Dewberry

Design Traffic Noise Analysis Technical Memorandum

SR 417 Widening, CFX Projects 417-141, 417-142, and 417-149 (from International Drive to Boggy Creek Road)

October 2020

SUBMITTED BY:

Dewberry Engineers Inc.
800 North Magnolia Avenue
Suite 1000
Orlando, Florida 32803

PREPARED FOR:

Central Florida Expressway Authority
4974 Orl Tower Rd
Orlando, Florida 32807

Version Control Summary

Design Traffic Noise Analysis Technical Memorandum

SR 417 Widening, CFX Projects 417-141, 417-142 and 417-149
(from International Drive to Boggy Creek Road)

Title	Design Traffic Noise Analysis SR 417-141, 417-142 and 417-149		
Date Created	October 2019		
Maintained By	Dewberry Engineers Inc.		
Version Number	**Date Modified**	**Milestone/ Rationale**	**Modification Made**
Version 1	N/A	N/A	Initial Draft Technical Memorandum
Version 2	Nov. 2019	CFX Review	Address CFX comments / directions from 10/25/2019 meeting.
Version 3	January 2020	External QC	Updated report to address comments provided by external QC
Version 4	June 2020	90% Design Drawings	Updated segments 141 and 142 to reflect barriers identified in 90% design drawings.
Version 5	July 2020	90% Design Drawings	Updated segments 149 to reflect barriers identified in 90% design drawings.
Version 6	October 2020	Public Meetings & 100% Designs Completed	Documents Finalized

Design Traffic Noise Analysis
Technical Memorandum

SR 417 Widening, CFX Projects 417-141, 417-142, and 417-149
(from International Drive to Boggy Creek Road)

TABLE OF CONTENTS

TABLE OF CONTENTS, continued

LIST OF FIGURES

TABLE OF CONTENTS, continued

LIST OF TABLES

TABLE OF CONTENTS, continued

LIST OF APPENDICES

1.0 INTRODUCTION

The Central Florida Expressway Authority (CFX) prepared design plans for the widening of S.R. 417 from International Drive to Boggy Creek Road encompassing CFX Projects 417-141, 417-142, and 417-149. Specifically, each project will initially widen to the median for the addition of one general-use lane and one Part-Time Shoulder Use (PTSU) lane in each direction to completely close in the existing median. Infrastructure for the PTSU lane will be set up in the initial phase but will not be in operation until future traffic growth dictates its need. The general use lanes are also being designed to allow for an ultimate condition consisting of four general use lanes and one special use lane separated from the mainline with a 4.0-foot buffer. The ultimate condition will be constructed as the need occurs in the future. Project 417-142 (segment from John Young Parkway to Landstar Boulevard) will also reconfigure the northbound exit ramp to Landstar Boulevard to reduce weaving and provide for better traffic flow.

The location of these three contiguous projects is shown on Figure 1-1. This Technical Memorandum documents a traffic noise study identifying noise-sensitive areas that may be affected by the proposed ultimate condition. The abatement provided with this design will far exceed the initial need as part of the widening to be conducted for Projects 417-141, 417-142, and 417-149. The study evaluates various noise barriers as an abatement measure for sensitive areas determined to be impacted.

2.0 METHODOLOGY

The traffic noise analysis was performed following Code of Federal Regulations Title 23 Part 772 (23 CFR 772), Procedures for Abatement of Highway Traffic Noise and Construction Noise, 1 using methodology established by the Florida Department of Transportation (FDOT) in the Project Development and Environment Manual 2, Part 2, Chapter 18 (January 14, 2019). Consistent with 23 CFR 772, noise level predictions are generated using the Federal Highway Administration's (FHWA) Traffic Noise Model (TNM), version 2.5. TNM Version 2.5 is FHWA's current approved version of the model.

2.1 Noise Metrics

Noise levels developed for this analysis are expressed in decibels (dB) using an "A"-scale [dB(A)] weighting. This scale most closely approximates the response characteristics of the human ear to traffic noise. Predicted noise levels documented in this memorandum are reported as hourly equivalent noise levels [Leq(h)]. The Leq(h) is defined as the equivalent steady-state sound level that, in a given hourly period, contains the same acoustic energy as the time-varying sound level for the same hourly period. These noise metrics are consistent with those established by FHWA in 23 CFR 772.

2.2 Traffic Data

Traffic noise is heavily dependent on the speed of vehicles as the amount of noise generated by traffic is directly proportional to vehicle speed. To predict worst-case hourly equivalent noise levels, the maximum hourly traffic volume that still allows vehicles to travel at the speed limit is used in the noise model. The FDOT's Project Development and Environment Manual identifies the level of service (LOS) C traffic volumes as the level that typically produces worst-case noise conditions. Following FDOT procedure, LOS C traffic volumes have been used in the noise modeling unless forecasted demand traffic volumes are less than those for LOS C. A comparison of forecasted design year (2045) demand traffic volumes to LOS C conditions is provided in Table 2-1. The speed assigned to vehicles is based on existing or proposed speed limits.

Traffic noise is also dependent on the types of vehicles (e.g., automobiles, trucks) traveling the road. An hourly truck factor of 6.2 percent is used. The classification of trucks is further refined by splitting the 6.2 percent between medium trucks (i.e., 5.6 percent for vehicles with two axles and six tires) and heavy trucks (i.e., 0.6 percent for vehicles with more than two axles).

Table 2-1: Traffic Volume Data

SR417 Roadway Segment	Directional Design Hourly Volume (vehicles/hour)	LOS C Peak Hour Directional (vehicles/hour)	Worst –Case Traffic Condition For Modeling Purposes (LOS C or Demand)	Vehicle Speed (mph)
Design Year (2045) Build Condition				
I-Drive to JYP	7,430	7,020	LOS C	70
JYP to Landstar	9,070	7,020	LOS C	70
Landstar to Boggy Creek	8,400	7,020	LOS C	70
Ramp M	1,390	N/A	N/A	35

Source: Revision 2 of the memorandum from Carleen Flynn of CDM Smith to Glenn Pressimore of CFX, dated October 28, 2019.

2.3 Elevation Data

The relationships among the elevation of the road, ground elevations at potential noise barrier locations (e.g., right-of-way [ROW] line), and ground elevation at the noise receptors have an impact on the predicted noise level at residences as well as the amount of noise reduction provided by potential noise barriers. In the vicinity of the highway, elevations for a potential noise barrier location may be based on either the SR 417 Design Plans or U.S. Geological Survey (USGS) elevation data. Ground elevations at the residences and along ROWs are based on the USGS elevation data. Ground elevations for potential shoulder barriers are based on the current design elevations presented in the 100 % design cross-sections for each roadway design segment. The heights of barriers modeled in this analysis are relative to the elevations cited above which were used in the modeling analysis. Should these elevations be revised during the final design of the segments, the ultimate barrier elevation (i.e., elevation from data source plus modeled barrier height) used in the analysis will be maintained.

2.4 Noise Abatement Criterion

FHWA has established noise levels at which noise abatement is considered for various types of noise-sensitive sites. These levels, used for evaluating traffic noise, are referred to as the Noise Abatement Criterion (NAC). As shown in Table 2-2, 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 dB(A) of the FHWA criteria. For comparison purposes, typical noise levels associated with common indoor and outdoor activities are provided in Table 2-3.

Table 2-2: FHWA Noise Abatement Criterion

Activity Category	Activity Criterion Leq(h)		Evaluation Location	Activity Description
	FHWA	FDOT		
A	57	56	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	66	Exterior	Residential.
C	67	66	Exterior	Active sports areas, amphitheaters, auditoriums, campgrounds, cemeteries, daycare centers, hospitals, libraries, medical facilities, parks, picnic areas, places of worship, playgrounds, public meeting rooms, public or nonprofit institutional structures, radio studios, recording studios, recreation areas, Section 4(f) sites, schools, television studios, trails, and trail crossings.
D	52	51	Interior	Auditoriums, daycare centers, hospitals, libraries, medical facilities, places of worship, public meeting rooms, public or nonprofit institutional structures, radio studios, recording studios, schools, and television studios.
E	72	71	Exterior	Hotels, motels, offices, restaurants/bars, and other developed lands, properties, or activities not included in A through D or F.
F	------	------	------	Agriculture, airports, bus yards, emergency services, industrial, logging, maintenance facilities, manufacturing, mining, rail yards, retail facilities, shipyards, utilities (water resources, water treatment, electrical), and warehousing.
G	------	------	------	Undeveloped lands that are not permitted.

Source: 23 CFR Part 772, Procedures for Abatement of Highway Traffic Noise and Construction Noise, FHWA, 2010.
LEq(h) refers to the equivalent steady-state sound level which in a stated period of time contains the same acoustic energy as the time-varying sound level during the same time period, with Leq(h) being the hourly value of Leq.

Table 2-3 Typical Noise Levels

Common Outdoor Activities	Noise Level dB(A)	Common Indoor Activities
	---110---	Rock Band
Jet Fly-over at 1,000 ft		
	---100---	
Gas Lawn Mower at 3 ft		
	---90---	
Diesel Truck at 50 ft, at 50 mph		Food Blender at 1 m (3 ft)
	---80---	Garbage Disposal at 1 m (3 ft)
Noise Urban Area (Daytime)		
Gas Lawn Mower at 100 ft	---70---	
Commercial Area		
	---60---	Vacuum Cleaner at 10 ft
		Normal Speech at 3 ft
Heavy Traffic at 300 ft		
	---50---	
Quiet Urban Daytime		Large Business Office
	---40---	Dishwasher Next Room
Quiet Urban Nighttime		
	---30---	
Quiet Suburban		Theater, Large Conference Room (Background)
Nighttime	---20---	Library
Quiet Rural Nighttime	---10---	Bedroom at Night, Concert Hall (Background)
Lowest Threshold of Human Hearing	---0---	Lowest Threshold of Human Hearing

Source: California Department of Transportation Technical Noise Supplement, Oct. 1998, Page 18.

Noise abatement measures are also considered when a substantial increase in traffic noise would occur as a direct result of the transportation project. Consistent with FDOT methodology, a substantial increase is defined as 15 dB(A) or more above existing conditions. A substantial increase typically occurs in areas where traffic noise is a minor component of the existing noise environment but would become a more prevalent component after the project is constructed (e.g., new alignment highway). Since the projects consist of the widening of an existing highway, traffic is already predominately the existing noise source at sensitive sites along the project; a substantial increase in traffic noise attributable to the project will not occur at any sensitive site due to the widening projects' Noise-Sensitive Sites.

2.5 Noise Sensitive Sites

Noise-sensitive sites are modeled as receptor points. Receptor points representing the individual noise-sensitive sites are located in accordance with the FDOT Project Development and Environment Manual, Part 2, Chapter 18 as follows:

- Residential receptor points are located at the egress for the building which is an area of frequent exterior use, or closest to the major traffic noise source.
- Where residences are clustered together, a single receptor point may represent a group of residences with similar noise propagation path characteristics. The analysis of the modeling data incorporates the number of residences at the single receptor point.
- Receptor points for recreational facilities (e.g., tennis court, community swimming pool) are placed in an area where people would commonly be when using the facility.
- Ground-floor receptor points are assumed to be five feet above the ground elevation. For each additional floor above ground level, where exterior use occurs, the receptor points are assumed to be 10 feet for each additional floor above ground level (i.e., 15 feet for a second-floor receptor).

2.6 Noise Abatement Considerations

The widening project uses the existing alignment of SR 417. In addition, noise-sensitive sites (e.g., residences) are already established along the project. Consequently, noise barriers are the only potentially viable abatement measure that could be implemented as part of the project. Noise barriers reduce noise levels by blocking the sound path between a highway and a noise-sensitive site. To effectively reduce traffic noise, a noise barrier must be relatively long, continuous (no intermittent openings), and of sufficient height. For a noise barrier to be feasible as well as reasonable in cost, the following conditions should be considered:

- A noise barrier should provide a minimum noise reduction of seven dB(A) (noise-reduction design goal) at one or more impacted noise-sensitive sites with at least one additional impacted noise-sensitive site provided with a noise-reduction of five dB(A) or more.
- When evaluating a noise barrier for cost reasonableness, FDOT has established a limit of $42,000 per benefitted residence. A benefitted noise-sensitive site is defined as a site that would experience at least a five dB(A) reduction as a result of providing a noise barrier.
- For this analysis, a unit cost of $30 per square foot for all non-shoulder barriers. For shoulder barriers unit costs of $36 per square foot for 10-foot shoulder barriers, $38 per square foot for 12-foot shoulder barriers, and $40 per square foot for 14-foot shoulder barriers were also used. All estimated costs were rounded to the nearest dollar.

- For illustration purposes only, residences that received a "minor benefit" from the proposed noise barrier are indicated on the associated figures for each community. A "minor benefit" is defined as a noise reduction of less than five dB(A) that results in a modeled noise level of less than 66 dB(A), the defined impact level.

Consistent with the FDOT Design Manual, Section 264, limitations on noise barrier heights are as follows:

- Noise barriers on bridge or wall structures are limited to a maximum height of eight feet.
- Ground-mounted noise barriers at the shoulder point are limited to a maximum height of 14 feet.
- Noise barriers located outside the clear recovery zone are limited to a maximum height of 22 feet.

At some locations, noise barriers may provide a benefit at residences where predicted noise levels do not approach or exceed the NAC (see Figures 2-1 through 2-3). Neither the FHWA regulation nor FDOT procedures require abatement consideration at these residences. Consequently, noise barrier lengths or heights are not increased to benefit these residences. However, if experiencing an incidental benefit because of proximity to an impacted residence, these residences are included when determining cost per benefitted residence. This procedure is consistent with FHWA analysis and abatement guidance. Due to design considerations, aesthetics, and/or limitations of the noise modeling methodology, CFX may also propose noise barriers that exceed the cost reasonableness limit presented above. An example would be extending a noise barrier to maintain community continuity (i.e., avoid terminating a noise barrier in the middle of a community).

Because the proposed widening will be performed in phases, it is the preference of CFX to construct noise barriers along the ROW instead of the shoulder in order to avoid potential alteration/reconstruction of barriers during future projects. Accordingly, shoulder barriers have only been considered for locations where a ROW barrier is not considered feasible. Additionally, a combination shoulder/ROW barrier may be proposed for communities located in the vicinity of a bridge due to changes in roadway elevation. The specific rationale for these exceptions will be explained, as necessary, in the appropriate subsections of 3.4 below.

3.0 TRAFFIC NOISE ANALYSIS

Traffic noise analysis includes the identification of noise-sensitive sites and the prediction of traffic noise levels for design year (2045) ultimate build conditions. Noise barriers are evaluated for those sites with predicted noise levels that approach or exceed the NAC for design year build conditions.

3.1 Noise-Sensitive Site Locations

Noise-sensitive land uses in the vicinity of SR 417 from International Drive to Boggy Creek Road include residences with associated common use recreational areas and five schools. These noise-sensitive sites are classified by Activity Category of the NAC as follows:

- Residences are classified as Activity Category B.
- Common use recreational areas in residential communities are classified as Activity Category C.
- Schools are classified as Activity Category C.

Discussion regarding the schools and the recreational areas is presented with the adjacent communities as presented below:

- West Creek Elementary School (Section 3.4.2, Figure 3-2);
- Hunter's Creek Middle School (Section 3.4.8, Figure 3-6);
- Endeavor Elementary School (Section 3.4.9, Figure 3-10);
- Meadow Woods Elementary School (Section 3.4.14, Figure 3-15); and
- Meadow Woods Middle School (Section 3.4.16, Figure 3-18).

3.2 Noise Model Validation

Noise monitoring activities were performed on December 4, 2018, to verify the accuracy of TNM predictions for the project area within each model segment. Two 3M™ SoundPro Sound Level Meter Kit DL noise monitors (Serial Numbers BIK100005 and BJ1040011) were used to measure noise levels. The monitors were calibrated with QC-10 calibrators (Serial Numbers A02383 and QID20048) prior to measurements. Traffic data was provided by CFX for the time period during each monitoring event and used in the base TNM model (i.e. without proposed noise barriers) to predict noise levels. The model is considered valid if the predicted noise levels are within the acceptance limit of three dB(A). Results of the validation process are summarized in Table 3-1.

Table 3-1: Comparison of Noise Monitoring with Model Predictions

Monitoring Location	Date	Monitoring Results [dB(A)]	Modeling Results [dB(A)]	Difference	Within 3 dB(A)?
NM 1-B	12/4/2018	66.5	67.6	1.1	Yes
NM 2-D	12/4/2018	67.3	65.2	2.1	Yes
NM 3-A	12/4/2018	64.4	64.5	0.1	Yes
NM 3-B	12/4/2018	60.9	61	0.1	Yes

3.3 Predicted Noise Levels

Noise levels are predicted for the year 2045 build conditions at 1,155 receptor points representing more than 3,500 residences, the five schools identified above, and common use areas associated with residential communities (neighborhood gazebo, tennis courts, swimming pool, neighborhood barbecue areas, outdoor seating areas with tables). Predicted noise levels are provided in Appendix A for the receptor point locations depicted on Figures 3-1 through 3-25.

3.4 Noise Barrier Analysis

When evaluating noise barriers, residences or communities clustered in close proximity to each other are analyzed as a group to lower the cost per benefitted residence for a particular barrier. For example, the evaluation of a barrier where 33 receptors were modeled may represent 99 residences (three residential units for each receptor). Additionally, the length of each noise barrier is optimized for a particular height in an effort to achieve cost reasonableness while maintaining at least a five dB(A) reduction at impacted noise-sensitive sites.

3.4.1 Barrier NBP1 for Northbound Residences on SR 417 in Hunters Creek Community West of Hunters Vista Boulevard

Residences border SR 417 on the northbound side to the west of Hunters Vista Boulevard. Predicted exterior noise levels range from less than 61.2 dB(A) to 73.3 dB(A) with noise levels approaching or exceeding the NAC at 44 residences for the year 2045 build condition. Initially, only a 2,864-foot-long ROW barrier from Hunters Vista Boulevard extending west of the toll plaza was evaluated for this community.

The results of the noise barrier analysis are provided in Table 3-2. A noise barrier must be at least 10 feet high to meet the minimum noise reduction requirement of seven dB(A) for at least one residence. A noise barrier height of at least 22 feet is needed to provide a benefit [i.e., noise reduction greater than five dB(A)] to the maximum number of impacted residences (31) for this location for both barrier scenarios. The cost exceeds the

limit of $42,000 per benefitted residence for the longer barrier length but is below the $42,000 per benefitted residence criterion for the shorter length; therefore, this option is cost feasible.

After further review of the cross-sections and ground elevations for this community, it was determined that a combination ROW/shoulder barrier would be more appropriate. Therefore, the following alternative was analyzed:

- A combination 14-foot-high, 652-foot-long shoulder barrier approaching the bridge crossing over Hunters Vista Boulevard with a 20-foot-high 2,346-foot-long ROW barrier extending west of the toll plaza.

Incorporating the shoulder barrier for this segment into the proposed noise barrier design resulted in providing a benefit to 36 of the 53 impacted residences with the maximum benefit occurring with a 14-foot-high shoulder barrier. The cost for the hybrid barrier alternative still exceeds the limit of $42,000 per benefitted residence for the longer barrier length but is less than the selected ROW-only barrier alternative above.

Based on design and aesthetic considerations, CFX has selected the hybrid shoulder barrier combined with the noise barrier ROW alternative even though the cost effectiveness exceeds the FDOT criterion. The proposed noise barriers are shown on Figure 3-1.

3.4.2 Barrier SBP1 for Southbound Residences on SR 417 in Hunters Creek Community West of Hunters Vista Boulevard

Residences border SR 417 on the southbound side to the west of Hunters Vista Boulevard. Predicted exterior noise levels range from 63.3 dB(A) to 72.2 dB(A) with noise levels approaching or exceeding the NAC at 20 residences for the year 2045 build condition. Both ROW and shoulder barriers were evaluated for this community.

The results of the noise barrier analysis are provided in Table 3-3. A shoulder noise barrier height of 14 feet is required to meet the minimum noise reduction requirement of seven dB(A) for at least one residence and provides a benefit to 16 of the 20 impacted residences for this community.

The cost of this option is below the FDOT criterion of $42,000 per benefitted residence and has been selected by CFX. The proposed noise barrier is shown on Figure 3-2.

The West Creek Elementary School is located west of the Hunters Creek Community. Since only the parking lot and access roads associated with the school border the project, a noise barrier analysis has not been conducted for this school.

3.4.3 Barrier NBP2 for Northbound Residences on SR 417 in Hunters Creek Community East of Hunters Vista Boulevard

Residences border SR 417 on the northbound side to the east of Hunters Vista Boulevard. Predicted exterior noise levels range from 62.8 dB(A) to 70.1 dB(A) with noise levels approaching or exceeding the NAC at 10 residences for the year 2045 build condition. Both ROW and shoulder barriers were evaluated for this community for the following two scenarios:

- A 687-foot-long ROW barrier from Hunters Vista Boulevard extending east adjacent to storm water detention pond; and
- A 545-foot-long shoulder barrier extending 150 feet past the near side of the storm water detention pond.

The results of the noise barrier analysis are provided in Table 3-4. Neither a ROW noise barrier nor a shoulder noise barrier meets the minimum noise reduction requirement of seven dB(A) for at least one residence. A shoulder barrier height of 14 feet is needed to provide a benefit [i.e., noise reduction greater than five dB(A)] to the maximum number of impacted residences (four) for this location.

The cost of this option is above the FDOT criterion of $42,000 per benefitted residence but has still been selected by CFX, since the noise levels for all impacted receptors will be reduced below the NAC. The proposed noise barrier is shown on Figure 3-3.

3.4.4 Barrier SBP2 for Southbound Residences on SR 417 in Hunters Creek Community East of Hunters Vista Boulevard

Residences border SR 417 on the southbound side, to the east of Hunters Vista Boulevard. Predicted exterior noise levels range from 62.3 dB(A) to 70.1 dB(A) with noise levels approaching or exceeding the NAC at seven residences for the year 2045 build condition. Both ROW and shoulder barriers were evaluated for this community.

The results of the noise barrier analysis are provided in Table 3-5. Neither a shoulder barrier of 12 feet is required to meet the minimum noise reduction requirement of seven dB(A) for at least one residence. A shoulder barrier height of 12 feet provides a benefit [i.e., noise reduction greater than five dB(A)] to three impacted residences for this location. The cost of this option exceeds the FDOT criterion of $42,000 per benefitted residence; however, this option has still been selected by CFX as it provides benefits to all impacted residences in the community. The evaluated noise barrier is shown on Figure 3-4.

3.4.5 Barrier NBP3 for Northbound Residences on SR 417 in Hunters Creek Community Southwest of Town Loop Boulevard

Residences border SR 417 on the northbound side, to the southwest of Town Loop Boulevard. Predicted exterior noise levels range from 58.5 dB(A) to 69.1 dB(A), with noise levels approaching or exceeding the NAC at four residences for the year 2045 build condition. The community has constructed an earthen berm/brick wall that functions as a noise barrier and has been identified as NBP-3. Initially, no other noise barriers have been considered for this location. Subsequent to the public meeting on June 18, 2020, Dewberry revised the analysis to evaluate the cost effectiveness of an additional noise barrier for this community. Both ROW and shoulder barriers were evaluated for this community for the following two scenarios:

- 3,522-foot-long shoulder barrier from the bridge over Shingle Creek extending northeast adjacent to storm water detention pond; and
- 3,619-foot-long ROW barrier from Shingle Creek extending northeast adjacent to storm water detention pond.

The results of the noise barrier analysis are provided in Table 3-5A. The 3,619 -foot ROW barrier scenario meets the minimum noise reduction requirement of seven dB(A) for at least one residence. This ROW barrier with a height of 10 feet provides a benefit [i.e., noise reduction greater than five dB(A)] to all impacted residences (4) for this location. The cost of this option exceeds the FDOT criterion of $42,000 per benefitted residence. Additional modeling indicated that a minimum barrier length of 1,070 feet would be required to provide benefit to these four impacted residences. This additional alternative extended from the storm water detention in front of the existing earthen berm/brick wall along the ROW. The cost of this additional alternative still greatly exceeds the FDOT criterion of $42,000 per benefitted residence. Therefore, CFX is not proposing a barrier in this location. The existing noise barrier is shown on Figure 3-5.

3.4.6 Barrier SBP3 for Southbound Residences on SR 417 in Hunters Creek Community Southeast of Town Loop Boulevard

Residences border SR 417 on the southbound side, to the southeast of Town Loop Boulevard. Predicted exterior noise levels range from less than 54.8 dB(A) to 70.3 dB(A), with noise levels approaching or exceeding the NAC at 86 residences for the year 2045 build condition. Initially, only a ROW barrier was evaluated for this community.

The results of the noise barrier analysis are provided in Table 3-6. A ROW noise barrier height of at least 20 feet is required to meet the minimum noise reduction requirement of seven dB(A) for at least one residence and provide the maximum benefit [i.e., noise reduction greater than five dB(A)] to 86 impacted residences for this location. The cost of this option is below the FDOT criterion of $42,000 per benefitted residence.

After further review of the cross-sections and ground elevations for this community, it was determined that a combination ROW/shoulder barrier would be more appropriate. Therefore, the following additional scenario was analyzed:

- A combination 12-foot-high, 934-foot-long shoulder barrier from the bridge crossing over Town Loop Boulevard with a 20-foot-high, 1,932-foot-long ROW barrier extending northeast along the highway entrance ramp 150 feet past the beginning of the stormwater basin.

Incorporating the shoulder barrier for this segment into the proposed noise barrier design resulted in providing a benefit to 76 of the impacted residences, with a 12-foot-high shoulder barrier. The cost for the hybrid barrier alternative is below the FDOT criterion of $42,000 per benefitted residence and has been selected by CFX. The proposed noise barrier is shown on Figure 3-6.

Hunters Creek Middle School is located west of the Hunters Creek Community on the opposite side of Town Loop Boulevard. Since only the parking lot and access roads associated with the school border the project, a noise barrier analysis has not been conducted for this school.

3.4.7 Barrier NBP4 for Northbound Residences on SR 417 in Hunters Creek Community East of John Young Parkway

Residences border SR 417 on the northbound side, to the east of John Young Parkway. Predicted exterior noise levels were below 66 dB(A) with no noise levels approaching or exceeding the NAC for the year 2045 build condition. Therefore, a noise barrier evaluation was not performed. The predicted impacts for this community are shown on Figure 3-7.

3.4.8 Barriers SBP4 and SBP5 for Southbound Residences on SR 417 in Park Place at Hunters Creek Community

Residences border SR 417 on the southbound side, to the east of John Young Parkway. Predicted exterior noise levels range from less than 59.3 dB(A) to 71.9 dB(A), with noise levels approaching or exceeding the NAC at 52 residences for the year 2045 build condition. ROW and shoulder barriers were evaluated for this community for the following two scenarios:

- A 5,930-foot-long ROW barrier from South Orange Blossom Trail extending west adjacent to the storm water detention pond; and
- A 4,371-foot-long ROW barrier from South Orange Blossom Trail terminating prior to the storm water detention pond.

The results of the noise barrier analysis are provided in Table 3-7. The 4,371-foot ROW barrier scenario meets the minimum noise reduction requirement of seven dB(A) for at least one residence. This ROW barrier with a height of 20 feet provides a benefit [i.e.,

noise reduction greater than five dB(A)] to all of the impacted residences (52) for this location. The cost of this option exceeds the FDOT criterion of $42,000 per benefitted residence.

During review of underground utility locations during final design, it was determined that the preliminary placement of the noise barrier would need to be revised and an alternate configuration that included a combination of two ROW barriers with a shoulder barrier would be required. Therefore, the following additional scenario was analyzed:

- A combination of a 1,612-foot-long ROW, 1,216-foot-long, 8-foot-high shoulder barrier / noise wall per FDOT Index 5210 and 2,155-foot-long ROW barriers.

The cost of this option also slightly exceeds the FDOT criterion of $42,000 per benefitted residence; however, this option has still been selected by CFX since it provides benefit to all impacted receptors. The noise barriers used in the modeling analysis are shown on Figures 3-8 and 3-9.

3.4.9 Barrier NBP5 for Northbound Residences on SR 417 in the Courtney Chase Community

Residences border SR 417 on the northbound side to the east of Balcombe Road. Predicted exterior noise levels range from 47.6 dB(A) to 73.7 dB(A) with noise levels approaching or exceeding the NAC at 150 residences for the year 2045 build condition. Only a shoulder barrier was evaluated for this community.

The results of the noise barrier analysis are provided in Table 3-8. A shoulder noise barrier height of 10 feet provides the maximum benefit [i.e., noise reduction greater than five dB(A)] to all impacted residences for this location and meets the minimum noise reduction requirement of seven dB(A) for at least one residence. The cost of this option is below the FDOT criterion of $42,000 per benefitted residence and has been selected by CFX. The proposed noise barrier is shown on Figure 3-10.

Endeavor Elementary School is located immediately west of the Courtney Chase Community. The predicted noise levels for the public use areas of the school exceed the NAC of 66 dB(A) for the year 2045 build condition. CFX has proposed to extend the proposed noise barrier NBP5 west to Balcomb Road to reduce the predicted noise levels below the NAC.

3.4.10 Barrier SBP6 for Southbound Residences on SR 417 in South Chase Community East of Balcombe Road

Residences border SR 417 on the southbound side to the east of Balcombe Road. Predicted exterior noise levels range from 63.9 dB(A) to 71 dB(A) with noise levels approaching or exceeding the NAC at 34 residences for the year 2045 build condition. Only a ROW barrier was evaluated for this community.

The results of the noise barrier analysis are provided in Table 3-9. A ROW noise barrier height of at least 10 feet is required to meet the minimum noise reduction requirement of seven dB(A) for at least one residence. A ROW barrier height of 22 feet is needed to provide a benefit [i.e., noise reduction greater than five dB(A)] to the maximum number of impacted residences (18) for this location. The cost of this option exceeds the FDOT criterion of $42,000 per benefitted residence; however, this option has still been selected by CFX as it only slightly exceeds this threshold. The noise barriers used in the modeling analysis are shown on Figure 3-11.

3.4.11 Barrier NBP6 for Northbound Residences on SR 417 in the Rosewood Community

Residences border SR 417 on the northbound side to the east of Orange Avenue. Predicted exterior noise levels were below 66 dB(A) with no noise levels approaching or exceeding the NAC for the year 2045 build condition. Therefore, a noise barrier evaluation was not performed. The predicted impacts for this community are shown on Figure 3-12.

The proposed widening project in this section also includes the construction of an elevated off-ramp (designated Ramp M) from southbound Florida Turnpike to northbound SR 417. The elevated ramp will include a Mechanically Stabilized Earth (MSE) wall along the ROW which will function as a noise barrier for this community. This eight-foot wall will extend along the ramp across the FDOT rail crossing and will provide additional benefit to the impacted residences in the Pinnacle Point Community. Since there is no incremental cost associated with this option, a cost-benefit analysis for the noise barrier has not been conducted and all reductions greater than 5 dB(A) have been proposed. The noise barrier is shown on Figure 3-12.

3.4.12 Barrier NBP7 for Northbound Residences on SR 417 in the Pinnacle Point Community

Residences border SR 417 on the northbound side to the west of Landstar Boulevard. Predicted exterior noise levels were below 66 dB(A) with no noise levels approaching or exceeding the NAC for the year 2045 build condition. Therefore, a noise barrier evaluation was not performed. The predicted impacts for this community are shown in Figure 3-13.

3.4.13 Barrier SBP7 for Southbound Residences on SR 417 in the Meadow Woods Community West of Landstar Boulevard

Residences border SR 417 on the southbound side, to the west of Landstar Boulevard. Predicted exterior noise levels range from 62.6 dB(A) to 73.3 dB(A) with noise levels exceeding the NAC at 120 residences for the year 2045 build condition. A noise barrier located 10 feet inside the SR 417 ROW line was evaluated for this location for the following two scenarios:

- A 896-foot-long ROW barrier located between the two community storm water detention ponds; and
- A 1,325-foot-long shoulder barrier from the railroad extending east adjacent to the storm water detention pond.

The results of the noise barrier analysis are provided in Table 3-10. A ROW noise barrier height of 18 feet is required to meet the minimum noise reduction requirement of seven dB(A) for at least one residence. A shoulder barrier height of 10 feet provides a benefit [i.e., noise reduction greater than five dB(A)] to the maximum number of impacted residences (120) for this location. The cost of this option is below the FDOT criterion of $42,000 per benefitted residence and has been selected by CFX. The proposed noise barrier is shown on Figure 3-14.

3.4.14 Barrier SBP8 for Southbound Residences on SR 417 in the Meadow Woods Community East of Landstar Boulevard

Residences border SR 417 on the southbound side, to the east of Landstar Boulevard. Predicted exterior noise levels range from 65 dB(A) to 72.9 dB(A), with noise levels approaching or exceeding the NAC at 40 residences for the year 2045 build condition. A 2,810-foot barrier running from Texas Woods Circle west beyond Oklahoma Woods Court and a portion of the exit ramp has been evaluated for this location.

The results of the noise barrier analysis are provided in Table 3-11. A ROW noise barrier height of at least 14 feet is required to meet the minimum noise reduction requirement of seven dB(A) for at least one residence. A ROW barrier height of 22 feet provides a benefit [i.e., noise reduction greater than five dB(A)] to the maximum number of impacted residences (33) for this location. The cost of this option exceeds the FDOT criterion of $42,000 per benefitted residence; however, this scenario results in all impacted residences having a predicted noise level below the 66 dB(A) threshold. The shorter 2,276-foot noise barrier analysis was evaluated but resulted in less residences benefitted. Therefore, the 2,810-foot alternative has been selected by CFX for this location. The proposed noise barrier is shown on Figure 3-15.

The Meadow Woods Elementary School is located immediately west of the Meadow Woods Village Community. The predicted noise levels for the public use areas of the school are less than the NAC of 66 dB(A) for the year 2045 build condition with the barrier; therefore, proposed by CFX has elected to extend the barrier in front of the entire school.

3.4.15 Barriers NBP8 and NBP9 for Northbound Residences on SR 417 in the Portofino Meadows, Chatham Place at Arbor Meadows, and Island Walk Communities

Residences border SR 417 on the northbound side, to the east of Landstar Boulevard. Predicted exterior noise levels range from 64.4 dB(A) to 75.9 dB(A), with noise levels

approaching or exceeding the NAC at 269 residences for the year 2045 build condition. Due to site constraints, a hybrid barrier was the only feasible option. The following scenario was evaluated for this location:

- A combination 12-foot-high, 1,870-foot-long shoulder barrier approaching the bridge crossing over Rhode Island Woods Circle with a 22-foot-high 3,594-foot-long ROW barrier.

After further design review and consideration a shoulder barrier was added north of the stormwater retention pond at the southwestern end of Portofino Meadows.

The results of the noise barrier analysis are provided in Table 3-12. The combined 22-foot-high ROW barrier and 12-foot-high shoulder noise barrier meet the minimum noise reduction requirement of seven dB(A) for at least one residence and benefits 267 of the 269 impacted residences. The cost for the hybrid barrier is below the limit of $42,000 per benefitted residence and selected by CFX for this location. The proposed noise barriers are shown on Figures 3-16 and 3-17.

3.4.16 Barrier SBP9 for Southbound Residences on SR 417 in the Harbor Lakes Community

Residences border SR 417 on the southbound side, to the west of Rhode Island Circle. Predicted exterior noise levels range from 68.7 dB(A) to 77 dB(A) with noise levels approaching or exceeding the NAC at 27 residences for the year 2045 build condition. The following barriers were evaluated for this community:

- A 1,346-foot-long ROW barrier; and
- A 1,343-foot-long shoulder barrier.

The results of the noise barrier analysis are provided in Table 3-13. A ROW noise barrier height of at least 18 feet is required to meet the minimum noise reduction requirement of seven dB(A) for at least one residence. A shoulder barrier height of 14 feet provides a benefit [i.e., noise reduction greater than five dB(A)] to the maximum number of impacted residences (24) for this location. The cost of this option is below the FDOT criterion of $42,000 per benefitted residence and has been selected by CFX for this location. The proposed noise barrier is shown on Figure 3-18.

The Meadow Woods Middle School is located immediately east of the Harbor Lakes Community. The predicted noise levels for the public use areas of the school are less than the NAC of 66 dB(A) for the year 2045 build condition; therefore, no extension of the proposed noise barrier is required.

3.4.17 Barrier NBP11 for Northbound Residences on SR 417 in the Meadow Creek Community

Residences border SR 417 on the northbound side, to the east of Rhode Island Woods Circle. Predicted exterior noise levels range from less than 65.9 dB(A) to 75.5 dB(A), with noise levels approaching or exceeding the NAC at 59 residences for the year 2045 build condition. A 1,779-foot-long shoulder barrier from the bridge crossing over Rhode Island Woods Circle was evaluated for this community.

The results of the noise barrier analysis are provided in Table 3-14. A shoulder barrier height of 14 feet provides a benefit [i.e., noise reduction greater than five dB(A)] to the maximum number of impacted residences (32) for this location. The cost for the option is below the FDOT criterion of $42,000 per benefitted residence and has been selected by CFX. The proposed noise barrier is shown on Figure 3-19.

3.4.18 Barrier NBP12 for Northbound Residences on SR 417 in Somerset Park Community

Residences border SR 417 on the northbound side, to the west of Wyndham Lakes Boulevard. Predicted exterior noise levels range from less than 63.4 dB(A) to 71.9 dB(A) with noise levels approaching or exceeding the NAC at 76 residences for the year 2045 build condition. Initially, a 4,918-foot-long ROW barrier from Wyndham Lakes Boulevard extending west beyond the toll plaza was evaluated for this community. After further design considerations a 3,786-foot-long ROW barrier and a 1,270-foot-long index shoulder barrier was evaluated. The ROW barrier will extend along the toll plaza in front of the western most retention basin, then wrap around behind the center basin between the community and the basin. The shoulder index barrier will be placed between SR 417 and the eastern retention basin.

The results of the noise barrier analysis are provided in Table 3-15. A 10-foot ROW noise barrier alternative in this community was able to meet the minimum noise reduction requirement of seven dB(A) for at least one residence. A combined ROW barrier 3,786 feet in length and 22 feet height and index shoulder barrier 1,270 feet in length and 14 feet height is needed to provide a benefit [i.e., noise reduction greater than five dB(A)] to the maximum number of impacted residences (62) for this location.

The cost of this option is slightly above the FDOT criterion of $42,000 per benefitted residence but has still been selected by CFX for this location since 62 of the 76 impacted residences will be below the 66 dB(A) level. The proposed noise barrier is shown on Figure 3-20.

3.4.19 Barrier SBP10 for Southbound Residences on SR 417 in Beacon Park Community

Predicted exterior noise levels range from 34.5 dB(A) to 69.1 dB(A) with noise levels approaching or exceeding the NAC at four residences for the year 2045 build condition. Only a ROW barrier was evaluated for this community.

The results of the noise barrier analysis are provided in Table 3-16. No noise barrier alternative used in the analysis provided benefit to the impacted residences, so no barrier has been selected by CFX for this location. The noise barrier used in the modeling analysis is shown on Figure 3-21.

3.4.20 Barrier SBP11 for Southbound Residences on SR 417 in La Cascada Community

Residences border SR 417 on the southbound side, to the east of Rhode Island Wood Court. Predicted exterior noise levels range from 61.5 dB(A) to 66.4 dB(A) with noise levels approaching or exceeding the NAC at 7 residences for the year 2045 build condition. Only a ROW barrier was evaluated for this community.

The results of the noise barrier analysis are provided in Table 3-17. The cost of this option is above the FDOT criterion of $42,000 per benefitted residence. Additionally, design considerations include a potential future ramp in the toll plaza area during the ultimate buildout. A supplemental analysis for this community for the four-lane build out also confirmed that a barrier would not be feasible. Should CFX pursue the ultimate buildout, a revised noise analysis would be required for this community. The noise barrier used in the modeling analysis is shown on Figure 3-22.

3.4.21 Barrier SBP12 for Southbound Residences on SR 417 in the Beacon Park Community

Residences border SR 417 on the southbound side to the west of Wyndham Lakes Boulevard. Predicted exterior noise levels range from 64.3 dB(A) to 74.3 dB(A) with noise levels approaching or exceeding the NAC at 94 residences for the year 2045 build condition. Initially, only a ROW barrier was evaluated for this community.

The results of the noise barrier analysis are provided in Table 3-18. A ROW noise barrier height of at least 14 feet is required to meet the minimum noise reduction requirement of seven dB(A) for at least one residence. A ROW barrier height of 22 feet provides a benefit [i.e., noise reduction greater than five dB(A)] to the maximum number of impacted residences (88) for this location. The cost of this option is below the FDOT criterion of $42,000 per benefitted residence.

After further review of the cross-sections and ground elevations for this community, it was determined that a combination ROW/shoulder barrier would be more appropriate. Therefore, the following additional scenario was analyzed:

- A combination 14-foot-high, 964-foot-long shoulder barrier from the bridge crossing over Wyndham Lake Boulevard with a 22-foot-high, 1,620-foot-long ROW barrier extending west of the toll plaza.

Incorporating the 14-foot-high shoulder barrier for this segment into the proposed noise barrier design resulted in two additional residences benefitted. The cost for the hybrid barrier alternative was below the limit of $42,000 per benefitted residence and was selected by CFX. The proposed noise barrier is shown on Figure 3-23.

3.4.22 Barrier NBP13-S for Northbound Residences on SR 417 in Somerset Crossings Boulevard Community

Residences border SR 417 on the northbound side, to the east of Wyndham Lakes Boulevard. Predicted exterior noise levels range from 61.3 dB(A) to 73.7 dB(A) with noise levels approaching or exceeding the NAC at 116 residences for the year 2045 build condition. A noise barrier located inside the shoulder of the expanded highway was evaluated for this location. Due to design considerations an Index 521 barrier was also evaluated.

The results of the noise barrier analysis are provided in Table 3-19. A shoulder barrier height of at least 12 feet is required to meet the minimum noise reduction requirement of seven dB(A) for at least one residence. A Index 521 shoulder barrier height of 14 feet provides a benefit [i.e., noise reduction greater than five dB(A)] to 86 residences for this location. The cost of this option is below the FDOT criterion of $42,000 per benefitted residence and has been selected by CFX for this location. The proposed noise barrier is shown on Figures 3-24.

3.4.23 Barrier NBP13 for Northbound Residences on SR 417 in Beacon Park Boulevard Community

Residences border SR 417 on the northbound side, to the west of Boggy Creek Road. Predicted exterior noise levels range from 60 dB(A) to 69.6 dB(A) with noise levels approaching or exceeding the NAC at 30 residences for the year 2045 build condition. A noise barrier located inside between the large retention basin and the residences was evaluated for this location.

The results of the noise barrier analysis are provided in Table 3-20. A ROW barrier height of at least 14 feet is required to meet the minimum noise reduction requirement of seven dB(A) for at least one residence. A ROW barrier height of 14 feet provides a benefit [i.e., noise reduction greater than five dB(A)] to the maximum number of impacted residences (98) for this location. The cost of this option is almost twice the FDOT criterion of

$42,000 per benefitted residence. Therefore, no noise barrier was recommended. The community is shown on Figure 3-25.

4.0 CONCLUSIONS

Since the projects consist of widening an existing highway, traffic is already predominately the existing noise source at sensitive sites along the project and a substantial increase in traffic noise attributable to the project will not occur at any sensitive site due to the widening projects.

For the Year 2045 build condition, noise levels are predicted to approach or exceed the NAC at 1213 residences. Noise barriers were not cost-reasonable for several communities with impacted residences because the cost per benefit would exceed the FDOT standard in each area. These communities are:

- Beacon Park
- Beacon Park Boulevard
- La Cascada

Noise barriers were proposed by CFX for several communities as detailed in Figures 2-1 through 2-3. Property owners and residents who would be affected by a noise barrier were surveyed to establish public support or opposition to the construction of a noise barrier. The construction of the proposed highway improvements will proceed as presented to the public during the associated public meetings. The results of the public survey will be documented in an addendum to this Design Traffic Noise Analysis Technical Memorandum. If a majority of the affected property owners and residents support the construction of a noise barrier, the noise barriers described in Table 4-1 will be included in the design plans for the project and constructed as part of the project.

5.0 CONSTRUCTION NOISE

Using FDOT's listing of vibration-sensitive sites, residences were identified as the only nearby land use potentially sensitive to vibration generated during construction. During final design, it will be determined whether provisions to control vibration are necessary. The project's construction provisions will be modified as needed.

6.0 PUBLIC COORDINATION

A Pre-Construction Meeting was held on June 18, 2020 to discuss Segments 417-141 and 417-142. The meeting was held virtually with a video presentation and provided an opportunity for the public, especially impacted residences, to ask questions about the project. A second Pre-Construction Meeting was held on July 22, 2020 to address Segment 417-149. This second meeting was also held virtually. Comments received at both of these meetings were responded to by CFX,

7.0 NOISE WALL NOMENCLATURE

To facilitate comparison of the noise walls referenced in the Traffic Noise Analysis Technical Memorandum to the noise walls referenced in the 100% design drawings Table 6-1 is provided. Only noise walls that have been identified for construction appear in this table.

Table 7-1: Comparison of Noise Wall Naming in Report vs. Design Drawings

Segment	Noise Report	100 % Design Drawings
141	NBP1	NW1
	NBP1S	NW2
	NBP2	NW3
	SBP1	NW4
	SBP2	NW5
	SBP3S	NW6
	SBP3	NW7
142	SBP4-5	NW1
		NW2
		NW3
	NBP5	NW4
	SBP6	NW5
	SBP7	NW7
149	SBP8	SBP8
	SBP9	Index Wall
	NBP 8 and 9	NBP9
	NBP11	Index Wall
	NBP12	NBP12
	SBP12	SBP12
	NBP13S	Index Wall

8.0 REFERENCES

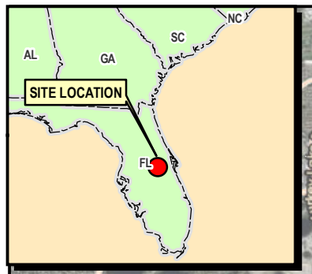
Procedures for Abatement of Highway Traffic Noise and Construction Noise; Federal Highway Administration; Washington, DC; July 2010.

Project Development and Environment Manual, Part 2, Chapter 18; Florida Department of Transportation; Tallahassee, Florida; January 14, 2019.

FHWA Traffic Noise Model (FHWA TNM®) Technical Manual, US Department of Transportation, 1998 and updates

Figures

www.dewberry.com



End Segment 1

End Segment 2

End Segment 3

Begin Project

LEGEND

- Segment End Points
- Begin Project
- SR 417 Project Limits

0 3,000 6,000 12,000 Feet

Source: World Imagery Online Service, ESRI

Central Florida Expressway Authority

SR 417 Widening - CFX Project No.'s 417-141, 417-142 & 417-149
(from International Drive to Boggy Creek Road)
Orange County, Florida

PROJECT LOCATION

Dewberry

October 2020

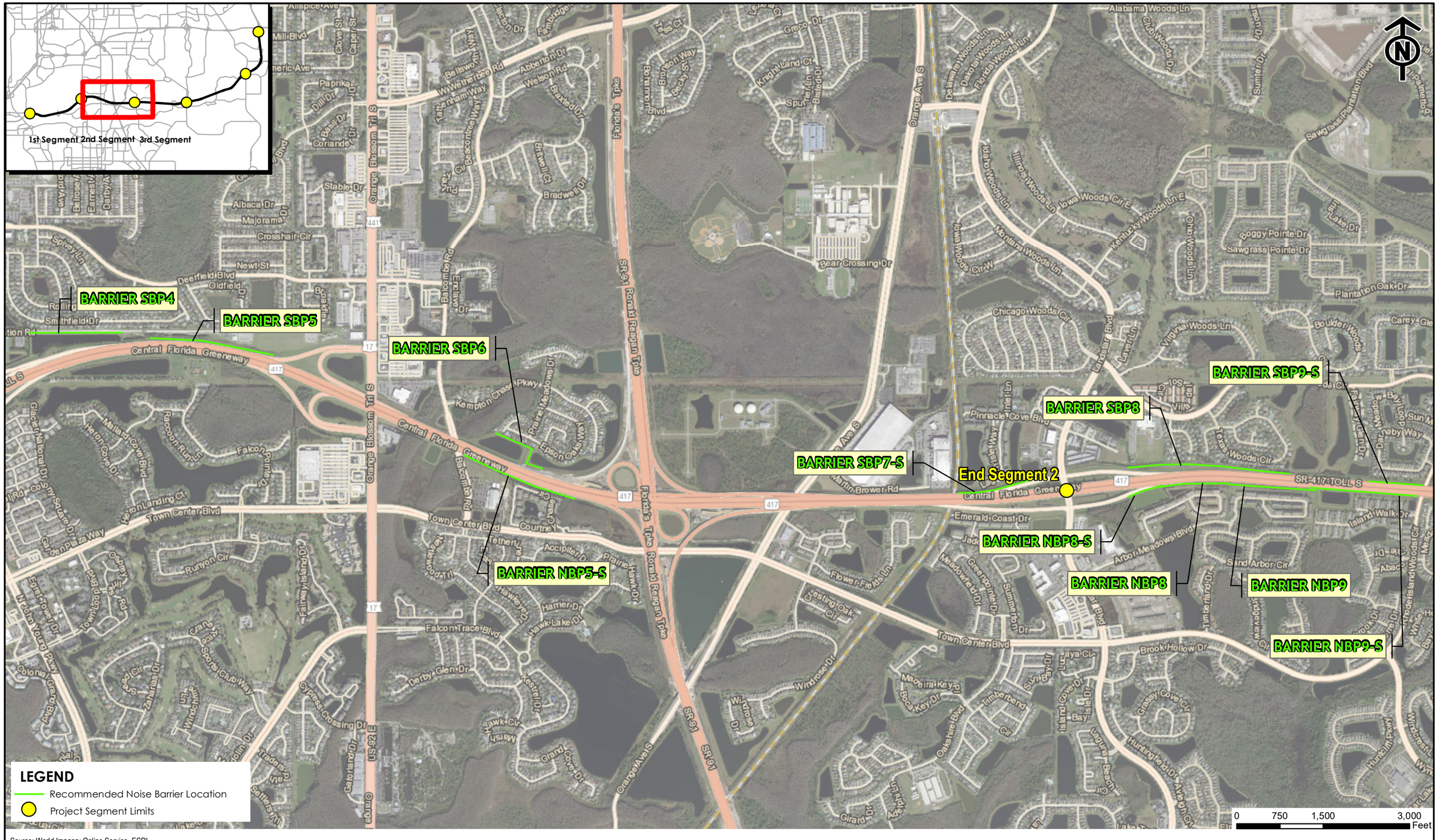
FIGURE 1-1

Path: Q:\50088262\GIS\Mxd\10-15-2020\1.1_Site_Location_Map_Updated_10-15-2020.mxd

Source: World Imagery Online Service, ESRI

Central Florida Expressway Authority	SR 417 Widening - CFX Project No.'s 417-141, 417-142 & 417-149 (from International Drive to Boggy Creek Road) Orange County, Florida **PROPOSED NOISE BARRIER LOCATIONS - 1**	Dewberry October 2020 **FIGURE 2-1**

Path: Q:\50088262\GIS\Mxd\10-15-2020\2-1_Noise Barrier Locations_10-15-2020.mxd



Source: World Imagery Online Service, ESRI

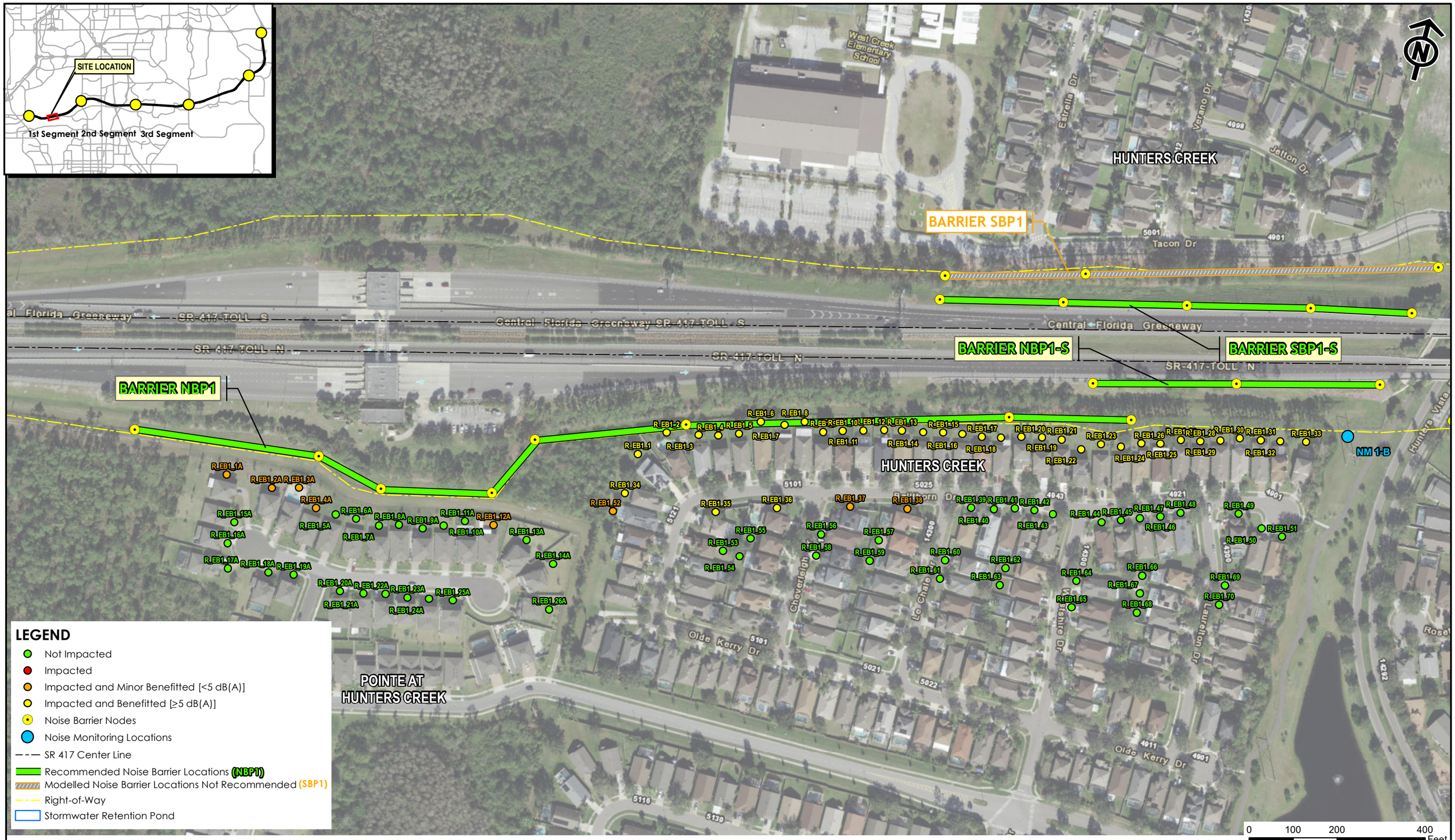
Central Florida Expressway Authority	SR 417 Widening - CFX Project No.'s 417-141, 417-142 & 417-149 (from International Drive to Boggy Creek Road) Orange County, Florida **PROPOSED NOISE BARRIER LOCATIONS - 2**	Dewberry October 2020 **FIGURE 2-2**

Path: Q:\50088262\GIS\Mxd\10-15-2020\2-2_Noise Barrier Locations_10-15-2020.mxd

Source: World Imagery Online Service, ESRI

Central Florida Expressway Authority	SR 417 Widening - CFX Project No.'s 417-141, 417-142 & 417-149 (from International Drive to Boggy Creek Road) Orange County, Florida **PROPOSED NOISE BARRIER LOCATIONS - 3**	Dewberry	October 2020 **FIGURE 2-3**

Path: Q:\50088262\GIS\Mxd\10-15-2020\2-3_Noise Barrier Locations_10-15-2020.mxd



Source: World Imagery Online Service, ESRI

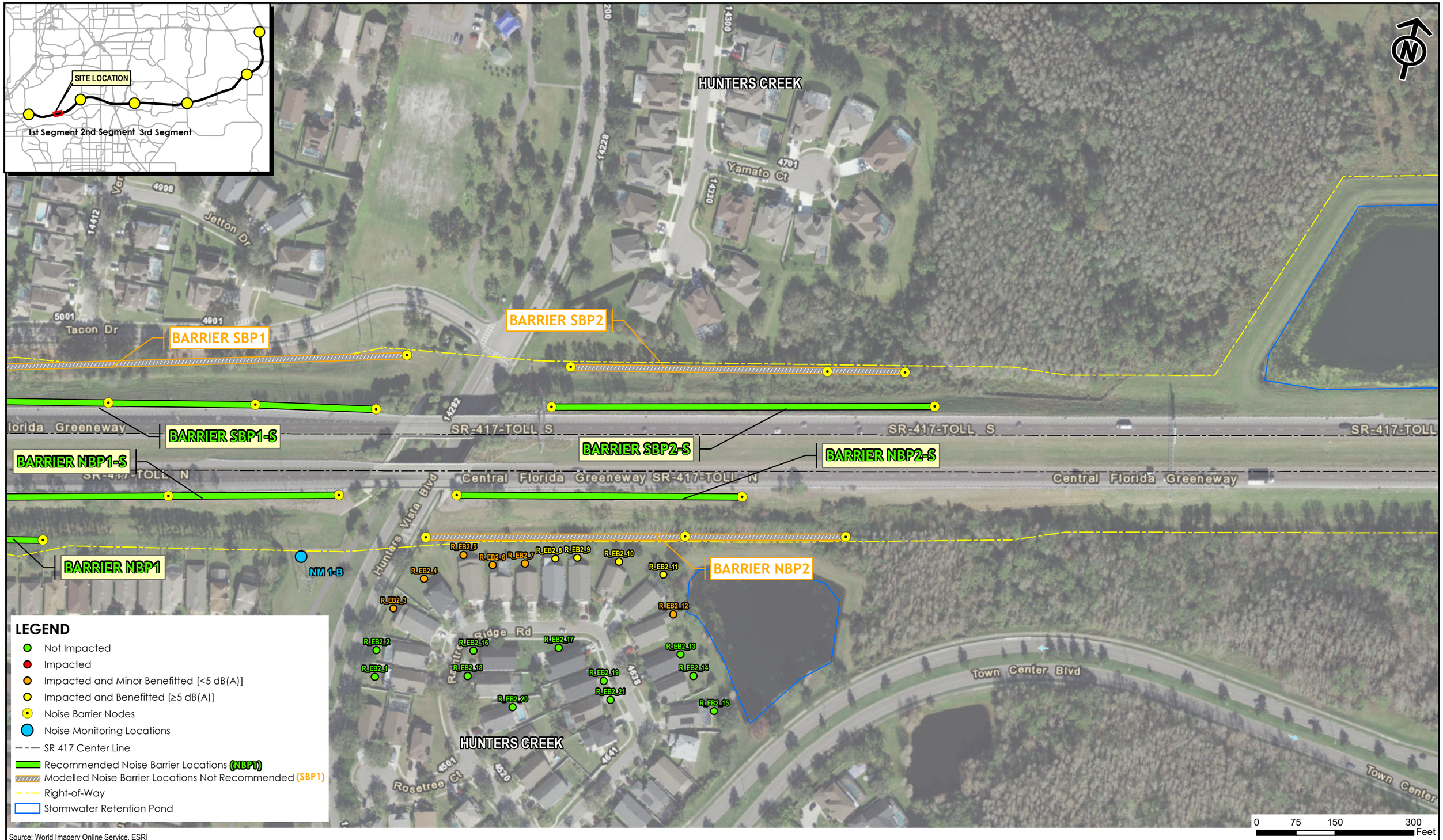
Central Florida Expressway Authority	SR 417 Widening - CFX Project No.'s 417-141, 417-142 & 417-149 (from International Drive to Boggy Creek Road) Orange County, Florida **NOISE BARRIER ANALYSIS - POINTE AT HUNTERS CREEK & HUNTERS CREEK COMMUNITIES (NBP1 & NBP1-S)**	Dewberry October 2020 **FIGURE 3-1**

Path: Q:\50088262\GIS\Mxd\10-15-2020\3-1_NoiseBarrier_NBP1_PointeatHuntersCreekandHuntersCreekCommunities_10-15-2020.mxd

Source: World Imagery Online Service, ESRI

Central Florida Expressway Authority	SR 417 Widening - CFX Project No.'s 417-141, 417-142 & 417-149 (from International Drive to Boggy Creek Road) Orange County, Florida **NOISE BARRIER ANALYSIS - HUNTERS CREEK COMMUNITY (SBP1-S)**	Dewberry®	October 2020 **FIGURE 3-2**

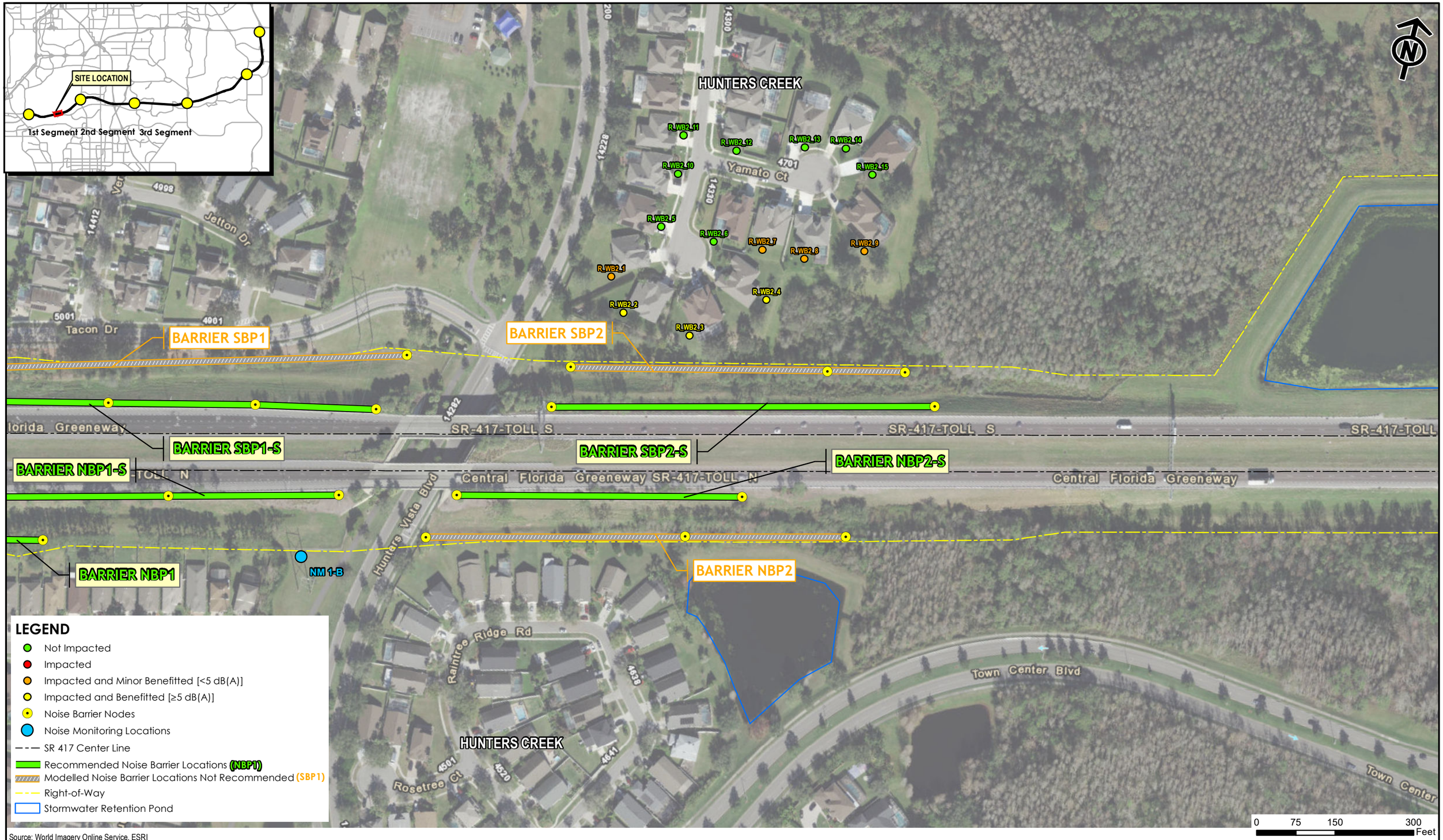
Path: Q:\50088262\GIS\Mxd\10-15-2020\3-2_NoiseBarrier_SBP1_S_HuntersCreekCommunity_10-15-2020.mxd



Source: World Imagery Online Service, ESRI

Central Florida Expressway Authority	SR 417 Widening - CFX Project No.'s 417-141, 417-142 & 417-149 (from International Drive to Boggy Creek Road) Orange County, Florida **NOISE BARRIER ANALYSIS - HUNTERS CREEK COMMUNITY (NBP2-S)**	Dewberry October 2020 **FIGURE 3-3**

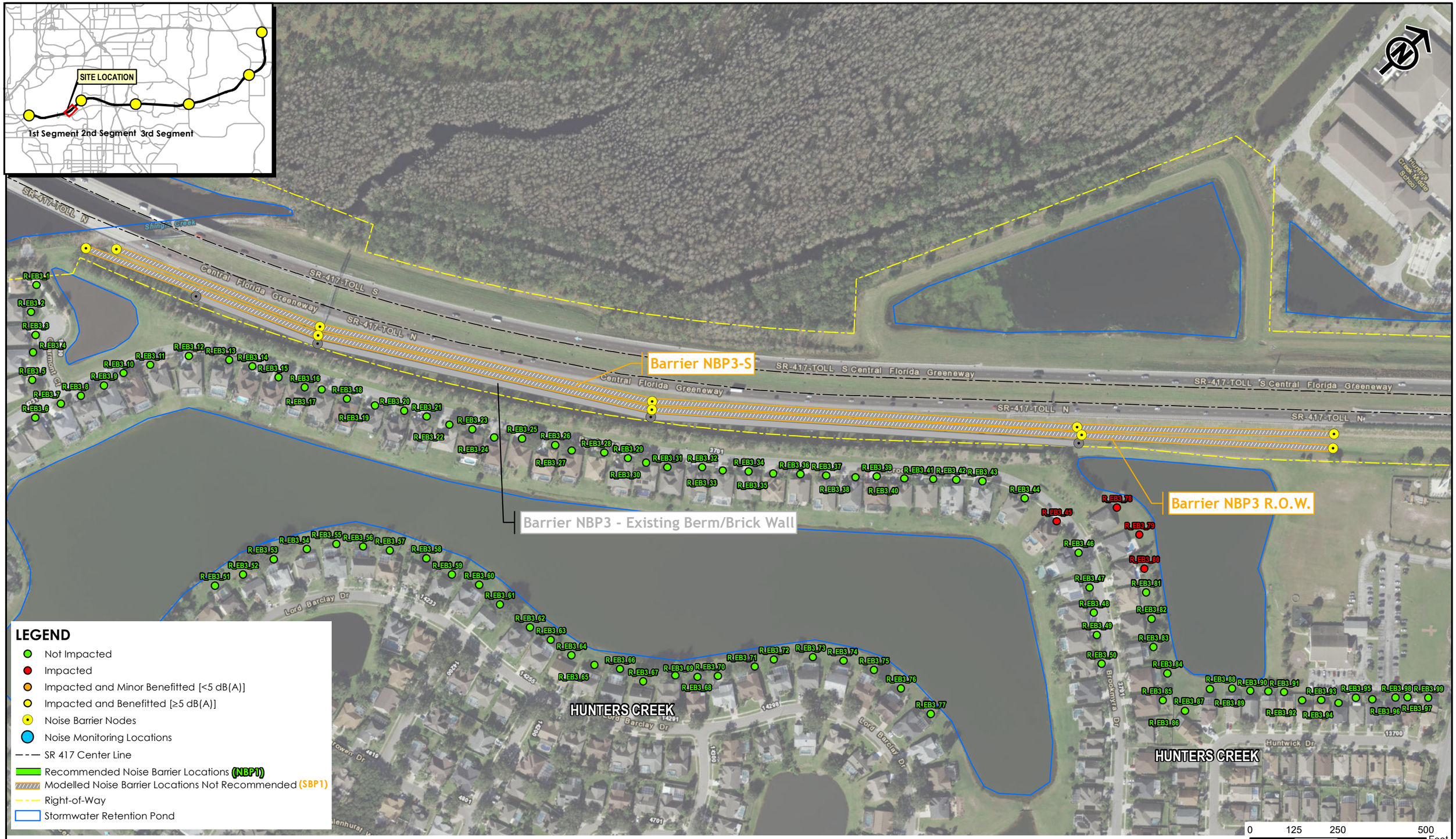
Path: Q:\50088262\GIS\Mxd\10-15-2020\3-3_NoiseBarrier_NBP2_HuntersCreekCommunities_10-15-2020.mxd



Source: World Imagery Online Service, ESRI

Central Florida Expressway Authority	SR 417 Widening - CFX Project No.'s 417-141, 417-142 & 417-149 (from International Drive to Boggy Creek Road) Orange County, Florida **NOISE BARRIER ANALYSIS - HUNTERS CREEK COMMUNITY (SBP2-S)**	Dewberry	October 2020 **FIGURE 3-4**

Path: Q:\50088262\GIS\Mxd\10-15-2020\3-4_NoiseBarrier_SBP2_S_HuntersCreekCommunities_10-15-2020.mxd



Source: World Imagery Online Service, ESRI

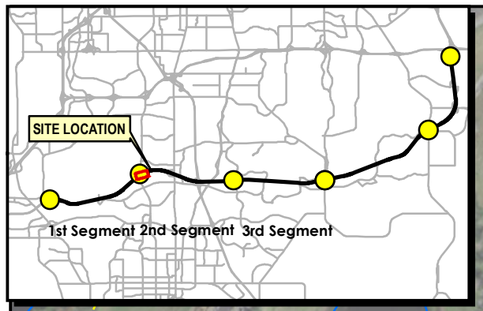
Central Florida Expressway Authority	SR 417 Widening - CFX Project No.'s 417-141, 417-142 & 417-149 (from International Drive to Boggy Creek Road) Orange County, Florida **NOISE BARRIER ANALYSIS - HUNTERS CREEK COMMUNITY (NBP3)**	Dewberry October 2020 **FIGURE 3-5**

Path: Q:\50088262\GIS\Mxd\10-15-2020\3-5_NoiseBarrier_NBP3_HuntersCreekCommunities_10-15-2020.mxd

Source: World Imagery Online Service, ESRI

Central Florida Expressway Authority	SR 417 Widening - CFX Project No.'s 417-141, 417-142 & 417-149 (from International Drive to Boggy Creek Road) Orange County, Florida **NOISE BARRIER ANALYSIS - HUNTERS CREEK COMMUNITY (SBP3 & SBP3-S)**	Dewberry October 2020 **FIGURE 3-6**

Path: Q:\50088262\GIS\Mxd\10-15-2020\3-6_NoiseBarrier_SBP3_HuntersCreekNWVillage_10-15-2020.mxd



SR-417-TOLL S

SR-417-TOLL S

Central Florida Greeneway

John Young Pkwy S

SR-417-TOLL N

Central Florida Greeneway SR-417-TOLL N

HUNTERS CREEK

Redwood National Dr

Glacier Nation

13320

13502

13207

13299

13300

3011

3101

3001

2901

3100

13330

R_EB5_1
R_EB5_2
R_EB5_3
R_EB5_4
R_EB5_5
R_EB5_6
R_EB5_7
R_EB5_8
R_EB5_9
R_EB5_10
R_EB5_11
R_EB5_12
R_EB5_13
R_EB5_14
R_EB5_15
R_EB5_16
R_EB5_17
R_EB5_18
R_EB5_19
R_EB5_20
R_EB5_21
R_EB5_22
R_EB5_23
R_EB5_24
R_EB5_25
R_EB5_26
R_EB5_27
R_EB5_28

LEGEND

- Not Impacted
- Impacted
- Impacted and Minor Benefitted [<5 dB(A)]
- Impacted and Benefitted [≥5 dB(A)]
- Noise Barrier Nodes
- Noise Monitoring Locations
- SR 417 Center Line
- Recommended Noise Barrier Locations **(NBP1)**
- Modelled Noise Barrier Locations Not Recommended **(SBP1)**
- Right-of-Way
- Stormwater Retention Pond

0 75 150 300 Feet

Source: World Imagery Online Service, ESRI

Central Florida Expressway Authority	SR 417 Widening - CFX Project No.'s 417-141, 417-142 & 417-149 (from International Drive to Boggy Creek Road) Orange County, Florida **NOISE BARRIER ANALYSIS - HUNTERS CREEK COMMUNITY**	**Dewberry** October 2020 **FIGURE 3-7**

Path: Q:\50088262\GIS\Mxd\10-15-2020\3-7_NoiseBarrier_NBP4_HuntersCreekCommunities_10-15-2020.mxd

Source: World Imagery Online Service, ESRI

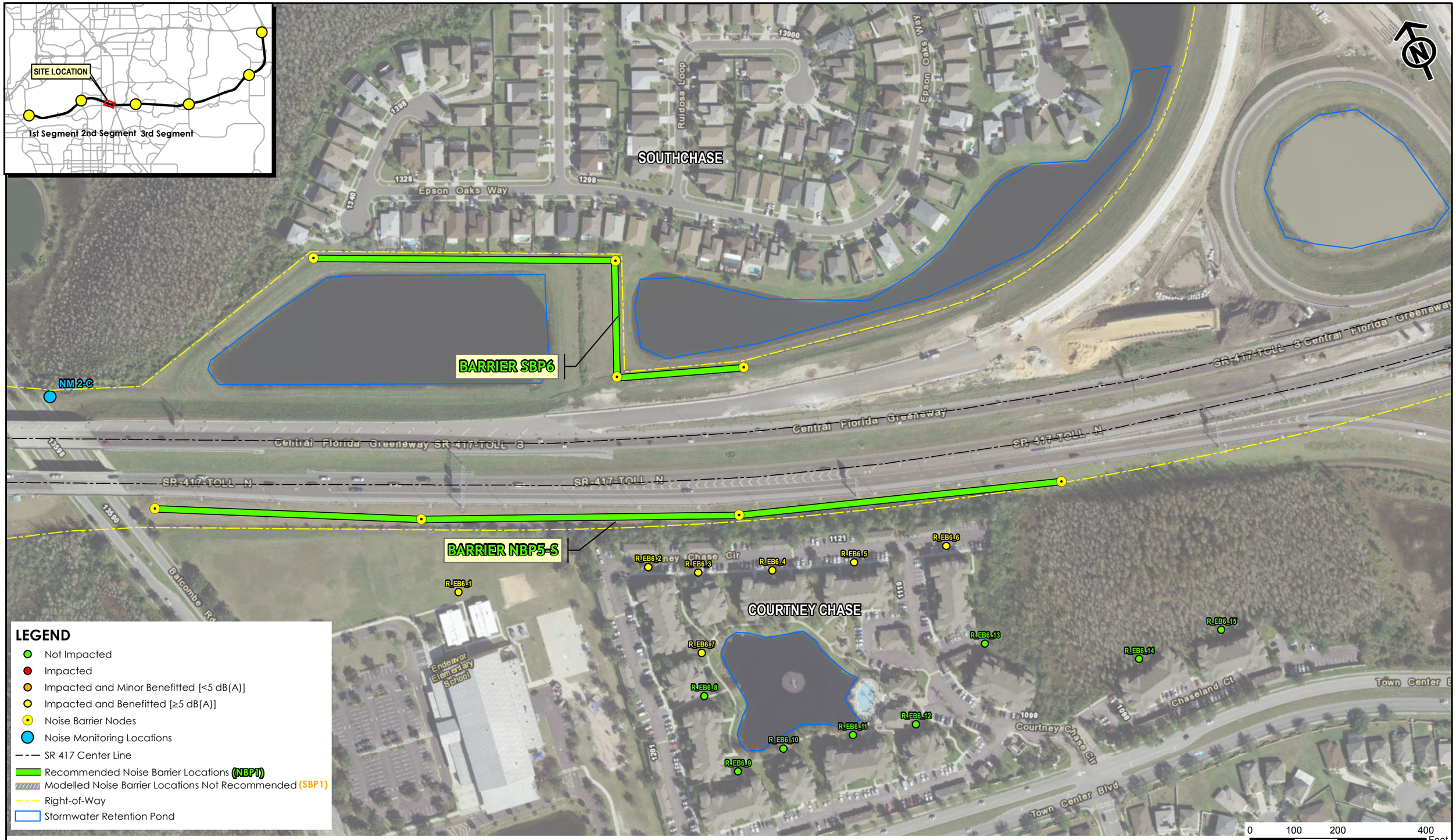
Central Florida Expressway Authority	SR 417 Widening - CFX Project No.'s 417-141, 417-142 & 417-149 (from International Drive to Boggy Creek Road) Orange County, Florida **NOISE BARRIER ANALYSIS - PARK PLACE AT HUNTERS CREEK COMMUNITY (SBP4)**	Dewberry October 2020 **FIGURE 3-8**

Path: Q:\50088262\GIS\Mxd\10-15-2020\3-8_NoiseBarrier_SBP4_S_ParkPlaceatHuntersCreekCommunities_10-15-2020.mxd

Source: World Imagery Online Service, ESRI

Central Florida Expressway Authority	SR 417 Widening - CFX Project No.'s 417-141, 417-142 & 417-149 (from International Drive to Boggy Creek Road) Orange County, Florida **NOISE BARRIER ANALYSIS - PARK PLACE AT HUNTERS CREEK COMMUNITY (SBP5)**	**Dewberry**	October 2020 **FIGURE 3-9**

Path: Q:\50088262\GIS\Mxd\10-15-2020\3-9_NoiseBarrier_SBP5_ParkPlaceatHuntersCreekCommunities_10-15-2020.mxd



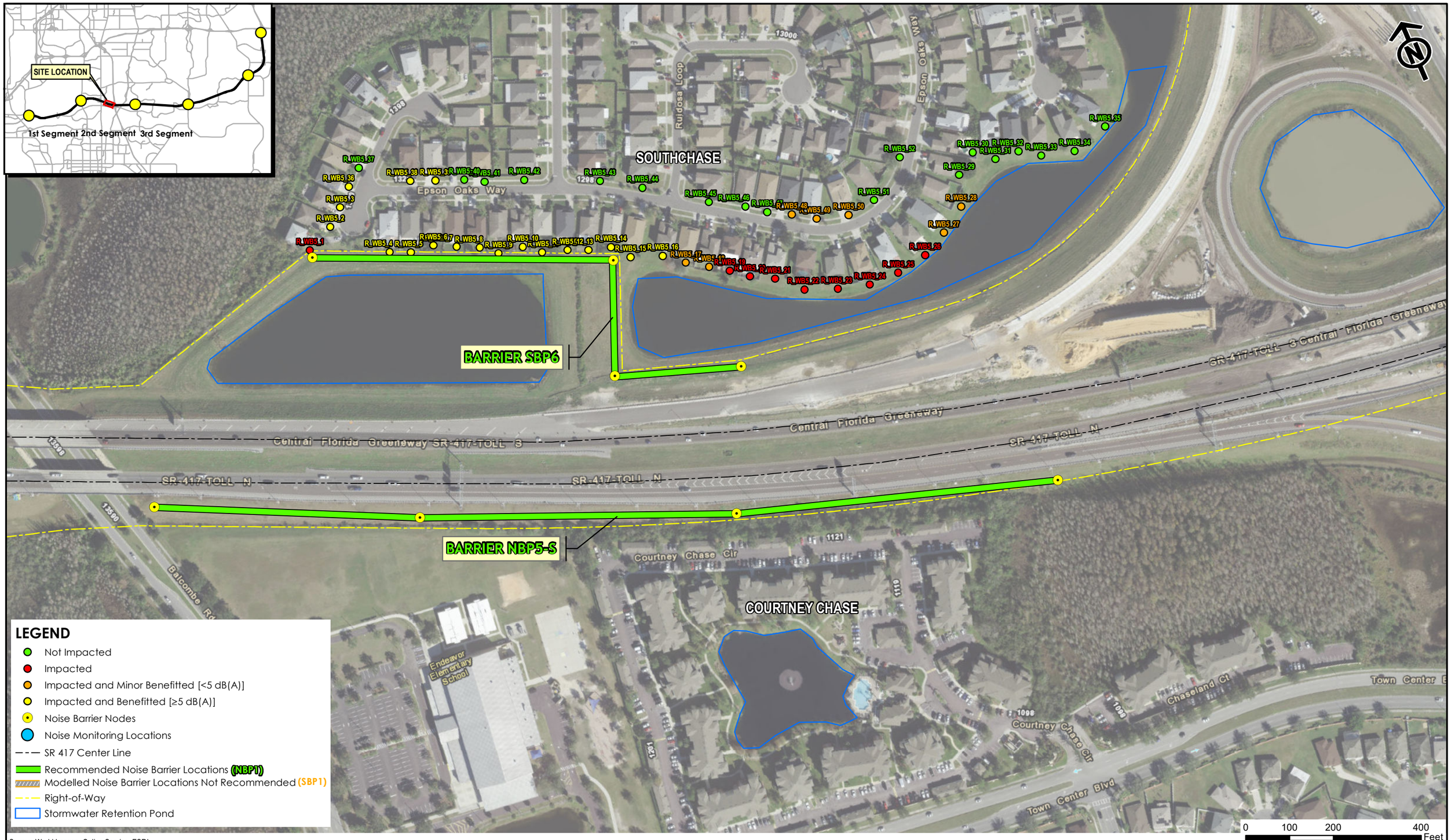
LEGEND

- Not Impacted
- Impacted
- Impacted and Minor Benefitted [<5 dB(A)]
- Impacted and Benefitted [≥5 dB(A)]
- Noise Barrier Nodes
- Noise Monitoring Locations
- SR 417 Center Line
- Recommended Noise Barrier Locations **(NBP1)**
- Modelled Noise Barrier Locations Not Recommended **(SBP1)**
- Right-of-Way
- Stormwater Retention Pond

Source: World Imagery Online Service, ESRI

Central Florida Expressway Authority	SR 417 Widening - CFX Project No.'s 417-141, 417-142 & 417-149 (from International Drive to Boggy Creek Road) Orange County, Florida **NOISE BARRIER ANALYSIS - COURTNEY CHASE COMMUNITY (NBP5-S)**	Dewberry October 2020 **FIGURE 3-10**

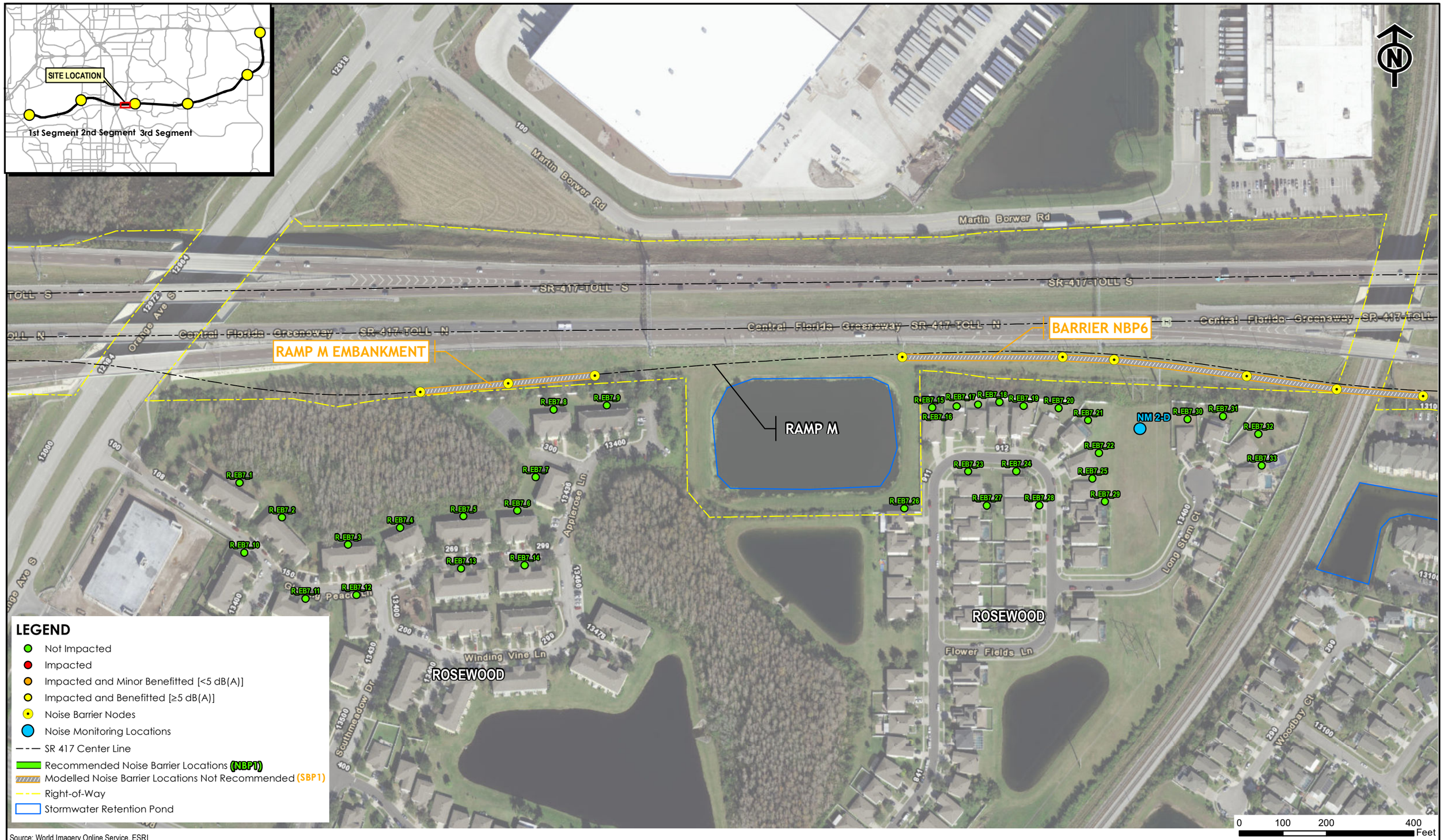
Path: Q:\50088262\GIS\Mxd\10-15-2020\3-10_NoiseBarrier_NBP5_CourtneyChaseCommunity_10-15-2020.mxd



Source: World Imagery Online Service, ESRI

Central Florida Expressway Authority	SR 417 Widening - CFX Project No.'s 417-141, 417-142 & 417-149 (from International Drive to Boggy Creek Road) Orange County, Florida **NOISE BARRIER ANALYSIS - SOUTHCHASE COMMUNITY (SBP6)**	**Dewberry**	October 2020 **FIGURE 3-11**

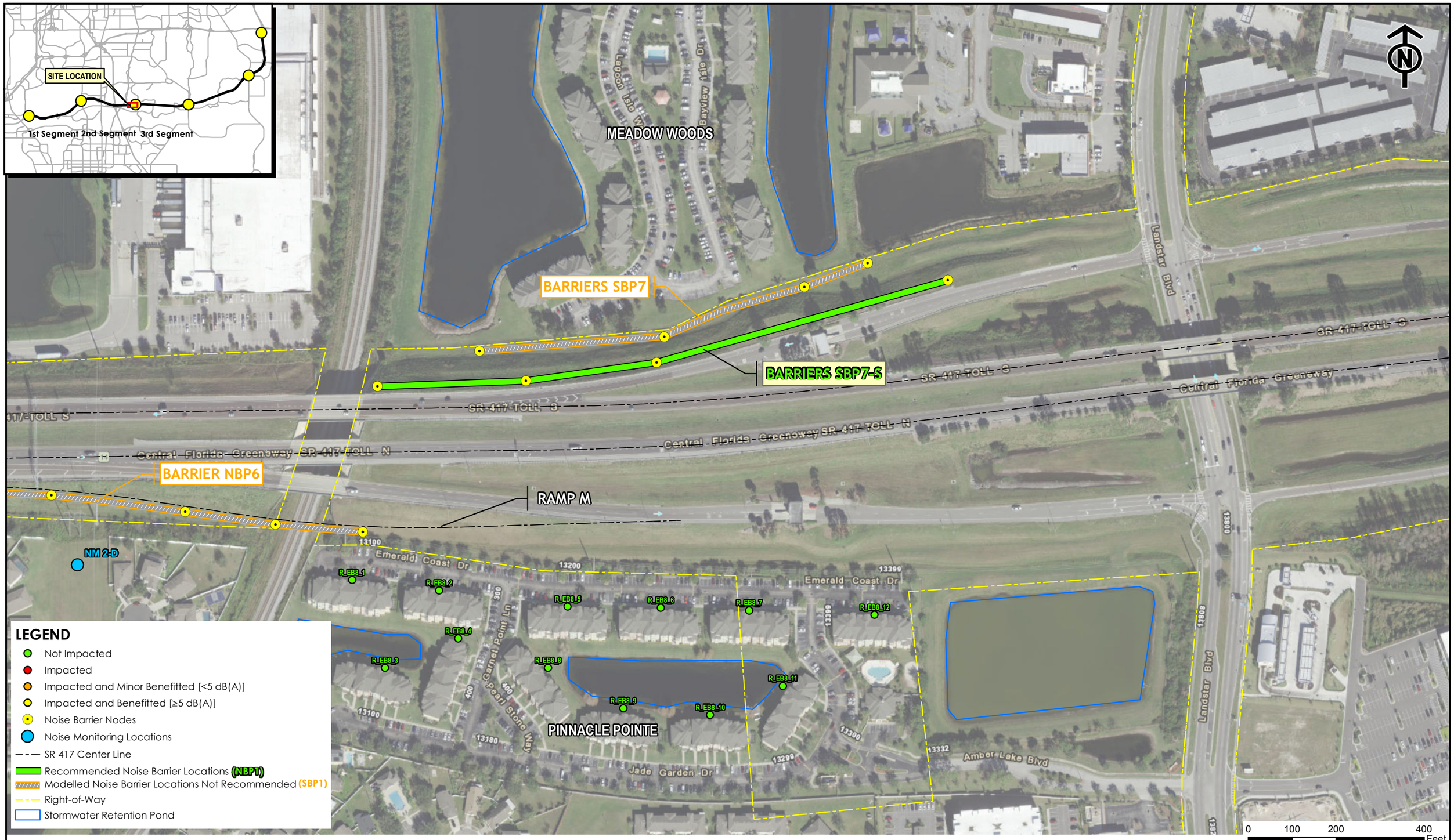
Path: Q:\50088262\GIS\Mxd\10-15-2020\3-11_NoiseBarrier_SBP6_S_SouthChaseCommunity_10-15-2020.mxd



Source: World Imagery Online Service, ESRI

Central Florida Expressway Authority	SR 417 Widening - CFX Project No.'s 417-141, 417-142 & 417-149 (from International Drive to Boggy Creek Road) Orange County, Florida **NOISE BARRIER ANALYSIS - ROSEWOOD COMMUNITY (RAMP M EMBANKMENT & NBP6)**	Dewberry®	October 2020 **FIGURE 3-12**

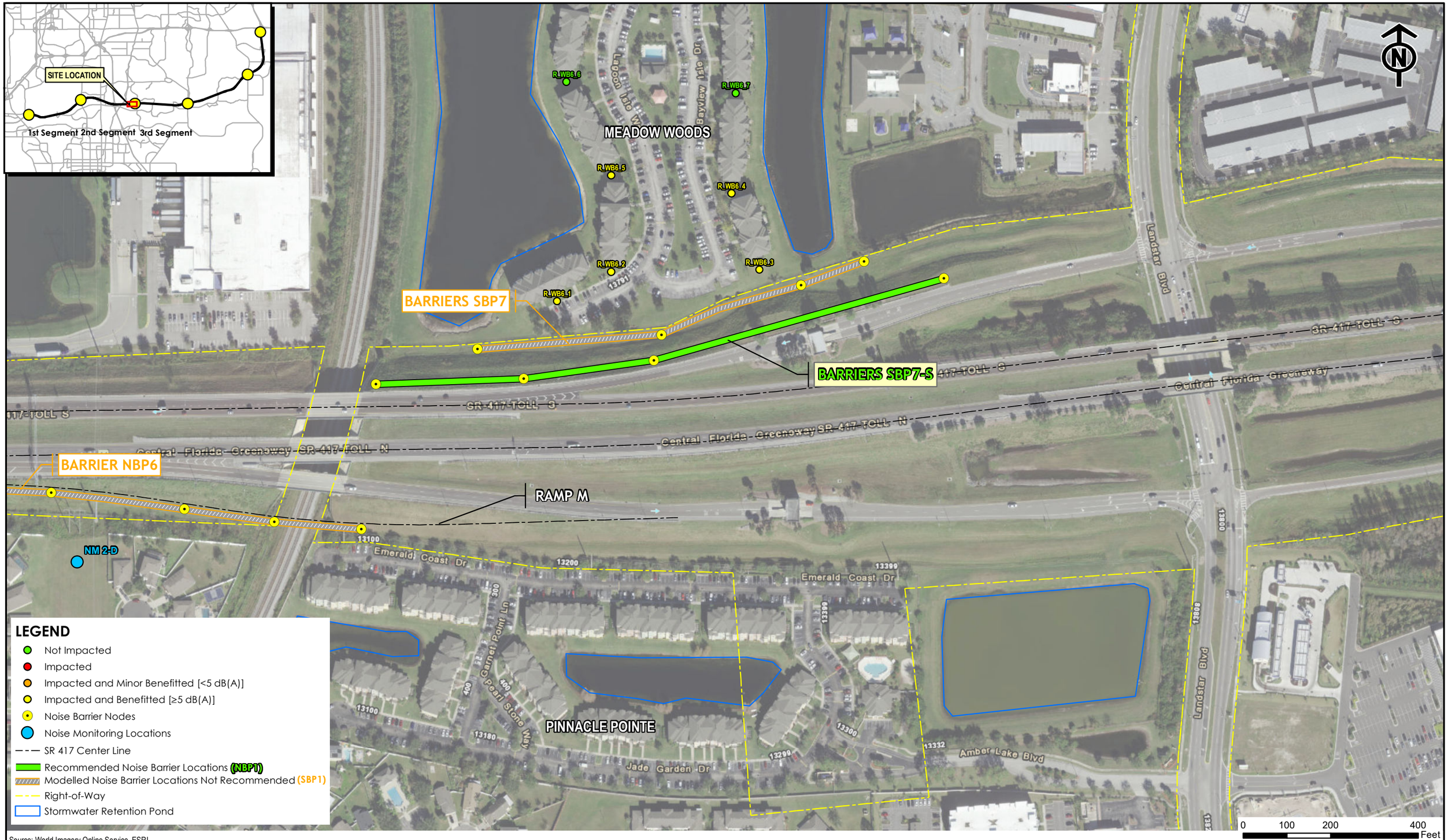
Path: Q:\50088262\GIS\Mxd\10-15-2020\3-12_NoiseBarrierNBP6_RosewoodCommunities_10-15-2020.mxd



Source: World Imagery Online Service, ESRI

Central Florida Expressway Authority	SR 417 Widening - CFX Project No.'s 417-141, 417-142 & 417-149 (from International Drive to Boggy Creek Road) Orange County, Florida **NOISE BARRIER ANALYSIS - PINNACLE POINTE COMMUNITY**	Dewberry®	October 2020 **FIGURE 3-13**

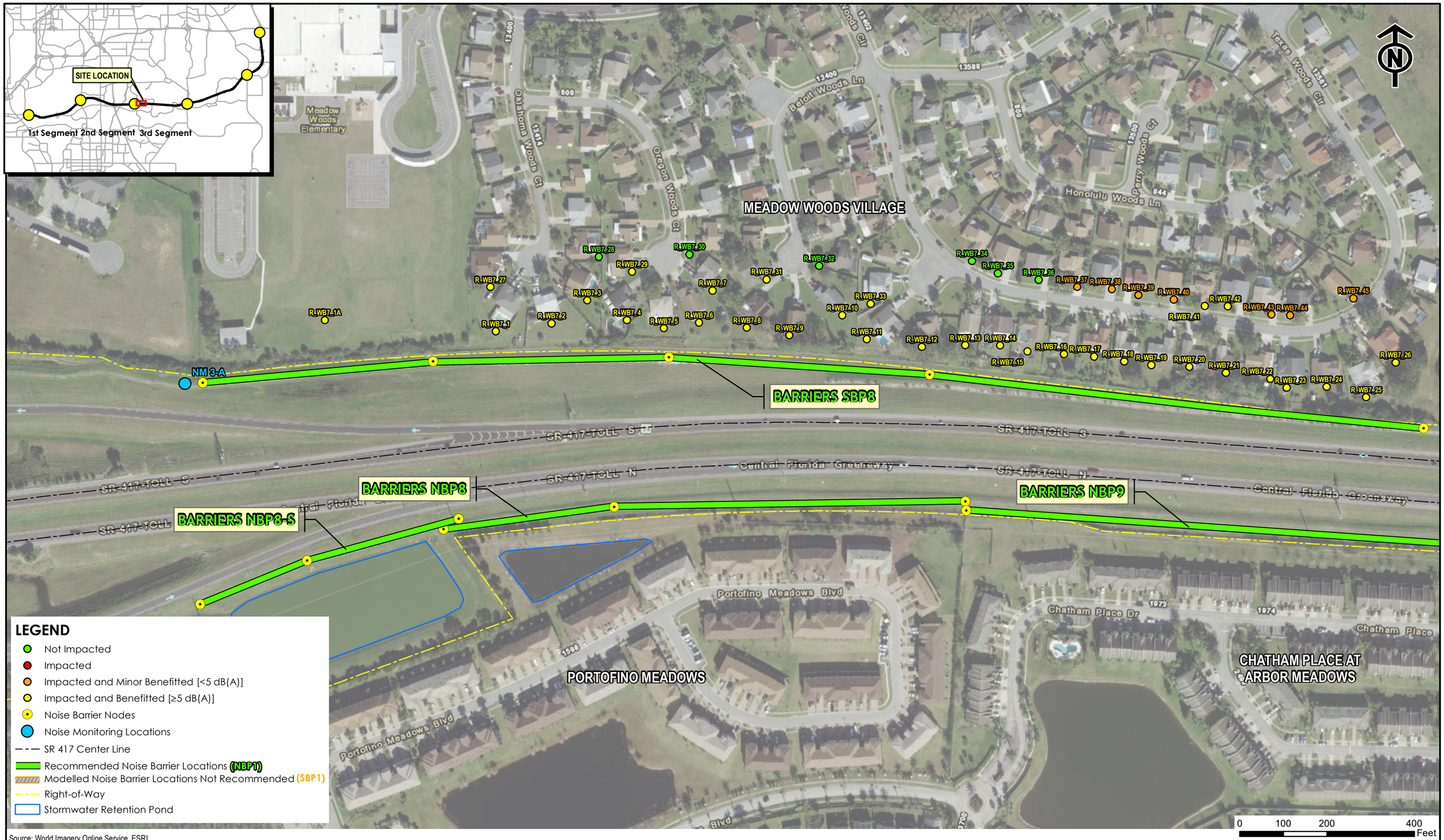
Path: Q:\50088262\GIS\Mxd\10-15-2020\3-13_NoiseBarrierNBP7_PinnaclePointeCommunity_10-15-2020.mxd



Source: World Imagery Online Service, ESRI

Central Florida Expressway Authority	SR 417 Widening - CFX Project No.'s 417-141, 417-142 & 417-149 (from International Drive to Boggy Creek Road) Orange County, Florida **NOISE BARRIER ANALYSIS - MEADOW WOODS COMMUNITY (SBP7)**	Dewberry®	October 2020 **FIGURE 3-14**

Path: Q:\50088262\GIS\Mxd\10-15-2020\3-14_NoiseBarrierSBP7_MeadowwoodsCommunity_10-15-2020.mxd



Source: World Imagery Online Service, ESRI

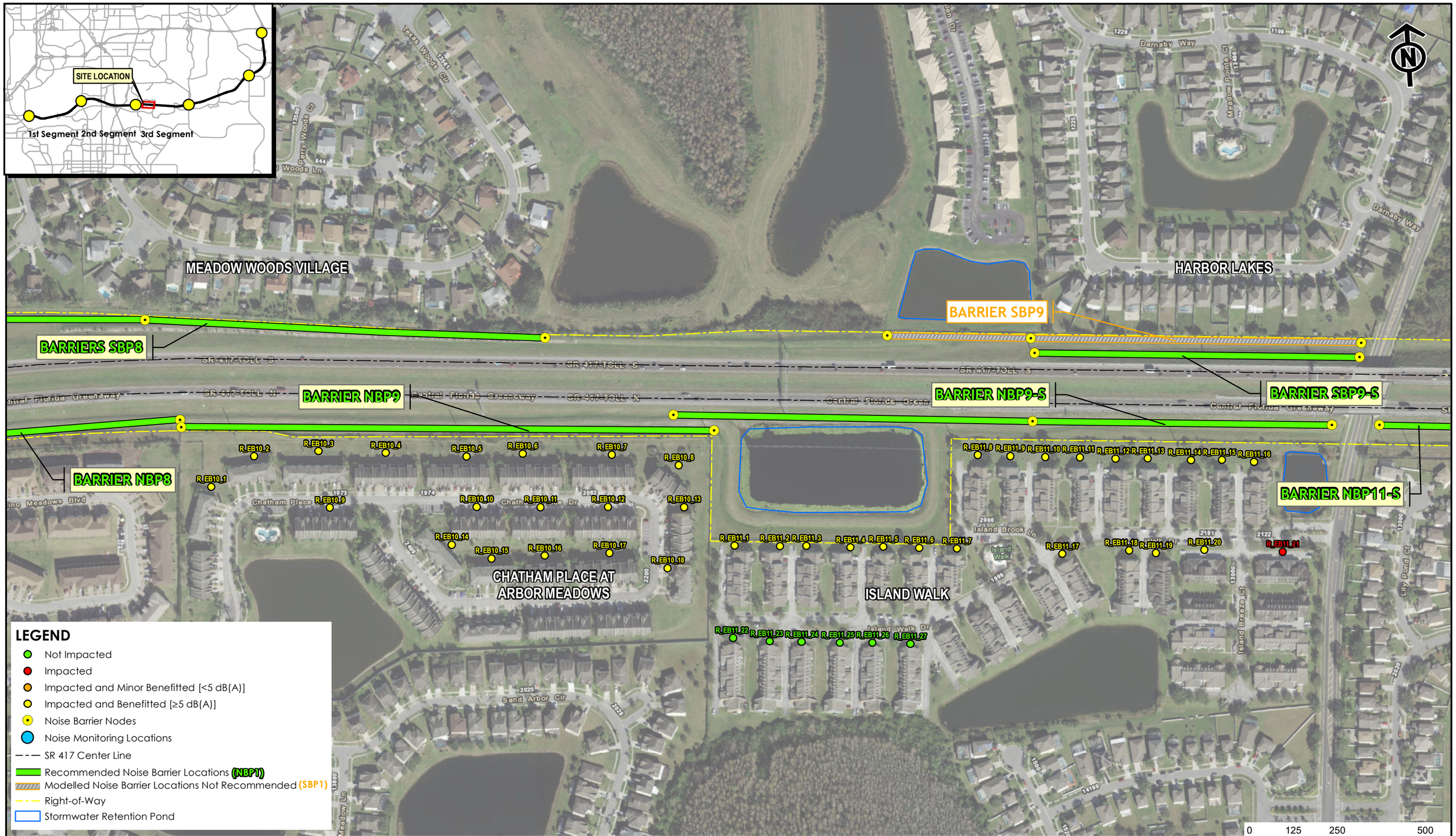
Central Florida Expressway Authority	SR 417 Widening - CFX Project No.'s 417-141, 417-142 & 417-149 (from International Drive to Boggy Creek Road) Orange County, Florida **NOISE BARRIER ANALYSIS - MEADOW WOODS VILLAGE COMMUNITY (SBP8)**	Dewberry®	October 2020 **FIGURE 3-15**

Path: Q:\50088262\GIS\Mxd\10-15-2020\3-15_NoiseBarrierSBP8_MeadowwoodsVillageCommunity_10-15-2020.mxd

Source: World Imagery Online Service, ESRI

Central Florida Expressway Authority	SR 417 Widening - CFX Project No.'s 417-141, 417-142 & 417-149 (from International Drive to Boggy Creek Road) Orange County, Florida **NOISE BARRIER ANALYSIS - PORTOFINO MEADOWS COMMUNITY (NBP8)**	Dewberry®	October 2020 **FIGURE 3-16**

Path: Q:\50088262\GIS\Mxd\10-15-2020\3-16_NoiseBarrierNBP8_PortofinoMeadowsCommunity_10-15-2020.mxd



Source: World Imagery Online Service, ESRI

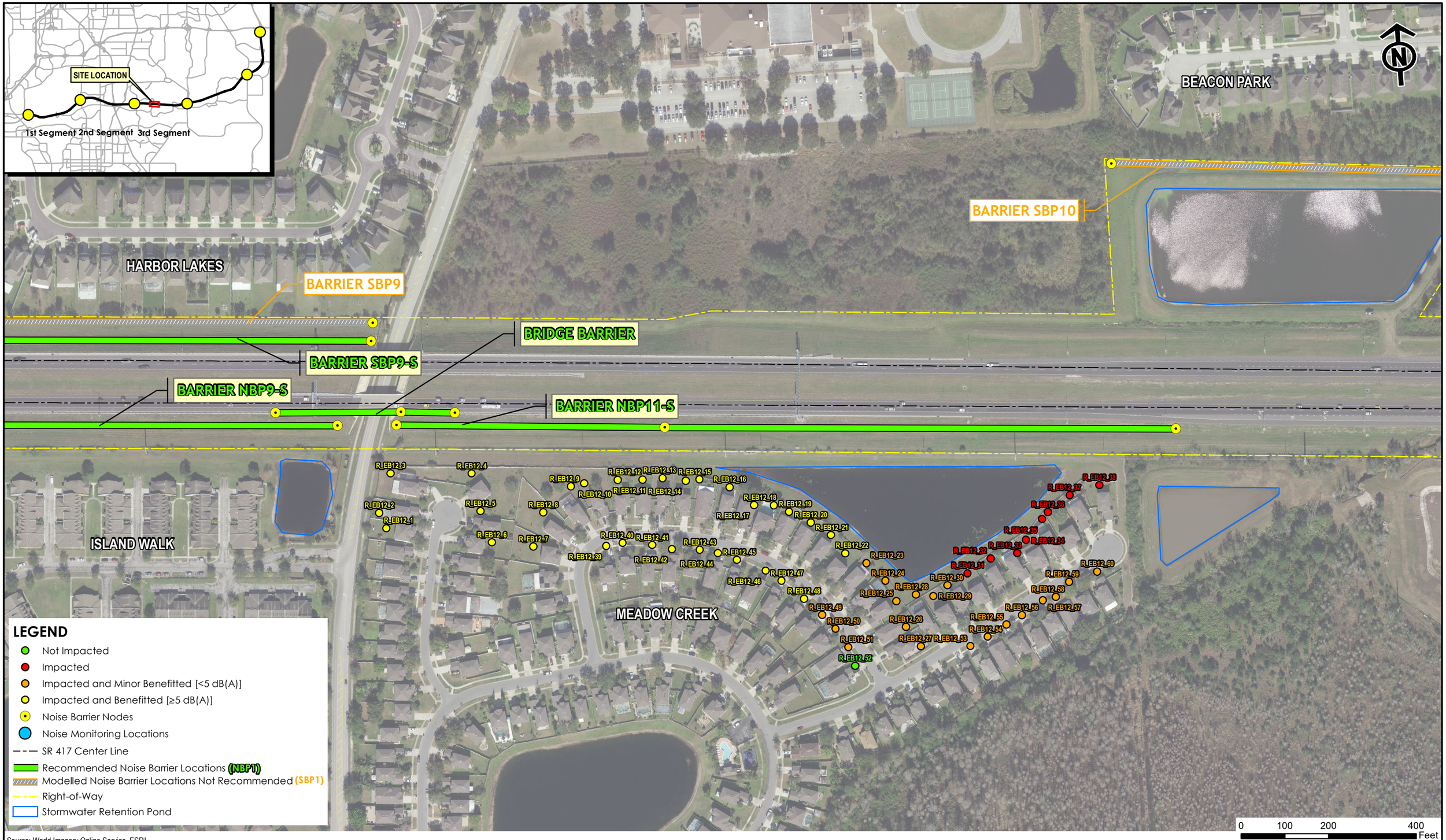
Central Florida Expressway Authority	SR 417 Widening - CFX Project No.'s 417-141, 417-142 & 417-149 (from International Drive to Boggy Creek Road) Orange County, Florida **NOISE BARRIER ANALYSIS - CHATHAM PLACE AT ARBOR MEADOWS AND ISLAND WALK COMMUNITIES (NBP9 & NBP9-S)**	Dewberry October 2020 **FIGURE 3-17**

Path: Q:\50088262\GIS\Mxd\10-15-2020\3-17_NoiseBarrierNBP9_ChathamPlaceatArborMeadowsCommunity_10-15-2020.mxd

Source: World Imagery Online Service, ESRI

Central Florida Expressway Authority	SR 417 Widening - CFX Project No.'s 417-141, 417-142 & 417-149 (from International Drive to Boggy Creek Road) Orange County, Florida **NOISE BARRIER ANALYSIS - HARBOR LAKES COMMUNITY (SBP9-S)**	**Dewberry**	October 2020 **FIGURE 3-18**

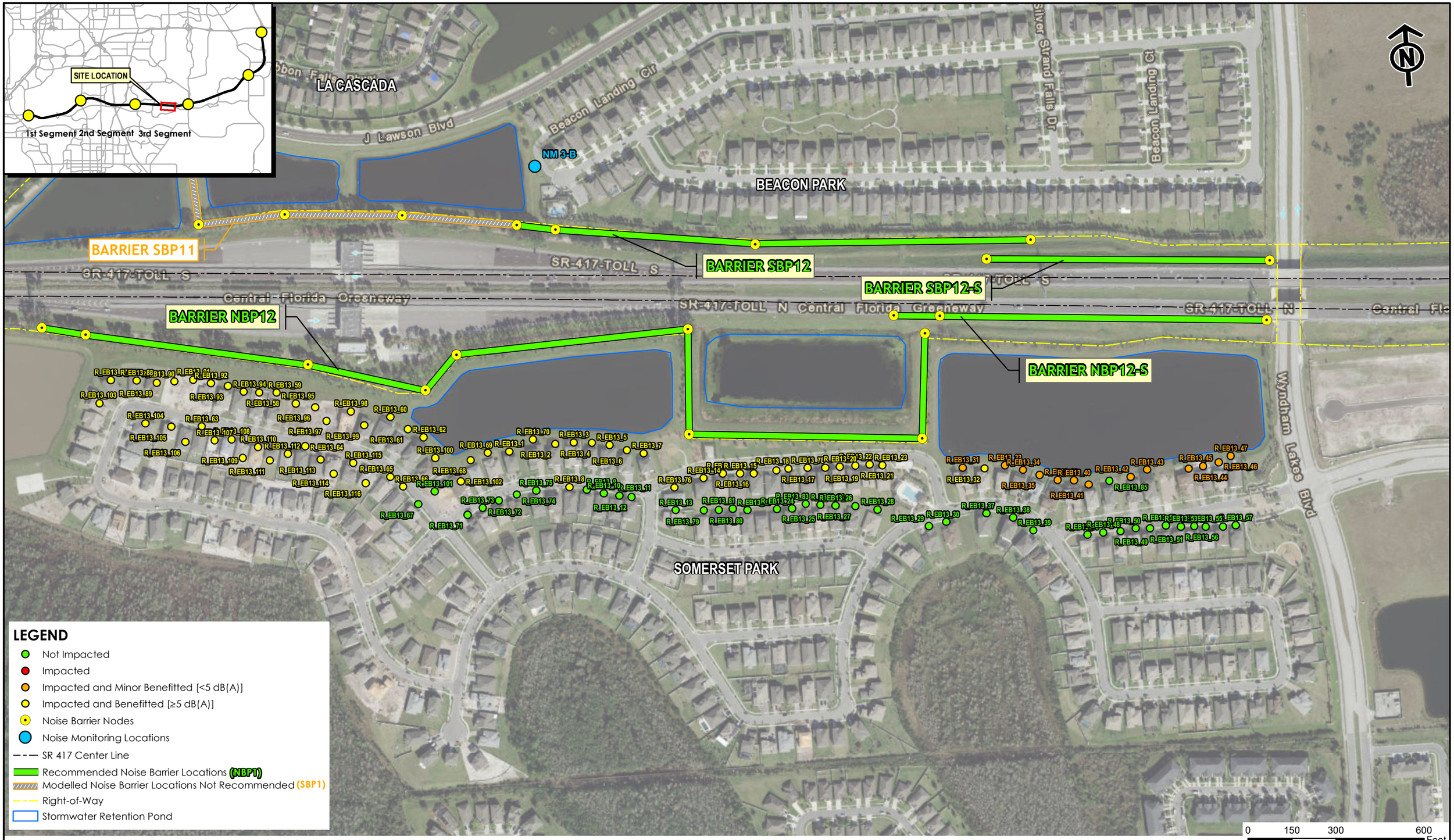
Path: Q:\50088262\GIS\Mxd\10-15-2020\3-18_NoiseBarrier_SBP9_HarborLakesCommunity_10-15-2020.mxd



Source: World Imagery Online Service, ESRI

Central Florida Expressway Authority	SR 417 Widening - CFX Project No.'s 417-141, 417-142 & 417-149 (from International Drive to Boggy Creek Road) Orange County, Florida **NOISE BARRIER ANALYSIS - MEADOW CREEK COMMUNITY (NBP11-S)**	Dewberry October 2020 **FIGURE 3-19**

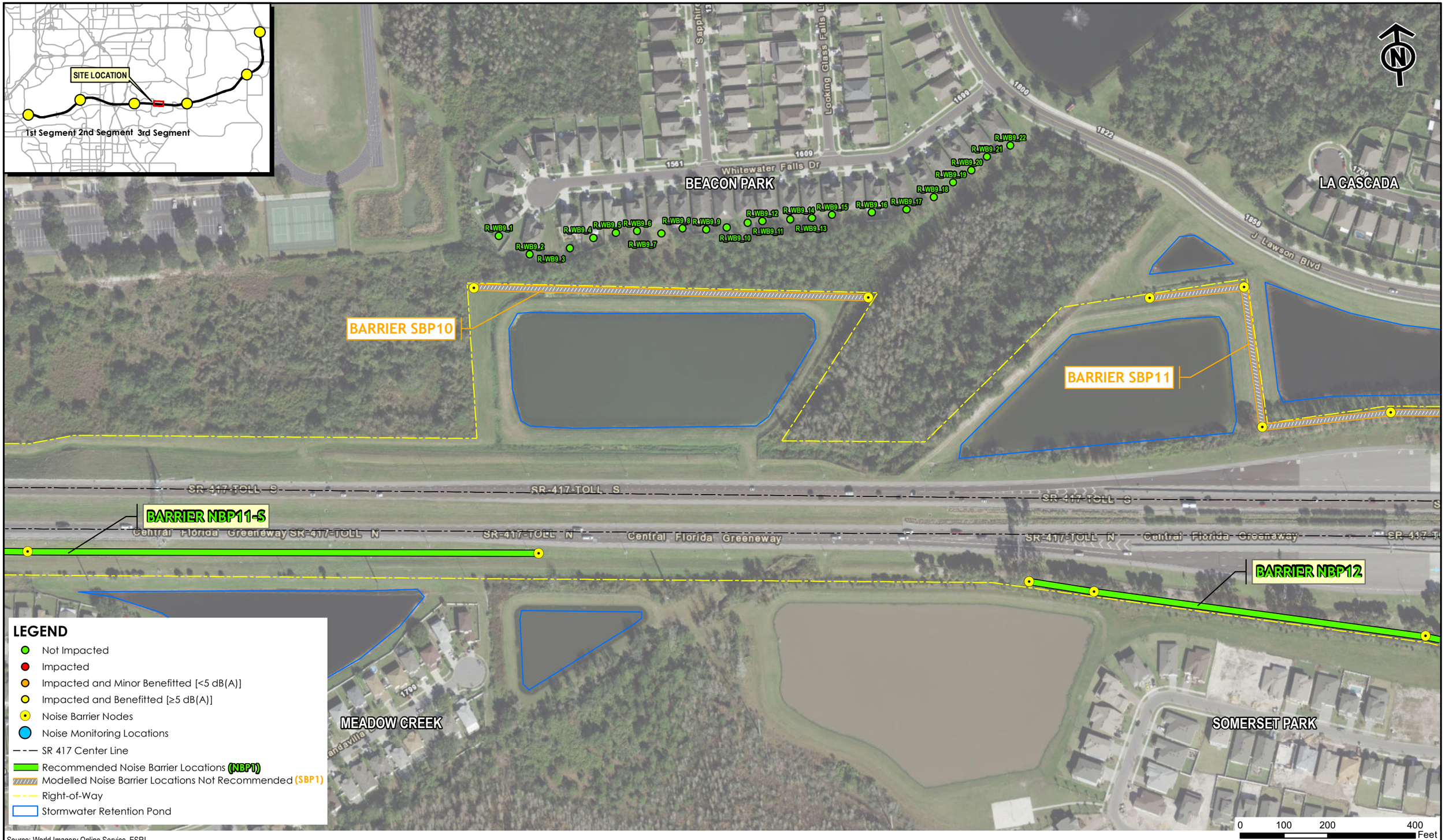
Path: Q:\50088262\GIS\Mxd\10-15-2020\3-19_NoiseBarrier_NBP11_MeadowCreekCommunity_10-15-2020.mxd



Source: World Imagery Online Service, ESRI

Central Florida Expressway Authority	SR 417 Widening - CFX Project No.'s 417-141, 417-142 & 417-149 (from International Drive to Boggy Creek Road) Orange County, Florida **NOISE BARRIER ANALYSIS - SOMERSET PARK COMMUNITY (NBP12)**	Dewberry	October 2020 **FIGURE 3-20**

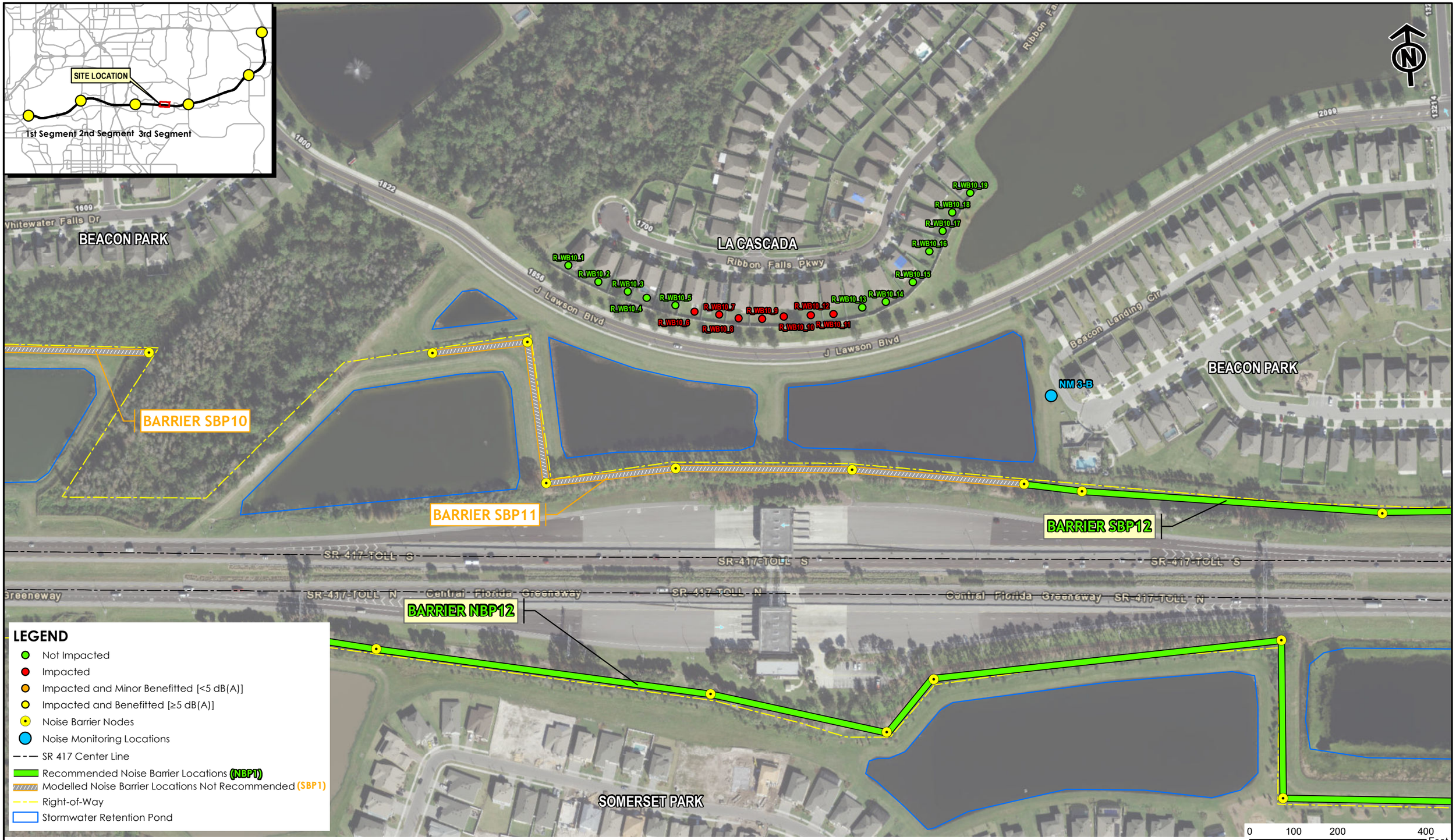
Path: Q:\50088262\GIS\Mxd\10-15-2020\3-20_NoiseBarrier_NBP12_SomersetParkCommunity_10-15-2020.mxd



Source: World Imagery Online Service, ESRI

Central Florida Expressway Authority	SR 417 Widening - CFX Project No.'s 417-141, 417-142 & 417-149 (from International Drive to Boggy Creek Road) Orange County, Florida **NOISE BARRIER ANALYSIS - BEACON PARK COMMUNITY (SBP10)**	Dewberry®	October 2020 **FIGURE 3-21**

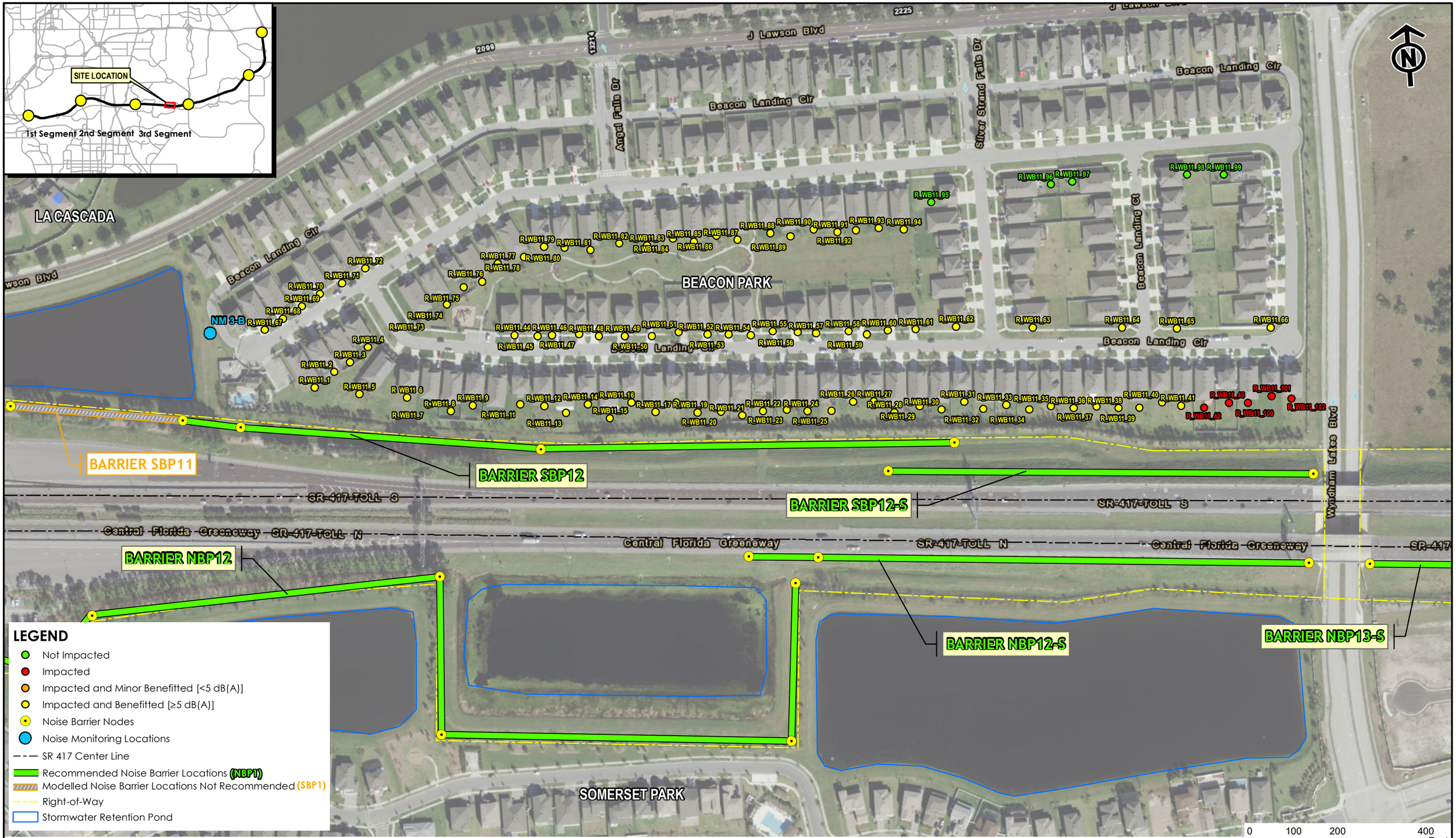
Path: Q:\50088262\GIS\Mxd\10-15-2020\3-21_NoiseBarrier_SBP10_BeaconParkCommunity_10-15-2020.mxd



Source: World Imagery Online Service, ESRI

Central Florida Expressway Authority	SR 417 Widening - CFX Project No.'s 417-141, 417-142 & 417-149 (from International Drive to Boggy Creek Road) Orange County, Florida **NOISE BARRIER ANALYSIS - LA CASCADA COMMUNITY (SBP11)**	Dewberry October 2020 **FIGURE 3-22**

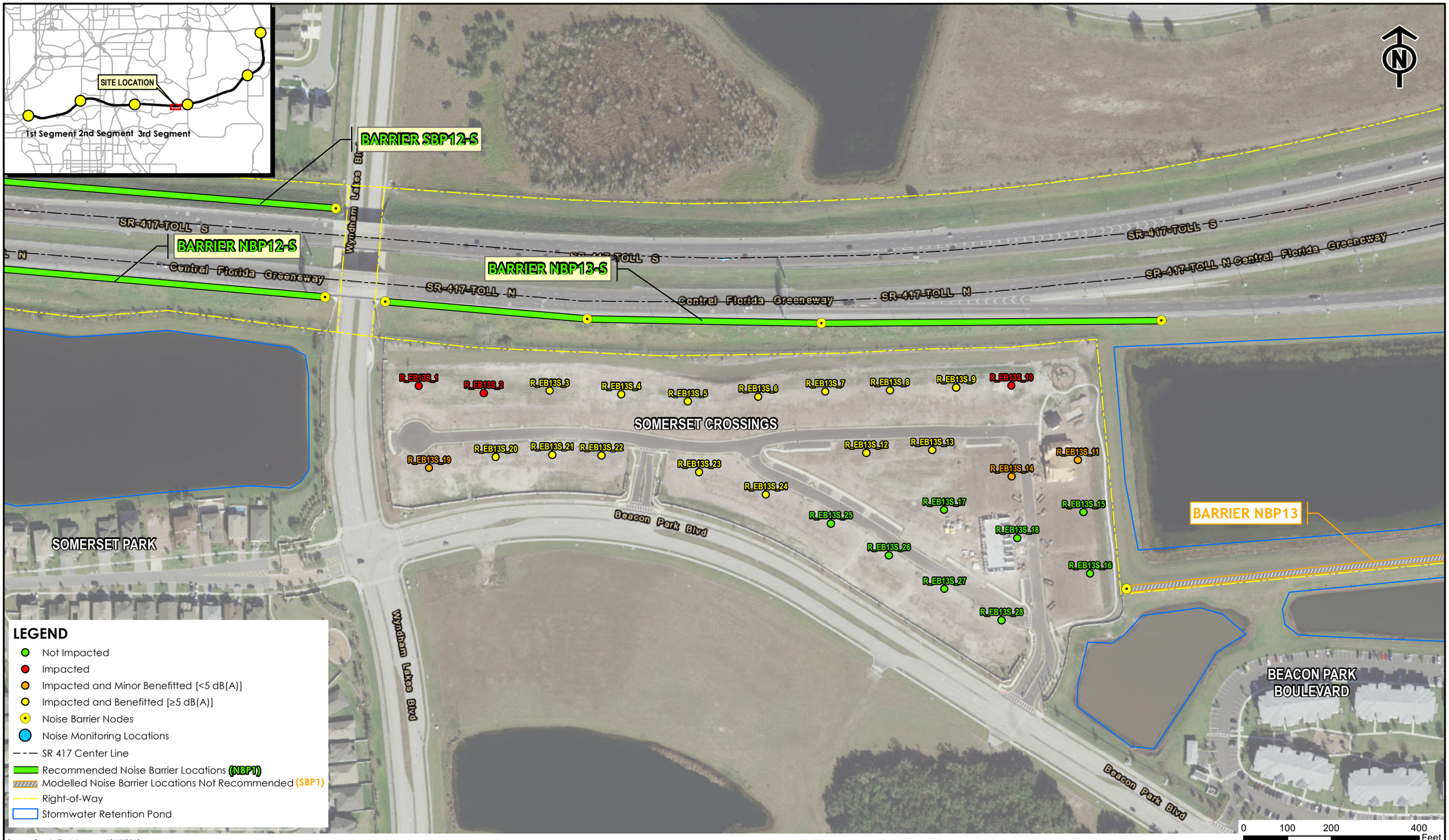
Path: Q:\50088262\GIS\Mxd\10-15-2020\3-22_NoiseBarrier_SBP11_LaCascadaCommunity_10-15-2020.mxd



Source: World Imagery Online Service, ESRI

Central Florida Expressway Authority	SR 417 Widening - CFX Project No.'s 417-141, 417-142 & 417-149 (from International Drive to Boggy Creek Road) Orange County, Florida **NOISE BARRIER ANALYSIS - BEACON PARK COMMUNITY (SBP12 & SBP12-S)**	Dewberry October 2020 **FIGURE 3-23**

Path: Q:\50088262\GIS\Mxd\10-15-2020\3-23_NoiseBarrier_SBP12_BeaconPark2Community_10-15-2020.mxd



Source: Google Earth Imagery, 12/17/2018.

Central Florida Expressway Authority	SR 417 Widening - CFX Project No.'s 417-141, 417-142 & 417-149 (from International Drive to Boggy Creek Road) Orange County, Florida **NOISE BARRIER ANALYSIS - SOMERSET CROSSINGS COMMUNITY (NBP13-S)**	**Dewberry** October 2020 **FIGURE 3-24**

Path: Q:\50088262\GIS\Mxd\10-15-2020\3-24_NoiseBarrier_NBP13_S_BeaconParkBoulevardCommunity_10-15-2020.mxd

Source: World Imagery Online Service, ESRI

Central Florida Expressway Authority	SR 417 Widening - CFX Project No.'s 417-141, 417-142 & 417-149 (from International Drive to Boggy Creek Road) Orange County, Florida **NOISE BARRIER ANALYSIS - BEACON PARK BOULEVARD COMMUNITY (NBP13)**	Dewberry October 2020 **FIGURE 3-25**

Path: Q:\50088262\GIS\Mxd\10-15-2020\3-25_NoiseBarrier_NBP13_BeaconParkBoulevardCommunity_10-15-2020.mxd

Tables

www.dewberry.com

Table 4-1
Summary of Proposed Noise Barriers For SR 417 Widening, Project No. 417-141, 417-142, and 417-149

Community Name	Barrier ID	Barrier Height (feet)	Est, Barrier Length[1] (feet)	Barrier Location	Number of Impacted Residences	Number of Impacted Residences Within a Noise Reduction Range			Total Number of Benefited Residences	Average Reduction dB(A)	Total Estimated Cost	Cost Per Benefited Residence
						5-5.9 dB(A)	6-6.9 dB(A)	≥ 7 dB(A)				
Hunters Creek and Point at Hunters Creek	NBP1	20/14	2,346 / 652	Hybrid	44	5	7	24	36	7.4	$1,772,720	$49,242
Hunters Creek	SBP1	14	1,073	Shoulder	20	7	4	5	16	5.2	$600,880	$37,555
Hunters Creek	NBP2	14	545	Shoulder	10	4	0	0	4	3.2	$305,200	$76,300
Hunters Creek	SBP2	12	732	Shoulder	7	1	1	1	3	3.9	$333,792	$111,264
Hunters Creek	SBP3	20/12	1,932/934	Hybrid	86	10	16	50	76	3.3	$1,514,120	$19,923
Park Place At Hunters Creek	SBP4 and SBP5	20/8/22	1612/1216/2155	Hybrid	52	0	3	49	52	5.4	$2,720,252	$52,313
Courtney Chase	NBP5	10	2,063	Shoulder	150	0	0	150	150	10.5	$742,680	$4,951
South Chase	SBP6	22	1,240	Right of Way	34	1	4	13	18	7.3	$818,400	$45,467
Meadow Woods	SBP7	10	1,325	Shoulder	120	24	24	72	120	8.0	$477,000	$3,975
Meadow Woods	SBP8	22	2,810	Right of Way	40	4	6	23	33	7.0	$1,854,600	$56,200
Harbor Lakes	SBP9	14	1,343	Shoulder	27	1	1	22	24	9.7	$752,080	$31,337
Portofino Meadows and Chatham Place	NBP8 and NBP9	22/14	2,711/2,494	Hybrid	269	6	13	248	267	9.7	$3,185,900	$11,932
Meadow Creek	NBP11	14	1,779	Shoulder	59	2	3	27	32	7.0	$996,240	$31,133
Somerset Park	NBP12	22 / 14	3,786/1,270	Right of Way / Index	76	1	3	58	62	7.6	$2,630,000	$42,419
Beacon Park	SBP12	22/14	1,620/964	Hybrid	94	3	3	84	90	9.4	$1,609,040	$17,878
Somerset Crossings	NBP13S	14	1,770	Index	116	24	16	46	86	6.3	$991,200	$11,526

Notes on Proposed Noise Summary:

1. Impacted residences are defined as residences where the modelled noise levels with no barrier exceeds the Noise Abatement Criteria (≥ 66dBA).
2. Benefitted residences are defined as residences where the modelled noise reduction with the barrier is at least > 5dBA.
3. All estimated costs rounded to the nearest dollar.
4. The complete analysis for each proposed barrier is presented on Tables 3-2 thru 3-19.

Table 3-2
Noise Barrier Analysis
Barrier NBP 1 Near Pointe at Hunters Creek and Hunter Creek Communities

Barrier Alternative	Barrier Height (feet)	Est. Barrier Length[1] (feet)	Barrier Location	Number of Impacted Residences	Number of Impacted Residences within a Noise Reduction Range			Total Number of Benefited Residences	Average Reduction dB(A)	Total Estimated Cost	Cost Per Benefitted Residence
					5-5.9 dB(A)	6-6.9 dB(A)	≥7 dB(A)				
1	10	2,864	Right of Way	44	2	0	1	3	<0.1	$859,200	$286,400
2	12	2,864	Right of Way		2	2	4	8	1.7	$1,031,040	$128,880
3	14	2,864	Right of Way		1	1	9	11	3.2	$1,202,880	$109,353
4	16	2,864	Right of Way		7	2	12	21	5.0	$1,374,720	$65,463
5	18	2,864	Right of Way		11	5	15	31	6.4	$1,546,560	$49,889
6	20	2,864	Right of Way		3	13	19	35	7.4	$1,718,400	$49,097
7	22	2,864	Right of Way		3	5	28	36	7.8	$1,890,240	$52,507
8	20/10	2,346 / 652	Hybrid		7	6	19	32	7.1	$1,642,320	$51,323
9	20/12	2,346 / 652	Hybrid		8	5	20	33	7.3	$1,704,912	$51,664
10	20/14	2,346 / 652	Hybrid		5	7	24	36	7.4	$1,772,720	$49,242

Notes on Noise Barrier Modelling for Barrier NBP11 (includes 60 Receptor Points in the Point at the Meadow Creek and Hunters Creek Communities):

1. Barrier lengths obtained from TNM Program.
2. Impacted residences are defined as residences where the modelled noise levels with no barrier exceeds the Noise Abatement Criteria [(≥ 66 dB(A)].
3. Benefitted residences are defined as residences where the modelled noise reduction with the barrier is ≥ 5 dB(A).
4. A **separate 2,346-foot long, 20-foot high right of barrier and 652-foot-long, 14-foot high shoulder barrier** is shown on the corresponding figure and highlighted above.

Table 3-3
Noise Barrier Analysis
Barrier SBP1 Near Hunters Creek Community

Barrier Alternative	Barrier Height (feet)	Est. Barrier Length[1] (feet)	Barrier Location	Number of Impacted Residences	Number of Impacted Residences within a Noise Reduction Range			Total Number of Benefited Residences	Average Reduction dB(A)	Total Estimated Cost	Cost Per Benefitted Residence
					5-5.9 dB(A)	6-6.9 dB(A)	≥7 dB(A)				
1	10	1,121	Right of Way	20	0	0	0	0	<0.1	$336,300	N/A
2	12	1,121	Right of Way		0	0	0	0	<0.1	$403,560	N/A
3	14	1,121	Right of Way		0	0	0	0	<0.1	$470,820	N/A
4	16	1,121	Right of Way		0	0	0	0	<0.1	$538,080	N/A
5	18	1,121	Right of Way		0	0	0	0	<0.1	$605,340	N/A
6	20	1,121	Right of Way		0	0	0	0	<0.1	$672,600	N/A
7	22	1,121	Right of Way		0	0	0	0	1.3	$739,860	N/A
8	10	1,073	Shoulder		6	4	0	10	4.7	$386,280	$38,628
9	12	1,073	Shoulder		8	5	0	13	5.0	$489,288	$37,638
10	14	1,073	Shoulder		7	4	5	16	5.2	$600,880	$37,555

Notes on Noise Barrier Modelling for Barrier SBP1-S (includes 26 Receptor Points in the Hunters Creek Community):

1. Barrier lengths obtained from TNM Program.
2. Impacted residences are defined as residences where the modelled noise levels with no barrier exceeds the Noise Abatement Criteria [(≥ 66 dB(A)].
3. Benefitted residences are defined as residences where the modelled noise reduction with the barrier is ≥ 5 dB(A).
4. **Separate 1,073-foot long, 14-foot high shoulder noise barrier** is shown on the corresponding figure and highlighted above.

Table 3-4
Noise Barrier Analysis
Barrier NBP2 Near Hunters Creek

Barrier Alternative	Barrier Height (feet)	Est. Barrier Length[1] (feet)	Barrier Location	Number of Impacted Residences	Number of Impacted Residences within a Noise Reduction Range			Total Number of Benefited Residences	Average Reduction dB(A)	Total Estimated Cost	Cost Per Benefitted Residence
					5-5.9 dB(A)	6-6.9 dB(A)	≥7 dB(A)				
1	10	687	Right of Way	10	0	0	0	0	<0.1	$206,100	N/A
2	12	687	Right of Way		0	0	0	0	<0.1	$247,320	N/A
3	14	687	Right of Way		0	0	0	0	<0.1	$288,540	N/A
4	16	687	Right of Way		0	0	0	0	<0.1	$329,760	N/A
5	18	687	Right of Way		0	0	0	0	<0.1	$370,980	N/A
6	20	687	Right of Way		0	0	0	0	<0.1	$412,200	N/A
7	22	687	Right of Way		0	0	0	0	0.7	$453,420	N/A
8	10	545	Shoulder		0	0	0	0	3.0	$196,200	N/A
9	12	545	Shoulder		3	0	0	3	3.1	$248,520	$82,840
10	14	545	Shoulder		4	0	0	4	3.2	$305,200	$76,300

Notes on Noise Barrier Modelling for Barrier NBP2 (includes 21 Receptor Points in the Hunters Creek Community):

1. Barrier lengths obtained from TNM Program.
2. Impacted residences are defined as residences where the modelled noise levels with no barrier exceeds the Noise Abatement Criteria [(≥ 66 dB(A)].
3. Benefitted residences are defined as residences where the modelled noise reduction with the barrier is ≥ 5 dB(A).
4. **Separate 545-foot long, 14-foot high shoulder noise barrier** is shown on the corresponding figure and highlighted above.

Table 3-5
Noise Barrier Analysis
Barrier SBP2 Near Hunters Creek Community

Barrier Alternative	Barrier Height (feet)	Est. Barrier Length[1] (feet)	Barrier Location	Number of Impacted Residences	Number of Impacted Residences within a Noise Reduction Range			Total Number of Benefited Residences	Average Reduction dB(A)	Total Estimated Cost	Cost Per Benefitted Residence
					5-5.9 dB(A)	6-6.9 dB(A)	≥7 dB(A)				
1	10	687	Right of Way	7	0	0	0	0	<0.1	$206,100	N/A
2	12	687	Right of Way		0	0	0	0	<0.1	$247,320	N/A
3	14	687	Right of Way		0	0	0	0	<0.1	$288,540	N/A
4	16	687	Right of Way		0	0	0	0	<0.1	$329,760	N/A
5	18	687	Right of Way		0	0	0	0	<0.1	$370,980	N/A
6	20	687	Right of Way		0	0	0	0	<0.1	$412,200	N/A
7	22	687	Right of Way		0	0	0	0	<0.1	$453,420	N/A
8	8	732	Shoulder		0	1	0	1	3.5	$175,680	$175,680
9	10	732	Shoulder		2	1	0	3	3.7	$263,520	$87,840
10	12	732	Shoulder		1	1	1	3	3.9	$333,792	$111,264
11	14	732	Shoulder		1	1	1	3	4.0	$409,920	$136,640

Notes on Noise Barrier Modelling for Barrier SBP2 (includes 15 Receptor Points representing 24 residences in the Hunters Creek Community):

1. Barrier lengths obtained from TNM Program.
2. Impacted residences are defined as residences where the modelled noise levels with no barrier exceeds the Noise Abatement Criteria [(≥ 66 dB(A)].
3. Benefitted residences are defined as residences where the modelled noise reduction with the barrier is ≥ 5 dB(A).
4. **Separate 732-foot long, 12-foot high shoulder noise barrier** is shown on the corresponding figure and highlighted above.

Table 3-6
Noise Barrier Analysis
Barrier SBP3 Near Hunters Creek Community

Barrier Alternative	Barrier Height (feet)	Est. Barrier Length[1] (feet)	Barrier Location	Number of Impacted Residences	Number of Impacted Residences within a Noise Reduction Range			Total Number of Benefited Residences	Average Reduction dB(A)	Total Estimated Cost	Cost Per Benefitted Residence
					5-5.9 dB(A)	6-6.9 dB(A)	≥7 dB(A)				
1	10	2,672	Right of Way	86	0	0	0	0	2.4	$801,600	N/A
2	12	2,672	Right of Way		40	0	0	40	4.0	$961,920	$24,048
3	14	2,672	Right of Way		30	30	0	60	5.3	$1,122,240	$18,704
4	16	2,672	Right of Way		20	40	20	60	6.2	$1,282,560	$21,376
5	18	2,672	Right of Way		6	40	40	66	7.0	$1,442,880	$21,862
6	20	2,672	Right of Way		0	6	80	76	7.5	$1,603,200	$21,095
7	22	2,672	Right of Way		0	0	86	76	8.1	$1,763,520	$23,204
8	20/8	1,932/934	Hybrid		10	0	36	46	5.5	$1,383,360	$30,073
9	20/10	1,932/934	Hybrid		10	6	50	66	7.0	$1,495,440	$22,658
10	20/12	1,932/934	Hybrid		10	16	50	76	8.1	$1,514,120	$19,923
11	20/14	1,932/934	Hybrid		10	16	50	76	8.3	$1,532,800	$20,168

Notes on Noise Barrier Modelling for Barrier SBP3 (includes 44 Receptor Points in the Hunters Creek Community):

1. Barrier lengths obtained from TNM Program.
2. Impacted residences are defined as residences where the modelled noise levels with no barrier exceeds the Noise Abatement Criteria [(≥ 66 dB(A)].
3. Benefitted residences are defined as residences where the modelled noise reduction with the barrier is ≥ 5 dB(A).
4. **Separate 1,932-foot long, 20-foot high right of way and 934 foot long, 12-foot high shoulder noise barriers** are shown on the corresponding figure and highlighted above.

Table 3-7
Noise Barrier Analysis
Barrier SBP4 and SBP5 Near Park Plaza At Hunters Creek Community

Barrier Alternative	Barrier Height (feet)	Est. Barrier Length[1] (feet)	Barrier Location	Number of Impacted Residences	Number of Impacted Residences within a Noise Reduction Range			Total Number of Benefited Residences	Average Reduction dB(A)	Total Estimated Cost	Cost Per Benefitted Residence
					5-5.9 dB(A)	6-6.9 dB(A)	≥7 dB(A)				
1	10	5,930	Right of Way	52	4	0	0	4	1.4	$1,779,000	$444,750
2	12	5,930	Right of Way		3	7	2	12	3.6	$2,134,800	$177,900
3	14	5,930	Right of Way		8	0	12	20	5.0	$2,490,600	$124,530
4	16	5,930	Right of Way		15	9	12	36	6.1	$2,846,400	$79,067
5	18	5,930	Right of Way		16	12	21	49	7.1	$3,202,200	$65,351
6	20	5,930	Right of Way		3	16	33	52	8.1	$3,558,000	$68,423
7	22	5,930	Right of Way		0	3	49	52	8.9	$3,913,800	$75,265
8	20	4,371	Right of Way		3	16	33	52	8.1	$2,622,600	$50,435
9	22	4,371	Right of Way		0	3	49	52	8.9	$2,884,860	$55,478
10	20/8/22	1612/1216/2155	Hybrid		0	3	49	52	5.4	$2,720,252	$52,313
11	20/14/22	1612/1216/2155	Hybrid		0	3	49	52	5.9	$3,070,460	$59,047

Notes on Noise Barrier Modelling for Barrier SBP45 (includes 122 Receptor Points representing the Hunters Creek Community):

1. Barrier lengths obtained from TNM Program.
2. Impacted residences are defined as residences where the modelled noise levels with no barrier exceeds the Noise Abatement Criteria [(≥ 66 dB(A)].
3. Benefitted residences are defined as residences where the modelled noise reduction with the barrier is ≥ 5 dB(A).
4. Separate 1,612-foot-long, 20-foot-high ROW barrier, and 1,216-foot-long, 8-foot-high shoulder and **2,155-foot-long, 22-foot-high ROW barriers** are shown on the corresponding figure and highlighted above.

Table 3-8
Noise Barrier Analysis
Barrier NBP5 Near Courtney Chase Community

Barrier Alternative	Barrier Height (feet)	Est. Barrier Length[1] (feet)	Barrier Location	Number of Impacted Residences	Number of Impacted Residences within a Noise Reduction Range			Total Number of Benefited Residences	Average Reduction dB(A)	Total Estimated Cost	Cost Per Benefitted Residence
					5-5.9 dB(A)	6-6.9 dB(A)	≥7 dB(A)				
1	10	2,063	Shoulder	150	0	0	150	150	10.5	$742,680	$4,951
2	12	2,063	Shoulder		0	0	150	150	10.9	$940,728	$6,272
3	14	2,063	Shoulder		0	0	150	150	11.9	$1,155,280	$7,702

Notes on Noise Barrier Modelling for Barrier SBP5 (includes 14 Receptor Points representing 360 residences in the Courtney ChaseCommunity):

1. Barrier lengths obtained from TNM Program.
2. Impacted residences are defined as residences where the modelled noise levels with no barrier exceeds the Noise Abatement Criteria [(≥ 66 dB(A)].
3. Benefitted residences are defined as residences where the modelled noise reduction with the barrier is ≥ 5 dB(A).
4. A **2,063-foot-long, 10-foot high shoulder noise barrier** is shown on the corresponding figure and highlighted above.

Table 3-9
Noise Barrier Analysis
Barrier SBP6 Near Southchase Community

Barrier Alternative	Barrier Height (feet)	Est. Barrier Length[1] (feet)	Barrier Location	Number of Impacted Residences	Number of Impacted Residences within a Noise Reduction Range			Total Number of Benefited Residences	Average Reduction dB(A)	Total Estimated Cost	Cost Per Benefitted Residence
					5-5.9 dB(A)	6-6.9 dB(A)	≥7 dB(A)				
1	10	1,240	Right of Way	34	0	2	8	10	3.6	$372,000	$37,200
2	12	1,240	Right of Way		0	0	10	10	4.8	$446,400	$44,640
3	14	1,240	Right of Way		4	0	10	14	5.4	$520,800	$37,200
4	16	1,240	Right of Way		2	3	10	15	6.1	$595,200	$39,680
5	18	1,240	Right of Way		2	4	10	16	6.4	$669,600	$41,850
6	20	1,240	Right of Way		2	2	12	16	6.8	$744,000	$46,500
7	22	1,240	Right of Way		1	4	13	18	7.3	$818,400	$45,467

Notes on Noise Barrier Modelling for Barrier SBP6 (includes 52 Receptor Points representing the Southchase Community):

1. Barrier lengths obtained from TNM Program.
2. Impacted residences are defined as residences where the modelled noise levels with no barrier exceeds the Noise Abatement Criteria [(≥ 66 dB(A)].
3. Benefitted residences are defined as residences where the modelled noise reduction with the barrier is ≥ 5 dB(A).
4. A **1,240-foot-long, 22-foot high noise barrier** is shown on the corresponding figure and highlighted above.

Table 3-10
Noise Barrier Analysis
Barrier SBP7 Near Meadow Woods Community

Barrier Alternative	Barrier Height (feet)	Est. Barrier Length[1] (feet)	Barrier Location	Number of Impacted Residences	Number of Impacted Residences within a Noise Reduction Range			Total Number of Benefited Residences	Average Reduction dB(A)	Total Estimated Cost	Cost Per Benefitted Residence
					5-5.9 dB(A)	6-6.9 dB(A)	≥7 dB(A)				
1	10	896	Right of Way	120	0	0	0	0	-0.3	$268,800	N/A
2	12	896	Right of Way		0	0	0	0	0.2	$322,560	N/A
3	14	896	Right of Way		0	0	0	0	0.7	$376,320	N/A
4	16	896	Right of Way		0	0	0	0	1.2	$430,080	N/A
5	18	896	Right of Way		0	0	48	48	4.9	$483,840	$10,080
6	20	896	Right of Way		0	0	48	48	5.5	$537,600	$11,200
7	22	896	Right of Way		0	0	48	48	6.1	$591,360	$12,320
8	10	1,325	Shoulder		24	24	72	120	8.0	$477,000	$3,975
9	12	1,325	Shoulder		0	48	72	120	8.2	$604,200	$5,035
10	14	1,325	Shoulder		0	48	72	120	8.4	$742,000	$6,183

Notes on Noise Barrier Modelling for Barrier SBP7 (includes 7 Receptor Points representing 168 residences in the Meadow Woods Community):

1. Barrier lengths obtained from TNM Program.
2. Impacted residences are defined as residences where the modelled noise levels with no barrier exceeds the Noise Abatement Criteria [(≥ 66 dB(A)].
3. Benefitted residences are defined as residences where the modelled noise reduction with the barrier is ≥ 5 dB(A).
4. A **1,325-foot-long, 10-foot high shoulder noise barrier** is shown on the corresponding figure and highlighted above.

Table 3-11
Noise Barrier Analysis
Barrier SBP8 Near Meadow Woods Village Community

Barrier Alternative	Barrier Height (feet)	Est, Barrier Length[1] (feet)	Barrier Location	Number of Impacted Residences	Number of Impacted Residences Within a Noise Reduction Range			Total Number of Benefited Residences	Average Reduction dB(A)	Total Estimated Cost	Cost Per Benefited Residence
					5-5.9 dB(A)	6-6.9 dB(A)	≥ 7 dB(A)				
1	10	2,276	Right of Way	40	1	0	0	1	2.3	$682,800	$682,800
2	12	2,276	Right of Way		6	0	0	6	3.5	$819,360	$136,560
3	14	2,276	Right of Way		11	4	0	15	4.3	$955,920	$63,728
4	16	2,276	Right of Way		5	11	4	20	4.9	$1,092,480	$54,624
5	18	2,276	Right of Way		1	11	11	23	5.6	$1,229,040	$53,437
6	20	2,276	Right of Way		2	4	20	26	6.2	$1,365,600	$52,523
7	22	2,276	Right of Way		4	3	23	30	6.8	$1,502,160	$50,072
8	10	2,810	Right of Way		1	0	0	1	2.6	$843,000	$843,000
9	12	2,810	Right of Way		5	1	0	6	3.6	$1,011,600	$168,600
10	14	2,810	Right of Way		12	3	1	16	4.4	$1,180,200	$73,763
11	16	2,810	Right of Way		7	11	4	22	5.1	$1,348,800	$61,309
12	18	2,810	Right of Way		5	11	11	27	5.8	$1,517,400	$56,200
13	20	2,810	Right of Way		5	5	20	30	6.5	$1,686,000	$56,200
14	22	2,810	Right of Way		4	6	23	33	7.0	$1,854,600	$56,200

Notes on Noise Barrier Modelling for Barrier SBP8 (includes 46 Receptor Points in the Point at the Meadow Woods Village Community):

1. Barrier lengths obtained from TNM Program and includes portion of wall infront of adjacent school.
2. Impacted residences are defined as residences where the modelled noise levels with no barrier exceeds the Noise Abatement Criteria [(≥ 66 dB(A)].
3. Benefitted residences are defined as residences where the modelled noise reduction with the barrier is ≥ 5 dB(A).
4. **A 2,810-foot long, 22-foot high noise barrier** is shown on the corresponding figure and highlighted above.

Table 3-12
Noise Barrier Analysis
Barrier NBP8 and NBP9 Near Portofino Meadows and Chatham Place Communities

Barrier Alternative	Barrier Height (feet)	Est, Barrier Length[1] (feet)	Barrier Location	Number of Impacted Residences	Number of Impacted Residences Within a Noise Reduction Range			Total Number of Benefited Residences	Average Reduction dB(A)	Total Estimated Cost	Cost Per Benefited Residence
					5-5.9 dB(A)	6-6.9 dB(A)	≥ 7 dB(A)				
1	22/10	3,594/1,870	Hybrid	269	63	32	135	230	8.0	$3,045,240	$13,240
2	22/12	3,594/1,870	Hybrid		36	36	196	268	8.5	$3,224,760	$12,033
3	22/14	3,594/1,870	Hybrid		0	1	267	268	10	$3,419,240	$12,758
4	22/10	2,711/2,494	Hybrid		45	31	179	255	8.4	$2,687,100	$10,538
5	22/12	2,711/2,494	Hybrid		18	30	214	262	9	$2,926,524	$11,170
6	22/14	2,711/2,494	Hybrid		6	13	248	267	9.7	$3,185,900	$11,932

Notes on Noise Barrier Modelling for Barrier NBP8 and NBP9 (includes 254 Receptor Points representing 274 residences in the Portifino Meadows and Chatham Place Communities):

1. Barrier lengths obtained from TNM Program.
2. Impacted residences are defined as residences where the modelled noise levels with no barrier exceeds the Noise Abatement Criteria [(≥ 66 dB(A)].
3. Benefitted residences are defined as residences where the modelled noise reduction with the barrier is ≥ 5 dB(A).
4. **Separate 2,711-foot long, 22-foot high right of way and 2,494 foot long, 14-foot high shoulder noise barriers** are shown on the corresponding figure and highlighted above.

Table 3-13
Noise Barrier Analysis
Barrier SBP9 Near Harbor Lakes Community

Barrier Alternative	Barrier Height (feet)	Est, Barrier Length[1] (feet)	Barrier Location	Number of Impacted Residences	Number of Impacted Residences Within a Noise Reduction Range			Total Number of Benefited Residences	Average Reduction dB(A)	Total Estimated Cost	Cost Per Benefited Residence
					5-5.9 dB(A)	6-6.9 dB(A)	≥ 7 dB(A)				
1	10	1,346	Right of Way	27	0	0	0	0	2.1	$403,800	N/A
2	12	1,346	Right of Way		0	0	0	0	3.4	$484,560	N/A
3	14	1,346	Right of Way		0	0	0	0	4.5	$565,320	N/A
4	16	1,346	Right of Way		0	0	0	0	5.4	$646,080	N/A
5	18	1,346	Right of Way		0	0	2	2	6.8	$726,840	$363,420
6	20	1,346	Right of Way		6	1	11	18	7.9	$807,600	$44,867
7	22	1,346	Right of Way		0	5	16	21	8.8	$888,360	$42,303
8	10	1,343	Shoulder		3	2	17	22	1.3	$483,480	$21,976
11	12	1,343	Shoulder		1	1	22	24	9.5	$612,408	$25,517
12	14	1,343	Shoulder		1	1	22	24	9.7	$752,080	$31,337

Notes on Noise Barrier Modelling for Barrier SBP9 (includes 31 Receptor Points in the Harbor Lakes Community):

1. Barrier lengths obtained from TNM Program.
2. Impacted residences are defined as residences where the modelled noise levels with no barrier exceeds the Noise Abatement Criteria [(≥ 66 dB(A)].
3. Benefitted residences are defined as residences where the modelled noise reduction with the barrier is ≥ 5 dB(A).
4. A **1,343 foot long, 14-foot shoulder barrier** is shown on the corresponding figure and highlighted above.

Table 3-14
Noise Barrier Analysis
Barrier NBP11 Near Meadow Creek Community

Barrier Alternative	Barrier Height (feet)	Est, Barrier Length[1] (feet)	Barrier Location	Number of Impacted Residences	Number of Impacted Residences Within a Noise Reduction Range			Total Number of Benefited Residences	Average Reduction dB(A)	Total Estimated Cost	Cost Per Benefited Residence
					5-5.9 dB(A)	6-6.9 dB(A)	≥ 7 dB(A)				
1	10	1,779	Shoulder	59	0	4	16	20	5.8	$640,440	$32,022
2	12	1,779	Shoulder		0	2	23	25	6.3	$811,224	$32,449
3	14	1,779	Shoulder		2	3	27	32	7.0	$996,240	$31,133

Notes on Noise Barrier Modelling for Barrier NBP11 (includes 60 Receptor Points in the Meadow Creek Community):

1. Barrier lengths obtained from TNM Program.
2. Impacted residences are defined as residences where the modelled noise levels with no barrier exceeds the Noise Abatement Criteria [(≥ 66 dB(A)].
3. Benefitted residences are defined as residences where the modelled noise reduction with the barrier is ≥ 5 dB(A).
4. A **1,779-foot long, 14-foot high shoulder noise barrier** is shown on the corresponding figure and highlighted above.

Table 3-15
Noise Barrier Analysis
Barrier NBP12 Near Somerset Park Community

Barrier Alternative	Barrier Height (feet)	Est, Barrier Length[1]	Barrier Location	Number of Impacted Residences	Number of Impacted Residences Within a Noise Reduction Range			Total Number of Benefited Residences	Average Reduction	Total Estimated Cost	Cost Per Benefited Residence
1	10	4,918	Right of Way	76	8	13	6	27	4.1	$1,475,400	$54,644
2	12	4,918	Right of Way		14	8	16	38	4.9	$1,770,480	$46,592
3	14	4,918	Right of Way		13	16	24	53	5.6	$2,065,560	$38,973
4	16	4,918	Right of Way		6	18	34	58	6.3	$2,360,640	$40,701
5	18	4,918	Right of Way		3	9	49	61	7.0	$2,655,720	$43,536
6	20	4,918	Right of Way		2	6	54	62	7.7	$2,950,800	$47,594
7	22	4,918	Right of Way		2	3	58	63	8.3	$3,245,880	$51,522
8	22/8	3,786/1,270	Hybrid/Index		1	3	58	62	7.4	$2,049,968	$33,064
9	22/14	3,786/1,270	Hybrid/Index		1	3	58	62	7.6	$2,630,000	$42,419

Notes on Noise Barrier Modelling for Barrier NBP12 (includes 116 Receptor Points in the Somerset Park Community):

1. Barrier lengths obtained from TNM Program.
2. Impacted residences are defined as residences where the modelled noise levels with no barrier exceeds the Noise Abatement Criteria [(≥ 66 dB(A)].
3. Benefitted residences are defined as residences where the modelled noise reduction with the barrier is ≥ 5 dB(A).
4. **Separate 3,786 foot long, 22-foot high and 1,270 14 foot-long, 8-foot high noise barriers are** shown on the corresponding figure and highlighted above.

Table 3-16
Noise Barrier Analysis
Barrier SBP10 Near Beacon Park Community

Barrier Alternative	Barrier Height (feet)	Est, Barrier Length[1] (feet)	Barrier Location	Number of Impacted Residences	Number of Impacted Residences Within a Noise Reduction Range			Total Number of Benefited Residences	Average Reduction dB(A)	Total Estimated Cost	Cost Per Benefited Residence
					5-5.9 dB(A)	6-6.9 dB(A)	≥ 7 dB(A)				
1	10	901	Right of Way	4	0	0	0	0	1.7	$270,300	N/A
2	12	901	Right of Way		0	0	0	0	1.7	$324,360	N/A
3	14	901	Right of Way		0	0	0	0	1.7	$378,420	N/A
4	16	901	Right of Way		0	0	0	0	1.7	$432,480	N/A
5	18	901	Right of Way		0	0	0	0	1.7	$486,540	N/A
6	20	901	Right of Way		0	0	0	0	1.7	$540,600	N/A
7	22	901	Right of Way		0	0	0	0	1.7	$594,660	N/A

Notes on Noise Barrier Modelling for Barrier SBP10 (includes 22 Receptor Points at the Beacon Park Community):

1. Barrier lengths obtained from TNM Program.
2. Impacted residences are defined as residences where the modelled noise levels with no barrier exceeds the Noise Abatement Criteria [(≥ 66 dB(A)].
3. Benefitted residences are defined as residences where the modelled noise reduction with the barrier is ≥ 5 dB(A).
4. **No barrier** is recommended for this segment.

Table 3-17
Noise Barrier Analysis
Barrier SBP11 Near La Cascada Community

Barrier Alternative	Barrier Height (feet)	Est, Barrier Length[1] (feet)	Barrier Location	Number of Impacted Residences	Number of Impacted Residences Within a Noise Reduction Range			Total Number of Benefited Residences	Average Reduction dB(A)	Total Estimated Cost	Cost Per Benefited Residence
					5-5.9 dB(A)	6-6.9 dB(A)	≥ 7 dB(A)				
1	10	925	Right of Way	13	2	1	3	6	4.4	$277,500	$46,250.00
2	12	925	Right of Way		3	1	3	7	4.6	$333,000	$47,571.43
3	14	925	Right of Way		2	3	3	8	4.8	$388,500	$48,562.50
4	16	925	Right of Way		2	2	4	8	5.0	$444,000	$55,500.00
5	18	925	Right of Way		2	3	4	9	5.1	$499,500	$55,500.00
6	20	925	Right of Way		2	2	5	9	5.3	$555,000	$61,666.67
7	22	925	Right of Way		1	1	7	9	5.8	$610,500	$67,833.33

Notes on Noise Barrier Modelling for Barrier SBP11 (includes 19 Receptor Points in the La Cascada Community):

1. Barrier lengths obtained from TNM Program.
2. Impacted residences are defined as residences where the modelled noise levels with no barrier exceeds the Noise Abatement Criteria [(≥ 66 dB(A)].
3. Benefitted residences are defined as residences where the modelled noise reduction with the barrier is ≥ 5 dB(A).
4. **No barrier** is recommended for this segment.

Table 3-18
Noise Barrier Analysis
Barrier SBP12 Near Beacon Park Community

Barrier Alternative	Barrier Height (feet)	Est, Barrier Length[1] (feet)	Barrier Location	Number of Impacted Residences	Number of Impacted Residences Within a Noise Reduction Range			Total Number of Benefited Residences	Average Reduction dB(A)	Total Estimated Cost	Cost Per Benefited Residence
					5-5.9 dB(A)	6-6.9 dB(A)	≥ 7 dB(A)				
1	10	2,462	Right of Way	94	0	0	0	0	3.1	$738,600	N/A
2	12	2,462	Right of Way		0	0	0	0	3.7	$886,320	N/A
3	14	2,462	Right of Way		3	2	5	10	4.6	$1,034,040	$103,404
4	16	2,462	Right of Way		12	5	23	40	5.6	$1,181,760	$29,544
5	18	2,462	Right of Way		16	12	35	63	6.5	$1,329,480	$21,103
6	20	2,462	Right of Way		13	13	52	78	7.5	$1,477,200	$18,938
7	22	2,462	Right of Way		10	13	65	88	8.4	$1,624,920	$18,465
8	22/10	1,620/964	Hybrid		3	3	75	81	9.4	$1,416,240	$17,484
9	22/12	1,620/964	Hybrid		3	3	82	88	9.4	$1,508,784	$17,145
10	22/14	1,620/964	Hybrid		3	3	84	90	9.4	$1,609,040	$17,878

Notes on Noise Barrier Modelling for Barrier SBP10 (includes 109 Receptor Points in the Beacon Park Community):

1. Barrier lengths obtained from TNM Program.
2. Impacted residences are defined as residences where the modelled noise levels with no barrier exceeds the Noise Abatement Criteria [(≥ 66 dB(A)].
3. Benefitted residences are defined as residences where the modelled noise reduction with the barrier is ≥ 5 dB(A).
4. **Separate 1,909-foot long, 22-foot high right of way and 924 foot long, 14-foot high shoulder noise barriers** are shown on the corresponding figure and highlighted above.

Table 3-19
Noise Barrier Analysis
Barrier NBP13-S Near Somerset Crossings Boulevard Community

Barrier Alternative	Barrier Height (feet)	Est, Barrier Length[1] (feet)	Barrier Location	Number of Impacted Residences	Number of Impacted Residences Within a Noise Reduction Range			Total Number of Benefited Residences	Average Reduction dB(A)	Total Estimated Cost	Cost Per Benefited Residence
					5-5.9 dB(A)	6-6.9 dB(A)	≥ 7 dB(A)				
1	10	1,772	Shoulder	116	0	0	0	0	2.9	$637,920	N/A
2	12	1,772	Shoulder		24	4	28	56	7.1	$808,032	$14,429
3	14	1,772	Shoulder		6	24	68	98	7.6	$992,320	$10,126
4	8	1,770	Index		12	0	0	12	3.8	$481,440	$40,120
5	14	1,770	Index		24	16	46	86	6.3	$991,200	$11,526

Notes on Noise Barrier Modelling for Barrier NBP13-S (includes 116 Receptor Points in the Somerset Crossings Community):

1. Barrier lengths obtained from TNM Program.
2. Impacted residences are defined as residences where the modelled noise levels with no barrier exceeds the Noise Abatement Criteria [(≥ 66 dB(A)].
3. Benefitted residences are defined as residences where the modelled noise reduction with the barrier is ≥ 5 dB(A).
4. **Separate 1,772-foot long, 14-foot high shoulder noise barrier** is shown on the corresponding figure and highlighted above.

Table 3-20
Noise Barrier Analysis
Barrier NBP13 Near Beacon Park Boulevard Community

Barrier Alternative	Barrier Height (feet)	Est, Barrier Length[1] (feet)	Barrier Location	Number of Impacted Residences	Number of Impacted Residences Within a Noise Reduction Range			Total Number of Benefited Residences	Average Reduction dB(A)	Total Estimated Cost	Cost Per Benefited Residence
					5-5.9 dB(A)	6-6.9 dB(A)	≥ 7 dB(A)				
1	10	2,340	Right of Way	24	0	0	0	0	2.2	$702,000	N/A
2	12	2,340	Right of Way		12	0	0	12	3.8	$842,400	$70,200
3	14	2,340	Right of Way		0	0	12	12	5.3	$982,800	$81,900
4	16	2,340	Right of Way		0	0	12	12	5.6	$1,123,200	$93,600
5	18	2,340	Right of Way		0	0	12	12	5.9	$1,263,600	$105,300
6	20	2,340	Right of Way		0	0	12	12	6	$1,404,000	$117,000
7	22	2,340	Right of Way		0	0	12	12	6.3	$1,544,400	$128,700

Notes on Noise Barrier Modelling for Barrier NBP13 (includes 10 Receptor Points representing 150 residences in the Beacon Park Boulevard Community):

1. Barrier lengths obtained from TNM Program.
2. Impacted residences are defined as residences where the modelled noise levels with no barrier exceeds the Noise Abatement Criteria [(≥ 66 dB(A)].
3. Benefitted residences are defined as residences where the modelled noise reduction with the barrier is ≥ 5 dB(A).
4. **No barrier** is recommended.

Appendix A: Predicted Noise Levels

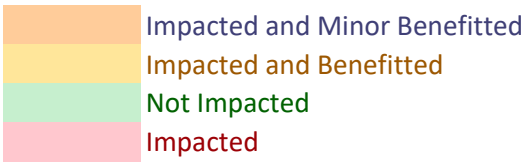
NBP1 20 ft ROW 14 ft Shoulder Barrier					
Receptor Name	No of Units	Predicted w/o barrier	Exceed Standard	Predicted w/ barrier	Reduction
R_EB1_1	1	71.1	Snd Lvl	62.6	8.5
R_EB1_10"	1	72.5	Snd Lvl	60.9	11.6
R_EB1_10A"	1	65.8	----	63.2	2.6
R_EB1_11"	1	72.4	Snd Lvl	61.1	11.3
R_EB1_11A"	1	65.9	----	62.3	3.6
R_EB1_12"	1	72.6	Snd Lvl	61.6	11
R_EB1_12A"	1	66.0	Snd Lvl	63.1	2.9
R_EB1_13"	1	72.3	Snd Lvl	62	10.3
R_EB1_13A"	1	65.4	----	63	2.4
R_EB1_14"	1	71.9	Snd Lvl	62.4	9.5
R_EB1_14A"	1	64.1	----	62.4	1.7
R_EB1_15"	1	71.7	Snd Lvl	62.7	9
R_EB1_15A"	1	65.2	----	65.9	-0.7
R_EB1_16"	1	71.4	Snd Lvl	63.2	8.2
R_EB1_16A"	1	64.2	----	65.7	-1.5
R_EB1_17"	1	70.8	Snd Lvl	63.6	7.2
R_EB1_17A"	1	63.0	----	64.9	-1.9
R_EB1_18"	1	70.3	Snd Lvl	63.2	7.1
R_EB1_18A"	1	62.8	----	64.9	-2.1
R_EB1_19"	1	70.7	Snd Lvl	63.5	7.2
R_EB1_19A"	1	62.6	----	64.2	-1.6
R_EB1_1A"	1	67.9	Snd Lvl	65.2	2.7
R_EB1_2"	1	73.0	Snd Lvl	58.9	14.1
R_EB1_20"	1	70.2	Snd Lvl	62.8	7.4
R_EB1_20A"	1	62.2	----	64.5	-2.3
R_EB1_21"	1	69.6	Snd Lvl	61.7	7.9
R_EB1_21A"	1	62.3	----	64.9	-2.6
R_EB1_22"	1	69.4	Snd Lvl	62.6	6.8
R_EB1_22A"	1	62.2	----	64.7	-2.5
R_EB1_23"	1	69.3	Snd Lvl	61.6	7.7
R_EB1_23A"	1	62.2	----	64.9	-2.7
R_EB1_24"	1	68.7	Snd Lvl	61.2	7.5
R_EB1_24A"	1	62.3	----	64.8	-2.5
R_EB1_25"	1	68.9	Snd Lvl	61.7	7.2
R_EB1_25A"	1	62.3	----	64.5	-2.2
R_EB1_26"	1	69.1	Snd Lvl	62.7	6.4
R_EB1_26A"	1	62.1	----	62.4	-0.3
R_EB1_27"	1	69.4	Snd Lvl	63.1	6.3
R_EB1_28"	1	69.2	Snd Lvl	62.8	6.4
R_EB1_29"	1	69.2	Snd Lvl	63	6.2
R_EB1_2A"	1	67.1	Snd Lvl	65.3	1.8
R_EB1_3"	1	72.7	Snd Lvl	59.9	12.8

Impacted and Minor Benefitted
Impacted and Benefitted
Not Impacted
Impacted

NBP1 20 ft ROW 14 ft Shoulder Barrier					
Receptor Name	No of Units	Predicted w/o barrier	Exceed Standard	Predicted w/ barrier	Reduction
R_EB1_30"	1	69.4	Snd Lvl	63.2	6.2
R_EB1_31"	1	69.1	Snd Lvl	63.1	6
R_EB1_32"	1	69.0	Snd Lvl	63.3	5.7
R_EB1_33"	1	69.1	Snd Lvl	63.8	5.3
R_EB1_34"	1	68.3	Snd Lvl	62.7	5.6
R_EB1_35"	1	66.9	Snd Lvl	61.2	5.7
R_EB1_36"	1	67.0	Snd Lvl	61.8	5.2
R_EB1_37"	1	66.9	Snd Lvl	62.1	4.8
R_EB1_38"	1	66.1	Snd Lvl	61.8	4.3
R_EB1_39"	1	65.7	----	61.8	3.9
R_EB1_3A"	1	67.2	Snd Lvl	65.1	2.1
R_EB1_4"	1	72.8	Snd Lvl	60.8	12
R_EB1_40"	1	65.6	----	62	3.6
R_EB1_41"	1	65.4	----	61.8	3.6
R_EB1_42"	1	65.4	----	62	3.4
R_EB1_43"	1	65.1	----	61.6	3.5
R_EB1_44"	1	64.6	----	60.9	3.7
R_EB1_45"	1	64.6	----	60.8	3.8
R_EB1_46"	1	64.9	----	61	3.9
R_EB1_47"	1	64.8	----	60.9	3.9
R_EB1_48"	1	64.7	----	60.6	4.1
R_EB1_49"	1	64.8	----	60.6	4.2
R_EB1_4A"	1	66.0	Snd Lvl	64.6	1.4
R_EB1_5"	1	72.9	Snd Lvl	60.8	12.1
R_EB1_50"	1	64.2	----	60.5	3.7
R_EB1_51"	1	64.3	----	60.9	3.4
R_EB1_52"	1	67.3	Snd Lvl	62.8	4.5
R_EB1_53"	1	65.3	----	62.4	2.9
R_EB1_54"	1	64.9	----	61.8	3.1
R_EB1_55"	1	65.8	----	62.3	3.5
R_EB1_56"	1	65.8	----	62.6	3.2
R_EB1_57"	1	65.2	----	62.2	3
R_EB1_58"	1	64.7	----	62	2.7
R_EB1_59"	1	64.3	----	61.7	2.6
R_EB1_5A"	1	65.9	----	65.1	0.8
R_EB1_6"	1	73.9	Snd Lvl	60.1	13.8
R_EB1_60"	1	63.6	----	61.2	2.4
R_EB1_61"	1	62.9	----	60.7	2.2
R_EB1_62"	1	63.2	----	61.1	2.1
R_EB1_63"	1	62.4	----	60.6	1.8
R_EB1_64"	1	62.4	----	60.2	2.2
R_EB1_65"	1	61.3	----	59.4	1.9

NBP1 20 ft ROW 14 ft Shoulder Barrier					
Receptor Name	**No of Units**	**Predicted w/o barrier**	**Exceed Standard**	**Predicted w/ barrier**	**Reduction**
R_EB1_66"	1	62.6	----	60.5	2.1
R_EB1_67"	1	62.1	----	59.9	2.2
R_EB1_68"	1	61.5	----	59.6	1.9
R_EB1_69"	1	62.5	----	59.7	2.8
R_EB1_6A"	1	65.9	----	65.6	0.3
R_EB1_7"	1	73.7	Snd Lvl	57.5	16.2
R_EB1_70"	1	61.8	----	59.2	2.6
R_EB1_7A"	1	65.5	----	64.3	1.2
R_EB1_8"	1	73.3	Snd Lvl	57	16.3
R_EB1_8A"	1	65.6	----	63.9	1.7
R_EB1_9"	1	72.7	Snd Lvl	61.3	11.4
R_EB1_9A"	1	65.6	----	64.2	1.4

SBP1 14 ft Shoulder Barrier					
Receptor Name	No of Units	Predicted w/o barrier	Exceed Standard	Predicted w/ barrier	Reduction
R_WB1_1"	1	72.2	Snd Lvl	65.6	6.6
R_WB1_2"	1	71.3	Snd Lvl	64.2	7.1
R_WB1_3"	1	70.5	Snd Lvl	63.1	7.4
R_WB1_4"	1	69.7	Snd Lvl	62.4	7.3
R_WB1_5"	1	69.3	Snd Lvl	62.1	7.2
R_WB1_6"	1	68.1	Snd Lvl	62.4	5.7
R_WB1_7"	1	70.8	Snd Lvl	65.1	5.7
R_WB1_8"	1	70.2	Snd Lvl	63.7	6.5
R_WB1_9"	1	68.9	Snd Lvl	62.7	6.2
R_WB1_10"	1	68.6	Snd Lvl	62.6	6
R_WB1_11"	1	68.5	Snd Lvl	63	5.5
R_WB1_12"	1	68.7	Snd Lvl	64.2	4.5
R_WB1_13"	1	69.1	Snd Lvl	64	5.1
R_WB1_14"	1	67.2	Snd Lvl	62.7	4.5
R_WB1_15"	1	68.6	Snd Lvl	62.8	5.8
R_WB1_16"	1	67.3	Snd Lvl	62	5.3
R_WB1_17"	1	65.7	----	62	3.7
R_WB1_18"	1	66.7	Snd Lvl	61.8	4.9
R_WB1_19"	1	66.5	Snd Lvl	61.4	5.1
R_WB1_20"	1	67.6	Snd Lvl	62.1	5.5
R_WB1_21"	1	66.8	Snd Lvl	62.7	4.1
R_WB1_22"	1	63.3	----	59.9	3.4
R_WB1_23"	1	63.7	----	60	3.7
R_WB1_24"	1	64.7	----	60.7	4
R_WB1_25"	1	64.8	----	60.8	4
R_WB1_26"	1	65.3	----	61	4.3



NBP2 14 ft Shoulder Barrier					
Receptor Name	No of Units	Predicted w/o barrier	Exceed Standard	Predicted w/ barrier	Reduction
R_EB2_1"	1	63.8	----	61.2	2.6
R_EB2_10"	1	67.9	Snd Lvl	62.6	5.3
R_EB2_11"	1	70.1	Snd Lvl	64.8	5.3
R_EB2_12"	1	66.2	Snd Lvl	62.9	3.3
R_EB2_13"	1	65.8	----	63.2	2.6
R_EB2_14"	1	64.3	----	62.3	2
R_EB2_15"	1	63.8	----	62.1	1.7
R_EB2_16"	1	64.8	----	61.9	2.9
R_EB2_17"	1	65.2	----	61.9	3.3
R_EB2_18"	1	63.5	----	60.7	2.8
R_EB2_19"	1	64.0	----	61.1	2.9
R_EB2_2"	1	64.7	----	62	2.7
R_EB2_20"	1	63.3	----	60.6	2.7
R_EB2_21"	1	62.8	----	60.3	2.5
R_EB2_3"	1	66.9	Snd Lvl	64.4	2.5
R_EB2_4"	1	67.3	Snd Lvl	65.4	1.9
R_EB2_5"	1	68.4	Snd Lvl	65.7	2.7
R_EB2_6"	1	67.7	Snd Lvl	64.2	3.5
R_EB2_7"	1	67.8	Snd Lvl	63.4	4.4
R_EB2_8"	1	68.2	Snd Lvl	63.2	5
R_EB2_9"	1	67.9	Snd Lvl	62.6	5.3

Impacted and Minor Benefitted
Impacted and Benefitted
Not Impacted
Impacted

SBP2 12 ft Shoulder Barrier					
Receptor Name	**No of Units**	**Predicted w/o barrier**	**Exceed Standard**	**Predicted w/ barrier**	**Reduction**
R_WB2_1"	1	66.3	Snd Lvl	61.7	4.6
R_WB2_2"	1	68.4	Snd Lvl	62.2	6.2
R_WB2_3"	1	70.1	Snd Lvl	62.9	7.2
R_WB2_4"	1	68.2	Snd Lvl	63	5.2
R_WB2_5"	1	65.5	----	61.1	4.4
R_WB2_6"	1	65.3	----	61.2	4.1
R_WB2_7"	1	67.0	Snd Lvl	62.6	4.4
R_WB2_8"	1	66.6	Snd Lvl	62.9	3.7
R_WB2_9"	1	66.8	Snd Lvl	64	2.8
R_WB2_10"	1	63.5	----	60.2	3.3
R_WB2_11"	1	62.3	----	59.4	2.9
R_WB2_12"	1	62.9	----	60	2.9
R_WB2_13"	1	63.0	----	60.6	2.4
R_WB2_14"	1	63.3	----	61.1	2.2
R_WB2_15"	10	64.3	----	62.1	2.2

Impacted and Minor Benefitted
Impacted and Benefitted
Not Impacted
Impacted

NBP3 Existing Berm / Brick Wall					
Receptor Name	**No of Units**	**Predicted w/o barrier**	**Exceed Standard**	**Predicted w/ barrier**	**Reduction**
R_EB3_1"	1	62.6	----	N/A	N/A
R_EB3_2"	1	62.2	----	N/A	N/A
R_EB3_3"	1	61.9	----	N/A	N/A
R_EB3_4"	1	61.6	----	N/A	N/A
R_EB3_5"	1	60.6	----	N/A	N/A
R_EB3_6"	1	59.4	----	N/A	N/A
R_EB3_7"	1	60	----	N/A	N/A
R_EB3_8"	1	60.5	----	N/A	N/A
R_EB3_9"	1	60.4	----	N/A	N/A
R_EB3_10"	1	61.5	----	N/A	N/A
R_EB3_11"	1	62	----	N/A	N/A
R_EB3_12"	1	62.4	----	N/A	N/A
R_EB3_13"	1	63.1	----	N/A	N/A
R_EB3_14"	1	63.4	----	N/A	N/A
R_EB3_15"	1	63.1	----	N/A	N/A
R_EB3_16"	1	63.6	----	N/A	N/A
R_EB3_17"	1	62.8	----	N/A	N/A
R_EB3_18"	1	63.8	----	N/A	N/A
R_EB3_19"	1	63.4	----	N/A	N/A
R_EB3_20"	1	63	----	N/A	N/A
R_EB3_21"	1	63.1	----	N/A	N/A
R_EB3_22"	1	63	----	N/A	N/A
R_EB3_23"	1	63	----	N/A	N/A
R_EB3_24"	1	63.8	----	N/A	N/A
R_EB3_25"	1	63	----	N/A	N/A
R_EB3_26"	1	63.3	----	N/A	N/A
R_EB3_27"	1	63.4	----	N/A	N/A
R_EB3_28"	1	63.1	----	N/A	N/A
R_EB3_29"	1	63.5	----	N/A	N/A
R_EB3_30"	1	63.9	----	N/A	N/A
R_EB3_31"	1	63.6	----	N/A	N/A
R_EB3_32"	1	63.8	----	N/A	N/A
R_EB3_33"	1	63.5	----	N/A	N/A
R_EB3_34"	1	63.8	----	N/A	N/A
R_EB3_35"	1	64.2	----	N/A	N/A
R_EB3_36"	1	64	----	N/A	N/A
R_EB3_37"	1	63.8	----	N/A	N/A
R_EB3_38"	1	64	----	N/A	N/A
R_EB3_39"	1	64.1	----	N/A	N/A
R_EB3_40"	1	63.8	----	N/A	N/A
R_EB3_41"	1	64	----	N/A	N/A
R_EB3_42"	1	64.2	----	N/A	N/A
R_EB3_43"	1	64.3	----	N/A	N/A

Impacted and Minor Benefitted
Impacted and Benefitted
Not Impacted
Impacted

NBP3 Existing Berm / Brick Wall					
Receptor Name	**No of Units**	**Predicted w/o barrier**	**Exceed Standard**	**Predicted w/ barrier**	**Reduction**
R_EB3_44"	1	65.6	----	N/A	N/A
R_EB3_45"	1	66.2	Snd Lvl	N/A	N/A
R_EB3_46"	1	65.3	----	N/A	N/A
R_EB3_47"	1	63.4	----	N/A	N/A
R_EB3_48"	1	62.6	----	N/A	N/A
R_EB3_49"	1	61.8	----	N/A	N/A
R_EB3_50"	1	61.2	----	N/A	N/A
R_EB3_51"	1	58.5	----	N/A	N/A
R_EB3_52"	1	58.8	----	N/A	N/A
R_EB3_53"	1	59.5	----	N/A	N/A
R_EB3_54"	1	59.9	----	N/A	N/A
R_EB3_55"	1	60	----	N/A	N/A
R_EB3_56"	1	60	----	N/A	N/A
R_EB3_57"	1	60.1	----	N/A	N/A
R_EB3_58"	1	60.2	----	N/A	N/A
R_EB3_59"	1	60.1	----	N/A	N/A
R_EB3_60"	1	60.2	----	N/A	N/A
R_EB3_61"	1	60.1	----	N/A	N/A
R_EB3_62"	1	59.8	----	N/A	N/A
R_EB3_63"	1	59.9	----	N/A	N/A
R_EB3_64"	1	59.7	----	N/A	N/A
R_EB3_65"	1	59.8	----	N/A	N/A
R_EB3_66"	1	60	----	N/A	N/A
R_EB3_67"	1	59.7	----	N/A	N/A
R_EB3_68"	1	60.2	----	N/A	N/A
R_EB3_69"	1	60	----	N/A	N/A
R_EB3_70"	1	59.9	----	N/A	N/A
R_EB3_71"	1	60.5	----	N/A	N/A
R_EB3_72"	1	60.7	----	N/A	N/A
R_EB3_73"	1	60.9	----	N/A	N/A
R_EB3_74"	1	61	----	N/A	N/A
R_EB3_75"	1	61	----	N/A	N/A
R_EB3_76"	1	60.5	----	N/A	N/A
R_EB3_77"	1	59.9	----	N/A	N/A
R_EB3_78"	1	69.1	Snd Lvl	N/A	N/A
R_EB3_79"	1	67.9	Snd Lvl	N/A	N/A
R_EB3_80"	1	66	Snd Lvl	N/A	N/A
R_EB3_81"	1	65	----	N/A	N/A
R_EB3_82"	1	64	----	N/A	N/A
R_EB3_83"	1	63.1	----	N/A	N/A
R_EB3_84"	1	62.6	----	N/A	N/A
R_EB3_85"	1	61.6	----	N/A	N/A
R_EB3_86"	1	61.7	----	N/A	N/A

NBP3 Existing Berm / Brick Wall					
Receptor Name	**No of Units**	**Predicted w/o barrier**	**Exceed Standard**	**Predicted w/ barrier**	**Reduction**
R_EB3_87"	1	62.8	----	N/A	N/A
R_EB3_88"	1	62.8	----	N/A	N/A
R_EB3_89"	1	62.6	----	N/A	N/A
R_EB3_90"	1	62.4	----	N/A	N/A
R_EB3_91"	1	62.2	----	N/A	N/A
R_EB3_92"	1	61.6	----	N/A	N/A
R_EB3_93"	1	61.1	----	N/A	N/A
R_EB3_94"	1	60.9	----	N/A	N/A
R_EB3_95"	1	60.9	----	N/A	N/A
R_EB3_96"	1	60.6	----	N/A	N/A
R_EB3_97"	1	60.7	----	N/A	N/A
R_EB3_98"	50	60.4	----	N/A	N/A
R_EB3_99"	100	60.4	----	N/A	N/A

SBP3 Hybrid 20 ft ROW 12 ft Shoulder Barrier					
Receptor Name	No of Units	Predicted w/o barrier	Exceed Standard	Predicted w/ barrier	Reduction
R_WB3_1"	10	67.1	Snd Lvl	63.6	3.5
R_WB3_2"	10	68.1	Snd Lvl	63.1	5
R_WB3_3"	10	68.8	Snd Lvl	62.7	6.1
R_WB3_4"	4	64.3	----	61.1	3.2
R_WB3_5"	10	62.8	----	60.4	2.4
R_WB3_6"	10	62.2	----	60	2.2
R_WB3_7"	10	70.3	Snd Lvl	60.7	9.6
R_WB3_8"	10	64.2	----	60.6	3.6
R_WB3_9"	10	69.4	Snd Lvl	61.5	7.9
R_WB3_10"	10	69.7	Snd Lvl	62.3	7.4
R_WB3_11"	10	69.4	Snd Lvl	62.4	7
R_WB3_12"	10	69.2	Snd Lvl	61.9	7.3
R_WB3_13"	6	67.5	Snd Lvl	61.3	6.2
R_WB3_14"	6	65.2	----	61.4	3.8
R_WB3_15"	10	62.2	----	60.5	1.7
R_WB3_16"	4	60.8	----	59.9	0.9
R_WB3_17"	8	64.5	----	61.8	2.7
R_WB3_18"	10	62.9	----	61.1	1.8
R_WB3_19"	10	62.6	----	60.8	1.8
R_WB3_20"	6	62.1	----	60.4	1.7
R_WB3_21"	6	61.6	----	60.1	1.5
R_WB3_22"	6	61.9	----	61.6	0.3
R_WB3_23"	6	60.8	----	60.6	0.2
R_WB3_24"	1	59	----	59.2	-0.2
R_WB3_25"	1	59.1	----	57.9	1.2
R_WB3_26"	1	59	----	58.1	0.9
R_WB3_27"	1	58.8	----	58.1	0.7
R_WB3_28"	1	58.8	----	58	0.8
R_WB3_29"	1	58.7	----	57.8	0.9
R_WB3_30"	1	58.7	----	57.7	1
R_WB3_31"	1	58.6	----	57.8	0.8
R_WB3_32"	1	58.1	----	57.6	0.5
R_WB3_33"	1	57.9	----	57.4	0.5
R_WB3_34"	1	57.1	----	56.7	0.4
R_WB3_35"	30	57.4	----	57	0.4
R_WB3_36"	30	57.2	----	56.3	0.9
R_WB3_37"	30	58.1	----	57.6	0.5
R_WB3_38"	30	57.8	----	57.6	0.2
R_WB3_39"	30	57.3	----	57.2	0.1
R_WB3_40"	30	58	----	57.9	0.1
R_WB3_41"	30	56.6	----	56.1	0.5
R_WB3_42"	30	56	----	55.7	0.3

Impacted and Minor Benefitted
Impacted and Benefitted
Not Impacted
Impacted

SBP3 Hybrid 20 ft ROW 12 ft Shoulder Barrier					
Receptor Name	**No of Units**	**Predicted w/o barrier**	**Exceed Standard**	**Predicted w/ barrier**	**Reduction**
R_WB3_43"	30	55.2	----	54.5	0.7
R_WB3_44"	1	54.8	----	54.3	0.5

NBP4_Baseline					
Receptor Name	No of Units	Predicted w/o barrier	Exceed Standard	Predicted w/ barrier	Reduction
R_EB5_1"	1	54.1	----	----	----
R_EB5_2"	10	55	----	----	----
R_EB5_3"	10	56.2	----	----	----
R_EB5_4"	10	58.1	----	----	----
R_EB5_5"	10	59.3	----	----	----
R_EB5_6"	10	61.2	----	----	----
R_EB5_7"	10	63.6	----	----	----
R_EB5_8"	10	64.3	----	----	----
R_EB5_9"	10	54	----	----	----
R_EB5_10"	10	55.5	----	----	----
R_EB5_11"	10	56.1	----	----	----
R_EB5_12"	10	57.4	----	----	----
R_EB5_13"	10	58.8	----	----	----
R_EB5_14"	10	61.3	----	----	----
R_EB5_15"	10	62.6	----	----	----
R_EB5_16"	10	53.6	----	----	----
R_EB5_17"	10	54.9	----	----	----
R_EB5_18"	10	55.8	----	----	----
R_EB5_19"	10	57.6	----	----	----
R_EB5_20"	10	58.9	----	----	----
R_EB5_21"	10	60.6	----	----	----
R_EB5_22"	10	61.1	----	----	----
R_EB5_23"	10	62	----	----	----
R_EB5_24"	10	62.2	----	----	----
R_EB5_25"	10	62.5	----	----	----
R_EB5_26"	1	62.7	----	----	----
R_EB5_27"	1	63.8	----	----	----
R_EB5_28"	1	64.3	----	----	----
R_EB5_29"	1	63.4	----	----	----
R_EB5_30"	1	64	----	----	----
R_EB5_31"	1	63.7	----	----	----
R_EB5_32"	1	63.6	----	----	----
R_EB5_33"	1	63.4	----	----	----
R_EB5_34"	1	63.9	----	----	----
R_EB5_35"	1	63.6	----	----	----
R_EB5_36"	1	64.2	----	----	----
R_EB5_37"	1	63.9	----	----	----
R_EB5_38"	1	63.7	----	----	----
R_EB5_39"	1	63.3	----	----	----
R_EB5_40"	1	62.8	----	----	----
R_EB5_41"	1	62.6	----	----	----
R_EB5_42"	1	62.2	----	----	----

Impacted and Minor Benefitted
Impacted and Benefitted
Not Impacted
Impacted

NBP4_Baseline					
Receptor Name	**No of Units**	**Predicted w/o barrier**	**Exceed Standard**	**Predicted w/ barrier**	**Reduction**
R_EB5_43"	1	62	----	----	----
R_EB5_44"	1	61.7	----	----	----
R_EB5_45"	1	61.4	----	----	----
R_EB5_46"	1	61.1	----	----	----
R_EB5_47"	1	61	----	----	----
R_EB5_48"	1	60.5	----	----	----
R_EB5_49"	1	60.5	----	----	----
R_EB5_50"	1	60.3	----	----	----
R_EB5_51"	1	60.4	----	----	----
R_EB5_52"	1	61.3	----	----	----
R_EB5_53"	1	61.4	----	----	----
R_EB5_54"	1	62.7	----	----	----
R_EB5_55"	1	63.6	----	----	----
R_EB5_56"	1	63.7	----	----	----
R_EB5_57"	1	63.5	----	----	----
R_EB5_58"	1	62.9	----	----	----
R_EB5_59"	1	62.4	----	----	----
R_EB5_60"	1	62.8	----	----	----
R_EB5_61"	1	62.5	----	----	----
R_EB5_62"	1	62.5	----	----	----
R_EB5_63"	1	62	----	----	----
R_EB5_64"	1	62.1	----	----	----
R_EB5_65"	1	61.7	----	----	----
R_EB5_66"	1	61.3	----	----	----
R_EB5_70"	1	59.3	----	----	----
R_EB5_69"	1	59.9	----	----	----
R_EB5_68"	1	60.2	----	----	----
R_EB5_67"	1	61.2	----	----	----
R_EB5_71"	1	58.8	----	----	----
R_EB5_72"	1	58.9	----	----	----
R_EB5_73"	1	57.8	----	----	----
R_EB5_74"	1	57.2	----	----	----
R_EB5_75"	1	55.1	----	----	----
R_EB5_76"	1	53.4	----	----	----
R_EB5_77"	1	53	----	----	----
R_EB5_78"	1	52.4	----	----	----
R_EB5_79"	1	50.8	----	----	----
R_EB5_80"	1	50.1	----	----	----
R_EB5_81"	1	49.8	----	----	----
R_EB5_82"	1	50.4	----	----	----
R_EB5_83"	1	48.6	----	----	----
R_EB5_84"	1	47.6	----	----	----

NBP4_Baseline					
Receptor Name	**No of Units**	**Predicted w/o barrier**	**Exceed Standard**	**Predicted w/ barrier**	**Reduction**
R_EB5_85"	1	46.1	----	----	----
R_EB5_86"	1	46.9	----	----	----
R_EB5_87"	1	47.8	----	----	----
R_EB5_88"	1	45.8	----	----	----
R_EB5_89"	1	48	----	----	----
R_EB5_90"	1	48	----	----	----
R_EB5_91"	1	48.4	----	----	----
R_EB5_92"	1	47.9	----	----	----
R_EB5_93"	1	48.8	----	----	----
R_EB5_94"	1	49.2	----	----	----
R_EB5_95"	1	50.6	----	----	----
R_EB5_96"	1	51.8	----	----	----
R_EB5_97"	1	52.5	----	----	----
R_EB5_98"	1	52.5	----	----	----
R_EB5_99"	1	52.9	----	----	----
R_EB5_100"	1	54.2	----	----	----

SBP4 and SBP5 20 ft ROW					
Receptor Name	No of Units	Predicted w/o barrier	Exceed Standard	Predicted w/ barrier	Reduction
R_WB4_1"	1	62.1	----	54.8	7.3
R_WB4_2"	1	62.8	----	55.2	7.6
R_WB4_3"	1	63.1	----	55.8	7.3
R_WB4_4"	1	63.4	----	56.7	6.7
R_WB4_5"	1	64.3	----	57	7.3
R_WB4_6"	1	64.3	----	56.8	7.5
R_WB4_7"	1	64.8	----	57	7.8
R_WB4_8"	1	65.4	----	57.1	8.3
R_WB4_9"	1	65.6	----	57	8.6
R_WB4_10"	1	66.1	Snd Lvl	57.2	8.9
R_WB4_11"	1	67.1	Snd Lvl	57.8	9.3
R_WB4_12"	1	67.4	Snd Lvl	57.7	9.7
R_WB4_13"	1	67.9	Snd Lvl	57.4	10.5
R_WB4_14"	1	68.3	Snd Lvl	57.6	10.7
R_WB4_15"	1	68.8	Snd Lvl	58.8	10
R_WB4_16"	1	69.2	Snd Lvl	58.9	10.3
R_WB4_17"	1	69	Snd Lvl	59.9	9.1
R_WB4_18"	1	69.2	Snd Lvl	60.8	8.4
R_WB4_19"	1	69.4	Snd Lvl	60.6	8.8
R_WB4_20"	1	69.6	Snd Lvl	60.4	9.2
R_WB4_21"	1	70.4	Snd Lvl	61.2	9.2
R_WB4_22"	1	70	Snd Lvl	63.3	6.7
R_WB4_23"	1	70.6	Snd Lvl	63.9	6.7
R_WB4_24"	1	70.2	Snd Lvl	64.1	6.1
R_WB4_25"	1	71	Snd Lvl	64.3	6.7
R_WB4_26"	1	71.1	Snd Lvl	64.1	7
R_WB4_27"	1	71.6	Snd Lvl	64	7.6
R_WB4_28"	1	71.5	Snd Lvl	64.5	7
R_WB4_29"	1	70.8	Snd Lvl	64.6	6.2
R_WB4_30"	1	71.3	Snd Lvl	63.9	7.4
R_WB4_31"	1	71.9	Snd Lvl	64.3	7.6
R_WB4_32"	1	70.8	Snd Lvl	64.4	6.4
R_WB4_33"	1	71.6	Snd Lvl	64.8	6.8
R_WB4_34"	1	69.7	Snd Lvl	63.1	6.6
R_WB4_35"	1	68	Snd Lvl	62.4	5.6
R_WB4_36"	1	70	Snd Lvl	63.1	6.9
R_WB4_37"	1	69.9	Snd Lvl	63.3	6.6
R_WB4_38"	1	68.7	Snd Lvl	63.5	5.2
R_WB4_39"	1	67.7	Snd Lvl	62.3	5.4
R_WB4_40"	1	69.3	Snd Lvl	63.5	5.8
R_WB4_41"	1	68.9	Snd Lvl	63.8	5.1
R_WB4_42"	1	68.2	Snd Lvl	63.3	4.9

Impacted and Minor Benefitted
Impacted and Benefitted
Not Impacted
Impacted

SBP4 and SBP5 20 ft ROW					
Receptor Name	No of Units	Predicted w/o barrier	Exceed Standard	Predicted w/ barrier	Reduction
R_WB4_43"	1	68.2	Snd Lvl	62.9	5.3
R_WB4_44"	1	68.4	Snd Lvl	63.4	5
R_WB4_45"	1	67.9	Snd Lvl	63.1	4.8
R_WB4_46"	1	67.6	Snd Lvl	62.6	5
R_WB4_47"	1	66.9	Snd Lvl	62.8	4.1
R_WB4_48"	1	66.4	Snd Lvl	62.45	3.95
R_WB4_49"	1	66.2	Snd Lvl	62.1	4.1
R_WB4_50"	1	65.1	----	62	3.1
R_WB4_51"	1	64.6	----	62	2.6
R_WB4_52"	1	64.9	----	62.1	2.8
R_WB4_53"	1	64	----	61.9	2.1
R_WB4_54"	1	63.6	----	61.7	1.9
R_WB4_55"	1	63.8	----	62.2	1.6
R_WB4_56"	1	63.5	----	62.2	1.3
R_WB4_57"	1	63.2	----	62.2	1
R_WB4_58"	1	62.6	----	62	0.6
R_WB4_59"	1	62	----	61.6	0.4
R_WB4_60"	1	62.4	----	62.1	0.3
R_WB4_61"	1	62.2	----	61.9	0.3
R_WB4_62"	1	62.1	----	61.8	0.3
R_WB4_63"	1	61.8	----	61.5	0.3
R_WB4_64"	1	61.6	----	61.4	0.2
R_WB4_65"	1	60.4	----	60.2	0.2
R_WB4_66"	1	59.7	----	55.2	4.5
R_WB4_67"	1	60.6	----	55.5	5.1
R_WB4_68"	1	61	----	56	5
R_WB4_69"	1	61.3	----	56.5	4.8
R_WB4_70"	1	61.7	----	56.6	5.1
R_WB4_71"	1	61.9	----	57.3	4.6
R_WB4_72"	1	62.2	----	56.9	5.3
R_WB4_73"	1	62.4	----	----	
R_WB4_74"	1	62.8	----	57.4	5.4
R_WB4_75"	1	63	----	57.6	5.4
R_WB4_76"	1	63.5	----	57.9	5.6
R_WB4_77"	1	63.8	----	58	5.8
R_WB4_78"	1	64	----	58.5	5.5
R_WB4_79"	1	64.2	----	58.8	5.4
R_WB4_80"	1	64.8	----	59.2	5.6
R_WB4_81"	1	65	----	59.3	5.7
R_WB4_82"	1	65.2	----	59.8	5.4
R_WB4_83"	1	65.3	----	59.9	5.4
R_WB4_84"	1	65.6	----	60.6	5

SBP4 and SBP5 20 ft ROW					
Receptor Name	No of Units	Predicted w/o barrier	Exceed Standard	Predicted w/ barrier	Reduction
R_WB4_85"	1	65.6	----	60.6	5
R_WB4_86"	1	66.2	Snd Lvl	61.4	4.8
R_WB4_87"	1	66	Snd Lvl	61.4	4.6
R_WB4_88"	1	66.2	Snd Lvl	61.1	5.1
R_WB4_89"	1	66.4	Snd Lvl	61.3	5.1
R_WB4_90"	1	66.4	Snd Lvl	61.2	5.2
R_WB4_91"	1	66.6	Snd Lvl	61.2	5.4
R_WB4_92"	1	66.8	Snd Lvl	61.3	5.5
R_WB4_93"	1	66.9	Snd Lvl	61.4	5.5
R_WB4_94"	1	66.3	Snd Lvl	61.7	4.6
R_WB4_95"	1	66.3	Snd Lvl	61.6	4.7
R_WB4_96"	1	66.1	Snd Lvl	61.5	4.6
R_WB4_97"	1	64.9	----	61.1	3.8
R_WB4_98"	1	64.1	----	60.3	3.8
R_WB4_99"	1	65.2	----	61.2	4
R_WB4_100"	1	66.7	Snd Lvl	61.4	5.3
R_WB4_101"	1	64.8	----	60.8	4
R_WB4_102"	1	64.5	----	60.9	3.6
R_WB4_103"	1	64.3	----	60.7	3.6
R_WB4_104"	1	64	----	60.9	3.1
R_WB4_105"	1	63.7	----	60.9	2.8
R_WB4_106"	1	63.3	----	60.5	2.8
R_WB4_107"	1	62.5	----	60	2.5
R_WB4_108"	1	62.2	----	60	2.2
R_WB4_109"	1	62	----	59.9	2.1
R_WB4_110"	1	61.7	----	59.9	1.8
R_WB4_111"	1	61.4	----	59.7	1.7
R_WB4_112"	1	61.2	----	59.8	1.4
R_WB4_113"	1	61.1	----	59.8	1.3
R_WB4_114"	1	60.8	----	59.8	1
R_WB4_115"	1	60.7	----	59.8	0.9
R_WB4_116"	1	61	----	60.3	0.7
R_WB4_117"	1	60.6	----	60.1	0.5
R_WB4_118"	1	60	----	59.6	0.4
R_WB4_119"	1	60	----	59.7	0.3
R_WB4_120"	1	59.7	----	59.4	0.3
R_WB4_121"	1	59.6	----	59.3	0.3
R_WB4_122"	1	59.3	----	59	0.3

SBP5 10 ft Shoulder Barrier					
Receptor Name	**No of Units**	**Predicted w/o barrier**	**Exceed Standard**	**Predicted w/ barrier**	**Reduction**
R_EB6_2"	30	73.7	Snd Lvl	62.9	10.8
R_EB6_3"	15	73	Snd Lvl	62.5	10.5
R_EB6_4"	30	72.7	Snd Lvl	61.9	10.8
R_EB6_5"	30	72.7	Snd Lvl	61.1	11.6
R_EB6_6"	30	72.9	Snd Lvl	60.7	12.2
R_EB6_7"	15	67.8	Snd Lvl	60.6	7.2
R_EB6_8"	30	65.9	----	59.2	6.7
R_EB6_9"	30	63.2	----	57.9	5.3
R_EB6_10"	15	63.8	----	55.9	7.9
R_EB6_11"	30	63.3	----	56.7	6.6
R_EB6_12"	15	61.8	----	56.6	5.2
R_EB6_13"	30	64.2	----	55.3	8.9
R_EB6_14"	30	52	----	56.3	-4.3
R_EB6_15"	30	47.6	----	50.5	-2.9

Impacted and Minor Benefitted
Impacted and Benefitted
Not Impacted
Impacted

SBP6 22 ft ROW					
Receptor Name	No of Units	Predicted w/o barrier	Exceed Standard	Predicted w/ barrier	Reduction
R_WB5_1"	1	69.1	Snd Lvl	67.1	2
R_WB5_2"	1	68.1	Snd Lvl	61.1	7
R_WB5_3"	1	67.2	Snd Lvl	60.7	6.5
R_WB5_4"	1	69.3	Snd Lvl	51.9	17.4
R_WB5_5"	1	69.4	Snd Lvl	50.4	19
R_WB5_6"	1	68.8	Snd Lvl	53.7	15.1
R_WB5_7"	1	68.8	Snd Lvl	53.2	15.6
R_WB5_8"	1	68.7	Snd Lvl	53.2	15.5
R_WB5_9"	1	68.9	Snd Lvl	51.1	17.8
R_WB5_10"	1	68.3	Snd Lvl	53.4	14.9
R_WB5_11"	1	68.7	Snd Lvl	51.8	16.9
R_WB5_12"	1	68.1	Snd Lvl	53.9	14.2
R_WB5_13"	1	68.4	Snd Lvl	51.1	17.3
R_WB5_14"	1	67.9	Snd Lvl	61.6	6.3
R_WB5_15"	1	68.5	Snd Lvl	62.5	6
R_WB5_16"	1	68.6	Snd Lvl	63.6	5
R_WB5_17"	1	69.1	Snd Lvl	64.7	4.4
R_WB5_18"	1	69.3	Snd Lvl	65.6	3.7
R_WB5_19"	1	69.2	Snd Lvl	66.3	2.9
R_WB5_20"	1	69.6	Snd Lvl	67.3	2.3
R_WB5_21"	1	69.8	Snd Lvl	68.2	1.6
R_WB5_22"	1	70.3	Snd Lvl	69.4	0.9
R_WB5_23"	1	70.3	Snd Lvl	69.7	0.6
R_WB5_24"	1	70.1	Snd Lvl	69.5	0.6
R_WB5_25"	1	69.6	Snd Lvl	68.8	0.8
R_WB5_26"	1	71	Snd Lvl	69.1	1.9
R_WB5_27"	1	67.5	Snd Lvl	65.7	1.8
R_WB5_28"	1	66.5	Snd Lvl	65.4	1.1
R_WB5_29"	1	65.3	----	65	0.3
R_WB5_30"	1	64.5	----	64.3	0.2
R_WB5_31"	1	65.1	----	64.9	0.2
R_WB5_32"	1	65	----	64.9	0.1
R_WB5_33"	1	65.4	----	65.2	0.2
R_WB5_34"	1	65.3	----	65.2	0.1
R_WB5_35"	1	64.6	----	64.5	0.1
R_WB5_36"	1	66.3	Snd Lvl	59.9	6.4
R_WB5_37"	1	65.4	----	59.2	6.2
R_WB5_38"	1	66.1	Snd Lvl	56.5	9.6
R_WB5_39"	1	66	Snd Lvl	56.4	9.6
R_WB5_40"	1	65.8	----	56.7	9.1
R_WB5_41"	1	65.7	----	57.2	8.5
R_WB5_42"	1	65.4	----	58	7.4

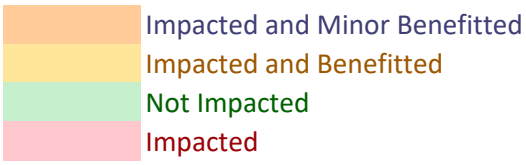
Impacted and Minor Benefitted
Impacted and Benefitted
Not Impacted
Impacted

SBP6 22 ft ROW					
Receptor Name	No of Units	Predicted w/o barrier	Exceed Standard	Predicted w/ barrier	Reduction
R_WB5_43"	1	65	----	59.6	5.4
R_WB5_44"	1	65.1	----	60.7	4.4
R_WB5_45"	1	65.6	----	62.5	3.1
R_WB5_46"	1	65.7	----	63.4	2.3
R_WB5_47"	1	65.8	----	63.9	1.9
R_WB5_48"	1	66	Snd Lvl	64.3	1.7
R_WB5_49"	1	66.2	Snd Lvl	64.8	1.4
R_WB5_50"	1	66	Snd Lvl	64.8	1.2
R_WB5_51"	1	65.4	----	64.8	0.6
R_WB5_52"	1	63.9	----	63.3	0.6

NBP6_Baseline				
Receptor Name	**No of Units**	**Predicted w/o barrier**	**Exceed Standard**	**Predicted w/ barrier**
R_EB7_1"	6	54.4	----	----
R_EB7_2"	6	53.4	----	----
R_EB7_3"	6	53.2	----	----
R_EB7_4"	4	51.6	----	----
R_EB7_5"	6	52.3	----	----
R_EB7_6"	4	52.9	----	----
R_EB7_7"	4	54.1	----	----
R_EB7_8"	4	57.9	----	----
R_EB7_9"	6	58.2	----	----
R_EB7_10"	6	53.7	----	----
R_EB7_11"	6	52.8	----	----
R_EB7_12"	4	52.6	----	----
R_EB7_13"	6	53	----	----
R_EB7_14"	6	52.8	----	----
R_EB7_15"	1	58.5	----	----
R_EB7_16"	1	58.7	----	----
R_EB7_17"	1	59.2	----	----
R_EB7_18"	1	59.5	----	----
R_EB7_19"	1	59.4	----	----
R_EB7_20"	1	59.4	----	----
R_EB7_21"	1	58.8	----	----
R_EB7_22"	1	57.3	----	----
R_EB7_23"	1	56.2	----	----
R_EB7_24"	1	56.5	----	----
R_EB7_25"	1	56.7	----	----
R_EB7_26"	1	54.5	----	----
R_EB7_27"	1	55.5	----	----
R_EB7_28"	1	55.6	----	----
R_EB7_29"	1	56.1	----	----
R_EB7_30"	1	59.5	----	----
R_EB7_31"	1	59.6	----	----
R_EB7_32"	1	58.9	----	----
R_EB7_33"	1	58	----	----

Impacted and Minor Benefitted
Impacted and Benefitted
Not Impacted
Impacted

NBP7_Baseline					
Receptor Name	**No of Units**	**Predicted w/o barrier**	**Exceed Standard**	**Predicted w/ barrier**	**Reduction**
R_EB8_1"	24	58.6	----	----	----
R_EB8_2"	24	57.9	----	----	----
R_EB8_3"	24	56.2	----	----	----
R_EB8_4"	24	57.1	----	----	----
R_EB8_5"	24	59	----	----	----
R_EB8_6"	24	62.2	----	----	----
R_EB8_7"	24	64.7	----	----	----
R_EB8_8"	24	57.7	----	----	----
R_EB8_9"	24	57.6	----	----	----
R_EB8_10"	24	59.3	----	----	----
R_EB8_11"	24	61.1	----	----	----
R_EB8_12"	24	64.4	----	----	----



SBP7 10 ft Shoulder Barrier					
Receptor Name	No of Units	Predicted w/o barrier	Exceed Standard	Predicted w/ barrier	Reduction
R_WB6_1"	24	73.3	Snd Lvl	63.8	9.5
R_WB6_2"	24	71.2	Snd Lvl	61.8	9.4
R_WB6_3"	24	70.5	Snd Lvl	60.9	9.6
R_WB6_4"	24	66.3	Snd Lvl	60.6	5.7
R_WB6_5"	24	66.3	Snd Lvl	60.3	6
R_WB6_6"	24	63.1	----	59.2	3.9
R_WB6_7"	24	62.6	----	59	3.6

Impacted and Minor Benefitted
Impacted and Benefitted
Not Impacted
Impacted

SBP8 22 ft ROW					
Receptor Name	No of Unit	Predicted w/o barrier	Exceed Standard	Predicted w/ barrier	Reduction
R_WB7_1A	1	67.8	Snd Lvl	61.2	6.6
R_WB7_1"	1	69.1	Snd Lvl	59.5	9.6
R_WB7_2"	1	69.2	Snd Lvl	60.2	9
R_WB7_3"	1	67.9	Snd Lvl	60.4	7.5
R_WB7_4"	1	70.1	Snd Lvl	61.1	9
R_WB7_5"	1	70.4	Snd Lvl	61	9.4
R_WB7_6"	1	69.7	Snd Lvl	61.1	8.6
R_WB7_7"	1	67.6	Snd Lvl	61.1	6.5
R_WB7_8"	1	70	Snd Lvl	61.3	8.7
R_WB7_9"	1	70.6	Snd Lvl	61.5	9.1
R_WB7_10"	1	68.7	Snd Lvl	61.9	6.8
R_WB7_11"	1	70.3	Snd Lvl	61.9	8.4
R_WB7_12"	1	71	Snd Lvl	62.6	8.4
R_WB7_13"	1	71.2	Snd Lvl	63.6	7.6
R_WB7_14"	1	70.3	Snd Lvl	62.6	7.7
R_WB7_15"	1	70.5	Snd Lvl	62.5	8
R_WB7_16"	1	70.5	Snd Lvl	62.6	7.9
R_WB7_17"	1	70.4	Snd Lvl	62.6	7.8
R_WB7_18"	1	70.7	Snd Lvl	62.7	8
R_WB7_19"	1	70.8	Snd Lvl	62.8	8
R_WB7_20"	1	70.8	Snd Lvl	62.9	7.9
R_WB7_21"	1	71.2	Snd Lvl	63.1	8.1
R_WB7_22"	1	71.5	Snd Lvl	63.3	8.2
R_WB7_23"	1	72.3	Snd Lvl	63.5	8.8
R_WB7_24"	1	72	Snd Lvl	64.1	7.9
R_WB7_25"	1	72.9	Snd Lvl	65.4	7.5
R_WB7_26"	1	69.6	Snd Lvl	66.1	3.5
R_WB7_27"	1	67.2	Snd Lvl	60.3	6.9
R_WB7_28"	1	65.9	----	60.1	5.8
R_WB7_29"	1	66.4	Snd Lvl	60.4	6
R_WB7_30"	1	65.3	----	60.2	5.1
R_WB7_31"	1	66.8	Snd Lvl	61	5.8
R_WB7_32"	1	65.8	----	60.7	5.1
R_WB7_33"	1	67.8	Snd Lvl	61.8	6
R_WB7_34"	1	65	----	60.6	4.4
R_WB7_35"	1	65.5	----	60.9	4.6
R_WB7_36"	1	65.8	----	61.1	4.7
R_WB7_37"	1	66.1	Snd Lvl	61.4	4.7
R_WB7_38"	1	66	Snd Lvl	61.2	4.8
R_WB7_39"	1	66.3	Snd Lvl	61.3	5
R_WB7_40"	1	66.4	Snd Lvl	61.5	4.9
R_WB7_41"	1	66.7	Snd Lvl	61.6	5.1
R_WB7_42"	1	66.7	Snd Lvl	61.7	5

Impacted and Minor Benefitted
Impacted and Benefitted
Not Impacted
Impacted

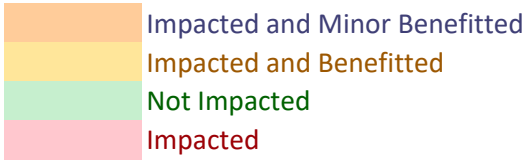
SBP8 22 ft ROW					
Receptor Name	**No of Unit**	**Predicted w/o barrier**	**Exceed Standard**	**Predicted w/ barrier**	**Reduction**
R_WB7_43"	1	67	Snd Lvl	62.2	4.8
R_WB7_44"	1	67	Snd Lvl	62.4	4.6
R_WB7_45"	1	66.5	Snd Lvl	63.2	3.3

NBP8 and NBP9 22 ft ROW 12 ft SB					
Receptor Name	No of Units	Predicted w/o barrier	Exceed Standard	Predicted w/ barrier	Reduction
R_EB9_1	6	66.4	Snd Lvl	60.6	5.8
R_EB9_2	6	68.5	Snd Lvl	60.6	7.9
R_EB9_3	6	69.2	Snd Lvl	62.2	7
R_EB9_4	6	70.3	Snd Lvl	63.7	6.6
R_EB9_5	6	72.2	Snd Lvl	64.3	7.9
R_EB9_6	6	74.1	Snd Lvl	65.5	8.6
R_EB9_7	6	75.1	Snd Lvl	65.3	9.8
R_EB9_8	6	64.4	----	61	3.4
R_EB9_9	6	65.5	----	60.5	5
R_EB9_10	6	66.3	Snd Lvl	60.8	5.5
R_EB9_11	6	67.3	Snd Lvl	61.4	5.9
R_EB9_12	6	68.2	Snd Lvl	62.3	5.9
R_EB9_13	6	69.1	Snd Lvl	62.8	6.3
R_EB9_14	6	70.6	Snd Lvl	63.6	7
R_EB9_15	6	67.5	Snd Lvl	61.7	5.8
R_EB9_16	1	75.1	Snd Lvl	65.3	9.8
R_EB9_17	1	75	Snd Lvl	65.7	9.3
R_EB9_18	1	73.4	Snd Lvl	65.1	8.3
R_EB9_19	1	70.1	Snd Lvl	63.4	6.7
R_EB9_20	1	67.3	Snd Lvl	61.4	5.9
R_EB9_21	1	69.6	Snd Lvl	62.5	7.1
R_EB10_1	6	71.7	Snd Lvl	62.5	9.2
R_EB10_2	6	74.1	Snd Lvl	62.4	11.7
R_EB10_3	6	74.7	Snd Lvl	62	12.7
R_EB10_4	6	74.7	Snd Lvl	62.2	12.5
R_EB10_5	6	74.4	Snd Lvl	62.7	11.7
R_EB10_6	6	74.8	Snd Lvl	62.8	12
R_EB10_7	6	74.9	Snd Lvl	63.2	11.7
R_EB10_8	6	74	Snd Lvl	65.6	8.4
R_EB10_9	6	70.4	Snd Lvl	61.4	9
R_EB10_10	6	70.6	Snd Lvl	61.7	8.9
R_EB10_11	6	70.7	Snd Lvl	61.9	8.8
R_EB10_12	6	70.9	Snd Lvl	62.6	8.3
R_EB10_13	6	71.2	Snd Lvl	64.5	6.7
R_EB11_1	5	69.2	Snd Lvl	63.3	5.9
R_EB11_2	5	69.3	Snd Lvl	63.3	6
R_EB11_3	5	69.4	Snd Lvl	63.2	6.2
R_EB11_4	5	69.5	Snd Lvl	62.7	6.8
R_EB11_5	5	69.6	Snd Lvl	62.5	7.1
R_EB11_6	5	69.6	Snd Lvl	62	7.6
R_EB11_7	5	69.6	Snd Lvl	61.8	7.8
R_EB11_8	5	75.8	Snd Lvl	64.4	11.4

Impacted and Minor Benefitted
Impacted and Benefitted
Not Impacted
Impacted

NBP8 and NBP9 22 ft ROW 12 ft SB					
Receptor Name	No of Units	Predicted w/o barrier	Exceed Standard	Predicted w/ barrier	Reduction
R_EB11_9	5	75.8	Snd Lvl	63.8	12
R_EB11_10	5	75.7	Snd Lvl	63.5	12.2
R_EB11_11	5	75.7	Snd Lvl	63.1	12.6
R_EB11_12	5	75.6	Snd Lvl	62.8	12.8
R_EB11_13	5	75.9	Snd Lvl	62.3	13.6
R_EB11_14	5	75.8	Snd Lvl	62.3	13.5
R_EB11_15	5	75.9	Snd Lvl	62.3	13.6
R_EB11_16	5	75.8	Snd Lvl	62.4	13.4
R_EB11_17	5	69.4	Snd Lvl	60.1	9.3
R_EB11_18	5	69.6	Snd Lvl	59.8	9.8
R_EB11_19	5	69.5	Snd Lvl	59.7	9.8
R_EB11_20	5	69.6	Snd Lvl	59.7	9.9
R_EB11_21	1	69.8	Snd Lvl	59.9	9.9
R_EB10_14	1	68.4	Snd Lvl	60.6	7.8
R_EB10_15	1	67.8	Snd Lvl	60.3	7.5
R_EB10_16	1	68	Snd Lvl	60.7	7.3
R_EB10_17	1	68.4	Snd Lvl	61.4	7
R_EB10_18	1	67.8	Snd Lvl	61.6	6.2
R_EB11_22	1	64.9	----	58.9	6
R_EB11_23	1	64.9	----	58.7	6.2
R_EB11_24	1	65	----	----	
R_EB11_25	1	65.1	----	58.4	6.7
R_EB11_26	1	65.1	----	58.2	6.9
R_EB11_27	1	65.1	----	57.9	7.2

SBP9 14 ft Shoulder Barrier					
Receptor Name	No of Units	Predicted w/o barrier	Exceed Standard	Predicted w/ barrier	Reduction
R_WB8_1	1	70.4	Snd Lvl	65.9	4.5
R_WB8_2	1	68.7	Snd Lvl	62.3	6.4
R_WB8_3	1	72.5	Snd Lvl	63.4	9.1
R_WB8_4	1	76	Snd Lvl	63.2	12.8
R_WB8_5	1	76.3	Snd Lvl	62.8	13.5
R_WB8_6	1	76	Snd Lvl	62.7	13.3
R_WB8_7	1	77	Snd Lvl	62.7	14.3
R_WB8_8	1	76.2	Snd Lvl	62.7	13.5
R_WB8_9	1	76.1	Snd Lvl	62.9	13.2
R_WB8_10	1	76.3	Snd Lvl	63.2	13.1
R_WB8_11	1	76.2	Snd Lvl	63.4	12.8
R_WB8_12	1	76.4	Snd Lvl	64	12.4
R_WB8_13	1	75.9	Snd Lvl	64.7	11.2
R_WB8_14	1	76.1	Snd Lvl	65.4	10.7
R_WB8_15	1	75.8	Snd Lvl	66.4	9.4
R_WB8_16	1	76.3	Snd Lvl	67.6	8.7
R_WB8_17	1	76	Snd Lvl	69	7
R_WB8_18	1	76	Snd Lvl	70.7	5.3
R_WB8_19	1	74.7	Snd Lvl	71.3	3.4
R_WB8_20	1	72	Snd Lvl	68.8	3.2
R_WB8_21	1	71.1	Snd Lvl	61.6	9.5
R_WB8_22	1	71.2	Snd Lvl	61.5	9.7
R_WB8_23	1	71.3	Snd Lvl	61.7	9.6
R_WB8_24	1	71.3	Snd Lvl	61.8	9.5
R_WB8_25	1	71.2	Snd Lvl	61.9	9.3
R_WB8_26	1	71.2	Snd Lvl	62.3	8.9
R_WB8_27	1	71.3	Snd Lvl	62.9	8.4



NBP11 14 ft Shoulder Barrier					
Receptor Name	No of Units	Predicted w/o barrier	Exceed Standard	Predicted w/ barrier	Reduction
R_EB12_1	1	72.4	Snd Lvl	61.8	10.6
R_EB12_2	1	73.7	Snd Lvl	62.6	11.1
R_EB12_3	1	75.5	Snd Lvl	63.8	11.7
R_EB12_4	1	75.4	Snd Lvl	62.6	12.8
R_EB12_5	1	73.9	Snd Lvl	61.9	12
R_EB12_6	1	71.2	Snd Lvl	61.2	10
R_EB12_7	1	71.4	Snd Lvl	61.2	10.2
R_EB12_8	1	73.8	Snd Lvl	61.9	11.9
R_EB12_9	1	74.9	Snd Lvl	62.4	12.5
R_EB12_10	1	75.1	Snd Lvl	62.6	12.5
R_EB12_11	1	75.2	Snd Lvl	62.9	12.3
R_EB12_12	1	75.2	Snd Lvl	63.2	12
R_EB12_13	1	75.2	Snd Lvl	63.4	11.8
R_EB12_14	1	75	Snd Lvl	63.8	11.2
R_EB12_15	1	75.1	Snd Lvl	63.8	11.3
R_EB12_16	1	74.6	Snd Lvl	64.3	10.3
R_EB12_17	1	73.7	Snd Lvl	64.4	9.3
R_EB12_18	1	73.7	Snd Lvl	65	8.7
R_EB12_19	1	73.4	Snd Lvl	65	8.4
R_EB12_20	1	72.9	Snd Lvl	65.4	7.5
R_EB12_21	1	72.2	Snd Lvl	65.6	6.6
R_EB12_22	1	70.6	Snd Lvl	65.4	5.2
R_EB12_23	1	70	Snd Lvl	65.8	4.2
R_EB12_24	1	69.3	Snd Lvl	65.7	3.6
R_EB12_25	1	68.5	Snd Lvl	64.7	3.8
R_EB12_26	1	67.4	Snd Lvl	64	3.4
R_EB12_27	1	66.6	Snd Lvl	63.2	3.4
R_EB12_28	1	68.8	Snd Lvl	65.3	3.5
R_EB12_29	1	68.7	Snd Lvl	65.2	3.5
R_EB12_30	1	69.1	Snd Lvl	65.8	3.3
R_EB12_31	1	69.5	Snd Lvl	66.5	3
R_EB12_32	1	70.1	Snd Lvl	67.1	3
R_EB12_33	1	70.1	Snd Lvl	67.8	2.3
R_EB12_34	1	71.4	Snd Lvl	68.3	3.1
R_EB12_35	1	72.9	Snd Lvl	69.6	3.3
R_EB12_36	1	73.2	Snd Lvl	70.1	3.1
R_EB12_37	1	73.9	Snd Lvl	71.2	2.7
R_EB12_38	1	74.3	Snd Lvl	71.8	2.5
R_EB12_39	1	72.2	Snd Lvl	61.6	10.6
R_EB12_40	1	72.3	Snd Lvl	61.9	10.4
R_EB12_41	1	72.1	Snd Lvl	62.2	9.9
R_EB12_42	1	71.2	Snd Lvl	62.5	8.7

Impacted and Minor Benefitted
Impacted and Benefitted
Not Impacted
Impacted

NBP11 14 ft Shoulder Barrier					
Receptor Name	**No of Units**	**Predicted w/o barrier**	**Exceed Standard**	**Predicted w/ barrier**	**Reduction**
R_EB12_43	1	71.4	Snd Lvl	62.8	8.6
R_EB12_44	1	71.4	Snd Lvl	62.9	8.5
R_EB12_45	1	70.7	Snd Lvl	63	7.7
R_EB12_46	1	69.6	Snd Lvl	63.2	6.4
R_EB12_47	1	69.1	Snd Lvl	63.2	5.9
R_EB12_48	1	68.4	Snd Lvl	63	5.4
R_EB12_49	1	67.8	Snd Lvl	62.9	4.9
R_EB12_50	1	67.3	Snd Lvl	62.6	4.7
R_EB12_51	1	66.6	Snd Lvl	62.1	4.5
R_EB12_52	1	65.9	----	61.6	4.3
R_EB12_53	1	66.5	Snd Lvl	63.9	2.6
R_EB12_54	1	66.8	Snd Lvl	64.2	2.6
R_EB12_55	1	67.2	Snd Lvl	64.8	2.4
R_EB12_56	1	67.5	Snd Lvl	65.3	2.2
R_EB12_57	1	70.4	Snd Lvl	65.2	5.2
R_EB12_58	1	71.1	Snd Lvl	64.5	6.6
R_EB12_59	1	71.1	Snd Lvl	63.8	7.3
R_EB12_60	1	71.2	Snd Lvl	63.3	7.9

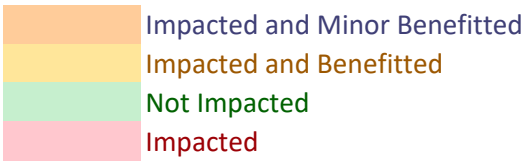
NBP12 22 ft ROW					
Receptor Name	No of Units	Predicted w/o barrier	Exceed Standard	Predicted w/ barrier	Reduction
R_EB13_1	1	67.9	Snd Lvl	58.7	9.2
R_EB13_2	1	68.4	Snd Lvl	59	9.4
R_EB13_3	1	68.4	Snd Lvl	59	9.4
R_EB13_4	1	68.4	Snd Lvl	58.9	9.5
R_EB13_5	1	68.3	Snd Lvl	56.9	11.4
R_EB13_6	1	68	Snd Lvl	58.4	9.6
R_EB13_7	1	67.9	Snd Lvl	58.1	9.8
R_EB13_8	1	66	Snd Lvl	57.8	8.2
R_EB13_9	1	65.9	----	57.6	8.3
R_EB13_10	1	65.7	----	57.4	8.3
R_EB13_11	1	65.6	----	57.2	8.4
R_EB13_12	1	65.6	----	57.1	8.5
R_EB13_13	1	65.3	----	56.5	8.8
R_EB13_14	1	66.6	Snd Lvl	56.5	10.1
R_EB13_15	1	66.9	Snd Lvl	55.3	11.6
R_EB13_16	1	66.9	Snd Lvl	55.1	11.8
R_EB13_17	1	67	Snd Lvl	55	12
R_EB13_18	1	67.1	Snd Lvl	55	12.1
R_EB13_19	1	67.2	Snd Lvl	55.1	12.1
R_EB13_20	1	67.3	Snd Lvl	55.2	12.1
R_EB13_21	1	67.3	Snd Lvl	55.3	12
R_EB13_22	1	67.4	Snd Lvl	55.9	11.5
R_EB13_23	1	67.4	Snd Lvl	57.3	10.1
R_EB13_24	1	65.1	----	55.3	9.8
R_EB13_25	1	65.1	----	55.3	9.8
R_EB13_26	1	65.3	----	55.8	9.5
R_EB13_27	1	65.3	----	56.4	8.9
R_EB13_28	1	65.1	----	57	8.1
R_EB13_29	1	64.4	----	57.6	6.8
R_EB13_30	1	64.6	----	58.1	6.5
R_EB13_31	1	67.3	Snd Lvl	63.1	4.2
R_EB13_32	1	67.3	Snd Lvl	63.4	3.9
R_EB13_33	1	67.4	Snd Lvl	64.3	3.1
R_EB13_34	1	67.2	Snd Lvl	64.4	2.8
R_EB13_35	1	67	Snd Lvl	64.5	2.5
R_EB13_36	1	66.7	Snd Lvl	64.8	1.9
R_EB13_37	1	65	----	59.4	5.6
R_EB13_38	1	64.8	----	59.7	5.1
R_EB13_39	1	64.2	----	59.1	5.1
R_EB13_40	1	66.7	Snd Lvl	59.4	5.6
R_EB13_41	1	66.5	Snd Lvl	59.7	5.1
R_EB13_42	1	66.9	Snd Lvl	59.1	5.1

Impacted and Minor Benefitted
Impacted and Benefitted
Not Impacted
Impacted

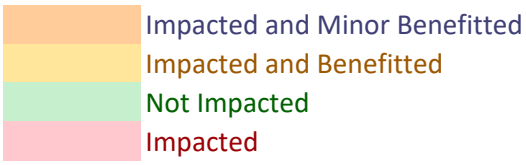
NBP12 22 ft ROW					
Receptor Name	No of Units	Predicted w/o barrier	Exceed Standard	Predicted w/ barrier	Reduction
R_EB13_43	1	67.3	Snd Lvl	63.2	4.1
R_EB13_44	1	67.3	Snd Lvl	63.1	4.2
R_EB13_45	1	67.4	Snd Lvl	63.3	4.1
R_EB13_46	1	67.6	Snd Lvl	63.6	4
R_EB13_47	1	67.9	Snd Lvl	64.2	3.7
R_EB13_48	1	64	----	59.8	4.2
R_EB13_49	1	64.1	----	60	4.1
R_EB13_50	1	64.2	----	60.2	4
R_EB13_51	1	64.2	----	60.2	4
R_EB13_52	1	64.4	----	60.4	4
R_EB13_53	1	64.3	----	60.5	3.8
R_EB13_54	1	64.3	----	60.5	3.8
R_EB13_55	1	64.3	----	60.7	3.6
R_EB13_56	1	64.3	----	60.5	3.8
R_EB13_57	1	64.3	----	60.5	3.8
R_EB13_58	1	71.2	Snd Lvl	60.8	10.4
R_EB13_59	1	71.2	Snd Lvl	60.4	10.8
R_EB13_60	1	69.8	Snd Lvl	59.6	10.2
R_EB13_61	1	69.1	Snd Lvl	59.8	9.3
R_EB13_62	1	68.7	Snd Lvl	59.8	8.9
R_EB13_63	1	68.9	Snd Lvl	61.2	7.7
R_EB13_64	1	68	Snd Lvl	59.5	8.5
R_EB13_65	1	66.5	Snd Lvl	58.3	8.2
R_EB13_66	1	66	Snd Lvl	58	8
R_EB13_67	1	65.1	----	57.4	7.7
R_EB13_68	1	67.4	Snd Lvl	58.2	9.2
R_EB13_69	1	67.8	Snd Lvl	58.7	9.1
R_EB13_70	1	68.6	Snd Lvl	59.5	9.1
R_EB13_71	1	64.6	----	57	7.6
R_EB13_72	1	64.9	----	57.2	7.7
R_EB13_73	1	65.3	----	57.4	7.9
R_EB13_74	1	65.6	----	57.6	8
R_EB13_75	1	65.9	----	57.7	8.2
R_EB13_76	1	66.1	Snd Lvl	56.9	9.2
R_EB13_77	1	66.8	Snd Lvl	60.3	6.5
R_EB13_78	1	67.2	Snd Lvl	55	12.2
R_EB13_79	1	64.9	----	56.1	8.8
R_EB13_80	1	65	----	55.9	9.1
R_EB13_81	1	65.1	----	55.8	9.3
R_EB13_82	1	65	----	55.6	9.4
R_EB13_83	1	65.3	----	55.9	9.4
R_EB13_84	1	64.6	----	56	8.6

NBP12 22 ft ROW					
Receptor Name	No of Units	Predicted w/o barrier	Exceed Standard	Predicted w/ barrier	Reduction
R_EB13_85	1	64	----	62.3	1.7
R_EB13_86	1	63.4	----	59.7	3.7
R_EB13_87	1	71.6	Snd Lvl	64.5	7.1
R_EB13_88	1	71.7	Snd Lvl	63.4	8.3
R_EB13_89	1	71.6	Snd Lvl	62.8	8.8
R_EB13_90	1	71.8	Snd Lvl	62.3	9.5
R_EB13_91	1	71.9	Snd Lvl	62	9.9
R_EB13_92	1	71.7	Snd Lvl	61.6	10.1
R_EB13_93	1	71.6	Snd Lvl	61.3	10.3
R_EB13_94	1	71.2	Snd Lvl	61	10.2
R_EB13_95	1	70.5	Snd Lvl	60.1	10.4
R_EB13_96	1	70.3	Snd Lvl	59.7	10.6
R_EB13_97	1	69.5	Snd Lvl	59.6	9.9
R_EB13_98	1	70.1	Snd Lvl	59.3	10.8
R_EB13_99	1	69.3	Snd Lvl	59.5	9.8
R_EB13_100	1	67.5	Snd Lvl	59	8.5
R_EB13_101	1	65.7	----	57.7	8
R_EB13_102	1	66.3	Snd Lvl	57.9	8.4
R_EB13_103	1	69.9	Snd Lvl	64.5	5.4
R_EB13_104	1	68.8	Snd Lvl	62.4	6.4
R_EB13_105	1	68.7	Snd Lvl	61.7	7
R_EB13_106	1	67.9	Snd Lvl	61.1	6.8
R_EB13_107	1	68.1	Snd Lvl	60.7	7.4
R_EB13_108	1	68.2	Snd Lvl	60.5	7.7
R_EB13_109	1	67.2	Snd Lvl	59.9	7.3
R_EB13_110	1	67.9	Snd Lvl	59.9	8
R_EB13_111	1	67.1	Snd Lvl	59.5	7.6
R_EB13_112	1	67.5	Snd Lvl	59.5	8
R_EB13_113	1	67.3	Snd Lvl	59.1	8.2
R_EB13_114	1	66.6	Snd Lvl	58.2	8.4
R_EB13_115	1	67.2	Snd Lvl	58.9	8.3
R_EB13_116	1	66.1	Snd Lvl	58.2	7.9

SBP10_Baseline					
Receptor Name	**No of Units**	**Predicted w/o barrier**	**Exceed Standard**	**Predicted w/ barrier**	**Reduction**
R_WB9_1"	1	68	Snd Lvl	----	----
R_WB9_2"	1	68.1	Snd Lvl	----	----
R_WB9_3"	1	68.7	Snd Lvl	----	----
R_WB9_4"	1	69.1	Snd Lvl	----	----
R_WB9_5"	1	63	----	----	----
R_WB9_6"	1	64.2	----	----	----
R_WB9_7"	1	64.4	----	----	----
R_WB9_8"	1	64	----	----	----
R_WB9_9"	1	63.8	----	----	----
R_WB9_10"	1	63.7	----	----	----
R_WB9_11"	1	62.5	----	----	----
R_WB9_12"	1	44.6	----	----	----
R_WB9_13"	1	40.6	----	----	----
R_WB9_14"	1	39	----	----	----
R_WB9_15"	1	38.3	----	----	----
R_WB9_16"	1	37.5	----	----	----
R_WB9_17"	1	36.7	----	----	----
R_WB9_18"	1	36	----	----	----
R_WB9_19"	1	35.8	----	----	----
R_WB9_20"	1	34.6	----	----	----
R_WB9_21"	1	34.3	----	----	----
R_WB9_22"	1	34.7	----	----	----



SBP11 22 ft ROW (4-Lanes)					
Receptor Name	**No of Units**	**Predicted w/o barrier**	**Exceed Standard**	**Predicted w/ barrier**	**Reduction**
R_WB10_1"	1	64	----	----	----
R_WB10_2"	1	64.7	----	----	----
R_WB10_3"	1	65.2	----	----	----
R_WB10_4"	1	65.5	----	----	----
R_WB10_5"	1	65.8	----	----	----
R_WB10_6"	1	66.1	Snd Lvl	----	----
R_WB10_7"	1	66.2	Snd Lvl	----	----
R_WB10_8"	1	66.4	Snd Lvl	----	----
R_WB10_9"	1	66.4	Snd Lvl	----	----
R_WB10_10"	1	66.3	Snd Lvl	----	----
R_WB10_11"	1	66.3	Snd Lvl	----	----
R_WB10_12"	1	66.2	Snd Lvl	----	----
R_WB10_13"	1	65.9	----	----	----
R_WB10_14"	1	65.6	----	----	----
R_WB10_15"	1	64.8	----	----	----
R_WB10_16"	1	63.6	----	----	----
R_WB10_17"	1	62.9	----	----	----
R_WB10_18"	1	62.2	----	----	----
R_WB10_19"	1	61.5	----	----	----



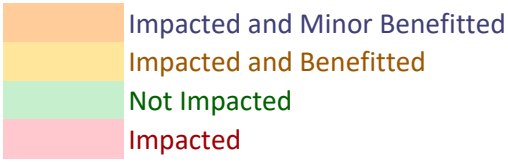
Hybrid SBP12 22 ft ROW and 14 ft Shoulder Barrier					
Receptor Name	No of Units	Predicted w/o barrier	Exceed Standard	Predicted w/ barrier	Reduction
R_WB11_1	1	72.8	Snd Lvl	64.2	8.6
R_WB11_2	1	72.1	Snd Lvl	63.7	8.4
R_WB11_3	1	71.7	Snd Lvl	63.3	8.4
R_WB11_4	1	71	Snd Lvl	62.8	8.2
R_WB11_5	1	73.1	Snd Lvl	62.7	10.4
R_WB11_6	1	73.2	Snd Lvl	62.3	10.9
R_WB11_7	1	73.6	Snd Lvl	62.3	11.3
R_WB11_8	1	73.9	Snd Lvl	62.2	11.7
R_WB11_9	1	73.6	Snd Lvl	62.3	11.3
R_WB11_10	1	74.1	Snd Lvl	62.2	11.9
R_WB11_11	1	73.5	Snd Lvl	62.4	11.1
R_WB11_12	1	73.6	Snd Lvl	62.4	11.2
R_WB11_13	1	74	Snd Lvl	62.3	11.7
R_WB11_14	1	73.5	Snd Lvl	62.5	11
R_WB11_15	1	74.3	Snd Lvl	62.2	12.1
R_WB11_16	1	73.4	Snd Lvl	62.5	10.9
R_WB11_17	1	73.9	Snd Lvl	62.4	11.5
R_WB11_18	1	73.4	Snd Lvl	62.5	10.9
R_WB11_19	1	73.9	Snd Lvl	62.3	11.6
R_WB11_20	1	73.8	Snd Lvl	62.3	11.5
R_WB11_21	1	74.1	Snd Lvl	62	12.1
R_WB11_22	1	73.8	Snd Lvl	62.2	11.6
R_WB11_23	1	73.8	Snd Lvl	62.2	11.6
R_WB11_24	1	73.8	Snd Lvl	61.9	11.9
R_WB11_25	1	73.8	Snd Lvl	61.7	12.1
R_WB11_26	1	73.3	Snd Lvl	61.8	11.5
R_WB11_27	1	73.3	Snd Lvl	61.6	11.7
R_WB11_28	1	73.9	Snd Lvl	60.5	13.4
R_WB11_29	1	73.5	Snd Lvl	61	12.5
R_WB11_30	1	73.7	Snd Lvl	60.2	13.5
R_WB11_31	1	73.3	Snd Lvl	60.7	12.6
R_WB11_32	1	73.8	Snd Lvl	60.4	13.4
R_WB11_33	1	73.5	Snd Lvl	60.6	12.9
R_WB11_34	1	73.8	Snd Lvl	60.7	13.1
R_WB11_35	1	73.7	Snd Lvl	61.3	12.4
R_WB11_36	1	73.8	Snd Lvl	62	11.8
R_WB11_37	1	73.7	Snd Lvl	62.4	11.3
R_WB11_38	1	73.9	Snd Lvl	62.8	11.1
R_WB11_39	1	73.9	Snd Lvl	63.4	10.5
R_WB11_40	1	73.6	Snd Lvl	64.2	9.4
R_WB11_41	1	73.9	Snd Lvl	65	8.9
R_WB11_42	1	74.1	Snd Lvl	66	8.1

Impacted and Minor Benefitted
Impacted and Benefitted
Not Impacted
Impacted

Hybrid SBP12 22 ft ROW and 14 ft Shoulder Barrier					
Receptor Name	No of Units	Predicted w/o barrier	Exceed Standard	Predicted w/ barrier	Reduction
R_WB11_43	1	73.7	Snd Lvl	67.2	6.5
R_WB11_44	1	70.5	Snd Lvl	61.5	9
R_WB11_45	1	70.5	Snd Lvl	61.5	9
R_WB11_46	1	70.5	Snd Lvl	61.5	9
R_WB11_47	1	70.4	Snd Lvl	61.5	8.9
R_WB11_48	1	70.5	Snd Lvl	61.5	9
R_WB11_49	1	70.5	Snd Lvl	61.5	9
R_WB11_50	1	70.5	Snd Lvl	61.4	9.1
R_WB11_51	1	70.3	Snd Lvl	61.3	9
R_WB11_52	1	70.4	Snd Lvl	61.3	9.1
R_WB11_53	1	70.4	Snd Lvl	61.3	9.1
R_WB11_54	1	70.4	Snd Lvl	61.3	9.1
R_WB11_55	1	70.2	Snd Lvl	61.1	9.1
R_WB11_56	1	70.3	Snd Lvl	61	9.3
R_WB11_57	1	70.3	Snd Lvl	61	9.3
R_WB11_58	1	70.2	Snd Lvl	60.7	9.5
R_WB11_59	1	70.3	Snd Lvl	60.6	9.7
R_WB11_60	1	70.2	Snd Lvl	60.4	9.8
R_WB11_61	1	70.1	Snd Lvl	60.2	9.9
R_WB11_62	1	70	Snd Lvl	60	10
R_WB11_63	1	70	Snd Lvl	60.1	9.9
R_WB11_64	1	69.9	Snd Lvl	61.2	8.7
R_WB11_65	1	69.9	Snd Lvl	62.6	7.3
R_WB11_66	1	66.7	Snd Lvl	66.7	0
R_WB11_67	1	70.4	Snd Lvl	65.3	5.1
R_WB11_68	1	69.9	Snd Lvl	64.4	5.5
R_WB11_69	1	69.4	Snd Lvl	63.6	5.8
R_WB11_70	1	68.9	Snd Lvl	62.8	6.1
R_WB11_71	1	68.5	Snd Lvl	62.1	6.4
R_WB11_72	1	68	Snd Lvl	61.4	6.6
R_WB11_73	1	69.8	Snd Lvl	61.6	8.2
R_WB11_74	1	69.3	Snd Lvl	61.3	8
R_WB11_75	1	68.6	Snd Lvl	60.9	7.7
R_WB11_76	1	68.4	Snd Lvl	60.7	7.7
R_WB11_77	1	67.7	Snd Lvl	60.2	7.5
R_WB11_78	1	67.5	Snd Lvl	60	7.5
R_WB11_79	1	67.1	Snd Lvl	59.8	7.3
R_WB11_80	1	67.1	Snd Lvl	59.7	7.4
R_WB11_81	1	67.2	Snd Lvl	59.7	7.5
R_WB11_82	1	67	Snd Lvl	59.6	7.4
R_WB11_83	1	67.1	Snd Lvl	59.6	7.5
R_WB11_84	1	66.8	Snd Lvl	59.4	7.4

Hybrid SBP12 22 ft ROW and 14 ft Shoulder Barrier					
Receptor Name	**No of Units**	**Predicted w/o barrier**	**Exceed Standard**	**Predicted w/ barrier**	**Reduction**
R_WB11_85	1	66.9	Snd Lvl	59.4	7.5
R_WB11_86	1	66.7	Snd Lvl	59.3	7.4
R_WB11_87	1	66.8	Snd Lvl	59.3	7.5
R_WB11_88	1	66.6	Snd Lvl	59.1	7.5
R_WB11_89	1	66.7	Snd Lvl	59.1	7.6
R_WB11_90	1	66.4	Snd Lvl	58.9	7.5
R_WB11_91	1	66.5	Snd Lvl	58.8	7.7
R_WB11_92	1	66.4	Snd Lvl	58.7	7.7
R_WB11_93	1	66.4	Snd Lvl	58.6	7.8
R_WB11_94	1	66.4	Snd Lvl	58.6	7.8
R_WB11_95	1	65.5	----	58	7.5
R_WB11_96	1	64.8	----	58	6.8
R_WB11_97	1	64.7	----	58.1	6.6
R_WB11_98	1	64.4	----	59.4	5
R_WB11_99	1	64.3	----	60	4.3

NBP13S 14 ft Shoulder Barrier					
Receptor Name	No of Units	Predicted w/o barrier	Exceed Standard	Predicted w/ barrier	Reduction
R_EB13S_1"	6	73.7	Snd Lvl	68.2	5.5
R_EB13S_2"	6	73.6	Snd Lvl	65	8.6
R_EB13S_3"	6	73.7	Snd Lvl	62.9	10.8
R_EB13S_4"	6	73.2	Snd Lvl	62	11.2
R_EB13S_5"	6	72.3	Snd Lvl	62.2	10.1
R_EB13S_6"	6	71.9	Snd Lvl	62.8	9.1
R_EB13S_7"	6	71.9	Snd Lvl	63.1	8.8
R_EB13S_8"	6	71.8	Snd Lvl	63	8.8
R_EB13S_9"	6	72.3	Snd Lvl	62.9	9.4
R_EB13S_10"	6	73.4	Snd Lvl	66.1	7.3
R_EB13S_11"	6	67.1	Snd Lvl	63.2	3.9
R_EB13S_12"	6	68.4	Snd Lvl	62	6.4
R_EB13S_13"	6	68.6	Snd Lvl	62.5	6.1
R_EB13S_14"	6	66.6	Snd Lvl	62	4.6
R_EB13S_15"	6	64.8	----	62.3	2.5
R_EB13S_16"	6	63	----	61	2
R_EB13S_17"	6	65.1	----	----	
R_EB13S_18"	6	64	----	61.6	2.4
R_EB13S_19"	6	69.2	Snd Lvl	64.4	4.8
R_EB13S_20"	6	69.7	Snd Lvl	62.9	6.8
R_EB13S_21"	6	69.6	Snd Lvl	62	7.6
R_EB13S_22"	4	69.4	Snd Lvl	61.1	8.3
R_EB13S_23"	4	67.9	Snd Lvl	60.6	7.3
R_EB13S_24"	6	66.6	Snd Lvl	60.5	6.1
R_EB13S_25"	6	65.2	----	62.8	2.4
R_EB13S_26"	6	63.5	----	62.3	1.2
R_EB13S_27"	6	62.1	----	60.9	1.2
R_EB13S_28"	6	61.3	----	60	1.3



NBP13_Baseline				
Receptor Name	**No of Units**	**Predicted w/o barrier**	**Exceed Standard**	**Predicted w/ barrier**
R_EB14_1"	15	69.6	Snd Lvl	----
R_EB14_2"	15	61.6	----	----
R_EB14_3"	15	62.2	----	----
R_EB14_4"	15	61.4	----	----
R_EB14_5"	15	63.2	----	----
R_EB14_6"	15	60	----	----
R_EB14_7"	15	64.3	----	----
R_EB14_8"	15	61.6	----	----
R_EB14_9"	15	66.7	Snd Lvl	----
R_EB14_10"	15	63.8	----	----

Impacted and Minor Benefitted
Impacted and Benefitted
Not Impacted
Impacted

Dewberry

www.dewberry.com