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June 24, 2013

Mr. Phillip M. Williams, PE  
Atkins NA, Inc.  
1250 Wood Branch Park Drive, Suite 300  
Houston, Texas 77079

Re: Geotechnical Investigation  
Martin Luther King Boulevard Reconstruction: IH 610S to Bellfort  
WBS No.: N-000801-0001-3  
Owner: City of Houston  
HVJ Report No. HG1018380

Dear Mr. Williams:

The project includes replacement of underground utilities and reconnecting the storm sewer line to the existing multiple box culvert at HCFCD channel, Salt Water Ditch. Based on the plan and profile drawings provided to us by Atkins NA, Inc., we understand that the invert depth of the proposed utilities range between 5 and 11 feet below the existing grade. The HCFCD ditch is located between Van Fleet Street and Doulton drive and the depth of the ditch at the location of the box culvert is about 10 feet below the existing grade. We also understand that the ditch will not be disturbed during the installation of utilities. This study was performed in general accordance with the City of Houston Department of Public Works and Engineering Infrastructure Design Manual dated July 2011.

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:

Boring No.	Street Name	OSHA Soil Type			
		Depth of Trench (ft)			
		0 – 5	5 – 10	10 – 15	15 – 20
B-1	MLK Blvd	B	B	B	-
B-2	MLK Blvd	B	B	B	-
B-3	MLK Blvd	B	B	B	-
B-4	MLK Blvd	B	B	C	C
B-5	MLK Blvd	B	B	B	-
B-6	MLK Blvd	B	B	B	-
B-7	MLK Blvd	B	B	B	-
B-8	MLK Blvd	B	B	B	-
B-9	MLK Blvd	B	B	B	-
B-10	MLK Blvd	B	B	B	-
B-11	MLK Blvd	B	B	B	-
B-12	MLK Blvd	B	B	B	-
B-13	MLK Blvd	B	B	B	-
B-14	MLK Blvd	B	B	B	-
B-15	MLK Blvd	B	B	B	-
B-16	MLK Blvd	B	B	B	-
B-17	MLK Blvd	B	B	C	C

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

Sincerely,

HVJ ASSOCIATES, INC.  
 Texas Fire Registration No. 7-00646

Ziad Al-Awar, P.E.  
 Project Manager  
 107115  
 PROFESSIONAL ENGINEER



ZA/sv/nl