. Excavation and backfilling irrigation system work.
7. Associated plumbing and accessories to complete the system.

1.3 QUALITY ASSURANCE

A. Installer's qualifications: Minimum of 12 years' experience installing golf course irrigation systems of comparable size. A minimum of 12 similar golf courses completed within the last 3 years.

B. Materials, equipment, and methods of installation shall comply with, but not limited to, the following codes and standards:

1. All local and state laws, ordinances, and all the established codes applicable thereto.
2. Texas Commission on Environmental Quality (TCEQ).
3. American Society of Irrigation Consultants (ASIC).
4. National Fire Protection Association (NFPA); National Electrical Code.
5. American Society for Testing and Materials (ASTM).
6. National Sanitation Foundation (NSF).
7. The Irrigation Association (IA).

C. The Contractor shall take out all required permits, arrange for all necessary inspections and shall pay any fees and expenses in conjunction with the same as a part of the work under this Section.

D. Excavating, backfilling, and compacting operations: Comply with execution requirements and as specified.

E. **Supply Irrigation Consultant with min. of (4) people for all staking visits, flags and (4) 100' tapes. Visits must be scheduled a minimum of 14 days prior to proposed visit and have 3 or more holes prepared for staking.**

- F. Obtain Irrigation Consultant's acceptance of installed and tested irrigation system prior to installing backfill materials.
- G. **Site must be Site HDPE Certified & Two-Wire Certified by manufacturer.**

1.4 SUBMITTALS

- A. **Irrigation Contractor to provide completed ICM Two-Wire station/address worksheet obtained from Irrigation Consultant prior to final approval.**
- B. Submit manufacturer's product data and installation instructions for each of the system components.
- C. Submit the following material samples:
 - 1. Wire, wire connectors and sealer.
- D. Submit the following equipment samples to Owner:
 - 1. Valves and valve access boxes.
 - 2. Controller.
- E. Approved equipment samples will be returned to Contractor and may be used in the work.
- F. Upon irrigation system acceptance, submit written operating and maintenance instructions. Provide format and contents as directed by the Irrigation Consultant **as well as completed LSM/ICM Two-Wire station/address worksheet obtained from Irrigation Consultant.**
- G. Provide irrigation system record drawings:
 - 1. The record as-built drawings shall be the original plan of the irrigation system as constructed. The final as-built drawings shall be prepared and delivered to Irrigation Consultant electronically at a scale of 1" = 100'. CADD drawings (.dwg) shall consist of a piping plan, a schedule plan, and a wiring plan, indicating the location, type and size of all wires, valves and other fittings. The drawing shall show all electronic controls, connections and wire splices. Measurements shall be indicated on the plan between sprinklers and valves. All pertinent materials shall be dimensioned from three fixed objects (i.e., drain valves, lateral isolation valves, mainline isolation valves, and wire splice connections). Station numbers shall be indicated on the drawings.
 - 2. The as-built drawings shall be made by an agent of the Contractor who shall utilize engineering skills and procedures in a manner satisfactory to the Owner's Representative in accomplishing his work. The record drawings shall be kept clean, dry and safe from damage at all times. The drawings shall be brought up-to-date at the close of each working day, and shall accurately indicate the location of all equipment placed to that time. In addition, a copy of the as-built drawing shall be mailed or delivered to the Owner's Representative every two weeks during the construction period. **No monthly pay requests will be approved without a current copy of the as-built drawings. No final approval will be given until the Owner approves the as-built drawings. Final "as-builts" shall be delivered electronically on minimum 2014 AutoCAD .dwg or newer.**
 - 3. Identify field changes of dimension and detail and changes made by Change Order.
 - 4. **GPS irrigation collection by the Irrigation Consultant does not remove the obligation of the Contractor to produce all "as-built" drawings as stated above. All locations must be located and flagged by Contractor prior to collection of those points by EC Design Group Ltd.**

1.5 DELIVERY, LANDS FOR STORAGE AND HANDLING

- A. Deliver irrigation system components in manufacturer's original undamaged and unopened containers with labels intact and legible.
- B. Deliver plastic piping in bundles, packaged to provide adequate protection of pipe ends.
- C. Store and handle materials to prevent damage and deterioration. Store materials in locations designated and approved by the Owner.
- D. Provide secure, locked storage for wire, pump station and similar components that cannot be immediately replaced, to prevent theft and therefore avoid installation delays.
- E. Contractor has the right to a temporary construction facility for storage and protection of materials.

1.6 PROJECT CONDITIONS

- A. Prior to any excavation at the site, contractor shall examine any applicable drawings, if any available from the Owner and/or Irrigation Consultant and consult with Owner's personnel and utility company's representatives to determine possible utility locations and depths. No compensation will be allowed for damage to existing utilities and systems.
- B. Take precautions to insure that equipment and vehicles do not disturb or damage existing site grading, walks, curbs, pavements, utilities, plants, and other existing items and elements on public and private property.
- C. Promptly repair damages to adjacent facilities caused by irrigation system work operations. Cost of repairs at Contractor's expense.
- D. Promptly notify the Irrigation Consultant of unexpected sub-surface conditions.
- E. **Irrigation system layout is diagrammatic.** Exact locations of piping, valves, wire and other components shall be established by Irrigation Consultant in the field at time of installation, and approved by the Owner or the Owners Representative before installation.
 - 1. Minor adjustments in system layout will be permitted to clear existing fixed obstructions.
- F. Cutting and patching (cart paths, walks, drives etc) – as applicable:
 - 1. Cut through concrete and masonry with core drills. Jackhammers not permitted.
 - 2. Materials and finishes for patching shall match existing cut surface materials and finish. Exercise special care to provide patching at openings in exterior wall watertight.
 - 3. Methods and materials used for cutting and patching shall be acceptable to the Irrigation Consultant.
- G. Protection of Persons and Property:
 - 1. Barricade open excavations occurring as part of this work and post warning lights.
 - 2. Operate warning lights as recommended by authorities having jurisdiction.
 - 3. Protect structures, utilities, sidewalks, pavements, curbs and other facilities from damage caused by settlement, lateral movement, undermining, washout and other hazards created by this work.

1.7 GUARANTEE

A. For a period of one (1) year from date of **final acceptance** of work performed under this Section, the Contractor shall promptly furnish and install any and all parts and equipment which prove defective in material, workmanship or install at no additional cost to the Owner except trench settling and any pipe/fittings failures will be guaranteed for (2) years.

Part 2 - Products

2.1 ACCEPTABLE MANUFACTURERS-OR PRE-APPROVED EQUAL

- A. RAIN BIRD SALES, GOLF DIVISION, ASUZA, CA
- B. THE TORO COMPANY, IRRIGATION DIVISION, RIVERSIDE, CA

2.2 MATERIALS

A. General:

1. Provide only new materials, without flaws or defects and of the highest quality of their specified class and kind.
2. Comply with pipe sizes indicated. No substitution of smaller pipes will be permitted. Larger sizes may be used subject to acceptance of the Irrigation Consultant. Remove damaged and defective pipe.
3. Provide pipe continuously and permanently marked with manufacturer's name or trademark, size, schedule and type of pipe, working pressure at 73 ° F. and National Sanitation Foundation (NSF) approval.
4. **All pipe and fittings (HDPE) shall be supplied from the same manufacturer throughout the entire job (pre-approved by Irrigation Consultant or Owner).**

B. Irrigation Mains/Laterals - HDPE pipe, fusion fittings and connections:

1. Pipe and tubing shall be manufactured from a PE4710 resin listed with the Plastic Pipe Institute (PPI) as TR-4. The PE 4710 resin material will meet the specifications of ASTM D 3350-09 with a minimum cell classification of PE 445474C. Pipe shall be manufactured to the dimensions and requirements of ASTM F714. The pipe shall contain no recycled compounds except that generated in the manufacturer's own plant from resin of the same specification from the same raw material. All HDPE pipe shall be in straight lengths or coils.
2. The supplier must be capable of supplying both the pipe and fittings – as required.
3. The supplier must have the capability to train the contractor's employees in butt fusion, electrofusion, socket fusion, sidewall saddle fusion and compatible fusion of HDPE pipe and fittings.
4. The supplier must be capable of providing a **"Fusion Technical Hot Line"** to assist in fusion and fusion equipment questions.
5. The supplier must be capable of providing a trained representative on site upon the request of the contractor, owner or consultant to address any problems that are encountered during the installation.
6. The supplier must furnish a written **25 year limited Warranty** for HDPE pipe fittings and valves for all irrigation applications
7. Main Line Isolation Valves shall be Polyethylene Ball Valves. They shall be PE 4710 and have operating nut and HDPE ball valves to be pipeline size or as per plan.
8. All gate valves will have stainless steel stem with HDPE stubs – see plan.

9. Mechanical taps on 2", 3", and 4" pipe for sprinkler connections can be made using LASCO. Saddle tee with 1½ acme thread outlet, drilling the hole prior to installing the saddle.
10. All fused taps on HDPE pipe shall be made using Electrofusion branch saddles with 2" IPS HDPE outlet or sidewall branch saddles. The pressure rating shall be equal to or greater than 100 PSI Central Plastics PE 4710 or approved equal.
11. Pipe and Fittings: Size as indicated on the plans. Install as shown in accordance with manufacturers recommendations.
12. Hauling, unloading and distributing pipe: During loading, transportation and unloading, every precaution shall be taken to prevent injury to the pipe. No pipe shall be dropped from cars or trucks, or allowed to roll down slides without proper retaining ropes. During transportation pipe shall rest on suitable pads, strips, skids or blocks securely wedged or tied in place. Any pipe damaged shall be replaced.
13. Sections of polyethylene pipe should be joined into continuous lengths on the jobsite above ground, whenever possible. The joining method shall be the butt fusion and or socket fusion method and shall be performed in strict accordance with the pipe supplier's recommendations. The butt fusion equipment used in the joining procedures should be capable of meeting all conditions recommended by the pipe supplier, including, but not limited to, temperature requirements of 425 +/- 15 degrees Fahrenheit, alignment, and an interfacial fusion pressure of 75 +/- 15 psi for hydraulic. The fusion equipment used shall be manufactured by McElroy Manufacturing, or equal. The butt fusion joining will produce a joint weld strength equal to or greater than the tensile strength of the pipe itself.
14. Electrofusion or socket fusion (500°F +/-25 may be used where the butt fusion method cannot be used. Electrofusion couplings and fittings shall be PE 4710 with a minimum cell classification of PE 445474C. Electro-fusion couplings or fittings shall have a manufacturing standard of ASTM F1055. Couplings and fittings shall have the same pressure rating as the pipe unless otherwise specified on the plans.
15. Mechanical connection to other types of pipe shall be made by one of the following methods:
16. Flange, using HDPE flange adapter with ductile iron back up ring, and zinc-plated bolt pack.
17. Mechanical joint, using HDPE Mechanical Joint (MJ) adapter kit.
18. Bell MJ adapter with kit (4"- 12)
19. Inspection: Inspect the pipe for defects before installation and fusion. Pipe shall not exhibit scratches or gouges greater than defective, damaged or unsound pipe will be rejected.
20. Testing if pressure testing is required, testing shall be done hydrostatically.
21. Prior to HDPE pipe being installed in the trench, at the beginning of the job, the contractor shall cut out the first butt fusion of each pipe size. The contractor shall prepare the sample for the test in accordance with the "Bend Back Testing" procedure in accordance with ASTM F 2620.
22. The samples shall be tested in the presence of the Owner's Representative and/or Irrigation Consultant, all in accordance with testing procedures outlined. All samples shall be labeled and saved. Testing must be done at 73 degrees F plus or minus 5 degrees. The test temperature and sample size are critical to testing. The purpose of the test is to determine if the weld meets specified standards. A pass means no failures during the bend back test. This means a good weld. A break means a bad weld. Any failure shall require additional testing.
23. The contractor shall have successfully installed high density polyethylene pipe in a minimum of (6) golf irrigation projects. References will be required.

These reference(s) must provide a satisfactory response or the experience will not be accepted.

24. If a contractor has not previously successfully installed HDPE pipe for golf irrigation projects, he will be required to have a qualified fusion technician from the supplier for a period of three to five days (at the expense of the contractor). The required time for HDPE pipe (fusion and mechanical) training shall be collectively agreed to by the Owners Representative, manufacturer's representative and Irrigation Consultant. Training shall be provided by a qualified technician and shall include the following:

Butt fusion

Socket fusion

Electrofusion

Attachment of mechanical saddles

If electro and/or sidewall fusion is required, this training must also be completed while the technician is on site.

Sidewall saddle fusion (if required for project)

Compatible fusion

25. If the contractor owns butt fusion equipment, the equipment must be serviced prior to use for this project. The machine must be environmentally friendly and in good working order. The hydraulic system must be leak free. All fusion equipment with pressure gauges shall be properly calibrated and the heating tool is to be in proper working condition prior to use.

26. Rented butt fusion machines must be rented from a company that has a fusion machine service center or centers certified by the butt fusion machine manufacturer. The fusion equipment supplied shall have certification that pressure gauges are properly calibrated and the heating tool is to be in proper working condition prior to use.

27. Product Warranty - Limited Warranty: Manufacturer warrants that, for a period of (25) twenty five years from the date of shipment for a golf irrigation application, it will replace any section of said manufacturers HDPE pipe product that is defective in materials or workmanship, provided that Buyer, upon discovery of a defect, promptly notifies Seller of the defect and, as instructed by Seller at such time, either returns the product to Seller for inspection or allows Seller to inspect at the place of installation. If Seller determines the product to be defective, Seller will provide new product of the same specification and same quantity as the defective product and Seller will bear the expense of freight to deliver the replacement product to the jobsite for domestic projects, and to the closest USA port for foreign projects. Seller does not warrant the installation of product. Any defects introduced after the shipment of product by Seller, whether due to handling, installation or other cause, are not covered by this warranty. This warranty does not cover labor or other costs of installing products. Buyer's sole remedy for defective product shall be to receive replacement product as provided in this Limited Warranty.

28. Swing Joints:

a. Lasco 360° swing joint assembly or equal. Contractor is responsible for proper installation of swing joints due to actual lateral depths lay lengths (as per manufacturer recommendations).

29. Service Tees:

a. CMF Global fusion riser or pre-approved equal. **Note – all fittings must be approved in the submittal process as well as style of lateral installation.**

b. Shall be located under all sprinkler heads and quick coupler valves **with appropriate thrust blocks at all change of directions and dead ends.** (see detail)

30. "Air Release Valves" – Qty. (10) in base bid:

a. Air release valves shall be installed at high points on golf course and/or where diagrammatically noted on irrigation plan. Irrigation plan locations are diagrammatic; Contractor will be responsible for proper location as approved by Irrigation Consultant. Air release valves shall be installed in a Jumbo valve box and plumbed with a ball valve and wye strainer to isolate for maintenance.

C. LSM/ICM sprinklers, valves and associated equipment:

1. Products and associated equipment are to be provided by only one manufacturer for the complete project. Refer to the drawings for the quantity and diagrammatic locations of the following:

2. Sprinkler heads:

a. Full Circle Two-Wire Series V-I-H (see drawings)

Part Circle Two-Wire Series V-I-H (see drawings)

b. Spacing of heads shall not exceed manufacturer's maximum recommendations. Conform to manufacturer's specifications concerning diameter of throw and gallonage at given pressures.

3. Isolation Valves:

a. HDPE 13.5 stub out isolation valve "resilient wedge" (or equal)-see plan

b. Harco lateral swivel 3" with PE 360° isolation 2" valves (or equal)-see plan

c. Size isolation valves to match line size-Manual Valves only.

d. Installed in specified valve access box.

e. Each style of isolation valve shall have (2) 4'-0" tee handle keys supplied by Irrigation Contractor.

4. Quick Coupler Valves:

a. 1" QCV with stabilizer and unitized swing joint.

b. Provide matching quick coupler keys.

c. Installed as specified on detail plan.

d. All Q.C.V. shall be plumbed with a 1" brass insert swing joint with stabilizer.

D. Control Equipment:

1. Refer to the drawings for the quantity and locations of the following:

2. Central Control:

a. RAIN BIRD ICI Cirrus CIR-TW-MRLK or TORO Lynx for Smart Hub,, premium computer, 5 year GSP, Freedom interface, (4) maintenance radios with DTMF, tuned to proper frequency. Base to include MI mobile, (2) cellular compatible Apple iPad and LifeProof case with mapping application.

b. Paige Electric 96" ground plate assembly on each communication wire path exiting the central.

c. Base antenna, antenna structure coaxial cable, lighting protection, ground plates, central UPS, and other items shall all be supplied and installed as per manufacturer's recommendations; as per survey for proper operation of said systems. Contractor shall be responsible for any items, mentioned or not, for the operation of either specified radio system.

d. FCC licensing and frequency shall be supplied by Contractor and performed by qualified agent, at no additional cost to the Owner

3. Weather Station: **Location by Owner**

a. Rain Bird WS-PRO-WL-S or Toro RF wireless/solar weather station with surge protection and grounding as per manufacturer recommendations.

b. Station will come with all R.F. equipment from weather station to maintenance facility and be loaded with software to be able to communicate directly to central software programs. Contractor shall be responsible for any items and software, mentioned or not, for the operation of either specified weather station.

E. Primary Electrical Wire: **In existing pump house(s).**

F. Secondary Control Wire: Two-wire maxi comm cable (see plans)

G. Controller Communication Wire: Specified #14 Paige Wire IC Maxi Communication Cable. To be routed with main line piping and looped. – See Plan (one exception noted on plan)

2.3 ADDITIONAL MATERIALS

A. Primary comm path connectors: **Decoder cable (as per manufacturer's recommendations) – Paige Electric #270RC-X (for switches).**

1. 3M COMPANY 3570G-N wire connectors or scotchcast and waterproof sealer, or Large 3M #4 Resin Bag UL listed for 600 volts and underground splice. All electrical connections shall apply to NEC standards and all local, state and federal codes whether listed or not.

B. Secondary Control Wire connectors: **As required - (sprinkler splices only)**

1. 3M COMPANY 3570G-N splice kits. All electrical connections shall apply to NEC standards and all local, state and federal codes whether listed or not.

2. **One decoder per head** to be programmed back to central. -See Plan

C. Valve Access Boxes:

1. Standard or Jumbo Box with extension kit-or equal; for air relief valves and isolation valves.-See Plan

D. Thrust Blocking for Drop Z-Piping: - as applicable (base bid HDPE)

1. Thrust blocks for reference only are anchors placed between pipe or fittings and the solid/virgin trench wall. Specified blocking of concrete which is calculated to have a compression strength of 2,000 pounds per square inch. The mixture is one part cement, two parts washed sand and five parts gravel. Thrust blocks must be constructed so the bearing surface is in direct line with the major force created by the pipe or fitting. See diagram. The earth bearing surface should be undisturbed (virgin wall).

2. Thrust blocking is to prevent the line from moving when the pressure load is applied, transferring the load from the pipe to a wide load bearing surface. Thrust blocks are required where fittings are used to change direction (i.e. the following but not limited to; all tees, elbows, wyes, caps, valves and reducers etc.) of the pipe line. The thrust blocking must be formed against a solid trench wall (virgin wall) and these fitting areas must be excavated by hand, mechanical equipment will damage the bearing surface of the trench wall.

3. The size and type of thrust depends on pipe size, line pressure, type of fitting, degree of bend and type of soil. Thrust block size may be calculated by the example procedures shown below.

4. It will be the responsibility of the Contractor for all change of direction thrust blocks on all size piping. Furthermore, the warranty period for pipe and/or fitting failures is for (2) years from the date of acceptance.

Step 1 – Multiply the pressure level desired for testing by the appropriate value shown in the following table:

Pipe Size	Dead End or Tee	90 deg Elbow	45 deg Elbow	22 ½ deg Elbow
1 ½"	2.94	4.16	2.25	1.15
2"	4.56	6.45	3.50	1.78
2 ½"	6.65	9.40	5.10	2.60
3"	9.80	13.90	7.51	3.82
3 ½"	12.80	18.10	9.81	4.99
4"	16.20	23.00	12.40	6.31
5"	24.70	35.00	18.90	9.63
6"	34.80	49.20	26.70	13.60
8"	59.00	83.50	45.20	23.00
10"	91.50	130.00	70.00	35.80
12"	129.00	182.00	98.50	50.30

Based on pounds per psi working pressure.

Step 2 – Determine the bearing strength of the soil from the table below:

Bearing Strength of Soils

Soils and Safe Bearing Loads Lbs. Sq. Ft.

Sound Shale	10,000
Cemented Gravel and Sand-difficult to pick	4,000
Coarse & Fine Compact Sand	3,000
Medium Clay - Can be spaded	2,000
Soft Clay	1,000
Muck	0

Step 3 – Divide the total thrust obtained in Step 1 by the bearing strength of the soil; this gives the square feet of area needed.

Side Thrust on Curves – An outward pressure exists on all deflections from a straight line. Good soil, properly tamped, can be sufficient to hold side thrust – unless soil conditions are unstable. In that case, to anchor against this side thrust, the blocking should be placed against the pipe on each side of the coupling. Do not thrust block the coupling itself.

Side Thrust

<i>Pipe Size Inches</i>	<i>Side Thrust Pounds per Degree</i>
1 ½"	5.1
2"	7.9
2 ½"	11.6
3"	17.1
3 ½"	22.4
4"	28.3
5"	43.1
6"	60.8
8"	103.0
10"	160.0
12"	225.0

Based on side thrust per 100 lb./in² pressure per degree of deflection.

Note: Multiply side thrust pounds by degrees of deflection times pounds of pressure divided by 100 to obtain total side thrust in pounds.

3. 2,000-psi test minimum on thrust block meeting all ASTM specifications C-33 and C-150 or C-175 standards. **Note: Thrust blocks can differ depending on the type of fittings and soils. Contractor must review all conditions for adequate thrust. Furthermore, a joint restraint may be required to obtain and secure a fitting from movement.**
- E. Harco Ductile Iron Fittings & Joint Restraints: **For Reference Only**
 1. Fittings for bell and gasket pipelines shall be ductile iron, slant-bell design, and deep bell type. Fittings shall be manufactured of ductile iron, grade 65-45-12 in accordance with ASTM A-536. Fitting gaskets shall be in accordance with ASTM F-477. All ductile iron fittings shall be equipped with four 90-degree apart, outwardly extending radial lugs to accommodate for appropriate method of mechanical restraints.

2. Fittings made from more than one piece shall utilize securely fastened bolt-on style spigot-bell links. Slip-on rings or loose rings as the method of attachment are not permissible.
3. All tee fittings used to connect remote control valve and quick coupling assemblies to the mainline shall be ductile iron, deep bell service tees.
4. All ductile iron bends; reducers, tees and gate valves shall be mechanically restrained. All bell and gasket joints adjacent to restrained joints shall be restrained in accordance to the manufacturers recommended design criteria and guides. **Note: Sites where ductile iron fittings without joint restraints and thrust blocks are acceptable in lieu of joint restraints and/or joint restraints that are used in cases of non-bearing soils or where joint restraints are used exclusively.**
5. The mechanical joint restraint shall be capable of securing the PVC pipe directly to the ductile iron fitting without the use of bolts, links and adapters. The joint restraint shall be capable of securing PVC gasket pipe joints and gate valves without use of threaded rods. Joint restraints made for iron or steel pipe are not permissible.
6. The joint restraint shall be manufactured from ductile iron, grade 65-45-12 in accordance with ASTM A-536. Bolts and nuts used on joint restraints shall be provided as part of the restraint assembly.
7. All joint restraints shall be installed using methods recommended by the manufacturer. All bolts and must be tightened as per manufacturer's recommended torque ratings.
8. All tees, bends, reducers and end caps should be restrained using LH Series clamp sets. Additionally, a certain number of bell-spigot joints before and after a restrained fitting require LB Series joint restraints. There are also LG series clamp kits for restraining slip-on gate valves.
9. The following table lists values for the minimum restrained length of pipe ("L"). Every joint within the distance "L" should be restrained. Bends require that all joints be restrained on both sides of the bend for the specified length. The most critical are capped pipe and gate valves installed at terminating points for future connections; these should be treated as Dead End applications.

Table values are based on 125 psi test pressure, 2 feet cover, sand-clay type soil and safety factor of 2. For pressures other than 125 psi, multiply the "L" values by the actual pressure and divide by 100.

MATERIAL SPECIFICATIONS:

Clamps and Tie Rods: Ductile Iron ASTM A-536

Bolts and Nuts: Low Alloy Steel standard 304 Stainless Steel (Optional)

Pipe Size (in)	Minimum Restrained Length (L), feet				Reductions (sizes down)		
	Bends (degrees)				1D	2D	DE
	11	22	45	90			
2	1	1	2	6	NA	NA	19
2.5	1	2	4	9	4	NA	23
3	2	3	5	11	8	10	30
4	2	4	9	20	14	20	45
6	3	6	13	29	30	40	63

8	4	8	15	38	33	55	83
10	5	9	19	45	31	56	100
12	5	10	21	53	54	58	118

Notes: 1D reduction denotes one size down (such as 4x3, 12x10)

2D reduction denotes two sized down (i.e. 4x2.5, 12x8)

DE is a dead end (for a cap, plug or a gate valve.)

More detailed tables are available upon request.

10. Ductile iron joint restraints shall be installed on all fittings and gate valves for all IPS-Size, ring joint PVC pipe. The joint restraint shall be capable of securing the PVC pipe directly to the lugs on the Leemco deep bell ductile iron fittings without the use of bolts, links and adapters. The joint restraint shall be capable of securing PVC pipe to PVC pipe and PVC pipe to ring joint gate valves without the use of threaded linkages.

All ductile iron fittings shall be secured to full-length pipes and on all bends and tee branches, the next joint of the pipe shall be secured. At least two full lengths of pipe must be secured when attached to bends and tee branched 8" and larger, and at least three full lengths of pipe must be secured to dead end pipe. Pipe joints that occur in less than full-length when attached to a fitting shall also be secured.

11. All fittings shall be deep bell, manufactured specifically for IPS-Size pipe and made of Grade 65-45-12 ductile iron. Fittings 4" and larger shall have slanted bells to allow deflection of pipe in all planes. Fittings shall have four lugs at each push-on joint with ribbed and cupped gasket design, made from EDPM elastomer.

12. All quick coupling valves shall be fitted with stabilizers. Quick coupling stabilizers shall be manufactured in Grade 65-45-12 ductile iron; shall attach to the hex portion of the valve and be secured with a single bolt. Stabilizer shall have 12" span and be capable of resisting rotational and vertical motions. Stabilizers shall be LS-120 (3/4" and 1") and LS-150 (1 1/2") as manufactured by Leemco, Inc., Colton, CA. Stabilizers made of plastic or fabricated from angle iron and U-bolts are not acceptable.

Part 3 - Execution

3.1 INSPECTION

A. Examine final grades and installation conditions. Do not start irrigation system work until unsatisfactory conditions are corrected and approved by Owner or Irrigation Consultant.

3.2 PREPARATION

A. Layout and stake the location of each pipe run and all sprinkler heads and sprinkler valves. Obtain Irrigation Consultant's acceptance of layout prior to excavating.

B. Strip sod for pipe trenches with a mechanical sod stripper uniformly 1" to 1-1/2" thick with clean-cut edges (for existing turf only).

C. Remove existing paving for sleeve installation. Saw cut existing paving to provide uniform straight transition at new to existing paving.

D. Place sleeves as indicated for installation of piping and control wire.

3.3 INSTALLATION

A. Excavating and backfilling:

1. Excavation shall include all materials encountered, except materials that cannot be excavated by normal mechanical means.
2. Excavate trenches of sufficient depth and width to permit proper handling and installation of pipe and fittings.
3. If the pulling method is used, the pipe "plow" shall be vibratory type. Starting and finishing holes for pipe pulling shall not exceed a 1'-0" by 3'-0" opening.
4. Excavate to depths required to provide 4" minimum depth of amended earth fill or sand bedding, free of all rock, and debris, for piping on all sides and bottom of pipe when rock or other unsuitable bearing material is encountered.
5. Fill to match adjacent grade elevations with approved earth fill material. Place and compact fill in layers not greater than 8" depth.
 - a. Provide approved earth fill or sand to a point 4" above the top of pipe - free of rock and debris
 - b. Fill to within 6" of final grade with approved excavated or borrows fill materials free of lumps or rocks larger than 2" in any dimension.
- c. Provide clean topsoil fill free of rocks and debris for top 6" of fill.
6. Except as indicated, install irrigation main lines with a minimum cover of 24" based on finished grades with a minimum depth of 30". Install irrigation lateral lines with a minimum cover of 18" based on finished grades with a minimum depth of 24". No sweeping of lateral lines.
7. Excavate trenches and install piping and fill during the same working day. Do not leave open trenches or partially filled trenches open overnight.
8. Replace stripped sod in sufficient time to allow for satisfactory sod recovery and growth. Water stripped and reinstalled sod until irrigation system is placed in operation (irrigation contractor to return turf to original condition or better). Existing turf conditions only.
9. Replace paving of same materials, using joints and patterns to match existing adjoining paving surfaces.
10. Backfill shall be compacted to 95% standard proctor density. Contractor will be responsible for the restoration of all settlement for period of (2) years from acceptance as well as all pipe and/or fitting failures.
11. **Vibratory pulling method to be employed on all greens, tees and fairways where 2" HDPE piping is shown on plans. Note: Contractor must shoot or lay decoder cable – pulling shall not be permitted. Furthermore, no pulling when encountering rocky soils.**

B. Plastic pipe: For reference only

1. Install plastic pipe in accordance with manufacturer's installation instructions. Provide for thermal expansion and contraction.
2. Saw cut plastic pipe. Use a square-in-sawing vice, to ensure a square cut. Remove burrs and shavings at cut ends prior to installation.
3. Make plastic to plastic joints with solvent weld joints or slip seal joints. Use only solvent and purple cleaner recommended by the pipe manufacturer's instructions. Contractor shall make arrangements with pipe manufacturer for all necessary field assistance.

4. Make plastic to metal joints with Sch. 80 piping.
 5. Make solvent weld joints in accordance with manufacturer's recommendations.
 6. Allow joints to set at least 24 hours before pressure is applied to the system.
 7. Maintain pipe interiors free of dirt and debris. Close open ends of pipe by acceptable methods when pipe installation is not in progress.
 8. All gasketed PVC pipe shall be installed per manufacturer's recommendation using appropriate gasket lube.
 9. Pulled pipe shall be solvent welded 36 hours in advance of pulling.
 10. Contractor shall not drag PVC pipe before installation.
 11. No substitution of smaller pipe, only larger sized pipe will be permitted.
 12. All piping must be installed as per manufacturer recommendations including piping velocity rates.
- C. LSM/ICM Sprinklers, fittings, valves and accessories:
1. Install fittings, valves, sprinkler heads, swing joints and accessories in accordance with manufacturer's instructions.
 2. Set sprinkler heads perpendicular to finished grades, except as otherwise indicated.
 3. Obtain Irrigation Consultant's review and acceptance of height for proposed sprinkler heads and valves prior to installation.
 4. Locate sprinkler heads to assure proper coverage of indicated areas. Do not exceed sprinkler head spacing distances indicated (as per manufacturer recommendations).
 5. Install pop-up gear driven sprinklers on specified swing joint assemblies. (See Detail)
 6. Install quick coupling valves on specified swing joint assemblies. (See Detail)
 7. Install decoder sprinklers as detailed.
 - a. Ground controller in accordance with manufacturer's recommendations (25 OHMS or less) with Paige Electric 96" plate configuration to get to 25 OHMS or less; measure by a meager device. It will be the responsibility of the contractor to prove such measurement before getting released from the said system installation. (See Plan & details).
 - b. ICSD's to be located every 15 ICM's or every 500 whichever condition is reached first. Field surge devices offer "containment" of surge during an event so that the damaged caused by the event will be limited by an ICSD located on either side of the event.
- D. Paige Electric Decoder Control Cable:
1. Install electric control cable in the piping trenches wherever possible. Place wire in trench adjacent to pipe. Install wire with slack to allow for thermal expansion and contraction. Expansion joints in wire may be provided at 200-foot intervals by making 5-6 turns of the wire around a piece of 1/2" pipe instead of slack. Where necessary to run wire in a separate trench, provide a minimum cover of 18" or as per local codes.
 2. Provide sufficient slack at site connections at remote control valves in control boxes, and at all wire splices to allow raising the valve bonnet or splice to the surface without disconnecting the wires when repair is required.
 3. Connect each remote control valve or V-I-H two-wire sprinkler head to one address of a central controller except as otherwise indicated.
 4. Connect remote control valves or sprinkler heads to a common ground wire system independent of all others.

5. Make secondary wire connections to sprinkler heads, remote control electric valves and splices of wire in the field; using PE listed burial splice connectors (i.e.: 3M DBY or 3M DBR), in accordance with manufacturer's recommendations.
 6. Provide tight joints to prevent leakage of water and corrosion build-up on the joint.
 7. Provide new sleeves for all locations where existing sleeves are not indicated. Install new sleeves prior to paving installation wherever possible.
 8. Install pipe sleeves under existing concrete or asphalt surface by jacking, boring, or hydraulic driving of the sleeve. Remove and replace existing concrete and asphalt surfaces where cutting is necessary. Obtain Owner's permission before setting existing concrete and asphalt surfaces. Where piping is shown under paved areas that are adjacent to turf areas, install the piping in the turf areas.
 9. One approved manufacturer shall be used for the entire project, no multiple manufacturers will be allowed for all wire, pipe, cement and primer etc.
- E. Flushing, testing and adjustment:
1. After sprinkler piping and swing joints are installed and before sprinkler heads are installed, open control valves and flush out the system with full head of water. Swing joints should be extended above grade by 2-3 feet above grade by a section of pipe. This will help prevent contaminate piping during flushing.
 2. Perform system testing upon completion of each section. Make necessary repairs and re-test repaired sections as required.
 3. Adjust sprinklers after installation for proper and adequate distribution of the water over the coverage pattern. Adjust for the proper arc of coverage.
 4. Test and demonstrate the controller by operating appropriate day, hour, and station selection features as required to automatically start and shut down irrigation cycles to accommodate plant requirements and weather conditions.
- F. HDPE Roadway Pipe Crossings (see plan):
1. Contractor shall contact and obtain permission from all governing bodies and agencies.
 2. Contractor shall install piping, sleeving and wire sleeves in accordance with said agencies.
 3. Coordinate with Owner for actual sleeving at existing and future roadways.
- G. Stream Pipe Crossings (See detail):
1. HDPE DR11 4710.
 2. Piping shall be stable and restrained to stop movement of piping.
 3. 2" minimal wire sleeve of PVC Sch. 80 conduit (gray in color) or as per local codes, shall be supported separately.
- H. Bridge Crossings (See detail)
1. HDPE DR11 4710 can be used for all bridge crossings as needed.
 2. Contractor is responsible for proper support system.-See Plan
 3. All piping to be hidden inside bridge trusses and exited by prefabricated "Z" piping.
 4. "Z" piping restrained and/or connected with flanges.
- I. Service:
1. When requested, return to the site during the subsequent fall season and winterize the system. Drain all water from the system and blow out the system with compressed air.

2. When requested, return to the site during the subsequent spring season and demonstrate to the Owner the proper procedures for the system start-up, operations, and maintenance (blow out climates only).

3.4 SPARE PARTS

- A. Provide the following:
1. Four extra sprinkler head (s) of each size and type.
 2. Two extra valve access box(s) of each size and type.
 3. Ten quick coupler valve keys and swivel elbows.
 4. Two repair coupling for each size and type of pipe.
 5. Two tee handles for both style isolation valves 4'-0" in length.

3.5 DISPOSAL OF WASTE MATERIAL

- A. Transport unsuitable excavated material, including rock or lava to designated disposal areas on Owner's property. Stockpile or spread as directed. Remove from site and legally dispose of trash and debris.
- B. Maintain disposal routes clear, clean, and free of debris.

3.6 ACCEPTANCE

- A. Test and demonstrate to the Irrigation Consultant and Owner the satisfactory operation of the system free of leaks.
- B. Instruct the Owner's designated personnel in the operation of the system, including adjustment of sprinklers, controller (s) and central, valves and pump station(s).
- C. Upon acceptance the Owner will assume operation of the system.-See application for payment

3.7 CLEANING

- A. Perform cleaning during installation of the work and upon completion of the work. Remove from site all excess materials, soil, debris, and equipment. Repair damage resulting from irrigation system installation.

V. Electrical

Part 1 - General

1.1 APPLICABLE STANDARDS

A. All apparatus, materials and work, shall be in accordance with standards, practices and codes of the electrical industry. Particular attention is directed to requirements of ANSI/NFPA 70 and Underwriters Laboratories, Inc. as suitable for purposes specified and shown.

B. The completed irrigation installation shall conform to all local and special laws, codes or ordinances of all Federal, State and municipal authorities with due jurisdiction.

1.2 PROJECT CONDITIONS

A. Locations of all controllers, heads and other elements of the system are to be approved by Owner or Owner's Representative before wiring is installed.

B. Conductor sizes are based on copper.

C. Wire and cable routing shown on the drawings are approximate. Route wire as required meeting project conditions.-See plan

D. Take precautions to avoid damage to existing site elements and features, including wiring and piping for existing underground irrigation system. Promptly repair damage to such features, cost at Contractor's expense.

Part 2 - Products

2.1 PRIMARY CABLE - N/A (two-wire system)

A. All power cables are Tray Cable (or approved equal); they are to be UL listed for direct burial, and rated at 600 volts. The cable shall include three conductors, which are to be colored per wire industry standard or numbered as 1, 2, and 3. The size of the "hot" and "common" conductors are to be as shown on the irrigation plans, and the size of the "equipment ground" conductor as required by the National Electrical Code, or larger. The inner copper conductors are to be covered with high dielectric PVC and Nylon. The outer jacket will be black PVC and is to be sunlight resistant. (Paige Electric Co., (or approved equal) LP specification number P7266D for 10 AWG and smaller and specification number P7267D for 8 AWG and larger.)

B. Conduit: All branch circuit wires, for 120 volts and higher, shall be installed in electrical conduit. The wires shall be type THWN and sized according to the irrigation system plans. Paige Electric Co., LP specification number P7316. Installation shall meet all local codes and regulations as well as NEC requirements for burial conduit piping. The total cross-sectional area of the wires sleeved through the electrical conduit shall be no more than 40% of the internal cross-sectional area of the conduit.

2.2 SECONDARY CABLE - (Maxi Two-Wire Decoder cable - #14)

A. Construction requirements for a 2/C control cable design to operate valve decoders consisting of tin coated copper conductors, insulated with PVC and having a high density polyethylene direct burial jacket. Conductors are UL approved Type UF. Soft annealed tin

coated copper conforming to ASTM B-33. Polyvinyl Chloride conforming to UF Standard 493 for Type UF rated 60°C. Pressure Extruded High Density PE conforming to ICEA S061-402 and NEMA WC5 Jacket Thickness 3/46" minimum jacket material to completely fill interstices between the two insulated conductors. Color coding of jacket shall be of one solid color. Standard colors red, blue, green, yellow, black, white. (Paige Electric Co., (or approved equal) specification number P7072D.)

2.3 EARTH GROUNDING – See plans for Paige Electric connections and grounding

A. It is the responsibility of the installer to connect all electronic equipment for which they are responsible to earth ground in accordance with Article 250 of the National Electrical Code (NEC). Grounding components will include the items described in the following paragraphs, at a minimum.

Use grounding electrodes that are UL listed or manufactured to meet the minimum requirements of Article 250 of the NEC. At the very minimum, the grounding circuit will include a copper clad steel ground rod, a solid copper ground plate and 100 pounds of PowerSet® earth contact material, as defined. See detail.

Ground rods are to have a minimum diameter of 5/8" and a minimum length of 10 feet. These are to be driven into the ground in a vertical position or an oblique angle not to exceed 45 degrees at a location 10 feet from the electronic equipment, the ground plate, or the wires and cables connected to said equipment. See detail.

The rod (system utilizes 96" plates) is to be stamped with the UL logo (Paige Electric part number 182007.) A 6 AWG solid bare copper wire (about 12 feet long) shall be connected to the ground rod by the installer using a Cadweld GR1161G "One-Shot" welding kit (Paige Electric part number 1820037.) This wire shall be connected to the electronic equipment ground lug. See detail.

The copper grounding plate assemblies (Paige Electric part number 182199L) will have minimum dimensions of 4" x 96" x 0.0625". A 25-foot continuous length (no splices allowed unless using exothermic welding process) of 6 AWG solid bare copper wire is to be attached to the plate by the manufacturer using an approved welding process. This wire is to be connected to the electronic equipment ground lug as shown in the detail of page 1. The ground plate is to be installed to a minimum depth of 30", or below the frost line if it is lower than 30", at a location 8 feet from the electronic equipment and underground wires and cables. Two 50-pound bags of PowerSet® with a neutral PH value (Paige Electric part number 1820058) earth contact material must be spread so that it surrounds the copper plate evenly along its length within a 6" wide trench. Salts, fertilizers, bentonite clay, cement, coke, carbon, and other chemicals are not to be used to improve soil conductivity because these materials are corrosive and will cause the copper electrodes to erode and become less effective with time.

Install all grounding circuit components in straight lines. When necessary to make bends, do not make sharp turns. To prevent the electrode-discharged energy from re-entering the underground wires and cables, all electrodes shall be installed away from said wires and cables. The spacing between any two electrodes shall be as shown in the detail of page 1, so that they don't compete for the same soil.

The earth-to-ground resistance of this circuit is to be measured using a Megger® or other similar instrument, and the reading is to be no more than 25 ohms. If the resistance is more than 10 ohms, additional ground plates and PowerSet® with a neutral PH value are to be

installed in the direction of an irrigated area at a distance of 10', 12', 14', etc. It is required that the soil surrounding copper electrodes be kept at a minimum moisture level of 15% at all times by dedicating an irrigation station at each controller location. The irrigated area should include a circle with a 10-foot radius around the ground rod and a rectangle measuring 1-foot x 24-feet around the plate.

All underground circuit connections are to be made using an exothermic welding process by utilizing products such as the Cadweld "One-Shot" kits. Solder shall not be allowed to make connections. In order to ensure proper ignition of the "One-Shot", the Cadweld T-320 igniter must be utilized (Paige Electric part number 1820040.) The 6 AWG bare copper wires are to be installed in as straight a line as possible, and if it is necessary to make a turn or a bend it shall be done in a sweeping curve with a minimum radius of 8" and a minimum included angle of 90°. Mechanical clamps shall be permitted temporarily during the resistance test process, but are to be replaced with Cadweld "One-Shot" kits immediately thereafter.

2.4 BONDING - None

A. Said grounding circuit is referred-to as "supplementary grounding" in the NEC. And for safety reasons, the NEC required that all supplementary grounds be "bonded" to each other and to the service entrance ground (power source) as shown. This is also "recommended practice" of IEEE Standard 1100-1999. Note that this is in addition to the equipment ground, which is commonly referred to as "the green wire." The power wires (black, white and green for 120 VAC and black, red and green for 240 VAC) must always be kept together in a trench/conduit/tray/etc. The bonding conductors are to be 6 AWG solid bare copper unless the system power conductors are larger than 1/0 AWG, in which case they are to be 4 AWG solid bare copper. All splices to the bonding conductors shall be made using a Cadweld "One-Shot" kit. See details. (Paige Electric part number 1820074)

2.5 SHIELDING - None

A. The bonding conductors are to be installed in such a way so that they act as shielding conductors. This becomes a network of solid bare copper wire over all the main bundles of other wires and cables. See details. The bare copper wire is to be installed as close to the surface as possible, yet being sufficiently below the ground level as to prevent damage from maintenance equipment such as aerators. And it must be placed above all other valve/power/communication wires and cables, per detail, and installed in all trenches as shown on the electrical plan drawings. It is not necessary to install this conductor over short wire runs (less than 150 feet) away from the main wire bundles. The conductor is laid in as straight a line as possible, and when necessary to make bends, do so in a sweeping motion using the detail as a guideline.

The shield network is to be connected to the service entrance earth ground, to all electronic equipment Paige RC connectors and all equipment supplementary grounding electrodes. One such network is necessary for each comm paths. Do not interconnect the equipment ground, bonding and shielding wires from different comm paths.

Connections to be by the Paige Electric Company – see plans and details for actual product applications.

2.6 VOLTAGE STABILIZING EQUIPMENT - None

A. Stabilizer to be installed as per plan. All stabilizers in field locations shall be in an encoded NEMA-3 type enclosure of sufficient size to accommodate the stabilizer and enough room to allow for wiring. The NEMA-3 enclosure shall have a BTU rating based on the following table:

Model listed below and location shown on plan.

1. SOLA model (or equal).-See Plan

Part 3 - Execution

3.1 GENERAL

A. Installation of wiring shall be in accordance with Section IV Irrigation System and in accordance to irrigation system manufacturer's instructions.

B. Any wire or cable that is stressed or damaged in any way shall be replaced at the Contractor's expense.

C. Make splices with approved connector assembly as specified in Section IV Irrigation System.

D. Inspect wire and cable for physical damage and proper connection. Verify continuity of each control circuit.

E. Wire and Cable Installation: Wire and cable burial depth is dictated by the National Electrical Code®. Temperature changes cause wires and cables to expand and contract as much as 1% of the length. And high voltage power lines create large electro-magnetic fields that cause interference and corrupt signals in communication lines. It is therefore necessary to take certain precautions when installing these products.

The contractor shall install all wires and cables carrying up to 30 volts at a minimum burial depth of 6". If mechanical equipment, such as aerifiers and shovels, are expected to disturb the area, then the wires and cables shall be installed at a 12" depth. For wires and cables carrying more than 30 volts and less than 600 volts, the minimum burial depth shall be 24". When installing wires and cables in a trench, they must be "snaked" so that some slack is created. At points along the trench where there are sharp bends, a loop of 12" to 24" shall be created to allow for shrinkage. When communication cables are in the same trench as power wires, there shall be a minimum separation between them of 12"

F. Wire and Cable Splices:

All electrical connections shall incorporate:

1. A solid mechanical connection of the copper conductors.
2. Electrical insulation of the mechanical connection.
3. A means to waterproof the insulated connection.
4. "Strain-relief" to prevent the connection from coming apart when wires/cables are pulled-upon.
5. All connections by Paige Electric and re-enterable connections.

VI. New Pump Station

TECHNICAL SPECIFICATIONS – IRON HORSE GC

Pumping System Model # VTVQ-1-50x2/5ST-500-3-1000-120

Total Design Criteria: Quantity of Pumps: 3

Design Flow: 1000 GPM @ 120 PSI Station Discharge

Third Party Listing

Starting Equipment	U.L. Listed as and Industrial Control Device
Controls	U.L. Listed as and Industrial Control Assembly
VFD Controls	U.L. Listed as and Industrial Control Assembly

Total Design Criteria

Zone	Flow (GPM)	Pressure (PSI)
1	1000	120

Pump Station Incoming Power Requirement

DEVICE	AMP	Voltage	Phase	Hertz
Lead Pump (50HP)/VFD	57	480	3	60
Lag Pumps (50HP)	57			
Sustain Pump (5 HP)	8			
Control Power	3			
Accessories				
Total Full load Amps	125			

Pump Station Main Disconnect Rating

Non-Fused	Amps	Volts
Control Panel	200	480

Operator Interface

Color	15" PC Touchscreen	Touchscreen	Memory Card
YES	NO	7.5"	YES

Variable Frequency Drive

Operating Temperature	0 to 50°C (32° -150°F)
Humidity	Non-Condensing
Minimum Efficiency	98% (full load, base speed)
Frequency Rating	100% continuous drive rating, Intermittent 111% Drive rating for one minute

Safeties

Safety	Setting
Incoming Phase Failure and Low Voltage and Phase Reversal	10% +/-
Individual Power Phase Failure and Low Voltage	10% +/-
Low Discharge Pressure Shut down	25 PSI Below Setpoint
High Discharge Pressure Shutdown	15 PSI Above Setpoint
Low Water Level Shutdown	2' Above Pump Suction

Motor and Pump Data

	PMP	Pump #1	Pump #2	Pump #3	Pump #4	Pump#5	Pump#6
Motor HP	5	50	50	NA	NA	NA	NA
Motor Starting Code G, Class F Insulation							
Motor/Pump RPM	3600	1800	1800	NA	NA	NA	NA
Motor Service Factor	1.15	1.15	1.15	NA	NA	NA	NA
Motor Efficiency	74%	94.1%	94.1%	NA	NA	NA	NA
Motor Power Factor	81%	87.7	87.7	NA	NA	NA	NA
Motor Type	SUB	VHS	VHS	NA	NA	NA	VHS
Motor Disconnect Volts	480	480	480	NA	NA	NA	NA
Motor Full Load Amps	8	57	57	NA	NA	NA	NA
Motor Locked Rotor Amps	53.4	357	357	NA	NA	NA	NA
Motor O.L. Rating, Amps	8.9	63	63	NA	NA	NA	NA
Motor Starter Type	XL	VFD/XL	VFD/XL	NA	NA	NA	NA
Motor Space Heater	N/A	Yes	Yes	NA	NA	NA	NA
Motor De-rate For Altitude	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Motor CFM Requirements	N/A	850	850	NA	NA	NA	NA
Total Station CFM Req'd	1700						
Pump GPM	50	500	500	NA	NA	NA	NA
Pump TDH	311	311	311	NA	NA	NA	NA
Pump Efficiency at Design	65%	84.7	84.7	NA	NA	NA	NA
Pump Shut Off Head, FT	430	410	410	NA	NA	NA	NA
Pump Column Pipe ID	2"	6"	6"	NA	NA	NA	NA
Pump Column Material	Steel	Steel	Steel	Steel		Steel	Steel
Pump Shaft Material		Stainless Steel	Stainless Steel	Stainless Steel	Stainless Steel	Stainless Steel	Stainless Steel
Pump Impeller Material		Stainless Steel	Stainless Steel	Stainless Steel	Stainless Steel	Stainless Steel	Stainless Steel
Pump Bowl Material		Cast Iron	Cast Iron	Cast Iron	Cast Iron	Cast Iron	Cast Iron
Pump Discharge Size	2"						
Pump Check Valve Size	2"	6"	6"	6"	6"	6"	6"
Check Valve Rating, PSI	200	200	200	200	200	200	200
Check Valve Drop at Capacity, PSI	.75	1.5	1.5	1.5	1.5	1.5	1.5
Pump Isolation Valve Size	2"	4"	4"	4"	4"	4"	5"
Isolation Valve Rating, PSI	200	200	200	200		200	200
Electronic Butterfly Valve	N/A	5"	5"	5"	4"	5"	5"
Station Relief Valve Size	3"		6"				

Sequence of Operation.

The system will Start or Stop based on the differential pressure setpoint.

Non-Irrigation times: The pressure maintenance pump (PM) should cycle ON and OFF to maintain irrigation setpoint system pressure. Pressure maintenance pump (PM) should turn OFF when main irrigation pumps Start.

Irrigation times: When the pressure maintenance pump cannot maintain the system pressure, the VFD on the main pump station will start the first main pump and gradually ramp the pressure up to desired irrigation system pressure. The start pressure of the VFD pump should be a differential below the setpoint. The pump speed will be modulated to hold a constant station pressure regardless of the flow. As the flow rate of the system increases and the VFD on the main pump can no longer maintain the system pressure at pump maximum speed, the next sequential pump should start on station VFD and first pump should accordingly reduce its speed and modulate. As the flow keep increasing, the pumps should sequentially be started until all the pumps are running to satisfy the system flow at the setpoint pressure.

When the irrigation demand of flow start to decrease, pumps should be sequentially turned off until a single VFD driven pump is operating.

When no flow demand is required the station pumps should turned OFF.

An algorithm should be written and included with the pump station for reducing the VFD pump speed as the next sequential pump is started so that no pressure surges are generated during the transition between pumps (even with across the line starting). If the operator/customer prefer to switch the VFD from pump to pump for sequential starting, he should be able to select this option with the HMI.

Pump Stuffing Box Style

Type	<i>Mechanical Seal</i>	Packing
	X	

Station Discharge Information

Zone	Isolation Valve	Meter Run Size	Flow Meter Type	Z Pipe	TOL's
1	6"	6"	Electromagnetic	NA	NA

Remote Interface Software & Alarm Notification (Optional)

Watervision Web Based Remote Monitoring	Cellular	X	Radio Bridge	N A	Ethernet Bridge	N A	Ethernet Local	N A
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Main Electrical Enclosure Lighting

Interior	X	Exterior	NA
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Fertigation Injection System

Qty of Single Head Units	Max GPH Per Pump	Tank size-Quantity	Tank Level Transducer	Run Relay & Optical Isolator
1	80	500,1000-1,2,3, N/A	QTY. 1	YES / NO
1	30	500,1000-1,2,3, N/A	?	YES / NO



**Iron Horse Golf Course Improvements Project
North Richland Hills, Texas**

RFB 20-002- SEPTEMBER 18, 2019

ADDENDUM NO. 3

ADD INFORMATION PROVIDED BELOW TO PAGE 3- INVITATION TO BID.

Add an additional bullet as follows: Date of Substantial Completion: Friday August 7, 2020.

Add an additional bullet as follows: Date of Iron Horse reopening: Tuesday September 1, 2020.

ADD INFORMATION PROVIDED BELOW TO PAGE 41 OF THE TECHNICAL SPECIFICATIONS:

B. Clearing and Grubbing- *The Contractor shall remove trees as shown on clearing plan, after field review with golf course architect. Add the following sentence: All stumps must be ground down to just below grade with appropriate tree grinding equipment.*

ADD INFORMATION PROVIDED BELOW TO PAGE 99 OF THE TECHNICAL SPECIFICATIONS:

III- Project Close-Out- 1.1 Substantial Completion- Prior to A, add the following:

July 15, 2020 is considered to be the last acceptable grassing date. Therefore, the date of Substantial Completion has been determined to be August 7, 2020. Owner's acceptance and last allowable day for construction is September 1, 2020. Iron Horse Golf Course will reopen to the public on September 1, 2020.

The Contractor agrees that, from the compensation otherwise to be paid, The Owner may retain the sum of Five Hundred dollars (\$500.00) for each calendar day after the published date of Substantial Completion that the work remains not substantially complete, which sum is agreed upon as the proper measure of liquidated damages which the Owner will sustain per diem by the failure of the Contractor complete the work by the time stipulated in the contact. This sum in not to be construed in any sense a penalty.

ADD INFORMATION PROVIDED BELOW TO THE IRRIGATON SPECIFICATIONS:

Regardless of irrigation sprinklers/ the control system specified and chosen, Contractor will use Rainbird Maxi Control Cable.

ADDENDUM #3 – SEPTEMBER 18, 2019 FOR RFB 20-002

ADD THE TWO ATTACHMENTS: IHR-EX IRR SCAN 1 AND IHR-EX IRR SCAN 2.

ADD THE ATTACHMENT: SIGN IN SHEET

THIS ADDENDUM MUST BE SIGNED AND RETURNED WITH YOUR BID.

Acknowledge receipt of this addendum by inserting these pages with your bid.

This addendum form is a part of the contract documents and it so modifies, amends, deletes and/or adds to the original bid document.

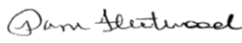
Name and Address of Company:

Fleetwood Services LLC

4311 Willow Street

Dallas, TX 75226

Authorized Representative:

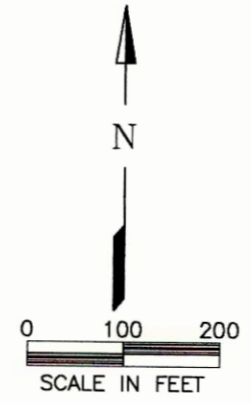
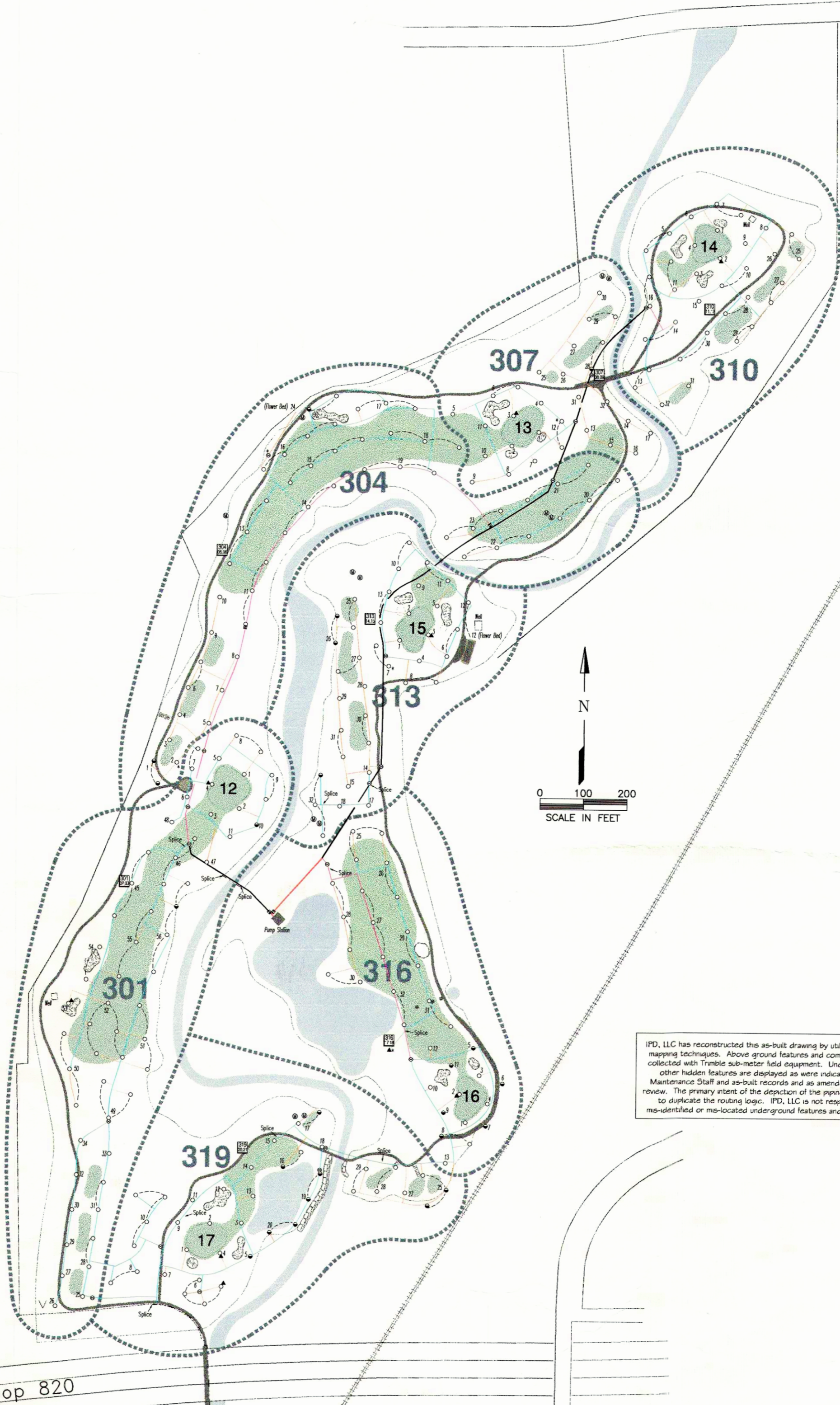
Signature: 

Name: Pam Fleetwood

Title: Owner

Phone: 972-707-8314

Email: pam@fleetwoodsolutions.net



IPD, LLC has reconstructed this as-built drawing by utilizing field GPS mapping techniques. Above ground features and components were collected with Trimble sub-meter field equipment. Underground and other hidden features are displayed as were indicated by the Maintenance Staff and as-built records and as amended after their review. The primary intent of the depiction of the piping is to attempt to duplicate the routing logic. IPD, LLC is not responsible for mis-identified or mis-located underground features and components.

Loop 820

IRRIGATION SYSTEM
HEAD & PIPE LAYOUT
SATELLITE STATION CONTROL

IronHorse Golf Course
North Richland Hills, Texas



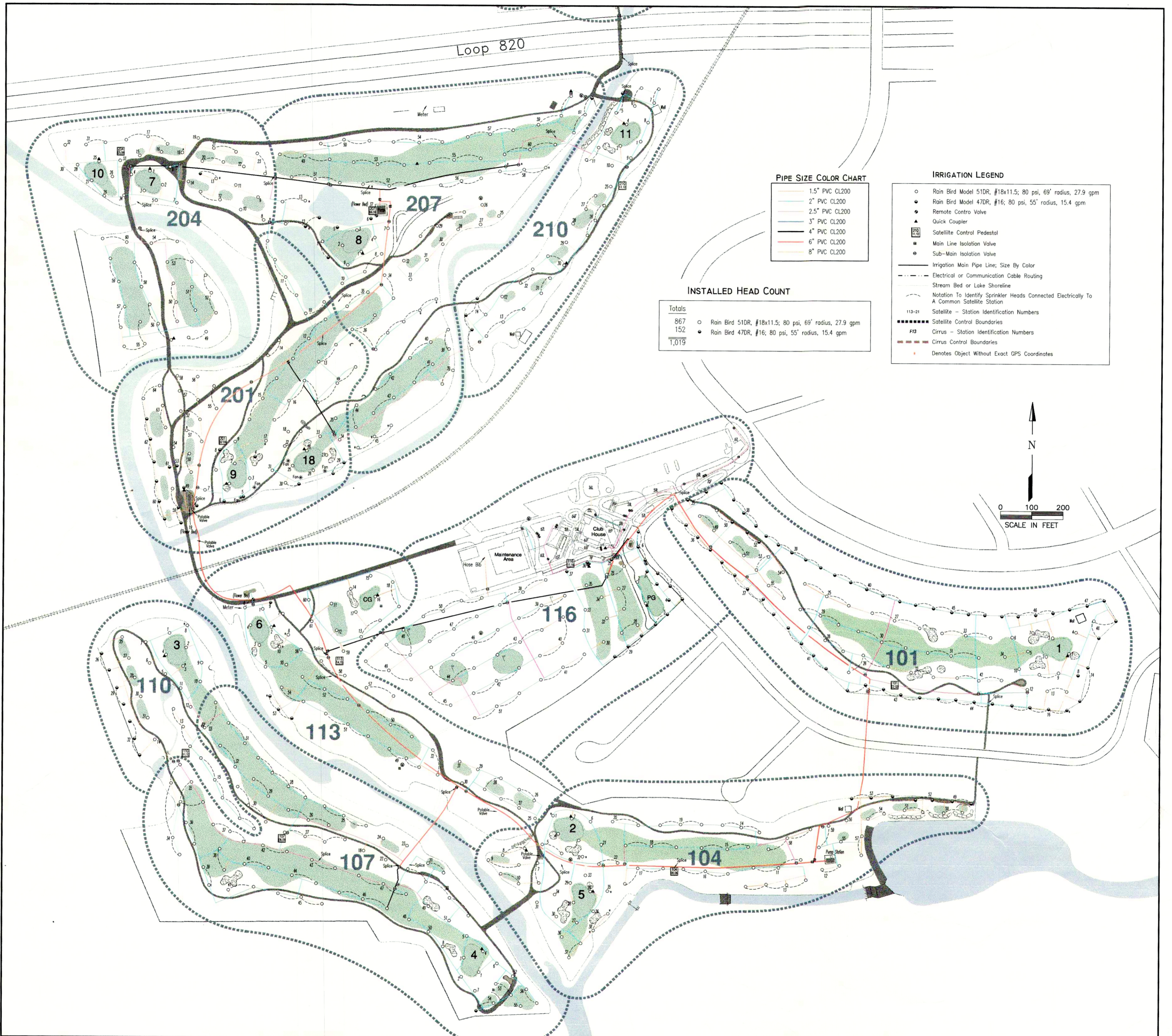
Mapping Tools
for
Better Golf

Golfmapstm

IPD, LLC
425 Patricia Road
Georgetown, Texas 78628
512-528-1669

IronHorse.dwg
Sheet 1 of 2
07/02/03 14:01





PIPE SIZE COLOR CHART

1.5" PVC CL200
2" PVC CL200
2.5" PVC CL200
3" PVC CL200
4" PVC CL200
6" PVC CL200
8" PVC CL200

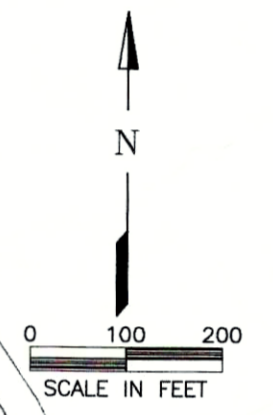
INSTALLED HEAD COUNT

Totals	867
	152
	1,019

- Rain Bird 51DR, #18x11.5; 80 psi, 69' radius, 27.9 gpm
- Rain Bird 47DR, #16; 80 psi, 55' radius, 15.4 gpm

IRRIGATION LEGEND

- Rain Bird Model 51DR, #18x11.5; 80 psi, 69' radius, 27.9 gpm
- Rain Bird Model 47DR, #16; 80 psi, 55' radius, 15.4 gpm
- ▲ Remote Control Valve
- ▲ Quick Coupler
- Satellite Control Pedestal
- Main Line Isolation Valve
- Sub-Main Isolation Valve
- Irrigation Main Pipe Line; Size By Color
- - - Electrical or Communication Cable Routing
- Stream Bed or Lake Shoreline
- Notation To Identify Sprinkler Heads Connected Electrically To A Common Satellite Station
- 113-21 Satellite - Station Identification Numbers
- Satellite Control Boundaries
- F13 Cirrus - Station Identification Numbers
- Cirrus Control Boundaries
- Denotes Object Without Exact GPS Coordinates



Iron Horse Pre-Bid Meeting – September 17, 2019

<u>Name</u>	<u>Organization</u>	<u>Phone</u>	<u>Email</u>
City of North Richland Hills			
Vicki Loftice		817-427-6624	VLOFTICE@nrhtx.com
Joe Pack	NRH	817-427-6622	jpack@nrhtx.com
Bill Thornton			BTHORNTON@nrhtx.com
Robert Fleetwood	Fleetwood-Service LLC	469-865-4721	robert@fleetwoodservice.net
Mark Craigton	Ewing Irrigation	214-697-4846	MCraigton@EwingIrrigation.com
Bill Hardy	Vm Golf	832-289-4345	whardy@VmGolfServices.com
James Sales	Vm Golf	710 6307261	
ANTONIO EVANGELISTA	NRH	817 427 6642	AEVANGELISTA@NRHTX.com
Scott Kendall	NRH	817 427 6156	skendall@nrhtx.com
Iron Horse Golf Course			
Jerrold Gibson	Arcis Golf	682-365-3245	jgibson@arcisgolf.com
Kevin Lindsey	Arcis Golf	817-992-8921	KLindsey@arcisgolf.com
Consultant			
Jeffrey D Brauer	GolfScapes, Inc.	817-797-6376	jeff@jeffreydbrauer.com
Larry Collins			
Other Suppliers			
CHAD FISHER	RAIN BIRD LANGHORN INC	713.551.6197	cfisher@Langhorninc.com
Bidders			



**Iron Horse Golf Course Improvements Project
North Richland Hills, Texas**

RFB 20-002- SEPTEMBER 23, 2019

ADDENDUM NO. 4

**ADD INFORMATION PROVIDED BELOW TO SCHEDULE F, C. TEE CONSTRUCTION, B.-
TEE MIX 4" DEPTH ITEMS PURCHASE AND PLACE/INSTALL.**

Place the number 67,400 in the estimated quantity line for each item. The itemized bid form has been corrected and highlighted in yellow.

**ADD INFORMATION PROVIDED BELOW TO PAGE 137 OF THE TECHNICAL
SPECIFICATIONS:**

The Harco lateral swivel valve on EF saddle, 3" and 2 ½" have been removed as they were accidentally repeated from page 136.

ADD INFORMATION PROVIDED BELOW TO THE ITEMIZED BID FORM:

Schedule B- Brushing, Clearing and Demo, A Clearing and Grubbing.

Round Up/Till Existing Turf (Bid Allowance of 5 AC), Estimated Quantity is 5 AC. The itemized bid form has been corrected and highlighted in yellow.

**ADD INFORMATION PROVIDED BELOW TO PAGE 89 OF THE TECHNICAL
SPECIFICATIONS.**

Accessories, I. Expansion Joints. ½" by 4" Zip Strips to be caulked with approved silicone caulk. All reference to details and specifications should place all expansion joints in the cart path to 50' c.c.

ADD INFORMATION PROVIDED BELOW TO THE ITEMIZED BID FORM:

Schedule G Soil Prep, Fertilize, Grass, Sod- A. Rock and Debris Removal, Fine Grad, Prepare Seedbed Fairways and Rough. Shaded areas have been added to the description to read Fairways, Roughs and Shaded Areas. The changes to the Itemized bid form are highlighted in yellow.

ADD INFORMATION PROVIDED BELOW TO THE ITEMIZED BID FORM:

Schedule G Soil Prep, Fertilize, Grass, Sod- C. Grassing-Fairway and Rough (419) The estimated quantity is changed to 18 AC. The change to the Itemized bid form is highlighted in yellow.

Schedule G Soil Prep, Fertilize, Grass, Sod- C. Grassing-

Steep Banks/Mounds (Double Rate 419 sprigs) The estimated quantity is 1 AC. The change to the itemized bid form is **highlighted in yellow.**

Shade Allowance. The Quantity has been changed to 2 and the unit remains as AC. The stabilization product has been added to the description, which is Futerra TRM netting or approved equal. The changes to the itemized bid form is **highlighted in yellow.**

Schedule G Soil Prep, Fertilize, Grass, Sod- D. Sod-

Tee Surface- Shade Zoysia.-The line is to be deleted entirely with the Quantity being zero (0). All 67,400 SF of the Tees are to be sprigged with 419. The changes to the bid form have been **highlighted in yellow.**

ADD INFORMATION PROVIDED BELOW TO PAGE 45 OF THE TECHNICAL SPECIFICATIONS:

B. Topsoil Management- Stripping Topsoil and Stockpiles- Amend the first sentence to read, “Topsoil shall be stripped at an average of 1”, where available , and all available topsoil shall be taken from areas where greater amounts of topsoil are available.

ADD INFORMATION PROVIDED BELOW TO PAGE 65 OF THE TECHNICAL SPECIFICATIONS:

Testing- Amend the first sentence to read, The Contractor shall make sure Top Mix is pre-tested at supplier for general conformance. The Owner will arrange for on- site testing of delivered samples a least one month before the first scheduled placement.

Testing- Amend the third paragraph to read, The Owner shall submit the materials to a USGA approved testing laboratory of its choosing. The owner will be fiscally responsible for all testing under this section.

ADD INFORMATION PROVIDED BELOW TO PAGE 92 OF THE TECHNICAL SPECIFICATIONS:

A General- Add an additional bullet at the beginning to read, The Owner will be responsible for hiring and compensating an independent testing laboratory for the required tests outlined in these specifications.

ADD THE ATTACHMENTS: FINAL DETAILED BASE BID FORM WITH QUANTITIES IN EXCEL AND PDF. THESE FORMS WILL BECOME THE FINAL BID FORM WITH QUANTITIES AND WILL REPLACE THE ORIGINAL. Areas highlighted in yellow have been changed.

ADD THE ATTACHMENT: FINAL BID AND ALTERNATE FORM ADDENDUM 4. THIS FORM WILL BECOME THE FINAL BID AND ALTERNATE FORM AND WILL REPLACE THE ORIGINAL. Areas highlighted in yellow have been changed.

ADD THE ATTACHMENT: ADDENDUM 4 DETAIL LOW WATER CROSSING MULTIPLE PIPE INLET

THIS ADDENDUM MUST BE SIGNED AND RETURNED WITH YOUR BID.

Acknowledge receipt of this addendum by inserting these pages with your bid.

This addendum form is a part of the contract documents and it so modifies, amends, deletes and/or adds to the original bid document.

Name and Address of Company:

Fleetwood Services LLC

4311 Willow Street

Dallas, TX 75226

Authorized Representative:

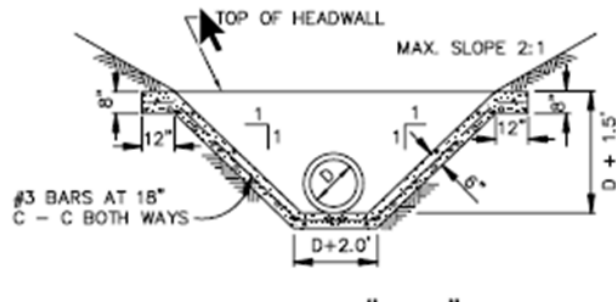
Signature: *Pam Fleetwood*

Name: Pam Fleetwood

Title: Owner

Phone: 972-707-8314

Email: pam@fleetwoodservices.net



SINGLE PIPE INLET AT 16 GREEN (ABOVE) CONCRETE AT SAME SPEC AS CART PATH

- NOTE: HEADWALL CONTAINING PIPE ALSO SLOPED BACK AT APPROX 2:1 SLOPE AS SIDE SLOPES

FOR 4x 36" PIPE CROSSING AT HOLE 13 –

- USE DETAIL ABOVE, PLUS
- PIPES MUST BE ALL ALSO BE SPACED AT DIAMETER + 2 FEET.

2019-2020 RENOVATION PROJECT DETAILED BASE BID FORM WITH QUANTITIES

BID DATE: September 25, 2019, at 2:00 P.M.

SCHEDULE A - ACTIVATION AND MOBILIZATION

DESCRIPTION	EST. QTY.	UNIT	UNIT COST	AMOUNT
A - BONDS AND PERMITS				
Bonds, Permits, Insurance, License	1	LS	\$110,000.00	\$110,000.00
B. - MOBILIZATION AND PROJECT MANAGEMENT				
Mobilization	1	LS	\$20,000.00	\$20,000.00
Staging / Fuel & Material Storage	1	LS	\$20,000.00	\$20,000.00
Project Management & Staking	1	LS	\$40,000.00	\$40,000.00
Schedule Total A				\$190,000.00

SCHEDULE B - BRUSHING, CLEARING & DEMO

DESCRIPTION	EST. QTY.	UNIT	UNIT COST	AMOUNT
A. - CLEARING & GRUBBING				
Round Up/Till Ex Turf (Bid Allowance of 5 ac)	5	AC	\$1,200.00	\$6,000.00
Clear/Grub Individual Trees (misc caliper)	125	EA	\$400.00	\$50,000.00
Protect Trees to Remain w/ Cable	1	LS	\$2,500.00	\$2,500.00
B - 300 DEMOLITION				
Asphalt Cart Paths & Legally Dispose	11,847	S.F.	\$1.00	\$11,847.00
Concrete Cart Paths & Legally Dispose	25,641	S.F.	\$1.00	\$25,641.00
Schedule Total B				\$95,988.00

SCHEDULE C - CUTS AND FILLS/MASS GRADING

DESCRIPTION	EST. QTY.	UNIT	UNIT COST	AMOUNT
C - 100 TOPSOIL MANAGEMENT AND MASS GRADING				
A. Topsoil Management				
Strip/Replace (Assume 1" Average)	2,900	CY	\$3.00	\$8,700.00
Import Fairway/Rough Topsoil (17.2 Ac)	9,303	CY	\$30.00	\$279,090.00
B. Mass Grading - Unclassified Excavation				
Fill (Bank Yards, Cuts 13,440 as per Plan)	10,725	CY	\$2.00	\$21,450.00
Weed Control & Dust Control	1	LS	\$2,000.00	\$2,000.00
C. Rough Shaping				
	1	LS	\$20,000.00	\$20,000.00
Schedule Total				\$331,240.00

SCHEDULE D - DRAINAGE

DESCRIPTION	EST. QTY.	UNIT	UNIT COST	AMOUNT
4"	2,740	LF	\$6.00	\$16,440.00
6"	6,450	LF	\$8.00	\$51,600.00
8"	3,580	LF	\$10.00	\$35,800.00
10"	2,925	LF	\$12.00	\$35,100.00
12"	525	LF	\$15.00	\$7,875.00
18"	140	LF	\$20.00	\$2,800.00

24"	610	LF	\$30.00	\$18,300.00
36"	1,080	LF	\$50.00	\$54,000.00
48"	90	LF	\$75.00	\$6,750.00
54"		LF		

B. Drainage Inlet / Outlets

1. ADS N12 Perf. Risers, 12" Gravel Encased, Light Duty Metal Grates, 3-6 (Max) feet deep

12"	86	EA	\$250.00	\$21,500.00
18"	43	EA	\$375.00	\$16,125.00
24"	9	EA	\$425.00	\$3,825.00
36"	3	EA	\$900.00	\$2,700.00
48"	1	EA	\$1,500.00	\$1,500.00

2. NDS Square Plastic Box XX15 Series Galvanized Grates

12"	14	EA	\$200.00	\$2,800.00
18"	3	EA	\$500.00	\$1,500.00

DESCRIPTION	EST. QTY.	UNIT	UNIT COST	AMOUNT
Flared End Sections Inlet - ADS N12 Pre Fab				
10/12"	6	EA	\$250.00	\$1,500.00
15"	0	EA	\$0.00	\$0.00
18"	1	EA	\$300.00	\$300.00
24"	2	EA	\$350.00	\$700.00
30"	0	EA	\$0.00	\$0.00
36"	0	EA	\$0.00	\$0.00
48"	1	EA	\$1,500.00	\$1,500.00
Small Pipe Outlets w Pipe Cut Flush to Angled Slope				
4", 6" & 8" with rodent guard	18	EA	\$25.00	\$450.00
Multiple Pipe Concrete Collar (Inlet and Outlet)				
Hole 13 - 4 -36" Collar	2	EA	\$1,500.00	\$3,000.00
Hole 16 - 24" Pipe w Concrete Collar	1	EA	\$1,500.00	\$1,500.00
Hole 16 - Outlet Beveled to Grade at WL	1	EA	\$1,000.00	\$1,000.00

Schedule Total D **\$288,565.00**

SCHEDULE E - ENVIRONMENTAL PROTECTION / SWPPP

DESCRIPTION	EST. QTY.	UNIT	UNIT COST	AMOUNT
A - BONDS AND PERMITS				
SWPPP Plan/Permit/Execution/Maintenance	1	LS	\$4,000.00	\$4,000.00

Schedule Total E **\$4,000.00**

SCHEDULE F - FEATURE CONSTRUCTION

DESCRIPTION	EST. QTY.	UNIT	UNIT COST	AMOUNT
A. - USGA GREENS CONSTRUCTION - Greens and Collars				
A. Perforated Tile				
1. Perforated Tile - 4" w gravel	1,320	LF	\$5.75	\$7,590.00
2. Flush Out/Connection Markers (Allow)	6	EA	\$45.00	\$270.00
B. Pea Gravel Layer				
1. Purchase	13,200	SF	\$1.40	\$18,480.00
2. Place / Install	13,200	SF	\$0.30	\$3,960.00
C. Greens Mix				
1. Purchase	13,200	SF	\$3.60	\$47,520.00
2. Place / Install	13,200	SF	\$0.50	\$6,600.00
F. Bio Roll/Silt Fence to Protect Mix				
	300	LF	\$1.40	\$420.00
H. Interface Liner/Tracer Wire				
	611	LF	\$1.25	\$763.75

C - TEE CONSTRUCTION

A. Tee Fine Grade & Laser Level	67,400	SF	\$0.15	\$10,110.00
B. Tee Mix - 4" Depth				
Purchase	67,400	SF	\$0.60	\$40,440.00
Place / Install	67,400	SF	\$0.30	\$20,220.00
D. - SAND BUNKERS				
A. Spray Weeds	24,000	SF	\$0.03	\$720.00
B. Perforated Tile - Approx QTY 1 per 20 S.F. of sand bunker				
1. 4"	1,200	LF	\$5.75	\$6,900.00
2. Flush Outs/Markers - 2 ea.	34	EA	\$40.00	\$1,360.00
C. Cut / Shape 8" Lip, Fine Shape & Compact Bunker Floor				
1. Edge & Shape	24,000	SF	\$0.30	\$7,200.00
2. Compact Base	24,000	SF	\$0.05	\$1,200.00
D. Better Billy Bunker Liner Furnish & Install	24,000	SF	\$1.80	\$43,200.00
E. Sand				
1. Supply	24,000	SF	\$0.85	\$20,400.00
2. Placement/Spread	24,000	SF	\$0.30	\$7,200.00
Schedule Total F				\$244,553.75

SCHEDULE G - SOIL PREP, FERTILIZE, GRASS, SOD

DESCRIPTION	EST. QTY.	UNIT	UNIT COST	AMOUNT
A. Rock & Debris Removal, Fine Grade, Prepare Seedbed				
Greens & Collars	13,200	SF	\$0.20	\$2,640.00
Tees	67,400	SF	\$0.20	\$13,480.00
Fairways, Roughs & Shade Areas	21	AC	\$1,200.00	\$25,200.00
Steep Banks/Mounds	1	AC	\$1,800.00	\$1,800.00
B. Fertilization and Ammendments				
Greens	13,200	SF	\$0.03	\$396.00
Tees	67,400	SF	\$0.03	\$2,022.00
Fairways, Roughs & Shade Areas	21	AC	\$300.00	\$6,300.00
Steep Banks/Mounds	1	AC	\$300.00	\$300.00
C. Grassing				
Greens (Champions)	13,200	SF	\$0.60	\$7,920.00
Tees (419)	67,400	SF	\$0.16	\$10,784.00
Fairways & Rough (419)	18	AC	\$2,400.00	\$43,200.00
Steep Banks/Mounds (Double Rate)	1	AC	\$5,000.00	\$5,000.00
Shade Allowance (Fescue Mix)w futerra TRM net	2	AC	\$2,500.00	\$5,000.00
D. - Sod				
419 Rough @ Greens, Tees, Sand Bunkers	93,665	S.F.	\$0.42	\$39,339.30
Green Collars - 3 feet Tif Top	1,700	S.F.	\$0.70	\$1,190.00
				\$0.00
Schedule Total G				\$164,571.30

SCHEDULE H - HARDSCAPE

DESCRIPTION	EST. QTY.	UNIT	UNIT COST	AMOUNT
H-200 CART PATH - 5" Depth w/ 650 Fibermesh, 3600 PSI. Broom Finish. Contraction Joints Width of Pavement, Exp. Every 8th				
A. Cart Path				
Subgrade & Pavement				
7' Width	30,320	SF	\$5.25	\$159,180.00
10' Width	16,170	SF	\$5.25	\$84,892.50
4" Roll Curb	680	LF	\$5.50	\$3,740.00
B. Patching, Saw Cuts, Repair	1	LS	\$2,000.00	\$2,000.00
Schedule Total H				\$249,812.50

SCHEDULE I - IRRIGATION SYSTEM

- NOTES: 1) SUPPLY LUMP SUM BASE BID FOR BOTH RAIN BIRD AND TORO, OWNER WILL SELECT.**
- 2) BASE BID DOES NOT INCLUDE PUMP STATION IN SECTION B (SUPPLIED BY OWNER), But Includes Z PIPING ON EXISTING PUMP STATIONS IN SECTION A AND C And B if Selected
- 3) BASE BID DOES INCLUDE ALL IRRIGATION MAIN LINES, LATERALS, SPRINKLERS AND RELATED EQUIPMENT FOR SECTIONS B AND C ONLY, BUT INCLUDING CONNECTING SECTIONS A AND B, AND B AND C
- 4) CONTRACTOR WILL INSTALL Z PIPE AT PUMP STATION B AS PART OF BASE BID.
- 5) CONTRACTOR SHALL REMOVE ALL SPRINKLERS, SATELITES AND RELATED EQUIPMENT.

DESCRIPTION	QTY.	UNIT	COST	AMOUNT
A. - LUMP SUM BID SECTION B & C - RAIN BIRD (Owner's Choice)				
INSTALL & CONNECT Z PIPE ON SECTION B PUMP	1	LS	\$1,500.00	\$1,500.00
IRRIGATION SYSTEM AS SHOWN ON PLAN	1	LS	\$1,006,724.00	\$1,006,724.00
INTEGRATE SECTION A CONTROL SYSTEM (Attach Separate Explanation)	1	LS	\$0.00	\$0.00

B. - LUMP SUM BID SECTION B & C - TORO (Owner's Choice)				
INSTALL & CONNECT Z PIPE ON SECTION B PUMP	1	LS	\$1,500.00	\$1,500.00
IRRIGATION SYSTEM AS SHOWN ON PLAN	1	LS	\$1,074,687.00	\$1,074,687.00
INTEGRATE SECTION A CONTROL SYSTEM (Attach Separate Explanation)	1	LS	\$0.00	\$0.00

Schedule Total I				\$
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SCHEDULE K - PROJECT CLOSE OUT

DESCRIPTION	EST. QTY.	UNIT	UNIT COST	AMOUNT
As-Builts/Manuals/Training	1	EA	\$ 25,000.00	\$ 25,000.00
Haul Road and Other Turf Repair	1	EA	\$ 5,000.00	\$ 5,000.00
Move Out/Equipment Removal	1	EA	\$ 10,000.00	\$ 10,000.00

Total Schedule K				\$ 40,000.00
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Total Construction Bid (with Toro Irrigation)				\$2,684,917.55
--	--	--	--	-----------------------

Total Construction Bid (with Rainbird Irrigation)				\$2,616,954.55
--	--	--	--	-----------------------



2640 Tarna
PO Box 59929
Dallas, TX 75229

713.551.6197
Fax 972.243.6478
cfisher@longhorninc.com



The City of North Richland Hills
Iron Horse Golf Course

Explanation of Irrigation Control System Integration

Iron Horse Golf Course currently has a Rain Bird control system consisting of a Central Control Computer located in the maintenance shop with Par+ Satellite Controllers in the field. This system provides *Real Time Two-Way Communication* utilizing Maxi-Wire wire paths.

The improvements proposed in RFP 20-002 call for the Complete Installation of Irrigation of Sections B & C with integration of Section A.

This is very simple to achieve with Rain Bird's unique ability to provide a *hybrid control system*. The newly renovated sections B & C will be connected to the Central Control Computer via remotely mounted ICI Interfaces and controlled by the existing computer (*Although we provided a new computer as a part of the bid package at No Extra Charge.*) The existing section A satellite system will remain untouched and operate from the same computer connected directly just as they are now. Thus, requiring only one central computer and no new interfaces or hardware change outs for Section A. It's that easy. This unique feature also makes it very easy to upgrade Section A at a later date without the need to upgrade section B & C interfaces or the central computer.

In addition, as a part of the Arcis Management Portfolio, Iron Horse Golf Course has significant warranty and discount offers in place. See attachment.

If you have any questions or need further clarification please don't hesitate to ask.

Chad Fisher
Golf Sales Manager
Longhorn, Inc.
713.551.6197
cfisher@longhorninc.com

SYSTEM PROFESSIONAL CUSTOMER SATISFACTION POLICY: Rain Bird's Professional Customer Satisfaction Policy includes repair or replacement of any product at no charge that fails in normal use for a specified period of time. The standard terms are listed in Rain Bird's Professional Customer Satisfaction Policy. Extended terms to the Corporate Account are listed below when a complete Golf irrigation system is purchased from Rain Bird.

Rain Bird shall provide the following extended Professional Customer Satisfaction Policy periods to ARCIS GOLF on new product purchases when a complete Golf irrigation system is purchased. A complete system is defined as the coincident purchase of a Rain Bird Control System, Rain Bird Swing Joints, Rain Bird Rotors, Rain Bird Valve Boxes and Rain Bird Pump Station to the extent that any such components are specified or used in such system. If the system does not require a pumping station due to pressurized supply, and if it is necessary to install flow sensing and activate Rain Bird Smart Pump in lieu of a Rain Bird Pump Station, they will be deemed part of a complete system for purposes of this section. When a complete system is purchased the following are in effect:

- GSP: Purchase of a new control system with a 3 year Global Service Plan (GSP) will receive 2 additional years of the Rain Bird GSP service at no additional charge. The total GSP coverage would be 5 full years.
- Field Controllers or Field Decoders: Will be increased from a 1 year warranty to a 2 year warranty on parts only.
- Integrated Control Modules (ICM's) will be increased from 3 year to a 5 year warranty.
- Golf Rotors: Upgraded from a standard 3 year to a 5 year warranty.
- Swing Joints: 5 year warranty.
- Pump Stations: 1 year parts & labor warranty. Year 2-3 parts warranty. Year 2-6 parts on VFD.
- Brass and Plastic Valves: EFB and PE-B Remote Control Valves, and Brass Quick Coupling Valves and Keys – 3 year warranty.
- All other golf products – 1 year warranty.



Toro Irrigation

5825 Jasmine Street • Riverside • California • 92504-1183 • (951) 688-9221

Toro Central Control System Integration
Ironhorse Golf Club

Base Bid- Sections B and C

Lynx 8.0 software will be capable of running both 2 wire systems and satellite systems from the same central computer. The software is due to be released in fall of 2020. In the event that the software is not available when needed, Toro will provide a second central computer, at no charge, to run the satellite system until such a time that Lynx 8.0 is released. This will be a temporary solution and will not cost the club any money. If the club chooses to be a beta site for the software, we will provide software as soon as its available for testing. Once Lynx 8.0 is officially released, Toro will integrate both control systems into one central computer at no charge to the golf course.

Base Bid plus Section A (Sections A, B, and C)

Only one central computer will be needed to run the entire irrigation system. Currently Lynx 7.0.

Wayne Deker
Golf Sales Manager
The Toro Company
(561) 701-0675
Wyane.deker@toro.com

BID FORM

IRON HORSE GOLF COURSE RENOVATION BID FORM

For the acquisition, delivery, installation of materials, labor and cleanup, incidentals and all appurtenances, and guarantee, all per plans and specifications, complete and in place. In the event of additions/deletions to the contract items, the price per unit shall be used to determine change order amounts.

NOTE: Show amount in both written form and figures. In case of discrepancy between the written amount and figure amount, the written amount shall govern. In case of discrepancy between the unit price and the total base bid (LUMP SUM), the unit price shall govern. The dollar amount for unit pricing will be rounded to the nearest penny.

Bidder must submit a bid for **all** alternates. Failure to do so may result in the City deeming such bid to be incomplete and disqualifying same.

All substitutions as an "OR EQUAL" must be approved in writing by the City at least five (5) working days prior to bid opening.

Bidder understands that the quantities of work shown in the schedule of bid items are approximate only and Bidder is expected to verify quantities to its satisfaction prior to submitting their bid. During the project, Owner reserves the right to change quantities during the project.

The undersigned further agrees that the unit prices quoted include all materials and work required to accomplish the projected work and these items include all work indicated on the Plans and Specifications for which no specific pay items have been established. Bidder understands and agrees that the unit prices provided shall be used for all additions and deletions from the accepted option, unless the increase or decrease in quantities exceeds 25% of the original quantity specified or anticipated.

It is understood and agreed that the selection of Base or Alternate Bid(s) shall be at the complete discretion of the City and without recourse by the bidder. The right is reserved by the City as is advantageous to the City, to reject any and all bids, award a contract based upon submitted bids, or to re-bid the contract and to waive any and all formalities.

Bidder acknowledges receipt and incorporation into the bid, the City's "General Provisions" applicable to all construction/demolition Contracts, a complete copy of which is on file in the office of the City Purchasing Agent.

Addenda: Contractor acknowledges receipt and incorporation into the bid of addenda as listed below:

Addendum No. 1 dated 9/9/2019
Addendum No. 2 dated 9/10/2019
Addendum No. 3 dated 9/18/2019
Addendum No. 4 dated 9/23/2019
Addendum No. 5 dated 9/24/2019

**PROPOSED BASE CONTRACT PRICE- WITH TORO
IRRIGATION**

(Transferred from Detailed Bid Form Construction Base Bid Total
Excluding all Alternate bids on pages10-12)

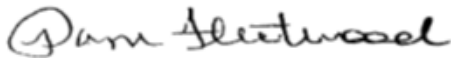
COMPANY Fleetwood Services LLC

CITY shall pay the CONTRACTOR for the performance of the work, subject to additions and deductions by change order or as otherwise provided in the provisions of the contract, in current funds the contract sum of:

Two million, six hundred eighty four thousand, nine hundred seventeen dollars and fifty five cents
In words

(\$ 2,684,917.55).
In figures:

Date: 9/24/2019



Signature of Authorized Representative

Owner

SEAL (If bidder is a Corporation)

Title of Authorized Representative

4311 Willow Street

Address

Dallas, TX 75226

City, State, Zip

972-707-8314

Telephone Number

pam@fleetwoodservices.net

Email Address

**PROPOSED BASE CONTRACT PRICE- WITH RAINBIRD
IRRIGATION**

(Transferred from Detailed Bid Form Construction Base Bid Total
Excluding all Alternate Bids on pages 10-12)

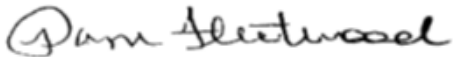
COMPANY Fleetwood Services LLC

CITY shall pay the CONTRACTOR for the performance of the work, subject to additions and deductions by change order or as otherwise provided in the provisions of the contract, in current funds the contract sum of:

Two million, six hundred sixteen thousand, nine hundred fifty four dollars and fifty five cents
In words

(\$ 2,616,954.55).
In figures:

Date: 9/24/2019



Signature of Authorized Representative

Owner

SEAL (If bidder is a Corporation)

Title of Authorized Representative

4311 Willow Street
Address

Dallas, TX 75226
City, State, Zip

972-707-8314
Telephone Number

pam@fleetwoodsolutions.net
Email Address

City of North Richland Hills
BIDDER'S LIST OF PROPOSED SUB-CONTRACTORS

COMPANY	TYPE	WORK PERFORMED	INSURANCE	PHONE
VM Golf	Inc.	Irrigation	Yes	281-978-2701
Mogotes	LLC	Concrete/Cart Path	Yes	817-908-6538
Bean Electrical		Bore	Yes	817-561-7400

City of North Richland Hills

CONTRACTOR'S LIST OF PROPOSED EQUIPMENT

Required information includes the make, model and year of the equipment proposed / available for use on the project and whether the equipment is owned, leased, rented or borrowed. This form shall be completed and submitted with bid.

<u>EQUIPMENT / VEHICLES TYPE TO BE USED ON THIS PROJECT</u> (not including hand tools, small power tools, wheelbarrows, etc.)	MAKE/ MANUFACTURER	YEAR MODEL	<u>OWNERSHIP:</u> <u>STATUS</u> Owned, Leased, Rented Or Borrowed
1 750 Dozer	John Deere		Rental
2 550 - 450 Dozer	John Deere		Rental
3 F-350 Job Truck	Ford	2013	Owned
4 LS 4701 Tractor -2 each	Kubota	2014	Owned
5 LS 4701 Tractor - 2 each	Kubota	2016	Owned
6 SVL75 Skidsteer - 2 each	Kubota	2018	Owned
7 RTV-900 - 3 each	Kubota	2016	Owned
8 KX71 Mini-Excavator - 2 each	Kubota	2015	Owned
9 U-55 Track-Hoe	Kubota	2010	Owned
10 Dump wagons - 4 each	Pronovost	2014	Owned
11 Sand Pro	John Deere	2016	Owned
12 Misc. Equipment Implements			Owned

City of North Richland Hills

SUBCONTRACTOR'S LIST OF PROPOSED EQUIPMENT

Required information includes the make, model and year of the equipment proposed / available for use on the project and whether the equipment is owned, leased, rented or borrowed. This form shall be completed and submitted with bid.

<u>EQUIPMENT / VEHICLES TYPE TO BE USED ON THIS PROJECT</u> (not including hand tools, small power tools, wheelbarrows, etc.)	MAKE/ MANUFACTURER	YEAR MODEL	<u>OWNERSHIP:</u> <u>STATUS</u> Owned, Leased, Rented Or Borrowed
1 RTX 1250 Quad Track Plow	Vermeer	2012	Owned
2 18K Mini-Excavator			Rented
3 28K Skid-Steer			Rented
4 RT 450 Trencher	Vermeer		Rented
5 Smooth Double Drum Roller			Rented
6 Pipe Trailer	Red River		Owned
7 Trac Star 412	McElroy		Rented
8			
9			
10			
11			
12			
13			

City of North Richland Hills

IRRIGATION UNIT PRICES

Rain Bird	EA
Rain Bird 900 series IC sprinkler w/1 ½" RB swing joint	\$600.00
Rain Bird 950 series IC sprinkler, w/1 ½" RB swing joint	\$650.00
50 Part Circle Heads – Model No. <u>RB 950 IC</u>	\$20,000.00
25 Part Circle Heads – Model No. <u>RC5 Quick Coupler</u>	\$3,750.00
1" Quick coupler valve with stabilizer - complete	\$250.00
Toro	
Toro FLX34-XX8-6 sprinkler w/1 ¼" Toro swing joint	\$550.00
Toro FLX35-XX-8-6 sprinkler w/1 ¼" Toro swing joint	\$600.00
50 Part Circle Heads – Model No. <u>FLX35</u>	\$15,000.00
25 Part Circle Heads – Model No. <u>474-04 Quick Coupler</u>	\$3,750.00
1" Quick coupler valve with stabilizer - complete	\$250.00
VALVES MISC	
Harco lateral swivel valve on EF saddle, 3"	\$750.00
Harco lateral swivel valve on EF saddle, 2 1/2"	\$700.00
PE 360° lateral isolation valve 2"	\$500.00
PE 360° lateral isolation valve 1 1/2"	\$400.00
Mainline Pipe Manufacturer/Model - Resilient Wedge HDPE Stub-out Isolation Valve – or equal (as specified)	
2"	N/A - \$0
3"	N/A - \$0
4"	\$900.00
6"	\$1250.00
8"	\$1800.00
10"	\$3000.00

City of North Richland Hills

12"		N/A - \$0
Lateral Pipe – Manufacturer/Model		
2"		\$1.20
3"		\$2.50
Mainline Pipe – Manufacturer/Model HDPE DR 13.5 4710 Pipe		
4"		\$5.00
6"		\$9.00
8"		\$14.00
10"		\$21.00
12"		\$32.00
Maxi IC cable for underground burial in pipe trench		\$0.60
Paige Electric ground rod assembly w/grounding gem set		\$50.00
Paige Electric 96" ground plate assembly w/grounding gem set		\$350.00
(Qty. 4) Maintenance Radio w/DTMF		\$635.00
Apple iPad/Verizon WiFi / central control application		\$800.00
RF/Solar Weather Station	Toro	\$4,633.00
	Rainbird	\$11,733.00

**PLAN TO INTEGRATE SECTION A
CONTROL SYSTEM WITH B AND C**

ALTERNATE BIDS

Definition and Intent

An "alternate bid" is an amount proposed by bidders on the Bid Form for modifying the scope, products, materials, equipment, systems or installation methods as for certain activities described in the Contract Documents.

The intent of any alternate bid is to explore alternate construction methods that may be financially beneficial to the Owner, while maintaining the quality and performance requirements for the Project.

Coordination

The Alternate Bids included in this Section generally describe requirements for changes in scope of work, materials and construction methods necessary to modify the work under consideration in each alternate. Bidders must review the Contract Documents in their entirety to assure that all elements of each alternate bid indicated maintain the quality and performance requirements for the Base Bid. Costs listed by bidders for each alternate must include all costs of related coordination, modification or adjustment.

When an alternate bid is accepted, Contractor shall:

- * Construct all work in accordance with Base Bid specifications, except as specifically changed by the acceptance of that alternate bid.
- * Coordinate and modify adjacent work as necessary, so that the work affected by each accepted alternate is complete and fully integrated into the project.
- * Include in their bid miscellaneous devices, accessory objects and items incidental to, or required for, a complete installation whether or not specifically mentioned.

Bid Acceptance

The Owner reserves the right to accept alternate bids at proposed prices, that:

- ❑ Are only ones that it deems in its best interest.
- ❑ Are part of the original bid and award of a contract , or
- ❑ Are accepted after the construction contract is executed, at the same prices proposed here, unless the Contractor demonstrates that later acceptance is inequitable in some way.

City of North Richland Hills

IRRIGATION ADD ALTERNATE NO. 1 – SECTION A

Add: Complete Installation of Irrigation System as depicted on plans for Section A.

Delete: Incorporate Section A Control Package with Section B and C

Total Add Toro	\$ 427,381
Total Add_Rain Bird	\$503,382

IRRIGATION ADD ALTERNATE NO. 2 – SECTION B PUMP STATION

Delete: Pump Station in Section B by Owner via Separate Contractor

Add: Contractor to purchase and complete Installation of Pump Station in Section B by Contractor as depicted on plans. However, note that Owner is still responsible for removing sections of structure required for installation and replacing after pump station, Z Pipe and other appurtenances are installed by Contractor.

Total Add _____ \$ \$148,715

IRRIGATION ADD ALTERNATE NO. 3 – GPS STAKING BY ECD

Add: GPS and As Built Plans by Irrigation Designer @ \$22,500 Lump Sum

Delete: Self Perform of GPS and As Built Plans by Contractor

Total Add _____ \$ \$22,500

IRRIGATION DEDUCT NO. 1 – WEATHER STATION

Delete: WEATHER STATION FROM SELECTED MANUFACTURER

Add: Nothing

Total Deduct _____ \$ T-\$4,663/RB-\$11,733

IRRIGATION DEDUCT NO. 2 – REPEATERS

Delete: 4 IRRIGATION CONTROL SYSTEM REPEATERS (4 TOTAL)

Add: Nothing

Total Deduct _____ \$ T-\$12,000/RB-\$26,600

GOLF ADD ALTERNATE NO. 1 – LOWER GREEN COLLARS

Delete: Nothing

Add: Lower green collars for drainage on 17 existing greens to remain, with about 35 total areas, 10-20 foot wide each by width of collar and tie in. Sod back tif tuff collar.

Total Add _____ \$ 12,000.00

City of North Richland Hills

GOLF ADD ALTERNATE NO. 2 – SPRING CORRECTION ABOVE NO. 4

Delete: Nothing

Add: – 250 L.F. of 4" Perforated Pipe, enclosed in pea gravel, tied to 24" Catch Basin Near No. 4 LZ

Total Add _____ \$ 1,500.00 _____

GOLF ADD/DEDUCT 1 – CAPILARY CONCRETE BUNKER LINERS

Delete: All Better Billy Bunker Liners (Approximately 24,000 S.F.)

Add: Capillary Concrete™ Bunker Liners (Approximately 24,000 S.F.)

Total Add/Deduct Add _____ \$ 24,000.00 _____

GOLF ADD/DEDUCT 2 – SOD ENTIRE WORK AREA

Delete: 17.8 AC 4" Screened Topsoil

Add: 16.8 AC (Approx. 734,000 SF net add of 419 SOD, Cut 1.5" (or as deep as practical).

Total Add/Deduct Add _____ \$ 29,190.00 _____

Platte River INDEMNITY CORPORATION

P. O. Box 5900, Madison, WI 53705-0900
Phone: (608) 231-4450 Tol 1 Free: (800) 475-4450

Bid Bond #: 41421704

BID BOND

KNOW ALL PERSONS BY THESE PRESENTS,

That we, Fleetwood Services, LLC (hereinafter called the "Principal"), as Principal, and the Platte River Insurance Company of Madison, Wisconsin a corporation duly organized under the laws of the State of Nebraska (hereinafter called the "Surety"), as Surety, are held and firmly bound unto City of North Richland Hills (hereinafter called the "Obligee"), in the sum of Ten Percent of the contract bid (10%), for the payment of which sum well and truly to be made, the said Principal and the said Surety, bind ourselves, our heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents.

WHEREAS, the Principal has submitted a bid for **Bid No. 20-002**
Iron Horse Golf Course Improvements

NOW, THEREFORE, if the Obligee shall accept the bid of the Principal and the Principal shall enter into a Contract with the Obligee in accordance with the terms of such bid, and give such bond or bonds as may be specified in the bidding or Contract documents with good and sufficient surety for the faithful performance of such Contract and for the prompt payment of labor and material furnished in the prosecution thereof, or in the event of the failure of the Principal to enter such Contract and give such bond or bonds, if the Principal shall pay to the Obligee the difference not to exceed the penalty hereof between the amount specified in said bid and such larger amount for which the Obligee may in good faith contract with another party to perform the Work covered by said bid, then this obligation shall be null and void, otherwise to remain in full force and effect.

Signed and sealed this 23 day of September, 2019.

This bond automatically expires ninety (90) days from the original bid date.

[Signature]
(Witness)

Fleetwood Services, LLC
(Print Name of Principal) (Seal)
Pam Fleetwood
(Signature of Officer of the Principal)
Pam Fleetwood owner
(Print Name of Officer of the Principal and Title)

[Signature]
(Witness)

Platte River Insurance Company
[Signature]
(Signature of Attorney-In-Fact) (Seal)
Chris Eley, Attorney-In-Fact
(Print Name of Attorney-in-Fact and Title)

**PLATTE RIVER INSURANCE COMPANY
POWER OF ATTORNEY**

41421704

KNOW ALL MEN BY THESE PRESENTS, That the **PLATTE RIVER INSURANCE COMPANY**, a corporation of the State of Nebraska, having its principal offices in the City of Middleton, Wisconsin, does make, constitute and appoint

-----CHRIS ELEY; AMELIA MCSHANE; JASON JENKINS-----

its true and lawful Attorney(s)-in-fact, to make, execute, seal and deliver for and on its behalf, as surety, and as its act and deed, any and all bonds, undertakings and contracts of suretyship, provided that no bond or undertaking or contract of suretyship executed under this authority shall exceed in amount the sum of

-----ALL WRITTEN INSTRUMENTS IN AN AMOUNT NOT TO EXCEED: \$20,000,000.00-----

This Power of Attorney is granted and is signed and sealed by facsimile under and by the authority of the following Resolution adopted by the Board of Directors of **PLATTE RIVER INSURANCE COMPANY** at a meeting duly called and held on the 8th day of January, 2002.

“**RESOLVED**, that the President, Executive Vice President, Vice President, Secretary or Treasurer, acting individually or otherwise, be and they hereby are granted the power and authorization to appoint by a Power of Attorney for the purposes only of executing and attesting bonds and undertakings, and other writings obligatory in the nature thereof, one or more resident vice-presidents, assistant secretaries and attorney(s)-in-fact, each appointee to have the powers and duties usual to such offices to the business of this company; the signature of such officers and seal of the Company may be affixed to any such power of attorney or to any certificate relating thereto by facsimile, and any such power of attorney or certificate bearing such facsimile signatures or facsimile seal shall be valid and binding upon the Company, and any such power so executed and certified by facsimile signatures and facsimile seal shall be valid and binding upon the Company in the future with respect to any bond or undertaking or other writing obligatory in the nature thereof to which it is attached. Any such appointment may be revoked, for cause, or without cause, by any of said officers, at any time.”

In connection with obligations in favor of the Florida Department of Transportation only, it is agreed that the power and authority hereby given to the Attorney-in-Fact includes any and all consents for the release of retained percentages and/or final estimates on engineering and construction contracts required by the State of Florida Department of Transportation. It is fully understood that consenting to the State of Florida Department of Transportation making payment of the final estimate to the Contractor and/or its assignee, shall not relieve this surety company of any of its obligations under its bond.

In connection with obligations in favor of the Kentucky Department of Highways only, it is agreed that the power and authority hereby given to the Attorney-in-Fact cannot be modified or revoked unless prior written personal notice of such intent has been given to the Commissioner – Department of Highways of the Commonwealth of Kentucky at least thirty (30) days prior to the modification or revocation.

IN WITNESS WHEREOF, the **PLATTE RIVER INSURANCE COMPANY** has caused these presents to be signed by its officer undersigned and its corporate seal to be hereto affixed duly attested, this 3rd day of May, 2017.

Attest:

John E. Rzepinski

John E. Rzepinski
Vice President, Treasurer & CFO

Suzanne M. Broadbent

Suzanne M. Broadbent
Assistant Secretary



PLATTE RIVER INSURANCE COMPANY

Stephen J. Sills

Stephen J. Sills
CEO & President

STATE OF WISCONSIN } s.s.:
COUNTY OF DANE

On the 3rd day of May, 2017 before me personally came Stephen J. Sills, to me known, who being by me duly sworn, did depose and say: that he resides in the County of New York, State of New York; that he is President of **PLATTE RIVER INSURANCE COMPANY**, the corporation described in and which executed the above instrument; that he knows the seal of the said corporation; that the seal affixed to said instrument is such corporate seal; that it was so affixed by order of the Board of Directors of said corporation and that he signed his name thereto by like order.



David J. Regele

David J. Regele
Notary Public, Dane Co., WI
My Commission Is Permanent

STATE OF WISCONSIN } s.s.:
COUNTY OF DANE

I, the undersigned, duly elected to the office stated below, now the incumbent in **PLATTE RIVER INSURANCE COMPANY**, a Nebraska Corporation, authorized to make this certificate, **DO HEREBY CERTIFY** that the foregoing attached Power of Attorney remains in full force and has not been revoked; and furthermore, that the Resolution of the Board of Directors, set forth in the Power of Attorney is now in force.

Signed and sealed at the City of Middleton, State of Wisconsin this 23 day of September, 2019



Antonio Celi

Antonio Celi
General Counsel, Vice President & Secretary