

November 15, 2016  
Project No. 601808009

Mr. Guled Ahmed, P.E.  
Arizona Department of Transportation  
1221 North 21<sup>st</sup> Avenue, MD068R  
Phoenix, Arizona 85009

Subject: Addendum No. 1  
Geotechnical/Foundation Evaluation Report Dated September 29, 2015  
I-10: Earley Road to Junction I-8  
Pinal County, Arizona  
ADOT Contract No. 07-24.06; Task Order No. 9  
TRACS No. 010 PN 196 H7984 01D

Dear Mr. Ahmed:

Ninyo & Moore is pleased to provide this report addendum for the above-mentioned project in Pinal County, Arizona. This report addendum presents revised / updated recommendations related to Section 9.1.3 of our original report dated September 29, 2015 and was developed after consultation with you and the project design team. Please note that the other report sections contained within our original report are unchanged. The following revised / updated report section should be used for the design and construction of the above-mentioned project:

### **9.1.3 Site and Subgrade Preparation**

Vegetation and debris from the clearing operation should be removed from the site in accordance with Sections 201 of the ADOT Standard Specifications. Demolition debris and obstructions that extend below finish grade, if present, should be removed from the site in accordance with Sections 202 of the Standard Specifications.

After rough grade has been achieved and prior to placement of fill, the exposed subgrade should be visually checked for the presence of debris, organic matter and other unsuitable materials. If unsuitable soils are encountered at subgrade level during earthwork operations, these soils should be improved as noted below or removed and replaced with engineered fill.

The on-site geotechnical representative should carefully evaluate any areas of soft or wet soils, observed during the site preparation activities, prior to placement of grade-

raise fill or other construction. Drying or overexcavation of some materials may be appropriate.

For the new embankment fill construction that extends 5 or less feet vertically above existing grade, we recommend that the subgrade soils be over-excavated to a depth of 2 feet and replaced with compacted engineered fill. Excavated soils may be used provided they do not contain organic matter and meet the project specifications as noted in Section 9.1.4. This overexcavation should extend laterally 2 or more feet horizontally beyond the edge of the embankment.

For the new embankment fill construction that extends more than 5 feet vertically above existing grade, we recommend that the subgrade soils be over-excavated to a depth of 5 feet and replaced with compacted engineered fill. Excavated soils may be used provided they do not contain organic matter and meet the project specifications as noted in Section 9.1.4. This overexcavation should extend laterally 5 or more feet horizontally beyond the edge of the embankment.

For the existing embankment receiving additional engineered fill, we recommend that the soil be overexcavated to a depth of 2 feet and replaced with compacted engineered fill. Excavated soils may be used provided they do not contain organic matter and meet the project specifications as noted in Section 9.1.4. This over-excavation should extend laterally to the edges of the embankment.

Laboratory testing on samples obtained from our borings located near planned retaining walls exhibited a tendency to swell or collapse, from about -0.7 to 1.6 percent, when inundated with water under relatively light loads. Therefore, for retaining wall footings, we recommend that the subgrade soils be overexcavated and replaced with compacted engineered fill to a depth of 2 feet below the bottom of the planned footings. This over-excavation should extend laterally beyond the edge of the structure to the edge of the embankment.

As stated previously, the borings disclosed near-surface fill, or alluvial deposits, consisting primarily of silty sand, clayey sand or sandy clay. The laboratory testing indicates that some of the existing subgrade soils may have relatively low R-values and/or a high percentage of material passing the No. 200 sieve and/or a high plasticity. Therefore, we recommend that the roadway subgrade areas that exhibited R-values less than 20 be founded on a zone of adequately moisture-conditioned and compacted engineered fill, extending 3 feet below the bottom of the aggregate base layer. Table 1 presents the areas where R-values less than 20 were obtained within 5 feet of subgrade and where subgrade improvement beneath pavements may be needed. However, the areas noted in the table below will also need improvement as part of the subgrade preparation for areas to receive embankment fill or support roadways, as described above. As such, the areas tabulated below should be improved such that soils within 3 feet of finish subgrade have a design R-value of 20 or more.

**Table 1 – Approximate Station Limits for Subgrade Improvement Areas**

<b>Boring No.</b>	<b>R-Value</b>	<b>Approximate Station Limits</b>	<b>Location</b>
B-1	16	2705+80 to 2714+26±	Mainline I-10
B-3	16	2731+16 to 2748+08±	Mainline I-10
B-5	10	2764+98 to 2781+90±	Mainline I-10
B-7	16	2800+00 to 2815+72	Mainline I-10

Improvement may be needed at other locations if the exposed subgrade material does not meet the requirements of the Subgrade Acceptance Chart provided in the Pavement Design Summary report.

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Engineered fill within improved zones should be placed in horizontal lifts not exceeding 8 inches in loose thickness and compacted to 95 percent relative compaction, in accordance with Section 205 of the ADOT Standard Specifications at a moisture content generally near the optimum.

We appreciate the opportunity to be of service to you during this phase of the project.

Sincerely,  
**NINYO & MOORE**

*Steven D. Nowaczyk*

Steven D. Nowaczyk, PE  
Managing Principal Engineer



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