



Messler & Associates

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MEMORANUM

To: Baytowne Homeowners Association
From: Tim Messler, PE
Date: November 28, 2007
Subject: Response to Comments
Fedon N. Petrides

Engineering Concerns:

1. Sub-Base Stability

We have conducted additional borings to verify the condition of the base and the results are expressed in the attached geotechnical report from Ardaman & Associates. In addition to the original 6 borings we have had the geotechnical take an additional sixteen (16) borings at locations where we determined that there were road failures. The borings indicated that in two locations there was muck located approximately 6' below the surface. The muck is approximately 3 feet in thickness and contains various amounts of roots and other deleterious material. The borings also indicated that the muck was approximately 0.5 to 1' below the existing water table. The loading from the vehicles at this location is relatively small and does not exceed the bearing capacity of the muck. However, the problem with muck is that, when not submerged, it will oxidize and reduce in volume thereby causing settlement. The muck should have been removed when the original road was constructed. To remove the muck at this time would be extremely expensive and almost impossible from the standpoint of having sufficient room to dig a hole almost 9' in to the ground. We have discussed this verbally with the geotechnical engineer and they generally agree that to remove the muck would be far more detrimental to the existing development than to leave the muck in place. The geotechnical engineer is conducting further testing to provide more technical information as to how much settlement we may expect. Based on the current life of the road, the settlement has been relatively minor; however, the settlement has caused the concrete pavement to fail and it needs to be repaired. The geotechnical engineer has suggested that a flexible pavement would be a better choice of surface than a rigid pavement. As a point of reference concrete is considered a rigid pavement and asphalt and concrete pavers are

considered to be flexible pavement. The pavers will be the best choice for this condition. Basically, if there is future settlement the pavers will be the easiest to repair.

2. Base

The existing base is approximately 12" in depth and is a mixture of local sands and shell-rock compacted to a specific density. The existing base for the most part has maintained its integrity and provided support for the concrete road surface. There are areas that have cracked and other areas that have failed and have been repaired. We have observed that the most severe cracking and failures have occurred in the area of the landscape islands. These islands are generally raised and could possibly allow water to drain under the curbs and over the base with a velocity that most likely have caused the migration of the fines within the base. The situation would cause a failure of the base and subsequently to the concrete road surface. Other failures occurred at locations where the concrete road surface cracked and water penetrated to the base. Over long periods of time this situation can cause base failures and in turn cause the already cracked concrete to further fail.

3. Drainage

It is true that improper roadway cross slopes and grading can cause premature base failure. There are conditions in the existing road that show signs of improper grading mostly due to minor settlement of the road for reasons mentioned above. The new plan for the road includes new valley curb and gutters and the proper cross slopes for the road. The new roadway will provide proper drainage patterns that will eliminate the current drainage conditions. The new design will include a proper topographic survey that will assist in determining the minimum road slopes.

4. Driveways

In the situations where a driveway needs adjustment to match the new curb, it will be the responsibility of the road contractor to make said adjustments and the road contractor will be paid out of the contract for the road.

5. Pool Sub-drains

The pool was resurfaced approximately one year ago and the pool service contractor indicated that there were no leaks.

6. Access During Construction

The current thinking is that the project can be accomplished by constructing the west side separate from the east side. This will allow access for the residence on

one side or the other during the construction phase of the project. I believe we can accomplish this by placing a statement in the construction bid documents requiring that the contractor provide a maintenance of traffic plan that will allow residence to have access at all times. This falls under the category of “means and methods” and is a contractor responsibility; however, it will be a requirement of the contract between the contractor and the owner.

7. Cost

The project has received five bids and, in our opinion, the bids were reasonable. Therefore, there is value to the existing cost estimates. In addition, it is anticipated that the project will be re-bid with the new design.

8. Contract

The contract will include all the construction documents including the plans, technical specifications and project specifications. The contract should be “lump sum” based on the contract documents. We believe that a 25% contingency should be sufficient based on the additional geotechnical information that has been accomplished for our use in the design process and will be part of the contract documents. The contract will have all this information available prior to the final bid.

- a. The standard contract documents have definitive language as to what constitutes additional work. In this case it probably will be any unforeseen conditions that may be discovered during the execution of the contract. The contract documents allow the engineer to rule on each unforeseen condition, so the condition will be properly investigated prior to it being presented to the owner.
- b. The contract documents define liquated damages and an agreed upon amount can be placed in the liquated damages sections. In most cases where liquated damages are part of the contract there should also be bonuses for completed the project early. This should be discussed by the committee at the time the project goes to bid.
- c. Performance and maintenance bonds are also defined in the contract documents. Understand that these items cost money and may not be available to all contractors. If the owner intends to use these items we believe that a general contractor will be required and not individual sub contractors. Again this will increase the cost, but will provide more security to the owner.
- d. We have discussed the contract documents above.

9. Paving Alternatives

The available paving alternatives for this project are Concrete, concrete pavers and asphalt. If the owner desires this then we can add additional paving section to the plans and technical specifications. We suggest that the alternatives be

discussed by the board and only one alternative be presented in the bid documents.

10. Future Maintenance

As with any paving option, pavers do require maintenance. Concrete pavers should be pressure cleaned every two years or so. They do have the advantage that repairs much easier with pavers as they can be remove and replaced easily where other paving options will require patches that will be a visual problem. For design purposes this roadway is consider light based mostly on the roadway speed. The road will still be designed to an H20 for static loading.

11. Project Inspection

We agree that the engineer of record should also provide the HOA with construction inspections. The fact that this project will not require a permit from Palm Beach County affords the HOA the option of not having an engineer inspector. However, unless the HOA has a qualified person that understands roadway construction, we strongly recommend that they contract with the engineer of record to provide inspection services.