APPENDIX B

Lincks and Associates, Inc. Traffic Report

Engineers
Planners

LINCKS & ASSOCIATES, INC.

August 6, 2014

Mr. Richard Christmas, Mayor
Town of St. Leo
c/o Jan Norsoph
jnorsoph@tampabay.rr.com

Re: St. Leo University
Lincks Project No. 14084

Dear Mr. Norsoph,

The purpose of this letter is to provide the following as outlined in our proposal to Mr. Richard Christmas dated July 3, 2014.

- Peer Review of Plant Operations Building Traffic Impact Study
- Truck Turn Evaluation
- Pavement Evaluation
- SR 52 and Pompanic Street Intersection Assessment
- Pompanic Street and Project Access Assessment

The following provides a review of the above:

TRAFFIC IMPACT STUDY (TIS)

A TIS was conducted by Raysor Transportation Consulting, LLC dated April 23, 2014, for the proposed relocation of the St. Leo University Plant Operations Building. The following provides our review of the TIS:

Plant Operations Building Description

A. The report states the proposed Plant Operations Building is to be 16,000 square feet with approximately 1/3 for offices and 2/3 for storage/warehouse. The office component is to be staffed by 4 to 5 full time employees.

B. The report states that other employees will access the building via motorized carts internal to the campus. The site plan for the project that was provided, shows a 16 foot stabilized gravel road. It is assumed this road will extend internally to the University.

5023 West Laurel Street
Tampa, Florida 33607
813 289 0039 Telephone
813 287 0674 Telefax
www.lincks.com Website

C. The site plan shows 15 parking spaces. This seems high if there are only 4 to 5 employees at the building.

D. The truck traffic will access the proposed facility via one (1) access to Pompanic Street.

Trip Generation

A. The report breaks down the trip generation into three (3) categories:

   a) Trips generated by the employees that will utilize SR 52/Pompanic Street to access the building.

   b) Trips generation by deliveries to the building that will utilize SR 52/Pompanic Street.

   c) Trips that will occur between the building and the remainder of the campus, which will be wholly internal to the campus.

B. The report assumes all trips to and from the campus will be via the 16 foot gravel road. Therefore, these trips were not included in the analysis.

C. The trips associated with the employees were based on an estimate of the number of full time employees at the facility and based on trip generation rates contained in the Institute of Transportation Engineers (ITE) Trip Generation, 9th Edition, 2012. The ITE Trip Generation provides a more realistic estimate of the traffic associated with the building.

D. The truck traffic was estimated based on counts provided by St. Leo staff at the existing Plant Operations Building. The traffic for the warehouse was also based on the trip generation contained in the ITE Trip Generation, 9th Edition, 2012.

E. In the analysis, the "worst case" scenario was based on the ITE trip generation rates for office and warehouse plus the truck traffic. The analysis assumed all the traffic was inbound during the AM peak hour and outbound during the PM peak hour. This is different than the traffic provided in the appendix, but should not impact the results of the analysis.

Existing Traffic

A. AM and PM peak hour turning movement counts were conducted at the intersection of SR 52 and Pompanic Street on Wednesday, April 2, 2014.

B. 24-hour machine counts were conducted along Pompanic Street north of SR 52 and north of Pennsylvania Avenue.

C. The turning movement counts and the machine counts were not seasonally adjusted. The seasonal adjustment factor is 1.01. The seasonal adjustment factor would not have a significant effect on the volume or results of the analysis.

D. There were no buildout analysis conducted.

E. The FDOT 2012 Quality/Level of Services Handbook was utilized to estimate the capacity of Pompanic Street. The capacity was based on a Non-State Signalized Roadway with adjustments as outlined in the publication. Pompanic Street is a local residential street; therefore, the methodology utilized to determine the capacity of Pompanic Street likely over estimates the capacity of the roadway.

Intersection Operational Analysis

A. An analysis was conducted for the intersection of SR 52 and Pompanic Street for the AM and PM peak hours based on the following scenarios:

- Existing Traffic
- Existing Traffic Plus SLU Expected Traffic
- Existing Traffic Plus SLU Worst Case Traffic

B. Due to the unusual geometry at the intersection of SR 52 and Pompanic Street, typical HCM and SYNCHRO analysis was not able to be conducted. Therefore, a SIM-Traffic model was prepared for the intersection.

C. The report indicates that all movements within the intersection will operate at an acceptable level of service during all of the above scenarios based on the SIM-Traffic model.

D. Lincks & Associates, Inc. also developed a SIM traffic model for the intersection with the worst case volumes and it provided the same results.

Conclusion

Based on our review of the traffic analysis, we offer the following:

1. The worst case trip generation appears to provide a more realistic estimate of the potential traffic for the facility based on the size of the facility and allocation of office/warehouse square footage.

2. Given the volumes and geometry at the intersection of SR 52 and Pompanic Street, it is likely the southbound approach may experience delays greater than what SIM traffic provides.

3. Pompanic Street is a local residential street; therefore, the methodology utilized to determine the capacity of Pompanic Street likely over estimates the capacity of the roadway.

4. Lincks & Associates, Inc. also developed a SIM traffic model for the intersection with the worst case volumes and it provided the same results as the Raysor report.

TRUCK TURN EVALUATION

Figures 1 and 2 provide the truck turns into and out of the proposed project access. It is our understanding the University and Town of St. Leo are to widen Pompanic Street to 24 feet. With the widening of the roadway and the accesses as shown, the trucks should be able to access the facility without off tracking. The access could be designed with the existing roadways to accommodate the trucks without off tracking. However, with eighteen (18) feet it would be difficult for two-way traffic along the roadway with large trucks.

PAVEMENT EVALUATION

The following provides our evaluation of the existing pavement within Pompanic Street.

Existing Pavement

Lincks & Associates, Inc. retained Mortensen Engineering, Inc. (MEI) to conduct core samples within Pompanic Street to determine the existing pavement structure. A copy of the MEI report is included in the Appendix of this letter. According to the MEI report, the existing asphalt is between 1 ¾ and 3 inches thick. The limerock base is between 2 and 3 ½ inches thick. There does not appear to be any stabilized subgrade.

Existing Structural Number

Based on the FDOT Flexible Pavement Design Manual, the existing structural number for the pavement ranges from 1.40 to 1.68. Table 1 provides the calculation of the structural number for the existing pavement.

Required Structural Number

The required structural number for Pompanic Street was calculated based on the following:

1. Traffic data contained in the Transportation Analysis prepared for rezoning was utilized to calculate the ESAL for Pompanic Street. Table 2 provides the ESAL for the roadway.

2. Based on Table A.3A from the FDOT Flexible Pavement Design Manual, the structural number for the roadway should be approximately 2.70.

3. According to the Pasco County Land Development Code (LDC), the structural number for the roadway should range between 2.34 and 3.50.

Conclusion

Based on the preliminary pavement assessment, it does not appear the existing pavement is adequate to accommodate the projected traffic for the roadway.

A detailed pavement design should be provided as a part of the widening of the roadway to bring it to a standard roadway.

Cost Estimate

Table 3 provides an estimate of the cost to widen Pompanic Street from SR 52 to McMullen Road from the existing eighteen (18) feet to twenty-four (24) feet. It should be noted that the cost estimate was prepared without the benefit of a survey, detailed geotechnical evaluation and design. In addition, the cost estimate assumes the existing roadway and base would be replaced.

SR 52 AND POMPANIC STREET INTERSECTION ASSESSMENT

Lincks & Associates, Inc. conducted an assessment of the existing pavement for Pompanic Street. This assessment included the following:

TABLE 1

EXISTING STRUCTURAL NUMBER

Core Boring	Roadway Type	Thickness	Structural/ Inch	Structural Number
PC-1	Asphalt	1 3/4"	0.44	0.77
	Limerock Base	3 1/2"	0.18	0.63
				1.40
PC-2	Asphalt	3"	0.44	1.32
	Limerock Base	2"	0.18	0.36
				1.68

TABLE 2

POMPANIC STREET ESAL CALCULATION

Year	Daily Traffic	Project Traffic	AADT	T	Df	Lf	E18	ESAL	Accumulated ESAL
2014	689	0	689	10%	0.5	1.000	0.96	12,071	12,071
2015	696	110	806	10%	0.5	1.000	0.96	14,121	26,192
2016	703	110	813	10%	0.5	1.000	0.96	14,244	40,436
2017	710	110	820	10%	0.5	1.000	0.96	14,366	54,802
2018	717	110	827	10%	0.5	1.000	0.96	14,489	69,291
2019	724	110	834	10%	0.5	1.000	0.96	14,612	83,903
2020	731	110	841	10%	0.5	1.000	0.96	14,734	98,637
2021	738	110	848	10%	0.5	1.000	0.96	14,857	113,494
2022	745	110	855	10%	0.5	1.000	0.96	14,980	128,474
2023	752	110	862	10%	0.5	1.000	0.96	15,102	143,576
2024	760	110	870	10%	0.5	1.000	0.96	15,242	158,818
2025	768	110	878	10%	0.5	1.000	0.96	15,383	174,201
2026	776	110	886	10%	0.5	1.000	0.96	15,523	189,724
2027	784	110	894	10%	0.5	1.000	0.96	15,663	205,387
2028	792	110	902	10%	0.5	1.000	0.96	15,803	221,190
2029	800	110	910	10%	0.5	1.000	0.96	15,943	237,133
2030	808	110	918	10%	0.5	1.000	0.96	16,083	253,216
2031	816	110	926	10%	0.5	1.000	0.96	16,224	269,440
2032	824	110	934	10%	0.5	1.000	0.96	16,364	285,804
2033	832	110	942	10%	0.5	1.000	0.96	16,504	302,308
2034	840	110	950	10%	0.5	1.000	0.96	16,644	318,952

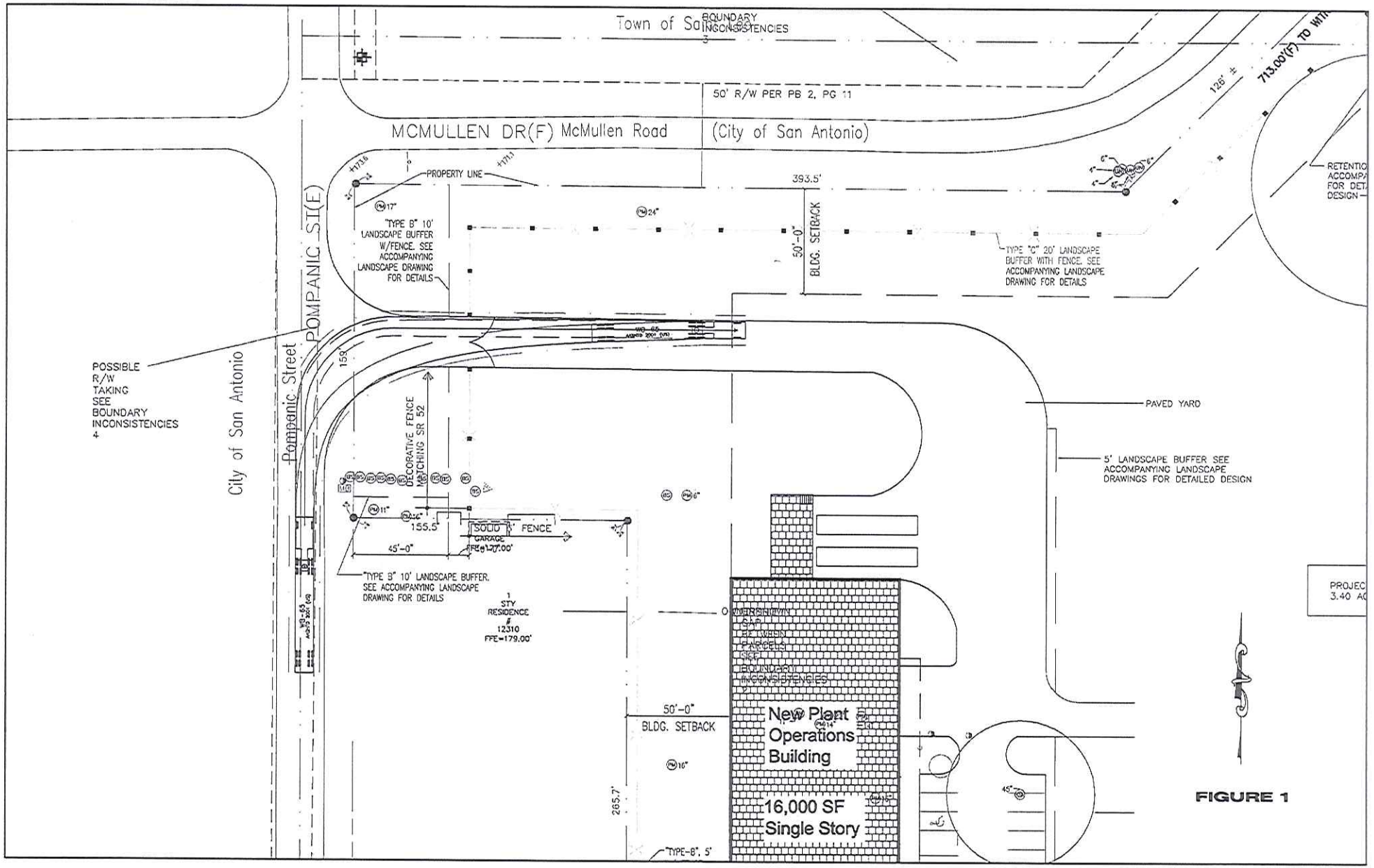
TABLE 3

POMPANIC STREET - CONSTRUCTION COST ESTIMATE

Item	Quantity	Unit	Unit Cost	Total
Clear & Grubbing	1	LS	$10,000.00	$10,000.00
Maintenance of Traffic	1	LS	$10,000.00	$10,000.00
Demolish Existing Asphalt/Base	1	LS	$20,000.00	$20,000.00
Demolish Sidewalk	20	LF	$2.00	$40.00
Survey/Stakeout	1	LS	$5,000.00	$5,000.00
Relocate/Adjust Utilities	1	LS	$20,000.00	$20,000.00
Adjust Driveways	5	EA	$500.00	$2,500.00
Relocate/Adjust Drainage Inlet	1	EA	$5,000.00	$5,000.00
Grading/Sod	1	LS	$15,000.00	$15,000.00
12" Stabilized Subbase (24' x 600 x 1/9)	1,600	SY	$5.00	$8,000.00
6" Limerock Base (LBR100)	1,600	SY	$10.00	$16,000.00
Asphalt - New (2.5" SP)	1,600	SY	$15.00	$24,000.00
Pavement Marking	1	LS	$3,000.00	$3,000.00
Engineering/Survey/Geotech	1	LS	$35,000.00	$35,000.00
			Sub-Total	$173,540.00
			Contingency (15%)	$26,031.00
			Total	$199,571.00

Pavement Section SN = 3.10

2.5" SP - 9.5:	2.5" x .44 = 1.06
6" Limerock:	6" x .18 = 1.08
12" Subbase:	12" x .08 = 0.96
	3.10


Town of San
BOUNDARY INCONSISTENCIES 3
50' R/W PER PB 2, PG 11
MCMULLEN DR(F) McMullen Road
(City of San Antonio)
126' ±
713.00'(F) TO WITH
PROPERTY LINE
393.5'
"TYPE B" 10' LANDSCAPE BUFFER W/FENCE. SEE ACCOMPANYING LANDSCAPE DRAWING FOR DETAILS
50'-0" BLDG. SETBACK
TYPE "C" 20' LANDSCAPE BUFFER WITH FENCE. SEE ACCOMPANYING LANDSCAPE DRAWING FOR DETAILS
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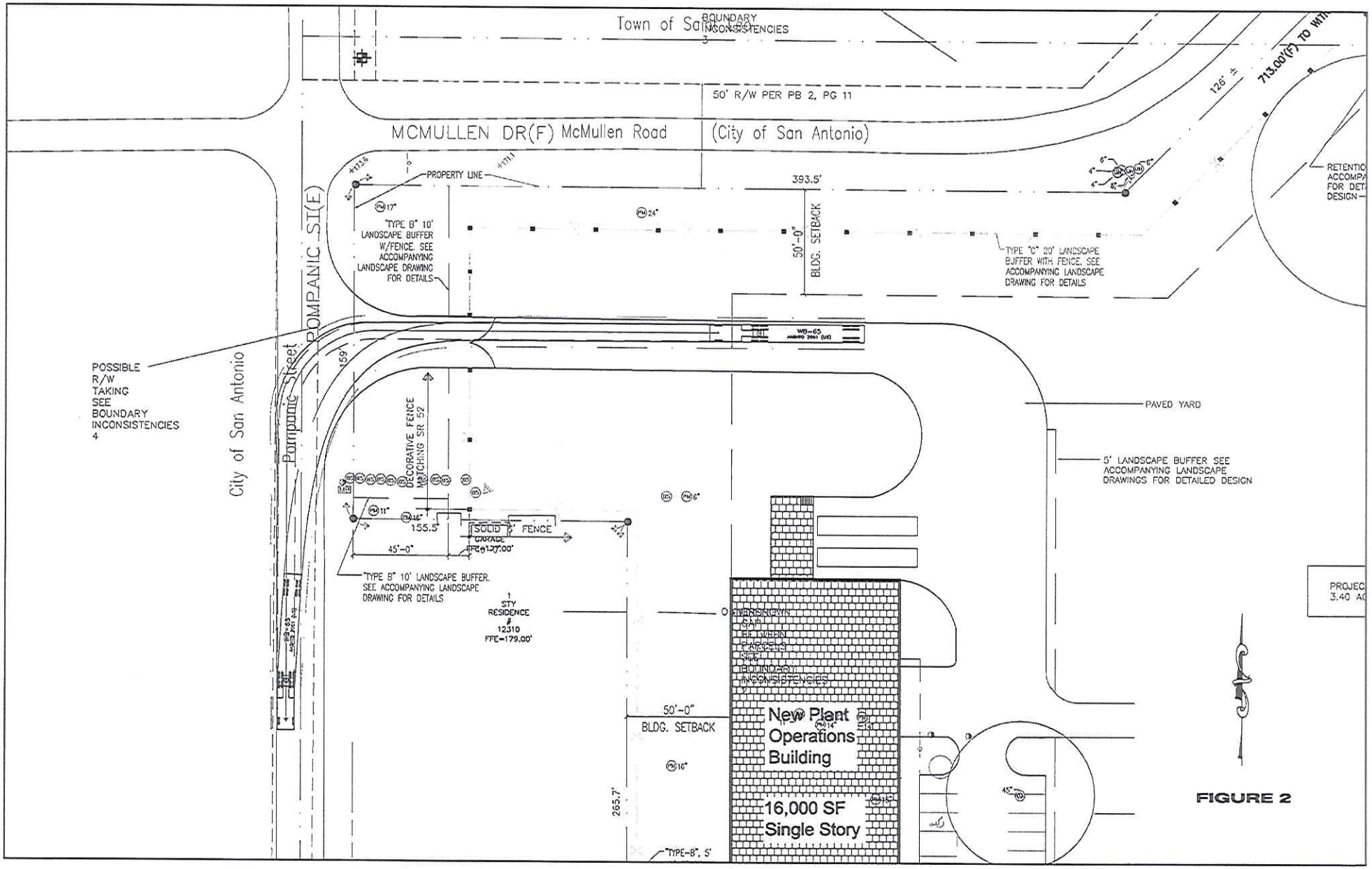
City of San Antonio
Pompanic Street
POMPANIC ST(E)
159'
DECORATIVE FENCE MATCHING SR 52
PAVED YARD
5' LANDSCAPE BUFFER SEE ACCOMPANYING LANDSCAPE DRAWINGS FOR DETAILED DESIGN
155.5'
SOLID 6' FENCE
45'-0"
GARAGE FFE=177.00'
"TYPE B" 10' LANDSCAPE BUFFER. SEE ACCOMPANYING LANDSCAPE DRAWING FOR DETAILS
1 STY RESIDENCE # 12310 FFE=179.00'
OWNERSHOWN
PROJEC
3.40 AC
50'-0" BLDG. SETBACK
New Plant Operations Building
16,000 SF Single Story
265.7'
"TYPE-B", 5'
45°

FIGURE 1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BOUNDARY INCONSISTENCIES
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New Plant Operations Building
16,000 SF Single Story
265.7'
TYPE-B", 5'
PROJEC
3.40 AC
FIGURE 2

A. There is a significant offset for the northbound and southbound approaches at the intersection. Due to the right of way constraints, there does not appear to be any reasonable improvements that can be constructed at the intersection to reduce the offset.

B. The subject project would add a small amount of traffic to the intersection. However, the intersection should be monitored as future development occurs along Pompanic Street.

C. There does appear to be some rutting along the radius of the westbound right turn on SR 52 to Pompanic Street. In addition, there is a drainage grate within the radius.

D. Figure 3 provides the truck turn template at the intersection. As shown, improvements to the radius of the intersection will be required to allow trucks to turn from SR 54 on to Pompanic Street.

POMPANIC STREET/PROJECT ACCESS ASSESSMENT

As requested, Lincks & Associates, Inc. has reviewed the project access to evaluate the option to restrict the right-out movement from the project access on to Pompanic Street. Figure 4 provides an option to channelize the access to direct traffic exiting the site to the south

If you have any questions, please do not hesitate to call.

Sincerely,

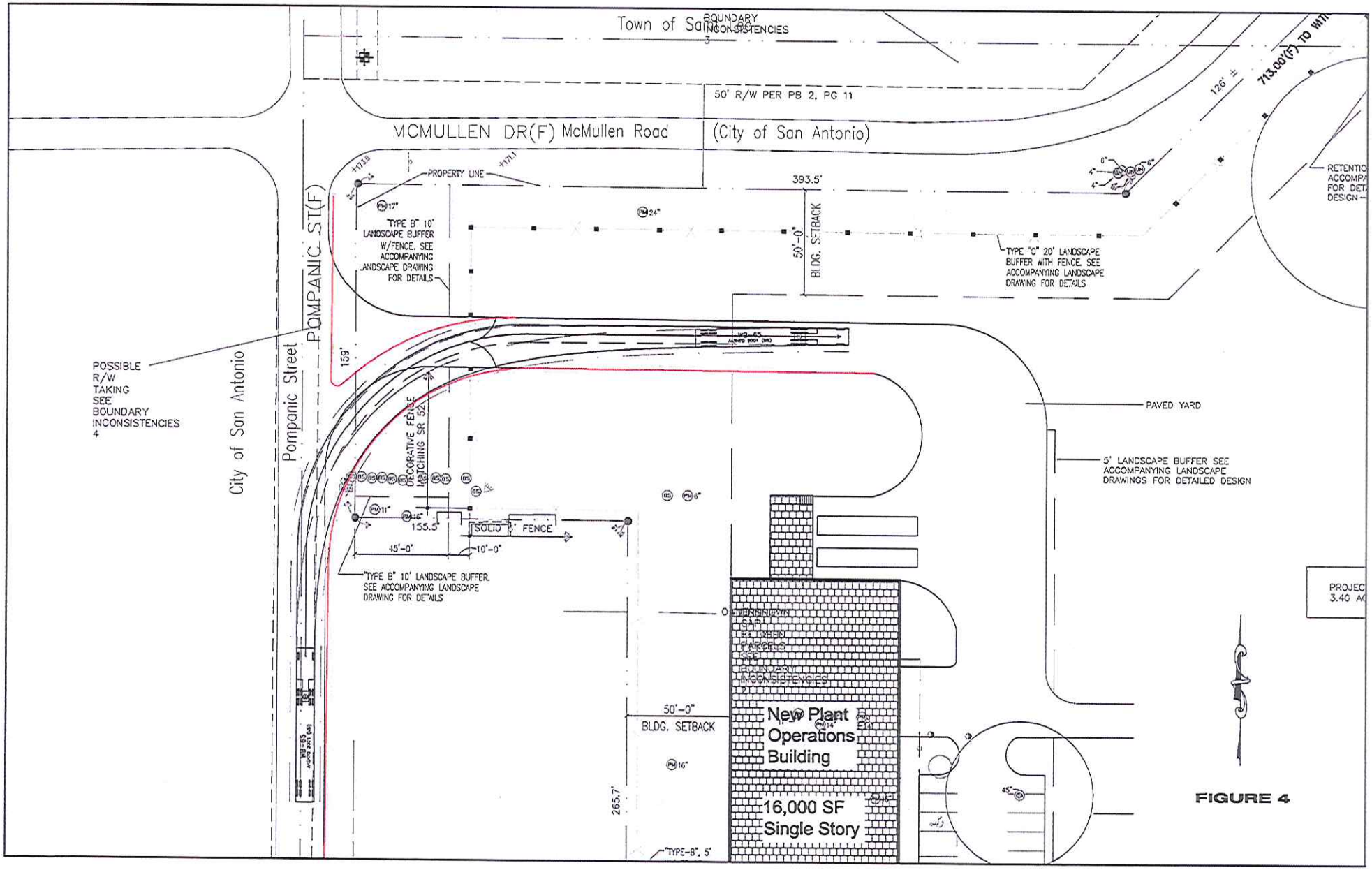
LINCKS & ASSOCIATES, INC.

Steven J. Henry, P.E.
President

SJH/cvc

Enclosures

FIGURE 3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"TYPE-B", 5'
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16,000 SF Single Story
PROJEC
3.40 AC

FIGURE 4

APPENDIX

MORTENSEN ENGINEERING, INC. (MEI) REPORT

MORTENSEN ENGINEERING, INC.

July 17, 2014
Project No. 14-10-08006

TO: Lincks & Associates, Inc.
5023 West Laurel Street
Tampa, Florida 33607

Attention: Mr. Steve Henry, P.E.

SUBJECT: ***Limited Geotechnical Services***
Existing Pavement Coring
Pompanic Street
St. Leo, Pasco County, Florida

As you requested in your email dated 7/11/14, we have completed the requested limited geotechnical services for the above referenced roadway improvement project, in eastern Pasco County, Florida. The following report summarizes the results of our limited field and laboratory testing.

Fieldwork and Results

Our pavement coring work herein on Pompanic Street was performed at your two (2) selected locations between College Avenue/SR 52 and McMullen Drive. The approximate pavement coring locations are approximately indicated (and designated) on Plate 1. Two (2) 4-inch diameter pavement cores (designated PC-1 and PC-2), through the existing asphalt and base materials were collected at selected locations along Pompanic Street, of the existing typically 2-lane rural roadway section.

At each pavement core location, we estimated the approximate asphalt structural course thickness, and the approximate number of asphalt lifts; and the base course material type and approximate thickness. Based solely on our visual observations, the existing roadway subgrade soils, beneath the limerock base materials appeared to be a sand/clayey sand fill material to varying depths below the bottom of the limerock base.

The results of our pavement coring are included on the attached summary table. To check the shallow soil material types beneath the pavement section, hand auger borings were performed at each pavement core location (PC-1 and PC-2), each to a depth of 2 feet (+/-). The results of our hand auger borings are included as drafted soil profiles on Plate 2. A soils legend is also included on Plate 2. A photograph of the asphalt cores is attached. No existing asphalt quality testing work, no existing base material quality testing work, and no existing subgrade quality testing work was performed, as this type of testing was not requested.

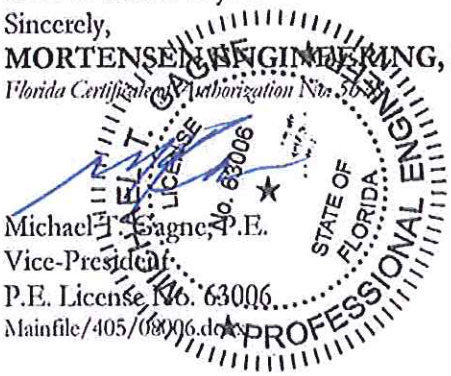
Closing

If you have any questions about this report, please give us a call. Thank you for this opportunity to be of service to you.

Sincerely,

MORTENSEN ENGINEERING, INC.

Florida Certificate of Authorization No. 30



Michael T. Gagne, P.E.
Vice-President
P.E. License No. 63006
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RAM

Richard A. Mortensen, P.E.
President
P.E. License No. 34604

Attachments: Plates 1 and 2
Coring Results Table
Core Photographs

LEGEND

● Approximate Pavement Core location

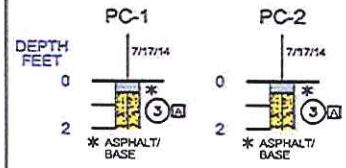
1"=300'

0' 300' 600'

N

REDUCED

MEI MORTENSEN ENGINEERING, INC.	*LIMITED GEOTECHNICAL SERVICES* **EXISTING PAVEMENT CORING** **POMPANIC STREET** **PASCO COUNTY, FLORIDA**	**TEST LOCATION PLAN**		
		CREATED BY: DNH CHECKED BY: MTG	DATE: JUL 2014 PROJECT NO: 14-10-08006	PLATE 1



LEGEND

1	Gray to dark gray fine SAND to slightly silty fine SAND, trace organics (SP/SP-SM)
2	White to light brown fine SAND to silty fine SAND (SP/SP-SM/SM)
3	Brown or gray fine SAND to silty fine SAND (SP/SP-SM/SM)
A	Clayey Sand Seams
SP	Unified Soil Classification group symbol as determined by visual review
N	SPT "N" value in blows/foot
7/17/14	Date of field work

The test boring results hereon are representative of the subsurface conditions only at the noted approximate boring location, only for the noted depth, and only on the date tested. Local variations characteristic of the subsurface materials of the region should be anticipated at different times and may be encountered particularly in areas previously disturbed. The soil profiles and the other field test data hereon are based on the driller's logs and visual review of selected soil samples in the laboratory. The delineations between different soil material types shown hereon should be considered approximate. The generalized soil descriptions hereon represent our interpretation of the subsurface soil conditions at the noted boring locations only on the dates drilled.

The groundwater level data shown hereon alongside the soil boring profiles represent short term (not necessarily stabilized) groundwater levels, measured in the boreholes or in an offset borehole on the date drilled, unless otherwise noted. Fluctuations in the shallow groundwater level from the levels shown hereon will occur and should be anticipated throughout the year; local variations from the levels shown hereon should also be anticipated.

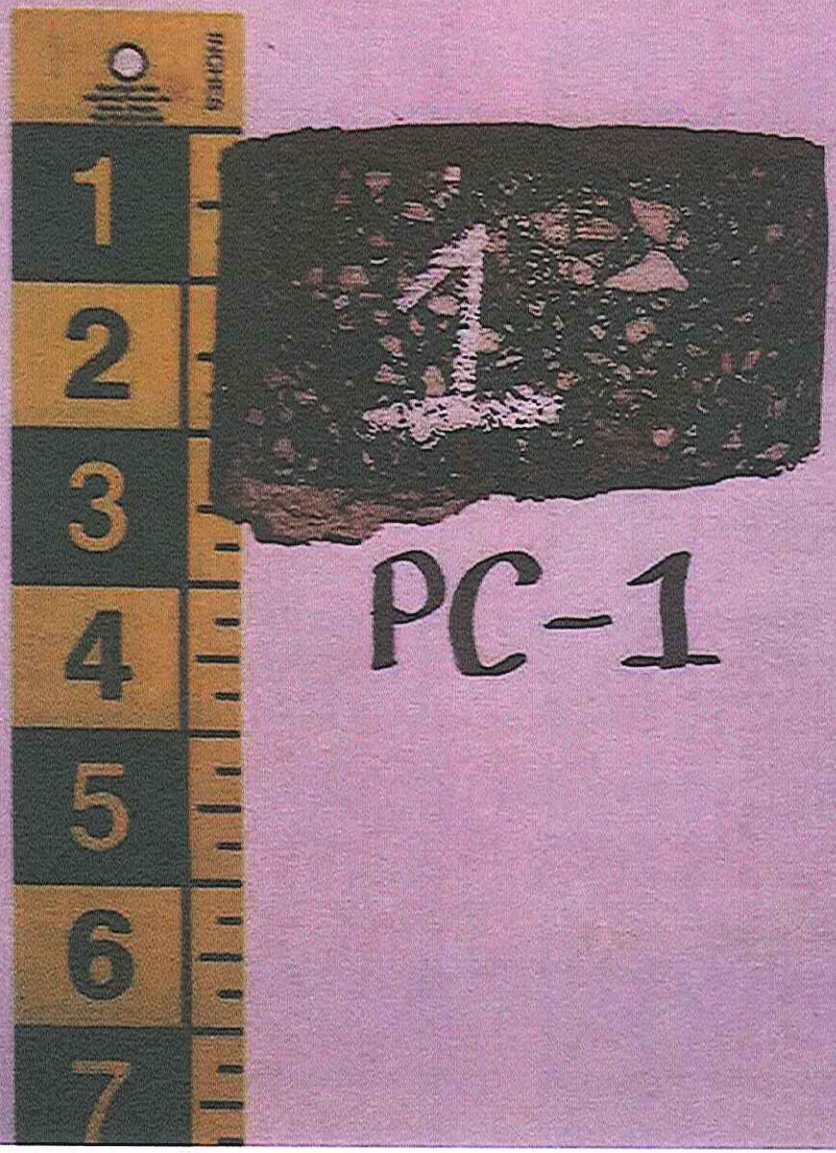
REDUCED

MORTENSEN ENGINEERING, INC.	*LIMITED GEOTECHNICAL SERVICES* EXISTING PAVEMENT CORING POMPANIC STREET PASCO COUNTY, FLORIDA	AUGER BORING SOIL PROFILES AND SOILS LEGEND	
		CREATED BY: DNH CHECKED BY: MTG	DATE: JUL 2014 PROJECT NO: 14-10-08006	PLATE 2

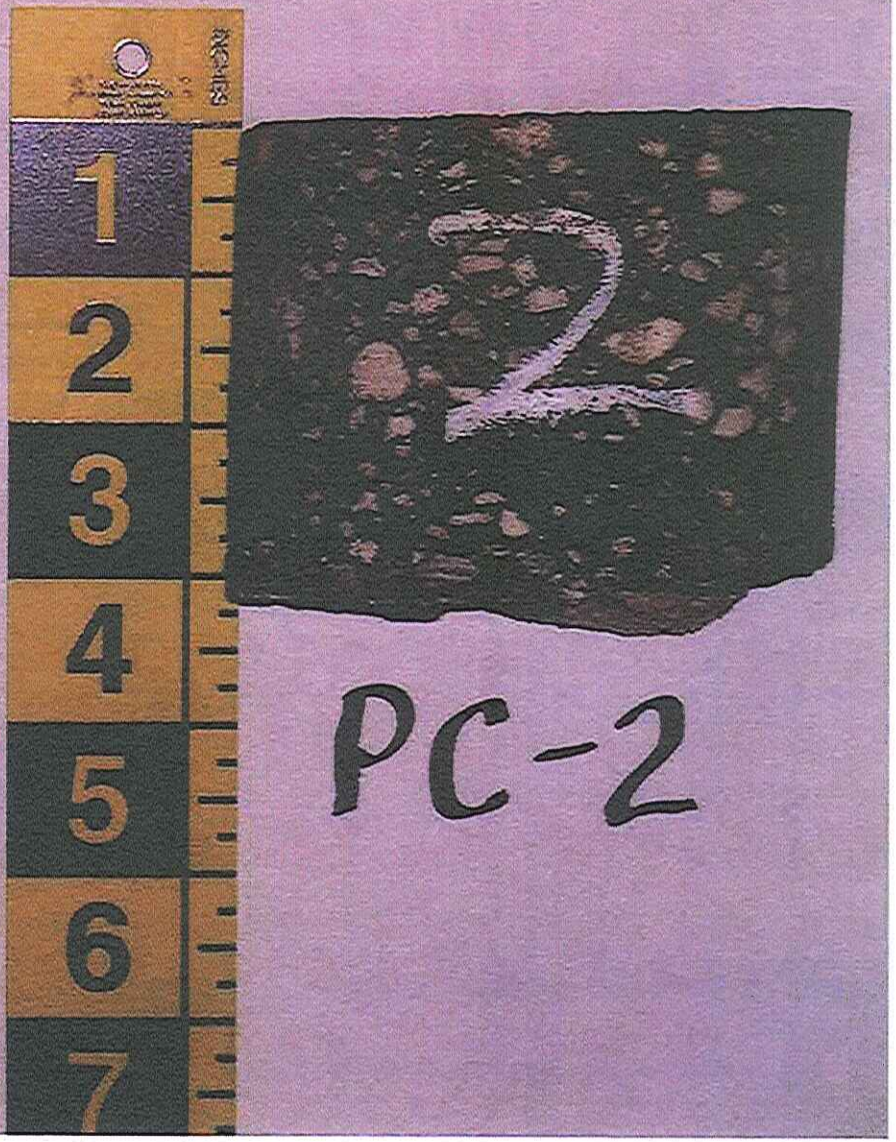
POMPANIC STREET
EXISTING PAVEMENT CORING RESULTS

CORE LOCATION	GENERAL LOCATION	APPROXIMATE ASPHALT THICKNESS (IN)	APPROXIMATE NO. ASPHALT LIFTS*	APPROXIMATE BASE THICKNESS (IN)	APPARENT BASE TYPE*
PC-1	CENTER OF NORTHBOUND LANE	1-3/4	2	3-1/2	LIMEROCK
PC-2	CENTER OF SOUTHBOUND LANE	3	3	2	LIMEROCK

*BASED ON VISUAL OBSERVATIONS



PC-1



PC-2

FLORIDA DEPARTMENT OF TRANSPORTATION (FDOT)

FLEXIBLE PAVEMENT DESIGN MANUAL

FLEXIBLE PAVEMENT DESIGN MANUAL

PUBLISHED BY
FLORIDA DEPARTMENT OF TRANSPORTATION
PAVEMENT MANAGEMENT OFFICE
605 SUWANNEE STREET, M.S. 32
TALLAHASSEE, FLORIDA 32399-0450

DOCUMENT NO. 625-010-002-g

MARCH 2008

D.2 BASIC EQUATION

The $ESAL_D$ required for pavement design purposes can be computed using the following equation:

$$ESAL_D = \sum_{y=1}^{y=x} (AADT \times T_{24} \times D_F \times L_F \times E_{18} \times 365)$$

where:

$ESAL_D$ = Number of accumulated 18-kip Equivalent Single Axle Loads in the design lane for the design period.

y = The year that the calculation is made for. When y=1, all the variables apply to year 1. Most of the variables are constant except AADT which may change from year to year. Others may change when changes in the system occur. Such changes include parallel roads, shopping centers, truck terminals, etc.

x = The Design Year.

AADT = Average Annual Daily Traffic.

T_{24} = Percent Heavy Trucks during a 24 hour period. Trucks with 6 tires or more are considered in the calculations.

D_F = Directional Distribution Factor. Use 1.0 if one way traffic is counted or 0.5 for two way traffic. This value is not to be confused with the Directional Factor use for planning capacity computations.

L_F = Lane Factor converts directional trucks to the design lane trucks. Lane factors can be adjusted to account for unique features known to the designer such as roadways with designated truck lanes. L_F values can be determined from Table D.2.

E_{18} = Equivalency factor which is the damage caused by one average heavy truck measured in 18 kip Equivalent Single Axle Loads. These factors will be periodically updated based on Weigh-In-Motion (WIM) data. E_{18}values can be determined from Table D.3.

TABLE D.2

LANE FACTORS (L_F) FOR DIFFERENT TYPES OF FACILITIES

Number of Lanes In One Direction

Total AADT	Two Lanes L_F	Three Lanes L_F
4 000	0.94	0.82
8 000	0.88	0.76
12 000	0.85	0.72
16 000	0.82	0.70
20 000	0.81	0.68
30 000	0.77	0.65
40 000	0.75	0.63
50 000	0.73	0.61
60 000	0.72	0.59
70 000	0.70	0.58
80 000	0.69	0.57
100 000	0.67	0.55
120 000	0.66	0.53
140 000	-	0.52
160 000	-	0.51
200 000	-	0.49

The equation that best defines this Lane Factor (L_F) information is:

$$L_F = (1.567 - 0.0826 \times \text{Ln(One Way AADT)} - 0.12368 \times LV)$$

where:

L_F = Proportion of all one directional trucks in the design lane.

LV = 0 if the number of lanes in one direction is 2. LV = 1 if the number of lanes in one direction is 3 or more.

Ln = Natural Logarithm.

Source - National Cooperative Highway Research Program Report 277, Portland Cement Concrete Pavement Evaluation System (COPES), Transportation Research Board, September 1986

TABLE D.3

EQUIVALENCY FACTORS E_{18} (E_{80}) FOR DIFFERENT TYPES OF FACILITIES

	Flexible Pavement	Rigid Pavement
Freeways		
Rural	1.05	1.60
Urban	0.90	1.27
Arterials and Collectors		
Rural	0.96	1.35
Urban	0.89	1.22

TABLE A.3A

REQUIRED STRUCTURAL NUMBER (SN_R)
85% RELIABILITY (%R)
RESILIENT MODULUS (M_R) RANGE 4000 PSI TO 18000 PSI

RESILIENT MODULUS (M_R), (PSI x 1000)

$ESAL_D$	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
100 000	2.90	2.66	2.48	2.33	2.22	2.12	2.03	1.96	1.89	1.83	1.78	1.73	1.68	1.64	1.60
150 000	3.10	2.84	2.65	2.50	2.37	2.27	2.18	2.10	2.03	1.96	1.91	1.85	1.81	1.76	1.72
200 000	3.25	2.98	2.78	2.62	2.49	2.38	2.28	2.20	2.13	2.06	2.00	1.95	1.90	1.85	1.81
250 000	3.37	3.10	2.89	2.72	2.58	2.47	2.37	2.28	2.21	2.14	2.08	2.02	1.97	1.93	1.88
300 000	3.47	3.19	2.97	2.80	2.66	2.54	2.44	2.35	2.28	2.21	2.14	2.09	2.03	1.99	1.94
350 000	3.56	3.27	3.05	2.88	2.73	2.61	2.51	2.42	2.34	2.26	2.20	2.14	2.09	2.04	1.99
400 000	3.64	3.35	3.12	2.94	2.79	2.67	2.56	2.47	2.39	2.32	2.25	2.19	2.14	2.09	2.04
450 000	3.71	3.41	3.18	3.00	2.85	2.72	2.61	2.52	2.44	2.36	2.29	2.23	2.18	2.13	2.08
500 000	3.77	3.47	3.24	3.05	2.90	2.77	2.66	2.56	2.48	2.40	2.34	2.27	2.22	2.17	2.12
600 000	3.89	3.58	3.34	3.14	2.99	2.85	2.74	2.64	2.55	2.48	2.41	2.34	2.29	2.23	2.18
700 000	3.98	3.67	3.42	3.23	3.06	2.93	2.81	2.71	2.62	2.54	2.47	2.40	2.35	2.29	2.24
800 000	4.07	3.75	3.50	3.30	3.13	2.99	2.88	2.77	2.68	2.60	2.53	2.46	2.40	2.34	2.29
900 000	4.14	3.82	3.56	3.36	3.19	3.05	2.93	2.83	2.73	2.65	2.58	2.51	2.45	2.39	2.34
1 000 000	4.21	3.88	3.63	3.42	3.25	3.11	2.98	2.88	2.78	2.70	2.62	2.55	2.49	2.43	2.38
1 500 000	4.48	4.14	3.87	3.65	3.47	3.32	3.19	3.08	2.98	2.88	2.80	2.73	2.66	2.60	2.54
2 000 000	4.68	4.33	4.05	3.83	3.64	3.48	3.35	3.23	3.12	3.03	2.94	2.86	2.79	2.73	2.67
2 500 000	4.83	4.47	4.19	3.97	3.78	3.61	3.47	3.35	3.24	3.14	3.05	2.97	2.90	2.83	2.77
3 000 000	4.96	4.60	4.31	4.08	3.89	3.72	3.58	3.45	3.34	3.24	3.15	3.06	2.99	2.92	2.86
3 500 000	5.07	4.70	4.42	4.18	3.98	3.81	3.67	3.54	3.42	3.32	3.23	3.14	3.07	2.99	2.93
4 000 000	5.17	4.80	4.51	4.27	4.07	3.90	3.75	3.61	3.50	3.39	3.30	3.21	3.13	3.06	2.99
4 500 000	5.25	4.88	4.59	4.35	4.14	3.97	3.82	3.68	3.57	3.46	3.36	3.28	3.20	3.12	3.05
5 000 000	5.33	4.95	4.66	4.42	4.21	4.04	3.88	3.75	3.63	3.52	3.42	3.33	3.25	3.18	3.11
6 000 000	5.47	5.08	4.78	4.54	4.33	4.15	4.00	3.86	3.74	3.63	3.53	3.43	3.35	3.27	3.20
7 000 000	5.58	5.20	4.89	4.64	4.43	4.25	4.09	3.95	3.83	3.72	3.61	3.52	3.44	3.36	3.29
8 000 000	5.68	5.29	4.99	4.74	4.52	4.34	4.18	4.04	3.91	3.80	3.69	3.60	3.51	3.43	3.36
9 000 000	5.77	5.38	5.07	4.82	4.60	4.42	4.26	4.11	3.99	3.87	3.76	3.67	3.58	3.50	3.42
10 000 000	5.86	5.46	5.15	4.89	4.68	4.49	4.33	4.18	4.05	3.94	3.83	3.73	3.64	3.56	3.48
15 000 000	6.18	5.77	5.45	5.18	4.96	4.77	4.60	4.45	4.31	4.19	4.08	3.98	3.89	3.80	3.72
20 000 000	6.42	5.99	5.67	5.39	5.17	4.97	4.80	4.64	4.51	4.38	4.27	4.16	4.07	3.98	3.90
25 000 000	6.60	6.17	5.84	5.56	5.33	5.13	4.96	4.80	4.66	4.53	4.42	4.31	4.21	4.12	4.04
30 000 000	6.76	6.32	5.98	5.70	5.47	5.26	5.09	4.93	4.79	4.66	4.54	4.43	4.33	4.24	4.15
35 000 000	6.89	6.45	6.10	5.82	5.58	5.38	5.20	5.04	4.89	4.76	4.64	4.54	4.43	4.34	4.25
40 000 000	7.01	6.56	6.21	5.93	5.68	5.48	5.30	5.13	4.99	4.86	4.74	4.63	4.52	4.43	4.34
45 000 000	7.11	6.66	6.31	6.02	5.78	5.57	5.38	5.22	5.07	4.94	4.82	4.71	4.60	4.51	4.42
50 000 000	7.21	6.75	6.39	6.10	5.86	5.65	5.46	5.30	5.15	5.02	4.89	4.78	4.68	4.58	4.49
60 000 000	7.37	6.91	6.55	6.25	6.00	5.79	5.60	5.43	5.28	5.15	5.02	4.91	4.80	4.71	4.61
70 000 000	7.52	7.05	6.68	6.38	6.12	5.91	5.72	5.55	5.40	5.26	5.13	5.02	4.91	4.81	4.72
80 000 000	7.64	7.17	6.79	6.49	6.23	6.01	5.82	5.65	5.50	5.36	5.23	5.11	5.01	4.91	4.81
90 000 000	7.75	7.27	6.89	6.59	6.33	6.11	5.91	5.74	5.59	5.45	5.32	5.20	5.09	4.99	4.90
100 000 000	7.86	7.37	6.99	6.68	6.42	6.19	6.00	5.82	5.67	5.52	5.40	5.28	5.17	5.07	4.97

PASCO COUNTY

LAND DEVELOPMENT CODE (LDC)

Street Type	Urban Pavement Width/Lanes	Rural Pavement Width/Lanes
4 with parking on one side	27/2	28/2
4 with parking on both sides	34/2	36/2
5 without parking	14/1	N/A

In general, pavement widths for rural streets shall be one (1) foot wider to allow for edge protection.

MRS accessways shall consist of a twelve (12) foot paved cross section with 1.5 feet of stabilized shoulders. This exception only applies where interconnection is not required. LFLD accessways shall consist of twelve (12) foot paved or unpaved stabilized sections with 1.5 feet of stabilized shoulders.

All accessways in excess of 500 feet shall provide a 10' X 38' turnout. The exact location of the turnout shall be determined by the Fire Marshal or designee. Additional turnouts may be required by the Fire Marshal or designee. (Figure 901.6.A: Accessway with Turnout)

Parking lanes shall be a minimum of eight (8) feet in width on Type 1B streets and a minimum of seven (7) feet in width on Types 2, 3, and 4 streets. On-street parking is not allowed on a Type 1A street, unless an alternative standard is approved in accordance with this Code, Section 407.5.

3. Pavement Cross-Slope. If approved by the County Engineer, the selection of pavement cross-slope may be a compromise between meeting the drainage requirements and providing for smooth vehicle operation.

   The recommended pavement cross-slope for a crowned pavement is 0.02 feet per foot. The pavement cross-slope shall not be less than 0.015 foot per foot or greater than 0.04 feet per foot. The change in cross-slope between adjacent through-travel lanes shall not exceed 0.04 feet per foot.

   Inverted crown may only be used for Type 5 streets.

   Where inverted crown is used, the centerline of the invert shall contain a minimum two (2) foot modified valley gutter.

4. Pavement Structure and Road Design. The pavement structure required shall be based on the street classification and the number of lots proposed, cumulative with the number of lots that can reasonably be anticipated to use the street.

The pavement structure required shall be based on a structural number obtained by multiplying the structural layer coefficient by the thickness of each type of material, then adding the resultant in accordance with the FDOT, *Flexible Pavement Design Manual*. Each layer shall adhere to the minimum thickness required by the FDOT.

The minimum pavement structure required for residential subdivisions (Note: this does not include Limited Family Lot Divisions) and for subdivision collectors, shall be as follows:

Land Use Classification	Number of Proposed Lots	Structural Number
AG (Agricultural)	Less than 16	2.04
AG (Agricultural)	16 or greater	2.34
AG/R (Agricultural/Rural)	Less than 16	2.04
AG/R (Agricultural/Rural)	16 or greater	2.34
RES-1 (Residential - 1 du/ga)	Less than or equal to 10	2.04
RES-1 (Residential - 1 du/ga)	Greater than 10	2.34
RES-3 (Residential - 3 du/ga)	N/A	2.34

Where minimum structural numbers of 2.04 or 2.34 are required, the pavement structure shall contain a minimum of one and one-half (1½) inch of Type SP asphaltic-concrete surface course.

Where a subdivision collector is required, a pavement design shall be submitted with the construction plans to determine the minimum pavement structure required. However, in no case, shall a structural number less than 3.5 with a minimum of three (3) inches of Type SP asphaltic-concrete surface course be provided.

Construction of a subdivision collector may be completed in stages with 2¼ inches of SP 12.5 or S-1 asphaltic-concrete surface course along with the required pavement markings installed at the time of the initial construction and ¾ inches of SP 9.5 or S-3 asphaltic-concrete surface course installed along with any required thermoplastic stripes, prior to release of the assurance of maintenance of improvements surety.

Where a connection is made to a street functionally classified as a Major County Road, then the minimum structural number required within the right-of-way of the functionally classified street shall be based on a minimum pavement design, but in no case less than:

a. Major Collector: 3.70 with a minimum of three (3) inches of Type SP asphaltic-concrete surface course.

b. Arterial: 4.00 with a minimum of three (3) inches of Type SP asphaltic-concrete surface course.

A minimum structural number of 4.00 is required on local, major collector, and subdivision collector roadways if heavy vehicles are ten (10) percent or more of the total daily driveway trips.

For commercial and industrial subdivisions, a pavement design shall be submitted with the construction plans to determine the minimum pavement structure required. However, in no case shall a structural number less than 3.5 (with a minimum of three [3] inches of Type S asphaltic-concrete surface course) be allowed.

For all roads below the stabilized subgrade, a minimum of two (2) feet of select material consisting of A-3 (SP) soil and/or A-2-4 with a maximum fifteen (15) percent passing number 200 sieve, shall be provided. The project engineer responsible for the project shall certify to the County Engineer that the select material meets these standards prior to installation of the base. Certification shall strictly comply with the subgrade certification form available in the Engineering Services Department's *A Procedural Guide for the Preparation of Assurances of Completion and Maintenance.*

For major collector, arterial, and subdivision collector roads, a minimum of twelve (12) inch stabilized subgrade (Type B) LBR 40 minimum shall be provided under all bases except for soil cement, which shall be constructed on a stable, nonyielding subgrade of LBR 20. The layer coefficient for LBR 20 shall be 0.04 and shall be limited to a maximum depth of twelve (12) inches.

The minimum separation between the bottom of the base to the design seasonal high water table (SHWT) shall be no less than two (2) feet where a limerock base is provided. Where soil cement, ABC-3 asphaltic concrete, or crushed concrete base material is used, the minimum separation between the bottom of the base to the design SHWT shall be no less than one (1) foot.

Design SHWT is the elevation to which the ground or surface water can be expected to rise due to the worst wet season within a ten (10) year period. The project engineer shall make a recommendation as to the SHWT elevation based on the assessment of historical records or other available data. This recommendation shall be reviewed for approval by the County Engineer or designee.

When required, either by the geotechnical report or as determined by the County Engineer, underdrains shall consist of aggregate, pipe, and filter fabric as indicated in the FDOT Index Drawing No. 286 and as referenced in any other FDOT index drawings and standard specifications. Underdrain inverts shall be located a minimum of two