



Memorandum

Date: June 4, 2008

To: Robin Rhinesmith
Florida Department of Transportation
District 7

From: Bob Finck

RE: Traffic Noise Re-analysis for the Tampa Bay Golf and Country Club
SR 93 (I-75) from north of CR 54 to north of SR 52
Financial Project ID 258736-2-52-01
Pasco County

INTRODUCTION

A design phase traffic noise re-analysis was performed in order to fulfill a commitment made in the I-75 Project Development and Environment (PD&E) Study pertaining to Segment D, Area 3 of the *Final Noise Study Report* (December 2000). The commitment states that noise sensitive sites that received a building permit prior to the location design acceptance (LDA) date (November 27, 2000) would be addressed during subsequent design, right-of-way (ROW) and construction phase reevaluations. This re-analysis will predict Build-condition traffic noise levels (at the homes that qualify for the above mentioned commitment) within the Tampa Bay Golf and Country Club residential development, utilizing the most recent design criteria available (Contract Plans-Phase 1 Submittal – December 13, 2007). Additionally, the feasibility and cost reasonableness of a potential noise barrier will be evaluated for any of these homes predicted to approach or exceed the Federal Highway Administration (FHWA) Noise Abatement Criteria (NAC).

METHODOLOGY

The traffic noise re-analysis was performed in accordance with Code of Federal Regulations Title 23 Part 772 (23 CFR 772), *Procedures for Abatement of Highway Traffic Noise and Construction Noise*, using methodology established by the Florida Department of Transportation (FDOT) in *Project Development and Environment Manual*, Part 2, Chapter 17 (April 2007). Predicted noise levels were produced using the FHWA Traffic Noise Model (TNM), version 2.5.

Traffic

Forecasted year 2032 annual average daily traffic volumes (AADT), documented in the Contract Plans - Phase 1 Submittal (December 13, 2007) are provided in Table 1 below. AADT volumes were reduced to design hour volumes by applying a factor (K factor) of 11.8 percent. A directional factor (D factor) of 54.8 percent was used to divide the design hour volume into directional volumes with the heaviest volume assigned to the direction of travel nearest a receiver point. Design hour volumes were distributed between vehicle types (cars, medium trucks, and heavy trucks) using a truck factor (T factor) of 10 percent divided evenly between medium and heavy trucks. All vehicles were assigned a speed of 70 miles per hour (mph) on the mainline and 50 mph on the ramps.

**Table 1
Traffic Data**

ROADWAY SEGMENT	YEAR 2032 AADT
Mainline S.R. 93 (I-75) from St. 915+00 to 1218+67	116,300
Ramp A – SB S.R. 93 (I-75) to S.R. 52	19,600
Ramp B – EB S.R. 52 to SB S.R. 93 (I-75)	19,600

Noise Abatement Criteria

The FHWA has established noise levels at which noise abatement must be considered for various types of noise sensitive sites. These levels, used for the purpose of evaluating traffic noise, are referred to as the NAC. As shown in Table 2 below, the NAC vary according to the activity category. Noise abatement measures are considered when predicted traffic noise levels approach or exceed the NAC. Consistent with FDOT methodology, “approach” is defined as within one decibel (dBA) of the FHWA criteria.

**Table 2
FHWA Noise Abatement Criteria**

ACTIVITY CATEGORY	LEQ(H)	DESCRIPTION OF LAND USE ACTIVITY CATEGORY
A	57 (Exterior)	Lands on which serenity and quiet are of extraordinary significance and serve an important public need and where the preservation of those qualities is essential if the area is to continue to serve its intended purpose.
B	67 (Exterior)	Picnic areas, recreation areas, playgrounds, active sports areas, parks, residences, motels, hotels, schools, churches, libraries, and hospitals.
C	72 (Exterior)	Developed lands, properties, or activities not included in Categories A or B.
D	--	Undeveloped lands.
E	52 (Interior)	Residences, motels, hotels, public meeting rooms, schools, churches, libraries, hospitals, and auditoriums.

Source: 23 CFR Part 772, *Procedures for Abatement of Highway Traffic Noise and Construction Noise*, FHWA, 2007.

Noise Abatement Consideration

The PD&E phase noise analysis determined that noise barriers are the only viable abatement measure to reduce traffic noise at existing residences. Noise Barriers located along the ROW line were evaluated at heights ranging from 8 to 22 feet (ft) in 2-ft increments. For a particular height, the length of a barrier was optimized to minimize the cost while trying to maintain at least a 5 dBA reduction at noise sensitive sites that have predicted noise levels which approach or exceed the NAC.

For a noise barrier to be considered feasible and cost reasonable, the following minimum conditions should be met:

- A noise barrier must provide a minimum noise reduction of at least 5 dBA with a design goal of 10 dBA, or more.
- The cost of the noise barrier should not exceed \$42,000 per benefited noise sensitive site. This is the reasonable cost limit established by the FDOT. A benefited noise sensitive site is defined as a site that would experience at least a 5 dBA reduction as a result of providing a noise barrier. The current unit cost used to evaluate economic reasonableness is \$30 per square foot (sq ft), which covers barrier materials and labor.

For comparison purposes with the PD&E phase noise analysis, barriers were also evaluated using a reasonable cost limit of \$30,000 per benefited noise sensitive site, and a unit cost of \$20 per sq ft. These are the cost factors used in the original PD&E Noise Analysis, and are documented in the *Final Noise Study Report* (December 2000).

ANALYSIS

Noise Sensitive Sites

The construction of homes in the portion of the Tampa Bay Golf and Country Club community near SR 93 (I-75) has been completed. Residences to be addressed in fulfillment of the PD&E phase commitment were identified by utilizing the building permit data available through the Pasco County Property Appraiser’s website. Building permit information for the homes located in closest proximity to SR 93 (I-75) along Collar Drive, Fade Court and Chatuge Drive were accessed, and the complete list can be found in Attachment A. Nine homes along Collar drive were found to have received a building permit before the LDA date of November 27, 2000. These nine homes are identified on the aerial photo in Attachment B. Table 3 summarizes the permit data available for the nine homes.

**Table 3
Permit Data**

Address	Location	Permit Type*	Permit Date	Permit Status**
10203 Collar Dr.	Front row	NRB	8/24/2000	Complete
10231 Collar Dr.	Front row	NRB NB1	1/26/2000 8/13/2002	S.O.L. - expired Complete
10237 Collar Dr.	Front row	NRB NRB	10/2/2000 1/26/2000	Complete S.O.L. - expired
10242 Collar Dr.	Second row	NRB	11/20/2000	Complete
10243 Collar Dr.	Front row	NRB	1/26/2000	Complete
10248 Collar Dr.	Second row	NRB	9/28/2000	Complete
10251 Collar Dr.	Front row	NRB	1/26/2000	Complete
10342 Collar Dr.	Second row	NRB NRB	1/26/2000 3/7/2001	S.O.L. - expired Complete
10352 Collar Dr.	Second row	NRB NRB	1/26/2000 3/7/2001	S.O.L. - expired Complete

*Permit Type - NRB = NEW RESIDNC BLOCK / NB1 = NEW RES BLK N/C / NB2 = NEW 2 STRY BLK RES / NTB = NEW 2 FAMILY BLOCK

**Permit Status - complete / S.O.L. – expired

Receiver Points representing the nine single family homes along Collar Drive were located in accordance with the FDOT *Project Development and Environment Manual*, Part 2, Chapter 17 as follows:

- Receiver points were located at the edge of the building closest to the major traffic noise source.
- Ground floor receiver points were assumed to be 5 ft above the ground elevation.

The aerial photo in attachment B identifies the location of the receivers representing each of these homes by street number.

RESULTS

Predicted Noise Levels

The predicted noise levels for the nine homes along Collar Drive (as identified above) were analyzed under Activity Category B of the NAC. Noise levels at five of the nine receiver locations are predicted to approach or exceed the NAC for the 2032 Build condition. These noise levels are provided in Table 4.

**Table 4
Predicted Noise Levels**

Receiver Identification	Noise Sensitive Sites Represented	2032 Build (dBA)	NAC Approached Or Exceeded
Tampa Bay Golf and Country Club Residential Development			
10203 Collar Drive – front row	1 House	69.5	Y
10231 Collar Drive – front row	1 House	68.5	Y
10237 Collar Drive – front row	1 House	69.2	Y
10243 Collar Drive – front row	1 House	68.6	Y
10251 Collar Drive – front row	1 House	68.8	Y
10242 Collar Drive – second row	1 House	60.6	N
10248 Collar Drive – second row	1 House	60.4	N
10342 Collar Drive – second row	1 House	61.4	N
10352 Collar Drive – second row	1 House	61.5	N

Barrier Analysis

A potential noise barrier located along the ROW was analyzed for the 5 affected residences identified in Table 4 above. The analysis determined that a noise barrier could provide at least a 5 dBA reduction to all five of the affected residences at barrier heights ranging between 16 and 22 ft.

The results of the noise barrier analysis are provided in Tables 5 and 6. The lowest cost per benefited residence was achieved at a height of 20 ft and a length of 1,300 ft. The barrier would provide at least a 5 dBA reduction to all 5 of the affected residences with this barrier configuration. At \$156,000 per benefited residence, the noise barrier cost exceeds the current FDOT reasonable criterion of \$42,000 as shown in Table 5. Similarly, at \$104,000 per benefited

residence, the noise barrier cost exceeds the reasonable criterion used in the original study of \$30,000 as shown in Table 6. Therefore, a noise barrier along the proposed ROW was determined to not be a cost reasonable abatement measure at this location.

**Table 5
Barrier Analysis Using Current Cost Criterion**

Barrier Height (feet)	Number of Residences Within a Noise Reduction Range						Total Wall Length (ft.)	Number of Benefited Residences			Total Estimated Cost ³	Cost Per Benefited Residence
	5-5.9 dBA	6-6.9 dBA	7-7.9 dBA	8-8.9 dBA	9+ dBA	Avg. (dBA)		Affected ¹	Other ²	Total		
14	0	0	0	0	0	N/A	N/A	0	0	0	N/A	N/A
16	5	0	0	0	0	5.4	2,316	5	0	5	\$1,111,680	\$222,336
18	5	0	0	0	0	5.5	1,706	5	0	5	\$921,240	\$184,248
20	5	0	0	0	0	5.5	1,300	5	0	5	\$780,000	\$156,000
22	5	0	0	0	0	5.4	1,200	5	0	5	\$792,000	\$158,400

¹Residence is affected and meets the requirements for the issue date of the building permit.
²Residence is not affected but does meet the requirements for the issue date of the building permit.
³Total estimated barrier cost is based on the most current planning cost of \$30.00 per square foot.

**Table 6
Barrier Analysis Using PD&E Phase Cost Criterion**

Barrier Height (feet)	Number of Residences Within a Noise Reduction Range						Total Wall Length (ft.)	Number of Benefited Residences			Total Estimated Cost ³	Cost Per Benefited Residence
	5-5.9 dBA	6-6.9 dBA	7-7.9 dBA	8-8.9 dBA	9+ dBA	Avg. (dBA)		Affected ¹	Other ²	Total		
14	0	0	0	0	0	N/A	N/A	0	0	0	N/A	N/A
16	5	0	0	0	0	5.4	2,316	5	0	5	\$741,120	\$148,224
18	5	0	0	0	0	5.5	1,706	5	0	5	\$614,160	\$122,832
20	5	0	0	0	0	5.5	1,300	5	0	5	\$520,000	\$104,000
22	5	0	0	0	0	5.4	1,200	5	0	5	\$528,000	\$105,600

¹Residence is affected and meets the requirements for the issue date of the building permit.
²Residence is not affected but does meet the requirements for the issue date of the building permit.
³Total estimated barrier cost is consistent with the planning cost used in the original study (Final Noise Study Report – 12/00) of \$20.00 per square foot.

Conclusion

With the improvements to SR 93 (I-75) adjacent to the Tampa Bay Golf and Country Club residential development, five of the nine residences identified as having building permits before the LDA date are predicted to experience outdoor traffic noise levels that approach or exceed the FHWA NAC for Activity Category B. Noise levels at the affected sites are predicted to range from 68.5 to 69.5 decibels (dBA). A noise barrier analysis for these five residences determined that a barrier is not cost reasonable at this location utilizing the current FDOT reasonableness criteria, nor the criteria used at the time of the original PD&E analysis (December 2000).

Attachment A

Building Permit Data

Address	Location	Permit Type	Permit Date	Permit Status
10133 Collar Dr.	Second row	NRB	3/13/2002	Complete
10137 Collar Dr.	Front row	NB1	9/16/2003	Complete
10147 Collar Dr.	Front row	NB1	11/26/2002	Complete
10203 Collar Dr.	Front row	NRB	8/24/2000	Complete
10204 Collar Dr.	Second row	NRB	7/5/2001	Complete
10209 Collar Dr.	Front row	NRB	6/22/2001	Complete
10217 Collar Dr.	Front row	NB1	11/8/2002	Complete
10223 Collar Dr.	Front row	NRB	5/1/2001	Complete
10231 Collar Dr.	Front row	NRB	1/26/2000	S.O.L. - expired
		NB1	8/13/2002	Complete
10237 Collar Dr.	Front row	NRB	10/2/2000	Complete
		NRB	1/26/2000	S.O.L. - expired
10242 Collar Dr.	Second row	NRB	11/20/2000	Complete
10243 Collar Dr.	Front row	NRB	1/26/2000	Complete
10248 Collar Dr.	Second row	NRB	9/23/2000	Complete
10251 Collar Dr.	Front row	NRB	1/26/2000	Complete
10301 Collar Dr.	Front row	NRB	10/17/2001	Complete
10302 Collar Dr.	Second row	NRB	3/8/2001	Complete
10308 Collar Dr.	Second row	NB1	5/14/2002	Complete
10309 Collar Dr.	Front row	NRB	11/1/2001	Complete
10315 Collar Dr.	Front row	NB1	11/8/2002	Complete
10316 Collar Dr.	Second row	NB1	8/13/2002	Complete
10321 Collar Dr.	Front row	NB1	11/27/2002	Complete
10322 Collar Dr.	Second row	NB1	8/15/2002	Complete
10328 Collar Dr.	Second row	NRB	3/13/2001	Complete
10329 Collar Dr.	Front row	NRB	1/13/2002	Complete
10334 Collar Dr.	Second row	NB1	3/12/2003	Complete
10337 Collar Dr.	Front row	NRB	3/6/2002	Complete
10342 Collar Dr.	Second row	NRB	1/26/2000	S.O.L. - expired
		NRB	3/7/2001	Complete
10345 Collar Dr.	Front row	NRB	1/11/2002	Complete
10348 Collar Dr.	Second row	NB1	5/14/2003	Complete
10351 Collar Dr.	Front row	NB1	10/3/2002	Complete
10352 Collar Dr.	Second row	NRB	1/26/2000	S.O.L. - expired
		NRB	3/7/2001	Complete
10403 Collar Dr.	Front row	NB1	10/9/2002	Complete
10404 Collar Dr.	Second row	NB1	9/23/2002	Complete
10409 Collar Dr.	Front row	NB1	2/18/2003	Complete
10410 Collar Dr.	Second row	NB1	6/11/2002	Complete
10415 Collar Dr.	Front row	NRB	3/6/2002	Complete
10418 Collar Dr.	Second row	NB1	11/8/2002	Complete
10423 Collar Dr.	Front row	NB1	5/14/2002	Complete
10426 Collar Dr.	Second row	NRB	6/22/2001	Complete
10427 Collar Dr.	Front row	NB1	8/13/2002	Complete

Attachment A

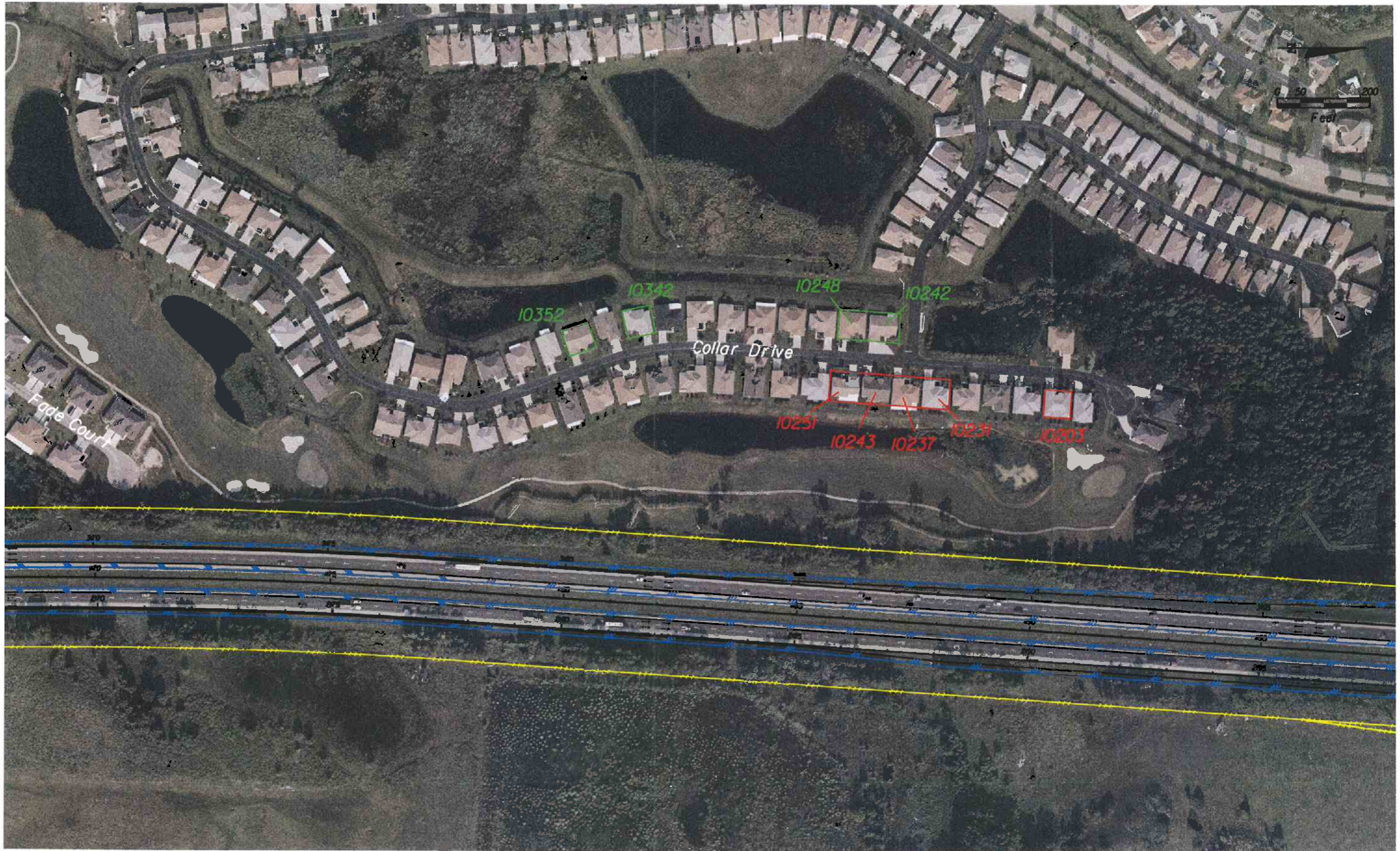
Building Permit Data

10433 Collar Dr.	Front row	NRB	4/24/2001	Complete
10434 Collar Dr.	Second row	NB1	9/18/2002	Complete
10441 Collar Dr.	Front row	NRB	4/24/2001	Complete
10442 Collar Dr.	Second row	NB1	11/27/2002	Complete
10448 Collar Dr.	Second row	NB1	9/18/2002	Complete
10451 Collar Dr.	Front row	NRB NB1	1/28/2002 6/14/2002	S.O.L. - expired Complete
10501 Collar Dr.	Front row	NB1	8/15/2002	Complete
10504 Collar Dr.	Second row	NB2	11/8/2002	Complete
10505 Collar Dr.	Front row	NRB	10/17/2001	Complete
29608 Fade Ct.	Front row	NTB	5/20/2004	Complete
29632 Fade Ct.	Front row	NTB	4/9/2003	Complete
29637 Fade Ct.	Second row	NTB	5/7/2004	Complete
29638 Fade Ct.	Front row	NTB	4/9/2003	Complete
29641 Fade Ct.	Second row	NTB	5/7/2004	Complete
10440 Chatuge Dr.	Front row	NTB	10/30/2003	Complete
10444 Chatuge Dr.	Front row	NTB	10/30/2003	Complete
10447 Chatuge Dr.	Second row	NTB	10/30/2003	Complete
10448 Chatuge Dr.	Front row	NTB	10/30/2003	Complete

Permit Type - NRB = NEW RESIDNC BLOCK / NB1 = NEW RES BLK N/C / NB2 = NEW 2 STRY BLK RES / NTB = NEW 2 FAMILY BLOCK

Permit Status - complete / S.O.L. - expired

These residences have been identified as having building permits prior to the LDA date (11/27/00) according to the Pasco county website reviewed on 3/17/08. (<http://opal.pascocountyfl.net/>)



DATE: 6/2/08
BY: JLS

——— L.A. RIGHT-OF-WAY LINE
- - - - - CENTERLINE CONSTRUCTION

10203 AFFECTED NOISE RECEIVER LOCATION

10242 NON-AFFECTED NOISE RECEIVER LOCATION

TRAFFIC NOISE RE-ANALYSIS
I-75 (SR 98) from north of CR 54 to north of SR 52 (FPID: 258736-3-53-01)
Pasco County, Florida

SHEET NO.

01