MANATEE COUNTY
FLORIDA

July 2, 2013

TO: All Interested Bidders

SUBJECT: Invitation for Bids #13-1543CD
Blackstone Park Expansion Site Work

ADDENDUM #1

Bidders are hereby notified that this Addendum shall be acknowledged on page 00300-1 of the Bid Form and made a part of the above named bidding and contract documents. Bids submitted without acknowledgment of the Addendum will be considered incomplete.

The following items are issued to add to, modify, and clarify the bid and contract documents. These items shall have the same force and effect as the original bidding and contract documents, and cost involved shall be included in the bid prices. Bids to be submitted on the specified bid date, shall conform to the additions and revisions listed herein.

1. **CHANGE** Article A.06, Deadline for Clarifications, on page 00010-2 of the bid documents to read as follows:

   July 8, 2013 at 3:00 PM shall be the deadline to submit all inquiries, suggestions, or requests concerning interpretation, clarification or additional information pertaining to the Invitation for Bids to the Manatee County Purchasing Division.

   This deadline has been established to maintain fair treatment for all potential Bidders, while maintaining the expedited nature of the Economic Stimulus that the contracting of this Work may achieve.

2. **DELETE** Bid Form pages 00300-2 thru 00300-7, and **INSERT** the REVISED Bid Form pages 00300-2 thru 00300-7 that are attached to this Addendum #1.
3. **DELETE** the Table of Contents page of the Technical Specifications, and **INSERT** the revised Table of Contents page dated 6/24/2013 that is attached to this Addendum #1.
4. **DELETE** all of the Measurement and Payment section of the Technical Specifications, and **INSERT** the revised Measurement and Payment section that is attached to this Addendum #1.
5. **ADD** Section 02480- Landscape Work, that is attached to this Addendum #1, to the Technical Specifications.
6. **ADD** Section 02810- Irrigation Systems, that is attached to this Addendum #1, to the Technical Specifcations.

Financial Management Department – Purchasing Division
1112 Manatee Avenue West, Suite 803, Bradenton, FL 34205
PHONE: 941.749.3014 * FAX: 941.749.3034
www.mymanatee.org

7. **ADD** the Landscape Planting Plans that are attached to this Addendum #1 to the Plan Set.
8. **ADD** the Landscape Irrigation Plans that are attached to this Addendum #1 to the Plan Set.

The following questions have been presented by potential bidders:

QUESTION #1: My customers are asking for clarification on the underdrain pipe specification on this job. The specification states that the pipe is to meet AASHTO M252. I've attached the spec sheets for both our single wall and dual wall pipe. Both types meet the AASHTO specification. Can you please clarify if the pipe needs to be dual wall or single wall as well as if it will require sock?

RESPONSE #1: There are two locations where underdrain pipe is proposed:
(1) For the treatment underdrain proposed within the Dry Retention Area, the underdrain pipe may be single-walled or dual wall. No factory installed sock shall be installed with this underdrain pipe as stated in the detail notes. See Typical Shallow Bottom Treatment Underdrain detail located on sheet 12 of 19 for additional requirements.

(2) For the Ball Field Underdrains, the underdrain pipe may also be single-walled or dual wall. A factory installed sock shall be provided for this underdrain pipe as noted on the details. See Ball Field Underdrain/Underdrain Cleanout Detail on sheet 12 of 19 for additional requirements.

QUESTION #2: Bid item 200, 2" Type S-III Asphalt has to be installed in two 1" lifts. S-III cannot be installed in one lift @ 2". Can you clarify this?

RESPONSE #2: Bid Item 200 represents the final in-place thickness of the 2" Type S-III Asphaltic Concrete. This bid item includes all work necessary to construct the specified asphaltic concrete thickness of 2", including multiple lifts as required.

QUESTION #3: Bid item 201 bituminous material prime and tack coat. Are you asking for prime & sand on the base prior to paving? And is the tack coat between the lifts of Asphalt need to be in this bid item?

RESPONSE #3: Bid Item 201 represents all bituminous prime and tack coatings needed to complete the parking lot pavement construction. Sand is only required on the primed base if open to traffic prior to asphaltic concrete being installed. Any tack coats required to construct the parking lot pavement shall also be included in this bid item. Please refer to Technical Specification Section 02912, 3.04.D. and 3.04.E. for clarification regarding the application of the prime coat and tack coats.

END OF ADDENDUM #1

Bids will be received at Manatee County Purchasing, 1112 Manatee Avenue West, Bradenton, Florida 34205 until **Tuesday, July 16, 2013 at 3:00 PM.**

Sincerely,

Melissa M. Wendel, CPPO
Purchasing Official

BID FORM

(Submit in Triplicate) Section 00300

BLACKSTONE PARK EXPANSION SITE WORK

Bid "A" Based on Completion Time of 180 Calendar Days

BID ITEM NUMBER	DESCRIPTION	UNITS	QTY.	BID PRICE PER UNIT ($)	TOTAL BID PRICE ($)
	DRAINAGE- (100 SERIES)				
100	6" PVC STORM PIPE (SDR 35)	LF	278	$ _____	$ _____
101	15" RCP	LF	903	$ _____	$ _____
102	18" RCP	LF	279	$ _____	$ _____
103	24" RCP	LF	77	$ _____	$ _____
104	30" RCP	LF	46	$ _____	$ _____
105	19" X 30" ERCP	LF	455	$ _____	$ _____
106	24" X 38" ERCP	LF	386	$ _____	$ _____
107	29" X 45" ERCP	LF	390	$ _____	$ _____
108	6" Treatment Underdrain System with Filter Material (complete per detail)	LF	200	$ _____	$ _____
109	Treatment Underdrain Cleanout	EA	4	$ _____	$ _____
110	Ball Field 6" Underdrain with Filter Sock	LF	1,770	$ _____	$ _____
111	Ball Field Underdrain Cleanout	EA	21	$ _____	$ _____
112	20 LF Trench Drain System (complete per detail)	EA	3	$ _____	$ _____
113	24" Mitered End Section w/ Grates	EA	2	$ _____	$ _____
114	19" x 30" Mitered End Section w/ Grates	EA	2	$ _____	$ _____
115	29" x 45" Mitered End Section w/ Grates	EA	1	$ _____	$ _____
116	Roof Drain Downspout Connection (complete per detail)	EA	5	$ _____	$ _____
117	Roof Drain Storm Cleanout	EA	3	$ _____	$ _____
118	FDOT Type 'D' Inlet (bubbler box)	EA	1	$ _____	$ _____
119	Type 'J' Inlet	EA	6	$ _____	$ _____
120	FDOT Type 'C' Inlet	EA	2	$ _____	$ _____
121	FDOT Type 'E' Inlet	EA	7	$ _____	$ _____
122	FDOT Manhole Type '7' w/ 'J' Bottom (4' x 4'), Modify Top w/ Frame and Grate	EA	5	$ _____	$ _____
123	FDOT Manhole Type '8' w/ 'P' Bottom (4' Dia)	EA	2	$ _____	$ _____

Bidder Name: _____

Authorized Signature: _____

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BLACKSTONE PARK EXPANSION SITE WORK

Bid "A" Based on Completion Time of 180 Calendar Days

BID ITEM NUMBER	DESCRIPTION	UNITS	QTY.	BID PRICE PER UNIT ($)	TOTAL BID PRICE ($)
124	Control Structure SCS-1 (complete with skimmers)	EA	1	$ _____	$ _____
125	Rip-rap with Filter Fabric	SY	53	$ _____	$ _____
	SUBTOTAL (DRAINAGE 100 SERIES ONLY)				$ _____
	PAVING (200 SERIES)				
200	2" Type S-III Asphaltic Concrete	SY	6,490	$ _____	$ _____
201	Bituminous material prime and tack coat	SY	6,490	$ _____	$ _____
202	8" Crushed Concrete Base (LBR 100)	SY	6,700	$ _____	$ _____
203	12" Stabilized subgrade (LBR 40)	SY	7,100	$ _____	$ _____
204	6" of 1/2" Washed Shell with Weed Barrier	SY	27	$ _____	$ _____
205	Type 'D' Curb	LF	1,190	$ _____	$ _____
206	Valley Crossing	EA	1	$ _____	$ _____
207	4" Concrete Sidewalk	SY	500	$ _____	$ _____
208	4" Concrete Pad for Bike Rack	SY	24	$ _____	$ _____
209	6" Concrete Pavement with 12" Compacted Subgrade	SY	1,530	$ _____	$ _____
210	7" Concrete Pavement with 12" Compacted Subgrade	SY	920	$ _____	$ _____
211	Dumpster Pad with Enclosure and Gates (complete)	LS	1	$ _____	$ _____
212	Wheel Stops	EA	150	$ _____	$ _____
213	Signage and Striping (complete)(includes removal of existing striping along 23rd Street West)	LS	1	$ _____	$ _____
214	2' Detectable Warning Strips	EA	12	$ _____	$ _____
215	3' Detectable Warning Strip	EA	1	$ _____	$ _____
216	Maintenance of Traffic (includes preparation of MOT Plans)	LS	1	$ _____	$ _____
217	Adjust Existing Utility Pads/Boxes to Finished Grade	LS	1	$ _____	$ _____
218	Specialty Paver Curbing	LF	135	$ _____	$ _____
219	Concrete Pavers - Baseball Paver Design (in-place; complete)	SF	113	$ _____	$ _____

Bidder Name: _____

Authorized Signature: _____

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BLACKSTONE PARK EXPANSION SITE WORK

Bid "A" Based on Completion Time of 180 Calendar Days

BID ITEM NUMBER	DESCRIPTION	UNITS	QTY.	BID PRICE PER UNIT ($)	TOTAL BID PRICE ($)
220	Concrete Pavers - Diamond Paver Design (in-place; complete)	SF	200	$ _____	$ _____
221	Concrete Pavers - Landscape Island Paver Design (in-place; complete)	SF	192	$ _____	$ _____
222	Removable Bollard (includes reinforced concrete strip footing)	EA	5	$ _____	$ _____
223	Fixed Bollard (includes reinforced concrete strip footing)	EA	3	$ _____	$ _____
	SUBTOTAL (PAVING 200 SERIES ONLY)				$ _____
	EARTHWORK (300 SERIES)				
300	Excavate, place, grade, & compact existing soil material to within 2 feet below finished grade elevation (complete)	LS	1	$ _____	$ _____
301	Provide, place, grade, and compact clean, suitable fill material to finished fill elevation (complete)	LS	1	$ _____	$ _____
302	Swale Construction	LF	3,768	$ _____	$ _____
303	FDOT Gravity Wall (Scheme 1) with Aluminum Handrail	LF	128	$ _____	$ _____
304	Best Management Practice (BMP) Maintenance (includes repair, re-installation, and maintenance of existing BMPs installed by others. Also includes SWPPP implementation, inspections, and reporting)	LS	1	$ _____	$ _____
305	Staked Hay Bales	LF	90	$ _____	$ _____
306	Common Bermudagrass (materials only)	SY	11,130	$ _____	$ _____
307	Common Bermudagrass (installation and maintenance only)	SY	11,130	$ _____	$ _____
310	Sodding - Bahia (materials only)	SY	9,400	$ _____	$ _____
311	Sodding - Bahia (installation and maintenance only)	SY	9,400	$ _____	$ _____
	SUBTOTAL (EARTHWORK 300 SERIES ONLY)				$ _____
	FENCING (400 SERIES)				
400	6' High Black Vinyl Chain Link Fence with Black Vinyl Slats around electrical control panels	LF	52	$ _____	$ _____
401	6' High x 4' Wide Black Vinyl Chain Link Swing Gate with Black Vinyl Slats	EA	1	$ _____	$ _____

Bidder Name: _____

Authorized Signature: _____

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BLACKSTONE PARK EXPANSION SITE WORK

Bid "A" Based on Completion Time of 180 Calendar Days

BID ITEM NUMBER	DESCRIPTION	UNITS	QTY.	BID PRICE PER UNIT ($)	TOTAL BID PRICE ($)
402	6' High Black Vinyl Chain Link Fence	LF	1,399	$ _____	$ _____
403	7' High Black Vinyl Chain Link Fence	LF	225	$ _____	$ _____
404	8' High Black Vinyl Chain Link Fence	LF	302	$ _____	$ _____
405	10' High Black Vinyl Chain Link Fence	LF	168	$ _____	$ _____
406	12' High Black Vinyl Chain Link Fence	LF	419	$ _____	$ _____
407	Black Vinyl Backstop Fence	LF	289	$ _____	$ _____
408	8' High x 6' Wide Black Vinyl Chain Link Swing Gate	EA	1	$ _____	$ _____
409	Slide Gate for 12' Wide Fence Opening	EA	6	$ _____	$ _____
410	Slide Gate for 16' Wide Fence Opening	EA	3	$ _____	$ _____
411	Poly-Cap Fence Guard	LF	568	$ _____	$ _____
412	Black Vinyl Coated Foul Pole (complete; includes poly-cap fence guard cover)	EA	6	$ _____	$ _____
	SUBTOTAL (FENCING 400 SERIES ONLY)				$ _____
	BALL FIELDS AND BATTING CAGES (500 SERIES)				
500	Ball Field Identification Sign	EA	3	$ _____	$ _____
501	Distance Sign	EA	3	$ _____	$ _____
502	Visitor / Home Sign	EA	6	$ _____	$ _____
503	4' x 10' Folding Backstop Padding Mats	EA	6	$ _____	$ _____
504	5' High Windscreen	LF	1,032	$ _____	$ _____
505	6' High Windscreen	LF	282	$ _____	$ _____
506	Pitcher's Plate	EA	3	$ _____	$ _____
507	Home Plate	EA	3	$ _____	$ _____
508	Bases (set of 3 per each)	EA	3	$ _____	$ _____
509	6" Clay Infield Mix - Rolled (includes all 3 ball fields)	LS	1	$ _____	$ _____
510	4" Root Zone Mixture Material per Ball Field Turf Detail & Specifications (includes all 3 ball fields)	LS	1	$ _____	$ _____

Bidder Name: _____

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BLACKSTONE PARK EXPANSION SITE WORK

Bid "A" Based on Completion Time of 180 Calendar Days

BID ITEM NUMBER	DESCRIPTION	UNITS	QTY.	BID PRICE PER UNIT ($)	TOTAL BID PRICE ($)
511	14" Imported Fill Material per Ball Field Turf Detail & Specifications (includes all 3 ball fields)	LS	1	$ _____	$ _____
512	Tifway 419 Bermudagrass - Rolled (materials only)	SY	11,120	$ _____	$ _____
513	Tifway 419 Bermudagrass - Rolled (installation and maintenance only)	SY	11,120	$ _____	$ _____
514	4" Concrete Pad for Dugout (10' x 22')	EA	6	$ _____	$ _____
515	Dugout Canopy Structure (complete)	EA	6	$ _____	$ _____
516	5" Concrete Pad for Bleachers (16' x 30')	EA	6	$ _____	$ _____
518	4" Concrete Slab for Batting Cages (69' x 85')	SY	652	$ _____	$ _____
519	Batting Cage Netting and Support Post System for 4 Batting Cages (complete)	LS	1	$ _____	$ _____
520	Indoor/Outdoor Artificial Turf for Batting Cages	SY	320	$ _____	$ _____
521	6' x 12' Home Plate Mats for Batting Cages	EA	4	$ _____	$ _____
522	12' Safety Netting with Galvanized Steel Support Posts	LF	525	$ _____	$ _____
	SUBTOTAL (BALL FIELDS AND BATTING CAGES 500 SERIES ONLY)				$ _____
	MISCELLANEOUS (600 SERIES)				
600	Construction Surveying & Stakeout (includes collection of record information and record drawing preparation)	LS	1	$ _____	$ _____
601	MOBILIZATION	LS	1	$ _____	$ _____
	SUBTOTAL (MISCELLANEOUS 600 SERIES ONLY)				$ _____
	LANDSCAPE (700 SERIES)				
700	Sweetbay Magnolia (14'-16' OA Ht. x 5' Spr., 4" Cal., 6' CT)	EA	16	$ _____	$ _____
701	Cathedral Live Oak (12' - 14' OA Ht. x 4' Spr., 3" Cal.)	EA	28	$ _____	$ _____
702	Cabbage Palm (10', 12', 14' CT, Mix, HC, Booted)	EA	38	$ _____	$ _____
703	Perennial Peanut (Liner, 18" OC)	EA	7,120	$ _____	$ _____

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BLACKSTONE PARK EXPANSION SITE WORK

Bid "A" Based on Completion Time of 180 Calendar Days

BID ITEM NUMBER	DESCRIPTION	UNITS	QTY.	BID PRICE PER UNIT ($)	TOTAL BID PRICE ($)
704	Florida Lantana (1 Gal., 24" OC)	EA	977	$ _____	$ _____
705	Muhly Grass (1 Gal.,12" OA., 30" OC)	EA	290	$ _____	$ _____
706	Wax Myrtle (7 Gal., 36" OA, Full, Space as indicated in plan)	EA	193	$ _____	$ _____
707	Sand Cordgrass (1 Gal.,12" OA., 30" OC)	EA	140	$ _____	$ _____
708	Fakahatchee Grass (3 Gal., 18" OA, 48" OC, Space as indicated in plan)	EA	250	$ _____	$ _____
709	Mrs Shillers Delight Viburnum (3 Gal., 18" OA, 36" OC)	EA	105	$ _____	$ _____
710	Walters Viburnum (3 Gal., 24" OA, Space as indicated in plan)	EA	112	$ _____	$ _____
711	Coontie (3 Gal., 18" OA, 36" OC)	EA	40	$ _____	$ _____
712	Mulch - Pine Bark Nuggets	CY	360	$ _____	$ _____
	SUBTOTAL (LANDSCAPE 700 SERIES ONLY)				$ _____
	IRRIGATION (800 SERIES)				
800	Irrigation System (complete)	LS	1	$ _____	$ _____
	DISCRETIONARY WORK (USED ONLY WITH COUNTY APPROVAL)				$160,000.00
	TOTAL PRICE FOR BID "A" - Based on Completion Time of 180 Calendar Days				$ _____

ADD ON UNIT PRICES FOR ADDITIONAL WORK AS DIRECTED BY THE COUNTY AND ENGINEER

The following prices are not inlcuded in the total amount, and are to be used only as directed by the COUNTY and ENGINEER.

ITEM NO	DESCRIPTION	ADD or DEDUCT	U/M	UNIT PRICE
1	**LABOR, MATERIALS, TOOLS, SERVICES AND INCIDENTALS TO IMPORT UP TO 3,000 CUBIC YARDS (TRUCK MEASURE) OF CLEAN, SUITABLE FILL MATERIAL SHOULD THE COUNTY NOT BE ABLE TO PROVIDE THE REFERENCED STOCKPILE CONSISTING OF 2,600 CUBIC YARDS.**		CY	$

Bidder Name: _____

Authorized Signature: _____

BLACKSTONE PARK EXPANSION
TABLE OF CONTENTS

BLACKSTONE PARK EXPANSION – SITE WORK
Manatee County, Florida
MEASUREMENT AND PAYMENT

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and General Provisions of Contract, including General and Supplementary Conditions and other Specification Sections, apply to this Section. See Stantec construction plans for reference [sheets 1 – 19 of 19; ~~and~~ sheet 1 of 1 (Concrete and Paver Surfacing Plan and Details) and sheets LP-101, LP-102, LP-401, LP-501, LP-601, LI-101, LI-102, LI-501, LI-502, and LI-601 (landscape and irrigation plans)]

1.2 SUMMARY

A. The scope of this section of the Contract Documents is to further define the items included in each Bid Item in the Bid Form section of the Contract Documents. Payment will be made based on the specified items included in the description in this section for each bid item.

B. All contract prices included in the Bid Form section will be full compensation for all shop drawings, working drawings, labor, materials, tools, testing, restoration, equipment and incidentals necessary to complete the construction as shown on the Drawings and/or as specified in the Contract Documents to be performed under this Contract. Actual quantities of each item contracted on a unit price basis will be determined upon completion of the construction and payment will be based on actual quantities. Payment for all items listed in the Bid Form will constitute full compensation for all work shown and/or specified to be performed under this Contract.

C. The quantities shown are approximate in-place quantities and are given only as a basis of calculation upon which the award of the Contract is to be made. The Owner/Engineer does not assume any responsibility for the final quantities, nor shall the Contractor claim misunderstanding or discrepancies because of such estimate of quantities. Final payment will be made only for satisfactorily completed in-place quantity of each item that is bid on a unit price basis.

D. No payment will be made for work constructed outside the authorized limits of work.

E. Unless otherwise specified for the particular items involved, all measurements of distance shall be taken horizontally.

F. Where payment for items is shown to be paid for on a lump sum basis, no separate or additional payment will be made for any item of work required to complete the lump sum items. Lump sum items shall be complete, tested and fully operable prior to request for final payment. Contractor may be required to provide a break-down of the lump sum items.

G. Access to the site is provided by the existing 23rd Street West.

H. Separate payment will be made for the items of work described herein and listed on the Bid Form. Any related work not specifically listed, but required for satisfactory completion of the work associated with the bid item shall be considered to be included in the scope of the appropriate listed bid items

BLACKSTONE PARK EXPANSION – SITE WORK
Manatee County, Florida
MEASUREMENT AND PAYMENT

1.3 UNIT PRICE

A. Actual quantities of each item contracted on a unit price basis will be determined upon completion of the construction and payment will be based on actual quantities.

1.4 BID ITEM DESCRIPTIONS

A. A general description of the bid items contained in the various Bid Sections are described below. All items of work referenced in the contract documents, plans, and specifications shall be included in the various lump sum and unit prices in the bid form/contract if not specifically included as a pay item on the bid form.

Bid Items 100 - 125 (DRAINAGE): The various bid items for DRAINAGE shall include all drainage piping, drainage structures, rip-rap, underdrain, and underdrain filter material. **This section includes full compensation for furnishing all labor, materials, tools, equipment, testing, restoration, and incidentals and for doing all the work involved with these bid items in accordance with the contract documents, plans, and specifications.**

Bid Items 200 - 223 (PAVING): The various bid items for PAVING shall include all asphalt, base, subgrade, shell, curbing, specialty paver curbing, sidewalks, concrete pads/pavement, concrete surfaces, handicap ramps, detectable warning strips, dumpster pad/enclosure/gates, wheel stops, signage and striping (including the removal of existing striping along 23rd Street West), maintenance of traffic, adjustments to existing utility boxes/pads, concrete pavers, and bollards. This section also includes all permitting and permitting fees as may be required for the installation of the dumpster pad/enclosure, work within right-of-way, preparation of traffic control plans as required for maintenance of traffic. **Full compensation for furnishing all labor, materials, tools, equipment, testing, restoration, and incidentals and for doing all the work involved with these bid items in accordance with the contract documents, plans, and specifications shall be included in this section.**

Bid Items 300 - 311 (EARTHWORK): The various bid items for EARTHWORK shall include all grading, excavation, loading/unloading/hauling/placement/compaction of fill material, swales, gravity wall, sodding, bermudagrass, tree root protection measures, tree protection, and best management practices controls (including the installation of the temporary construction entrance/existing drainage inlet protection located along 23rd Street West, as well as the repair, re-installation, and maintenance of existing BMPs installed by others). The best management practices controls shall include temporary dewatering activities (if needed), as well as the implementation of the Stormwater Pollution Prevention Plan (SWPPP) including all inspections and reporting required as part of the SWPPP.

Please note that an entity hired separately by Manatee County will remove the top 6" of existing soil material from within the entire 9.92-acre (+/-) project area and haul the removed soil material to the landfill. The removal and off-site disposal of the top 6" of existing soil material shall not be included as part of this bid. After the top 6" of existing soil material is removed from the site, topographic survey information will be provided to

the Contractor by Manatee County prior to the Contractor starting work on the site. The Contractor is required to review the topographic survey information and notify the County and Engineer of any issues/discrepancies prior to starting any earthwork activities.

Upon confirmation by the Contractor that the top 6" of existing soil has been satisfactorily removed, the Contractor shall excavate, place, grade, and compact existing soil material to within 2 feet below the finished grade elevations depicted on the construction plans. This includes stockpiling any excess existing soil material on-site for removal by others. In no case shall any existing soil material be placed within 2 feet of finished grade elevation without prior written permission by the County and the Engineer. Once the Contractor balances the site to within 2 feet of finished grade and before any import/off-site fill material is placed, the Contractor shall prepare a topographic survey of the site and confirm that all existing soil material is 2 feet below finished grade. This topographic survey shall also be reviewed and accepted by the County and the Engineer prior to the placement of any additional fill on-site. All work described in this paragraph shall be included as part of Bid Item #300 as indicated on the Bid Proposal Form.

Upon confirmation that the work described above has been satisfactorily completed, the Contractor shall provide, place, grade, and compact clean, suitable fill material to the finished fill elevations depicted on the construction plans. This shall include all finished grading activities for the entire project including the complete construction of the dry retention area. Two stockpiles of clean, suitable fill will be provided on-site by the County for full use by the Contractor. The first stockpile will consist of 10,700 cubic yards (truck measure) and will be located west of the proposed dry retention area. The second stockpile will consist of 2,600 cubic yards (truck measure) and will also be located west of the proposed dry retention area. Prior to use of any of the stockpiled fill material, the Contractor shall confirm the quantity of the stockpiled fill material and notify the County and Engineer of any issues/discrepancies or acceptance of quantities provided. Any claim of discrepancy by the Contractor shall be supported by certified topographic survey data and volumetric calculations detailing the discrepancy amount. The clean, suitable stockpiled fill material shall only be placed within 2 feet below finished grade. In addition to utilizing the stockpiled fill material provided by the County, the Contractor shall also import any additional clean, suitable fill material needed to complete the project to the finished grade elevations. This shall include all hauling, loading/unloading, placement, grading, and compaction of the import fill material. Prior to being transported to the site, all import fill material shall be tested by Manatee County to confirm it is clean of any hazardous materials/contaminants and is suitable for construction of the proposed facilities. Please refer to the enclosed testing criteria/thresholds for all imported fill material. All work described in this paragraph shall be included as part of Bid Item #301 as indicated on the Bid Proposal Form.

BLACKSTONE PARK EXPANSION – SITE WORK
Manatee County, Florida
MEASUREMENT AND PAYMENT

Please note that an alternate bid item has been provided which includes the import of 2,600 cubic yards (truck measure) of clean, suitable fill material by the Contractor should the County be unable to provide the referenced stockpile consisting of 2,600 cubic yards of clean, suitable fill.

This section includes full compensation for furnishing all labor, materials, tools, equipment, testing, restoration, and incidentals and for doing all the work involved with all earthwork bid items in accordance with the contract documents, plans, and specifications.

Bid Items 400 - 412 (FENCING): The various bid items for FENCING shall include all posts, rails, fabric, gates, concrete footings/foundations, chains, slats, and poly-cap fence guard. **This section also includes full compensation for furnishing all labor, materials, hardware, tools, equipment, testing, restoration, and incidentals and for doing all the work involved with these bid items in accordance with the contract documents, plans, and specifications.**

Bid Items 500 - 522 (BALL FIELDS AND BATTING CAGES): The various pay items for BALL FIELDS AND BATTING CAGES shall include all ball field signage, backstop padding mats, windscreens, pitcher/home plates, bases, infield clay mix, root zone mixture and import fill material per Ball Field Turf Detail & Specifications, concrete pads for dugouts/bleachers/batting cages, dugout canopy structures (including signed and sealed structural design calculations/design plans for the dugout canopy structures), batting cage netting and support post system, artificial turf and home plate mats for batting cages, safety netting and support post system, and all hardware/appurtenances needed to construct all BALL FIELD AND BATTING CAGES pay items per the contract documents, plans, and specifications complete and in-place. Prior to being transported to the site, all import fill material shall be tested by the ~~Contractor~~ Manatee County to confirm it is clean of any hazardous materials/contaminants and is suitable for construction of the proposed facilities. Please refer to the enclosed testing criteria/thresholds for all imported fill material. **This section also includes full compensation for furnishing all labor, materials, tools, equipment, testing, restoration, and incidentals and for doing all the work involved with the bid items in accordance with the contract documents, plans, and specifications.**

Bid Items 600 - 601 (MISCELLANEOUS): The various pay items for MISCELLANEOUS shall include construction survey/stakeout/record drawings, mobilization, miscellaneous permits not already obtained by the County, and bonding required per the contract documents. **This section includes full compensation for furnishing all labor, materials, tools, equipment, testing, restoration, and incidentals and for doing all the work involved with these bid items in accordance with the contract documents, plans, and specifications.**

Bid Items 700 – 712 (LANDSCAPE): The various bid items for LANDSCAPE shall include all trees, palms, shrubs, mulch, and groundcover materials, including the preparation/installation of planting soil as required per the plans and specifications. **This section also includes full compensation for furnishing all labor, materials, tools, equipment, testing, restoration, and incidentals and for doing all the work involved with these bid items in accordance with the contract documents, plans, and specifications.**

BLACKSTONE PARK EXPANSION – SITE WORK
Manatee County, Florida
MEASUREMENT AND PAYMENT

Bid Item 800 (IRRIGATION): The lump sum pay item for IRRIGATION shall include the controller (electrical junction box for irrigation controller will be provided by others), rain sensor, piping, sprinklers, bubblers, rotors, sleeves, thrust blocks, fittings, valves, control wires, reuse water signs, connection to the existing 4" reclaimed service line/valve, and all appurtenances needed to construct the complete irrigation system per the contract documents, plans, and specifications. **This section also includes full compensation for furnishing all labor, materials, tools, equipment, testing, restoration, and incidentals and for doing all the work involved with this bid item in accordance with the contract documents, plans, and specifications.**

SECTION 02480
LANDSCAPE WORK

PART 1 GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and provisions of the Contract, including Contract Conditions, Division -1 Specification Sections, apply to work of this section.

1.02 SCOPE

A. Provide all plants, materials, tools, equipment, labor, and services necessary to complete the landscape work and related work as indicated on the drawings and in these specifications.

B. Grade Elevations: Excavation, filling and grading will be as specified on the related documents. Finished or fine grading is specified herein.

1.03 RELATED WORK

A. Section 02810 - Irrigation System

1.04 QUALITY ASSURANCE

A. Installer Qualifications: Installer shall be a firm specializing in landscape work with not less than five (5) years of experience installing landscape work on projects similar in size and scope to this project.

B. The CONTRACTOR, as part of their bid, will list not less than six (6) projects completed by their company of similar size and scope to the work specified herein. The six (6) or more projects will be listed by project, name, location, owner's name and phone number, and the total paid cost of work executed. The listed projects will be considered as representative of the CONTRACTOR's ability to execute the work specified herein. The OWNER, at their sole discretion, reserves the right to reject any CONTRACTOR's bid which either does not respond to this condition or does not represent satisfactory performance of prior work of similar size and scope as that specified herein.

C. General: Ship landscape materials with certificates of inspection required by governing authorities. Comply with regulations applicable to landscape materials.

D. Grades and Standards: All plant material furnished by the CONTRACTOR unless otherwise specified shall be Florida No. 1 or better in accordance with the most recent edition; "Grades and Standards for Nursery Plants", parts 1 and 2, published by Florida Department of Agriculture, Division of Plant Industry, Gainesville, Florida. Provide healthy, vigorous stock, grown in recognized nursery standards in accordance with good horticultural practice and free of disease, insects, eggs, larvae and defects such as knots, sun-scald, injuries, abrasions, or disfigurement. Specialty or accent plant material as noted on the drawings or in the plant list shall be Florida Fancy as defined by said standards.

E. Analysis and Standards: Package standard products with manufacturer's certified analysis. For other materials, provide analysis by recognized laboratory made in accordance with methods established by the Association of Official Agriculture Chemists, wherever applicable.

F. Verification: The CONTRACTOR shall provide photographic evidence or videocassette of a representative example of all plant material specified on this project. Other specialty plant material may require individual and specific photographs as noted on the drawings.

G. Source: The CONTRACTOR will provide the name, address, and phone number of all nursery stock dealers or plant material sources providing material for the project. The CONTRACTOR shall submit certification or verification of source or purchase prior to delivery to the site. Approved equals will only be considered prior to bid opening and notified via addenda.

H. The OWNER's Landscape Architect or designated individual, herein referred to as the OWNER's Representative or LANDSCAPE ARCHITECT shall have full authority to approve or reject work performed by the CONTRACTOR. The OWNER's Authorized Representative shall also have full authority to make field changes that are deemed necessary.

1.05 JOB CONDITIONS

A. Examination of the Site:

1. The bidder must acknowledge that they have examined the site, plans and specifications. The submission of a quotation will be considered evidence that examinations have been made.

2. The bidder will verify availability of materials prior to submittal of bid. Submission of a bid will be considered confirmation of availability of specified material.

B. Field Conditions: The CONTRACTOR will verify drawing dimensions with actual field conditions and inspect related work and adjacent surfaces. The CONTRACTOR will report to the LANDSCAPE ARCHITECT all conditions which prevent proper execution of this work.

C. The CONTRACTOR shall be responsible for determining the exact size, type, and location of all utilities, services, irrigation, and other underground or overhead appurtenances prior to commencing work. The CONTRACTOR agrees to be fully responsible for any damages which may be occasioned by their failure to locate any or all said utilities, services, and appurtenances at the expense of the CONTRACTOR.

D. The CONTRACTOR will verify the accuracy of all finish grades within the work area. Maintain grade stakes set by others until removal is mutually agreed upon by parties concerned.

E. Excavation: Should any objectionable material, such as concrete, limerock, bricks, roots or other debris, be encountered during landscape operations, they will be removed from the site and legally disposed of by the CONTRACTOR. All open excavations will be properly barricaded and lighted at night.

1.06 SUBMITTALS

A. Certification: Submit certificates of inspection as required by governmental authorities. Submit manufacturer's or vendors certified analysis for soil amendments and fertilizer materials.

B. Planting Schedule: Submit a planting schedule, indicating the dates of installation anticipated for this project. Once accepted, revise dates only as approved in writing by the LANDSCAPE ARCHITECT, after documentation of reasons for delay.

C. The following submittals, defined more specifically in their relative paragraphs herein, are required to be approved by the LANDSCAPE ARCHITECT prior to the authorization or acceptance of any work. The submittals are, but not limited to:

1. Manufacturer's or vendor's certified analysis for soil amendments and fertilizer.

2. Plant material source.

3. Mulch certification or sample.

4. Itemized material cost breakdown.

5. Topsoil and backfill analysis.

6. Representative material photos or video.

7. Certification of herbicides and pesticides.

D. The following submittals, defined more specifically in their relative paragraphs herein, are required to be approved by the LANDSCAPE ARCHITECT prior to Final Acceptance. The submittals are, but not limited to:

1. Maintenance Instructions: Provide typewritten instructions recommending procedures for maintenance over a one-year period. Submit prior to and in condition of Final Acceptance.

2. Warranty.

1.07 DELIVERY, STORAGE AND HANDLING

A. Packaged Materials: Deliver packaged materials in containers showing weight, analysis and name of manufacturer. Protect materials from deterioration during delivery, and while stored at site.

B. Protection During Transportation: All plant material will be protected from foliage and bark injury or breakage of branches. All plants transported by open trucks will be adequately covered to prevent windburn, drying or damage to plants. All palm trunks will be adequately supported so as not to damage their root balls or buds.

C. Trees and Shrubs: Trees to be balled and burlapped shall be root pruned in advance, in accordance with good horticultural practice. Number and timing of root prunings may vary with species. Provide freshly dug trees and shrubs. Do not prune prior to delivery unless otherwise approved by Landscape Architect. Do not bend or bind-tie trees or shrubs in such manner as to damage bark, break branches or destroy natural shape. Provide protective covering during delivery. Do not drop balled and burlapped stock during delivery.

D. Root Protection: Balled and burlapped plants (B&B) shall be dug with firm natural balls of earth of sufficient diameter and depth to encompass the fibrous and feeding root system necessary for full recovery of the plant. Balls shall be firmly wrapped with burlap or similar materials and bound with twine, cord or wire mesh. All collected plants shall be balled and burlapped. If balled plants are dropped or otherwise mishandled, or if the balling materials are broken prior to planting, the plant may be rejected by the Landscape Architect.

E. Protection of Palms: Only a minimum of fronds shall be removed from the crown of the palm to facilitate moving and handling. Sabal palms shall have a minimum of eight fronds remaining and tied to protect the bud unless otherwise specified. Base sucker growth fronds shall be trimmed back to allow for easier handling, however, no stems should be cut off unless authorized by the LANDSCAPE ARCHITECT. Clear trunk (c.t.) measurement shall be as specified after the fronds have been removed. Sabal Palm boots and burns shall be removed except as otherwise directed. Cabbage palms shall be taken from moist soils. All single trunk palms shall be triple braced and staked with new, clean lumber at least six feet in length, to resist tree displacement. (See Planting Details.) All moving of palms shall be in accordance with the provisions for Heavy Trunk Palms, as described in "Florida Grades and Standards for Nursery Plants", Part II. All palms shall be tied and/or braced to protect the bud(s).

F. Container Grown Plants: Plants grown in containers will be accepted as "B&B" providing that all other specified requirements are met. Container grown plants shall meet plant sizes as specified on the plant list and on the plans, and shall not be governed by container sizes. Minimum root balls of container grown material shall be no more than 25% less proportionately in size than that stated in "Grades & Standards" for nursery plants. Plants shall exhibit a fully developed root system when removed from the container.

G. Use of Anti-desiccant: At any time between the delivery and installation of plant material exposed to wind, sun, or drying conditions, plant material will be treated with the anti-desiccant specified, in accordance with the manufacturer's directions. Wilting, drying or sunscald will be considered reason for plant rejection.

H. Care will be taken to protect and properly handle balled and burlapped stock during delivery and installation. If balled plants are dropped or otherwise mishandled, or if the root balls are broken prior to planting, the plant may be rejected by LANDSCAPE ARCHITECT.

I. Deliver field grown trees, palms, and shrubs after preparations for planting have been completed and plant immediately. If planting is delayed more than four hours after delivery, set trees and shrubs in shade, protect from weather and mechanical damage, and keep roots moist by covering with mulch, burlap or other acceptable means of protection from drying wind and sun. All plants will be watered as necessary until planted. Storage period will not exceed 72 hours. The CONTRACTOR will assume responsibilities for unplanted materials on site at all times and under any circumstances.

J. Do not prune trees or shrubs prior to delivery unless otherwise approved by LANDSCAPE ARCHITECT. Do not bend or bind-tie trees or shrubs in such manner as to damage bark, break branches or destroy natural shape. Provide protective covering during delivery. Do not drop balled and burlapped stock during delivery or installation.

K. Cleanup: The CONTRACTOR will keep the premises free from accumulation of waste material, soil, and/or rubbish caused by their employees or work. CONTRACTOR will arrange their material storage so as to not interfere with the operation of the project. CONTRACTOR will clean behind their work immediately and will take necessary precautions to keep concrete, brick and other paving material clean of soil. This will include the use of drop-cloths, etc. Damage to grades or lawns will be repaired immediately and all debris and excess soil removed from the site. Should the CONTRACTOR fail to keep the premises in a clean satisfactory condition, the OWNER reserves the right to hire appropriate personnel to perform clean-up work and back charge the CONTRACTOR for all costs incurred.

L. Do not remove container-grown stock from containers until time of installation.

1.08 MAINTENANCE

A. Begin maintenance of plants upon delivery to the site. All plants will be maintained by the CONTRACTOR until final acceptance or by special maintenance agreement as specified or indicated in the Contract Documents. Maintenance by the CONTRACTOR through Final Acceptance shall include all measures necessary to assure a clean appearance and survivability of the plant material.

B. Maintain trees, palms, shrubs and other plants by watering, pruning, cultivating and weeding as required for healthy growth. CONTRACTOR will be responsible for all landscape maintenance activities during this period including, weeding, fertilizing, mowing and watering. CONTRACTOR will be responsible for all costs associated with maintenance activities (including watering) during the maintenance period. CONTRACTOR will be responsible for the maintenance of "weed free" planting areas, beds and planters through final acceptance. All planting areas must be weed-free at the time of final acceptance. Restore planting saucers. Tighten and repair stake and guy supports and reset trees and shrubs to proper grades or vertical position as required. Spray as required to keep trees and shrubs free of insects and disease.

C. At no time shall required maintenance applications by the CONTRACTOR exceed a period of 15 days. Maintenance by the CONTRACTOR shall be required through Final Acceptance.

D. Cleanup: The CONTRACTOR shall at all times keep the premises free from accumulation of waste material, soil, and/or rubbish caused by their employees or work. CONTRACTOR shall clean behind their work immediately and shall take necessary precautions to keep concrete, brick and other paving material clean of soil. This shall include the use of drop-cloths, etc. Damage to grades or lawns shall be repaired immediately and all debris and excess soil removed. Should the CONTRACTOR fail to keep the premises in a clean satisfactory condition, the OWNER reserves the right to hire appropriate personnel to perform clean-up work and back charge the CONTRACTOR for all costs incurred.

1.09 COMPLETION AND ACCEPTANCE

A. Completion of the work shall be in compliance and conformity with the provisions expressed or implied in the drawings and specifications, associated change orders and field orders.

B. The acceptability of all material, workmanship, labor and compliance with the specifications, grades and standards will be solely determined by the LANDSCAPE ARCHITECT.

C. Right to Reject: The LANDSCAPE ARCHITECT will have the right, at any stage of the work, to reject any and all work and materials which, in their opinion, does not meet the requirements of the plans and specifications. Rejected material will be immediately removed from the site and acceptable material substituted in its place.

D. Substantial Completion site observation will be performed by the LANDSCAPE ARCHITECT, at the request of the CONTRACTOR to observe if the CONTRACTOR has completed the work in substantial compliance with the plans and specifications. All requirements of the specifications will apply until Final Acceptance of the work by the LANDSCAPE ARCHITECT. The request by the CONTRACTOR must be made at least three working days before the anticipated substantial completion site observation.

E. Final Acceptance: Upon notification by the CONTRACTOR that all defects have been corrected, the LANDSCAPE ARCHITECT will perform a final site observation. Final acceptance will be given upon satisfactory completion of all work, including "punch list" items. The LANDSCAPE ARCHITECT will conduct one final inspection. Any additional inspections as a result of the CONTRACTOR's failure to comply with the punch list, will be done at the CONTRACTOR's expense, based on the LANDSCAPE ARCHITECT's standard hourly rates and expenses. The notification by the CONTRACTOR must be made at least three working days before the anticipated final site observation.

1.10 SEQUENCING AND SCHEDULING

A. Plant Installation: Proceed with, and complete, landscape work as rapidly as portions of site become available as specified by the Contract Documents and the approved schedule submitted by the CONTRACTOR.

B. Coordination with Turf Installation: Plant trees and shrubs after final grades are established and prior to planting of turf, unless otherwise acceptable to LANDSCAPE ARCHITECT. If planting of trees and shrubs occurs after turf work, protect turf areas and promptly repair damage to turf resulting from planting operations.

C. CONTRACTOR will be responsible for coordinating with other Contractors on the job and in the proper sequencing of work.

1.11 WARRANTY

A. All plant materials (trees, palms, shrubs, ground covers, etc.), landscape accessories (i.e., edging, etc.), and workmanship will be warranted for a period of not less than one year from the date of Final Acceptance of the landscape installation. Turf (sodding, seeding, sprigging) will be warranted for a period of not less than 90 days, unless otherwise specified.

B. Landscape which was installed in accordance with the drawings and specifications and is damaged or destroyed through vandalism, theft, traffic or by phenomena considered an Act of God, will be replaced by the CONTRACTOR at the CONTRACTOR's expense through the construction period and until Final Acceptance.

C. After Final Acceptance by the LANDSCAPE ARCHITECT and OWNER, the OWNER will be responsible for the maintenance of the landscape. It will be understood that in accordance with the terms of the warranty that the CONTRACTOR must promptly inform the OWNER if proper maintenance is not being given to the installation. Such notice will be in writing outlining corrective measures to be taken with a copy to the LANDSCAPE ARCHITECT.

D. Inspections by the CONTRACTOR of the job will be made during the warranty period to determine and assure proper maintenance. No claim shall be made by the CONTRACTOR that invalidates the warranty based on the OWNER's lack of or improper maintenance of the landscape without written documentation by the CONTRACTOR to the OWNER, with a copy to the LANDSCAPE ARCHITECT, that identifies said maintenance concerns.

E. At the end of the warranty period, inspections will be made jointly by the OWNER, LANDSCAPE ARCHITECT, and CONTRACTOR. All plants not in a healthy growing condition will be removed and replaced with plants of a like kind and size, except for defects resulting from neglect by OWNER, abuse or damage by others, or unusual phenomena or incidents which are beyond CONTRACTOR's control.

F. All replacement plants will be guaranteed for an additional period of one year. Replacement turf will be guaranteed for an additional period of 90 days unless otherwise specified.

PART 2 PRODUCTS

2.01 QUANTITIES

A. All quantities indicated on the plans are intended as a guide for the bidders and does not relieve the bidder of their responsibility to do a comprehensive estimation of plant and material quantities. The CONTRACTOR will be responsible for the quantities shown and illustrated on the drawings.

B. Should a discrepancy occur between the bidder's bid quantity and the plant list quantity, the LANDSCAPE ARCHITECT is to be notified for clarification prior to the submission of bids.

C. After receipt of bids any quantities added to or deleted from the bid schedule by the LANDSCAPE ARCHITECT will be at the agreed upon unit cost as reflected in the itemized breakdown submitted, and will not effect any other unit price within the contract whether the contract is based on unit costs or lump sum.

2.02 TOPSOIL

A. For all landscape areas, the CONTRACTOR will provide and install topsoil as defined on the drawings or within the contract bid form.

B. Topsoil will be fertile, natural topsoil, typical of the locality, obtained from a well-drained site where topsoil occurs not less than four inches deep. Do not obtain from bogs or marshes. It will be without admixture of subsoil or clay and will be free of stones, lumps, sticks, plants or their roots, toxic substances or other extraneous matter that maybe harmful to plant growth or would interfere with future maintenance.

1. Obtain topsoil from local sources or from areas having similar soil characteristics to that found at the project site.

C. Topsoil will contain at least two percent of organic matter and will have a pH range of 6.0 - 7.0, unless otherwise recommended by the soil analysis.

2.03 BACKFILL SOIL MIXTURE

A. CONTRACTOR will provide backfill soil mixture for all trees, shrubs and ground covers.

B. Backfill mixture:

50% Topsoil (existing soil, if determined acceptable by the soil analysis, or topsoil provided by the CONTRACTOR).
50% Soil Amendments (60% peat, 40% composted manure, unless soil analysis recommends otherwise).

2.04 SOIL AMENDMENTS (AS QUALIFIED BY THE SOIL ANALYSIS)

A. Lime: Natural dolomitic limestone containing not less than 85% percent of total carbonates with a minimum of 30% magnesium carbonates, ground so that not less than 90% passes a 10-mesh sieve and not less than 50% passes a 100-mesh sieve.

B. Aluminum Sulfate: Commercial grade.

C. Peat Humus: Finely divided peat, so completely decomposed and free of fibers that biological identity is lost. Provide in granular form, free of hard lumps, and with a pH range suitable for intended use.

D. Bonemeal: Commercial, raw, finely ground, 4% nitrogen and 20% phosphoric acid.

E. Supersulfate: Soluble mixture of treated minerals; 20% available phosphoric acid.

F. Sand: Clean washed sand, free of toxic materials.

G. Perlite: Conforming to National Bureau of Standards PS 23.

H. Vermiculite: Horticultural grade, free of toxic substances.

I. Sawdust: Rotted sawdust, free of chips, stones, sticks, soil, or toxic substances and with 7.5 pounds of nitrogen uniformly mixed into each cubic yard of sawdust.

J. Manure: Well rotted, unleached stable cattle manure containing not more than 20% by volume of straw, sawdust, or other bedding or materials and containing no chemical or ingredients harmful to plants.

2.05 FERTILIZER

A. For trees, palms, shrubs, and ground covers, the CONTRACTOR will provide and install fertilizer. Submit fertilizer analysis to LANDSCAPE ARCHITECT for approval.

B. All fertilizers will be uniform in composition, free flowing and suitable for application by mechanical spreader equipment. Fertilizers will be delivered to the site fully labeled according to applicable State Fertilizer Laws. The following information will be shown on the fertilizer bag or package or on a tag:

1. Name and address of manufacturer

2. Name, brand or trademark

3. Number of net pounds of ready mixed material in the package

4. Chemical composition or analysis

5. Guarantee of analysis

6. If a brand or grade of fertilizer is delivered in the bulk, a written statement having the above listed information must accompany each load

C. All fertilizers shall have a written statement containing the following information with each load:

1. Weight of each commercial fertilizer used in the custom mixing

2. The guaranteed analysis of each commercial fertilizer used in the custom mixing

3. Total weight of fertilizer delivered in each load

4. The manufacturer of each of the commercial fertilizers used in the custom mix

5. Guaranteed analysis of each load to be stated as follows:

   a. Percent of Nitrogen
   b. Percent of total available Phosphoric Acid
   c. Percent of total Soluble Potash

6. Name and address of the person providing the fertilizer

D. Fertilizer Formulation

1. Trees, shrubs, and ground covers will have an 8-10-10 analysis fertilizer containing a minimum of 2% magnesium, 2% water soluble magnesium, 2% manganese, 2% iron, and quantities of other secondaries or a fertilizer analysis as recommended by soil testing lab. A minimum of 1.75 units will be slow release nitrogen.

2. Palms will have a 13-3-13 analysis fertilizer containing a minimum of 5% magnesium, 5% water-soluble magnesium, 1.5% manganese, 1.5% iron, and other secondaries or a fertilizer analysis as recommended by soil testing lab. A minimum of 4.85 units will be slow release nitrogen and 2.45 units slow release potash.

3. Turf areas will have a 16-4-8-analysis fertilizer containing a minimum of 2% magnesium, 2% water-soluble magnesium, 2% manganese, 2% iron, and quantities of other secondaries or a fertilizer analysis recommended by soil testing lab unless otherwise specified. Season of application may warrant a differing analysis than indicated above.

4. No substitutions will be made without notification to and acceptance by the LANDSCAPE ARCHITECT. The CONTRACTOR will submit, fertilizer labels to the LANDSCAPE ARCHITECT, defining the guaranteed analysis of the proposed substitution.

2.06 MULCH

A. Mulch material will be the type and grade as indicated on the drawings. Mulch will be of a relative uniform particle size, and will be free of sticks, stones, leaves, weed seeds, and any other debris.

B. Submit certification of mulch or a one-quart sample to the LANDSCAPE ARCHITECT for approval.

2.07 PLANT MATERIALS

A. Summary of Materials Lists: An itemized list of plants is shown on the drawings and complete requirements for these plants are part of these specifications.

B. Description: Species and variety as specified on the drawings and delivered to the site will be certified true to their genus, species, and variety and as defined within the current edition of International Code of Nomenclature for Cultivated Plants, issued by the International Union of Biological Sciences.

C. Quality: Provide trees, shrubs, and other plants of size, genus, species, and variety shown and scheduled for landscape work and complying with recommendations and requirements of ANSI 260.1 "American Standard or Nursery Stock" and Florida #1 or better "Grades and Standards for Nursery Plants", Parts I and II, State Plant Board of Florida (most recent edition) unless directed by the LANDSCAPE ARCHITECT. All accent and specialty plants will be Florida Fancy as defined by the above referenced standards.

D. Plants will be nursery grown unless otherwise approved by LANDSCAPE ARCHITECT and will be of varieties specified on the plant list bearing botanical names.

E. Planting stock will be well branched and well formed, sound, vigorous, healthy, free from disease, sun-scale, windburn, abrasion, weeds, and harmful insects or insects eggs; and will have healthy, normal unbroken root systems. Trees will be symmetrically developed, of uniform habit of growth, with straight trunks or stems, and free form objectionable disfigurements or scars.

F. Container-grown trees, shrubs, and ground covers will have sufficient root growth to hold earth intact when removed from the container and will not be root-bound.

G. Balled and burlapped plants (B&B) will be dug with firm natural balls of earth of sufficient diameter and depth to encompass the fibrous and feeding root system necessary for full recovery of the plant. Balls will be firmly wrapped with burlap or similar materials and bound with twine, cord or wire mesh. All collected plants will be balled and burlapped.

H. Palms: Only a minimum of fronds will be removed from the crown of the palm to facilitate moving and handling. Sabal palms will have a minimum of eight fronds remaining and tied to protect the bud, unless otherwise noted on the drawings. Base sucker growth fronds will be trimmed back to allow for easier handling, however, no stems should be cut off unless authorized by the LANDSCAPE ARCHITECT. Clear trunk (c.t.) measurement will be as specified after the fronds have been removed. Sabal Palm boots and burns will be removed except as otherwise directed. Sabal palms will be taken from moist soils. All moving of palms will be in accordance with the provisions for Heavy Trunk Palms, as described in "Florida Grades and Standards for Nursery Plants", Part II (most recent edition). All palms will be tied and/or braced to protect the bud(s).

I. Plants will have been grown under climatic conditions similar to those in the locality of the project. Plants budding into leaf or having soft growth will be sprayed with an anti-desiccant at the nursery before digging.

J. Quality and Size

1. Habit and growth will be normal for the species and will meet or exceed the measurements specified in the plant list, which are the minimum acceptable sizes.

2. Measurement will be performed before pruning with branches in normal position and to the average extents of growth. Any necessary pruning will be done at the time of planting with the approval of the LANDSCAPE ARCHITECT.

3. Where measurements are called out as a range in the plant list (e.g., 10-12'), the average height of the total of all such specified trees will fall at the middle of the range (e.g., 11'). The number of plants that are smaller than the average will not exceed the number that are larger than the average.

4. Plants larger than specified may be used if approved by the LANDSCAPE ARCHITECT, but the use of such plants will not increase the Contract price. The size of container or root ball for large plants will be increased in proportion to the size of the plant specified.

K. Substitutions

1. Plant substitution requests by the CONTRACTOR will be considered by the LANDSCAPE ARCHITECT only upon submission of proof that any plant is not obtainable in the type or size specified. Under no circumstances will unauthorized substitutions be included in the Bid Proposal and breakdown.

2. The LANDSCAPE ARCHITECT will determine the nearest equivalent replacement in an obtainable size and variety.

3. If contract is based on unit costs, the unit price of the substitute item will not exceed the bid item replaced, unless authorized by LANDSCAPE ARCHITECT.

L. Inspection: The LANDSCAPE ARCHITECT may inspect trees and shrubs either at place of growth or at site before planting, for compliance with requirements for genus, species, variety, size and quality. LANDSCAPE ARCHITECT retains right to further inspect trees and shrubs for size and condition of balls and root systems, insects, injuries and latent defects, and to reject unsatisfactory or defective material at any time during progress of work. Remove rejected plant material immediately from the project site. If additional inspections are warranted, field verifications of specified plant material will be performed by the LANDSCAPE ARCHITECT at the CONTRACTOR's expense utilizing WilsonMiller, Inc. standard hourly rates, including expenses.

2.08 GUYING AND STAKING MATERIALS

A. Guying and staking materials will be as indicated on the planting details.

2.09 ANTI-DESICCANT

A. Anti-desiccant will be "Wilt-Pruf" or approved equal, delivered in manufacturer's unopened containers and used in accordance with manufacturer's instructions.

B. Anti-desiccant will be an emulsion that will provide a film over plant surfaces permeable enough to permit transpiration, and not damage the plant.

2.10 HERBICIDES

A. Herbicides used must comply with all applicable State and Federal Laws and be registered with the U.S. Environmental Protection Agency. Submit certification of type to the LANDSCAPE ARCHITECT for approval.

B. Herbicide control will be:

1. Pre-emergence application of "Treflan 5% Granules" or equivalent, applied according to manufacturer's recommendations and incorporated into soil as specified.

2. Post-emergence application of "Roundup" or equivalent, applied as specified by manufacturer. Spray with extreme care to avoid contact with landscape plantings and adjoining turf areas.

2.11 PESTICIDES

A. Pesticides used must comply with all applicable Federal, State and local laws and be registered with the U.S. Environmental Protection Agency.

B. Pesticide Control shall utilize lindane or an approved equal. Submit certification of pesticide analysis to the LANDSCAPE ARCHITECT for approval.

2.12 EDGING

A. Edging, where and when specified, will be as specified on the plans and will be one of the following:

1. Ryerson 4" x 1/8" steel edging by Ryerson, Chicago, Illinois (312) 762-2121.
2. Curv-Rite Aluminum Edging, Grand Rapids, Michigan (616) 878-3845.
3. 1" x 4" Bender Board of sound new Southern Pine.

B. If no specific edging is indicated or specified on the drawings, the CONTRACTOR will install five-inch-deep mulch trenches at all plant bed transitions.

2.13 SUPERABSORBENT POLYMER

A. Material will be as specified on the plans and will be one of the following:

1. Aqua Mend
2. Terra Sorb

B. Material to be installed at the amount and rates specified or in accordance to manufacturer's recommendations.

PART 3 EXECUTION

3.01 COORDINATION OF WORK

A. The CONTRACTOR will be responsible for complete coordination of planting operations with the other Contractors on the job. Repair of damage to plants, grades, lawns, etc., during installation will not be considered as an extra, and not be charged to the "OWNER".

3.02 GENERAL PREPARATION

A. Site Preparation and Soil Amendments

1. Prior to beginning the work of this section, verify that rough grading and site preparation have been property completed.

2. CONTRACTOR will remove residual debris from the site and provide a finished grade that is in conformance with the plans.

3. Eradicate any weak growth in all landscape planting areas prior to planting operations.

4. Spray existing grass and weeds with Round-up. Use as many applications as necessary to completely kill all grass and weeds.

5. All shrub, palm and tree planting areas to be 100% weed free. Kill existing weeds, water to encourage dormant weed seed germination and then spray the area until it is free of all noxious weed species.

6. When grass and weeds are completely dead, add soil amendments in the planting and sod areas as specified. Soil amendments shall be thoroughly tilled in with existing soil, to a minimum depth of 12".

7. CONTRACTOR shall keep all areas prepared for planting weed-free until planting takes place.

8. Care and deposition of Existing Vegetation: All unpaved areas within the landscape contract limits as denoted on the drawings, shall be cleared of noxious weeds, dead material, together with any material noted for removal on the plans or within the Contract Documents.

3.03 FINISHED GRADING

A. CONTRACTOR will be responsible for finished (fine) grading of all landscape bed and turf areas prior to commencement of any installation of plant material.

B. General: As a final grading operation, the surface of the earthwork will be shaped to conform to the lines, grades, and contours shown on the plans. For cuts or fills where plant growth will be established, slopes will be left in a roughened condition as approved by the LANDSCAPE ARCHITECT. Hand dressing will be required in confined areas where equipment operation is restricted.

CONTRACTOR will take necessary precautions to prevent erosion of slopes before and after finish grading. Any erosion damage will be repaired at the expense of the CONTRACTOR until Final Acceptance of the project.

C. Tolerances: In final shaping of the surface of earthwork, a tolerance of 0.1 foot above or below the plan elevations and contours will be allowed with the following exceptions:

1. In areas where sod, ground cover or other finish landscape surface will be used, an allowance shall be made for the thickness of sod, etc. that will result in the finish landscape elevation to be congruent with the adjoining surface.

2. Earthwork shall be shaped to match adjacent pavement, curb, sidewalk, structures, etc. with applicable allowance for sod, etc.

3. Ditch bottoms may have higher tolerances approved by the LANDSCAPE ARCHITECT or ENGINEER provided that no water will be impounded or that no stormwater flows will be imported.

4. Absolutely no back of curb, or any other vertical or horizontal gaps in construction will be acceptable.

D. CONTRACTOR will take the appropriate measures necessary to maintain the positive flow of surface water runoff away from buildings, structures, and walkways, etc. to stormwater conveyance systems. The CONTRACTOR will notify the LANDSCAPE ARCHITECT of any conflicts in general grading and the positive flow of surface water to stormwater conveyance systems. CONTRACTOR will not knowingly commence plant installation where drainage conditions will adversely affect newly installed plant materials and any reinstallation of plant materials will be at the CONTRACTOR's expense.

3.04 SOIL PREPARATION

A. Soil Testing:

1. CONTRACTOR will be responsible for having samples of the existing soil tested. Samples will be taken from several representative areas, and are to be tested for acidity, fertility and general composition by a recognized commercial or governmental agency. The CONTRACTOR will furnish three copies of the soil analysis and recommended amendments (to meet the desired pH, nutritional and organic levels determined to be adequate for the area) prepared by the testing agency.

2. Existing soil must meet the requirements for topsoil as specified in Section 2.02, B and C. If existing soil does not meet the specified requirements, CONTRACTOR will provide soil amendments as recommended by the approved testing agency to bring soil analysis up to the proper levels. If the existing soil cannot be amended to the proper levels, the CONTRACTOR will excavate the unacceptable soil and replace with clean topsoil.

B. CONTRACTOR will excavate all limerock, compacted subgrade or any other deleterious material from all landscape areas, and replace excavated material with acceptable topsoil. Any compacted fill or subgrade must be pierced through completely to allow for percolation and drainage from the entire bed area in question.

C. Additional soil amendments will be added as recommended by the soil analysis to the areas as indicated on the plans. Additional soil amendment will be added to all landscape bed areas and to all trees, palms, shrubs, ground covers as indicated herein. Soil amendments will be thoroughly tilled in with the existing soil to a minimum depth of 12 inches from existing grade.

3.05 EXISTING VEGETATION

A. Relocated Existing Plants: Existing plants shown on the drawings to be relocated will be root-pruned sufficiently in advance of planting time to assure safe moving and will be protected and treated as new material in all respects. Pruning of the canopy or foliage will be conducted by the CONTRACTOR under the direction of the LANDSCAPE ARCHITECT. Plant installation will be in accordance with these specifications.

B. Existing plant material shown on the plans to remain will not be disturbed. New plant material to be installed will be field adjusted to accommodate existing plant material such as overhead canopy trees, understory trees and shrubs or ground cover. Therefore, no existing plant material will be altered by removing cutting, trimming or destroying in order to install new plant material unless directed to do so by the LANDSCAPE ARCHITECT.

C. If lawns have been established prior to planting operations, CONTRACTOR will make all efforts to protect turf areas during planting operations. If lawn is damaged by the CONTRACTOR, it will be restored to its original condition by the CONTRACTOR and at their time and expense.

3.06 TREE, SHRUB AND GROUND COVER PLANTING

A. All planting will be performed by personnel familiar with accepted horticultural procedures of planting and under the constant supervision of a qualified Foreman. The LANDSCAPE ARCHITECT reserves the right to have the Foreman removed from the job if, in the opinion of the LANDSCAPE ARCHITECT, the Foreman is not demonstrating an acceptable knowledge of horticultural standards or construction procedures. Any time delays or expenses incurred by the Foreman's dismissal will be at the CONTRACTOR's expense.

B. All planting is to be conducted as shown on drawings and as specified herein and in strict accordance with standard horticultural practices.

C. Coordination with Lawns: Plant trees and shrubs after final grades are established and prior to planting of lawns, unless otherwise acceptable to LANDSCAPE ARCHITECT. If planting of trees and shrubs occurs after lawn work, protect lawn areas and promptly repair damage to lawns resulting from planting operations. Any damage to lawns caused by these procedures will be corrected by the CONTRACTOR.

D. Layout:

1. Plant material locations and bed outlines will be staked out on site according to the plans by CONTRACTOR and approved by LANDSCAPE ARCHITECT prior to the commencement of material installations.

2. Layout: Location for plants and outlines of areas to be planted are indicated on the drawings. All plants will be located in the field by the CONTRACTOR, to the satisfaction of the LANDSCAPE ARCHITECT. Where construction or utilities below ground or overhead are encountered, or where changes have been made in the construction, necessary adjustments will be approved by the LANDSCAPE ARCHITECT. The CONTRACTOR must receive approval of LANDSCAPE ARCHITECT prior to installation of plant material. Failure to do so may result in the CONTRACTOR re-executing work at the request of the LANDSCAPE ARCHITECT and at the CONTRACTOR's expense.

E. Installation of Trees, Palms, Shrubs, and Ground Covers:

1. Plant pits will be circular in outline with sides approximately vertical with bottom excavation slightly raised at center to provide proper drainage and will extend to the required sub-grades as determined by the plant's root ball or growing container size. Loosen hard subsoil in bottom of excavation. The minimum depth of plant pits specified below will be measured from the finish grade.

2. For balled and burlapped (B&B trees and shrubs) make excavations at least half again as wide as the ball diameter and equal to the ball depth, plus following allowance for setting of ball on a layer of compacted backfill. The top of the root ball shall be even with the surrounding finished grade. Allow for three-inch-thick setting layer of planting soil mixture. Refer to planting details for minimum pit sizes.

3. Balled and Burlapped Plants: After final setting loosen burlap wrappings exposing the top of the root ball, leaving the ball unbroken. Remove excessive amounts of burlap and string wrapping materials to eliminate voids which may be caused upon decomposition (See planting details).

4. Container Grown Plants: Plant pits for container materials will be formed flat on the bottom. Containers will be removed carefully to prevent damage to plant or root system. Excavate as specified for balled and burlapped stock, adjusted to size of container width and depth. Refer to planting details for minimum pit sizes.

5. All excavated soils from plant pits or beds will be used on site, if needed, or removed from the site at no additional cost to the OWNER. Excavated soils, if acceptable topsoil quality, may be mixed with soil amendments to compose the backfill soil mixture.

6. Mass annual planting beds as specified on the drawings will be excavated, to a minimum depth of six inches. Only planting mixture as specified on the planting details will be used to backfill annual beds areas.

7. Setting Trees, Palms, and Shrubs: Unless otherwise specified, all trees and shrubs will be planted in pits, centered, and set on compacted soils to such depths that the finished level of the plant after settlement will be the same as that at which the plant was grown. They will be planted upright and faced to give the best appearance or relationship to viewing stations, approaches, or adjacent structures. Remove burlap from upper 1/2 of balls. When set, place additional backfill around base and sides of ball and work each layer to settle backfill and eliminate voids and air pockets. No burlap will be pulled out from under the balls. Platforms, wire and surface binding from top and sides of the balls will be removed. All broken or frayed roots will be cut off cleanly. After placing approximately 2/3 of planting backfill, water thoroughly before placing remainder of backfill. Repeat watering until no more is absorbed. Water again after placing final layer of backfill. No filling around trunks will be permitted. Additional soils will be filled in to the level of the finished grade, allowing for minimum three inches of mulch or as otherwise specified. Form a shallow saucer around each tree to a size needed for adequate water retention (See planting details).

8. Set container grown stock, as specified for balled burlapped stock, except cut cans on two sides with an approved can cutter; remove bottoms or wooden boxes after partial backfilling so as not to damage root system.

9. Back Fill Soils: Plant pits will be backfilled with backfill soil mixture as specified on the plans. All backfill soils will be free of all clods, sticks, roots, stones or other extraneous matter.

10. Fertilizer will be placed during backfilling, at the ratio recommended by the soil analysis.

11. Dish top of backfill to allow for mulching in tree/palm pits.

12. Protection During Planting: Trees and palms moved by winch or crane will be thoroughly protected from chain marks, girdling or bark slippage by means of burlap, wooden battens or other approved methods. No nails or spikes will be driven into palm or tree trunks. Any damage to tree/palm trunks, limbs, structure, etc. will be grounds for rejection.

F. Pruning

1. Prune, thin out and shape trees, palms, and shrubs in accordance with standard horticultural practices. Dead and broken limbs will be removed. Balled and burlapped trees and shrubs will be pruned to reduce total amount of anticipated foliage by 1/5. Typical growth habit of individual plant will be retained with as much height and spread as is practicable. Cuts will be made with sharp instruments, and will be flush with trunk or adjacent branch to insure elimination of stubs. "Headback" cuts at right angles to line of growth will not be permitted. Tree will not be poled or the leader removed, nor will the leader be pruned or "topped off". Trimming will be removed from the site. Cuts one inch in diameter and larger will be painted with black asphalt antiseptic paint or an approved equal.

2. Remove and replace excessively pruned or misformed stock resulting from improper pruning.

G. Anti-desiccant: If deciduous trees or shrubs are moved in full-leaf, out of season, spray with anti-desiccant at nursery before moving and again two weeks after planting, using power spray to provide an adequate film over trunks, branches, stems, twigs, and foliage.

H. Staking and Guying

1. Stakes and Guys: Provide stakes and deadmen of sound new southern pine, unless otherwise specified. Provide wire ties and guys of 2-strand, twisted pliable galvanized iron wire not lighter than 12 gauge with one-coated turnbuckles. Provide not less than ½ inch diameter protective hose of uniform color, material, and size to protect trunks and branches from the wire, unless otherwise specified.

2. Plants will be staked and guyed as indicated on plans within 24 hours of planting.

3. Stakes will be driven vertically into the ground to a depth specified in details and in such a manner as not to damage the ball or roots.

4. Ground stakes for tree guying will be driven into the firm ground outside of the plant pit, and the top of the stake will be flush with the ground.

5. Flags will be securely fastened on each guy wire approximately 2/3 of the distance up from ground level.

I. Mulch:

1. All trees, shrubs and planting beds will be mulched immediately after planting. The CONTRACTOR shall place mulch to a three-inch depth or as specified on the drawings or as approved by the LANDSCAPE ARCHITECT. Mulch will be thoroughly watered-in to prevent wind displacement. All landscape beds will have a five-inch mulch trench installed at all edges except adjacent to sidewalks, curbs, buildings, and structures.

2. Prior to the installation of either bark or stone mulch and weed barrier (if required) all areas to be covered will be weed free and will be treated with a pre-emergent herbicide. Submittal as required.

3. Mulch will be kept out of the crowns of shrubs and off buildings, sidewalks, light standards, and other structures.

4. Mulch type and grade are as specified on the drawings.

3.07 RECONDITIONING EXISTING LAWNS

A. Existing lawn areas which have been damaged during construction will be repaired by the CONTRACTOR at their expense.

B. Recondition existing lawn areas damaged by CONTRACTOR's operations including storage of materials and equipment and movement of vehicles. Also, recondition existing lawn areas where minor regarding is required.

C. Provide new topsoil, as required, to fill low spots and meet new finish grades.

D. Cultivate bare and compacted areas thoroughly to provide a satisfactory planting bed.

E. Remove diseased and unsatisfactory lawn areas; do not bury into soil. Remove topsoil containing foreign materials resulting from CONTRACTOR operations, including oil drippings, stone, gravel, and other loose building materials.

F. The CONTRACTOR shall repair existing lawns under the direction of LANDSCAPE ARCHITECT where existing conditions warrant. CONTRACTOR shall be responsible for all damage and wear to existing lawns caused by construction activities. Remove weeds before seeding or, if extensive, apply selective chemical weed killers as required. Apply a seed bed mulch to maintain moist condition.

G. Water newly planted lawn areas and keep moist until new grass is established.

PART 4 MEASUREMENT AND PAYMENT

4.01 BASIS FOR PAYMENT

A. CONTRACTOR shall submit a lump sum bid and will receive full compensation for conforming to the provisions of this section and related drawings. Lump sum paid for the complete installation as shown and specified will be categorized as follows:

1. Trees/Palms
2. Accents (Specialties)
3. Shrubs/Ground Covers/Vines
4. Sod/Mulch

B. No additional compensation will be allowed excluding relative change orders. A complete unit cost breakdown, based on the included Plant Lists (pay items), will be included as a separate item and submitted with the CONTRACTOR's bid or submitted prior to executing any work on the project. The OWNER reserves the right to reject any bid that does not include said unit cost breakdown.

END OF SECTION 02480

SECTION 02810
IRRIGATION SYSTEMS

PART 1 GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and provisions of the Contract including Contract Conditions, Division-1 and Division-2 Specifications, apply to work of this section.

1.02 SCOPE

A. The work covered by this specification shall include the furnishing of all labor, materials, tools and equipment necessary to perform and complete the installation of an automatic irrigation system as specified herein and as shown on the drawings and any incidental work not shown or specified which can reasonably be determined to be part of the work and necessary to provide a complete and functional system.

B. The work covered by this specification also includes all permits, federal, state and local fees and all other costs and tests, both foreseeable and unforeseeable at the time of construction.

C. No deviation from these specifications, the accompanying drawings, or agreement is authorized or shall be made without prior written authorization signed by the OWNER or their duly appointed representative.

1.03 RELATED WORK

A. Section 02480 - Landscape Work

1.04 MANUFACTURER

A. The manufacturer(s) for the components of the irrigation system will be as specified on the drawings. Approved equals must be submitted to the LANDSCAPE ARCHITECT, in writing, no less than 10 days prior to bid deadline. LANDSCAPE ARCHITECT shall determine acceptance of approved equals.

1.05 QUALITY ASSURANCE

A. Contractor Qualifications: A firm specializing in irrigation work with not less than five years of experience in installing irrigation systems similar to those required for this project.

B. The CONTRACTOR, as part of their bid, shall list not less than six projects completed by their company of similar size and scope to the work specified herein. The six or more projects shall be listed by project, name, location, owner's name and phone number, and the total paid cost of work executed. The listed project shall be considered as representative of the CONTRACTOR's ability to execute the work specified herein. The OWNER, at their sole discretion, reserves the right

to reject any bids which either do not respond to this condition or do not represent satisfactory performance of prior work of similar size and scope as that specified herein.

C. Coordination: Coordinate and cooperate with other CONTRACTORs to enable the work to proceed as rapidly and efficiently as possible.

D. Codes and Inspections: The entire installation shall comply fully with all local and state laws and ordinances and with all established codes applicable thereto. The CONTRACTOR shall obtain all required permits, arrange for all necessary inspections and shall pay all fees and expenses in connection with same, as part of the work under this contract. Upon completion of the work, they shall furnish to the OWNER all inspection certificates customarily issued in connection with the class of work involved.

E. The CONTRACTOR shall keep on their work, during its progress, a competent superintendent and any necessary assistants, all satisfactory to the OWNER, or OWNER's representative.

F. The superintendent shall represent the CONTRACTOR in their absence and all directions given to him shall be as bindings if given to the CONTRACTOR.

G. The OWNER's Landscape Architect or designated individual, herein referred to as the OWNER's Representative or LANDSCAPE ARCHITECT shall have full authority to approve or reject work performed by the CONTRACTOR. The OWNER's Authorized Representative shall also have full authority to make field changes that are deemed necessary.

H. In all cases where observation of the irrigation system work is required and/or where portions of the work specified to be performed under the direction of the OWNER's Representative, the CONTRACTOR shall notify same, at least 48 hours prior to the time such observation or direction is required.

I. Any necessary re-excavation or changes to the system needed because of failure of the CONTRACTOR to have the required observations, shall be performed at the CONTRACTOR's expense.

1.06 SUBMITTALS

A. Refer to Section 01730 Operation and Maintenance Data and Section 01300 Shop Drawings.

B. All materials shall be those specified and or approved by the LANDSCAPE ARCHITECT.

C. Product Data: After the award of the contract and prior to beginning work, the CONTRACTOR shall submit for approval by the OWNER and LANDSCAPE ARCHITECT, six copies of the complete list of materials, manufacturer's technical data, shop drawings, and installation instructions which they propose to install. The CONTRACTOR shall forward all required submittals to the LANDSCAPE ARCHITECT within 14 days of award of contract.

D. Installation Schedule: Submit a construction schedule, indicating the dates of installation anticipated for this project. Once accepted, revise dates only as approved in writing by the LANDSCAPE ARCHITECT, after documentation of reasons for delay.

E. Commence no work before approval of material list and descriptive material by the LANDSCAPE ARCHITECT.

F. Record Drawings: The OWNER shall furnish the CONTRACTOR with one set of reproducible reverse mylar sepias showing all work required under this contract for the purpose of having the CONTRACTOR record on these reproducibles all changes that may be made during actual installation of the system. "Record" locations shall be provided for all water source connection appurtenance, backflow preventer, controllers, valves, mainline fittings, wire splices, etc. Location shall include dimensions from two permanent points of reference (building corner, street corner, fence line, etc.).

1. Immediately upon installation of any piping, valves, wiring, sprinklers, etc., in locations other than shown on the original drawings or of sizes other than indicated, the CONTRACTOR shall clearly indicate such changes on a set of blueline prints. Records shall be made on a daily basis. All records shall be neat and subject to the approval of the OWNER and LANDSCAPE ARCHITECT.

2. The CONTRACTOR shall also indicate on the record prints the location of all wire splices, original or due to repair, that are installed underground in a location other than the controller pedestal, remote control valve box, power source or connection to a valve-n-head sprinkler.

3. Identify field changes of dimension and detail of changes made by Change Order or Field Order.

4. These drawings shall also serve as work progress sheets. The CONTRACTOR shall make neat and legible notations thereon daily as the work proceeds, showing the work as actually installed. These drawings shall be available at all times for review and shall be kept in a location designated by the OWNER's Representative.

5. Each month when CONTRACTOR submits their progress payment request to the OWNER it shall include the up to date record drawing information for all material installed to that date.

6. Progress payment request and record drawing information must be approved by the LANDSCAPE ARCHITECT before payment is made.

7. If in the opinion of the OWNER or LANDSCAPE ARCHITECT, the record drawing information is not being properly or promptly recorded, construction payment may be stopped until the proper information has been recorded and submitted.

8. Upon completion, all information noted on the prints shall be transferred to a reproducible reverse mylar by the CONTRACTOR. Drawings shall be to scale and all information shall be recorded in a neat, orderly way.

9. Record Drawings: Before the date of the final site observation and approval, the CONTRACTOR shall deliver two sets (of blueline prints) of the record drawing plans and notes to the LANDSCAPE ARCHITECT. Upon approval of the record drawings, the CONTRACTOR will forward the original marked reproducibles to the LANDSCAPE ARCHITECT. Upon approval of the record drawings, the LANDSCAPE ARCHITECT will forward the documents to the OWNER. Record drawing information shall be approved by the LANDSCAPE ARCHITECT and OWNER prior to final payments, including retentions. The delivery of the prints shall not relieve the CONTRACTOR of the responsibility of furnishing required information that may have been omitted. Incorrect or unacceptable record drawings will be returned to the CONTRACTOR for corrections and resubmittal.

G. CONTRACTOR shall furnish one Manufacturer's service manual each to, the OWNER, or Tenant. Manuals may be loose-leaf and shall contain complete exploded drawings of all equipment installed showing components and catalog numbers together with the manufacturer's name and address.

H. Loose equipment to furnish: Loose irrigation equipment, operating keys and spare parts will be furnished by the Irrigation Contractor in quantities as shown on the plans.

1. Three quick coupler keys and matching swivel hose ells (if required).
2. Two valve keys for gate vales (if required).
3. Two keys for each controller.

1.07 JOB CONDITIONS

A. Examination of the Site: The bidder acknowledges that they have examined the site, with the plans and specifications. The submission of a quotation shall be considered evidence that examinations have been made.

B. Field Conditions: The CONTRACTOR shall acquaint himself with all site conditions, including underground utilities before construction is to begin. CONTRACTOR shall coordinate placement of underground materials with CONTRACTORs previously working underground in the vicinity or those scheduled to do underground work in the vicinity. CONTRACTOR is responsible for adjustments in the layout of the work to accommodate existing facilities.

C. The CONTRACTOR shall verify the correctness of all finish grades within the work area to insure the proper soil coverage of the irrigation system pipes.

D. Protection of Existing Plants and Site Conditions: The CONTRACTOR shall take necessary precautions to protect all existing vegetation. Contact LANDSCAPE ARCHITECT if minor adjustments are not sufficient to protect existing site conditions. All existing grades shall be maintained and restored to their previously existing condition immediately following installation and testing.

E. Protection of Work and Property: The CONTRACTOR shall be liable for and shall take the following actions as required with regard to damage to any of the OWNER's property.

1. Any existing building, equipment, piping, pipe coverings, electrical systems, sewers, sidewalks, roads, grounds, landscaping or structure of any kind (including without limitation, damage from leaks in the piping system being installed or having been installed by CONTRACTOR) damaged by the CONTRACTOR, or by their agents, employees, or subcontractors, during the course of their work, whether through negligence or otherwise, shall be replaced or repaired by CONTRACTOR at their own expense in a manner satisfactory to OWNER, which repair or replacement shall be a condition precedent to OWNER's obligation to make final payment under the contract.

2. CONTRACTOR shall also be responsible for damage to any work covered by these specifications before final acceptance of the work. They shall securely cover all openings into the systems and over all apparatus, equipment and appliances, both before and after being set in place to prevent obstructions on the pipes and the breakage, misuse or disfigurement of the apparatus, equipment or appliance.

1.08 MATERIALS STORAGE AND CLEANUP

A. The CONTRACTOR shall keep the premises free from rubbish and all debris at all times and shall arrange their material storage so as to not interfere with the operation of the project. All unused materials, rubbish and debris shall be removed from the site.

B. Storage and Handling: Use care in handling, loading, storing and assembling components to avoid damage. Store plastic pipe and fittings under cover and protect from sunlight before using. Discolored plastic pipe and fittings shall be rejected.

C. All metallic pipe and fittings shall be handled, stored, loaded and assembled with the same care used for plastic components. Metallic components shall be stored in an enclosure to prevent rusting and general deterioration.

1.09 COMPLETION AND ACCEPTANCE

A. The completion of the contract will be accepted and Notice of Completion recorded only when the entire contract is completed to the satisfaction of the LANDSCAPE ARCHITECT.

B. The acceptability of material, components, workmanship, labor, compliance with the specifications and required coverages shall be solely determined by the LANDSCAPE ARCHITECT.

C. Right to Reject: The LANDSCAPE ARCHITECT will have the right, at any stage of the work, to reject any and all work, materials, and components which, in their opinion, does not meet the requirements of the drawings and specifications. Rejected material and components shall be immediately removed from the site and acceptable material substituted in its place.

D. Substantial Completion: Upon notification by the CONTRACTOR that the installation is substantially complete, the LANDSCAPE ARCHITECT will perform a substantial completion site observation to determine if the CONTRACTOR has completed the work in accordance with the plans and specifications. If final acceptance is not given, the LANDSCAPE ARCHITECT will prepare a "punch list". The notification by CONTRACTOR must be at least three days before the anticipated substantial completion site observation.

E. Final Completion: Upon notification by the CONTRACTOR that all defects have been repaired or replaced following substantial completion site observation, the LANDSCAPE ARCHITECT will perform one final site observation. The request by the CONTRACTOR must be made at least three working days before the anticipated final completion site observation. Any additional inspections as a result of the CONTRACTOR's failure to comply with punch list, will be done at the CONTRACTOR's expense, based on the LANDSCAPE ARCHITECT's standard hourly rates and expenses. The work will be accepted by the LANDSCAPE ARCHITECT upon satisfactory completion of all work including "punch list" items.

F. "Record" Irrigation Drawings: Record drawings shall be delivered to the LANDSCAPE ARCHITECT, for approval. Upon approval the LANDSCAPE ARCHITECT will forward record drawings to the OWNER before final acceptance of work.

1.10 WARRANTY

A. Warranty: The CONTRACTOR shall furnish three written warranties, stating that all work included under this contract shall be warranted against all defect and malfunction of workmanship and materials for a period of one year from the date of Final Acceptance of this project.

B. The CONTRACTOR further agrees that they will at their own expense repair and/or replace all such defective work and materials and all other work damaged thereby and which becomes defective during the term of the guaranty-warranty in an expedient manner.

C. The OWNER retains the right to make emergency repairs without relieving the CONTRACTOR's guaranty obligation. In the event the CONTRACTOR does not respond to the OWNER's request for repair work under their guaranty-warranty within a period of 48 hours, the OWNER may make such repairs as they deem necessary, at the full expense of the CONTRACTOR.

D. Any settling of backfilled trenches which may occur during the guaranty-warranty period shall be repaired by the CONTRACTOR at no additional expense to the OWNER, including the complete restoration of all damaged planting, sod, paving or other improvement of any kind.

1.11 OPERATION AND MAINTENANCE

A. Instructions: After completion and testing of the system, the CONTRACTOR will instruct the OWNER's personnel in the proper operation and maintenance of the system. The CONTRACTOR will submit proof to the LANDSCAPE ARCHITECT that said instructions were conducted. Submittal will include the name of attendees, attendees phone number, date, time, place, and content of instruction.

B. CONTRACTOR will at the above on-site instruction with the OWNER's representative, supply complete manuals to the OWNER and/or the Tenant (three total) containing component description, operating instructions, and maintenance recommendations.

PART 2 PRODUCTS

2.01 GENERAL

A. All products shall be as specified on the plans and in these specifications. The materials chosen for the design of the irrigation system have been specifically referred to by the manufacturer so as to enable the LANDSCAPE ARCHITECT to establish the level of quality and performance required by the system design. Equipment by other manufacturers may be used only if submittal of manufacturer's technical data and installation instructions are reviewed and approved by the LANDSCAPE ARCHITECT. Approval may be granted only if substitution is equal to the specified equipment as determined by the LANDSCAPE ARCHITECT.

B. All materials to be incorporated in this system shall be new (latest model) and without flaws or defect and of quality and performance as specified and meeting the requirements of this system.

2.02 MATERIALS

A. Water Meters: Shall be provided and installed per local requirements, if applicable.

B. Well and Pump: Shall be as indicated on the drawings, if applicable.

C. Centrifugal or Vertical Turbine Pump: Shall be as indicated on the drawings, if applicable.

D. Backflow Preventor: The backflow prevention device shall be as specified on the drawings. Installation shall conform to the manufacturer's specifications and all applicable codes. If backflow prevention device is required by local or state laws or ordinances, it shall be considered part of this contract whether or not it is specified on the accompanying Contract Documents.

E. Polyvinyl Chloride Pipe (PVC):

1. All PVC pipe shall be homogeneous throughout, free from visible cracks, holes and foreign materials. The pipe shall be free from blisters, dents, ripples, extrusion die and heat marks.

2. All PVC pipe shall be continuously and permanently marked with the manufacturer's name or trademark, kind and size (IPS) of pipe, material, and manufacturer's lot number, schedule, class or type and the National Sanitation Foundation (NSF) seal of approval.

3. Piping under constant pressure, upstream of irrigation control valves:

   a. Shall be PVC 1120/1220, Class 200, unless otherwise specified.
   b. Pipe size three inches and larger shall be Bell End Gasket Type.
   c. Pipe size 2½ inches and smaller shall be Solvent Weld Type.
   d. Materials shall be in accordance with the latest revision of the following specifications:

      American Society for Testing Materials
      ASTM-D 1784, ASTM-D 2241
      Department of Commerce, PS 22-70
      National Sanitation Foundation Testing Laboratories

4. Piping on non-constant pressure side of irrigation control valves:

   a. Shall be PVC 1120/1220, Class 160, unless otherwise specified.
   b. Pipe size three inches and large shall be as specified on drawings.
   c. Pipe size 2½ inches and smaller shall be Solvent Weld Type.
   d. Materials shall be in accordance with the latest revision of the following specifications:

      American Society for Testing and Materials
      ASTM-D 1784, ASTM-D 2241
      Department of Commerce, PS 22-70
      National Sanitation Foundation Testing Laboratories

5. Schedule 40, High impact type, PVC 2110 pipe:

   a. All solvent weld or bell end gasket Schedule 40 PVC pipe shall be in accordance with the latest revisions of the following specification:

      ASTM-D 1785
      Department of Commerce, PS 22-70
      National Sanitation Foundation Testing Laboratories

6. Provide written certification from manufacturer that all PVC pipe has successfully passed all tests per ASTM D 1785.

7. Piping for Sleeving: High impact type pipe, PVC 2110, minimum Schedule 40.

8. PVC Pipe Fittings:

   a. Molded solvent weld socket fittings shall be PVC Schedule 40, Type I/II in accordance with ASTM-D 2466. Sockets shall be tapered conforming to the outside diameter of the pipe, as

recommended by the pipe manufacturer. All fittings must conform to the 20-minute acetone test as for pipe and shall be approved.

b. Molded threaded fittings shall be PVC Schedule 40 in accordance with ASTM-2464. All fittings shall withstand the 20-minute acetone test and be approved.

c. All molded fittings shall be marked with manufacturer's name and/or trademark, type PVC, schedule, size and NSF seal of approval. Extruded couplings shall be from NSF rated raw materials and meet ASTM standards. Supplier shall provide certification on extruded couplings when requested.

d. Schedule 40 threaded male/female adapters shall be used in connecting to threaded joints.

e. All changes in depth of mainline pipe shall be made using 45° fittings.

f. All threaded PVC to metallic connections shall be made in accordance with the PVC fitting manufacturers recommendations. Any sealant used shall be of the non-hardening, non-petroleum base type, and shall not adversely effect PVC pipe or fittings.

F. PVC Solvent Cement: PVC solvent cement and primer/cleaner shall be compatible with the specific size and type of PVC pipe and fittings, of proper consistency in accordance with the pipe manufacturer's recommendations and will conform to ASTM D-2855, D-2564, F-656.

G. Rubber Rings and Gasket Joint Lubricant: Rubber rings shall conform to ASTM F 477. CONTRACTOR shall only use pipe joint lubricant supplied by or recommended by the pipe manufacturer. Lubricant shall be water soluble, non-toxic, an inhibitor to bacterial growth, and shall be non-detrimental to the elastomeric seal and pipe. Mineral oil, petroleum jelly, hydrogenated vegetable fat (i.e. Crisco, petroleum products, cooking oil, grease, etc.) shall not be used.

H. Automatic Field Controller: The irrigation controller shall be as specified on the plans. All field controllers shall be equipped with all available electrical surge/lightning protection devices for all circuits. Protection shall be factory supplied and installed whenever possible. Protection devices not supplied by the Manufacturer shall be as recommended by Manufacturer to provide a maximum degree of protection.

I. Low Voltage Valve Control Wire (24 Volt): All 24 volt control wire shall be #14 AWG UL listed single conductor solid copper, type UF, 600 volt test for direct burial installation.

1. Provide one individual 24-volt valve control wire between the field controller terminal strip station lug and each control valve/sprinkler solenoid lead. Provide one consistently colored 24-volt common wire from the terminal strip common wire lug to all control valves/ sprinklers.

2. Valve common wire shall be white in color. Individual valve control wires shall be color-coded or identified by an approved tagging method.

3. All wire shall be furnished in minimum 2,500-foot rolls and spliced only at the valve and the controller.

J. Control Valves: The remote control valves shall be as specified on the plans, and shall perform to the manufacturer's specifications.

K. Gate Valves: Gate valves one inch through four inch shall be Series 206 bronze threaded end gate valves manufactured by "Red-White" unless otherwise specified.

L. Quick Coupling Valve: All quick coupling valves shall be solid bronze as specified on the plans, and shall perform to the manufacturer's specifications.

M. Control Valve Boxes: All control valve, gate valve and quick coupling valve boxes shall be Ametek Box (unless otherwise specified) with Cover marked "Control Valve". Box shall be of sufficient size to allow easy operation and maintenance of valve. Where possible, gate valves shall be installed with control valves and occur in the same box. Ametek Jumbo Box Model 190101 w/cover 192101 shall be used for the pair.

1. Locking lids shall be green in color, boxes and extensions shall be black or green and constructed of high strength, light weight thermoplastic.

N. Pop-Up Spray Head to PVC Pipe Fittings: All pop-up spray sprinkler heads are to be connected to PVC pipe with barbed x threaded adapters and an 18" minimum length of polyethylene tubing (i.e., funny pipe). All tubing ends shall be cut square to the outside diameter of the pipe. Pop-Up Spray Heads: All pop-up spray heads are to be of the type specified on the plans, and shall perform to the manufacturer's specifications. Spacing shall not exceed that which is graphically depicted on the plans or by the manufacturer's maximum recommendation.

O. Rotor Sprinkler to PVC Pipe Fittings:

1. All rotor sprinklers are to be connected to PVC lateral lines using swing joints. Swing joints shall be the same size (IPS) as the inlet size of the sprinklers, unless otherwise indicated on the installation details. All swing joints shall be capable of 360 degrees of freedom.

P. Rotor Sprinklers: All rotor sprinklers are to be of the type specified on the plans. The sprinklers shall perform to manufacturer's specifications concerning the diameter of throw and gallonage at given pressures. Sprinkler spacing shall not exceed the manufacturer's maximum recommendation.

1. Matched precipitation between full and part circle sprinklers will be required on all sprinklers operating on the same zone.

Q. Swing Joints: Prefabricated swing joints (triple swing) shall be used as specified. Swing joints from individual nipples and fittings shall be assembled from PVC Schedule 40 or better.

R. Teflon Tape: Any threaded connection using Teflon tapes as an anti seize device shall avoid excessive use of Teflon tape. Apply Teflon tape only in accordance with fittings and/or component manufacturer's recommendations.

S. Rain shut-off devices shall be of the type on the plans, and shall perform to the manufacturer's specifications.

T. Splicing Materials: 3M Direct Bury (DBY) splice kits by 3M Corporation, Austin TX (512) 984-5657 or "Snip-Snap" connector by Imperial, Lenexa, KS (913) 469-5700, unless otherwise noted.

U. Metalized tape: CONTRACTOR shall provide metalized identification tape on all mainline piping (non-pressurized and pressurized).

PART 3 EXECUTION

3.01 GENERAL

A. The CONTRACTOR shall carefully schedule their work with the General Contractor and all other trades on site.

B. Sleeves are required wherever piping or electrical wires are placed under paved surfaces. CONTRACTOR will install sleeves prior to commencement of paving and will be responsible for coordinating with other trades. No additional compensation shall be made for the CONTRACTOR's failure to coordinate with other trades.

C. CONTRACTOR will install the irrigation system as shown on the Contract Documents. Should any changes be deemed necessary after award of contract, for proper installation and operation of the system, such changes must be approved by the LANDSCAPE ARCHITECT. In the event that notification of the OWNER or LANDSCAPE ARCHITECT is not given, the CONTRACTOR shall assume full responsibility of all revisions.

D. The plans and drawings are diagrammatic of the work to be performed. All piping, wires, field controllers, etc. shall be installed within the project boundaries. The CONTRACTOR shall not willfully install the irrigation system as shown on the plans when it is obvious in the field that obstructions, grade differences or discrepancies in area dimensions exist that might not have been known in the design of the system.

E. Layout: The CONTRACTOR shall carefully review all relative drawings for this project and will be responsible for coordinating the irrigation system installation with all known improvements. If at any time the irrigation system conflicts with other improvements (i.e., structures, landscape, etc.), the CONTRACTOR will be responsible for relocating irrigation components at their time and expense.

F. Design Pressures: Main line pressure at the source location shall be as required to operate the irrigation heads at the design pressures as specified on the plans. Pressure shall not exceed the manufacturer's specifications. Pressure at the last irrigation head on the circuit shall not be less than 35 psi, unless otherwise noted on plans.

G. Minimum Water Coverage: In turf planting areas, 100 percent coverage shall be provided. Layout may be modified if necessary and approved by the LANDSCAPE ARCHITECT, to obtain coverage. Do not decrease number of heads specified unless otherwise approved by the LANDSCAPE ARCHITECT.

H. Locate all irrigation system components within planting areas where possible. Do not install irrigation lines directly over another unrelated line in same trench.

I. Final location of piping and wiring shall be done following CONTRACTOR ascertaining location of existing underground utilities. All work shall be installed in a manner to avoid conflicts with utilities and other construction elements.

J. CONTRACTOR shall coordinate with other trades executing work on the project to avoid conflicts with locations of plant material, utilities and other site improvements.

K. Sprinkler spacings are maximums. Do not exceed spacings shown or noted on the plans. Sprinkler spacings may be adjusted to accommodate changes in terrain, proposed planting locations, and existing site conditions, only if approved prior to installation by the LANDSCAPE ARCHITECT.

L. Pipe sizes shall conform to those shown on the drawings. No substitutions of smaller pipe sizes will be permitted. However, substitutions of larger sizes may be approved.

3.02 EXCAVATION AND TRENCHING

A. Perform all excavations as required for the installation of the work as defined and described on the irrigations plans, in accordance with the contract documents and under this section of specifications. Work may include shoring of earth banks, if necessary. Restore all surfaces, existing underground installation, etc., damaged or cut as a result of the excavations, to their original condition.

B. All construction shall be done in a neat and workman like manner in strict accordance with manufacturer's recommendations. No sand or foreign material shall be allowed to enter the pipe. Ends shall be suitably plugged when pipe laying is not in progress.

C. Main and Lateral Line Trenching - irrigation lines shall be installed in accordance with the installation details and by cutting and removing sod if necessary, trenching, laying pipe, backfilling, compacting soil, restoring grades, and replacing sod, if required.

D. Should utilities not shown on the plans be found during excavation, CONTRACTOR shall promptly notify the OWNER or LANDSCAPE ARCHITECT for instructing as to further action. Failure to do so will make CONTRACTOR liable for any and all damage thereto arising from their operations subsequent to discovery of such utilities. Indicate such utility crossings on the record drawings promptly.

E. Trenches shall be open, vertical sided construction wide enough to provide free working space around work installed and to provide ample space for backfilling and compacting. ABSOLUTELY NO PULLING OF PIPE SHALL BE PERMITTED.

Trench width shall not be greater than is necessary to permit satisfactory jointing and other installation procedures.

F. Trench Bottom: Construct a continuous, firm, smooth trench bottom, free of rocks or other hard objects. Where ledge rock, hardpan, debris or boulders are encountered, undercut and fill the trench bottom with bedding material, using sand or compacted fine-grained soils to provide a minimum depth of bed between the pipe and rock of six inches. Where unstable trench bottom conditions are encountered, use stabilizing methods and materials to provide continuous and permanent support.

G. When two pipes are to be placed in the same trench, a six-inch space is to be maintained between pipes. The CONTRACTOR shall not install two pipes with one directly above the other.

H. The CONTRACTOR shall cut trenches for pipe to required grade lines and compact trench bottom provide accurate grade and uniform bearing and support for each section of pipe at every point along its entire length. Trench bottoms shall be free of rocks, gravel and all extraneous debris.

I. Trenches located under paving shall be backfilled as specified in paragraph 3.16. Depth of trenches shall be sufficient to provide a minimum cover above the top of the pipe as follows:

- 12 inches over non-pressure lateral lines, unless otherwise noted on the drawings
- 18 inches over non-pressure lateral lines under paving, unless otherwise noted on the drawings
- 18 inches over control wires, unless otherwise noted on the drawings
- 24 inches over irrigation main line, unless otherwise noted on the drawings
- 24 inches over an irrigation line under rigged paving, unless otherwise noted on the drawings

J. Safety: Maintain all warning signs, shoring, barricades, flares and red lanterns as required by the Safety Orders of the Division of Industrial Safety and any applicable federal, state, and local ordinances.

3.03 EXCAVATION AND TRENCHING INSPECTION

A. The following inspections are required. Notify the LANDSCAPE ARCHITECT in advance that each item is ready for inspection as indicated below in accordance with the contract documents.

1. Inspection of all flagged pipeline locations at one single inspection prior to beginning construction - notify one week in advance.

2. Inspection of all pipeline placed in trench must be done before any backfill is put in. All mainlines and laterals will be inspected in one single inspection - notify one week in advance.

3. Pipeline hydrostatic pressure test - notify one week in advance.

4. Pipeline flushing - notify one week in advance.

5. Sprinkler coverage test - notify one week in advance.

6. Final inspection - notify one week in advance.

3.04 WATER METER AND BACKFLOW PREVENTION DEVICE (when applicable)

A. Water Meter: Shall be installed according to all federal, state, and local codes and requirements.

1. Installation of the backflow prevention device shall conform to the details on the drawings, local codes, and/or manufacturers specifications. All backflow prevention and piping shall be sized to allow no more than a 20 percent decrease in pressure from that which is available from the main source.

3.05 PIPE LINE ASSEMBLY

A. General

1. Install pipes and fittings in accordance with manufacturers latest printed instructions.

2. Clean all pipes and fittings of dirt, scales and moisture before assembly.

3. All pipe, fittings, and valves, etc. shall be carefully placed in the trenches. Interior of pipes shall be kept free from dirt and debris and when pipe laying is not in progress, open ends of pipe shall be closed by approved means.

4. All lateral connections to the mainline as well as all other connections shall be made to the side of the mainline pipe. No connections to the top of the line shall be allowed.

5. Plastic pipe shall be cut with PVC pipe cutters or hacksaw, or in a manner so as to ensure a square cut. Burrs at cut ends shall be removed prior to installation so that a smooth unobstructed flow will be obtained.

B. Above Ground Piping: All pipe and fittings permanently installed above ground shall be galvanized steel Schedule 40 pipe. Piping shall be painted or wrapped to prevent rusting. Paint color shall be approved by the OWNER.

1. All pipe fittings intended for temporary use and installed above ground shall be UV resistant PVC Schedule 40.

C. Solvent-Weld Joints for PVC Pipes

1. Use only a color tinted cleaner/primer to prepare the outside diameter of the pipe and the inside diameter of the fitting socket. Cleaner/ primer and solvent cement shall be compatible with the specific sizes and types of PVC pipe and fittings being used.

2. Use only those applicator devices approved or recommended by the pipe and fitting manufacturer to apply the cleaner/primer and the solvent cement. Applications shall also be approved by the manufacturer of the cleaner/primer and solvent cement.

3. Priming the joints: Prime the socket side of the joint first, using an applicator. Prime the male pipe end to the length of the joint, making sure that all surfaces are entirely softened. Re-prime the sock and proceed immediately with cement.

4. Make all joints immediately after applying the solvent cement. Check all fittings for correct position. Hold joint steady so that pipe does not push out from fitting. Use a clean rag to remove any excess solvent from completed joint area.

5. Cure all joints a minimum of one hour before applying any external stress on the piping and at least 24 hours before placing the joint under water pressure, unless otherwise specified by manufacturer.

D. Threaded Joints for PVC Pipes

1. Use Teflon tape on all threaded PVC fittings. All threads shall be thoroughly cleaned of dirt, dust, and moisture before wrapping with teflon tape.

2. Use strap-type friction wrench only. Do not use metal-jawed wrench.

3. When connection is plastic to metal, male adapters shall be used. The male adaptor shall be hand tightened, plus one turn with a strap wrench.

E. Laying of Pipe

1. Pipes shall be bedded in at least two inches of finely divided material with no rocks or clods over one inch diameter to provide a uniform bearing.

2. Pipe shall be snaked from side to side of trench bottom to allow for expansion and contraction. One additional foot per 100 feet of pipe is the minimum allowance for snaking.

3. Do not lay PVC pipe when there is water in the trench.

4. Mainline trench depths will be as noted on the drawings and herein. Use 45° fittings for all changes in depth or direction of mainline pipe.

F. PVC Sleeves and Electrical Conduit

1. PVC sleeves shall be of Schedule 40 PVC, and sized as indicated on the drawings. All sleeves shall extend at least 24 inches beyond the edge of paving when passing under roadways, parking lots, sidewalks, or other paved surfaces.

2. All PVC control wire conduit shall be sufficient size to hold the required quantity of control and common wires. Electrical wires are not to be placed in the same sleeve with water pipes. However, in no case shall more than 50 percent of the control wire sleeve be filled with wire.

G. Thrust Blocks

1. Concrete thrust blocks must be provided on the thrust side of the mainline pipe wherever the pipe line:

   a. Changes direction, as at tees or bends.
   b. Dead ends.
   c. Any other spot where thrust is to be expected.

2. All irrigation mainline and lateral pipes three inches and larger will be thrust blocked. See irrigation drawings for Thrust Block Details.

3.06 SHUT-OFF VALVES

A. If indicated in plans, shut-off valves shall be located in the following locations:

1. After backflow preventor and prior to main supply loop.
2. Between mainline and each remote control valve.

B. To be located within planting and lawn areas.

C. All shut-off valves shall be housed in valve boxes. Shut-off (ball) valves shall be housed in the same box as Irrigation Control Valves, where applicable.

3.07 IRRIGATION CONTROL VALVES

A. Install control valves in valve boxes, grouping together where practical. Place no closer than 12 inches to walk edges, buildings, and walls.

B. Pressure regulating remote control valves shall be adjusted so that the most remote sprinkler heads operate at the pressure specified.

C. Valves shall be installed as shown in details and in accordance with manufacturer's instructions and the specifications.

3.08 QUICK COUPLING VALVES

A. Shall be set a minimum of 12 inches from walks, curbs or paved areas where applicable or as otherwise noted. Quick coupling valves shall be housed in valve boxes.

B. Valves shall be installed on three elbow PVC Schedule 40 swing joint assembly as detailed on the drawings. Quick coupler shall be anchored with rebars as shown on the details.

C. Where possible, quick coupling valves may be installed with control valves and occur in the same box.

3.09 VALVE BOXES

A. Valve boxes shall be set flush with finish grade in lawn areas and one-half-inch above finish grade in ground cover and shrub bed areas.

B. Install all valve boxes to avoid direct contact with PVC irrigation piping. Following valve box installation place gravel or sand as indicated in the detail.

C. CONTRACTOR shall label/number all zone valve covers/boxes with the corresponding controller zone number and isolation valve box covers with record drawing numbers. Numbers shall be applied using a weather resistant tape or paint.

3.10 SPRINKLER HEADS

A. Sprinkler Head Installation: Locate all sprinkler heads a minimum distance of six inches from walks, pavement, and back of curbs.

B. Pop-Up Spray Heads in sodded areas shall be installed flush (+ one-half-inch tolerance) with finished sod elevations. In mulched and planted areas all heads are to be flush with finish mulch elevations or as otherwise indicated on the plans.

C. Rotor Heads shall be installed to be flush (+ one-fourth-inch tolerance) with finish sod elevations except those rotor heads specifically designed to be mounted below grade.

D. All sprinkler nozzles shall be adjusted for the proper radius and direction of spray pattern. Make adjustments where possible to prevent over spraying onto walks, pavement or buildings.

E. Sprinkler heads and quick coupling valves shall be set perpendicular to finished grade unless otherwise designated on the plans.

3.11 DRAIN VALVES

A. All laterals shall be provided with manual drain valves to be installed as shown in details.

B. The mainline shall be drained with manual drain valves to be installed as shown in details.

C. Drain valves are to be provided at sufficient intervals to provide complete drainage of all piping.

3.12 AUTOMATIC CONTROLLER

A. The automatic controller shall be installed at the approximate location shown on the drawings. The actual location shall be approved by the LANDSCAPE ARCHITECT following stake-out in the field by the CONTRACTOR. CONTRACTOR shall be responsible for monitoring the integrity of the flag markings.

B. Controllers shall be installed in accordance with the drawings, details, manufacturer's instruction and local codes.

C. CONTRACTOR shall provide controller grounding in accordance with the manufacturer's requirements and/or recommendations. If specified ground resistance cannot be obtained consult manufacturer for prescribed methods. Use conduit for connection of power source to controller.

D. Connect remote control valve to controller in the sequence shown on the plans. If plan is not labeled then connect remote control valves to controller in a clockwise sequence to correspond with station setting beginning with Stations 1, 2, 3, etc. CONTRACTOR shall verify that each station number corresponds with the same numbered control valve.

E. Affix controller name (i.e. "Controller A") on inside of controller cabinet door with letters minimum of one inch high. Affix a non-fading copy of irrigation diagram to cabinet door below controller name. Irrigation diagram to be sealed between two sheets of 20 mil (minimum) plastic. Irrigation diagram shall be a reduced copy of the as-built drawing and shall show clearly all valves operated by the controller, showing station number, valve size and type of planting irrigated.

F. The CONTRACTOR shall be responsible for stationing the Controller as shown in the Irrigation Station Schedule on the drawings, where applicable.

3.13 CONTROL WIRING AND ELECTRICAL

A. CONTRACTOR shall be responsible for the placement of the 110 volt AC service necessary for the operation of electric controller as specified on the plans and in accordance with the manufacturer's specifications.

B. All electrical equipment and wiring shall be installed in accordance with the latest provisions of the National Electrical Code, state and local code and be installed by those skilled and licensed in the trade.

C. Electric control lines (24 volt) from controller to automatic valves shall be direct burial wire of a different color than the 110 volt service to controllers. The 24 volt common ground shall be of one continual color and a different color than the other 24 volt lines and the 110 volt service. All 110 volt AC wiring shall be installed in accordance with Federal, State, and local electric requirements.

D. All 24 volt wire shall be encased in two-inch Schedule 40 PVC sleeves when extending under roadways, parking lots, sidewalks, or other rigged surfaces shown or not shown on the drawings.

E. All wire passing under existing or future paving, or construction, shall be encased in plastic conduit extending at least 24 inches beyond edges of paving or construction as indicated on the irrigation drawings or elsewhere in these specifications.

F. All above ground low voltage wiring shall be installed in UL listed plastic conduit and connectors in accordance with prevailing local codes.

G. Install all 24-volt valve control wires and common wire to one side of mainline trench. Placement over pipes is not permitted. Installation depth shall conform to the depth of the mainline as indicated elsewhere in these specifications. Install all 24-volt wires in mainline trench except for distance between controller and mainline pipe location.

H. All field repair splices shall be made using Scotch-Lok No 3500 or DBY connector sealing packs, or approved equivalent. Each individual wire splice requires one connector sealing pack.

I. All in the field low voltage wire splices shall be made in a valve box as described within these specifications or in the pedestal of the field controller. Direct bury splices shall be prohibited.

J. When more than one wire is placed in the same open trench, wires shall be bundled and taped together at intervals of ten feet, using black electrical tape.

K. Provide an expansion curl within three feet of each wire connection and at each change of direction, and at least every 100 feet of wire length on runs of more than 100 feet in length. Each expansion curl shall be formed by wrapping at least six turns of wire around a two-inch diameter pipe, then removing the pipe.

L. Provide an expansion coil of eight to 10 feet of wire or cable at each change in direction along the wire routing, where wire is direct buried in a trench. Provide an expansion coil of four to six feet of wire every 1,000 feet of straight wire run. Coil diameter to be 24 to 30 inches. Do not tape restrain the wire coil. Lay the wire coil flat in the trench.

M. Provide an expansion coil of eight to 10 feet of wire or cable at each side of a road crossing. Coil diameters to be 24 to 30 inch. Do not tape restrain the wire coil. Lay the wire coil flat in the trench.

N. The 24 VAC low voltage wiring system between field controller and remote control valves shall be properly grounded per manufacturer's instructions.

O. The main line shall have two spare wires installed its entire length and to the automatic controller. Label each end "spare wire".

3.14 CLOSING OF PIPE AND FLUSHING OF LINES

A. Cap or plug all openings as soon as lines have been installed to prevent the entrance of materials that would obstruct the pipe. Leave in place until removal is necessary for completion of installation.

1. Thoroughly flush out all water lines under a full head of water before installing heads, valves, quick coupler assemblies, etc. Maintain flushing for a minimum of three minutes at the valve located furthest from water supply.

2. Test as specified below.

3. Upon completion of testing, complete assembly and adjust sprinkler heads for proper grade and distribution.

3.15 TESTING

A. Request the presence of the LANDSCAPE ARCHITECT or ENGINEER in writing or by phone at least 48 hours in advance of testing. Final testing is to be accomplished in the presence of the LANDSCAPE ARCHITECT or ENGINEER. Any additional tests required due to the failure of the initial test shall be accomplished at the expense of the CONTRACTOR.

B. Hydrostatic Testing: Center load piping with small amount of backfill to prevent arching or slipping under pressure. A continuous and static water pressure of 120 psi will be applied for a period of not less than two hours. Repair all leaks resulting from pressure test. Expel air from system after testing, flush all lines.

C. Tests shall be made between valves and as far as practicable in section of approximately 1,000 feet long or as approved by the LANDSCAPE ARCHITECT or ENGINEER. Potable water from an existing water distribution system shall be used if available. The test pressure for the water lines shall be 120 psi and this pressure shall be maintained for a period of not less than two hours. Pressure shall not vary more than two pounds from the above during the two-hour test period. Allowable leakage shall be computed on the basis of Table 3, Section 13.7. AWWA Standard C600-64, or the applicable formula for other than 18 foot lengths.

All leaks evident at the surface shall be uncovered and repaired regardless of the total leakage as indicated by the test, and all pipes, valves and fittings and other materials found defective under the test shall be removed and replaced at the CONTRACTOR's expense. Tests shall be repeated until leakage has been reduced below the allowable amount.

D. Operational Testing: Perform operational testing after hydrostatic testing is completed, backfill is in place, and sprinkler heads adjusted to final position.

E. Demonstration: The CONTRACTOR shall demonstrate to the LANDSCAPE ARCHITECT that the system meets coverage requirements and that automatic controls function properly. Coverage requirements are based on operation of one circuit at a time.

F. Clearly list dates of all pressure tests on the record drawings.

3.16 INSPECTION

A. The CONTRACTOR shall maintain proper facilities and provide safe access for inspection to all parts of the work.

B. Irrigation inspection shall consist of a minimum of:

1. Mainline pressure test.
2. Trench excavation and pipe coverage.
3. Coverage/hydrological test.
4. Final irrigation inspection.

C. If the specifications, the LANDSCAPE ARCHITECT's instructions, laws, ordinances or any public authority require any work to be specifically tested or approved, the CONTRACTOR shall give three days notice of its readiness for inspection.

D. The CONTRACTOR shall be solely responsible for notifying the LANDSCAPE ARCHITECT where and when such work is in readiness for testing.

E. If any work should be covered up without approval, it must be uncovered, if required, for examination at CONTRACTOR's expense.

F. No inspection shall commence without "Record" drawings and without completing previously noted corrections, or without preparing the system for inspection.

3.17 BACKFILL AND COMPACTING

A. CONTRACTOR shall not backfill over fittings, valves, couplings, etc., until pressure tests have been executed and approved.

B. After testing of system has occurred and inspections have been made, backfill excavations and trenches with clean soil, free of stones, sticks, construction debris and rubbish. Unsuitable material, including clods and rocks over two inches in size shall be removed from the site.

C. Metallic identification tape shall be buried approximately three inches above PVC pipe. Metallic tape shall be buried approximately three inches above ductile iron pipe. Tape width shall be three inch minimum tape colors and imprints shall be as follows:

Imprint	Color
Caution - Non-Potable Irrigation Water Line Buried	Purple

D. Water Packing: When water packing is used, the pipeline must first be filled with water, all air removed, and the pipe kept full during the backfill operation. The backfill, before wetting, shall be 12 to 18 inches deep over the top of the pipe. Water packing is accomplished by adding water in such quantity as to thoroughly saturate the initial backfill. While saturated, rods, shovels, concrete vibrators or other means nay be used to help consolidate the backfill around the pipe, taking care not to float of damage the pipe. After saturation, the pipeline shall remain full until after final backfill is made. Allow the wetted fill to dry until firm enough to walk on before final backfill is begun.

E. Hand or Mechanical Backfilling: Tamp the backfill in layers not to exceed six inches lift and compact firmly around the pipe and up to a least six inches above the top of the pipe. The backfill must be sufficiently damp to permit thorough compaction under and on each side of the pipe to provide support free from voids. Take care to avoid deforming, displacing, or damaging the pipe.

F. Backfill for all trenches, regardless of the type of pipe covered, shall be compacted to minimum 98 percent modified (T-180) density under pavement, 85 percent under planted areas. Compact trenches in areas to be planted by thoroughly flooding the backfill. Jetting process shall be used when necessary in those areas.

G. A fine granular material shall be placed initially on all lines with a minimum of three inches cover. No foreign matter large than one-half inch in size shall be permitted in the initial backfill.

Trenches located under paving shall be backfilled with sand (a layer six inches below the pipe and three inches above the pipe) and compacted in layers of 98 percent modified (T-180) compaction.

H. Dress off all areas to finish grades and restore to condition previous to irrigation installation.

I. Clean-Up: Remove from the site all debris and surplus earth resulting from work of this section. Clean-up shall be conducted continuously throughout the installation process to keep extraneous materials off the work site.

PART 4 MEASUREMENT AND PAYMENT

4.01 BASIS OF PAYMENT

A. CONTRACTOR will submit a lump sum bid and shall receive full compensation for conforming to the provisions of this section and related drawings. Lump sum paid for the complete installation as shown and specified will be categorized as follows:

1. Sleeving (Mains and Laterals)
2. Primary Components (Mains/Controllers/Solenoid Valves)
3. Secondary Components (Heads/Valves/Laterals/Wiring/Couplers)

B. No additional compensation will be allowed excluding relative change orders. The CONTRACTOR shall provide a complete unit cost breakdown for all irrigation components shown on the drawings or noted in the legend and shall be included as part of the CONTRACTOR's bid. Said breakdown may be submitted after award of contract and prior to the execution of work. However, the OWNER reserves the right to reject any bid that does not include said unit cost breakdown.

END OF SECTION 02810