# GEOTECHNICAL/FOUNDATION EVALUATION I-10: EARLEY ROAD TO JUNCTION I-8 TRACS NO. 010 PN 196 H7984 01D PINAL COUNTY, ARIZONA

## PREPARED FOR:

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## PREPARED BY:

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> September 29, 2015 Project No. 601808009

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

Subject:

Geotechnical/Foundation Evaluation

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

RODGERS

## Dear Mr. Ahmed:

In accordance with our revised proposal, and your authorization, Ninyo & Moore has performed a Geotechnical/Foundation Evaluation for Interstate (I-10), from Earley Road to Junction I-8 in Pinal County, Arizona. This report presents our findings, conclusions, and geotechnical and foundation recommendations for the project.

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

Sincerely,

NINYO & MOORE

Jeffrey S. Rodgers, PE, R Senior Project Engineer

JSR/SG/SDN/tlp

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## 1. INTRODUCTION

This report presents the results of our geotechnical/foundation evaluation for planned improvements to I-10 between Earley Road and Junction I-8 in Pinal County, Arizona. This project is intended to add capacity to the existing roadway. The objectives of this evaluation were to assess the subsurface conditions along the project alignment, and provide recommendations relative to the geotechnical and foundation aspects of the planned improvements.

## 2. SCOPE OF SERVICES

Our scope of services for this project generally included:

- Reviewing readily available Arizona Department of Transportation (ADOT) as-built plans, subsurface data, geologic literature, reports, subsidence/earth fissure studies, aerial photographs of the area, and published maps pertaining to the highway section under study.
- Preparing an exploration plan for submittal to ADOT Materials Group for their review and environmental clearance.
- Arranging for appropriate traffic control services and obtaining an encroachment permit from ADOT.
- Conducting a field trip to mark out the exploration locations. Arizona Blue Stake was notified of the proposed boring locations prior to drilling.
- Performing a geotechnical exploration, which included drilling 38 soil borings to depths ranging from about 3 to 120 feet below ground surface (bgs). The borings were logged in general accordance with industry standard methods, and soil samples were obtained for laboratory testing. The boring logs are included in Appendix A.
- Conducting laboratory tests of representative samples obtained from the borings including, in-situ moisture content and dry density, grain-size analysis, Atterberg limits, consolidation, maximum dry density/optimum moisture relationship, R-value, and corrosivity. Laboratory test results are included in Appendix B.
- Preparing this report that presents our findings, conclusions, and geotechnical/foundation recommendations.



## 3. SITE DESCRIPTION

The proposed project, located within Pinal County, includes approximately 3 miles of roadway widening and reconstruction of the Jimmie Kerr Boulevard (Blvd) Overpass (OP) Traffic Interchange (TI) as well as the existing roadway. The alignment is generally orientated in a north-south direction along the existing I-10 corridor between Earley Road and Junction I-8, as depicted on Figure 1.

The existing I-10 roadway is an asphalt concrete (AC)-paved roadway that traverses in a north-south direction and is surrounded by developed commercial and residential areas, as well as agricultural and undeveloped desert areas. The existing roadway consists of two-lanes in each direction of travel with paved shoulders on either side of the travel lanes and unpaved median. The Casa Grande Canal Extension owned/operated by San Carlos Apache Tribe/San Carlo Irrigation District (SCAT/SCID) crosses under I-10 at the Jimmie Kerr Blvd OP. The Junction between I-10 and I-8 is located near the southern limits of the project.

According to the Casa Grande Mountains, Pinal County Arizona, 7.5-Minute United States Geological Survey (USGS) Topographic Quadrangle Maps (2014), the elevation of the site ranges from approximately 1,430 feet near the north end of the project to approximately 1,490 feet near the south end. Based on information from this quadrangle map, the topography in the site vicinity slopes from the southeast down to the northwest.

Various aerial photographs from the Google Earth<sup>TM</sup> were reviewed for this project. Aerial photographs from 1996 to 2002 depicted I-10 as a paved roadway bounded by agricultural areas throughout the project limits with a commercial development at Jimmie Kerr Blvd and I-10. Aerial photographs from 2003 to 2005 depicted an increase in residential development north of the project limits. Aerial photographs from 2006 to 2011 depicted an increase in residential development to the north and east of the project limits. Aerial photographs dated 2012 to 2014 depicted the site as being similar to its current conditions.



## 4. PROJECT DESCRIPTION

The overall project includes median widening of approximately 3.2-mile long stretch of I-10, roughly between Earley Road and Junction I-8, in Pinal County, Arizona. Improvements generally include the design and construction of one, 12-foot wide general purpose lane with shoulders in each direction divided by a concrete center barrier along the approximate 3.2-mile reach. In addition to the widening, we understand roadway and ramp improvements, including a "U-Turn" ramp, eastbound, and westbound frontage drainage improvements are also planned. We also understand that the southern embankment will be cut back for future Union Pacific Railroad track expansions. The planned widening alignment is generally at-grade except at the Jimmie Kerr OP. Retaining walls are also planned for the Jimmie Kerr OP with an approximate height of 13 feet.

As noted above, the project will also include the design and construction of the Jimmie Kerr Blvd OP TI. We understand the new bridges will be four-span structures supported on drilled shafts at the piers as well as the abutments. The reconfiguration of the northern embankment will consist of placement of engineered grade-raise fill ranging in heights from about 5 to 35 feet. The reconfiguration of the southern embankment will utilize retaining walls retaining engineered backfill with the footings placed near the current grade on top of the embankment as well as engineered grade raise fill. It is our understanding that the foundations for the bridge structures as well as the footings for the retaining walls will be designed using Load Resistance Factor Design (LRFD) methods (6<sup>th</sup> Edition American Association of State Highway Transportation Officials [AASHTO], 2012). Foundation recommendations, per the ADOT Materials Group are provided in this report.

Pavement sections will consist of an AC pavement section with a rubberized asphaltic concrete friction (AR-ACFC) overlay. We understand that ADOT Materials Group will develop pavement design recommendations provided in the Pavement Design Summary and Materials Design Report for this project.



## 5. GEOTECHNICAL FIELD EXPLORATION

We mobilized to the site and performed our field exploration between February 4, 2015 and February 9, 2015 and April 11, 2015 and April 24, 2015. Enviro-Drill Inc. of Phoenix, Arizona, was retained by Ninyo & Moore to drill 29 8-inch-diameter soil borings using a CME-75 truck-mounted drill rig and hollow-stem auger (HSA) drilling techniques. The borings were drilled within the existing right-of-way to depths ranging from about 5 to 120 feet bgs. Of these borings, 10 borings (denoted as BR-1 through BR-10) were drilled for the bridge structures, nine borings (denoted as RW-1 through RW-9) were drilled for the retaining walls, and 10 borings (denoted as B-1 through B-10) were drilled for the roadway. An additional nine hand-auger borings were advanced to depths of approximate 3 feet bgs for possible drainage culverts. The approximate locations of the borings are provided on Figures 2A through 2O.

Soil samples from the borings were obtained by driving a split-spoon sampler, approximately 18 inches into the soil at selected depths using a 140-pound automatic trip hammer falling approximately 30 inches. California Modified and Standard Penetration Test (SPT) split-spoon samplers were used in generally alternating intervals. Samples were typically taken at 2.5-foot to a 5.0-foot depth intervals. Relatively undisturbed ring samples were obtained with the California Modified sampler, and small bag samples were obtained using the unlined SPT sampler. The equipment and sampling methodology are described in detail in Appendix A.

Ninyo & Moore personnel logged the borings in general accordance with the Unified Soil Classification System (USCS) and American Society for Testing and Materials (ASTM) test method D 2488 by observing cuttings and split-spoon samples. The ring samples were trimmed in the field, wrapped in plastic bags, and placed in moisture-tight cylindrical plastic containers, while the SPT samples were placed in resealable bags to help preserve their natural moisture. Bulk samples were also collected from the HSA cuttings as well as the hand-auger samples and placed in large plastic bags. Field classifications and other pertinent data are presented on the boring logs in Appendix A.



It should be noted that stationing and offset noted on the boring logs are based on the stationing of mainline I-10. Also, the ground surface elevations noted on the logs were estimated from topographic information shown in the 60 percent plans that we received from the project team.

## 6. GEOTECHNICAL LABORATORY TESTING

Samples collected from our exploration locations were transported to the Ninyo & Moore laboratory in Phoenix, Arizona for geotechnical laboratory analyses. The laboratory analyses included in-situ moisture content and dry density, grain-size analysis, Atterberg limits, consolidation tests, maximum dry density/optimum moisture relationship, R-values, and corrosivity. Samples collected from our exploration location were transported to ADOT Materials Group laboratory in Phoenix, for corrosivity characteristics (including pH, minimum electrical resistivity, soluble sulfates, and chlorides). The results of the in-situ moisture and density testing are presented on the logs in Appendix A. A description of each test method and the remainder of the laboratory test results are presented in Appendix B.

## 7. GEOLOGIC SETTING

The project site is located in the Sonoran Desert subprovince of the Basin and Range physiographic province, which is typified by broad alluvial valleys separated by steep, discontinuous subparallel mountain ranges. The mountain ranges generally trend north-south and northwest-southeast. The basins consist of alluvium with thicknesses extending to several thousands of feet.

The basins and surrounding mountains were formed approximately 10 to 18 million years ago during the mid- to late-Tertiary. Extensional tectonics resulted in the formation of horsts (mountains) and grabens (basins) with vertical displacement along high-angle normal faults. Intermittent volcanic activity also occurred during this time. The surrounding basins filled with alluvium from the erosion of the surrounding mountains, as well as from deposition from rivers. Coarser-grained alluvial material was deposited at the margins of the basins near the mountains.



The surficial geology of the site is described as Quaternary age alluvium. The alluvium is generally described as deposits of sand, silt, and gravel (Bergquist and Blacet, 1978). The United States Department of Agriculture (USDA) Web Soil Survey described the site as generally containing Casa Grande fine sandy loam, Casa Grande clay, loam, Ginland clay, and Mohall clay loam. Loam is an agricultural soil classification that refers to a soil comprised of a mixture of clay, silt, and sand. A clay loam indicates a higher percentage of clay in the mixture.

## 7.1. Subsurface Conditions

Our knowledge of the subsurface conditions at the project site is based on our field exploration, laboratory testing, and our general experience in the area. The following sections provide generalized descriptions of the materials encountered. The boring logs contain our field and laboratory test results, as well as our interpretation of conditions believed to exist between actual samples retrieved. Therefore, these boring logs contain both factual and interpretive information. Lines delineating subsurface strata on the boring logs are intended to group soils having similar engineering properties and characteristics. They should be considered approximate as the actual transition between soil types (strata) may be gradual. A key to the soil symbols and terms used on the boring logs is provided in Appendix A.

## **7.1.1.** Pavement over Aggregate Base

We performed two borings within the paved shoulders along the project alignment. The pavement thicknesses for this project varied by location but were generally comprised of approximately 5 to 8 inches of AC supported on approximately 3 inches of AB at these locations.

## 7.1.2. Fill

Fill soil was encountered beneath the pavement sections or at the ground surface of many of our borings. The thickness of this fill typically ranged from about 0 to about 40 feet bgs at our boring locations. The composition of the fill material varied, typically



from medium dense to very dense silty sand to clayey sand with varying amounts of gravel. Although not observed in our borings, it is possible cobbles may be encountered within fill materials and should be anticipated.

## **7.1.3.** Alluvium

The native alluvium was either encountered at the ground surface or immediately below the fill soils. The native alluvium generally consisted of layered strata comprised of medium dense to very dense poorly graded sand, silty sand, clayey sand with varying amounts of gravel, soft to hard sandy clay and clayey gravel and poorly graded gravel in our borings. The presence and degree of caliche (calcium carbonate) cementation was variable across the site and with depth, but generally ranged from weakly to strongly cemented.

## 7.2. Groundwater

Groundwater was not encountered in our exploratory borings. Historic well data obtained from the Arizona Department of Water Resources (ADWR) indicate that the groundwater level ranges from about 60 to 480 feet bgs along I-10 in the vicinity of the project. It should be noted that groundwater levels could fluctuate due to seasonal variations, irrigation, groundwater withdrawal or recharge, and other factors not apparent at the time of our fieldwork. However, we do not anticipate groundwater to be a constraint to the construction of the project.

## 8. GEOLOGIC HAZARDS AND CONDITIONS

The following sections describe potential geologic hazards at the site, including land subsidence and earth fissures, faulting and seismicity, and liquefaction potential.



#### **8.1.** Land Subsidence and Earth Fissures

Groundwater depletion due to groundwater pumping has caused land subsidence and earth fissures in numerous alluvial basins in Arizona. It has been estimated that subsidence has affected more than 3,000 square miles and has caused damage to a variety of engineered structures and agricultural land (Schumann and Genualdi, 1986).

In Arizona, earth fissures are generally associated with land subsidence and pose an ongoing geologic hazard. Earth fissures generally form near the margins of geomorphic basins where significant amounts of groundwater depletion have occurred. Reportedly, earth fissures have also formed due to tensional stress caused by differential subsidence of the unconsolidated alluvial materials over buried bedrock ridges and irregular bedrock surfaces (Schumann and Genualdi, 1986).

According to the information from ADWR, the sections of the project alignment lie within the Picacho-Eloy land subsidence feature. The InSAR data that compared satellite passes on January 14, 2004, and September 29, 2010, indicated that about 0 to 1 centimeter of subsidence had occurred at some locations within the southern section of the project limits within the approximate 6-year timespan. The InSAR data on the most recent available imagery was obtained by comparing satellite passes on May 15, 2010, and March 31, 2014. Based on the InSAR data from ADWR, subsidence of about 0 to 2 centimeters has occurred at some locations during the approximate 4-year timespan. Therefore, within the last approximately 10 years, up to about 3 centimeters (or 1.2 inches) of subsidence has been measured in the project area. Historic subsidence may have also occurred prior to ADWR's 2004 measurements.

Based on our research of referenced materials, aerial photograph review, and geologic reconnaissance, there are no known earth fissures underlying the project site. The closest documented earth fissures to the site are less than 0.5 mile from I-10 at Junction I-8. While no documented earth fissures are present within this reach of the I-10, new fissures may be



discovered during construction. If encountered, Ninyo & Moore should be contacted immediately for further recommendations.

## 8.2. Faulting

The project corridor lies within the Sonoran Desert subprovince of the Basin and Range Zone, which is a relatively stable tectonic region located in southwestern Arizona, southeastern California, southern Nevada, and northern Mexico (Euge et al., 1992). This zone is characterized by sparse seismicity and few Quaternary faults. Based on our review of readily available published geological maps and literature, there are no known active faults underlying the project site or adjacent areas. The closest known Quaternary fault is located approximately 56 miles to the east of the project site and is known as the Sand Tank Fault (Pearthree, 1998). The Sand Tank Fault is a northeast striking normal faults that dip to the northwest. Recent movement along this fault was approximately 130,000 years ago during the Late Quaternary epoch. The slip-rate category of this fault is less than 0.2 millimeters per year (Pearthree, 1998). Seismic parameters recommended for design of the proposed improvements are presented in Section 9.4.

## **8.3.** Liquefaction Potential

Based on the SPT values recorded at various depths in our exploratory borings, the density and consistency of the soils, the general lack of near-surface water, and the low ground motion hazard (relatively low peak ground accelerations), the likelihood or potential for liquefaction is considered to be negligible and, therefore, liquefaction is not a design consideration.

## 9. **RECOMMENDATIONS**

The following sections present our geotechnical recommendations for the proposed project. Ninyo & Moore should be contacted for additional recommendations if the actual design values change from those detailed or assumed in this report.



## 9.1. Earthwork

Earthwork and materials for grading, subgrade, sub-bases, and bases shall be in accordance with ADOT Standard Specifications for Road and Bridge Construction (Standard Specifications) and the recommendations presented in this report. The following sections provide our earthwork recommendations.

## 9.1.1. Excavation and Grading

Excavation and grading should be performed in accordance with Sections 203, 204, and 205 of the Standard Specifications.

It is our understanding that many of the planned improvements will be situated at or near the existing grade and that some grade-raise fill will be needed. The soil conditions below the mainline roadway are expected to consist of fills soils and native alluvium, including layers of medium dense to very dense silty or clayey sand with varying amounts of gravel. Cobbles and possible boulders, while not observed in our borings, should be anticipated during construction, particularly for the deeper excavations.

Our evaluation of the excavation characteristics of the on-site materials is based on the results of the exploratory borings, our site observations, and our experience with similar materials. In our opinion, excavation of the on-site fill and alluvium materials can generally be accomplished with conventional equipment in good operating condition. However, gravel and caliche were encountered in some of our borings, which could be more difficult to excavate and might slow the excavation rate depending on the actual particle size and degree of cementation encountered during construction.

The contractor should provide safely sloped excavations or an adequately constructed and braced shoring system in compliance with Occupational Safety and Health Administration (OSHA) Regulations for employees working in an excavation that may expose them to the danger of moving ground. Based on the soil conditions at the site,



we recommend that OSHA Soil "Type C" classification be used for excavations within the alluvial soils at the site.

In general, temporary cut slopes should be inclined no steeper than 1.5:1 (H:V) to a depth of 20 feet below the surface. Some temporary excavations may need shoring. If construction or earth material is stored or equipment is operated near an excavation, flatter slope geometry or stronger shoring should be used during construction. Care should be taken by the contractor when excavating near existing utilities to protect them from damage.

# 9.1.2. Vertical Shoring and Trench Boxes

Because of previously described soil conditions, the proposed depths of the excavations, and presence of existing utilities and structures (e.g., roadways, utilities, and buildings), it may be preferable to shore or brace the trenches rather than using open cuts to the base of the excavations. Temporary earth retaining systems will be subjected to lateral loads resulting from earth pressures.

Spoils from the excavation or other surcharge loads should not be placed above the excavation within a 1:1 (H:V) plane extending up and back from the base of the excavation. If spoil piles are placed closer than this to the braced excavation, the resulting surcharge loads should be considered in the bracing design. We recommend that an experienced structural engineer design the shoring system.

The contractor should anticipate repairing cracks in pavements adjacent to shored portions of the excavation due to anticipated lateral displacements of the shoring system. Horizontal and vertical movements of the shoring system should be monitored by a surveyor and the results reviewed by the project Geotechnical Engineer.

Trench boxes may also be a suitable alternative to laying back the side walls; however, due to the presence of granular soils, the excavations may not stand open long enough to install the trench boxes. The contractor should be prepared to deal with these soil



conditions and plan accordingly. Once installed, some sloughing is possible at the ends of the trench box; therefore, any loose material should be removed prior to backfilling of the trench.

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

For the new embankment fill construction, 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 9.1.3. 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 9.1.3. 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 overexcavation 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** 

Boring No.	R-Value	Approximate Location Station Limits	
B-1	16	16 2705+80 to 2714+26± Mainline I-10	
B-3	16	2731+16 to 2748+08±	Mainline I-10



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

Boring No.	R-Value	Approximate Station Limits	Location
B-5	10 2764+98 to 2781+90± Mainline I-		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.

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.

## 9.1.4. Fill Material and Compaction

Soils generated from on-site excavation activities, provided any oversize or deleterious materials are removed to meet the specifications in Section 203 of the ADOT Standard Specifications, are generally suitable for reuse as engineered fill. However, the on-site alluvial soils to be utilized within the top 3 feet below the proposed pavement base may need additional processing/moisture-conditioning, and are subject to additional gradation and plasticity index requirements, such that the material meets the Subgrade Acceptance Chart provided in the Materials Design Report for this project. In addition, embankment fills placed at bridge abutments shall have a Plasticity Index of no more than 15, as specified in the ADOT Standard Specifications, Section 203-10.03.

Any soils exhibiting an organic content more than about 3 percent or significant roots and other organic matter or vegetation, should not be used as engineered fill and should be removed from below settlement-sensitive structures. This material should be



disposed of offsite or may be used in non-structural areas or as topsoil, if it meets the requirements.

If borrow material is needed for this project, we recommend that it comply with Section 1001 of the Standard Specifications. The on-site geotechnical representative should evaluate the potential borrow material before it is brought to the site.

Engineered fill materials associated with this project should be placed in lifts not exceeding 8 inches in thickness and compacted in accordance with Section 203 of the Standard Specifications.

#### 9.2. Earthwork Factors

The earthwork factors discussed below were calculated in accordance with ADOT procedures. Testing for calculation of earthwork factors included in-situ density tests performed in the laboratory. The earthwork factor was based on an average Proctor dry density of 119.9 pounds per cubic feet (pcf) and an average in-situ dry density of 107.8 pcf, resulting in an earthwork factor of 10 percent shrinkage. In accordance with ADOT procedures, the recommended earthwork factors are rounded to the nearest 5 percent. As such, for this project, we recommend an earthwork factor of 10 percent shrinkage. The earthwork factors represent an average of the material observed with varying consistencies. Potential bidders should consider this in preparing estimates and should review the available data to make their own conclusions regarding excavation conditions.

We recommend that a ground compaction factor of 0.2 feet be used for this project. The ground compaction factor given should be adjusted when constructing embankment fill sections outside the existing roadway prism.

# 9.3. Design R-value

Table 2 summarizes the tested and correlated R-values measured on soil samples obtained within the upper 5 feet of the planned finished roadway profile from various borings within



the project limits. The results are arranged in the order of increasing station numbers. Correlated R-values were obtained using the procedure described in the ADOT Preliminary Engineering and Design Manual (PEDM).

**Table 2 – R-Value Summary** 

Boring No.	Approximate Station, Offset	Sample Depth (ft.)	Correlated R-value	Laboratory R-value
B-1	2705+80; 0'±	0.0-5.0	35	16
B-2	2722+71; 0'±	0.0-4.4	33	
B-3	2739+62; 0'±	0.0-5.0	26	16
B-4	2756+53; 0'±	0.0-4.8	24	
B-5	2773+44; 0'±	0.0-5.0	31	10
B-6	2790+35; 0'±	0.0-4.3	36	
B-7	2807+26; 0'±	0.0-4.0	31	16
B-8	2824+17; 0'±	0.0-4.4	22	
B-9	2841+80; 0'±	0.0-5.0	43	35
B-10	2858+00; 0'±	0.0-5.0	41	41
			$R_c$ Mean = 32	$R_t$ Mean = 20

Based on the procedure outlined in the PEDM, we calculated a mean R-value of 30; however, we recommend a design R-value of 20 for conservatism. We recommend that soils placed within 3 feet of finished roadway subgrade demonstrate a construction control R-value of 20 or more.

# 9.4. Seismic Design Considerations

Based on American Association of State Highway and Transportation Officials (AASHTO) 2007 Seismic Design Parameters, the site is located in a zone where the horizontal peak ground acceleration coefficient (PGA) of 0.057g has a 7 percent probability of being exceeded in 75 years. Short and long-period spectral acceleration coefficients,  $S_S$  and  $S_1$ , are 0.130 and 0.042, respectively. Additional seismic design parameters according to the



AASHTO Load Resistance Factor Design (LRFD) Bridge Design Specifications (6th Edition, 2012) are presented in Table 3 below.

**Table 3 – Seismic Design Parameters** 

Parameter	Value	AASHTO LRFD Bridge Design Specifications
Site Class	С	Table 3.10.3.1-1
$F_{pga}$	1.20	Table 3.10.3.2-1
$F_a$	1.20	Table 3.10.3.2-2
$F_{\rm v}$	1.70	Table 3.10.3.2-3
$A_{S}$	0.068	Section 3.10.4.2
$\mathrm{S}_{\mathrm{DS}}$	0.156	Section 3.10.4.2
$S_{\mathrm{D1}}$	0.071	Section 3.10.4.2
Seismic Zone	1	Table 3.10.6-1

#### 9.5. **Deep Foundations**

#### 9.5.1. **Downdrag**

The effects of downdrag were analyzed for the drilled shafts in accordance with the methods outlined in Sections 3.11.8 and 10.8.1.6.2 of the AASHTO LRFD Bridge Design Specification (6<sup>th</sup> Edition -2012). A settlement analysis was performed using the methodology outlined above using the idealized soil profile presented Table 4. A fill surcharge of 4,750 psf, which corresponds to 35 feet of new embankment fill was also used for the settlement analysis. The results of the settlement analysis indicated the settlement within any idealized soil layer was less than 1/4 inch, which is less than the required amount to for downdrag to fully develop within the idealized soil layer. Therefore, downdrag is not considered to be a design constraint for the drilled shafts at the site.



**Table 4 – Downdrag Idealized Soil Profile** 

Approximate	Soil T	ype	Effective	N <sub>60</sub>
Depth bgs (ft) <sup>1</sup>	Density	Soil Classification	Unit Weight (pcf) <sup>3</sup>	$(blows/ft)^2$
0'-5'	Dense	Clayey Sand	110	31
5'-15'	Dense	Silty Sand	110	34
15'-25'	Very Dense	Clayey Sand	115	37
25-35'	Very Dense	Silty Sand	115	25
35'-45'	Medium Dense to Dense	Clayey Sand	115	14
45'-55'	Medium Dense	Silty Sand	120	17
55'-65'	Medium Dense to Dense	Silty Sand	120	21
65'-70'	Dense	Clayey Sand	120	30
70'-80'	Very Dense	Silty Sand	120	36

#### Note:

- 1. Approximate depth bgs 0-ft corresponds to Elevation 1,455 ft.
- 2. N<sub>60</sub> is energy-corrected Standard Penetration Test N-value.
- 3. No groundwater was encountered during exploration and soils exhibit drained behavior.
- 4. Depth of 80-ft represent the bottom of the borings.

## 9.5.2. Drilled Shafts

Axial drilled shaft capacities were evaluated using side friction resistance and end bearing resistance in accordance with the methods outlined in AASHTO LRFD Bridge Design Specifications (6<sup>th</sup> Edition - 2012), Section 10.8. Specifically, the Beta Method, for drained soil conditions, was used to calculate shaft axial capacities. The upper 5 feet of soil was neglected in the capacities to account for utilities or other disturbance. The effects of downdrag loads at the abutments were not considered because of the granular nature of the subsurface materials and the analysis indicated no significant post-construction downdrag loads.

Strength Axial Resistance Charts and Service Axial Resistance Charts (with selected values of settlement at the top of the shaft) for Jimmie Kerr Blvd TI OP are presented on Figures 3A through 6F. The charts were developed in accordance with AASHTO (2012) Section 10.8.3.5.2 using averaged N-values obtained from our borings, unit



weights obtained from laboratory testing, the Beta Method for sandy soils, and with the idealized soil profiles presented in Table 5 and 6 for the piers and abutments, respectively.

Table 5 – Idealized Soil Profile for the Piers

Approximate	Soil Type	Effective Unit	N <sub>60</sub>	
Depth bgs (ft) <sup>1</sup>	Density	Soil Classification	$(\mathbf{n} \circ \mathbf{f})^3$	
0'-5'	Medium Dense	Clayey Sand	110	19
5'-10'	Dense	Clayey Sand	110	24
10'-15'	Medium Dense	Silty Sand	115	26
15'-25'	Medium Dense to Dense	Silty Sand	115	27
25'-35'	Medium Dense to Dense	Clayey Sand	115	30
35'-50'	Medium Dense to Dense	Clayey Sand	120	27
50'-75'	Medium Dense	Silty Sand	120	20
75'-95'	Medium Dense	Silty Sand	120	13
95'-100'	Medium Dense	Clayey Sand	120	28
100'-115'	Medium Dense	Silty Sand	120	24
115'-120'	Medium Dense to Dense	Silty Sand	120	30

#### Note:

- 1. Approximate depth bgs 0 corresponds to Approximate Elevation 1,455 ft.
- 2. N60 is energy-corrected Standard Penetration Test N-value.
- 3. No groundwater was encountered during exploration and soils exhibit drained behavior.
- 4. Depth of 120-ft represents the bottom of the borings.

**Table 6 – Idealized soil profile for the Abutments** 

Approximate	Soil Type	Soil Type Effec Un		N <sub>60</sub>	
Depth bgs (ft) <sup>1</sup>	Density	Soil Classification	Weight (pcf) <sup>3</sup>	(Blows/ft <sub>)</sub>	
0'-5'	Dense	Clayey Sand	110	31	
5'-15'	Dense	Silty Sand	110	34	
15'-45'	Medium Dense	Clayey Sand	115	14	



Table 6 – Idealized soil profile for the Abutments

Approximate	Soil Type	Effective Unit	N <sub>60</sub>		
Depth bgs (ft) <sup>1</sup>	Density	Soil Classification	Weight (pcf) <sup>3</sup>	(Blows/ft <sub>)</sub>	
45'-55'	Medium Dense	Silty Sand	120	17	
55'-65'	Medium Dense to Dense	Silty Sand	120	21	
65'-70'	Dense	Clayey Sand	120	30	
70'-80'	Very Dense	Silty Sand	120	36	

#### Note:

- 1. Approximate depth bgs 0 corresponds to Approximate Elevation 1,455 ft.
- 2. N60 is energy-corrected Standard Penetration Test N-value.
- 3. No groundwater was encountered during exploration and soils exhibit drained behavior.
- 4. Depth of 80-ft represents the bottom of the borings.

These design parameters and the idealized soil profile, along with the reductions factors were used in the analyses. The charts are for a redundant shaft in a group spaced with center-to-center spacing of 4 diameters or more and are also applicable for a shaft in a group consisting of a single row of shafts. The charts are in accordance with the O'Neill and Reese (1999) method using normalized load-transfer vs. settlement curves. For our analyses, we included the effects of elastic shortening of the shaft due to the axial loads. The minimum tip elevation of the drilled shafts at Jimmie Kerr TI OP is Elevation 1,395 feet (i.e., 60 feet bgs) for the piers and Elevation 1,405 feet (i.e., 50 feet bgs) for the abutments.

In accordance with AASHTO Section 10.8, drilled shafts in a group may be considered to act individually when the center-to-center (CTC) spacing is more than 4 diameters. For a drilled shaft in a group with center-to-center spacing of 2.5B (where B is the diameter of the shaft in question), the strength limit resistances should be reduced by multiplying the strength limit chart capacity by an efficiency factor,  $\eta = 0.65$ . This reduction factor should linearly increase until a spacing of 4B is achieved, at which



point the reduction factor is not applied ( $\eta = 1.0$ ). For intermediate spacing, the reduction factor may be evaluated by linear interpolation.

For a single non-redundant drilled shaft foundation (such as a single shaft supporting a bridge pier), the strength limit chart resistances should be reduced by 20 percent to account for a reduction in resistance factors for this case. Similarly, for a group of 5 or more shafts, the strength limit chart resistances may be increased by 20 percent to account for an increase in resistance factors due to increased redundancy.

## 9.5.3. Lateral Load Parameters

The soil parameters recommended for lateral load analyses of drilled shafts of the pier and abutments are presented in Table 7 and Table 8, respectively. We understand that lateral load analysis of drilled shafts will be performed by others. For loading either in the direction in-line with the group of drilled shafts or in the direction perpendicular to a row of shafts, the lateral resistance (p-y curves) should be modified within the COM624P or LPILE program to account for group effects. This may be accomplished by using a p-multiplier to reduce the apparent resistance to lateral movement. These multipliers for drilled shaft spacing between 3 and 5 diameters center-to-center are discussed in AASHTO (2010) Section 10.7.2.4.

**Table 7 – Soil Parameters for Lateral Load Analysis of Drilled Shafts - Piers** 

Approx. Depth Below Existing Ground Surface(ft) <sup>1</sup>	Soil Type to be used in Lateral Analysis	Effective Unit Weight, (pcf) <sup>2</sup>	Cohesio n (psf)	Angle of Internal Friction (degrees)	p-y modulus, K (lb/in³)	Strain Factor E <sub>50</sub>
0'-40'	Sand (Reese Criteria)	120	0	32	90	-
40'-80'	Sand (Reese Criteria)	120	0	33	150	_



Table 7 – Soil Parameters for Lateral Load Analysis of Drilled Shafts - Piers

Approx. Depth Below Existing Ground Surface(ft) <sup>1</sup>	Soil Type to be used in Lateral Analysis	Effective Unit Weight, (pcf) <sup>2</sup>	Cohesio n (psf)	Angle of Internal Friction (degrees)	p-y modulus, K (lb/in³)	Strain Factor E <sub>50</sub>
80'-120'	Sand (Reese Criteria)	125	0	34	225	_

#### Note:

- 1. Approximate depth bgs 0 corresponds to the ground surface of the current embankment at approximate Elevation 1,455 ft.
- 2. No groundwater was encountered during exploration and soils exhibit drained behavior.
- 3. Depth of 120 ft represents the bottom of the borings.

Table 8 – Soil Parameters for Lateral Load Analysis of Drilled Shafts - Abutments

Approx. Depth Below Existing Ground Surface(ft) <sup>1</sup>	Soil Type to be used in Lateral Analysis	Effective Unit Weight, (pcf) <sup>2</sup>	Cohesion (psf)	Angle of Internal Friction (degrees)	p-y modulus, K (lb/in³)	Strain Factor E <sub>50</sub>
0'-40'	Sand (Reese Criteria)	120	0	32	90	_
40'-80'	Sand (Reese Criteria)	120	0	33	150	_

#### Note:

- $1.\ Approximate\ depth\ bgs\ 0\ corresponds\ to\ the\ ground\ surface\ of\ the\ current\ embankment\ at\ approximate\ Elevation\ 1,455\ ft.$
- 2. No groundwater was encountered during exploration and soils exhibit drained behavior.
- 3. Depth of 80 ft represents the bottom of the borings.

#### 9.5.4. Drilled Shaft Construction Considerations

The drilled shaft construction should be observed and evaluated by the project geotechnical consultant to check that competent bearing material has been reached and that the bearing surface has been adequately cleaned.

Where possible, the drilled shafts should be constructed in the "dry" (i.e., no more than 3 inches of water covering the base of the drilled shaft excavation). Also, the bottom of



the hole should be cleaned such that no more than 3 inches of loose material remains. Depending on the type of auger used and the depth of the pier excavation, alternative cleaning techniques, including hand cleaning or vacuuming, may be needed. For drilled shafts constructed in the "dry", the concrete may be placed by the free-fall method. This method consists of using a vertical section of concrete chute to direct the concrete flow out of the truck in a vertical stream of concrete with a relatively small diameter. The stream should be aimed to avoid hitting the sides of the drilled shaft or the reinforcing cage, which could cause concrete segregation. Adequate compaction will be achieved by free-fall of the concrete up to the top 10 feet. The top 10 feet of concrete should be vibrated in order to achieve proper compaction. The concrete should be designed so that the slump during placement is in the range of 4 to 6 inches for dry, uncased conditions.

Where the drilled shafts are constructed in the "wet", a tremie pipe connected either to a hopper or concrete pump should be used to displace the water in the drilled shaft excavation upwards as the concrete is placed. If this method is used, detailed procedures should be submitted by the contractor for review and approval by the geotechnical engineer. The top 10 feet of concrete should be vibrated in order to achieve proper compaction. The concrete should be designed so that the slump during placement is in the range of 7 to 9 inches for conditions other than a dry, uncased hole.

We recommend that the drilled shafts installation and the foundation concrete mix design be in accordance with ADOT Standard Specification 609 (2008). A requirement of this specification includes submission of a detailed installation plan to the Engineer by the drilled shaft contractor. The Geotechnical Engineer should be given the opportunity to review the plans, specifications, and the contractor's installation plan prior to construction.

## 9.6. Shallow Foundations

Shallow spread footings may be utilized for support of planned retaining walls on the project. As stated previously, our exploratory borings revealed fill and alluvial soils,



consisting primarily of clayey and silty sand, with varying amounts of gravel. Due to the compressible nature of soils present near the ground surface, we recommend that the existing foundation soils be overexcavated and replaced with compacted fill, as described below.

New engineered fill should be placed in horizontal lifts no more than approximately 8 inches in loose thickness and should be compacted by appropriate mechanical methods to a relative compaction of 95 percent, in accordance with ASTM D698 at a moisture content slightly above its optimum moisture. The overexcavated zone should extend to a depth of 2 feet below the foundation footing and extend laterally to the edge of the embankment.

Following the overexcavation described above, and prior to the placement of new fill, the resulting exposed surface should be carefully evaluated by the geotechnical consultant for the presence of loose and/or unsuitable soil. Based on this evaluation, additional remediation may be needed. This could include scarification of the exposed surface. This additional remediation, if needed, should be addressed by the geotechnical consultant during the earthwork operations.

The idealized soil profiles for the eastbound and westbound footing design analysis at the Jimmy Kerr Blvd TI are presented in Tables 9 and 10, respectively. The footing design was performed in general accordance with AASHTO (2012) and supplemented with the ADOT geotechnical design policies.



Table 9 - Idealized Soil Profile for the Eastbound Foundation

Approximate	Soil Type	Effective Unit	$N_{60}$		
Depth bgs (ft) <sup>1</sup>	Density	Soil Classification	Weight (pcf) <sup>3</sup>	(Blows/ft <sub>)</sub> <sup>2</sup>	
0'-8.5'	Medium Dense	Clayey Sand	115	19	
8.5'-15'	Medium Dense to Dense	Clayey Sand	115	24	
15'-22'	Very Dense	Clayey Sand	115	26	
25'-25'	Very Dense	Clayey Sand	115	27	
25'-32'	Dense	Clayey Sand	115	30	
32'-36'	Dense	Clayey Sand	115	27	
36'-40'	Medium Dense	Clayey Sand	115	20	
40'-55'	Dense	Clayey Sand	115	13	

- $1.\ Approximate\ depth\ bgs\ 0\ corresponds\ to\ the\ ground\ surface\ of\ the\ current\ embankment\ at\ approximate\ Elevation\ 1,478\ ft.$
- 2. N60 is energy-corrected Standard Penetration Test N-value.
- 3. No groundwater was encountered during exploration and soils exhibit drained behavior.
- 4. Depth of 55ft represents the bottom of the borings.

Table 10 – Idealized Soil Profile for the Westbound Foundation

Approximate Depth bgs (ft) <sup>1</sup>	Soil	Effective Unit	$N_{60}$	
	Density	Soil Classification	Weight (pcf) <sup>3</sup>	(Blows/ft <sub>)</sub> <sup>2</sup>
0'-8'	Dense	Clayey Sand	115	27
8'-16'	Dense	Clayey Sand	115	36
16'-26'	Dense	Clayey Sand	115	44
26'-30'	Very Dense	Clayey Sand	115	45
30'-35'	Very Dense	Clayey Sand	115	60
35'-40'	Dense	Clayey Sand	115	68
40'-45'	Very Dense	Clayey Sand	115	42
40'-55'	Very Dense Clayey Sand		115	92

- 1. Approximate depth bgs 0 corresponds to the ground surface of the current embankment at approximate Elevation 1,480 ft.
- 2. N60 is energy-corrected Standard Penetration Test N-value.
- 3. No groundwater was encountered during exploration and soils exhibit drained behavior.
- 4. Depth of 55ft represents the bottom of the borings.



For use in footing design, a Factored Bearing Resistance Chart is presented for the proposed footings on Figure 7A for the eastbound wall and Figure 7B for the westbound wall. The factored net bearing resistance on the vertical axis corresponds to the equivalent "net" uniform (Meyerhoff) stress on an equivalent footing with a calculated "effective" footing width B' based on load eccentricity (AASHTO, 2012). The weight of any soil above the footings should be added to the weight of the structure when calculating the total factored equivalent uniform vertical bearing pressure,  $q_{tveu}$ . An estimated unit weight of 120 pcf may be assumed for compacted soil density above spread footings. For computing the "net" equivalent uniform vertical bearing pressures,  $q_{nveu}$ , the weight of concrete plus soil above base-of-footing level (to finished grade) times the appropriate load factor should be subtracted from  $q_{tveu}$ . As an approximation, the difference in unit weights of concrete and soil can be neglected, i.e., the soil unit weight may substitute as for the weight of material (concrete plus soil) above base of footing level.

The assumed footing depths and lengths noted above and presented on the Factored Bearing Resistance Charts are based on design information provided to us. A minor change in footing depth or length will not significantly alter the Service Limit Settlement Curves. However, a notable change in footing depth may have a significant effect on the Strength Limit Curve. We should be contacted in the event that recommendations are needed for different footing geometry or footing depths.

It should be noted that the settlements noted on the attached design curves represent immediate elastic settlements plus estimated creep for a period of 1 year, based on the existing soil moisture conditions. Long-term ponding of water near footings may increase the post-construction settlement. It is our understanding that following excavation and construction of the footings, the area will be backfilled and graded such that water will not pond near newly constructed footings.

In accordance with AASHTO (2012), spread footings that are subject to lateral loadings may be designed using a coefficient of friction of 0.58 for cast-in-place structures for strength



limit state design. An ultimate passive resistance of up to 300 psf per foot of depth can be used up to a value of 3,000 psf.

#### 9.7. Lateral Earth Pressures

Equivalent fluid unit weights of soil recommended below were estimated in accordance with AASHTO Section 3.11.5 for a free draining (no hydrostatic pressure) horizontal backfill, and a vertical wall. For calculation of lateral earth pressures, formed or precast concrete against granular soil was assumed. In addition, we assumed an average effective angle of internal friction of the backfill of 32 degrees and the backfill unit weight of 125 pcf.

Retaining walls that are not restrained from movement at the top and have a level backfill behind the wall may be designed using an "active" equivalent fluid unit weight of 38 pcf. This value assumes that compaction within about 5 feet of the wall will be accomplished with relatively light compaction equipment, and that very low-to-low expansive backfill will be placed behind the wall. Unrestrained retaining walls and below-grade walls should also be designed to resist a lateral surcharge pressure of 0.31q. The value for "q" represents the vertical pressure induced by adjacent light loads, slab, or traffic loads plus any adjacent footing loads. The wall displacement required to mobilize the active pressure is approximately 5 percent of the wall height (0.005H).

The "at-rest" earth pressure against walls that are restrained at the top or braced so that they cannot yield, such as culvert walls, and with level backfill, may be taken as equivalent to the pressure exerted by a fluid weighing 59 pcf. Restrained retaining walls should also be designed to resist a lateral earth pressure of 0.47q. The value for "q" represents the vertical pressure induced by adjacent light loads, slab, or traffic loads plus any adjacent footing loads.

Measures should be taken so that moisture does not build up behind any retaining walls. Back drainage measures should include free-draining backfill material and perforated drainpipes or weep holes. Drainpipes should outlet away from structures, and retaining walls



should be waterproofed in accordance with the recommendations of the project civil engineer or architect. To reduce the potential for water- and sulfate/salt-related damage to the retaining walls, particular care should be taken in the selection of the appropriate type of waterproofing material to be utilized and in the application of this material. Drainage should consist of free-draining granular material and could be accompanied by weep holes through the walls or corrugated, perforated pipe placed parallel to the wall or abutment bottom, wrapped in a filter fabric, and surrounded by 6 or more inches of a granular filter material (e.g., pea gravel or drain rock). In lieu of the wrapped open-graded gravel, a geocomposite drainage mat attached to the wall and discharging to a drain pipe or weep holes may be considered.

# 9.8. Constructed Slopes

Based on the boring information and our experience with similar projects, we recommend that temporary cut slopes associated with this project be constructed no steeper than 1.5:1 (H:V) and that permanent cut and fill slopes associated with this project be constructed no steeper than 2.5:1 (H:V). New embankment fills should be benched into existing embankments, where appropriate. Benches should be level and wide enough to allow operation of, and compaction by, construction equipment. Fill slopes should be constructed in a manner (e.g., overfilling and cutting to grade) such that the recommended degree of compaction is achieved to the finished slope face. Cut and fill slopes should be protected from erosion.

## 9.9. Embankment Settlement

Embankment fills up to approximately 35 feet in height are planned. Based on our analysis, these fills may settle up to about 2 inches beneath the center of the fills. This estimate includes the overexcavation recommendations provided above. A majority of this settlement is anticipated to occur during placement of the fill. Therefore, if structural elements or other rigid features are planned to be constructed within the influence zone of the embankment fills and prior to placement of the fill, they should be designed to accommodate differential



settlement on the order of 1 inch over a distance of about 40 feet for the higher embankments. Post-construction settlement of the embankment fills is anticipated to be less than 1 inch, provided the fill is placed as required by the Standard Specifications and recommendations contained in this report. Preloading of select sites could be considered to reduce the amount of settlement under embankment loads.

Calculated settlements were estimated using the Schmertmann method for sands. The settlement was calculated using  $E_s$  modulus values based on correlation to the  $N_{60}$  SPT blow count values, using methods presented in Foundation Design, by Donald P. Coduto, Section 7.6. For large loaded areas, such as embankments or mat foundations, Coduto recommends progressively increasing the  $E_s$  values with depth such that  $E_s$  at a depth of 100 feet is 3 times that calculated from SPT correlations. We used the depth-adjusted values of  $E_s$  to calculate the embankment and retaining wall settlements presented in this report.

## 9.10. Embankment Slope Stability

Slope stability was evaluated using SVSlope<sup>™</sup> software, which is part of SVOffice 2009, Version 2.4.21, from SoilVision Systems Ltd. SVSlope can be used to estimate slope stability using a variety of methods. For this project, the Spencer method, one of several limit equilibrium method of slices, and circular failure surfaces, were used. For the Spencer method, it is assumed that the ratio of interslice shear force to the interslice normal force is constant throughout the sliding mass.

## 9.10.1. Slope Stability Material Properties

A summary of the material properties used in the analysis are presented in Table 11. The shear strength and unit weight parameters were estimated using from SPT correlations, unit weights obtained from laboratory testing, and our experience with similar materials.



**Table 11 – Stability Analysis Material Properties** 

Material	Unit Weight	Shear Strength Parameters		
Material	(pcf)	phi' (deg.)	C' (psf)	
Alluvium	115.0	30	0	
Existing embankment fill	130.0	35	0	
New embankment fill	135.0	35	0	
Concrete	150.0	0	12,500*	
Note: * Concrete strength per SVSLOPE Slope S		, v	12,500	

The critical embankment sections evaluated for the final design configuration were located at Station 2793+98 and Station 2801+50. The two cases evaluated were as follows: (1) End of construction Station 2793+98, left and right face; and (2) End of construction Station 2801+50, left and right face. For the evaluation performed for Section 2793+98, we assumed that the new embankment fill would be founded on 5 feet of engineered fill and the over-excavation extended 5 feet laterally. For the evaluation performed for Station 2801+50, we assumed the retaining wall had a base width of 8-feet, were embedded 2-feet below the existing embankment surface, and wall terminated at elevation 1,489 feet.

## 9.10.2. Slope Stability Results

A summary of the slope stability analyses results, for the critical sections at Station 2793+98 and Station 2801+50 is presented in Table 6.



**Table 12 – Stability Analysis Results** 

Design Case	Station	Minimum Factor of Safety*	Calculated Factor of Safety
End of Construction, Left face	2793+98	1.5	1.8
End of Construction, Right face	2793+98	1.5	1.7
End of Construction, Left face	2801+50	1.5	1.5
End of Construction, Right face	2801+50	1.5	1.5
Note: * Minimum factor of safety per FHWA 2013.			

Based on the tabulated results, the planned embankment configuration meets the requirements for minimum slope stability factor of safety for the design cases analyzed. Each case analyzed produced surficial slope failure such that the critical slip surface and the additional 250 most critical failure surfaces penetrated into the slope faces no more than 8 feet, as depicted in Figures 8A through 8B.

# 9.11. Corrosivity Information

The corrosivity information given below is based on the corrosivity tests performed on select soil samples obtained from our explorations. For details with respect to these tests, please refer to Appendix B.

**Table 13 – Corrosivity Test Results** 

Test Location	Approximate Station, Offset	Sample Depth (ft).	Water Soluble Sulfate Content in Soil, %	Chloride Content, ppm	pН	Resistivity (ohm-cm)
HA-3	2719+70;10'R±	0.0-3.0	0.006	40	7.9	1,680
HA-4	2746+40;10'R±	0.0-3.0	0.008	40	7.6	1,210
HA-5	2759+80;10'R±	0.0-3.0	0.011	60	7.5	680
НА-6	31+60; 10'R±	0.0-3.0	0.013	90	7.7	1,010



**Table 13 – Corrosivity Test Results** 

Test Location	Approximate Station, Offset	Sample Depth (ft).	Water Soluble Sulfate Content in Soil, %	Chloride Content, ppm	рН	Resistivity (ohm-cm)
HA-7	13+80; 10'R±	0.0-3.0	0.008	20	7.3	1,680
HA-8	11+50; 10'R±	0.0-3.0	0.008	10	7.7	5,100
HA-9	2812+70;10'R±	0.0-3.0	0.013	150	7.7	940
HA-10	2828+50;10'R±	0.0-3.0	0.008	20	7.5	4,030
HA-11	2847+80;10'R±	0.0-3.0	0.005	30	7.4	5,230

## 9.12. Water Requirements

Approximately 90 gallons of water per cubic yard may be estimated for compaction of embankment materials, and approximately 70 gallons of water per cubic yard for compaction of AB materials. This includes a conservative overrun for losses due to seepage, evaporation, inadequate mixing, spillage, etc. Precipitation during and/or before construction may also reduce the amount of water significantly.

## 9.13. Site Drainage

Drainage should be provided to divert water away from the paved surfaces and foundation elements. Surface water should not be permitted to pond on pavement areas. Positive drainage is defined as a slope of 2 percent or more for a distance of 5 feet or more away from the pavements.

Erosion protection may be needed for the new soil embankments. These protection measures may include grading, riprap, gravel mulch, geotextiles, gabion mats, concrete lining, soil-cement lining, bio-reinforcement, or methods considered appropriate by the design engineer.



#### **9.14.** Pre-Construction Conference

We recommend that a pre-construction conference be held. Representatives of the owner, the civil engineer, the geotechnical consultant, and the contractor should be in attendance to discuss the project plans and schedule. Our office should be notified if the project description included herein is incorrect, or if the project characteristics are significantly changed.

#### 9.15. Construction Observation and Testing

We recommend that the on-site geotechnical representative perform construction-phase observation and testing services for the project. These services should be performed to evaluate exposed subgrade conditions, including the extent and depth of overexcavation (if needed), to evaluate the suitability of proposed borrow materials for use as fill, and to observe placement and test compaction of fill soils. Qualified subcontractors utilizing appropriate techniques and construction materials should perform construction of the proposed improvements.

#### 10. LIMITATIONS

The field evaluation, laboratory testing, and geotechnical analyses presented in this geotechnical report have been conducted in general accordance with current practice and the standard of care exercised by geotechnical consultants performing similar tasks in the project area. No warranty, expressed or implied, is made regarding the conclusions, recommendations, and opinions presented in this report. There is no evaluation detailed enough to reveal every subsurface condition. Variations may exist and conditions not observed or described in this report may be encountered during construction. Uncertainties relative to subsurface conditions can be reduced through additional subsurface exploration. Additional subsurface evaluation will be performed upon request. Please also note that our evaluation was limited to assessment of the geotechnical aspects of the project, and did not include evaluation of structural issues, environmental concerns, or the presence of hazardous materials.



This document is intended to be used only in its entirety. No portion of the document, by itself, is designed to completely represent any aspect of the project described herein. Ninyo & Moore should be contacted if the reader requires additional information or has questions regarding the content, interpretations presented, or completeness of this document.

This report is intended for design purposes only. It does not provide sufficient data to prepare an accurate bid by contractors. It is suggested that the bidders and their geotechnical consultant perform an independent evaluation of the subsurface conditions in the project areas. The independent evaluations may include, but not be limited to, review of other geotechnical reports prepared for the adjacent areas, site reconnaissance, and additional exploration and laboratory testing.

Our conclusions, recommendations, and opinions are based on an analysis of the observed site conditions. If geotechnical conditions different from those described in this report are encountered, our office should be notified and additional recommendations, if warranted, will be provided upon request. It should be understood that the conditions of a site could change with time as a result of natural processes or the activities of man at the subject site or nearby sites. In addition, changes to the applicable laws, regulations, codes, and standards of practice may occur due to government action or the broadening of knowledge. The findings of this report may, therefore, be invalidated over time, in part or in whole, by changes over which Ninyo & Moore has no control.

This report is intended exclusively for use by the client. Any use or reuse of the findings, conclusions, and/or recommendations of this report by parties other than the client is undertaken at said parties' sole risk.



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#### **Aerial Photographs Reviewed**

Source	Date(s)
Google Earth <sup>TM</sup>	1992,1996,2002, 2003 – 2007, 2010 – 2014

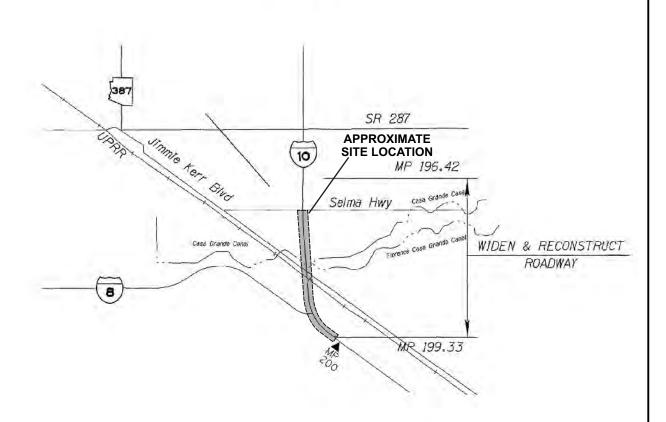


# STATE OF ARIZONA DEPARTMENT OF TRANSPORTATION INTERMODAL TRANSPORTATION DIVISION

PROJECT PLANS

# STATE HIGHWAY CASA GRANDE - TUCSON HWY INTERSTATE 10

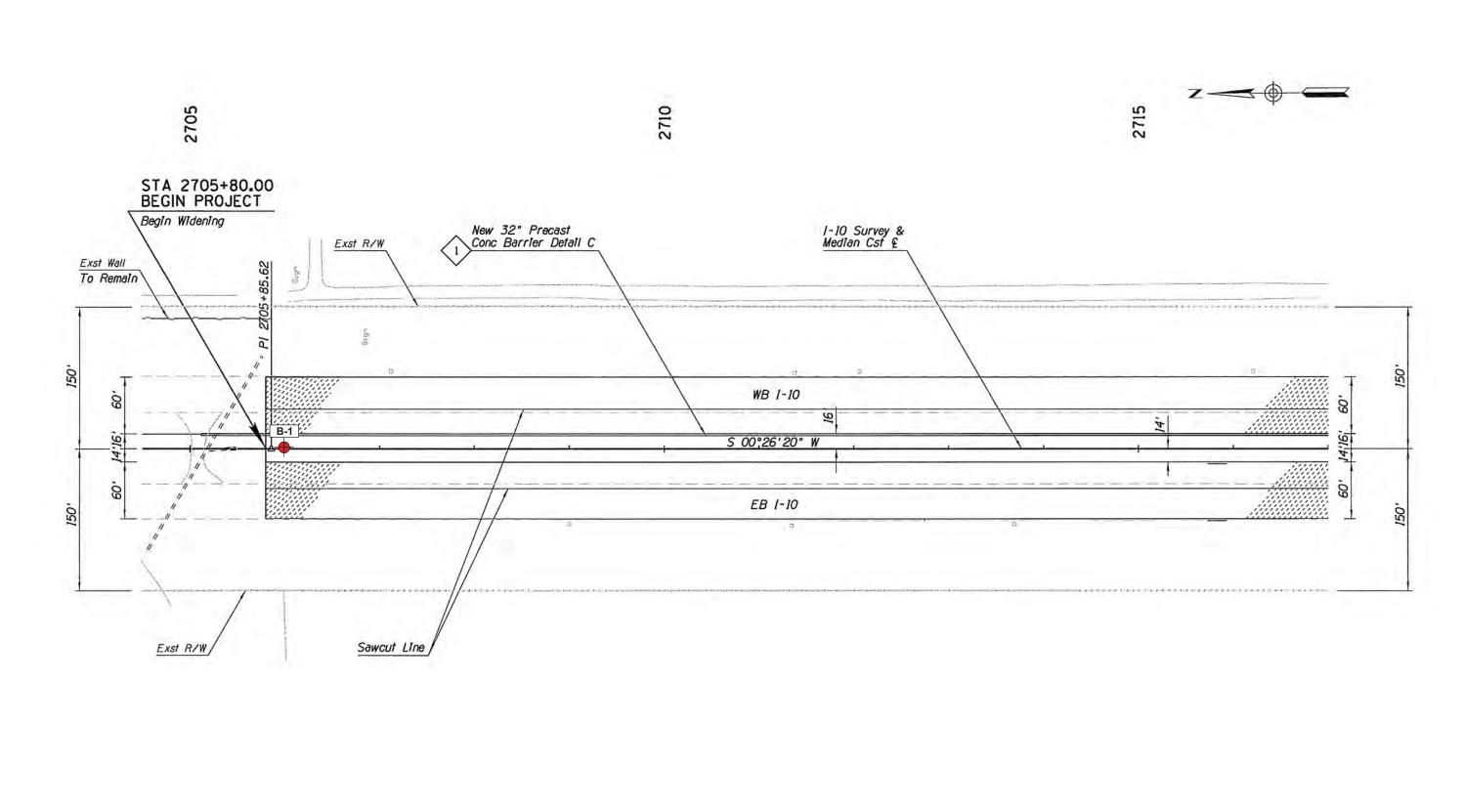


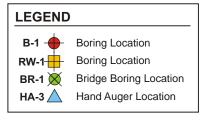


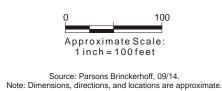
# EARLEY RD - JCT I-8

PROJECT NO. 010 PN 196 H7984 01C FEDERAL AID NO. NH-010-C(206)A

<i>Ninyo</i> & Moore		SITE LOCATION	FIGURE
PROJECT NO:	DATE:	I-10: EARLEY ROAD TO JUNCTION I-8	1
601808009	9/15	PINAL COUNTY, ARIZONA	





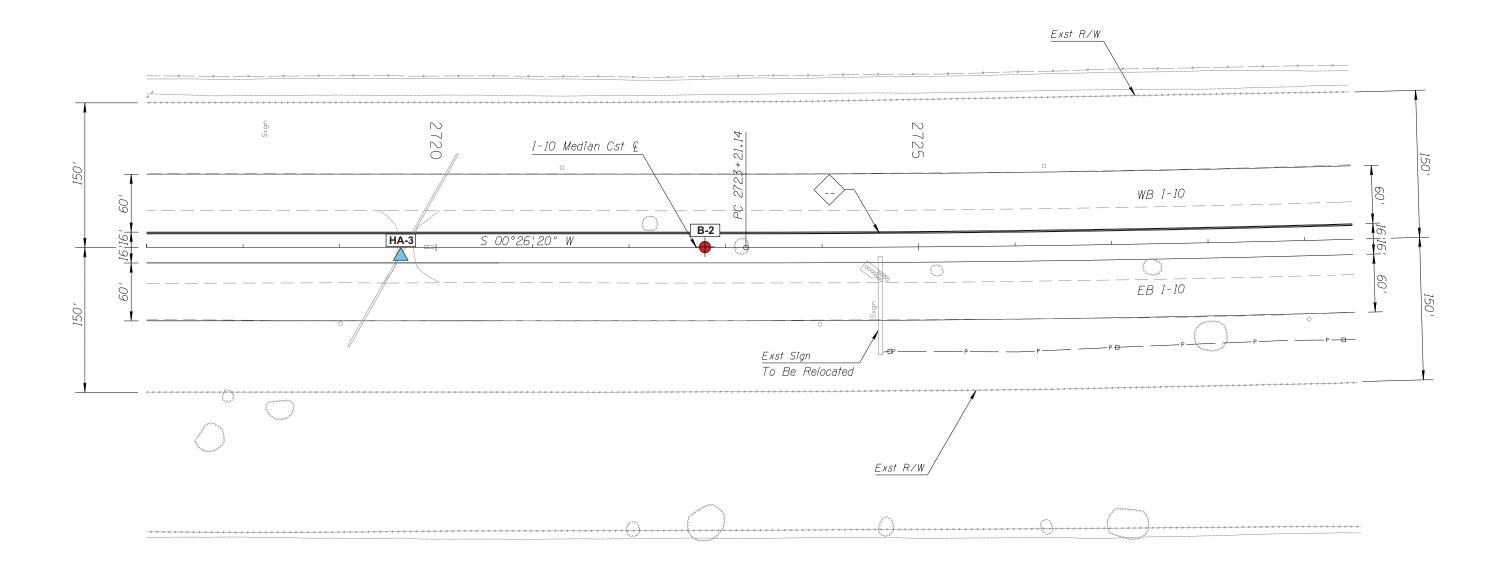


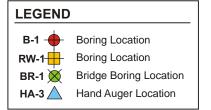
Ninyo & Moore  PROJECT NO: DATE:		EXPLORATION LOCATIONS
PROJECT NO:	DATE:	I-10: EARLEY ROAD TO JUNCTION I-8
601808009	9/15	PINAL COUNTY, ARIZONA

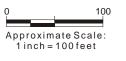
FIGURE

**2A** 









<b>Minyo</b> &	Moore
DDO IEOT NO	DATE

I-10: EARLEY ROAD TO JUNCTION I-8 PINAL COUNTY, ARIZONA

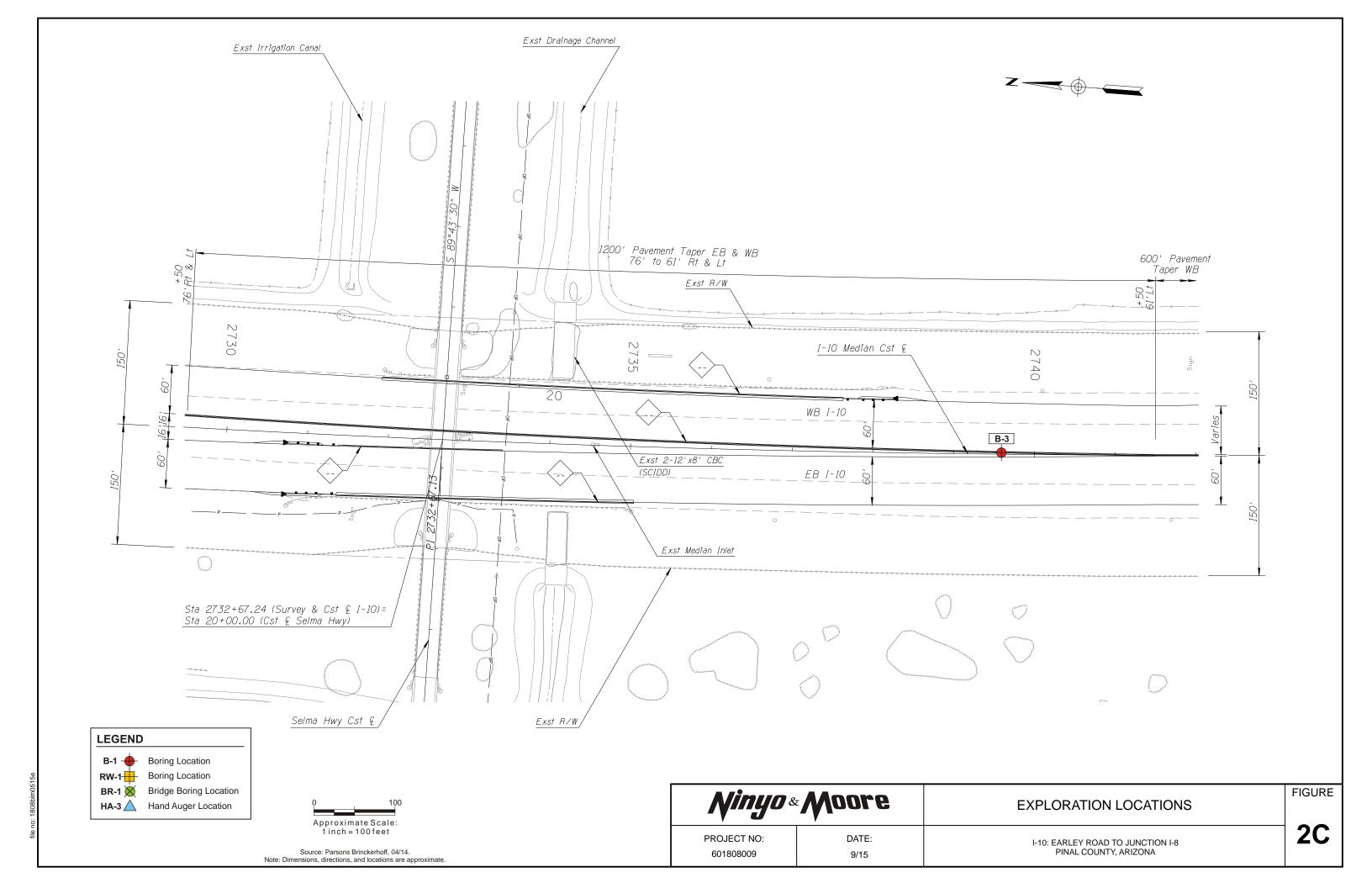
**2B** 

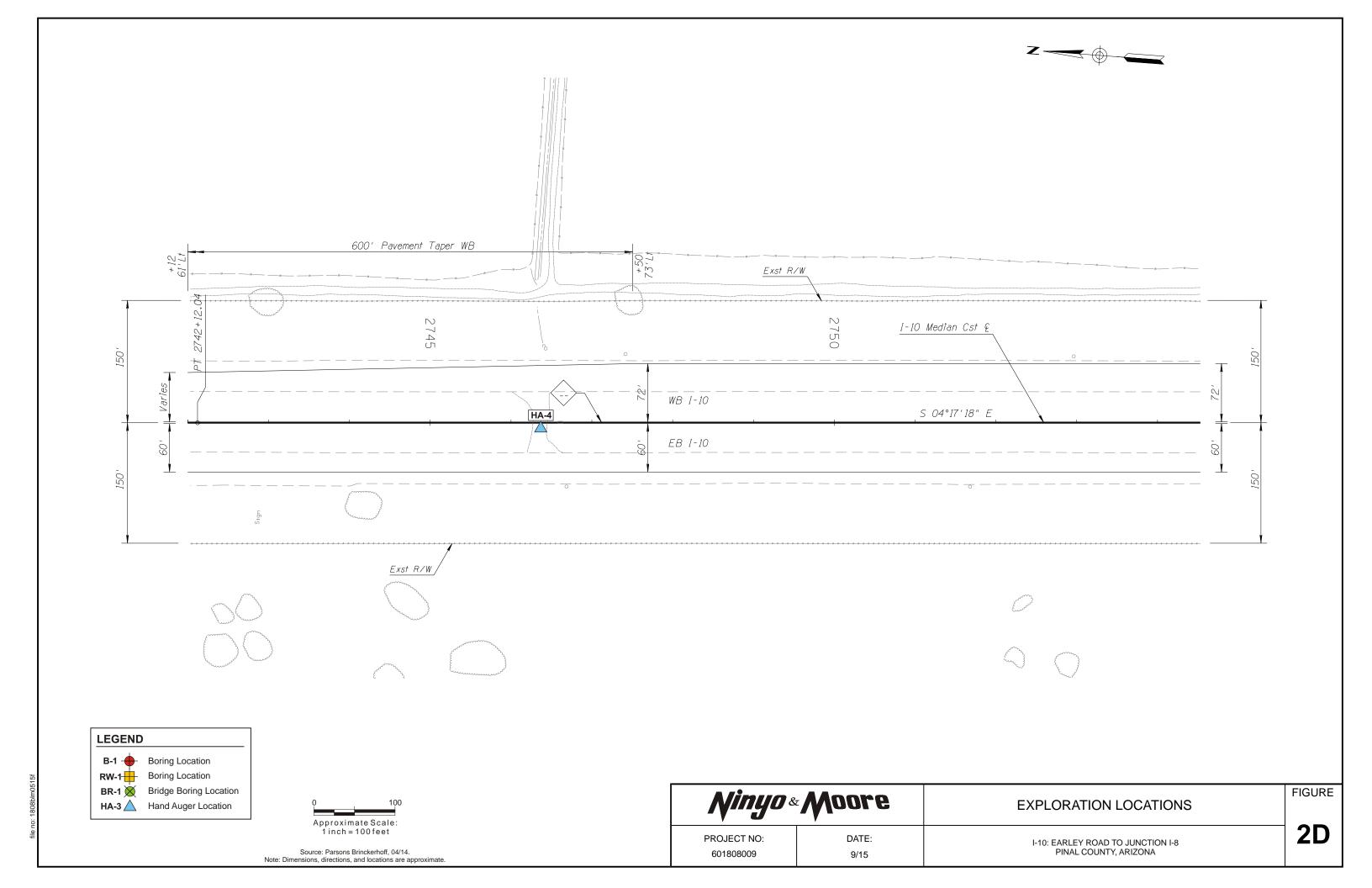
FIGURE

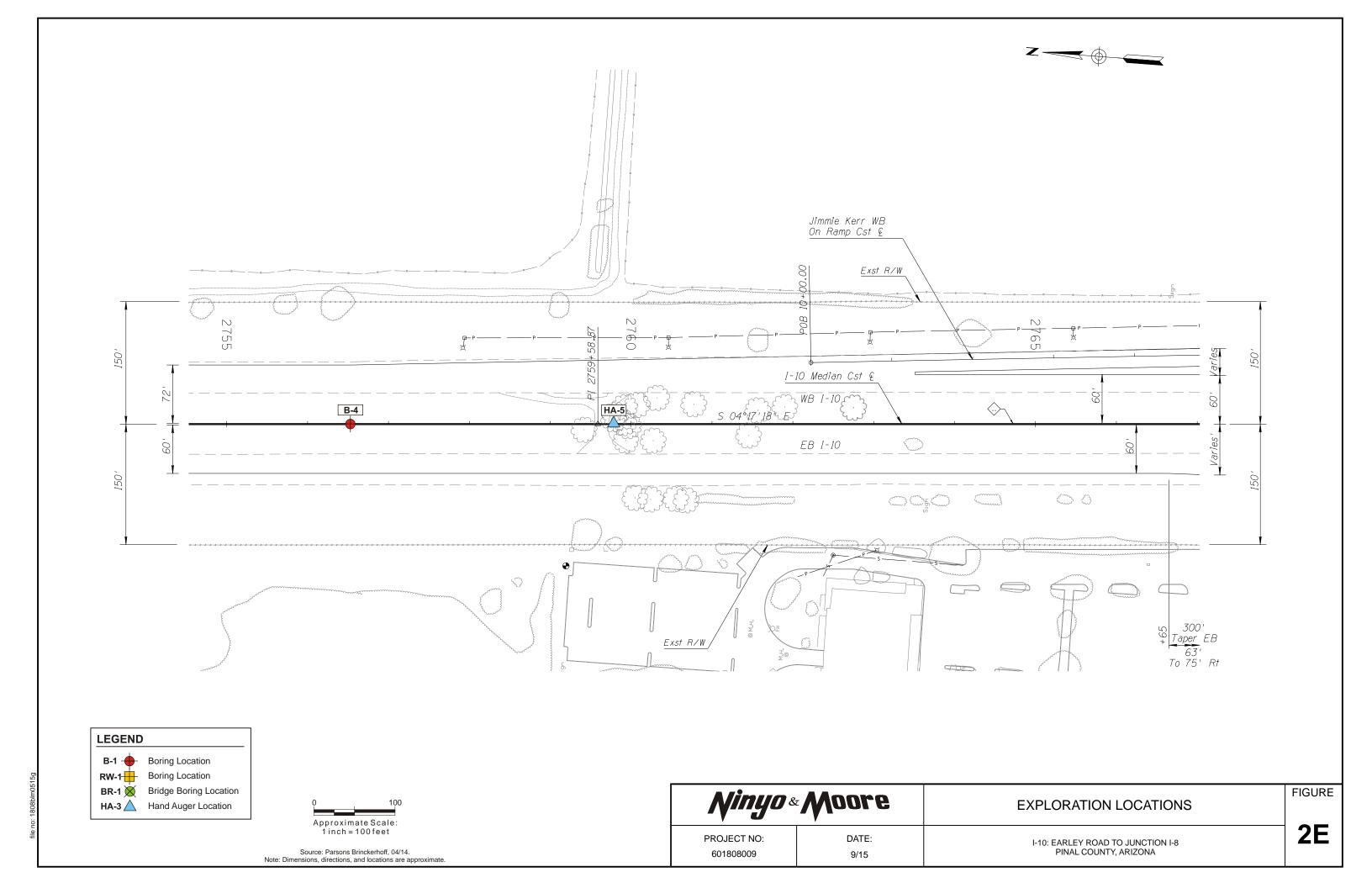
Source: Parsons Brinckerhoff, 04/14. Note: Dimensions, directions, and locations are approximate.

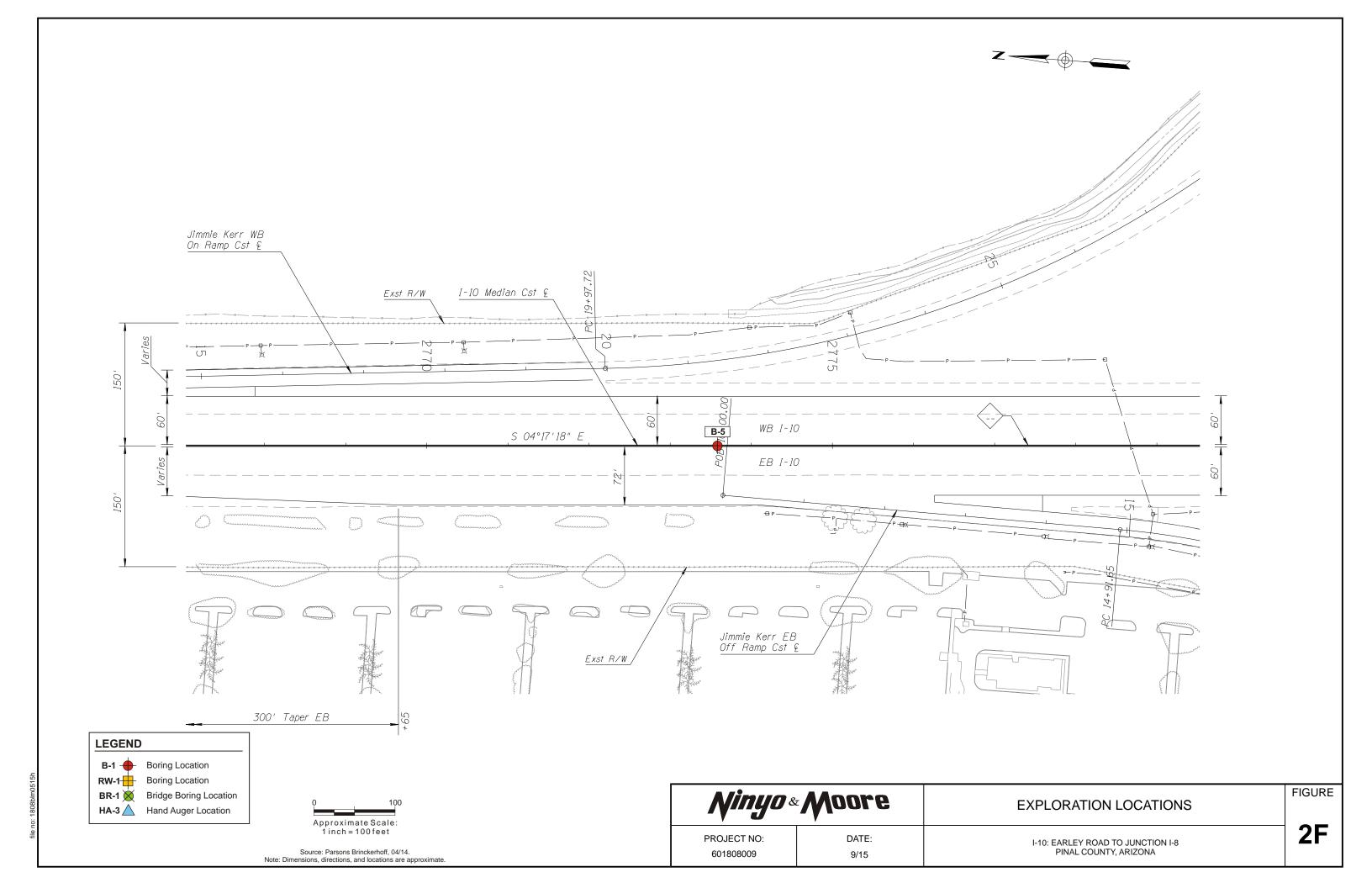
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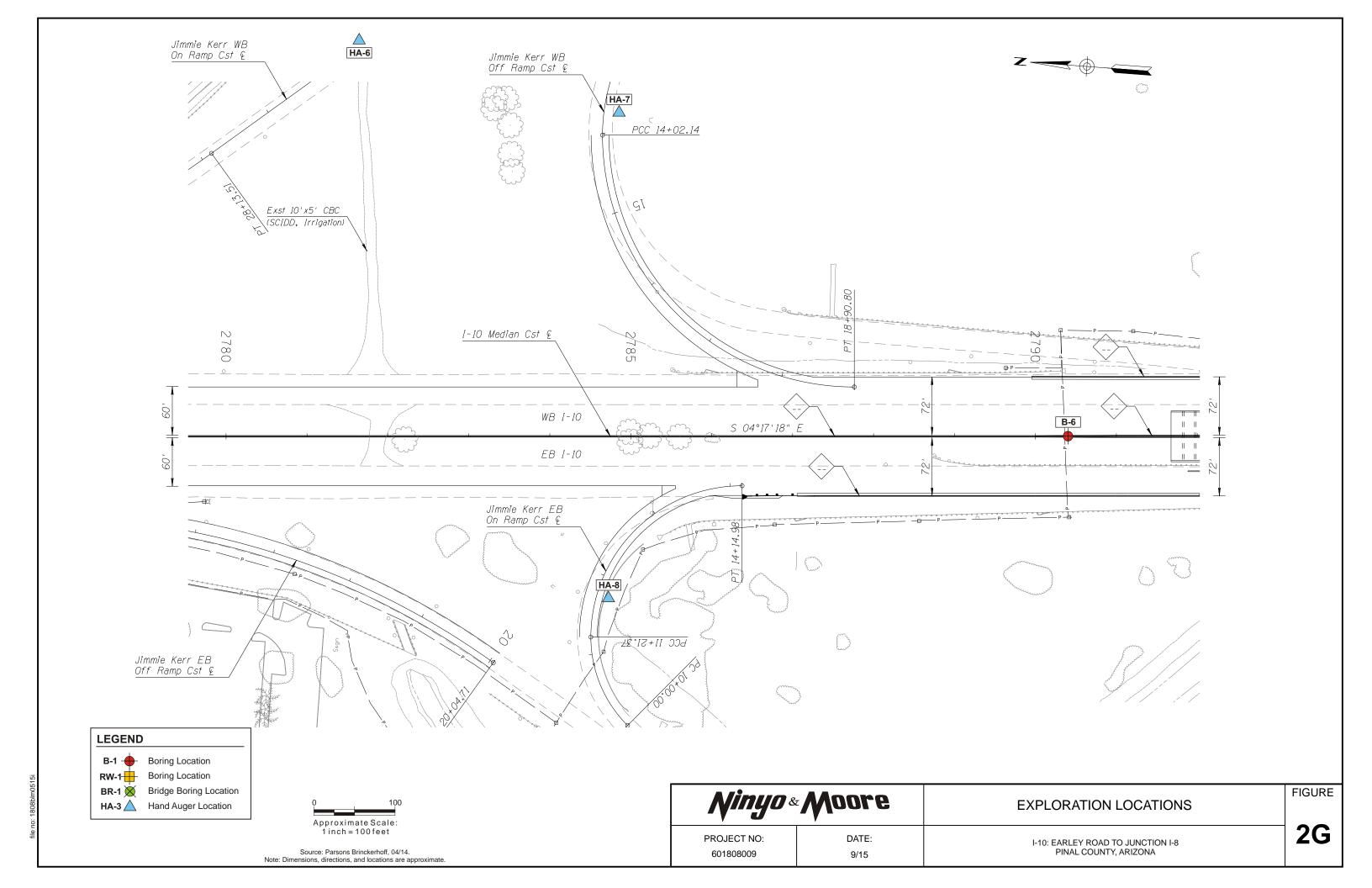
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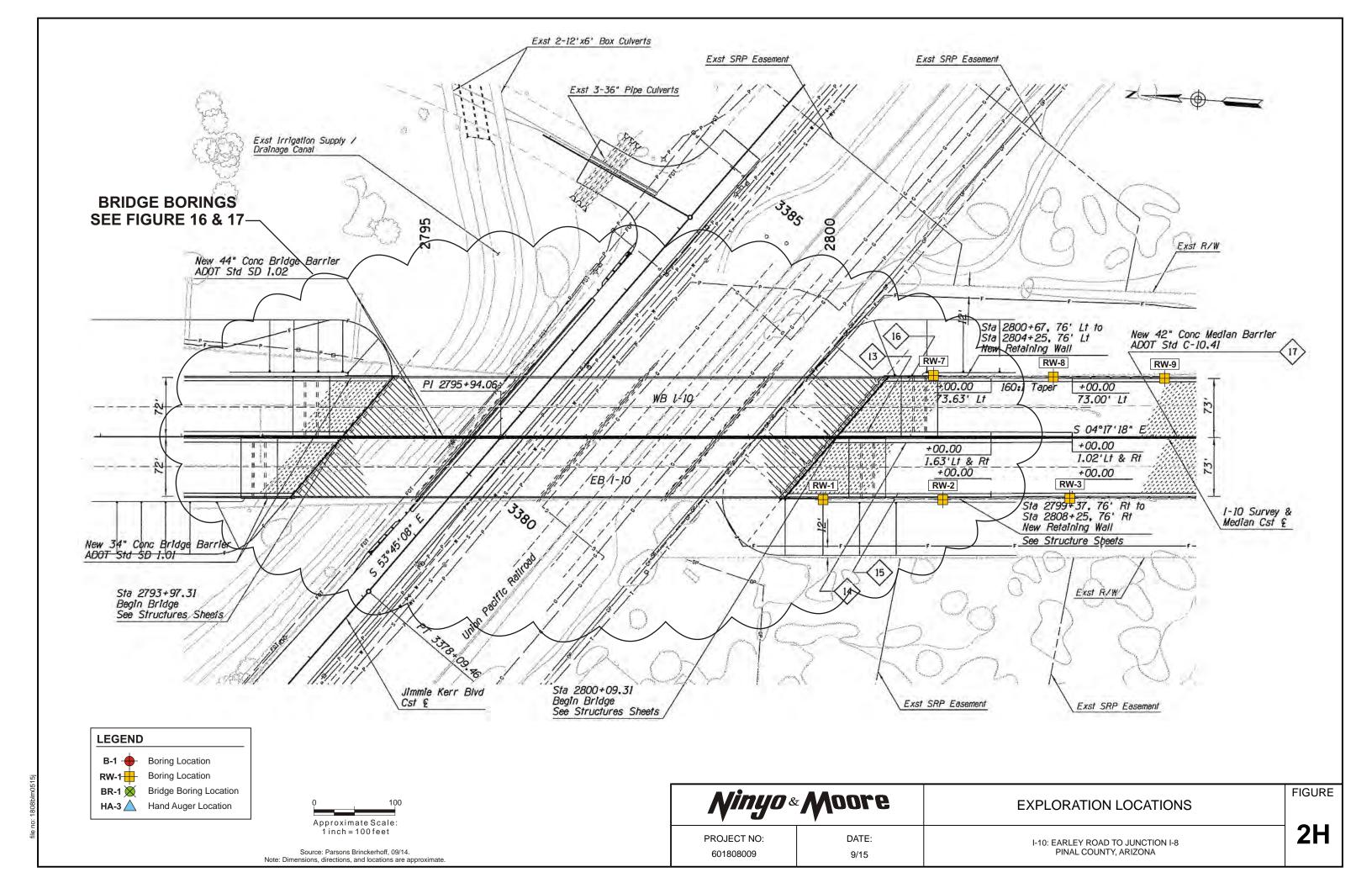


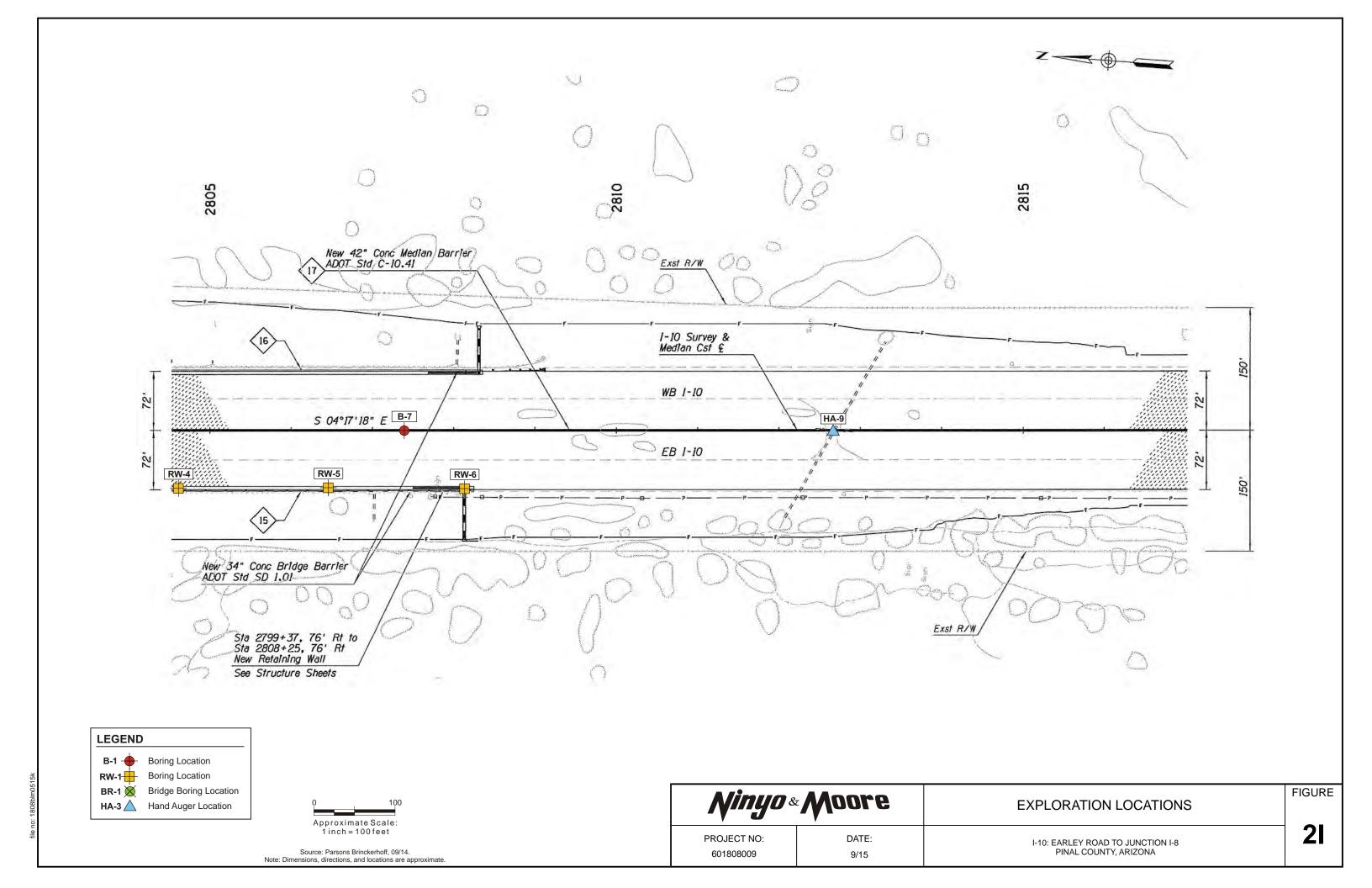


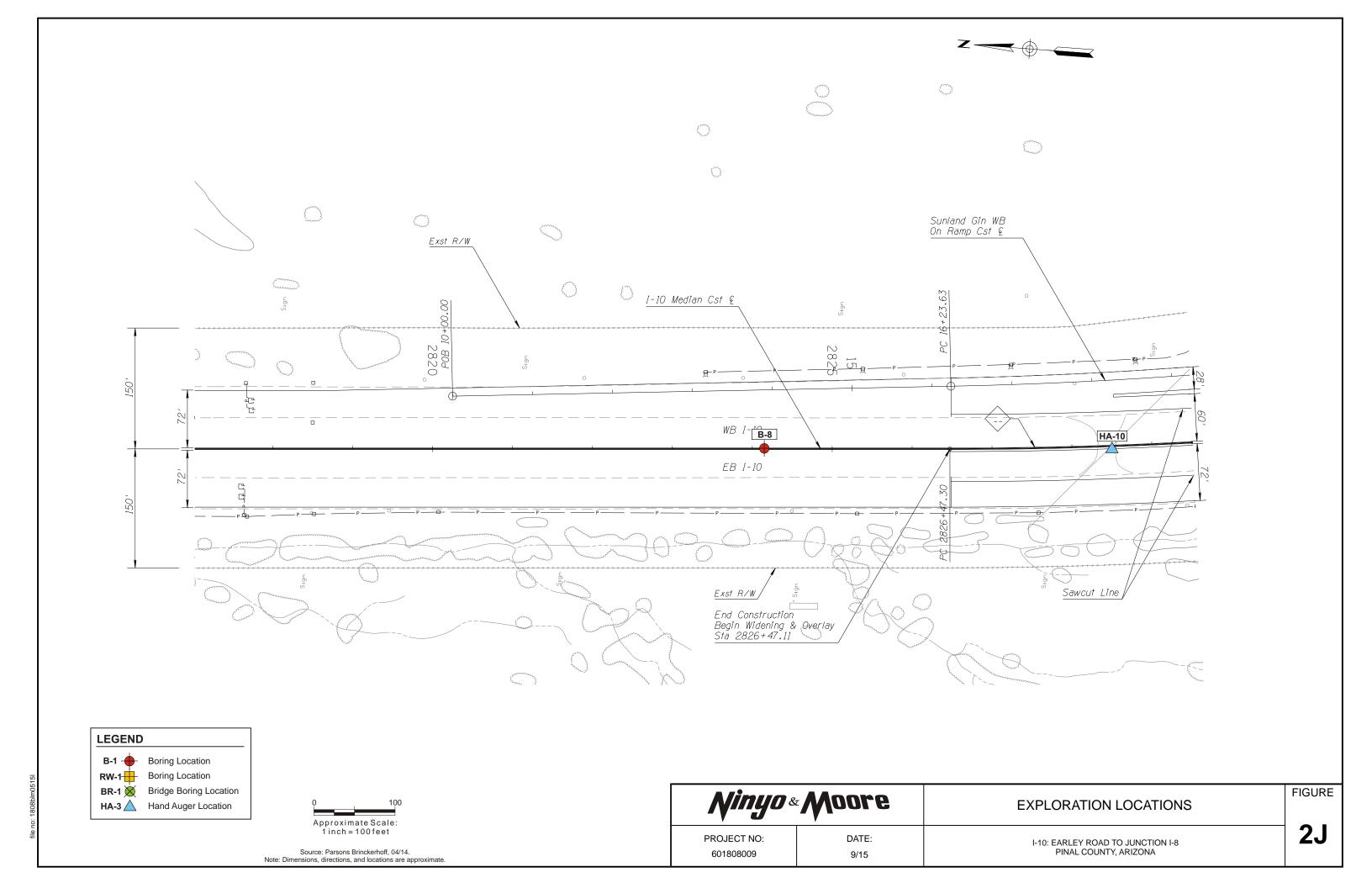


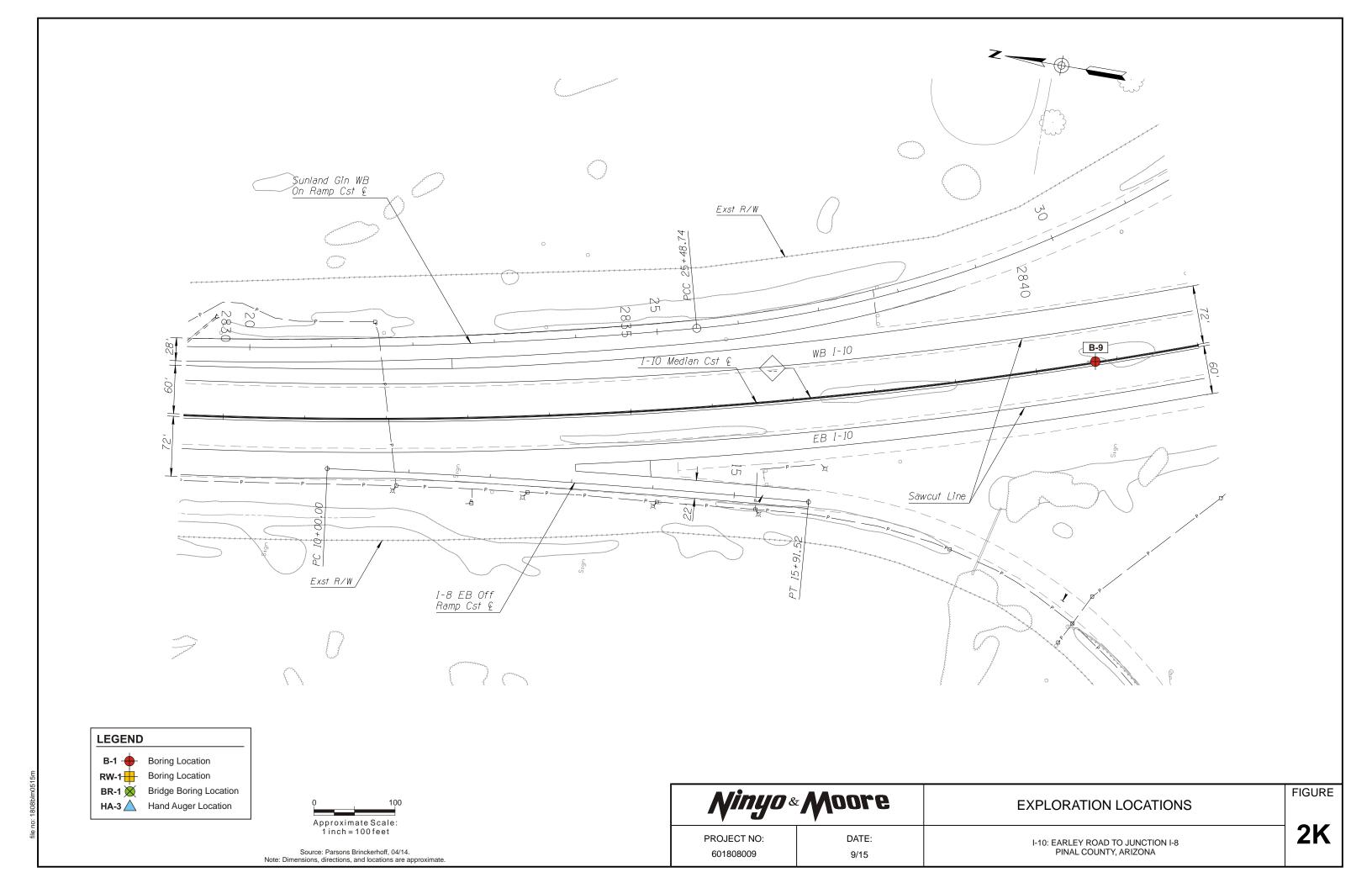


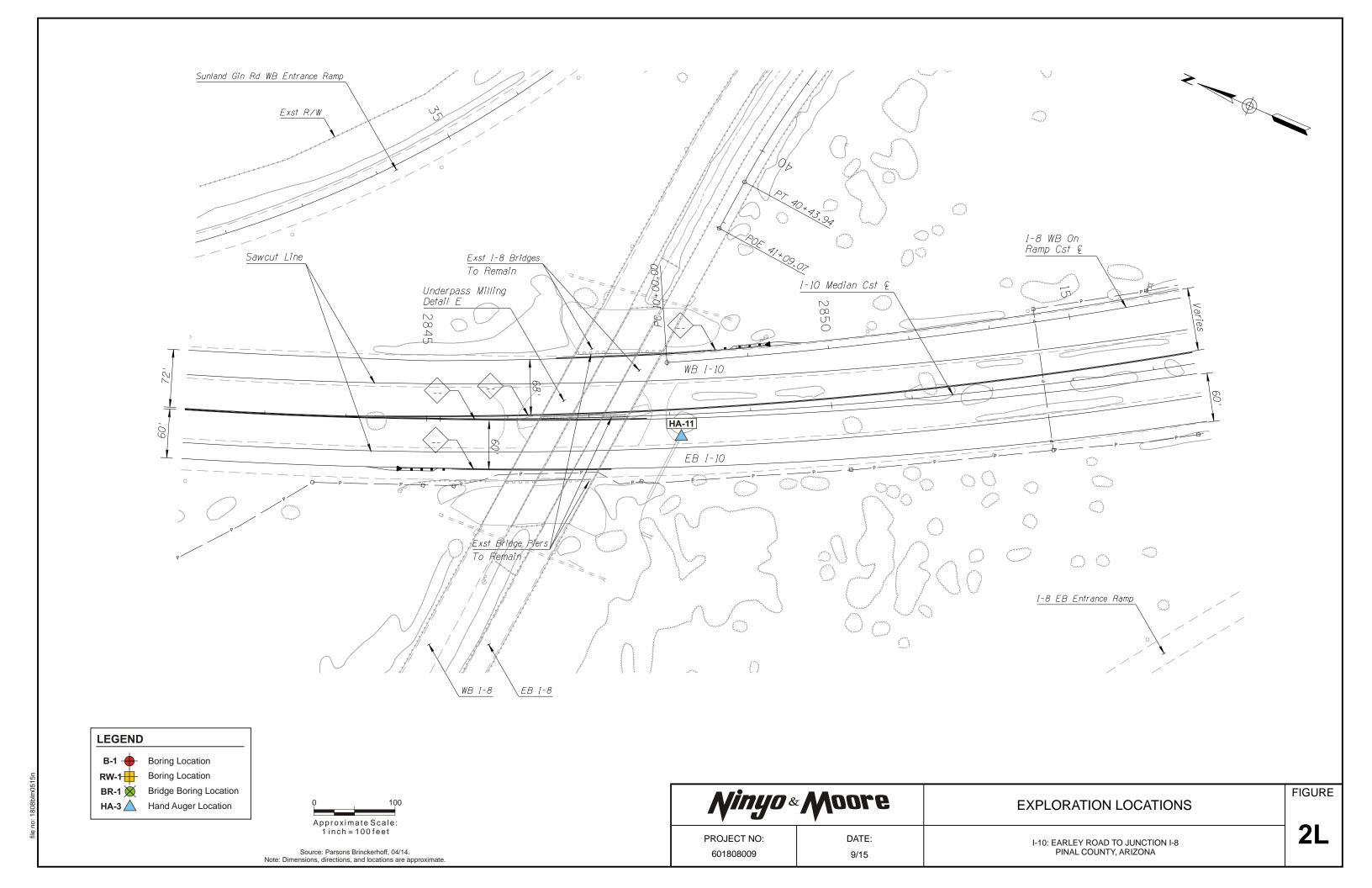


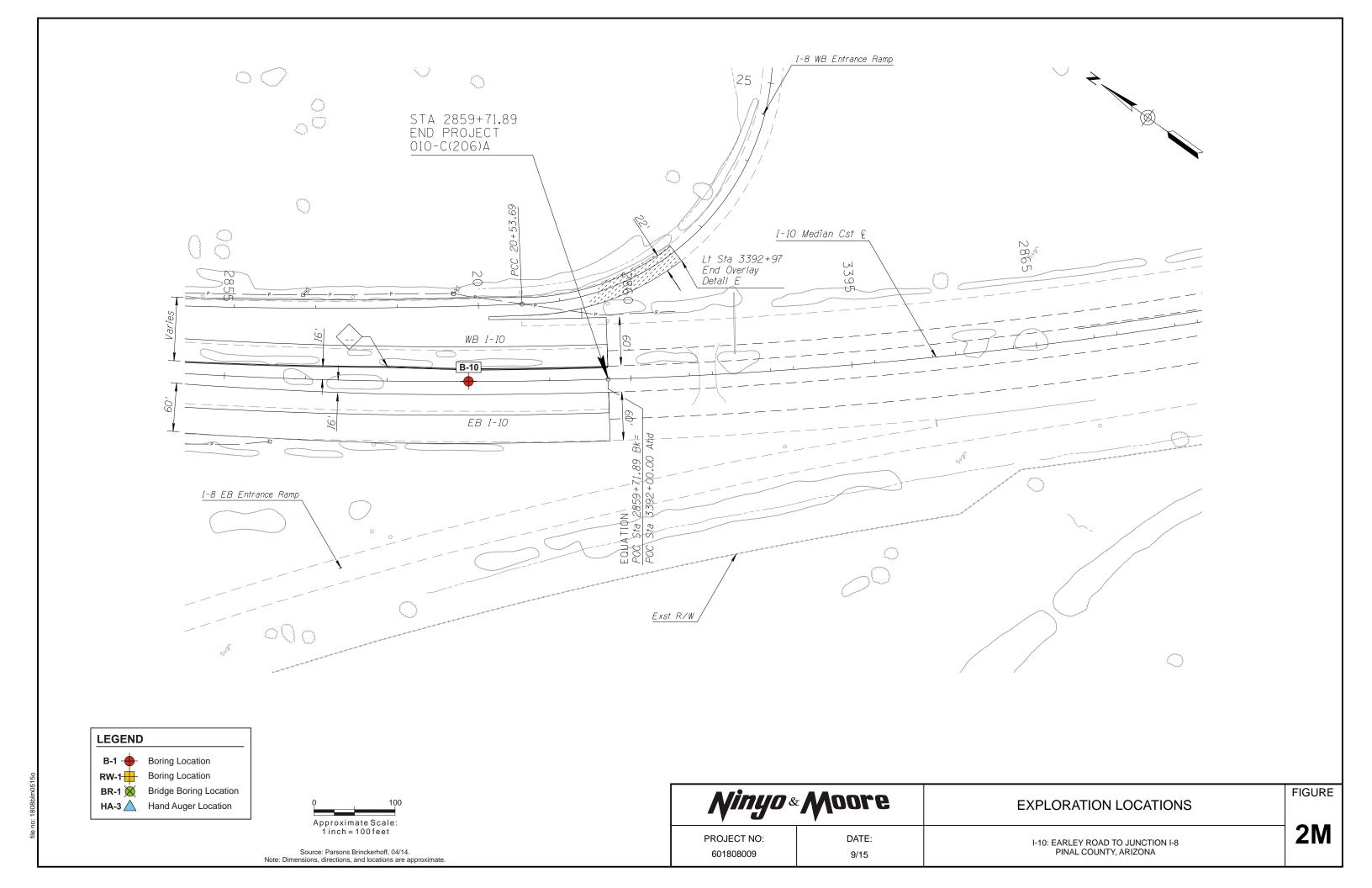


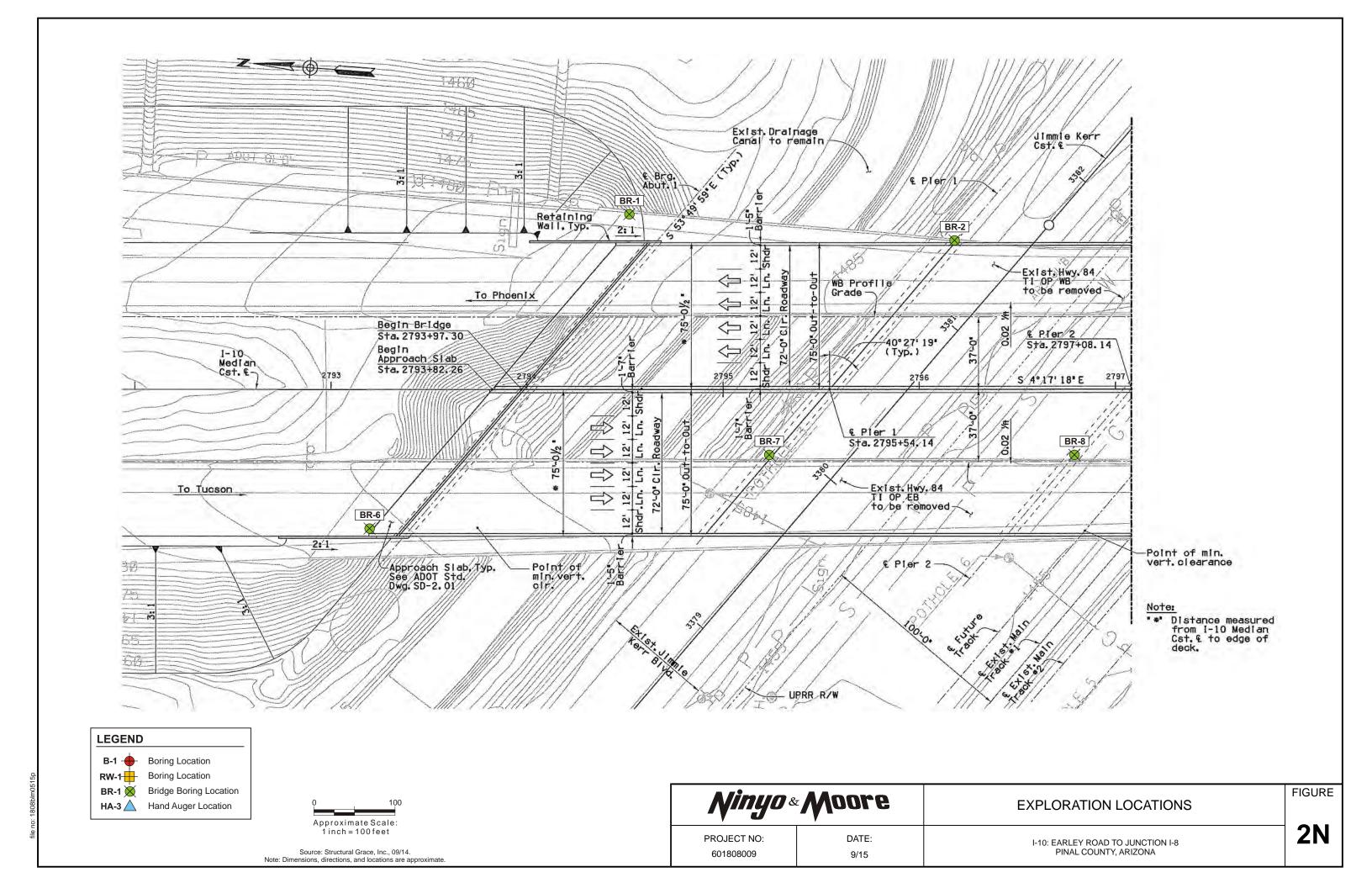


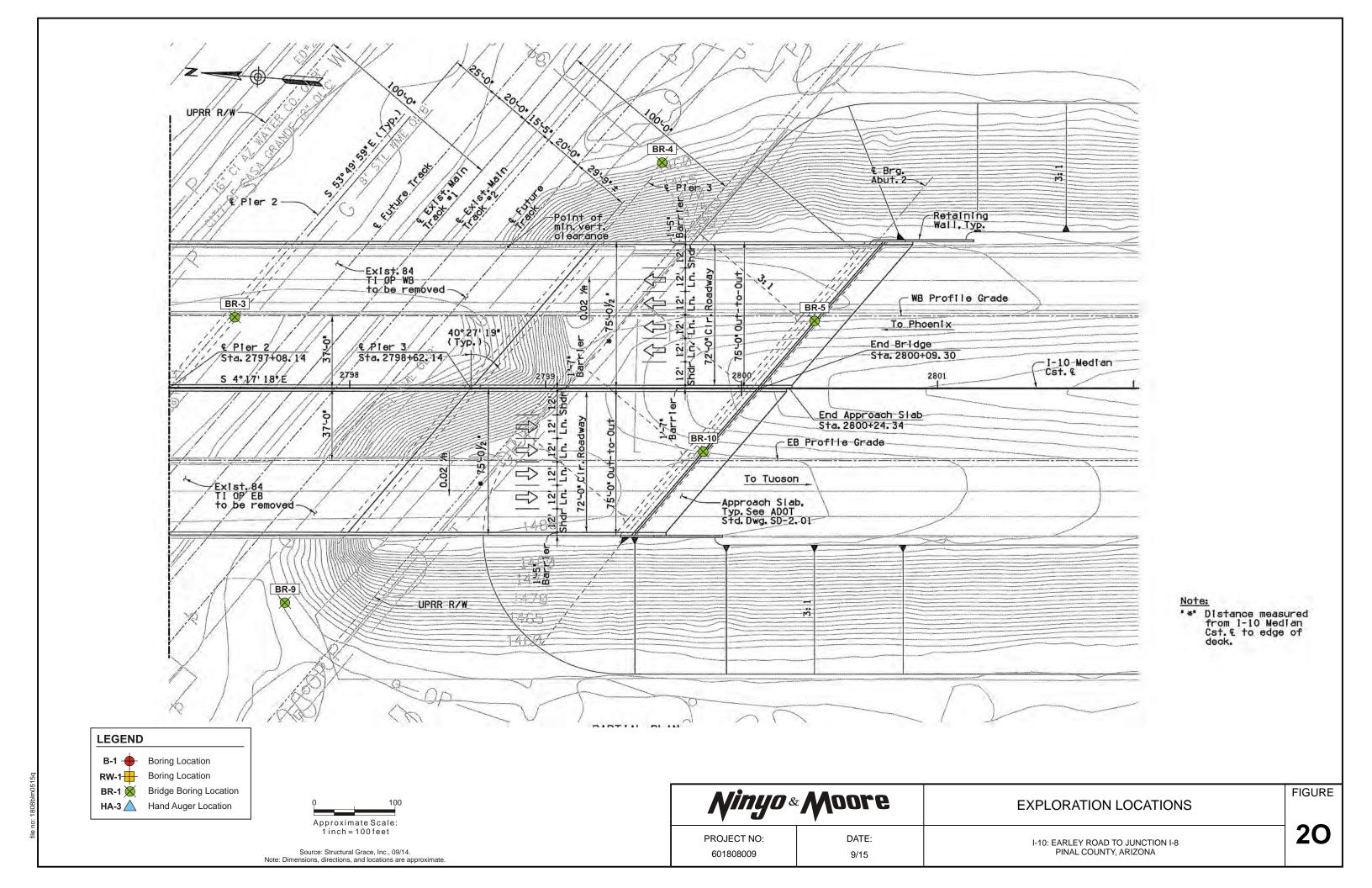


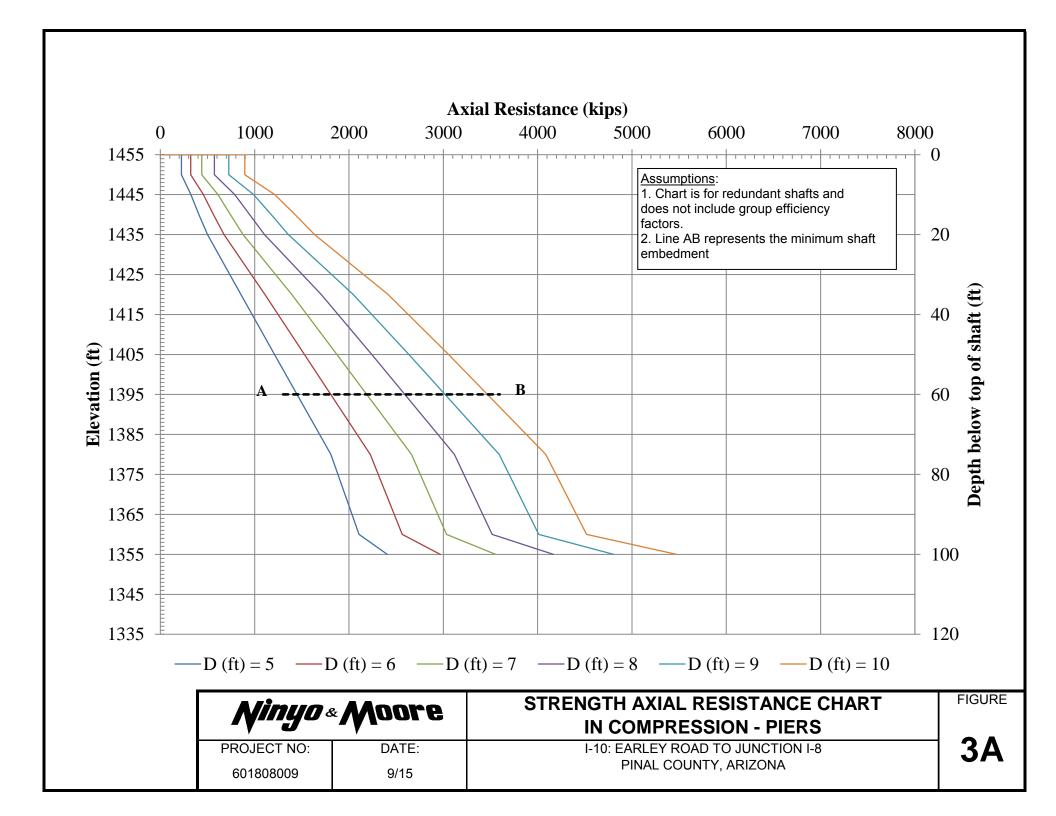


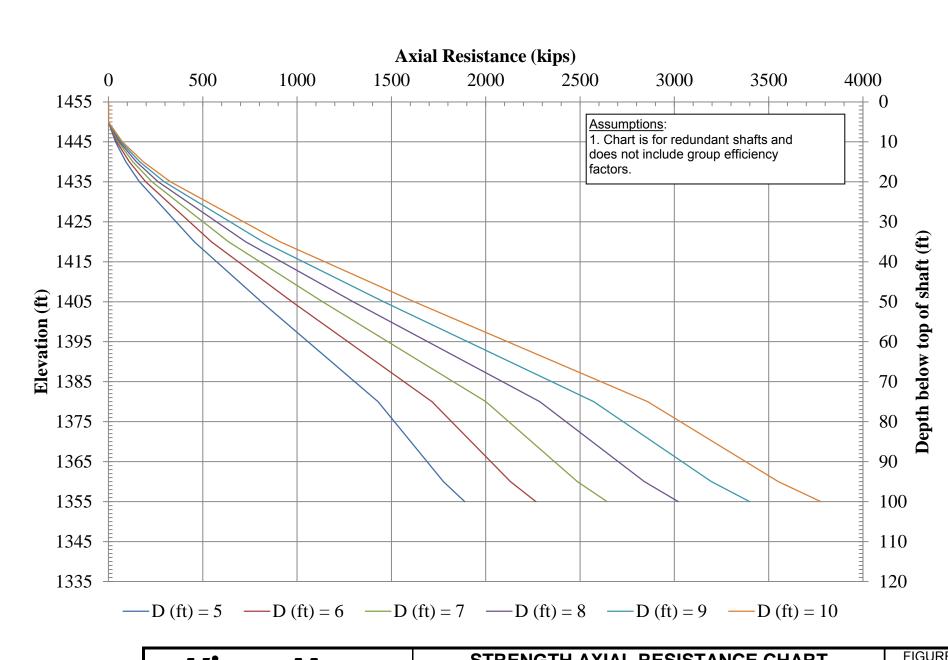






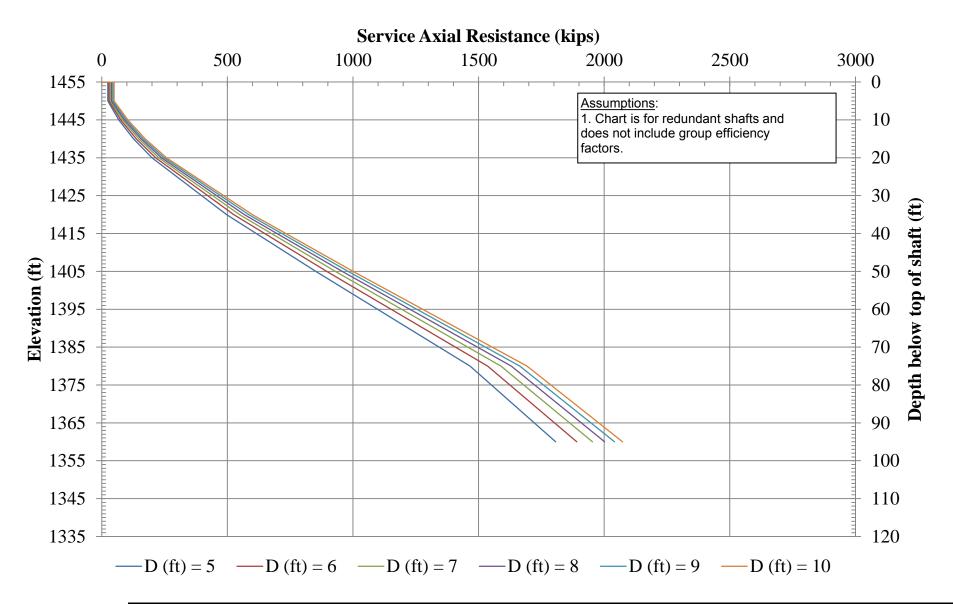






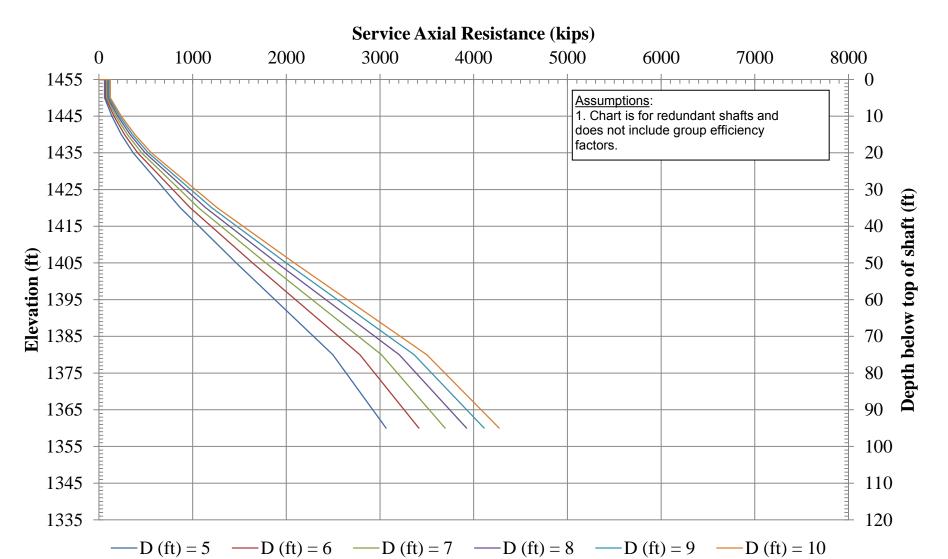
<i>Ninyo</i> « Moore		STRENGTH AXIAL RESISTANCE CHART IN TENSION - PIERS	FIGURE
PROJECT NO:	DATE:	I-10: EARLEY ROAD TO JUNCTION I-8	1 3B 1
601808009	9/15	PINAL COUNTY, ARIZONA	

### Service Axial Resistance Chart for wt = 0.1"



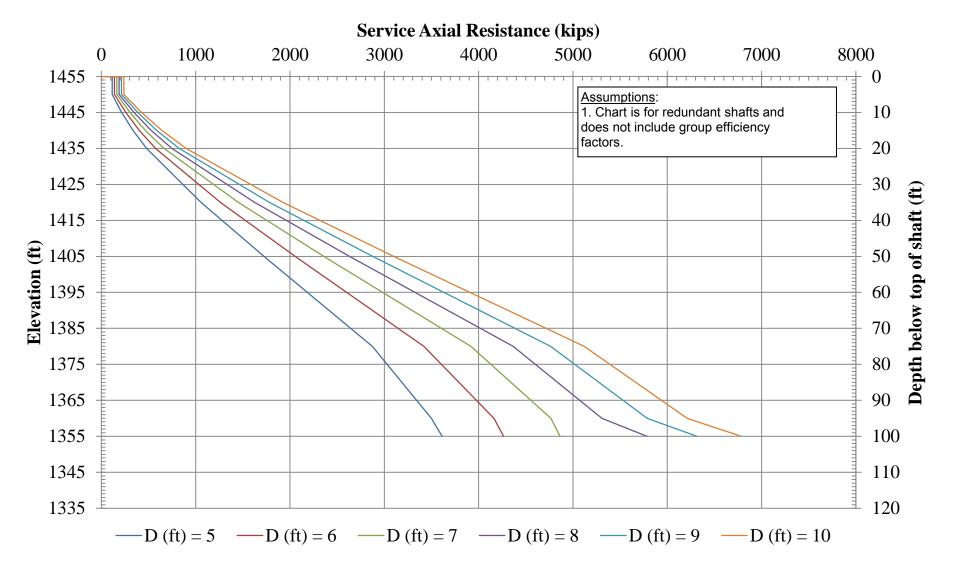
Ninyo	Moore	SERVICE AXIAL RESISTANCE CHART PIERS	FIGURE
PROJECT NO:	DATE:	I-10: EARLEY ROAD TO JUNCTION I-8	<b>4</b> A
601808009	9/15	PINAL COUNTY, ARIZONA	

#### Service Axial Resistance Chart for wt = 0.25"



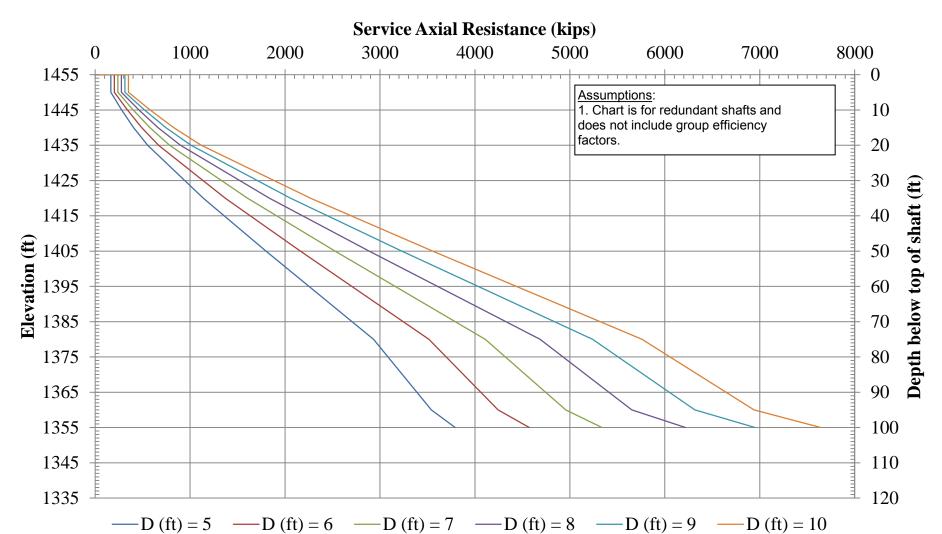
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PROJECT NO:	DATE:	I-10: EARLEY ROAD TO JUNCTION I-8	4B
601808009	9/15	PINAL COUNTY, ARIZONA	

#### Service Axial Resistance Chart for wt = 0.5"



Ninyo	Moore	SERVICE AXIAL RESISTANCE CHART PIERS	FIGURE
PROJECT NO:	DATE:	I-10: EARLEY ROAD TO JUNCTION I-8	4C
601808009	9/15	PINAL COUNTY, ARIZONA	. •

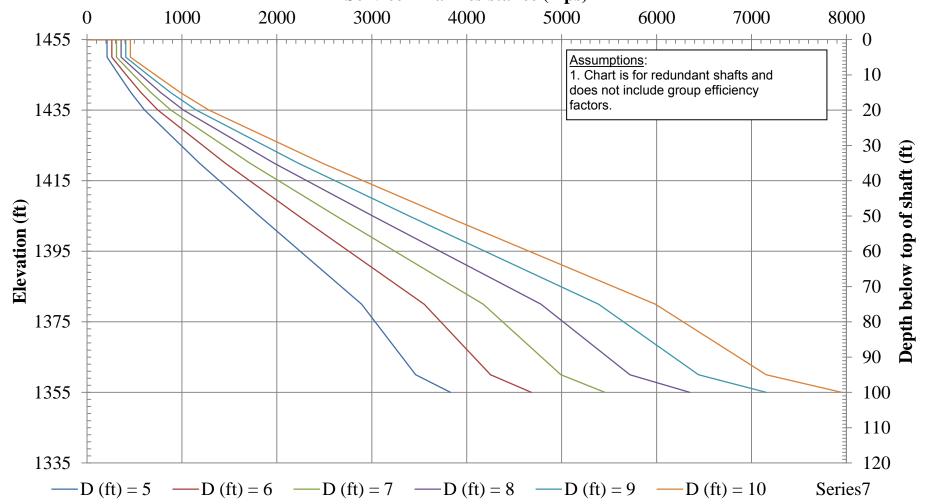
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Ninyo	Moore	SERVICE AXIAL RESISTANCE CHART PIERS	FIGURE
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601808009	9/15	PINAL COUNTY, ARIZONA	

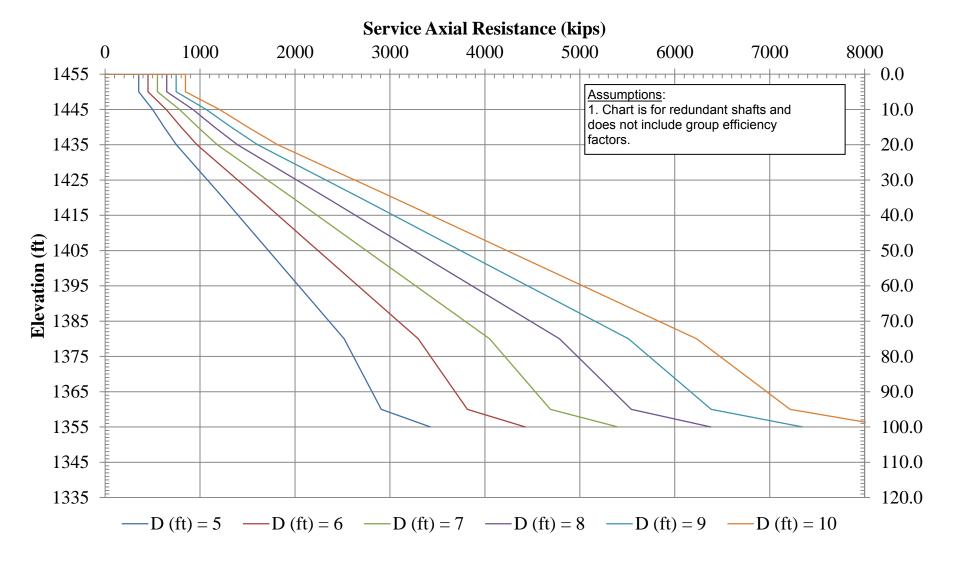
# **Service Axial Resistance Chart for wt = 1"**



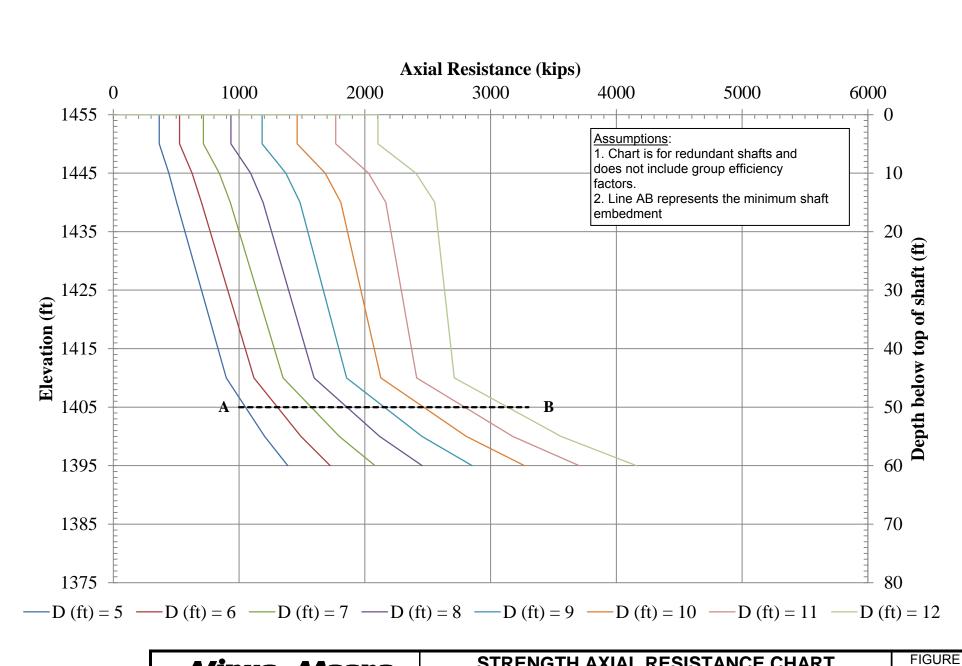


Ninyo	Moore	SERVICE AXIAL RESISTANCE CHART PIERS	FIGURE
PROJECT NO:	DATE:	I-10: EARLEY ROAD TO JUNCTION I-8	4E
601808009	9/15	PINAL COUNTY, ARIZONA	

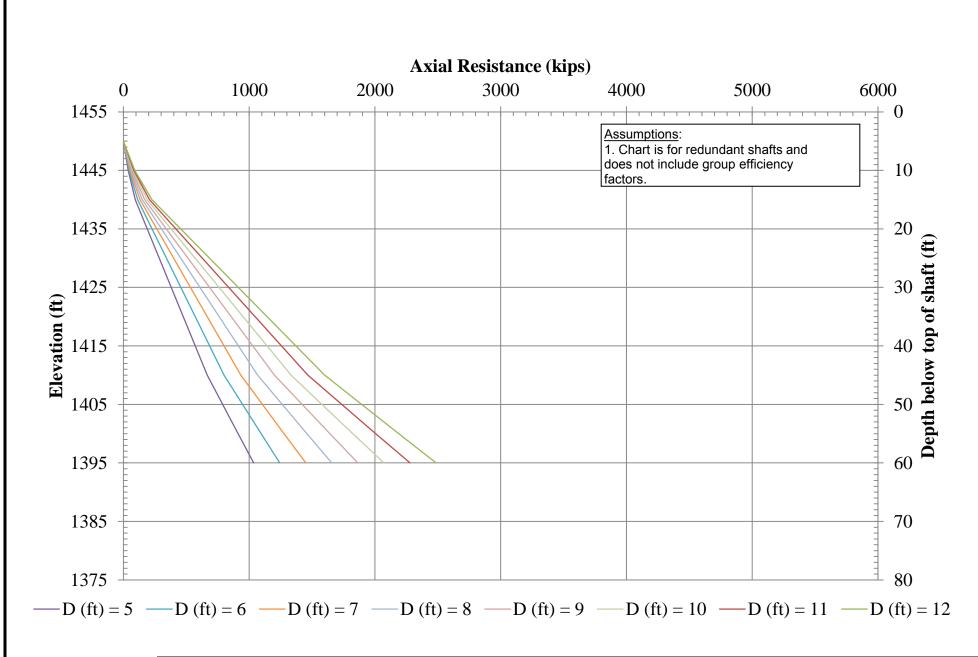
### **Service Axial Resistance Chart for wt = 2"**



Ninyo	Moore	SERVICE AXIAL RESISTANCE CHART PIERS	FIGURE
PROJECT NO:	DATE:	I-10: EARLEY ROAD TO JUNCTION I-8	4F
601808009	9/15	PINAL COUNTY, ARIZONA	

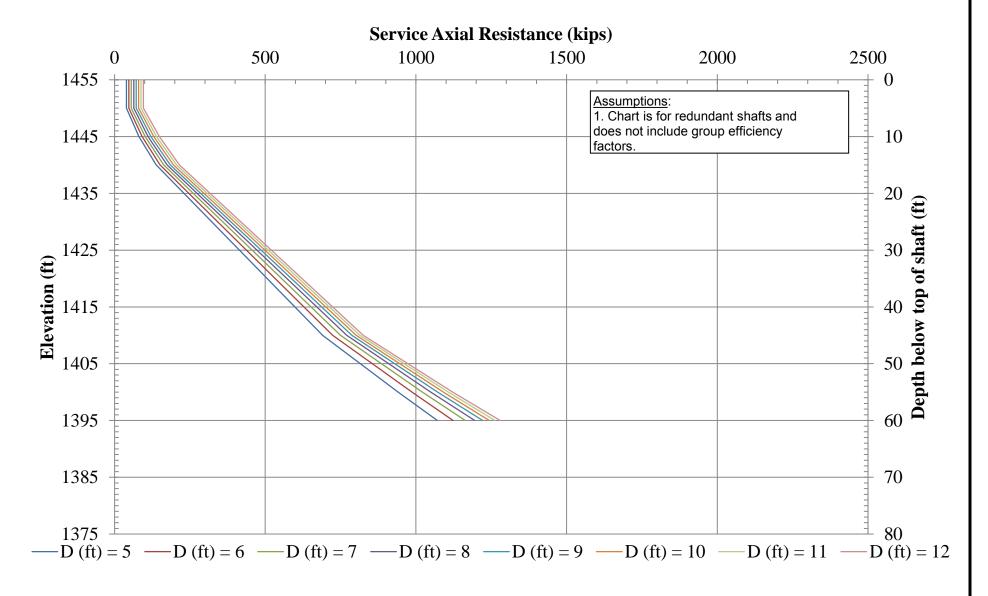


Ninyo	« <b>Moore</b>	STRENGTH AXIAL RESISTANCE CHART IN COMPRESSION - ABUTMENTS	FIGURE
PROJECT NO:	DATE:	I-10: EARLEY ROAD TO JUNCTION I-8	5 <b>A</b>
601808009	9/15	PINAL COUNTY, ARIZONA	



Ninyo	Moore	STRENGTH AXIAL RESISTANCE CHART IN TENSION - ABUTMENTS	FIGURE
PROJECT NO:	DATE:	I-10: EARLEY ROAD TO JUNCTION I-8	5B
601808009	9/15	PINAL COUNTY, ARIZONA	

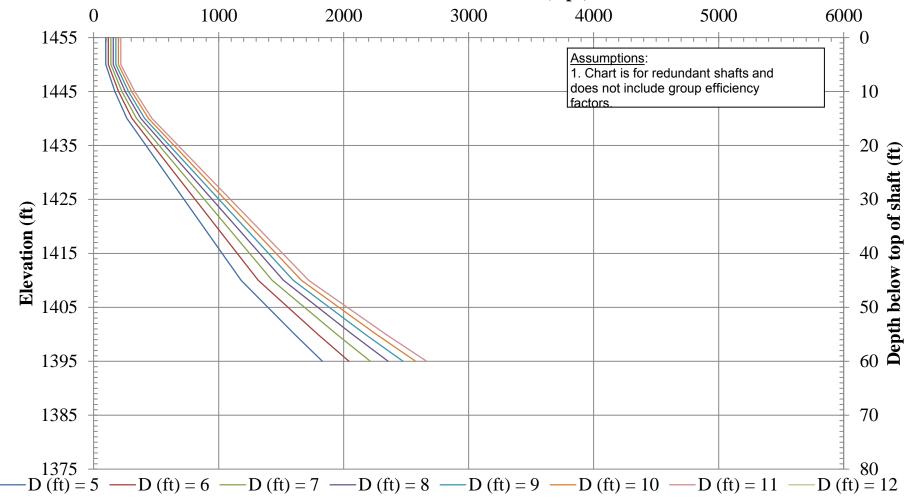
# Service Axial Resistance Chart for wt = 0.1"



Ninyo	Moore	SERVICE AXIAL RESISTANCE CHART ABUTMENTS	FIGURE
PROJECT NO:	DATE:	I-10: EARLEY ROAD TO JUNCTION I-8	1 6A
601808009	9/15	PINAL COUNTY, ARIZONA	

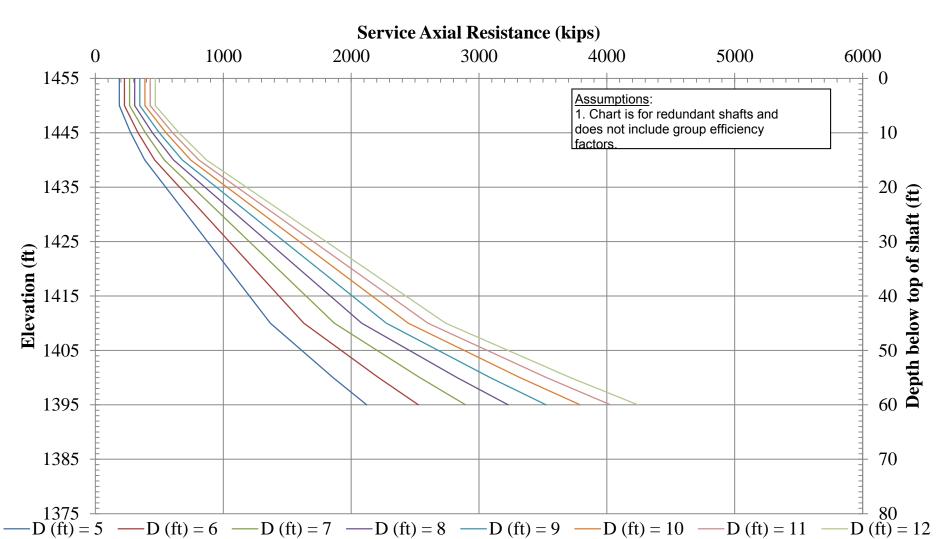
#### Service Axial Resistance Chart for wt = 0.25"





Ninyo	Moore	SERVICE AXIAL RESISTANCE CHART ABUTMENTS	FIGURE
PROJECT NO:	DATE:	I-10: EARLEY ROAD TO JUNCTION I-8	6B
601808009	9/15	PINAL COUNTY, ARIZONA	

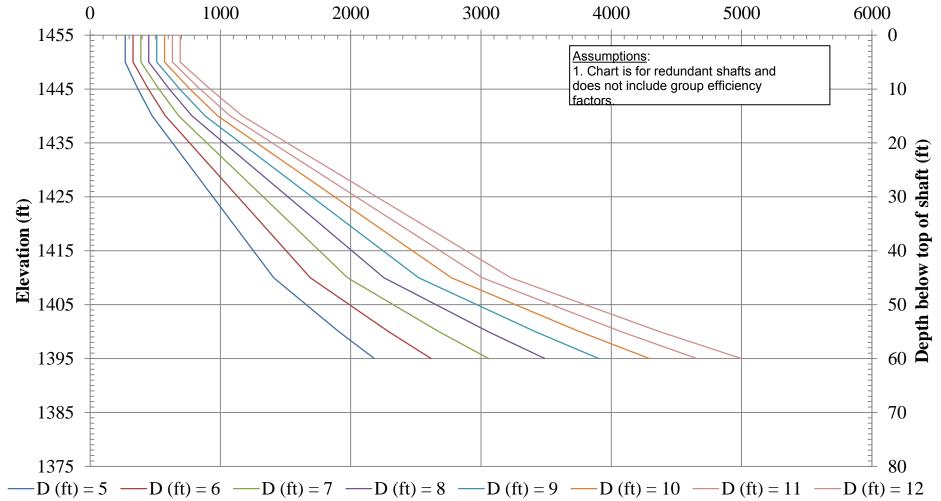
#### Service Axial Resistance Chart for wt = 0.5"



Ninyo	Moore	SERVICE AXIAL RESISTANCE CHART ABUTMENTS	FIGURE
PROJECT NO:	DATE:	I-10: EARLEY ROAD TO JUNCTION I-8	6C
601808009	9/15	PINAL COUNTY, ARIZONA	

# Service Axial Resistance Chart for wt = 0.75"

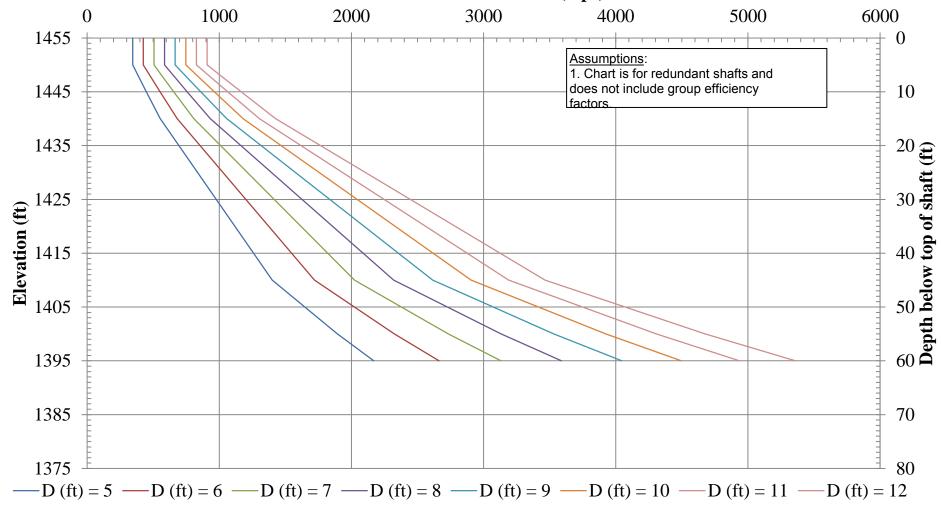




Ninyo	Moore	SERVICE AXIAL RESISTANCE CHART ABUTMENTS	FIGURE
PROJECT NO:	DATE:	I-10: EARLEY ROAD TO JUNCTION I-8	6D
601808009	9/15	PINAL COUNTY, ARIZONA	

#### **Service Axial Resistance Chart for wt = 1"**

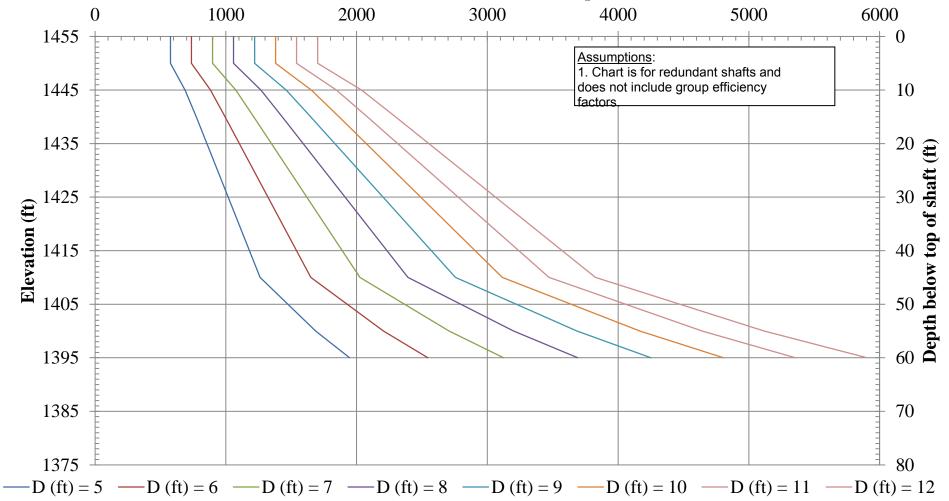




Ninyo	Moore	SERVICE AXIAL RESISTANCE CHART ABUTMENTS	FIGURE
PROJECT NO:	DATE:	I-10: EARLEY ROAD TO JUNCTION I-8	6E
601808009	9/15	PINAL COUNTY, ARIZONA	

### **Service Axial Resistance Chart for wt = 2"**

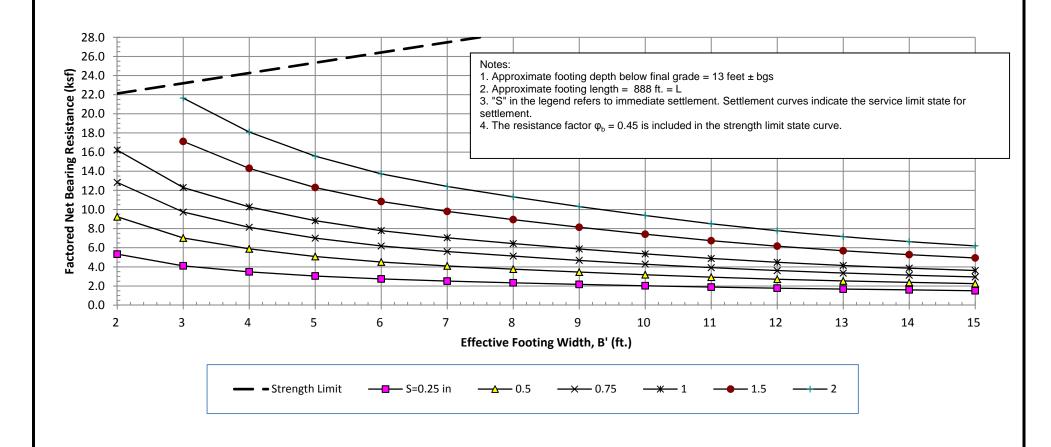




Ninyo	Moore	SERVICE AXIAL RESISTANCE CHART ABUTMENTS	FIGURE
PROJECT NO:	DATE:	I-10: EARLEY ROAD TO JUNCTION I-8	1 6F
601808009	9/15	PINAL COUNTY, ARIZONA	

**EASTBOUND I-10** 

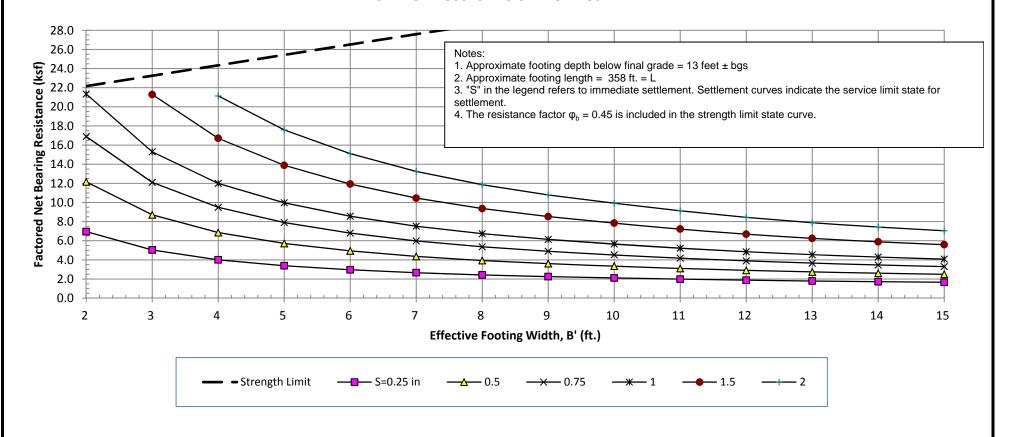
### STATION 2799+37 TO STATION 2808+25



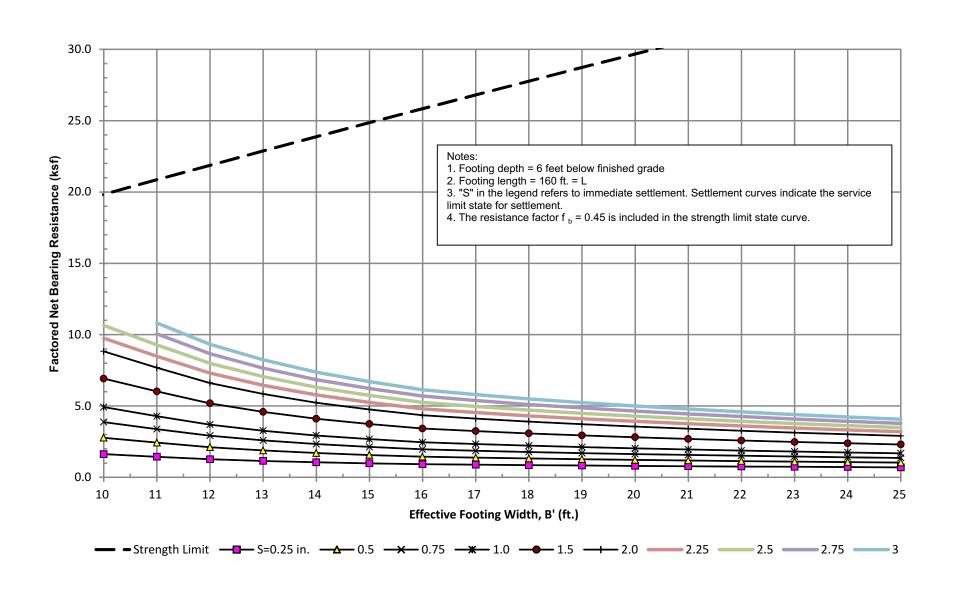
Ninyo	Moore	FACTORED BEARING RESISTANCE CHART	FIGURE
PROJECT NO:	DATE:	I-10: EARLEY ROAD TO JUNCTION I-8	<b>7</b> A
601808009	4/15	PINAL COUNTY, ARIZONA	. , \

#### **WESTBOUND I-10**

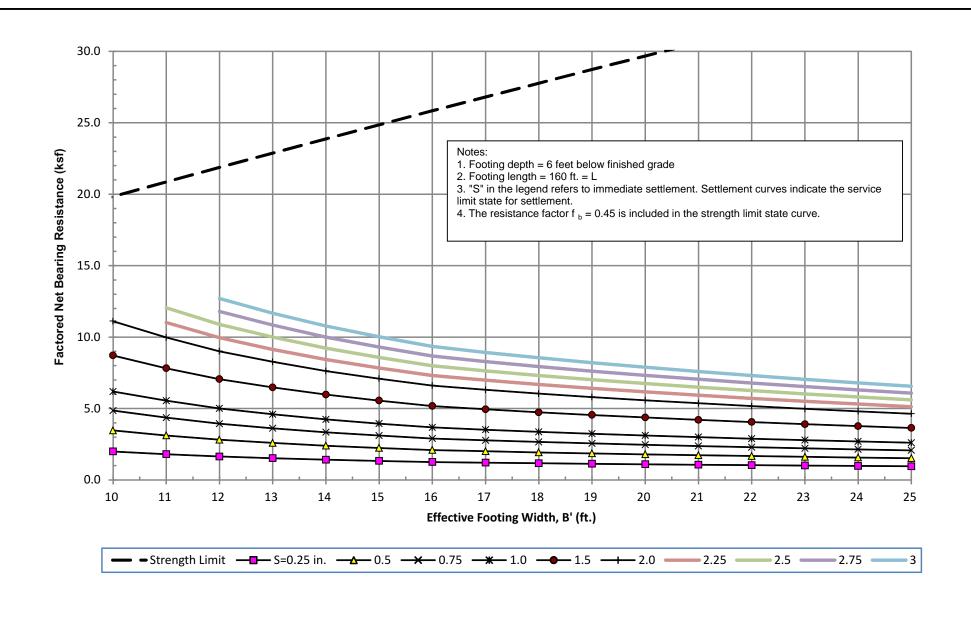
### STATION 2800+67 TO STATION 2804+



Ninyo	Moore	FACTORED BEARING RESISTANCE CHART	FIGURE
PROJECT NO:	DATE:	I-10: EARLEY ROAD TO JUNCTION I-8	7B
601808009	9/15	PINAL COUNTY, ARIZONA	

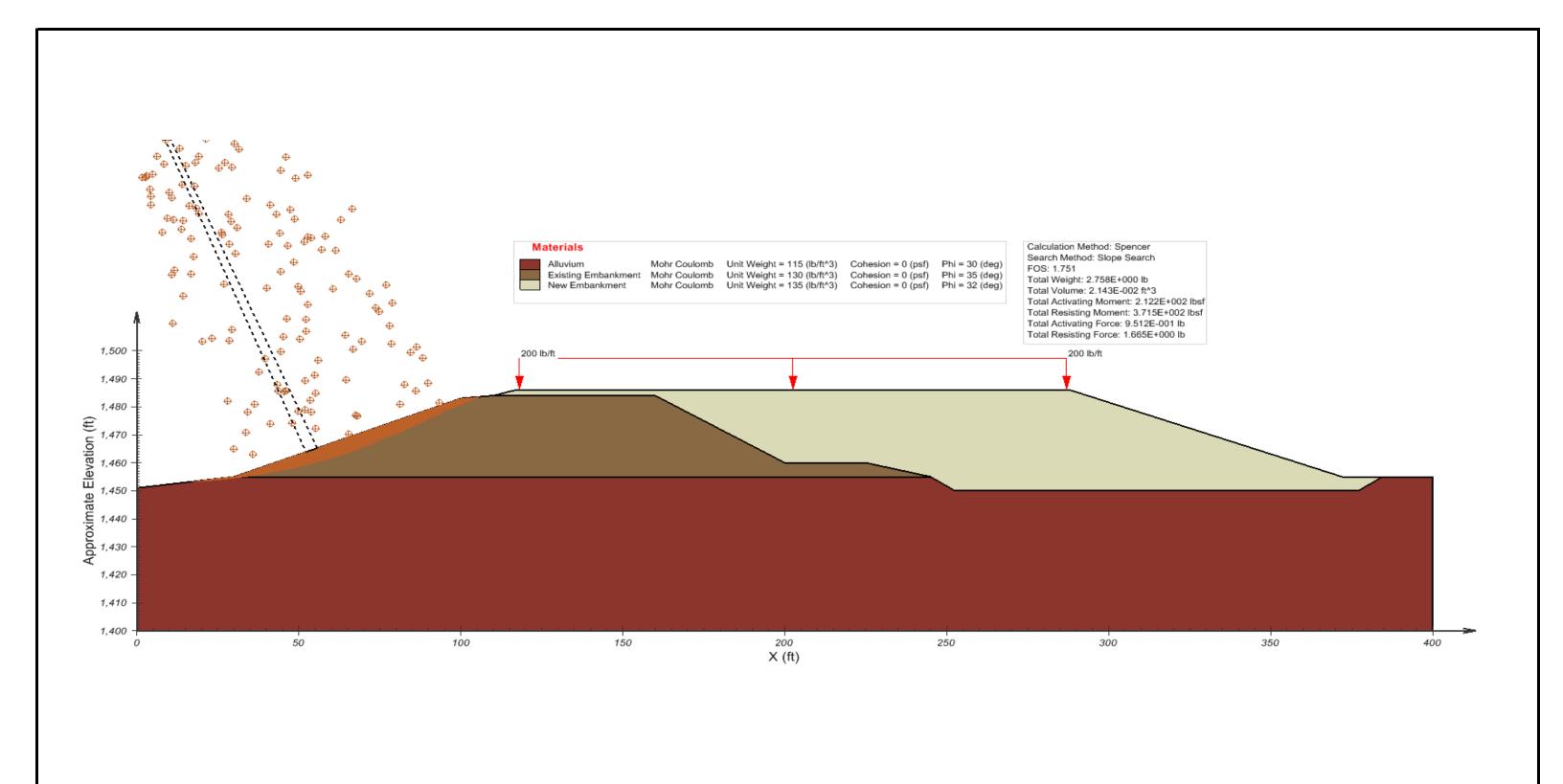


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PROJECT NO:	DATE:	I-10: EARLEY ROAD TO JUNCTION I-8	7C
601808009	9/15	PINAL COUNTY, ARIZONA	

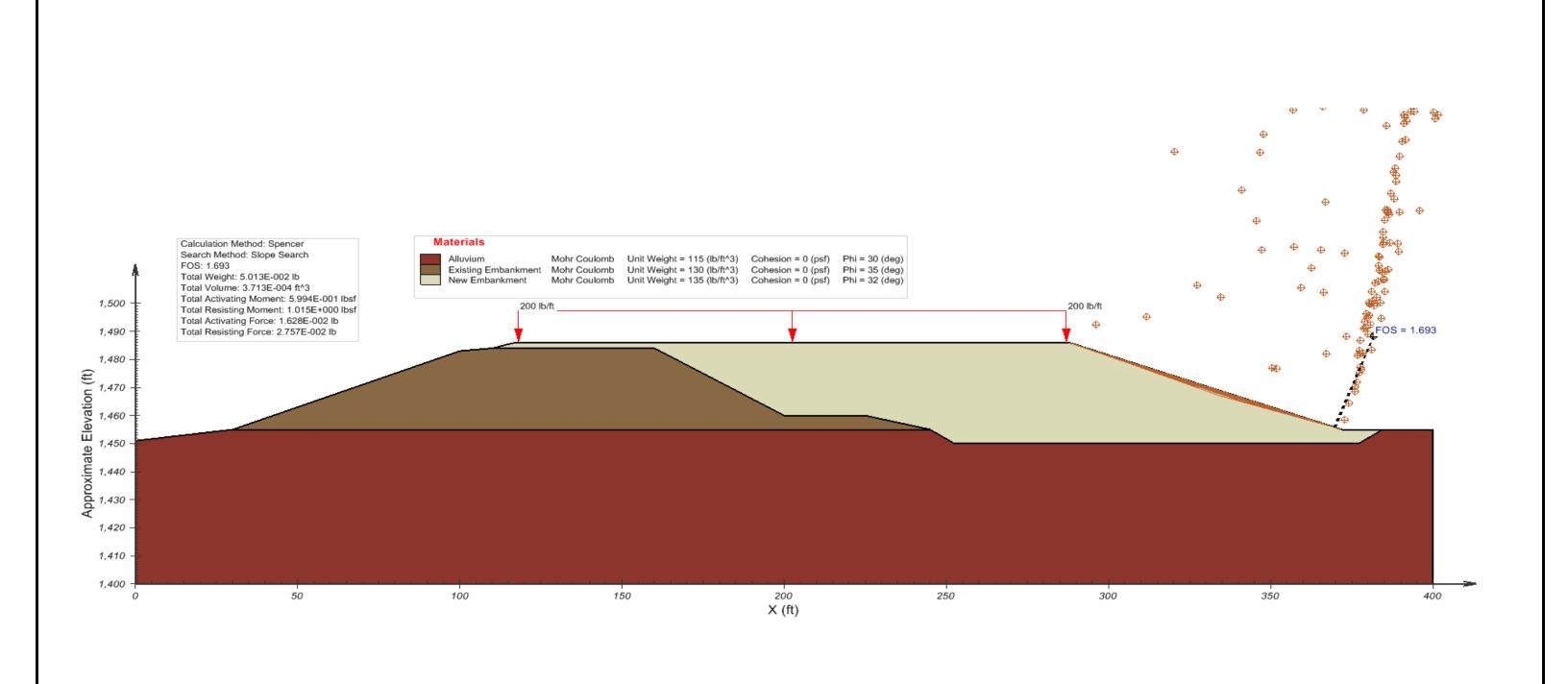




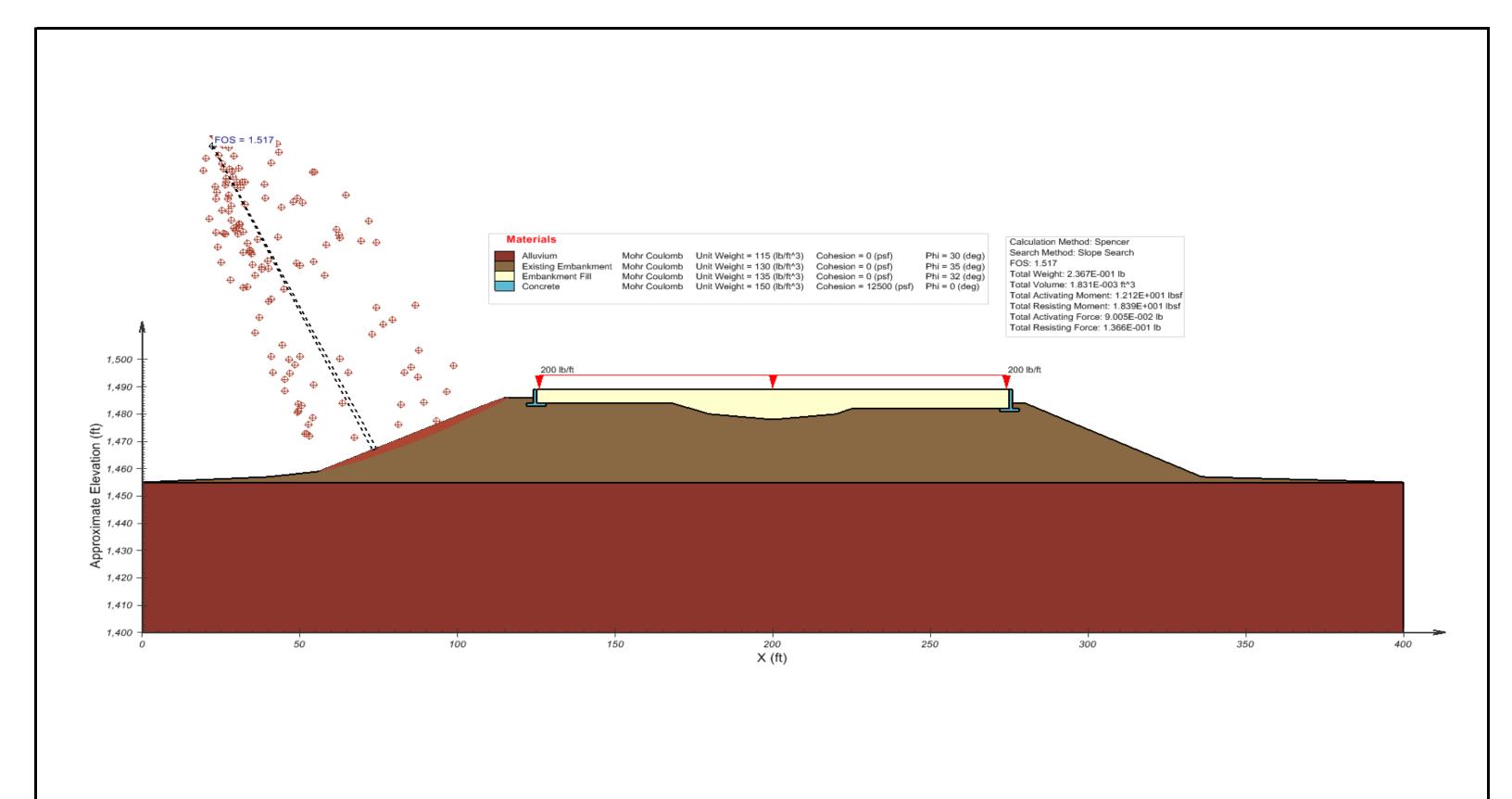
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Ninyo	Moore	END OF CONSTRUCTION, STATION 2793+98, LEFT FACE	FIGURE
PROJECT NO:	DATE:	I-10: EARLEY ROAD TO JUNCTION I-8	<b>8</b> A
601808009	9/15	PINAL COUNTY, ARIZONA	



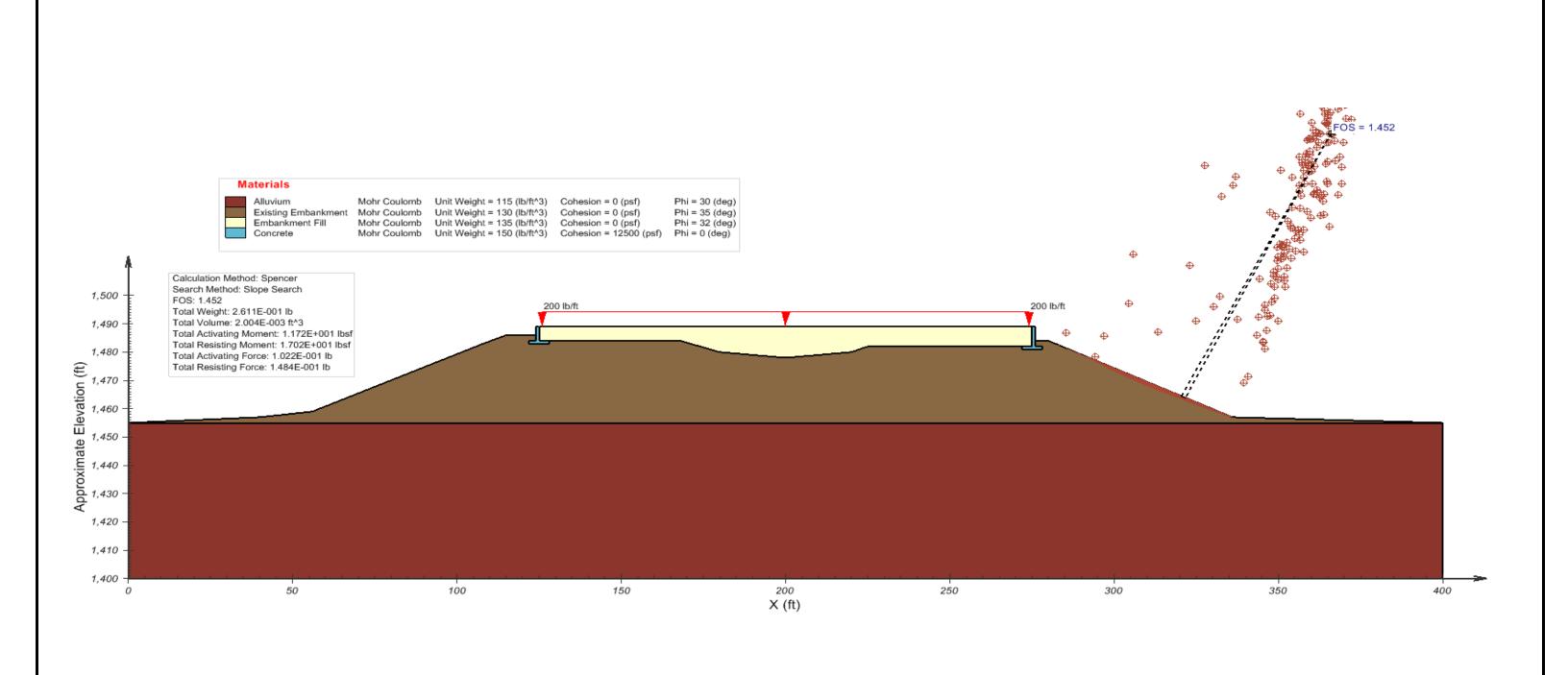
Ninyo	Moore	END OF CONSTRUCTION, STATION 2793+98, RIGHT FACE	FIGURE
PROJECT NO:	DATE:	I-10: EARLEY ROAD TO JUNCTION I-8	7 8B
601808009	9/15	PINAL COUNTY, ARIZONA	



Ninyo	Moore	END OF CONSTRUCTION, STATION 2801+50, LEFT FACE
PROJECT NO:	DATE:	I-10: EARLEY ROAD TO JUNCTION I-8
601808009	9/15	PINAL COUNTY, ARIZONA

FIGURE

9A



Ninyo	Moore	END OF CONSTRUCTION, STATION 2801+50, RIGHT FACE	FIGURE
PROJECT NO:	DATE:	I-10: EARLEY ROAD TO JUNCTION I-8	9B
601808009	9/15	PINAL COUNTY, ARIZONA	

#### APPENDIX A

### **BORING LOGS**

## Field Procedure for the Collection of Disturbed Samples

Disturbed soil samples were obtained in the field using the following methods.

## **Bulk Samples**

Bulk samples of representative earth materials were obtained from the exploratory borings. The samples were bagged and transported to the laboratory for testing.

# The Standard Penetration Test (SPT) Sampler

Disturbed drive samples of earth materials were obtained by means of a Standard Penetration Test sampler. The sampler is composed of a split barrel with an external diameter of 2 inches and an unlined internal diameter of 1-3/8 inches. The sampler was driven into the ground 12 to 18 inches with a 140-pound hammer falling freely from a height of 30 inches in general accordance with ASTM D 1586. The blow counts were recorded for every 6 inches of penetration; the blow counts reported on the logs are those for the last 12 inches of penetration. Soil samples were observed and removed from the sampler, bagged, sealed and transported to the laboratory for testing.

### Field Procedure for the Collection of Relatively Undisturbed Samples

Relatively undisturbed soil samples were obtained in the field using the following methods.

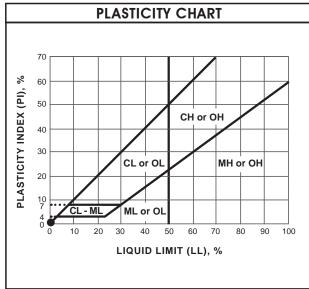
### **The Modified Split-Barrel Drive Sampler**

The sampler, with an external diameter of 3.0 inches, was lined with 1-inch long, thin brass rings with inside diameters of approximately 2.4 inches. The sample barrel was driven into the ground with the weight of a hammer or the Kelly bar of the drill rig in general accordance with ASTM D 3550. The driving weight was permitted to fall freely. The approximate length of the fall, the weight of the hammer or bar, and the number of blows per foot of driving are presented on the boring logs as an index to the relative resistance of the materials sampled. The samples were removed from the sample barrel in the brass rings, sealed, and transported to the laboratory for testing.



	SOIL CLASSIFICATION			CHART PER ASTM D 2488		
DD	IMARY DIVIS	SIONS		SECONDARY DIVISIONS		
PK	IMARI DIVISIONS		GRO	OUP SYMBOL	GROUP NAME	
		CLEAN GRAVEL		GW	well-graded GRAVEL	
		less than 5% fines	•	GP	poorly graded GRAVEL	
	GRAVEL			GW-GM	well-graded GRAVEL with silt	
	more than 50% of	GRAVEL with DUAL		GP-GM	poorly graded GRAVEL with silt	
	coarse	CLASSIFICATIONS 5% to 12% fines		GW-GC	well-graded GRAVEL with clay	
	retained on			GP-GC	poorly graded GRAVEL with clay	
	No. 4 sieve	GRAVEL with		GM	silty GRAVEL	
COARSE- GRAINED		FINES more than		GC	clayey GRAVEL	
SOILS more than		12% fines		GC-GM	silty, clayey GRAVEL	
50% retained		CLEAN SAND		SW	well-graded SAND	
on No. 200 sieve	SAND 50% or more of coarse fraction	less than 5% fines		SP	poorly graded SAND	
				SW-SM	well-graded SAND with silt	
		SAND with DUAL		SP-SM	poorly graded SAND with silt	
		CLASSIFICATIONS 5% to 12% fines		SW-SC	well-graded SAND with clay	
	passes No. 4 sieve			SP-SC	poorly graded SAND with clay	
		SAND with FINES		SM	silty SAND	
		more than 12% fines		SC	clayey SAND	
		12 % IIIIeS		SC-SM	silty, clayey SAND	
				CL	lean CLAY	
	SILT and	INORGANIC		ML	SILT	
	CLAY liquid limit			CL-ML	silty CLAY	
FINE-	less than 50%	ORGANIC		OL (PI > 4)	organic CLAY	
GRAINED SOILS		ONGAINIC		OL (PI < 4)	organic SILT	
50% or more passes		INORGANIC		СН	fat CLAY	
No. 200 sieve	SILT and CLAY	INONGAINIO		MH	elastic SILT	
	liquid limit 50% or more	ORGANIC		OH (plots on or above "A"-line)	organic CLAY	
		ONGAINIC		OH (plots below "A"-line)	organic SILT	
	Highly (	Organic Soils		PT	Peat	

		GRAI	N SIZE	
DESCRIPTION		SIEVE SIZE	GRAIN SIZE	APPROXIMATE SIZE
Вои	ılders	> 12"	> 12"	Larger than basketball-sized
Col	obles	3 - 12"	3 - 12"	Fist-sized to basketball-sized
Gravel	Coarse	3/4 - 3"	3/4 - 3"	Thumb-sized to fist-sized
Gravei	Fine	#4 - 3/4"	0.19 - 0.75"	Pea-sized to thumb-sized
	Coarse	#10 - #4	0.079 - 0.19"	Rock-salt-sized to pea-sized
Sand	Medium	#40 - #10	0.017 - 0.079"	Sugar-sized to rock-salt-sized
	Fine	#200 - #40	0.0029 - 0.017"	Flour-sized to sugar-sized
Fi	nes	Passing #200	< 0.0029"	Flour-sized and smaller



APPA	RENT DEN	ISITY - COAR	SE-GRAIN	ED SOIL
	SPOOLING CA	ABLE OR CATHEAD	AUTOMATI	C TRIP HAMMER
APPARENT DENSITY	SPT (blows/foot)	MODIFIED SPLIT BARREL (blows/foot)	SPT (blows/foot)	MODIFIED SPLIT BARREL (blows/foot)
Very Loose	≤ 4	≤ 8	≤ 3	≤ 5
Loose	5 - 10	9 - 21	4 - 7	6 - 14
Medium Dense	11 - 30	22 - 63	8 - 20	15 - 42
Dense	31 - 50	64 - 105	21 - 33	43 - 70
Very Dense	> 50	> 105	> 33	> 70

(	CONSISTENCY - FINE-GRAINED SOIL					
	SPOOLING CA	ABLE OR CATHEAD	AUTOMATI	C TRIP HAMMER		
CONSIS- TENCY	SPT (blows/foot)	MODIFIED SPLIT BARREL (blows/foot)	SPT (blows/foot)	MODIFIED SPLIT BARREL (blows/foot)		
Very Soft	< 2	< 3	< 1	< 2		
Soft	2 - 4	3 - 5	1 - 3	2 - 3		
Firm	5 - 8	6 - 10	4 - 5	4 - 6		
Stiff	9 - 15	11 - 20	6 - 10	7 - 13		
Very Stiff	16 - 30	21 - 39	11 - 20	14 - 26		
Hard	> 30	> 39	> 20	> 26		



USCS METHOD OF SOIL CLASSIFICATION	SOIL CLASSIFICATION	OD OF	USCS ME
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**Explanation of USCS Method of Soil Classification** 

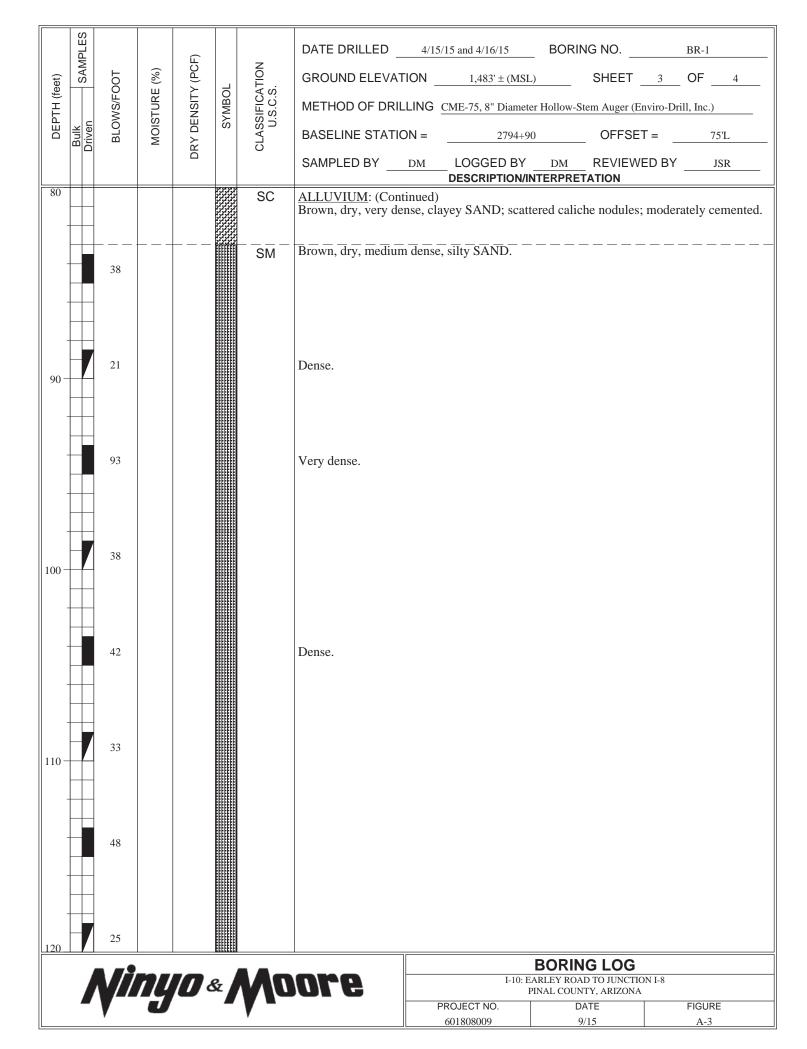
PROJECT NO. DATE FIGURE

DEPTH (feet)  Bulk SAMPLES  Driven SAMPLES	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.		RING LOG EX	PLANATION :	SHEET
0		DR		SM CL	Bulk sample.  Modified split-barrel No recovery with mod Sample retained by of Standard Penetration No recovery with a Si Shelby tube sample. I No recovery with She Continuous Push Sam Seepage. Groundwater encount Groundwater measure  MAJOR MATERIAL Solid line denotes uni Dashed line denotes r Attitudes: Strike/Dip b: Bedding	dified split-barrel dri thers.  Test (SPT).  PT.  Distance pushed in in elby tube sampler.  apple.  tered during drilling.  tered after drilling.		e recovered in inches.
20	<i>ny</i>	10 à	& <b>/</b>	Na	b: Bedding c: Contact j: Joint f: Fracture F: Fault cs: Clay Seam s: Shear bss: Basal Slide Surfa sf: Shear Fracture sz: Shear Zone sbs: Shear Bedding St  The total depth line is	urface	BORING LOC Explanation of Boring Log Sy DATE	G

	ES									505000		
	SAMPLES			CF)		Z	DATE DRILLED _				0	
(feet)	S/S	-001	%) J		ОГ	SATIC S.	GROUND ELEVAT	ION _	1,483' ± (MSL)	SH	EET1	OF4
DEPTH (feet)		BLOWS/FOOT	MOISTURE (%)	IS N	SYMBOL	SIFIC J.S.C	METHOD OF DRIL	LING	CME-75, 8" Diameter I	Hollow-Stem Au	ıger (Enviro-Dr	ill, Inc.)
믬	Bulk	BLC	MOM	DRY DENSITY (PCF)	0)	CLASSIFICATION U.S.C.S.	BASELINE STATIO	N =	2794+90	O	FFSET = _	75'L
							SAMPLED BY	DM			VIEWED BY	JSR
0							ASPHALT CONCR	ETE: A	DESCRIPTION/INT		'N	
						SC	FILL: Brown, dry, clayey S					
							Blown, dry, clayey S	DAND.				
	Ш											
10-												
	Ш											
20 -												
30 -												
	H											
						SC	ALLUVIUM:	1 0	'A NID			
40_		21					Brown, dry, dense, c	rayey S		ODING:	00	
			7)/	m	e I	Mn	ore		I-10: EAR	LEY ROAD TO J	UNCTION I-8	
			$\mathcal{F}$		^	Ala		P	ROJECT NO.	AL COUNTY, AR DATE	LIZONA	FIGURE
		*				7			601808009	9/15		A-1

Œ.	SAMPLES		(%	PCF)		N O	DATE DRILLED		5 and 4/16/15	-	G NO	
DEPTH (feet)		S/FOC	URE (	SITY (	SYMBOL	FICATI .C.S.	METHOD OF DRIL					<u> </u>
DEPT	Driven	BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYN	CLASSIFICATION U.S.C.S.	BASELINE STATIC	_	2794+90		OFFSET =	75'L
	۵۵	ш	2	DRY		15		DM	LOGGED BY	DM	REVIEWED E	
40						SC	ALLUVIUM: (Cont. Brown, dry, dense, c	tinued)	DESCRIPTION/IN	HERPREI	ATION	
							,					
50	7	80/11"				SM	Brown, dry, very den	nse, silty	SAND; trace gr	ravel.		
		50/5"				 GP	Brown, dry, very der	nse, poo	rly graded GRA	VEL with	sand.	
60	7	32				GC	Brown, dry, dense, c	clayey G	RAVEL with sa	nd		
		55					Brown, dry, dense, c	clayey S.	AND. — — — —		. — — — — .	
70 —	7	81/11"					Very dense.					
		61					Dense; scattered cali	iche nod	ules.			
80	1	50					Very dense; moderat	itely cem	ented.			
		- #2								BORIN		
		$\mathbf{V}//$	IU		& <b>▲</b>	UN	ore				TO JUNCTION I-8 Y, ARIZONA	
						<b>—</b>		ll .	OJECT NO.	DA		FIGURE
		-				-		11 4	01808000	Ω/	1.7	A 2

9/15



	SAMPLES			(=			DATE DRILLED	4/15	/15 and 4/16/15	BORIN	IG NO		BR-1	
et)	SAN	T00	(%)	(PCF		NOIL .	GROUND ELEVATI	ION _	$1,483' \pm (MSL)$		SHEET	4	OF	4
DEPTH (feet)		BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	METHOD OF DRILI	LING	CME-75, 8" Diameter	Hollow-St	em Auger (E	nviro-Dı	rill, Inc.)	
DEP	Bulk Driven	BLO	MOIS	XY DE	S	SLASS U	BASELINE STATIO	N =	2794+90		OFFSE	T = _	7	75'L
				<u> </u>			SAMPLED BY	DM	LOGGED BY	DM	REVIEW	ED BY		JSR
120							Total Depth = 120 fe	et.	DESCRIPTION/INT	ERPREI	ATION			
							Groundwater not end Backfilled, grouted to drilling.	counter		ched on 4	1/16/15 sho	ortly aft	ter com	pletion of
							Notes: Groundwater, though due to seasonal varia report.							
130 -							The ground elevation of published maps ar not sufficiently accur	nd othe	er documents review	ved for tl	he purpose	s of thi	s evalu	ation. It is
140 -														
	+													
150 -	H													
	$\parallel$													
	$\mathbb{H}$													
160							11				0100			
		Vi	77.	m	e I	Mn	ore		I-10: EAF	RLEY ROAI	G LOG			
			4					F	PROJECT NO.		ΓY, ARIZONA ΛΤΕ		FIGUR	RE

9/15

	SE						DATE DOULED DOUBLE DOUB
	SAMPLES	Ŀ	(%	PCF)		N O	DATE DRILLED $4/20/15$ BORING NO. BR-2 GROUND ELEVATION 1,456' $\pm$ (MSL) SHEET 1 OF 4
DEPTH (feet)	0	BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	BOL	CLASSIFICATION U.S.C.S.	
EPTF	≚ u	-OWS	DISTL	DENS	SYMBOL	SSIF U.S.U	METHOD OF DRILLING CME-75, 8" Diameter Hollow-Stem Auger (Enviro-Drill, Inc.)
	Bulk Driven	BI	M	DRY		CLA	BASELINE STATION = 2796+00 OFFSET = 55'L
							SAMPLED BY DM LOGGED BY DM REVIEWED BY JSR  DESCRIPTION/INTERPRETATION
0						SM	ASPHALT CONCRETE: Approximately 6 inches thick.  AGGREGATE BASE: Approximately 3 inches thick.
		27					ALLUVIUM: Brown, dry, dense, silty SAND; few gravel.
		35					Medium dense.
						SC	Brown, dry, very dense, clayey SAND; scattered caliche nodules.
	H	36					
		26					Description
10 -		36					Dense.
	Ш						
							Brown, dry, dense, silty SAND; trace gravel.
		32				Olvi	
	$\blacksquare$						
						SW-SM	Brown, dry, very dense, well graded SAND with silt; trace gravel.
		39	3.0	110.8			
20 -		5,		110.0			
							Brown, moist, very dense, silty SAND.
-		44					
	+						
			L				<u></u>
		50				CL	Brown, moist, hard, sandy lean CLAY.
30 -							
							Brown, dry, very dense, clayey SAND; few gravel.
							Brown, dry, very dense, clayey SAND; few gravel.
		42					Brown, dry, very dense, clayey SAND; few gravel.
	7	42					
	- <b>7</b>	42 42  73				SC SC	Brown, dry, very dense, clayey SAND; few gravel.  Brown, dry, very dense, poorly graded SAND; few gravel.
40	7	73				 SP	Brown, dry, very dense, poorly graded SAND; few gravel.
40	7	73	714	<b>10</b> &	&	 SP	Brown, dry, very dense, poorly graded SAND; few gravel.

LES						DATE DRILLED		1/20/15	BORING NO.	BR-2
et) SAMPLES		(%)	(PCF)		NOI	GROUND ELEVAT				
DEPTH (feet)	BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	METHOD OF DRIL				
DEP1	BLOM	MOIST	Y DEN	SY	LASSI U.S	BASELINE STATIC	N = _	2796+00	OFFSE	Γ =55'L
			DR		0	SAMPLED BY		LOGGED BY	DM REVIEWE	ED BYJSR
40					SP	ALLUVIUM: (Cont		DESCRIPTION/INT	ERPRETATION	
					01	Brown, dry, very der	nse, poor	ly graded SAND;	few gravel.	
				////		Brown, moist, very	dense, cla	ayey SAND; scatt	ered caliche nodule	es.
	50/5"									
50	<u> </u>					Dense. Brown, moist, dense	$\overline{s}$ , $\overline{siltv}$ $\overline{SA}$	ND.		
						, ,	, ,			
	24									
					 SP	Brown, dry, very der		ly graded SAND		- – – – – – – –
60	80/11"				52	Drown, dry, very der	nse, poor	ly gladed SAIVD.		
	_									
	31				SC	Brown, moist, dense cemented.	e, clayey	SAND; scattered	caliche nodules; we	eakly to moderately
					 SP	Brown, moist, dense	noorly	graded SAND: tre		
70	62				5P	Brown, moist, dense	, poorry	graded SAND, ira	acc graver.	
	<u> </u>					Brown, moist, medic		silty SAND	- — — — — —	
	18				SM	Diown, moist, moult	ani dense	, only DAND.		
				7,7,7,2		Brown, moist, mediu	dense	clavey SAND:	cattered caliche no	
80	33				30	Diown, moist, moult				
	A #2	<b>5</b> 0 -			44-				ORING LOG	
	$\Lambda / I / I$	ιŲ		&	$M_{II}$	ore			LEY ROAD TO JUNCTIO AL COUNTY, ARIZONA	N I-8
	<b>V</b>	U			<b>V</b> -			OJECT NO. 01808009	DATE 9/15	FIGURE A-6

	S													
	SAMPLES			(F)		z	DATE DRILLED _	4	4/20/15	BORIN	NG NO		BR-2	
feet)	SA	T00.	E (%)	.Y (P(	7	ATIO S.	GROUND ELEVAT	TION	1,456' ± (MSL)		SHEET	3	OF _	4
DEPTH (feet)		BLOWS/FOOT	MOISTURE (%)	INSI	SYMBOL	SIFIC	METHOD OF DRIL	LING C	ME-75, 8" Diameter l	Hollow-S	tem Auger (Ei	nviro-Di	rill, Inc.)	
DEF	Bulk Driven	BLO	MOIS	DRY DENSITY (PCF)	S	CLASSIFICATION U.S.C.S.	BASELINE STATIO	= NC	2796+00		OFFSET	Γ= _	55	5'L
							SAMPLED BY		LOGGED BY	DM	_	ED BY	J	SR
80					7777	SC	ALLUVIUM: (Cont	tinued)						
							Brown, moist, medi	um dense	e, clayey SAND; s	scattered	l caliche no	dules.		
	7	18				SM	Brown, moist, medi	um dense	s, silty SAND.					
90 -		48				SC	Brown, moist, dense cemented.			vel; scat	tered calich	e nodu	īles; wez	ıkly —
	7	26				SM	Brown, moist, dense							
100 -		50/4"				SC	Brown, moist, very	dense, cla	ayey SAND; scatt	tered cal	iche nodule	es; wea	kly cem	nented.
		30				CL	Brown, moist, hard,	sandy le	an CLAY.					
110 -		87/10"				SM	Brown, moist, very	dense, sil	ty SAND.					
		69 50/5"												
120_							Total Depth = 119.4	feet.						
			<b>F</b> 0 <b>F</b>		0	440	OMO				G LOG	N J-8		
		<b>Y</b> //	44		X.	$M_{II}$	ore		PIN	IAL COUN	TY, ARIZONA	I	FIOUR	_
		<b>V</b>	J			▼			OJECT NO. 01808009		ATE /15		FIGURE A-7	=

	SAMPLES			(:			DATE DRILLED _		4/20/15	BORIN	IG NO		BR-2	
eet)	SAM	TOC	(%)	DRY DENSITY (PCF)		CLASSIFICATION U.S.C.S.	GROUND ELEVAT	TION _	1,456' ± (MSL	)	SHEET	4	OF _	4
DEPTH (feet)		BLOWS/FOOT	MOISTURE (%)	TISN	SYMBOL	SIFICA	METHOD OF DRII	LLING	CME-75, 8" Diamete	r Hollow-St	em Auger (E	nviro-Dı	rill, Inc.)	
DEF	Bulk Driven	BLO	MOIS	RY DE	Ś	CLAS!	BASELINE STATION	= NC	2796+00	)	OFFSE	T = _	5	55'L
				□			SAMPLED BY	DM	LOGGED BY	DM	REVIEW	ED BY	J	JSR
130 - 140 -				Δ			Groundwater not en Backfilled and asph  Notes: Groundwater, thoug due to seasonal vari report.  The ground elevation of published maps a not sufficiently accurately	acounter alt patch gh not er ations in	DESCRIPTION/IN ed during drilling hed on 4/20/15 sh accountered at the a precipitation an above is an estir r documents revie	TERPRET  . ortly after  time of dr d several of mation on ewed for the	r completic rilling, may other factor ly. It is bas he purpose	on of dr y rise to rs as dis	rilling.  o a high scussed our inters evalue.	ner level I in the erpretations ation. It is
160_						<u> </u>				BORIN	G LOG			
		V		0	&	DN	ore		I-10: E	ARLEY ROAI	D TO JUNCTION TY, ARIZONA			
				,		_		Р	ROJECT NO.	DA	ATE		FIGUR	E

9/15

	ES						
	SAMPLES	<b>—</b>	(9)	CF)		N O	DATE DRILLED 2/05/15 BORING NO. BR-3
DEPTH (feet)	S	BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	BOL	CLASSIFICATION U.S.C.S.	GROUND ELEVATION1,455' ± (MSL)
EPTH	lk en	-ows	DISTU	DENS	SYMBOL	SSIFI U.S.(	METHOD OF DRILLING CME-75, 8" Diameter Hollow-Stem Auger (Enviro-Drill, Inc.)
	Bulk	BI	M	DRY		CLA	BASELINE STATION = 2797+50 OFFSET = 40'L
							SAMPLED BY DM LOGGED BY DM REVIEWED BY JSR  DESCRIPTION/INTERPRETATION
0	L	51	6.3	104.7		CL	ALLUVIUM: Brown, dry, hard, sandy lean CLAY; trace gravel.
-		31	0.5	104.7			
-		38					
						SC	Brown, dry, very dense, clayey SAND.
		90/11"					
	-7	20					Light brown; medium dense; scattered caliche nodules.
10							
+							
		— — — · 77				SM	Light brown, dry, very dense, silty SAND; scattered caliche nodules; weakly cemented.
		,,					
20 —		27					Dense.
+		44					Few gravel.
		·					Brown, dry, very dense, clayey SAND; scattered caliche nodules.
30		50/3"				55	
		·					Brown, dry, very dense, silty SAND; few gravel.
+		59				SM	brown, dry, very dense, smy SAND; few graver.
		50/5"				SC	Brown, dry, very dense, clayey SAND; scattered caliche nodules; weakly to moderately cemented.
40		<b>.</b>					BORING LOG
		$\sqrt{I}$	H'	D	&	Na	I-10: EARLEY ROAD TO JUNCTION I-8 PINAL COUNTY, ARIZONA PROJECT NO. DATE FIGURE
			U			_	PROJECT NO. DATE FIGURE 601808009 9/15 A-9

		Ι								
et)	<u> </u>		(-			DATE DRILLED _	2/05/15	BORIN	NG NO	BR-3
et)	T 0	(%)	(PCF		NOIT .	GROUND ELEVAT	ION1,455' ± (	MSL)	SHEET _	2 OF4
H (fe	/S/FC	'URE	JSITY	SYMBOL	FICA S.C.S	METHOD OF DRIL	LING CME-75, 8" Dia	meter Hollow-St	tem Auger (Env	iro-Drill, Inc.)
DEPTH (feet)	iven C	MOISTURE (%)	DRY DENSITY (PCF)	S	CLASSIFICATION U.S.C.S.	BASELINE STATION	DN = 279	97+50	OFFSET	= 40'L
		2	DRY		ט כ		DM LOGGED		-	
40				5555			DESCRIPTION	N/INTERPRET		
40	50/5"				SC	ALLUVIUM: (Cont Brown, dry, very de cemented.	inued) nse, clayey SAND; s	scattered calic	he nodules; v	weakly to moderately
50	23				 SM	Brown, moist, dense	, silty SAND.			
60	63/10"					Very dense.				
	94/11"					Few gravel.				
70	29					Dense.				
	50/5"					Very dense.				
	<u> </u>					Brown, moist, dense	, silty SAND; scatte	red caliche no	dules.	
80	24						· ·			
	A #2	<b>56</b> -		_		<b>0 C C C C C C C C C C</b>			G LOG	
	M	ľĽ		&	$N_{II}$	ore		10: EARLEY ROA PINAL COUN	D TO JUNCTION TY, ARIZONA	
<b>"</b>	<b>T</b>	U			<b>V</b> -		PROJECT NO. 601808009		ATE /15	FIGURE
							001909003		/13	A-10

st) SAMPLES			<u> </u>			DATE DRILLED		2/05/15	BORIN	G NO.	BR-3
set)	DOT	(%)	DRY DENSITY (PCF)		CLASSIFICATION U.S.C.S.	GROUND ELEVATION	ON _	$1,455'\pm(MSL)$		SHEET3_	OF4
DEPTH (feet)	BLOWS/FOOT	MOISTURE (%)	NSIT	SYMBOL	SIFICA S.C.S	METHOD OF DRILL	ING C	ME-75, 8" Diameter I	Hollow-Ste	em Auger (Enviro-Dr	ill, Inc.)
DEP Bulk Driven	BLO\	MOIS	RY DE	S	SLASS U.	BASELINE STATION	N =	2797+50		OFFSET = _	40'L
			PO		0	SAMPLED BY	DM	LOGGED BY	DM ERPRET	REVIEWED BY ATION	JSR
80					SM	ALLUVIUM: (Conting Brown, moist, dense,	nued) silty SA	AND; scattered ca	liche noc	lules.	
	93/9"					Very dense.					
90	55										
00	57 27					Dense.					
	91/11"					Very dense; trace grav	vel; mo	derately to strong	ly cemen	ited.	
10	67/11"										
	50/5"					Dense.					
20									ORIN	G LOG	
	VM	$\eta \eta$	17 8	<b>₽</b>	Mn	ore		I-10: EAR	LEY ROAD	TO JUNCTION I-8 Y, ARIZONA	

77.73

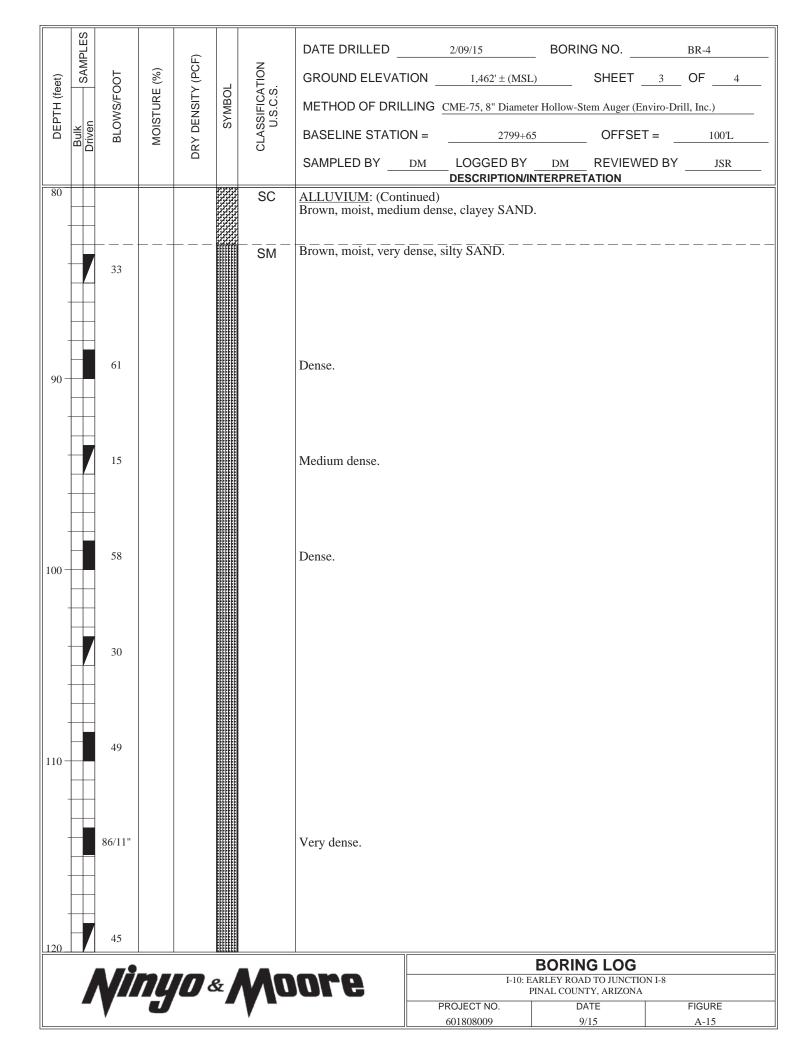
I-10: EARLEY ROAD TO JUNCTION I-8 PINAL COUNTY, ARIZONA									
PROJECT NO.	PROJECT NO. DATE FIGURE								
601808009	601808009 9/15 A-11								

	SAMPLES			(:			DATE DRILLED	2	/05/15	BORING NO.		BR-3	
eet)	SAM		(%)	DRY DENSITY (PCF)		NOI .	GROUND ELEVAT	ION	1,455' ± (MSL)	SHEE	T4_	OF	4
DEPTH (feet)		Ilven   BLOWS/FOOT	MOISTURE (%)	NSIT	SYMBOL	CLASSIFICATION U.S.C.S.	METHOD OF DRIL	LING CM	IE-75, 8" Diameter I	Hollow-Stem Auge	er (Enviro-D	rill, Inc.)	
DEP	Balk.	BLO	MOIS	Y DE	S	SLASS U	BASELINE STATIC	)N = _	2797+50	OFF	SET =	40'L	4
				A P			SAMPLED BY		LOGGED BY		EWED BY	JSR	<u> </u>
120	H				+		Total depth = 120 fe		ESCRIPTION/INT	ERPRETATION			
	H						Groundwater not end		during drilling.				
-		-					Backfilled on 2/05/1			of drilling.			
	Ħ						Notes: Groundwater	though i	not encountered a	at the time of dr	illing, may	rise to a	higher
-							level due to seasonal						
							the report.						
							The ground elevation	n shown a	above is an estim	ation only. It is	based on	our interpi	retations
	Ш						of published maps ar						on. It is
	Н						not sufficiently accu	rate for p	reparing construc	ction bids and d	esign doci	iments.	
130 -	H	_											
	Н												
-	H												
	+												
-	H												
	П												
-													
140 -	Ш												
	Н												
		-											
	Н												
-		-											
	H												
-	H	1											
	П												
150 -													
130	Ц												
	Ш												
	Н												
-		-											
	$\forall$	$\dashv$											
	+	+											
	$\forall$	+											
-	$\forall$	+											
160	$\parallel$	1											
			•	1					В	ORING LO	G		
		M			&	IM	ore		I-10: EAR	LEY ROAD TO JUN AL COUNTY, ARIZ	CTION I-8		
	4	<b>, ,</b> ,	7	7		A 7-		PRO	DJECT NO.	DATE		FIGURE	

9/15

	7						
	SAMPLES	<b>-</b>	(%)	CF)		N O	DATE DRILLED 2/09/15 BORING NO. BR-4
DEPTH (feet)	S	BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	GROUND ELEVATION 1,462' ± (MSL) SHEET 1 OF 4  METHOD OF DRILLING CME-75, 8" Diameter Hollow-Stem Auger (Enviro-Drill, Inc.)
DEPT!	Bulk	LOWS	OIST	DEN	SYM	ASSIF U.S.	BASELINE STATION = 2799+65 OFFSET = 100'L
	D i	Δ	Σ	DRY		S	SAMPLED BY DM LOGGED BY DM REVIEWED BY JSR
0					(7/7/)		DESCRIPTION/INTERPRETATION
-	7	13				SC	ALLUVIUM: Brown, dry, medium dense, clayey SAND; trace gravel.
		39					Very dense; scattered caliche filaments.
	-/ 	26		112.0			Dense; scattered caliche nodules.
10		94/11"	6.3	113.0			Very dense.
-	7	15				SM	Brown, dry, medium dense, silty SAND; few gravel.
20		41					
		52					Very dense.
30		90/12"					Brown, moist, very dense, clayey SAND; scattered caliche nodules.
-		84/11"				50	
40		70				SP	Brown, moist, dense, poorly graded SAND; few gravel.
40		<b>.</b> #9	<b>-</b>		<u>.</u>		BORING LOG
		$\mathcal{N}//$	1]/	1 8	<b>E</b>	DM	I-10: EARLEY ROAD TO JUNCTION I-8 PINAL COUNTY, ARIZONA PROJECT NO. DATE FIGURE
							PROJECT NO. DATE FIGURE

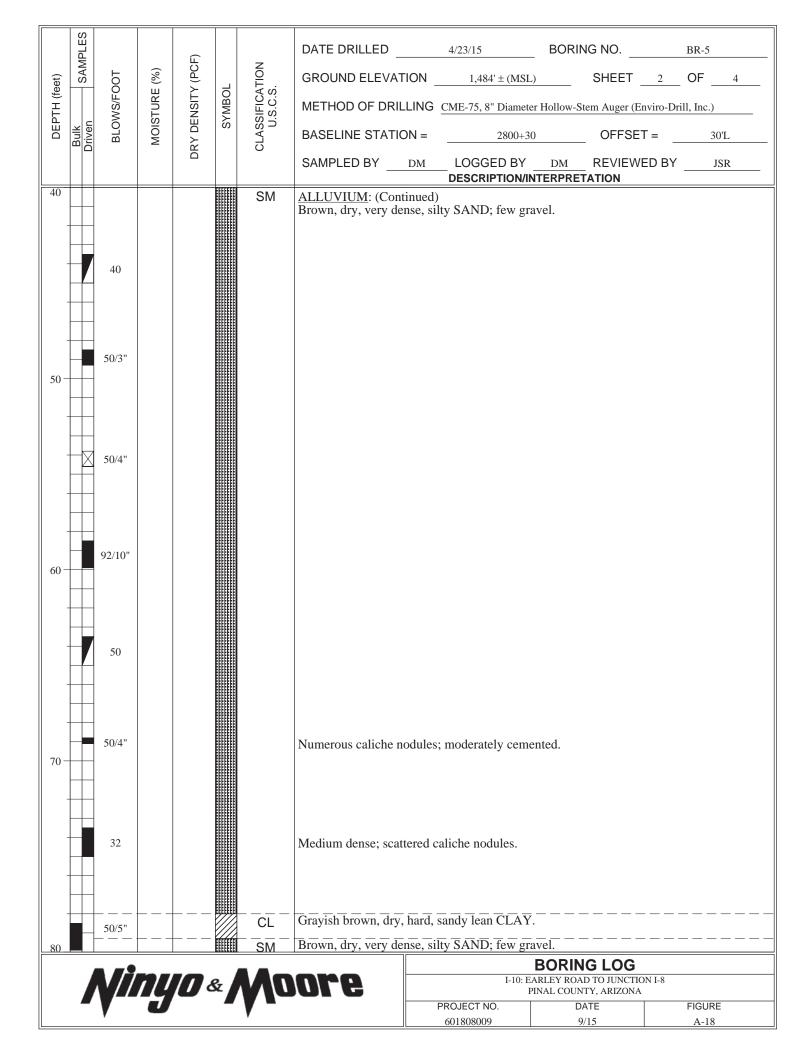
	S											
	SAMPLES			(F)		z	DATE DRILLED		2/09/15	BORING NO		BR-4
feet)	SA	T00:	E (%)	\ \ (P(	占	ATIO S.	GROUND ELEVAT	ION _	1,462' ± (MSL)	SHEET	2	OF4
DEPTH (feet)		BLOWS/FOOT	MOISTURE	LISN	SYMBOL	SIFIC	METHOD OF DRIL	LING o	CME-75, 8" Diameter l	Hollow-Stem Auger (E	nviro-Dril	l, Inc.)
DEI	Bulk	BLO	MOIS	DRY DENSITY (PCF)	S	CLASSIFICATION U.S.C.S.	BASELINE STATIC	DN =	2799+65	OFFSE	T =	100'L
							SAMPLED BY	DM	LOGGED BY	DM REVIEW	ED BY	JSR
40						SP	ALLUVIUM: (Conti	inued)				
							Brown, moist, dense	, poorly	graded SAND; fe	w gravel.		
		50/4"				sc	Brown, moist, very o	dense, c	layey SAND; scatt	ered caliche nodul	es.	- — — — — —
50-		39					Medium dense.					
							L					
	-7	18				SM	Brown, moist, mediu	ım dens	se, silty SAND.			
						SP	Light brown, dry, ve	ery dens	e, poorly graded S	ĀND.		
60 -		<u>69/11"</u>				SC -	Brown, moist, very o	dense, c	layey SAND; scatt	ered caliche nodul	es.	- — — — — —
					222	 SP	Brown, moist, very	dense, p	oorly graded SAN	D; trace gravel.		
		50/5"								-		
									=	,		
		50/5"				SM	Brown, moist, very o	dense, s	ilty SAND; few gr	avel.		
70 -												
		24					Dense.					
		·			22,22		Brown, moist, mediu	 ım dens	se, clayev SAND			
80_		36					,, 1110010					
		a #2				A A -				ORING LOG		
		<b>V//</b>	II'		&	$\mathbf{M}_{I}$	ore		PIN	LEY ROAD TO JUNCTION AL COUNTY, ARIZONA		
	_	<b>V</b>	U		_	<b>V</b> –			ROJECT NO.	DATE 9/15		FIGURE



	SAMPLES			(-			DATE DRILLED _		2/09/15	BORING NO.		BR-4	
eet)	SAM	DOT	(%) :	DRY DENSITY (PCF)	ب	CLASSIFICATION U.S.C.S.	GROUND ELEVAT	TION _	1,462' ± (MSL)	SHEE	T4_	_ OF _	4
DEPTH (feet)		BLOWS/FOOT	MOISTURE (%)	NSIT	SYMBOL	SIFIC/	METHOD OF DRII	LLING o	CME-75, 8" Diameter	Hollow-Stem Auge	(Enviro-D	orill, Inc.)	
DEF	Bulk Driven	BLO	MOIS	RY DE	S	CLAS	BASELINE STATION	ON =	2799+65	OFF	SET =	100	)'L
						_	SAMPLED BY	DM	LOGGED BY DESCRIPTION/IN		EWED BY	JS	SR
120	$\dagger$						Total depth = 120 fe						
							Groundwater not en Backfilled on 2/09/						
							Notes: Groundwate						
							level due to seasona the report.	al variati	ons in precipitatio	on and several oth	ier factors	s as discu	ssed in
							The ground elevation						
							of published maps a not sufficiently accu						tion. It is
130 -													
140 -													
150 -													
	$\vdash$												
160_		<b>.</b>				<b>.</b>				BORING LO	G		
		VI	íЦ		&	$N_{\mathcal{Q}}$	ore		PI	RLEY ROAD TO JUNG NAL COUNTY, ARIZO		F101:	
II .	_	$\blacksquare$			_	_		P	ROJECT NO.	DATE	1	FIGURE	

9/15

	LES						DATE DRILLED		4/23/15	BORIN	IG NO.		BR-5	
et)	SAMPLES	ОТ	(%)	DRY DENSITY (PCF)		NOI	GROUND ELEVA				SHEET			4
DEPTH (feet)		BLOWS/FOOT	MOISTURE (%)	YTISN	SYMBOL	IFICA <sup>-</sup> S.C.S.	METHOD OF DRII	_LING	CME-75, 8" Diameter	Hollow-St	em Auger (Er	viro-Dri	ill, Inc.)	
DEP.	Bulk Driven	BLOV	MOIS	Y DE	λS	CLASSIFICATION U.S.C.S.	BASELINE STATION	= NC	2800+30		OFFSET		30	0'L
				DR		0	SAMPLED BY	DM				D BY	J	SR
0						SC	FILL:		DESCRIPTION/INT	TERPRET	ATION			
							Brown, dry, clayey	SAND.						
10-														
20 -														
30 -														
	H													
						CN4	A I I I I I I I I I I I I I I I I I I I							
40_		90/9"				SM	ALLUVIUM: Brown, dry, very de	ense, silt	y SAND; few grav	vel.				
			56 J								G LOG	N I. Q		
		<b>Y</b> //	4		经	$M_{\Pi}$	ore	P		NAL COUN	ΓΥ, ARIZONA ΑΤΕ	14 1-0	FIGURI	E
		7				▼			601808009		15		A-17	



	_	1			_	1	T						
	SAMPLES			(-			DATE DRILLED _	4	./23/15	BORING N	O	BR-5	
et)	SAM	T00	(%)	(PCF		NOIL .	GROUND ELEVAT	ION	1,484' ± (MSL)	SH	EET3_	_ OF	4
DEPTH (feet)		BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	METHOD OF DRIL	LING CN	/IE-75, 8" Diameter l	Hollow-Stem A	uger (Enviro-D	rill, Inc.)	
DEF	Bulk Driven	BLO	MOIS	۲Y DE	S	SLASS	BASELINE STATIC	DN = _	2800+30	O	FFSET =	30'L	
				DF			SAMPLED BY		LOGGED BY DESCRIPTION/INT		VIEWED BY	JSR_	
80						SM	ALLUVIUM: (Cont		DESCRIPTION/INT	ERFRETATIO	/IN		
-						Sivi	Brown, dry, very der	nse, silty		el.			
-						CL	Brown, moist, hard,	sandy lea	$\overline{\text{CLAY}}$ .	_ — — — — –			
	$\perp 4$	33											
		50/5"											
		50/5"								_ —.— — — -			
90-						SP	Brown, moist, very o	dense, po	orly graded SAN	D; few grave	1.		
-													
	$\perp \! \! \perp$	59											
-													
		50/4"				SC	Brown, moist, very cemented.	dense, cla	yey SAND; scatt	tered caliche	nodules; mo	derately	
100 -							cemented.						
		40											
	$\perp \!\!\! \perp$	42											
							Brown, moist, hard,	sandy lea	n CLAY; trace g	gravel; scatter	ed caliche n	odules;	
							moderately cemented	d.	_				
		50/5"											
110 -													
-													
						SC	Brown, moist, very o	dense, cla	yey SAND.	_ — — — — –			
	$\square$	36											
		50/4"											
120					- W W W		Total Depth = 119.3	feet.					
					0. 1	AAn	oro			BORING L			
		<b>V</b> //	44		×	$M_{I_{I}}$	ore	DD/		AL COUNTY, AR		FIGURE	
		▼				▼			0JECT NO. 01808000	0/15		FIGURE Δ_10	

					=									
	SAMPLES			(-			DATE DRILLED _		4/23/15		BORING NO.		BR-5	
eet)	SAM		(%) :	DRY DENSITY (PCF)		CLASSIFICATION U.S.C.S.	GROUND ELEVAT	ION _	1,484' ± (	(MSL)	SHEE	ET4_	_ OF	4
DEPTH (feet)		BLOWS/FOOT	MOISTURE (%)	NSIT	SYMBOL	SIFICA .S.C.S	METHOD OF DRIL	LING	CME-75, 8" Dia	ameter F	Hollow-Stem Auge	er (Enviro-D	rill, Inc.	)
DEF	Bulk	BLO	MOIS	₹Y DE	Ś	CLAS!	BASELINE STATIO	ON =	280	00+30	OFF	SET =		30'L
						J	SAMPLED BY	DM	LOGGED		DM REVIERPRETATION	EWED BY	′	JSR
120							Groundwater not end Backfilled on 4/23/1		red during dri	illing.				
-								3 81101	try arter comp	netion	of drining.			
-							Notes: Groundwater, thoug							
							due to seasonal varia	ations i	n precipitatio	n and s	several other ta	ctors as d	ıscusse	d in the
							The ground elevatio							
-							of published maps a not sufficiently accu							
130 -														
-														
140 -														
-														
-														
150 -	$\parallel$													
-														
	$\vdash$													
-														
	$\parallel$													
-														
160														
				in i	. 1	Ma	nro		Į.		ORING LO			
		7//	74		Z	$\mathbf{M}_{\mathbf{n}}$	ore		PROJECT NO.		AL COUNTY, ARIZ DATE		FIGU	RE

9/15

	LES						DATE DRILLED	4/11	/15 and 4/12/15	BORIN	NG NO.		BR-6	
Đ.	SAMPLES	<u></u>	(%)	DRY DENSITY (PCF)		NO NO	GROUND ELEVAT							
H (fee		S/FO(	URE (	SITY	SYMBOL	FICAT .C.S.	METHOD OF DRIL							
DEPTH (feet)	Bulk Driven	BLOWS/FOOT	MOISTURE (%)	DEN	SYN	CLASSIFICATION U.S.C.S.	BASELINE STATIO				OFFSE <sup>-</sup>		75'1	 R
	B	ш	2	DRY		ਹ 	SAMPLED BY				_			
0							ASPHALT CONCR		DESCRIPTION/INT	ERPRE	TATION			
						SC	FILL:	<u>EIE</u> . 1	Approximately 8 mg	ches unc	JK.			
							Brown, dry, clayey	SAND.						
10-														
20-														
30-														
	Ш													
						SM	ALLUVIUM:							
40_		61					Brown, dry, very de	nse, sil						
			<b>72</b>		0_ /	440	nro		I-10: EAR	BORIN RLEY ROA	G LOG	N I-8		
		<b>Y</b> //	14		×	$\mathbf{M}_{\mathbf{I}_{\mathbf{I}}}$	ore	F		IAL COUN	TY, ARIZONA ATE		FIGURE	
		*				7			601808009	9	/15		A-21	

	SAMPLES			<u> </u>			DATE DRILLED	4/11/15 and 4/12/15	BORIN	IG NO	BR-6
eet)	SAM	T0C	(%)	DRY DENSITY (PCF)	ب	CLASSIFICATION U.S.C.S.	GROUND ELEVATION	ON1,481' ± (MS	SL)	SHEET 2	OF4
DEPTH (feet)		BLOWS/FOOT	MOISTURE (%)	NSIT	SYMBOL	SIFICA S.C.S	METHOD OF DRILL	ING CME-75, 8" Diame	eter Hollow-St	em Auger (Enviro-	Drill, Inc.)
DEF	Bulk	BLO	MOIS	XY DE	S	SLASS U	BASELINE STATION	N = 2793+	90	OFFSET =	75'R
				<u>P</u>		0	SAMPLED BYI	LOGGED BY			YJSR
40						SM	ALLUVIUM: (Conting Brown, dry, very dens	nued) se, silty SAND			
-		78					Trace gravel.				
50 -		50/5"									
		51					Brown, moist, very de	ense, clayey SAND; s	cattered cal	iche nodules.	
60 -		79/11"									
		77/11"				SM	Brown, moist, very de	ense, silty SAND.			
70 -	7	26				SC	Brown, moist, dense,	clayey SAND.			
		37					Medium dense.				
80_	1	40					Very dense.				
80_		a #3	<b>56</b> -		<u>rxxx</u>				BORIN		
		$\sqrt{//}$			۶.	$N_{\mathcal{Q}}$	ore		PINAL COUN		
		<b>V</b>	U			<b>V</b> -		PROJECT NO. 601808009		ATE /15	FIGURE A-22

	I					T .			
et) SAMPLES			(E			DATE DRILLED _	4/11/15 and 4/12/15	BORING NO.	BR-6
set)	TOC	(%)	/ (PCI		NOIL .	GROUND ELEVAT	1,481' ± (MSL)	SHEET	3 OF 4
DEPTH (feet)	BLOWS/FOOT	MOISTURE (%)	NSIT	SYMBOL	S.C.S	METHOD OF DRIL	LING CME-75, 8" Diameter	Hollow-Stem Auger (En	nviro-Drill, Inc.)
DEP: Bulk Driven	BLO	MOIS	DRY DENSITY (PCF)	S	CLASSIFICATION U.S.C.S.	BASELINE STATIO	ON = 2793+90	OFFSE	Γ = 75'R
			DR		O	SAMPLED BY	DM LOGGED BY		ED BY
80					SC	ALLUVIUM: (Cont	DESCRIPTION/INT		
	-					Brown, moist, very	dense, clayey SAND; scat	tered caliche nodule	es.
	-								
	21					Medium dense.			
	_								
	20								
90									
	_								
	25								
	23								
100	24					Dense.			
	_								
_	32					Medium dense.			
	20				CL	Brown, moist, very	stiff, sandy lean CLAY.		
110									
	-								
	56					Hard.			
120	33				SM	Brown, moist, very	dense, silty SAND.		
				,	Ma	nro		BORING LOG	DN I-8
	7/	4		Ý.	$\mathbf{M}_{II}$	<b>970</b>		NAL COUNTY, ARIZONA  DATE	FIGURE
	<b>Y</b>				<b>V</b>		601808009	9/15	A-23

	SAMPLES			F)			DATE DRILLED	4/11/15 and 4/12/15	BOI	RING NO.		BR-6	
eet)	SAN	TOC	(%)	r (PC	ب	TION .:	GROUND ELEVATIO	N1,481' ± (1	MSL)	SHEET _	4	OF _	4
DEPTH (feet)		BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	METHOD OF DRILLI	NG <u>CME-75, 8" Dia</u>	meter Hollov	w-Stem Auger (En	viro-Dr	ill, Inc.)	
DEF	Bulk Driven	BLO	MOIS	KY DE	Ś	) LASS	BASELINE STATION	= 279	3+90	OFFSET		75	'R
				A P			SAMPLED BYD	M LOGGED I			D BY	J	SR
120							Total Depth = 120 feet	DESCRIPTIO	N/IN I ERPI	RETATION			
							Groundwater not encor Backfilled on 4/12/15			rilling.			
							Notes:	morthy urter comp	otion of di				
							Groundwater, though r						
							due to seasonal variation report.	ons in precipitation	and sever	ral other factors	s as dis	scussed	in the
							The ground elevation s	shown above is an	estimation	only. It is base	ed on c	our inter	pretations
							of published maps and not sufficiently accurate	other documents	eviewed for	or the purposes	of this	s evalua	
130 -							not sufficiently accura-	e for preparing co	iistruction	olds and design	ii docu	mems.	
140 -													
150 -													
	++												
160						<b>.</b> .			BOR	ING LOG			
			n!		&	DM	ore	I-	0: EARLEY R	ROAD TO JUNCTIO	N I-8		
		V		,		_		PROJECT NO.		DATE		FIGURE	

9/15

et) SAMPLES			(			DATE DRILLED	4/21/15	BORING NO.	BR-7
set) SAM	TOC	(%)	, (PCF		NOI .	GROUND ELEVATION	1,456' ± (MSL)	SHEET	1OF4
DEPTH (feet)	BLOWS/FOOT	MOISTURE (%)	NSIT	SYMBOL	SIFICA S.C.S	METHOD OF DRILLIN	G CME-75, 8" Diameter	Hollow-Stem Auger (E	nviro-Drill, Inc.)
DEP. Bulk Driven	BLO	MOIS	DRY DENSITY (PCF)	Ś	CLASSIFICATION U.S.C.S.	BASELINE STATION =	2795+10	OFFSE	T = 50'R
						SAMPLED BYDM	LOGGED BY DESCRIPTION/IN		ED BYJSR
0						A CRIVALE CONCRETE			
				777	00	ASPHALT CONCRETE			
	26				SC	AGGREGATE BASE: A	Approximately 3 inch	es thick	
	-~					ALLUVIUM:			
	1					Brown, moist, medium of	dense, clayey SAND.		
	1 10								
	12								
	42								
	1								
	24					Dense; scattered caliche	nodules.		
10	1								
	_								
	-								
	<u> </u>		<u> </u>	////		Brown, dry, dense, silty	<u> </u>		
	<b>~</b> 0				SM	Brown, dry, dense, snry	SAND.		
	50								
	1								
	-								
	_								
	1								
20	23								
20									
	1								
+	1								
	-								
	<b>7</b> 0					W7'-41 1			
	58					With gravel.			
	1								
	1								
	-								
	25								
30									
	]								
	1								
	<u> </u>	<u> </u>	<u> </u>		SC -	Brown, moist, very dens	se, clayev SAND: trac	e gravel.	
	80/10"	20.7	103.9		30	, , , , , , , , , , , , , , , , , , , ,	,,,,,,,,,,,,,,	6 ··· · · ·	
	1								
	85					With gravel; scattered ca	aliche nodules.		
40			<u> </u>	1272	l			BORING LOG	
				0	AAc	ore	I-10: EA	RLEY ROAD TO JUNCTIO	ON I-8
	$\Gamma / I / I$	IL'		Ý.	$\nu \nu$		PI	NAL COUNTY, ARIZONA	
	<b>V</b>	U			<b>V</b> -		PROJECT NO.	DATE	FIGURE
II							601808009	9/15	A-25

SAMPLES			(i			DATE DRILLED _		4/21/15	BORIN	NG NO		BR-7	
set)	T00	(%)	, (PCI		NOI.	GROUND ELEVAT	ΓΙΟΝ _	$1,456' \pm (MSI)$	ـــ)	SHEET _	2	OF _	4
DEPTH (feet)	BLOWS/FOOT	rure	(SIT)	SYMBOL	IFICA S.C.S	METHOD OF DRIL	LING G	CME-75, 8" Diamete	er Hollow-S	tem Auger (En	viro-Dri	ll, Inc.)	
DEP. Bulk Driven	BLOV	MOISTURE (%)	DRY DENSITY (PCF)	SY	CLASSIFICATION U.S.C.S.	BASELINE STATIO	ON =	2795+1	0	OFFSET	·	50	)'R
			DR		O	SAMPLED BY	DM				D BY	J	SR
40					SC	ALLUVIUM: (Cont	tinued)	DESCRIPTION/II					
						Brown, moist, very	dense, c	layey SAND wi	th gravel;	scattered cal	liche no	dules.	
	50/3"												
	17					Medium dense.							
50													
	50/5"/					Vary dance							
	\/		_		SP	Very dense. Brown, moist, very	dense, p	oorly graded SA	ND; few	gravel.	- — —		- — — -
60	39												
	46				SC	Brown, moist, dense	e, clayey	SAND; scattere	ed caliche	nodules.			
70	36					Very dense; few gra	ivel.						
	30					Medium dense.							
	18												
80	•			KXXXI						G LOG			
	<b>V</b> //		D &	ž	Na	ore		1		D TO JUNCTION TY, ARIZONA	N I-8		
	<b>V</b>	U			<b>V</b> -		ll .	ROJECT NO. 601808009		ATE /15		FIGURE A-26	<b>I</b>

ις. Θ											
et) SAMPLES			(F)		Z	DATE DRILLED		4/21/15	BORING NO		BR-7
feet)	T00.	MOISTURE (%)	DRY DENSITY (PCF)	기	CLASSIFICATION U.S.C.S.	GROUND ELEVATI	ION _	1,456' ± (MSL)	SHEI	ET3	OF4
DEPTH (feet)	BLOWS/FOOT	STUR	INSI	SYMBOL	SIFIC	METHOD OF DRILL	LING C	ME-75, 8" Diameter I	Hollow-Stem Aug	er (Enviro-Dri	ll, Inc.)
DEF Bulk Driven	BLO	MOIS	۲Y D€	S	CLAS	BASELINE STATIO	N =	2795+10	OFF	FSET = _	50'R
			□		J	SAMPLED BY	DM	LOGGED BY		EWED BY	JSR
80					SC	ALLUVIUM: (Continuous) Brown, moist, mediu:	inued) im dense	e, clavev SAND.			
	40										
	40										
90 —	32					Brown, moist, dense,	silty S	ĀND. — — — —			
	32										
	23				SC	Brown, moist, mediu	ım dense	e, clayey SAND.			
	 21					Brown, moist, dense,	, silty S	ĀND. — — — —			
100	21										
	82/11"					Very dense.					
	24					Dense.					
110											
	40					N. 1					
	40					Medium dense.					
120	27					Dense.					
		<b>50</b> //				OKO			BORING LC		
	<b>Y</b> //	14		Ý	$M_{II}$	ore	PR		AL COUNTY, ARIZ		FIGURE
	<b>V</b>				▼			01808009	9/15		A-27

	SAMPLES			(:			DATE DRILLED	4/21/	/15	BORING NO	O	BR-7	
eet)	SAM	TOC	(%) :	DRY DENSITY (PCF)		CLASSIFICATION U.S.C.S.	GROUND ELEVATION	ON	1,456' ± (MSL)	SHI	EET4	OF _	4
DEPTH (feet)		BLOWS/FOOT	MOISTURE (%)	LISN	SYMBOL	SIFICA .S.C.S	METHOD OF DRILLI	ING CME-	75, 8" Diameter I	Hollow-Stem Au	ıger (Enviro-	Drill, Inc.)	
DEF	Bulk Driven	BLO	MOIS	3Y DE	Ś	CLAS(	BASELINE STATION	l =	2795+10	OI	FFSET =	5	50'R
							SAMPLED BYD		GGED BY		VIEWED B	BY	JSR
120							Total Depth = 120 feet	t.					
							Groundwater not enco Backfilled and asphalt			rtly after com	pletion of	drilling.	
							Notes: Groundwater, though is due to seasonal variation report.						
							The ground elevation sof published maps and not sufficiently accura	l other doc	uments reviev	ved for the pu	irposes of t	this evalu	ation. It is
130 -													
140 -													
150 -													
	+												
160													
	_	n #2	<b>-</b> -			44-		BORING LOG					
		<b>V//</b>	I U		&	$N_{II}$	ore	I-10: EARLEY ROAD TO JUNCTION I-8 PINAL COUNTY, ARIZONA					
		▼	The state of the s			_		PROJE	CT NO.	DATE		FIGUR	RE

9/15

	σ l									
	SAMPLES			(ř.		7	DATE DRILLED _	2/04/15	BORING NO	BR-8
feet)	SAI	T00	MOISTURE (%)	.Y (PC	7	ATIOI S.	GROUND ELEVAT	1,455' ± (MSL	SHEET	1OF4
DEPTH (feet)		BLOWS/FOOT	STUR	INSI	SYMBOL	SIFIC J.S.C.	METHOD OF DRIL	LING CME-75, 8" Diameter	er Hollow-Stem Auger (l	Enviro-Drill, Inc.)
DE	Bulk	BLO	MOIS	DRY DENSITY (PCF)	S	CLASSIFICATION U.S.C.S.	BASELINE STATIO	ON = 2796+80	OFFSE	ET = 35'R
							SAMPLED BY	DM LOGGED BY DESCRIPTION/IN	DM REVIEW	VED BYJSR
0						SC	ALLUVIUM: Brown, dry, medium	n dense, clayey SAND.		
-		39								
-		15								
		10								
		80					Very dense.			
						 SM	Light brown, dry, de	ense, silty SAND; weakly	v cemented.	
10 -	$\bot$	21				Sivi	Zigin ere wii, dry, de		, ••••••••••	
		63					Brown.			
-	+									
	7	30					Trace gravel.			
20										
-							Brown, moist, dense	e, clayey SAND with gra	vel.	
		70	7.0	121.21						
		70	7.0	121.21						
							Brown, moist, very	stiff, sandy lean CLAY.		
30 -		19								
						SM	Brown, moist, dense	e, silty SAND; few grave		
		44				Sivi	,,	, , , , , , , , , , , , , , , , , , , ,		
	+									
	$\parallel$									
40		50/5"				CL	Brown, moist, hard,	sandy lean CLAY.		
40		N #2			<u> </u>				BORING LOG	
		1//	IQ		&	$N_{I}$	ore	P	ARLEY ROAD TO JUNCT VINAL COUNTY, ARIZON	A
		<b>V</b>	U			<b>V</b> -		PROJECT NO. 601808009	DATE 9/15	FIGURE A-29
								<del></del>		

	I			<del>                                     </del>		
st) SAMPLES			<u>(-</u>			DATE DRILLED
et) SAM	T00	(%)	(PCF		NOIT .	GROUND ELEVATION1,455' ± (MSL)
DEPTH (feet)	BLOWS/FOOT	rure	\TISN	SYMBOL	IFICA S.C.S	METHOD OF DRILLING CME-75, 8" Diameter Hollow-Stem Auger (Enviro-Drill, Inc.)
DEP Bulk Driven	BLOW	MOISTURE (%)	DRY DENSITY (PCF)	SY	CLASSIFICATION U.S.C.S.	BASELINE STATION = 2796+80 OFFSET = 35'R
		_	DR		Ö	SAMPLED BY DM LOGGED BY DM REVIEWED BY JSR
40				///	CL	DESCRIPTION/INTERPRETATION  ALLUVIUM: (Continued)
	_				CL	Brown, moist, hard, sandy lean CLAY.
	<u> </u> 					Brown, moist, medium dense, silty SAND.
	20				SM	Brown, moist, medium dense, sitty BAND.
	_					
	10					
50	18					
	62					Dense.
	_					
	39				SC	Brown, moist, very dense, clayey SAND; scattered caliche nodules; weakly cemented.
60						
	55				SM	Brown, moist, dense, silty SAND; few gravel.
	_					
	40				SC	Brown, moist, very dense, clayey SAND; trace gravel.
70						
	_					
	<u>37</u> _					Medium dense. Brown, moist, medium dense, silty SAND; few gravel.
	_					
	-					
	29					Dense; scattered caliche nodules.
80	<b>.</b>	)		EEEEEEE		BORING LOG
	$N/\tilde{I}$	n!		&	DN	I-10: EARLEY ROAD TO JUNCTION I-8 PINAL COUNTY, ARIZONA PROJECT NO. DATE FIGURE
_						
<u> </u>						601808009 9/15 A-30

Very dense; trace gravel; moderately cemented.  SC Brown, moist, very dense, clayey SAND; scattered caliche nodules; moderately cemented.	80 BLOWS/FO S	GROUND ELEVAT METHOD OF DRIL BASELINE STATIC SAMPLED BY  SM ALLUVIUM: (Con Brown, moist, dense  Medium dense.  SM Brown, moist, medi  Very dense; trace gr  Very dense; trace gr  SC Brown, moist, very cemented.	ROUND ELEVATION	SHEET3 OF4 tem Auger (Enviro-Drill, Inc.)  OFFSET = 35'R  REVIEWED BY JSR  TATION  odules.
Section   Sect	90 DEPTH (fee BLOWS/FO DRY DENSITY (Fee Page 1100 PRY DENSITY PROPERTY (Fee Page 1100 PRY DENSITY PROPERTY PROP	SM ALLUVIUM: (Con Brown, moist, dense Medium dense.  CL Brown, moist, firm,  SM Brown, moist, medi  Very dense; trace grant gr	ASELINE STATION = 2796+80 OFFSET = MPLED BY DM LOGGED BY DM REVIEWED BY DESCRIPTION/INTERPRETATION  LUVIUM: (Continued) Dwn, moist, dense, silty SAND; scattered caliche nodules.  Down, moist, firm, sandy lean CLAY.  Down, moist, medium dense, silty SAND.  The sandy lean CLAY.  Down, moist, wery dense, clayey SAND; scattered caliche nodules; moderated caliche nodules.	tem Auger (Enviro-Drill, Inc.)  OFFSET = 35'R  REVIEWED BY JSR  TATION  Odules.
SAMPLED BY DM LOGGED BY DM REVIEWED BY JSR  DESCRIPTIONALISTERRETATION  SM ALLUVIUM: (Continued) Brown, moist, dense, silty SAND; scattered caliche nodules.  Medium dense.  CL Brown, moist, firm, sandy lean CLAY.  SM Brown, moist, medium dense, silty SAND.  Very dense; trace gravel; moderately cemented.  SC Brown, moist, very dense, clayey SAND; scattered caliche nodules; moderately cemented.  No recovery.	80	SM ALLUVIUM: (Con Brown, moist, dense Medium dense.  CL Brown, moist, firm,  SM Brown, moist, medi  Very dense; trace grant gr	ASELINE STATION = 2796+80 OFFSET = MMPLED BY DM REVIEWED BY DESCRIPTION/INTERPRETATION  LUYIUM: (Continued) DESCRIPTION/INTERPRETATION  LUYIUM: (Continued) Description of the state of the	REVIEWED BY JSR TATION  Odules.
SAMPLED BY DM LOGGED BY DM REVIEWED BY JSR  DESCRIPTIONALISTERRETATION  SM ALLUVIUM: (Continued) Brown, moist, dense, silty SAND; scattered caliche nodules.  Medium dense.  CL Brown, moist, firm, sandy lean CLAY.  SM Brown, moist, medium dense, silty SAND.  Very dense; trace gravel; moderately cemented.  SC Brown, moist, very dense, clayey SAND; scattered caliche nodules; moderately cemented.  No recovery.	80	SM ALLUVIUM: (Con Brown, moist, dense Medium dense.  CL Brown, moist, firm,  SM Brown, moist, medi  Very dense; trace grant gr	DESCRIPTION/INTERPRETATION  LUVIUM: (Continued) Down, moist, dense, silty SAND; scattered caliche nodules.  dium dense.  Down, moist, firm, sandy lean CLAY.  Down, moist, medium dense, silty SAND.  Ty dense; trace gravel; moderately cemented.  Down, moist, very dense, clayey SAND; scattered caliche nodules; moderately mented.	REVIEWED BY JSR TATION  Odules.
SAMPLED BY DM LOGGED BY DM REVIEWED BY JSR  DESCRIPTIONALISTERRETATION  SM ALLUVIUM: (Continued) Brown, moist, dense, silty SAND; scattered caliche nodules.  Medium dense.  CL Brown, moist, firm, sandy lean CLAY.  SM Brown, moist, medium dense, silty SAND.  Very dense; trace gravel; moderately cemented.  SC Brown, moist, very dense, clayey SAND; scattered caliche nodules; moderately cemented.  No recovery.	80	SM ALLUVIUM: (Con Brown, moist, dense Medium dense.  CL Brown, moist, firm,  SM Brown, moist, medi  Very dense; trace grant gr	DESCRIPTION/INTERPRETATION  LUVIUM: (Continued) Down, moist, dense, silty SAND; scattered caliche nodules.  dium dense.  Down, moist, firm, sandy lean CLAY.  Down, moist, medium dense, silty SAND.  Ty dense; trace gravel; moderately cemented.  Down, moist, very dense, clayey SAND; scattered caliche nodules; moderatel nented.	Ddules.
Brown, moist, dense, silty SAND; scattered caliche nodules.  Medium dense.  Brown, moist, firm, sandy lcan CLAY.  SM  Brown, moist, medium dense, silty SAND.  Very dense; trace gravel; moderately cemented.  SC  Brown, moist, very dense, clayey SAND; scattered caliche nodules; moderately cemented.  No recovery.	33 33 30 30 30 30 30 30 30 30	Brown, moist, dense  Medium dense.  Brown, moist, firm,  SM Brown, moist, medi  Very dense; trace grant gran	own, moist, dense, silty SAND; scattered caliche nodules.  dium dense.  own, moist, firm, sandy lean CLAY.  own, moist, medium dense, silty SAND.  ry dense; trace gravel; moderately cemented.  own, moist, very dense, clayey SAND; scattered caliche nodules; moderatel nented.	
SM Brown, moist, medium dense, silty SAND.  Very dense; trace gravel; moderately cemented.  SC Brown, moist, very dense, clayey SAND; scattered caliche nodules; moderately cemented.  No recovery.	90 - 5	Very dense; trace grant SC Brown, moist, very cemented.	own, moist, medium dense, silty SAND.  ry dense; trace gravel; moderately cemented.  own, moist, very dense, clayey SAND; scattered caliche nodules; moderatel nented.	liche nodules; moderately
SM Brown, moist, medium dense, silty SAND.  Very dense; trace gravel; moderately cemented.  SC Brown, moist, very dense, clayey SAND; scattered caliche nodules; moderately cemented.  No recovery.	90 — 20 — S S S S S S S S S S S S S S S S S S	Very dense; trace grant of the second of the	ry dense; trace gravel; moderately cemented.  own, moist, very dense, clayey SAND; scattered caliche nodules; moderatel nented.  recovery.	liche nodules; moderately
Very dense; trace gravel; moderately cemented.  SC  Brown, moist, very dense, clayey SAND; scattered caliche nodules; moderately cemented.  No recovery.	19 100 88 110 41	Very dense; trace grant of the second of the	ry dense; trace gravel; moderately cemented.  own, moist, very dense, clayey SAND; scattered caliche nodules; moderatel nented.  recovery.	liche nodules; moderately
Very dense; trace gravel; moderately cemented.  SC  Brown, moist, very dense, clayey SAND; scattered caliche nodules; moderately cemented.  No recovery.	88 88 110 41	Brown, moist, very cemented.	own, moist, very dense, clayey SAND; scattered caliche nodules; moderatel nented.	liche nodules; moderately
Brown, moist, very dense, clayey SAND; scattered caliche nodules; moderately cemented.    SC   Brown, moist, very dense, clayey SAND; scattered caliche nodules; moderately cemented.	110 — 41	Brown, moist, very cemented.	own, moist, very dense, clayey SAND; scattered caliche nodules; moderatel nented.	liche nodules; moderately
110	41	cemented.	recovery.	liche nodules; moderately
	50/3"	No recovery.		
SM Brown, moist, medium dense, silty SAND.			own, moist, medium dense, silty SAND.	
	20	SM Brown, moist, medi		
DODING LOG	120	_	BORING LOG	IG I OG
I-10: EARLEY ROAD TO JUNCTION I-8	Alinine. Al		I-10: EARLEY ROAD TO IUNCTION I-8	
PROJECT NO. DATE FIGURE	/YIIIYU ~ /Y	<b>Noore</b>	PINAL COUNTY, ARIZONA	D TO JUNCTION I-8 ITY, ARIZONA

	SAMPLES			(-			DATE DRILLED		2/04/15	BORING NO.		BR-8	
eet)	SAM	DOT	(%)	DRY DENSITY (PCF)	ب	CLASSIFICATION U.S.C.S.	GROUND ELEVAT	TION _	$1,455' \pm (MSL)$	SHEET	4	OF _	4
DEPTH (feet)		BLOWS/FOOT	MOISTURE (%)	NSIT	SYMBOL	SIFICA .S.C.S	METHOD OF DRII	LLING o	CME-75, 8" Diameter	Hollow-Stem Auger (F	nviro-Dı	rill, Inc.)	
DEF	Bulk Driven	BLO	MOIS	₹Y DE	Ś	CLASS	BASELINE STATION	ON =	2796+80	OFFSE	T = _	35	'R
				P. D.			SAMPLED BY	DM	LOGGED BY	DM REVIEW	ED BY	JS	SR
120							Total depth = 120 fe	eet.	DESCRIPTION/INT	IERPRETATION			
							Groundwater not en Backfilled on 2/04/2	ncountere		n of drilling.			
							Notes: Groundwate: level due to seasona						
							the report.	ai variau	ons in precipitatio	n and several other	ractors	as discu	issed iii
							The ground elevation of published maps a						
							not sufficiently accu						tion. It is
130 -													
	+												
140 -													
	+												
	$\blacksquare$												
150 -													
130													
	H												
	$\blacksquare$												
160	H												
100		a #2				44-	ana			BORING LOG	ONTO		
		<b>Y</b> //	14		交	$M_{II}$	ore	PI		RLEY ROAD TO JUNCTI NAL COUNTY, ARIZONA DATE		FIGURE	
H.		_				_		11			1		

9/15

et)	)					DATE DRILLED	2	/06/15	BORING NO.	BR-9
eet)	TO	(%)	DRY DENSITY (PCF)		NOIL .	GROUND ELEVATI	ION	1,457' ± (MSL)	SHEET	1OF4
DEPTH (feet)	iven   C.	MOISTURE (%)	NSIT	SYMBOL	SIFICA S.C.S	METHOD OF DRILL	LING CN	ME-75, 8" Diameter	Hollow-Stem Auger (F	Enviro-Drill, Inc.)
DEP'	Driven BLO	MOIS	₹Y DE	S	CLASSIFICATION U.S.C.S.	BASELINE STATIO	N = _	2797+10	OFFSE	ET = 110'R
			AQ		0	SAMPLED BY		LOGGED BY _		/ED BYJSR
0	27				SC	ALLUVIUM: Brown, dry, dense, cl	layey SA	ND.		
	27									
-	88					Very dense.				
$\mathbb{H}$	61									
	61									
10	79									
10										
	<b>1</b>					Brown, dry, medium	dense	ilty SAND		
	19				SM	Brown, dry, medium	uciisc, s	iity SAND.		
$\mathbb{H}$	_									
20	56					Dense; few gravel.				
20	_									
	<b>1</b>				 GP	Brown, dry, very den		v graded GRAV	FI with sand	
	87/11"				GP	Brown, dry, very den	ise, poor	ry graded GIVIV	EE with said.	
$\mathbb{H}$										
30	94/11"_	<u> </u>		222	 SC	Light brown, dry, ver	ry dense,	clayey SAND;	scattered caliche no	odules; weakly to
30	-					moderately cemented				, , ,
	<b>_</b>	<u>_</u>				Light brown, dry, ver	ry dense	silty SAND: tra		
	34				SM	Light blown, dry, ver	ry delise,	omy omio, ua	ce giuvei.	
	#	<u>_</u>		7,7,7,2		Brown, dry, very den	se clavo	N SAND: trace	prayel: scattered co	liche nodules
40	50/2"				SC	moderately cemented		y sand, have g	stavet, scattered ca	nene nodules,
		50 F							BORING LOG	ON I-8
	<b>/</b> ///	14'		文	$M_{II}$	ore	ppo		VAL COUNTY, ARIZONA  DATE	
	▼				▼			01808009	9/15	A-33

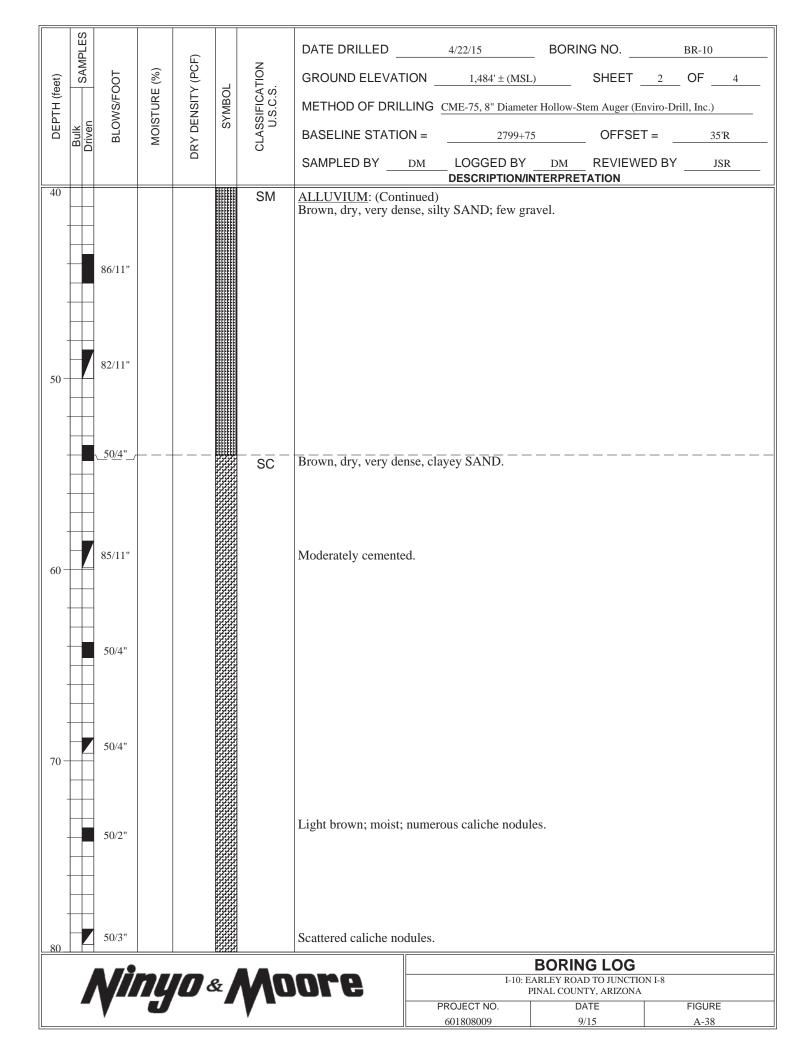
ll l	S						
	SAMPLES			Œ.		7	DATE DRILLED BORING NO BR-9
feet)	SAI	T00	E (%)	У (РС	7	ATIOI S.	GROUND ELEVATION1,457' ± (MSL) SHEET2
DEPTH (feet)		BLOWS/FOOT	MOISTURE (%)	LISN	SYMBOL	SIFIC.	METHOD OF DRILLING CME-75, 8" Diameter Hollow-Stem Auger (Enviro-Drill, Inc.)
DEF	Bulk	BLO	MOIS	DRY DENSITY (PCF)	S	CLASSIFICATION U.S.C.S.	BASELINE STATION = 2797+10 OFFSET = 110'R
				۵		Ü	SAMPLED BY DM LOGGED BY REVIEWED BY JSR  DESCRIPTION/INTERPRETATION
40	7	54				SC	ALLUVIUM: (Continued) Brown, dry, very dense, clayey SAND; trace gravel; scattered cliche nodules; moderately cemented.
50 —		56					Brown, dry, dense, silty SAND; few gravel.
-	1	37				SP	Brown, dry, very dense, poorly graded SAND; trace gravel.
60		59	15.2	109.9		CL	Brown, moist, hard, sandy lean CLAY; trace gravel; scattered caliche nodules.
-	7	36				SP	Brown, dry, very dense, poorly graded SAND; few gravel.
70		69					Dense; few to little gravel.
-	7	55				SC	Brown, moist, very dense, clayey SAND; scattered caliche nodules; weakly cemented.
90		47				SM	Brown, moist, dense, silty SAND.
80		<b>.</b> #9			<u> </u>		BORING LOG
		<b>V//</b>			&	$N_{\it I}$	I-10: EARLEY ROAD TO JUNCTION I-8 PINAL COUNTY, ARIZONA PROJECT NO. DATE FIGURE
II					_	_	PROJECT NO. DATE FIGURE

	SAMPLES			(.			DATE DRILLED _	2,	/06/15	BORING NO.		BR-9
eet)	SAM	T00	(%)	DRY DENSITY (PCF)		NOIT.	GROUND ELEVAT	TION	1,457' ± (MSL)	SHEET	3	OF4
DEPTH (feet)		BLOWS/FOOT	MOISTURE (%)	(TISN:	SYMBOL	SIFICA .S.C.S	METHOD OF DRIL	LING CM	IE-75, 8" Diameter	Hollow-Stem Auger (	Enviro-Dril	l, Inc.)
DEF	Bulk Driven	BLO	MOIS	3Y DE	S	CLASSIFICATION U.S.C.S.	BASELINE STATIC	DN =	2797+10	OFFSE	ET =	110'R
				□			SAMPLED BY		LOGGED BY ESCRIPTION/INT		VED BY	JSR
80						SM	ALLUVIUM: (Cont Brown, moist, dense	tinued)		-		
	Н							, 51105 211				
	-7	26										
	$\mathbb{H}$											
		77					Very dense.					
90 -												
	Н											
		39				SC	Brown, moist, very	dense, cla	yey SAND; scatt	tered caliche nodu	les.	
	H											
		- <del>7</del> 3-					Brown, moist, very	dense silt	V SAND ———			
100 -		73				SM	Diown, moist, very	dense, siit	y SAND.			
	Н											
		26				SC -	Brown, moist, dense	e, clayey S	5AND. — — — —			
		20										
		83				SM	Brown, moist, very	dense, silt	y SAND.			
110 -		63										
						SC	Brown, moist, dense	e, clayey S	SAND.			- – – – – –
	$\mathbb{H}$	25										
	H											
		06/11"				SM	Brown, moist, very	dense, silt	y SAND.			
120_		96/11"							F	ORING LOG		
			$n_{l}$	10	&	DM	ore		I-10: EAR	LEY ROAD TO JUNCT AL COUNTY, ARIZON	ION I-8	
			U			<b>—</b>		II	JECT NO. 1808009	DATE 9/15		FIGURE A-35

	SAMPLES			(-			DATE DRILLED		2/06/15	BORING	9 NO		BR-9	
eet)	SAM	ООТ	(%)	DRY DENSITY (PCF)	ب	CLASSIFICATION U.S.C.S.	GROUND ELEVA	TION _	1,457' ± (MSL)		SHEET	4	OF _	4
DEPTH (feet)		BLOWS/FOOT	MOISTURE (%)	NSIT	SYMBOL	SIFICA .S.C.S	METHOD OF DRII	LLING o	CME-75, 8" Diameter	Hollow-Ster	n Auger (E	nviro-Dr	rill, Inc.)	
DEF	Bulk Driven	BLO	MOIS	3Y DE	Ś	CLASS	BASELINE STATION	ON =	2797+10		OFFSE	T = _	11	0'R
				ā			SAMPLED BY	DM	LOGGED BY DESCRIPTION/IN		REVIEW	ED BY	J	SR
120							Total depth = 120 fe		DESCRIPTION/IN	IERPREIA	TION			
							Groundwater not en Backfilled on 2/06/				g.			
							Notes: Groundwate							
							level due to seasona the report.	ai variati	ons in precipitation	on and seve	erai otner	Tactors	as disci	ussed in
							The ground elevation							
							of published maps a not sufficiently accu							ition. It is
130 -														
140 -														
150 -														
	H													
160		•				<b>.</b> .				BORING	LOG			
			Ωļ	0	&	Na	ore		PI	RLEY ROAD NAL COUNTY	, ARIZONA	ON I-8		
	_				_	_		PI	ROJECT NO.	DAT	E		FIGURE	

9/15

10		LES						DATE DRILLED		4/22/15	BORIN	G NO.		BR-10	
SSMPLED BY DM LOGGED BY SIR  DESCRIPTIONANTERPRETATION  SC ETLL: Brown, dry, claycy SAND.  SM ALLUVIUM: Brown, dry, very dense, sitry SAND; few gravel.  SM ALLUVIUM: Brown, dry, very dense, sitry SAND; few gravel.  10	et)	SAMPLES	TO	(%)	(PCF)		NOI	_							4
SSMPLED BY DM LOGGED BY SIR  DESCRIPTIONANTERPRETATION  SC ETLL: Brown, dry, claycy SAND.  SM ALLUVIUM: Brown, dry, very dense, sitry SAND; few gravel.  SM ALLUVIUM: Brown, dry, very dense, sitry SAND; few gravel.  10	 TH (fe		VS/FO	TURE	YEIE	MBOL	IFICA <sup>-</sup> S.C.S.	METHOD OF DRIL	_LING (	CME-75, 8" Diameter	Hollow-St	em Auger (Er	viro-Dr	ill, Inc.)	
SSMPLED BY DM LOGGED BY SIR  DESCRIPTIONANTERPRETATION  SC ETLL: Brown, dry, claycy SAND.  SM ALLUVIUM: Brown, dry, very dense, sitry SAND; few gravel.  SM ALLUVIUM: Brown, dry, very dense, sitry SAND; few gravel.  10	DEP	Bulk	BLOV	MOIS	Y DEI	λS	LASS U.	BASELINE STATION	ON =	2799+75		OFFSE1	-= _	35	5'R
SC PILL: Brown, dry, clayey SAND.  30 - 55 SM ALLUVIUM: Brown, dry, very dense, silty SAND, few gravel.  BROWN, dry, very dense, silty SAND, few gravel.  BROWN, dry, very dense, silty SAND, few gravel.  BROWN ALLUVIUM: BROWN, dry, very dense, silty SAND, few gravel.  PROJECT NO. DATE FIGURE					PA			SAMPLED BY	DM				D BY	J	SR
SM ALLUVIUM: Brown, dry, very dense, silty SAND; few gravel.  BORING LOG  H-BEARLEY ROAD TO LINCTION IS PROJECT NO. DATE FROURE	0						SC		CAND	DESCRIPTION/IN	ERPREI	ATION			
30  SM ALLUVIUM: Brown, dry, very dense, silty SAND; few gravel.  BORING LOG  1-10: EARLEY ROAD TO JUNCTION I-S PROJECT NO. DATE FIGURE								Brown, dry, clayey	SAND.						
30  SM ALLUVIUM: Brown, dry, very dense, silty SAND; few gravel.  BORING LOG  1-10. EARLEY ROAD TO JUNCTION 1-8 PROJECT NO. DOAT PROJECT NO. D															
30  SM ALLUVIUM: Brown, dry, very dense, silty SAND; few gravel.  BORING LOG  1-10. EARLEY ROAD TO JUNCTION 1-8 PROJECT NO. DOAT PROJECT NO. D															
30  SM ALLUVIUM: Brown, dry, very dense, silty SAND; few gravel.  BORING LOG  1-10. EARLEY ROAD TO JUNCTION 1-8 PROJECT NO. DOAT PROJECT NO. D															
30  SM ALLUVIUM: Brown, dry, very dense, silty SAND; few gravel.  BORING LOG  10: EARLEY ROAD TO JUNCTION IS PROJECT NO. DATE FIGURE															
SM ALLUVIUM: Brown, dry, very dense, silty SAND; few gravel.  SM BORING LOG  1-10: EARLEY ROAD TO JUNCTION 1-8 PINAL COUNTY, ARIZONA PROJECT NO. DATE FIGURE	10-														
SM ALLUVIUM: Brown, dry, very dense, silty SAND; few gravel.  SM BORING LOG  1-10: EARLEY ROAD TO JUNCTION 1-8 PINAL COUNTY, ARIZONA PROJECT NO. DATE FIGURE															
SM ALLUVIUM: Brown, dry, very dense, silty SAND; few gravel.  SM BORING LOG  1-10: EARLEY ROAD TO JUNCTION 1-8 PINAL COUNTY, ARIZONA PROJECT NO. DATE FIGURE															
SM ALLUVIUM: Brown, dry, very dense, silty SAND; few gravel.  SM BORING LOG  1-10: EARLEY ROAD TO JUNCTION 1-8 PINAL COUNTY, ARIZONA PROJECT NO. DATE FIGURE															
SM ALLUVIUM: Brown, dry, very dense, silty SAND; few gravel.  SM BORING LOG  1-10: EARLEY ROAD TO JUNCTION 1-8 PINAL COUNTY, ARIZONA PROJECT NO. DATE FIGURE															
SM ALLUVIUM: Brown, dry, very dense, silty SAND; few gravel.  SM BORING LOG  1-10: EARLEY ROAD TO JUNCTION 1-8 PINAL COUNTY, ARIZONA PROJECT NO. DATE FIGURE															
SM ALLUVIUM: Brown, dry, very dense, silty SAND; few gravel.  BORING LOG  1-10: EARLEY ROAD TO JUNCTION I-8 PINAL COUNTY, ARIZONA PROJECT NO. DATE FIGURE	20 -														
SM ALLUVIUM: Brown, dry, very dense, silty SAND; few gravel.  BORING LOG  1-10: EARLEY ROAD TO JUNCTION I-8 PINAL COUNTY, ARIZONA PROJECT NO. DATE FIGURE															
SM ALLUVIUM: Brown, dry, very dense, silty SAND; few gravel.  BORING LOG  1-10: EARLEY ROAD TO JUNCTION I-8 PINAL COUNTY, ARIZONA PROJECT NO. DATE FIGURE															
SM ALLUVIUM: Brown, dry, very dense, silty SAND; few gravel.  BORING LOG  1-10: EARLEY ROAD TO JUNCTION I-8 PINAL COUNTY, ARIZONA PROJECT NO. DATE FIGURE															
SM ALLUVIUM: Brown, dry, very dense, silty SAND; few gravel.  BORING LOG  1-10: EARLEY ROAD TO JUNCTION I-8 PINAL COUNTY, ARIZONA PROJECT NO. DATE FIGURE															
SM ALLUVIUM: Brown, dry, very dense, silty SAND; few gravel.  BORING LOG  1-10: EARLEY ROAD TO JUNCTION I-8 PINAL COUNTY, ARIZONA PROJECT NO. DATE FIGURE															
Brown, dry, very dense, silty SAND; few gravel.    BORING LOG	30 -														
Brown, dry, very dense, silty SAND; few gravel.    BORING LOG															
Brown, dry, very dense, silty SAND; few gravel.    BORING LOG															
Brown, dry, very dense, silty SAND; few gravel.    BORING LOG															
Brown, dry, very dense, silty SAND; few gravel.    BORING LOG															
Brown, dry, very dense, silty SAND; few gravel.    BORING LOG							SM	ALLUVIUM:							
I-10: EARLEY ROAD TO JUNCTION I-8 PINAL COUNTY, ARIZONA PROJECT NO. DATE FIGURE	40_		55					Brown, dry, very de	ense, silt						
			Vi	77/	m	e I	Mn	nre		I-10: EAI	RLEY ROAI	TO JUNCTIO	N I-8		
				H			Alg			ROJECT NO.	DA	TE			<u> </u>



	LES						DATE DRILLED 4/22/15 BORING NO. BR-10
eet)	SAMPLES	TOC	(%) =	DRY DENSITY (PCF)	ادا	CLASSIFICATION U.S.C.S.	GROUND ELEVATION 1,484' ± (MSL) SHEET3 OF4
DEPTH (feet)		VS/F	TURE	NSIT	SYMBOL	S.C.S	METHOD OF DRILLING CME-75, 8" Diameter Hollow-Stem Auger (Enviro-Drill, Inc.)
DEP	Bulk	BLOWS/FOOT	MOISTURE (%)	₹Y DE	S	SLASS U.	BASELINE STATION = 2799+75 OFFSET = 35'R
				ä		Ü	SAMPLED BY DM LOGGED BY REVIEWED BY JSR  DESCRIPTION/INTERPRETATION
80						SC	ALLUVIUM: (Continued) Brown, moist, very dense, clayey SAND; scattered caliche nodules.
-		50/5"					Strongly cemented.
90	7	66					Trace gravel.
  -  -  -		50/5"					
100	7	34				 SM	Brown, dry, very dense, silty SAND.
-		50/4"					
110	7	38				SC	Brown, dry, very dense, clayey SAND; scattered caliche nodules.
		50/4"					Brown, moist, very dense, silty SAND; scattered caliche nodules.
+							Brown, dry, dense, clayey SAND; scattered caliche nodules.
		24					
120							BORING LOG
120					. 4	Ma	LIN FARI EV ROAD TO HINCTION 1 9
120		Vi			&	Na	I-10: EARLEY ROAD TO JUNCTION I-8 PINAL COUNTY, ARIZONA PROJECT NO. DATE FIGURE

	SAMPLES			(:			DATE DRILLED	4/22/15	вс	ORING NO.		BR-10	
eet)	SAM	JOT	(%)	DRY DENSITY (PCF)		CLASSIFICATION U.S.C.S.	GROUND ELEVATION	N1,484' ± (N	MSL)	SHEET	4	OF	4
DEPTH (feet)		BLOWS/FOOT	MOISTURE (%)	NSIT	SYMBOL	SIFICA .S.C.S	METHOD OF DRILLIN	NG <u>CME-75, 8" Dia</u>	neter Hollo	ow-Stem Auger (E	Enviro-D	rill, Inc.)	
DEF	Bulk Driven	BLO	MOIS	3Y DE	Ś	CLASS	BASELINE STATION	= 279	9+75	OFFSE	T = _	3	5'R
				ā			SAMPLED BYD	LOGGED E			ED BY	'	JSR
120							Total Depth = 120 feet.		IN/IIN I LIXI	KLIATION			
							Groundwater not encou Backfilled on 4/22/15 s Notes:			drilling.			
							Groundwater, though i due to seasonal variation report.						
							The ground elevation so of published maps and not sufficiently accurat	other documents r	eviewed	for the purpose	es of the	is evalu	ation. It is
130 -											5		
140 -													
150 -													
	$\blacksquare$												
	H												
	$\parallel$												
	$\coprod$												
160									ROI	RING LOG			
<i>Minyo &amp; M</i> oore						Mn	ore	I-1	0: EARLEY	ROAD TO JUNCTION OF THE PROPERTY OF THE PROPER			
		V	4			A 12		PROJECT NO.	IIIVAL	DATE	<u> </u>	FIGUR	E

9/15

	(0						T				
	SAMPLES			E E		_	DATE DRILLED _		4/12/15	BORING NO.	RW-1
eet)	SAN	00T	(%) =	DRY DENSITY (PCF)	7	CLASSIFICATION U.S.C.S.	GROUND ELEVAT	TION _	$1,484' \pm (MSL)$	SHEET _	1 OF 2
DEPTH (feet)		BLOWS/FOOT	MOISTURE (%)	LISN	SYMBOL	SIFIC, I.S.C.	METHOD OF DRIL	LING o	CME-75, 8" Diameter I	Hollow-Stem Auger (Er	nviro-Drill, Inc.)
DEF	Bulk Driven	BLO	MOIS	RY DE	S	CLAS	BASELINE STATIO	= NC	2799+37	OFFSET	$\Gamma = 75^{\circ}R$
							SAMPLED BY	DM	LOGGED BY DESCRIPTION/INT	DM REVIEWE	ED BY
0					7,7,7,0	SC	ASPHALT CONCR	RETE: A			
_		38					FILL: Brown, dry, medium	n dense,	clayey SAND.		
		10									
	_/_	18									
-		39	8.4	117.3			Moist; trace gravel.				
_											
10-		27					Dense.				
-		62									
_											
	7	55					Very dense; trace gr	ravel.			
20 -											
_											
		84/11"									
		84/11"									
-											
_											
30 -		59					Scattered caliche no	dules.			
	H										
							ALLUVIUM: Brown, moist, very	dense, c	layey SAND.		
-		95/11"					,,	-, -			
-											
		43				SM	Brown, dry, very de	ense, silt	y SAND.		
40_				_						ORING LOG	
			$\Omega '$	0 8	ž	Na	<b>970</b>		I-10: EAR PIN	LEY ROAD TO JUNCTIO AL COUNTY, ARIZONA	
		<b>V</b>	U		_	<b>V</b> -			ROJECT NO. 601808009	DATE 9/15	FIGURE A-41

	SAMPLES			(-			DATE DRILLED _		4/12/15	BORING NO.		RW-1	
eet)	SAM	TOC	(%) :	/ (PCF		NOIT :	GROUND ELEVAT	TION _	1,484' ± (MSL)	SHEET	2	_ OF _	2
DEPTH (feet)		BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	METHOD OF DRIL	LLING C	CME-75, 8" Diameter	Hollow-Stem Auger	(Enviro-Γ	Orill, Inc.)	
DEF	Bulk Driven	BLO	MOIS	3Y DE	Ś	CLASS	BASELINE STATION	ON =	2799+37	OFFS	ET =	75	5'R
				ā			SAMPLED BY	DM	LOGGED BY DESCRIPTION/IN		WED BY	/ <u>J</u>	SR
40						SM	ALLUVIUM: (Cont Brown, dry, very de	tinued)		IER RETATION			
							Brown, dry, very de	ense, smy	y SAND.				
		80					Trace creavel						
		- 60					Trace gravel.  Total Depth = 45 fe						
							Groundwater not en Backfilled and asph				tion of d	rilling.	
							Notes:						
50 -							Groundwater, thous due to seasonal vari						
							report.						
							The ground elevation of published maps a	and other	documents review	wed for the purpo	ses of th	is evalua	
							not sufficiently accu	urate for	preparing constru	ction bids and de	sign doc	uments.	
	+												
60 -													
	+												
70 -													
	$\mathbb{H}$												
	Ħ												
80_						<b>.</b>			E	BORING LOC	<b>;</b>		
		<b>V</b> //	14		&	$N_{\mathcal{Q}}$	ore		PI	RLEY ROAD TO JUNC NAL COUNTY, ARIZOI		FIGURE	_
II.		_						II PF	ROJECT NO.	DATE	1	FIGURE	=

9/15

		T T		т —		I								
et)			li (i			DATE DRILLED	4	/12/15	BORING NO	RW-2				
eet)	TOC	(%)	DRY DENSITY (PCF)	ب	CLASSIFICATION U.S.C.S.	GROUND ELEVATI	ION	1,482' ± (MSL)	SHEET _	1 OF 2				
DEPTH (feet)	Iven C.	MOISTURE (%)	NSIT	SYMBOL	SIFICA	METHOD OF DRILL	LING CN	ME-75, 8" Diameter I	Hollow-Stem Auger (En	nviro-Drill, Inc.)				
DEP	Driven BLO	MOIS	₹Y DE	Ś	SLAS6 U	BASELINE STATIO	N = _	2801+10	OFFSE	T = 75'R				
			P P		0	SAMPLED BY		LOGGED BY		ED BYJSR				
0						L CRYLLY E COLVERY		ESCRIPTION/INT						
				444444		ASPHALT CONCRI	ETE: Ap	proximately 5" th	nck.					
-	17				SM	FILL: Brown, dry, medium	dense, s	ilty SAND; few g	gravel.					
	33				CL	Brown, moist, hard, s	sandy lea	n CLAY.						
	31				SC	Brown, moist, dense,	, clayey S	SAND.						
	74					Vorus donas								
10	74					Very dense.								
	49													
	50/5"													
20	30/3													
	90/12"				SC	ALLUVIUM: Brown, moist, very d	lense, cla	yey SAND; scatt	tered caliche nodule	es.				
	52					Dense.								
30														
	27				SM	Brown, dense, silty S	SAND; tr	race gravel.						
	50/5"					Very dense; trace to	few grav	el.						
40		)	l					B	ORING LOG					
	Mi	$n_{l}$		&	Na	ore		I-10: EAR PIN	LEY ROAD TO JUNCTIC AL COUNTY, ARIZONA					
	•	U		_	<b>y</b> -			DJECT NO. 01808009	DATE 9/15	FIGURE A-43				

	SAMPLES			(-			DATE DRILLED _		4/12/15	BORII	NG NO		RW-2	
eet)	SAM	70T	(%)	/ (PCF		NOIT	GROUND ELEVAT	TION _	1,482' ± (MS		SHEET	2	OF _	2
DEPTH (feet)		BLOWS/FOOT	MOISTURE (%)	TISN	SYMBOL	SIFICA S.C.S	METHOD OF DRIL	LLING C	CME-75, 8" Diame	er Hollow-S	stem Auger (E	nviro-D	rill, Inc.)	
DEF	Bulk Driven	BLO	MOIS	DRY DENSITY (PCF)	Ś	CLASSIFICATION U.S.C.S.	BASELINE STATION	ON =	2801+3	.0	OFFSE	Γ= _	7:	5'R
				ā			SAMPLED BY	DM	LOGGED BY		REVIEW	ED BY	J	ISR
50 - 60 -		45				SM	ALLUVIUM: (Combrown, dry, very description)  Total Depth = 45 feroundwater not en Backfilled and asphonous Motes: Groundwater, though due to seasonal variate port.  The ground elevation of published maps a not sufficiently accurate the seasonal variate port.	et. acountered alt patch ations in shown and other	ed during drillinged on 4/12/15 sencountered at the precipitation at above is an esterodocuments rev	g. hortly after time of cond several imation or inewed for	er completion drilling, may other factor only. It is bas the purpose	n of dr	rilling. to a high scussed our interior interior interior interior in the control of the control	ner level in the
80_		<b>V</b> i	7/	10	&	Mo	ore			EARLEY ROA	IG LOG	DN I-8		
				_				PF	ROJECT NO.		ATE		FIGUR	E

9/15

	(0)										
	SAMPLES			(F			DATE DRILLED _	4/13/15	BORI	NG NO	RW-3
eet)	SAN	DOT	(%) :	r (PC	_	NOIT :	GROUND ELEVAT	ION1,480' ± (N	MSL)	SHEET _	1 OF 2
DEPTH (feet)		BLOWS/FOOT	MOISTURE (%)	NSIT	SYMBOL	S.C.S	METHOD OF DRIL	LING CME-75, 8" Dian	neter Hollow-S	tem Auger (En	viro-Drill, Inc.)
DEP	Bulk Driven	BLOV	MOIS	DRY DENSITY (PCF)	S	CLASSIFICATION U.S.C.S.	BASELINE STATIC	0N = 280	2+80	OFFSET	= 75'R
				DR		O	SAMPLED BY	DM LOGGED E			ED BYJSR
0	+				****		ASPHALT CONCR	DESCRIPTIO  ETF: Approximately		TATION	
		44				SC	FILL: Brown, dry, dense, c				
							Brown, dry, dense, e	layey SAND, iew gi	avei.		
-		36					Very dense.				
		50/5"									
		JU/J									
		38									
10	+										
	$\blacksquare$										
-		50/5"									
		50/5"									
+											
-	7	58					Moist.				
20											
+	+					SC	ALLUVIUM: Brown, moist, very of	lense, clayey SAND:	scattered ca	liche filame	nts.
		50/5"					Scattered caliche no	lules.			
_											
		32					Dense.				
30											
	+										
									- — — — -		
		86/11"		_		SM	Brown, dry, very der	nse, silty $\overrightarrow{SAND}$ .			
	$\prod$										
40		86/11"					Trace to few gravel.				
			7)//	<b>1</b> 0 4	2.	Ma	nro	I-1	0: EARLEY ROA		N I-8
		<b>V</b> -/-	4		×	Ala	ore	PROJECT NO.		ATE	FIGURE
		*				*		601808009	9	9/15	A-45

st) SAMPLES			(			DATE DRILLED	4/1	3/15	BORIN	G NO		RW-3	
set)	TOC	(%)	, (PCF		NOI .	GROUND ELEVAT	ION	1,480' ± (MSL)		SHEET	2	OF _	2
DEPTH (feet)	BLOWS/FOOT	MOISTURE (%)	NSIT	SYMBOL	SIFICA S.C.S	METHOD OF DRIL	LING CME	E-75, 8" Diameter	Hollow-Ste	em Auger (Ei	nviro-Dr	ill, Inc.)	
DEP Bulk Driven	BLO	MOIS	DRY DENSITY (PCF)	S	CLASSIFICATION U.S.C.S.	BASELINE STATIC	DN =	2802+80		OFFSE	Γ= _	75	5'R
			Ö		O	SAMPLED BY		OGGED BY	DM	REVIEW	ED BY	J	SR
50	32				SM	ALLUVIUM: (Cont. Brown, dry, very der Brown, dry, very der Groundwater not end Backfilled and asphanous Services Groundwater, thoug due to seasonal variate report.  The ground elevation of published maps and sufficiently accurate to the seasonal variate report.	et. countered calt patched gh not encoations in pr	during drilling. on 4/12/15 sho untered at the trecipitation and rove is an estimate exparing construction.	artly after ime of dr several of action only wed for the ction bids	completio rilling, may ther factor y. It is basine purposes and desig	y rise to sa as dis	o a high scussed our inter s evalua	in the
		4		ž.	$M_{\it G}$	ore	PROI			TO JUNCTIO Y, ARIZONA TE	N 1-8	FIGURE	
					_	li li			-/(				

9/15

	SAMPLES			(.			DATE DRILLED _		4/13/15	BORIN	G NO	RW-	4
eet)	SAM	70C	(%) :	DRY DENSITY (PCF)	ب	CLASSIFICATION U.S.C.S.	GROUND ELEVAT	ION _	1,477' ± (MSL)	l	SHEET 1	OF	2
DEPTH (feet)		BLOWS/FOOT	MOISTURE (%)	NSIT	SYMBOL	SIFICA S.C.S	METHOD OF DRIL	LING 9	CME-75, 8" Diameter	r Hollow-Ste	em Auger (Enviro-	-Drill, Inc	:.)
DEF	Bulk	BLO	MOIS	۲Y DE	Ś	SLAS8 U	BASELINE STATIC	ON =	2804+58		OFFSET =		75'R
				DF		0	SAMPLED BY	DM	LOGGED BY DESCRIPTION/IN		REVIEWED E	BY	JSR
0						SC	∖ <u>ASPHALT CONCR</u> FILL:	ETE: A	Approximately 5"	thick.			
-		51					Brown, moist, dense	e, clayey	y SAND; trace to	few grave	1.		
_		67	9.3	117.3			Scattered caliche no	dulac: t	raca graval				
		07	7.3	117.3			Scattered carreire no	uuics, t	race graver.				
-		39					Very dense.						
-													
10-		88/12"											
-													
-	7	18					Medium dense.						
-													
-		50/5"				SC	ALLUVIUM: Brown, moist, very o	dense, c	clayey SAND.				
20 -							•	,	•				
-													
-		33					Scattered caliche no	dules.					
-													
_							Brown, dry, dense, s	silty SA	ND: trace gravel				
20		64/11"				SIVI	, ary, acise, s	571	z , auco giuroi.				
30 -													
-													
-	7	82/9"					Very dense; modera	telv cer	mented.				
							, , , , , , , , , , , , , , , , , , , ,	<i>y</i>					
-		50/5"					Four grove1						
40_		50/5"					Few gravel.			D.C.D	0100		
		Vi		<b>1</b>	3	Mn	ore		I-10: EA		TO JUNCTION I-8		
			4			Ar		P	ROJECT NO.		TY, ARIZONA TE	FIGL	JRE
		*				*			601808009	9/	15	A	47

	SAMPLES			(-			DATE DRILLED _	4,	/13/15	BORING NO		RW-4	
eet)	SAM	T00	(%) :	/ (PCF		NOIT :	GROUND ELEVAT	ION	$1,477' \pm (MSL)$	SHEET	2	OF _	2
DEPTH (feet)		BLOWS/FOOT	MOISTURE (%)	NSIT	SYMBOL	SIFICA S.C.S	METHOD OF DRIL	LING CM	IE-75, 8" Diameter I	Hollow-Stem Auger (E	nviro-Dı	rill, Inc.)	
DEF	Bulk Driven	BLO	MOIS	DRY DENSITY (PCF)	Ś	CLASSIFICATION U.S.C.S.	BASELINE STATIC	)N = _	2804+58	OFFSE	Γ= _	75	'R
							SAMPLED BY		LOGGED BY	DM REVIEW	∃D BY	JS	SR
40						SM	ALLUVIUM: (Conti	inued)					
	-						Brown, dry to moist,	, very den	ise, silty SAND; i	few gravel.			
						 GP	Brown, dry, very der	nse, poorl	y graded GRAVI	EL with sand.			
	$\mathbb{H}$	47				<u>.</u>							
	$\parallel$												
	Н				7///		Brown, dry, very der	nse, claye	$\overline{SAND}$ ; $\overline{Trace}$				
50-		50/3"					Total Depth = 49.3 f	eet.					
							Groundwater not end Backfilled and aspha			rtly after completio	n of dr	rilling.	
	I						Notes:						
	+						Groundwater, thoug due to seasonal varia						
	$\blacksquare$						report.						
	H						The ground elevation of published maps ar						
							not sufficiently accur	rate for p	reparing construc	etion bids and desig	n docu	iments.	
60 -													
	$\vdash$												
	$\vdash$												
	+												
70 -													
	$\parallel$												
	$\prod$												
	$\parallel$												
	$\vdash$												
	$\parallel$												
00	+												
80_		a #2				44-				ORING LOG	NI LO		
		V//	14		&	$M_{II}$	ore	PRC		LEY ROAD TO JUNCTION AL COUNTY, ARIZONA DATE	IN 1-8	FIGURE	:
11		_				_	ll l	, ,,,,,		-/ · · · -	1		-

9/15

	ES						DATE DOLLED		4/14/15	DODIN	C NO	DW 5
	SAMPLES	<b>-</b>	(%)	CF)		NO	DATE DRILLED				G NO	
DEPTH (feet)	S	BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	BOL	CLASSIFICATION U.S.C.S.	GROUND ELEVAT				SHEET	
EPTH	en en	SWO-	JISTU	DENS	SYMBOL	SSIFI U.S.(	METHOD OF DRIL	_				
	Bulk	BI	M	DRY		CLA	BASELINE STATIC		2806+30		OFFSET =	
							SAMPLED BY	DM	LOGGED BY DESCRIPTION/IN	DM FERPRET	REVIEWED ATION	BY JSR
0						CL	ASPHALT CONCR FILL:	ETE: A	pproximately 5" t	hick.		
-		64	3.4	131.7			Brown, moist, hard,	sandy l	ean CLAY; trace t	to few gra	ivel.	
_		49					Very dense.					
							, ory delige.					
		50/4"										
-												
10 -		46										
-		78										
						SC	ALLUVIUM: Brown, dry, very der	nse clas	vev SAND: scatte	red calich	ne nodules	
							Brown, dry, very der	1150, 614	ey Britis, seatte	red canen	ie nodules.	
		70										
20 —	$-\!\!\!/$	78										
											. — — — —	- — — — — — -
-		70				SM	Brown, dry, dense, s	silty SA	ND; very dense, tr	race few g	gravel.	
-												
	-7	45										
30 —	-	43										
		#0.75°										
		50/5"										
	+											
46	-7	43										
40_					EEEEEEE						G LOG	
			$n_{l}$	10	&	$N_{\mathcal{Q}}$	ore		I-10: EA	RLEY ROAD	TO JUNCTION I	-8
		<b>V</b>	U	•		<b>V</b> -		PI	ROJECT NO.	DA	TE	FIGURE

9/15

	SAMPLES			(=			DATE DRILLED _		4/14/15	BORIN	NG NO.		RW-5	
eet)	SAM	ТОС	(%)	DRY DENSITY (PCF)	٦	CLASSIFICATION U.S.C.S.	GROUND ELEVAT	ΓΙΟΝ	1,443' ± (MSL)		SHEET	2	OF _	2
DEPTH (feet)		BLOWS/FOOT	MOISTURE (%)	NSIT	SYMBOL	SIFICA .S.C.S	METHOD OF DRIL	LING C	ME-75, 8" Diameter I	Hollow-S	tem Auger (E	nviro-Dr	ill, Inc.)	
DEF	Bulk Driven	BLO	MOIS	RY DE	Ś	CLAS	BASELINE STATIO	ON =	2806+30		_ OFFSE	T = _	7	75'R
							SAMPLED BY	DM	LOGGED BY	DM FRPRF	_	ED BY		JSR
50 - 70 -		50/5"		DRY		SM SC	SAMPLED BY  ALLUVIUM: (Cont Brown, dry, very de Brown, dry, very de Brown, dry to moist Total Depth = 54 fee Groundwater not en Backfilled and asphone Notes: Groundwater, thoug due to seasonal variareport.  The ground elevation of published maps a not sufficiently accurate.	et. countere alt patche ations in shown and other	LOGGED BY DESCRIPTION/INT  SAND with grave sand during drilling. End on 4/14/15 show countered at the transprecipitation and above is an estima documents review.	el.  D; mode  rtly afte  ime of d several  ation or	rately ceme	ented.  ented.  y rise to a softhis ed on cos of this	illing. o a higocussed	her level l in the erpretations
_80_		<b>y</b> i	ny	<b>[0</b>	&	Νa	ore	PR	I-10: EAR	LEY ROA AL COUN	G LOG D TO JUNCTIO TY, ARIZONA		FIGUR	
		*				,		6	01808009	9	/15		A-50	)

2LES						DATE DRILLED	4/14/15	BORIN	IG NO.	RW-6
et) SAMPLES	ТО	(%)	(PCF)		NOI	GROUND ELEVATIO			SHEET	
DEPTH (feet)	/S/FO	'URE	ISITY	SYMBOL	FICAT S.C.S.	METHOD OF DRILLII			em Auger (Enviro	o-Drill, Inc.)
DEPT Bulk Driven	BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYI	CLASSIFICATION U.S.C.S.	BASELINE STATION			OFFSET =	
غ ا ۱			DR		ਹ	SAMPLED BYDI	M LOGGED E	BY DM N/INTERPRET	REVIEWED	BY JSR
0				7777	SC	ASPHALT CONCRET			ATION	
- 7	24				00	FILL: Brown, dry to moist, do	ense clayey SAND	).		
	86/11"					Very dense.				
					SC	ALLUVIUM: Brown, dry to moist, ve	erv dense, clavev S	SAND.		
1	35									
10	77/11"					Scattered caliche filam	nents, strong cemer	ntation.		
	52									
+										
20	50/5"	6.0	104.3			Scattered caliche nodu	les.			
						<u></u>				
	20				SM	Brown, dry, medium d	ense, silty SAND.			
30	58					Dense with gravel.				
	50					Very dense.				
#										
	0.4									
40	84							BORIN	G LOG	
		$n_{l}$	10 6	&	DN	ore	I-1		D TO JUNCTION I-	8
	<b>V</b>		,		<b>—</b>		PROJECT NO.		ATE	FIGURE

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			<b>72</b>	in i	2.	AAn	BORING LOG  I-10: EARLEY ROAD TO JUNCTION I-8 PINAL COUNTY, ARIZONA
80_							
-							
-							
-							
_							
70 -							
-							
	$\vdash$						
-							
-							
							not sufficiently accurate for preparing construction bids and design documents.
-							The ground elevation shown above is an estimation only. It is based on our interpretation of published maps and other documents reviewed for the purposes of this evaluation. It is
00							report.
60 -							due to seasonal variations in precipitation and several other factors as discussed in the
-							Notes: Groundwater, though not encountered at the time of drilling, may rise to a higher level
-							Groundwater not encountered during drilling.  Backfilled and asphalt patched on 4/15/15 shortly after completion of drilling.
		30/+			EEEEEEE		Total Depth = $54.3$ feet.
_		50/4"					Coarse gravel.
-							
50-		30/2					rew graver.
-		50/2"					Few gravel.
-							
		70/9"					Dense.
-							210 may, very dense, start 2 main graves
40						SM	ALLUVIUM: (Continued) Brown, dry, very dense, silty SAND with gravel.
				_			SAMPLED BY DM LOGGED BY DM REVIEWED BY JSR DESCRIPTION/INTERPRETATION
	Bulk Driven	BL	MO	JRY [		CLA	BASELINE STATION = 2808+25 OFFSET = 75'R
DEPTH (feet)	A L	OWS,	ULSIO	DENS	SYMBOL	SSIFI U.S.C	METHOD OF DRILLING CME-75, 8" Diameter Hollow-Stem Auger (Enviro-Drill, Inc.)
(feet)	-S/	BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	ا ا	CLASSIFICATION U.S.C.S.	GROUND ELEVATION1,469' ± (MSL)
	SAMPLES			CF)		z	DATE DRILLED 4/14/15 BORING NO. RW-6
	ES						2.77.224.72

14.19

I-10: EARLEY ROAD TO JUNCTION I-8 PINAL COUNTY, ARIZONA										
PROJECT NO.	DATE	FIGURE								
601808009 9/15 A-52										

	SAMPLES						DATE DRILLED _		4/17/15	BORIN	IG NO.		RW-7	
eet)	SAM	10C	(%)	DRY DENSITY (PCF)	ر ا	NOIT .	GROUND ELEVAT	ION _	$1,484' \pm (MSL)$		SHEET	1	OF _	2
DEPTH (feet)		BLOWS/FOOT	MOISTURE (%)	LISN	SYMBOL	CLASSIFICATION U.S.C.S.	METHOD OF DRIL	LING	CME-75, 8" Diameter I	Hollow-St	em Auger (E	nviro-Dr	ill, Inc.)	
DEF	Bulk	BLO	MOIS	RY DE	S	CLAS	BASELINE STATIC	DN =	2800+67		OFFSE	T = _	7	75'R
							SAMPLED BY	DM	LOGGED BY DESCRIPTION/INT	DM ERPRET	REVIEW	ED BY		JSR
0							ASPHALT CONCR	ETE. A						
						SC	FILL:	<u>.E.I.E.</u> , F	approximatery 5 ti	IICK.				
	F	31					Brown, dry, dense, o	layey S	SAND.					
	L													
	7	24												
		<u></u>												
		51	14.1	117.3		CL	Brown, moist, hard,	lean sa	ndy CLAY.					
10		32												
10 -						SC	Brown, moist, dense	e, claye	y SAND.					- — — — —
		-												
		50												
20-		33												
20		_												
		-												
		82/11"					Very dense.							
						SC	ALLUVIUM: Brown, moist, very of	dense, d	clayey SAND.					
30 -	lacksquare	40												
	$\vdash$	_												
		-												
						SM	Brown, dry, dense, s	silty SA	ND.					- — — —
		45												
	+	_												
		28												
40_							1			ODIN	C I CC			
			7)	m.	g /	AAn	ore		I-10: EAR	LEY ROA	G LOG			
			4		^	Ala		P	ROJECT NO.		TY, ARIZONA ATE		FIGUR	ιE
		*				7			601808009	9/	/15		A-53	

	SAMPLES			(			DATE DRILLED	4/	/17/15	BORIN	G NO		RW-7	
et)	SAM	TOO	(%)	, (PCF		NOI .	GROUND ELEVAT	ION	1,484' ± (MSL)		SHEET	2	OF _	2
DEPTH (feet)		BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	METHOD OF DRIL	LING CM	IE-75, 8" Diameter I	Hollow-Ste	em Auger (E	nviro-Dr	ill, Inc.)	
DEP	Bulk Driven	BLO	MOIS	XY DE	S	)LASS U.	BASELINE STATIC	)N =	2800+67		OFFSE <sup>*</sup>	Γ= _	75	5'R
				P.O.			SAMPLED BY		LOGGED BY	DM	REVIEW	ED BY	J	SR
40						SM	ALLUVIUM: (Cont.	inued)	ESCRIPTION/INT	EKPKEI	ATION			
_							Brown, dry, dense, s	ilty SANI	D.					
-		50/5"					Very dense, few grav	vel.						
-														
	-7	69												
50 -					EEEEEE		Total Depth = 50 fee							
_							Groundwater not end Backfilled and aspha	countered alt patched	during drilling. d on 4/17/15 sho	rtly after	completio	n of dr	illing.	
							Notes:							
-							Groundwater, thoug due to seasonal varia							
-							report.	m p	recipitation and	se verar o	ther factor	s as an	cusseu	in the
							The ground elevation							
							of published maps an not sufficiently accur							ition. It is
60 -														
_														
-														
-														
70 –														
-	+													
_														
	+													
-														
-	+													
80														
			<b>79 3</b>		0 1		nro				G LOG	N I-8		
		<b>Y</b> /	H'		×	$\mathbf{M}_{\mathbf{I}_{\mathbf{I}}}$	ore	PRO			Y, ARIZONA		FIGURE	

9/15

S										
st) SAMPLES			Ű.		7	DATE DRILLED _	4/16/15	BORIN	IG NO	RW-8
feet)	T00	MOISTURE (%)	Y (PC	기	CLASSIFICATION U.S.C.S.	GROUND ELEVAT	ION1,482' ± (MS	SL)	SHEET _	1 OF2
DEPTH (feet)	BLOWS/FOOT	STUR	INSI	SYMBOL	SIFIC	METHOD OF DRIL	LING CME-75, 8" Diamo	eter Hollow-Ste	em Auger (Env	viro-Drill, Inc.)
DEP. Bulk Driven	BLO	MOIS	DRY DENSITY (PCF)	S	CLAS	BASELINE STATIC	ON = 2802+	45	OFFSET	= 75'R
						SAMPLED BY	DM LOGGED BY		REVIEWE	D BYJSR
0				2,2,2,4			ETE: Approximately 8		ATION	
-	30				SC	FILL: Brown, dry, dense, o	layey SAND.			
	58									
	24									
10	44					Dense.				
	29									
			119.7		CL	Brown, moist, hard,	lean sandy CLAY; tra	ce gravel.		
20	75	9.5	119.7							
	30				00					
					SC	ALLUVIUM: Brown, dry to moist	, dense clayey SAND.			
20	50/4"					Very dense; scattere	d caliche nodules.			
30										
	50/5"					Possible cobbles.				
						Brown, dry, very de	nse, silty SAND; few g	gravel.		
40	80/9"							DOC	0100	
	Vi		<b>1</b> 0 8	<b>₹</b>	Mn	ore	I-10:		O TO JUNCTION	I I-8
		J			A 1.		PROJECT NO.		TE	FIGURE
							601808009	9/	15	A-55

	SAMPLES			(.			DATE DRILLED _	4	4/16/15	BORING NO.		RW-8	
eet)	SAM	T00	(%)	DRY DENSITY (PCF)		NOIL .	GROUND ELEVAT	ION	1,482' ± (MSL)	SHEET	2	OF _	2
DEPTH (feet)		BLOWS/FOOT	MOISTURE (%)	NSIT	SYMBOL	SIFICA S.C.S	METHOD OF DRIL	LING CM	ME-75, 8" Diameter l	Hollow-Stem Auger (E	nviro-Dr	ill, Inc.)	
DEP	Bulk	BLO	MOIS	3Y DE	S	CLASSIFICATION U.S.C.S.	BASELINE STATIC	DN = _	2802+45	OFFSE	T = _	75	R
				Ä		J	SAMPLED BY	DM	LOGGED BY _	DM REVIEW	ED BY	JS	SR
40						SM	ALLUVIUM: (Cont Brown, dry, very der	inued)					
-							, , , , , , , , , , , , ,	,	, , , , , , , ,				
-	7	41											
-		50/4"											
50 -							Total Depth = 49.8 f Groundwater not end		d d d.:11:				
-							Backfilled and aspha			rtly after completion	on of dr	illing.	
							Notes: Groundwater, thoug	rh not one	acuntared at the ti	ima of drilling ma	u mica t	o o high	or loval
							due to seasonal varia						
-							The ground elevation	n chourn	ahova is an astim	ation only. It is has	and on a	ur intor	protetions
							of published maps and not sufficiently accu	nd other	documents review	ved for the purpose	s of thi	s evalua	
60 -							not sufficiently accu	rate for p	neparing construc	ction blus and desig	gii docu	ments.	
-													
70-													
-													
-													
80_													
			<b>59</b> #			Ma				BORING LOG	ON I-8		
		<b>Y</b> //	14		Ý.	$M_{II}$	ore	PRO		AL COUNTY, ARIZONA  DATE		FIGURE	

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	S											
	SAMPLES	.		CF)		Z	DATE DRILLED _				NO	
DEPTH (feet)	/S	BLOWS/FOOT	MOISTURE (%)	TY (P	3OL	CLASSIFICATION U.S.C.S.	GROUND ELEVAT				SHEET 1	
PTH.	\ <u>\</u>	/SMO	ISTUI	ENSI	SYMBOL	SSIFI U.S.C	METHOD OF DRIL	_				Orill, Inc.)
	Driven	BL	Θ W	DRY DENSITY (PCF)		CLA	BASELINE STATIC				OFFSET =	75'R
							SAMPLED BY	DM	LOGGED BY DESCRIPTION/IN		REVIEWED BY	Y JSR
0						SC	ASPHALT CONCR FILL:	ETE: A	pproximately 5"	thick.		
-		49					Brown, dry to moist,	, dense,	clayey SAND; tr	ace gravel.		
-		33										
		33										
		44				CL	Brown, moist, hard,	sandy lo	ean CLAY; trace	gravel.		
+												
10		25 					Brown, moist, dense	- clavor	SAND			
	+					SC	Diown, moist, uchse	, ciaycy	SAND.			
+		86					Very dense.					
		36										
20		30				SC	ALLUVIUM:					
							Brown, dry, very der	nse, clay	ey SAND.			
		50/5"					Scattered caliche no	dules.				
+												
	7	68										
30	$\blacksquare$											
+	+											
		86/11"				SM	Brown, dry, very der	nse, silt	y SAND; trace gr	avel.		
		30,11										
+												
40	1	64					Few gravel.					
		V			z. /	Mn	ore		I-10: EA		O JUNCTION I-8	
		<b>V</b> "	4		^	Ala		PI	ROJECT NO.	NAL COUNTY, DATE		FIGURE
		*				*			601808009	9/15		A-57

st) SAMPLES			(			DATE DRILLED	۷	1/16/15	BORIN	IG NO		RW-9	
set) SAM	TOO	(%)	, (PCF		NOI .	GROUND ELEVAT	TION	$1,480' \pm (MSL)$		SHEET	2	OF _	2
DEPTH (feet)	BLOWS/FOOT	MOISTURE (%)	NSITY	SYMBOL	S.C.S	METHOD OF DRIL	LING C	ME-75, 8" Diameter	Hollow-Sto	em Auger (E	nviro-Dr	rill, Inc.)	
DEP Bulk Driven	BLO\	MOIS	DRY DENSITY (PCF)	S	CLASSIFICATION U.S.C.S.	BASELINE STATIC	DN = _	2804+25		OFFSE	Τ= _	75	5'R
			PA		O	SAMPLED BY		LOGGED BY	DM	REVIEW	ED BY	J	SR
50 <b>7</b> 0	80				SM	Total Depth = 50 fee Groundwater not end Backfilled and aspha Notes: Groundwater, though due to seasonal varia report.  The ground elevation of published maps an not sufficiently accu	et. countered alt patche ations in another of the counter of the c	SAND; trace to SAND; trace to during drilling. Sand on 4/16/15 shows ountered at the transprecipitation and above is an estimate documents review or eparing construction.	ertly after time of dr several of the control of th	el. completio illing, may other factor ly. It is bas he purpose	n of dr	illing.  a highescussed  our inters	er level in the
		$\Omega_{i}^{\prime}$		&	Na	ore		PIN	NAL COUNT	O TO JUNCTIC ΓΥ, ARIZONA	ON I-8		
_				_	_		PR	OJECT NO.	DA	\TE		FIGURE	Ξ

9/15

·						
et) SAMPLES						DATE DRILLED 4/24/15 BORING NO. B-1
et) SAMI	10	(%)	(PCF	١.	NOIL .	GROUND ELEVATION1,437' ± (MSL) SHEET1 OF1
DEPTH (feet)	BLOWS/FOOT	MOISTURE (%)	VSITY	SYMBOL	IFICA S.C.S	METHOD OF DRILLING CME-75, 8" Diameter Hollow-Stem Auger (Enviro-Drill, Inc.)
DEP' Bulk Driven	BLOV	MOIS	DRY DENSITY (PCF)	SY	CLASSIFICATION U.S.C.S.	BASELINE STATION = 2705+80 OFFSET = 0
			P.O.			SAMPLED BY DM LOGGED BY DM REVIEWED BY JSR
0					SC	DESCRIPTION/INTERPRETATION  ALLUVIUM:
- <u>-</u>	33	9.4	106.9			Brown, dry, medium dense, clayey SAND; trace gravel.
	46			222		Very dense.  Total Depth = 5 feet.
						Groundwater not encountered during drilling.  Backfilled on 4/24/15 shortly after completion of drilling.
						Backfilled on 4/24/13 shortly after completion of driffing.
						Notes: Groundwater, though not encountered at the time of drilling, may rise to a higher level
10						due to seasonal variations in precipitation and several other factors as discussed in the report.
						The ground elevation shown above is an estimation only. It is based on our interpretations
						of published maps and other documents reviewed for the purposes of this evaluation. It is not sufficiently accurate for preparing construction bids and design documents.
20						
-						
30						
40	A #2	<b>-</b>			<b>A A -</b>	BORING LOG
	$\mathcal{N}//$	III		Sz 📗	IIN	I-10: EARLEY ROAD TO JUNCTION I-8 PINAL COUNTY, ARIZONA

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	DOMINO EGG	
I-10: E	ARLEY ROAD TO JUNCTIO	N I-8
1	PINAL COUNTY, ARIZONA	
DJECT NO.	DATE	FIGURE

PRO 601808009 9/15

	SAMPLES						DATE DRILLED	4/24/1	15	BORING N	NO	I	3-2	
et)	SAM	T00	(%)	, (PCF		NOIL.	GROUND ELEVATION	ON1	,438' ± (MSL)	SI	HEET	1 C	)F	1
DEPTH (feet)		BLOWS/FOOT	MOISTURE (%)	NSIT	SYMBOL	SIFICA S.C.S	METHOD OF DRILLI	NG CME-7	5, 8" Diameter l	Hollow-Stem	Auger (Envi	ro-Drill,	Inc.)	
DEP	Bulk Driven	BLO	MOIS	DRY DENSITY (PCF)	S	CLASSIFICATION U.S.C.S.	BASELINE STATION	l =	2722+71		OFFSET =	·	0	
				AQ			SAMPLED BYD		GGED BY		EVIEWED	BY _	JSR	
0						SC	ALLUVIUM:							
		19	10.3	99.3			Brown, dry, medium d	iense, ciaye	ey SAND; tra	ce gravei.				
		50/4"												
					.7.7.7.		Total Depth = 4.4 feet. Groundwater not enco		ring drilling.					
							Backfilled on 4/24/15			of drilling.				
							Notes: Groundwater, though	not encoun	itered at the ti	ime of drilli	ng. may i	rise to a	higher	level
10-							due to seasonal variation report.							
							The ground elevation s	shown abov	ve is an estim	ation only.	It is based	on our	interpre	etations
							of published maps and not sufficiently accura	l other docu	iments reviev	ved for the p	ourposes o	f this e	valuatio	
							not sufficiently accura	ice for prope	aring construc		ia acsign		110.	
20-														
20														
·														
30 -														
40_										BORING	LOG			
		Vi		10	&	Mo	ore		I-10: EAR	RLEY ROAD TO JAL COUNTY, A	JUNCTION 1	[-8		
								PROJEC	T NO.	DATE		FI	GURE	

9/15

	PLES	SAMPLES	(%)			NOIL .	DATE DRILLED	4/24	/15	BORING NO.		B-3	
eet)	SAM			(PCF			GROUND ELEVATION	ON	1,442' ± (MSL)	SHEET	1	OF _	1
DEPTH (feet)	DEPTH (feet) Sulk SA iven SA		MOISTURE (%)	VSIT	SYMBOL	S.C.S	METHOD OF DRILLING CME-75, 8" Diameter Hollow-Stem Auger (Enviro-Drill, Inc.)						
DEP	Bulk Driven	BLO	MOIS	DRY DENSITY (PCF)	S)	CLASSIFICATION U.S.C.S.	BASELINE STATION	N =	2739+62	OFFSE	T = _		0
							SAMPLED BY		GGED BY	DM REVIEW	ED BY	J	SR
10 -		50/4"	5.7	104.9		CL	ALLUVIUM: Brown, dry, hard, lear  Total Depth = 5 feet. Groundwater not ence Backfilled on 4/24/15  Notes: Groundwater, though due to seasonal variati report.  The ground elevation of published maps and not sufficiently accura	ountered do shortly af not encourions in preshown about other door	LAY; scattered aring drilling. ter completion and cipitation and ove is an estimatements review.	of drilling.  ime of drilling, maseveral other factor	y rise to rs as dis sed on o	o a high cussed ur inter	ner level in the
30 -													
<i>Ninuo &amp; M</i> oore						BORING LOG  I-10: EARLEY ROAD TO JUNCTION I-8							
		$\Gamma / I$	IIC'	TU '	×				PIN	AL COUNTY, ARIZONA			

BOKING EGG									
I-10: EARLEY ROAD TO JUNCTION I-8									
PINAL COUNTY, ARIZONA									
JECT NO.	DATE	FIGURE							

PROJE 601808009 9/15 A-61

	SAMPLES			(			DATE DRILLED	4/2	4/15	BORING NO.		B-4		
eet)	SAM	10C	(%) :	DRY DENSITY (PCF)		NOIL.	GROUND ELEVATION	ON	1,447' ± (MSL)	SHEET	1_	_ OF	1	
DEPTH (feet)		BLOWS/FOOT	MOISTURE (%)	TISN	SYMBOL	SIFICA	METHOD OF DRILL	ING CME	E-75, 8" Diameter I	Hollow-Stem Auger	(Enviro-D	Orill, Inc.	)	
DEF	Bulk	BLO	MOIS	RY DE	Ś	CLASSIFICATION U.S.C.S.	BASELINE STATION	N =	2756+53	OFFS	SET =		0	
							SAMPLED BYI		OGGED BY SCRIPTION/INT		WED BY	/	JSR	
20 -		26	6.4	106.8		CL	ALLUVIUM: Brown, dry, hard, lead  Total Depth = 4.8 fee Groundwater not ence Backfilled on 4/24/15  Notes: Groundwater, though due to seasonal variate report.  The ground elevation of published maps and not sufficiently accurate.	n sandy Control of the control of th	LAY; scattered luring drilling. fter completion untered at the ti ecipitation and ove is an estim cuments review	of drilling.  me of drilling, asseveral other factories attion only. It is byed for the purpose.	may rise tors as d	to a hig iscussed our inte	gher level d in the erpretations uation. It is	
40_										ORING LOC				
		Mi			&	DN	ore		I-10: EAR	LEY ROAD TO JUNC AL COUNTY, ARIZO	TION I-8			
				7		_		PROJECT NO. DATE FIGURE						

9/15

	SAMPLES			(E			DATE DRILLED _		4/24/15	BORII	NG NO.		B-5	
	SAM		(%)	(PCF		NOIL .	GROUND ELEVAT	ION _	1,449' ± (MSL	)	SHEET	1	OF	1
DEPTH (feet)		BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	METHOD OF DRIL	LING o	CME-75, 8" Diamete	r Hollow-S	stem Auger (E	nviro-Dr	ill, Inc.	)
DEF	Bulk	BLO	MOIS	₹Y DE	Ś	SLASS U	BASELINE STATIO	ON =	2773+4	1	_ OFFSE	Γ= _		0
				AQ			SAMPLED BY	DM	LOGGED BY DESCRIPTION/II		REVIEWI	ED BY		JSR
0						CL	ALLUVIUM:							
	-	43	5.8	103.4			Brown, dry, hard, le	an sand	y CLAY; scatter	ed caliche	e nodules.			
		7												
		39					Total Depth = 5 feet	t.						
							Groundwater not end Backfilled on 4/24/1	counter			ing.			
	+						Notes:		J I I		<i>6</i> *			
10							Groundwater, though due to seasonal variation							
							report.	ations ii	i precipitation an	u severar	other ractor	s as un	scussci	a iii uic
	$\perp$						The ground elevation							
	+						of published maps at not sufficiently accu							
	I													
20														
	$\perp$													
	+													
30														
	$\parallel$													
	+													
	$\parallel$													
	$\parallel$													
40			)							BORIN	IG LOG			
			$n_{\ell}$	10	&	$N_{\mathcal{Q}}$	ore		I	ARLEY ROA	AD TO JUNCTIONTY, ARIZONA	ON I-8		
		_		,	_	_		P	ROJECT NO.	D	ATE		FIGUE	RE

9/15

	SAMPLES			(:			DATE DRILLED _		4/24/15	BORING NO.		B-6	
eet)	SAM	T00	(%)	/ (PCF		NOIL .	GROUND ELEVAT	TION _	1,472' ± (MSL)	SHEET	1	OF1	<u>.                                    </u>
DEPTH (feet)		BLOWS/FOOT	MOISTURE (%)	NSIT	SYMBOL	SIFICA .S.C.S	METHOD OF DRIL	LLING <u>c</u>	CME-75, 8" Diameter	Hollow-Stem Auger (E	nviro-Dri	ll, Inc.)	
DEF	Bulk	BLO	MOIS	DRY DENSITY (PCF)	Ś	CLASSIFICATION U.S.C.S.	BASELINE STATION	ON =	2790+35	OFFSE	T =	0	
							SAMPLED BY	DM	LOGGED BY	DM REVIEW	ED BY	JSR	
0						SC	ALLUVIUM:						
	$+$ $\angle$	31					Brown, dry, dense,	ciayey S	AND.				
		50/4"	7.4	110.2			Very dense; weakly	to mode	erately cemented.				
							Total Depth = 4.3 for Groundwater not en	eet.					
							Backfilled on 4/24/2			of drilling.			
							Notes: Groundwater, thou	gh not o	accumtared at the t	ima of drilling me	ov rico te	a higher l	lovol
10-							due to seasonal vari						
							report.	1	1	. 1 7. 1	1	• ,	
							The ground elevation of published maps a	and other	documents review	wed for the purpose	es of this	evaluation	
							not sufficiently accu	urate for	preparing construc	ction bids and desig	gn docur	nents.	
20													
30-													
40_		A #9			1	<b>A A</b> -				BORING LOG			
			14		&	$N_{\mathcal{Q}}$	ore		PIN	RLEY ROAD TO JUNCTIONAL COUNTY, ARIZONA		FIOUR	
II .		•				•		II PI	ROJECT NO.	DATE		FIGURE	

9/15

	SAMPLES			(			DATE DRILLED	4/24/15	E	BORING NO.		B-7	
eet)	SAM	TOC	(%) :	DRY DENSITY (PCF)		NOIL.	GROUND ELEVATION	ON1,466' ± (	MSL)	SHEET	1	OF	1
DEPTH (feet)		BLOWS/FOOT	MOISTURE (%)	TISN	SYMBOL	SIFICA .S.C.S	METHOD OF DRILLI	NG <u>CME-75, 8" Dia</u>	ameter Ho	ollow-Stem Auger (E	nviro-Dı	rill, Inc.)	
DEF	Bulk Driven	BLO	MOIS	RY DE	Ś	CLASSIFICATION U.S.C.S.	BASELINE STATION	l =280	07+26	OFFSE	T = _		0
							SAMPLED BYD	M LOGGED  DESCRIPTION		DM REVIEW	ED BY		JSR
0						CL	ALLUVIUM:						
		50/5"	6.0	110.6			Brown, dry, hard, lean	sandy CLAY.					
		50/5"			////		Weakly to moderately Total Depth = 4 feet.	cemented.					
							Groundwater not enco			0.1.111			
·							Backfilled on 4/24/15	shortly after comp	oletion of	f drilling.			
							Notes:		4 41 4:	£ 4.:11:	: 4	1.:	1 1 1
							Groundwater, though due to seasonal variati						
10 -							report.						
							The ground elevation						
							of published maps and not sufficiently accura						
							not sufficiently accura	to for propuring of	mstructi	on ords and desig	,ii docu	iments.	
-													
20 -													
30 -													
40_			)						ВС	ORING LOG			
		$\mathcal{N}/\mathcal{I}$		10	&	M	ore	Į.	10: EARLE	EY ROAD TO JUNCTION ARIZONA			
				_				PROJECT NO.		DATE		FIGUR	RE

9/15

	SAMPLES			(-			DATE DRILLED	4/2	24/15	BORING NO.		B-8		
eet)	SAM	T00	(%)	DRY DENSITY (PCF)	با	CLASSIFICATION U.S.C.S.	GROUND ELEVATION	ON	1,463' ± (MSL)	SHEET _	(	OF1		
DEPTH (feet)		BLOWS/FOOT	MOISTURE (%)	LISN	SYMBOL	SIFICA	METHOD OF DRILL	LING CMI	E-75, 8" Diameter F	Hollow-Stem Auger (En	viro-Drill	, Inc.)		
DEF	Bulk Driven	BLO	MOIS	RY DE	Ś	CLAS(	BASELINE STATIO	N =	2824+17	OFFSE	Γ =	0		
							SAMPLED BY		OGGED BY	DM REVIEWS	ED BY _	JSR		
0						CL	ALLUVIUM:			<u> </u>				
		30					Brown, dry, hard, lea	ın sandy C	CLAY.					
		50/5"	5.7	101.4			Moderately cemented Total Depth = 4.4 fee	et.						
							Groundwater not ence Backfilled on 4/24/15			of drilling.				
							Notes:	•	•	C				
							Groundwater, though due to seasonal variat							
10-							report.	uons in pi	ecipitation and s	several other factor	s as uisci	assed in the		
							The ground elevation							
							of published maps an not sufficiently accur-							
20														
20 -														
30 -														
40_									D	ORING LOG				
		MÌ		10	&	Mo	ore		I-10: EAR	LEY ROAD TO JUNCTIC AL COUNTY, ARIZONA	N I-8			
		V		, —		A 7.		PROJECT NO. DATE FIGURE						

9/15

et) SAMPLES						DATE DRILLED 4/24/15 BORING NO. B-9
et) SAM	TO	(%)	(PCF		NOI .	GROUND ELEVATION1,469' ± (MSL)
DEPTH (feet)	BLOWS/FOOT	MOISTURE (%)	NSITY	SYMBOL	S.C.S	METHOD OF DRILLING CME-75, 8" Diameter Hollow-Stem Auger (Enviro-Drill, Inc.)
DEP' Bulk Driven	BLOV	MOIS	DRY DENSITY (PCF)	S	CLASSIFICATION U.S.C.S.	BASELINE STATION =
			AQ			SAMPLED BY DM LOGGED BY DM REVIEWED BY JSR DESCRIPTION/INTERPRETATION
0					CL	ALLUVIUM:
_	30	2.9	125.3			Brown, dry, hard, clayey SAND.
	4.5					
	46					Trace gravel; scattered caliche nodules.  Total Depth = 5 feet.
						Groundwater not encountered during drilling.  Backfilled on 4/24/15 shortly after completion of drilling.
						Notes: Groundwater, though not encountered at the time of drilling, may rise to a higher level
10						due to seasonal variations in precipitation and several other factors as discussed in the report.
						The ground elevation shown above is an estimation only. It is based on our interpretations
						of published maps and other documents reviewed for the purposes of this evaluation. It is not sufficiently accurate for preparing construction bids and design documents.
20						
30						
40						
	a #2			1		BORING LOG
	N / / /			&	IJN	I-10: EARLEY ROAD TO JUNCTION I-8 PINAL COUNTY, ARIZONA

**7 7 -- - 3** 

	DOMINO LOG									
I-10: EARLEY ROAD TO JUNCTION I-8 PINAL COUNTY, ARIZONA										
	INAL COUNTT, ARIZONA									
PROJECT NO.	DATE	FIGURE								

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	SAMPLES						DATE DRILLED	4/24/	15	BORING NO.		B-10	
eet)	SAM	TOC	(%)	DRY DENSITY (PCF)		CLASSIFICATION U.S.C.S.	GROUND ELEVATION	ON1	1,484' ± (MSL)	SHEET	1	OF _	1
DEPTH (feet)		BLOWS/FOOT	MOISTURE (%)	NSIT	SYMBOL	SIFICA S.C.S	METHOD OF DRILLI	ING CME-7	75, 8" Diameter I	Hollow-Stem Auger (E	nviro-Dril	l, Inc.)	
DEP.	Bulk Driven	BLO	MOIS	RY DE	S	)LASS	BASELINE STATION	l =	2858+00	OFFSE	T =	0	l
				AQ			SAMPLED BYD		GGED BY _	DM REVIEW ERPRETATION	ED BY	JS	SR
0						SC	FILL: Brown, dry, loose, cla			<u> </u>			
-		6					Brown, dry, roose, cra	ycy SAND	with graver.				
-		14	6.2	109.4			Very dense; scattered	caliche noc	lules				
			0.2	107.1	7777		Total Depth = 5 feet.						
-							Groundwater not enco Backfilled on 4/24/15			of drilling.			
-							Notes:						
10 -	Н						Groundwater, though due to seasonal variati						
-							report.						
	Н						The ground elevation of published maps and	d other docu	uments reviev	ved for the purpose	s of this	evaluat	
-	Щ						not sufficiently accura	ite for prepa	aring construc	ction bids and desig	gn docun	nents.	
=													
-													
20-													
	П												
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	H												
30 -	H												
-													
-	$\mathbb{H}$												
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	H												
-	H												
40_						<b>.</b> .			В	ORING LOG			
		V		10	Sz	DM	ore			LEY ROAD TO JUNCTIONAL COUNTY, ARIZONA			

I-10: E	ARLEY ROAD TO JUNCTIO	N I-8
I	PINAL COUNTY, ARIZONA	
PROJECT NO.	DATE	FIGURE

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	SAMPLES			(			DATE DRILLED	4/	7/15	BORI	NG NO.		HA-3	
eet)	SAM	TOC	(%) :	DRY DENSITY (PCF)		CLASSIFICATION U.S.C.S.	GROUND ELEVATION	ON	1,443' ± (MSL)		SHEET	1	OF _	1
DEPTH (feet)		BLOWS/FOOT	MOISTURE (%)	TISN	SYMBOL	SIFICA	METHOD OF DRILLI	ING Han	d Sample					
DEF	Bulk Driven	BLO	MOIS	RY DE	Ś	CLAS(	BASELINE STATION	J =	2719+70		_ OFFSE	Γ= _	10	0'R
							SAMPLED BYD		OGGED BY _	DM ERPRE	REVIEWI	ED BY	J	JSR
20 -						SC	ALLUVIUM: Brown, dry, medium d  Total Depth = 3 feet. Groundwater not enco Backfilled on 4/7/15 sl  Notes: Groundwater, though is due to seasonal variation report.  The ground elevation is of published maps and not sufficiently accurate.	dense, classification dense, classification and encodens in processions and dense de	ayey SAND; traduring drilling. ter completion of the traduction and th	ce grave of drilling me of conserveral ation oved for	rel.  drilling, may other factor only. It is bas the purpose	rise to s as dis	o a high scussed our inter s evalua	ner level in the
40														
		Vi	7/	IN a	&	Mn	ore		I-10: EAR	RLEY RO	NG LOG AD TO JUNCTION NTY, ARIZONA	ON I-8		
		V	H			A 12		PRO	JECT NO.		DATE		FIGUR	 E

9/15

	SAMPLES						DATE DRILLED	4/	7/15	BORI	NG NO.		HA-4	
eet)	SAM	TOC	(%)	DRY DENSITY (PCF)		CLASSIFICATION U.S.C.S.	GROUND ELEVATION	ON	1,448' ± (MSL)		SHEET	1	OF _	1
DEPTH (feet)		BLOWS/FOOT	MOISTURE (%)	TISN	SYMBOL	SIFICA	METHOD OF DRILLI	ING Han	d Sample					
DEF	Bulk Driven	BLO	MOIS	RY DE	Ś	CLAS(	BASELINE STATION	<b>1</b> =	2746+40		_ OFFSE	Γ= _	10	0'R
							SAMPLED BYD		OGGED BY _	DM ERPRE	REVIEWI	ED BY	J	JSR
20 -						SC	ALLUVIUM: Brown, dry, medium of  Total Depth = 3 feet. Groundwater not enco Backfilled on 4/7/15 st  Notes: Groundwater, though of due to seasonal variatireport.  The ground elevation of published maps and not sufficiently accura	dense, classification dense, classification and enco	ayey SAND; traduring drilling. ter completion of the traduction and th	ce grave of drilling me of conserveral ation oved for	rel.  drilling, may other factor only. It is bas the purpose	rise to s as dis	o a high scussed our inter s evalua	ner level in the
40_										BORIN	NG LOG			
				10	&	Ma	ore		I-10: EAR	RLEY RO	AD TO JUNCTIONTY, ARIZONA	ON I-8		
				,		_		PRO	JECT NO.	[	DATE		FIGUR	E

9/15

	SAMPLES			(			DATE DRILLED	4/7/1	15	BORI	NG NO.		HA-5	
eet)	SAM	TOC	(%) :	/ (PCF		NOIL .	GROUND ELEVATIO	N	1,457' ± (MSL)		SHEET	1	OF _	1
DEPTH (feet)		BLOWS/FOOT	MOISTURE (%)	LISN	SYMBOL	SIFICA .S.C.S	METHOD OF DRILLIN	NG Hand S	Sample					
DEF	Bulk Driven	BLO	MOIS	DRY DENSITY (PCF)	S	CLASSIFICATION U.S.C.S.	BASELINE STATION	=	2759+80		_ OFFSE	Γ= _	1	0'R
						J	SAMPLED BYD		GGED BY	DM ERPRE	REVIEWI	ED BY	J	ISR
20 -						SC	ALLUVIUM: Brown, dry, medium de  Total Depth = 3 feet. Groundwater not encou Backfilled on 4/7/15 sh  Notes: Groundwater, though n due to seasonal variation report.  The ground elevation s of published maps and not sufficiently accurate	ense, clayer untered du nortly after not encoun ons in prec	ey SAND; tra  ring drilling. r completion of  tered at the ticipitation and  ve is an estimuments review	ce grave of drilling me of conserveral action oved for	rel.  rel.  drilling, may other factor only. It is bas the purpose	rise to s as dis	o a high scussed our inter s evalua	er level in the
40														
		Vi		IN a	s.	Mn	ore		I-10: EAR	RLEY RO	AD TO JUNCTION	ON I-8		
		<b>V</b>	4	, •		Ala		PROJEC			NTY, ARIZONA DATE		FIGUR	E

9/15

	SAMPLES						DATE DRILLED		4/7/15	BORING NO.	НА-6
eet)	SAM	TOO	(%)	DRY DENSITY (PCF)		NOIL .	GROUND ELEVAT	ION _	1,456' ± (MSL)	SHEET	1 OF 1
DEPTH (feet)		BLOWS/FOOT	MOISTURE (%)	NSIT	SYMBOL	SIFICA S.C.S	METHOD OF DRIL	LING <u>I</u>	Iand Sample		
DEP	Bulk Driven	BLO	MOIS	Y DE	S	CLASSIFICATION U.S.C.S.	BASELINE STATIO	DN =	31+60	OFFSET =	: 10'R
				PG		O	SAMPLED BY	DM	LOGGED BY	DM REVIEWED	BYJSR
10						SC	due to seasonal varia report.  The ground elevatio of published maps a	countered shortly hand enactions in showing other	clayey SAND; tra	of drilling.  me of drilling, may riseveral other factors a	on our interpretations f this evaluation. It is
30										BORING LOG	-8
			n!		&	DN	ore		I-10: EAR		-8
II				,							

BOKING LOG									
I-10: EARLEY ROAD TO JUNCTION I-8									
PINAL COUNTY, ARIZONA									
PROJECT NO.	DATE	FIGURE							
601808009	9/15	A-72							

	SAMPLES						DATE DRILLED	4/7/15		BORI	NG NO.		HA-7	
eet)	SAM	TOC	(%)	/ (PCF		NOIL .	GROUND ELEVATIO	N1,462'	± (MSL)		SHEET	1	OF _	1
DEPTH (feet)		BLOWS/FOOT	MOISTURE (%)	NSIT	SYMBOL	SIFICA .S.C.S	METHOD OF DRILLIN	NG Hand Sample	e					
DEF	Bulk Driven	BLO	MOIS	DRY DENSITY (PCF)	Ś	CLASSIFICATION U.S.C.S.	BASELINE STATION	=	13+80		_ OFFSE	Γ= _	10	)'R
						J	SAMPLED BYD			DM ERPRE	_ REVIEWI	ED BY	J;	SR
20 -						SC	ALLUVIUM: Brown, dry, medium de  Total Depth = 3 feet. Groundwater not encou Backfilled on 4/7/15 sh  Notes: Groundwater, though n due to seasonal variation report.  The ground elevation s of published maps and not sufficiently accurate	ense, clayey Sa untered during nortly after con not encountered ons in precipita hown above is other documer	drilling.  drilling.  npletion of the tite	ce grave of drilling me of conserveral ation oved for	rel.  rel.  rel.  rel.  rel.  rilling, may other factor  rolly. It is bas the purpose	rise to s as dis	o a high scussed our inter s evalua	er level in the
40														
40_		N #3	<b>50 7</b>		_ 4						NG LOG	NI O		
		<b>Y</b> //	4		交	$M_{II}$	ore	PROJECT NO	PIN	IAL COU	NTY, ARIZONA	.1 N 1-0	FIGURE	
(1)		_				_	11		1	_		i		

9/15

	SAMPLES			(.			DATE DRILLED	4/7	//15	BORI	NG NO.		HA-8	
eet)	SAM	TOC	(%)	/ (PCF		NOIT.	GROUND ELEVATION	N	1,463' ± (MSL)		SHEET	1	OF _	1
DEPTH (feet)		BLOWS/FOOT	MOISTURE (%)	NSIT	SYMBOL	SIFICA .S.C.S	METHOD OF DRILLIN	NG Hand	Sample					
DEF	Bulk Driven	BLO	MOIS	DRY DENSITY (PCF)	Ś	CLASSIFICATION U.S.C.S.	BASELINE STATION	=	11+50		_ OFFSE	Γ= _	1	0'R
							SAMPLED BYDM		OGGED BY _	DM ERPRE	REVIEWI	ED BY	]	ISR
20 -						SC	ALLUVIUM: Brown, dry, medium de  Total Depth = 3 feet. Groundwater not encou Backfilled on 4/7/15 sh  Notes: Groundwater, though n due to seasonal variation report.  The ground elevation so of published maps and not sufficiently accurate	ense, clar untered d nortly aft not encou ons in pre-	yey SAND; tra uring drilling. er completion of intered at the tirecipitation and ove is an estimate cuments review	ce grave of drilling me of conserveral ation oved for	rel.  rel.  drilling, may other factor only. It is bas the purpose	rise to s as dis	o a high scussed our inte s evalu	er level in the
40_														
					e.	Ma	nra				NG LOG	ON I-8		
		<b>V</b>	H'		×	MA	ore	PROJE	PIN ECT NO.		NTY, ARIZONA DATE		FIGUR	E

9/15

	SAMPLES						DATE DRILLED		4/7/15	BORING NO.	НА-9
eet)	SAM	TOO	(%)	DRY DENSITY (PCF)		NOIL:	GROUND ELEVAT	ION _	1,462' ± (MSL)	SHEET	1 OF 1
DEPTH (feet)		BLOWS/FOOT	MOISTURE (%)	NSIT	SYMBOL	S.C.S	METHOD OF DRIL	LING <u>F</u>	Iand Sample		
DEP	Bulk Driven	BLO√	MOIS	Y DE	SY	CLASSIFICATION U.S.C.S.	BASELINE STATIO	ON =	2812+70	OFFSET:	= 10'R
				AQ .		0	SAMPLED BY	DM	LOGGED BY _	DM REVIEWE	DBYJSR
0						SC	ALLUVIUM: Brown, dry, medium  Total Depth = 3 feet Groundwater not end Backfilled on 4/7/15	 countere	ed during drilling.		
10-										me of drilling, may r several other factors	
-							of published maps a	nd other	documents review		d on our interpretations of this evaluation. It is documents.
20 -											
30 -											
40_		n #2								ORING LOG	
		<b>V//</b>	14		&	$N_{I}$	ore			RLEY ROAD TO JUNCTION IAL COUNTY, ARIZONA	1-8

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	DOMING LOG									
I-10: EARLEY ROAD TO JUNCTION I-8										
PINAL COUNTY, ARIZONA										
PROJECT NO.	DATE	FIGURE								
601808009	9/15	A-75								

	SAMPLES			(			DATE DRILLED	4/	7/15	BORI	NG NO.		HA-10	
eet)	SAM	TOC	(%) :	DRY DENSITY (PCF)		CLASSIFICATION U.S.C.S.	GROUND ELEVATION	ON	1,467' ± (MSL)		SHEET	1	OF _	1
DEPTH (feet)		BLOWS/FOOT	MOISTURE (%)	LISN	SYMBOL	SIFICA .S.C.S	METHOD OF DRILLI	ING <u>Han</u>	d Sample					
DEP	Bulk Driven	BLO	MOIS	3Y DE	S	SLAS6 U	BASELINE STATION	J =	2828+50		OFFSE	Γ= _	1	0'R
				۵		O	SAMPLED BYD		OGGED BY	DM FRPRF	REVIEW	ED BY		JSR
20 -				AQ		SM	ALLUVIUM: Brown, dry, medium d  Total Depth = 3 feet. Groundwater not enco Backfilled on 4/7/15 st  Notes: Groundwater, though a due to seasonal variation of published maps and not sufficiently accura	dense, sildense,	ty SAND; trace during drilling. ter completion of untered at the tirecipitation and	gravel  of drilli  me of c  several  ation o	ng. drilling, may other factor nly. It is bas the purpose	rise to as di	o a high scussed our inte s evalu	ner level l in the rpretations ation. It is
40_										BORIN	NG LOG			
			$n_{\ell}$	0	&	Na	ore		I-10: EAR PIN	RLEY ROA	AD TO JUNCTIO NTY, ARIZONA	ON I-8		
						_		PRO	JECT NO.		DATE		FIGUR	E

9/15

	SAMPLES			(			DATE DRILLED	4/	7/15	BORI	NG NO.		HA-11	
eet)	SAM	TOC	(%)	DRY DENSITY (PCF)		CLASSIFICATION U.S.C.S.	GROUND ELEVATION	ON	1,480' ± (MSL)		SHEET	1	OF _	1
DEPTH (feet)		BLOWS/FOOT	MOISTURE (%)	TISN	SYMBOL	SIFICA	METHOD OF DRILLI	ING Han	d Sample					
DEF	Bulk Driven	BLO	MOIS	RY DE	Ś	CLAS(	BASELINE STATION	<b>1</b> =	2847+80		_ OFFSE	Γ= _	10	0'R
							SAMPLED BYD		OGGED BY _	DM ERPRE	REVIEWI	ED BY	J	SR
20 -						SC	ALLUVIUM: Brown, dry, medium of  Total Depth = 3 feet. Groundwater not enco Backfilled on 4/7/15 st  Notes: Groundwater, though of due to seasonal variation report.  The ground elevation of published maps and not sufficiently accura	dense, classification dense, classification and enco	ayey SAND; traduring drilling. ter completion of the traduction and th	ce grave of drilling me of conserveral ation oved for	rel.  rel.  drilling, may other factor only. It is bas the purpose	rise to	o a high scussed our inter s evalua	er level in the
40						<b>.</b>			E	BORIN	NG LOG			
			$n_{l}$	0	&	Na	ore		I-10: EAR PIN	RLEY ROA	AD TO JUNCTIO NTY, ARIZONA	ON I-8		
	_				_	_		PRO	JECT NO.		DATE		FIGURE	E

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#### APPENDIX B

### LABORATORY TESTING

### Classification

Soils were visually and texturally classified in accordance with the Unified Soil Classification System (USCS) in general accordance with ASTM D 2488. Soil classifications are indicated on the logs of the exploratory borings in Appendix A.

# **In-Place Moisture and Density Tests**

The moisture content and dry density of relatively undisturbed samples obtained from the exploratory borings were evaluated in general accordance with AASHTO T265. These test results are presented on the logs of the exploratory borings in Appendix A.

## **Gradation Analysis**

Gradation analysis tests were performed on selected representative soil samples in general accordance with ASTM D 422. The grain-size distribution curves are shown on Figures B-1 through B-25. These test results were utilized in evaluating the soil classifications in accordance with the USCS.

### **Atterberg Limits**

Tests were performed on selected representative fine-grained soil samples to evaluate the liquid limit, plastic limit, and plasticity index in general accordance with ASTM D 4318. These test results were utilized to evaluate the soil classification in accordance with the USCS. The test results and classifications are shown on Figures B-26 through B-29.

### **Consolidation Tests**

Consolidation tests were performed on selected relatively undisturbed soil samples in general accordance with ASTM D 2435. The samples were inundated during testing to represent adverse field conditions. The percent of consolidation for each load cycle was recorded as a ratio of the amount of vertical compression to the original height of the sample. The results of the test are summarized on Figures B-30 through B-36.

# **Maximum Dry Density and Optimum Moisture Content Tests**

The maximum dry density and optimum moisture content of selected representative soil samples were evaluated in general accordance with ASTM D 698. The results of these tests are summarized on Figures B-37 through B-40.



Geotechnical/Foundation Report I-10: Earley Road to Junction I-8 Pinal County, Arizona

# **R-value**

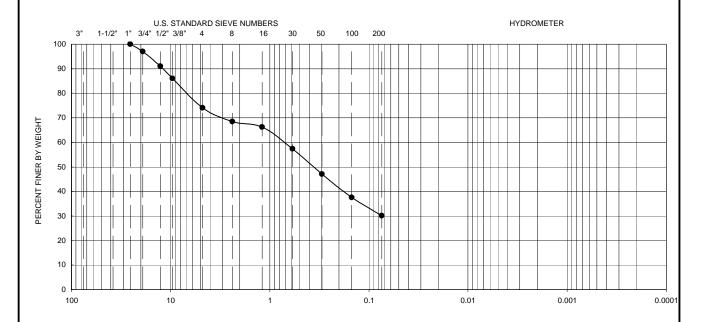
The resistance value, or R-value, for site soils was evaluated in general accordance with ASTM D 2844. Samples were prepared and evaluated for exudation pressure and expansion pressure. The equilibrium R-value is reported as the lesser or more conservative of the two calculated results. The test results are shown on Figure B-41.

## **Soil Corrosivity Tests**

Soil pH and minimum resistivity tests were performed on representative samples in general accordance with Arizona Test 236c. The chloride content of the selected samples was evaluated in general accordance with Arizona Test 736. The sulfate content of the selected samples was evaluated in general accordance with Arizona Test 733. The test results are presented on Figures B-42 and B-43.



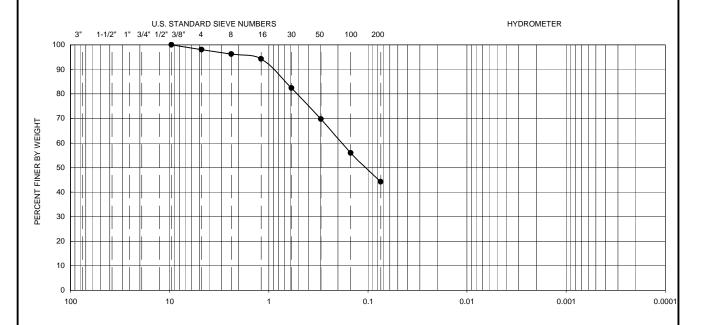
GRAV			SAND		FINES				
Coarse	Fine	Coarse	Medium	Fine	Silt	Clay			



Symbol	Hole No.	Depth (ft)	Liquid Limit	Plastic Limit	Plasticity Index	D <sub>10</sub>	D <sub>30</sub>	D <sub>60</sub>	Cu	C <sub>c</sub>	Passing No. 200 (%)	U.S.C.S
•	B-1	0.0-5.0	29	13	16	1					30	SC

<b>Ninyo</b> «	Moore	GRADATION TEST RESULTS	FIGURE
PROJECT NO.	DATE	I-10, EARLEY ROAD TO JUNCTION I-8 PINAL COUNTY, ARIZONA	B-1
601808009	9/15	T HALL GOOD TT, AND LOVE	D-1

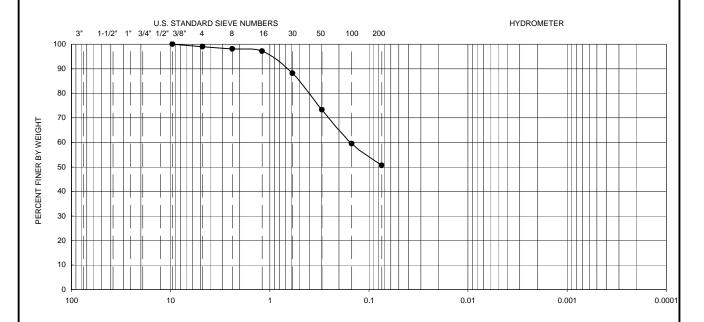
GRAV			SAND		FINES				
Coarse	Fine	Coarse	Medium	Fine	Silt	Clay			



Symbol	Hole No.	Depth (ft)	Liquid Limit	Plastic Limit	Plasticity Index	D <sub>10</sub>	D <sub>30</sub>	D <sub>60</sub>	Cu	C <sub>c</sub>	Passing No. 200 (%)	U.S.C.S
•	B-2	0.0-4.4	28	15	13						44	SC

<b>Ninyo</b> «	Woore	GRADATION TEST RESULTS	FIGURE
PROJECT NO.	DATE	I-10, EARLEY ROAD TO JUNCTION I-8 PINAL COUNTY, ARIZONA	B-2
601808009	9/15	T HALL GOOTH T, MAZOWA	D-Z

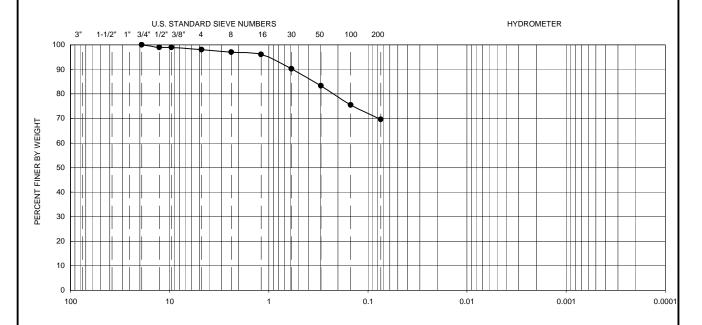
GRAV			SAND		FINES		
Coarse	Fine	Coarse	Medium	Fine	Silt	Clay	



Symbol	Hole No.	Depth (ft)	Liquid Limit	Plastic Limit	Plasticity Index	D <sub>10</sub>	D <sub>30</sub>	D <sub>60</sub>	Cu	C <sub>c</sub>	Passing No. 200 (%)	U.S.C.S
•	B-3	0.0-5.0	32	16	16						51	CL

<b>Ninyo</b> «	Moore	GRADATION TEST RESULTS	FIGURE
PROJECT NO.	DATE	I-10, EARLEY ROAD TO JUNCTION I-8 PINAL COUNTY, ARIZONA	B-3
601808009	9/15	THATE GOONTT, ANIZONA	D-3

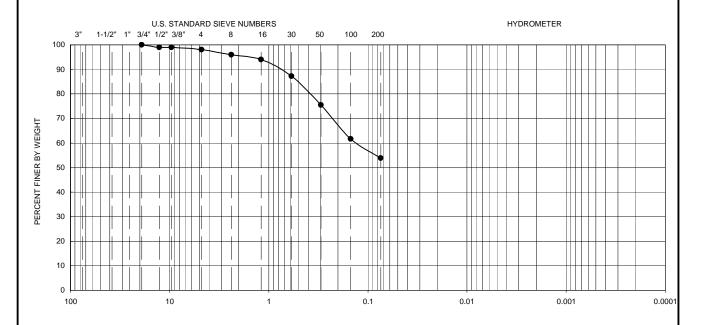
GRAV			SAND			FINES
Coarse	Fine	Coarse	Medium	Fine	Silt	Clay



Symbol	Hole No.	Depth (ft)	Liquid Limit	Plastic Limit	Plasticity Index	D <sub>10</sub>	D <sub>30</sub>	D <sub>60</sub>	Cu	C <sub>c</sub>	Passing No. 200 (%)	U.S.C.S
•	B-4	0.0-4.8	28	16	12						70	CL

<b>Ninyo</b> «	Moore	GRADATION TEST RESULTS	FIGURE
PROJECT NO.	DATE	I-10, EARLEY ROAD TO JUNCTION I-8 PINAL COUNTY, ARIZONA	B-4
601808009	9/15	THAL GOOTT, MIZOWY	D-4

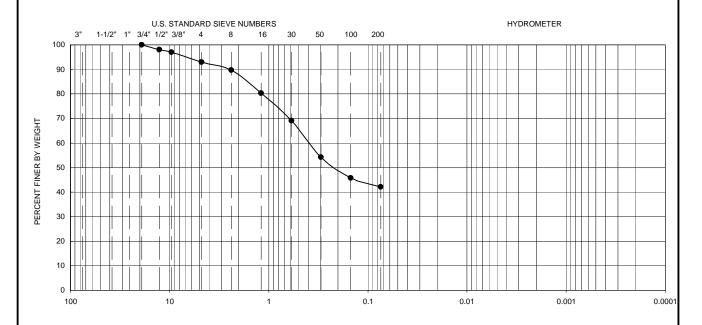
GRAV			SAND			FINES
Coarse	Fine	Coarse	Medium	Fine	Silt	Clay



Symbol	Hole No.	Depth (ft)	Liquid Limit	Plastic Limit	Plasticity Index	D <sub>10</sub>	D <sub>30</sub>	D <sub>60</sub>	Cu	C <sub>c</sub>	Passing No. 200 (%)	U.S.C.S
•	B-5	0.0-5.0	28	17	11						54	CL

<b>Ninyo</b> «	Woore	GRADATION TEST RESULTS	FIGURE
PROJECT NO.	DATE	I-10, EARLEY ROAD TO JUNCTION I-8 PINAL COUNTY, ARIZONA	B-5
601808009	9/15	T HALL GOOD TT, AND LOVE	D-3

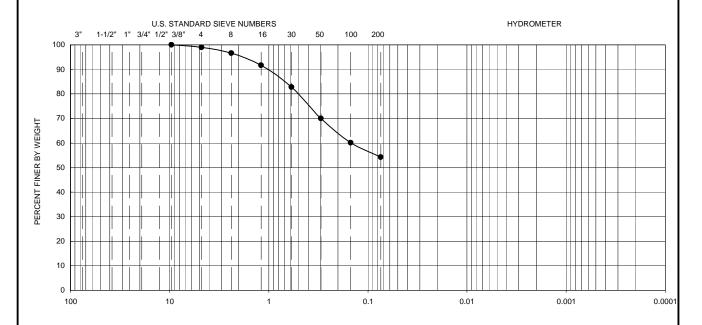
GRAV			SAND			FINES
Coarse	Fine	Coarse	Medium	Fine	Silt	Clay



Symbol	Hole No.	Depth (ft)	Liquid Limit	Plastic Limit	Plasticity Index	D <sub>10</sub>	D <sub>30</sub>	D <sub>60</sub>	Cu	C <sub>c</sub>	Passing No. 200 (%)	U.S.C.S
•	B-6	0.0-4.4	26	15	11			1		1	42	SC

<b>Ninyo</b> «	Woore	GRADATION TEST RESULTS	FIGURE
PROJECT NO.	DATE	I-10, EARLEY ROAD TO JUNCTION I-8 PINAL COUNTY, ARIZONA	B-6
601808009	9/15	THAT GOOTH, MIZOW	D-0

GRAV			SAND		FINES		
Coarse	Fine	Coarse	Medium	Fine	Silt	Clay	



Symbol	Hole No.	Depth (ft)	Liquid Limit	Plastic Limit	Plasticity Index	D <sub>10</sub>	D <sub>30</sub>	D <sub>60</sub>	Cu	C <sub>c</sub>	Passing No. 200 (%)	U.S.C.S
•	B-7	0.0-4.0	27	16	11						54	CL

<b>Ninyo</b> «	Moore	GRADATION TEST RESULTS	FIGURE
PROJECT NO.	DATE	I-10, EARLEY ROAD TO JUNCTION I-8 PINAL COUNTY, ARIZONA	B-7
601808009	9/15	T HALL GOOD TT, AND LOVE	D-1

GRAV			SAND		FINES		
Coarse	Fine	Coarse	Medium	Fine	Silt	Clay	



Symbol	Hole No.	Depth (ft)	Liquid Limit	Plastic Limit	Plasticity Index	D <sub>10</sub>	D <sub>30</sub>	D <sub>60</sub>	Cu	C <sub>c</sub>	Passing No. 200 (%)	U.S.C.S
•	B-8	0.0-4.4	30	14	16						63	CL

<b>Ninyo</b> «	Woore	GRADATION TEST RESULTS	FIGURE
PROJECT NO.	DATE	I-10, EARLEY ROAD TO JUNCTION I-8 PINAL COUNTY, ARIZONA	R-8
601808009	9/15	T HALL GOOD TT, AND LOVE	D-0

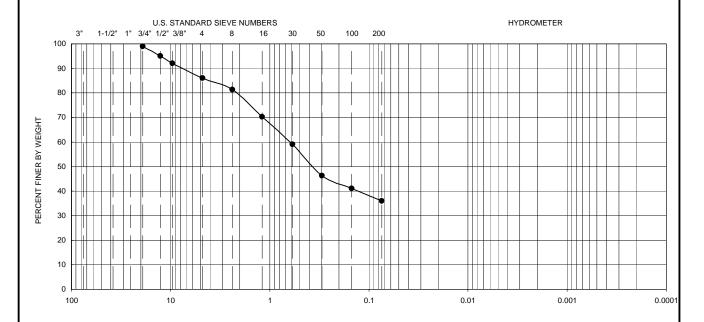
	GRAVEL		SAND		FINES			
Coarse	Fine	Coarse	Medium	Fine	Silt	Clay		



Symbol	Hole No.	Depth (ft)	Liquid Limit	Plastic Limit	Plasticity Index	D <sub>10</sub>	D <sub>30</sub>	D <sub>60</sub>	Cu	C <sub>c</sub>	Passing No. 200 (%)	U.S.C.S
•	B-9	0.0-5.0	22	14	8						38	SC

<b>Ninyo</b> «	Woore	GRADATION TEST RESULTS	FIGURE
PROJECT NO.	DATE	I-10, EARLEY ROAD TO JUNCTION I-8 PINAL COUNTY, ARIZONA	B-9
601808009	9/15	T HALL GOOD TT, AND LOW	ל

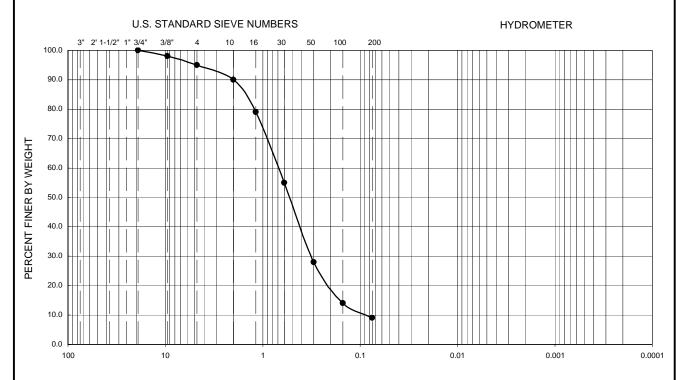
GRAV			SAND		FINES		
Coarse	Fine	Coarse	Medium	Fine	Silt	Clay	



Symbol	Hole No.	Depth (ft)	Liquid Limit	Plastic Limit	Plasticity Index	D <sub>10</sub>	D <sub>30</sub>	D <sub>60</sub>	Cu	C <sub>c</sub>	Passing No. 200 (%)	U.S.C.S
•	B-10	0.0-5.0	27	17	10						36	SC

<b>Ninyo</b> «	Woore	GRADATION TEST RESULTS	FIGURE
PROJECT NO.	DATE	I-10, EARLEY ROAD TO JUNCTION I-8 PINAL COUNTY, ARIZONA	B-10
601808009	9/15	1 IIVL 000W1,7M20W	D-10

I GRAN	GRAVEL SAND		FINES				
Coarse	Fine	Coarse	Medium	Fine	SILT	CLAY	

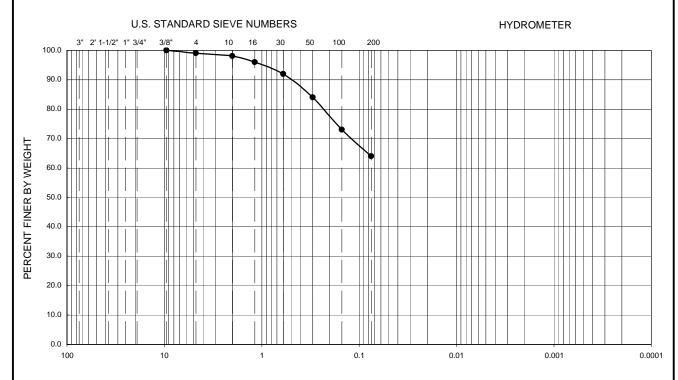


Symbol	Sample Location	Depth (ft)	Liquid Limit	Plastic Limit	Plasticity Index	D <sub>10</sub>	D <sub>30</sub>	D <sub>60</sub>	Cu	Сс	Passing No. 200 (%)	USCS
•	BR-2	18.5-20.0	1	1	NP	0.09	0.32	0.69	7.7	1.6	9	SW-SM

PERFORMED IN GENERAL ACCORDANCE WITH ASTM D 422  $\ensuremath{\mathsf{NP}}$  - INDICATES NON-PLASTIC

<b>Ninyo</b> «	Woore	GRADATION TEST RESULTS	FIGURE
PROJECT NO.	DATE	I-10, EARLEY ROAD TO JUNCTION I-8 PINAL COUNTY, ARIZONA	B-11
601808009	9/15	T INAL COUNTT, ANIZONA	D-11

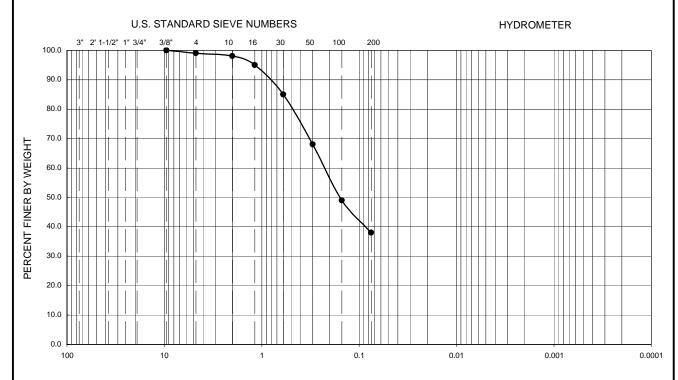
I GRAN	GRAVEL SAND		FINES				
Coarse	Fine	Coarse	Medium	Fine	SILT	CLAY	



Symbol	Sample Location	Depth (ft)	Liquid Limit	Plastic Limit	Plasticity Index	D <sub>10</sub>	D <sub>30</sub>	D <sub>60</sub>	Cu	Сс	Passing No. 200 (%)	uscs
•	BR-3	1.0-2.5	32	16	16	ı	ı	1	1	ı	64	CL

<b>Ninyo</b> &	Woore	GRADATION TEST RESULTS	FIGURE
PROJECT NO.	DATE	I-10, EARLEY ROAD TO JUNCTION I-8 PINAL COUNTY, ARIZONA	B-12
601808009	9/15	THATE GOODNIT, ANIZONA	D-12

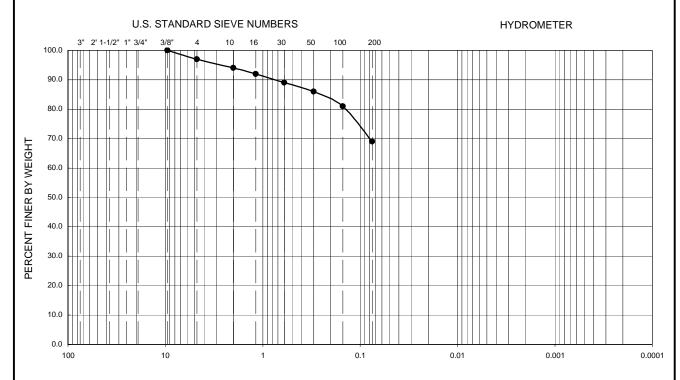
GRA	GRAVEL			D	FINES				
Coarse	Fine	Coarse	Medium	Fine	SILT	CLAY			



Symbol	Sample Location	Depth (ft)	Liquid Limit	Plastic Limit	Plasticity Index	D <sub>10</sub>	D <sub>30</sub>	D <sub>60</sub>	Cu	Cc	Passing No. 200 (%)	USCS
•	BR-4	8.5-10.0	31	14	17	1	1	1		ı	38	sc

<b>Ninyo</b> &	Woore	GRADATION TEST RESULTS	FIGURE
PROJECT NO.	DATE	I-10, EARLEY ROAD TO JUNCTION I-8 PINAL COUNTY, ARIZONA	B-13
601808009	9/15	T IIVIL GOONTT, ANLEGNA	בוים

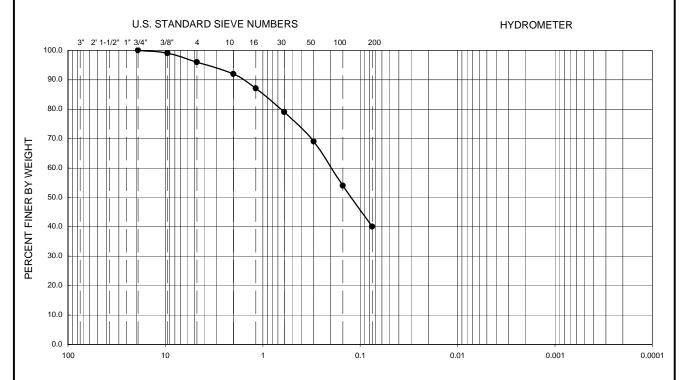
GRA\	/EL		SAN	D	FINES				
Coarse	Fine	Coarse	Medium	Fine	SILT	CLAY			



Symbol	Sample Location	Depth (ft)	Liquid Limit	Plastic Limit	Plasticity Index	D <sub>10</sub>	D <sub>30</sub>	D <sub>60</sub>	Cu	Сс	Passing No. 200 (%)	uscs
•	BR-5	108.5-109.4	35	17	18	1	1	ı	1	ı	69	CL

<b>Ninyo</b> «	Woore	GRADATION TEST RESULTS	FIGURE
PROJECT NO.	DATE	I-10, EARLEY ROAD TO JUNCTION I-8 PINAL COUNTY, ARIZONA	B-14
601808009	9/15	T IIVAL GOUNTT, ANIZONA	D-14

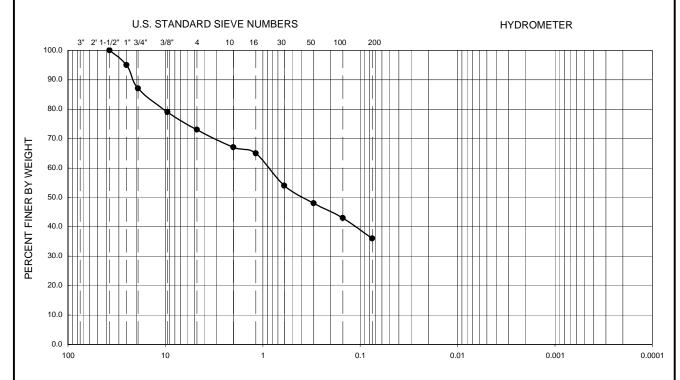
GRA\	/EL	SAND		FINES		
Coarse	Fine	Coarse	Medium	Fine	SILT	CLAY



Symbol	Sample Location	Depth (ft)	Liquid Limit	Plastic Limit	Plasticity Index	D <sub>10</sub>	D <sub>30</sub>	D <sub>60</sub>	Cu	Сс	Passing No. 200 (%)	uscs
•	BR-7	33.5-34.8	39	21	18	1	1	ı	1	ı	40	sc

<b>Ninyo</b> &	Woore	GRADATION TEST RESULTS	FIGURE
PROJECT NO.	DATE	I-10, EARLEY ROAD TO JUNCTION I-8 PINAL COUNTY, ARIZONA	B-15
601808009	9/15	THAT GOONTT, ANZONA	וים

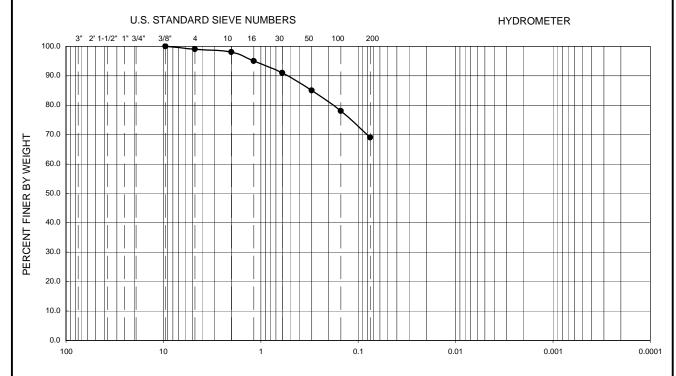
GRA\	/EL	SAND		FINES		
Coarse	Fine	Coarse	Medium	Fine	SILT	CLAY



Symbol	Sample Location	Depth (ft)	Liquid Limit	Plastic Limit	Plasticity Index	D <sub>10</sub>	D <sub>30</sub>	D <sub>60</sub>	Cu	Сс	Passing No. 200 (%)	uscs
•	BR-8	23.5-25.0	26	18	8	1	1	ı		ı	36	sc

<b>Ninyo</b> «	Woore	GRADATION TEST RESULTS	FIGURE
PROJECT NO.	DATE	I-10, EARLEY ROAD TO JUNCTION I-8 PINAL COUNTY, ARIZONA	B-16
601808009	9/15	THATE GOODNIT, ANIZONA	טיים ו

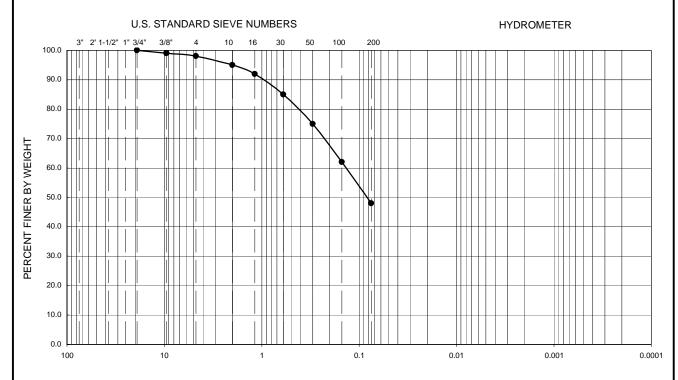
GRA\	/EL		SAN	D		FINES		
Coarse	Fine	Coarse	Medium	Fine	SILT	CLAY		



Symbol	Sample Location	Depth (ft)	Liquid Limit	Plastic Limit	Plasticity Index	D <sub>10</sub>	D <sub>30</sub>	D <sub>60</sub>	Cu	Сс	Passing No. 200 (%)	USCS
•	BR-9	58.5-60.0	34	16	18	1	1	1	1	ı	69	CL

<b>Ninyo</b> &	Woore	GRADATION TEST RESULTS	FIGURE
PROJECT NO.	DATE	I-10, EARLEY ROAD TO JUNCTION I-8 PINAL COUNTY, ARIZONA	B-17
601808009	9/15	THAT GOONTT, ANZONA	וי-ט

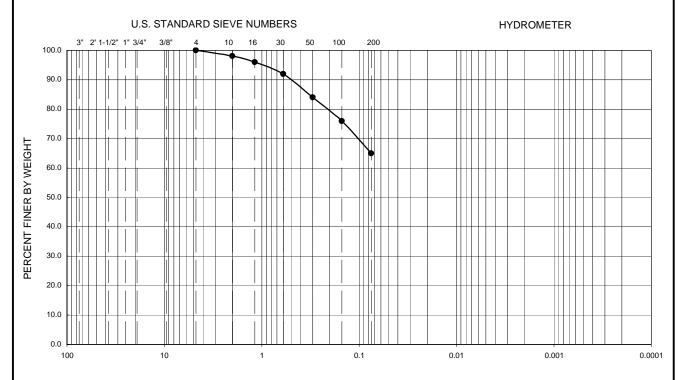
GRA\	/EL		SAN	D		FINES
Coarse	Fine	Coarse	Medium	Fine	SILT	CLAY



Symbol	Sample Location	Depth (ft)	Liquid Limit	Plastic Limit	Plasticity Index	D <sub>10</sub>	D <sub>30</sub>	D <sub>60</sub>	Cu	Сс	Passing No. 200 (%)	uscs
•	RW-1	6.0-7.5	32	15	17	1	1	1	1	ı	48	sc

<b>Ninyo</b> &	Woore	GRADATION TEST RESULTS	FIGURE	
PROJECT NO.	DATE	I-10, EARLEY ROAD TO JUNCTION I-8 PINAL COUNTY, ARIZONA	B-18	
601808009	9/15		D-10	

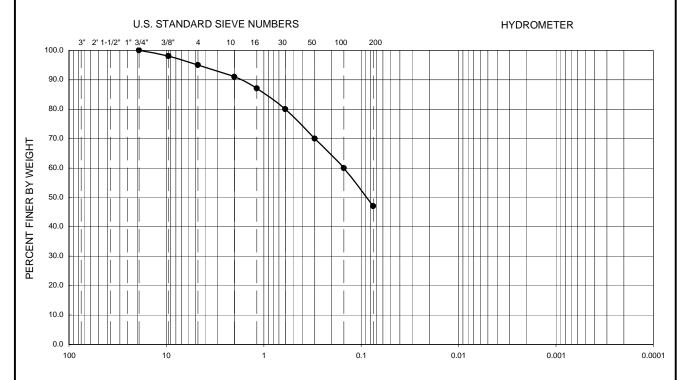
GRA	GRAVEL SAND			D	FINES			
Coarse	Fine	Coarse	Medium	Fine	SILT	CLAY		



s	Symbol	Sample Location	Depth (ft)	Liquid Limit	Plastic Limit	Plasticity Index	D <sub>10</sub>	D <sub>30</sub>	D <sub>60</sub>	Cu	Cc	Passing No. 200 (%)	USCS
	•	RW-2	3.5-5.0	36	16	20	1	ı	1	1	ı	65	CL

<b>Ninyo</b> &	Woore	GRADATION TEST RESULTS	FIGURE
PROJECT NO.	DATE	I-10, EARLEY ROAD TO JUNCTION I-8 PINAL COUNTY, ARIZONA	B-19
601808009	9/15	T IIVIL GOONTT, ANLEGNA	פוים

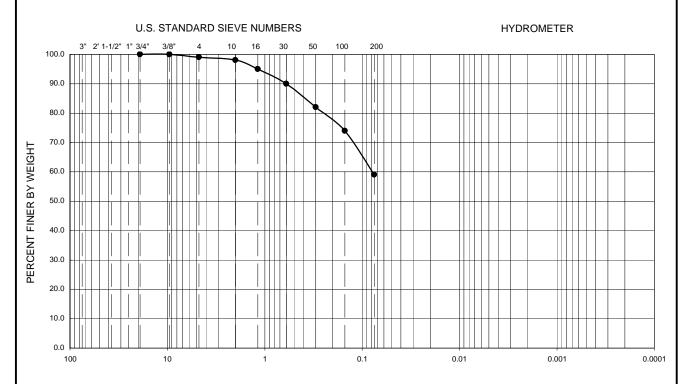
GRA\	/EL	EI I SAND			FINES		
Coarse	Fine	Coarse	Medium	Fine	SILT	CLAY	



Symbol	Sample Location	Depth (ft)	Liquid Limit	Plastic Limit	Plasticity Index	D <sub>10</sub>	D <sub>30</sub>	D <sub>60</sub>	Cu	Сс	Passing No. 200 (%)	uscs
•	RW-4	3.5-5.0	35	17	18	1	1	ı	ı	ı	47	sc

<b>Ninyo</b> «	Woore	GRADATION TEST RESULTS	FIGURE
PROJECT NO.	DATE	I-10, EARLEY ROAD TO JUNCTION I-8 PINAL COUNTY, ARIZONA	B-20
601808009	9/15	T IIVIL GOONTT, ANLEGNA	D-20

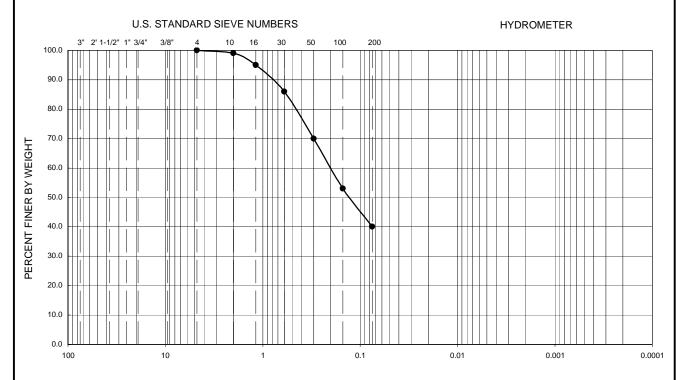
GRA	VEL SAND				FINES			
Coarse	Fine	Coarse	Medium	Fine	SILT	CLAY		



Symbol	Sample Location	Depth (ft)	Liquid Limit	Plastic Limit	Plasticity Index	D <sub>10</sub>	D <sub>30</sub>	D <sub>60</sub>	Cu	Сс	Passing No. 200 (%)	uscs
•	RW-5	1.0-2.5	33	16	17	1	1	ı	ı	ı	59	CL

<b>Ninyo</b> &	Woore	GRADATION TEST RESULTS	FIGURE
PROJECT NO.	DATE	I-10, EARLEY ROAD TO JUNCTION I-8 PINAL COUNTY, ARIZONA	B-21
601808009	9/15	THATE GOODITT, ANEONA	D-Z I

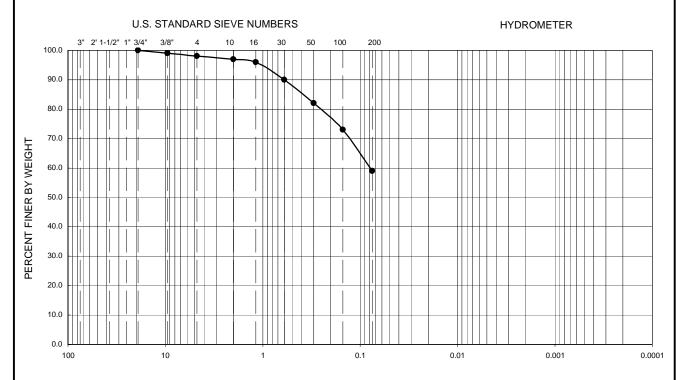
GRA	GRAVEL SAND				FINES			
Coarse	Fine	Coarse	Medium	Fine	SILT	CLAY		



Symbol	Sample Location	Depth (ft)	Liquid Limit	Plastic Limit	Plasticity Index	D <sub>10</sub>	D <sub>30</sub>	D <sub>60</sub>	Cu	Сс	Passing No. 200 (%)	uscs
•	RW-6	18.5-19.4	31	15	16	1	1	1	1	ı	40	sc

<b>Ninyo</b> &	Woore	GRADATION TEST RESULTS	FIGURE
PROJECT NO.	DATE	I-10, EARLEY ROAD TO JUNCTION I-8 PINAL COUNTY, ARIZONA	B-22
601808009	9/15	THAT GOONTT, ANZONA	D-22

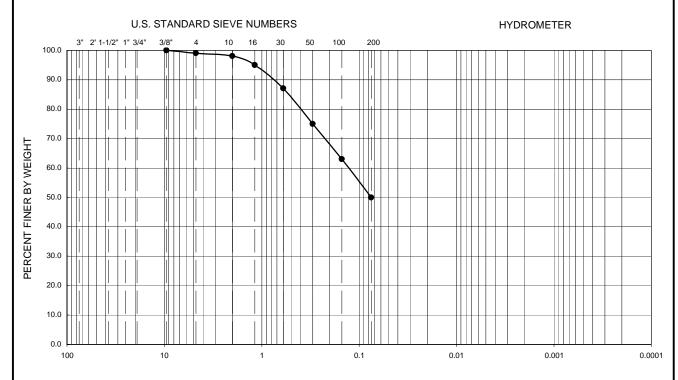
GRA\	/EL		SAN	D	FINES			
Coarse	Fine	Coarse	Medium	Fine	SILT	CLAY		



Symbol	Sample Location	Depth (ft)	Liquid Limit	Plastic Limit	Plasticity Index	D <sub>10</sub>	D <sub>30</sub>	D <sub>60</sub>	Cu	Сс	Passing No. 200 (%)	USCS
•	RW-7	6.0-7.5	37	16	21	1	1	ı	ı	ı	59	CL

<b>Ninyo</b> «	Woore	GRADATION TEST RESULTS	FIGURE
PROJECT NO.	DATE	I-10, EARLEY ROAD TO JUNCTION I-8 PINAL COUNTY, ARIZONA	B-23
601808009	9/15	T INAL COUNTT, ANZONA	D-23

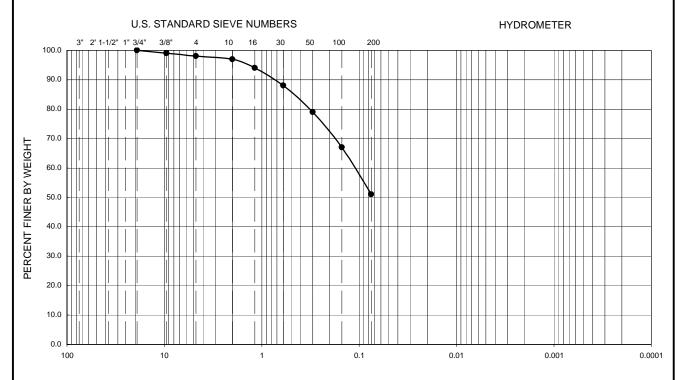
GRA\	/EL		SAN	D	FINES			
Coarse	Fine	Coarse	Medium	Fine	SILT	CLAY		



Symbol	Sample Location	Depth (ft)	Liquid Limit	Plastic Limit	Plasticity Index	D <sub>10</sub>	D <sub>30</sub>	D <sub>60</sub>	Cu	Сс	Passing No. 200 (%)	uscs
•	RW-8	18.5-20.0	40	15	25	1	1	ı	1	ı	50	CL

<b>Ninyo</b> &	Woore	GRADATION TEST RESULTS	FIGURE
PROJECT NO.	DATE	I-10, EARLEY ROAD TO JUNCTION I-8 PINAL COUNTY, ARIZONA	B-24
601808009	9/15	T IIVIL GOONTT, ANLEGNA	D-24

GRA	VEL		SAN	D	FINES			
Coarse	Fine	Coarse	Medium	Fine	SILT	CLAY		

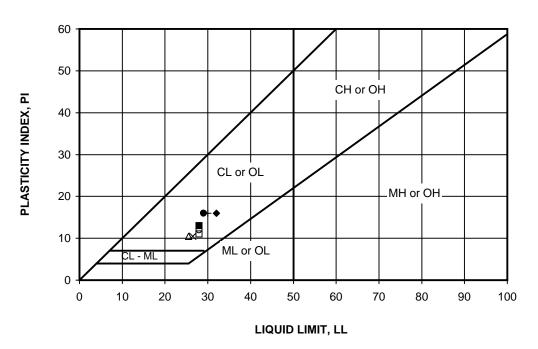


Symbol	Sample Location	Depth (ft)	Liquid Limit	Plastic Limit	Plasticity Index	D <sub>10</sub>	D <sub>30</sub>	D <sub>60</sub>	Cu	Cc	Passing No. 200 (%)	USCS
•	RW-9	6.0-7.5	36	16	20	1	ı	1	1	ı	51	CL

<b>Ninyo</b> &	Woore	GRADATION TEST RESULTS	FIGURE
PROJECT NO.	DATE	I-10, EARLEY ROAD TO JUNCTION I-8 PINAL COUNTY, ARIZONA	B-25
601808009	9/15	TINAL COUNTY, ANIZONA	D-23

SYMBOL	LOCATION	DEPTH (FT)	LIQUID LIMIT, LL	PLASTIC LIMIT, PL	PLASTICITY INDEX, PI	USCS CLASSIFICATION (Fraction Finer Than No. 40 Sieve)	USCS (Entire Sample)
•	B-1	0.0-5.0	29	13	16	CL	SC
-	B-2	0.0-4.4	28	15	13	CL	SC
•	B-3	0.0-5.0	32	16	16	CL	CL
0	B-4	0.0-4.8	28	16	12	CL	CL
	B-5	0.0-5.0	28	17	11	CL	CL
Δ	B-6	0.0-4.4	26	15	11	CL	sc
х	B-7	0.0-4.0	27	16	11	CL	CL
+	B-8	0.0-4.4	30	14	16	CL	CL

NP - INDICATES NON-PLASTIC

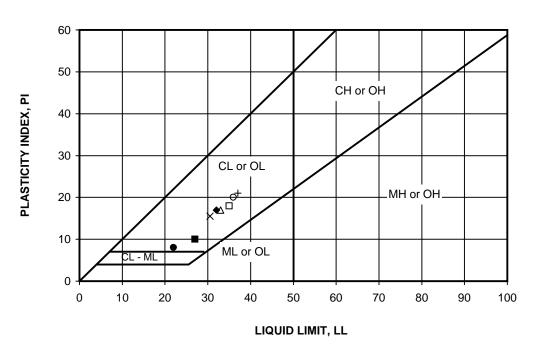


PERFORMED IN GENERAL ACCORDANCE WITH ASTM D 4318

Ninyo	Moore	ATTERBERG LIMITS TEST RESULTS	FIGURE
PROJECT NO.	DATE	I-10, EARLEY ROAD TO JUNCTION I-8 PINAL COUNTY, ARIZONA	D 26
601808009	9/15	FIIVAL COUNTT, ARIZONA	D-20

SYMBOL	LOCATION	DEPTH (FT)	LIQUID LIMIT, LL	PLASTIC LIMIT, PL	PLASTICITY INDEX, PI	USCS CLASSIFICATION (Fraction Finer Than No. 40 Sieve)	USCS (Entire Sample)
•	B-9	0.0-5.0	22	14	8	CL	SC
-	B-10	0.0-5.0	27	17	10	CL	sc
•	RW-1	6.0-7.5	32	15	17	CL	sc
0	RW-2	3.5-5.0	36	16	20	CL	CL
	RW-4	3.5-5.0	35	17	18	CL	sc
Δ	RW-5	1.0-2.5	33	16	17	CL	CL
х	RW-6	18.5-19.4	31	15	16	CL	sc
+	RW-7	6.0-7.5	37	16	21	CL	CL

NP - INDICATES NON-PLASTIC

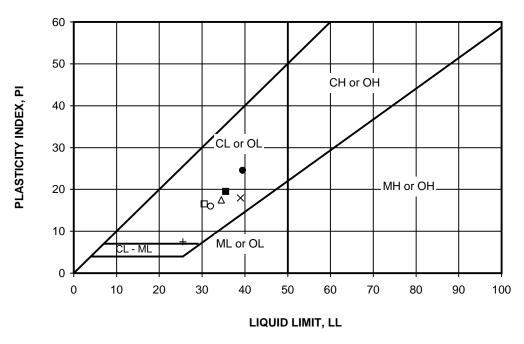


PERFORMED IN GENERAL ACCORDANCE WITH ASTM D 4318

Ninyo	Moore	ATTERBERG LIMITS TEST RESULTS	FIGURE
PROJECT NO.	DATE	I-10, EARLEY ROAD TO JUNCTION I-8 PINAL COUNTY, ARIZONA	B-27
601808009	9/15	FIIVAL COUNTT, ARIZONA	D-21

SYMBOL	LOCATION	DEPTH (FT)	LIQUID LIMIT, LL	PLASTIC LIMIT, PL	PLASTICITY INDEX, PI	USCS CLASSIFICATION (Fraction Finer Than No. 40 Sieve)	USCS (Entire Sample)
•	RW-8	18.5-20.0	40	15	25	CL	CL
-	RW-9	6.0-7.5	36	16	20	CL	CL
•	BR-2	18.5-20.0			NP	ML	SW-SM
0	BR-3	1.0-2.5	32	16	16	CL	CL
	BR-4	8.5-10.0	31	14	17	CL	sc
Δ	BR-5	108.5-109.4	35	17	18	CL	CL
x	BR-7	33.5-34.8	39	21	18	CL	sc
+	BR-8	23.5-25.0	26	18	8	CL	SC

NP - INDICATES NON-PLASTIC

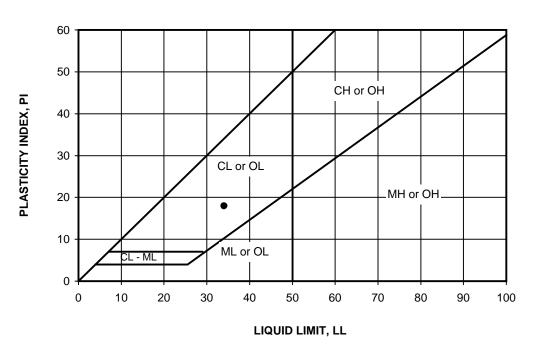


PERFORMED IN GENERAL ACCORDANCE WITH ASTM D 4318

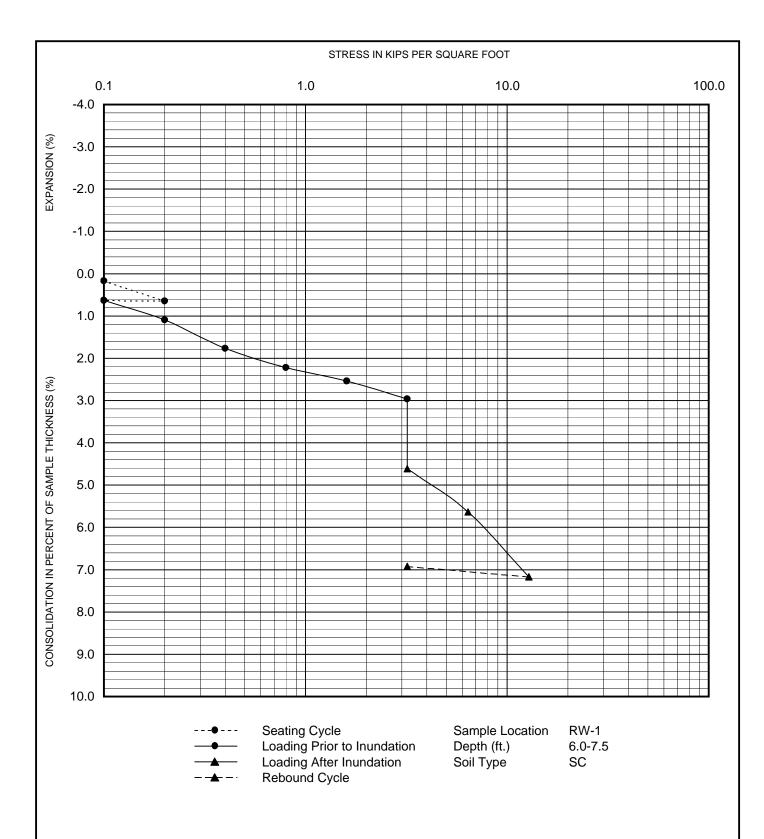
Ninyo	Moore	ATTERBERG LIMITS TEST RESULTS	FIGURE
PROJECT NO.	DATE	I-10, EARLEY ROAD TO JUNCTION I-8 PINAL COUNTY. ARIZONA	B-28
601808009	9/15	- FINAL COUNTY, ARIZONA	D-20

SYMBOL	LOCATION	DEPTH (FT)	LIQUID LIMIT, LL	PLASTIC LIMIT, PL	PLASTICITY INDEX, PI	USCS CLASSIFICATION (Fraction Finer Than No. 40 Sieve)	USCS (Entire Sample)
•	BR-9	58.5-60.0	34	16	18	CL	CL

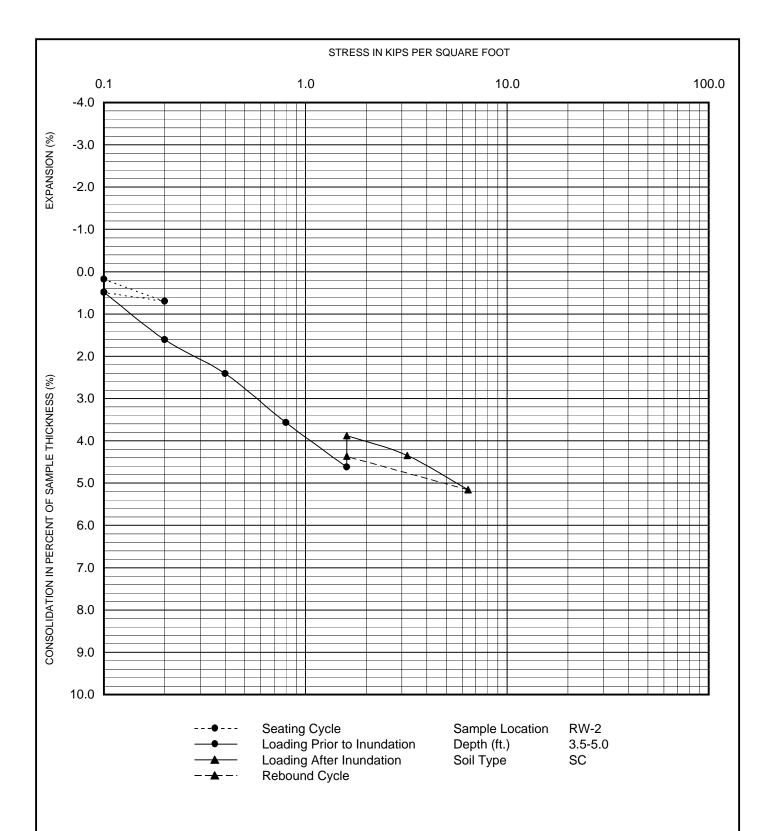
NP - INDICATES NON-PLASTIC



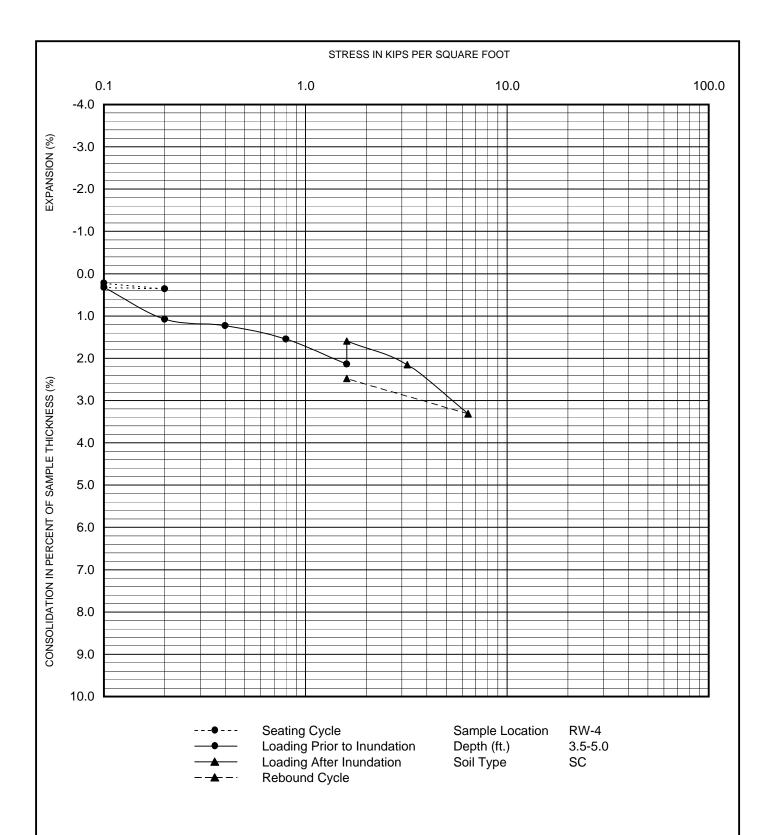
Ninyo	Moore	ATTERBERG LIMITS TEST RESULTS	FIGURE
PROJECT NO.	DATE	I-10, EARLEY ROAD TO JUNCTION I-8 PINAL COUNTY, ARIZONA	B-29
601808009	9/15	FIIVAL COUNTT, ARIZONA	D-29



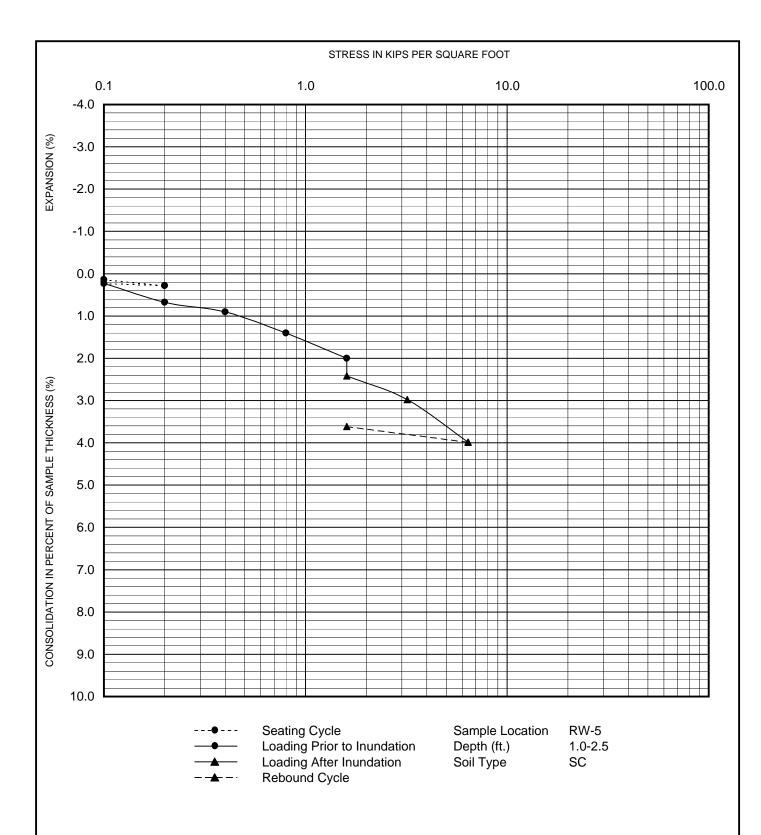
<b>Ninyo</b> &	<b>Moore</b>	CONSOLIDATION TEST RESULTS	FIGURE
PROJECT NO.	DATE	I-10, EARLEY ROAD TO JUNCTION I-8	D 20
601808009	9/15	PINAL COUNTY, ARIZONA	B-30



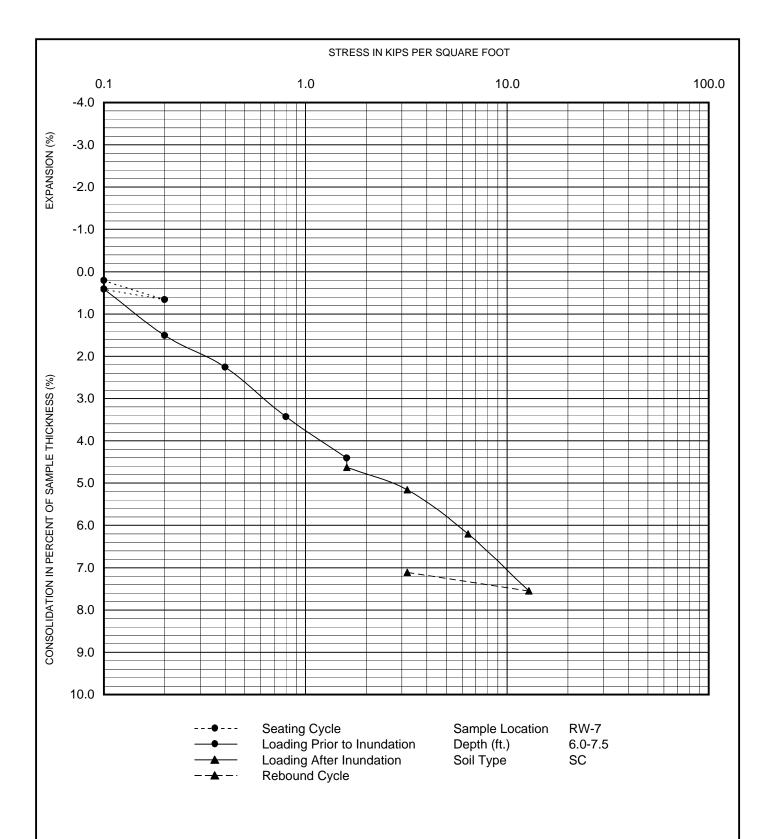
<b>Ninyo</b> &	Woore	CONSOLIDATION TEST RESULTS	FIGURE
PROJECT NO.	DATE	I-10, EARLEY ROAD TO JUNCTION I-8	B-31
601808009	9/15	PINAL COUNTY, ARIZONA	D-31



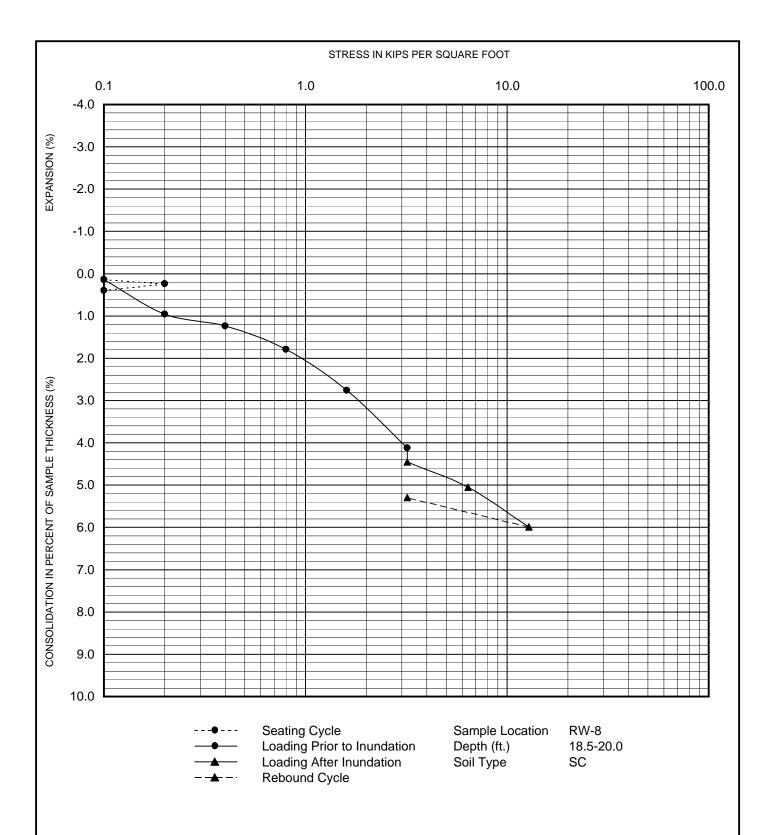
<i>Minyo &amp; Moore</i>		CONSOLIDATION TEST RESULTS	FIGURE
PROJECT NO.	DATE	I-10, EARLEY ROAD TO JUNCTION I-8	D 22
601808009	9/15	PINAL COUNTY, ARIZONA	B-32



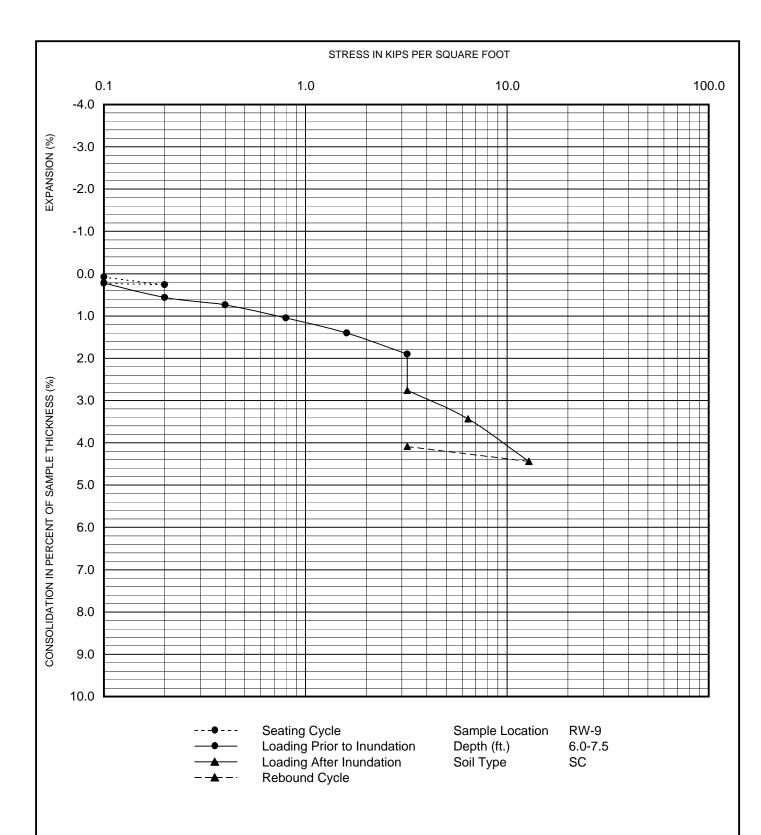
<b>Ninyo</b> &	<b>Moore</b>	CONSOLIDATION TEST RESULTS	FIGURE
PROJECT NO.	DATE	I-10, EARLEY ROAD TO JUNCTION I-8	D 22
601808009	9/15	PINAL COUNTY, ARIZONA	B-33



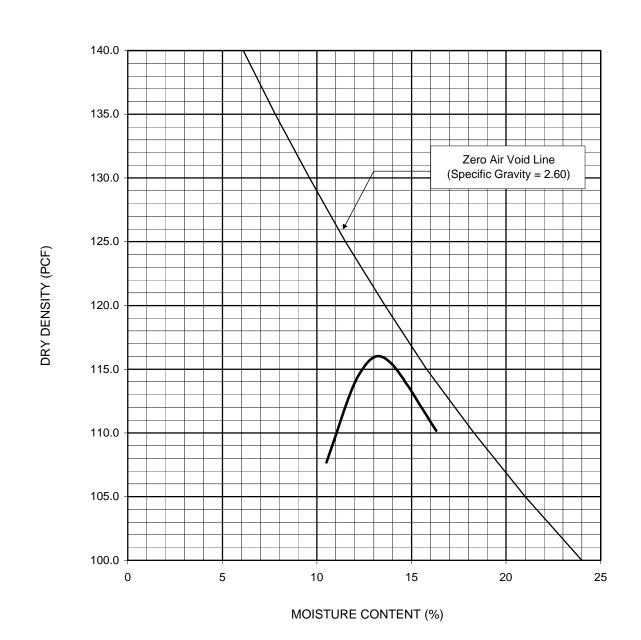
<i>Minyo &amp; Moore</i>		CONSOLIDATION TEST RESULTS	FIGURE
PROJECT NO.	DATE	I-10, EARLEY ROAD TO JUNCTION I-8	D 24
601808009	9/15	PINAL COUNTY, ARIZONA	B-34



<i>Minyo &amp; Moore</i>		CONSOLIDATION TEST RESULTS	FIGURE
PROJECT NO.	DATE	I-10, EARLEY ROAD TO JUNCTION I-8	D 25
601808009	9/15	PINAL COUNTY, ARIZONA	B-35

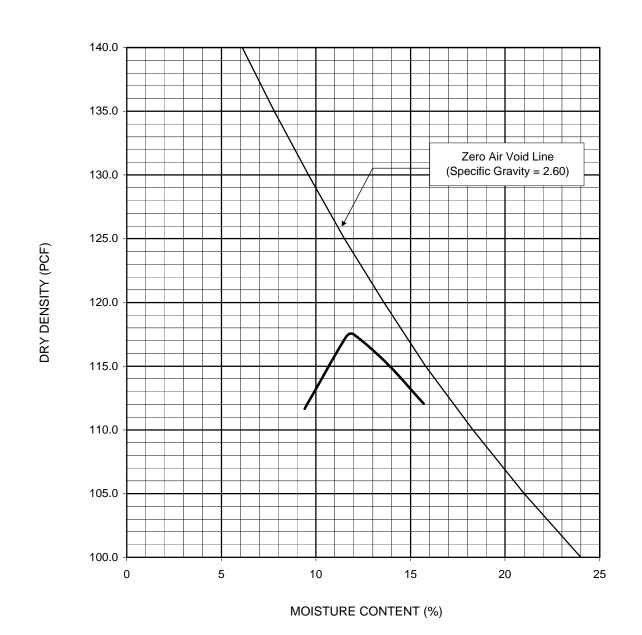


<i>Minyo &amp; Moore</i>		CONSOLIDATION TEST RESULTS	FIGURE
PROJECT NO.	DATE	I-10, EARLEY ROAD TO JUNCTION I-8	D 26
601808009	9/15	PINAL COUNTY, ARIZONA	B-36



Sample Location	Depth (ft)	Soil Description	Maximum Dry Density (pcf)	Optimum Moisture Content (%)
B-2	0.0-5.0	CLAYEY SAND	116.0	13.1
Dry Density a	Dry Density and Moisture Content Values Corrected for Oversize (ASTM D 4718-87)			N/A

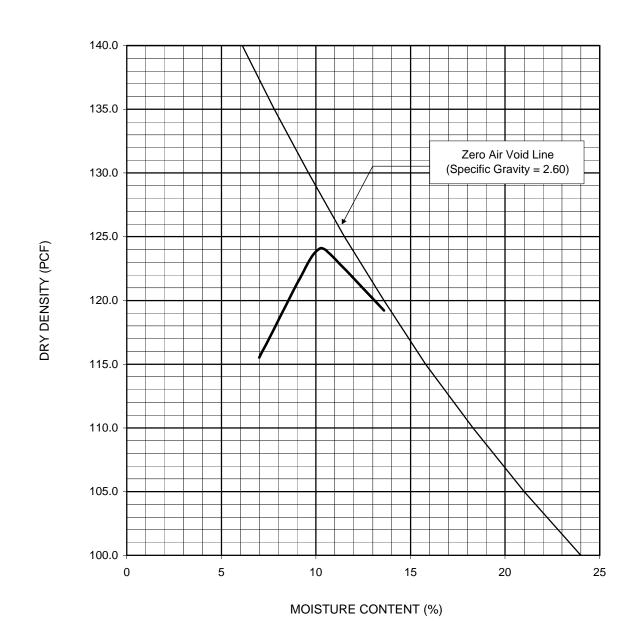
Ninyo &	<b>Moore</b>	PROCTOR DENSITY TEST RESULTS	FIGURE
PROJECT NO.	DATE	I-10, EARLEY ROAD TO JUNCTION I-8 PINAL COUNTY, ARIZONA	B-37
601808009	9/15	THAL SSSATT, AMAZOTA	D-31



Sample Location	Depth (ft)	Soil Description	Maximum Dry Density (pcf)	Optimum Moisture Content (%)
B-4	0.0-4.8	LEAN CLAY WITH SAND	117.5	12.0
Dry Density a	Dry Density and Moisture Content Values Corrected for Oversize (ASTM D 4718-87)		N/A	N/A

PERFORMED IN GENERAL ACCORDANCE WITH	☐ ASTM D 1557	✓ ASTM D 698	METHOD ☑ A ☐ B ☐ C
Alimus Alsons			

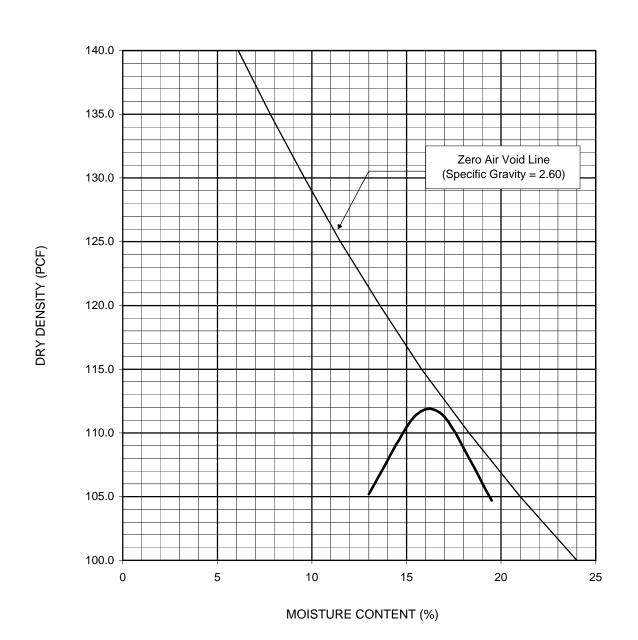
<b>Ninyo</b> «	Woore	PROCTOR DENSITY TEST RESULTS	FIGURE
PROJECT NO.	DATE	I-10, EARLEY ROAD TO JUNCTION I-8 PINAL COUNTY, ARIZONA	B-38
601808009	9/15	111012 3331111,711123101	D-30



Sample Location	Depth (ft)	Soil Description	Maximum Dry Density (pcf)	Optimum Moisture Content (%)
B -6	0.0-4.4	CLAYEY SAND	124.1	10.3
Dry Density and Moisture Content Values Corrected for Oversize (ASTM D 4718-87)		126.0	9.5	

PERFORMED IN GENERAL ACCORDANCE WITH ASTM D 1557 ASTM D 698 METHOD A B C

Minyo &	Moore	PROCTOR DENSITY TEST RESULTS	FIGURE
PROJECT NO.	DATE	I-10, EARLEY ROAD TO JUNCTION I-8 PINAL COUNTY, ARIZONA	B-39
601808009	9/15	THAL SSSATT, AMAZOTA	D-33



Sample Location	Depth (ft)	Soil Description	Maximum Dry Density (pcf)	Optimum Moisture Content (%)
B-8	0.0-4.4	SANDY LEAN CLAY	111.9	16.2
Dry Density a	Dry Density and Moisture Content Values Corrected for Oversize (ASTM D 4718-87)			N/A

PERFORMED IN GENERAL ACCORDANCE WITH ASTM D 1557 ASTM D 698 METHOD A B C

Ninyo &	<b>Moore</b>	PROCTOR DENSITY TEST RESULTS	FIGURE
PROJECT NO.	DATE	I-10, EARLEY ROAD TO JUNCTION I-8 PINAL COUNTY, ARIZONA	B-40
601808009	9/15	110/2 333/(17,7/((23)0)	D-40

SAMPLE LOCATION	SAMPLE DEPTH (FT)	SOIL TYPE	R-VALUE
B-1	0.0-5.0	sc	16
B-3	0.0-5.0	CL	16
B-5	0.0-5.0	CL	10
B-7	0.0-4.0	CL	16
B-9	0.0-5.0	sc	35
B-10	0.0-5.0	sc	41

<b>Ninyo</b> «	Woore	R-VALUE TEST RESULTS	FIGURE
PROJECT NO.	DATE	I-10, EARLEY ROAD TO JUNCTION I-8 PINAL COUNTY, ARIZONA	B-41
601808009	9/15	FINAL COUNTY, ANIZONA	

SAMPLE	SAMPLE DEPTH	1	RESISTIVITY <sup>1</sup>	SULFATE (	ULFATE CONTENT <sup>2</sup> CHLORIDE	
LOCATION	(FT)	pH <sup>1</sup>	(Ohm-cm)	(ppm)	(%)	CONTENT <sup>3</sup> (ppm)
HA-3	0.0-3.0	7.9	1,680	60	0.006	40
HA-4	0.0-3.0	7.6	1,210	80	0.008	40
HA-5	0.0-3.0	7.5	680	110	0.011	60
HA-6	0.0-3.0	7.7	1,010	130	0.013	90
HA-7	0.0-3.0	7.3	1,680	80	0.008	20
HA-8	0.0-3.0	7.7	5,100	80	0.008	10
HA-9	0.0-3.0	7.7	940	130	0.013	150
HA-10	0.0-3.0	7.5	4,030	80	0.008	20

<sup>&</sup>lt;sup>1</sup> PERFORMED IN GENERAL ACCORDANCE WITH ARIZONA TEST METHOD 236c

<i>Ninyo «</i> Moore		CORROSIVITY TEST RESULTS	FIGURE
PROJECT NO.	DATE	I-10, EARLEY ROAD TO JUNCTION I-8 PINAL COUNTY, ARIZONA	B-42
601808009	9/15	T IIVAL GOORTT, ARIZONA	D-42

<sup>&</sup>lt;sup>2</sup> PERFORMED IN GENERAL ACCORDANCE WITH ARIZONA TEST METHOD 733

 $<sup>^{\</sup>rm 3}$   $\,$  PERFORMED IN GENERAL ACCORDANCE WITH ARIZONA TEST METHOD 736  $\,$ 

SAMPLE LOCATION	SAMPLE DEPTH	pH <sup>1</sup>	RESISTIVITY <sup>1</sup> (Ohm-cm)	SULFATE (	SULFATE CONTENT <sup>2</sup>	
	(FT)			(ppm)	(%)	CONTENT <sup>3</sup> (ppm)
HA-11	0.0-3.0	7.4	5,230	50	0.005	30

- <sup>1</sup> PERFORMED IN GENERAL ACCORDANCE WITH ARIZONA TEST METHOD 236c
- <sup>2</sup> PERFORMED IN GENERAL ACCORDANCE WITH ARIZONA TEST METHOD 733
- $^{\rm 3}$   $\,$  PERFORMED IN GENERAL ACCORDANCE WITH ARIZONA TEST METHOD 736  $\,$

<i>Ninyo &amp; M</i> oore		CORROSIVITY TEST RESULTS	FIGURE
PROJECT NO.	DATE	I-10, EARLEY ROAD TO JUNCTION I-8 PINAL COUNTY, ARIZONA	B-43
601808009	9/15	TINAL COUNTY, ANIZONA	D-43