Breckenridge
group
architects/
planners

Addendum #1

Amphitheater Public Schools
CDO High School – East Parking Lot Improvements
BG Project No: 17.14.66

ADDENDUM 1 – Date: January 13, 2021

This revision shall amend the construction documents and shall become part of the contract. All requirements contained in the original construction documents shall apply to this revision, and the general character of the work called for in this revision shall be the same as originally set forth in applicable portions of the original documents for similar work, unless otherwise specified herein. All work shall be performed as specified in the original documents, even if not particularly mentioned in this revision.

DOCUMENTS ISSUED:

Attachment #1 – Geotechnical Report – Pavement Evaluation

SPECIFICATIONS:

1. Add Geotechnical Report – Pavement Evaluation to Construction Specifications

DRAWINGS:

1. N/A

GENERAL COMMENTS / CLARIFICATIONS:

1. N/A

REGISTERED ARCHITECT
CERTIFICATE NO.
17605
KLINDT D.
BRECKENRIDGE
Date Signed 01 / 13 / 22
ARIZONA U.S.A.

REGISTRATION EXPIRATION DATE: 3/31/2023

END OF ADDENDUM #1

SPEEDIE AND ASSOCIATES
Geotechnical ▪ Environmental ▪ Materials Engineers

www.speedie.net

ADDENDUM #1
ATTACHMENT #1

June 3, 2021

Mr. Shane Chism
Breckenridge Group, Inc.
1735 East Fort Lowell Road, Suite 12
Tucson, Arizona 85719

RE: Geotechnical Report – Pavement Evaluation
Canyon de Oro High School East Parking Lot
25 West Calle Concordia
Oro Valley, Arizona
S&A project Number 211349ST

Dear Mr. Chism:

This letter presents recommendations prepared by Speedie & Associates, Inc. (S&A) for a pavement evaluation for the east parking lot for the Canyon de Oro High School located at 25 West Calle Concordia, Oro Valley, Arizona.

We understand that the east parking lot and the south drop-off lane will be removed and replaced. Based on a review of aerial photos, these areas are approximately 130,000 square feet and approximately 7,000 square feet, respectively. The east parking lot is located at the southeast corner of the Canyon del Oro High School, on the north side of West Calle Concordia. The parking lot has solar powered shade canopies over a majority of parking spots. The ground surface of the lot appears to trend towards the middle of the parking lot from north to south, and is relatively level east to west. The lot is approximately 2 to 3 feet higher in elevation than the south drop-off lane, which trends downwards from east to west, following the grade of West Calle Concordia.

In general, the pavement appears to be in a below average to poor condition. The pavement is exhibiting significant distress including severe stripping (loss of surface fines). This is typically due to an issue with the mix design used and/or poor compaction when installed. Drying shrinkage block cracking is also occurring typical of aged asphalt pavements throughout the entire parking lot and drop off lane. See Photo Log in the Appendix. Block cracking is normal in asphalt pavements. As the asphalt binder (oil) ages, the mix becomes stiffer (less flexible) to the point where the pavement cannot tolerate the daily shrinkage forces that result from temperature changes. Block cracks typically do not represent structural failure. The block-cracked pavement has deteriorated to "alligator" cracking in several areas indicating overstressing and possible subgrade failure. This is typical of progressive failure in part due to lack of maintenance and/or poor drainage that allows water to enter the subgrade resulting in loss of support. Based on field observations, it appears that there has not been a significant effort to maintain the pavement through crack filling or surface treatments.

Geotechnical Evaluation: S&A obtained information about the subsurface conditions at the site using ten (10) hand sample auger soil borings to record the soil conditions and collect samples for laboratory testing. The boring locations were placed in the existing pavement, and were cored with a portable core drill equipped with a 4-inch diameter diamond core barrel to expose the subgrade soils. Bulk soil samples were collected from below the granular fill to depths of up to 3.5 feet below the existing ground surface (bgs). The soil samples were laboratory tested to determine grain-size distribution and plasticity (Atterberg Limits)

3331 East Wood Street ■ Phoenix, AZ 85040 ■ Phone (602) 997-6391 ■ Fax (602) 943-5508
2026 North 3rd Street ■ Flagstaff, AZ 86004 ■ Phone (928) 526-6681 ■ Fax (928) 526-6685
3125 East 47th Street ■ Tucson, AZ 85713 ■ Phone (520) 514-9411 ■ Fax (520) 514-9474

for classification and pavement design parameters. The approximate boring locations are shown on the attached Soil Boring Location Plan. The laboratory data is presented in the attached Tabulation of Test Data.

Based on the results of the field and laboratory evaluation, the existing pavement section consists of 3.1 to 4.6 inches of asphaltic concrete in the parking lot area and 1.7 to 2.3 inches of asphaltic concrete in the south drop off lane. The parking lot appears to have been paved in two lifts, with the bottom lift ranging from 1.3 to 2.2 inches and the top lift ranging from 1.5 to 2.7 inches. The south drop off lane appears to have been placed in a single lift. Two to three inches of course-grained gravel with minimal fines were evident below the AC at all locations. This gravel resembles Number 57 rock, typically used underneath Portland Cement Concrete Pavement for drainage purposes. The gravel is underlain by 3 to 5 inches of poorly graded gravel with sand and silt at most locations. Native alluvial soils are evident beneath the pavement sections to the depth of the exploration (4 feet bgs). The alluvium typically consists of silty sand, and occasionally well-graded sand with silt. The samples contain between approximately 6 and 34 percent of material passing the U.S. Standard #200 sieve and were non-plastic. These results correlate to an R-value of 74.

Recommended Minimum Pavement Sections: The subgrade will provide excellent support of the proposed new pavement section, provided that the subgrade is properly compacted and stable, **and adequate surface drainage is provided and maintained**. The pavement section capacity is reported as daily ESALs, (Equivalent 18 kip Single Axle Loads). Heavy vehicles such as school buses, refuse trucks, fire trucks, delivery vans, Class A motor coaches, etc., apply approximately 1 ESAL per vehicle. By comparison, it requires about 1200 autos to apply one ESAL.

The following alternate design parameters and sections are recommended for asphaltic concrete (AC) on aggregate base course (ABC), or Portland cement concrete pavement (PCCP):

Area of Placement	Flexible (AC Pavement)			Rigid (PCC Pavement)	
	Thickness		Daily 18-kip ESALs	Thickness	Daily 18-kip ESALs
	AC (0.39)	ABC (0.12)		PCCP	
Auto Parking	2.0"	4.0	6	5.0"	9
	3.0"[4]	None	4	5.5"	15
Bus/Truck Drives	3.0"	4.0"	25	6.0"	23
	4.0"[4]	None	28	6.5"	34
	4.5"	None	57	7.0"	51

Notes:

1. Designs are based on AASHTO design equations and ADOT correlated R-Values.
2. The PCCP thickness is increased to provide better load transfer and reduce potential for joint & edge failures. Design PCCP per ACI 330R-87.
3. Full depth asphalt or increased asphalt thickness can be increased by adding 1.0-inch asphalt for each 3 inches of base course replaced.
4. These represent the approximate existing pavement sections.

Pavement Design Parameters

Assume:	One 18 kip Equivalent Single Axle Load (ESAL)/Truck
Life:	20 years
Subgrade Soil Profile:	
Material Passing #200 sieve:	23 Percent (Ave.)
Plasticity Index:	Non-plastic (Ave.)
k:	150 pci (assumed)
R value:	74 (per ADOT tables)
M_R:	26,000 (Maximum Allowed per AASHTO Design)

The designs presented the table above assume that all subgrade areas are properly prepared in accordance with the recommendations outlined in this report.

The entire area to be occupied by the proposed construction should be stripped of all vegetation, debris, asphalt, rubble, obviously loose surface soils, (fill, foundations, etc. if any are encountered), and any other deleterious materials. The existing asphaltic concrete may be cold-milled in-place to a gradation like that of an ABC and stockpiled for reuse under new paved areas as sub-base.

The soils are moisture sensitive and the exposed subgrade may become unstable depending on the moisture content at the time of construction. If areas of elevated moisture exists, there is a potential for the soils to become soft and unstable. Several options are available to remedy this condition including deep ripping to open the wet subgrade and allow the soils time to dry, or removal and replacement of the wet, soft soils with suitable materials. If instability extends too deep, replacement can be combined with at least 12 inches of granular fill (ABC and/or millings) with geogrid such as Tensar Triax installed per the manufacturer's recommendations. Or cement could be used to create a cement-treated subgrade. Prior to placement of the aggregate base course, the pavement subgrade could be proof rolled with a 5,000 gallon water truck (or similar vehicle) to determine if there are soft areas.

After grading to provide proper drainage the exposed grades should be scarified a minimum of 8 inches deep. The scarified soils should be thoroughly and uniformly moisture conditioned to ±2 percent of the material's optimum moisture content and compacted to at least 95 percent of its maximum dry density as determined by ASTM D-698 laboratory test procedures. If fill is required, the fill should be placed in horizontal lifts of a maximum of 8-inch loose thickness (or less depending on the compaction equipment) properly moisture conditioned as described above and compacted to at least 95 percent of the material's maximum dry density per ASTM D-698. Aggregate base course should be properly moisture conditioned and compacted to a minimum of 100 percent of the material's maximum dry density per ASTM D-698.

Silty fine sand soils may be exposed and may be sensitive to excessive moisture content and will become unstable at elevated moisture content. Accordingly, it may be necessary to compact soils on the dry side of optimum. The reduced moisture content under slabs-on-grade should only be used upon approval of the engineer in the field.

Asphaltic concrete pavement base course material should be per Pima County/City of Tucson (PAG/COT) Section 303 Specifications. Asphaltic concrete materials and mix design should conform to PAG/COT Section 406. It is recommended that mix designation No. 2 or No. 3 be used for the pavements. While the No. 2 mix has a somewhat rougher texture, it tends to offer more stability and resistance against surface scuffing, particularly in truck turning areas. Pavement installation should be carried out under applicable portions of PAG/COT Section 406 and municipality standards. The asphalt supplier should be informed of the pavement use and required to provide a mix that will provide stability and be aesthetically acceptable. Some of the newer mixes are very coarse and could cause placing and finish problems. A mix design should be submitted for review to determine if it will be acceptable for the intended use.

Portland Cement Concrete Pavement must have a minimum 28-day flexural strength 550 psi (compressive strength of approximately 3,700 psi). It may be cast directly on the prepared subgrade with proper compaction. Lacking an aggregate base course, attention must be paid to using low slump concrete and proper curing, especially on the thinner sections. No reinforcing is necessary. Joint design and spacing should be in accordance with ACI recommendations. Construction joints should contain dowels or be tongue and grooved to provide load transfer. Tie bars are recommended on the joints adjacent to unsupported edges. Maximum joint spacing in feet should not exceed 2 to 3 times the thickness in inches. Joint sealing with a quality silicone sealer is required recommended to prevent water from entering the subgrade allowing pumping and loss of support. If not sealed, add a nominal 4-inch ABC subbase.

Proper subgrade preparation and joint sealing will reduce (but not eliminate) the potential for slab movements (thus cracking) on the native soils. Frequent jointing will reduce uncontrolled cracking and increase the efficiency of aggregate interlock joint transfer.

It must be noted that all new asphalt pavements will eventually crack. Cracking in asphalt pavement is typical and should be expected over the life of the pavement. In fact, it has been our experience of late that the new asphalt binders that are available, we are seeing the onset or earlier aging and cracking. These require routine maintenance to prevent accelerated deterioration. Accordingly, it is highly recommended to establish a maintenance program where the cracks are routinely filled, as they appear beginning at about the second year of life. It is also recommended that surface fog seal coats be considered beginning at about year 5 and every 5 years after. This will help preserve the pavements, extending the service life.

General: Our analysis of data and the recommendations presented herein are based on the assumption that soil conditions do not vary significantly from those found at specific sample locations. Our work has been performed in accordance with generally accepted engineering principles and practice; this warranty is in lieu of all other warranties express or implied.

We recommend that a representative of the Geotechnical Engineer observe and test the earthwork and pavement portions of this project to ensure compliance to project specifications and the field applicability of subsurface conditions which are the basis of the recommendations presented in this report. If any significant changes are made in the scope of work or type of construction that was assumed in this report, we must review such revised conditions to confirm our findings if the conclusions and recommendations presented herein are to apply.

We trust this meets your needs. If there are any questions, please call.

Respectfully Submitted,
SPEEDIE & ASSOCIATES, INC.

Daniel Stratulat, E.I.T.
Staff Engineer

Registered Professional Engineer (Civil)
CERTIFICATE NO.
14388
GREGG ALAN
CREASER
Date Signed 6/3/2021
ARIZONA, U.S.A.

Gregg A Creaser, P.E.
Principal

Attachments: Boring Location Plan, Boring Logs, Laboratory Data, Photo Log

SOIL BORING LOCATION PLAN

SHEET: 1 of 1 | DR: DS | REV: | DATE: 5/26/21 | PROJECT NO. 211349ST

CDO HIGH SCHOOL EAST PARKING LOT
25 WEST CALLE CONCORDIA
ORO VALLEY, ARIZONA

SPEEDIE AND ASSOCIATES
GEOTECHNICAL • ENVIROMENTAL • MATERIALS ENGINEERS

SOIL LEGEND

SAMPLE DESIGNATION		DESCRIPTION
AS	**Auger Sample**	A grab sample taken directly from auger flights.
BS	**Large Bulk Sample**	A grab sample taken from auger spoils or from bucket of backhoe.
S	**Spoon Sample**	Standard Penetration Test (ASTM D-1586) Driving a 2.0 inch outside diameter split spoon sampler into undisturbed soil for three successive 6-inch increments by means of a 140 lb. weight free falling through a distance of 30 inches. The cumulative number of blows for the final 12 inches of penetration is the Standard Penetration Resistance.
RS	**Ring Sample**	Driving a 3.0 inch outside diameter spoon equipped with a series of 2.42-inch inside diameter, 1-inch long brass rings, into undisturbed soil for one 12-inch increment by the same means of the Spoon Sample. The blows required for the 12 inches of penetration are recorded.
LS	**Liner Sample**	Standard Penetration Test driving a 2.0-inch outside diameter split spoon equipped with two 3-inch long, 3/8-inch inside diameter brass liners, separated by a 1-inch long spacer, into undisturbed soil by the same means of the Spoon Sample.
ST	**Shelby Tube**	A 3.0-inch outside diameter thin-walled tube continuously pushed into the undisturbed soil by a rapid motion, without impact or twisting (ASTM D-1587).
--	**Continuous Penetration Resistance**	Driving a 2.0-inch outside diameter "Bullnose Penetrometer" continuously into undisturbed soil by the same means of the spoon sample. The blows for each successive 12-inch increment are recorded.

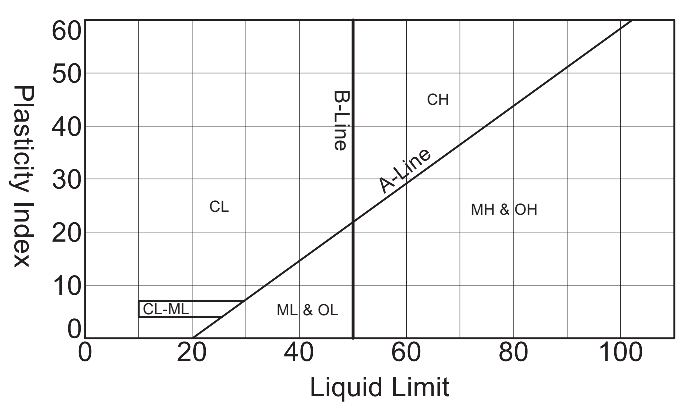
CONSISTENCY			RELATIVE DENSITY	
Clays & Silts	Blows/Foot	Strength (tons/sq ft)	Sands & Gravels	Blows/Foot
Very Soft	0 - 2	0 - 0.25	Very Loose	0 - 4
Soft	2 - 4	0.25 - 0.5	Loose	5 - 10
Firm	5 - 8	0.5 - 1.0	Medium Dense	11 - 30
Stiff	9 - 15	1 - 2	Dense	31 - 50
Very Stiff	16 - 30	2 - 4	Very Dense	> 50
Hard	> 30	> 4		

MAJOR DIVISIONS			SYMBOLS GRAPH	SYMBOLS LETTER	TYPICAL DESCRIPTIONS
COARSE GRAINED SOILS	GRAVEL AND GRAVELLY SOILS	CLEAN GRAVELS (LITTLE OR NO FINES)		GW	WELL-GRADED GRAVELS, GRAVEL - SAND MIXTURES, LITTLE OR NO FINES
				GP	POORLY-GRADED GRAVELS, GRAVEL - SAND MIXTURES, LITTLE OR NO FINES
	MORE THAN 50% OF COARSE FRACTION RETAINED ON NO. 4 SIEVE	GRAVELS WITH FINES (APPRECIABLE AMOUNT OF FINES)		GM	SILTY GRAVELS, GRAVEL - SAND - SILT MIXTURES
				GC	CLAYEY GRAVELS, GRAVEL - SAND - CLAY MIXTURES
MORE THAN 50% OF MATERIAL IS LARGER THAN NO. 200 SIEVE SIZE	SAND AND SANDY SOILS	CLEAN SANDS (LITTLE OR NO FINES)		SW	WELL-GRADED SANDS, GRAVELLY SANDS, LITTLE OR NO FINES
				SP	POORLY-GRADED SANDS, GRAVELLY SAND, LITTLE OR NO FINES
	MORE THAN 50% OF COARSE FRACTION PASSING ON NO. 4 SIEVE	SANDS WITH FINES (APPRECIABLE AMOUNT OF FINES)		SM	SILTY SANDS, SAND - SILT MIXTURES
				SC	CLAYEY SANDS, SAND - CLAY MIXTURES
FINE GRAINED SOILS	SILTS AND CLAYS	LIQUID LIMIT LESS THAN 50		ML	INORGANIC SILTS AND VERY FINE SANDS, ROCK FLOUR, SILTY OR CLAYEY FINE SANDS OR CLAYEY SILTS WITH SLIGHT PLASTICITY
				CL	INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, GRAVELLY CLAYS, SANDY CLAYS, SILTY CLAYS, LEAN CLAYS
				OL	ORGANIC SILTS AND ORGANIC SILTY CLAYS OF LOW PLASTICITY
MORE THAN 50% OF MATERIAL IS SMALLER THAN NO. 200 SIEVE SIZE	SILTS AND CLAYS	LIQUID LIMIT GREATER THAN 50		MH	INORGANIC SILTS, MICACEOUS OR DIATOMACEOUS FINE SAND OR SILTY SOILS
				CH	INORGANIC CLAYS OF HIGH PLASTICITY
				OH	ORGANIC CLAYS OF MEDIUM TO HIGH PLASTICITY, ORGANIC SILTS
HIGHLY ORGANIC SOILS				PT	PEAT, HUMUS, SWAMP SOILS WITH HIGH ORGANIC CONTENTS

NOTE: DUAL OR MODIFIED SYMBOLS MAY BE USED TO INDICATE BORDERLINE SOIL CLASSIFICATIONS OR TO PROVIDE A BETTER GRAPHICAL PRESENTATION OF THE SOIL

MATERIAL SIZE	PARTICLE SIZE Lower Limit		PARTICLE SIZE Upper Limit	
	mm	Sieve Size ◆	mm	Sieve Size ◆
SANDS				
Fine	0.075	#200	0.42	#40
Medium	0.420	#40	2.00	#10
Coarse	2.000	#10	4.75	#4
GRAVELS				
Fine	4.75	#4	19	0.75" ×
Coarse	19	0.75" ×	75	3" ×
COBBLES	75	3" ×	300	12" ×
BOULDERS	300	12" ×	900	36" ×

◆U.S. Standard ×Clear Square Openings



Depth (feet)	Graphic Log	Rig Type: Hand Auger Boring Type: Hollow Stem Auger Surface Elevation: N/A Visual Classification	Sample Number	Depth of Sample	Natural Water Content (%)	In-place Dry Density (P.C.F.)	Penetration Resistance Blows per Foot (0 – 25 – 50)
0		4.6 inches Asphaltic Concrete					
0.4		2 inches Coarse-Grained Gravel					
0.6		Brown POORLY-GRADED GRAVEL with SAND and SILT (GP/GM-Moist) coarse-grained					
0.8		Orangish Brown SILTY SAND (SM-Dry to Moist) fine to coarse-grained					
			BS-1	2.5	9.8	NT	
3.5		End of Boring					
5							

Boring Date: **5-28-21**
Field Engineer/Technician: **D. Stratulat**
Driller: **D. Stratulat**
Contractor: **Speedie & Assoc.**

Water Level

Depth	Hour	Date
Free Water was Not Encountered		

NT = Not Tested

SPEEDIE AND ASSOCIATES

Log of Test Boring Number: **B - 1**

CDO High School East Parking Lot

25 West Calle Concordia

Oro Valley, Arizona

Project No.: **211349ST**

_SPEEDIE 211349ST.GPJ GENGEO.GDT 6/3/21

Rig Type:	**Hand Auger**
Boring Type:	**Hollow Stem Auger**
Surface Elevation:	**N/A**

Depth (feet)	Visual Classification	Depth	Sample Number	Depth of Sample	Natural Water Content (%)	In-place Dry Density (P.C.F.)	Penetration Resistance Blows per Foot (0 / 25 / 50)
0	4.0 inches Asphaltic Concrete	0.3					
	2 inches Coarse-Grained Gravel	0.5					
	Brown <u>POORLY-GRADED GRAVEL with SAND and SILT</u> (GP/GM-Moist) coarse-grained	0.8					
	Orangish Brown <u>SILTY SAND</u> (SM-Dry to Moist) fine to coarse-grained	3.0	BS-1	2.5	7.4	NT	
	End of Boring						
5							

Boring Date:	**5-28-21**
Field Engineer/Technician:	**D. Stratulat**
Driller:	**D. Stratulat**
Contractor:	**Speedie & Assoc.**

Water Level

Depth	Hour	Date
Free Water was Not Encountered		

NT = Not Tested

SPEEDIE AND ASSOCIATES

Log of Test Boring Number: **B - 2**

CDO High School East Parking Lot

25 West Calle Concordia

Oro Valley, Arizona

Project No.: **211349ST**

_SPEEDIE 211349ST.GPJ GENGEO.GDT 6/3/21

Rig Type:	Hand Auger
Boring Type:	Hollow Stem Auger
Surface Elevation:	N/A

Depth (feet)	Visual Classification	Depth	Sample Number	Depth of Sample	Natural Water Content (%)	In-place Dry Density (P.C.F.)	Penetration Resistance Blows per Foot (0 – 25 – 50)
0	3.3 inches Asphaltic Concrete	0.3					
	3 inches Coarse-Grained Gravel	0.5					
	Brown POORLY-GRADED GRAVEL with SAND and SILT (GP/GM-Moist) coarse-grained	0.8					
	Orangish Brown SILTY SAND (SM-Dry to Moist) fine to coarse-grained	3.5	BS-1	2.5	NT	NT	
	End of Boring						
5							

Boring Date:	5-28-21
Field Engineer/Technician:	D. Stratulat
Driller:	D. Stratulat
Contractor:	Speedie & Assoc.

Water Level

Depth	Hour	Date
Free Water was Not Encountered		

NT = Not Tested

SPEEDIE AND ASSOCIATES

Log of Test Boring Number: **B - 3**

CDO High School East Parking Lot

25 West Calle Concordia

Oro Valley, Arizona

Project No.: **211349ST**

_SPEEDIE 211349ST.GPJ GENGEO.GDT 6/3/21

Depth (feet)	Graphic Log	Rig Type: Hand Auger Boring Type: Hollow Stem Auger Surface Elevation: N/A Visual Classification	Depth	Sample Number	Depth of Sample	Natural Water Content (%)	In-place Dry Density (P.C.F.)	Penetration Resistance Blows per Foot (0 / 25 / 50)
0		3.5 inches Asphaltic Concrete	0.3					
		3 inches Coarse-Grained Gravel	0.5					
		Brown POORLY-GRADED GRAVEL with SAND and SILT (GP/GM-Moist) coarse-grained	0.8					
		Orangish Brown SILTY SAND (SM-Dry to Moist) fine to coarse-grained	4.0	BS-1	3.0	9.0	NT	
		End of Boring						
5								

Boring Date: **5-28-21**
Field Engineer/Technician: **D. Stratulat**
Driller: **D. Stratulat**
Contractor: **Speedie & Assoc.**

Water Level

Depth	Hour	Date
Free Water was Not Encountered		

NT = Not Tested

SPEEDIE AND ASSOCIATES

Log of Test Boring Number: **B - 4**

CDO High School East Parking Lot

25 West Calle Concordia

Oro Valley, Arizona

Project No.: **211349ST**

_SPEEDIE 211349ST.GPJ GENGEO.GDT 6/3/21

Depth (feet)	Graphic Log	Visual Classification		Sample Number	Depth of Sample	Natural Water Content (%)	In-place Dry Density (P.C.F.)	Penetration Resistance Blows per Foot (0 – 25 – 50)
0		3.7 inches Asphaltic Concrete	0.3					
		3 inches Coarse-Grained Gravel	0.6					
		Orangish Brown SILTY SAND (SM-Dry to Moist) fine to coarse-grained With gravel below 2.5 feet	3.0	BS-1	3.0	NT	NT	
		End of Boring						
5								

Rig Type: **Hand Auger**
Boring Type: **Hollow Stem Auger**
Surface Elevation: **N/A**

Boring Date: **5-28-21**
Field Engineer/Technician: **D. Stratulat**
Driller: **D. Stratulat**
Contractor: **Speedie & Assoc.**

Water Level

Depth	Hour	Date
Free Water was Not Encountered		

NT = Not Tested

SPEEDIE AND ASSOCIATES

Log of Test Boring Number: **B - 5**

CDO High School East Parking Lot

25 West Calle Concordia

Oro Valley, Arizona

Project No.: **211349ST**

_SPEEDIE 211349ST.GPJ GENGEO.GDT 6/3/21

Rig Type:	Hand Auger	
Boring Type:	Hollow Stem Auger	
Surface Elevation:	N/A	

Depth (feet)	Visual Classification	Depth	Sample Number	Depth of Sample	Natural Water Content (%)	In-place Dry Density (P.C.F.)	Penetration Resistance Blows per Foot (0 – 25 – 50)
0	3.1 inches Asphaltic Concrete	0.3					
	2 inches Coarse-Grained Gravel	0.4					
	Brown POORLY-GRADED GRAVEL with SAND and SILT (GP/GM-Moist) coarse-grained	0.8					
	Orangish Brown SILTY SAND (SM-Dry to Moist) fine to coarse-grained	3.5	BS-1	3.5	4.1	NT	
	End of Boring						
5							

Boring Date:	5-28-21
Field Engineer/Technician:	D. Stratulat
Driller:	D. Stratulat
Contractor:	Speedie & Assoc.

Water Level

Depth	Hour	Date
Free Water was Not Encountered		

NT = Not Tested

SPEEDIE AND ASSOCIATES

Log of Test Boring Number: **B - 6**

CDO High School East Parking Lot

25 West Calle Concordia

Oro Valley, Arizona

Project No.: **211349ST**

_SPEEDIE 211349ST.GPJ GENGEO.GDT 6/3/21

Depth (feet)	Graphic Log	Rig Type: **Hand Auger** Boring Type: **Hollow Stem Auger** Surface Elevation: **N/A** Visual Classification		Sample Number	Depth of Sample	Natural Water Content (%)	In-place Dry Density (P.C.F.)	Penetration Resistance Blows per Foot (0 25 50)
0		3.8 inches Asphaltic Concrete	0.3					
		2 inches Coarse-Grained Gravel	0.5					
		Brown <u>POORLY-GRADED GRAVEL with SAND and SILT</u> (GP/GM-Moist) coarse-grained	0.7					
		Orangish Brown <u>SILTY SAND</u> (SM-Dry to Moist) fine to coarse-grained		BS-1	3.0	NT	NT	
			3.5					
		End of Boring						
5								

Boring Date: **5-28-21**
Field Engineer/Technician: **D. Stratulat**
Driller: **D. Stratulat**
Contractor: **Speedie & Assoc.**

Water Level

Depth	Hour	Date
Free Water was Not Encountered		

▽ ▼

NT = Not Tested

SPEEDIE AND ASSOCIATES

Log of Test Boring Number: **B - 7**

CDO High School East Parking Lot

25 West Calle Concordia

Oro Valley, Arizona

Project No.: **211349ST**

_SPEEDIE 211349ST.GPJ GENGEO.GDT 6/3/21

Depth (feet)	Graphic Log	Visual Classification		Sample Number	Depth of Sample	Natural Water Content (%)	In-place Dry Density (P.C.F.)	Penetration Resistance Blows per Foot (0 – 25 – 50)
0		4.5 inches Asphaltic Concrete	0.4					
		2 inches Coarse-Grained Gravel	0.5					
		Brown POORLY-GRADED GRAVEL with SAND and SILT (GP/GM-Moist) coarse-grained	0.8					
		Auger Refusal on Gravel		BS-1	1.0	NT	NT	
5								

Rig Type: **Hand Auger**
Boring Type: **Hollow Stem Auger**
Surface Elevation: **N/A**

Boring Date: **5-28-21**
Field Engineer/Technician: **D. Stratulat**
Driller: **D. Stratulat**
Contractor: **Speedie & Assoc.**

Water Level

Depth	Hour	Date
Free Water was Not Encountered		

NT = Not Tested

SPEEDIE AND ASSOCIATES

Log of Test Boring Number: **B - 8**

CDO High School East Parking Lot

25 West Calle Concordia

Oro Valley, Arizona

Project No.: **211349ST**

_SPEEDIE 211349ST.GPJ GENGEO.GDT 6/3/21

Rig Type:	**Hand Auger**
Boring Type:	**Hollow Stem Auger**
Surface Elevation:	**N/A**

Depth (feet)	Visual Classification	Depth	Sample Number	Depth of Sample	Natural Water Content (%)	In-place Dry Density (P.C.F.)	Penetration Resistance Blows per Foot (0 – 25 – 50)
0	1.7 inches Asphaltic Concrete	0.1					
	2 inches Coarse-Grained Gravel	0.3					
	Brown POORLY-GRADED GRAVEL with SAND and SILT (GP/GM-Moist) coarse-grained	0.8					
	Orangish Brown WELL-GRADED SAND with SILT (SW/SM-Dry to Moist) fine to coarse-grained	2.5	BS-1	2.5	3.8	NT	
	Orangish Brown SILTY SAND (SM-Dry to Moist) fine to coarse-grained	4.0					
	End of Boring						
5							

Boring Date:	**5-28-21**
Field Engineer/Technician:	**D. Stratulat**
Driller:	**D. Stratulat**
Contractor:	**Speedie & Assoc.**

Water Level

Depth	Hour	Date
Free Water was Not Encountered		

NT = Not Tested

SPEEDIE AND ASSOCIATES

Log of Test Boring Number: **B - 9**

CDO High School East Parking Lot

25 West Calle Concordia

Oro Valley, Arizona

Project No.: **211349ST**

_SPEEDIE 211349ST.GPJ GENGEO.GDT 6/3/21

Depth (feet)	Graphic Log	Rig Type: Hand Auger Boring Type: Hollow Stem Auger Surface Elevation: N/A Visual Classification	Depth	Sample Number	Depth of Sample	Natural Water Content (%)	In-place Dry Density (P.C.F.)	Penetration Resistance Blows per Foot (0 – 25 – 50)
0		2.3 inches Asphaltic Concrete	0.2					
		2 inches Coarse-Grained Gravel	0.4					
		Brown POORLY-GRADED GRAVEL with SAND and SILT (GP/GM-Moist) coarse-grained	0.7					
		Orangish Brown SILTY SAND (SM-Dry to Moist) fine to coarse-grained		BS-1	2.5	4.8	NT	
			3.0					
		End of Boring						
5								

Boring Date: **5-28-21**
Field Engineer/Technician: **D. Stratulat**
Driller: **D. Stratulat**
Contractor: **Speedie & Assoc.**

Water Level

Depth	Hour	Date
Free Water was Not Encountered		

NT = Not Tested

SPEEDIE AND ASSOCIATES

Log of Test Boring Number: **B -10**

CDO High School East Parking Lot

25 West Calle Concordia

Oro Valley, Arizona

Project No.: **211349ST**

_SPEEDIE 211349ST.GPJ GENGEO.GDT 6/3/21

TABULATION OF TEST DATA

SOIL BORING or TEST PIT NUMBER	SAMPLE NUMBER	SAMPLE TYPE	SAMPLE INTERVAL (ft)	NATURAL WATER CONTENT (Percent of Dry Weight)	IN-PLACE DRY DENSITY (Pounds Per Cubic Foot)	PARTICLE SIZE DISTRIBUTION (Percent Finer)					ATTERBERG LIMITS			UNIFIED SOIL CLASSIFICATION	SPECIMEN DESCRIPTION
						#200 SIEVE	#40 SIEVE	#10 SIEVE	#4 SIEVE	3" SIEVE	LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX		
B - 1	BS-1	BULK	1.0 - 2.5	9.8	NT	32.8	60	87	95	100	NP	NP	NP	SM	SILTY SAND
B - 2	BS-1	BULK	1.0 - 2.5	7.4	NT	33.3	60	85	93	100	NP	NP	NP	SM	SILTY SAND
B - 4	BS-1	BULK	1.0 - 3.0	9.0	NT	31.3	57	84	92	100	NP	NP	NP	SM	SILTY SAND
B - 6	BS-1	BULK	1.0 - 3.5	4.1	NT	16.2	42	76	90	100	NP	NP	NP	SM	SILTY SAND
B - 9	BS-1	BULK	1.0 - 2.5	3.8	NT	6.5	23	73	92	100	NP	NP	NP	SW-SM	WELL-GRADED SAND with SILT
B -10	BS-1	BULK	1.0 - 2.5	4.8	NT	16.0	40	79	93	100	NP	NP	NP	SM	SILTY SAND

Sieve analysis results do not include material greater than 3". Refer to the actual boring logs for the possibility of cobble and boulder sized materials.

NT=Not Tested

CDO High School East Parking Lot
25 West Calle Concordia
Oro Valley, Arizona
Project No. 211349ST

SPEEDIE AND ASSOCIATES

TABULATION OF TEST DATA 211349ST.GPJ GENGEO.GDT 6/3/21

APPENDIX A: Surface Photographs

Project No. 211349ST

Photo No. 1: Stripping close up.

Photo No. 2: Conditions under canopies

Photo No. 3: Drop off lane.

Photo No. 4: Drop off lane close up.

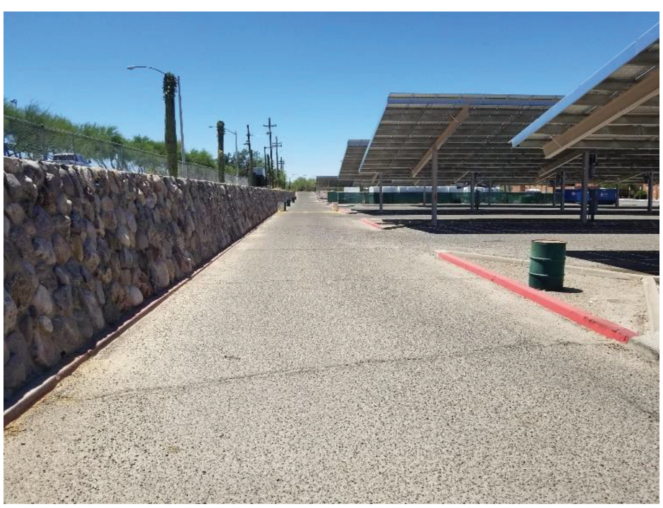


Photo No. 5: Drive lane typical.

Photo No. 6: Alligator cracking typical.