

5.4 Noise Abatement

Noise barriers reduce noise levels by blocking the sound path between a roadway and noise sensitive sites. To effectively reduce traffic noise, a noise barrier must be relatively long, continuous (with no intermittent openings) and of sufficient height.

Noise barriers were evaluated within Orange and Lake Counties at the right of way line at heights ranging from 6 feet to 22 feet. Noise barriers were evaluated along the outside edge of paved shoulder of the elevated expressway in Seminole County at heights ranging from 6 feet to 8 feet. Noise barriers were also evaluated along the right-of-way line at heights ranging from 6 feet to 22 feet at similar locations. For a noise barrier to be considered reasonable and feasible, 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 unless a higher level of expenditure can be justified by other circumstances. This is the reasonable cost limit established by 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, which covers barrier materials and labor.

The TNM model was used to analyze the acoustical effectiveness of each noise barrier. A discussion of the noise barriers evaluated for each noise sensitive site with a predicted future noise level that approaches or exceeds the NAC is provided below. At each barrier location, the feasibility (i.e., at least a 5 dBA reduction can be achieved) was established. If feasible, then the cost reasonableness was evaluated. The location, length, and height of a barrier were optimized for all of the impacted noise sensitive sites to determine the most effective barrier configuration. The optimization process considered maximizing the number of impacted noise sensitive sites that could be provided at least a 5 dBA reduction while trying to reduce the cost below the reasonable cost limit of \$42,000 per benefited noise sensitive site. Noise barriers were evaluated for every noise sensitive sites. The noise barriers analyzed for the preferred alternative are described below.

5.4.1 Orange County Preferred Alternative

Noise barriers were not evaluated for the Plymouth Harbor subdivision because it does not have any permits for construction from the City of Apopka and therefore doesn't qualify as a noise impact. A noise barrier was evaluated for the **Plymouth Sorrento south area** as it had 10 residences predicted to experience future noise levels that approach or exceed the NAC (see **Exhibit 5-8**). This noise barrier was evaluated along the right-of-way line at heights ranging from 6 feet to 22 feet. The results of these analyses are shown in **Table 5-8**. Based on the analysis, there were no benefited receivers. Therefore, a barrier in the Plymouth Sorrento south area is not feasible. The residences are located a few hundred feet from the alignment therefore it is difficult to achieve a 5 dBA reduction.

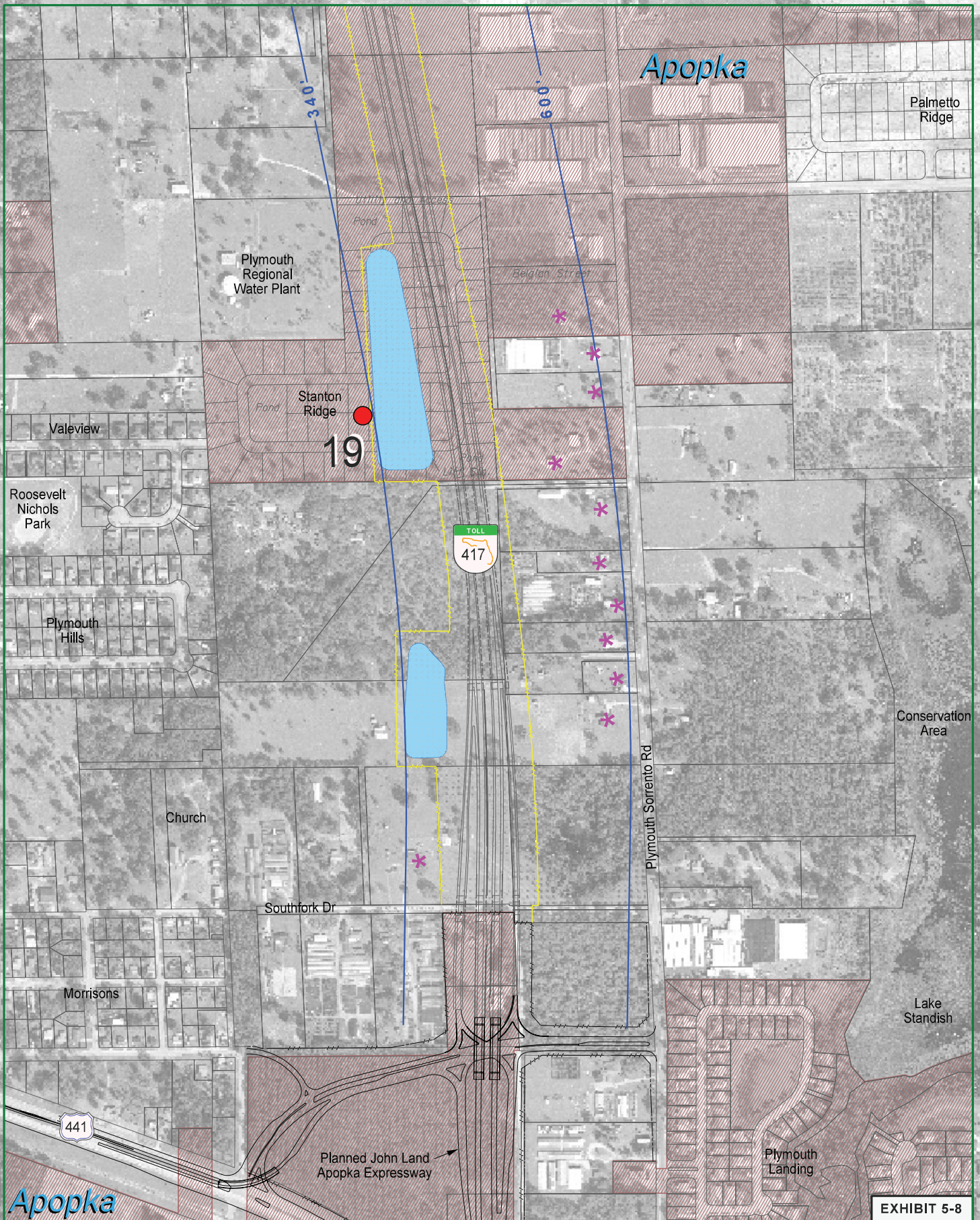


EXHIBIT 5-8

LEGEND

- Noise Monitoring Location
- Noise Contour (66 dBA/15 dBA increase)
- * Noise Impact Receptor



ORANGE COUNTY
Plymouth Sorrento Road
South Area
Noise Impact Plan Sheet
MARCH 2008

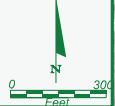


TABLE 5-8

BARRIER ANALYSIS FOR PLYMOUTH SORRENTO ROAD SOUTH AREA

Height/ Length (ft)	Number of Receivers with Insertion Loss of (dBA)					Number of Benefited Receivers	Total Estimated Cost	Cost per Benefited Receiver	Cost Reasonable Yes/No
	5- 5.9	6- 6.9	7- 7.9	8- 8.9	9+				
6 ¹ /2109	0	0	0	0	0	0	\$379,552	N/A	N/A
8 ¹ /2109	0	0	0	0	0	0	\$506,069	N/A	N/A
10 ¹ /2109	0	0	0	0	0	0	\$632,587	N/A	N/A
12 ¹ /2109	0	0	0	0	0	0	\$759,104	N/A	N/A
14 ¹ /2109	0	0	0	0	0	0	\$885,622	N/A	N/A
16 ¹ /2109	0	0	0	0	0	0	\$1,012,139	N/A	N/A
18 ¹ /2109	0	0	0	0	0	0	\$1,138,656	N/A	N/A
20/2109	0	0	0	0	0	0	\$1,265,174	N/A	N/A
22 ¹ /2109	0	0	0	0	0	0	\$1,391,691	N/A	N/A

¹Noise Barrier Wall located at roadway right of way line.

A noise barrier was evaluated for the **Appy Lane area** west of Plymouth Sorrento Road as it had 4 residences predicted to experience future noise levels that approach or exceed the NAC (see **Exhibit 5-9**). This noise barrier was evaluated along the right-of-way line at heights ranging from 6 feet to 22 feet. The results of these analyses are shown in **Table 5-9**. Based on the analysis, there were no benefited receivers. Therefore, a barrier in the Appy Lane area near Plymouth Sorrento south area does not meet the cost feasible guideline. The residences are located a few hundred feet from the alignment therefore it is difficult to achieve a 5 dBA reduction.

TABLE 5-9

BARRIER ANALYSIS FOR APPY LANE AREA

Height/ Length (ft)	Number of Receivers with Insertion Loss of (dBA)					Number of Benefited Receivers	Total Estimated Cost	Cost per Benefited Receiver	Cost Reasonable Yes/No
	5- 5.9	6- 6.9	7- 7.9	8- 8.9	9+				
6 ¹ /678	0	0	0	0	0	0	\$122,062	N/A	N/A
8 ¹ /678	0	0	0	0	0	0	\$162,749	N/A	N/A
10 ¹ /678	0	0	0	0	0	0	\$203,436	N/A	N/A
12 ¹ /678	0	0	0	0	0	0	\$244,123	N/A	N/A
14 ¹ /678	0	0	0	0	0	0	\$284,811	N/A	N/A
16 ¹ /678	0	0	0	0	0	0	\$325,498	N/A	N/A
18 ¹ /678	0	0	0	0	0	0	\$366,185	N/A	N/A
20 ¹ /678	0	0	0	0	0	0	\$406,872	N/A	N/A
22 ¹ /678	0	0	0	0	0	0	\$447,560	N/A	N/A

¹Noise Barrier Wall located at roadway right of way line.

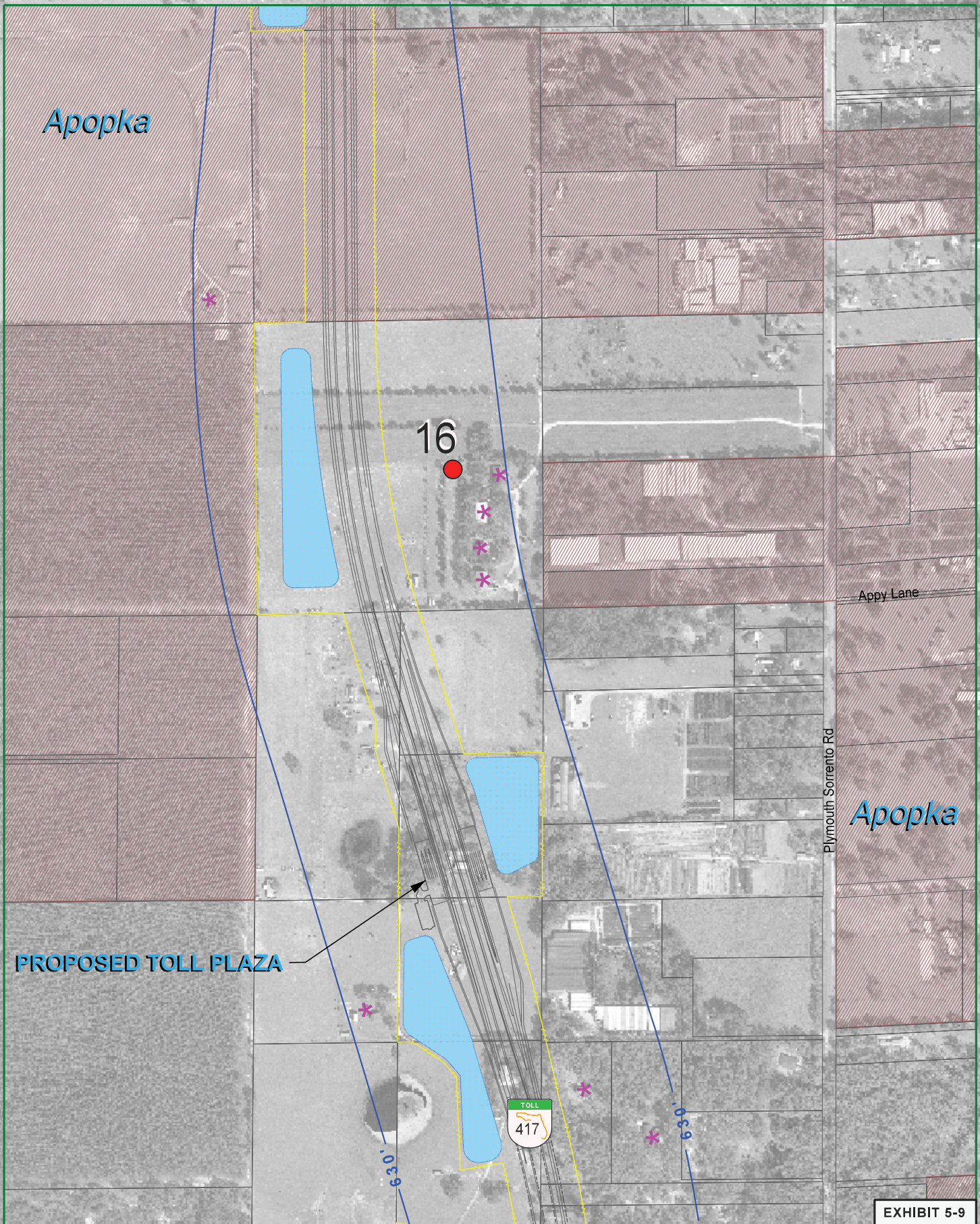


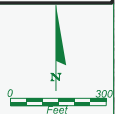
EXHIBIT 5-9

LEGEND

- Noise Monitoring Location
- Noise Contour (66 dBA/15 dBA increase)
- * Noise Impact Receptor



ORANGE COUNTY
Appy Lane
Area
Noise Impact Plan Sheet
MARCH 2008



A noise barrier was evaluated for the **Smith Emery area** as it had 4 residences predicted to experience future noise levels that approach or exceed the NAC (see **Exhibit 5-10**). This noise barrier was evaluated along the right-of-way line at heights ranging from 6 feet to 22 feet. The results of these analyses are shown in **Table 5-10**. Based on the analysis, there were no benefited receivers. Therefore, a barrier in the Smith Emery area does not meet the cost feasible guideline. The residences are located several hundred feet from the alignment therefore it is difficult to achieve a 5 dBA reduction.

TABLE 5-10

BARRIER ANALYSIS FOR SMITH EMERY AREA

Height/ Length (ft)	Number of Receivers with Insertion Loss of (dBA)					Number of Benefited Receivers	Total Estimated Cost	Cost per Benefited Receiver	Cost Reasonable Yes/No
	5- 5.9	6- 6.9	7- 7.9	8- 8.9	9+				
6 ¹ /731	0	0	0	0	0	0	\$131,512	N/A	N/A
8 ¹ /731	0	0	0	0	0	0	\$175,350	N/A	N/A
10 ¹ /731	0	0	0	0	0	0	\$219,187	N/A	N/A
12 ¹ /731	0	0	0	0	0	0	\$263,024	N/A	N/A
14 ¹ /731	0	0	0	0	0	0	\$306,862	N/A	N/A
16 ¹ /731	0	0	0	0	0	0	\$350,699	N/A	N/A
18 ¹ /731	0	0	0	0	0	0	\$394,536	N/A	N/A
20 ¹ /731	0	0	0	0	0	0	\$438,374	N/A	N/A
22 ¹ /731	0	0	0	0	0	0	\$482,211	N/A	N/A

¹Noise Barrier Wall located at roadway right of way line.

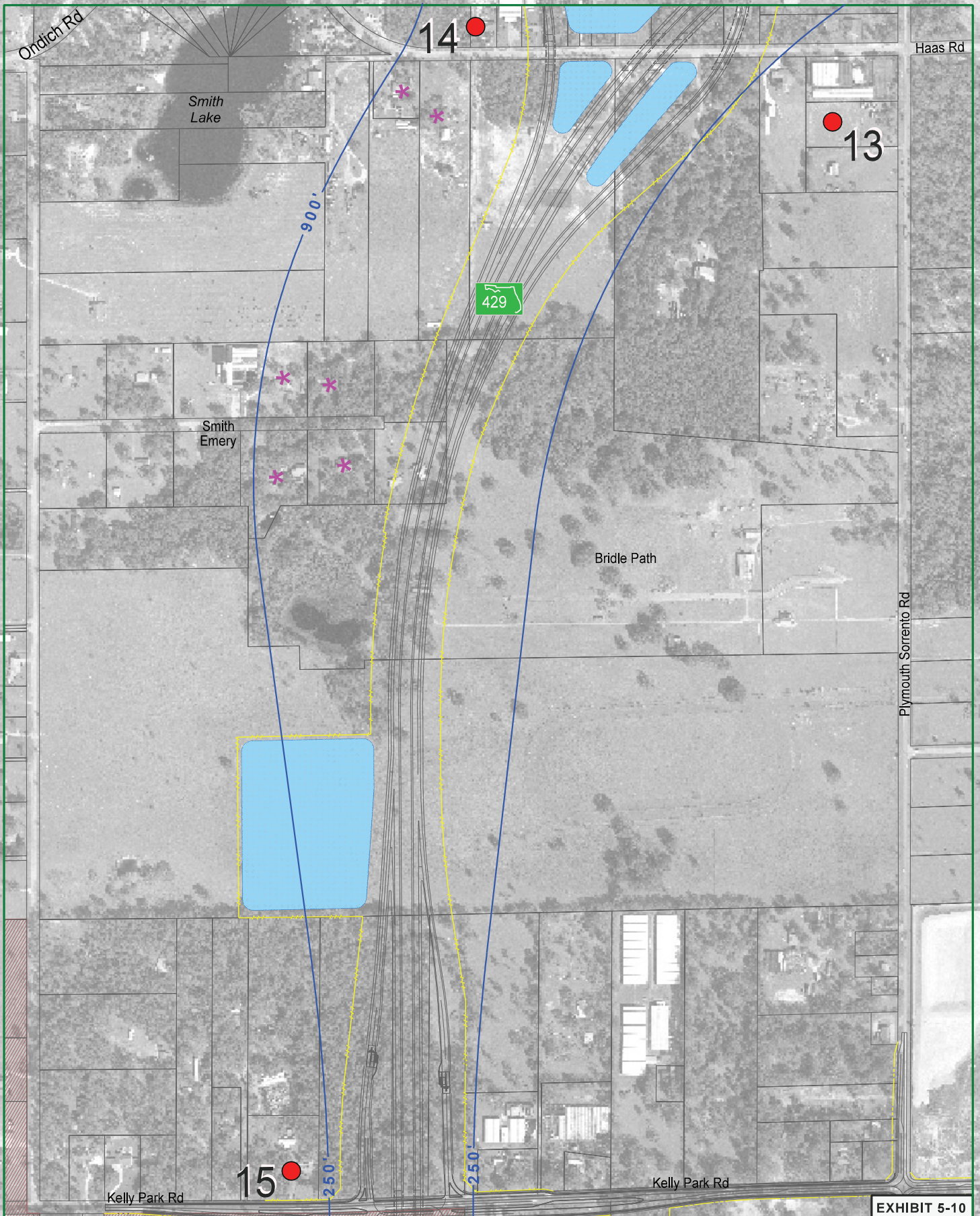


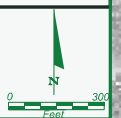
EXHIBIT 5-10

LEGEND

- Noise Monitoring Location
- Noise Contour
(66 dBA/15 dBA increase)
- * Noise Impact Receptor



ORANGE COUNTY
Smith Emery
Area
Noise Impact Plan Sheet
MARCH 2008



A noise barrier was evaluated for the **Boch Road area** east of Plymouth Sorrento Road as it had 6 residences predicted to experience future noise levels that approach or exceed the NAC (see **Exhibit 5-11**). This noise barrier was evaluated along the right-of-way line at heights ranging from 6 feet to 22 feet. The results of these analyses are shown in **Table 5-11**. Based on the analysis, a 22 foot wall provides 2 benefited receivers. Therefore, a barrier in the Boch Road area east of Plymouth Sorrento Road does not meet the cost reasonable guideline since the cost per benefited receiver for that 22 foot wall is \$731,039.

TABLE 5-11

BARRIER ANALYSIS FOR BOCH ROAD AREA

Height/ Length (ft)	Number of Receivers with Insertion Loss of (dBA)					Number of Benefited Receivers	Total Estimated Cost	Cost per Benefited Receiver	Cost Reasonable Yes/No
	5- 5.9	6- 6.9	7- 7.9	8- 8.9	9+				
6 ¹ /2215	0	0	0	0	0	0	\$398,749	N/A	N/A
8 ¹ /2215	0	0	0	0	0	0	\$531,665	N/A	N/A
10 ¹ /2215	0	0	0	0	0	0	\$664,581	N/A	N/A
12 ¹ /2215	0	0	0	0	0	0	\$797,497	N/A	N/A
14 ¹ /2215	0	0	0	0	0	0	\$930,413	N/A	N/A
16 ¹ /2215	0	0	0	0	0	0	\$1,063,330	N/A	N/A
18 ¹ /2215	0	0	0	0	0	0	\$1,196,246	N/A	N/A
20 ¹ /2215	0	0	0	0	0	0	\$1,329,162	N/A	N/A
22 ¹ /2215	2	0	0	0	0	2	\$1,462,078	\$731,039	No

¹Noise Barrier Wall located at roadway right of way line.



EXHIBIT 5-11

LEGEND

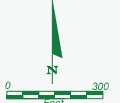
- Noise Monitoring Location
- Noise Contour
(66 dBA/15 dBA increase)
- * Noise Impact Receptor



225 E. Robinson Street, Suite 505
Orlando, FL 32801-4321
Tel 407.423.0030
Cert. of Authorization No. 000072



ORANGE COUNTY
Boch Road
Area
Noise Impact Plan Sheet
MARCH 2008



5.4.2 Lake County West Preferred Alternative

A noise barrier was evaluated for the **Summerbrooke at Mount Dora** subdivision as it had 6 residences predicted to experience future noise levels that approach or exceed the NAC (see the previously referenced **Exhibit 5-12**). This noise barrier was evaluated along the property line of the Summerbrooke at Mount Dora subdivision at heights ranging from 6 feet to 22 feet. The results of these analyses are shown in **Table 5-12**. Based on the analysis, there were 6 benefited receivers with a 16 foot wall starting on either side of the entrance to the subdivision. However, this barrier at the Summerbrooke at Mount Dora subdivision does not meet the cost reasonable guideline since the cost per benefited receiver of that wall is \$66,743.

TABLE 5-12

BARRIER ANALYSIS FOR SUMMERBROOKE AT MOUNT DORA

Height/ Length (ft)	Number of Receivers with Insertion Loss of (dBA)					Number of Benefited Receivers	Total Estimated Cost	Cost per Benefited Receiver	Cost Reasonable Yes/No
	5- 5.9	6- 6.9	7- 7.9	8- 8.9	9+				
6 ¹ /834	0	0	0	0	0	0	\$150,172	N/A	N/A
8 ¹ /834	0	1	0	0	0	1	\$200,230	\$200,230	No
10 ¹ /834	3	1	1	0	0	5	\$250,287	\$50,057	No
12 ¹ /834	0	3	1	0	1	5	\$300,345	\$60,069	No
14 ¹ /834	0	0	3	1	1	5	\$350,402	\$70,080	No
16 ¹ /834	1	0	1	2	2	6	\$400,460	\$66,743	No
18 ¹ /834	1	0	0	3	2	6	\$450,517	\$75,086	No
20 ¹ /834	1	0	0	1	4	6	\$500,575	\$83,429	No
22 ¹ /834	1	0	0	0	5	6	\$550,632	\$91,772	No

¹Noise Barrier Wall located at right of way line of Summerbrooke at Mount Dora.

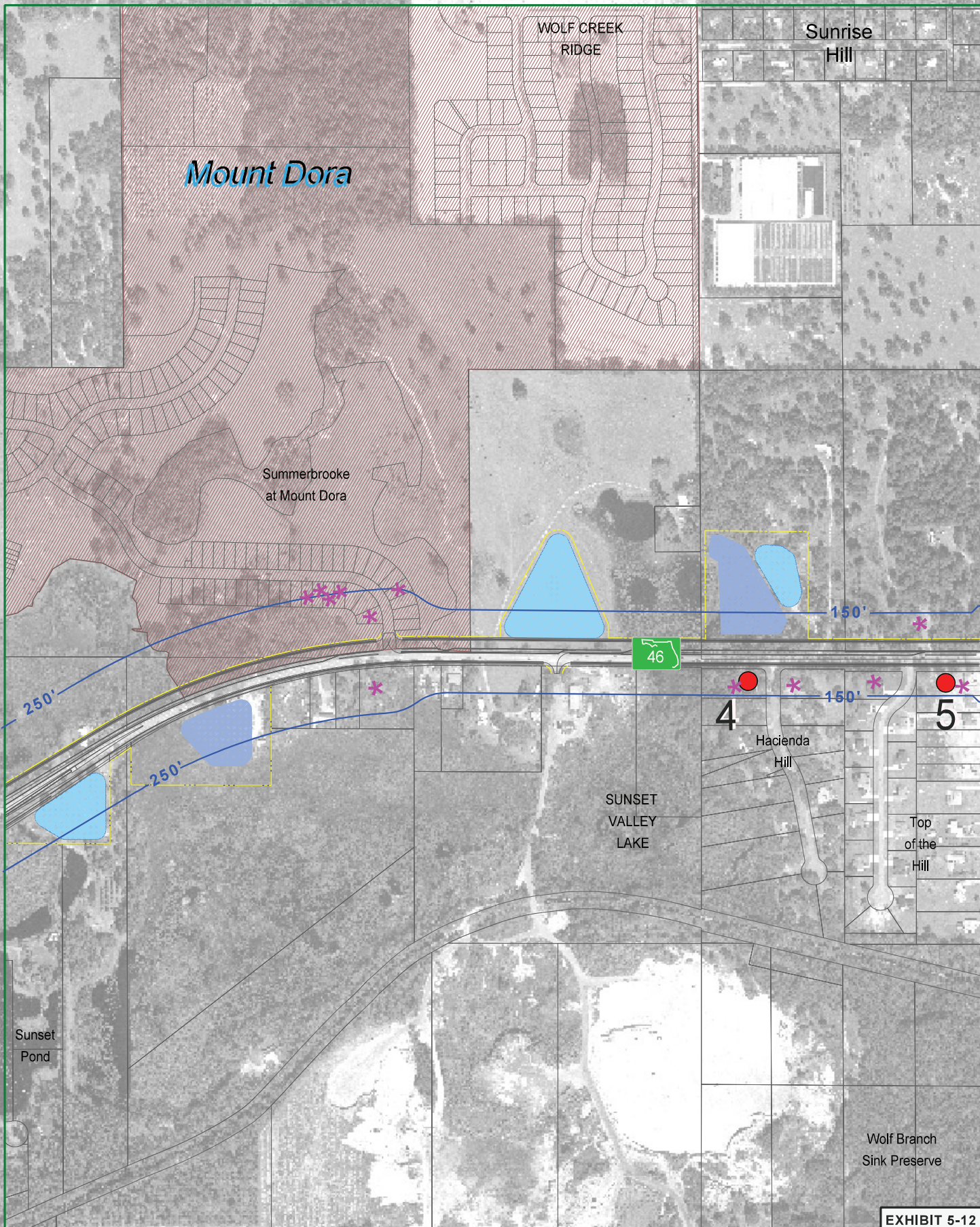


EXHIBIT 5-12

LEGEND

- Noise Monitoring Location
- Noise Contour
(66 dBA/15 dBA increase)
- * Noise Impact Receptor



LAKE COUNTY WEST
Summerbrooke at
Mount Dora
Noise Impact Plan Sheet
MARCH 2008



A noise barrier was evaluated for the **Lake Franklin Park** subdivision as it had 11 residences predicted to experience future noise levels that approach or exceed the NAC (see **Exhibit 5-13**). This noise barrier was evaluated along the property line of the Lake Franklin Park subdivision at heights ranging from 6 feet to 22 feet. The results of these analyses are shown in **Table 5-13**. Based on the analysis, there were benefited receivers with different wall heights however none of them met the cost per benefited receiver guideline of \$42,000. There were 9 benefited receivers with a 20 foot wall. However, a barrier at the Lake Franklin Park subdivision does not meet the cost reasonable guideline since the cost of per benefited receiver for that 20 foot wall is \$78,224.

TABLE 5-13

BARRIER ANALYSIS FOR LAKE FRANKLIN PARK

Height/L ength (ft)	Number of Receivers with Insertion Loss of (dBA)					Number of Benefited Receivers	Total Estimated Cost	Cost per Benefited Receiver	Cost Reasonable Yes/No
	5- 5.9	6- 6.9	7- 7.9	8- 8.9	9+				
6 ¹ /1173	0	0	0	0	0	0	\$211,204	N/A	N/A
8 ¹ /1173	4	0	0	0	0	4	\$281,606	\$70,402	No
10 ¹ /1173	4	2	0	0	0	6	\$352,007	\$58,668	No
12 ¹ /1173	1	5	0	0	0	6	\$422,408	\$70,401	No
14 ¹ /1173	1	4	2	0	0	7	\$492,810	\$70,401	No
16 ¹ /1173	2	2	4	0	0	8	\$563,211	\$70,401	No
18 ¹ /1173	1	1	6	0	0	8	\$633,613	\$79,202	No
20 ¹ /1173	2	1	3	3	0	9	\$704,014	\$78,224	No
22 ¹ /1173	2	1	2	4	0	9	\$774,415	\$86,046	No

¹Noise Barrier Wall located at right of way line.

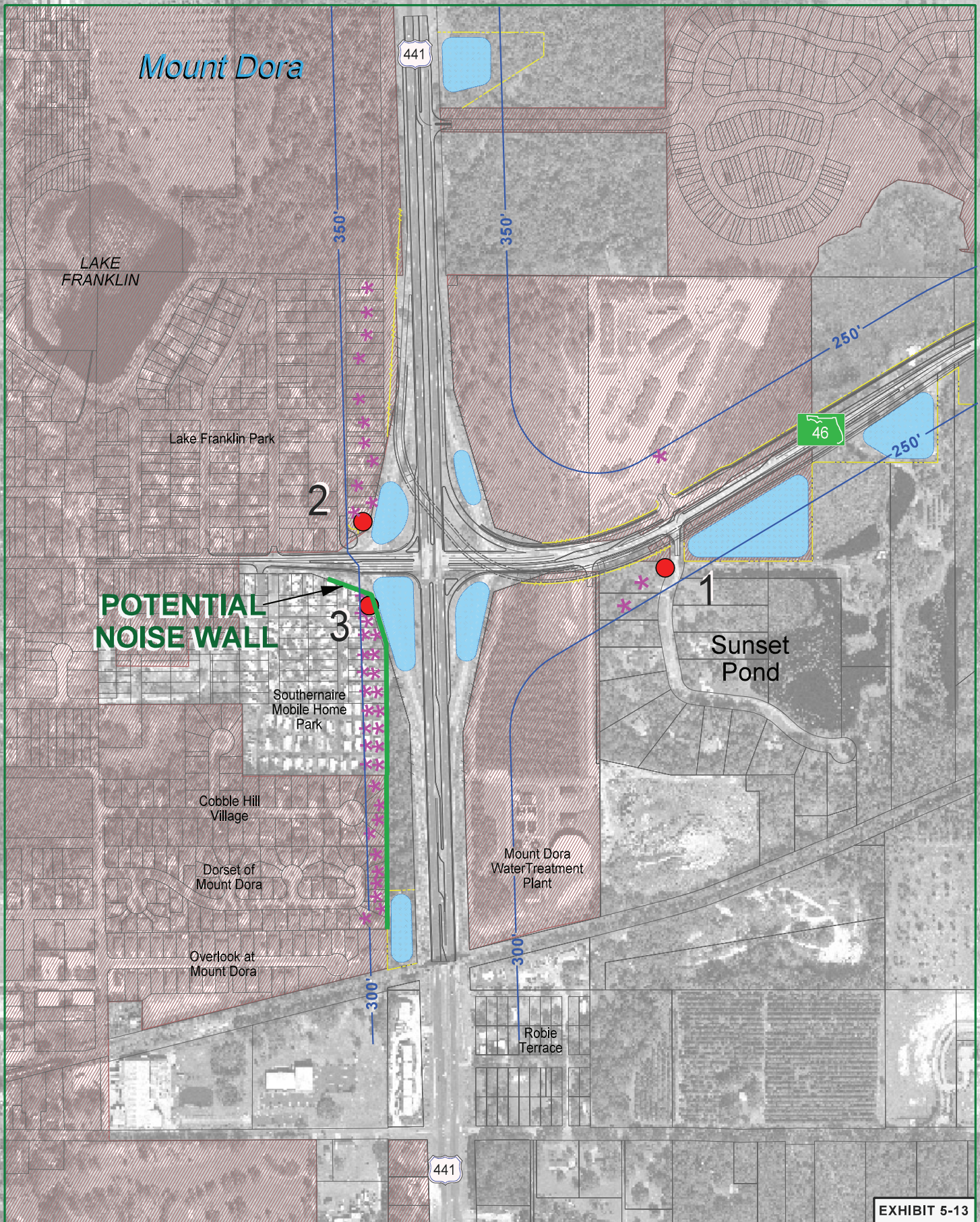


EXHIBIT 5-13

LEGEND

- Noise Monitoring Location
- Noise Contour
(66 dBA/15 dBA increase)
- ✱ Noise Impact Receptor
- Noise Wall



LAKE COUNTY WEST
US441/SR 46
Interchange Area
Noise Impact Plan Sheet
 MARCH 2008



A noise barrier was evaluated for the **Southern Mobile Home Park, Cobble Hill Village and Dorset of Mount Dora** as they had 29 residences predicted to experience future noise levels that approach or exceed the NAC (see the previously referenced **Exhibit 5-13**). This noise barrier was evaluated along the property lines of the Mobile Home Park, Cobble Hill Village and Dorset of Mount Dora, at heights ranging from 6 feet to 22 feet. The results of these analyses are shown in **Table 5-14**. These three subdivisions would be covered by one wall. Based on the analysis, the barriers analyzed provided benefited receivers for the majority of barrier heights. Although a 12 foot barrier has a cost per benefited receiver of \$22,983 and benefits 28 residences, a 16 foot barrier is recommended. This 16 foot barrier has a cost per benefited receiver of \$30,643 and gives a higher insertion loss for these 28 residences. Along high speed, limited access highways, FDOT District 5 does not recommend walls less than 16 feet high unless there are special, abnormal circumstances. Therefore, this barrier that covers the Southern Mobile Home Park, Cobble Hill Village and Dorset of Mount Dora meets the cost reasonable guideline. The owner of Southern Mobile Home Park indicated he would like to have a noise barrier wall adjacent to his property.

TABLE 5-14

BARRIER ANALYSIS FOR SOUTHERN MOBILE HOME PARK, COBBLE HILL VILLAGE AND DORSET OF MOUNT DORA

Height/ Length (ft)	Number of Receivers with Insertion Loss of (dBA)					Number of Benefited Receivers	Total Estimated Cost	Cost per Benefited Receiver	Cost Reasonable Yes/No
	5- 5.9	6- 6.9	7- 7.9	8- 8.9	9+				
6 ¹ /1788	7	0	0	0	0	7	\$321,756	\$45,965	No
8 ¹ /1788	10	7	2	0	0	19	\$429,008	\$22,579	Yes
10 ¹ /1788	9	8	8	2	0	27	\$536,260	\$19,861	Yes
12 ¹ /1788	3	8	8	7	2	28	\$643,512	\$22,983	Yes
14 ¹ /1788	0	7	8	6	7	28	\$750,764	\$26,813	Yes
16 ¹ /1788	0	3	6	8	11	28	\$858,016	\$30,643	Yes
18 ¹ /1788	0	1	6	7	14	28	\$965,268	\$34,474	Yes
20 ¹ /1788	0	0	4	5	19	28	\$1,072,520	\$38,304	Yes
22 ¹ /1788	0	0	2	5	21	28	\$1,179,772	\$42,135	No

¹Noise Barrier Wall located at right of way line.

5.4.3 Lake County East Preferred Alternative

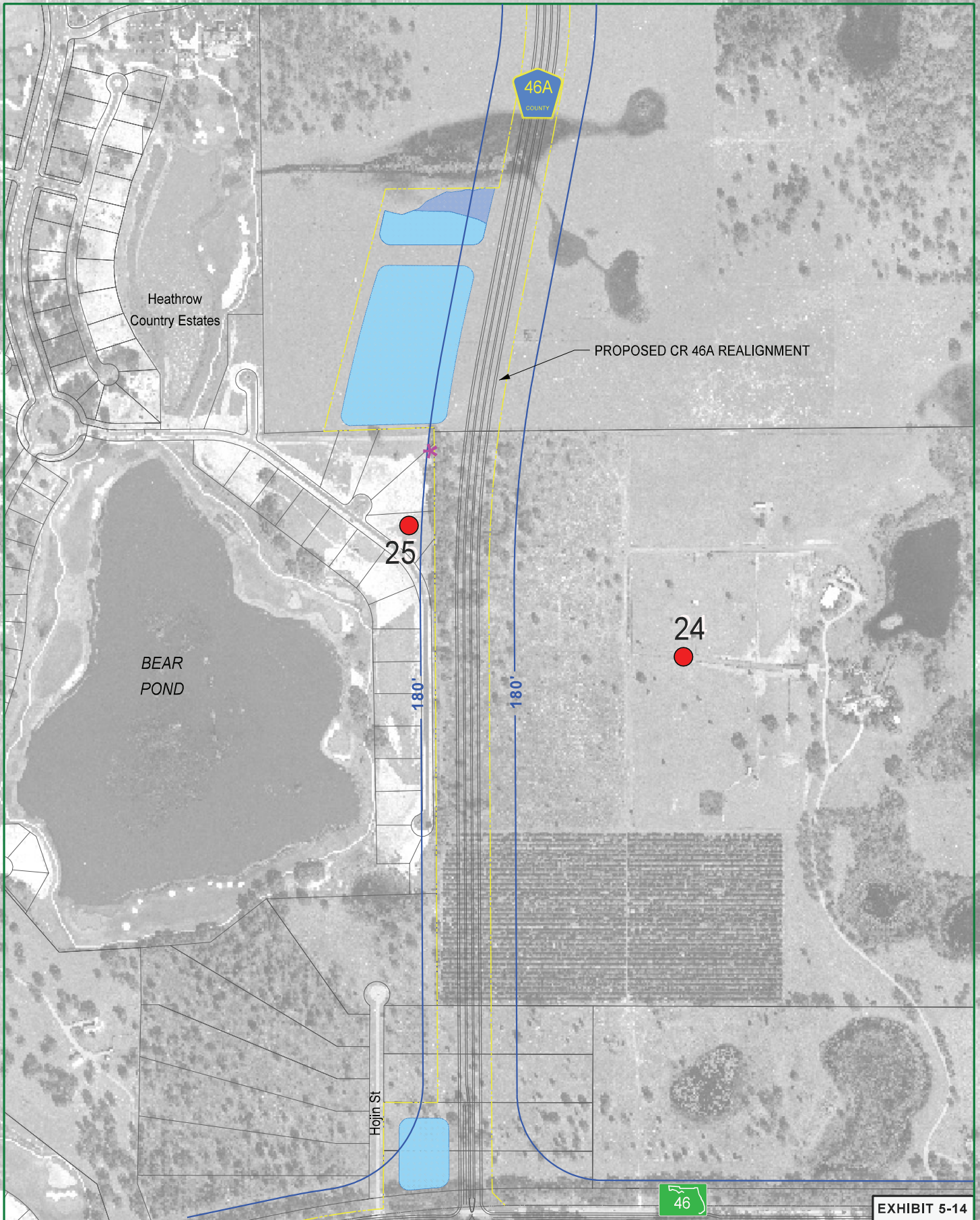
A noise barrier was evaluated for the **Heathrow Country Estates** subdivision to determine if it qualifies for a noise barrier as it had one noise sensitive site (see **Exhibit 5-14**). A noise barrier was evaluated along the right-of-way line at heights ranging from 6 feet to 22 feet. The results of these analyses are shown in **Table 5-15**. Based on the analysis, there was 1 benefited receiver in the subdivision. However, a noise barrier at the Heathrow Country Estates subdivision does not meet the cost reasonable guideline since the cost of that barrier is \$306,030.

TABLE 5-15

BARRIER ANALYSIS FOR HEATHROW COUNTRY ESTATES

Height/ Length (ft)	Number of Receivers with Insertion Loss of (dBA)					Number of Benefited Receivers	Total Estimated Cost	Cost per Benefited Receiver	Cost Reasonable Yes/No
	5- 5.9	6- 6.9	7- 7.9	8- 8.9	9+				
6 ¹ /510	0	0	0	0	0	0	\$91,809	N/A	N/A
8 ¹ /510	0	0	0	0	0	0	\$122,412	N/A	N/A
10 ¹ /510	0	0	0	0	0	0	\$153,015	N/A	N/A
12 ¹ /510	0	0	0	0	0	0	\$183,618	N/A	N/A
14 ¹ /510	0	0	0	0	0	0	\$214,221	N/A	N/A
16 ¹ /510	0	0	0	0	0	0	\$244,824	N/A	N/A
18 ¹ /510	0	0	0	0	0	0	\$275,427	N/A	N/A
20 ¹ /510	1	0	0	0	0	1	\$306,030	\$306,030	No
22 ¹ /510	1	0	0	0	0	1	\$336,633	\$336,633	No

¹Berm located at right of way line.



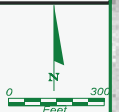
LEGEND

- Noise Monitoring Location
- Noise Contour (66 dBA/15 dBA increase)
- * Noise Impact Receptor



LAKE COUNTY EAST
Heathrow
Country Estates
Noise Impact Plan Sheet
 MARCH 2008

EXHIBIT 5-14



A noise barrier was evaluated for the **Mount Plymouth Golf Club** as it had 4 residences predicted to experience future noise levels that approach or exceed the NAC (see **Exhibit 5-15**). This noise barrier was evaluated along the right-of-way line at heights ranging from 6 feet to 22 feet. The results of these analyses are shown in **Table 5-16**. Based on the analysis, there were no benefited receivers and a barrier at the Mount Plymouth Golf Club subdivision does not meet the cost feasible guideline.

TABLE 5-16

BARRIER ANALYSIS FOR MOUNT PLYMOUTH GOLF CLUB

Height/ Length (ft)	Number of Receivers with Insertion Loss of (dBA)					Number of Benefited Receivers	Total Estimated Cost	Cost per Benefited Receiver	Cost Reasonable Yes/No
	5- 5.9	6- 6.9	7- 7.9	8- 8.9	9+				
6 ¹ /672	0	0	0	0	0	0	\$121,022	N/A	No
8 ¹ /672	0	0	0	0	0	0	\$161,362	N/A	No
10 ¹ /672	0	0	0	0	0	0	\$201,703	N/A	No
12 ¹ /672	0	0	0	0	0	0	\$242,043	N/A	No
14 ¹ /672	0	0	0	0	0	0	\$282,384	N/A	No
16 ¹ /672	0	0	0	0	0	0	\$322,725	N/A	No
18 ¹ /672	0	0	0	0	0	0	\$363,065	N/A	No
20 ¹ /672	0	0	0	0	0	0	\$403,406	N/A	No
22 ¹ /672	0	0	0	0	0	0	\$443,746	N/A	No

¹Barrier located at right of way line.

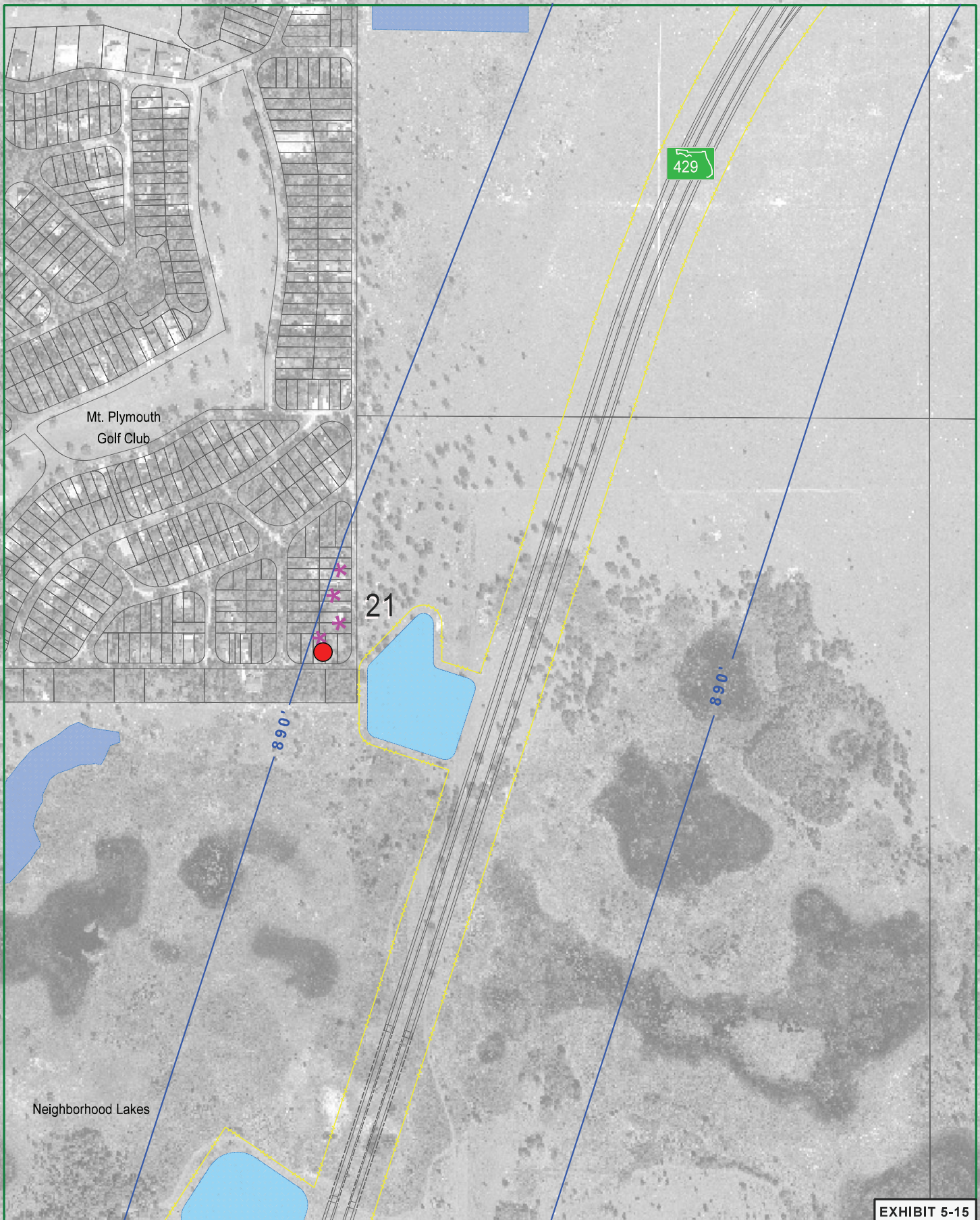


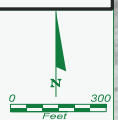
EXHIBIT 5-15

LEGEND

- Noise Monitoring Location
- Noise Contour
(66 dBA/15 dBA increase)
- ✱ Noise Impact Receptor



LAKE COUNTY EAST
Mount Plymouth
Golf Club
Noise Impact Plan Sheet
 MARCH 2008



5.4.4 Seminole County Preferred Alternative

A noise barrier was evaluated for the **Wekiva River Oaks** subdivision as it had 7 residences predicted to experience future noise levels that approach or exceed the NAC (see Exhibit 5-16). A noise barrier was evaluated along the outside edge of the paved shoulder of the elevated expressway at heights ranging from 5 feet to 8 feet. In addition, another noise barrier was evaluated along the right-of-way line at heights ranging from 6 feet to 22 feet. The results of these analyses are shown in **Table 5-17**. Based on the analysis, there were no benefited receivers and a barrier at the Wekiva River Oaks subdivision does not meet the cost feasible guideline.

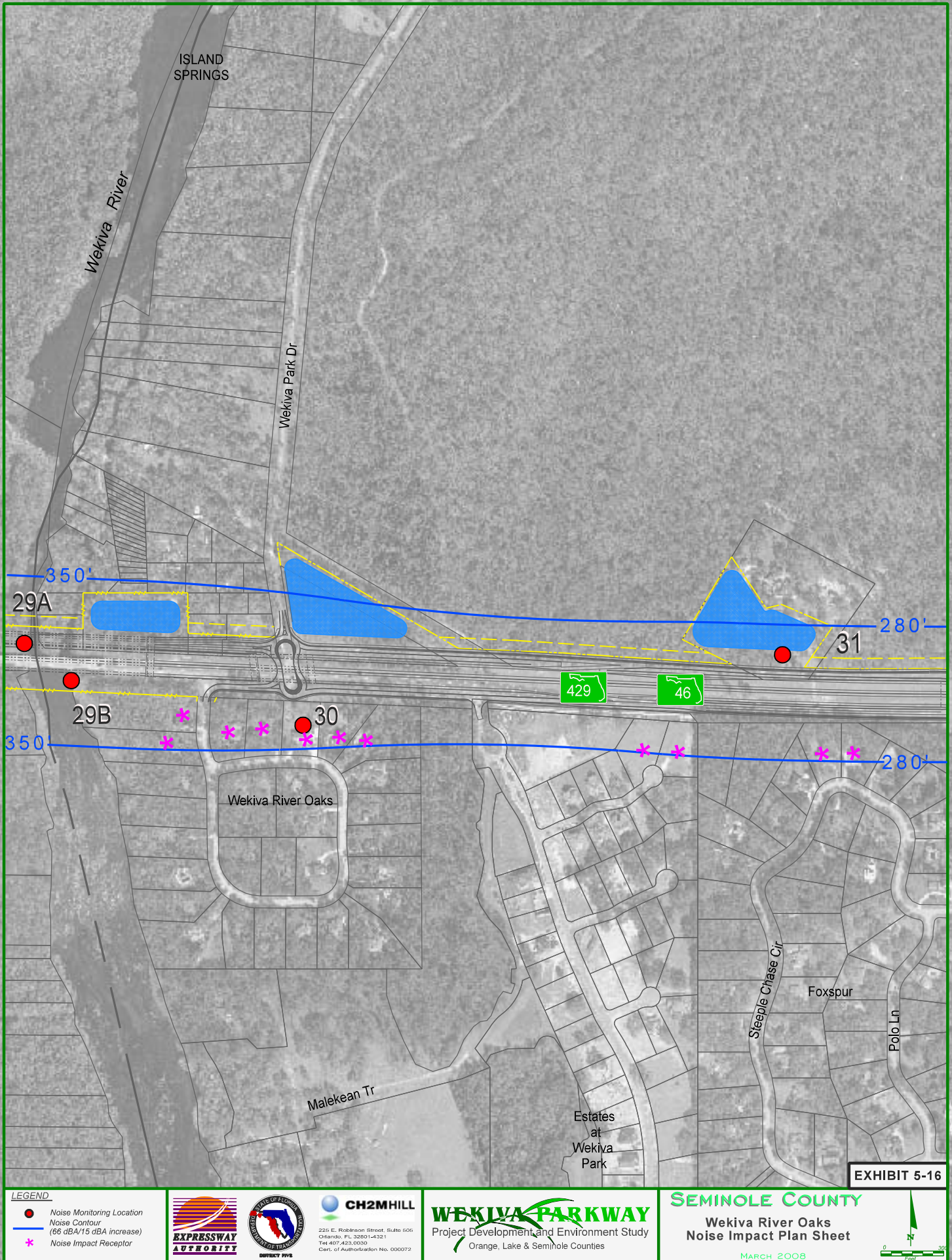
TABLE 5-17

BARRIER ANALYSIS FOR WEKIVA RIVER OAKS

Height/ Length (ft)	Number of Receivers with Insertion Loss of (dBA)					Number of Benefited Receivers	Total Estimated Cost	Cost per Benefited Receiver	Cost Reasonable Yes/No
	5- 5.9	6- 6.9	7- 7.9	8- 8.9	9+				
5 ¹ /849	0	0	0	0	0	0	\$127,295	N/A	No
6 ¹ /849	0	0	0	0	0	0	\$152,754	N/A	No
7 ¹ /849	0	0	0	0	0	0	\$178,214	N/A	No
8 ¹ /849	0	0	0	0	0	0	\$203,673	N/A	No
6 ² /1422	0	0	0	0	0	0	\$256,008	N/A	No
8 ² /1422	0	0	0	0	0	0	\$341,344	N/A	No
10 ² /1422	0	0	0	0	0	0	\$426,680	N/A	No
12 ² /1422	0	0	0	0	0	0	\$512,016	N/A	No
14 ² /1422	0	0	0	0	0	0	\$597,352	N/A	No
16 ² /1422	0	0	0	0	0	0	\$682,688	N/A	No
18 ² /1422	0	0	0	0	0	0	\$768,024	N/A	No
20 ² /1422	0	0	0	0	0	0	\$853,360	N/A	No
22 ² /1422	3	0	0	0	0	3	\$958,696	\$312,899	No

¹Noise Barrier Wall located at outside edge of paved shoulder of mainline.

²Noise Barrier Wall located at right of way line.



A noise barrier was evaluated for the **Markham Forest** subdivision as it had 8 residences predicted to experience future noise levels that approach or exceed the NAC (see **Exhibit 5-17**). A noise barrier was evaluated along the outside edge of the paved shoulder of the elevated expressway at heights ranging from 5 feet to 8 feet. In addition, another noise barrier was evaluated along the right-of-way line at heights ranging from 6 feet to 22 feet. The results of these analyses are shown in **Table 5-18**. Based on the analysis, there were no benefited receivers and a barrier at the Markham Forest subdivision does not meet the cost feasible guideline.

TABLE 5-18

BARRIER ANALYSIS FOR MARKHAM FOREST

Height/ Length (ft)	Number of Receivers with Insertion Loss of (dBA)					Number of Benefited Receivers	Total Estimated Cost	Cost per Benefited Receiver	Cost Reasonable Yes/No
	5- 5.9	6- 6.9	7- 7.9	8- 8.9	9+				
5 ¹ /1145	0	0	0	0	0	0	\$171,806	N/A	No
6 ¹ /1145	0	0	0	0	0	0	\$206,168	N/A	No
7 ¹ /1145	0	0	0	0	0	0	\$240,529	N/A	No
8 ¹ /1145	0	0	0	0	0	0	\$274,890	N/A	No
6 ² /1137	0	0	0	0	0	0	\$204,660	N/A	No
8 ² /1137	0	0	0	0	0	0	\$272,880	N/A	No
10 ² /1137	0	0	0	0	0	0	\$341,100	N/A	No
12 ² /1137	0	0	0	0	0	0	\$409,320	N/A	No
14 ² /1137	0	0	0	0	0	0	\$477,540	N/A	No
16 ² /1137	0	0	0	0	0	0	\$545,760	N/A	No
18 ² /1137	0	0	0	0	0	0	\$613,980	N/A	No
20 ² /1137	0	0	0	0	0	0	\$682,200	N/A	No
22 ² /1137	0	0	0	0	0	0	\$750,420	N/A	No

¹Noise Barrier Wall located at outside edge of paved shoulder of mainline.

²Noise Barrier Wall located at right of way line.

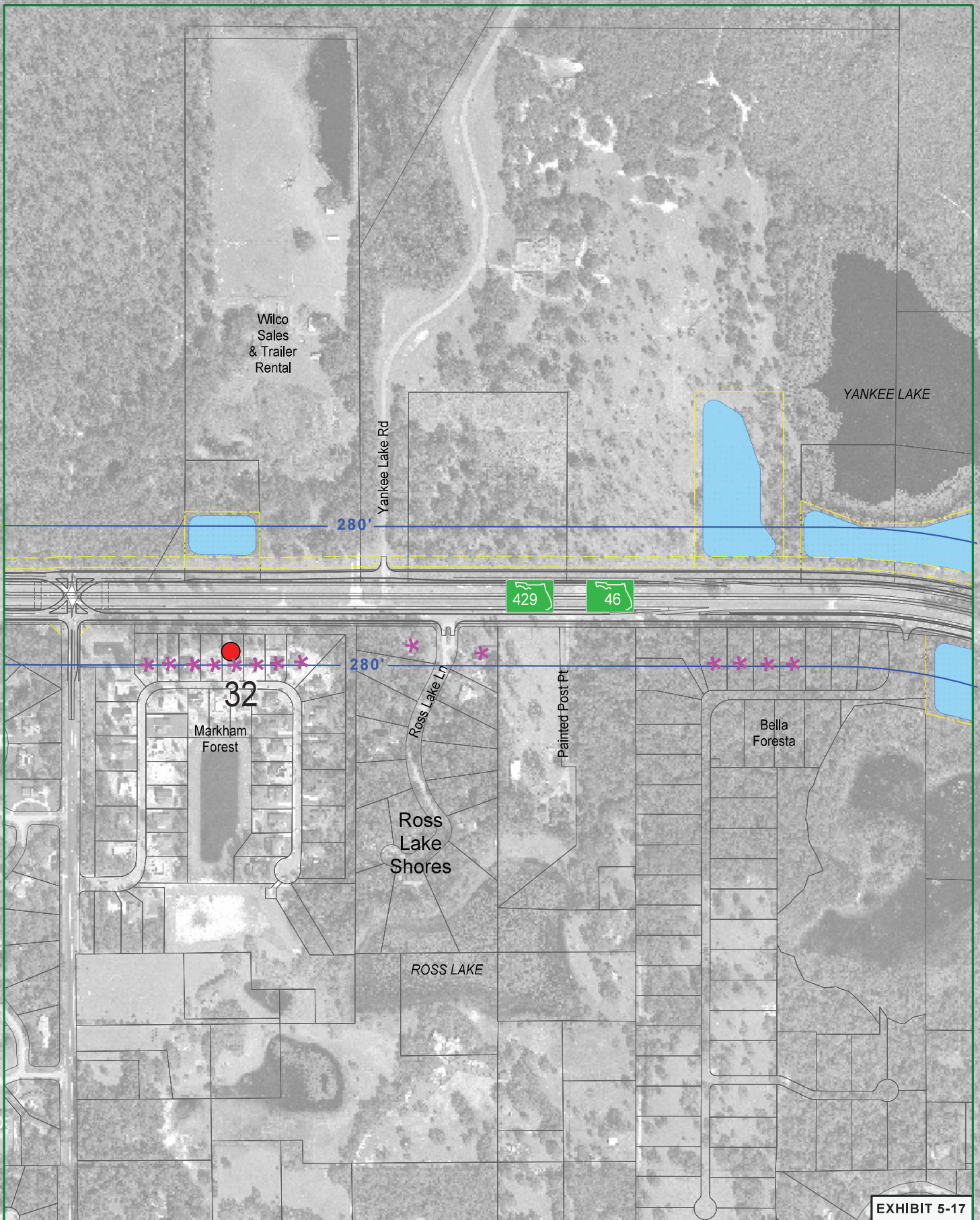


EXHIBIT 5-17

LEGEND

- Noise Monitoring Location
- Noise Contour
(66 dBA/15 dBA increase)
- * Noise Impact Receptor



SEMINOLE COUNTY
Markham Forest and
Bella Foresta
Noise Impact Plan Sheet
MARCH 2008



A noise barrier was evaluated for the **Bella Foresta** subdivision as it had 4 planned or recently constructed residences predicted to experience future noise levels that approach or exceed the NAC (see the previously referenced **Exhibit 5-17**). A noise barrier was evaluated along the outside edge of the paved shoulder of the elevated expressway at heights ranging from 5 feet to 8 feet. In addition, another noise barrier was evaluated along the right-of-way line at heights ranging from 6 feet to 22 feet. The results of these analyses are shown in **Table 5-19**. Based on the analysis, there were 4 benefited receivers with an 18 foot wall, however a barrier at the Bella Foresta subdivision does not meet the cost reasonable guideline since the cost per benefited receiver for that wall is \$162,270.

TABLE 5-19

BARRIER ANALYSIS FOR BELLA FORESTA

Height/ Length (ft)	Number of Receivers with Insertion Loss of (dBA)					Number of Benefited Receivers	Total Estimated Cost	Cost per Benefited Receiver	Cost Reasonable Yes/No
	5- 5.9	6- 6.9	7- 7.9	8- 8.9	9+				
5 ¹ /1562	0	0	0	0	0	0	\$179,551	N/A	No
6 ¹ /1562	0	0	0	0	0	0	\$215,461	N/A	No
7 ¹ /1562	0	0	0	0	0	0	\$251,371	N/A	No
8 ¹ /1562	0	0	0	0	0	0	\$287,281	N/A	No
6 ² /1695	0	0	0	0	0	0	\$216,360	N/A	No
8 ² /1695	0	0	0	0	0	0	\$288,480	N/A	No
10 ² /1695	0	0	0	0	0	0	\$360,600	N/A	No
12 ² /1695	3	0	0	0	0	3	\$432,721	\$144,240	No
14 ² /1695	1	2	0	0	0	3	\$504,841	\$168,280	No
16 ² /1695	0	3	0	0	0	3	\$576,961	\$192,320	No
18 ² /1695	1	1	2	0	0	4	\$649,081	\$162,270	No
20 ² /1695	1	1	2	0	0	4	\$721,201	\$180,300	No
22 ² /1695	1	0	2	1	0	4	\$793,321	\$198,330	No

¹Noise Barrier Wall located at outside edge of paved shoulder of mainline.

²Noise Barrier Wall located at right of way line.

A noise barrier was evaluated for the **Sylvan Glade** subdivision as it had 6 residences predicted to experience future noise levels that approach or exceed the NAC (see **Exhibit 5-18**). A noise barrier was evaluated along the outside edge of the paved shoulder of the elevated expressway at heights ranging from 5 feet to 8 feet. In addition, another noise barrier was evaluated along the right-of-way line at heights ranging from 6 feet to 22 feet. The results of these analyses are shown in **Table 5-20**. Based on the analysis, there were 5 benefited receivers with an 18 foot wall, however a barrier at the Sylvan Glade subdivision does not meet the cost reasonable guideline since the cost per benefited receiver for that wall is \$183,064.

TABLE 5-20

BARRIER ANALYSIS FOR SYLVAN GLADE

Height/ Length (ft)	Number of Receivers with Insertion Loss of (dBA)					Number of Benefited Receivers	Total Estimated Cost	Cost per Benefited Receiver	Cost Reasonable Yes/No
	5- 5.9	6- 6.9	7- 7.9	8- 8.9	9+				
5 ¹ /1562	0	0	0	0	0	0	\$234,302	N/A	No
6 ¹ /1562	0	0	0	0	0	0	\$281,163	N/A	No
7 ¹ /1562	0	0	0	0	0	0	\$328,023	N/A	No
8 ¹ /1562	0	0	0	0	0	0	\$374,884	N/A	No
6 ² /1695	0	0	0	0	0	0	\$305,107	N/A	No
8 ² /1695	0	0	0	0	0	0	\$406,810	N/A	No
10 ² /1695	2	0	0	0	0	2	\$508,512	\$254,256	No
12 ² /1695	1	1	1	0	0	3	\$610,215	\$203,405	No
14 ² /1695	0	1	0	2	0	3	\$711,918	\$237,306	No
16 ² /1695	0	1	1	0	2	4	\$813,620	\$203,405	No
18 ² /1695	1	0	1	1	3	5	\$915,322	\$183,064	No
20 ² /1695	0	1	0	1	3	5	\$1,017,025	\$203,405	No
22 ² /1695	1	0	1	1	3	6	\$1,118,727	\$186,455	No

¹Noise Barrier Wall located at outside edge of paved shoulder of mainline.

²Noise Barrier Wall located at right of way line.



EXHIBIT 5-18

LEGEND

- Noise Monitoring Location
- Noise Contour
(66 dBA/15 dBA increase)
- ✱ Noise Impact Receptor



SEMINOLE COUNTY

**Sylvan Glade
Noise Impact Plan Sheet**

MARCH 2008



A noise barrier was evaluated for the **Twelve Oaks RV Resort** as it had several residences predicted to experience future noise levels that approach or exceed the NAC (see **Exhibit 5-19**). This barrier was modeled with access provided to the RV park from SR 46. This RV park has seasonal and permanent residents. Only permanent residential structures were evaluated in the analysis. A noise barrier was evaluated along the right-of-way line at heights ranging from 6 feet to 22 feet. The results of these analyses are shown in **Table 5-21**. It is recommended to use a 22 foot noise barrier wall as it provides mitigation for 50 benefited receivers at a cost of \$18,863 per benefited receiver. A 22 foot wall also provides the lowest cost per benefited receiver in the analysis. The owner of the Twelve Oaks RV Resort indicated he would like to have a noise barrier wall adjacent to his property.

TABLE 5-21

BARRIER ANALYSIS FOR TWELVE OAKS RV RESORT

Height/ Length (ft)	Number of Receivers with Insertion Loss of (dBA)					Number of Benefited Receivers	Total Estimated Cost	Cost per Benefited Receiver	Cost Reasonable Yes/No
	5- 5.9	6- 6.9	7- 7.9	8- 8.9	9+				
6 ¹ /1429	2	2	0	0	0	4	\$257,218	\$64,305	No
8 ¹ /1429	0	4	5	0	0	9	\$342,958	\$38,106	Yes
10 ¹ /1429	4	2	3	6	0	15	\$428,697	\$28,580	Yes
12 ¹ /1429	4	4	3	3	6	20	\$514,436	\$25,722	Yes
14 ¹ /1429	4	5	5	2	9	25	\$600,176	\$24,007	Yes
16 ¹ /1429	4	6	5	5	9	29	\$685,915	\$23,652	Yes
18 ¹ /1429	4	6	7	5	12	34	\$771,654	\$22,696	Yes
20 ¹ /1429	12	7	7	3	16	45	\$857,394	\$19,053	Yes
22 ¹ /1429	13	9	6	6	16	50	\$943,133	\$18,863	Yes

¹Noise Barrier Wall located at right of way line.

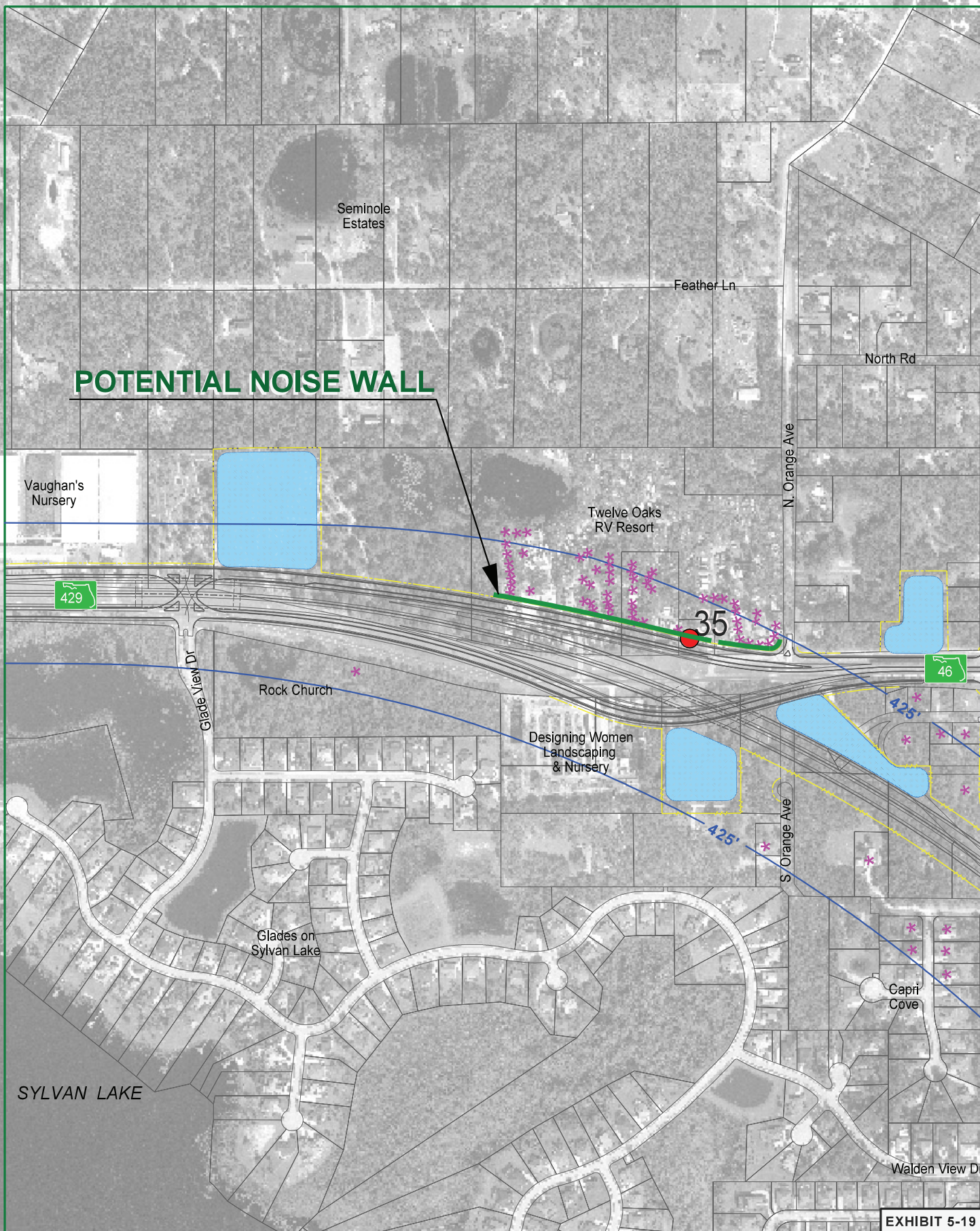


EXHIBIT 5-19

LEGEND

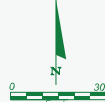
- Noise Monitoring Location
- Noise Contour (66 dBA/15 dBA increase)
- * Noise Impact Receptor
- Noise Wall



SEMINOLE COUNTY

Twelve Oaks RV Resort
Noise Impact Plan Sheet

MARCH 2008



A noise barrier was evaluated for the **Alderene Park** area as it had 5 residences predicted to experience future noise levels that approach or exceed the NAC (see **Exhibit 5-20**). A noise barrier was evaluated along the right-of-way line at heights ranging from 6 feet to 22 feet. The results of these analyses are shown in **Table 5-22**. Based on the analysis, there were no benefited receivers and a barrier in the Alderene Park area does not meet the cost feasible guideline.

TABLE 5-22

BARRIER ANALYSIS FOR ALDERENE PARK

Height/ Length (ft)	Number of Receivers with Insertion Loss of (dBA)					Number of Benefited Receivers	Total Estimated Cost	Cost per Benefited Receiver	Cost Reasonable Yes/No
	5- 5.9	6- 6.9	7- 7.9	8- 8.9	9+				
6 ¹ /719	0	0	0	0	0	0	\$129,409	N/A	No
8 ¹ /719	0	0	0	0	0	0	\$172,545	N/A	No
10 ¹ /719	0	0	0	0	0	0	\$215,682	N/A	No
12 ¹ /719	0	0	0	0	0	0	\$258,818	N/A	No
14 ¹ /719	0	0	0	0	0	0	\$301,954	N/A	No
16 ¹ /719	0	0	0	0	0	0	\$345,090	N/A	No
18 ¹ /719	0	0	0	0	0	0	\$388,227	N/A	No
20 ¹ /719	0	0	0	0	0	0	\$431,363	N/A	No
22 ¹ /719	0	0	0	0	0	0	\$474,499	N/A	No

¹Noise Barrier Wall located at right of way line.

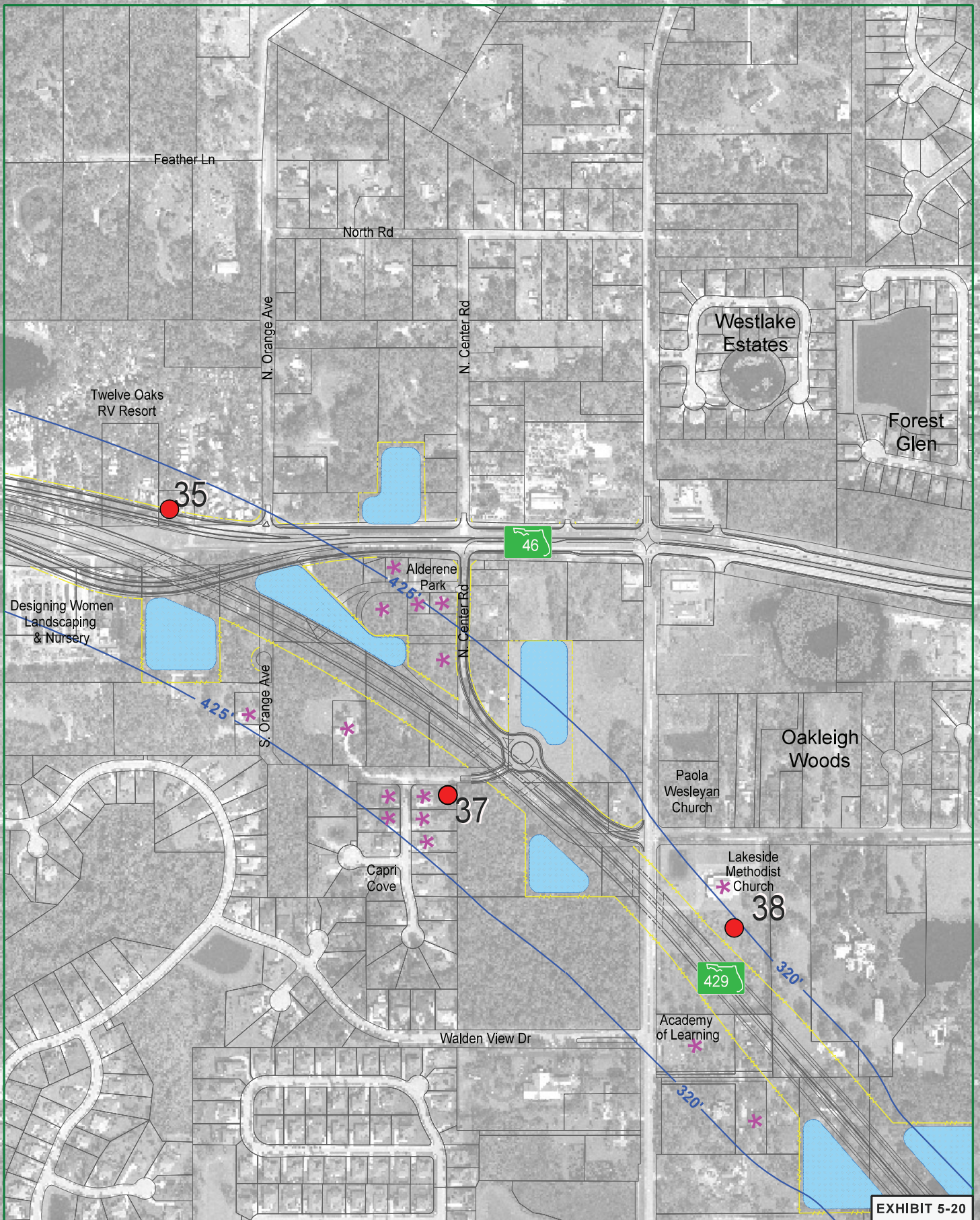


EXHIBIT 5-20

LEGEND

- Noise Monitoring Location
- Noise Contour
(66 dBA/15 dBA increase)
- ✱ Noise Impact Receptor



SEMINOLE COUNTY

**Alderene Park
Noise Impact Plan Sheet**

MARCH 2008



A noise barrier was evaluated for the **Capri Cove** subdivision as it had 5 residences predicted to experience future noise levels that approach or exceed the NAC (see the previously referenced **Exhibit 5-20**). A noise barrier was evaluated along the outside edge of the paved shoulder of the elevated roadway at heights ranging from 5 feet to 8 feet. In addition, another noise barrier was evaluated along the right-of-way line at heights ranging from 6 feet to 22 feet. The results of these analyses are shown in **Table 5-23**. Based on the analysis, there were no benefited receivers and a barrier in the Capri Cove area does not meet the cost feasible guideline.

TABLE 5-23

BARRIER ANALYSIS FOR CAPRI COVE

Height/ Length (ft)	Number of Receivers with Insertion Loss of (dBA)					Number of Benefited Receivers	Total Estimated Cost	Cost per Benefited Receiver	Cost Reasonable Yes/No
	5- 5.9	6- 6.9	7- 7.9	8- 8.9	9+				
5 ¹ /1444	0	0	0	0	0	0	\$216,648	N/A	N/A
6 ¹ /1444	0	0	0	0	0	0	\$259,977	N/A	N/A
7 ¹ /1444	0	0	0	0	0	0	\$303,307	N/A	N/A
8 ¹ /1444	0	0	0	0	0	0	\$346,636	N/A	N/A
6 ² /1122	0	0	0	0	0	0	\$202,015	N/A	N/A
8 ² /1122	0	0	0	0	0	0	\$269,353	N/A	N/A
10 ² /1122	0	0	0	0	0	0	\$336,691	N/A	N/A
12 ² /1122	0	0	0	0	0	0	\$404,030	N/A	N/A
14 ² /1122	0	0	0	0	0	0	\$471,368	N/A	N/A
16 ² /1122	0	0	0	0	0	0	\$538,706	N/A	N/A
18 ² /1122	0	0	0	0	0	0	\$606,045	N/A	N/A
20 ² /1122	0	0	0	0	0	0	\$673,383	N/A	N/A
22 ² /1122	0	0	0	0	0	0	\$740,721	N/A	N/A

¹Noise Barrier Wall located at outside edge of paved shoulder of mainline.

²Noise Barrier Wall located at right of way line.

A noise barrier was evaluated for the **Lakeside Methodist Church** as it is predicted to experience future noise levels that approach or exceed the NAC (see the previously referenced **Exhibit 5-20**). A noise barrier was evaluated along the outside edge of the paved shoulder of the elevated roadway at heights ranging from 5 feet to 8 feet. In addition, another noise barrier was evaluated along the right-of-way line at heights ranging from 6 feet to 22 feet. The results of these analyses are shown in **Table 5-24**. Based on the analysis, there were no benefited receivers and a barrier for Lakeside Methodist Church does not meet the cost feasible guideline. The receiver was placed in the playground area, east of the church.

TABLE 5-24

BARRIER ANALYSIS FOR LAKESIDE METHODIST CHURCH

Height/ Length (ft)	Number of Receivers with Insertion Loss of (dBA)					Number of Benefited Receivers	Total Estimated Cost	Cost per Benefited Receiver	Cost Reasonable Yes/No
	5- 5.9	6- 6.9	7- 7.9	8- 8.9	9+				
5 ¹ /795	0	0	0	0	0	0	\$119,302	N/A	N/A
6 ¹ /795	0	0	0	0	0	0	\$143,162	N/A	N/A
7 ¹ /795	0	0	0	0	0	0	\$167,022	N/A	N/A
8 ¹ /795	0	0	0	0	0	0	\$190,883	N/A	N/A
6 ² /765	0	0	0	0	0	0	\$137,740	N/A	N/A
8 ² /765	0	0	0	0	0	0	\$183,653	N/A	N/A
10 ² /765	0	0	0	0	0	0	\$229,566	N/A	N/A
12 ² /765	0	0	0	0	0	0	\$275,479	N/A	N/A
14 ² /765	0	0	0	0	0	0	\$321,393	N/A	N/A
16 ² /765	0	0	0	0	0	0	\$367,306	N/A	N/A
18 ² /765	0	0	0	0	0	0	\$413,219	N/A	N/A
20 ² /765	0	0	0	0	0	0	\$459,132	N/A	N/A
22 ² /765	0	0	0	0	0	0	\$505,045	N/A	N/A

¹Noise Barrier Wall located at outside edge of paved shoulder of mainline.

²Noise Barrier Wall located at right of way line.

A noise barrier was evaluated for the **Academy of Learning** private school as it is predicted to experience future noise levels that approach or exceed the NAC (see the previously referenced **Exhibit 5-20**). A noise barrier was evaluated along the right-of-way line at heights ranging from 6 feet to 22 feet. The results of these analyses are shown in **Table 5-25**. Based on the analysis, there were no benefited receivers and a barrier for the Academy of Learning does not meet the cost feasible guideline.

TABLE 5-25

BARRIER ANALYSIS FOR ACADEMY OF LEARNING

Height/ Length (ft)	Number of Receivers with Insertion Loss of (dBA)					Number of Benefited Receivers	Total Estimated Cost	Cost per Benefited Receiver	Cost Reasonable Yes/No
	5- 5.9	6- 6.9	7- 7.9	8- 8.9	9+				
6 ¹ /329	0	0	0	0	0	0	\$59,146	N/A	N/A
8 ¹ /329	0	0	0	0	0	0	\$78,862	N/A	N/A
10 ¹ /329	0	0	0	0	0	0	\$98,577	N/A	N/A
12 ¹ /329	0	0	0	0	0	0	\$118,293	N/A	N/A
14 ¹ /329	0	0	0	0	0	0	\$138,008	N/A	N/A
16 ¹ /329	0	0	0	0	0	0	\$157,724	N/A	N/A
18 ¹ /329	0	0	0	0	0	0	\$177,439	N/A	N/A
20 ¹ /329	0	0	0	0	0	0	\$197,155	N/A	N/A
22 ¹ /329	0	0	0	0	0	0	\$216,870	N/A	N/A

¹Noise Barrier Wall located at right of way line.

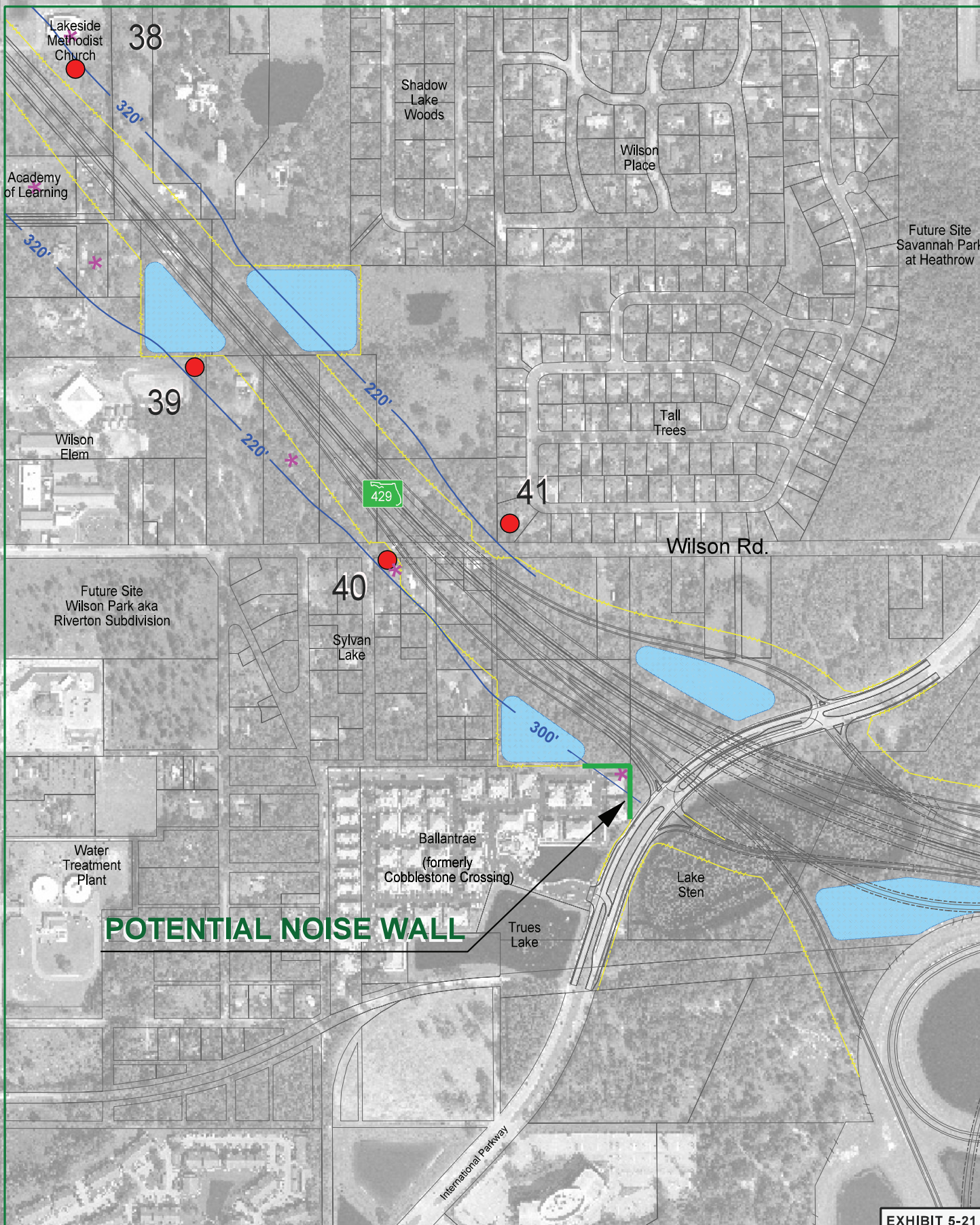
A noise barrier was evaluated for the **Ballantrae Apartments (formerly Cobblestone Crossing)** as it had one multi family structure with ten units predicted to experience future noise levels that approach or exceed the NAC (see **Exhibit 5-21**). A noise barrier was evaluated along the right-of-way line at heights ranging from 6 feet to 22 feet. The results of these analyses are shown in **Table 5-26**. Although a 12 foot barrier has a cost per benefited receiver of \$10,444 and benefits 10 residences, a 16 foot barrier is recommended. This 16 foot barrier has a cost per benefited receiver of \$13,926 and gives a higher insertion loss for these 10 residences. Along high speed, limited access highways, FDOT District 5 does not recommend walls less than 16 feet high unless there are special, abnormal circumstances.

TABLE 5-26

BARRIER ANALYSIS FOR BALLANTRAE APARTMENTS

Height/ Length (ft)	Number of Receivers with Insertion Loss of (dBA)					Number of Benefited Receivers	Total Estimated Cost	Cost per Benefited Receiver	Cost Reasonable Yes/No
	5- 5.9	6- 6.9	7- 7.9	8- 8.9	9+				
6 ¹ /290	0	0	0	0	0	0	\$52,221	N/A	N/A
8 ¹ /290	0	0	0	0	0	0	\$69,628	N/A	N/A
10 ¹ /290	0	0	0	0	0	0	\$87,034	N/A	N/A
12 ¹ /290	10	0	0	0	0	10	\$104,441	\$10,444	Yes
14 ¹ /290	0	0	10	0	0	10	\$121,848	\$12,185	Yes
16 ¹ /290	0	0	0	10	0	10	\$139,255	\$13,926	Yes
18 ¹ /290	0	0	0	0	10	10	\$156,662	\$15,666	Yes
20 ¹ /290	0	0	0	0	10	10	\$174,069	\$17,407	Yes
22 ¹ /290	0	0	0	0	10	10	\$191,476	\$19,148	Yes

¹Noise Barrier Wall located at right of way line.



POTENTIAL NOISE WALL

EXHIBIT 5-21

LEGEND

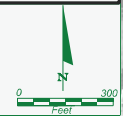
- Noise Monitoring Location
- Noise Contour (66 dBA/15 dBA increase)
- * Noise Impact Receptor
- Noise Wall



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 Cert. of Authorization No. 000072

WEEKIWA PARKWAY
 Project Development and Environment Study
 Orange, Lake & Seminole Counties

SEMINOLE COUNTY
 Ballantrae
 Noise Impact Plan Sheet
 MARCH 2008



5.4.5 Recommendations and Conclusions

The results of the noise abatement evaluation indicate:

- A 16 foot high noise barrier wall meets cost reasonable criteria for the Southernaire Mobile Home Park, Cobble Hill Village, and Dorset of Mount Dora subdivisions in the Lake County West project area.
- A 22 foot high noise barrier wall meets cost reasonable criteria for the Twelve Oaks RV Resort in the Seminole County project area.
- A 16 foot high noise barrier wall meets cost reasonable criteria for the Ballantrae Apartments (formerly Cobblestone Apartments) in the Seminole County project area.

Table 5-27 provides a summary of recommendations for the evaluated noise barriers.

TABLE 5-27

SUMMARY OF BARRIER ANALYSIS

SUMMARY OF BARRIER ANALYSIS									
Height/ Length (ft)	Number of Receivers with Insertion Loss of (dBA)					Number of Benefited Receivers	Total Estimated Cost	Cost per Benefited Receiver	Cost Reasonable Yes/No
	5- 5.9	6- 6.9	7- 7.9	8- 8.9	9+				
Southernaire Mobile Home Park, Cobble Hill Village, Dorset of Mount Dora									
16 ¹ /1788	0	3	6	8	11	28	\$858,016	\$30,643	Yes
Twelve Oaks RV Resort									
22 ¹ /1429	13	9	6	6	16	50	\$943,133	\$18,863	Yes
Ballantrae Apartments (formerly Cobblestone Apartments)									
16 ¹ /290	0	0	0	10	0	10	\$139,255	\$13,926	Yes

¹Noise Barrier Wall located at right of way line.

In this analysis, noise abatement is proposed based on the preferred alternative. If pertinent parameters change substantially for any reason, the noise barriers may be altered or eliminated from the final project design. A final decision on construction of noise barriers will be made upon public input and completion of the project design. The FDOT is committed to the construction of feasible noise abatement measures at noise-impacted receivers contingent upon the following: a) detailed noise analyses during the final design process supports the need for abatement; b) reasonable cost analysis indicates that the economic cost of the barrier will not exceed the FDOT guidelines; c) community input regarding desires, types, heights and locations of barriers has been solicited by the District Office; d) local officials have addressed preferences regarding compatibility with adjacent land uses; e) safety and engineering aspects as related to the roadway user and the adjacent property owner have been reviewed.

The owners of Southernaire Mobile Home Park in Mount Dora and Twelve Oaks RV Resort in Sanford were both advised that this is only a preliminary noise study and the potential affects of the proposed project would be reevaluated in final design. Mr. Tom Vellanti, owner of the 12 Oaks RV Resort, confirmed that the residents are there over 2/3 of the year. He indicated his opposition to the proposed project, but stated if it is actually constructed he would want a noise wall. Mr. Joseph Oxford, a representative of the Southernaire Mobile Home Park landowner Equity Lifestyle Properties (dba Southernaire MHP LLC), also indicated a noise wall would be wanted if the proposed project is constructed.