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CONCEPT ANALYSIS REPORT  
NOISE ABATEMENT WALL  
Northeast Quadrant of the I-355 and I-55 Interchange

GENERAL

A memo was developed by HDR, dated August 10, 2005, regarding Traffic Noise Analysis Summary for New Developments along I-355 South Extension. The analysis identifies two new developments located adjacent to I-55, in the NE quadrant of I-355 and I-55. Farmingdale Village in Woodridge platted on 04-28-04 and was under construction at the time the HDR memo was written. Vicente in Woodridge was platted 12-01-95. Table 5 of the HDR memo identifies this location as Noise Barrier ID - 1 (ND-1) which requires a 15' high, 4,500 foot long noise wall between Murphy Road and Lemont Road. The memo stated that ND-1 would benefit approximately 23 residences. Plan sheet 1 is an overall site plan of the area identifying the location of the proposed noise abatement wall in relation to the proposed reconstruction of the I-355/I-55 interchange.

ALTERNATE LOCATIONS

Wight & Company has identified 3 possible locations for the construction of the proposed noise abatement wall ND-1 between Murphy and Lemont Roads.

1. Ground mounted along the access control fence between the I-355/I-55 Ramp O-N and the frontage road
2. Ground mounted along the North right-of-way line of the frontage road
3. Retaining/barrier wall mounted along the north side of I-355/I-55 Ramp O-N

Location 1.

A ground mounted noise wall along the access control fence between the I-355/I-55 Ramp O-N and the frontage road requires the existing frontage road guardrail to be temporarily removed and replaced after the wall is constructed. The existing guardrail and the paved shoulder need to be extended east to protect the noise wall and errant vehicles from end of the noise wall. There are cross road culverts under the frontage road recently constructed that will require special attention when designing the final noise wall. Also, a sign identifying underground telecommunications was identified on site which will require special attention when preparing the final design for this alternate.

### Location 2.

A ground mounted noise wall along the north right-of-way line of the frontage road is the furthest location, of the three alternate locations, from the noise generator. This distance could require the noise abatement wall to be increased in height. This location also limits sight distance for drivers exiting the Vicente subdivision and for drivers and bicyclist on curves of the frontage road. A break in the wall would also be required at the Vicente access drive thereby decreasing the number of benefited residences.

### Location 3.

Retaining/barrier wall mounted along the north side of I-355/I-55 Ramp O-N is the closest to the noise generator. Since the retaining/barrier wall was not designed for the additional wind loading of a noise wall, the retaining/barrier wall will need to be redesigned and reconstructed to accommodate this load. Ground mounting the noise wall directly behind the retaining/barrier wall would place the noise wall close to, and in some locations, at the bottom of storm conveyance ditch. This location would also obstruct storm water flow from the drainage pipe constructed through the retaining/barrier wall, and would require the wall to increase in height. There would also be vertical and horizontal conflicts with two overhead truss signs.

Based on the requirements necessary for each of the noise wall locations Wight & Co. recommends that the noise wall be constructed as described for Location 1. Plan sheets 2 through 5 provides preliminary details of a ground mounted noise wall located along the access control fence between the I-55/I-355 Ramp O-N and the frontage road.

### MATERIALS

The Tollway considers five different types of materials for their noise walls:

- Precast Concrete – These panels are fabricated with a square cut random ashlar rusticated limestone surface pattern.
- Concrete Masonry – The varying concrete masonry unit sizes are fabricated with a square cut random ashlar rusticated limestone surface pattern.
- Brick Masonry – The brick masonry units are sized 2" x 3-3/4" x 8" bricks
- Wood – Treated southern yellow pine or douglas fir material.
- Composite Material – The panels are comprised of composite plastic extruded material.

The Tollway requires that the noise walls have a minimum service life of 25 years.

The current I-355 interchange contract includes the construction of a precast concrete panel noise abatement wall adjacent to the south side of I-55 from Murphy Road to Lemont Road.

### ESTIMATED CONSTRUCTION COSTS

Detailed construction cost estimates have been included with this document as Exhibits A, B, C, & D. The construction cost estimates are based on the above recommended alignment for each type of material indicated.

### Total Cost Summary

- Exhibit A \_ Precast Concrete - \$ 3,915,900
- Exhibit B \_ Concrete or Brick Masonry - \$ 6,752,100
- Exhibit C \_ Wood - \$ 1,725,200
- Exhibit D \_ Composite - \$ 2,701,100

These preliminary cost estimates are for evaluation of alternate and are based on the preliminary wall dimensions and unit costs based on recent Tollway bids and supplier input.

### RECOMMENDATION

As indicated above, Location 1. is the noise wall location that we recommend. Even though a wood noise wall would be the least expensive material meeting the 25 minimum service life we recommend the precast concrete noise wall. The precast concrete could provide over 50 years service life and requires much less annual maintenance than the wood noise wall. Also, the Tollways Contract 7711 for the I-355/I-55 interchange construction includes the construction of precast concrete noise abatement wall within the same east/west limits except that is located on the south side of I-55. In order to maintain the overall aesthetics of the I-355/I-55 interchange, we consider that precast concrete would be the preferred alternate type material for the noise abatement wall.