



SR 179 AT TLAQUEPAQUE PEDESTRIAN
CROSSING

FINAL GEOTECHNICAL REPORT

CITY OF SEDONA, ARIZONA

PROJECT NO.: 30900006A
DATE: AUGUST 2022

WSP
1230 WEST WASHINGTON STREET, SUITE 405
TEMPE, ARIZONA 85281

August 29, 2022

Attn: Mr. Robert Welch, PE
City of Sedona

Re: Final Geotechnical Report
SR 179 at Tlaquepaque Pedestrian Crossing
Sedona, Arizona

Presented herein is our Final Geotechnical Report for the subject project. This report is based on the results of our evaluation of pre-existing subsurface information collected by others in the immediate area and our surface observations of the geologic and geotechnical conditions during a limited site reconnaissance. A new subsurface exploration specifically for the pedestrian crossing was *not* performed for this project, due to the limited access for exploration equipment and because some subsurface data from others was available. As a result, we recommend performance of on-site inspections by the Geotechnical Engineer during construction to confirm the geotechnical assumption made herein.

The evaluation included a review of available geologic and geotechnical information from nearby projects and the anticipated geotechnical profile associated with the geologic units exposed in the immediate vicinity of the project. The report presents our geotechnical recommendations for design and construction of planned structure and earth-related elements.

Please do not hesitate to contact us if you have any questions concerning this report.

Respectfully submitted,
WSP USA

By:



Expires 12/31/22

Kevin L. Porter, PE
Senior Geotechnical Engineer
cc: Addressee (PDF)

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1 INTRODUCTION & SCOPE OF WORK

The proposed project consists of the construction of a new pedestrian crossing beneath SR 179, in the Tlaquepaque area of Sedona, Arizona. The path of the pedestrian walkway will follow Alternative 3, Underpass at Oak Creek, as provided in the Feasibility Study for the project by WSP, dated June 2019. This alternative includes a pathway under the existing Oak Creek bridge to cross SR 179 with less disturbance to vehicular traffic on SR 179. The project will include access ramps from the roadway elevation down to the lower path crossing under the bridge on each side of the SR 179 roadway.

Our geotechnical scope of work included the following:

- Review of the record drawings for the existing bridges, published geologic and hydrogeologic literature, relevant reports, and subsurface data from geotechnical reports by others at the project site.
- A brief on-site geologic site reconnaissance to observe existing site features and confirm geologic deposits present.
- Preparation of this geotechnical design report, presenting the results of our review, site observations, and geotechnical design profile and recommendations for the planned improvements.

Due to access constraints and pre-existing geotechnical information available for the immediate area, new geotechnical borings were not performed for this project. Our geotechnical design recommendations presented herein rely on existing subsurface information provided on record drawings by others for the existing bridges in the immediate area and surface exposures observed during the site visit.

The following record drawings from projects near the site were reviewed for existing geotechnical information as part of this project.

- North Forest Boundary to City of Sedona (179 CN 310 H3414 03C): Record Drawings, including Foundation Data Sheets.

A site inspection during excavation for the sidewalk ramps, retaining walls and the sidewalk beneath the bridge by the Geotechnical Engineer or Geologist is essential for confirmation of foundation conditions, particularly since undocumented fills are present at the site and project specific exploratory borings were not completed.

2 PROJECT DESCRIPTION

As noted above, the recommended alternative is to construct a pedestrian pathway under the existing SR 179 Oak Creek Bridge, with access ramps dropping down to the creek level from the roadway elevation on each side of SR 179. The pathway will be constructed of concrete, including the section under the Oak Creek Bridge, and it will connect both the north and south sidewalks of SR 179. In addition, pavement markings, signage, pedestrian channelization and enhanced landscaping will be included.

The planned concrete pedestrian path will be approximately 10 to 12 feet wide. Since the path will ultimately drop below the highwater level of Oak Creek, scour and erosion protection of the pathway will be required to reduce potential damage to the pathway during storm water runoff events. In addition, we understand that retaining walls, generally less than 15 feet in height, will be needed along portions of the path due to topographic relief and side hill construction along the ramps.

3 SITE CONDITIONS

The project site is located near downtown Sedona along SR 179 near the developed Tlaquepaque area, as depicted in Figure 1 below. SR 179 at this location is an east-west trending asphalt concrete (AC) paved roadway with one lane in each direction of travel. SR 179 crosses Oak Creek Bridge to the east and includes a roundabout immediately east side of the bridge that transitions to a north-south trending roadway. There are existing sidewalks on both sides of the roadway and a raised median. The Oak Creek Pedestrian Bridge is located immediately north of SR179 providing pedestrian connectivity across Oak Creek on the north side of SR 179.

Oak Creek is a perennial spring-fed stream generally flowing in a southerly direction and lined with vegetation consisting of trees, grass and bushes. Surface water flows within the drainage bottom of Oak Creek immediately upstream of the bridge site include two distinct flow paths. The main channel which carries the higher volume flows is located on the east side of the drainage floor and crosses under the bridge between the east piers and the east abutment. The secondary channel flows along the west side of the drainage floor and turns east toward the main channel where it intersects the base of the fills placed on the north side for the SR 179 roadway approach. The two channels merge beneath the Pedestrian Bridge before flowing under the SR 179 Bridge as shown in Figure 2. The surface water level of the secondary channel is higher than the lower main channel upstream of the bridge crossing. The existing western side slopes on both the upstream and downstream sides of SR 179 are lined with gabion mattresses for erosion protection. Bedrock exposures are visible below the east abutment of SR 179 but no bedrock outcrops were observed on the west side of the creek.

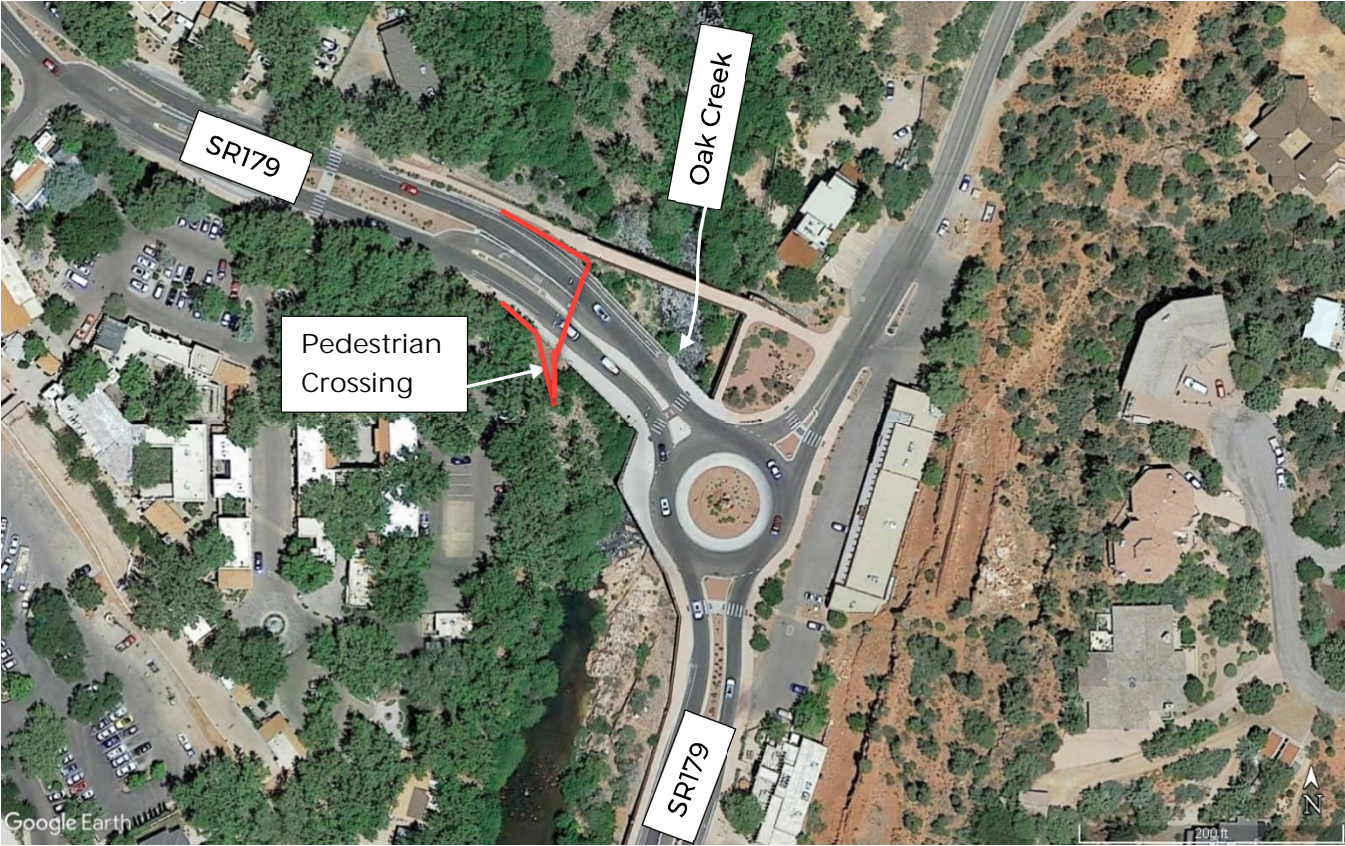


FIGURE 1: Project Site



Figure 2: Oak Creek Flows in Site Area (looking West)

Based on review of the record drawings for the existing bridges, Abutment 2 of both the Oak Creek Bridge (Structure No. 2850) and the Oak Creek Pedestrian Bridge (Structure No. 10624) (shown in Figure 2) are supported on 42-inch diameter drilled shaft foundations socketed into the underlying bedrock.

Grouted riprap, reportedly 5 to 10 feet in width, extends down to the bedrock contact in front of the Abutment 2 foundations of both bridges for scour protection. The grouted riprap also reportedly was placed along retaining wall R6, which is located parallel to SR 179 on the north side of the Pedestrian Bridge Abutment 2 for a length of about 55 feet. The top of the grouted riprap is reported to match the elevation of the top of the adjacent footing. Select drawings/details from the record drawings are provided in Appendix A.

The existing ground surface elevation along the proposed path alignment varies from about Elevation 4,200 feet near the connections with SR 179 roadway surface down to about Elevation 4,180 below the bridge in front of the existing bridge abutments (noted as New Walkway in Figure 2).

3.1 GEOLOGIC SETTING

The project site lies within the Transition Zone Physiographic Province in central Arizona at the base of the Mogollon Rim. The Mogollon Rim marks the boundary between the Transition Zone and the uplifted Colorado Plateau. However, the geologic units exposed in the Sedona area are dominated by a thick sequence of Paleozoic-age sedimentary rocks including siltstone, sandstone, mudstone and lesser limestone which is typically associated with the sequence underlying the Colorado Plateau Province. Significant erosion over time below the uplifted Mogollon Rim escarpment has resulted in the high relief topography of the Mogollon foothills in the Sedona area. The sequence of Paleozoic sedimentary rocks is ultimately capped with Tertiary volcanic flows on top of the Rim at the higher elevations.

The primary unit of the Paleozoic sedimentary sequence exposed in the site area consists of the Lower Permian-age Hermit Formation. The formation generally consists of thin-bedded deposits of fine-grained sandstone, siltstone and mudstones (Dewitt et al., 2008) and previously was referred to as the Hermit Shale. The Hermit Formation is locally covered with Oak Creek Alluvium that was deposited within the defined path of Oak Creek, which passes through the project site.

3.2 GENERAL GEOTECHNICAL PROFILE

Based on review of the available record drawings for the adjacent bridge structures and our observation during the geologic site reconnaissance, we anticipate a relatively shallow profile of alluvial soils and fill primarily consisting of silty sand, gravel, and cobbles/boulders overlying bedrock of the Hermit Formation. Large boulders associated with the high energy depositional environment within Oak Creek are present and should be anticipated during construction. Previous explorations near Abutment 2 indicate that the elevation of top of bedrock is near Elevation 4,170 feet. It is likely that the top of bedrock elevations will vary along the pathway alignment due to variable erosion over time.

As noted, the geologic units exposed at the site include undocumented fill, coarse-grained Oak Creek alluvium and sandstone bedrock as presented below:

Oak Creek Alluvium:

The Oak Creek alluvial deposit is exposed within the confines of the Oak Creek drainage channel and adjacent terrace levels above the creek floor. The exposures of Oak Creek alluvium at the site occur in the drainage floor beneath the bridges and on the west banks of the creek. The deposit is expected to be very lenticular and composed of minor sand layers interbedded with poorly sorted sand, gravel and cobble mixtures with boulders. The alluvial soils are highly variable and range in density from loose to dense. The sand lenses are composed of brown fine-grained sand and the material is non-plastic to low in plasticity. Figure 3 shows a thin deposit of sand along the walkway alignment below the bridge. The deposit is local and non-continuous and represents deposition during lower flow or backwater conditions in recent runoff events.



Figure 3: Oak Creek sand layer along pathway alignment beneath bridge

The coarse-grained poorly sorted mixtures of sand, gravel, cobbles, and boulders are prevalent over the site. The deposits are expected to be highly variable and contain some silt and locally may contain a small amount of clay. The particles are generally rounded to sub-rounded in shape and the deposit is low in plasticity to non-plastic, dense and grayish brown. Boulders are common up to about 3-feet in diameter.



Figure 4: Coarse-grained Oak Creek alluvium

Undocumented Fill:

Fill material is present at the site and largely consists of reworked Oak Creek alluvial deposits. The fill is generally located in three areas including:

- Area 1 - Parking lot fill south of SR 179 forming the current western banks of Oak Creek,
- Area 2 - Grouted Riprap beneath the SR 179 bridge in front of the west abutment, and,
- Area 3 - North side fill between the SR 179 retaining wall and the secondary creek channel.

Area 1 likely includes some fill over native Oak Creek alluvium. The entire height of the slope below the parking lot down to the upper level of the creek floor is covered with a gabion mattress and thus no native alluvium is exposed in the slope. It is not known how thick the fill may be at this location. Figures 5 and 6 shows photos of the slope in this access ramp area.



Figure 5: Parking lot fill looking south



Figure 6: Parking lot fill looking north with gabion mattress

Construction of the pathway on this south side of SR 179 will require side hill construction and a retaining wall on the downslope side. Due to a lack of subsurface information in this area, an inspection of conditions is required during construction to verify the foundations are placed on native alluvium and the capacity of the alluvium is adequate to support the wall and sidewalk. The lower portions of the walkway and wall will be below the high-water mark and require scour protection.

Area 2 is reported to have grouted riprap down to the bedrock contact estimated at 10-feet deep (elevation 4170 feet). Exposures in this area include a thin sand layer overlying gravel, cobbles and boulders. However, the grouted riprap is not exposed at the surface. It is reported that the width of grouted riprap in front of the abutment wall is about 5 to 10 feet. Figure 7 shows the area and coarse-grained material in front of the wall but the grouted riprap is not exposed. There is a 36-inch diameter drain pipe penetrating through the abutment wall in the photo.



Figure 7: Coarse-grained rock in front of abutment wall

Area 3 is composed of gabion mattresses on the surface of the access ramp for the north side of SR 179. The exposed fill consists of gravel and cobbles and the thickness is not known. At some depth, the fill likely overlies coarse grained Oak Creek alluvium as exposed across the drainage channel. Figure 8 shows the gabion mattress of Area 3. Depths of fill and foundation conditions will need to be inspected during construction to verify adequate conditions are present. The lower levels will also require scour protection from adjacent flows within Oak Creek.



Figure 8: Access ramp and fill on north side of SR 179

Bedrock, Hermit Formation:

Bedrock is exposed only on the west side of the Oak Creek bank in the site area. The bedrock is reddish brown and consists of horizontally layered beds of silty sandstone and sandy siltstone. The bedrock is medium to thickly bedded, and is soft to moderately hard and reddish brown.



Figure 9: Hermit Formation sandstone bedrock on east Oak Creek banks

3.3 GROUNDWATER CONDITIONS

The regional depth to groundwater based on historic available well data from the Arizona Department of Water Resources (ADWR), is on the order of 30 feet or more below ground. However, groundwater is expected to be present along the creek within the Oak Creek alluvium. The depth to water will fluctuate seasonally and given the surface flows it should be expected in excavations at depths of a few feet below the ground surface and is anticipated to be a constraint to design and construction of the planned improvements. The elevation of the ground in front of the abutment is approximately 3 to 5 feet higher than directly adjacent surface water levels in the two channels of the creek.

3.4 SITE SEISMICITY

The project seismic AASHTO LRFD criteria were included in this report, in accordance with Section 3.10 of the AASHTO LRFD Bridge Design Specifications (2012). The horizontal design acceleration is defined as having a 7 percent chance of exceedance during a 75-year recurrence interval. The probabilistic horizontal spectral acceleration values for the designated return period and corresponding peak horizontal ground acceleration (PGA) were obtained from the United States Geological Survey (USGS) seismic hazards program website (USGS 2013). The values obtained from the website are based on 2009 AASHTO Guide Specifications for LRFD Seismic Bridge Design and use 2002 USGS seismic hazard data.

Based on the assumed soil and bedrock characteristics at the site, the underlying bedrock is expected to have a shear wave velocity of more than 2,500 feet/sec. As such, in accordance with AASHTO (2012), the site was classified as Site Class B. The seismic design parameters are presented in Table 3.1 - Summary of Seismic Design Parameters.

Table 3.1 - Summary of Seismic Design Parameters

Location	Latitude & Longitude ⁽¹⁾	Site Class	Seismic Design Parameter	Period, T (second)	Spectral Acceleration Value, g
SR 179 at Tlaquepaque	34.862441°N -111.762065°W	B	A _s	0.0	0.088
			S _{DS}	0.2	0.208
			S _{D1}	1.0	0.062

Note: ¹ Latitude and longitude of location used to determine seismic design coefficients from USGS website.

4 DISCUSSION AND RECOMMENDATIONS

The following sections present our geotechnical recommendations for the planned improvements based on limited subsurface data. These recommendations are based on our understanding of the project. We should be contacted for additional recommendations and/or evaluation during construction to confirm assumptions presented in this report.

4.1 PATH STABILIZATION TECHNIQUES

We understand that stabilization of the alluvial materials beneath the planned pathway is needed to protect the pathway from scour and erosion. Various stabilization methods could be considered, as well as other structural techniques. We recommend that within the limits of the pathway subject to scour/erosion, the existing alluvial materials be removed down to bedrock and replaced with scour-resistant materials such as grouted riprap, controlled low strength material (CLSM), or mass concrete.

Excavation of the alluvial materials overlying bedrock are discussed below. The excavation should penetrate the underlying bedrock a minimum of 6 inches. The exposed bedrock surface should be observed and approved by the geotechnical engineer prior to placement of any backfill materials. Groundwater and seepage from adjacent creeks and drainages should be anticipated. Dewatering and the overall stability of the excavation should be made the sole responsibility of the contractor.

Excavation adjacent to the existing grouted riprap should be performed so that damage to the grouted riprap does not occur or cause the mass to become unstable. The limits of the grouted riprap may be different than shown on the record drawings. The contractor should perform their own evaluation of the existing conditions.

4.2 FOUNDATIONS

Shallow spread footings sized to support the structural loads are anticipated to support retaining walls for the access ramps on the north and south sides of SR 179. Based on our review of available information and our experience, we recommend footings for retaining walls that are supported on stabilized materials or on at least 2 feet of engineered fill be designed using an allowable bearing capacity of 4,000 pounds per square foot. Total and differential settlement of the footings are anticipated to be less than ½-inch and ¼-inch, respectively.

Footings should be at least 18 inches in width and located at least 1.5 feet below the lowest adjacent grade. Where adjoining continuous footings are located at different elevations, we recommend that the upper footings be stepped down to the lower footing.

Lateral resistance for spread footings is provided by sliding along the base of the footing. Foundations subject to lateral loading may be designed using a coefficient of friction of 0.5 for footings bearing on stabilized materials.

4.3 EARTHWORK

The following sections provide our earthwork recommendations for the project. The earthwork specifications contained in the Maricopa Association of Governments (MAG), Uniform Standard Specifications and Details for Public Works Construction (including any amendments from the City of Sedona) should apply, except as noted in this report.

4.3.1 EXCAVATIONS

Based on our review of available information, the surface materials should be excavatable with heavy-duty excavation equipment to the depths anticipated for this project. Bedrock was encountered in previous borings in the vicinity and should be anticipated. Heavy-duty excavation equipment is anticipated to be able to penetrate the bedrock materials to the depths needed for this project.

4.3.2 TEMPORARY SLOPE STABILITY AND SHORING

Excavations that are less than 20 feet in depth may be constructed using a sloped excavation in accordance with Occupational Safety and Health Administration (OSHA) Standards and based on the soil types encountered during excavation. We recommend that the OSHA soil "Type C" be used for the alluvial soils present at the site with a temporary slope of 1.5H:1V (Horizontal:Vertical) be considered for sloped excavations less than 20 feet deep. Excavations extending significantly into bedrock are not anticipated but steeper slope excavations in rock may be possible based on the condition of the bedrock encountered.

Temporary excavations that encounter surface seepage may need temporary shoring or other stabilization techniques. Excavations encountering seepage, if any, should be evaluated on a case-by-case basis.

Shoring should be used in areas where slopes would exceed the inclinations recommended by OSHA or encounter seepage causing slope instability. Shoring may be required for construction excavations adjacent to existing structures or retaining walls. Shoring methods should avoid causing disturbance to existing Sycamore trees. The shoring system details should be left to the discretion of the contractor and should be designed by a qualified civil engineer.

4.3.3 BOTTOM STABILITY AND DEWATERING

Excavations may encounter perched groundwater or saturated geologic units and may cause the exposed bearing surface to weaken. The base of excavations should be sloped to drain towards a sump or other dewatering equipment. Heavily saturated units or zones may call for more aggressive dewatering techniques and consultation with a qualified expert. Discharge of water from excavations should be in accordance with project specifications and any applicable laws or regulations.

4.3.4 GRADING, FILL PLACEMENT AND COMPACTION

Vegetation, debris and other unsuitable materials from the clearing operation should be removed from the site and properly disposed. On-site and imported soils with low plasticity indices are considered suitable for re-use as fill. Low plasticity indices are defined as a Plasticity Index (PI) value of 20 or less, as defined by ASTM D 4318. Suitable fill should not include construction debris, organic materials, or other non-soil materials. Rock particles and clay lumps should be less than 6 inches in dimension. Oversize excavation materials should be expected and sorting and/or screening will be needed.

For areas to receive grade-raise fill or below structures, we recommend the surface be prepared by scarifying the upper 8 inches, unless bedrock is exposed. The scarified material should be moisture-conditioned and compacted by appropriate mechanical methods to a relative compaction of 95 percent and at a moisture content near optimum using ASTM D 698 as a standard. Grade-raise fill should be placed in lifts less than 8 inches in loose thickness and compacted as noted above. Unsuitable soils, if encountered, should not be used as backfill behind walls or as structural fill in the upper 3 feet below structures but may be placed as fill in other non-structural locations.

Placement of fill against sloped surfaces steeper than 5H:1V should be benched so that a weak zone against the slope is not formed and to promote uniform compaction across each lift of fill.

4.3.5 PERMANENT FILL SLOPES

Permanent fill slopes for this project can be sloped at an angle of 2H:1V if protected from erosion. Flatter slopes may be used to promote vegetation. Erosion protection could consist of riprap, shotcrete or other manufactured products. Erosion control products should be placed in accordance with the manufacturer's recommendations.

4.3.6 EARTHWORK FACTORS

Based on our review of available data, we estimate the on-site soils will shrink approximately 15 to 20 percent when recompacted to 95 percent of standard Proctor density. A ground compaction factor of 0.2 feet is estimated for compaction of the exposed ground surface outside the limits of the existing roadway prism.

4.4 LATERAL EARTH PRESSURES

Active earth pressure occurs when the wall moves away from the soil and the soil mass stretches horizontally, sufficient to mobilize its shear strength, and a condition of plastic equilibrium is reached. For a drained granular backfill, an equivalent fluid active earth pressure of 35 pounds per square foot per foot (psf/ft) of wall height should be used for the design of cantilevered, yielding walls. Drainage should consist of free-draining granular material and could be accompanied by weepholes through the walls or a geocomposite drainage mat attached to the wall and discharging to a drain pipe may be considered. If drainage is not provided, an equivalent fluid earth pressure of 85 psf/ft of wall height should be used for design of the walls. These earth pressures are based on the walls being flexible enough to allow mobilization of the active earth pressure condition. An outward lateral movement of about $0.001H$ (where H is the height of the wall) at the top of the wall is generally needed to mobilize the active earth pressure condition.

A soil mass that is neither stretched nor compressed is said to be in an at-rest state. If the wall is rigidly restrained, so that it does not rotate sufficiently to reach the active earth pressure condition, at-rest earth pressure conditions will exist. An equivalent fluid at-rest earth pressure of 57 psf/ft should be used for the drained condition, and 90 psf/ft should be used for the undrained condition.

Passive earth pressure occurs when the wall or foundation moves into the soil and the soil mass is compressed horizontally, mobilizing its shear strength. For below-grade portions of the walls with granular backfill in front of the toe of the wall, an equivalent fluid passive earth pressure of 350 psf/ft of wall height can be utilized (triangular pressure distribution). This should be reduced for walls with sloping foreslopes and eliminated for walls subject to erosion or scour effects from the creek.

5 REFERENCES

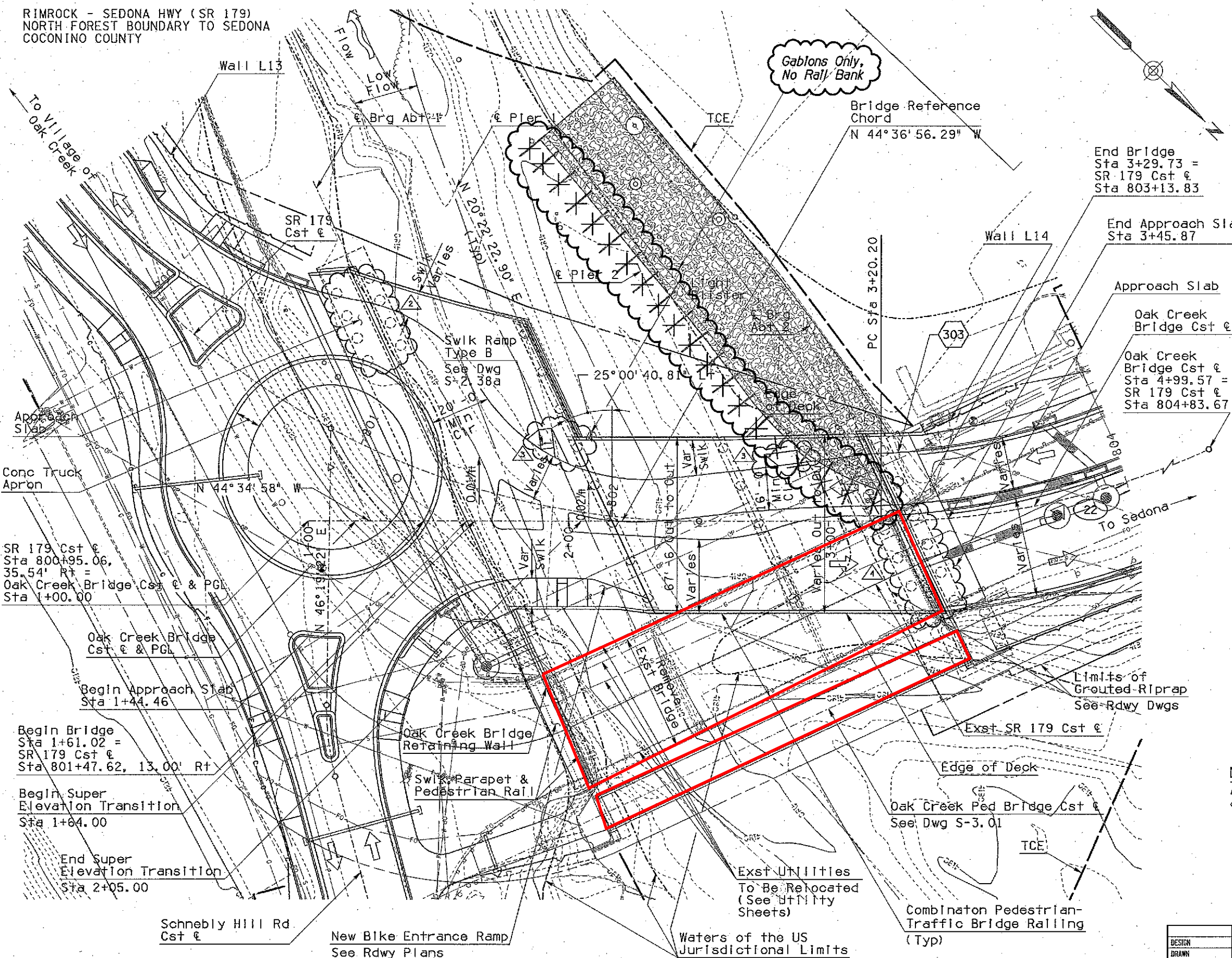
- American Association of State Highway and Transportation Officials (AASHTO), 2012. *AASHTO LRFD Bridge Design Specifications*. 6th Edition. Washington, DC: American Association of State Highway and Transportation Officials.
- Arizona Department of Water Resources (ADWR), 2012. Groundwater Site Inventory (GWSI) database <https://gisweb.azwater.gov/waterresourcedata/GWSI.aspx> (Accessed January 2020).
- United States Geological Survey (USGS), 2013. U.S. Seismic Design Maps. Version 3.1.0. <http://earthquake.usgs.gov/designmaps/us/application.php> (Accessed January 2020).
- Dewitt, E., Langenheim, V., Force, E., Vance, R.K., Lindberg, P.A., Driscoll, R.L., 2008, Geologic Map of the Prescott National Forest and headwaters of the Verde River, Yavapai and Coconino Counties, Arizona.
- Kamilli, R.J. and Richard, S.M., 1998, Geologic Highway Map of Arizona: Arizona Geological Society and Arizona Geological Survey Map.
- Maricopa Association of Governments, 2012, Specifications and Details for Construction.
- Occupational Safety and Health Administration (OSHA), Title 29 of the Code of federal Regulations (CFR), Part No. 1926 – Safety and Health Regulations for Construction, Subpart P – Excavations.

APPENDIX A

RIMROCK - SEDONA HWY (SR 179)
NORTH FOREST BOUNDARY TO SEDONA
COCONINO COUNTY

F.H.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARIZ.	179-A-(002)B	430	760	3/15/11

179 CN 310



DRAWING INDEX:

- S-2.01 General Plan & Index
- S-2.02 Elevation & Typical Sections
- S-2.03 General Notes & Quantities
- S-2.04 Phasing Sequence 1
- S-2.05 Phasing Sequence 2
- S-2.06 Bridge Removal Limits
- S-2.07 Excavation & Backfill Limits
- S-2.08 Foundation Plan & Details
- S-2.09 Abutment 1 Plan & Elevation
- S-2.10 Abutment 2 Plan & Elevation
- S-2.11 Abutment Details 1
- S-2.12 Abutment Details 2
- S-2.13 Abutment Details 3
- S-2.14 Retaining Wall
- S-2.15 Pier 1 Plan & Elevation
- S-2.16 Pier 2 Plan & Elevation
- S-2.17 Pier Details 1
- S-2.18 Pier Details 2
- S-2.19 Framing Plan Span 1
- S-2.20 Framing Plan Spans 2 & 3
- S-2.21 Box Girder Details 1
- S-2.22 Box Girder Details 2
- S-2.23 Box Girder Details 3
- S-2.24 Box Girder Details 4
- S-2.25 Box Girder Details 5
- S-2.26 Box Girder Details 6
- S-2.27 Deck Plan
- S-2.28 Deck Details 1
- S-2.29 Deck Details 2
- S-2.30 Deck Details 3
- S-2.31 Deck Details 4
- S-2.32 Combination Pedestrian-Traffic Bridge Railing 1
- S-2.33 Combination Pedestrian-Traffic Bridge Railing 2
- S-2.34 Combination Pedestrian-Traffic Bridge Railing 3
- S-2.35 Combination Pedestrian-Traffic Bridge Railing 4
- S-2.36 Miscellaneous Details 1
- S-2.37 Miscellaneous Details 2
- S-2.38 Miscellaneous Details 3
- S-2.39 Screed Elevations 1 of 3
- S-2.40 Screed Elevations 2 of 3
- S-2.41 Screed Elevations 3 of 3
- S-2.42 Compression Seal Modification Detail
- SF-2.01 Foundation Data 1
- SF-2.02 Foundation Data 2
- SF-2.03 Foundation Data 3
- SF-2.04 Foundation Data 4
- SF-2.05 Foundation Data 5

NOTE:

All stations & dimensions are given along the Oak Creek Bridge Cst &.

PLAN
New Three Span Precast-Prestressed Concrete Box Girder Bridge
Contour Interval = 1'-0
Skew = 25°00'40.81" Lt
Scale: 1" = 20'-0

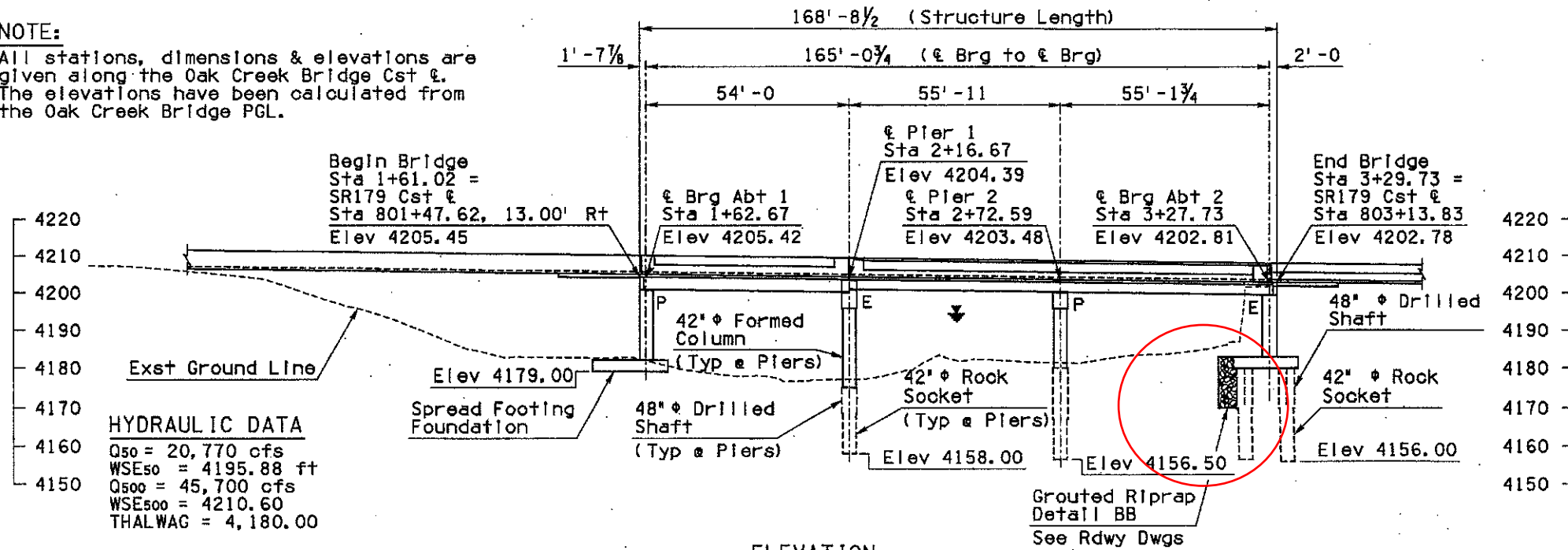


DESIGN	NAME	DATE	ARIZONA DEPARTMENT OF TRANSPORTATION INTERMODAL TRANSPORTATION DIVISION BRIDGE GROUP	
DESIGN	SEO	05/07		
DRAWN	TST	05/07		
CHECKED	DPC	05/07	STA 801+ OAK CREEK BRIDGE GENERAL PLAN & INDEX	
DMJM HARRIS	AECOM	2771 E. CAMELBACK RD SUITE 200 PHOENIX, AZ 85016-4302 6022 337-2177		
ROUTE	MILEPOST	STRUCTURE NO.	LOCATION	DATE
SR 179	313.10	2850	NORTH FOREST BOUNDARY TO CITY OF SEDONA	9/20/2011
TRACS NO. H 3414 03C			179-A-(002)B	DWG NO. S-2.01
				601 OF 1016

F.J.M.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARIZ.	179-A-10021B	431	760	3/17/11

179 CN 310

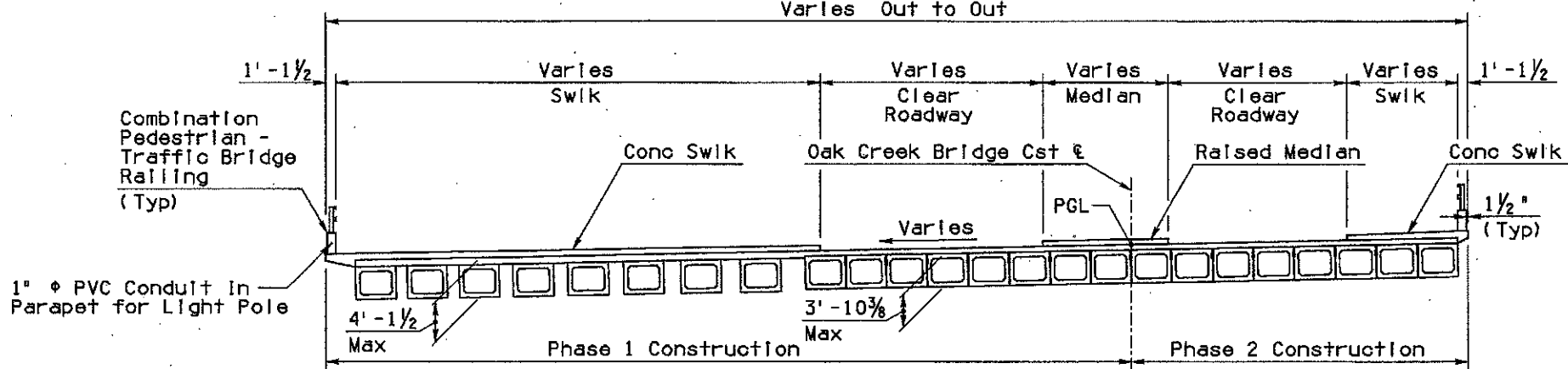
NOTE:
All stations, dimensions & elevations are given along the Oak Creek Bridge Cst &. The elevations have been calculated from the Oak Creek Bridge PGL.



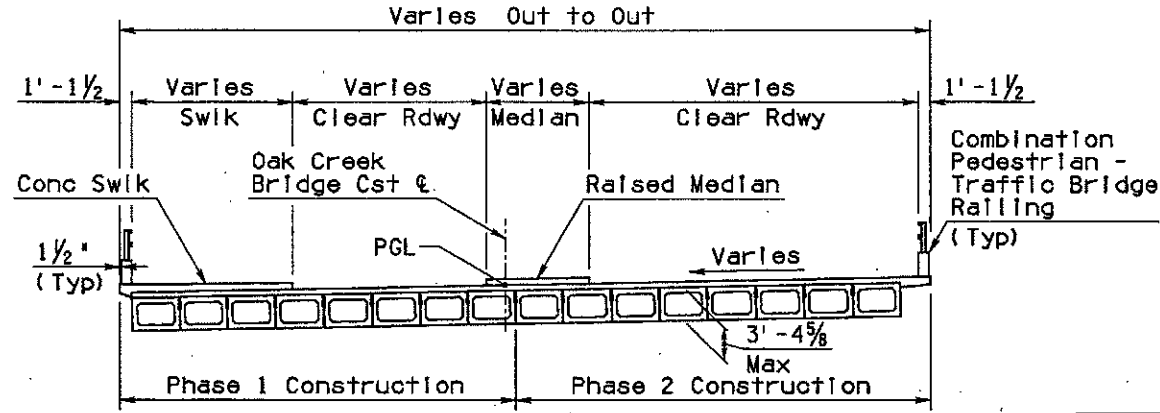
22 CURVE DATA
 $\Delta = 24^\circ 56' 59''$ L+
 $D = 19^\circ 05' 55''$
 $R = 300.00'$
 $L = 130.64'$
 $T = 66.37'$
 $E = 7.25'$

HYDRAULIC DATA
 $Q_{50} = 20,770$ cfs
 $WSE_{50} = 4195.88$ ft
 $Q_{500} = 45,700$ cfs
 $WSE_{500} = 4210.60$
 $THALWAG = 4,180.00$

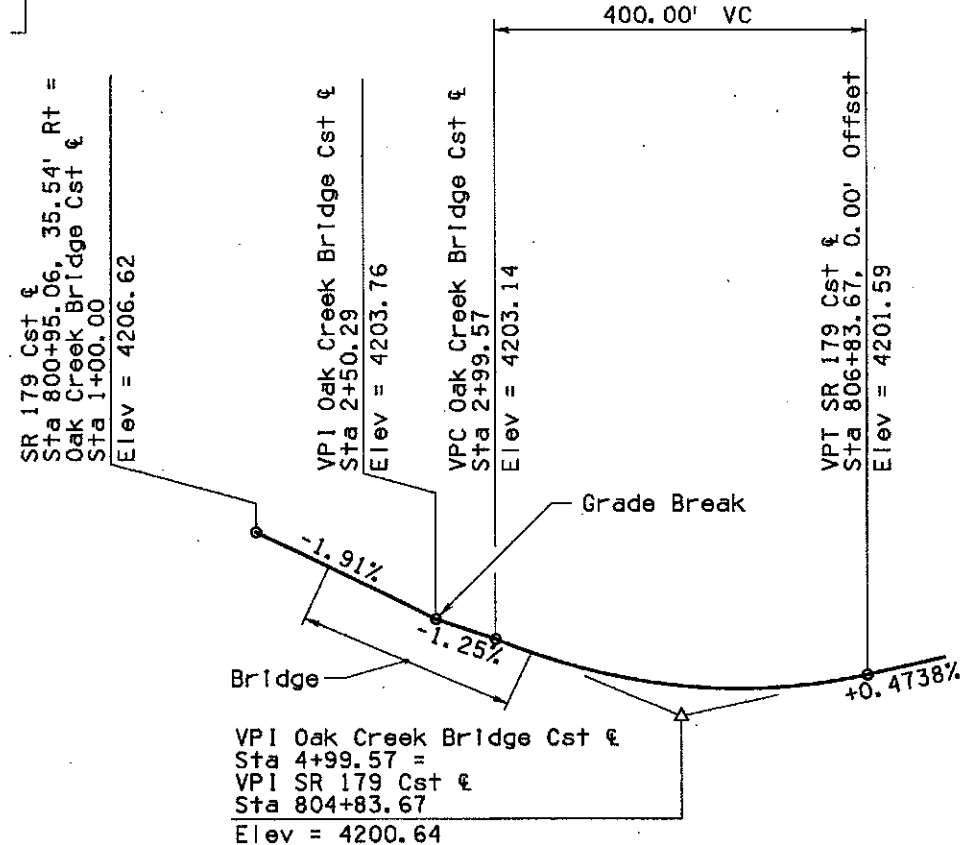
ELEVATION
Scale: 1" = 20'-0"



TYPICAL SECTION - SPAN 1
Scale: 1/8" = 1'-0"



TYPICAL SECTION - SPANS 2 & 3
Scale: 1/8" = 1'-0"



NOTE:
The Oak Creek Bridge PGL should be used to construct the bridge & approach slab.

OAK CREEK BRIDGE PROFILE GRADE LINE
NTS

DESIGN	NAME	DATE	ARIZONA DEPARTMENT OF TRANSPORTATION INTERMODAL TRANSPORTATION DIVISION BRIDGE GROUP		
DRWN	SEO	05/07			
CHECKED	TST	05/07			
DMJM HARRIS AECOM 2777 E. CAMELBACK RD. SUITE 200 PHOENIX, AZ 85016-4302 (602) 314-7171			STA 801+ OAK CREEK BRIDGE ELEVATION & TYPICAL SECTIONS		
ROUTE	MILEPOST	STRUCTURE NO.		NORTH FOREST BOUNDARY TO CITY OF SEDONA	
SR 179	313.10	2850	TRACS NO.: H 3414 03C	179-A-10021B	DWG NO. 5-2.02 602 OF 1016

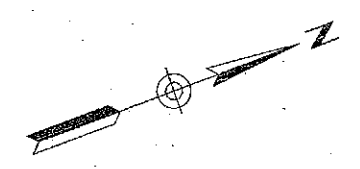
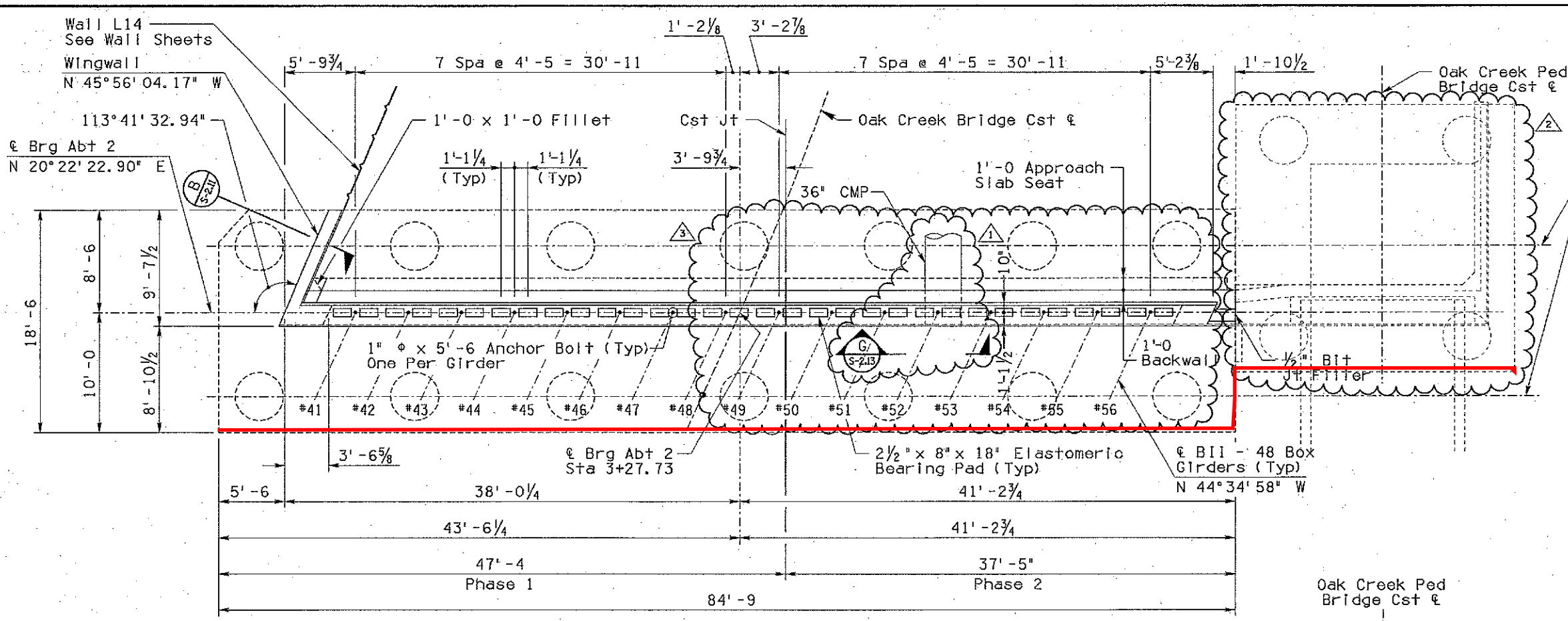


DATE: LOCATION: REVISIONS: FINISHED PLANS: SURVEY NO.

REVISIONS
 1. REVISED PIPE LOCATION & FED BRIDGE ABT 2 9/16/07
 2. REVISED PIPE LOCATION & FINISHED GRADE 1/22/09
 3. REVISED DRILLED SHAFT LAYOUT & FINISHED GRADE 1/22/09

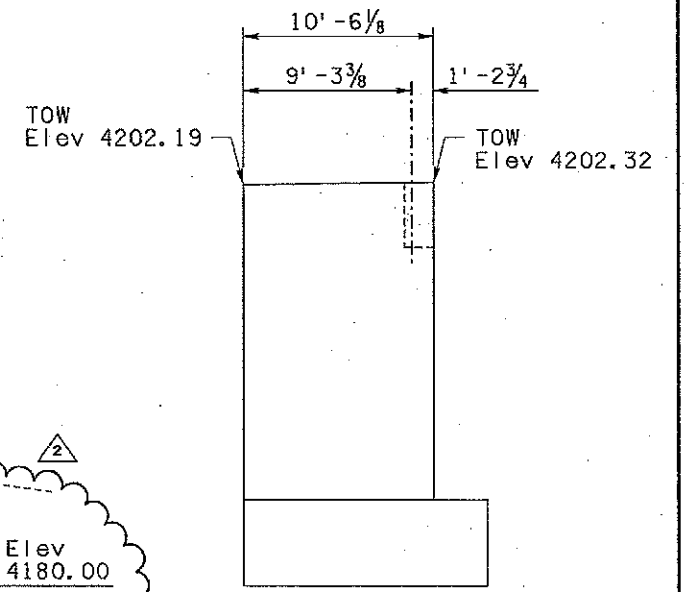
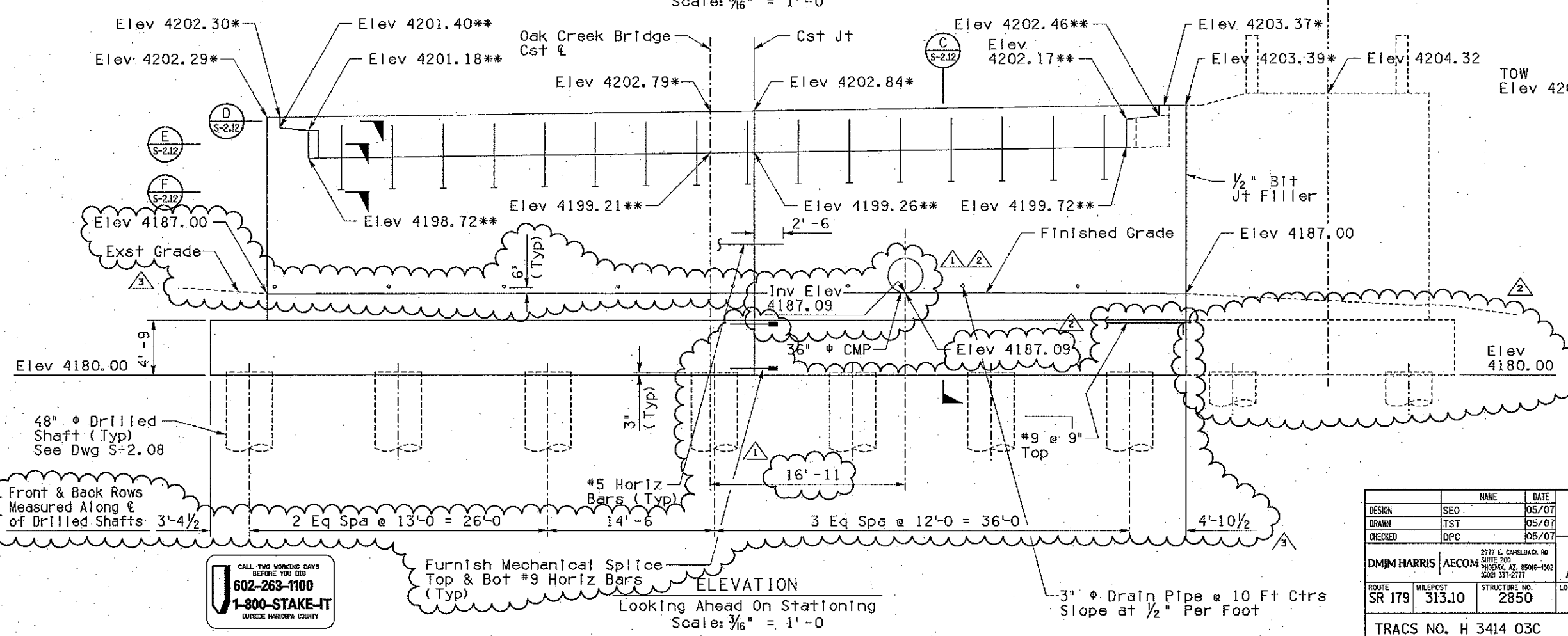
F.H.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARIZ.	179-A-(002)B	439	760	3/17/11

179 CN 310



- NOTES:
1. See Dwg S-2.31 for Bearing Pad Details.
 2. The bearing seat varies in elevation linearly between elevations indicated in drawing.
- * Elevations shown at front face of backwall.
 ** Elevations shown at € bearing.

PLAN
 Scale: 3/16" = 1'-0"



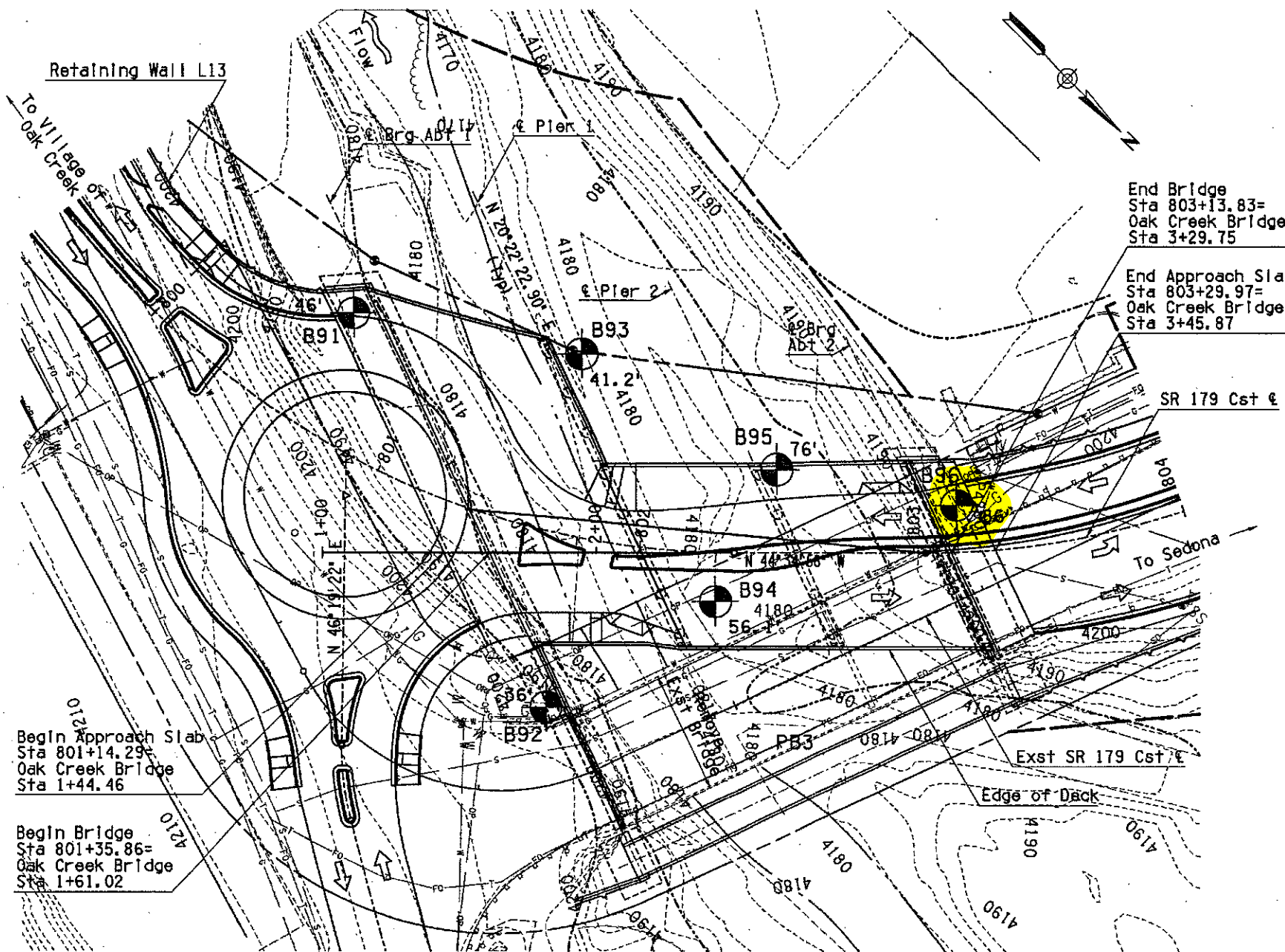
ABUTMENT WINGWALL ELEVATION
 Scale: 3/16" = 1'-0"

CALL TWO WORKING DAYS BEFORE YOU DIG
 602-263-1100
 1-800-STAKE-IT
 OUTSIDE MARICOPA COUNTY

DESIGN	NAME	DATE	ARIZONA DEPARTMENT OF TRANSPORTATION INTERMODAL TRANSPORTATION DIVISION BRIDGE GROUP
SE0	SE0	05/07	
TST	TST	05/07	
DPC	DPC	05/07	Sta 801+ OAK CREEK BRIDGE ABUTMENT 2 PLAN & ELEVATION
DMJM HARRIS	AECOM	2777 E. CAMELBACK RD SUITE 200 PHOENIX, AZ 85016-1002 602 331-2777	
ROUTE SR 179	MILEPOST 313.10	STRUCTURE NO. 2850	LOCATION NORTH FOREST BOUNDARY TO CITY OF SEDONA
TRACS NO. H 3414 03C			179-A-(002)B
			616 OF 1016

F.H.M.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARIZ.	179-A-(002)B	472	760	3/23/11

179 CN 310



End Bridge
Sta 803+13.83=
Oak Creek Bridge
Sta 3+29.75

End Approach Slab
Sta 803+29.97=
Oak Creek Bridge
Sta 3+45.87

Begin Approach Slab
Sta 801+14.29=
Oak Creek Bridge
Sta 1+44.46

Begin Bridge
Sta 801+35.86=
Oak Creek Bridge
Sta 1+61.02

PLAN VIEW
NTS

GENERAL NOTES:

1. General soil and rock strata descriptions and indicated boundaries are based on engineering interpretation of available subsurface information by the geotechnical engineer and may not reflect actual variation in subsurface conditions between borings and samples. The location of contacts between strata shown on the logs are generally approximate, and changes between material types may be gradual rather than abrupt. Classification of soil materials is in general accordance with ASTM D 2488-00 and is based on field observation unless accompanied by mechanical analysis presented in the Geotechnical Report.
2. The water levels and/or moisture conditions indicated on the boring logs are as recorded at the time of exploration. These water levels and/or moisture conditions may vary considerably with time according to the prevailing climate, rainfall or other factors and are otherwise dependent upon the duration of and methods used in the exploration program.
3. The boring logs indicate that the depth to groundwater was not determined (as the borings were advanced with water). However, Oak Creek is a perennial stream and shallow groundwater should be anticipated at all drilled shaft locations.
4. Sound engineering judgment was exercised in preparing the subsurface information presented on these sheets. This information was prepared and is intended for design and estimate purposes. Its presentation on the plans or elsewhere is for the purpose of providing intended users with access to the same information as the State and its designers. This subsurface information interpretation is presented in good faith and is not intended as a substitute for personal investigation, independent interpretations or judgment of the contractor.
5. A 140 lb hammer, 30 inch free-fall, was used to drive the 2 inch O.D. Standard Penetration Test (SPT) split-spoon sampler (ASTM D 1586-99).
6. For further information, refer to Final Foundation Design Report, DMJM Harris (July, 2006). This report is available at ADOT Contracts and Specifications.
7. All geotechnical/foundation reports prepared for this project shall be considered by the drilled shaft contractor in developing bid documents.

LEGEND

BB12 34.8' DMJM Harris Test Boring Location and Depth (feet)

DESIGN	KHD	DATE	05/07	ARIZONA DEPARTMENT OF TRANSPORTATION INTERMODAL TRANSPORTATION DIVISION BRIDGE GROUP	
DRAWN	JTN	DATE	05/07		
CHECKED	CAL	DATE	05/07		
DMJM HARRIS	AECOM	2771 EAST CAMELBACK RD SUITE 200 PHOENIX, AZ 85016 (602) 351-2177		STA 801+ OAK CREEK BRIDGE FOUNDATION DATA 1	
SR 179	313.10	2850		LOCATION NORTH FOREST BOUNDARY TO CITY OF SEDONA	DWG. NO. SF- 2.01
				TRACS NO. H 3414 03C	179-A-(002)B
					664 OF 1016

F.H.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARIZ.	179-A-10021B	473	760	3/23/11

Project Name: SR179, Sedona
 Location: Coconino County, AZ
 Project Number: 5961.0000
 Logged By: C. White/P.Garza

BORING LOG NO. B91
 Date(s): 10/04/2005
 Backhoe/Trackhoe Type: Burley 2500ST w/HQ-3 Wireline Core & HQ Adv w/GB
 Surface Elevation: 4,182.0' ±
 Location: Sta 800+62, 45' Lt, SR179 Cst &

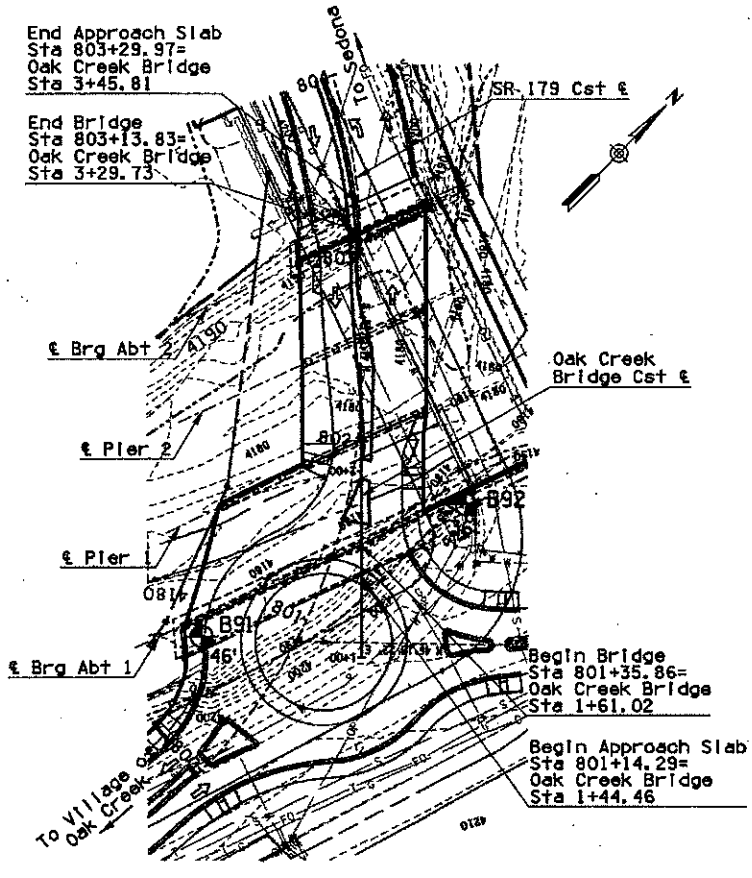
Depth (ft)	Drilling Operation	Drill Rate (min/ft)	Sample Interval	Sample Type & (Blockouts)	% Recovery	Rock Quality Designation (RQD)	% Fluid Recovery	Spacing of Discontinuities	Orientation of Discontinuities	Dip of Discontinuities	Relative Rock Hardness	Geological Log	MATERIAL DESCRIPTION
4,177.0	HQ3	1.8		HQ	100	65			5-10°	SW	S/MH		SANDSTONE HERMIT FORMATION Reddish Brown to Yellowish Tan, Very Well-Cemented, Fine Grained Quartz and Arkose Sand with Some Silt. Subhorizontal Medium Thick and Thick Beds Interbedded with Thin Shaly Lenses Notes: Grades with Gravel Below 3.5'
4,172.0	HQ	1.8		HQ	100	10			5-10°	NW to SW	S to VS		SILTY SANDSTONE TO SANDY SILTSTONE HERMIT FORMATION Reddish Brown, Variously Well to Poorly-Cemented, Fine Grained Silty Sandstone, Typically Ripple-Laminated Medium Thick to Thick Subhorizontal Beds with Some Interbedded Thin Lenses of Silty Sandstone and Shaly Sandstone
4,167.0	HQ	2.0		HQ	100	15			5-10°		S		Notes: 3/4" Diameter Plug Lined with Calcite Crystals at 15.65' Notes: Zone of Friable, Decomposed Silty Sandstone from 16.5' to 20.5'
4,162.0	HQ	2.4		HQ	100	5			5-15° Random	Dec	ES		Notes: Fast and Easy Drilling Approx 23.2' to 25.4' Poor to No Recovery of Decomposed Silty Sandstone
4,157.0	HQ	1.2		HQ	50	20			Bkn Random	Dec	ES		Notes: Fast and Easy Drilling Approx 30.0' to 39.5' Very Poor to No Recovery of Fine Grained Silty Sandstone, Friable and Decomposed
4,152.0	HQ	2.2		HQ	90	40			5-15°	SW to MH	S		Notes: Fast and Easy Drilling Approx 30.0' to 39.5' Very Poor to No Recovery of Fine Grained Silty Sandstone, Friable and Decomposed
4,147.0	HQ	0.3		HQ	15	0			Bkn Random	HW to Dec	VS to ES		Notes: Fast and Easy Drilling Approx 30.0' to 39.5' Very Poor to No Recovery of Fine Grained Silty Sandstone, Friable and Decomposed
4,142.0	HQ	1.1		HQ	70	10			VC Random				
4,137.0	HQ	1.8		HQ	100	40			5-15°	NW/HW	VS/S		SILTY TO GRAVELLY SANDSTONE HERMIT FORMATION Reddish Brown, Predominantly Very Well-Cemented Fine Grained Sand with Some Silt. Subhorizontal Medium Thick Bedding with Thin Interbedded Shaly Lenses Notes: Grades with Loose Rounded Gravel Clasts Below 4.5'
4,132.0													STOPPED CORING @ 46.0'

Project Name: SR179, Sedona
 Location: Coconino County, AZ
 Project Number: 5961.0000
 Logged By: P. Garza/C. White

BORING LOG NO. B92
 Date(s): 09/25/2005
 Backhoe/Trackhoe Type: Craned Burley 2500RT w/HQ-3 Wireline Core
 Surface Elevation: 4,192.0' ±
 Location: Sta 801+77, 63' Rt, SR179 Cst &

Depth (ft)	Drilling Operation	Drill Rate (min/ft)	Sample Interval	Sample Type & (Blockouts)	% Recovery	Rock Quality Designation (RQD)	% Fluid Recovery	Spacing of Discontinuities	Orientation of Discontinuities	Dip of Discontinuities	Relative Rock Hardness	Geological Log	MATERIAL DESCRIPTION
4,187.0	HQ3	2.8		HQ	90	60			0°-10°		S to VS		SILTY SAND & GRAVEL (SM-GM) Occasional to Some Cobbles, Considerable Widely-Graded Subrounded to Rounded Gravel Predominantly Basaltic Fragmental, Predominantly Fine to Medium Grained Sand Slightly Plasticity, Brown, Moist; Very Fine Note: Wood Spike Wash and Clear Overbank Terrace Analogue
4,182.0	HQ	3.0		HQ	100	100			0°-10°	SW	S/MH		SILTY TO GRAVELLY SANDSTONE W/ MINOR SILTSTONE HERMIT FORMATION Reddish Brown, Soft to Medium Hard and Very Well-Cemented, Fine Grained Sand with Some to Considerable Durants of Well-Bounded Predominantly Fine Gravel in Thick, Subhorizontal, Poorly-Defined Beds with Common Ripple-Laminated Sections and Occasionally Interbedded Thin to Medium Silty Sandstone
4,177.0	HQ	2.6		HQ	100	70			5°-20°		S		Notes: Moderately to Poorly-Cemented with Discontinuous Very Soft Zones of Sandstone Above 4.5'. Numerous Very Close Spaced Imperfect and Incipient to Tight Random Fractures
4,172.0	HQ	3.0		HQ	100	50			0°-10°	SW	S/MH		Notes: Strongly Gravelly and Silty Sandstone with Fine Moderately Close to Widely Spaced Parting Breaks from 4.5' to 14.5'. 40' Dip Slightly Open Planer Joint at 6.0' Inclined to Tight 60' Dip Planer Joint at 12.5'. Grades with Increases in Silt Below 14.0'
4,167.0	HQ	3.0		HQ	100	100			5°-15°	SW	S/MH		Notes: Poorly-Cemented Fine Grained Silty Sandstone Lenses from 14.5' to 15.7'
4,162.0	HQ	3.1		HQ	100	100			5°-15°	SW	S/MH		Notes: Recovered Core from 15.7' to 18.2' is Moderately to Slightly Fractured along Axis, but Several Very Close Spaced Pairs of Near Vertical Joints Present Below 15.7'
4,157.0	HQ	3.6		HQ	100	85			0°-20°	SW to MH	VS to S		Notes: Shear Zone along Near Vertical Joint from 18.2' to 20.5'. Thick (2-3') Zone of Friable Decomposed Sandstone Material Filling Near Vertical Joint from Approx. 15.0' to 19.5'. Very Soft and Highly Weathered Tail Rock along joints above and below
4,152.0	HQ								0°-10°	SW	MH		SILTY TO GRAVELLY SANDSTONE W/ MINOR SILTSTONE HERMIT FORMATION Reddish Brown, Predominantly Slightly Weathered, Soft to Medium Hard and Very Well-Cemented, Fine Grained Sand with Some to Considerable Durants of Well-Bounded Predominantly Fine Gravel in Thick, Subhorizontal, Poorly-Defined Beds with Common Ripple-Laminated Sections and Occasionally Interbedded Thin to Medium Thick Lenses of Very to Extremely Soft Silty Sandstone
4,147.0	HQ								0°-10°	SW	MH		Notes: Core Slightly to Very Slightly Broken by Typically Widely Spaced and Mechanical Parting-Type Separations from 20.15' to 32.8'
4,142.0	HQ								0°-10°	SW	MH		Notes: Closely to Very Closely Broken and Moderately to Poorly-Cemented Silty Sandstone Lenses from 32.8' to 34.0'
4,137.0	HQ								0°-10°	SW	MH		PEBBLE/GRAVEL CONGLOMERATE Grayish Brown, Very Well-Cemented and Silty, Well-Rounded Predominantly Fine Gravel Clasts in Matrix of Fine Grained Silty Sand Subhorizontal Sharp But Continuous Lower Contact Surface Notes: Core Closely Broken, But Numerous Random Very Close Spaced Headed and Tight, Blocking Fractures to 35.2'
4,132.0													STOPPED CORING @ 36.0'

- LEGEND**
- Sample
 - S-Split Spoon
 - R-Ring Sampler
 - A-Drill Cuttings
 - HQ-Wireline Core
 - Drilling Operation
 - NQ-Wireline Core
 - HSA-Hollow Stem Auger
 - GB-Gearbit
 - HWT-Casing Adv. w/Wireline GB
 - HQ-Wireline Core
 - Discontinuity Spacing
 - VW > 10.0'
 - W 3.0'-10.0'
 - MC 1.0'-3.0'
 - C 0.2'-1.0'
 - VC 0-0.2'



LEGEND
 B91 46' DMJM Harris Test Boring Location and Depth (feet)

LOCATION PLAN
 N.T.S.

DESIGN	KHD	DATE	05/07	ARIZONA DEPARTMENT OF TRANSPORTATION INTERMODAL TRANSPORTATION DIVISION BRIDGE GROUP
DRAWN	JTN	DATE	05/07	
CHECKED	CAL	DATE	05/07	
DMJM HARRIS	AECOM	2771 EAST CAMELBACK RD SUITE 200 PHOENIX, AZ 85016 (602) 331-2777	2850	Sta 801+ OAK CREEK BRIDGE FOUNDATION DATA 2
SR 179	313.10	2850	LOCATION	NORTH FOREST BOUNDARY TO CITY OF SEDONA
TRACS NO. H 3414 03C			179-A-10021B	DWG. NO. SF- 2.02 665 OF 1016

Project Name: SRI79, Sedona
 Location: Coconino County, AZ
 Project Number: 5961.0000
 Logged By: P. Garza/C. White

BORING LOG NO. B93
 Date(s): 09/23/2005
 Rig & Boring Type: Craned Buryly 2500RT
 w/HQ-3 Wireline Core
 Logged By: P. Garza
 Surface Elevation: 4,178.0' ±
 Location: Sta 801+63, 65' Lt, SRI79 Cst &

Groundwater		
Depth	Hour	Date
Not Determined	N/D	N/D

Elev (ft)	Depth (ft)	Drilling Operation	Drill Rate (in/hr)	Sample Interval	Sample Type & (B/COUNTS)	% Recovery	Rock Quality Designation (RQD)	% Fluid Recovery	Spinning of Discontinuity	Orientation of Discontinuity	Degree of Weathering	Relative Rock Hardness	Geotechnical Log	MATERIAL DESCRIPTION
4,173.0	5	HQ3	3.8		HQ	80	0		N/A	N/A	N/A	N/A	COBBLES, GRAVEL & SAND (GP-GM) Some to Considerable 1/2 to 4/8 Boulders, Mostly But Cap Graded Cobbles and Gravel, Predominantly Subangular to Subrounded Sand, Non-Plastic, Gray to Brown, Moist, Dense Notes: Oak Creek Channel Alluvium with Well-Rounded Quartz of Basalt, Sandstone, and Limestone Notes: Core Blocked Off at 4.3' and 5.0', No SPT Taken at 6.0' Due to Large Sandstone Boulder from Approx 4.2' to 1.5'	
4,168.0	10		3.2		HQ	85	20						SILTY TO GRAVELLY SANDSTONE W/ MINOR SANDY SILTSTONE GEMMET FORMATION Grayish to Dark Reddish Brown, Predominantly Slightly Weathered, Soft to Medium Hard, Very Well-Cemented and Partially Silty Fine Grained Sand with Considerable to Some Silt and Varied to Fine Gravel, Subhorizontal Thin to Very Thick Beds of Compactly Rippled-Laminated Sandstone with Occasional Thin to Medium Thick Interbedded Lenses of Poorly-Cemented Fine Grained Silty Sandstone Notes: Frequent Very Close Spaced Incident, Impermeable and Silty/Calcite Healed Fractures from 3.4' to 12.5' Recovered Core in Interval Typically Closely Broken by Natural and Mechanical Parting Separations	
4,163.0	15		3.8		HQ	100	100		0°-15° 70°-90° + Rdm	SW	MH			
4,158.0	20		3.0		HQ	100	45		0°-10°	MW	VS to ES			
4,153.0	25		3.0		HQ	100	100		0°-15° 70°-90° + Rdm	MW to SW				
4,148.0	30		3.2		HQ	100	80		0°-10°	SW	S/MH			
4,143.0	35		3.1		HQ	100	100		0°-10° 70°-90° + Rdm	SW	S/MH			
4,138.0	40		3.1		HQ	60	60							
4,133.0	45												STOPPED CORING @ 41.2' CORE PULLED UP SHORT @ 39.3'	

Project Name: SRI79, Sedona
 Location: Coconino County, AZ
 Project Number: 5961.0000
 Logged By: P. Garza

BORING LOG NO. B94
 Date(s): 09/23/2005
 Rig & Boring Type: Craned Buryly 2500RT
 w/HQ-3 Wireline Core
 Logged By: P. Garza
 Surface Elevation: 4,180.0' ±
 Location: Sta 802+28, 18' Rt, SRI79 Cst &

Groundwater		
Depth	Hour	Date
Not Determined	N/D	N/D

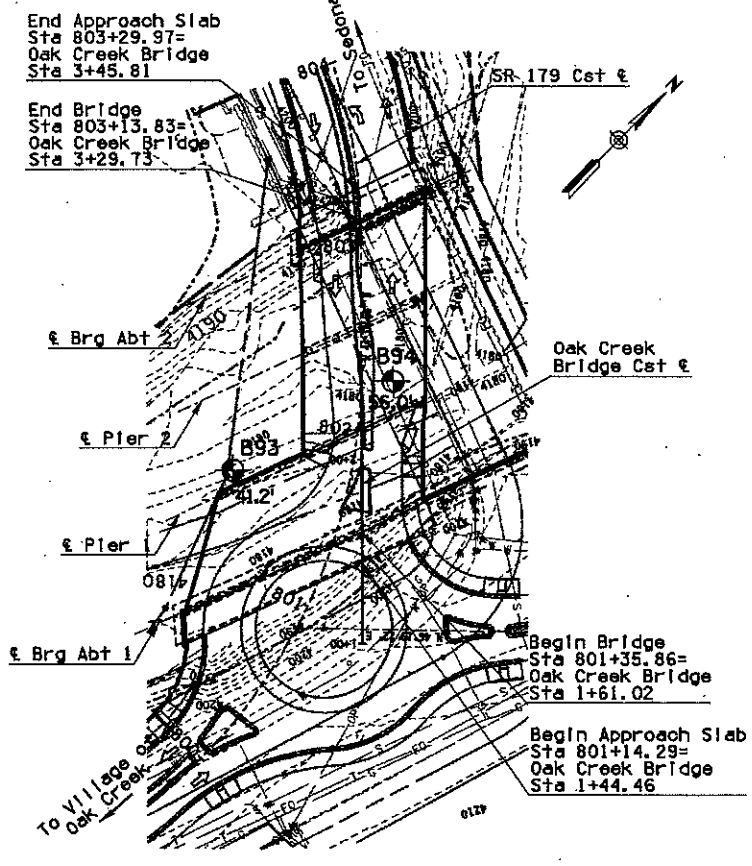
Elev (ft)	Depth (ft)	Drilling Operation	Drill Rate (in/hr)	Sample Interval	Sample Type & (B/COUNTS)	% Recovery	Rock Quality Designation (RQD)	% Fluid Recovery	Spinning of Discontinuity	Orientation of Discontinuity	Degree of Weathering	Relative Rock Hardness	Geotechnical Log	MATERIAL DESCRIPTION
4,175.0	5	HQ3	2.7		HQ	60	0		N/A	N/A	N/A	N/A	GRAVEL (GP-GM) Numerous Subrounded and Rounded Cobbles and Boulders, Predominantly Subrounded and Rounded Subangular to Subrounded Coarse Subangular Sand, Some Non-Plastic Fines, Moist, Dense Notes: Oak Creek Channel Alluvium Notes: Core Blocked Off @ 3.5' and 7.5'	
4,170.0	10		3.1		HQ	95	50						SILTY SANDSTONE GEMMET FORMATION Reddish Brown, Very Well-Cemented, Partially Silty Fine Grained Sand and Silt, Flat to Subhorizontal Very Thick Sequence of Poorly-Defined Medium Thick to Thick Beds with Some Fairly Rippled-Lamination Notes: Core Typically Slightly Broken by Natural and Mechanical Parting Separations Few Non-Bedding Fractures Notes: Near-Vertical Fracture Filled and Healed by 1/2" to 3/4" of Calcite from 11.5' to 13.0'	
4,165.0	15		2.7		HQ	100	100		5°-15°		SW	S/MH		
4,160.0	20		2.7		HQ	100	70		5°-15° 80°-90°					
4,155.0	25		0.6		HQ	30	0		60°-90° + Random		HW	VS	SANDY SILTSTONE/ SHEAR ZONE GEMMET FORMATION Reddish Brown, Highly Weathered to Decomposed and Friable Predominantly Medium to High Plasticity Clayey Silt with Fine Grained Sand Notes: Possible Shear Zone, Very Poor Recovery of Recovery Broken, Decomposed Silty Sandstone Material in Interval Spacing and Orientation of Fractures and/or Bedding Structures Indeterminate from Poor Recovery and Decomposition of Material	
4,150.0	30	HQ(3)	1.6		HQ	30	20		5°-20° 45°		SW	S/MH		
4,145.0	35		2.7		HQ	100	95		5°-10° 40°-85°					
4,140.0	40		3.8		HQ	100	98		5°-15°					
4,135.0	45		3.3		HQ	95	95		40°-55° 5°-15°					
4,130.0	50		3.9		HQ	100	100		5°-20°					
4,125.0	55		3.8		HQ	95	95		5°-15° 45°					
4,120.0	60												STOPPED CORING @ 56.0'	

F.H.N.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARIZ.	179-A-(002)B	474	760	3/23/11

179 CN 310

LEGEND

- Sample
 - S-Split Spoon
 - R-Ring Sampler
 - A-Drill Cuttings
 - HQ-Wireline Core
- Drilling Operation
 - NQ-Wireline Core
 - HSA-Hollow Stem Auger
 - GB-Gearbit
 - HWT-Casing Adv. w/Wireline GB
 - HQ-Wireline Core
- Discontinuity Spacing
 - VW > 10.0'
 - W 3.0'-10.0'
 - MC 1.0'-3.0'
 - C 0.2'-1.0'
 - VC 0-0.2'



LEGEND

B93
41.2'
DMJM Harris Test Boring
Location and Depth (feet)

LOCATION PLAN

N.T.S.

DESIGN	KHD	05/07	ARIZONA DEPARTMENT OF TRANSPORTATION INTERMODAL TRANSPORTATION DIVISION BRIDGE GROUP	
DRAWN	JTN	05/07		
CHECKED	CAL	05/07		
DMJM HARRIS	AECOM	2777 EAST CAMELBACK RD SUITE 200 PHOENIX, AZ 85016 602.331-2177	Sta 801+ OAK CREEK BRIDGE FOUNDATION DATA 3	
SR 179	313.10	2850	LOCATION	NORTH FOREST BOUNDARY TO CITY OF SEDONA
ROUTE	MILEPOST	STRUCTURE NO.		DWG. NO. SF-203
TRACS NO. H 3414 03C			179-A-(002)B	666 OF 1016

F.H.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARZ.	179-A-(002)B	475	760	3/23/11

Project Name: SR179, Sedona
 Location: Coconino County, AZ
 Project Number: 5961.0000
 Logged By: P. Garza

BORING LOG NO. B95
 Date(s): 09/22/2005
 Rig & Boring Type: Craned Buryl 2500RT w/HQ-3 Wireline Core
 Surface Elevation: 4,183.0' ±
 Location: Sta 802+50, 30' Lt, SR179 Cst €

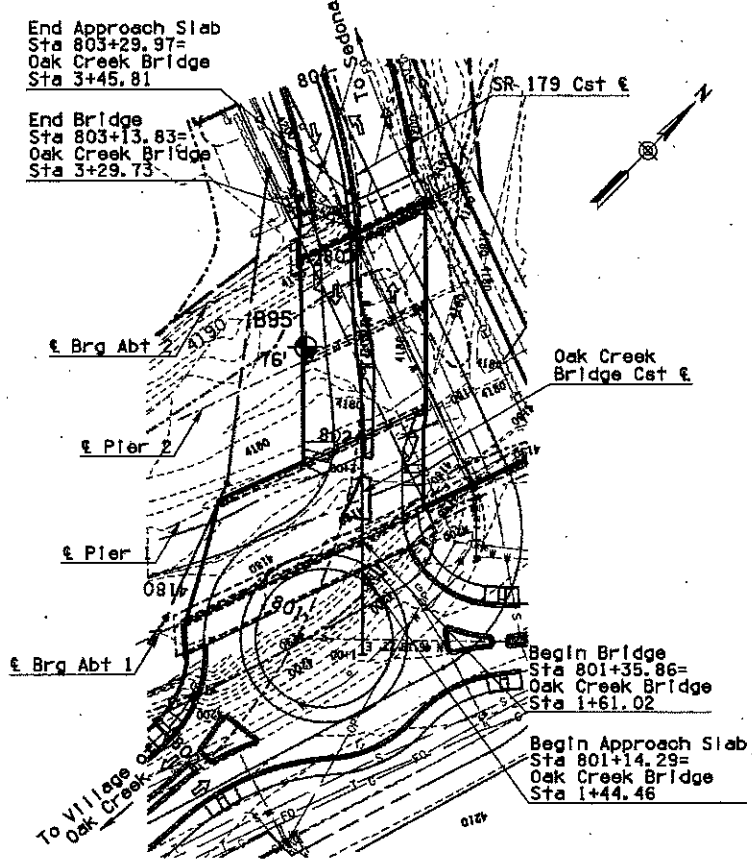
Elow (ft)	Depth (ft)	Drilling Operation	Drill Rate (min/ft)	Sample Interval	Sample Type & (Encountered)	% Recovery	Rock Quality Designation (RQD)	% Fluid Recovery	Sealing of Discontinuities	Orientation of Discontinuities	Degree of Weathering	Relative Rock Hardness	Geotechnical Log	MATERIAL DESCRIPTION
4,178.0	5	HQ3	2.2		HQ	60	0							SILTY GRAVEL (GM) Numerous Subrounded and Rounded Cobbles and Boulders, Predominantly Subrounded and Rounded Gap-Graded Gravel, Some Subangular Sand and Non-Plastic Fines, Molar Grey to Dark Brown, Dense to Very Dense Notes: Oak Creek Channel Alluvium Notes: No SPT a 6.0' Due to Basalt Boulder
4,173.0	10		2.4		HQ	50	0							Notes: No SPT a 11.0' Due to Boulder
4,168.0	15	NR			HQ	85	0							
4,163.0	20		3.0		HQ	95	90			5°-15°	SW	S/MH		SILTY SANDSTONE HERMIST FORMATION Reddish Brown Very Well-Cemented and Partly Silty Fine Grained Sand with Silty Subhorizontal Thick Bed with Faint Ripple-Lamination Notes: 75° Dip Fracture Healed with Calcite from 20.5' to 20.75'
4,158.0	25		0.4		HQ	10	0			5°-15°/75°				SANDY SILTSTONE HERMIST FORMATION Reddish Brown Very Poor Recovery of Predominantly Medium to Low Plasticity Clayey to Silty Fine Grained Sand Notes: Poor to No Recovery of Very to Extremely Weak Material within Interval (NEAR-VERTICAL SHEAR ZONE 7 1/2' Top and Bottom Contact Depths are Inferred and Approximate Bedding Structure Indeterminate, Spacing and Attitude of Discontinuities Measured where Possible in Short Intervals of Recovered Material
4,153.0	30		0.2		HQ	40	0							Notes: Intermittent Fast and Slow Drilling from 34.0' to 36.0', Recovered Very Soft and Friable Silty Sandstone from 34.8' to 36.0'
4,148.0	35		0.8		HQ	35	0							Notes: Extremely Fast Drilling, Minimal Recovery of Extremely Soft and Friable Silty Sandstone from 36.0' to 39.0'
4,143.0	40		1.6		HQ	50	25							SILTY SANDSTONE HERMIST FORMATION Reddish Brown Very Well-Cemented, Partly Silty Fine Grained Sand and Silty Flat to Subhorizontal Vary Thick Bed with Some Faint Ripple-Lamination Notes: Core Below 40.0' Very Slightly Broken by Few Widely Spaced Natural or Mechanical Parting Separations
4,138.0	45		2.4		HQ	100	100							
4,133.0	50		2.0		HQ	75	75							SANDY SILTSTONE/ SHEAR ZONE HERMIST FORMATION Reddish Brown Friable Predominantly Medium to Low Plasticity Clayey to Silty Fine Grained Sand Notes: Probable Shear Zones Very Poor Recovery of Randomly Sheared and Decomposed Siltstone and Sandstone Material Between Open Near-Vertical Fractures with Moderately to Highly Weathered Red Rock at Top and Bottom of Interval Notes: Spacing and Orientation of Fractures and/or Bedding Structure Indeterminate from Poor Recovery and Decomposition of Material
4,128.0	55		0.8		HQ	25	10							SILTY SANDSTONE HERMIST FORMATION Reddish Brown, Predominantly Very Well-Cemented, Partly Silty Fine Grained Sand and Silty Flat to Subhorizontal Bedding Notes: Moderately Weathered Zones along Near-Vertical Fractures at Top and Bottom of Section Core Moderately to Slightly Broken by Parting
4,123.0	60		1.6		HQ	60	50							SANDY SILTSTONE/SHEAR ZONE HERMIST FORMATION See Next Page...

Project Name: SR179, Sedona
 Location: Coconino County, AZ
 Project Number: 5961.0000
 Logged By: P. Garza

BORING LOG NO. B95
 Date(s): 09/22/2005
 Rig & Boring Type: Craned Buryl 2500RT w/HQ-3 Wireline Core
 Surface Elevation: 4,183.0' ±
 Location: Sta 802+50, 30' Lt, SR179 Cst €

Elow (ft)	Depth (ft)	Drilling Operation	Drill Rate (min/ft)	Sample Interval	Sample Type & (Encountered)	% Recovery	Rock Quality Designation (RQD)	% Fluid Recovery	Sealing of Discontinuities	Orientation of Discontinuities	Degree of Weathering	Relative Rock Hardness	Geotechnical Log	MATERIAL DESCRIPTION
4,118.0	65		0.2		HQ	10	0							SANDY SILTSTONE/SHEAR ZONE HERMIST FORMATION Reddish Brown Very Poor to Minimal Recovery of Decomposed and Friable Predominantly Medium to Low Plasticity Clayey to Silty Fine Grained Sand Notes: Probable Shear Zones Fast Drilling and Poor to No Recovery of Randomly Sheared and Decomposed Siltstone and Sandstone Material within Interval Between Open Near-Vertical Fractures with Moderately to Highly Weathered Red Rock at Top and Bottom Top and Bottom Contact Depths are Inferred and Approximate Bedding Structure Indeterminate from Poor Recovery and Decomposition of Material
4,113.0	70		0.6		HQ	15	0							SILTY TO GRAVELLY SANDSTONE HERMIST FORMATION Reddish Brown Very Well-Cemented, Partly Silty Fine Grained Sand and Silty with Some Fine Subrounded to Rounded Gravel Flat to Subhorizontal Bedding with Some Faint Ripple-Lamination Notes: Spacing and Orientation of Fractures and/or Bedding Structure Indeterminate from Poor Recovery and Decomposition of Material
4,108.0	75		2.0		HQ	55	20							STOPPED CORING a 76.0'

LEGEND
 Sample
 S-Split Spoon
 R-Ring Sampler
 A-Drill Cuttings
 HQ-Wireline Core
 Drilling Operation
 NQ-Wireline Core
 HSA-Hollow Stem Auger
 GB-Gearbit
 HWT-Casing Adv. w/Wireline GB
 HQ-Wireline Core
 Discontinuity Spacing
 VW >10.0'
 W 3.0'-10.0'
 MC 1.0'-3.0'
 C 0.2'-1.0'
 VC 0-0.2'



LEGEND
 B95
 76'
 DMJM Harris Test Boring Location and Depth (feet)

LOCATION PLAN
 N.T.S.

DESIGN	KHD	05/07	ARIZONA DEPARTMENT OF TRANSPORTATION INTERMODAL TRANSPORTATION DIVISION BRIDGE GROUP	
DRAWN	JTN	05/07		
CHECKED	CAL	05/07		
DMJM HARRIS	AECOM	2777 EAST CAMELBACK RD SUITE 200 PHOENIX, AZ 85066 602.331-2177	Sta 801+ OAK CREEK BRIDGE FOUNDATION DATA 4	
SR 179	313.10	2850	LOCATION	NORTH FOREST BOUNDARY TO CITY OF SEDONA
ROUTE	MELEPOST	STRUCTURE NO.		DWG. NO. SF- 2.04
TRACS NO. H 3414 03C			179-A-(002)B	667 OF 1016

Project Name: SR179, Sedona
 Location: Coconino County, AZ
 Project Number: 5961.0000
 Logged By: C. White/P. Garza

BORING LOG NO. B96
 Date(s): 09/08/2005 & 09/09/2005
 Rig & Boring Type: Burley 2500RT w/HQ-3 Wireline Core
 Surface Elevation: 4,198.0' ±
 Location: Sta 803+17, 17' Lt, SR179 Cst E

Groundwater			MATERIAL DESCRIPTION		
Depth	Hour	Date	Elw (ft)	Depth (ft)	Drilling Operation
Not Determined	N/D	N/D	4,193.0	5	HQ3
			4,188.0	10	HQ
			4,183.0	15	HQ
			4,178.0	20	HQ
			4,173.0	25	NR
			4,168.0	30	HQ
			4,163.0	35	HQ
			4,158.0	40	HQ
			4,153.0	45	HQ
			4,148.0	50	HQ
			4,143.0	55	HQ
			4,138.0	60	HQ

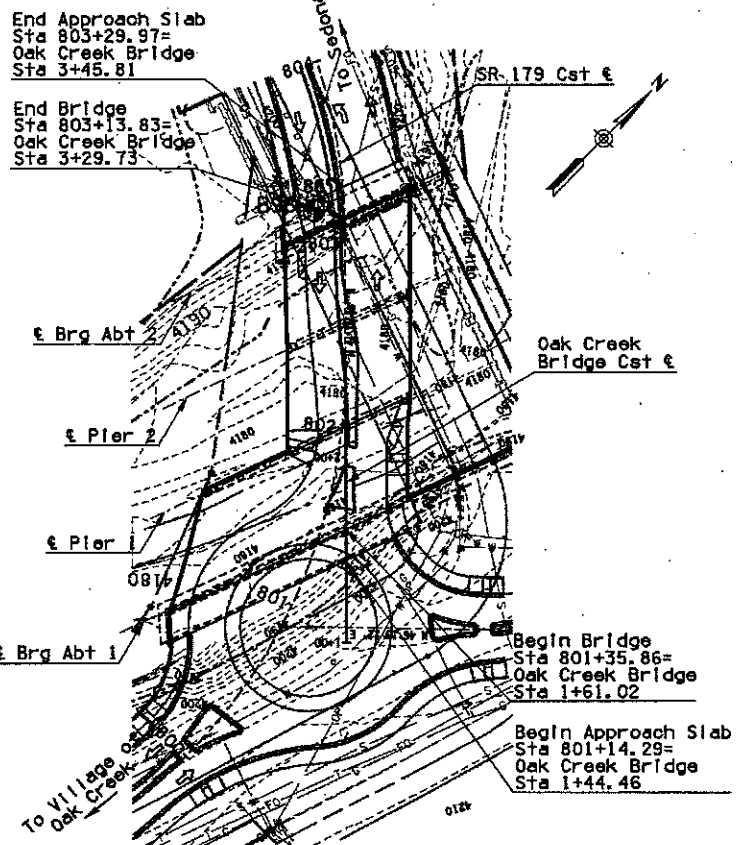
Project Name: SR179, Sedona
 Location: Coconino County, AZ
 Project Number: 5961.0000
 Logged By: C. White/P. Garza

BORING LOG NO. B96
 Date(s): 09/08/2005 & 09/09/2005
 Rig & Boring Type: Burley 2500RT w/HQ-3 Wireline Core
 Surface Elevation: 4,198.0' ±
 Location: Sta 803+17, 17' Lt, SR179 Cst E

Groundwater			MATERIAL DESCRIPTION		
Depth	Hour	Date	Elw (ft)	Depth (ft)	Drilling Operation
Not Determined	N/D	N/D	4,133.0	65	HQ
			4,128.0	70	HQ
			4,123.0	75	HQ
			4,118.0	80	HQ
			4,113.0	85	HQ
			4,108.0	90	HQ

LEGEND

- Sample:
 - S-Split Spoon
 - R-Ring Sampler
 - A-Drill Cuttings
 - HQ-Wireline Core
- Drilling Operation:
 - NQ-Wireline Core
 - HSA-Hollow Stem Auger
 - GB-Gearbit
 - HWT-Casing Adv. w/Wireline GB
 - HQ-Wireline Core
- Discontinuity Spacing:
 - VW > 10.0'
 - W 3.0'-10.0'
 - MC 1.0'-3.0'
 - C 0.2'-1.0'
 - VC 0-0.2'



LEGEND
 B96
 86' DMJM Harris Test Boring Location and Depth (feet)

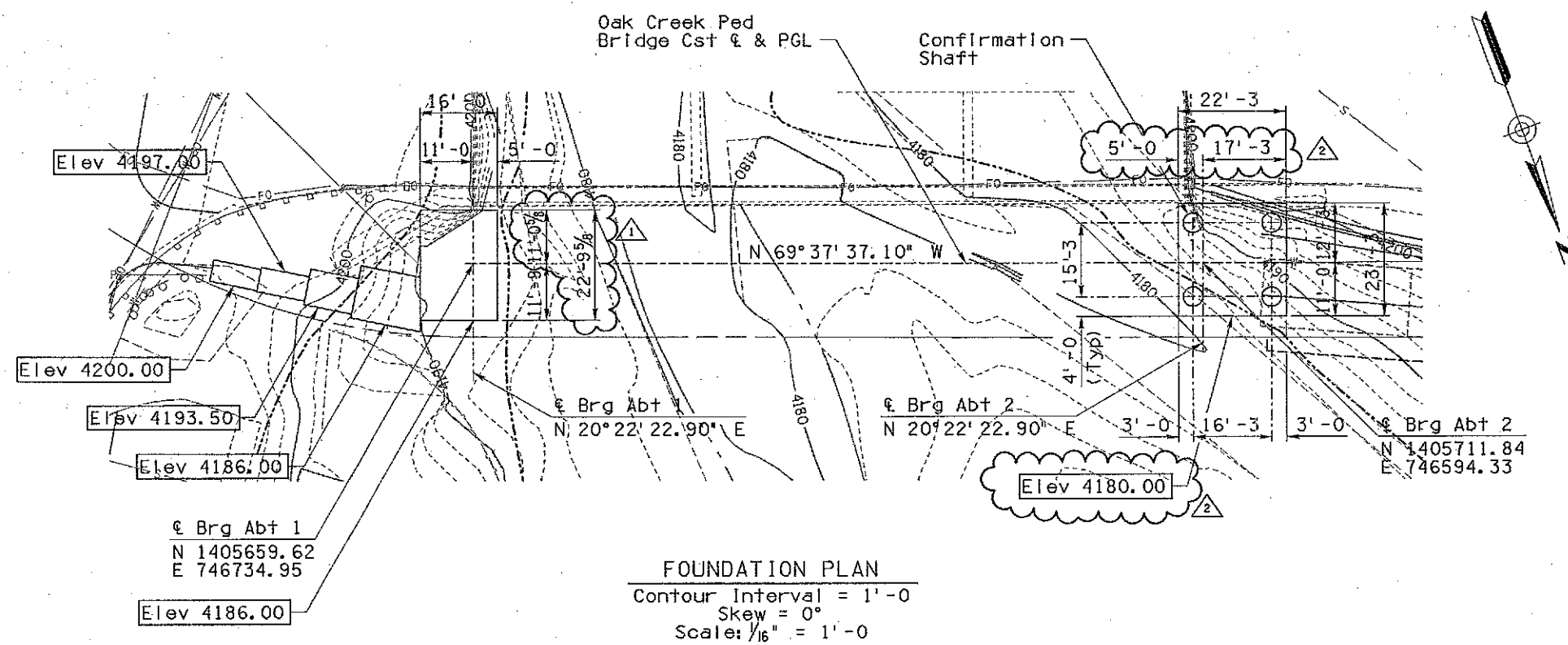
LOCATION PLAN
 N.T.S.

DESIGN	KHD	DATE	05/07	ARIZONA DEPARTMENT OF TRANSPORTATION INTERMODAL TRANSPORTATION DIVISION BRIDGE GROUP	
DRAWN	JTN	DATE	05/07		
CHECKED	CAL	DATE	05/07		
DMJM HARRIS	AECOM	2777 EAST DANIELS RD SUITE 200 PHOENIX, AZ 85016 602.551-2177		Sta 801+ OAK CREEK BRIDGE FOUNDATION DATA 5	
SR 179	313.10	2850		LOCATION NORTH FOREST BOUNDARY TO CITY OF SEDONA	
				DWG. NO. SF- 2.05	
TRACS NO. H 3414 03C				179-A-(002)B	668 OF 1016

REV. NO.	LOCATION	DATE
1	REVISED FOOTING LIMITS	11/28/08
2	REVISED ABT 2 SHAFT CAP LOCATION & ELEVATION	5/7/09

F.H.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARIZ.	179-A-(002)B	481	760	3/23/11

179 CN 310



FOUNDATION PLAN
 Contour Interval = 1'-0
 Skew = 0°
 Scale: 1/16" = 1'-0

DRILLED SHAFT NOTES:

1. No new shaft drilling is permitted within 4 shaft diameters measured center to center of an adjacent shaft until 48 hours after the concreting of the drilled shaft.
2. Construction joints not shown on plans shall require the approval of the Engineer prior to construction.
3. Caving conditions & groundwater are anticipated above rock socket construction and will likely require soil stabilization.
4. If slurry assisted drilling is required, the Contractor shall provide four equally spaced 2 1/2" nominal diameter PVC pipes (Sch 80) to allow for integrity testing of the drilled shafts. These pipes shall be securely tied to the inside of the reinforcing cage and shall extend from the bottom of the reinforcing cage to 12" above the top of drilled shafts with caps at each end.
5. The 48" diameter Drilled Shafts (Foundation) shall be advanced to the top of rock. The bottom of shaft elevations for the 48" diameter Drilled Shafts (Foundation) shall be adjusted in the field. The minimum penetration into the rock with the 42" diameter Drilled Shafts (Rock) shall be as per the dimensions shown in the abutment drilled shaft details. Adjustments in additional quantities for Drilled Shafts (Foundation) 48" Dia and Drilled Shafts (Rock) 42" Dia will be paid per the contract unit cost for the respective item.
6. The Engineer will observe the drilling operation to verify top of sound rock elevation. If top of sound rock is encountered at an elevation that varies more than one foot from the elevation shown in the table, the Contractor shall notify the Engineer prior to placement of the reinforcement cage.
7. A confirmation shaft is required. See Special Provisions.

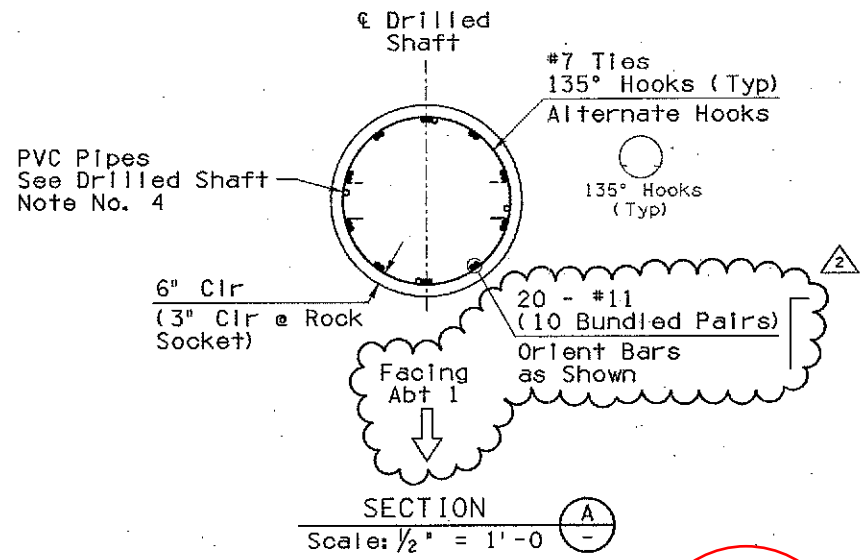
The location of all utilities is approximate only. Locations shown reflect the findings of the latest utility survey. Contractor shall locate all utilities prior to commencement of work.

FOUNDATION NOTE:

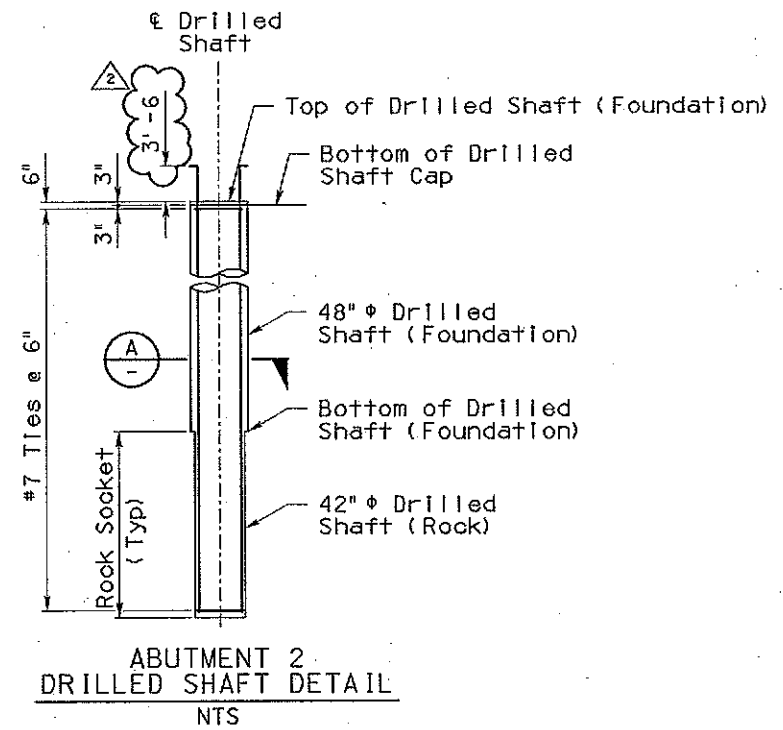
Information pertaining to the geotechnical profile and site conditions can be obtained from the Final Foundation Design Report for this bridge prepared by DMJM Harris dated July, 2006. The report is available at ADOT Contracts and Specifications.

FOOTING NOTES:

1. Uniform allowable bearing pressure:
 Abutment 1 & retaining wall 10.0 ksf
2. [Symbol] Denotes bottom of footing elevation.
3. See Dwg S-3.10 for Oak Creek Ped Bridge retaining wall dimensions.
4. The Engineer will observe and inspect the exposed surfaces of the footing excavations to determine the acceptable bearing conditions prior to the placement of reinforcement or concrete. All loose materials shall be removed from the exposed rock foundation.



SECTION A-A
 Scale: 1/2" = 1'-0



**ABUTMENT 2
 DRILLED SHAFT DETAIL
 NTS**

DRILLED SHAFT TABLE	
Top of Drilled Shaft (Foundation) Elev	Abt 2 4180.25
Top of Drilled Shaft (Rock) Elev	4169.00
Bottom of Drilled Shaft (Rock) Elev	4156.00
Capacity (kips)	626.00

CALL TWO WORKING DAYS BEFORE YOU DIG
602-263-1100
1-800-STAKE-IT
 OUTSIDE MARICOPA COUNTY

DESIGN	SED	DATE	05/07	ARIZONA DEPARTMENT OF TRANSPORTATION INTERMODAL TRANSPORTATION DIVISION BRIDGE GROUP
DRAWN	TST	DATE	05/07	
CHECKED	DPG	DATE	05/07	
DMJM HARRIS	AECOM	2771 E. CAMELBACK RD SUITE 200 PHOENIX, AZ 8506-4002 (602) 351-2177		
ROUTE	MILEPOST	STRUCTURE NO.	LOCATION	STA 801+ OAK CREEK PED BRIDGE FOUNDATION PLAN & DETAILS NORTH FOREST BOUNDARY TO CITY OF SEDONA
SR 179	313.10	10624		
TRACS NO. H 3414 03C			179-A-(002)B	676 OF 1016

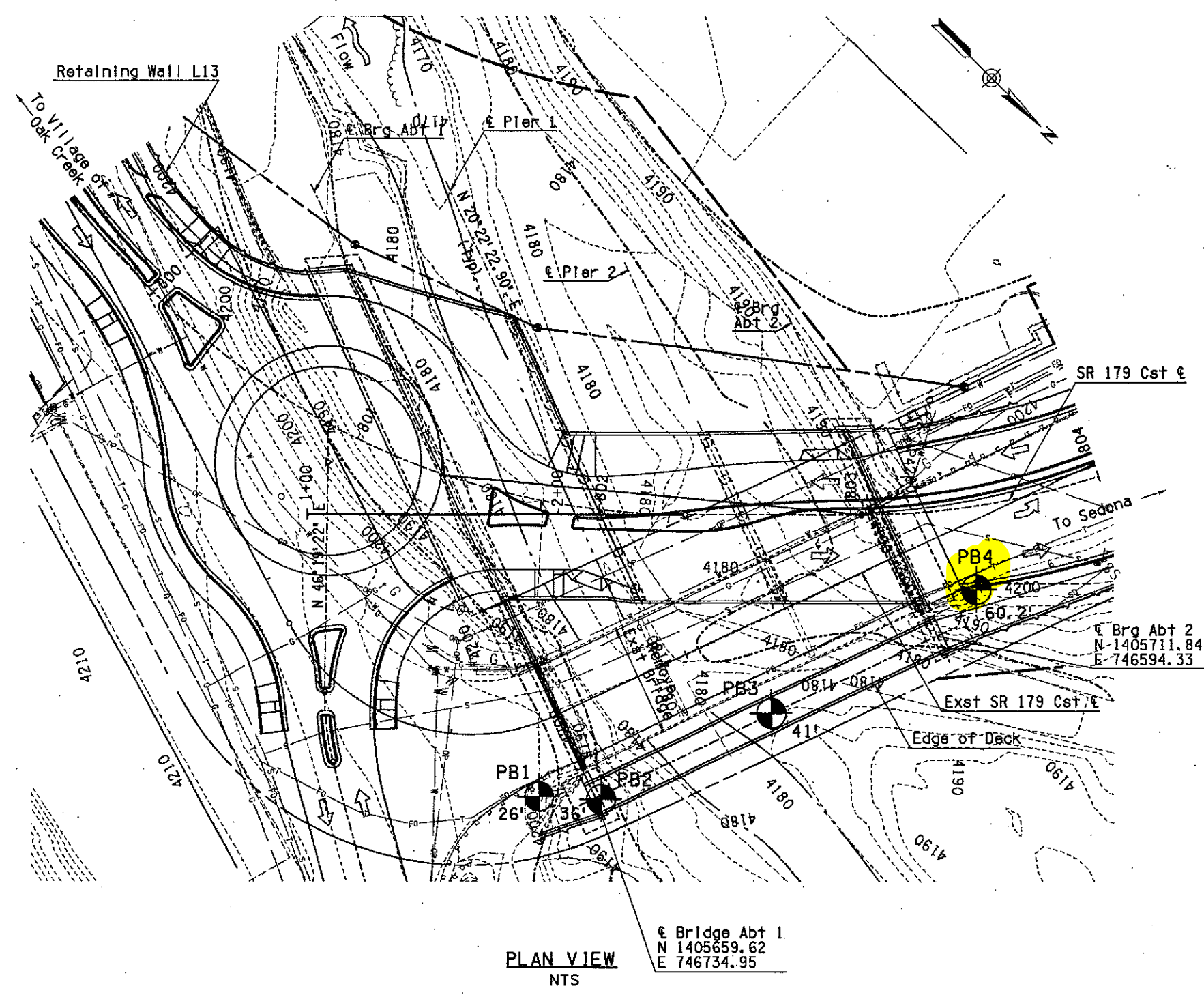


F.J.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARIZ.	179-A-(002)B	492	760	3/24/11

179 CN 310

GENERAL NOTES:

1. General soil and rock strata descriptions and indicated boundaries are based on engineering interpretation of available subsurface information by the geotechnical engineer and may not reflect actual variation in subsurface conditions between borings and samples. The location of contacts between strata shown on the logs are generally approximate, and changes between material types may be gradual rather than abrupt. Classification of soil materials is in general accordance with ASTM D 2488-00 and is based on field observation unless accompanied by mechanical analysis presented in the Geotechnical Report.
2. The water levels and/or moisture conditions indicated on the boring logs are as recorded at the time of exploration. These water levels and/or moisture conditions may vary considerably with time according to the prevailing climate, rainfall or other factors and are otherwise dependent upon the duration of and methods used in the exploration program.
3. The boring logs indicate that the depth to groundwater was not determined (as the borings were advanced with water). However, Oak Creek is a perennial stream and shallow groundwater should be anticipated at all drilled shaft locations.
4. Sound engineering judgment was exercised in preparing the subsurface information presented on these sheets. This information was prepared and is intended for design and estimate purposes. Its presentation on the plans or elsewhere is for the purpose of providing intended users with access to the same information as the State and its designers. This subsurface information interpretation is presented in good faith and is not intended as a substitute for personal investigation, independent interpretations or judgment of the contractor.
5. A 140 lb hammer, 30 inch free-fall, was used to drive the 2 inch O.D. Standard Penetration Test (SPT) split-spoon sampler (ASTM D 1586-99).
6. For further information, refer to Final Foundation Design Report, DMJM Harris (July, 2006). This report is available at ADOT Contracts and Specifications.
7. All geotechnical/foundation reports prepared for this project shall be considered by the drilled shaft contractor in developing bid documents.



LEGEND

PB1 26' DMJM Harris Test Boring Location and Depth (feet)

DESIGN	KHD	05/07	ARIZONA DEPARTMENT OF TRANSPORTATION INTERMODAL TRANSPORTATION DIVISION BRIDGE GROUP	
DRAWN	JTN	05/07		
CHECKED	CAL	05/07		
DMJM HARRIS	AECOM	2777 EAST CAMELBACK RD SUITE 200 PHOENIX, AZ 85016 (602) 331-2777	STA 801+ OAK CREEK PED BRIDGE FOUNDATION DATA 1	NORTH FOREST BOUNDARY TO CITY OF SEDONA
SR 179	313.10	2850	ROUTE MILEPOST STRUCTURE NO.	
TRACS NO. H 3414 03C			179-A-(002)B	691 OF 1016

Project Name: SR179, Sedona
 Location: Coconino County, AZ
 Project Number: 5961.0000
 Logged By: C. White/P. Garza

BORING LOG NO. PB1
 Date(s): 09/28/2005
 Rig & Boring Type: Craned Burley 2500RT
 w/HQ-3 Wireline Core
 Surface Elevation: 4,202.0' ±
 Location: Sta 801+91, 118' Rt, SR179 Cst &

Groundwater		
Depth	Hour	Date
None	N/A	N/A

Elev (ft)	Depth (ft)	Drilling Operation	Drill Rate (min/ft)	Sample Interval	Sample Type & (Blowcounts)	% Recovery	Rock Quality Designation (RQD)	% Fluid Recovery	Sealing of Discontinuities	Orientation of Discontinuities	Degree of Weathering	Relative Rock Hardness	Graphical Log	MATERIAL DESCRIPTION					
4,197.0	5	HQ (3)	NR		HQ	35	0	90	N/A	N/A	N/A	N/A		Non-Made Fill - Bridge Abutment Backfill SILTY GRAVEL & SAND (GM-SM) Predominantly Fine Gravel, Non-Plastic, Medium Dense Notes: 1.5' of AC at Surface Notes: Very Poor Recovery of Material 1.5' Length of Old, Soft Concrete Recovered from 0' to 5.0' Run					
4,192.0	10	L2			HQ	45	0							Non-Made Fill - Bridge Abutment Backfill COBBLES, GRAVEL & SAND (GP-GM) Subrounded to Rounded Cobbles and Occasional Boulders, Predominantly Subrounded to Rounded Gap-Graded Gravel, Subangular Coarse Grained Sand, Non-Plastic, Moist, Brown to Gray, Dense Notes: Fill Indicated by Non-Native Rock and Concrete Fragments					
4,187.0	15	NR			HQ	80	20	0	VC 5°-20° 80°-90° 60°-70° Bkn		MW	S to VS		SILTY TO GRAVELLY SANDSTONE BERMIT FORMATION Reddish Brown, Typically Well-Cemented Fine Grained Sand and Silt with Subhorizontal Thick to Very Thick Bedding Notes: Partially Silicified Lens of Silty Fine Grained Sandstone with Some to Considerable Predominantly Fine Subrounded to Rounded Gravel from 12.6' to 16.0' Notes: Core Intensely to Moderately Fractured by Steep Fractures and Subhorizontal Parting Breaks from 12.6' to 17.4' Notes: Densely Crossbedded; Partially Silicified Fine Grained Silty Sandstone Below 17.4'; Core Typically Slightly to Very Slightly Broken by Natural and Mechanical Parting Breaks and Few Interbedded Clay Lenses					
4,182.0	20	L6			HQ	100	70		W										
4,177.0	25	L4			HQ	98	70		MC VC C		SW	S/MH							
4,172.0	30													STOPPED CORING @ 26.0'					
<table border="0"> <tr> <td>Sample Type S-Split Spoon R-Ring Sampler A-Drill Cuttings HQ-Wireline Core</td> <td>Drilling Operation NQ-Wireline Core HSA-Hollow Stem Auger GB-Gearbit HWT-Casing Adv. w/Wireline GB HQ-Wireline Core</td> <td>Discontinuities VW >10.0' W 3.0'-10.0' MC 1.0'-3.0' C 0.2'-1.0' VC 0-0.2'</td> <td>DMJM HARRIS AECOM</td> <td>2777 E. CAMELBACK RD SUITE 200 PHOENIX, AZ, 85016-4302 (602) 331-2777</td> </tr> </table>															Sample Type S-Split Spoon R-Ring Sampler A-Drill Cuttings HQ-Wireline Core	Drilling Operation NQ-Wireline Core HSA-Hollow Stem Auger GB-Gearbit HWT-Casing Adv. w/Wireline GB HQ-Wireline Core	Discontinuities VW >10.0' W 3.0'-10.0' MC 1.0'-3.0' C 0.2'-1.0' VC 0-0.2'	DMJM HARRIS AECOM	2777 E. CAMELBACK RD SUITE 200 PHOENIX, AZ, 85016-4302 (602) 331-2777
Sample Type S-Split Spoon R-Ring Sampler A-Drill Cuttings HQ-Wireline Core	Drilling Operation NQ-Wireline Core HSA-Hollow Stem Auger GB-Gearbit HWT-Casing Adv. w/Wireline GB HQ-Wireline Core	Discontinuities VW >10.0' W 3.0'-10.0' MC 1.0'-3.0' C 0.2'-1.0' VC 0-0.2'	DMJM HARRIS AECOM	2777 E. CAMELBACK RD SUITE 200 PHOENIX, AZ, 85016-4302 (602) 331-2777															

Project Name: SR179, Sedona
 Location: Coconino County, AZ
 Project Number: 5961.0000
 Logged By: P. Garza

BORING LOG NO. PB2
 Date(s): 09/26/2005
 Rig & Boring Type: Craned Burley 2500RT
 w/HQ-3 Wireline Core & HWT Adv
 Surface Elevation: 4,189.0' ±
 Location: Sta 802+10, 114' Rt, SR179 Cst &

Groundwater		
Depth	Hour	Date
None	N/A	N/A

Elev (ft)	Depth (ft)	Drilling Operation	Drill Rate (min/ft)	Sample Interval	Sample Type & (Blowcounts)	% Recovery	Rock Quality Designation (RQD)	% Fluid Recovery	Sealing of Discontinuities	Orientation of Discontinuities	Degree of Weathering	Relative Rock Hardness	Graphical Log	MATERIAL DESCRIPTION					
4,184.0	5	HQ (3)			HQ	100	60	75	NR	NR	NR	NR		SILTY TO GRAVELLY SANDSTONE BERMIT FORMATION Reddish Brown Predominantly Very Well-Cemented Fine Grained Sand and Silt with Some Well-Rounded Predominantly Fine Gravel; Flat to Subhorizontal Sequence of Poorly-Defined Medium Thick to Thick Beds with Some Faint Ripple-Lamination and Partially Silicified Zones Notes: Core Moderately Broken by Natural and Mechanical Parting Separations above 4.0'					
4,179.0	10				HQ	100	70		C/VC 75°-90° 5°-15°		MW	S/VS		Notes: Slightly Open, Undulating Near-Vertical Fracture with Highly Weathered Well Rock from Approx. 4.77' to 6.4'					
4,174.0	15				HQ	100	45		VC 8°-18° 60°-90°		HW	VS		Notes: Partially Silicified Section with No Natural Developed Fractures from 6.4' to 9.8'					
4,169.0	20				HQ	100	90		C 5°-15°		SW	S/MH		Notes: Short Very Intensely Broken Zones along Intersecting Near-Vertical Fractures and Bedding Separations from 9.8' to 10.7' and from 11.6' to 12.2'					
4,164.0	25				HQ	100	50		MC 5°-15°		SW	S/MH		Notes: Poorly-Cemented Zone of Silty Sandstone with Numerous Incipient and Partially Healed Steeply-Dipping Fractures from 14.2' to 16.1'					
4,159.0	30				HQ	80	15	75	VC 80°-85° 0°-10°		SW	S		Notes: Core Typically Closely Broken by Natural and Mechanical Parting Separations with Several Short Very Closely Broken Intervals Below 21.6'					
4,154.0	35				HQ				C/VC 0°-15°		SW to MW	S		Notes: Laminated Very Soft Silty Sandstone with Numerous Healed to Incipient Fractures from 32.9' to 35.0'					
4,149.0	40				HQ				VC 0°-15°		MW	VS		Notes: Probable Soft Zone; No Recovery from 35.0' to 36.0'					
<table border="0"> <tr> <td>Sample Type S-Split Spoon R-Ring Sampler A-Drill Cuttings HQ-Wireline Core</td> <td>Drilling Operation NQ-Wireline Core HSA-Hollow Stem Auger GB-Gearbit HWT-Casing Adv. w/Wireline GB HQ-Wireline Core</td> <td>Discontinuities VW >10.0' W 3.0'-10.0' MC 1.0'-3.0' C 0.2'-1.0' VC 0-0.2'</td> <td>DMJM HARRIS AECOM</td> <td>2777 E. CAMELBACK RD SUITE 200 PHOENIX, AZ, 85016-4302 (602) 331-2777</td> </tr> </table>															Sample Type S-Split Spoon R-Ring Sampler A-Drill Cuttings HQ-Wireline Core	Drilling Operation NQ-Wireline Core HSA-Hollow Stem Auger GB-Gearbit HWT-Casing Adv. w/Wireline GB HQ-Wireline Core	Discontinuities VW >10.0' W 3.0'-10.0' MC 1.0'-3.0' C 0.2'-1.0' VC 0-0.2'	DMJM HARRIS AECOM	2777 E. CAMELBACK RD SUITE 200 PHOENIX, AZ, 85016-4302 (602) 331-2777
Sample Type S-Split Spoon R-Ring Sampler A-Drill Cuttings HQ-Wireline Core	Drilling Operation NQ-Wireline Core HSA-Hollow Stem Auger GB-Gearbit HWT-Casing Adv. w/Wireline GB HQ-Wireline Core	Discontinuities VW >10.0' W 3.0'-10.0' MC 1.0'-3.0' C 0.2'-1.0' VC 0-0.2'	DMJM HARRIS AECOM	2777 E. CAMELBACK RD SUITE 200 PHOENIX, AZ, 85016-4302 (602) 331-2777															

F.H.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	AZ	179-A-1002JB	493	760	3/24/11

179 CN 310

LEGEND

Sample

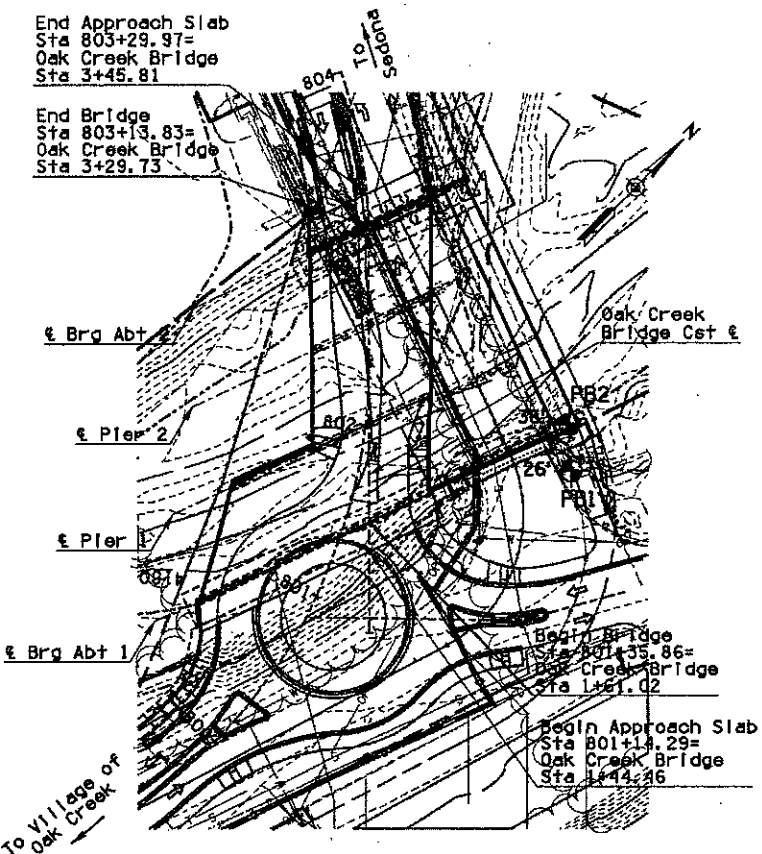
S-Split Spoon
 R-Ring Sampler
 A-Drill Cuttings
 HQ-Wireline Core

Drilling Operation

NQ-Wireline Core
 HSA-Hollow Stem Auger
 GB-Gearbit
 HWT-Casing Adv. w/Wireline GB
 HQ-Wireline Core

Discontinuity Spacing

VW >10.0'
 W 3.0'-10.0'
 MC 1.0'-3.0'
 C 0.2'-1.0'
 VC 0-0.2'



LEGEND

PB1
 26' DMJM Harris Test Boring Location and Depth (feet)

LOCATION PLAN

N.T.S.

DESIGN	NAME	DATE	ARIZONA DEPARTMENT OF TRANSPORTATION INTERMODAL TRANSPORTATION DIVISION BRIDGE GROUP		
DRAWN	KHD	05/07	Sta 801+ OAK CREEK PED BRIDGE FOUNDATION DATA 2		
CHECKED	JTN	05/07			
DMJM HARRIS AECOM			2777 EAST CAMELBACK RD SUITE 200 PHOENIX, AZ, 85016 (602) 331-2777		
SR 179	313.10	2850	LOCATION	NORTH FOREST BOUNDARY TO CITY OF SEDONA	
TRACS NO. H 3414 03C			179-A-(002)B		DWG. NO. SF- 3.02



Project Name: SR179, Sedona
 Location: Coconino County, AZ
 Project Number: 596L0000
 Logged By: P. Garza

BORING LOG NO. PB3
 Date(s): 09/27/2005
 Rig & Boring Type: Craned Burley 2500RT
 w/HQ-3 Wireline Core
 Surface Elevation: 4,182.0' ±
 Location: Sta 802+70, 78' Rt, SR179 Cst &

Elev (ft)	Depth (ft)	Drilling Operation	Drill Rate (min/ft)	Sample Interval	Sample Type & (Blowcounts)	% Recovery	Rock Quality Designation (RQD)	% Fluid Recovery	Spelling of Discontinuities	Orientation of Discontinuities	Degree of Weathering	Relative Rock Hardness	Geological Log	MATERIAL DESCRIPTION
4,177.0	5	HQ	2.6		HQ	40	0							Oak Creek Alluvium SANDY GRAVEL (GP-GM) Numerous Subrounded and Rounded Cobbles and Boulders. Predominantly Subrounded and Rounded Gap Graded Gravel, Coarse Subangular Sand, Non-Plastic, Moist, Brown to Gray, Very Dense Notes: Blocked Off at 3.3', 5.0', 6.7', 8.5' and 9.3'
4,172.0	10	HQ	3.7		HQ	60	0							
4,167.0	15	HQ	2.1		HQ	100	95		VC/C 5'-15" 55'					SILTY SANDSTONE (HERMIT FORMATION) Light Red Brown to Reddish Brown, Very Well-Cemented Predominantly Fine Grained Sand with Silt. Subhorizontal Medium Thick to Very Thick Beds. Variable Faint to Strong Ripple-Lamination and Gentle Cross-Bedding Notes: Recovered Core Typically Moderately Fractured by Close to Moderately Close Spaced Natural and Mechanical Parting Breaks
4,162.0	20	HQ	1.8		HQ	100	70							
4,157.0	25	HQ	1.2		HQ	65	45							SANDY SILTSTONE (?) (HERMIT FORMATION) Reddish Brown, Highly Weathered to Decomposed and Friable. Predominantly Low to Medium Plasticity Silt and Clayey Silt with Some Fine Grained Sand Notes: Very Poor to No Recovery of Material and Very Fast and Easy Drilling from 23.6' to 29.4' Notes: Probable Shear Zone Inferred from Presence of Decomposed Material along Steeply Dipping Fractures at 23.6' and 29.4'
4,152.0	30	HQ	1.3		HQ	40	30							
4,147.0	35	HQ	1.8		HQ	85	65							
4,142.0	40	HQ	1.9		HQ	100	80							
4,137.0	45													STOPPED CORING at 41.0'

Sample Type: S-Split Spoon, R-Ring Sampler, A-Drill Cuttings, HQ-Wireline Core
 Drilling Operation: HQ-Wireline Core, HSA-Hollow Stem Auger, GB-Gearbit, HWT-Casing Adv. w/Wireline GB, HQ-Wireline Core
 Discontinuities: W 3.0'-10.0', MC 1.0'-3.0', C 0.2'-1.0', VC-C-0.2'
 DMJM HARRIS | AECOM | 2777 E. CAMELBACK RD SUITE 200 PHOENIX, AZ 85016-4302 (602) 331-2777

Project Name: SR179, Sedona
 Location: Coconino County, AZ
 Project Number: 596L0000
 Logged By: C. White/P. Garza

BORING LOG NO. PB4
 Date(s): 09/07/2005
 Rig & Boring Type: Burley 2500RT w/HQ-3
 Wireline Core
 Surface Elevation: 4,199.0' ±
 Location: Sta 803+46, 33' Rt, SR179 Cst &

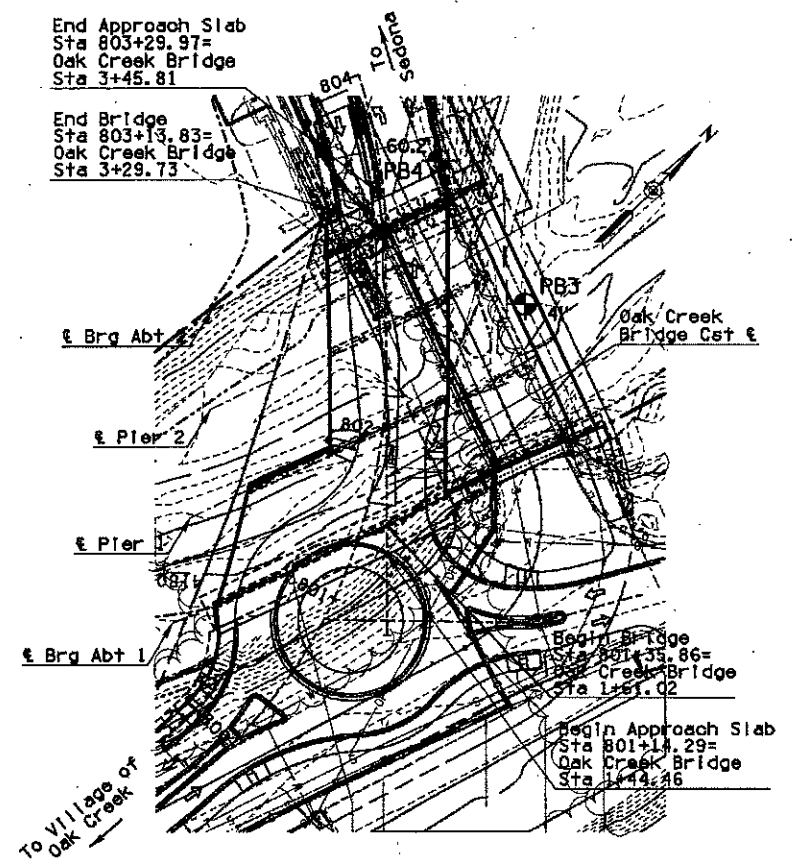
Elev (ft)	Depth (ft)	Drilling Operation	Drill Rate (min/ft)	Sample Interval	Sample Type & (Blowcounts)	% Recovery	Rock Quality Designation (RQD)	% Fluid Recovery	Spelling of Discontinuities	Orientation of Discontinuities	Degree of Weathering	Relative Rock Hardness	Geological Log	MATERIAL DESCRIPTION
4,194.0	5	NR			HQ	60	0							Non-Mode Fill: Roadway Embankment and Bridge Abutment Backfill SILTY TO CLAYEY SAND & GRAVEL (SM-GM) Some Subrounded to Rounded Cobbles, Widely-Graded Subrounded to Rounded Gravel and Subangular Sand, No to Medium Plasticity, Reddish Brown to Gray Brown, Moist, Variably Loose/Soft to Dense/Firm Notes: Considerable Reddish Brown, Medium Plastic, Clayey Fine Grained Sand above 6.0' Notes: Depth of Fill Inferred from Material Change and As-Built Bridge Plans Possible Native Material Below Approx. 15.0'
4,189.0	10	NR			HQ	30	0							
4,184.0	15	NR			HQ	75	0							
4,179.0	20	NR			HQ	75	0							
4,174.0	25	NR			HQ	70	0							
4,169.0	30	NR			HQ	75	15							
4,164.0	35	NR			HQ	100	100							
4,159.0	40	NR			HQ	100	100							
4,154.0	45	NR			HQ	95	80							
4,149.0	50	NR			HQ	60	0							
4,144.0	55	NR			HQ	90	70							
4,139.0	60	NR			HQ	100	100							

Sample Type: S-Split Spoon, R-Ring Sampler, A-Drill Cuttings, HQ-Wireline Core
 Drilling Operation: HQ-Wireline Core, HSA-Hollow Stem Auger, GB-Gearbit, HWT-Casing Adv. w/Wireline GB, HQ-Wireline Core
 Discontinuities: W 3.0'-10.0', MC 1.0'-3.0', C 0.2'-1.0', VC-C-0.2'
 DMJM HARRIS | AECOM | 2777 E. CAMELBACK RD SUITE 200 PHOENIX, AZ 85016-4302 (602) 331-2777

F.H.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARIZ.	179-A-(002)B	494	760	3/24/11

179 CN 310

LEGEND
 Sample
 S-Split Spoon
 R-Ring Sampler
 A-Drill Cuttings
 HQ-Wireline Core
 Drilling Operation
 HQ-Wireline Core
 HSA-Hollow Stem Auger
 GB-Gearbit
 HWT-Casing Adv. w/Wireline GB
 HQ-Wireline Core
 Discontinuity Spacing
 VW > 10.0'
 W 3.0'-10.0'
 MC 1.0'-3.0'
 C 0.2'-1.0'
 VC 0-0.2'



LEGEND
 PB1 26' DMJM Harris Test Boring Location and Depth (feet)
LOCATION PLAN
 N.T.S.

DESIGN	KHD	05/07	ARIZONA DEPARTMENT OF TRANSPORTATION INTERMODAL TRANSPORTATION DIVISION BRIDGE GROUP	
DRAWN	JTN	05/07		
CHECKED	CAL	05/07		
DMJM HARRIS	AECOM	2777 EAST CAMELBACK RD SUITE 200 PHOENIX, AZ 85016 (602) 331-2777	Sta 801+ OAK CREEK PED BRIDGE FOUNDATION DATA 3	
SR 179	313.10	2850	NORTH FOREST BOUNDARY TO CITY OF SEDONA	
ROUTE	MILEPOST	STRUCTURE NO.	179-A-(002)B	
TRACS NO. H 3414 03C				DWG. NO. SF- 3.03