

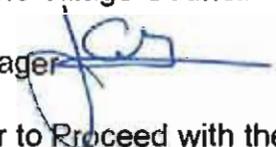


VILLAGE OF KEY BISCAIYNE

Office of the Village Manager MEMORANDUM

Village Council
Franklin H. Caplan, *Mayor*
Michael E. Kelly, *Vice Mayor*
Michael W. Davey
Enrique Garcia
Robert Gusman
Mayra P. Lindsay
James S. Taintor

Village Manager
Genaro "Chip" Iglesias

DATE: October 3, 2011
TO: Honorable Mayor and Members of the Village Council
FROM: John C. Gilbert, Interim Village Manager 
RE: Motion to Authorize Village Manager to Proceed with the Village Green Irrigation System Rehabilitation Bid Process

RECOMMENDATION

It is recommended that the Village Council authorize the Village Manager to proceed with the enclosed bid process included as Exhibit "A". The results of the competitive process will return before Council with a recommendation to accept a bid.

BACKGROUND

The Village has been working to improve the performance of the Village Green playing fields. API Graphics Inc. was hired to provide aerial photographs of the Village Green, Key Biscayne Community School, and St. Agnes fields in April 2011. These images were to be used to evaluate the performance of the maintenance programs and track the wear issues as they arose. In June 2011, the images provided substantiated a concern that the irrigation system was not performing as designed.

In July of 2011 the Village scheduled meetings with experienced individuals to evaluate the irrigation issue. The results of these consultations confirmed that the systems performance was insufficient. These individuals provided the Village with various recommendations to address the systems performance.

Village staff determined the best course of action would be to hire a firm to test the system and provide a detailed report describing the rehabilitation work required. On July 29, 2011, the Village contracted C3TS to complete the following work:

1. Investigation of the existing irrigation system by a licensed irrigation contractor, including: pressure/flow test at water meter point-of-connection and investigate the heads, zone layouts, solenoid valves, and controls.
2. Prepare a written plan and specification for the rehabilitation and improvement of the existing system including a construction cost estimate.

On August 25, 2011, the report, "Irrigation System Rehabilitation Notes", included as Exhibit "B" was completed by Rosenberg Gardner Design and on September 15th they provided a preliminary cost estimate from \$15,000 to \$20,000.

Exhibit “A”

PROPOSAL

VILLAGE GREEN – IRRIGATION SYSTEM REHABILITATION VILLAGE OF KEY BISCAYNE, FLORIDA

Village Clerk's Office
Village of Key Biscayne Village Hall
88 W. McIntyre Street
Key Biscayne, Florida 33149

The undersigned, as Bidder, hereby declares that the only person or persons interested in the Proposal, as principal or principals, is or are named herein and that no other person than herein mentioned has any interest in the Proposal of the Contract to which the work pertains; that this Proposal is made without connection or arrangement with any other person, company, or parties making a bid or proposal and that the Proposal is in all respects fair and made in good faith without collusion or fraud.

The Bidder further declares that he has examined the site of the work and that from personal knowledge and experience, or that he has made sufficient observations of the conditions of the proposed Project Site to satisfy himself that such site is a correct and suitable one for this work and he assumes full responsibility therefore, that he has examined the Drawings and Specifications for the work and from his own experience or from professional advice that the Drawings, including bid item quantities, and Specifications are sufficient for the work to be done and he has examined the other Contractual Documents relating thereto, including the Proposal, Contract (Exhibit 1) Scope of Work and Technical Specifications (Exhibit 2), and that he has satisfied himself fully, relative to all matters and conditions with respect to the work to which this Proposal pertains.

The Bidder proposes and agrees, if this Proposal is accepted, to contract with the Village of Key Biscayne (Owner), in the form of contract specified, to furnish all necessary materials, all equipment, all necessary machinery, tools, apparatus, means of transportation, and labor necessary to complete the work specified in the Proposal and the Contract, and called for by the Drawings and Specifications and in the manner specified.

The Bidder further proposes and agrees to comply in all respects with the time limits for commencement and completion of the work as stated in the Contract Form.

The Bidder further agrees that the deductions for liquidated damages, as stated in the Contract Form, constitute fixed, agreed, and liquidated damages to reimburse the Owner for additional costs to the Owner resulting from the work not being completed within the time limit stated in the Contract Form.

The undersigned agrees to accept in full compensation therefore the total of the lump sum prices for the items named in the following schedule, based on the plan quantities contained within this bid form. Furthermore, the undersigned has checked these quantities and agrees that bid quantities are correct and adequate to complete the job in its entirety, as described in the contract document.

BID FORM

**VILLAGE GREEN – IRRIGATION SYSTEM REHABILITATION
VILLAGE OF KEY BISCAWAYNE, FLORIDA**

Bid unit prices stated in this proposal include all costs and expenses for labor, equipment, materials, contractor's overhead and profit. Unit prices for the various work items are intended to establish a total price for completing the project in its entirety. The Contractor shall include in the Bid price any work item and materials for which a separate pay item has not been included in the Bid Form. All work and incidental costs shall be included for payment under the several scheduled items of the overall contract, and no separate payment will be made therefore.

No.	ITEM	EST. QTY.	UNIT	UNIT COST	TOTAL COST
1	Furnish and install a new variable frequency drive 7.5hp booster pump and pressure tank (incl. electrical connection, control panel, fiberglass enclosure, concrete pad, mounting assembly, pressure transmitter, piping, wiring and testing)	1	L.S.	\$	\$
2	Furnish & install a new Rainbird IQ controller (Incl. electrical connections, and connection to Villagewide central control (via new radio transmitter), software/hardware installation, training of Village staff.)	1	L.S.	\$	\$
3	Repair valve boxes (to change lids to lockable and ensure gravel at the bottom of the box)	28	EA.	\$	\$
4	Repair of leaking solenoid or gate valves at valve boxes	1	L.S.	\$	\$
5	Pressure test of all irrigation mains from meter to zone valves	1	L.S.	\$	\$
6	Locate, uncover and repair breaks in mains	10	EA.	\$	\$
7	Replace irrigation heads that do not meet specification requirements	50	EA.	\$	\$
8	Re-install irrigation heads that are not installed at the correct grade and/or are not plumb	15	EA.	\$	\$
9	Pressure test of individual zone piping	28	EA.	\$	\$
10	Locate, uncover and repair breaks in piping within individual zones	50	EA.	\$	\$
11	Project Close Out (provide operation manuals, instruct Village staff on the proper operation of all equipment, provide record drawings and warrantee system for a period of one year)	1	L.S.	\$	\$
12	Contingency	1	L.S.	\$ 5,000.00	\$ 5,000.00

GRAND TOTAL IN FIGURES \$ _____

GRAND TOTAL (WRITTEN): _____

Bidder: _____

By: _____

Title: _____

Telephone: _____

Fax: _____

EXHIBIT 1

CONTRACT FOR CONSTRUCTION

THIS IS A CONTRACT, by and between THE VILLAGE OF KEY BISCAYNE, FLORIDA, a municipal corporation of the State of Florida, (hereinafter referred to as "Village"), and _____, a _____ corporation, (hereinafter referred to as "Contractor".)

W I T N E S S E T H, that Contractor and Village, for the considerations hereinafter named, agree as follows:

ARTICLE 1

SCOPE OF WORK

- 1.1 Contractor hereby agrees to furnish all of the labor, materials, equipment, services and incidentals necessary to perform all of the Work described in the Scope of Work and Technical Specifications attached as Exhibit 2 for the following Project:

**VILLAGE GREEN – IRRIGATION SYSTEM REHABILITATION
VILLAGE OF KEY BISCAYNE**

ARTICLE 2

CONTRACT TIME

- 2.1 Contractor shall be instructed to commence the Work by written instructions in the form of a Notice to Proceed issued by the Village Manager. The Notice to Proceed will not be issued until Contractor's submission to Village of all required documents and after execution of this Contract.
- 2.2 Time is of the essence throughout this Contract. The Contractor shall prosecute the work with faithfulness and diligence and the Work shall be substantially completed within sixty (60) calendar days from the date specified in the Notice to Proceed. The Work shall be completed and ready for final payment in accordance with Article 3 within thirty (30) calendar days from the date certified by Village's Project Engineer as the date of Substantial Completion.
- 2.3 Upon failure of Contractor to substantially complete the Contract within the specified period of time, Contractor shall pay to Village the sum of Two Hundred Fifty Dollars (\$250.00) for each calendar day after the time specified in Section 2.2 above for Substantial Completion. After Substantial Completion, should Contractor fail to complete the remaining Work within the time specified in Section 2.2 above

for completion and readiness for final payment, Contractor shall pay to Village the sum of One Hundred and Fifty Dollars (\$150.00) for each calendar day after the time specified in Section 2.2 for completion and readiness for final payment. These amounts are not penalties but are liquidated damages to Village for its inability to obtain full beneficial occupancy and use of the Project. Liquidated damages are hereby fixed and agreed upon between the parties, recognizing the impossibility of precisely ascertaining the amount of damages that will be sustained by Village as a consequence of such delay, and both parties desiring to obviate any question or dispute concerning the amount of said damages and the cost and effect of the failure of Contractor to complete the Contract on time.

- 2.4 Village is authorized to deduct the liquidated damages from monies due to Contractor for the Work under this Contract.

ARTICLE 3

CONTRACT PRICE

- 3.1 Village shall pay to Contractor for the performance of the Contract, the total lump sum of _____ (\$ _____) subject to the conditions, limitations and restrictions of Section 3.3. This price shall be full compensation for all costs, including overhead and profit, associated with completion of all the Work in full conformity with the requirements as stated or shown, or both, in the Scope of Work and Specifications.
- 3.2 The sum set forth in Paragraph 3.1 shall constitute the Contract Price which shall not be modified except by any Change Order issued by Village or as otherwise specified herein.
- 3.3 Village and Contractor agree that this Contract shall be subject to the condition precedent that Village funds are available and budgeted for the accomplishment of the Work for this Project, and that the Village secures and obtains any necessary loans for the accomplishment of this Project pursuant to a borrowing enabling ordinance and any loan implementing resolution adopted by the Village Council, and as described in the Village Council Resolution which awards and authorizes the execution of this Contract.
- 3.4 In the absence of the need for a performance and payment bond on this project, the Contractor hereby agrees to receive payment of no more than 50% of the total contract amount prior to full completion of all work, and acceptance by the City.

ARTICLE 4

CONTRACT DOCUMENTS

- 4.1 The Contract Documents which comprise the entire agreement between the Village and the Contractor concerning the Work consist of this Contract for Construction, the Proposal, the Scope of work and Specifications, Insurance Certificate, the Notice of Award, the Notice to Proceed, any Change Orders and any other Contract Documents, not specifically listed herein which shall be considered incorporated into and made a part of this Contract by this reference and shall govern this Project. Contractor is reminded and hereby recognizes that all Work under this contract must comply with applicable regulations.
- 4.2 This document incorporates and includes all prior negotiations, correspondence, conversations, agreements, or understandings applicable to the matters contained herein and the parties agree that there are no commitments, agreements, or understandings concerning the subject matter of these Contract Documents that are not contained herein. Accordingly it is agreed that no deviation from the terms hereof shall be predicated upon any prior representations or agreements, whether oral or written.
- 4.3 The Contract Documents shall remain the property of the Village. The Contractor shall have the right to keep one record set of the Contract Documents upon completion of the Project; provided; however, that in no event shall the Contractor use, or permit to be used, any or all of such Contract Documents on other Projects without the Village's prior written authorization.

ARTICLE 5

WAIVER OF JURY TRIAL

Village and Contractor knowingly, irrevocably, voluntarily and intentionally waive any right either may have to a trial by jury in State and or Federal court proceedings in respect to any action, proceeding, lawsuit or counterclaim based upon the Contract for Construction, arising out of, under, or in connection with the Construction of the Work, or any course of conduct, course of dealing, statements or actions or inactions of any party.

ARTICLE 6

ASSIGNMENT

Neither party shall assign the Contract or any sub-contract in whole or in part without the written consent of the other, nor shall Contractor assign any monies due or to become due to it hereunder, without the previous written consent of the Village Manager.

ARTICLE 7

MISCELLANEOUS

7. **Insurance Requirements:**

7.1 The Contractor will, at his own expense, purchase and maintain such insurance as will protect the Village and Contractor from claims under workmen's compensation laws, disability benefit laws or other similar employee laws; from claims for damages because of bodily injury, occupational sickness or disease, or death of his employees, or any person other than his employees, including claims insured by usual personal injury liability coverage; from claims for injury to or destruction of tangible property including loss of use resulting therefrom – any or all of which may arise out of or result from the Contractor's operations under the Contract Documents, whether such operations be by any Subcontractor or anyone directly or indirectly employed by any of them or for whose acts may be legally liable. This insurance shall be written for not less than \$1,000,000.00 combine single limit per occurrence (no aggregate limitation) or as required by law, whichever is greater, and shall include contractual liability insurance. Before starting the work, the Contractor will file with the Village and Engineer certificates of such insurance, acceptable to the Village, these certificates shall contain a provision that the coverage afforded under the policies will not be cancelled or materially changed until at least 15 days after written notice is given to the Village and Engineer. These policies shall be written to cover Village and Village's Engineer as additionally insured.

7.2 **Village's Right To Terminate Contract**

7.2.1 If Contractor fails to timely begin the Work, or fails to perform the Work with sufficient workers and equipment or with sufficient materials to insure the prompt completion of the Work, or shall perform the Work unsuitably, or cause it to be rejected as defective and unsuitable, or shall discontinue the prosecution of the Work pursuant to the accepted schedule or if the Contractor shall fail to perform any material term set forth in the Contract Documents or if Contractor shall become insolvent or be declared bankrupt, or commit any act of bankruptcy or insolvency, or shall make an assignment for the benefit of creditors, or from any other cause whatsoever shall not carry on the Work in an acceptable manner, Village may, upon seven (7) days written Notice of Termination, terminate the services of Contractor, exclude Contractor from the Project site and take the prosecution of the Work out of the hands of Contractor, and use any or all materials on the Project site which have been paid for by the Village, as may be suitable and acceptable and may finish the Work by whatever methods it may deem expedient. In such case Contractor shall not be entitled to receive any further payment until the Project is completed. All damages, costs and charges incurred by Village, together with the costs of completing the Project, shall be deducted from any monies due or which may become due to Contractor.

In case the damages and expenses so incurred by Village shall exceed the unpaid balance, then Contractor shall be liable and shall pay to Village the amount of said excess.

7.3 **Contractor to Check Plans, Specifications and Data:**

Contractor shall verify all dimensions, quantities and details shown on the plans, specifications or other data received from Village's Project Engineer, and shall notify Village's Project Engineer in writing of all errors, omissions and discrepancies found therein within three (3) calendar days of discovery and Village's Project Engineer will promptly review the same. Any Work done after such discovery, but prior to written authorization of the Village's Project Engineer, will be done at the Contractor's sole risk.

7.4 **Contractor's Responsibility for Damages and Accidents**

7.4.1 Contractor shall accept full responsibility for the Work against all loss or damage of any nature sustained until final acceptance by Village, and shall promptly repair any damage done from any cause.

7.4.2 Contractor shall be responsible for all materials, equipment and supplies pertaining to the Project. In the event any such materials, equipment and supplies are lost, stolen, damaged or destroyed prior to final acceptance by Village, Contractor shall replace same without cost to Village.

7.5 **Defective Work/Guarantee**

7.5.1 Village shall have the authority to reject or disapprove Work which the Village finds to be defective. If required by the Village, Contractor shall promptly either correct all defective Work or remove such defective Work and replace it with nondefective Work. Contractor shall bear all direct, indirect and consequential costs of such removal or corrections including cost of testing laboratories and personnel.

7.5.2 Should Contractor fail or refuse to remove or correct any defective Work or to make any necessary repairs in accordance with the requirements of the Contract Documents within the time indicated in writing by Village's Project Consultant, Village shall have the authority to cause the defective Work to be removed or corrected, or make such repairs as may be necessary at Contractor's expense. Any expense incurred by Village in making such removals, corrections or repairs, shall be paid for out of any monies due or which may become due to Contractor. In the event of failure of Contractor to make all necessary repairs promptly and fully, Village may declare Contractor in default.

7.5.3 The Contractor shall unconditionally guarantee all materials and equipment furnished and Work performed for a period of one (1) year from the date of substantial completion. If, within one (1) year after the date of substantial completion, any of the Work is found to be defective or not in accordance with the Contract Documents, Contractor, after receipt of written notice from Village, shall promptly correct such defective or nonconforming Work within the time specified by Village without cost to Village. Nothing contained herein shall be construed to establish a period of limitation with respect to any other obligation which Contractor might have under the Contract Documents including but not limited to any claim regarding latent defects.

7.5.4 Failure to reject any defective Work or material shall not in any way prevent later rejection when such defect is discovered.

7.6 Legal Restrictions and Traffic Provisions:

Contractor shall conform to and obey all applicable laws, regulations, or ordinances with regard to labor employed, hours of Work and Contractor's general operations. Contractor shall conduct its operations so as not to interfere with or close any thoroughfare, except as provided for in the Contract Documents, without the written consent of the proper authorities.

7.7 Examination and retention of Contractor's Records

7.7.1 The Village or any of their duly authorized representatives shall, until 3 years after final payment under this contract, have access to and the right to examine any of the Contractor's books, ledgers, documents, papers, or other records involving transactions related to this contract for the purpose of making audit, examination, excerpts, and transcriptions.

7.7.2 The Contractor agrees to include in first-tier subcontracts under this contract a clause substantially the same as subparagraph 7.7.1 above. "Subcontract," as used in this clause, excludes purchase orders not exceeding \$10,000.

7.7.3 The right to access and examination of records in subparagraph 7.7.1 shall continue until disposition of any mediation, claims, litigation or appeals.

7.8 No Damages for Delay

No claim for damages or any claim, other than for an extension of time shall be made or asserted against Village by reason of any delays. Contractor shall not be entitled to an increase in the Contract Price or payment or compensation of any kind from Village for direct, indirect, consequential, impact or other costs, expenses or damages, including but not limited to, costs of acceleration or inefficiency, arising because of delay, disruption, interference or hindrance from any cause whatsoever,

whether such delay, disruption, interference or hindrance be reasonable or unreasonable, foreseeable or unforeseeable, or avoidable or unavoidable. Contractor shall be entitled only to extensions of the Contract Time as the sole and exclusive remedy for such resulting delay. Notwithstanding the above, the Contractor shall be granted an extension of time and suspension of liquidated damages for any delay beyond the control of the Contractor. Should any delay, disruption, interference or hindrance be caused by the Village, for a continuous period or cumulative period of thirty (30) days, the Contractor may terminate the Contract upon seven days written notice to the Village.

7.9 **Public Entity Crimes Affidavit**

Contractor shall comply with Section 287.133, Florida Statutes, (Public Entity Crimes Statute) notification of which is hereby incorporated herein by reference, including execution of any required affidavit.

7.10 **Indemnification**

Contractor shall indemnify and hold harmless Village, Village's officers and employees and Village's Engineer and its officers and employees, from liabilities, damages, losses and costs, including, but not limited to, reasonable attorney's fees, to the extent caused by the negligence, recklessness or intentional wrongful conduct of Contractor and persons employed or utilized by Contractor in the performance of the Agreement.

7.11 **Capitalized Terms**

Capitalized terms shall have their plain meaning as indicated herein.

7.12 **Independent Contractor:**

The Contractor is an independent contractor under the Contract. Services provided by the Contractor shall be by employees of the Contractor and subject to supervision by the Contractor, and not as officers, employees, or agents of the Village. Personnel policies, tax responsibilities, social security and health insurance, employee benefits, purchasing policies and other similar administrative procedures, applicable to services rendered under the Contract shall be those of the Contractor.

7.13 **Payment to Sub-contractors**

Certification of Payment to Subcontractors:

Before receiving Firm's Payment, the Contractor shall pay all subcontractors and suppliers having an interest in the Contract for all work completed and materials furnished, and provide Releases of Lien to the Village from each.

IN WITNESS WHEREOF, the parties hereto have made and executed this Agreement on the respective dates under each signature: VILLAGE OF KEY BISCAYNE, FLORIDA, signing by and through its Village Manager authorized to execute same by Council action on the ____ day of _____ 2011, and _____ signing by and through _____, duly authorized to execute same.

ATTEST:

VILLAGE OF KEY BISCAYNE, FLORIDA

Village Clerk

By: _____
Village Manager

APPROVED AS TO FORM
AND LEGAL SUFFICIENCY:

By: _____
VILLAGE ATTORNEY

This ____ day of _____, 2011.

CONTRACTOR MUST EXECUTE THIS CONTRACT AS INDICATED BELOW. USE CORPORATION FORMAT, AS APPLICABLE.

CONTRACTOR

ATTEST:

(Secretary)

(Corporate Seal)

By: _____
(Signature and Title)

(Type Name/Title signed above)

This ____ day of _____, 2011.

TREE FARM PARK

Key Biscayne

Florida

CONSTRUCTION DOCUMENTS
JULY 5, 1994

VILLAGE OF KEY BISCAYNE

Mayor : John F. Festa
Vice Mayor : Joe I. Rasco
Council Members : Mortimer Fried
Raul Llorente
Betty Sime
Raymond P. Sullivan
John Waid
Village Manager : C. Samuel Kissinger
Village Attorney : Weiss, Serota & Helfman, P.A.
Village Clerk : Guido H. Inguanzo, Jr.

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SITE & LANDSCAPE DETAILS	L-3
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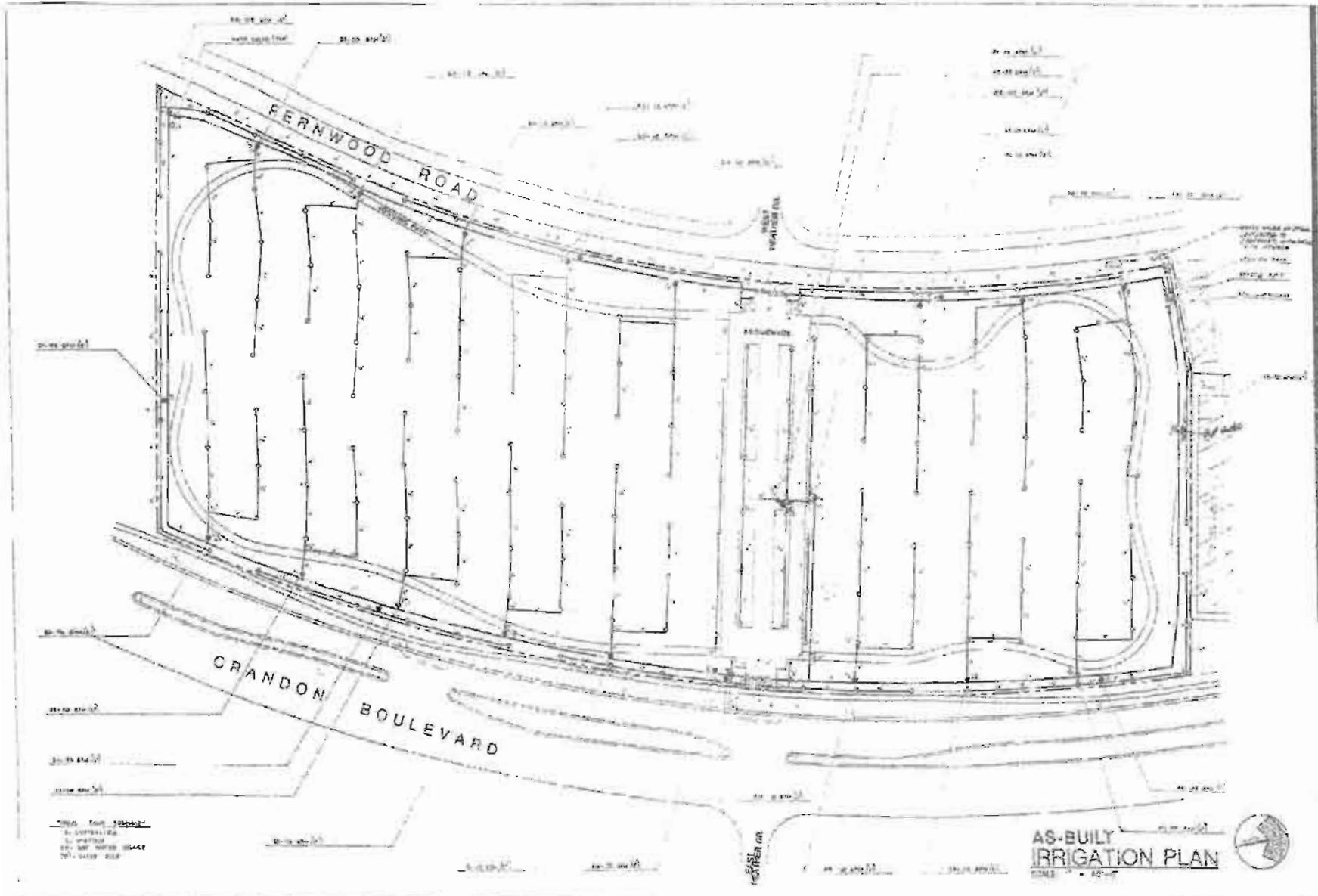
CONSULTANTS

 **C.A.P. ENGINEERING CONSULTANTS, Inc.**
7000 S.W. 50TH TERRACE STE 201, MIAMI, FLORIDA, 33155
TEL: 305-548-5484 FAX: 305-548-8378

 **O'LEARY DESIGN ASSOCIATES P.A.**
LANDSCAPE ARCHITECTURE LAND PLANNING
URBAN DESIGN GRAPHIC DESIGN
CALIFORNIA PROFESSIONAL CENTER
300 S.W. 32nd STREET, SUITE 2100 MIAMI, FLORIDA 33135
TEL: 305-375-1100 FAX: 305-375-1101

AS-BUILT

C.S. 10/94
Village Green



1. THIS PLAN IS FOR THE
 2. IRRIGATION SYSTEM
 3. OF THE TREE FARM PARK
 4. AND IS NOT TO BE USED
 5. FOR ANY OTHER PURPOSE

**AS-BUILT
 IRRIGATION PLAN**
 SCALE: 1" = 40'-0"

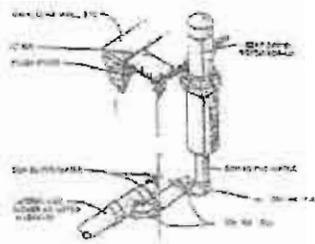


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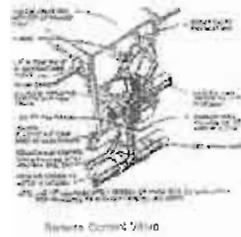
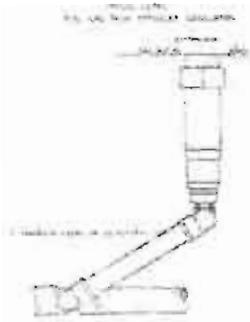
TREE FARM PARK

Key Biscayne Florida

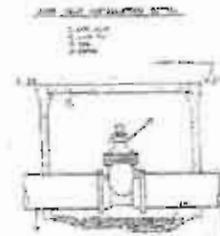
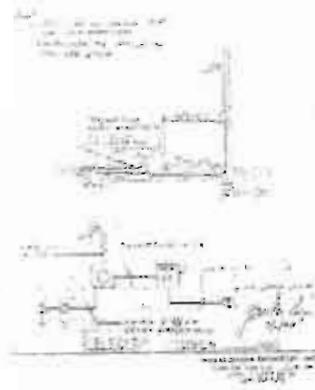
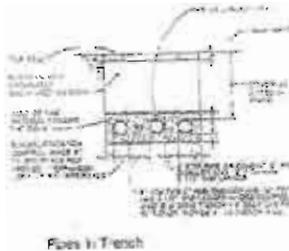
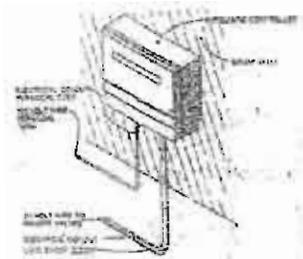
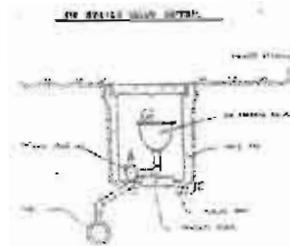
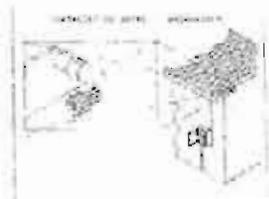
ODA
 O'LEARY DESIGN ASSOCIATES P.A.
 11000 S.W. 15th Avenue, Suite 100
 Miami, FL 33185
 Phone: 305.271.1100 Fax: 305.271.1101
 www.olearydesign.com



Gear Driven Rotor Pop-up Sprinkler



NO.	DESCRIPTION	QTY	UNIT
1	ROTOR	1	EA
2	WATER MAIN	1	EA
3	GEAR DRIVE	1	EA
4	SPRINKLER HEAD	1	EA
5	SYSTEM CONTROL VALVE	1	EA
6	WATER MAIN	1	EA
7	VALVE BODY	1	EA
8	HANDLE	1	EA



AS-BUILT
IRRIGATION DETAILS

Exhibit “B”



Village of Key Biscayne

Village Green

Print #110609142
Date: 06/09/11
Lat/Lon: 25.69298 -80.16388

 Aerial Photography, inc. 954-568-0484



Village of Key Biscayne

Village Green

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VILLAGE GREEN PARK



VILLAGE OF KEY BISCAYNE, FL

IRRIGATION SYSTEM REHABILITATION NOTES

August 25, 2011

PREPARED FOR THE
VILLAGE OF KEY BISCAYNE, FL

BY
ROSENBERG GARDNER DESIGN
LANDSCAPE ARCHITECTURE AND LAND PLANNING

ROSENBERG
GARDNER
DESIGN



PURPOSE:

The intent of these notes and details is to prepare a method for the testing, evaluation and rehabilitation of the existing irrigation system at Village Green Park in Key Biscayne, Florida.

PRELIMINARY TESTING:



The primary task is to evaluate the effectiveness of the supply to the existing system. The first step in this process was to have the Irrigation Contractor perform tests on the system. Lemus Irrigation, Inc. performed these tests and prepared a report (Appendix A) and determined that the available pressure was insufficient to properly run the system.

In synopsis, the report consisted of a few sections. They are the determination of the existing equipment, pressure testing of the system, de-

termination of the system requirements as designed, a summary of the findings and the Irrigation Contractor's recommendations.

Existing Equipment

The system is being fed from a 3" water meter with a 3" DCA Wilkins Model 950 backflow preventer. The 3" PVC main line feeds 2" Irritrol 100 and 200 Series Solenoid Valves. The irrigation heads are either Rainbird Falcon 6500 heads (light brown) or Toro 2001 (dark brown) and are spaced about 53' on center.

Pressure Testing

The static pressure was tested with one oil filled pressure gauge at the



inlet and another at the discharge side of the backflow preventer and the dynamic pressure was calculated for three different zones.

It was determined that there was significant pressure loss in the both the water meter and backflow preventer (8 PSI each) and the available dynamic pressure for the tested zones was only 53-54 PSI.

Determination of System Requirements

To determine if the available pressure was sufficient for the proposed system, it was necessary to determine the system's requirements. This is basically a function of determining the required pressure (PSI) and flow (GPM).

The Irrigation Contractor's testing revealed that with the available pressures the zones could handle approximately 70 GPM. The As-Builts show that the zones are typically approximately 110 GPM and will required 50 PSI (at the head).

Summary of Findings

In all, the available pressure is wholly insufficient for the system to function as designed.

Irrigation Contractor's Recommendations

To have the system run properly, the Irrigation Contractor recommends that the existing water meter be replaced, a booster pump be installed that will provide the requisite pressures and replacing the irrigation heads to the Rainbird Falcon 6500 Series rotor heads. The Irrigation Contractor further recommends additional testing on the rest of the system.

Rosenberg Gardner Design reviewed the report by Lemus Irrigation, Inc. and found it to be complete and the report's recommendations appear accurate.



SECONDARY TESTING AND SYSTEM REHABILITATION:

Of primary concern, is the installation of a booster pump to increase the system's available pressure. Rosenberg Gardner Design contacted a local pump supplier to assist in the recommendation of the proper sized pump. Based upon the available pressures and system demands, Hoover Pumping Systems rec-

ommended a 7.5hp pump. The specifications, details and electrical requirements of this pump are included in Appendix B.

The Irrigation Contractor shall be responsible to hire any necessary Sub-Contractors to perform work that is not able to be performed under their abilities.

After the installation of the booster pump and pressure tank the available pressures will be sufficient to operate the system as designed.



While the exact supplier of the irrigation head shall be established by the Village of Key Biscayne, it is anticipated that the heads will be the Rainbird Falcon 6504 Series Gear Driven Rotor Heads with the appropriate nozzles. These heads will be used to replace all of the irrigation heads. Particular nozzles must be used depending on the spray pattern. The nozzles shall be selected according to following schedule:

- For 90° radius pattern throw use a #4 nozzle
- For 180° radius pattern throw use a #8 nozzle
- For 270° radius pattern throw use a #12 nozzle
- For 360° radius pattern throw use a #16 nozzle

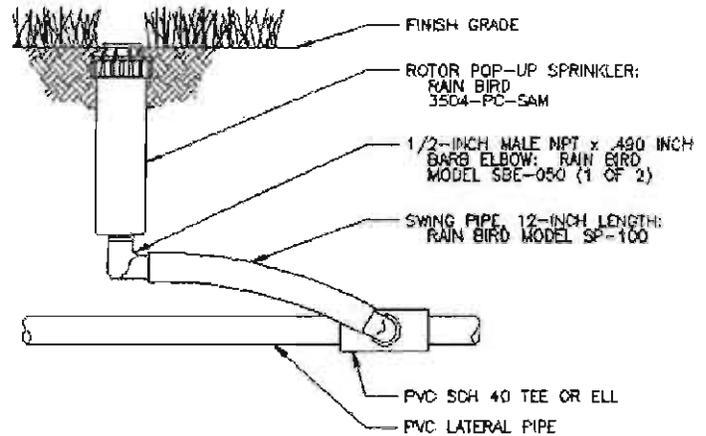
It is imperative that the previous nozzle chart is utilized. By varying the nozzles for the differing radius throws, consistent precipitation rates throughout the park will be ensured.

Secondary System Testing and Repair

Now ensured the system will be providing sufficient flow and pressure to fully operate the system and that the correct irrigation heads are installed, it is possible to test the rest of the system. The first step shall be to test the system visually. Prior to commencement, ensure that all of the zone valves are fully open and haven't been shut down manually.

The system shall be turned on at the controller and every zone shall be cycled through allowing sufficient time to measure and record the throw of every head as well as for sufficient time for "wet spots" caused by line breaks to become visible. If any of these breaks are visible, the Irrigation Contractor shall immediate repair the break.

The spray throw shall reach the adjacent head thereby ensuring "head-to-head" coverage. All non-functioning or inappropriate (not conforming to the design parameters) heads shall be replaced. Further, heads that are not installed at the correct elevation compared to finish grade or plumb shall be adjusted. During this test all heads shall be cleaned of debris regardless of whether they appear to be providing sufficient throw.



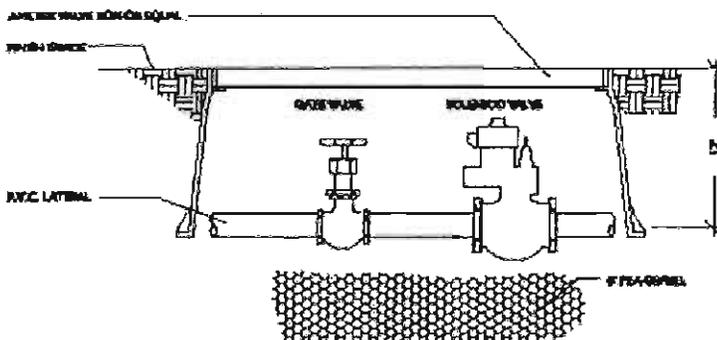
NOTE:
FOR FLOWS ABOVE 4 GPM USE A SWING JOINT INSTEAD OF SWING PIPE OR SWING ASSEMBLY.



The As-Built drawings shall be verified to ensure that heads are installed in the same place and zoned as noted on the plan. If there are any deviations from the As-Built drawings, the Irrigation Contractor shall bring this to the immediate attention of RGD.

Once the testing of the individual zones is complete and repaired, the Irrigation Contractor shall begin the testing of the main. Prior to commencement of the main line pressure test, the Irrigation Contractor shall open every valve box and verify that there is a gate valve that is fully operational and can be closed. If there is no gate valve present, then one shall be installed.

All of the above mentioned gate valves shall be closed and main's pressure shall be tested by pressurizing the main just after the booster pump. A pressure gauge shall be installed at the end of the main furthest from the location of the pressurization equipment and then the main shall be pressurized with water to 100 pounds per square inch (PSI) for a period of one hour. If more than one pound of pressure is lost during a one hour testing period, the test shall be considered a failure. All breaks shall be repaired and the test shall be redone. This process shall be repeated until the assembly passes the pressure test.



TYPICAL SOLENOID VALVE ASSEMBLY

N/A

After the completion of this test-



ing, the piping and water throw of the irrigation system should function properly. The Irrigation Contractor shall disassemble and remove all testing equipment, reconnect the system and open the gate valves at the zone valves.

In recap, after this phase, the water meter should provide sufficient flow and the back-flow preventer should function as required. There will be a booster pump and pressure tank providing sufficient pressures. The main line will be able to withstand the required pressures and will have no breaks. The valves will all function properly and there will be gate valves in each valve box. Laterals will be free of breaks and the correct irrigation heads will be of the correct type, clear of debris and installed plumb on swing joints at the correct elevation.

OTHER EQUIPMENT:



Controller and Rain Shut-Off Devices

The Village is in the process of deciding if the existing irrigation controller will remain or if it will be converted as part of a village-wide central control system. At this point it should be assumed that the existing controller will remain. If it is determined that this central control system will be required, then the proposed irrigation controller will be furnished and installed as required.

The existing irrigation controller shall be re-wired to ensure that zones are connected in a logical order. For example, adjacent zones will be in consecutive order. Additionally, the irrigation system shall be equipped with a rain shut-off device such as a weather station, rain sensor or soil moisture sensors. RGD will assist in the location of these devices once it is determined which shut-off devices are to be used.

The controller will be located in the booster pump enclosure.

Valve Boxes

All valve boxes shall be opened and excess soil shall be removed from the bottom of the box to allow for the installation of a minimum of 6" of $\frac{3}{4}$ " aggregate size gravel with a minimum of 2" of clearance between the bottom of the valve and the top of the

gravel. This includes the valve box for the water meter.

The lids of all of the valve boxes (except for the water meter) shall be replaced with lockable lids.

If any leaks in solenoid or gate valves are noted, the Irrigation Contractor shall repair them immediately.



PROTECTION:

Protection of Existing Utilities, Structures and Landscaping

The Irrigation Contractor is responsible to preserve and protect existing facilities from damage caused by this work. In the event damage does occur, damage shall be completely repaired to its original condition at no additional cost to the Village. The proper utility companies shall be contacted to stake the exact location of any underground lines including but not limited to electric, gas, telephone service, water, and cable prior to the commencement of any work.

Any disruption or disturbance of any existing plant, tree, shrub, or turf, or any structure shall be completely restored to the satisfaction of the Village at no additional cost. The Irrigation Contractor shall be responsible to maintain pedestrian access and provide protection to the public from any construction activities.



CLEANUP AND CLOSEOUT:

Cleanup

Prior to completion, the Irrigation Contractor shall thoroughly flush out the entire system to remove dirt, debris and other particulates. All areas that have been disturbed

by construction activities shall be returned to their previous condition prior to final acceptance.

Record Drawings

After completion of installation, the Irrigation Contractor shall furnish completed as-built plans showing locations of water meter and backflow preventer assembly, booster pump and pressure tank, mains, valves, laterals and irrigation heads with dimensions where required or necessary. The Irrigation Contractor shall furnish a reduced color-coded copy of the as-built drawings laminated in plastic and mounted inside the controller cover. Note the valve number on drawings and include same number on tag attached to valve, or engrave on outside cover of valve box.

Operation and Maintenance Manuals:

Prepare and deliver to the Village an index sheet stating the Irrigation Contractor's address and business telephone number, list of equipment with names and addresses of local manufacturers' representatives, catalog and parts sheet on every piece of equipment installed and complete operating and maintenance instructions on major equipment components. The Irrigation Contractor shall provide the Village's maintenance personnel with instructions for the proper operation techniques for major equipment and show evidence in writing to the Landscape Architect at the conclusion of the project that these services have been rendered.

Warranty:

The Irrigation Contractor shall fully warrant the irrigation system for a period of one year after the written confirmation from the Landscape Architect that the warranty period is in effect. During the warranty period, enforce manufacturer's and supplier's warranties. Any malfunctions, deficiencies, breaks, damage, disrepair, or installations by the Irrigation Contractor and his suppliers shall be immediately and properly corrected to the proper order as directed by the Village or Landscape Architect. Make full and immediate restoration for any damages caused by system malfunction at no additional cost to the Village.

Final Acceptance:

Prior to the final acceptance of the system's remediation, Rosenberg Gardner Design and the Village will conduct a visual inspection of the operation of the system. During this inspection, the Irrigation Contractor shall cycle through the system (operated from the controller) and the system will be checked for valve installation, main and lateral breaks and proper irrigation head installation ("head-to-head" coverage, no clogs, plumb installation and proper elevation of heads). Until approval from the Village and the Landscape Architect, the project shall not be considered "Accepted".

APPENDIX A



VILLAGE GREEN PARK

IRRIGATION SYSTEM EVALUATION

PURPOSE OF THE EVALUATION: *The Village Green Park located at Khiscayne, had problems to maintenance the landscaping due to a lack of the watering system. It is necessary to evaluate it to find out the problems, and what are the steps to follow to improve it and make it efficient on the operation and coverage.*

At the field we found the following:

- 1) Available water source : 3" water meter - disc type*
- 2) Back Flow Preventer : 3" DCA - Wilkins - Model 950*
- 3) Irrigation Design Criteria:*
 - a. Block Type*
 - b. Square distribution*
 - c. Spacing +/- 53' - between heads and rows.*
 - d. Solenoid Valve : 2" Irritroll 100 Et 200 series*
 - e. Main line size: 3"*
 - f. Heads type : Rainbird Falcon 6500 Et Toro 2001*
 - g. Nozzles :*
 - i. Rainbird Head : Light Brown.*
 - ii. Toro Heads : Dark Brown*

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VILLAGE GREEN PARK

IRRIGATION SYSTEM EVALUATION

First it was determinate the static available pressure:

- *We install a pressure gauge (oil filled) at the inlet (1st) and the discharge side (2nd) of the back flow preventer.*
 - *It was read: 70 psi*

- *After that, zone #s 9, 3 and 2 were ran in sequence to find the dynamic available pressure for the system.*
 - *Reading:*

<i>Zone</i>	<i>1st P. Gauge</i>	<i>2nd P. Gauge</i>
<i>9</i>	<i>62 Psi</i>	<i>54 Psi</i>
<i>3</i>	<i>62 Psi</i>	<i>54 Psi</i>
<i>2</i>	<i>61 Psi</i>	<i>53 Psi</i>

- *See Detail # 1 (attached)*
- *Conclusion:*
 - *Water Meter Losses: 8 Psi.*
 - *Back-flow Preventer Losses: 8 Psi.*

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VILLAGE GREEN PARK

IRRIGATION SYSTEM EVALUATION

Next, it was found the G.P.M used by each zone.

Since the dynamic pressure is about same in all three zones we can infer that the water usage of each is about the same.

- *For this, it was evaluated zone # 2 (one of the farthest from the water source); we did the following:*
 - 1) *Unassembled last head(farthest from the solenoid valve)*
 - 2) *Install 4' riser with a swing joint at the end of the riser, and install the head back on the swing joint upside down; fit the head inside a 5 galls. bucket; using a chronograph and with the water running it was measured the time that the bucket was filled of water; it was read the following:*
 - *1st reading : 31 seconds*
 - *2nd reading : 30 seconds*
 - *3 reading: 31 seconds.*

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VILLAGE GREEN PARK**IRRIGATION SYSTEM EVALUATION**

- *Conclusion: It is a 10 GPM flow; we have 7 heads in the zone, meaning the total GPM of 70. We can said that in average it is been used about 70 GPM per zone on the system.*
- *We also found the pressure available in the head inlet, installing a pressure gauge at this point, and it was red 30 PSI. This head to reach the spacing installed needs at least 60PSI.*

The average radio of coverage of the heads was 40'.

With all variables found we can calculate the following:

1) Precipitation (in/hr) :

$$P = \text{GPM} (360) * 96.25/\text{Head Sp} * \text{Row Sp}$$

a. GPM = 10

b. Spacing = 53'

$$P = 10 * 96.25 / 53 * 53 = 0.34 \text{ "/hr}$$

2) Coverage: Reach of the head = 40'

Field Spacing Diameter: 106'

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VILLAGE GREEN PARK
IRRIGATION SYSTEM EVALUATION



Coverage: $40'/106' = 38\%$ of the Diameter.

Very poor coverage. Good coverage should be at least 50% of Diameter.

In Summary, the field conditions are as follows:

- Water Meter size: 3" Disc Type.
- Back Flow Preventer:
 - Size: 3"
 - Made: Wilkins
 - Model: 950
- City Static Pressure: 70 psi.
- System water usage: 70 G.P.M.
- Dynamic Pressure at 70 G.P.M. at discharge of Back Flow Preventer: 54 psi.
- Available Pressure at last Head: 30 psi.
- Pressure losses from Back Flow Preventer to last head:
 - $54 - 30 = 24$ psi.
- Heads & Rows Spacing: 53'
- Head water usage: 10 G.P.M.
- Heads radius: 40'
- Precipitation: 0.34"/hr.
- Coverage: 38%

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VILLAGE GREEN PARK
IRRIGATION SYSTEM EVALUATION



Hydraulic calculations to be compared with field results:

Available pressure: 70 psi:

- *Water Usage: 70 G.P.M.*
- *Water Meter losses: 8 Psi.*
- *Back Flow Preventer Losses: 8 Psi.*

Since these variables are constant we are going to evaluate from the discharge of the Back Flow preventer out to the zone.

- *Master valve losses: 2" - 70 gpm = 2.5 Psi*
- *Zone Valve losses: 2" - 70 gpm = 2.5 Psi*
- *Main line Losses:*
 - *We are assuming all flow go in one direction (worst scenario)*
 - *Distance to zone: 1260' (Zone 9 on timer - B5 on plan)*
 - *Main Line size: 3"*
 - *Flow: 70 G.P.M.*
 - *M. Line Losses: 5.92 psi.*

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VILLAGE GREEN PARK
IRRIGATION SYSTEM EVALUATION



• *Lateral Losses:*

<i>Q (gpm)</i>	<i>Diam. (")</i>	<i>L (feet)</i>	<i>P. Losses (psi)</i>
10	1-1/4	53	0.34
20	1-1/2	53	0.57
30	2	53	0.36
40	2-1/2	10	0.05
70	3	25	0.12

Total P. losses: 1.44 Psi

Total Losses in the system:

- *Master valve : 2.5 Psi*
- *Zone Valve : 2.5 Psi*
- *Main Line : 5.92 Psi*
- *Lateral: 1.44 Psi*

Total = 12.36 Psi

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VILLAGE GREEN PARK

IRRIGATION SYSTEM EVALUATION



At the field we found the pressure losses from Back Flow Preventer to last head = 24 Psi

We have a differential of : $24 \text{ psi} - 12.36 = 11.64 \text{ Psi}$

This may be caused , at gate valves, change of the flow direction, leaks etc.

Evaluating the system under normal operating conditions:

- Heads Spacing = 53'
 - Considering the wind factor (45% Diameter) for 8 m/s wind velocity, the head radius will be as follows:
 - Spacing = 53'
 - Wind factor spacing: 45% diameter.
 - $(106' * 0.50) / (0.45 / 2) = 59'$
 - Head should have a radius of 59'
- To get this radius the Falcon head needs:
 - Nozzle : #12 light brown
 - PSI : 70
 - G.P.M. = 13.2

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VILLAGE GREEN PARK**IRRIGATION SYSTEM EVALUATION**

- Total G.P.M. on the system: $13.2 * 7 = 92.4$
- With this new flow:
 - Main line: 1260' / 3" / 95 G.P.M. : losses = 10.46 psi
 - Zone valve: 5 psi
 - Master valve: 5 psi
 - Water Meter : Field +/- 10 psi (Chart = 2.0 psi)
 - Back Flow Preventer : 8 psi (same)
 - Pressure at the head : 70 psi
 - Unforeseen pressure losses : 11.64 psi
 - Lateral:
- Lateral Losses: 2.31 psi

Q (gpm)	Diam. (")	L (feet)	P. Losses (psi)
13	1-1/4	53	0.48
26	1-1/2	53	0.95
39	2	53	0.61
52	2-1/2	10	0.08
92	3	25	0.19
Total P. losses:			2.31 Psi

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VILLAGE GREEN PARK**IRRIGATION SYSTEM EVALUATION**

TDH system needs : 122.41 psi (283')

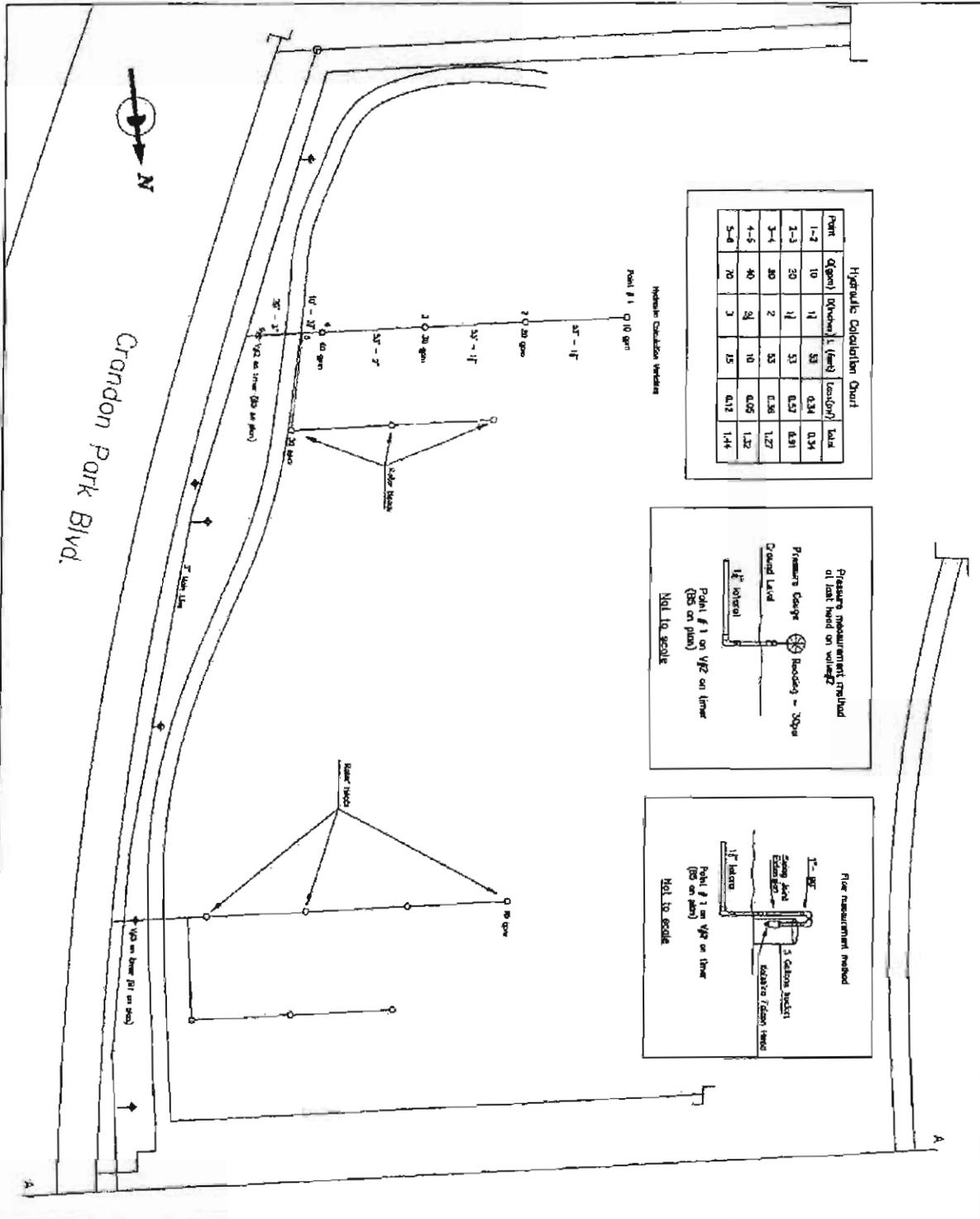
It is necessary a booster pump with the following performance:

- *122.41 Psi - 70psi = 52.41 psi. (121')*
- *Flow = 95 G.P.M.*
- *Efficiency no less than 65%*

We recommend the following:

- *Replace the existing water meter for new one, too much pressure losses.*
- *To performance a pressure test to main line, to find leaks.*
- *Install a booster pump with the following characteristics: 95 G.P.M VS 121' at 65% Eff.*
- *Replace any head by a Rainbird Falcon Model 6500, nozzle #12 light brown, for the purpose of maintaining uniformity in the precipitation of the system.*

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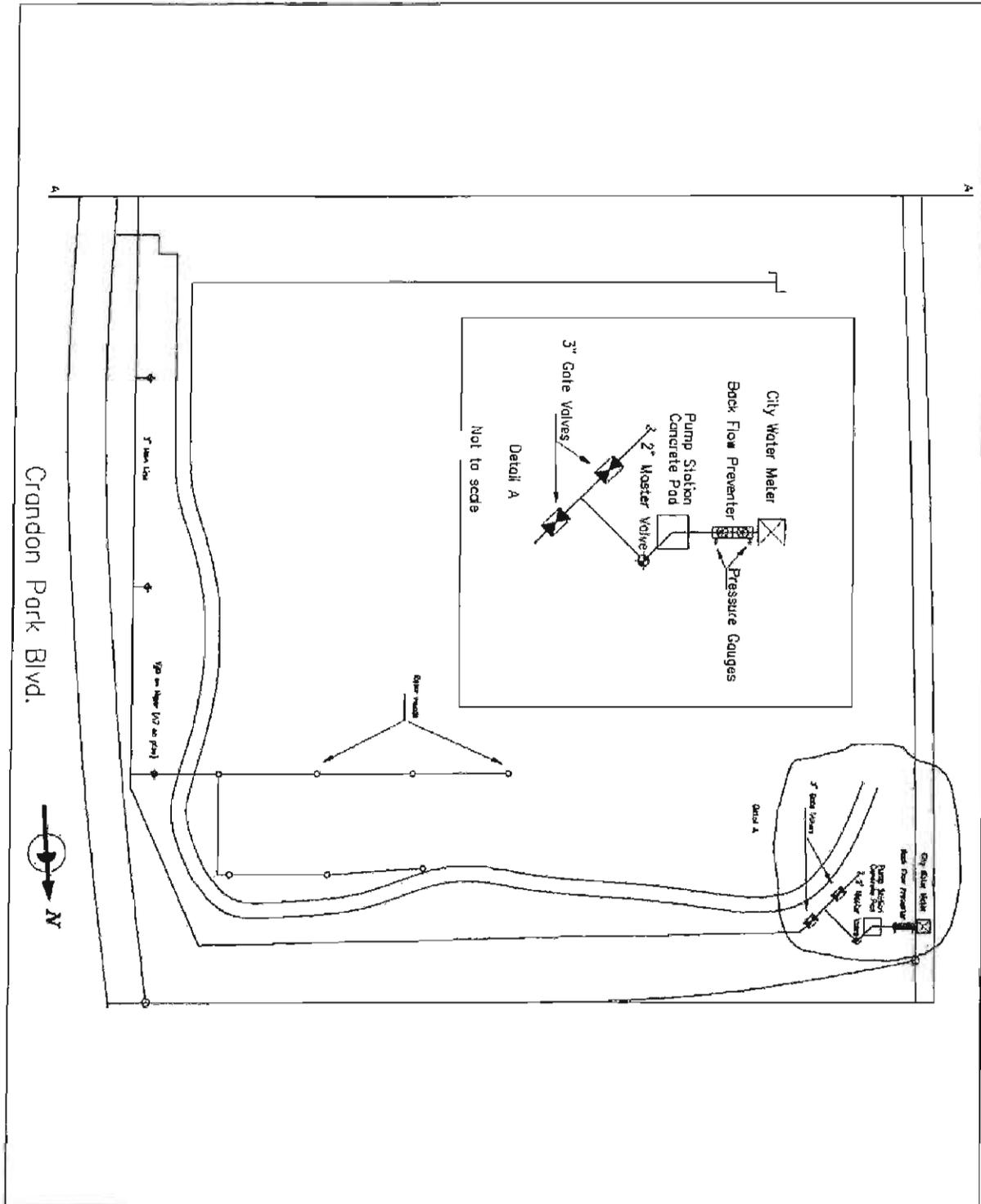
lemus irrigation, inc.
Dade #3 p 001370 - Broward #5 CLS 41 PW
Palm Beach #198 311 480
Design, Irrigation and Service

PROJECT: **Village Green Park**
City Of Key Biscayne, Florida.
Irrigation Sketch

Date: 8/25/11
Scale: 1"=30'
IRR1

LEMUS IRRIGATION, INC.
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DRAWN BY: A. LEMUS

Revision:



 <p>Lemus Irrigation, Inc. Dade #3 p 006330 - Approved #3 CLS #1 Pk. Palm Beach #3 / 21483 Design, Installation and Service</p>	PROJECT: Village Green Park City Of Key Biscayne, Florida.	Date: 8/25/11	LEMUS IRRIGATION, INC. 18120 S.W. 147th. Av. Miami, FL 33187 DRAW BY: A. LEMUS	Revision:
	ZONE: Irrigation Sketch	Scale: 1"=30'		IRR2

APPENDIX B

**VILLAGE OF KEY BISCAYNE
VILLAGE GREEN PARK REPLACEMENT BOOSTER**

HOOVER GREEN

SPECIFICATIONS

**SINGLE CENTRIFUGAL PUMP SYSTEM
PRESSURE DEMAND VFD**

PURPOSE:

To provide a complete prefabricated variable frequency drive skid mounted pressure demand centrifugal pump system from a sole source company, herein after referred to as the "manufacturer", whose primary business is the manufacture of prefabricated pump systems. The manufacturer will manufacture, flow test, install and warrant the system to meet all specified operating requirements described below and in the system detail. The system shall be a Model HCF-7.5PDV-230/3-Y,Z as manufactured by Hoover Pumping Systems of Pompano Beach, Florida USA 954-971-7350 specified below and shown on the plan details. This specification describes the general components and minimal operating requirements and shall not be construed as a manufacturing guide or complete list of required system components and appurtenances.

The contractor shall submit seven (7) complete copies of the shop drawings to the designer for approval, prior to system order placement. The submittal shall contain cut sheets for all system components. To be considered an equal, the contractor must submit the following 12 days prior to bid opening: manufacturer brochure showing prefabricated pump systems manufacturing is the primary business of the manufacturer or division proposed to manufacture the system, written specifications, dimensioned layout detail, electrical schematic, product sheets for all main components, Underwriters Laboratory electrical control panel and "Packaged Pumping System" manufacturer's file numbers, list of 6 projects with similar operating systems with current name and phone number of person responsible for system operation, manufacturer's insurance certificate for general liability showing minimum coverage of \$1 million, and written certification from the manufacturer stating the proposed system meets all requirements described in this specification, the detail and the bid documents.

If the data submitted is determined to be an equal by the designer the bidder will be notified prior to the bid date.

FIBERGLASS ENCLOSURE: The pump station shall be protected by a fiberglass enclosure with chemical and ultraviolet resistant open mold resin with exterior finish that is uniform in color and texture, reinforced with fiberglass and stiffeners for rigidity. The enclosure shall open clear of the equipment for ease of service with the aid of gas filled struts, a stainless steel hinge and latching lockable handle. The enclosure shall be of dimensions adequate to contain the pump system mounted on the skid as shown on the system detail.

MOUNTING ASSEMBLY:

The pump station shall be mounted on a prefabricated aluminum or hot dipped galvanized skid. Pedestals shall be provided to mount the pump motor and control panel assemblies. The entire sta-

tion shall be installed on a reinforced concrete slab sized as noted on the system detail.

PUMP AND MOTOR:

The pump shall be a single-stage end-suction centrifugal type, with the liquid end mounted directly to the motor enclosure to allow rear pull out of the entire motor. A pressure sensor for loss of prime protection and thermal sensor for pump overheat protection shall be mounted into the pump volute.

The system will be designed for operation at 3,450 RPM. The pump driving motor shall be of the squirrel cage induction type. The motor shall be suitable for full voltage starting at 60 Hz. The motor enclosure shall be totally enclosed fan cooled for all motors greater than 4 horsepower and open drip proof (ODP) for 5.5 horsepower and smaller, configured to allow direct mounting of the pump's liquid end.

The main motor shall be rated at 7.5 HP at 60 Hz. Motor will not exceed 10HP when only single phase electric service is available.

PUMP STATION PERFORMANCE:

The required pump performance with a maximum of 12 ft. of suction lift is as follows: a) discharge pressure of 75 psi with minimum 45 psi boost, b) maximum required flow of 110 GPM for the main pump, and c) minimum required flow of 35 GPM.

IRRIGATION PUMP CONTROL PANEL:

The control panel assembly shall be Underwriters Laboratories listed in accordance with section 508A for "enclosed industrial control panels." All control devices and electronic auto-sensory circuitry shall be housed in a self-contained weather-resistant NEMA 4 control cabinet. The control panel shall be identified with a permanent label approved by Underwriters Laboratories Inc. containing the word "LISTED", the name and / or symbol of Underwriters Laboratories Inc., a control number and the product name "Enclosed Industrial Control Panel". An electrical schematic shall be permanently mounted inside the cabinet. The control cabinet shall contain the following protection and control equipment:

Operation

This station operates as a Variable Frequency Drive (VFD) pressure demand start, reduced-flow retirement system. The station automatically maintains a constant discharge pressure from a pressure transducer input regardless of varying flow demands within the station operating range. The operator interface allows for viewing of system setup parameters.

Software features include flow, diagnostic information, Phase Loss protection, Phase Unbalance protection, Voltage monitoring and protection, Hoover Drive control.

Pressure Demand

The main pump starts when the mainline pressure drops below the setting of the start pressure switch.

No-flow Retirement

The pump shuts off if water stops flowing.

Loss of Prime Protection

If the system pressure remains below the start pressure, and there is no flow of water through the system during pump operation, the pump will shut off. The system will remain off until 'Reset'.

Thermal Protection

If the temperature at the pump volute exceeds 43C after at least 3 minutes of pump operation, the pump will shut off, and the 'Pump Overheat' light will turn on. The system will remain off until 'Reset'.

Drive Fault

In case of a drive fault, including under or over voltage, over current, heat sink thermal, and ground fault, the affected pump will shut off, the operator interface will display 'Drive Fault'. The pump will remain off until the system is 'Reset'.

PROTECTION EQUIPMENT

- Front operated main power disconnect
- Motor fuses for motor and drive short circuit and ground fault protection
- Metal oxide varistors (MOV) for transient voltage suppression per phase
- Fused control circuitry with blown fuse lighted indicator for each circuit

PENETRATION STANDARD REQUIREMENTS:

All control panel penetrations shall be performed by a licensed electrician to minimum NEMA 4X requirements, and compliant with International Electrotechnical Commissions (IEC) IP56 rating under its IP code, to protect against duct ingress and against any harmful effects from water projected in powerful jets from any direction and protection against corrosion.

VARIABLE FREQUENCY DRIVES (VFD):

Variable Frequency Drive with the following characteristics shall be provided for the pump motor: 32-bit microprocessor controlled Pulse Width Modulated output, IGBT transistors, line reactors, built-in adjustable PID control, and acceleration ramp up and down, single pump VFD systems 25 hp or less NEMA 4 VFD with forced-air cooling. All other VFD system cooling is by industrial air conditioner. Variable torque control, 32 character alphanumeric English full text parameter display, single function keys, block parameter access, dual analog outputs, automatic and manual reset, opto-isolated outputs, log of last 30 events retained in memory.

PRESSURE TRANSMITTER:

A 4-20mA-pressure transmitter shall provide a feedback signal to drive PID loops and for system pressure control. The transmitter shall be CE & UL recognized and built with an all stainless steel housing and pressure port, rated to NEMA 4, and able to withstand shock and vibration levels to MIL-STD-810E. The transmitter sensor element will provide a signal over 0-150 PSIG range while rated for 600-PSI overpressure minimum. Conformity error will be less than or equal to 0.50% and the transmitter shall be capable of operation from -40 to +120C.

DISCHARGE PIPE MANIFOLD:

The pipe discharge manifold shall be constructed of galvanized steel pipe with galvanized roll groove fittings. A flow-switch, pressure gauge and hose bib will be provided on the station discharge. A wafer type butterfly valve will be provided at pump station discharge. A hydropneumatic

tank with air/water separation bladder will be connected to the discharge header as shown on the system detail to supply replacement water when the pump is not operating.

SUCTION LINE:

The minimum size suction line shall be 3" diameter or larger as required for a maximum of 5 feet per second velocity flow. If a reducing fitting is required at the pump suction, an eccentric reducer shall be installed. Any above ground pipe at the pump system exposed to sunlight shall be schedule 40 galvanized steel with galvanized roll groove fittings.

WARRANTIES:

Prior to shipping, the manufacturer shall flow test the system and submit a certified report to the designer stating the system is within 1% + or - of the specified flow rate and pressure, and meets the operational requirements.

The manufacturer of the pumping station shall warrant all components for a period of one (1) year from date of manufacture.

PN#11926



**Power Requirements -
Please Forward to Design Professional or Your Customer**

DATE: 24 August 2011
TO: Kenneth Gardner, Rosenberg Gardner Design Group
FROM: Kathleen VanKuren, Hoover Pumping Systems
RE: Village of Key Biscayne Village Green Park Replacement Pump System Electrical Service PN11926

Thank you for selecting Hoover Pumping Systems to provide the packaged pump system for this project.

The following design information should be given to the engineering professional responsible for the design of the electrical supply to the pump system.

The system will be manufactured based on one of the following electrical configurations:

Voltage	Phase	Hertz	Panel Connections
208	1	60	4 Wires (A, B, Neutral, Ground)
230	1	60	4 Wires (A, B, Neutral, Ground)
208	3	60	5 Wires (A, B, C, Neutral, Ground)
230	3	60	5 Wires (A, B, C, Neutral, Ground)
460	3	60	4 Wires (A, B, C, Ground)

Note: Three phase power is required for systems over 10 horsepower.

The Hoover Pumping Systems pump system is supplied with an Underwriters Laboratory® listed enclosed Industrial Control Panel assembly. The Control Panel assembly contains all of the pump system controls, a main disconnect, and a ground connection. A separate service disconnect is required for systems less than 40 total horsepower.

The pump station will include the following pump motor loads:

Load	Horsepower	Amps ¹	Service Factor
Pump#1	7.5	Based on voltage/phase	1.15
Control Panel	N/A	4	N/A

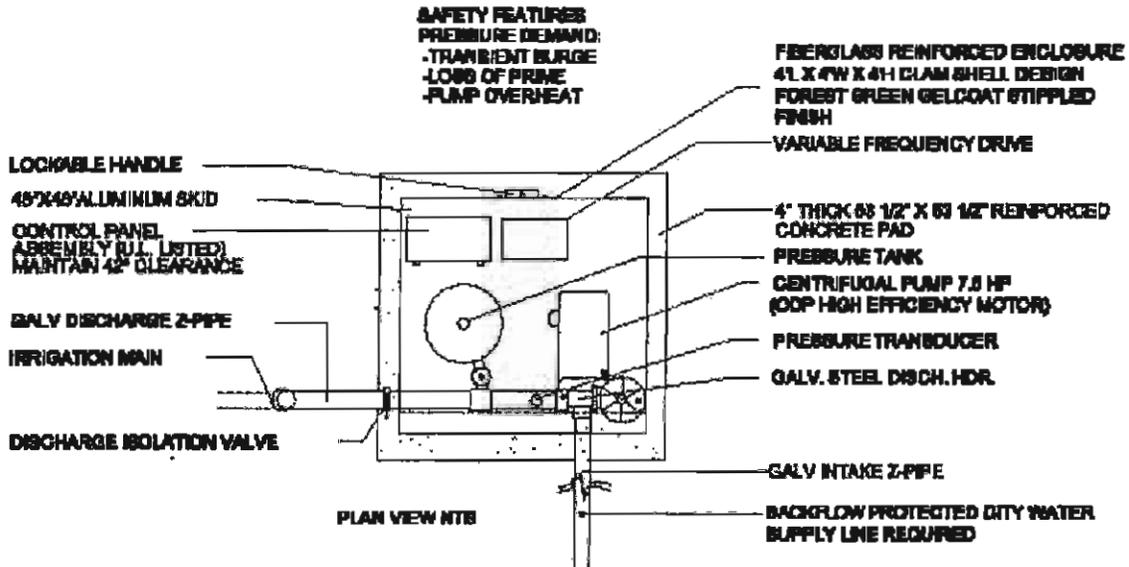
The data here may be used for selection of appropriate electrical supply equipment, including feeder, branch circuit protection, and disconnects.

Please contact Hoover Pumping Systems at (954) 971-7350 for assistance with voltage drop or other application considerations. Thank you.

¹ Pump motor Full Load Amps (FLA) per N.E.C. tables 430-148 & 430-150

NOTE: SUCTION AND DISCHARGE PIPE SHALL BE 60HED 40 GALVANIZED STEEL WITH GALVANIZED ROLL GROOVE FITTINGS FOR ALL ABOVE GROUND PIPE.
 REMOVE EXISTING PUMP SYSTEM AND CONCRETE PAD AND DISPOSE OF PROPERLY OFF-SITE.

* OPTIONAL FEATURES ARE INCLUDED IF MARKED WITH AN "X"
 _____ PRESSURE CONTROL VALVE
 _____ IRRIGATION CONTROLLER STATIONS, WITH RAIN SENSOR
 X PRESSURE TANK FOR PRESSURE DEMAND SYSTEMS



PUMP PERFORMANCE
 110 GPM @ 135 TDH, 75 PSI
 WITH UP TO 45 PSI BOOST

FILE PN110280HIG 0811

HOOVER PUMPING MODEL: HCBF-7.0FDV-2003-Y,Z
 Pompano Beach, Florida, Tel 884-871-7200

**VILLAGE OF KEY BISCAYNE VILLAGE GREEN
 PARK BOOSTER
 CENTRIFUGAL PUMP SYSTEM DETAIL
 FIBERGLASS ENCLOSED SINGLE CITY WATER
 PRESSURE DEMAND VARIABLE FREQUENCY DRIVE
 HOOVER GREEN**