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February 20, 2015

Ms. Erin E. Williford, PE
AECOM
5444 Westheimer Rd, Suite 200
Houston, Texas 77056

Re: Geotechnical Investigation
Skyscraper Shadows Local Drainage Project - Storm Sewer and Paving
WBS No. M-000126-0070-3
Houston, Texas
Owner: City of Houston
HVJ Report No. 98-240G-06

Dear Ms. Williford:

The project includes replacement of storm sewers and associated pavement along Gulick Lane from Randolph Street to Monroe Street, along Holiday Lane from Wingtip Drive to Monroe Road, at the intersection of Wetherby Lane and Monroe Road, and at the intersection of Swiftwater Lane and Monroe Road in Houston, Texas.

Trench Excavation Considerations. Excavations should satisfy two requirements. First, the soils above final grade must be removed without disturbing the soil below excavation grade, which will support constructed facilities. Second, the sides of the excavation must be stable to prevent damage to adjacent streets and facilities as a result of either vertical or lateral movements of the soil. In addition, a satisfactory excavation procedure must include an adequate construction dewatering system to lower and maintain the water level at least a few feet below the lowest excavation grade.

Excavation Stability. Excavations shall be shored, laid back to a stable slope or some other equivalent means may be used to provide safety for workers and adjacent structures. Assessment of the need for excavation sloping, use of trench boxes or other measures required to provide a stable excavation, and the use of appropriate construction practices and/or equipment is the contractor's responsibility. The following comments are intended to represent common solutions to stability problems encountered in similar soil conditions in the Houston area, and may not be construed as excavation system design recommendations. The excavation operations shall be performed in accordance with 29 CFR Part 1926 subpart P, as amended, including rules published in the Federal Register, Vol. 54, No. 209, dated October 31, 1989, as a minimum. In addition, the provisions of legislation enacted by the Texas Legislature and City of Houston should be satisfied.

Excavations Shallower Than Five Feet. Trenches that are less than five feet deep should be appropriately protected when any indication of hazardous ground movement is anticipated. Based on the soil conditions revealed by the borings, all trenches shallower than five feet may be excavated with side slopes of one vertical to one and one-half horizontal. If there are any indications of sloughing during excavation, the side slopes should be flattened.

Excavations Deeper Than Five Feet. Trenches that are deeper than five feet should be shored, laid back to a stable slope, or some other appropriate means of protection should be provided where workers might be exposed to moving ground or caving. The slopes may be constructed in accordance with Table B-1 and shoring may be constructed in accordance with Table C-1.1, Table C-1.2 and Table C-1.3 of 29 CFR Part 1926. Soil types required by Table C-1.1, Table C-1.2 and Table C-1.3 (Trench Shoring - Minimum Timber Requirements) are given below:

Table 1. OSHA Soil Type

Boring No.	OSHA Soil Type		
	Depth of Trench (ft.)		
	0 – 5	5 – 10	10-15
B-1	B	B	C
B-2	B	B	B
B-3	B	C	C
B-4	B	B	C
B-5	B	B	C
B-6	B	B	C

Please call us if you have any questions or need more information.

Sincerely,

HVJ ASSOCIATES, INC.
 Texas Firm Registration No. F-000646

S Vedantam

Sharmi P. Vedantam, PE
 Project Manager



SV/SS