QUIDDITY

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June 6, 2024

City of Manor – Planning and Zoning Committee
Manor City Hall
Council Chambers
105 E. Eggleston St.
Manor, TX 78653

Re: Pavement Variance – Letter of Intent
Newhaven Subdivision Plans
Manor, TX 78653

Dear Members of the Planning and Zoning Department

On behalf of our client, Gregg Lane Development, LLC Quiddity Engineering is submitting this pavement variance request in accordance with the City of Manor's guidelines and municipal code, which defers to the City of Austin Transportation Criteria Manual. Quiddity Engineering understands the importance of maintaining a balance between adherence to regulations and the accommodation of unique property conditions.

We have coordinated closely with the Engineering Consultant for the City of Manor throughout this process. After thorough review and discussion, they have approved our proposed design, acknowledging the benefits and process of our approach.

In July 2022, the City of Austin updated their Transportation Criteria Manual, introducing Potential Vertical Rise (PVR) limits for the design of pavement sections in expansive clay soils. In consulting with a locally established geotechnical engineering firm, Raba Kistner, it was identified that the recently updated guidelines resulted in pavement sections that were significantly more robust than what the City of Austin and other local city/county jurisdictions have designed **successfully** for similar developments in expansive clay soils. This was strictly in part due to the newly adopted limiting PVR requirements.

Given the highly expansive subgrade conditions that exist in Manor and our understanding of their properties, Quiddity Engineering and Raba Kistner Consultants recognized the opportunity to value engineer the resulting pavement section. A holistic design approach addressing adequate drainage, curb and gutters, minimizing moisture migration, and treatment of the expansive clay soils was considered, all while adhering to the overarching goals of the City of Manor infrastructure development plans.

The current PVR requirements set by section 5.2.2 of the City of Austin Transportation Manual specify a PVR limit of 2 inches for collector roads and 3 inches for residential roads. Our proposed design will have a PVR of 3 3/4 inches for residential roads and 3 ½ for collector roads. While this exceeds the current PVR limits, our design incorporates additional measures to ensure the pavement's durability and functionality.

As an additional measure to enhance the long-term durability of the road, this proposal incorporates geogrid reinforcement into the pavement structure. Although the use of geogrid is not mandated by the City of Manor's current code, it offers significant benefits in improving the structural integrity and longevity of the pavement. Geogrids help to distribute loads more evenly, reduce subgrade deformation, and improve overall pavement performance, especially in challenging soil conditions such as those found in Manor.

This variance seeks to present a proposed alternative to the City of Manor's required pavement design guidelines that the City will find acceptable. The proposal includes:

1. Adequate Drainage: Ensuring proper drainage to mitigate water accumulation and potential damage to the pavement structure.
2. Curb and Gutters: Implementing effective curb and gutter designs to facilitate water runoff and protect the pavement edges.
3. Minimizing Moisture Migration: Utilizing advanced techniques and materials to reduce the movement of moisture through the subgrade, thereby enhancing pavement durability.
4. Treatment of Expansive Clay Soils: Applying proven methods to stabilize the expansive clay soils, ensuring a stable foundation for the pavement.
5. Geogrid Reinforcement: Incorporating geogrid into the pavement structure to improve load distribution, reduce subgrade deformation, and enhance long-term durability.

We believe that this variance not only addresses the unique conditions in Manor but also provides a practical and economically feasible solution that aligns with the overarching goals of the City's infrastructure development plans. We are confident that our approach will meet the necessary performance criteria while providing long-term benefits to the community.

Sincerely,

Brad Carabajal, PE
Project Engineer