ORIGINAL

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December 29, 2005

VIA OVERNIGHT DELIVERY

Ms. Blanca Bayo
Commission Clerk and Administrative Services Director
Florida Public Service Commission
2540 Shumard Oak Boulevard
Tallahassee, Florida 32399

Re: Docket No. 040384-WS; Application of Sanlando Utilities Corporation for an Amendment of Water and Wastewater Certificates in Seminole County, Florida

Dear Ms. Bayo:

Enclosed for filing in the above-referenced docket is the original and fifteen (15) copies of the Direct Testimony of Thomas Jensen.

Should you have any questions regarding this filing, please do not hesitate to contact me.

Sincerely,

RSTaylor for

Richard S. Taylor, Jr.

CMP ____
COM 3
CTR ORG
ECR ____
GCL 1
OPC ____
RCA ____
SCR ____
SGA ____
SEC 1
OTH ____

RST/ps
Enclosures
cc: Jennifer Brubaker, Esquire
Valerie Lord, Esquire

BEFORE THE FLORIDA PUBLIC SERVICE COMMISSION

DOCKET NO.: 040384-WS

IN RE: Application of
SANLANDO UTILITES
CORPORATION for amendment
of water and wastewater certificates
in Seminole County, Florida.
_____/

NOTICE OF FILING

COMES NOW the City of Longwood, and hereby gives notice of filing in the above-referenced docket the Direct Testimony of Thomas Jensen, on behalf of the City of Longwood.

Respectfully submitted on this 29th day of December, 2005, by:

Richard S. Taylor, Jr., Esquire
Florida Bar No.: 221686
531 Dog Track Road
Post Office Box 1117
Longwood, Florida 32752-1117
Telephone: (407) 339-7888
Attorney for City of Longwood

BEFORE THE FLORIDA PUBLIC SERVICE COMMISSION

DOCKET NO. 40384-WS

CITY OF LONGWOOD'S

TESTIMONY OF

THOMAS JENSEN

REGARDING THE APPLICATION FOR

AMENDMENT TO CERTIFICATES 247-W AND 189-S

IN SEMINOLE COUNTY, FLORIDA

TESTIMONY OF THOMAS JENSEN

Q. **Please state your name and business address.**

A. My name is Thomas Jensen and my business address is 6415 Lake Worth Road, Suite 307, Lake Worth, Florida 33463-2907.

Q. **By whom are you employed and in what capacity?**

A. I am employed by Arcadis RMA (formerly known as RMA Reese, Macon and Associates, Inc.). Presently, I serve as the Wastewater Department Manager.

Q. **What is the purpose of your testimony in this proceeding?**

A. To support the feasibility of the City of Longwood taking over the utility service as reflected in my Water and Wastewater Feasibility Analysis dated August 1999 and January 2000. True and correct copies of the Water and Wastewater Feasibility Analysis dated August 1999 and January 2000 are attached to my testimony.

Q. **Does this conclude your testimony?**

A. Yes it does.

CITY OF LONGWOOD
SANLANDO UTILITY ACQUISITION
Water and Wastewater
Feasibility Analysis

January 2000

Reese, Macon & Associates, Inc.
6415 Lake Worth Road, Ste. 307
Lake Worth, FL 33463-2907
(561) 433-3226

longwood/sanfeas

INTRODUCTION

Reese, Macon & Associates, Inc. (RMA) was authorized by the City of Longwood (the City) to perform a feasibility study of the proposed improvements recommended by RMA in their August 1999 report concerning the Sanlando Utility Acquisition. The purpose of this study was to determine the feasibility of the proposed pipeline routes stated in the August 1999 report. The study was to also determine the available space within the proposed corridor, its constructability, its potential for being permitted and to also update the cost estimate provided in the original report.

The scope of services to be performed by RMA included the following:

1. Review record drawing information available for the proposed pipeline corridor as provided by the City.

2. Perform an on-site investigation of the proposed pipeline corridor/route to identify its feasibility and potential construction concerns.

3. Have discussions with the appropriate regulatory agency to determine the permitting requirements and its potential permitable feasibility for the pipeline route chosen.

4. Update and refine the cost estimates developed in the August 1999 System Analysis report based upon the above findings.

5. Summarize the above results in a brief report (five (5) copies) for the City's review.

GENERAL INFORMATION

As discussed, this report will outline the Engineer's recommendation as to the pipeline route which will be in the City's best interest, from a cost and constructability standpoint, for the connection/acquisition of the Sanlando Utility System. It will act as a supplement to the August 1999 report which outlined a conceptual plan/analysis for the sizing of mains (water/sewer) and lift stations and the points of connection/disconnection to the Sanlando System. The City is encouraged to review the August 1999 report concurrently, since all of the discussions on service areas and design criteria is still applicable for the feasibility analysis presented herein.

EASEMENTS/RIGHT OF WAYS

The pipeline corridor chosen utilizes existing City/State Road right of ways and platted utility easements through subdivisions. The amount of available right of ways/easements was determined from City record drawings, recorded plats and discussions with City and Florida Department of Transportation (FDOT) personnel. Utilizing existing platted easements/right of ways saves the City considerable time and money, thereby eliminating the need to purchase/condemn property for the purpose of installing the proposed utilities.

Portions of the pipeline corridor fall within platted easements adjacent to residential subdivisions, Winsor Manor and Harbor Isle. Over the years, residents have encroached upon these easements

with wooden fences and landscaping. Though the cost estimates reflect the added costs of restoration through these areas, it does not reflect the additional effort required to provide up-front discussions with these residences to address the limit of the City's restoration effort within these areas. The added public relations work up-front can save time and money as the project construction commences.

PERMITTING CONDITIONS/REQUIREMENTS

For the proposed water and wastewater system improvements, several permits will be required prior to construction. Those permits are:

- City of Longwood Utility/Right of Way
- Seminole County Right of Way
- Florida Department of Transportation (FDOT)
- Florida Department of Environmental Protection (FDEP)

The most critical of the permits to obtain will be that from the FDOT. The bulk of the utility work will be installed within the SR 434 corridor, which has become built out, leaving minimal room for future utilities, especially east of Harbor Isle Way, where the right of way reduces. The proposed mains would be installed within SR 434 between Tarry Town Trail and Harbor Isle Way. Discussions with the Ovieda office of FDOT concerning this project, indicate that they will permit this project as presented herein. Note that Stan Mann of FDOT reviewed the proposed route and has conceptually approved the alignment. The next step, according to Mr. Mann, is to formally submit for permit approval.

The FDEP was another permitting concern. Their main concern was the ability to maintain the required regulatory separation from both existing and proposed mains. As the proposed alignment indicates, and as shown in the individual road cross sections, we were able to maintain the required separation distances.

WATER DISTRIBUTION SYSTEM

System Upgrades

The proposed water distribution system improvements shown in Exhibit 1, show no deviations from the planned routing/pipe sizes proposed in our August 1999 report. For clarification purposes, and to assist the regulatory agencies in their conceptual review of this project, we have provided roadway cross sections to show the locations of existing/proposed utilities within the right of way corridor. These cross sections are shown in Exhibit 4 through 6.

Our on site field visit of November 11, 1999, verified that the proposed corridor, along the north side of SR 434, is a viable option. During our field visit, we were able to confirm a location of the water main and determine the extent of restoration work required along the proposed route and at points of connection/disconnection to the Sanlando System.

As discussed in the previous report, all areas were able to provide a minimum fire flow of 750 GPM, except for the northeast area of Sleepy Hollow (Windmill Way and Sleepy Hollow Drive). This area exhibited a fire flow on 730 GPM which we feel is more than adequate for a residential type area. We therefore planned no improvements in this area.

It is proposed that all driveways and residential entry roadways to be crossed along SR 434 be open cut and replaced in kind. For the water main connection into the Devonshire subdivision, a directional bore of Rangeline Road is proposed, utilizing high density polyethylene (HDPE) pipe.

Exhibit 7 outlines the Engineer's estimated cost of the proposed improvements/modifications.

WASTEWATER COLLECTION/TRANSMISSION SYSTEM

System Upgrades

As discussed previously, the right of way width significantly reduces east of Harbour Isle Way, in addition to having numerous concrete driveways to the businesses along SR 434. In order to avoid these major conflicts, we revised the force main alignment as shown in Exhibit 2. This new alignment moves the main off of SR 434 just prior to approaching Harbour Isle Way to City owned easements, which border the Winsor Manor and Harbour Isle subdivisions. This main would exit at Rangeline Road and continue within the Longwood Club force main easement, ultimately connecting to the South Seminole Medical Center lift station. In order to improve the system hydraulics, it is anticipated that the proposed 6-inch force main would tie into the existing 4-inch force main leaving the Longwood Club lift station. This new alignment eliminates any pump/panel modifications that was previously planned for the Longwood Club lift station. The alignment change did have a minimal impact on the previously proposed pump sizes, but none were significant enough to warrant existing wetwell inside diameter concerns. The proposed and existing pump capacities are listed at the end of this section.

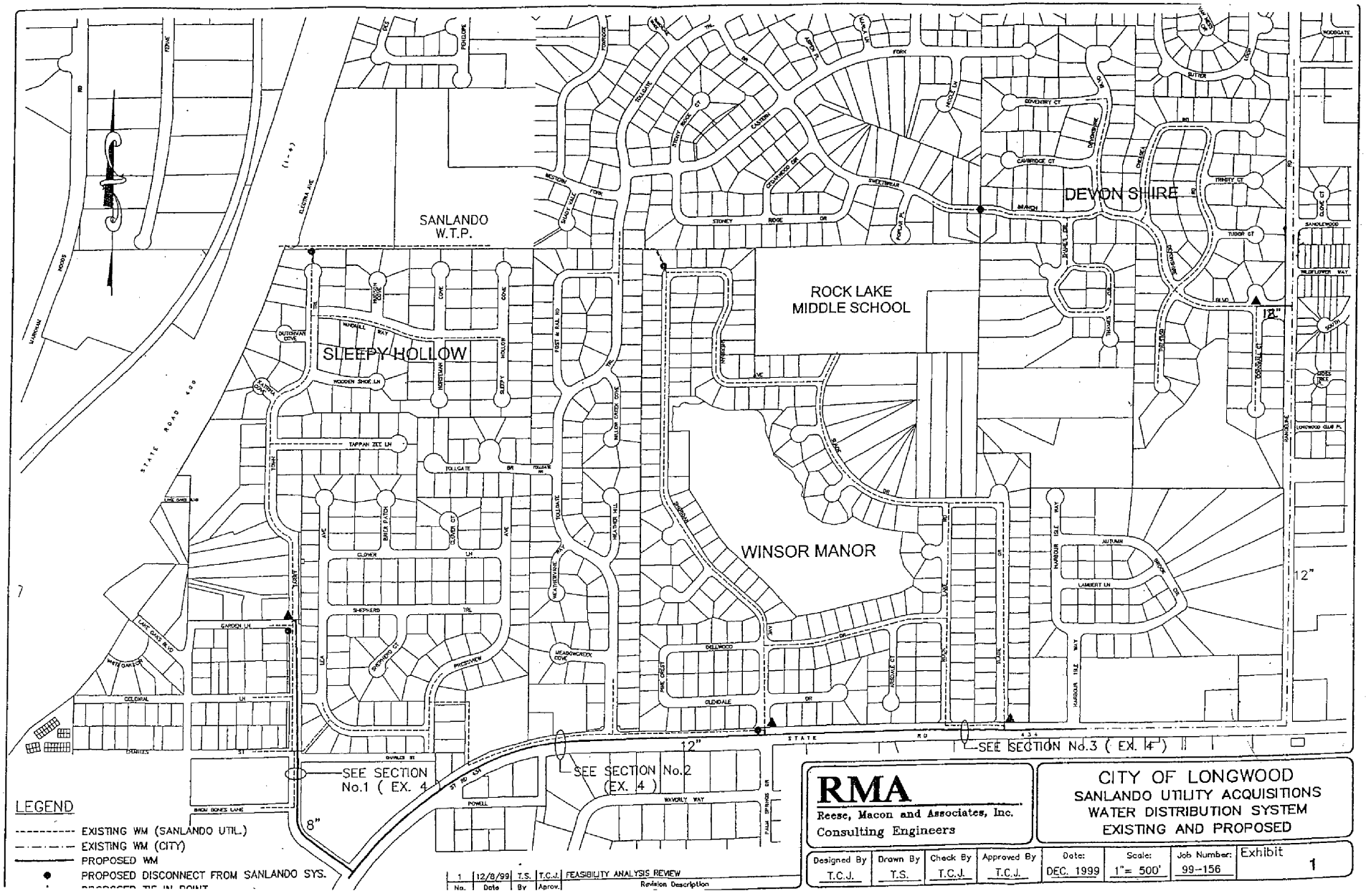
As in the previous report, all stations ultimately discharge into the South Seminole Medical Center lift station. The proposed replacement pumps for the Medical Center will be in the 20 to 25 horsepower range. Portions of the 6-inch force main leaving the Medical Center station will be parallel to a new 6-inch force main as shown in Exhibit 3. This proposed alignment eliminates an expensive directional bore at Longwood Street and the railroad, and avoids further restoration on the Medical Center property.

As discussed previously, all driveways and residential entry roads along the force main corridor will be open cut and replaced in kind. The force main will have five (5) planned directional bores, utilizing HDPE pipe.

Exhibit 8 outlines the Engineer's estimated cost of the proposed improvements/modifications. The existing and proposed pump capacities are listed below:

Lift Sta. No./ Description	Existing Capacity	Proposed Capacity
1 / A6	60 GPM [2]	90 GPM @ 80 TDH
2 / A5	125 GPM[2] @ 44TDH	150 GPM @ 95 TDH
3 / A4	100 GPM[2]	120 GPM @ 50 TDH
4 / Proposed	N/A	60 GPM @ 20 TDH
5 / Longwood Club	100 GPM @ 45 TDH	NO CHANGE
6 / So. Seminole Med. Ctr.	290 GPM @ 58 TDH	500 GPM @ 90 TDH

[2] Est. pump rates based upon number of dwelling units within station service area. TDH unknown.

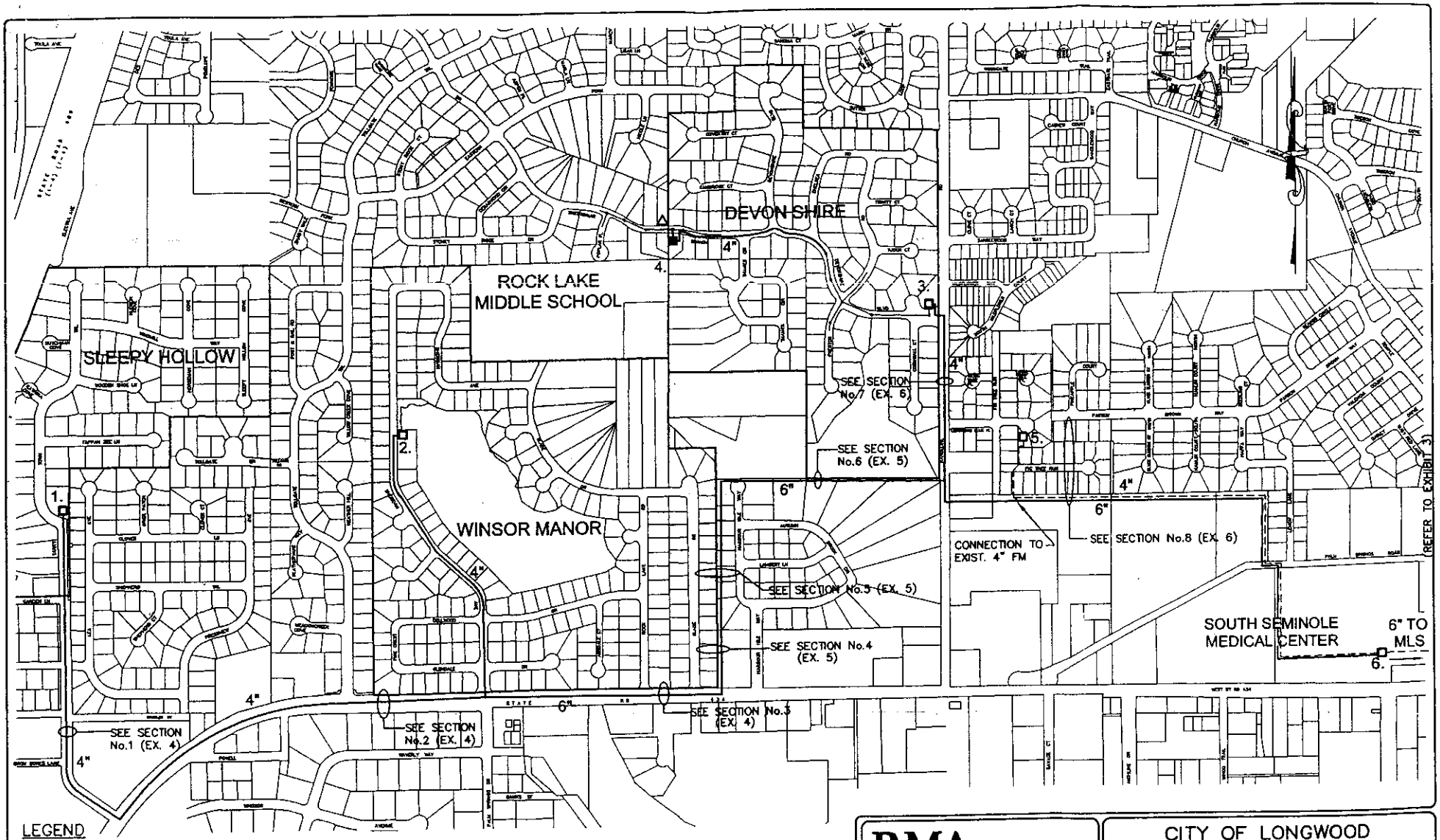


No.	Date	By	Aprov.	Revision Description
1	12/8/99	T.S.	T.C.J.	FEASIBILITY ANALYSIS REVIEW

RMA
Reese, Macon and Associates, Inc.
Consulting Engineers

CITY OF LONGWOOD
SANLANDO UTILITY ACQUISITIONS
WATER DISTRIBUTION SYSTEM
EXISTING AND PROPOSED

Designed By	Drawn By	Check By	Approved By	Date:	Scale:	Job Number:	Exhibit
T.C.J.	T.S.	T.C.J.	T.C.J.	DEC. 1999	1"= 500'	99-156	1



LEGEND

- EXISTING GRAVITY SEWER
- EXISTING FORCE MAIN
- PROPOSED FORCE MAIN
- ■ PROPOSED LIFT STATION
- □ EXISTING LIFT STATION
- △ PROPOSED GRAVITY SEWER DISCONNECT

No.	Date	By	Aprov.	Revision Description
1	12/8/99	T.S.	T.C.J.	FEASIBILITY ANALYSIS REVIEW

RMA
Reese, Macon and Associates, Inc.
Consulting Engineers

CITY OF LONGWOOD
SANLANDO UTILITY ACQUISITIONS
WW COLLECTION/TRANSMISSION SYSTEM
EXISTING AND PROPOSED

Designed By	Drawn By	Check By	Approved By	Date:	Scale:	Job Number:	EXHIBIT
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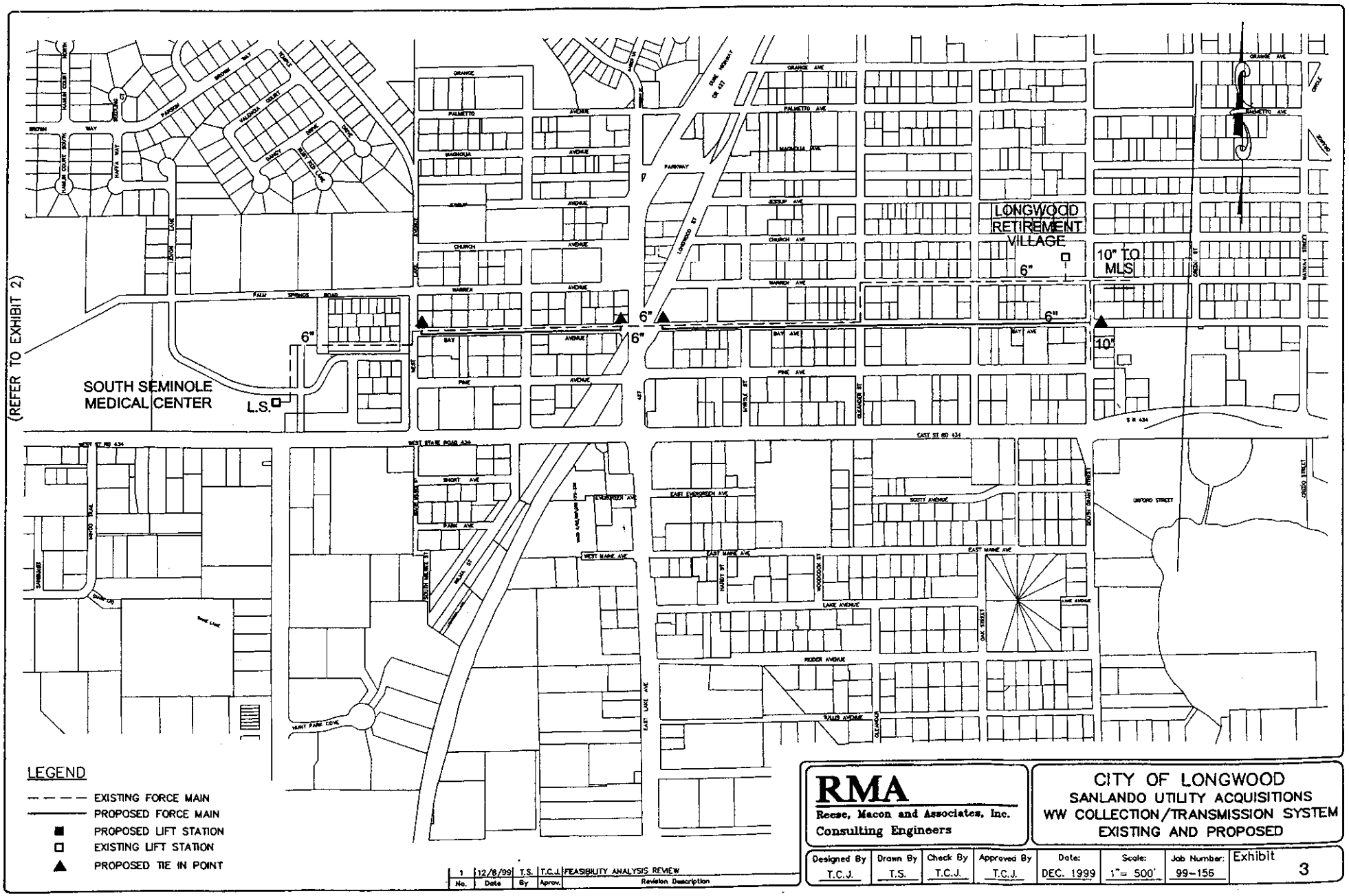
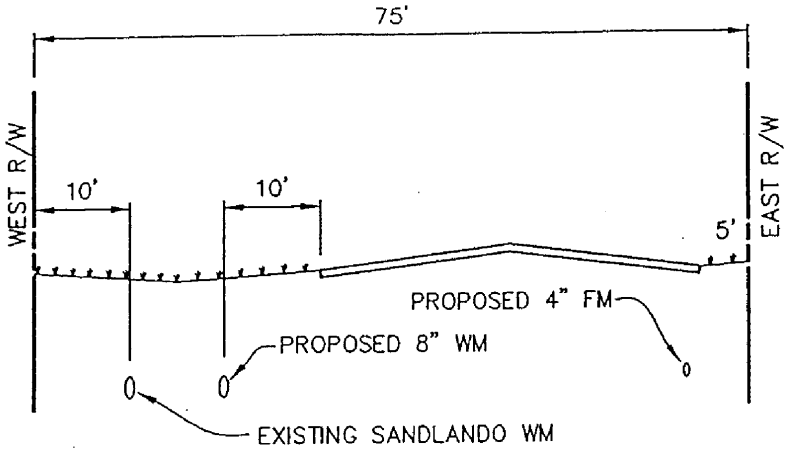


No.	Date	By	Aprov.	Revision Description
1	12/8/99	T.S.	T.C.J.	FEASIBILITY ANALYSIS REVIEW

RMA
Reese, Macon and Associates, Inc.
Consulting Engineers

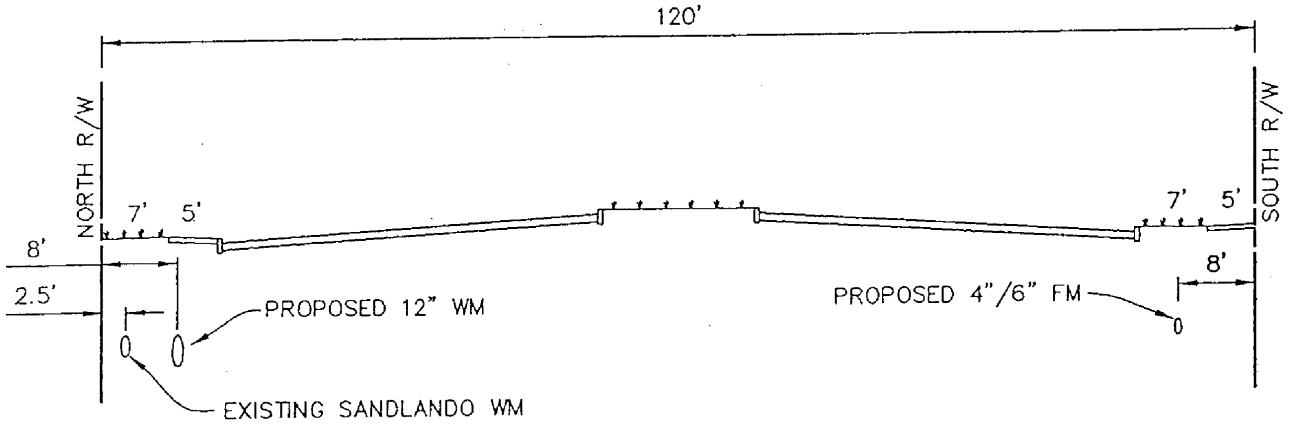
CITY OF LONGWOOD
SANLANDO UTILITY ACQUISITIONS
WW COLLECTION/TRANSMISSION SYSTEM
EXISTING AND PROPOSED

Designed By	Drawn By	Check By	Approved By	Date:	Scale:	Job Number:	Exhibit
T.C.J.	T.S.	T.C.J.	T.C.J.	DEC. 1999	1"= 500'	99-156	3



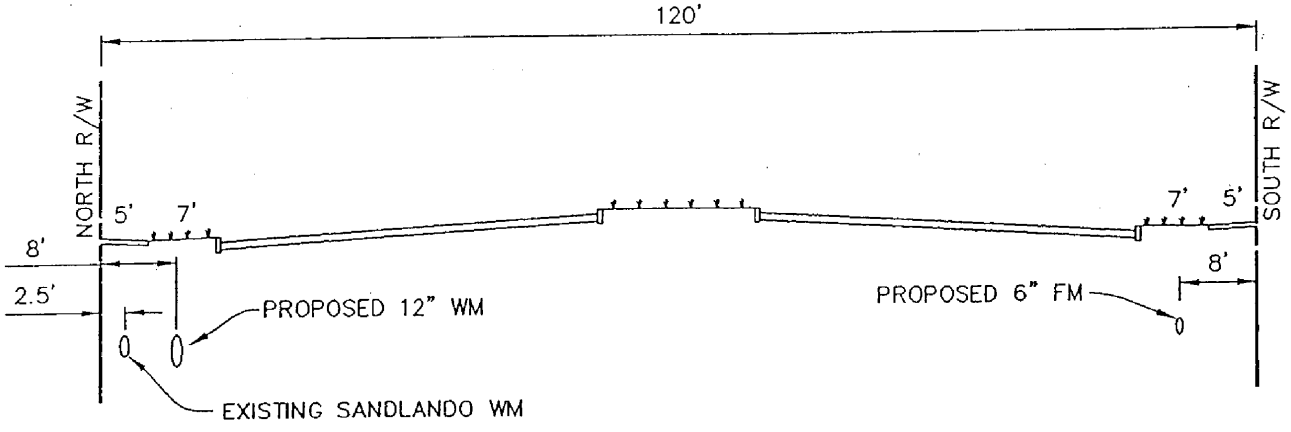
SECTION No. 1

(TARRY TOWN TRAIL)



SECTION No. 2 (S.R. 434)

(TARRY TOWN TRAIL TO ROCK LAKE ROAD)



SECTION No. 3 (S.R. 434)

(ROCK LAKE ROAD TO HARBOUR ISLE WAY)

RMA
Reese, Macon and Associates, Inc.
Consulting Engineers

CITY OF LONGWOOD
SANLANDO UTILITY ACQUISTIONS
WATER DISTRIBUTION SYSTEM
SECTIONS

Designed By	Drawn By	Check By	Approved By	Date:	Scale:	Job Number:	Exhibit
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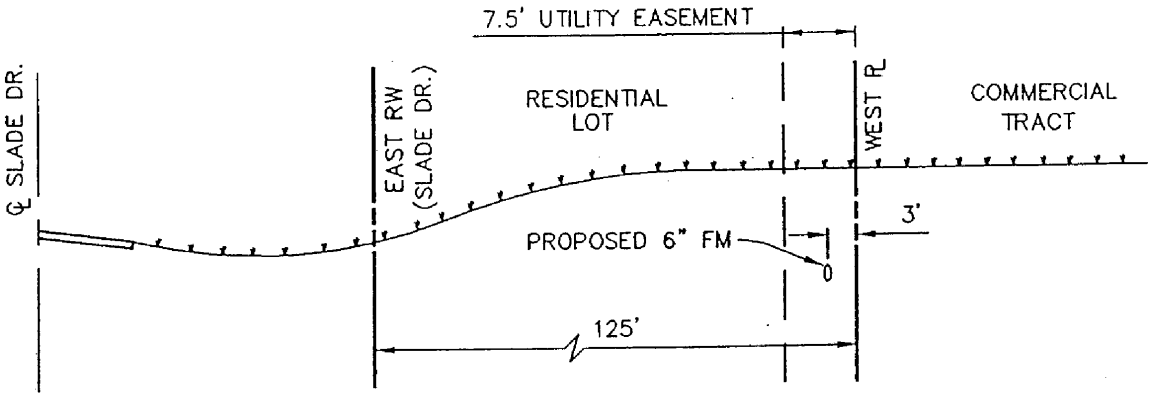
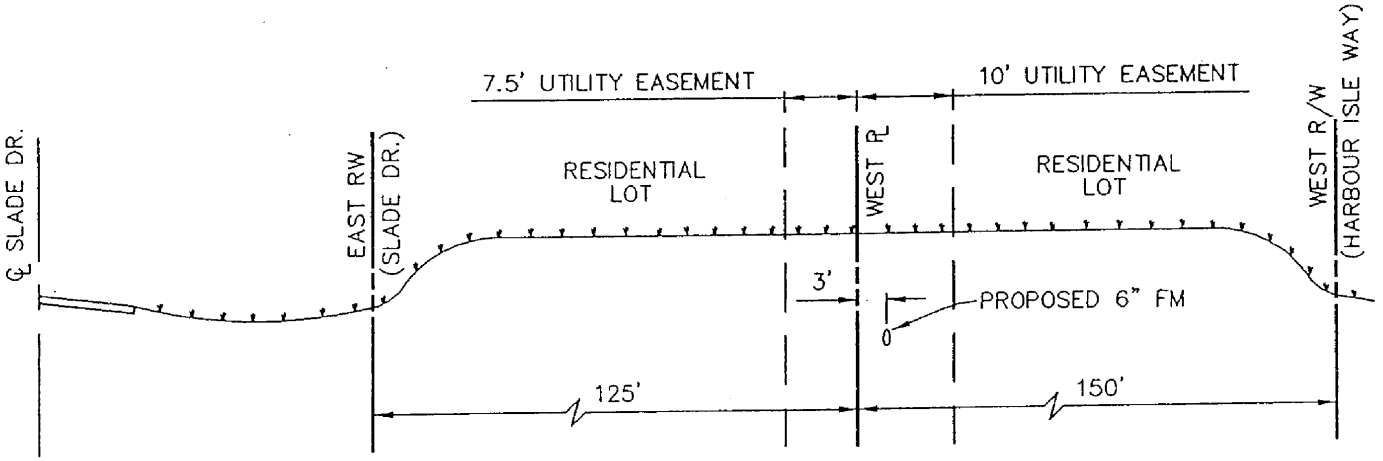
No.	Date	By	Aprov.	Revision Description



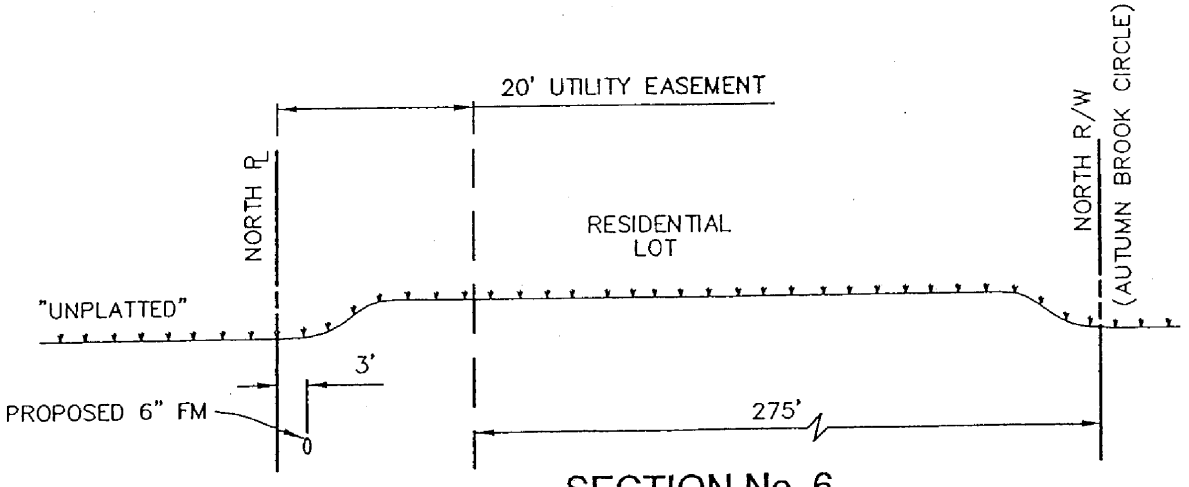
SECTION No. 4

(WINSOR MANOR / SLADE DRIVE)



SECTION No. 5

(WINSOR MANOR / HARBOUR ISLE)



SECTION No. 6

(HARBOUR ISLE)

No.	Date	By	Aprov.	Revision Description

RMA
Reese, Macon and Associates, Inc.
Consulting Engineers

CITY OF LONGWOOD
SANLANDO UTILITY ACQUISTIONS
WATER DISTRIBUTION SYSTEM
SECTIONS

Designed By	Drawn By	Check By	Approved By	Date:	Scale:	Job Number:	Exhibit
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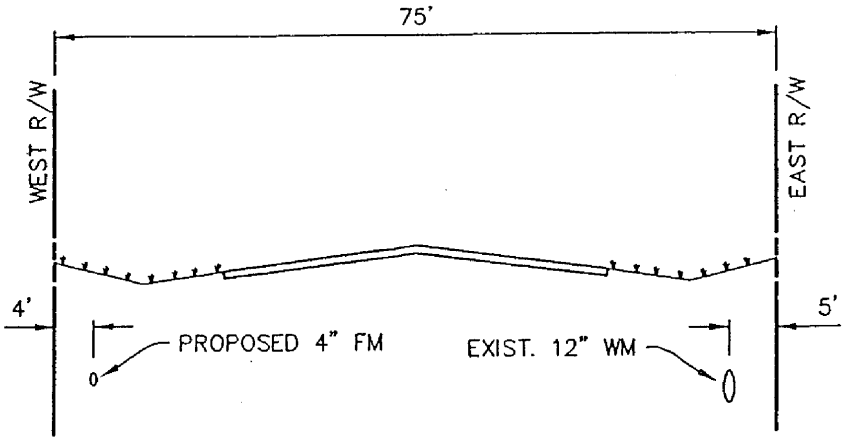
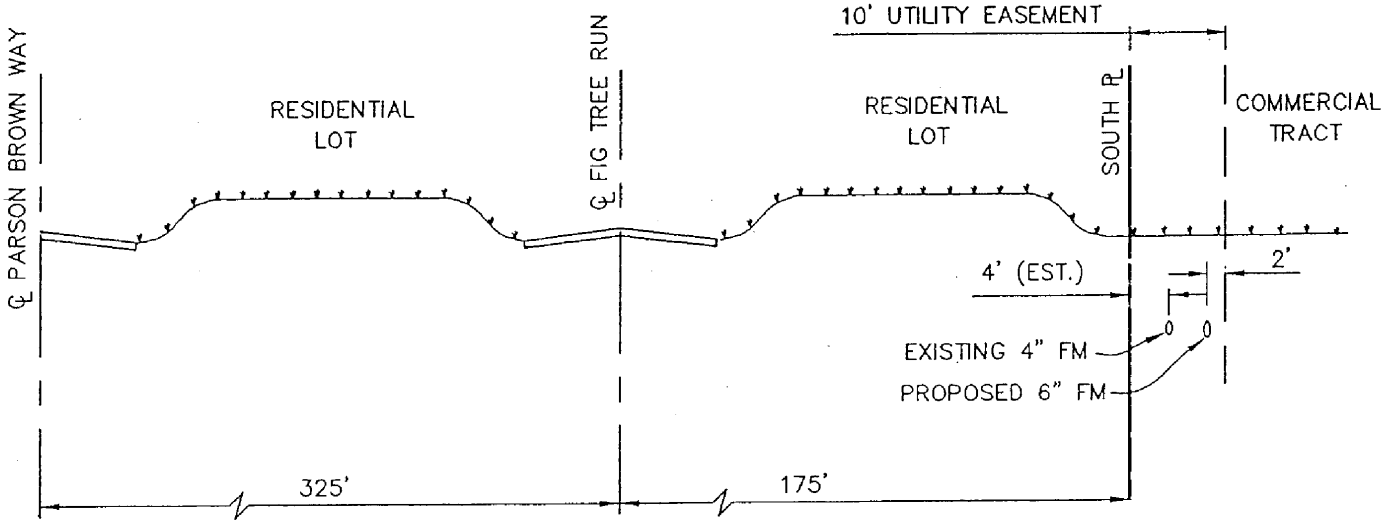


SECTION No. 7
(RANGELINE ROAD)



SECTION No. 8
(LONGWOOD CLUB LS / FM EASEMENT)

No.	Date	By	Aprov.	Revision Description

RMA
Reese, Macon and Associates, Inc.
Consulting Engineers

CITY OF LONGWOOD
SANLANDO UTILITY ACQUISTIONS
WATER DISTRIBUTION SYSTEM
SECTIONS

Designed By	Drawn By	Check By	Approved By	Date:	Scale:	Job Number:	Exhibit
T.C.J	T.S	T.C.J	T.C.J	DEC. 1999	NONE	99-156	6

EXHIBIT 7
CITY OF LONGWOOD
SANLANDO UTILITY ACQUISITION
WATER DISTRIBUTION SYSTEM
- ENGINEER'S COST ESTIMATE -

1.	Water Main (PVC)					
	a. 8" (Tarry Town Trail)	1,550	LF	@	$18	27,900
	b. 8" (Devonshire Blvd.)	200	LF	@	18	3,600
	c. 12" (SR 434)	4,650	LF	@	27	125,550
2.	Water Main (DIP)					
	a. 8"	100	LF	@	25	2,500
	b. 12"	300	LF	@	40	12,000
3.	Valves (RSGV)					
	a. 8"	5	LF	@	750	3,750
	b. 12"	5	LF	@	1,000	5,000
4.	D.I. Fittings	3,500	LF	@	2	7,000
5.	Sample Points	10	LF	@	200	2,000
6.	Directional Bore					
	a. 8" HDPE (Rangeline Road)	100	LF	@	90	9,000
7.	Main Disconnects	5	EA	@	3,000	15,000
8.	Main Tie In's	4	EA	@	3,000	12,000
9.	12" x 8" Tapping Sleeve/Valve	1	EA	@	2,500	2,500
10.	Air Release Valves	3	EA	@	2,500	7,500
11.	Pavement Restoration (Asphalt)	300	SY	@	20	6,000
12.	Concrete Driveway	200	SY	@	24	4,800
13.	Concrete Sidewalk	2000	SY	@	18	36,000
14.	Sod	5,000	SY	@	3	15,000
15.	Traffic control (SR 434)	1	Job	LS		10,000
16.	Miscellaneous	1	Job	LS		10,000
				Subtotal		$317,100
				Contingency		$ 32,900
				TOTAL		$350,000

EXHIBIT 8
CITY OF LONGWOOD
SANLANDO UTILITY ACQUISITION
WASTEWATER COLLECTION/TRANSMISSION SYSTEM
- ENGINEER' COST ESTIMATE -

1.	Force Main (PVC)					
	a. 4" (Sleepy Hollow)	2,300	LF	@	$10	$23,000
	b. 4" (SR 434)	2,750	LF	@	10	27,500
	c. 4" (Winsor Manor)	2,100	LF	@	10	21,000
	d. 4" (Rangeline)	1,300	LF	@	10	13,000
	e. 4" (Devonshire)	1,100	LF	@	10	11,000
	f. 6" (SR 434)	1,700	LF	@	14	23,800
	g. 6" (Easements)	7,100	LF	@	14	99,400
	h. 6" (Bay Ave.)	3,900	LF	@	14	54,600
2.	Force Main (DIP)					
	a. 4"	200	LF	@	15	3,000
	b. 6"	500	LF	@	20	10,000
3.	Plug Valves					
	a. 4 "	4	LF	@	550	2,200
	b. 6"	3	LF	@	750	2,250
4.	Directional Bore					
	a. 4" HDPE (SR 434 @ Tarry Town Trail)	125	LF	@	90	11,250
	b. 4" HDPE (SR 434 @ Sheridan Ave.)	125	LF	@	90	11,250
	c. 6" HDPE (SR 434 @ Winsor Manor/Harbor Isle)	150	LF	@	90	13,500
	d. 6" HDPE (SR 434 @ Palm Springs Dr.)	75	LF	@	90	6,750
	e. 6" HDPE (Rangeline Road)	100	LF	@	90	9,000
5.	D. I. Fittings	6,500	LBS	@	2	13,000
6.	Gravity Sewer Mod./Disconnect [1]	1	Job		LS	6,000

7.	Lift Station Mod./Upgrades [2]					
	a. Sta. No. 1 (Sleepy Hollow)	1	Job		LS	32,000
	b. Sta. No. 2 (Winsor Manor)	1	Job		LS	38,000
	c. Sta. No. 3 (Devonshire)	1	Job		LS	28,000
	d. Sta. No. 6 (Medical Center)	1	Job		LS	60,000
8.	Lift Station (New)					
	a. Sta. No. 4 (Devonshire)	1	Job		LS	65,000
9.	Air Release Valves	4	EA	@	2,500	10,000
10.	Tapping Sleeve & Valve					
	a. 4" x 4"	1	EA	@	1,200	1,200
	b. 6" x 6"	3	EA	@	1,500	4,500
	c. 10" x 6"	1	EA	@	1,800	1,800
11.	Pavement Restoration (Asphalt)	2,400	SY	@	20	48,000
12.	Concrete Driveway	750	SY	@	24	18,000
13.	Concrete Sidewalk	1,500	SY	@	18	27,000
14.	Shellrock Road Restoration	2,750	SY	@	8	22,000
15.	Sod	10,000	SY	@	3	30,000
16.	Seed/Mulch	6,000	SY	@	0.30	1,800
17.	Traffic Control	1	Job		LS	10,000
18.	Miscellaneous	1	Job		LS	25,000
				Subtotal		$ 783,800
				Contingency		$ 79,200
				TOTAL		$ 863,000

Summary:

Water Distribution System	**$ 350,000**
Wastewater Coll./Tran. System	**$ 863,000**
TOTAL	**$1,213,000**

[1] Includes one new manhole, 50 LF DIP gravity sewer and disconnect from gravity sewer to the west.

[2] Includes new pumps (2), guide rails, float controls, control panel, disconnect from Sanlando system and site restoration.

CITY OF LONGWOOD
SANLANDO UTILITY ACQUISITION
WATER AND WASTEWATER
SYSTEM ANALYSIS

AUGUST 1999

Reese, Macon & Associates, Inc.
6415 Lake Worth Road, Suite 307
Lake Worth, FL 33463-2907
(561)433-3226 Telephone
(561)433-8011 Facsimile

TABLE OF CONTENTS

LIST OF EXHIBITS

EXHIBIT	DESCRIPTION
1.	ACQUISITION AREAS
2.	WATER DISTRIBUTION SYSTEM (Existing & Proposed)
3.	WASTEWATER COLLECTION / TRANSMISSION SYSTEM (Existing & Proposed) - OPTION A
4.	WASTEWATER COLLECTION / TRANSMISSION SYSTEM (Existing & Proposed) - OPTION B
5.	WATER DISTRIBUTION SYSTEM, EXTIMATED COSTS (Without Sleepy Hollow 8 inch WM extension)
6.	WATER DISTRIBUTION SYSTEM, ESTIMATED COSTS W/ (With Sleepy hollow 8 inch wm extension
7.	FIRE FLOWS UNDER 1000 GPM (Locations / Flows)
8.	WASTEWATER COLLECTION / TRANSMISSION SYSTEM Estimated Costs - Option A
9.	WASTEWATER COLLECTION / TRANSMISSION SYSTEM Estimated Costs - OPTION B
10.	WASTEWATER COLLECTION / TRANSMISSION SYSTEM Medical Center Lift Station Alternative
11.	WASTEWATER COLLECITON / TRANSMISSION SYSTEM Estimated Costs - So. Seminole Medical Ctr. Lift Station Alternative
12.	WASTEWATER COLLECTION / TRANSMISSION SYSTEM Cost Summary

INTRODUCTION

Reese, Macon and Associates, Inc. (RMA) was authorized by the City of Longwood (the City) to conduct a hydraulic analysis on a portion of the water and wastewater system within the Sanlando Utility Service area which the City is considering as a possible acquisition. The scope of services to be performed by RMA included the following:

1. Review previous hydraulic studies of the water distribution and wastewater collection systems.

2. Prepare a "backbone" hydraulic model of the water distribution system in the western area of the City to determine impacts if portions of the Sanlando Utility are connected to the City system.

3. Determine impacts to the remaining Sanlando water distribution system in the vicinity of the subject areas.

4. Prepare a "backbone" hydraulic model of the lift station and force main system from the subject area to the master pump station.

5. Analyze both systems and determine the most cost effective approach for provision of service from the City.

6. Summarize the results of the analyses in a brief report which will include conceptual cost estimates for the recommended improvements.

7. Present five (5) copies of the report to the City for review.

GENERAL INFORMATION

For system information (main types / locations/ system demand / pressures, etc.), RMA relied upon Richard Kornbluh, the City's Utilities Division Manager. RMA also made use of the following reference material;

- Distribution System Handbook, 1998 and 1991 version as prepared by the City of Longwood staff

- Comprehensive Master Wastewater Collection Plan, revised April 1989, as prepared by Lochrane Engineering, Inc.

SERVICE AREA

The portion of the Sanlando Utility which the City is considering for acquisition consists of three (3) existing residential subdivisions and a possible future school site. These developments are

known as Devonshire, Winsor Manor and Sleepy Hollow, refer to exhibit 1. The developments fall within an area west of Rangeline Road, along State Road 434. The westernmost community, Sleepy Hollow, borders State Road 400 along its western edge. The following outlines the number of single family connections within each development:

DEVELOPMENT	NO. OF UNITS
Devonshire	154
Winsor Manor	240
Sleepy Hollow	96
School Site (Proposed)	15 Acres

SYSTEM REQUIREMENTS - DESIGN CRITERIA

Water Distribution System

For this analysis, water usage records from Sanlando Utilities was not available. For the purposes of projecting system demands, a unit water demand of 350 gal/day/unit was assumed. A maximum day peak factor of 1.60 times the average daily demand was used.

Wastewater Collection / Transmission

For projecting the wastewater flows, it was assumed that 100% return of the water usage occurs. This would generate a wastewater flow of 350 gal/day/unit. From past City reports, it was determined that the peak daily flow factor of 2.5 times the average daily flow is applicable to the system.

WATER DISTRIBUTION SYSTEM

Water Demands / Fire Flow

A computer model was developed to analyze the impacts on the City's system if the acquisition areas were acquired. The maximum daily demand plus fire flow was analyzed. Based upon the unit demands discussed above, the acquisition areas had the following projected demands:

DEVELOPMENT	AVERAGE DAY DEMANDS	MAXIMUM DAY DEMANDS
DEVONSHIRE	53,900 GAL / DAY	86,240 GAL / DAY
WINSOR MANOR	84,000 GAL / DAY	134,400 GAL / DAY
SLEEPY HOLLOW	33,600 GAL / DAY	53,760 GAL / DAY

Based upon past City reports, fire flows of 1000 GPM were used, for any type of use. Typically the following fire flow criteria is acceptable:

Type use	Fire Flow (GPM)
SINGLE FAMILY	500
MULTI FAMILY	750
INDUSTRIAL / OFFICE / COMMERCIAL	1,500
PUBLIC / CIVIC	2,000

During modeling of the system, we set a range of 750 to 1000 GPM for fire flows with a 20 psi residual. For the proposed school site, along the northern edge of Winsor Manor, we modeled the system to achieve the maximum allowable fire flow attainable with a 20 psi residual.

System Upgrades / Modifications

The water system was modeled with the three (3) possible acquisition areas for maximum daily demands and maximum day demand plus fire flow. As discussed previously, fire flows were set in a range of 750 to 1000 GPM with the criteria that a 20 psi residual had to be maintained within the system. The model utilized system pressures / demands generated from the Rangeline Road and Warren Ave. water treatment plants of 70 psi.

Providing water service to the acquisition areas will require the City to extend their water mains and make certain modifications to the existing Sanlando Utility Distribution system so that a separation of service is maintained between the two utilities. Exhibit 2 shows the proposed upgrades and modifications.

For the Devonshire development, the connection to the City system was made off of an existing 12-inch water main within Rangeline Road. A jack and bore crossing of Rangeline Road is proposed, utilizing an 8-inch carrier / 16-inch casing. The proposed 8-inch main extension will tie into an existing 6-inch main just inside the development that presently provides water service from the Sanlando Utility System. The separation of the Sanlando Utility system will occur within Sweetbriar Branch Road at the west end of the Devonshire development. All existing mains within the development are 6-inch and 2-inch mains with eight (8) fire hydrants.

The Winsor Manor and Sleepy Hollow Developments are located off of S.R. 434. The City does not have mains in the vicinity, so an extension of a 12-inch water main is proposed. The point of connection of this proposed 12-inch main is just east of the Winsor Manor development along S.R. 434. The Winsor Manor development is proposed to have two (2) points of connection off the proposed 12-inch main, one at Slade Dr. and the other at Sheridan Avenue. The two existing Sanlando Utility connections, one at Sheridan Ave. and S.R. 434 and the other in the northwest corner of the development, will be planned to be disconnected. The Winsor Manor development consists of 8-inch, 6-inch and 2-inch water mains with eleven (11) fire hydrants.

Club station pumps presently to the South Seminole Medical Center station thru a 4-inch force main. Due to the hydraulic constraints of this main, a parallel main (4-inch) is required to alleviate the high head losses experienced by the single 4-inch main. The three acquisition areas flow place a greater demand on the existing Medical Center station. Fortunately, it has on 8ft diameter wetwell that can handle the additional flow and the increased pump sizes. It's s only restriction is the single 6-inch force main that pumps east to the City master lift station. This main causes significant head losses in the main due to the required increased pump capacity of 475 gpm. The proposed pumps are 46 horsepower. For this reason, we developed an alternative which adds a parallel 6-inch force main, as shown in exhibit 10. This reduces the pump motor size down to 10 horsepower.

The option B plan is similar to the above, except that Sleepy Hollow and Winsor pump directly to the Longwood Club station, refer to exhibit 3. The additional flow in to the Longwood Club station requires the existing 4-inch main to be paralleled with a 6-inch main.

The existing and proposed pump capacities are listed below;

Lift Sta. No./ Description	Existing Capacity	- Option A - Proposed Capacity	- Option B - Proposed Capacity
1. / A6	60 GPM [2]	90 GPM @ 77 TDH	90GPM @ 75 TDH
2. / A5	145 GPM[2]	150 GPM @ 87 TDH	150 GPM @ 84 TDH
3. / A4	100 GPM[2]	100 GPM @ 27 TDH	100 GPM @ 28 TDH
4. / Proposed	N/A	50 GPM @ 25 TDH	50 GPM @ 25 TDH
5. / Longwood Club	100 GPM @ 45 TDH	200 GPM @ 43 TDH	350 GPM @ 37 TDH
6. / So. Seminole Med. Ctr.	280 GPM @ 60 TDH	475 GPM @ 128 TDH[3]	475 GPM @ 128 TDH[3]

[1] Sanlando Util. / City Nomenclature

[2] Est. pump rates based upon number of dwelling units within station service area. TDH unknown.

[3] Assumes 6-inch main from Med. Ctr. sta. is utilized. If 6-inch main is paralleled with another 6" main as outlined in L.S. Alternatives (exhibit 10), proposed capacity for option A/B would be 475 GPM @ 48 ft. TDH.

CONCLUSIONS AND RECOMMENDATIONS

Water Distribution System

As shown within exhibit 2, the proposed improvements recommended can handle the acquisition areas commensurate within the levels of service presently provided by other areas within the City. As previously mentioned, when fire flow analyses were run, the fire flows were set for a minimum of 750 GPM and a maximum of 1000 GPM, all with a criteria that a 20 psi residual was to be maintained. Within the Sleepy Hollow subdivision, a fire flow at Sleepy Hollow Cove and Windmill Way produced a maximum attainable fire flow (w/20psi residual) of 734 gpm. For a single family subdivision, this should be more than adequate. If the City feels that additional fire flow is required, the existing 6-inch main within Windmill Way could be replaced with an 8-inch main from Tarry Town Trail to Sleepy Hollow Cove, this would increase the available fire flow to 946 GPM (w/20 psi residual). Exhibit 6 shows the net increase in costs if the City deemed it necessary to add the 8-inch water main discussed above.

In exhibit 7, we list the locations and available fire flows which did not meet the maximum 1000 GPM fire flow limitation. Based upon our review, we would recommend the following as it relates to the water distribution system, if the City so chooses to provide service to the three (3) acquisition areas:

- Implement the suggested improvements as outlined in exhibit 5, without the additional 8-inch main within Sleepy Hollow.

- Confirm Sanlando's capabilities to maintain their present level of service after the proposed disconnections from their system are completed. This can be field verified by closing the existing mains at the proposed disconnection points.

Wastewater Collection / Transmission System

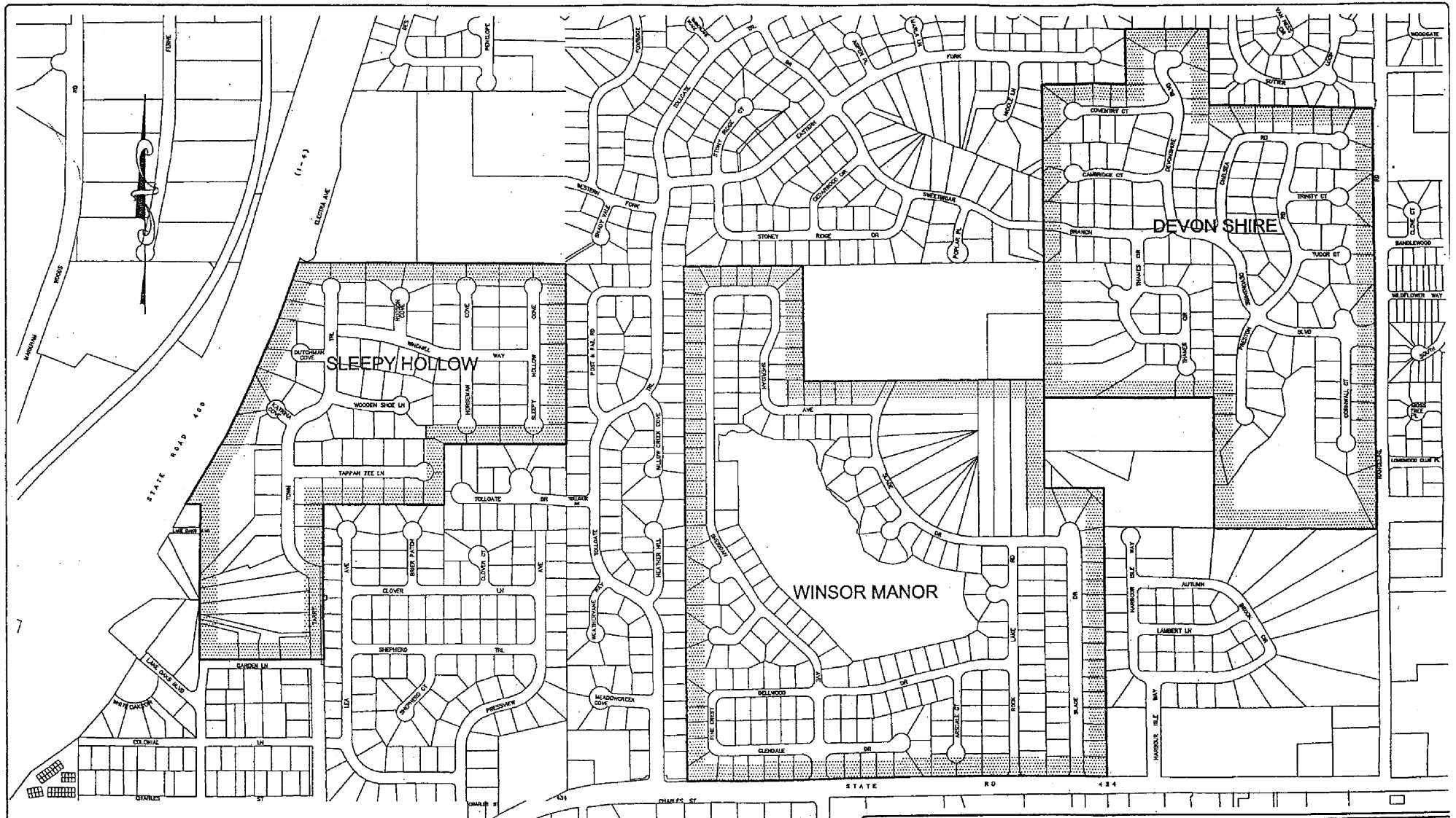
As discussed earlier, available options were developed as viable alternatives for the routing of wastewater from the acquisition areas to the City. Within either option, the City will be required to install force mains along significant portions of SR 434 / Rangeline Road. The force main sizes are not sized to take into account other potential developments along the proposed force main route. The City may want to consider up-sizing these mains to have the ability in the future to handle additional flow.

Based upon our analysis, it is our recommendation that the City consider Option A, not only because of its cost effectiveness, but due to the potential hydraulic benefits it could offer for future development along SR 434.

For consideration, we outlined additional modifications for the City to consider. As noted, the existing City lift station at the South Seminole Medical Center sees the greatest impact. It would act as a master repump station for the City's western development area if the acquisitions come to fruition. Though Option A & B identify costs for the Medical Center's station upgrades, it's proposed pumps are rated at 46 hp, a significant size compared to other stations within the City. To correct this, a parallel main (additional 6-inch force main) could be installed to alleviate the high head loss the station experience, refer to exhibit 10. Exhibit 11 & 12 summarizes the cost implication for this modification and its associated cost adjustments to Options A and B.

Prior to placing these acquisition areas on-line within the City system, the City should evalulate the run times within the existing master lift station on Grant Street. The additional flows from these developments may warrant the next phase of pump upgrades to handle the additional flow. We also recommend that field evaluation of the existing stations be made to ascertain conditions of existing piping, wetwell / valve vault and hatches.

EXHIBITS

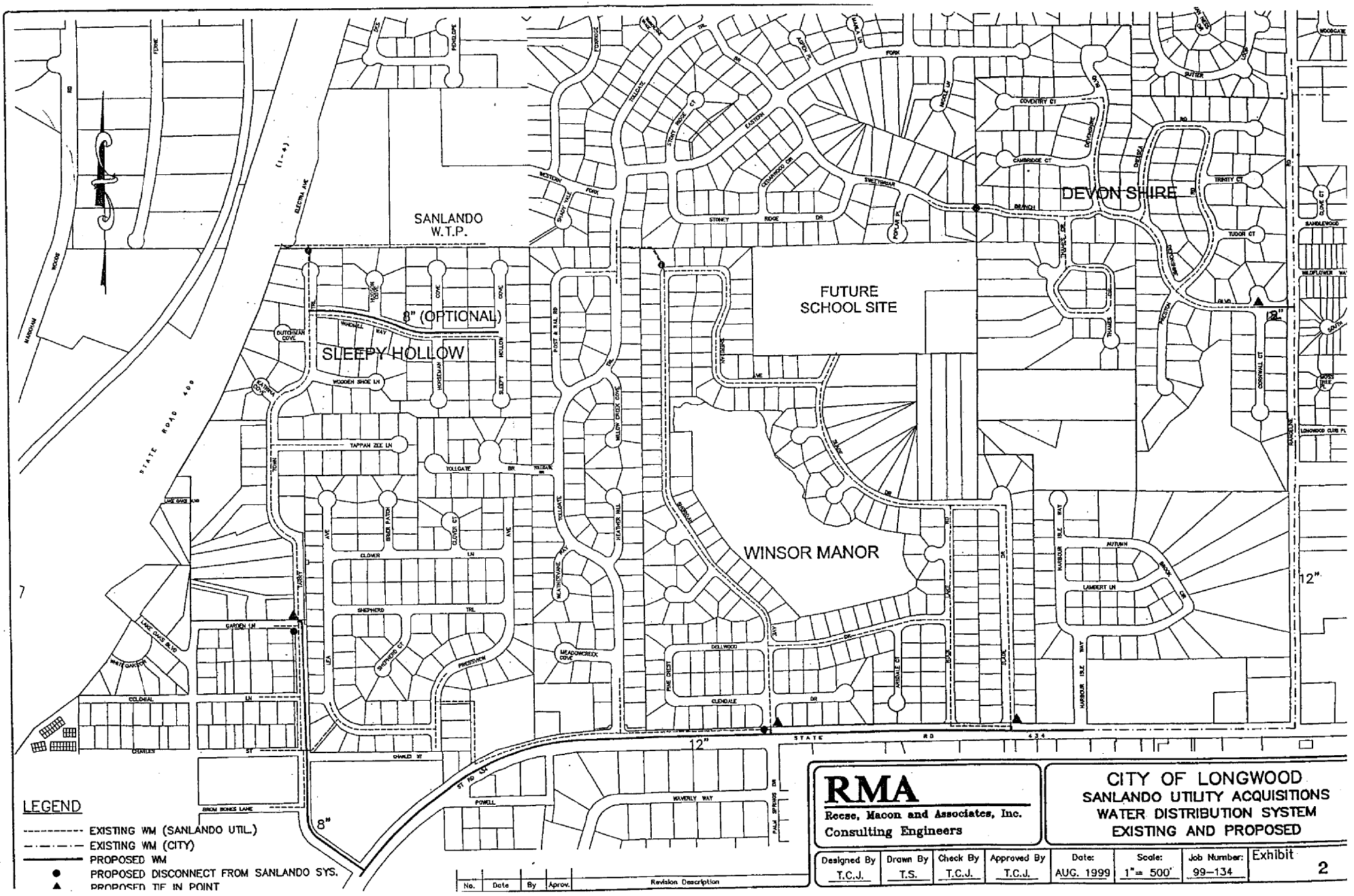


RMA
Reese, Macon and Associates, Inc.
Consulting Engineers

CITY OF LONGWOOD
SANLANDO UTILITY ACQUISITIONS
ACQUISITION AREAS

Designed By	Drawn By	Check By	Approved By	Date:	Scale:	Job Number:	Exhibit
T.C.J.	T.S.	T.C.J.	T.C.J.	AUG. 1999	1"= 500'	99-134	1

No.	Date	By	Aprov.	Revision Description



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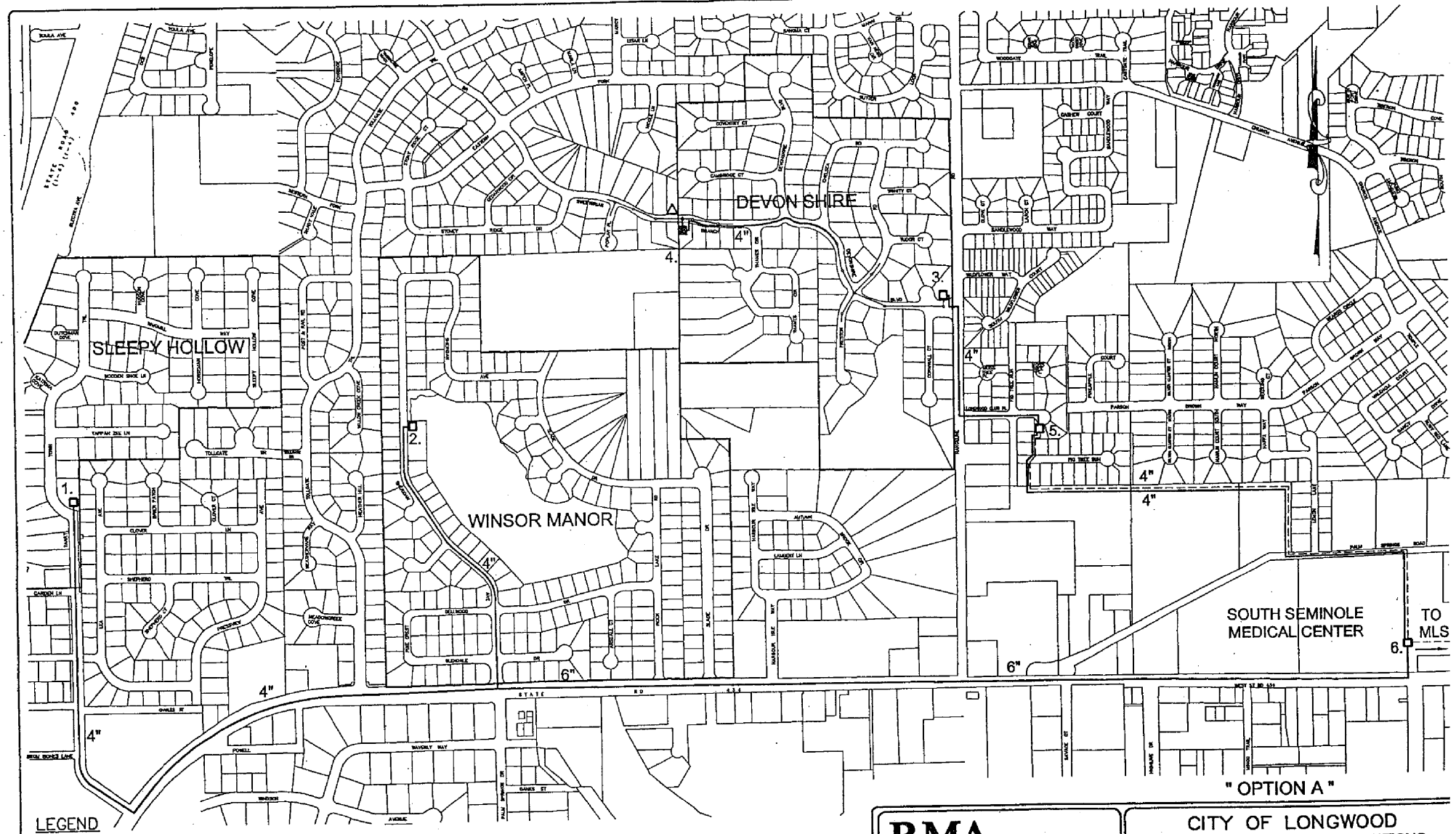
Consulting Engineers

CITY OF LONGWOOD
SANLANDO UTILITY ACQUISITIONS
WATER DISTRIBUTION SYSTEM
EXISTING AND PROPOSED

Designed By	Drawn By	Check By	Approved By	Date:	Scale:	Job Number:	Exhibit
T.C.J.	T.S.	T.C.J.	T.C.J.	AUG. 1999	1"= 500'	99-134	2



" OPTION A "

LEGEND

- EXISTING GRAVITY SEWER
- EXISTING FORCE MAIN
- PROPOSED FORCE MAIN
- ■ PROPOSED LIFT STATION
- □ EXISTING LIFT STATION
- △ PROPOSED GRAVITY SEWER DISCONNECT

No.	Date	By	Aprov.	Revision Description

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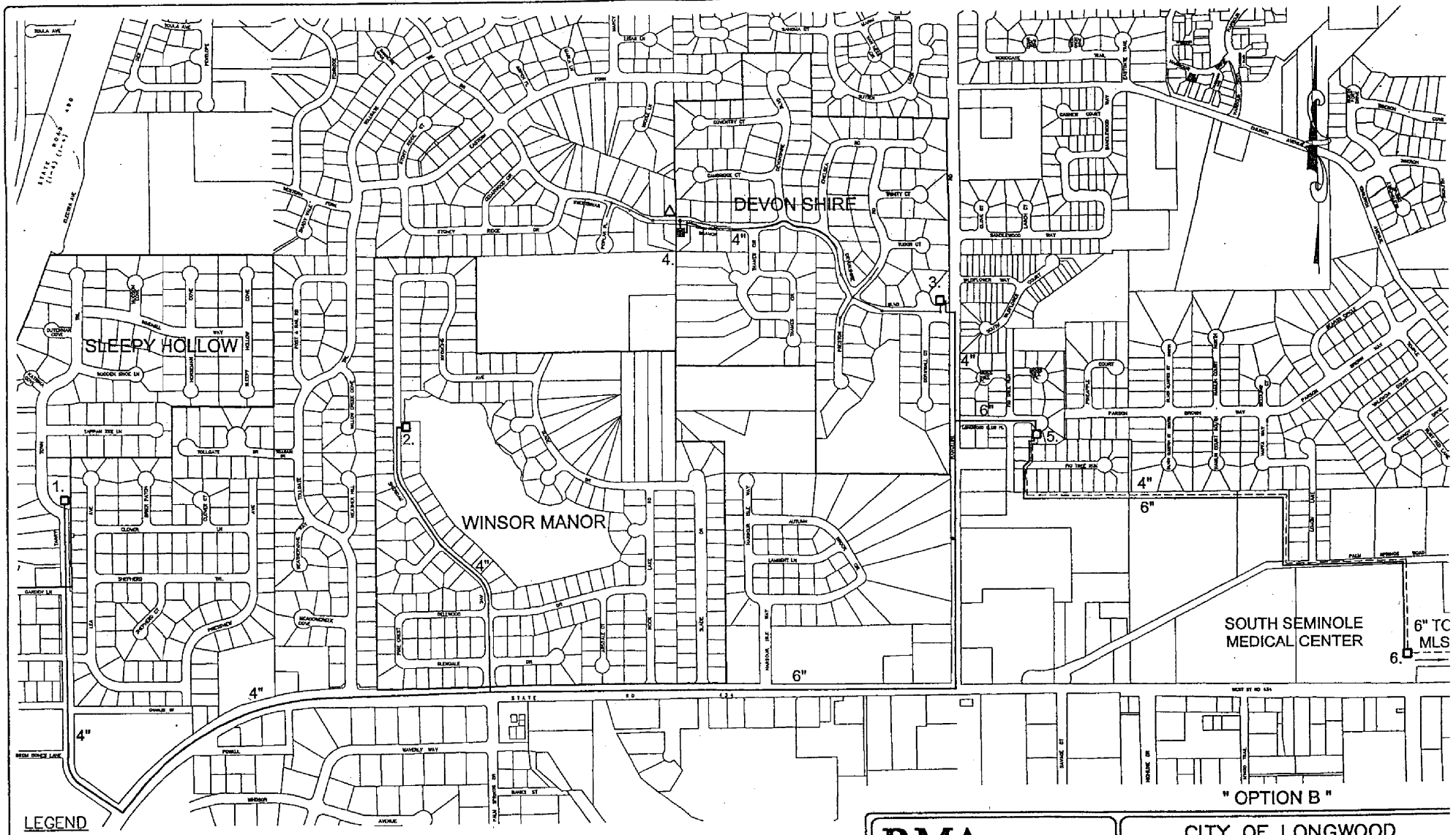
CITY OF LONGWOOD
SANLANDO UTILITY ACQUISITIONS
WW COLLECTION/TRANSMISSION SYSTEM
EXISTING AND PROPOSED

Designed By	Drawn By	Check By	Approved By	Date:	Scale:	Job Number:	EXHIBIT
T.C.J.	T.S.	T.C.J.	T.C.J.	AUG. 1999	1"= 600'	99-134	3



" OPTION B "

LEGEND

- EXISTING GRAVITY SEWER
- EXISTING FORCE MAIN
- PROPOSED FORCE MAIN
- ■ PROPOSED LIFT STATION
- □ EXISTING LIFT STATION
- △ PROPOSED GRAVITY SEWER DISCONNECT

No.	Date	By	Aprov.	Revision Description

RMA
Reese, Macon and Associates, Inc.
Consulting Engineers

CITY OF LONGWOOD
SANLANDO UTILITY ACQUISITIONS
WW COLLECTION/TRANSMISSION SYSTEM
EXISTING AND PROPOSED

Designed By	Drawn By	Check By	Approved By	Date:	Scale:	Job Number:	EXHIBIT
T.C.J.	T.S.	T.C.J.	T.C.J.	AUG. 1999	1" = 600'	99-134	4

EXHIBIT 5

CITY OF LONGWOOD
SANLANDO UTILITY ACQUISITION
ESTIMATED COSTS
- WATER DISTRIBUTION SYSTEM -

1. Water Main (DIP)			
a. 12" (S.R. 434)	4950 LF @ 27.50	$	136,125
b. 8" (Tarry Town Trail, S.R. 434 to Garden Lake	1500 LF @ 18.50		27,750
c. 8" (Devonshire Blvd.)	100 LF @ 18.50		1,850
2. Valves (RSGV)			
a. 12"	3 ea @ 1000		3,000
b. 8"	3 ea @ 750		2,250
3. D.I. Fittings	3000 lbs @ 2.00		6,000
4. Jack & Bore			
a. 8" carrier / 16" casing (Rangeline Rd.. & Devonshire)	100 LF @ 275		27,500
5. Sample Points	10 ea @ 200		2,000
6. Main, cut & cap			
a. NW corner Winsor Lake	1 ea @ 3000		3,000
b. Garden Lake / Tarry Town Trail	1 ea @ 3000		3,000
c. Tarry Town Trail	1 ea @ 3000		3,000
d. Sweet Brair Branch	1 ea @ 3000		3,000
7. Main connects			
a. Slade Dr.	1 ea @ 3000		3,000
b. Sheridan Ave.	1 ea @ 3000		3,000
c. Garden Lake	1 ea @ 3000		3,000
d. Devonshire Blvd.	1 ea @ 3000		3,000
8. Pavement Restoration	300 SY @ 20		6,000
9. Sod	2,500 SY @ 3		7,500
10. Seed / Mulch	6,000 SY @ 0.30		1,800
11. Miscellaneous	----------		10,000
	Subtotal	$	255,775
	Contingency	$	26,225
	Total	$	282,000

EXHIBIT 6

CITY OF LONGWOOD
SANLANDO UTILITY ACQUISITION
ESTIMATED COSTS
- WATER DISTRIBUTION SYSTEM -
W/ Sleepy Hollow 8-inch Water Main Extension

1. Water Main (DIP)			
a. 12" (S.R. 434)	4950 LF @ 27.50	$	136,125
b. 8" (Tarry Town Trail, S.R. 434 to Garden Lake	1500 LF @ 18.50		27,750
c. 8" (Devonshire Blvd.)	100 LF @ 18.50		1,850
d. 8" (Windmir Way)	1200 LF @ 18.50		22,200
2. Valves (RSGV)			
a. 12"	3 ea @ 1000		3,000
b. 8"	4 ea @ 750		3,000
3. D.I. Fittings	4400 lbs @ 2.00		8,800
4. Jack & Bore			
a. 8" carrier / 16" casing (Rangeline Rd.. & Devonshire)	100 LF @ 275		27,500
5. Sample Points	12 ea @ 200		2,400
6. Main, cut & cap			
a. NW corner Winsor Lake	1 ea @ 3000		3,000
b. Garden Lake / Tarry Town Trail	1 ea @ 3000		3,000
c. Tarry Town Trail	1 ea @ 3000		3,000
d. Sweet Brair Branch	1 ea @ 3000		3,000
7. Main connects			
a. Slade Dr.	1 ea @ 3000		3,000
b. Sheridan Ave	1 ea @ 3000		3,000
c. Garden Lake	1 ea @ 3000		3,000
d. Devonshire Blvd.	1 ea @ 3000		3,000
e. Horseman Cove	1 ea @ 3000		3,000
f. Sleepy Hollow Cove	1 ea @ 3000		3,000
g. Tarry Town Trail	1 ea @ 3000		3,000
8. Pavement Restoration	300 SY @ 20		6,000
9. Sod	3,000 SY @ 3		9,000
10. Seed / Mulch	6,500 SY @ 0.30		1,950
11. Miscellaneous	---		12,000
	Subtotal	$	294,575
	Contingency	$	29,425
	Total	$	324,000

EXHIBIT 7
FIRE FLOWS UNDER 1000 GPM (Locations / flows)

Development	Location	Available Fire Flow[1]	Available Fire Flow[2]
Devonshire	Thames Ct.	807 GPM	807 GPM
Devonshire	Sweetbrair	930 GPM	930 GPM
Devonshire	Coventry Ct./ Devonshire Blvd.	803 GPM	803 GPM
Sleepy Hollow	Windmill Way/ Sleepy Hollow Cove	734 GPM	946 GPM
Sleepy Hollow	Horseman Cove / Windmill Way	802 GPM	978 GPM

1. As per improvements denoted in Exhibit 4 w/ 20 psi residual
2. As per improvements denoted in Exhibit 5 w/ 20 psi residual

EXHIBIT 8

CITY OF LONGWOOD
SANLANDO UTILITY ACQUISITION
ESTIMATED COSTS
WASTEWATER COLLECTION / TRANSMISSION SYSTEM
- OPTION A -

1. Force Main (DIP)		
a. 4" (Sleepy Hollow)	2300 LF @ 10.00	23,000
b. 4" (SR 434)	2800 LF @ 10.00	28,000
c. 4" (Winsor Manor)	2200 LF @ 10.00	22,000
d. 4" (Rangeline Rd.)	1600 LF @ 10.00	16,000
e. 4" (Parallel Main, Longwood Club)	4200 LF @ 10.00	42,000
f. 4" (Devonshire)	1300 LF @ 7.00	13,000
g. 6" (SR 434)	6500 LF @ 14.00	91,000
2. Plug Valves		
a. 6"	3 ea @ 750.	2,250
b. 4"	7 ea @ 550.	3,850
3. Jack & Bore		
a. 4" Carrier / 10" casing (Rangeline Rd. & Devenshire)	100 LF @ 275	27,500
b. 6" carrier / 12" cashing (Rangeline Road & SR 434)	100 LF @ 275	27,500
4. D.I. Fittings	9000 lbs @ 2.00	18,000
5. Gravity Sewer Mod. / Disconnect (Devonshire)	1 Job LS	6,000
6. Lift Sta. Mod. / Upgrades[1]		
a. STA. No. 1 (Sleepy Hollow)	1 Job LS	32,000
b. STA. No. 2 (Winsor Manor)	1 Job LS	37,000
c. STA. No. 3 (Devonshire)	1 Job LS	27,000
d. STA. No. 5 (Longwood Club)	1 Job LS	33,000
e. STA. No. 6 (Medical Ctr.)	1 Job LS	75,000
7. New Lift Sta.		
a. Sta. No. 4 (Devonshire)	1 Job LS	60,000
8. Pavement Restoration	600 SY @ 20.000	12,000
9. Sod	10,000 SY @ 3.00	30,000
10. Seed / Mulch	12,000 SY @ 0.30	3,600
11. Miscellaneous		15,000
	Subtotal	$ 644,700
	Contingency	$ 65,300
	Total	$ 710,000

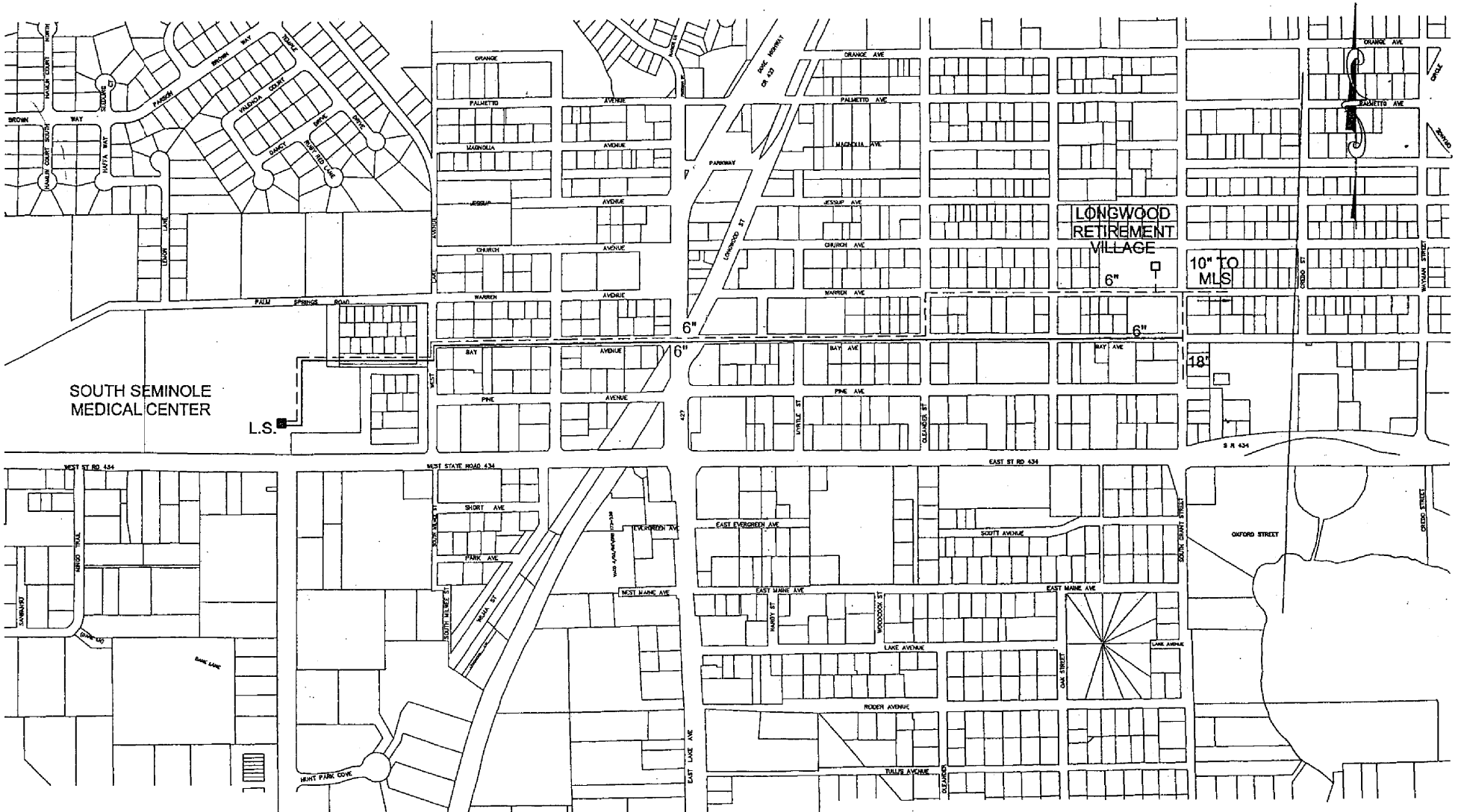
[1] Includes the following; New pumps, guide rails, float level controls, control panel, force main disconnect from Sanlando system and site restoration.

EXHIBIT 9

CITY OF LONGWOOD
SANLANDO UTILITY ACQUISITION
ESTIMATED COSTS
WASTEWATER COLLECTION / TRANSMISSION SYSTEM
- OPTION B -

1. Force Main (DIP)		
a. 4" (Sleepy Hollow)	2300 LF @ 10.00	23,000
b. 4" (SR 434)	2800 LF @ 10.00	28,000
c. 4" (Winsor Manor)	2200 LF @ 10.00	22,000
d. 4" (Rangeline Rd)	700 LF @ 10.00	7,000
e. 4" (Devonshire)	1300 LF @ 10.00	13,000
f. 6" (Longwood Club)	900 LF @ 14.00	12,600
g. 6" (SR 434)	1750 LF @ 14.00	24,500
h. 6" (Parallel Main, Longwood Club)	4200 LF @ 14.00	58,800
2. Plug Valves		
g. 6"	4 ea @ 750	3,000
h. 4"	5 ea @ 550	2,750
3. Jack & Bore		
i. 4" carrier / 10" casing (Rangeline Road / Devonshire)	200 LF @ 275	55,500
j. 6" Carrier / 12" Casing (SR 434 / Rangeline)	150 LF @ 275	41,250
4. D.I. Fittings	7000 lbs @ 2	14,000
5. Gravity Sewer Mod. / Disconnect	1 Job LS	6,000
6. Lift Sta. Mod. / Upgrades[1]		
a. Sta. No. 1 (Sleepy Hollow)	1 Job LS	32,000
b. Sta. No. 2 (Winsor Manor)	1 Job LS	37,000
c. Sta. No. 3 (Devonshire)	1 Job LS	27,000
d. Sta. No. 5 (Longwood Club)	1 Job LS	29,000
e. Sta. No. 6 (Medical Ctr.)	1 Job LS	75,000
7. New Lift Sta.		
a. Sta No. 4 (Devonshire)	1 Job LS	60,000
8. Pavement Restoration	500 SY @ 20.00	10,000
9. Sod	8,000 SY @ 3.00	24,000
10. Seed / Mulch	10,000 SY @ 0.30	3,000
11. Miscellaneous		15,000
	Subtotal	$ 623,400
	Contingency	$ 61,600
	Total	$ 685,000

[1] Includes the following; New pumps, guide rails, float level controls, control panel, force main disconnect from Sanlando system and site restoration.



No.	Date	By	Aprov.	Revision Description

RMA
Reese, Macon and Associates, Inc.
Consulting Engineers

CITY OF LONGWOOD
SANLANDO UTILITY ACQUISITIONS
WW COLLECTION/TRANSMISSION SYSTEM
MEDICAL CENTER LS ALTERNATIVE

Designed By	Drawn By	Check By	Approved By	Date:	Scale:	Job Number:	Exhibit
T.C.J.	T.S.	T.C.J.	T.C.J.	AUG 1999	1"= 500'	99-134	10

EXHIBIT 11

CITY OF LONGWOOD
SANLANDO UTILITY ACQUISITION
ESTIMATED COSTS
WASTEWATER COLLECTION / TRANSMISSION SYSTEM
- SO. SEMINOLE MED. CTR L.S. ALTERNATIVES -

1. Force Main a. 6" DIP	5250 LF @ 14	73,500
2. D.I. Fittings	2000 lbs @ 2	4,000
3. Plug Valves	3 ea @ 750	2,250
4. 18" x 6" T.S. & V.	1 ea @ 4,000	4,000
5. Lift Sta. Mod. / Upgrades a. Sta No. 6 (Med. Ctr.)	1 Job LS	33,000
6. Pavement Restoration	250 SY @ 20	5,000
7. Sod	2,000 SY @ 3	6,000
8. Seed / Mulch	2,000 SY @ 0.3	600
9. Miscellaneous	-----	5,000
	Subtotal	$133,350
	Contingency	$ 13,650
	Total	$147,000

EXHIBIT 12

CITY OF LONGWOOD
SANLANDO UTILITY ACQUISITION
COST SUMMARY
WASTEWATER COLLECTION / TRANSMISSION SYSTEM

Option A W/ parallel main from So. Seminole Med. Ctr.

Option A total cost (Exhibit 8) w/ item 6e deleted	$ 635,000
L.S. Alternative cost total (Exhibit 11)	$ 147,000
Total	$ 782,000

Option B W/ parallel main from S. Seminole Med. Ctr.

Option B total cost (Exhibit 9) w/ item 6e deleted	$ 610,000
L.S. alternative cost total (Exhibit 11)	$ 147,000
Total	$ 757,000