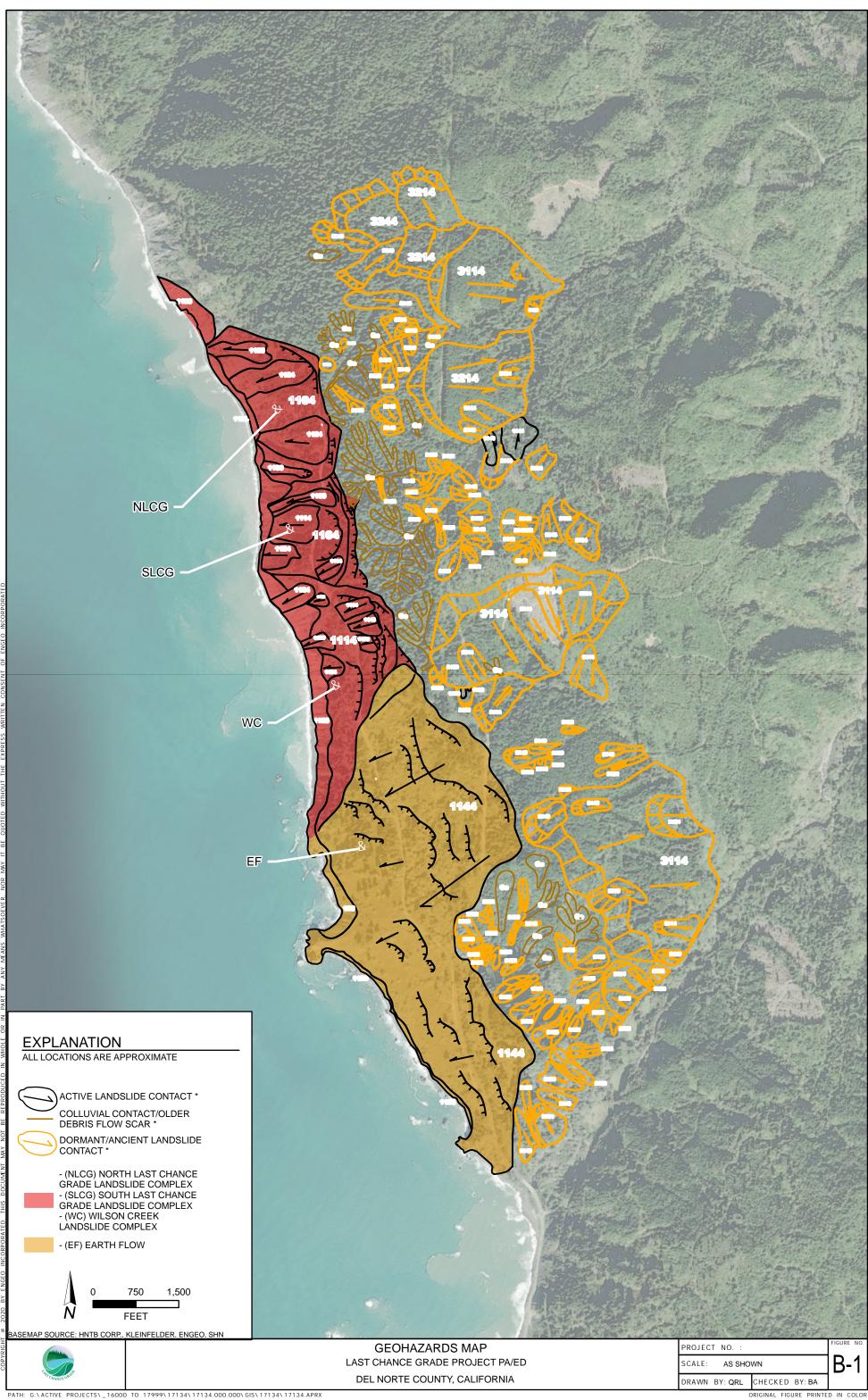
### **APPENDIX B** Geohazards Map



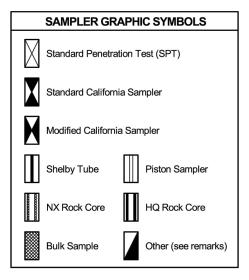
### **APPENDIX C** Boring Records

Auger Drilling

	GROUP SYMBOLS AND NAMES					
Graphic	Symbol   Group Names   Graphic / Symbol   Group Names				Group Names	
20000	GW GP	Well-graded GRAVEL Well-graded GRAVEL with SAND Poorly graded GRAVEL Peorly graded GRAVEL		CL	Lean CLAY Lean CLAY with SAND Lean CLAY with GRAVEL SANDY lean CLAY SANDY lean CLAY GRAVELLY lean CLAY GRAVELLY lean CLAY	
	GW-GM	Poorly graded GRAVEL with SAND  Well-graded GRAVEL with SILT  Well-graded GRAVEL with SILT and SAND			GRAVELLY lean CLAY with SAND  SILTY CLAY SILTY CLAY with SAND SILTY CLAY with GRAVEL	
	GW-GC	Well-graded GRAVEL with CLAY (or SILTY CLAY) Well-graded GRAVEL with CLAY and SAND (or SILTY CLAY and SAND)		CL-ML	SANDY SILTY CLAY SANDY SILTY CLAY with GRAVEL GRAVELLY SILTY CLAY GRAVELLY SILTY CLAY with SAND	
	GP-GM	Poorly graded GRAVEL with SILT Poorly graded GRAVEL with SILT and SAND Poorly graded GRAVEL with CLAY		ML	SILT SILT with SAND SILT with GRAVEL SANDY SILT SANDY SILT	
	GP-GC	(or SILTY CLAY) Poorly graded GRAVEL with CLAY and SAND (or SILTY CLAY and SAND)			GRAVELLY SILT GRAVELLY SILT with SAND ORGANIC lean CLAY	
	GM	SILTY GRAVEL SILTY GRAVEL with SAND		OL	ORGANIC Iean CLAY with SAND ORGANIC Iean CLAY with GRAVEL SANDY ORGANIC Iean CLAY	
	GC	CLAYEY GRAVEL CLAYEY GRAVEL with SAND			SANDY ORGANIC lean CLAY with GRAVEL GRAVELLY ORGANIC lean CLAY GRAVELLY ORGANIC lean CLAY with SAND	
	GC-GM	SILTY, CLAYEY GRAVEL with SAND		OL	ORGANIC SILT ORGANIC SILT with SAND ORGANIC SILT with GRAVEL SANDY ORGANIC SILT SANDY ORGANIC SILT	
A. A. A.	sw	Well-graded SAND Well-graded SAND with GRAVEL			SANDT ORGANIC SILT WILL GRAVEL GRAVELLY ORGANIC SILT GRAVELLY ORGANIC SILT with SAND Fat CLAY	
	SP SW-SM	Poorly graded SAND Poorly graded SAND with GRAVEL Well-graded SAND with SILT		СН	Fat CLAY with SAND Fat CLAY with GRAVEL SANDY fat CLAY SANDY fat CLAY GRAVELLY fat CLAY GRAVELLY fat CLAY	
	sw-sc	Well-graded SAND with SILT and GRAVEL  Well-graded SAND with CLAY (or SILTY CLAY)  Well-graded SAND with CLAY and GRAVEL (or SILTY CLAY) and GRAVEL)			GRAVELLY fat CLAY with SAND  Elastic SILT  Elastic SILT with SAND  Elastic SILT with GRAVEL	
	SP-SM	Poorly graded SAND with SILT Poorly graded SAND with SILT and GRAVEL		МН	SANDY elastic SILT SANDY elastic SILT with GRAVEL GRAVELLY elastic SILT GRAVELLY elastic SILT with SAND	
	SP-SC	Poorly graded SAND with CLAY (or SILTY CLAY) Poorly graded SAND with CLAY and GRAVEL (or SILTY CLAY and GRAVEL)		ОН	ORGANIC fat CLAY ORGANIC fat CLAY with SAND ORGANIC fat CLAY with GRAVEL SANDY ORGANIC fat CLAY	
	SM	SILTY SAND SILTY SAND with GRAVEL			SANDY ORGANIC fat CLAY with GRAVEL GRAVELLY ORGANIC fat CLAY GRAVELLY ORGANIC fat CLAY with SAND ORGANIC elastic SILT	
	sc	CLAYEY SAND CLAYEY SAND with GRAVEL		ОН	ORGANIC elastic SILT with SAND ORGANIC elastic SILT with GRAVEL SANDY elastic ELASTIC SILT	
	SC-SM	SILTY, CLAYEY SAND SILTY, CLAYEY SAND with GRAVEL			SANDY ORGANIC elastic SILT with GRAVEL GRAVELLY ORGANIC elastic SILT GRAVELLY ORGANIC elastic SILT with SAND ORGANIC SOIL	
r 4r 4r 4r 7r 7 r 4r 4r	PT	PEAT		оц/он	ORGANIC SOIL with SAND ORGANIC SOIL with GRAVEL SANDY ORGANIC SOIL	
K		COBBLES and BOULDERS BOULDERS			SANDY ORGANIC SOIL with GRAVEL GRAVELLY ORGANIC SOIL GRAVELLY ORGANIC SOIL with SAND	

## Rotary Drilling Dynamic Cone or Hand Driven Diamond Core

#### FIELD AND LABORATORY TESTS Consolidation (ASTM D 2435-04) Collapse Potential (ASTM D 5333-03) Compaction Curve (CTM 216 - 06) Corrosion, Sulfates, Chlorides (CTM 643 - 99; CTM 417 - 06; CTM 422 - 06) Consolidated Undrained Triaxial (ASTM D 4767-02) Direct Shear (ASTM D 3080-04) Expansion Index (ASTM D 4829-03) Moisture Content (ASTM D 2216-05) Organic Content (ASTM D 2974-07) Permeability (CTM 220 - 05) Particle Size Analysis (ASTM D 422-63 [2002]) Liquid Limit, Plastic Limit, Plasticity Index (AASHTO T 89-02, AASHTO T 90-00) Point Load Index (ASTM D 5731-05) PM Pressure Meter Pocket Penetrometer R-Value (CTM 301 - 00) Sand Equivalent (CTM 217 - 99) SG Specific Gravity (AASHTO T 100-06) Shrinkage Limit (ASTM D 427-04) SW Swell Potential (ASTM D 4546-03) Pocket Torvane Unconfined Compression - Soil (ASTM D 2166-06) Unconfined Compression - Rock (ASTM D 2938-95) Unconsolidated Undrained Triaxial UU (ASTM D 2850-03) UW Unit Weight (ASTM D 4767-04)



VS Vane Shear (AASHTO T 223-96 [2004])

## WATER LEVEL SYMBOLS ☑ First Water Level Reading (during drilling) ☑ Static Water Level Reading (short-term) ☑ Static Water Level Reading (long-term)

LAST CHANCE GRADE PERMANENT RESTORATION PROJECT

PRELIMINARY GEOTECHNICAL DATA REPORT

APRIL 2022

BORING RECORD LEGEND

PLATE

**C-1** 

APPENDIX C - BORING RECORDS

	CONSISTENCY OF COHESIVE SOILS					
Descriptor	Unconfined Compressive Strength (tsf)	Pocket Penetrometer (tsf)	Torvane (tsf)	Field Approximation		
Very Soft	< 0.25	< 0.25	< 0.12	Easily penetrated several inches by fist		
Soft	0.25 - 0.50	0.25 - 0.50	0.12 - 0.25	Easily penetrated several inches by thumb		
Medium Stiff	0.50 - 1.0	0.50 - 1.0	0.25 - 0.50	Can be penetrated several inches by thumb with moderate effort		
Stiff	1.0 - 2.0	1.0 - 2.0	0.50 - 1.0	Readily indented by thumb but penetrated only with great effort		
Very Stiff	2.0 - 4.0	2.0 - 4.0	1.0 - 2.0	Readily indented by thumbnail		
Hard	> 4.0	> 4.0	> 2.0	Indented by thumbnail with difficulty		

APPARENT DENSITY OF COHESIONLESS SOILS				
Descriptor	SPT N <sub>60</sub> - Value (blows / foot)			
Very Loose	0 - 4			
Loose	5 - 10			
Medium Dense	11 - 30			
Dense	31 - 50			
Very Dense	> 50			

MOISTURE				
Descriptor Criteria				
Dry	Absence of moisture, dusty, dry to the touch			
Moist	Damp but no visible water			
Wet	Visible free water, usually soil is below water table			

PERCENT OR PROPORTION OF SOILS				
Descriptor	Criteria			
Trace	Particles are present but estimated to be less than 5%			
Few	5 to 10%			
Little	15 to 25%			
Some	30 to 45%			
Mostly	50 to 100%			

SOIL PARTICLE SIZE				
Descriptor		Size		
Boulder		> 12 inches		
Cobble		3 to 12 inches		
Gravel	Coarse	3/4 inch to 3 inches		
Gravei	Fine	No. 4 Sieve to 3/4 inch		
	Coarse	No. 10 Sieve to No. 4 Sieve		
Sand	Medium	No. 40 Sieve to No. 10 Sieve		
	Fine	No. 200 Sieve to No. 40 Sieve		
Silt and Clay		Passing No. 200 Sieve		

PLASTICITY OF FINE-GRAINED SOILS				
Descriptor	Criteria			
Nonplastic	A 1/8-inch thread cannot be rolled at any water content.			
Low	The thread can barely be rolled, and the lump cannot be formed when drier than the plastic limit.			
Medium	The thread is easy to roll, and not much time is required to reach the plastic limit; it cannot be rerolled after reaching the plastic limit. The lump crumbles when drier than the plastic limit.			
High	It takes considerable time rolling and kneading to reach the plastic limit. The thread can be rerolled several times after reaching the plastic limit. The lump can be formed without crumbling when drier than the plastic limit.			

CEMENTATION			
Descriptor	Criteria		
Weak	Crumbles or breaks with handling or little finger pressure.		
Moderate	Crumbles or breaks with considerable finger pressure.		
Strong	Will not crumble or break with finger pressure.		

NOTE: This legend sheet provides descriptors and associated criteria for required soil description components only. Refer to Caltrans Soil and Rock Logging, Classification, and Presentation Manual (2010), Section 2, for tables of additional soil description components and discussion of soil description and identification.

LAST CHANCE GRADE PERMANENT RESTORATION PROJECT

PRELIMINARY GEOTECHNICAL DATA REPORT

APRIL 2022

BORING RECORD LEGEND

PLATE

**C-2** 

APPENDIX C - BORING RECORDS

ROCK GRAPHIC SYMBOLS				
$\boxtimes$	IGNEOUS ROCK			
	SEDIMENTARY ROCK			
	METAMORPHIC ROCK			

BEDDING SPACING				
Descriptor	Thickness or Spacing			
Massive Very thickly bedded Thickly bedded Moderately bedded Thinly bedded Very thinly bedded Laminated	> 10 ft 3 to 10 ft 1 to 3 ft 3-5/8 inches to 1 ft 1-1/4 to 3-5/8 inches 3/8 inch to 1-1/4 inches < 3/8 inch			

	WEATHERING DESCRIPTORS FOR INTACT ROCK					
Diagnostic Features						
	Chemical Weathering-Discoloration-Oxidation		Mechanical Weathering	Texture and Solutioning		
Descriptor	Body of Rock	Fracture Surfaces	and Grain Boundary Conditions	Texture	Solutioning	General Characteristics
Fresh	No discoloration, not oxidized	No discoloration or oxidation	No separation, intact (tight)	No change	No solutioning	Hammer rings when crystalline rocks are struck.
Slightly Weathered	Discoloration or oxidation is limited to surface of, or short distance from, fractures, some feldspar crystals are dull	Minor to complete discoloration or oxidation of most surfaces	No visible separation, intact (tight)	Preserved	Minor leaching of some soluble minerals may be noted	Hammer rings when crystalline rocks are struck. Body of rock not weakened.
Moderately Weathered	Discoloration or oxidation extends from fractures usually throughout; Fe-Mg minerals are "rusty"; feldspar crystals are "cloudy"	All fracture surfaces are discolored or oxidized	Partial separation of boundaries visible	Generally preserved	Soluble minerals may be mostly leached	Hammer does not ring when rock is struck. Body of rock is slightly weakened.
Intensely Weathered	Discoloration or oxidation throughout; all feldspars and Fe-Mg minerals are altered to clay to some extent; or chemical alteration produces in situ disaggregation (refer to grain boundary conditions)	All fracture surfaces are discolored or oxidized; surfaces are friable	Partial separation, rock is friable; in semi-arid conditions, granitics are disaggregated	Altered by chemical disintegration such as via hydration or argillation	Leaching of soluble minerals may be complete	Dull sound when struck with hammer; usually can be broken with moderate to heavy manual pressure or by light hammer blow without reference to planes of weakness such as incipient or hairline fractures or veinlets. Rock is significantly weakened.
Decomposed	Discolored of oxidized throughout, but resistant minerals such as quartz may be unaltered; all feldspars and Fe-Mg minerals are completely altered to clay		Complete separation of grain boundaries (disaggregated)	Resembles as complete remr may be preser soluble minera complete	coil; partial or sant rock structure ved; leaching of lls usually	Can be granulated by hand. Resistant minerals such as quartz may be present as "stringers" or "dikes".

Note: Combination descriptors (such as "slightly weathered to fresh") are used where equal distribution of both weathering characteristics is present over significant intervals or where characteristics present are "in between" the diagnostic feature. However, combination descriptors should not be used where significant identifiable zones can be delineated. Only two adjacent descriptors shall be combined. "Very intensely weathered" is the combination descriptor for "decomposed to intensely weathered".

RELATIVE STRENGTH OF INTACT ROCK				
Descriptor	Uniaxial Compressive Strength (psi)			
Extremely Strong	> 30,000			
Very Strong	14,500 - 30,000			
Strong	7,000 - 14,500			
Medium Strong	3,500 - 7,000			
Weak	700 - 3,500			
Very Weak	150 - 700			
Extremely Weak	< 150			

# CORE RECOVERY CALCULATION (%) Length of the recovered core pieces (in.) Total length of core run (in.)

RQD CALCULATION (%)	
Σ Length of intact core pieces > 4 in.  Total length of core run (in.)	x 100

	ROCK HARDNESS
Descriptor	Criteria
Extremely Hard	Specimen cannot be scratched with pocket knife or sharp pick; can only be chipped with repeated heavy hammer blows
Very hard	Specimen cannot be scratched with pocket knife or sharp pick; breaks with repeated heavy hammer blows
Hard	Specimen can be scratched with pocket knife or sharp pick with heavy pressure; heavy hammer blows required to break specimen
Moderately Hard	Specimen can be scratched with pocket knife or sharp pick with light or moderate pressure; breaks with moderate hammer blows
Moderately Soft	Specimen can be grooved 1/6 in. with pocket knife or sharp pick with moderate or heavy pressure; breaks with light hammer blow or heavy hand pressure
Soft	Specimen can be grooved or gouged with pocket knife or sharp pick with light pressure, breaks with light to moderate hand pressure
Very Soft	Specimen can be readily indented, grooved, or gouged with fingernail, or carved with pocket knife; breaks with light hand pressure

	FRACTURE DENSITY
Descriptor	Criteria
Unfractured	No fractures
Very Slightly Fractured	Lengths greater 3 ft
Slightly Fractured	Lengths from 1 to 3 ft, few lengths outside that range
Moderately Fractured	Lengths mostly in range of 4 in. to 1 ft, with most lengths about 8 in.
Intensely Fractured	Lengths average from 1 in. to 4 in. with scattered fragmented intervals with lengths less than 4 in.
Very Intensely Fractured	Mostly chips and fragments with few scattered short core lengths

LAST CHANCE GRADE PERMANENT RESTORATION PROJECT

PRELIMINARY GEOTECHNICAL DATA REPORT

APRIL 2022

BORING RECORD LEGEND

PLATE

**C-3** 

APPENDIX C - BORING RECORDS

LOGGED BY

M. Porter

**Gregg Drilling** 

DRILLING METHOD

DEPTH (ft)

**Rotary Core** 

ELEVATION (ft)

DRILLING CONTRACTOR

SAMPLER TYPE(S) AND SIZE(S) (ID)

BOREHOLE BACKFILL AND COMPLETION

VWP, TDR, Inclinometer; cement-bentonite

1.9 feet: reddish yellow

SPT (1.4"), HQ Core (2.5")

Material Graphics

COMPLETION DATE

9-28-20

**DESCRIPTION** 

Fat CLAY (CH); very stiff; reddish brown; moist; trace SAND; high plasticity; abundant rootlets; weak cementation (COLLUVIUM); PP = 4.0 tsf

BEGIN DATE

9-23-20

gINT TEMPLATE:

830	5		5.2 feet: red brown and yellow brown  6.5 feet: PP = 2.5 tsf	X	S02	3 6 9	15	67	0	0.00	\$\\\ \\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\				•	_
825	10		7.0 feet: trace angular fine GRAVEL; weak to moderate cementation; faint relic rock structure (COLLUVIUM / RESIDUAL SOIL)  SEDIMENTARY ROCK (ARGILLITE); very thinly bedded; reddish brown, yellowish brown, gray; decomposed; very soft; very intensely fractured; pervasively sheared		C03	6	23	40		0.00	X					
820	15		SEDIMENTARY ROCK (ARGILLITE); very thinly bedded; reddish brown, yellowish brown, gray; decomposed; very soft; very intensely fractured; pervasively sheared to: (Lean CLAY with SAND (CL)); very soft; moist; mostly fines; little fine to coarse SAND; medium plasticity; no cementation (FRANCISCAN COMPLEX / ANCIENT LANDSLIDE DEPOSIT); PP = 0 tsf	X	S04	11 12	20	NR		2.00	X					
815	20		20.0 feet: advance HWT casing to 20'		C06			12		0.00	×					
			21.0 feet: stiff; weak cementation; PP = 1.0 tsf	X	S07	3 8 15	23	53		0.00	\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\					
810	-25-		23.0 feet: PP = 2.5 tsf		C08			100	0	7.00						
	20		(continued)			REPOR	T T13					Luc	DLE ID			]
		KL	EINFELDER  Bright People. Right Solutions.		C	BORI DIST. 01 PROJE	NG CO D	UNT el N R BF	Y <b>orte</b> RIDG	F	101	POSTMILE 12-15.5	)-20-002 	A	5000099	
			/		В	RIDGE				PREPAR D. Ro	RED BY		DATE <b>5-11-2</b>	21	SHEET 1 of 4	1
										,	<u> </u>			ı		_

BOREHOLE LOCATION (Lat/Long or North/East and Datum)

GROUNDWATER DURING DRILLING AFTER DRILLING (DATE)

**Not Determined** 

Drilling Method
Casing Depth

Drill Rate (min/ft)

**Not Determined** 

Blows per foot

Recovery (%)

36

RQD (%)

2489208.417 ft / 5985460.159 ft NAD83

BOREHOLE LOCATION (Offset, Station, Line) Alignment A2/G2, Sta. 162+00

Automatic; 140 lbs / 30-inch drop

Uncorr. Blows per 6 in.

DRILL RIG

Geoprobe 3230

SPT HAMMER TYPE

Sample Location

Sample/Run#

C01

HOLE ID

4.5 in

100.0 ft

**Discontinuity Description** 

Fracture Identification: (Depth), Dip, Width, Infilling Composition, Weathering, Hardness, Healing, Roughness

D-20-002

SURFACE ELEVATION

834.46 ft NAVD88

BOREHOLE DIAMETER

HAMMER EFFICIENCY, ERI

TOTAL DEPTH OF BORING

ELEVATION (ft)	(#) HLGUUS	(וו) בו בפת	Material Graphics		Sample Location	Sample/Run#	Uncorr. Blows per 6 in.	Blows per foot	Recovery (%)	RQD (%)	Drill Rate (min/ft)	Drilling Method Casing Depth	Discontinuity Description  Fracture Identification: (Depth), Dip, Width, Infilling Composition, Weathering, Hardness, Healing, Roughness
				SEDIMENTARY ROCK (ARGILLITE); very thinly bedded; dark gray; decomposed; very soft; very intensely fractured; pervasively sheared to: (Sandy lean CLAY (CL)); stiff; mostly fines; some fine to coarse SAND; few fine subangular GRAVEL (ARGILLITE fragments) (FRANCISCAN COMPLEX: ANCIENT LANDSLIDE DEPOSIT)		C10			14	0	7.60	>\\\ \\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	_ _ _
805	30			30.0 feet: black; fresh; hard; intensely fractured; quartz and calcite veining to 0.1"		C11			24	0	2.40	\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	
800				32.5 feet: very intensely fractured 34.2 feet: drill bit clogged at start of run; did not advance		C12			NR NR		7.50	\\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\	_
	35			34.8 feet: circulation loss  SEDIMENTARY ROCK (ARGILLITE); thinly bedded; dark gray; decomposed; soft to very soft; very intensely fractured; pervasively sheared to: (Sandy fat CLAY with GRAVEL (CH)) stiff; dark gray; moist; mostly fines; some fine to coarse SAND; little subangular fine to coarse GRAVEL (SANDSTONE and ARGILLITE fragments); (FRANCISCAN COMPLEX: ANCIENT LANDSLIDE DEPOSIT)		C14			32	0	3.20		<del>-</del> - -
795	40			ragments); (FRANCISCAN COMPLEX: ANCIENT LANDSLIDE DEPOSIT) 36.8 feet: circulation loss		C15			28	0	1.20	\ \ \ \ \ \	_ 
[-/				40.0 feet: equip NQ core for pressure meter test; interval from 40.0-45.0 feet; advance HWT casing to 40'		C16			36	0	3.60		_
790	45			43.5 feet: PMT, maximum pressure 110 psi					47	0	5.88	\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	_ _ _
				45.0 feet: PMT, maximum pressure 125 psi; water loss 45.2 feet: PP = 0 tsf and 1.0 tsf  46.5 feet: circulation loss 47.0 feet: very soft to very stiff; PP = 0 tsf and 2.5 tsf 47.4 feet: very hard 1" SANDSTONE clast in shoe;		C17			24	0	6.97		_
785	50			circulation return		C18			NR		6.80	>>	
T						C19			36	0	5.20		_ _ _
780	55			53.0 feet: 4" ARGILLITE clast; slightly weathered; moderately soft 54.0 feet: rig chatter  (continued)		C20							_
				(acriminate)			EPOR						HOLE ID
		11				D	BORI IST. 01	NG I		Y	F	ROUTE <b>101</b>	D-20-002   POSTMILE
		^	LE	EINFELDER Bright People. Right Solutions.							E NAME de Byp		
				<i>y</i>			RIDGE				PREPA	RED BY	DATE SHEET
							-				D. Ro	oss	5-11-21 2 of 4

	C3	3	52	0	4.00		F: (83.6'), 60°, weathered, ha rough		
(continued)									
			T TITLE	COF	RD			DLE ID <b>D-20-002</b>	
(KI EINEEL DED		DIST.	COUNT Del N		1 '	ROUTE <b>101</b>	POSTMILE <b>12-15.5</b>	EA <b>01</b> 1	5000099
KLEINFELDER  Bright People. Right Solutions.					E NAME		•		
		BRIDGE	E NUMBE	R	PREPA D. Ro	RED BY		DATE <b>5-11-21</b>	SHEET 3 of 4

Γ	<u> </u>				ے						æ		
١	ELEVATION (ft)				Sample Location	#	6 in.	foot	(%)		Drill Rate (min/ft)	ے اوا	Discontinuity Description
l	ē	Œ		DESCRIPTION	8	Rur	er 6	교	y (%		ш) <del>(</del>	leth ept	Erecture Identification: (Denth) Din
l	Ϋ́	I	<u>.</u> <u>a</u> .	DESCRIPTION	e E	Je/I	rr. s pe	s be	ver	%)	Rate	g g □ ∑	Fracture Identification: (Depth), Dip, Width, Infilling Composition, Weathering,
l	É	DEРТН (ft)	Material		ami	Sample/Run#	Uncorr. Blows per (	Blows per	Recovery (%)	RQD (%)	ı III	Drilling Method Casing Depth	Hardness, Healing, Roughness
ŀ	ш	-55 <del>-</del>			S	S	U B	В	<b>℃</b> 28	٥ R	7.20		
ı				SEDIMENTARY ROCK (ARGILLITE) 55.0 feet: circulation loss					28	0	7.20		
ı			1=			C21						$\Diamond$	_
ı			Æ										_
ı									NR		24.29	$\sim$	
ı						C22							_
ı			==						NR		7.78	$\sim$	
ı	775		==			C23						$\Diamond$	
ı		60							28	0	3.60	<b>→</b> <	_
ı				very soft; very intensely fractured; with moderately hard					20	"	3.00	$\Diamond$	
ı			T==	ARGILLITE and SANDSTONE clasts; pervasively sheared to: (CLAYEY GRAVEL with SAND (GC)):		C24							_
ı			4=	loose; dark gray; moist to wet; mostly subangular fine to									_
ı				60.0 feet: dark gray; intensely weathered to decomposed; very soft; very intensely fractured; with moderately hard ARGILLITE and SANDSTONE clasts; pervasively sheared to: (CLAYEY GRAVEL with SAND (GC)); loose; dark gray; moist to wet; mostly subangular fine to coarse GRAVEL; some moderate to high plasticity fines; little fine to coarse SAND; local chaotic quartz and calcite veining; advance HWT casing to 60.0'	Н				NR		8.00		
ı			⇟	calcite veining; advance HWT casing to 60.0'					INIX		0.00	$\searrow$	_
ı			_==	63.5 feet: circulation loss		C25						$\Diamond$	_
ı	770		=	<u> </u>								$\triangleright \triangleleft$	
ı		65	+==	65.0 feet: continuous circulation loss during drilling	Н				24	0	2.40	-[<>]	_
ı			E	1 00.0 leet. continuous circulation loss during drilling					24	"	2.40		
ı			7=			C26							_
ı			4=										_
ı			E	67.5 feet: intensely fractured	Н				56	0	4.80	$\rightarrow$	
ı			⇟	07.5 leet. Interisely fractured					30	0	4.00	$\Diamond$	
ı			E			C27							F: (68.2'), 40°, open, clean, moderately hard, not healed, slightly rough —
ı	765		E	69.2 feet: rig chatter								$\Diamond$	······-, ······, ····g····, ··g··
ı		70	┽═	70.0 feet: very intensely fractured	Н				28	0	4.80	-><	_
ı			E	70.0 leet. very interisely fractured					20	ľ	1.00		
ı			=			C28							_
1			4=									$\searrow$	_
١			E						24	0	9.60	$ \diamondsuit $	
ı			7=	-								$\triangleright$ <	_
ı			丰			C29						$\Diamond$	_
ı	760		E	74.0 feet: rig chatter									
ı		75	<del> </del> ==	75.0 feet: continuous circulation loss during drilling;	H				16	0	3.20	$\sim$	<del>-</del>
ı			_E	advance HWT casing to 75.0'								$\Diamond$	_
١			E			C30						$\searrow$	
ı			臣	-								$\Diamond$	-
ı				3					NR		3.20	$\triangleright \triangleleft$	
١			E	3								$\Diamond$	_
ı			ᆂ			C31							_
١	755		E	3									
ı		80	==	- 80.0 feet: recovering dominantly moderately hard					28	0	2.80	$\langle \rangle$	<del>-</del>
ı			_=	80.0 feet: recovering dominantly moderately hard ARGILLITE and SANDSTONE fragments to 4"; localized zone of disturbed SAND and Fat CLAY (CH);								$\searrow$	_
١				poor recovery; circulation loss		C32						$\Diamond$	
			▐▔	4								$\triangleright \triangleleft$	_
1				1	H				52	0	4.00	$\langle \rangle$	
			E	4									
1			-==	1		C33						$\sim$	F: (83.6'), 60°, wide, clean, slightly
	750											$\Diamond$	weathered, hard, not healed, moderately rough
t		<del>-</del> 85 <del>-</del>		(continued)									· wwith
┟				(		F	REPOR	T TI	ΓLE				HOLE ID
1							BORI			COR	ח		D-20-002

PEOTTED: 04/19/2022 03:24 PM BY: DSulliv	ELEVATION (ft)	» ភDEPTH (ft)	Material Graphics	DESCRIPTION	Sample Location	Sample/Run#	Uncorr. Blows per 6 in.	Blows per foot	Recovery (%)	RQD (%)	Drill Rate (min/ft)	Drilling Method Casing Depth	Discontinuity Description Fracture Identification: (Depth), Dip, Width, Infilling Composition, Weathering, Hardness, Healing, Roughness
01 IED: 04/19/202		-		SEDIMENTARY ROCK (ARGILLITE); as above (FRANCISCAN COMPLEX: BROKEN FORMATION) 85.0 feet: unfractured 85.5 feet: very intensely fractured 87.0 feet: drill bit continually becoming clogged		C34			28	0	7.14 2.78	)	_
	745	90 -				C36			28	0	2.40	>< >>< >><	
		-				C37			24	0	2.40	\\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\	- -
	740	95		94.0 feet: rig chatter		C38			NR NR 20		7.14 8.89 7.20	>>< >>< >>< >><	_ _ _
		-		97.0 feet: circulation loss		C40			NR	-	10.00	>< >>< ><	F: (95.3'), 50°, wide, fresh, hard, — — — — —
	735	100		98.8 feet: circulation loss  100.0 feet: advance HWT casing to full depth (100.0')  Bottom of borehole at 100.0 ft bgs		C42			NR		11.00		_
KA1E)2]		-											_ _ _
-F MOD W DRILL	730	105 -											<u>-</u>
CALIKANS (KI		-											
UZZ.GLB [CLIEN	725	110											_
GIN I_LIBRAR I_4		-											
L STANDARD	720	115					REPOR						HOLE ID
gini lemplate: e:kle_standard_gini_library_2022.GLB [Clieni_Calirans (Kl-mod w drill rate)z]		P	<le< td=""><td>EINFELDER Bright People. Right Solutions.</td><td></td><td>F</td><td>BORI DIST. 01 PROJEC Last ( BRIDGE</td><td>CO D CT C Cha</td><td>UNT el N R BF nce</td><td>Y <b>orte</b> RIDG <b>Gra</b></td><td>R</td><td>OUTE 101 ass RED BY</td><td>D-20-002    POSTMILE</td></le<>	EINFELDER Bright People. Right Solutions.		F	BORI DIST. 01 PROJEC Last ( BRIDGE	CO D CT C Cha	UNT el N R BF nce	Y <b>orte</b> RIDG <b>Gra</b>	R	OUTE 101 ass RED BY	D-20-002    POSTMILE

DRILLII Greg DRILLII Rota		MITD	10700			5 ft /	598	6035		um)	HOLE ID  RC-20-003  SURFACE ELEVATION			
Rota	,		ACTOR	BOREHOL	E LO	CATIO	ON (Of	fset, S	Station	n, Line)			774.80 ft N	
C, (1411 E	ry Co	ore	O AND SIZE(S) (ID)	DRILL RIG CME 856	0 Tra								BOREHOLE D 4.5 in HAMMER EFF	DIAMETER FICIENCY, ERI
HQ C	Core (	(2.5")		Automa							D DDILLI	NG (DATE)	TOTAL DEDT	LL OF DODING
VWP			linometer; cement-bentonite	READINGS	3		lot Det				t Determi		155.0 ft	H OF BORING
ELEVATION (ft)	Роертн (ft)	Material Graphics			Sample Location	Sample/Run# Uncorr.	Blows per 6 in.			Drill Rate (min/ft)	Drilling Method Casing Depth	Fractur Width, Inf	iscontinuity De e Identification: illing Compositi ness, Healing,	: (Depth), Dip, ion, Weathering,
770	5 -		SEDIMENTARY ROCK (SANDSTONE) Fine- to medium-grained sand; massive; dark g brown; moderately weathered; soft; intensely fra mineralization on fracture surfaces (FRANCISC COMPLEX / ANCIENT LANDSLIDE DEPOSIT)  2.6 feet: yellowish brown; very intensely fracture 3.0 feet: intensely fractured 3.6 feet: Lean CLAY (CL) fracture infill 4.1 feet: dark grayish brown; moderately soft 4.8 feet: Lean CLAY (CL) fracture infill	actured; :AN )	Co			60		3.80	\ \\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\			
765	10		7.1 feet: yellowish brown 7.6 feet: very intensely fractured 7.8 feet: intensely fractured 8.6 feet: very intensely fractured 8.7 feet: intensely fractured 9.1 feet: very intensely fractured 9.8 feet: Lean CLAY (CL) fracture infill 10.0 feet: intensely fractured		Co	02		64	9	1.80	\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\			
760	15		14.3 feet: SANDY lean CLAY (CL) fracture infi	iu	Co	03		58	0	2.40	\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\			
	-		18.0 feet: circulation loss (30-40 gallons)		C	04					\$\\\ \\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\			
755	20 -		19.8 feet: Sandy lean CLAY (CL) fracture infill	l	Co	05		92	23	1.80	$\bigcirc$			
750	25		(continued)											
/								OUN	COR		ROUTE <b>101</b>	POSTMIL <b>12-15.</b>		
KLEINFELDER  Bright People. Right Solutions.							JECT	OR E	RIDG	E NAME		,	- 1 9	
Bright People. Right Solutions.							GE N				RED BY		DATE <b>5-11-2</b>	SHEET 1 1 of 6

ELEVATION (ft)	л ОЕРТН (ft)	Material Graphics		Sample Location	Sample/Run#	Uncorr. Blows per 6 in.	Blows per foot	Recovery (%)	RQD (%)	Drill Rate (min/ft)	Drilling Method Casing Depth	Discontinuity Description  Fracture Identification: (Depth), Dip, Width, Infilling Composition, Weathering, Hardness, Healing, Roughness
745	_	-	SEDIMENTARY ROCK (SANDSTONE)  26.2 feet: calcite crystals; up to 0.5"  26.9 feet: calcite crystals up to 0.2"  28.0 feet: Lean CLAY (CL) seam 0.5" thick  28.7 to 29.1 feet: Lean CLAY (CL) fracture infill	C	C06			80	15	2.60	>><>><	- - -
745	30 -			(	C07			62	0	4.67	X	- - - -
740	35 -		34.0 to 34.5 feet: very intensely fractured with Lean CLAY (CL) fracture infill 35.0 feet: slightly weathered; moderately hard; intensely fractured		C08			80 95	0 14	5.00	$\Diamond \times \Diamond \times$	- - -
735	40 -		37.5 feet: moderately fractured 38.0 feet to 40.0 feet: trace ARGILLITE clasts up to 0.1"  39.0 feet: 0.25" Lean CLAY (CL) infill; trace ARGILLITE clasts up to 0.1"  39.5 feet: intensely fractured  41.2 to 41.5 feet: bluish gray with yellowish brown staining on fracture surfaces		C10			100	0	3.00		F: (37.8'), 10°, slightly open, very thin, manganese, moderately weathered, moderately hard, not healed, moderately rough F: (38.4'), 30°, very thin, manganese, moderately weathered, moderately hard, not healed, rough
730	45	-	45.0 to 45.2 feet: laminated ARGILLITE interbeds; gray; moderately weathered; moderately soft to moderately hard		C12			93	0	4.67 5.14	X	- - -
725	50 -	=	48.5 to 48.7 feet: laminated ARGILLITE interbeds; gray; moderately weathered; moderately soft to moderately hard 49.8 feet: yellowish brown and bluish gray		C13			100		3.33	×	- - -
720			52.0 to 59.2 feet: trace ARGILLITE clasts up to 0.1"		C15			90	0	3.60	$\Diamond \times \Diamond \times \Diamond \times \Diamond \rangle$	_ _ _
720	55	:::::	/ 4i								$\Diamond$	
	K	CLE	(continued)  EINFELDER  Bright People. Right Solutions.		D P		CT OC	REC UNT el N R BF nce	Y <b>orte</b> RIDG <b>Gra</b>	F	RED BY	HOLE ID RC-20-003  POSTMILE 12-15.5 EA 0115000099  DATE SHEET 5-11-21 2 of 6

715

710 65

60

DEPTH (ft)

Material Graphics

705	70			69.3 feet: grayish brown; moderately weathered	C19		100	0	3.19	$\Rightarrow \langle$				
					C20		100	0	2.33					_
700				72.9 feet: bluish gray and grayish brown; slightly weathered; ARGILLITE clasts up to 0.25" 73.5 feet: grayish brown; moderately weathered	C21		100	0	2.50					
100	75			74.7 to 76.5 feet: ARGILLITE clasts up to 0.2"			100	0	3.68	>< >><				
				SEDIMENTARY ROCK (SANDSTONE); fine to medium grained sand; massive; bluish gray with grayish brown; slightly weathered; moderately hard to hard; intensely fractured; (FRANCISCAN COMPLEX/ANCIENT LANDSLIDE DEPOSIT)  7.7 3 to 78.0 feet; 0.25 to 0.75" open dissolution.	C22									_
695	80			77.3 to 78.0 feet: 0.25 to 0.75" open dissolution cavities 78.5 feet: 0.5" ARGILLITE bed: dips 40°; very dark gray; slightly weathered; moderately soft; trace ARGILLITE clasts up to 0.2"	C23		8	0	7.50					
		H		78.8 feet: circulation loss (30 gallons)	C24		5	0	3.50					_
690	0.5			SEDIMENTARY ROCK (SANDSTONE) Fine to medium grained; massive; bluish gray; slightly weathered; moderately hard; intensely fractured; localized convolute; ARGILLITE bed remnants, clasts up to 0.2"; planar and chaotic quartz and calcite veining, up to 0.1" thick (FRANCISCAN COMPLEX/ANCIENT LANDSLIDE DEPOSIT)	C25		66	15	5.00	×				
	-00			(continued)							1			
						REPORT TITLE BORING RECORD						DLE ID <b>C-20-0</b> 0		
(		L	7 6	` EINFELDER		01	COUNT	orte		101	POSTMILE <b>12-15.5</b>	E	A <b>0115000099</b>	
		<b>7</b> \		Bright People. Right Solutions.		PROJECT OR BRIDGE NAME  Last Chance Grade Bypass								
	-				E	BRIDGE NUMBER PREPARED E D. Ross						DATE <b>5-11-2</b>	SHEET 3 of 6	

Sample Location

DESCRIPTION

59.2 to 59.4 feet: laminated ARGILLITE interbeds; gray; moderately weathered; moderately hard

67.2 feet: fine to medium grained; massive; bluish gray and grayish brown; slightly weathered; moderately hard; intensely fractured

61.5 to 64.5 feet: 0.25" vertical quartz veining

65.9 feet: 2" ARGILLITE clast

SEDIMENTARY ROCK (SANDSTONE)

Sample/Run#

C16

C17

C18

Uncorr. Blows per 6 in.

Blows per foot

Recovery (%)

80

92 | 20

81 0

RQD (%)

Drill Rate (min/ft)

2.20

4.40

5.95

Drilling Method Casing Depth

Discontinuity Description

112.8 feet: intensely fractured 113.6 feet: moderately fractured	C35				$\Diamond$	F: (112.8'), 45 calcite, intense healed, moder	ely weathered,		_
(continued)									
		REPORT <b>BORIN</b>	TITLE IG REC	ORD			DLE ID <b>C-20-003</b>		
CALENTER DED	_	DIST. <b>01</b>	COUNTY Del No		ROUTE <b>101</b>	POSTMILE <b>12-15.5</b>	EA <b>01</b> ′	15000099	
KLEINFELDER  Bright People. Right Solutions.				IDGE NAM Grade By			•		
	E	BRIDGE	NUMBER		ARED BY		DATE <b>5-11-21</b>	SHEET 4 of 6	
									_

ELEVATION (ft)	х ОЕРТН (ft)	(-)	Material Graphics	DESCRIPTION	Sample Location	Sample/Run#	Uncorr. Blows per 6 in.	Blows per foot	Recovery (%)	RQD (%)	Drill Rate (min/ft)	Drilling Method	Discontinuity Description  Discontinuity Description  Fracture Identification: (Depth), Dip, Width, Infilling Composition, Weathering, Hardness, Healing, Roughness
	-00-			SEDIMENTARY ROCK (SANDSTONE)		C26 C27			NR NR		9.00	\ \ \ \	-
						C28			NR		11.33		> < >
685	00			89.0 feet: moderately fractured		C29			100	83	6.00	$\Diamond$	F: (89.1'), 5°, very thin, calcite, intensely weathered, soft, not healed, rough
000	90					C30			100	45	4.60	<u> </u>	F: (89.3'), 45°, very thin, calcite, intensely weathered, soft, not healed, moderately rough F: (90.8'), 20°, moderately open, very thin, calcite, intensely weathered, very soft, not healed, rough
680	0.5			92.6 feet: intensely fractured 92.6 to 94.5 feet: ARGILLITE clasts up to 0.2"								\ \ \ \ \	V: (91.2'), 10°, moderately open, very thin, calcite, intensely weathered, very soft, not healed, rough F: (91.6'), 70°, slightly open, very thin,
	95								100	33	3.60	\ \ \ \ \ \ \	calcite, intensely weathered, very soft, totally healed, moderately rough F: (92.0'), 75°, slightly open, very thin, calcite, intensely weathered, very soft, not healed, moderately rough
675				98.3 feet: moderately fractured		C31						\ \ \ \ \ \ \	F: (92.2'), 70°, tight, very thin, calcite, intensely weathered, very soft, not healed, moderately rough F: (98.3'), 60°, moderately open, very thin, calcite, intensely weathered, soft, not healed, rough
616	100			100.0 feet bluish gray; fresh; moderately hard to hard; slightly fractured; calcite veining		C32			100	95	2.20	$\langle \Diamond \times \Diamond \times \Diamond \times \rangle$	F: (99.7'), 80°, moderately open, very thin, calcite, intensely weathered, soft, not healed, moderately rough (99.9'), 15°, moderately open, very thin, calcite, intensely weathered, soft, not healed, rough F: (101.0'), 8°, slightly open, very thin, calcite, intensely weathered, soft, not
670	105	_		105.0 feet: equip HQ core for pressure meter test; interval from 105.0 to 110.0'	_				97	86	4.00	\ \ \ \ \	healed, rough F: (101.6'), 85°, moderately open, moderately thin, calcite, intensely weathered, soft, partly healed,
						C33						×< > × <	moderately rough  F: (104.4'), 70°, moderately open, moderately thin, calcite, intensely weathered, soft, partly healed, moderately rough
665	110			108.4 feet; moderately fractured to intensely fractured		C34			39	24	18.33	)	F: (108.1'), 50°, slightly open, very thin, calcite, intensely weathered, soft, not healed, rough F: (108.5'), 60°, slightly open, very thin,
				110.3 feet: moderately fractured 111.0 feet: trace ARGILLITE clasts up to 0.2"					100	90	3.19	$\Diamond \times \Diamond \times$	calcite, intensely weathered, soft, rough  — — —
				112.8 feet: intensely fractured 113.6 feet: moderately fractured		C35						♦ ♦ ♦ ♦	F: (112.8'), 45°, slightly open, very thin, calcite, intensely weathered, soft, not healed, moderately rough
660	115	<u> </u>		(continued)		 	REPOR	 	FI F			$ert \vee$	HOLE ID

DEPTH (ft)

Material Graphics

Ш		_ 15 <del>-</del>	ΣŪ		ιχ	ΐ	⊃⊠	В	Ř	Ř	٥	تَ مَ	
7707161	1.			114.6 feet: intensely fractured SEDIMENTARY ROCK (SANDSTONE)					98	84	4.00		F: (114.6'), 40°, slightly open, very thin,
2		L	<b>⊥∷∷</b>	115.2 feet: moderately fractured									calcite, intensely weathered, soft, not
5			::::	1 13.2 leet. moderately fractured									healed, moderately rough
į		L	<u>]</u> ::::										F: (114.8'), 70°, slightly open, very thin,
			::::									$\Diamond$	calcite, intensely weathered, soft, not
3			]::::			C36						$\triangleright \triangleleft$	healed, moderately rough
-			7::::									$\Diamond$	F: (115.8'), 30°, slightly open, clean, not
			1::::									Š.	healed, rough
		Г	7::::										F: (116.4'), 25°, slightly open, clean, not
655	1,	_	::::	119.6 feet: 0.1" convolute ARGILLITE interbed: dips									healed, rough
	12	20 -	7::::	30°; dark gray; slightly weathered; moderately hard;	П				100	96	4.22		F: (116.7'), 15°, slightly open, clean, not
			::::	mass parts on bedding plane									healed, rough
		F	<b>†∷∷</b> ∶										F: (118.2'), 70°, slightly open, very thin,
			::::									$\Diamond$	calcite, intensely weathered, soft, not
		F	∃∷::		,	C37							healed, moderately rough
			::::			037						$\Diamond$	F: (119.1'), 30°, slightly open, clean, not healed, slightly rough
		F	<b>†∷∷</b> ∶									Š	B: (119.6'), 40°, slightly open, clean, not
			::::	123.4 feet: intensely fractured									healed, rough
		F	<b> </b> ∷∷:										F: (120.7'), 35°, open, clean, not healed,
650			:::::	124 5 foot: moderately fractured: APCILLITE clasts up to	H,	C20			100	100	2.00		rough
1 000	12	25	<b>-</b>  ::::	124.5 feet: moderately fractured; ARGILLITE clasts up to 0.2"	H	C38			100	-	6.00		F: (121.0'), 80°, moderately open, clean,
			[::::						.55	"	0.00	),<	not healed, rough
1		H	<b>┤</b> ∶∶∶∶									$\Diamond$	F: (122.4'), 45°, slightly open, clean, not
			[::::	126.5 feet: intensely fractured									healed, slightly rough
		H	<del> </del> ∷∷:	120.5 leet. Intensely fractured								$\Diamond$	F: (123.0'), 10°, slightly open, clean, not
			[::::	127.4 feet: slightly fractured		C39							healed, slightly rough
1		$\vdash$	<b>┤</b> ::::										F: (123.4'), 70°, slightly open, clean, not
			::::									×	healed, slightly rough
		H	<b>┤</b> ∷∷∶	128.9 feet: 0.5" planar calcite vein: dips 70°; blue									F: (123.6'), 15°, slightly open, clean, not
645			::::	mineralization; mass parts on vein									healed, slightly rough
045	13	30 -	<b>-</b>  ∶∶∶∶		H				97	83	6.20		F: (124.2'), 30°, slightly open, clean, not
			1::::						31	00	0.20		healed, rough
		H	<del> </del> ::::										F: (124.5'), 40°, clean, not healed, rough
			::::									$\Diamond$	F: (125.0'), 45°, slightly open, clean, not
_ <b> </b>		H	<b>⊣</b> ∷∷:										healed, slightly rough
- K-   K-   K-   K-   K-   K-   K-   K-			::::			C40						$\Diamond$	F: (126.0'), 25°, slightly open, very thin,
5		H	<b>∃</b> ∷∷:										calcite, intensely weathered, soft, not
-			1::::										healed, slightly rough
		H	<b>⊣</b> ∷∷:									× I	F: (126.3'), 65°, slightly open, very thin,
640			::::										calcite, intensely weathered, soft, not
640	13	35 -		405.0 for at 1 more a likely the control of and	Н				100	QQ	6.40		healed, slightly rough F: (127.4'), 40°, slightly open, thin,
É			::::	135.0 feet: gray; slightly weathered; hard					100	00	0.40		calcite, intensely weathered, moderately
2		H	<b>┤::::</b>										soft, partly healed, rough
			::::										F/V: (129.2'), 70°, moderately wide,
Ś		H	<b>∤∷∷</b> ∶									$\Diamond$	moderately thick, calcite, intensely
			::::	127 F to 120 1 foots ADOIL ITT intent - 1		C41						$\triangleright \triangleleft$	weathered, moderately soft, not healed,
5		$\vdash$	<b>-</b>  ::::	137.5 to 138.1 feet: ARGILLITE interbed remnants/clasts up to 1"; dark gray; slightly weathered to fresh; hard								$\Diamond$	moderately rough to rough
-			::::	138.1 feet: ARGILLITE clasts up to 0.2"								) \	F: (130.1'), 15°, slightly open, clean, not
		-	<b>┤</b> ∶∶∶∶										healed, rough
			[::::									$\sim$	F: (131.5'), 35°, slightly open, very thin,
635	14	40 <b> -</b>	<b>-</b>  ::::	140 O feet, medewatek for the set	H				98	98	3.60		calcite, intensely weathered, soft, not
) .i			[::::	140.0 feet: moderately fractured					90	90	3.60		healed, rough
770		-	<b>∤</b> ∷∷	140.6 feet: parting on 0.1" ARGILLITE interbed									F/V: (132.6'), 80°, moderately open, very
			::::									$\Diamond$	thin, calcite, slightly weathered,
		-	<del> </del> ::::	14006 1 11 11 6 1								$\triangleright \triangleleft$	moderately soft, partly healed, slightly
			[::::	142.0 feet: slightly fractured 142.4 feet: 0.2" calcite vein: dips 80°		C42						$\Diamond$	rough
5		-	4::::	142.4 leet. 0.2 calcite veill. ulps ou									F: (134.1'), 75°, slightly open, clean, not
			::::										healed, rough
٦		-	<b>-</b>  ::::									\ <u>`</u>	F: (135.4'), 60°, moderately open, clean,
200			::::										not healed, slightly rough
630	<b>-</b> 14	45 L	1	<u> </u>	Ш							$ \vee $	
5				(continued)									
ġ <sup>'</sup>							EPOR			·OD	חי		HOLE ID RC-20-003
						_	BORI					DOLITE	
	1			\		- 1	IST. <b>01</b>		UNT <b>el N</b>			101	POSTMILE EA 0115000099
5		K	CLE	EINFELDER					-		E NAME		12-13.3 0113000033
	1	-		Bright People. Right Solutions.							ic NAME		
							RIDGE			_		RED BY	DATE SHEET
5					_						D. R		5-11-21 5 of 6
-		_			_	_							

Sample Location

**DESCRIPTION** 

Sample/Run#

Uncorr. Blows per 6 in.

Blows per foot

Recovery (%)

RQD (%)

Drill Rate (min/ft)

Drilling Method Casing Depth

Discontinuity Description

ELEVATION (ft)	DEPTH (ft)	Material Graphics	DESCRIPTION	Sample Location	Sample/Run#	Uncorr. Blows per 6 in.	Blows per foot	Recovery (%)	RQD (%)	Drill Rate (min/ft)	Drilling Method Casing Depth	Discontinuity Description Fracture Identification: (Depth), Dip, Width, Infilling Composition, Weathering, Hardness, Healing, Roughness
625	-145		SEDIMENTARY ROCK (SANDSTONE)  145.6 feet: moderately fractured  146.0 to 146.2 feet: ARGILLITE clasts to 1"; dark gray; slightly weathered; moderately hard to hard  149.4 feet: 8" ARGILLITE interbed; dark gray; fresh;		C43			97	88	7.50	\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	F: (139.5'), 70°, moderately open, very thin, calcite, slightly weathered, moderately soft, not healed, moderately rough to rough F: (140.6'), 15°, slightly open, very thin, Argillite, slightly weathered, moderately hard, not healed, moderately rough F: (141.4'), 25°, moderately open, clean, not healed, rough F: (141.5'), 60°, moderately open, clean,
020	150		moderately hard  SEDIMENTARY ROCK (SANDSTONE); fine to medium-grained; gray to dark gray; fresh; hard; moderately fractured; ARGILLITE clasts up to 0.3"; quartz and calcite veining up to 0.2" thick (FRANCISCAN COMPLEX/ANCIENT LANDSLIDE DEPOSIT)  153.8 feet: 0.1" ARGILLITE interbed: dips 60°; mass		C45			100		5.53	× <	not healed, moderately rough B: (141.9'), 50°, very thin, Argillite, totally healed B: (142.8'), 50° F: (145.7'), 25°, moderately open, clean, ont healed, moderately rough F: (146.4'), 40°, moderately open, clean, not healed, rough F: (146.6'), 75°, moderately open, clean,
620	155 —		parts on bedding 154.5 feet: 0.1" ARGILLITE interbed: dips 60°; mass parts on bedding 155.0 feet: advance HWT casing to full depth (155.0') Bottom of borehole at 155.0 ft bgs		C46							not healed, moderately rough F: (148.4'), 25°, moderately open, moderately thin, calcite, slightly weathered, moderately hard, not healed, moderately rough F: (151.2'), 30°, slightly open, clean, not healed, rough F: (151.5'), 65°, slightly open, very thin, calcite, intensely weathered, soft, not healed, moderately rough
615	160											F: (152.4'), 30°, moderately open, very thin, calcite, slightly weathered, hard, not healed, moderately rough F: (152.8'), 60°, moderately open, very thin, calcite, slightly weathered, hard, partly healed, moderately rough F/B: (153.8'), 60°, slightly open, very thin, Argillite, slightly weathered, moderately hard, not healed, smooth F: (154.5'), 0°, slightly open, very thin,
610	165 -											Argillite, slightly weathered, moderately hard, not healed, smooth
605	170 -											- - - -
	175					JEDOD.	T T11					
	K	LE	EINFELDER Bright People. Right Solutions.		F		NG CO DCT OC Cha	REC UNT el No R BF nce	Y <b>orte</b> RIDG <b>Gra</b>	R	ED BY	12-15.5 0115000099

LOGGED BY

J. Klamecki

COMPLETION DATE

10-6-20

BEGIN DATE

9-29-20

DRILLING CONTRACTOR CRUX Subsurface, Inc. DRILLING METHOD  BOREHOLE LOCATION (Offset, Station, Line)  DRILL RIG										E ELEVATI							
		IG ME			DRILL RIG		1								BOREHO 4.5 in	DLE DIAMET	ΓER
	IPLE	R T	YPE(S)	AND SIZE(S) (ID) Core (2.5")	SPT HAMN	ΛEF	R TY		140	) lhs	/ 30	n-inch d	lron			R EFFICIEN	CY, ERi
BOR VV	EHO	OLE	BACKF	FILL AND COMPLETION  linometer; cement-bentonite		۷Α		DURI	NG I		ING	AFTER		ING (DATE) ined	TOTAL I		BORING
ELEVATION (ft)		<sup>2</sup> DЕРТН (ft)	Material Graphics	DESCRIPTION		Sample Location	Sample/Run#	Uncorr. Blows per 6 in.	Blows per foot	Recovery (%)	RQD (%)	Drill Rate (min/ft)	Drilling Method Casing Depth	Fractui Width, Int	re Identific	ty Description ation: (Dept position, Wo lling, Rough	h), Dip, eathering,
				Lean CLAY (CL); very soft to soft; very dark brown; moist; medium plasticity; medium dry strength; no dilatancy; few rootlets; (SURFA SOIL/COLLUVIUM)	CE			3	7	100			>X				-
790	,			2.0 feet: PP = 0.25 tsf		X	S01	3 4	,	100			>				-
		5											>>< >><				<b>-</b>
785	;			7.0 feet: stiff; yellowish brown; PP = 1.0 tsf		X	S02	2 3 4	7	100			>><				-
	1	10		SEDIMENTARY ROCK (ARGILLITE) Very thickly bedded; grayish brown; decomposoft; (Lean CLAY with GRAVEL (CL); very sti		V	S03	31 33	73	100			>>				- -
[-(-				brown; moist; mostly fines; little angular fine of fine to coarse SAND); (FRANCISCAN COMPLANCIENT LANDSLIDE DEPOSIT)  12.7 feet: decomposed to intensely weather very intensely fractured; (Poorly-graded GR/SILT (GP-GM)); angular fine GRAVEL; few f	RAVEL; few .EX / ed; soft; AVEL with		C04	40		100	0		> > > > >				-
780		15		14.0 feet: decomposed; (CLAYEY GRAVEL; little SANE fines; few coarse GRAVEL)	,					100	0		>\ \ \ \				- -
775				16.2 feet: 7" block of SANDSTONE: dark gray weathered; hard; intensely fractured 16.8 feet: 10" zone of ARGILLITE; decompose very intensely fractured; (Lean CLAY (CL); ver = 2.5 tsf			C05										- -
		20								68	0						- -
770				20.5 feet: very dark gray; very intensely fract prominent shear fabric; (GRAVELLYFat CLA SAND (CH); stiff; some angular fine GRAVE 21.0 feet: slightly weathered; hard; intensely with few SANDSTONE clasts up to 1"	L)		C06										_
770		25		24.0 feet: decomposed; soft			C07			98	0		         				
				(continued)				REPOR							HOLE ID		
							Г	BORI DIST. 01	NG CC		Υ	F	ROUTE <b>101</b>	POSTMII.	<b>RC-2</b> 0		nnnaa
		K	CLE	EINFELDER  Bright People. Right Solutions.			F	ROJE Last	CT C	R BE	RIDG <b>Gra</b>	E NAME	ass				
								RIDGE	: NU	MBE	К	D. Ro	SS SS		DAT <b>5-</b>		HEET Of 7

BOREHOLE LOCATION (Lat/Long or North/East and Datum)

2488300.126 ft / 5985985.573 ft NAD83

HOLE ID

RC-20-004

765

760

755

750

745

740

E:KLF

gINT TEMPLATE:

30

35

40

45

50

DEPTH (ft)

Material Graphics

51.5 feet: 6" zone: slightly weathered; moderately hard; intensely fractured  53.3 feet: slightly weathered; moderately hard; intensely fractured	C1	3	100	0 0		> \ \ \ \ \ \ \				- - -
(continued)										
		BORI	T TITLE	COF	RD		I	HOLE ID RC-20-		
( KI EINEEL DED		DIST. <b>01</b>	COUNT Del N		e	ROUTE <b>101</b>	POSTMIL <b>12-15</b> .		EA 011	5000099
KLEINFELDER  Bright People. Right Solutions.			CT OR B							
		BRIDGE 	NUMBE	R	PREP.	ARED BY		DATE <b>5-1</b>	: 1-21	SHEET 2 of 7

Sample Location

DESCRIPTION

28.3 feet: intensely weathered; soft to moderately soft; prominent convolute shear fabric

29.5 feet: slightly weathered; moderately hard; very intensely fractured

34.5 feet: intensely weathered; soft; very intensely fractured; prominent shear fabric

 $36.0\ \text{feet: }2\text{"}\ \text{SANDSTONE}\ \text{clast: fine-grained; very dark gray; fresh; very hard}$ 

38.5 feet: decomposed; soft; very intensely fractured; (Clayey GRAVEL with SAND (GC); angular fine to coarse GRAVEL; some SAND; little fines); predominant shear fabric orientation: dips 60°

SEDIMENTARY ROCK (ARGILLITE) 25.4 feet: advance HWT casing to 25.4'

26.8 feet: PP = 3.5 tsf

26.3 feet: very intensely fractured; PP = 1.5 tsf

Sample/Run#

C07

C08

C09

C10

C11

C12

Uncorr. Blows per 6 in.

Blows per foot

Recovery (%)

98 0

88 0

100 0

98 0

100 0

RQD (%)

0 64

Drill Rate (min/ft)

Drilling Method Casing Depth

Discontinuity Description

735

730

725

720

715

710

TEMPLATE:

60

65

70

DEPTH (ft)

Material Graphics

			illustrated						$\Diamond$				
0	75		73.3 feet: decomposed; (CLAYEY SAND with GRAVEL (SC); fine to coarse SAND; some angular fine to coarse GRAVEL; some fines)			100	9	6.00	$\langle \diamond \rangle \langle \diamond \rangle$				-
			75.0 feet: 1.7 foot zone: moderately weathered; moderately hard; intensely fractured 77.7 feet: 6" SANDSTONE clast; fine-grained sand; slightly weathered; very hard; with calcite veining	C18	3				×				-
5	80		79.2 feet: moderately weathered; moderately hard; very intensely fractured to intensely fractured 80.0 feet: advance HWT casing to 80.0'	C1:	9	100	0	6.00	♦				
			81.4 feet: decomposed; soft; very intensely fractured; (CLAYEY GRAVEL with SAND (GC); mostly angular fine GRAVEL; some fines; little SAND)	C2	D	100	8	7.50	>< >><				-
0			83.0 feet: slightly weathered; very hard; 5" SANDSTONE clast: fine-grained; slightly weathered; very hard  84.1 to 85.1 feet: moderately weathered; moderately hard; with 0.25 to 1" SANDSTONE clasts	C2	1	100	17	0.00	>< >><				-
	85-		(continued)						v				
						T TITLE	OF	RD			HOLE ID RC-20	004	
	KLEINFELDER					COUNT Del No CT OR BE	orte RIDG	E NAME	OUTE <b>101</b>	POSTMIL 12-15.5		EA <b>011</b>	5000099
\			Bright People. Right Solutions.			E NUMBEI		PREPAR D. Ro	RED BY		DATE <b>5-1</b>	1-21	SHEET 3 of 7

Sample Location

DESCRIPTION

55.8 feet: decomposed; very soft to soft; very intensely fractured; (SILTY GRAVEL with SAND (GM); mostly angular fine GRAVEL; some angular coarse GRAVEL; little SAND; little fines)

62.3 feet: very soft; brittle coarse-sand sized chips in clayey matrix; (CLAYEY SAND (SC); hard; fine to coarse SAND; some fines); PP = 4 tsf

63.6 feet: intensely weathered; moderately soft; intensely fractured

67.3 feet: 2" SANDSTONE clast: fine-grained sand; dark gray; slightly weathered; very hard; with calcite veining 67.8 feet: decomposed; soft; (CLAYEY SAND with GRAVEL (SC); dark gray; mostly sand; some fines; little GRAVEL) 68.5 feet: moderately weathered; moderately bard.

71.0 feet: intensely weathered; soft; very intensely

65.3 feet: PP = 4.5 tsf

hard

fractured

66.0 feet: very intensely fractured

69.0 feet: intensely fractured

70.5 feet: prominent shear: 55°

SEDIMENTARY ROCK (ARGILLITE)

Sample/Run#

C13

C14

C15

C16

C17

Uncorr. Blows per 6 in. Blows per foot

Recovery (%)

100 0

86 0

100 0

100 0

100 0

RQD (%)

Drill Rate (min/ft)

6.67

6.67

6.00

Drilling Method Casing Depth

Discontinuity Description

705

700

695

690

685

680

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DEPTH (ft)

90

95

100

105

Material Graphics

110		108.3 feet: intensely weathered				100	0	6.00	> > > > >				-
		110.3 feet: moderately weathered; moderately hard  111.6 feet: packer test performed 111.6' to 130.8' 112.0 feet: intensely fractured	C2	27					>				
115		·	C2	!8		100	0	6.00	   				
110		(continued)											
				REPO <b>BO</b> I	RT TI		OR	RD			OLE ID <b>RC-20-004</b>		
<i>(</i> ,	<i>-</i>			DIST. <b>01</b>		OUNT Oel N			ROUTE <b>101</b>	POSTMILE <b>12-15.5</b>	EA <b>01</b>	15000099	
P	<i>\L E</i>	EINFELDER Bright People. Right Solutions.						E NAME					
				BRID(	GE NU	MBEI	R	PREPA D. R	RED BY		DATE <b>5-11-21</b>	SHEET 4 of 7	

Sample Location

DESCRIPTION

SEDIMENTARY ROCK (ARGILLITE) 85.1 feet: 8" SANDSTONE clast: fine-grained sand;

88.3 feet: moderately weathered; moderately hard; very

intensely fractured 88.7 feet: decomposed; very soft; (GRAVELLY Fat CLAY with SAND (CH); some angular fine GRAVEL;

90.0 feet: 4" SANDSTONE clast: fine-grained sand; slightly weathered; very hard

91.8 feet: moderately weathered; moderately hard; intensely fractured; with clasts of SANDSTONE up to 3": fine-grained sand; slightly weathered; very hard

93.3 feet: intensely weathered; soft; very intensely fractured; with clasts of SANDSTONE up to 3": fine-grained sand; slightly weathered; very hard

97.8 feet: intensely weathered; soft; very intensely

99.0 feet: 7" SANDSTONE clast: fine-grained sand; dark gray; fresh; very hard; intensely fractured

103.3 feet: locally intensely weathered

100.0 feet: decomposed; soft; very intensely fractured; with few SANDSTONE clasts to 3"; (CLAYEY SAND with GRAVEL (SC); mostly SAND; little fines; little GRAVEL)

95.0 feet: moderately weathered; moderately hard; very intensely fractured to intensely fractured

slightly weathered; very hard

little SAND)

fractured

Sample/Run#

C21

C22

C23

C24

C25

C26

per 6 in.

Uncorr. Blows p Blows per Recovery (

%)

100 17

100

100 0

100

100 0

88 0

0

%

RQD (

Drill Rate (min/ft)

6.00

3.40

6.00

6.00

6.00

Drilling Method Casing Depth

Discontinuity Description

2000 - 100 -	ELEVATION (ft)	115 115	Material Graphics		Sample Location	Sample/Run#	Uncorr. Blows per 6 in.	Blows per foot	Recovery (%)	RQD (%)	Drill Rate (min/ft)	Drilling Method Casing Depth	Discontinuity Description  Fracture Identification: (Depth), Dip, Width, Infilling Composition, Weathering, Hardness, Healing, Roughness
5	675	_		SEDIMENTARY ROCK (ARGILLITE)  116.9 feet: moderately weathered; moderately hard; very intensely fractured; with few very hard SANDSTONE clasts from 0.25 to 2"		C28			92	0	6.00	·X <> X <>	_ _ _ _
		120 -		120.0 feet: 5" zone of calcite veining 120.4 to 121.3 feet: decomposed; very soft; very intensely fractured; (CLAYEY GRAVEL with SAND (GC); fine to coarse GRAVEL) 121.0 feet: moderately weathered; moderately hard 122.0 feet: prominent shear: dips 45°; striations down		C29						X	- - -
	670	125		dip  123.3 feet: 6" SANDSTONE clast: fine-grained sand; dark gray; fresh; very hard; intensely fractured 123.8 feet: decomposed; soft; (CLAYEY GRAVEL with SAND (GC); angular fine to coarse GRAVEL; some fines; little SAND)		C30			100	16	6.00	$\Diamond$	- - -
	665	_		126.3 to 128.3 feet: zone of 3 to 12" SANDSTONE clasts: hard to very hard; moderately fractured; minor calcite veining  128.3 feet: intensely weathered		C31			100	0	6.00	\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	_ _ _
W DINEE 1771 - 17	000	130 -		130.2 feet: moderately weathered; moderately hard; intensely fractured; with few SANDSTONE clasts from 0.25 to 4": very hard; prominent shear fabric: dips 45° 131.5 feet: prominent shear: dips 45°; striations strike-parallel		C32			100		6.67		- - -
)	660	135 -		133.3 feet: intensely weathered; soft; very intensely fractured  135.5 feet: moderately weathered; moderately hard;		C33			100	21	6.67	\$\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	- - -
	655	140		intensely fractured; some SANDSTONE clasts to 3"; trace calcite veining					100	29	6.67		
	650	_		140.6 feet: trace SANDSTONE clasts		C34			100	10	6.67	>X	_ _ _
312312		145		(continued)		C35						$\Diamond$	
	KLEINFELDER  Bright People. Right Solutions.						Last (	NG CO D CT C Cha	REC UNT el N OR BI nce	Y <b>orte</b> RIDG <b>Gra</b>	R		HOLE ID RC-20-004  POSTMILE EA 0115000099
							RIDGE	NU	MBE	К	D. Ro	SS SS	DATE SHEET <b>5-11-21 5 of 7</b>

645

640

635

630

625

620

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<u> </u>	
(continued)	
	REPOR <b>BORI</b>
	DIST. <b>01</b>
KLEINFELDER  Bright People. Right Solutions.	PROJE
	BRIDGE

173.3 feet: intensely weathered; soft

	T TITLE NG RECOR	ים י			HOLE	EID 5-20-004	
BUKI	NG KECOK	<u> </u>			2	-20-004	
DIST.	COUNTY		ROUTE	POSTMIL	E.	EA	
01	Del Norte	)	101	12-15.	5	011	5000099
PROJEC	CT OR BRIDG	E NAM	IE				
Last (	Chance Gra	de By	/pass				
BRIDGE	NUMBER	PREP	ARED BY		1	DATE	SHEET
		D. F	Ross			5-11-21	6 of 7

Sample Location Drill Rate (min/ft) Drilling Method Casing Depth per 6 in. Discontinuity Description Sample/Run# (%) DEPTH (ft) Blows per Recovery Fracture Identification: (Depth), Dip, Width, Infilling Composition, Weathering, Hardness, Healing, Roughness DESCRIPTION Material Graphics RQD (%) SEDIMENTARY ROCK (ARGILLITE) 100 10 C35 147.0 feet: decomposed; very soft; very intensely fractured; (CLAYEY GRAVEL with SAND (GC); mostly angular fine GRAVEL; little angular SAND; little fines) 6.00 100 0 150 C36 7.50 153.3 feet: intensely weathered; soft 94 20 155 155.0 feet: 2.2 foot SANDSTONE clast: fine-grained sand; dark gray; fresh; very hard; moderately fractured to intensely fractured; calcite veining C37 7.50 100 159.0 feet: moderately weathered; moderately hard; intensely fractured; with some SANDSTONE clasts from 0.125 to 3": hard to very hard 160 C38 161.4 feet: moderately soft; very intensley fractured 163.0 feet: 10" SANDSTONE clast: fine-grained sand; 100 fresh; very hard; intensely fractured 165 165.0 feet: intensely weathered; soft to moderately soft; very intensley fractured C39 167.0 feet: decomposed; very soft to soft; (CLAYEY GRAVEL with SAND (GC); mostly angular fine GRAVEL; little angular coarse GRAVEL; little SAND; little fines) 0 100

C40

C41

100 0

ELEVATION (ft)	175 175	Material Graphics	DESCRIPTION	Sample Location Sample/Run#	Uncorr. Blows per 6 in.	Blows per foot	Recovery (%)	RQD (%)	Drill Rate (min/ft) Drilling Method Casing Depth	Discontinuity Description  Fracture Identification: (Depth), Dip, Width, Infilling Composition, Weathering, Hardness, Healing, Roughness
615			SEDIMENTARY ROCK (ARGILLITE)  175.8 feet: 8" SANDSTONE clast: fine-grained sand; slightly weathered; very hard; intensely fractured; trace ARGILLITE  177.0 feet: moderately weathered; moderately hard; intensely fractured; trace gravel-sized SANDSTONE clasts	C4			100	0 0	\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	
	180 -			C4	3		98	0		<del>-</del> -
610	185 -		183.0 feet: prominent shear plane: dips 75°  185.9 feet: advance HWT casing to full depth (185.9')  Bottom of borehole at 185.9 ft bgs	C4	1				\$\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	
605	190 -									
600	195 -	_								- - -
	200	_								- - - -
590	205									_ _ _
	K	CLE	EINFELDER Bright People. Right Solutions.		REPOR BOR DIST. 01 PROJE Last BRIDG	CT C Cha	UNT el No er Br nce	orte EIDGE Grade	ROUTE <b>101</b>	HOLE ID   RC-20-004     POSTMILE   EA   0115000099     DATE   SHEET   7 of 7

TEMPLATE:

gINT FILE:

LOGGED BY **BEGIN DATE** COMPLETION DATE BOREHOLE LOCATION (Lat/Long or North/East and Datum) HOLE ID C. Tipp 9-30-20 10-7-20 2484488.630 ft / 5984431.755 ft NAD83 RC-20-005 DRILLING CONTRACTOR BOREHOLE LOCATION (Offset, Station, Line) SURFACE ELEVATION CRUX Subsurface, Inc. 859.05 ft NAVD88 DRILLING METHOD DRILL RIG BOREHOLE DIAMETER **Rotary Core** Burley 6000 4.5 in SAMPLER TYPE(S) AND SIZE(S) (ID) SPT HAMMER TYPE HAMMER EFFICIENCY, ERI SPT (1.4"), HQ Core (2.5") Cathead; 140 lbs / 30-inch drop BOREHOLE BACKFILL AND COMPLETION GROUNDWATER DURING DRILLING AFTER DRILLING (DATE) TOTAL DEPTH OF BORING **Not Determined Not Determined** VWP, TDR, Inclinometer; cement-bentonite 250.0 ft Sample Location Rate (min/ft foot **Discontinuity Description Drilling Method** Sample/Run# EVATION 8 9 € ber Blows per Fracture Identification: (Depth), Dip, Width, Infilling Composition, Weathering, Hardness, Healing, Roughness Material Graphics Recovery DESCRIPTION DEPTH ing Blows RQD Ē ᆸ SANDY SILT (ML); very soft; brown to dark brown; moist; mostly fines; some fine SAND; low plasticity; (COLLUVIUM / LANDSLIDE DEPOSIT) 3.0 feet: moist to wet; dark brown; stiff; mostly fines; some fine to medium SAND; few fine subangular GRAVEL; PP 2 17 S01 855 = 1.25 tsf1 5 SANDY LEAN CLAY (CL); soft; yellowish brown; moist to wet; mostly fines; some coarse to fine SAND; few fine subangular GRAVEL; (COLLUVIUM / LANDSLIDE DEPOSIT) 2 17 S02 850 1 10.0 feet: advance HWT casing to 10.0'; equip HQ core SEDIMENTARY ROCK (ARGILLITE); fine-grained; 9 84/8 92 massive; brown to dark gray; intensely weathered; soft; very intensely fractured; (LANDSLIDE DEPOSIT) S03 34 50/2 10.5 feet: advance HWT casing to 10.5 0.00 76 0 C04 12.0 feet: circulation loss 66 0 0.00 COF 100 0 2.78 845 C06 15 15 feet: laminated; apparent bedding: dips 30° 34 17 S07 17 SEDIMENTARY ROCK (SANDSTONE) thinly bedded with thin interbeds of ARGILLITE. SANDSTONE; fine-grained sand; thinly bedded; yellowish brown and gray; intensely weathered; soft; very intensely fractured; ARGILLITE; fine-grained; gray; intensely weathered; so 80 0 7.14 C08 82 0 5 00 C09 840 0.00 NR C10 20 SEDIMENTARY ROCK (ARGILLITE); fine-grained; moderately bedded; light brown and gray; intensely weathered; soft; very intensely fractured; (LANDSLIDE 38 50/3 100 S11 50/3 110 8.33 0 C12 23 0 8.82 C13 23.2 feet: advance HWT casing to 23.2'; circulation return 75 0 0.00 C14 835 XS15 \$0/5.5 83 24.3 feet: light brown; decomposed; (Sandy Lean CLAY (continued) REPORT TITLE HOLE ID RC-20-005 **BORING RECORD** POSTMILE DIST COUNTY ROUTE 0115000099 **Del Norte** 101 12-15.5 01 KLEINFELDER PROJECT OR BRIDGE NAME Bright People. Right Solutions. **Last Chance Grade Bypass BRIDGE NUMBER** PREPARED BY

D. Ross

5-11-21

1 of 9

.z 03.z+ rivi b1. Dodii	ELEVATION (ft)	ភិDEРТН (ft)	Material Graphics	DESCRIPTION	Sample Location	Sample/Run#	Uncorr. Blows per 6 in.	Blows per foot	Recovery (%)	RQD (%)	Drill Rate (min/ft)	Drilling Method Casing Depth	Discontinuity Description Fracture Identification: (Depth), Dip, Width, Infilling Composition, Weathering, Hardness, Healing, Roughness
		-25-		(CL); very soft; wet; mostly fines; some fine SAND) SEDIMENTARY ROCK (SANDSTONE) Fine-grained sand; massive; gray to yellowish brown; moderately weathered; moderately hard; intensely to very intensely fractured; dominantly planar calcite veining locally (LANDSLIDE DEPOSIT)		C16			74	13	0.00	\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	
	830	30		28.0 feet: advance HWT casing to 28.0'; equip softer HQ core bit		C17 <del>S18</del> /		50/3	100 100 94		3.18	$\Diamond \times \Diamond \times \Diamond$	F: (30.5'), 75°, moderately open,
	825			30.75 feet: fractures infilled locally with SANDY Lean CLAY (CL), SILT (ML), iron oxide		C19						X	moderately thin, clay, very soft, not healed, rough  F: (32.6'), 50°, moderately open, moderately thin, iron oxide/clay, decomposed, very soft, not healed,
	-	35 _				C20			73	0 17.6	6.00	>< >>< >><	slightly rough F: (33.5'), 5°, slightly open, clean, not healed, smooth
		-				C21						\ \ \ \ \	
	820	40	•	38.8 feet: fractures dominantly infilled with iron oxide  40.6 to 42.0 feet: fractures infilled locally with Sandy SILT		C22			91	9.3	2.92	$\Diamond$	F: (39.3'), 90°, slightly open, very thin, iron oxide, intensely weathered, soft, not healed, moderately rough F: (40.2'), 40°, slightly open, very thin,
[=/=::::::		-		(ML), iron oxide		C23						\$\\\ \\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	iron oxide/magnesium, intensely weathered, moderately hard, partly healed, slightly rough F: (42.3'), 75°, slightly open, very thin, iron oxide, intensely weathered,
	815	45		\\45.5 feet: shear with Sandy SILT (ML) infill		C24			95	23.2	3.19	$\rangle$	moderately hard, not healed, smooth  F: (45.5'), 20°, tight, thin, silt, very soft,
				SEDIMENTARY ROCK (SANDSTONE/ARGILLITE BRECCIA); fine-grained sand; massive; gray, dark gray, yellowish brown; slightly to moderately weathered; moderately hard; intensely fractured; angular SANDSTONE and ARGILLITE fragments, locally rehealed by chaotic calcite veining (LANDSLIDE DEDOSIT)		J24			00	2.5	0.05	,	not healed, slightly rough F: (46.6'), 60°, open, thin, silt, very soft, not healed, smooth F/S: (47.3'), 45°, tight, thin, silt, very soft, not healed, slightly rough
	810	50	<u> </u>	DEPOSIT) 48.3 feet: polished shear: dips 25° SEDIMENTARY ROCK (SANDSTONE) Fine-grained; massive; gray and yellowish brown; slightly weathered; hard; moderately fractured; chaotic, locally pitted/vuggy quartz/calcite veining (LANDSLIDE		C25			88	0	4.55	$\langle \Diamond \rangle \langle \Diamond \rangle$	F: (48.3'), 20°, slightly open, very thin, clay, very soft, not healed, smooth
				DEPOSITY'		C26						$\langle \Diamond \rangle \langle \Diamond \rangle \langle \rangle \rangle$	
	805	-55-		53.9 to 54.2 feet: failure zone: subangular SANDSTONE clasts in sheared Lean CLAY (CL) matrix; polished, faintly (continued)		C27			85	6.7	3.29	$\Diamond$	
				(continued)			REPOR						HOLE ID
		K		EINFELDER		С	BORI IST. 01	NG CO D	REC UNT el N	Y <b>orte</b>	R	OUTE <b>101</b>	RC-20-005
	,			Bright People. Right Solutions.		В		Cha	nce	Gra	E NAME de Bypa PREPAF D. Ro	RED BY	DATE SHEET 5-11-21 2 of 9

DEPTH (ft)

Material Graphics

Ш	<u> </u>		ΣŌ		ιχ	ű		В	Ř	Ř	۵	اثا ۵	
	33			striated shear at base of zone SEDIMENTARY ROCK (SANDSTONE) 55.9 to 57.2 feet: abundant heavily pitted calcite veining		C27			85	6.7		>< >>	F/S: (54.2'), 35°, wide, thick, clay/gravel, soft, not healed, smooth
				57.2 to 57.5 feet: convolute ARGILLITE interbeds to 0.5", locally sheared		<u> </u>			111	00.0	2 22	 	F/S: (57.5'), 40°, slightly open, very thin, clay, very soft, not healed, smooth
800	60			58.5 feet: 1.5" sheared ARGILLITE interbed: dips 25° 58.8 feet: sheared ARGILLITE interbed, convolute		C28			111	90.9	3.33	>< <	- -
				60 to 61.2 feet: localized ARGILLITE interbeds to 0.5"; 20° 61.2 feet: abundant planar, chaotic, and locally ptygmatic					87	44	3.31	$\Diamond$	-
795				quartz and calcite veining		C29						>	F: (62.3'), 50°, slightly open, very thin, iron oxide, intensely weathered, soft, not healed, smooth F: (63.0'), 55°, open, thin, iron oxide,
	65	_							94	18	3.33	→ → → → → →	intensely weathered, soft, not healed, moderately rough F: (63.4'), 50°, slightly open, very thin, iron oxide/calcite, intensely weathered, soft, not healed, smooth
790						C30						$\Diamond \times \Diamond \times \Diamond$	F: (65.3'), 10°, open, thin, iron oxide/silt, intensely weathered, soft, not healed, slightly rough F: (67.7'), 65°, slightly open, very thin, calcite, decomposed, very soft, not healed, slightly rough
	70	_							96	78.3	3.40	→	F: (70.4'), 60°, open, thin, silt, very soft, not healed, smooth F: (71.3'), 30°, moderately open,
785				73.7 feet: 0.8" quartz vein		C31						$\langle \Diamond \rangle \langle \Diamond \rangle$	moderately thin, calcite, decomposed, very soft, not healed, smooth F: (72.1'), 30°, moderately open, moderately thin, calcite, decomposed, very soft, not healed, smooth
	75			74.8 to 80.0 feet: localized ARGILLITE interbeds to 3", convolute bed remnants: dark gray; slightly weathered; moderately hard; intensely fractured; planar to convolute, multiple orientations		C32			89	12.5	3.70	\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	F: (73.7'), 10°, moderately wide, moderately thick, quartz, moderately weathered, moderately hard, partly healed, smooth
				78.1 to 78.4 feet: failure zone: interbedded ARGILLITE	_				65	17.8	3.91		- F/S: (78.1'), 40°, wide, thick, sand/silt,
780	80	_		and SANDSTONE sheared to: (SILTY SAND with GRAVEL (SM); mostly fine to coarse sand; little fines; little fine subangular gravel); polished shear at upper and lower boundaries		C33			04	52.4	2.94	>< ->< -><	very soft, not healed, smooth F/S: (78.4'), 30°, wide, thick, sand/silt, very soft, not healed, smooth
				\[ \frac{78.4 \text{ feet: moderately weathered; moderately hard} \] \[ \script{SEDIMENTARY ROCK (SANDSTONE)} \] \[ Fine-grained; massive; gray and gray blue; slightly weathered; hard; intensely fractured; planar and chaotic, randomly oriented quartz and calcite veining; (LANDSLIDE DEPOSIT) \]		C34			34	J2.4	2.34	\\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\	F: (80.4'), 50°, slightly open, very thin, iron oxide, moderately hard, not healed, moderately rough
775	85-			83.0 feet: moderately fractured		504						×<	F: (83.0'), 50°, slightly open, very thin, iron oxide, intensely weathered, moderately hard, not healed, moderately rough
		_		(continued)	_								
					_	R	EPOR	TTI	LE				HOLE ID
		K	LE	EINFELDER			BORI IST. 01 ROJEC	CO <b>D</b>	UNT <b>el N</b>	Y <b>orte</b>		ROUTE 101	RC-20-005   POSTMILE
				Bright People. Right Solutions.		В		Cha	nce	Gra	de Byr	<b>DASS</b> RED BY	DATE SHEET 5-11-21 3 of 9

Sample Location

DESCRIPTION

Sample/Run#

Uncorr. Blows per 6 in.

Blows per foot

Recovery (%)

RQD (%)

Drill Rate (min/ft)

Drilling Method Casing Depth

Discontinuity Description

DEPTH (ft)

Material Graphics

22	Е	_ -85 <del>-</del>	≥(		v.	ŝ	D B	В	Ř	Ř	а	ان م			_
: 04/19/2022				SEDIMENTARY ROCK (SANDSTONE)					96	57.6	2.24	$\Diamond$	iron oxide, inte	slightly open, very thin, nsely weathered, d, not healed, moderately	$\exists$
PLOTTED:						C35						$\Diamond$	F: (85.9'), 45°, iron oxide, inter	slightly open, very thin, nsely weathered, d, not healed, slightly	
	770			88.5 feet: PP > 4.5 tsf								$\Diamond$	rough F: (87.3'), 40°,	slightly open, very thin,	-
		90	<b>-</b>  :::	90.0 feet: intensely fractured					100	66.6	3.00	$\rightarrow$	rough	d, not healed, moderately slightly open, very thin,	
				91.1 feet: moderately fractured 91.6 feet: slightly fractured		C36						$\Diamond$	moderately har	te, intensely weathered, d, not healed, rough slightly open, very thin,	-
	765					030						$\Diamond$	moderately har	tz, intensely weathered, d, not healed, rough slightly open, very thin,	
	700	95 -	- :::	94.7 feet: intensely fractured					100	81.6	2.60	→< ><	not healed, slig F: (92.1'), 35°,	slightly open, very thin,	$\dashv$
				95.8 feet: moderately fractured								$\Diamond$	moderately har rough	nsely weathered, d, not healed, slightly	_
						C37						$\Diamond$	moderately thir weathered, sof	moderately open, n, iron oxide, intensely t, not healed, moderately	
	760	100										$\Diamond \langle \Diamond \rangle$	, ,	lightly open, very thin, iron tensely weathered, soft,	
		100		100.0 feet: slightly fractured  101.2 feet: moderately fractured					100	80	3.00	$\Diamond$	F: (94.7'), 30°, iron oxide, inter	slightly open, very thin, nsely weathered, d, not healed, slightly	_
(1E)Z]				102.3 feet: intensely fractured		C38						$\Diamond$	rough F: (95.8'), 45°,	slightly open, very thin, nsely weathered,	
CALTRANS (KLF MOD W DRILL RATE)2]	755			104.0 feet: slightly fractured								$\Diamond$	moderately har rough	d, not healed, slightly slightly open, very thin,	_
.F MOD w		105	-						98	79.6	3.10		soft, not healed	nsely weathered, very d, rough slightly open, very thin,	-
KANS (KI			]:::  :::	106.3 feet: intensely fractured								$\stackrel{\checkmark}{\diamond}$	healed, steppe F: (99.4'), 60°,	slightly open, very thin,	$\exists$
<u>-</u> ' ▮	750			107.4 feet: moderately fractured		C39						$\Diamond$	moderately hear F: (101.2'), 3°,	weathered, hard, aled, slightly rough tight, clean, not healed,	$\exists$
SLB [CLIEN	750	110	- - - : : :	109.2 feet: slightly fractured 110.0 feet: moderately fractured					98	88.3	3.00	<b>♦</b>   <b>♦</b>	calcite/quartz,	, slightly open, very thin, slightly weathered,	4
47_2022.GLB				110.5 feet: few healed calcite fractures up to 0.25" thick								$\Diamond$	rough F: (106.3'), 50°	d, partly healed, slightly , slightly open, very thin,	_
STANDARD_GINT_LIBRARY						C40						$\Diamond$	hard, partly hea	weathered, moderately aled, slightly rough, slightly open, clean, not ately rough	
JAKD_GIN	745											$\Diamond$	F: (108.6'), 55° calcite/quartz,	nery rough, , slightly open, very thin, slightly weathered, d, partly healed, smooth	-
ANI	LE CONTRACTOR DE	115		(continued)		-					<u> </u>	· ·		-, -3.47 1100.000, 01110.0011	ヿ
				,			REPOR							LE ID	ᅱ
E:KLF							BORI		REC UNT		D	DOLLTE		C-20-005	$\dashv$
		,	/,				DIST. <b>01</b>			Y orte	.	101	POSTMILE <b>12-15.5</b>	EA 0115000099	
gINT TEMPLATE:		r	\ \	EINFELDER							E NAME		•	,	$\Box$
				Bright People. Right Solutions.			Last (			_	de By	<b>DASS</b> ARED BY		DATE SHEET	$\dashv$
als S						- 1				•	D. R			5-11-21 4 of 9	

Sample Location

DESCRIPTION

Sample/Run#

Uncorr. Blows per 6 in.

Blows per foot

Recovery (%)

RQD (%)

Drill Rate (min/ft)

Drilling Method Casing Depth

Discontinuity Description

Fracture Identification: (Depth), Dip, Width, Infilling Composition, Weathering, Hardness, Healing, Roughness

ELEVATION (ft)	SDEPTH (ft)	Material Graphics	DESCRIPTION	Sample Location	Sample/Run#	Uncorr. Blows per 6 in.	Blows per foot	Recovery (%)	RQD (%)	Drill Rate (min/ft)	Drilling Method	Discontinuity Description Fracture Identification: (Depth), Dip, Width, Infilling Composition, Weathering, Hardness, Healing, Roughness
	-		SEDIMENTARY ROCK (SANDSTONE) 115.0 feet: intensely fractured 115.8 feet: moderately fractured		0.11			90	40	3.00	$\Diamond \times \Diamond \times \Diamond$	F: (111.7'), 40°, slightly open, very thin, iron oxide, intensely weathered, moderately hard, not healed, slightly rough F: (113.1'), 60°, slightly open, very thin,
740			117.5 feet: intensely fractured		C41						$\stackrel{>}{\diamond}$	iron oxide, intensely weathered, moderately hard, not healed, slightly rough
140	120		<ul><li>119.0 feet: moderately fractured</li><li>120.0 feet: fine to coarse grained; massive; light gray to gray; slightly weathered; hard; moderately fractured;</li></ul>					94	63.3	3.00	$\Diamond$	F: (119.0'), 60°, slightly open, very thin, iron oxide, intensely weathered, moderately hard, not healed, slightly
			planar to chaotic quartz and calcite veining; PP > 4.5 tsf		C42						\\	rough F: (120.4'), 60°, slightly open, very thin, silt, soft, not healed, moderately rough F: (121.0'), 55°, slightly open, very thin, silt, soft, not healed, moderately rough F: (122.2'), 80°, slightly open, very thin, calcite, intensely weathered, very soft,
735	125		124.5 feet: intensely fractured					104	50	3.40	> < > >	not healed, moderately rough F: (123.0'), 60°, slightly open, very thin, calcite/silt, intensely weathered, very soft, not healed, smooth
			127.5 to 128.2 feet: mass readily parts on multiple 0.5" ARGILLITE beds/bed remnants, oriented 0 to 60°		C43						$\Diamond \times \Diamond \times \Diamond \times \Diamond$	F: (123.6'), 50°, slightly open, very thin, — calcite/silt, intensely weathered, very soft, not healed, slightly rough —
730	130		128.5 feet: moderately fractured  130 to 131.8 feet: multiple convolute ARGILLITE bed					72	21.1	3.72	$\rangle \times \Diamond \times \langle$	F: (128.5'), 60°, slightly open, very thin, calcite/silt, intensely weathered, very soft, not healed, slightly rough F: (129.3'), 55°, slightly open, very thin,
<u>.</u>			remnants to 1": very thinly bedded; black; slightly weathered; moderately hard to hard; intensely fractured; mass generally parts on remnants  131.8 feet: moderately fractured		C44						$\stackrel{\diamond}{\sim}$	calcite/silt, intensely weathered, very soft, not healed, slightly rough —
725			132.6 to 135.5 feet: multiple convolute ARGILLITE bed remnants to 1": very thinly bedded; black; slightly weathered; moderately hard to hard; intensely fractured; mass generally parts on remnants								$\langle \rangle \langle \langle \rangle \langle \rangle \langle \rangle$	F/B: (132.6'), 30°, tight, clean, not healed, smooth
725	135		135.5 feet: fine-grained; massive; gray; slightly weathered; hard; intensely fractured		C45			97	20.4	3.24	$\langle \rangle \times \Diamond \times \langle \rangle$	<del>-</del>
720								100	62.5	4.00	$\langle \rangle \langle \rangle \langle \rangle$	_
	140		138.9 feet: PP > 4.5 tsf  140.0 feet: moderately fractured		C46			94	34.4	3.53	$\Diamond$	F: (138.9'), 60°, slightly open, very thin, silt, very soft, not healed, slightly rough F: (139.5'), 50°, slightly open, clean, not healed, slightly rough
715			140 to 145.1 feet: abundant randomly oriented calcite and quartz veining; mass appears brecciated and rehealed  141.7 feet: intensely fractured		C47						$\times \Diamond \times \Diamond \times \Diamond \times$	F: (141.2'), 65°, slightly open, clean, not healed, stepped —
715	145	: : : :	(continued)								$\Diamond$	_
			(			EPOR'			OR	RD.		HOLE ID RC-20-005
	K	LE	EINFELDER Bright People. Right Solutions.		P		<b>D</b> CT O	R BF	orte RIDG		OUTI <b>101</b>	E POSTMILE EA 0115000099
			, <del>-</del>			RIDGE				PREPAR D. Ro	RED E	DATE SHEET 5-11-21 5 of 9

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KLEINFELDER Bright People. Right Solution	

ELEVATION (ft)	45 145	Material Graphics		Sample Location	Sample/Run#	Uncorr. Blows per 6 in.	Blows per foot	Recovery (%)	RQD (%)	Drill Rate (min/ft)	Drilling Method Casing Depth	Fracture Id Width, Infilling	entinuity Descr entification: (I g Composition s, Healing, Ro	Depth), Dip, , Weathering,
	_		SEDIMENTARY ROCK (ARGILLITE); thinly to very thinly bedded; dark gray to black; slightly weathered; moderately soft; intensely fractured; trace SANDSTONE interbeds; fine grained; thinly bedded; dark gray; slightly weathered; moderately hard; bedding is convolute; trace fragmented quartz and calcite veins (LANDSLIDE DEPOSIT)		C48			77	0	6.67				- - -
710	150				C49			90	0	4.20	>< >>			-
			LANDSLIDE BASAL FAILURE ZONE (ARGILLITE); sheared/brecciated to (CLAYEY GRAVEL with Sand		C50			102	0	3.44	$\rightarrow$			_
705	155		(GC); medium dense; dark gray to black; moist; mostly angular GRAVEL (ARGILLITE fragments); some fines; little coarse to fine SAND)		C51						X			- - -
			SEDIMENTARY ROCK (SANDSTONE) Fine-grained; massive; gray; slightly weathered; moderately hard to hard; very intensely fractured with silty		C52			100	0	4.44				- - -
700			sand infill; local ARGILLITE interbeds to 0.5"; fragmented quartz and calcite veining (FRANCISCAN COMPLEX: BROKEN FORMATION)		C53			66	0	5.00				-
	160		158.0 feet: PP > 4.5 tsf <sup>2</sup>		C54			87	0	4.38	><			<b>-</b>
					C55			100	0	4.23				- -
695	165	•	163.8 feet: intensely fractured; decreased fracture infill		C56			86	0	2.33	>> < < < < < < < < < < < < < < < < < <			- - -
			166.6 feet: very intensely fractured 166.9 to 168.9 feet: abundant ARGILLITE interbeds to 0.5": very thinly bedded; dark gray; slightly weathered; moderately soft to moderately hard 168.0 feet: circulation loss		C57			100		4.76				-
690	170		FAILURE ZONE (ARGILLITE); sheared/brecciated to (Clayey GRAVEL with Sand (GC); medium dense; dark gray to black; moist; mostly angular GRAVEL (ARGILLITE fragments); some fines; little coarse to fine SAND)		C58			100	0	6.25				-
			(FŘANCISCAN COMPLEX: BROKEN FORMATIÓN)  SEDIMENTARY ROCK (ARGILLITE)  Thinly bedded with interbeds/remnants of SANDSTONE		C59						$\Diamond$			-
			up to 5" locally. ARGILLITE; dark gray to black; slightly weathered; intensely fractured; SANDSTONE; fine grained; gray to dark gray; slightly weathered; hard;		C60			85 100	0	5.71 2.00				7
685			convolute interbeds/remnants; fragmented quartz, calcite veining (FRANCISCAN COMPLEX: BROKEN FORMATION)		C61						>< >><			
	175	<u> </u>	(continued)					85	0	5.71	$  \vee  $			
						EPOR BORI			OR	D			DLE ID C-20-005	
	را	~	INFELDER			IST. <b>01</b>	D		orte		ROUTE <b>101</b>	POSTMILE <b>12-15.5</b>	EA <b>01</b> 1	5000099
			Bright People. Right Solutions.			Last (	Cha	nce	Gra	E NAME <b>de By</b> p	oass			
					В	RIDGE 	NUI	MBEI	₹	PREPA <b>D. R</b> e	RED BY		DATE <b>5-11-21</b>	SHEET 6 of 9

04/19/2022 03:24 PM BY: DSUIIF	ELEVATION (ft)	175-	Material   Graphics	DESCRIPTION	Sample Location		Uncorr. Blows per 6 in.	Blows per foot	Recovery (%)	RQD (%)	Drill Rate (min/ft)	Drilling Method Casing Depth	Discontinuity Description Fracture Identification: (Depth), Dip, Width, Infilling Composition, Weathering, Hardness, Healing, Roughness
PLO11ED: 04/19/20;		-		SEDIMENTARY ROCK (ARGILLITE)  176.7 feet: equip harder HQ core bit		C62 C63 C64			100	0 0	8.75 7.06	>	_ _
	680	180		177.7 feet: very intensely fractured		C65			82	0	9.13		- -
		-		SEDIMENTARY ROCK (SANDSTONE) Fine- to coarse-grained sand; massive; gray; slightly weathered; hard; very intensely fractured; randomly oriented calcite and quartz veining (FRANCISCAN COMPLEX: BROKEN FORMATION)		C67			89	0	6.58	>	- - -
	675	185	- - - -	183.1 feet: intensely fractured		C68						\$\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	- - -
	670			186.7 to 189.1 feet: localized convolute ARGILLITE interbeds up to 1": very thinly bedded; black; slightly weathered; moderately hard  188.1 feet: parting on ARGILLITE bed: dips 25°		C69				20 19.3	5.60		F/B: (188.1'), 25°, tight, clean, not healed, smooth
	070	190	-	190.4 feet: slightly weathered; hard; intensely fractured		C70			95	0	4.17	♦	F: (188.6'), 70°, slightly open, very thin, silt, soft, not healed, smooth
	665	-				C71			100		3.44	>	- - -
ING (NET INIOD W		195		195.0 feet: moderately fractured; circulation loss 196.0 feet: intensely fractured		C72						\\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\	F: (196.0'), 90°, slightly open, very thin, iron oxide, intensely weathered,
CELIEN I_CALITAINS (NET MOD W DRIEE NATE)	660								100	0	5.26	>>	moderately hard, not healed, slightly rough F: (197.3'), 90°, slightly open, very thin, iron oxide, intensely weathered, moderately hard, not healed, slightly rough
		200		200.9 feet: PP > 4.5 tsf		C73			90	24	4.29	>	rough F: (197.6'), 40°, moderately open, moderately thin, silt/sand, soft, not healed, slightly rough F: (200.5'), 90°, moderately open, moderately thin, silt/sand, very soft, not
SIANDARD_GINI_LIBRART_2022.GLB	655			202.6 feet: PP > 4.5 tsf 203.1 feet: moderately fractured		C75			100	75.5	3.66		healed, slightly rough F: (201.8'), 80°, slightly open, very thin, calcite, intensely weathered, very soft, not healed, slightly rough F: (203.8'), 50°, tight, clean, not healed, moderately rough
5		-205-		(continued)			EDGE						
gin i leiwir LATE. E. R.F.		F	< <le< td=""><td>EINFELDER Bright People. Right Solutions.</td><td></td><td>C</td><td></td><td>NG CO D</td><td>REC UNT el N R BF</td><td>Y <b>orte</b> RIDG</td><td>F</td><td></td><td>POSTMILE 12-15.5 EA 0115000099</td></le<>	EINFELDER Bright People. Right Solutions.		C		NG CO D	REC UNT el N R BF	Y <b>orte</b> RIDG	F		POSTMILE 12-15.5 EA 0115000099
				,		В	RIDGE				PREPA D. Ro	RED BY	DATE SHEET <b>5-11-21 7 of 9</b>

E:KLF

TEMPLATE:

gINT FILE:

ELEVATION (ft) Sample Locatior Drill Rate (min/ft Drilling Method Casing Depth Sample/Run# DEPTH (ft) Blows per Recovery Material Graphics RQD ( Hardness, Healing, Roughness F: (204.5'), 55°, slightly open, very thin, SEDIMENTARY ROCK (SANDSTONE) 205.2 feet: PP > 4.5 tsf 100 75.5 silt, soft, not healed, moderately rough 205.5 feet: intensely fractured C75 F: (205.5'), 75°, slightly open, very thin, iron oxide, intensely weathered, moderately hard, not healed, moderately  $\Diamond$ 96 35.2 4.29 F: (206.5'), 85°, slightly open, very thin, silt, soft, not healed, slightly rough C76 650 210 4.90 209.9 feet: increased randomly oriented calcite and quartz F: (211.3'), 70°, slightly open, very thin, 211.3 feet: moderately fractured silt, very soft, not healed, rough C77 F: (213.0'), 50°, tight, clean, not healed, slightly rough 645 F: (214.5'), 83°, slightly open, very thin, 215 214.8 to 224.8 feet: abundant ARGILLITE clasts to 0.25" 100 68.3 3.40 clay, very soft, not healed, slightly rough present within SANDSTONE mass 215.8 to 216.2 feet: brecciated zone: angular SANDSTONE fragments to 1" with SILTY infill, fragment interlock largely retained 216.2 feet: moderately fractured SAND (SM) C78 F: (217.3'), 50°, slightly open, very thin, silt, very soft, not healed, slightly rough 640 F: (219.0'), 75°, slightly open, very thin, silt, very soft, not healed, moderately 220 3.65 98 39.6 rough F: (220.5'), 60°, moderately open, very thin, calcite, intensely weathered, soft, not healed, slightly rough F: (221.1'), 40°, slightly open, very thin, C79 silt, very soft, not healed, slightly rough 223.5 feet: 0.75" ARGILLITE interbed remnant: dips 30° 635 224.2 feet: 0.5" ARGILLITE interbed remnant: dips 45° 224.6 feet: 0.75" ARGILLITE interbed remnant: dips 25° 225 SEDIMENTARY ROCK (ARGILLITE); locally thinly bedded with interbeds/remnants of SANDSTONE up to 0.5". ARGILLITE; thinly to very thinly bedded; dark gray to black; slightly weathered; moderately soft to moderately hard; intensely to very intensely fractured; SANDSTONE; 5.00 75 0 C80 nard, intensely to very intensely fractured; SANDSTOMI fine grained; thinly bedded; gray to dark gray; slightly weathered; moderately hard; intensely to very intensely fractured; trace quartz and calcite veining; mass parts readily on bedding planes (FRANCISCAN COMPLEX: BROKEN FORMATION) 226 feet: bedding: dips 15-20° NR 12.86 C81 87 6.96 0 C82 630 230 NR NR 40.00 SEDIMENTARY ROCK (ARGILLITE); sheared/ brecciated to (SILTY SAND with Gravel (SM); loose; gray; wet; mostly coarse to fine SAND; little subangular to subrounded coarse to fine GRAVEL to 1"; little fines) (FRANCISCAN COMPLEX: BROKEN FORMATION) C83 6.84 C84 231.0 feet: caving noted 100 0 9.29 C85 SEDIMENTARY ROCK (SANDSTONE) Fine-grained sand; massive; gray; slightly weathered; hard; very intensely fractured; planar to chaotic quartz and calcite veining (FRANCISCAN COMPLEX: BROKEN 85 0 3.24 625 C86 (continued) REPORT TITLE HOLE ID **BORING RECORD** RC-20-005 DIST COUNTY ROUTE POSTMILE 0115000099 **Del Norte** 101 01 12-15.5 *KLEINFELDER* PROJECT OR BRIDGE NAME Last Chance Grade Bypass Bright People. Right Solutions. **BRIDGE NUMBER** PREPARED BY

D. Ross

5-11-21

8 of 9

per 6 in.

DESCRIPTION

**f**oot %)

%

**Discontinuity Description** 

Fracture Identification: (Depth), Dip, Width, Infilling Composition, Weathering,

ELEVATION (ft)	235 14)	Material Graphics	DESCRIPTION	Sample Location	Sample/Run#	Uncorr. Blows per 6 in.	Blows per foot	Recovery (%)	RQD (%)	Drill Rate (min/ft)	Drilling Method Casing Depth	Discontinuity Description Fracture Identification: (Depth), Dip, Width, Infilling Composition, Weathering, Hardness, Healing, Roughness
			FORMATION) SEDIMENTARY ROCK (SANDSTONE)  237.8 feet: intensely fractured		C86			100	0	4.00	>	
620	240				C87			96	14.7	3.92	>>< >>< >>< >>< >>< >><	- - -
615			243.5 feet: moderately fractured; PP > 4.5 tsf 244.1 feet: intensely fractured		C88							F: (243.5'), 90°, slightly open, very thin, calcite, intensely weathered, soft, not healed, rough
	245		246.8 feet: very intensely fractured; PP > 4.5 tsf 247.2 feet: intensely fractured		C89			NR 100	0	6.00	>>< >>< >>< >>< >><	
610	250 —		248.5 feet: moderately weathered; moderately hard; PP > 4.5 tsf 249.5 feet: very intensely fractured (250.0 feet: advance HWT casing to full depth (250.0') Bottom of borehole at 250.0 ft bgs	/_ 	C90			100	0	10.00		
605												_ _ _
	255 —											- - -
600	260											- - -
505												_ _ _
595	265				F	REPOR	ТТП	TLE.				HOLE ID
	K	LE	EINFELDER Bright People. Right Solutions.		F	BORI DIST. 01 PROJEC Last (	OCT OCC	REC UNT el N R BF nce	Y <b>orte</b> RIDGI <b>Gra</b>	E NAME de Bypa	OUTE 101	RC-20-005   POSTMILE
					E	RIDGE	. NUI	MBEI	۲	PREPAR D. Ros	ED BY SS	DATE SHEET <b>5-11-21 9 of 9</b>

gINT FILE:

LOGGED BY **BEGIN DATE** COMPLETION DATE BOREHOLE LOCATION (Lat/Long or North/East and Datum) HOLE ID 2482739.493 ft / 5984385.015 ft NAD83 G. Vadurro 10-1-20 10-6-20 RC-20-006 DRILLING CONTRACTOR BOREHOLE LOCATION (Offset, Station, Line) SURFACE ELEVATION CRUX Subsurface, Inc. 619.28 ft NAVD88 DRILLING METHOD DRILL RIG BOREHOLE DIAMETER **Rotary Core DMW 45** 4.5 in SAMPLER TYPE(S) AND SIZE(S) (ID) SPT HAMMER TYPE HAMMER EFFICIENCY, ERI SPT (1.4"), HQ Core (2.5") Cathead; 140 lbs / 30-inch drop AFTER DRILLING (DATE) GROUNDWATER DURING DRILLING BOREHOLE BACKFILL AND COMPLETION TOTAL DEPTH OF BORING **Not Determined Not Determined** VWP, TDR, Inclinometer; cement-bentonite 251.3 ft Sample Location Rate (min/ft Blows per 6 in. foot **Drilling Method Discontinuity Description EVATION** Sample/Run# 8 € Blows per f Fracture Identification: (Depth), Dip, Width, Infilling Composition, Weathering, Hardness, Healing, Roughness Material Graphics Recovery DESCRIPTION DEPTH ( Casing [ RQD ( ᆸ 3" GRAVEL road bed FAT CLAY with SAND (CH); stiff; dark gray with rust staining; moist; mostly fines; little coarse to fine angular SAND; trace fine angular GRAVEL; high plasticity; (LANDSLIDE DEPOSIT) 615 5 11 44 5 S1 6 610 10 10.0 feet: medium stiff; dark grayish brown; wet; some SAND; few ARGILLITE-derived GRAVEL 3 4 33 S2 605 15 15.0 feet: stiff; moist; little SAND 8 44 3 S3 5 CLAYEY SAND with GRAVEL (SC); medium dense; dark grayish brown; wet; mostly coarse to fine angular SAND; some fines; little angular GRAVEL; high plasticity; mostly coarse to fine angular SAND; some high plasticity fines; little angular ARGILLITE-derived GRAVEL (LANDSLIDE DEPOSIT) 600 20 3 7 61 3 S4 4 20.0 feet: advance HWT casing to 20.0' 595 (continued) REPORT TITLE HOLE ID E:KLF RC-20-006 **BORING RECORD** POSTMILE DIST. COUNTY ROUTE TEMPLATE: 0115000099 **Del Norte** 101 12-15.5 01 *KLEINFELDER* PROJECT OR BRIDGE NAME Bright People. Right Solutions. **Last Chance Grade Bypass BRIDGE NUMBER** PREPARED BY DATE

D. Ross

1 of 9

6-4-21

ELEVATION (ft)	SDEPTH (ft)	Material Graphics	DESCRIPTION	Sample Location	Sample/Run#	Uncorr. Blows per 6 in.	Blows per foot	Recovery (%)	RQD (%)	Drill Rate (min/ft)	Drilling Method Casing Depth	Discontinuity Description Fracture Identification: (Depth), Dip, Width, Infilling Composition, Weathering, Hardness, Healing, Roughness
			CLAYEY SAND with GRAVEL (SC); medium dense; dark grayish brown; wet; mostly coarse to fine angular SAND; some fines; little angular GRAVEL; high plasticity; mostly coarse to fine angular SAND; some high plasticity fines; little angular ARGILLITE-derived GRAVEL (LANDSLIDE DEPOSIT) 25.0 feet: few fine GRAVEL		S5	2 2 4	6	50			0000000000	- - -
590	30 •		30.0 feet: moist; increased high plasticity fines content; advance HWT casing to 30.0'	X	S6	3 6 5	11	61			0000000000	- - -
585	35		35.0 feet: wet; little fines; advanced HWT casing to 35.0'	X	S7	4 4 6	10	67			000000000000000000000000000000000000000	- - - -
580	40 •	-(// -/// -/// -///	40.0 feet: advanced HWT casing to 40.0'		S8	7 7 11	18	72			000000000000000000000000000000000000000	- - - - -
575	45 •	-// -/// -///	45.0 feet: decreasing fines; circulation loss; advance HWT casing to 45.0	X	S9	8 10 16	26	61			000000000000000000000000000000000000000	- - - -
	50		50.0 feet: advanced HWT casing to 50.0'  SEDIMENTARY ROCK (SANDSTONE) Fine- to medium-grained sand; massive; light gray; fresh; very hard; intensely fractured; block in landslide (LANDSLIDE DEPOSIT) 50.5 feet: equip HQ core for pressuremeter test; interval from 50.5' to 55.5'	X	<u>\$10</u>		50/3/	\NR <sub>/</sub> 11	0	0.00	× > × 4000000000000	- - -
565	-55		(continued)	•	C11			-1				
	P	<le< td=""><td>EINFELDER Bright People. Right Solutions.</td><td></td><td>F</td><td></td><td>CT OC</td><td>REC UNT el N R BF nce</td><td>Y <b>orte</b> RIDGI <b>Gra</b></td><td>F</td><td>RED BY</td><td>POSTMILE 12-15.5 EA 0115000099  DATE SHEET 6-4-21 2 of 9</td></le<>	EINFELDER Bright People. Right Solutions.		F		CT OC	REC UNT el N R BF nce	Y <b>orte</b> RIDGI <b>Gra</b>	F	RED BY	POSTMILE 12-15.5 EA 0115000099  DATE SHEET 6-4-21 2 of 9

ELEVATION (ft)	- ՆЕРТН (#)	Material Graphics	DESCRIPTION	Sample Location	Sample/Run#	Uncorr. Blows per 6 in.	Blows per foot	Recovery (%)	RQD (%)	Drill Rate (min/ft)	Drilling Method Casing Depth	Dis Fracture Width, Infilli Hardne	continuity D Identification g Composess, Healing	n: (Depth) sition. Wea	, Dip, therir
	55		SEDIMENTARY ROCK (SANDSTONE)		C11			11 NR	0	0.00	$\stackrel{\wedge}{\sim}$				
	_				C12					0.00	$\langle \rangle$				
560			SEDIMENTARY ROCK (ARGILLITE); black; intensely weathered; soft; very intensely fractured; block in landslide (LANDSLIDE DEPOSIT) 59.2 to 60.0 feet: poor recovery; soil likely washed out					34	0	0.00	$\Diamond$				
	60		60.0 feet: decomposed: (SANDY fat CLAY (CH); very stiff, dark gray; moist; mostly high plasticity fines; some coarse to fine SAND; trace GRAVEL)		C13						$\Diamond$				
			61.5 feet: advance HWT casing to 61.5'; HQ core; interval from 61.5' to 70'	_	S14	7 9 20	29	78			$\Diamond$				
						20		13	0	0.00	$\Diamond$				
555	65		64.0 feet: increased ARGILLITE-derived coarse SAND and fine GRAVEL		C15						$\Diamond$				
											$\Diamond$				
			68.0 feet: some angular ARGILLITE GRAVEL		040			38	0	0.00					
550	70		70.0 feet: equip HQ core SEDIMENTARY ROCK (ARGILLITE)		C16			64	0	6.15	$\Rightarrow$				
			Dark gray to black; decomposed; very soft; very intensely fractured; pervasively sheared to: (CLAYEY SAND with GRAVEL (SC): dark gray to black; moist:	ŀ	C17			60	0	6.82	$\stackrel{\searrow}{\diamond}$				
			mostly SAND; some fines; little GRÁVEL; medium plasticity fines) (LANDSLIDE DEPOSIT) 72.5 feet: trace carbonate		C18						$\Diamond$				
545	75 -		73.5 feet: with few SANDSTONE fragments to 2.5": fine-grained sand; with calcite veining		040			80	0	4.64	$\Diamond$				
	/5				C19			00		1.00	>< <>				
			76.7 feet: with SANDSTONE fragments to 1.5"					98	0	4.08	$\Diamond$				
540	_		SEDIMENTARY ROCK (ARGILLITE)		C20						$\Diamond$				
	80		Dark gray to black; decomposed; very soft; very intensely fractured; pervasively sheared to: (CLAYEY SAND with GRAVEL (SC); dark gray to black; moist; mostly SAND; some fines; little GRAVEL; medium plasticity fines) (FRANCISCAN COMPLEX)								$\Rightarrow <$				
			piasucity lines) (FRANCISCAN COMPLEX)					100	0	4.00	$\Diamond$				
535					C21						>< >>				
	⊥ <sub>85</sub> ⊥	<u> </u>	(continued)	_							$  \Diamond  $				
						EPOR BORI	NG	REC					OLE ID RC-20-0		
	L		` EINFELDER			01 01	D		orte	)	101	POSTMILE <b>12-15.5</b>		EA <b>011500</b> 0	099
		` <i></i>	Bright People. Right Solutions.			Last (	Cha	nce	Gra	E NAME de Byp					
					- 1	RIDGE	NU	MBE	R	PREPAI D. Ro	RED B	Y	DATE <b>6-4-2</b>	1 SHE	of 9

530

525

520

515

505

gINT TEMPLATE:

90

95

100

105

DEPTH (ft)

Material Graphics

	110			97	7 0	4.00	><					_
5	113.6 feet: 7" SANDSTONE clast: fine-grained sand; dark gray; fresh; very hard; moderately fractured	C29										_
	(continued)											
		F		T TITLE <b>NG RE</b>		RD			HOLE ID RC-20-	006		
	KI EINEEL DED	ī	DIST. <b>01</b>	COUN <b>Del</b>	TY <b>Nort</b> e		ROUTE 101	POSTMIL 12-15.5		EA <b>01</b> 1	5000099	
1	KLEINFELDER  Bright People. Right Solutions.	F				E NAME						
		E	BRIDGE	NUMB	ER	PREPA D. R	ARED BY OSS		DATE <b>6-4</b> -		SHEET 4 of 9	

Sample Location

DESCRIPTION

94.4 feet: 15" SANDSTONE clast: dark gray; fresh; very hard; intensely fractured; dips 80° sheared contact with ARGILLITE

98.4 feet: 17" SANDSTONE clast: coarse- to fine-grained sand; gray to dark gray; slightly weathered; very hard; intensely fractured

101.2 feet: 2" zone of abundant calcite veining

104.0 feet: intensely weathered

102.8 feet: decreasing amount of SANDSTONE clasts

106.6 feet: 6" SANDSTONE clast: fine-grained sand; dark gray; slightly weathered; hard; intensely fractured; with calcite veining

SEDIMENTARY ROCK (ARGILLITE)

Sample/Run#

C21

C22

C23

C24

C25

C26

C27

C28

Uncorr. Blows per 6 in.

Blows per foot

Recovery (%)

100 0

78 0

100 0

87 0

88 0

100 0

97 0

0

RQD (%)

Drill Rate (min/ft)

4.26

5.56

6.00

5.10

7.06

4.17

3.60

Drilling Method Casing Depth

Discontinuity Description

5   145											
(continued)											
	F	REPOR <b>BORI</b>			OR	D			OLE ID RC-20-	006	
KI FINISEI DED		DIST. <b>01</b>		TANU			ROUTE <b>101</b>	POSTMILE <b>12-15.5</b>		EA <b>011</b>	5000099
KLEINFELDER  Bright People. Right Solutions.	F	PROJE					ME ypass				
	E	BRIDGE	NUN	MBEF	₹		PARED BY Ross		DATE <b>6-4-</b> 2		SHEET 5 of 9

				_						<u> </u>	ТП	1
ELEVATION (ft)				Sample Location	#	6 in.	oot	@		Drill Rate (min/ft)	po 4	Discontinuity Description
	(ft)	ا <sub>م</sub> ا	DESCRIPTION	2	Rur	er 6	er fo	() 2	<u></u>	e (m	Method Depth	Fracture Identification: (Depth), Dip,
.A	TH	Prial Shic	BEOOK!! HOW	ald	ple/	orr. /s p	/s p	ove	%) (	Rat	ng n	Width, Infilling Composition, Weathering, Hardness, Healing, Roughness
	DEРТН (ft)	Material Graphics		Sam	Sample/Run#	Uncorr. Blows per (	Blows per foot	Recovery (%)	RQD (%)	Drill	Drilling Metho Casing Depth	nardness, nealing, Roughness
	115	20	114.8 feet: decomposed; (CLAYEY SAND with	0,	0,			97	0			-
			114.8 feet: decomposed; (CLAYEY SAND with GRAVEL (SC); dark gray; moist; mostly SAND; some fines; little GRAVEL; medium plasticity fines) SEDIMENTARY ROCK (ARGILLITE)		C29							_
			SEDIMENTARY ROCK (ARGILLITE)					100	0	6.00		
		Ħ									$\Diamond$	$\dashv$
											$\triangleright$	_
500		Ħ			C30							-
	120		119.5 feet: 11" SANDSTONE clast: fine-grained sand;								$\sim$	_
			dark gray; fresh; very hard; with ARGILLITE clasts and pervasive calcite veining								$\Diamond$	
		囯	121.3 feet: intensely weathered; soft									-
		囯						100	0	4.60		_
			122.8 feet: 3" SANDSTONE clast: fine-grained sand;								$\sim$	-
		E	dark gray; fresh; hard; with calcite veining 123.5 to 125.0 feet: shear fabric: dips 30°		C31						$\Diamond$	_
495		E										
	125											
												_
			126.0 feet: 3" SANDSTONE clast: fine-grained sand;					93	0	4.00	$\rightarrow$	
		==	dark gray; fresh; hard; with calcite veining 126.3 feet: decomposed; moderately soft; (CLAYEY SAND with GRAVEL (SC); moist; mostly fine to coarse SAND; some medium plasticity fines; little fine to coarse								$\Diamond$	-
			SAND; some medium plasticity fines; little fine to coarse									_
			subangular GRAVEL)									
490					C32							-
	130										$\rangle$	_
											$\Diamond$	
								100	0	4.40		7
	L	EE						100	U	4.40	$\sim$	_
											$\Diamond$	
												7
405	L				C33							-
485			134.4 feet: with trace SANDSTONE clasts to 2"									
	135		135.0 feet: intensely weathered; moderately soft								$\searrow$	٦
	L										$\Diamond$	-
			136.3 feet: decomposed; soft; few SANDSTONE clasts					78	0	3.41		
		闫										٦
	H	E	137.7 feet: 7" SANDSTONE clast: medium-grained								$\Diamond$	-
		E	sand; dark gray; fresh; very hard; with ARGILLITE clasts at contact; trace calcite veining		C34						Š	
480												7
	140											႕
								89	0	4.76		
								บฮ	١٠	4.70	$\Diamond$	٦
	<b> </b> -	扫	141.8 feet: intensely weathered; moderately soft									-
					C35						$\Diamond$	
			143.2 feet: decomposed; soft									7
475	-	扫	•								$\searrow$	-1
.,,	145											
			(continued)									

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KLEINFELDE Bright People. Right Solution	

ELEVATION (ft)	145 145 145	Material	Graphics		Sample Location	Sample/Run#	Uncorr. Blows per 6 in.	Blows per foot	Recovery (%)	RQD (%)	Drill Rate (min/ft)	Drilling Method	Discontinuity Description Fracture Identification: (Depth), Dip, Width, Infilling Composition, Weathering, Hardness, Healing, Roughness
				SEDIMENTARY ROCK (ARGILLITE) 145.0 feet: 6" zone of prominent shearing: dips 35° 145.4: 3" SANDSTONE clast: fine-grained sand; dark gray; fresh; very hard; sheared contact with ARGILLITE		C36			100	0	5.56	\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	- -
470	150			148.0 feet: intensely weathered; moderately soft 149.0 feet: decomposed; soft 149.5 feet: 3" SANDSTONE clast: fine-grained sand; dark gray; fresh; very hard; with calcite veining		C37			77	0	7.69		_ _ _
				150.3 feet: intensely weathered; moderately soft		C38			100		4.80	$\begin{array}{c} \Diamond \\ \Diamond \\ \Diamond \\ \Diamond \\ \end{array}$	_
465	155			153.9 feet: 4" SANDSTONE clast: medium-grained sand; dark gray; fresh; very hard; minor calcite veining; sheared contact with ARGILLITE  155.5 feet: prominent shear surface: dips 45°		C39						×	- - -
				156.3 feet: 5" SANDSTONE clast; fine grained sand; dark gray; fresh; very hard; little calcite veining					100	8.3	6.00		_ _ _
460	160					C40							- - -
455						C41			100	0	5.00	\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	- - -
	165			165.0 feet: 6" SANDSTONE clast: fine-grained sand; dark gray; fresh; very hard; intensely fractured; very thin calcite veining 166.3 to 170.0 feet: few SANDSTONE clasts up to 3"					100	0	5.00	$\bigcirc \bigcirc $	<del>-</del> - -
450	170			170.0 feet: decomposed; soft; (CLAYEY SAND with GRAVEL (SC); dark gray; moist; mostly fine to coarse		C42						\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	- - -
445				SAND; some fines; little fine subangular GRAVEL) 171.5 feet: trace SANDSTONE clasts		C43			100	0	5.00	\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	_ _ _ _
	175	<u>LF</u>	_7	(continued)								$  \vee  $	_
				· · ·			EPOR <b>BORI</b>			COR	D.		HOLE ID RC-20-006
						D	DIST. COUNTY  01 Del Norte					ROUTE <b>101</b>	
	F	K L	LE	EINFELDER Bright People. Right Solutions.		P	ROJE	CT C	R BF	RIDG	E NAME	<b>=</b>	
						В	RIDGE					ARED B	DATE SHEET 6-4-21 6 of 9

440

435

430

425

420

415

gINT TEMPLATE:

180

185

190

195

DEPTH (ft)

Material Graphics

5 205	C4	9		98	0	4.00	\\\ \\\ \\\\\\\\\\\\\\\\\\\\\\\\\\\\\\				- - -
(continued)											
		REPOI BOR	RT TIT RING		OR	RD			HOLE ID RC-20-0	06	
KI FINESI DEB		DIST. <b>01</b>		UNT el N			101	POSTMILE <b>12-15.5</b>		EA <b>011</b>	5000099
KLEINFELDER  Bright People. Right Solutions.						E NAME	ass				
		BRIDG 	E NUI	MBEI	R	PREPAR D. Ro			DATE <b>6-4-2</b>	21	SHEET 7 of 9
									·		

Sample Location

DESCRIPTION

SEDIMENTARY ROCK (ARGILLITE)

179.0 feet: intensely weathered; moderately soft

181.7 feet: few SANDSTONE clasts up to 2"

189.1 feet: 6" SANDSTONE clast: fine-grained sand; dark gray; fresh; very hard; intensely fractured; with calcite veining

196.8 feet: prominent shear: dips 40° 197.2 feet: 4" SANDSTONE clast: fine-grained sand; dark

gray; fresh; very hard

199.8 feet: prominent shear: dips 30°

Sample/Run#

C43

C44

C45

C46

C47

C48

Uncorr. Blows per 6 in.

Blows per foot

Recovery (%)

100 0

100

100 0

100 0

93 0

100 0

RQD (%)

0

Drill Rate (min/ft)

4.00

3.40

3.00

5.60

5.00

Drilling Method Casing Depth

**Discontinuity Description** 

Fracture Identification: (Depth), Dip, Width, Infilling Composition, Weathering, Hardness, Healing, Roughness

(coi	ntinue
KLEINFELDEI Bright People. Right Solutio	

ELEVATION (ft)	205 205 14)	Material Graphics		Sample Location	Sample/Run#	Uncorr. Blows per 6 in.	Blows per foot	Recovery (%)	RQD (%)	Drill Rate (min/ft)	Drilling Method Casing Depth	Discontinuity Description Fracture Identification: (Depth), Dip, Width, Infilling Composition, Weathering, Hardness, Healing, Roughness
			SEDIMENTARY ROCK (ARGILLITE)  207.0 to 208.0 feet: dominant shear fabric: dips 60°; minor striations along dip		C49			100	0	3.60	>X	- - -
410	210		209.5 feet: SANDSTONE clasts up to 3"		C50			100	0	3.00		- - -
405	_		212.2 feet: 14" SANDSTONE clast: fine-grained sand; dark gray; fresh; very hard; intensely fractured		C51			100	U	3.00	\$\\\ \\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	- - -
	215		215.0 feet: moderately weathered; moderately hard; intensely fractured 216.3 feet: intensely weathered; moderately soft					100	0	4.00		<del>-</del>
400	220		217.0 feet: decreasing SANDSTONE clasts; some Lean CLAY (CL) fracture infill  220.1 to 221.2 feet: SANDSTONE clasts up to 3"		C52				3	1.00	\\\ \\\ \\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	- - -
			221.5 to 226.0 feet: intensely weathered to decomposed					100	0	3.40	\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	- - -
395	225 -				C53						$\Diamond \times \Diamond \times \Diamond$	- - -
390	230		227.6 feet: 3" SANDSTONE clast: medium-grained sand; dark gray; fresh; very hard  229.0 feet: calcite veining 229.0 to 230.0 feet: moderately hard		C54			100	0	3.40	X	- - - -
385	235				C55			100	0	5.00	\\\ \\\ \\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	- - -
			(continued)		1-	EDOS	T 7'					LIOLE ID
	K	\(\text{LE}	EINFELDER		D	REPOR BORI DIST. 01	NG CO D	UNT el N	Y <b>orte</b>		ROUTE 101	POSTMILE EA 0115000099
			Bright People. Right Solutions.			Last (	Cha	nce	Gra	ide Byp	<b>DASS</b> RED BY	DATE SHEET 6-4-21 8 of 9
				_						· ·		1 2 - 2 1   0 01 0

PLOTTED: 04/19/2022 03:25 PM BY: DSUII	ELEVATION (ft)	235 235 235	Material		Sample Location Sample/Run#	Uncorr. Blows per 6 in.	Blows per foot	Recovery (%)	ראלו (איס) Drill Rate (min/ft)	Drilling Method Casing Depth	Discontinuity Description  Fracture Identification: (Depth), Dip, Width, Infilling Composition, Weathering, Hardness, Healing, Roughness
PLO11ED: 04/19/202	380	240		SEDIMENTARY ROCK (ARGILLITE)  237.0 feet: 3" SANDSTONE clast: fine-grained sand; dark gray; fresh; very hard; minor calcite veining	C55		1	00 (		\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	
	375	2-40		241.3 to 242.3 feet: moderately hard 241.6 feet: trace SANDSTONE clasts	C57		1	00 (	0 4.00		- - - -
	270	245		247.0 feet: with calcite veining	C58		1	00 (	0 5.00	$\Diamond \times \Diamond \times \Diamond \times \Diamond \times \Diamond \times \Diamond$	- - - -
LL KA   E   Z	370	250		251.3 feet: advance HWT casing to full depth (251.3') Bottom of borehole at 251.3 ft bgs						$\Diamond$	- - - -
CALINANS (ALF INOD W DAI	365	255•	- -								- - - -
gini Tewitatie: E:rkf _ Standard_Gini_cibrart2022;Glb [Clieni_calirans (net mod w drile rate)z]	360	260	<u>-</u>								- - - -
SIANDARD	355	265			1 -	OEDOS	T TIT'				
GINI IEMPLAIE. E.NLT		V	<l.< td=""><td>EINFELDER Bright People. Right Solutions.</td><td>Ē</td><td>REPOR BORI DIST. 01 PROJEC Last (BRIDGE</td><td>OUI COUI Del CT OR Chan</td><td>NTY Nor BRID Ce G</td><td>rte DGE NAME Brade By</td><td><b>pass</b> ARED BY</td><td>  HOLE ID   RC-20-006     POSTMILE   EA   0115000099     DATE   SHEET   9 of 9</td></l.<>	EINFELDER Bright People. Right Solutions.	Ē	REPOR BORI DIST. 01 PROJEC Last (BRIDGE	OUI COUI Del CT OR Chan	NTY Nor BRID Ce G	rte DGE NAME Brade By	<b>pass</b> ARED BY	HOLE ID   RC-20-006     POSTMILE   EA   0115000099     DATE   SHEET   9 of 9

LOGGED BY

K. Ogbom/T. Morelli 10-5-20

DRILLING CONTRACTOR

**BEGIN DATE** 

COMPLETION DATE

10-8-20

TEMPLATE:

gINT FILE:

**Gregg Drilling** 751.18 ft NAVD88 DRILLING METHOD DRILL RIG BOREHOLE DIAMETER **Rotary Core CME 850** 4.5 in SAMPLER TYPE(S) AND SIZE(S) (ID) SPT HAMMER TYPE HAMMER EFFICIENCY, ERI SPT (1.4"), HQ Core (2.5") Cathead; 140 lbs / 30-inch drop BOREHOLE BACKFILL AND COMPLETION GROUNDWATER DURING DRILLING AFTER DRILLING (DATE) TOTAL DEPTH OF BORING **Not Determined Not Determined** VWP, TDR, Inclinometer; cement-bentonite 150.0 ft Sample Location Rate (min/ft foot **Discontinuity Description** Sample/Run# Blows per 6 in **Drilling Method EVATION** 8 € Blows per Fracture Identification: (Depth), Dip, Width, Infilling Composition, Weathering, Hardness, Healing, Roughness Material Graphics Recovery DESCRIPTION % DEPTH Casing [ ROD ᆸ SANDY SILT (ML); very stiff; brown to dark brown; moist; mostly fines; some fine grained SAND; few fine subangular GRAVEL; rootlets (COLLUVIUM) 750 C01 SILTY/CLAYEY SAND (SC-SM); medium dense to dense; olive yellow to pale olive; moist; mostly fine grained SAND; some low plasticity fines; roots (COLLUVIUM / RESIDUAL SOIL) 30 33 15 15 S02 5 15 C03 745 46 0 6.0 feet: large roots 6.5 feet: trace subangular fine to coarse sandstone fragments 7.0 feet: circulation loss C04 SEDIMENTARY ROCK (SANDSTONE)
Fine- to medium-grained sand; massive; yellowish brown to pale olive; decomposed; very soft; very intensely fractured; (SILTY SAND with GRAVEL (SM); medium 10 dense; moist; mostly fine to medium grained SAND; some fines; little subangular fine SANDSTONE 740 9 16 50 fragments) S05 (FRANCISCAN COMPLEX: BROKEN FORMATION) 0 13.0 feet: pale olive to light brownish gray C06 14.0 feet: circulation loss 15 735 26 50 8 13 S07 SEDIMENTARY ROCK (SANDSTONE)
Fine-grained sand; massive; dark brownish gray;
intensely weathered; moderately soft to soft; (SILTY/
CLAYEY GRAVEL with SAND (GM-GC); medium
dense; moist; mostly subangular fine to coarse
SANDSTONE fragments; some low plasticity fines;
little fine to medium grained SAND) (FRANCISCAN
COMPLEX) 13 0 C08 20 730 10 25 | 33 10 S09 15 0 C10 NR C11 (continued) REPORT TITLE **HOLE ID** RC-20-007 **BORING RECORD** POSTMILE DIST COUNTY ROUTE 0115000099 **Del Norte** 01 101 12-15.5 *KLEINFELDER* PROJECT OR BRIDGE NAME Bright People. Right Solutions. **Last Chance Grade Bypass BRIDGE NUMBER** PREPARED BY DATE SHEE1

D. Ross

6-4-21

1 of 6

BOREHOLE LOCATION (Lat/Long or North/East and Datum)

2487641.20 ft / 5985892.459 ft NAD83

BOREHOLE LOCATION (Offset, Station, Line)

HOLE ID

RC-20-007

SURFACE ELEVATION

53.4 feet: slightly weathered; hard 54.0 feet: moderately fractured	C22		><	rough F: (50.3'), 55°, s silt, very soft, no	slightly open,	very thin,
(continued)						
		T TITLE NG RECORE	)		LE ID <b>C-20-007</b>	
CKI FINIFFI DED	DIST. <b>01</b>	COUNTY  Del Norte	ROUTE <b>101</b>	POSTMILE <b>12-15.5</b>	EA <b>011</b>	5000099
KLEINFELDER  Bright People. Right Solutions.		CT OR BRIDGE Chance Grad			·	
	BRIDGE 	NUMBER	PREPARED BY <b>D. Ross</b>		DATE <b>6-4-21</b>	SHEET 2 of 6

ELEVATION (ft)	ЕРТН (ft)	ial	DESCRIPTION	Sample Location	Sample/Run#	rr. s per 6 in.	Blows per foot	very (%)	(%)	Drill Rate (min/ft)	Drilling Method Casing Depth	Discontinuity Description  Fracture Identification: (Depth), Dip, Width, Infilling Composition, Weathering,
ELE	DEP	Material Graphics		Samp	Samp	Uncorr. Blows per (	Blows	Recovery	RQD (%)		Drillin Casin	Hardness, Healing, Roughness
			SEDIMENTARY ROCK (SANDSTONE)		C11			NR			$\stackrel{\sim}{\sim}$	
725				M	S12	8	38	55				
			SEDIMENTARY ROCK (SANDSTONE) Fine-grained sand; light grayish brown and brown; intensely weathered; moderately soft; very intensely fractured with minor iron oxide infill (FRANCISCAN	Ή		29			0			_
			intensely weathered; moderately soft; very intensely fractured with minor iron oxide infill (FRANCISCAN COMPLEX)								$\Diamond$	
			22.4)		C13						$\Diamond$	_
	30		30.1 feet: 3" ARGILLITE interbed: dips 30-40°; thinly bedded; black; slightly weathered; moderately soft;		C14			24			$\Diamond$	_
720		::::	lintensely fractured 31.0 feet: equip NQ core for pressure meter test; interval 31.0' to 36.0'	-	S15 <sub>/</sub>		50/3	93	14	15.00	$\Diamond$	
		<b> </b>	SEDIMENTARY ROCK (SANDSTONE) Thickly bedded gray to dark gray: slightly weathered:								$\langle \rangle$	
			SEDIMENTARY ROCK (SANDSTONE) Thickly bedded; gray to dark gray; slightly weathered; moderately hard; intensely fractured; with minimal infill; local ARGILLITE clasts; interbed remnants to 0.25";		C16							
		  :::::	planar and chaotic quartz and calcite veining to 0.1" (FRANCISCAN COMPLEX)					100	77	0.00	$\stackrel{\sim}{\sim}$	-
	35 -	<b>-</b>	34.0 feet: moderately fractured 34.5 feet: intensely fractured		C17			100		0.00	><	F: (35.0'), 25°, slightly open, clean, not healed, moderately rough
715		 	36.0 feet: moderately fractured; equip HQ core					93	16	4.80	$\Diamond$	F: (36.3'), 30°, slightly open, clean, not
		  :::::	37.0 feet: intensely fractured								$\Diamond$	healed, slightly rough F: (36.8'), 60°, slightly open, clean, not
		    :::::			C18						$\Diamond$	healed, slightly rough —
											$\Diamond$	_
	40	-									$\Diamond$	_
710		    :::::	41.0 to 42.7 feet: ARGILLITE interbed remnants to 4": convolute: dark gray to black; slightly weathered:					95	31	6.50	$\Diamond$	_
		  :::::	convolute; dark gray to black; slightly weathered; moderately hard; intensely fractured								$\Diamond$	_
		<b> </b>	42.8 feet: slightly weathered; moderately hard to hard; intensely fractured		C19							_
			44.E fact intercely freetyred								$\stackrel{\checkmark}{\sim}$	F: (43.8'), 70°, slightly open, clean, not healed, moderately rough
	45	<del>-</del>  ::::	44.5 feet: intensely fractured 45.0 feet: performed packer test; interval 45.0' to 46.0'		C20			100		13.00		_
705		    :::::	46.0 feet: moderately fractured 46.0 to 50.0 feet: mass very intensely fractures but calcite					96	58	5.60		F: (46.5'), 90°, slightly open, very thin,
		    -  -	rehealed								$\Diamond$	silt, very soft, not healed, moderately rough
		 			C21						$\Diamond$	F: (47.5'), 50°, slightly open, clean, not healed, moderately rough
		  :::::									$\Diamond$	F: (48.1'), 50°, slightly open, very thin, silt, very soft, not healed, moderately
	50	<b>-</b>  ::::	50.0 feet: very intensely fractured								$\Diamond$	rough F: (48.8'), 55°, slightly open, very thin,
700		  :::::	51.5 feet: moderately fractured	H				100	62	5.33	$\Diamond$	calcite, fresh to slightly weathered, — moderately hard, partly healed,
			51.5 reet. moderatery fractured								$\Diamond$	moderately rough F: (49.4'), 40°, slightly open, very thin,
		::::	53.4 feet: slightly weathered; hard		C22						$\Diamond$	silt, very soft, not healed, moderately — rough
		 	54.0 feet: moderately fractured									F: (50.3'), 55°, slightly open, very thin, silt, very soft, not healed, slightly rough
	<u> </u>	1	(continued)									
						EPOR			`^D			HOLE ID

ELEVATION (ft)	DЕРТН (ft)	Material Graphics	DESCRIPTION	Sample Location	Sample/Run#	Uncorr. Blows per 6 in.	Blows per foot	Recovery (%)	RQD (%)	Drill Rate (min/ft)	Drilling Method Casing Depth	Discontinuity Description  Fracture Identification: (Depth), Dip, Width, Infilling Composition, Weathering, Hardness, Healing, Roughness
	55 -55	≱ັ້	SEDIMENTARY ROCK (SANDSTONE)	Sa	Sa	고照	В	ag.	Σ.	۵		F: (52.0'), 60°, slightly open, very thin,
695	60		SEDIMENTANT NOON (SANDSTONE)		C23			100 95	100 66	5.20	X\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	silt, very soft, not healed, smooth F: (53.5'), 60°, slightly open, clean, not healed, slightly rough F: (55.2'), 80°, slightly open, very thin, silt/sand, very soft, not healed, moderately rough F: (56.0'), 60°, slightly open, clean, not healed, moderately rough F: (56.4'), 65°, slightly open, very thin to moderately thin, silt, very soft, not
690					C25			99	67	4.26	>X	healed, moderately rough to rough F: (58.3'), 35°, slightly open, very thin, silt, very soft, not healed, slightly rough F: (59.4'), 60°, slightly open, clean, not healed, rough F: (60.0'), 30°, slightly open, clean, not healed, slightly rough F: (61.2'), 40°, slightly open, very thin,
685	65 -		64.0 feet: intensely fractured 66.1 feet: moderately fractured					89	16	6.33	$\rangle \times \Diamond \times \Diamond$	r. (61.2), 40 , slightly open, very tillin, calcite, fresh to slightly weathered, moderately hard, not healed, moderately rough F: (61.8'), 55°, slightly open, very thin, calcite, fresh to slightly weathered,
			66.8 feet: intensely fractured 67.0 feet: 1.5" ARGILLITE bed remnant: black; slightly weathered; moderately hard; intensely fractured		C26			0.4	67	4.70	>< >> >> >>	moderately hard, not healed, moderately rough F: (62.1'), 70°, slightly open, very thin, calcite, fresh to slightly weathered, moderately hard, not healed, rough
	70		69.3 feet: moderately fractured 70.5 feet: 1" ARGILLITE bed remnant: dips 25°: dark		C27			94	67	4.78	$\Diamond \\ \Diamond \\ \Diamond \\$	F: (63.1'), 70°, slightly open, very thin, calcite, fresh to slightly weathered, moderately hard, not healed, rough F: (66.3'), 45°, slightly open, very thin,
680	75		gray; slightly weathered; moderately hard; intensely fractured 71.1 feet: 2" ARGILLITE bed remnant: dark gray; slightly weathered; moderately hard; intensely fractured 72.0 feet: intensely fractured 72.6 to 73.9 feet: 2" ARGILLITE bed remnants: convolute dark gray; slightly weathered; moderately hard; intensely fractured 72.6 feet: moderately hard to hard		C28			96	36	6.00	X \ \ \ \ \ \ \ \	calcite, slightly weathered, moderately hard, partly healed, moderately rough  F: (72.0'), 40°, slightly open, clean, not healed, slightly rough
	/5		75.5 feet: 4" ARGILLITE bed remnant: convolute dark					100	00	5.00	>< -<>	F: (75.7'), 45°, slightly open, clean, not —
675			gray; slightly weathered; moderately hard; intensely fractured		C29			100	66	5.33	\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	healed, slightly rough F: (76.4'), 90°, slightly open, clean, not — healed F: (76.9'), 40°, slightly open, clean, not — healed
	80 -		77.9 feet: bedding: dips 55° 78.2 feet: parting on ARGILLITE remnant 78.5 feet: 4" ARGILLITE bed remnant: convolute dark gray; slightly weathered; moderately hard; intensely fractured 78.6 feet intensely fractured 79.0 to 81.0 feet: abundant 0.1" planar ARGILLITE		C30			91	45	5.50	>< >>< >>< >><	F: (78.5'), 55°, slightly open, very thin, Argillite, fresh to slightly weathered, not healed
670			interbeds: dips 30°: dark gray; slightly weathered; hard; moderately to intensely fractured  82.5 feet: moderately fractured		C31			99	75	4.76	$\Diamond$	F: (81.0'), 60°, slightly open, clean, not healed, slightly rough F: (81.5'), 35°, slightly open, very thin, calcite, fresh to slightly weathered, partly healed, slightly rough
	85		83.9 feet: intensely fractured								$\diamondsuit \\ \diamondsuit \\ \diamondsuit$	F: (83.0'), 35°, slightly open, very thin, calcite, slightly weathered, partly healed, slightly rough
			(continued)		1.5	FDOR	T T1-	15				TIGIT IS
	K	LE	EINFELDER Bright People. Right Solutions.		P		NG I CO De CT O Chai	REC UNT el N R BF nce	Y <b>orte</b> RIDG <b>Gra</b>	F	ass	12-15.5 0115000099
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113.5 feet: moderately fractured 113.8 feet: fine- to medium-grained sand 114.0 to 114.8 feet: intensely to very intensely fractured	:43	100 60	5.60		60°, moderate thin, calcite,	
(continued)						
		T TITLE NG RECOR	RD		HOLE ID RC-20-00	)7
(KI EINEEL DED	DIST. <b>01</b>	COUNTY  Del Norte	ROUTE <b>101</b>	POSTMIL <b>12-15.</b>		A <b>0115000099</b>
KLEINFELDER  Bright People. Right Solutions.		CT OR BRIDG	E NAME ade Bypass	·		
	BRIDGE	NUMBER	PREPARED B <b>D. Ross</b>	Υ	DATE <b>6-4-2</b> 1	SHEET 4 of 6

ELEVATION (ft)	DEPTH (ft)	Material	DESCRIPTION	Sample Location	Sample/Run#	Uncorr. Blows per 6 in.	Blows per foot	Recovery (%)	RQD (%)	Drill Rate (min/ft)	Drilling Method Casing Depth	Discontinuity Description  Fracture Identification: (Depth), Dip, Width, Infilling Composition, Weathering, Hardness, Healing, Roughness
	_oo_		SEDIMENTARY ROCK (SANDSTONE) thinly bedded with thin interbeds/remnants of ARGILLITE.		C32			42	0	8.75	$\sim$	F: (83.3'), 60°, slightly open, very thin, calcite, slightly weathered, partly healed,
665			SANDSTONE; fine grained; thinly bedded; gray to dark gray; slightly weathered; moderately hard; intensely fractured; ARGILLITE; thinly bedded; dark gray to black;					100	0	5.71	$\langle \rangle$	slightly rough F: (84.0'), 30°, slightly open, clean, not
			<ul> <li>fractured; ARGILLITE; thinly bedded; dark gray to black;</li> <li>slightly weathered; moderately hard; intensely fractured,</li> <li>chaotic quartz and calcite veining to 0.3" (FRANCISCAN)</li> </ul>								$\Diamond$	healed, moderately rough
		H	- COMPLEX) - 87.0 feet: circulation loss (20 gallons)		C33						$\Diamond$	
		Hii	` ° '								$\Diamond$	=
	90		90.0 feet: intensely to very intensely fractured		C34			100	0	5.33		-
660		H						66	0	12.00	$\stackrel{\sim}{\sim}$	-
		Hil			C35						$\stackrel{\smile}{\sim}$	-
		H						92	0	5.43	$\Diamond$	_
		Hii			C36						$\Diamond$	_
	95	$\exists$	94.4 feet: parting on ARGILLITE interbed: dips 40°								$\Diamond$	4
655		H	95.7 feet: very intensely fractured					86	0	9.20	$\Diamond$	_
		H	    96.8 to 97.3 feet: brecciated zone		007					0.20	$\Diamond$	_
		H::			C37							_
			98.5 feet: moderately to intensely fractured	r				83	46	4.40	$\stackrel{\checkmark}{\sim}$	F/D: (00.01) 45° tight clean not healed
	100		- 99.0 feet: parting on ARGILLITE interbed remnant: dips 45°		C38						$\stackrel{\checkmark}{>}$	F/B: (99.0'), 45°, tight, clean, not healed, smooth
050			SEDIMENTARY ROCK (ARGILLITE); thinly bedded;	_							$\Diamond$	F: (99.7'), 45°, tight, clean, not healed, rough
650		Œ	black; fresh; moderately soft; intensely to very intensely fractured; (FRANCISCAN COMPLEX)					89	11	6.00	$\Diamond$	F: (101.6'), 30°, tight to slightly open,
					C39						$\Diamond$	clean, not healed, smooth F: (102.5'), 50°, tight to slightly open,
			SEDIMENTARY ROCK (SANDSTONE) Fine-grained sand; moderately bedded; very dark gray;								$\Diamond$	clean, not healed, smooth
	105		fresh; hard; intensely fractured; calcite veining (FRANCISCAN COMPLEX) 104.0 feet: 6" ARGILLITE clast; thinly bedded; black;					100	29	5.50	$\Diamond$	F: (104.5'), 45°, tight, clean, not healed,
	105		fresh; moderately soft		C40							smooth
645			106.0 feet: moderately fractured; decrease in calcite veining					96	20	3.56	$\sim$	F: (106.2'), 45°, tight, clean, not healed,
											$\langle \rangle$	moderately rough F: (106.4'), 40°, tight, clean, not healed,
			: 108.2 feet: increase in calcite veining		C41						$\Diamond$	moderately rough F: (106.8'), 25°, tight, clean, not healed,
		H									$\Diamond$	moderately rough F: (107.5'), 50°, tight, clean, not healed,
	110		: 110.4 feet: moderately to intensely fractured					100	200	F 00	$\Diamond$	moderately rough F: (108.2'), 45°, tight, clean, not healed,
640		H	110.4 reet. moderately to mensely fractured					100	38	5.33	$\Diamond$	moderately rough F: (110.5'), 60°, tight, clean, not healed,
		H			C42							rough F: (111.0'), 60°, tight, clean, not healed,
		H									×	rough F: (111.5'), 60°, tight, clean, not healed,
		H	113.5 feet: moderately fractured 113.8 feet: fine- to medium-grained sand		C43			100	60	5.60		rough F: (112.4'), 60°, moderately open,
	115	::	: 114.0 to 114.8 feet: intensely to very intensely fractured (continued)								$ \diamondsuit $	moderately thin, calcite, fresh,
			(		F	REPOR	T TI	TLE		_		HOLE ID

(#)				۲						£)		
	ŧ.			Sample Location	#un	6 in.	foot	(%)		Drill Rate (min/ft)	Drilling Method Casing Depth	Discontinuity Description
ATIC	₩   <u>H</u>	<u>  S</u>	DESCRIPTION	e Lo	e/Ru	₫			(%)	ate (	) Met	Fracture Identification: (Depth), Dip, Width, Infilling Composition, Weathering,
ELEVATION	DEРТН (ft)	Material Graphics		amp	Sample/Run#	Uncorr. Blows p	Blows per	Recovery	RQD (	<u>≡</u> R	rilling	Hardness, Healing, Roughness
<del>                                   </del>	115	∑Ū	calcite rehealed	ιŏ	κ̈	ΞĒ	B	관 100	원 60	Ď	Ōΰ	moderately hard, moderately healed,
635			SEDIMENTARY ROCK (SANDSTONE)		C43							moderately rough
		::::	115.5 feet: calcite veining					100	58	3.80		F: (112.8'), 75°, slighlty open, very thin, calcite, fresh, moderately healed,
		<del> </del> ∷∷:	116.8 feet: strike-parallel striations								$\Diamond$	moderately rough
		<b>↓∷∷</b>										F: (115.0'), 30°, moderately open, very thin, calcite, fresh, moderately hard, not
					C44							healed, rough
		]: : : : :  : : : : :									$\Diamond$	F: (115.8'), 50°, slightly open, very thin, calcite, fresh, moderately hard, not
	120	-	120.0 feet: striations: dips 45°									healed, moderately rough
630		<b>.</b> ::::	121.0 feet: slightly to moderately fractured					400	70	4.00		F: (116.2'), 50°, slightly open, very thin, calcite, fresh, moderately hard, not
630			122.0 feet: striations: dips 20°					100	78	4.20	$\Diamond$	healed, moderately rough
		1:::::	122.5 feet: 6" ARGILLITE clast: black; fresh; moderately									F: (116.8'), 65°, slightly open, clean, not — healed, moderately rough
	-	<b>∤∷∷</b>	soft to hard; intensely fractured									F: (117.4'), 45°, open to moderately wide, thin to moderately thin, calcite,
		<b>∐∷∷</b>	-		C45						$\Diamond$	fresh, moderately hard, totally healed
		::::	124.2 feet: 0.25" ARGILLITE band									F: (118.2'), 60°, tight, very thin, calcite, fresh, moderately hard, moderately
	125	<b> </b>										healed, moderately rough
625		<b> ∷∷</b>		H				100	56	5.60		F: (120.0'), 60°, slightly open, very thin, clay, soft, not healed, moderately rough
		<u> </u> ::::						.00	55	5.00		F: (120.5'), 30°, slightly open, very thin,
		::::	127.5 feet: striations: dips 40°									calcite, fresh, moderately hard, partly healed, rough
		:::i	127.3 (66). Surations. (11ps 40)		040						$\Diamond$	F: (122.2'), 60°, slightly open, very thin,
		<b> ∷∷</b>			C46							clay, soft, not healed, slightly rough F: (123.0'), 50°, tight, very thin, calcite,
	130	<u> </u> ::::										fresh, moderately hard, partly healed,
	130	]::::									$\Diamond$	rough F: (123.5'), 50°, slightly open, very thin,
620	-	<del> </del> ::::		H				100	55	5.00		calcite, fresh, moderately hard, totally — healed
		<b>.</b> ::::										F: (124.0'), 45°, tight, clean, not healed,
		::::										moderately rough F: (126.4'), 45°, slightly open, very thin,
		]:::::			C47							clay, soft, not healed, slightly rough
	-	<del> </del> ∷∷:			- 11							F: (127.4'), 85°, tight, clean, not healed,slightly rough
	135	<b> </b> ::::										F: (128.2'), 40°, tight, very thin, calcite,
		[::::]										fresh, moderately hard, partly healed, rough
615		 	136.0 feet: intensely to very intensely fractured 136.3 to 138.3 feet: ARGILLITE clasts up to 5"	П				100	17	8.70		F: (129.6'), 45°, tight, very thin, calcite, fresh, moderately hard, partly healed,
		<del> </del> ::::	130.3 to 130.3 leet. ARGILLITE clasts up to 5"		C48						$\Diamond$	resh, moderately hard, partly healed, — rough
		<u> </u>										F: (130.0'), 30°, slightly open, very thin, calcite, fresh, moderately hard, partly
		::::	138.3 feet: intensely fractured	H				100	25	2.59		healed, rough
		::::									$\Diamond$	F: (130.6'), 30°, slightly open, very thin, calcite, fresh, moderately hard, partly
	140	<b>-</b>  ::::			C49							healed, moderately rough
2		<u> </u> ::::		Ц							ightharpoonup	F: (130.9'), 45°, slightly open, very thin, calcite, fresh, moderately hard, partly —
610		[::::]	141.0 feet: fine-grained sand; moderately fractured					100	51	2.20	$\Diamond$	healed, moderately rough
		::::										F: (131.1'), 35°, slightly open, very thin, — calcite, fresh, moderately hard, partly
		<b>∤∷∷</b>			C50						$\rangle$	healed, moderately rough to rough
		<u> </u> ::::									$\Diamond$	F: (131.3'), 35°, slightly open, very thin, calcite, fresh, moderately hard, partly
		::::	144.0 feet: intensely fractured									healed, rough
	-145 <sup>L</sup> -	1	(continued)							<u> </u>		
			(Landing System)			EPOR						HOLE ID
					_	BORI IST.		REC UNT			ROUTE	RC-20-007 POSTMILE EA
	L		EINFELDER			01	D	el N	orte		101	12-15.5 0115000099
			Bright People. Right Solutions.							E NAME de Byp	ass	
				BRIDGE NUMBER PREPARED BY DATE D. Ross 6-4-21				DATE SHEET <b>6-4-21 5 of 6</b>				
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TEMPLATE:

Bright People. Right Solutions.

gINT FILE:

ELEVATION (ft) Sample Locatior Drill Rate (min/ft) Drilling Method Casing Depth per 6 in. Blows per foot Discontinuity Description Sample/Run# Recovery (%) DEPTH (ft) Fracture Identification: (Depth), Dip, Width, Infilling Composition, Weathering, Hardness, Healing, Roughness DESCRIPTION Material Graphics RQD (%) SEDIMENTARY ROCK (SANDSTONE) 145.2 feet: moderately fractured 100 51 F: (131.5'), 25°, slightly open, very thin, C50 calcite, fresh, moderately hard, partly 145.5 feet: 6" zone: medium grained 605 healed, moderately rough 100 39 2.00 146.0 feet: moderately to intensely fractured F: (131.8'), 35°, slightly open, very thin, calcite, fresh, moderately hard, partly healed, moderately rough F: (132.0'), 25°, slightly open, very thin, C51 148.0 feet: slightly weathered; intensely to very intensely fractured; fractures infilled with calcite and clay calcite, fresh, moderately hard, partly healed, moderately rough F: (132.6'), 60°, slightly open, very thin, 150.0 feet: advanced HWT casing to 152.0' to account 150 calcite, fresh, moderately hard, partly for grout valve healed, moderately rough Bottom of borehole at 150.0 ft bgs F: (133.4'), 60°, slightly open, very thin, 600 calcite, fresh, moderately hard, partly healed, moderately rough F: (134.7'), 30°, tight, very thin, calcite, fresh, moderately hard, partly healed, slightly rough F: (140.8'), 35°, slightly open, very thin, calcite, fresh, moderately hard, partly healed, moderately rough 155 F: (141.4'), 40°, slightly open, very thin, calcite, fresh, moderately hard, partly 595 healed, rough F: (142.0'), 40°, tight, clean, not healed, moderately rough F: (142.4'), 30°, tight, clean, not healed, moderately rough F: (143.2'), 50°, tight, clean, not healed, moderately rough F: (145.4'), 65°, open, thin, clay, soft, not 160 healed, moderately rough F: (146.1'), 55°, slightly open, very thin, calcite/clay, slightly weathered, 590 moderately hard, partly healed, moderately rough F: (146.8'), 55°, slightly open, very thin, calcite, slightly weathered, moderately hard, partly healed, moderately rough 165 585 170 580 HOLE ID RC-20-007 REPORT TITLE **BORING RECORD** COUNTY POSTMILE DIST. ROUTE Del Norte 12-15.5 0115000099 101 01 KLEINFELDER PROJECT OR BRIDGE NAME

Last Chance Grade Bypass

PREPARED BY

D. Ross

DATE

6-4-21

SHEET

6 of 6

BRIDGE NUMBER

>	OGG M.Pc	ED BY orter		BEGIN DATE <b>10-23-20</b>	COMPLETION DATE	2480179	9.30	7 ft	/ 598	499	8.7	57 ft	NAD83		tum)	HOLE ID <b>D-20-0</b>	10	
ا ا ا		NG CO <b>3g Dr</b> i	ONTRA I <b>lling</b>	CTOR		BOREHOL	E LC	OCA	TION	(Offs	et, S	tation,	Line)			SURFACE <b>438.92</b> fr		
<u> </u>	DRILLI	NG ME	ETHOD	)		DRILL RIG		n: -								BOREHOL	E DIAMET	ER
-	Cori SAMPL	_	YPE(S)	AND SIZE(S) (ID)		Sonic D										4 in HAMMER E	EFFICIENC	CY, ERi
10210				Core (2.5") ILL AND COMPLETIO		Cathead	-							DDILL	NO (DATE)	TOTAL DE	DTU OF D	ODINO
				inometer; cement		READINGS		EK	Not I					Determ	NG (DATE) ined	150.0 ft	PIHOFB	ORING
	ELEVATION (ft)	DEPTH (ft)	Material Graphics	,	DESCRIPTION		Sample Location	Sample/Run#	Uncorr. Blows per 6 in.	Blows per foot	Recovery (%)	RQD (%)	Drill Rate (min/ft)	Drilling Method Casing Depth	Fracture Width, Infi	scontinuity le e Identificati lling Compo ness, Healir	on: (Depth	n), Dip, athering,
ŀ	山	-0 <u>-</u>	≅ğ	Lean CLAY (CL): da	rk brown: moist: mostly	fines:	Sa	Sa	- 등 %	쯂	광 37	RC	۵					
	435	5		1.0 feet: upper 1' rev	rk brown; moist; mostly v to medium plasticity vorked, intermixed with of orange-brown silty s	grout	S	501			57			\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\				- - -
		5		7.0 feet; veriousted o	ranga braum braum lig	ht grove					73			\\				- -
	430	10		mostly fines; trace fin	range brown, brown, lig e SAND; medium plasti ture (COLLUVIUM / LAN	city; localized	S	502						$\langle \diamond \times \diamond \times \diamond \rangle$				- -
	425	-	00000	disturbance Poorly-graded GRA\ dry; mostly coarse G sandstone boulder/c Fat CLAY with SANI brown, and gray; mc coarse to fine SAND	etructure, possible sonice VEL (GP); gray to grayis; RAVEL; few fines; possiblests brecciated by drill of (CH); variegated oranist to wet; mostly fines; trace coarse GRAVE, SIT-argillite derived)	ish brown; sible ling nge, ; little	5	S03			58			×				- - -
		15 -		SANDY fat CLAY wit to wet; mostly fines;	th GRAVEL (CH); dark some coarse to fine SA gular GRAVEL; (LAND	ŇD; little	<u>-</u>	504			70			\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\				- - -
	420	20 -		21.0 feet: decreased	gravel content						61			>>< >> < >> < >> < >> < >> < >> < >> < >> < >> < >> < >> < >> < >> < >> < >> < >> < >> < >> < >> < >> < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < > < >				- - -
	415	25						805						>< >>< >><				
5					(continued)			R	EPOR	T TI	ΓLE					HOLE ID		
		K	LE	INFELD	DER			D	BORI IST. 01	NG CO D	UNT el N	Y <b>orte</b>	R	OUTE <b>101</b>	POSTMIL 12-15.5	<b>D-20-01</b>	EA 011500	0099
				Bright People. Right S					Last (	Cha	nce	Grad	le Bypa					
									RIDGE 	NU	MBEI	₹	PREPAR <b>D. Ro</b>			DATE <b>3-26</b>		of 6

04/19/2022 03:23 FIN DT. DOUBLE	ELEVATION (ft)	ў DЕРТН (ft)	Material Graphics	DESCRIPTION	Sample Location	Sample/Run#	Uncorr. Blows per 6 in.	Blows per foot	Recovery (%)	RQD (%)	Drill Rate (min/ft)	Drilling Method Casing Depth	Discontinuity Description  Fracture Identification: (Depth), Dip, Width, Infilling Composition, Weathering, Hardness, Healing, Roughness
PEOTIED: 04/18/202		_		SANDY fat CLAY with GRAVEL (CH) 25.0 to 25.8 feet: dominantly subangular SANDSTONE clasts up to 4" 27.0 to 28.5 feet: faint relic shear structure with remolded corestones to 0.5"	;	S06			68			>><>>	- - -
	410	30 -		CLAYEY SAND with GRAVEL (SC); dark gray; moist to wet; mostly coarse to fine SAND; little coarse to fine subangular GRAVEL; little fines; (LANDSLIDE DEPOSIT - argillite derived)					42			X	- - -
	405	35 -		35.0 to 36.0 feet: dominantly angular SANDSTONE fragments to 4"		S07			76			$\langle \Diamond \rangle \langle \Diamond \rangle \langle \Diamond \rangle$	 
	400			POORLY GRADED SAND with GRAVEL AND CLAY (SP-SC); dark gray to black; dry; mostly coarse to fine SAND; little coarse to fine subangular GRAVEL; few fines;(LANDSLIDE DEPOSIT)		S08						$\Diamond \times \Diamond \times \Diamond \times \Diamond$	- - - -
[7/7]		40		41.0 feet: wet	:	S09			27			\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	<u>-</u> - -
	395	45 -		45.0 feet: increased clay content					73				- - -
	390	50		47.1 to 48.7 feet: dominantly angular SANDSTONE fragments to 3" in localized clay matrix (brecciated by drilling)	:	S10			34			$\Diamond \times \Diamond \times \Diamond \times \Diamond \times \Diamond$	- - -
	205			SANDY fat CLAY (CH); dark gray to black; moist to wet; mostly fines; some coarse to fine SAND; few coarse to fine subangular GRAVEL; (LANDSLIDE DEPOSIT) 51.7 feet: increased sand and gravel content	:	S11			J4			>><>><	- - -
זייאטאו	385	-55										$\Diamond \langle$	
				(continued)		R	EPOR	T TIT	LE				HOLE ID
		K	(LE	EINFELDER Bright People. Right Solutions.		P	Last (	CO De CT O Chai	UNT el N R BF nce	Y <b>orte</b> RIDGE <b>Gra</b> c	NAME de Byp	ROUTE 101 ass	D-20-010   POSTMILE
		_				B	RIDGE	NUN	NBE	≺	PREPAR D. Ro	KED BY DSS	DATE SHEET 3-26-21 2 of 6

85	
	(continue
KLEINFELDE Bright People. Right Solu	

ELEVATION (ft)	SOBPTH (ft)	Material Graphics	DESCRIPTION	Sample Location	Sample/Run#	Uncorr. Blows per 6 in.	Blows per foot	Recovery (%)	RQD (%)	Drill Rate (min/ft)	Drilling Method Casing Depth	Discontinuity Description  Fracture Identification: (Depth), Dip, Width, Infilling Composition, Weathering, Hardness, Healing, Roughness
380	_		SANDY fat CLAY (CH)		S11			34			× < × < × < × < × < × < × < × < × < × <	- - -
	60 -		CLAYEY SAND with GRAVEL (SC); dark gray to black; wet; mostly coarse to fine SAND; some fines; little coarse to fine subangular GRAVEL; (LANDSLIDE DEPOSIT)  62.0 feet: rapid drilling rate: 62.0' to 67.0'		S12			68			× </td <td>- - -</td>	- - -
375	65 -							71	0		>><	- -
370	_		METAMORPHIC ROCK (ARGILLITE); aphanitic; massive; dark gray to black; decomposed; very soft; very intensely fractured; Trace rounded ARGILLITE, SANDSTONE corestone to 0.5", pervasively sheared to:(SANDY fat CLAY (CL); moist; mostly fines; little fine SAND; trace fine subrounded GRAVEL)		S13						\$\\\ \\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	- - -
	70 -	+ 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	72.8 to 73.4 feet: brecciated SANDSTONE clast (drilling		S14			63	0		X	- - -
365	75 -		disturbance) fine-grained; gray; slightly weathered; hard					80	0		\$\\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\	- -
360	_		SEDIMENTARY ROCK (SANDSTONE); fine-grained; massive; dark gray to black; slightly weathered; moderately hard; very intensely fractured; sheared ARGILLITE matrix, locally (brecciated SANDSTONE and ARGILLITE fragments)		S15						\$\\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\	- - -
	80 -		SEDIMENTARY ROCK (ARGILLITE) Massive; dark gray to black; decomposed; very soft; SANDSTONE corestone to 2"; very intensely fractured/pervasively sheared to: (SANDY fat CLAY with GRAVEL (CH); moist to wet; mostly fines; some fine to coarse SAND; few subangular GRAVEL to 2")		S16			73	0		$\Diamond \times \Diamond \times$	- - -
355	85		(continued)									
			• • •		F	REPOR	T TI	TLE	<u> </u>			HOLE ID
						BORI DIST. 01	CO	UNT		R	OUTE <b>101</b>	D-20-010   POSTMILE
	K	LE	EINFELDER Bright People. Right Solutions.		F	ROJE	СТ С	R B	RIDG	E NAME		
			Signer copie, night solutions.			RIDGE				de Bypa PREPAF	RED BY	
	_				- 1					D. Ro		3-26-21 3 of 6

ELEVATION (ft)	ж ЭОЕРТН (ft)	Material Graphics		Sample Location	Sample/Run#	Uncorr. Blows per 6 in.	Blows per foot	Recovery (%)	RQD (%)	Drill Rate (min/ft)	Drilling Method Casing Depth	Fracture Id Width, Infilling	entinuity Desc entification: (g Compositio s, Healing, R	Depth), Dip, n. Weathering.
			SEDIMENTARY ROCK (ARGILLITE)					66	0		$\triangleright$			
			86.0 to 87.0 feet: SANDSTONE corestones up to 3"; slightly weathered; hard								$\Diamond$			
	-		siightiy weathered, nard								$\Diamond$			_
					S17									_
350														_
											$\Diamond$			
	90		Decomposed; very soft; very intensely fractured; Sample S18 slough					48	0		$\Diamond$			-
	-		3 to slough											_
	-										$\langle \rangle$			_
					S18									
345											$\langle \rangle$			
343														
	95		95.0 to 95.6 feet: slough					83	0		$\Diamond$			_
	-													_
											$\Diamond$			_
					S19						Š			
0.40											$\Diamond$			
340											$\Diamond$			
	100							81	0					-
	-		101.0 fact: decomposed: you coft: you intencely								$\rangle$			_
			101.0 feet: decomposed; very soft; very intensely fractured; visible tectonic shear fabric (locally in unaffected sample fragments)								$\Diamond$			
			ananosta campio nagmonto,		S20						$\Diamond$			
														_
335											$\rangle$			_
	105		105.0 feet: decomposed; soft; very intensely fractured;					80	0		$\Diamond$			_
	-		dry, visible tectonic shear fabric in marginally affected sample fragments								$\Diamond$			_
			· ·											_
					S21						$\searrow$			
			108.0 to 109.0 feet: light gray to gray; slightly weathered; hard; SANDSTONE fragments present (possible SANDSTONE clast brecciated by drilling)								$\Diamond$			
330			SANDSTONE clast brecciated by drilling)								$\Diamond$			
	110		110.0 feet: visible tectonic shear fabric in marginally					51	0					_
			110.0 feet: visible tectonic shear fabric in marginally affected sample fragments; few slightly weathered, hard ARGILLITE corestone up to 3" pervasively sheared to: (SANDY fat CLAY with GRAVEL (CH); dark gray; moist; mostly fines; some fine to coarse SAND, few subrounded fine to coarse GRAVEL)											_
			(SANDY fat CLAY with GRAVEL (CH); dark gray; moist; mostly fines; some fine to coarse SAND, few								$\Diamond$			
			subrounded fine to coarse GRAVEL)		S22									
325														_
	115		(continued)								$\Diamond$			_
			(continued)			EPOR						HC	DLE ID	
					_	BORI IST.		REC UNT			OUTE	POSTMILE	20-010 EA	
	K	LE	INFELDER			01	D	el N	orte		101	12-15.5		15000099
			Bright People. Right Solutions.			Last (	Cha	nce	Gra	de Bypa			T	10
				BRIDGE NUMBER PREPARED BY D. Ross DATE SHI								SHEET 4 of 6		

320

315

310

305

300

295

E:KLF

TEMPLATE:

gINT FILE:

120

125

130

135

DEPTH (ft)

Material Graphics

5	143.0 feet: light gray to gray; slightly weathered; soft to moderately hard fragments of ARGILLITE, fine grained SANDSTONE present	52	5			> > > >			
	(continued)								
				T TITLE ING RECO	RD			DLE ID <b>)-20-0</b> 1	10
	IXI FINEEL DED		DIST. <b>01</b>	COUNTY  Del Nort	1 -	ROUTE 101	POSTMILE <b>12-15.5</b>		EA <b>01</b> ′
	KLEINFELDER Bright People. Right Solutions.			CT OR BRID Chance Gr					
			BRIDGE 	ENUMBER	PREPA <b>D. R</b> o	RED BY DSS		DATE <b>3-26</b>	

Sample Location

DESCRIPTION

SEDIMENTARY ROCK (ARGILLITE)

116.0 feet: few subrounded, slightly weathered, moderately hard ARGILLITE corestones

121.0 feet: gray to light gray; slightly weathered; moderately hard to hard fragment of fine grained SANDSTONE, ARGILLITE present

126.9 feet: dark gray; decomposed; very soft; few slightly weathered moderately hard ARGILLITE corestones up to 3"

131.0 feet: decomposed; soft to very soft; very intensely fractured; visible tectonic shear fabric in marginally affected sample fragments; trace subrounded, slightly weathered, moderately hard to hard ARGILLITE

133.0 feet: pervasively sheared to: (SANDY fat CLAY with GRAVEL (CH))

140.0 feet: decomposed; soft to very soft; very intensely

135.8 feet: light gray; slightly weathered; hard SANDSTONE corestone to 3"

corestones to 2'

fractured

Sample/Run#

S23

S24

S25

S26

S27

Uncorr. Blows per 6 in.

Blows per

%)

Recovery

68 0

81 0

73 0

63 0

76

78 0

RQD (

Drill Rate (min/ft)

Drilling Method Casing Depth

Discontinuity Description

Fracture Identification: (Depth), Dip, Width, Infilling Composition, Weathering, Hardness, Healing, Roughness

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Sample Location ELEVATION (ft) Uncorr. Blows per 6 in. Drill Rate (min/ft) Drilling Method Casing Depth Blows per foot Sample/Run# **Discontinuity Description** Recovery (%) DEPTH (ft) Fracture Identification: (Depth), Dip, Width, Infilling Composition, Weathering, Hardness, Healing, Roughness RQD (%) DESCRIPTION Material Graphics SEDIMENTARY ROCK (ARGILLITE) 78 0 S29 290 150.0 feet: advanced HWT casing to full depth (150') 150 Bottom of borehole at 150.0 ft bgs 285 155 280 160 275 165 170 265 REPORT TITLE
BORING RECORD HOLE ID **D-20-010** COUNTY **Del Norte** ROUTE **101** POSTMILE **12-15.5** DIST. 0115000099 01 KLEINFELDER PROJECT OR BRIDGE NAME Bright People. Right Solutions. **Last Chance Grade Bypass** PREPARED BY **D. Ross** DATE **3-26-21** BRIDGE NUMBER SHEET 6 of 6

**BEGIN DATE** 

COMPLETION DATE

E:KLF

TEMPLATE:

FILE

gINT

LOGGED BY BOREHOLE LOCATION (Lat/Long or North/East and Datum) J.Klamecki 10-20-20 11-6-20 2485835.49 ft / 5983413.964 ft NAD83 RC-20-011 DRILLING CONTRACTOR BOREHOLE LOCATION (Offset, Station, Line) SURFACE ELEVATION **CRUX Subsurface Inc.** 698.52 ft NAVD88 DRILLING METHOD DRILL RIG BOREHOLE DIAMETER **Mud Rotary** Burley 55-1 4.5 in SAMPLER TYPE(S) AND SIZE(S) (ID) SPT HAMMER TYPE HAMMER EFFICIENCY, ERI SPT (1.4"), HQ Core (2.5") Cathead; 140 lbs / 30-inch drop BOREHOLE BACKFILL AND COMPLETION GROUNDWATER DURING DRILLING AFTER DRILLING (DATE) TOTAL DEPTH OF BORING **Not Determined Not Determined** VWP, TDR, Inclinometer; cement-bentonite 302.6 ft Sample Location Rate (min/ft .0 foot **Discontinuity Description** Sample/Run# **Drilling Method** 8 EVATION € Blows per Blows per Fracture Identification: (Depth), Dip, Width, Infilling Composition, Weathering, Hardness, Healing, Roughness Material Graphics Recovery DESCRIPTION DEPTH Casing [ ROD Ē ᆸ CLAYEY SAND with GRAVEL (SC); yellowish brown; moist; little GRAVEL; little fine subangular GRAVEL; mostly coarse to fine SAND; some medium plasticity fines (FILL) 28 2 2 S01 1 SILT (ML); very soft; dark brown; moist; mostly fines; some coarse to fine SAND; trace fine subangular GRAVEL; (SURFACE SOIL/COLLUVIUM) 550 5 5.0 feet: advance HWT casing to 5.0' SILTY CLAY (CL-ML); very soft; dark brown; moist; mostly fines; trace fine GRAVEL; trace SAND (SURFACE SOIL/COLLUVIUM) 33 2 S02 1 545 39 2 S03 3 540 15 66 2 SEDIMENTARY ROCK (SANDSTONE) S04 SEDIMENTARY ROCK (SANDSTONE)
Fine-grained; massive; yellowish brown; decomposed;
very soft; very intensely fractured; with moderately hard
gravel size clasts; (GRAVELLY SILT with SAND (ML);
medium dense; moist; mostly fines; little to some
subangular fine to coarse GRAVEL; little SAND)
(LANDSLIDE DEPOSIT) 8 535 20 17 27 17 S05 10 21.3 feet: moderately weathered; moderately soft; 100 0 very intensely fractured 21.5 feet: equip HQ core C06 50 50/3  $\mathbb{X}|_{\mathbf{S07}}$ 50/3" 100 0 530 (continued) REPORT TITLE **HOLE ID BORING RECORD** RC-20-011 DIST. COUNTY ROUTE POSTMILE 0115000099 **Del Norte** 101 01 12-15.5 *KLEINFELDER* PROJECT OR BRIDGE NAME Bright People. Right Solutions. **Last Chance Grade Bypass** 

**BRIDGE NUMBER** 

PREPARED BY

D. Ross

DATE

3-26-21

SHEE1

1 of 11

HOLE ID

	ELEVATION (ft)	PDEPTH (ft)	Material Graphics		Sample Location	Sample/Run#	Uncorr. Blows per 6 in.	Blows per foot	Recovery (%)	RQD (%)	Drill Rate (min/ft)	Drilling Method Casing Depth	Discontinuity Description  Fracture Identification: (Depth), Dip, Width, Infilling Composition, Weathering, Hardness, Healing, Roughness
04/22/2022		_	-	SEDIMENTARY ROCK (SANDSTONE)					100	0		$\stackrel{\checkmark}{\diamond}$	_
TEO I IED.			::::: 			C08						$\Diamond$	_
7				28.1 feet: yellowish brown; decomposed; very soft; (CLAYEY GRAVEL with SAND (GC); mostly subangular					97	0		$\Diamond$	_
	525	30		fine to coarse GRAVEL; some fine to coarse SAND; little fines)		C09							_
									100	0			_
				32.0 feet: moderately weathered; moderately soft; very intensely fractured 32.5 feet: intensely fractured		C10						> <   	_
			-						100	0		>	_
	520	35 -		35.3 to 36.3 feet: Convolute ARGILLITE interbeds; dark gray; moderately weathered; moderately soft									_
				gray, moderately weathered, moderately soft		C11							_
		_	-	38.0 to 39.9 feet: healed/indurated brecciated zone; fragments of ARGILLITE and SANDSTONE; dark gray								$\diamond$	_
	515	40		and yellowish brown; decomposed; very soft; intensely fractured		C12			100	0		><	_
			-	39.9 feet: moderately weathered; moderately soft 40.6 feet: light yellowish brown; slightly weathered; hard; intensely fractured					100	0			_
[ 7/2 ]						C13						>< 	_
סט זיי טרובב הא וב)בן				43.9 to 44.0 feet: laminated ARGII LITE interheds: gravish					98	0		$\diamond$	_
	510	45		43.9 to 44.0 feet: laminated ARGILLITE interbeds; grayish brown; moderately weathered; moderately hard; intensely fractured 44.0 to 44.5 feet: gray								$\Diamond$	-
NIAS (NEL IN						C14							
2				48.1 feet: dark grayish brown to yellowish brown; highly								><	_
	505			weathered to decomposed; moderately soft to very soft; very intensely fractured; with SANDY lean CLAY infill (CLAYEY GRAVEL (GC); mostly subangular fine GRAVEL; little medium plasticity fines; few fine SAND)					100	0		> <	_
.022.GED		50		GRAVEL; little medium plasticity fines; few fine SAND) 48.6 feet: circulation loss		C15						$\Diamond$	<del>-</del> -
				51.6 feet: 6" interbed of very intensely fractured ARGILLITE; decomposed; very soft 52.2 feet: moderately weathered; moderately hard; very intensely fractured		C16			100	0			_
	500		::::   ::::	53.6 feet: intensely fractured 53.6 to 55.6 feet: very thin convolute ARGILLITE interbeds; moderately weathered; moderately hard; very		C17			90	0		<b>◇</b>	_
48.1 feet: dark grayish brown to yellowish brown; highly weathered to decomposed; moderately soft to very soft; very intensely fractured; with SANDY lean CLAY infill (CLAYEY GRAVEL (GC); mostly subangular fine GRAVEL; little medium plasticity fines; few fine SAND)  48.6 feet: circulation loss  51.6 feet: 6" interbed of very intensely fractured ARGILITE; decomposed; very soft 52.2 feet: moderately weathered; moderately hard; very intensely fractured 53.6 feet: intensely fractured 53.6 feet: wery thin convolute ARGILLITE interbeds; moderately weathered; moderately hard; very  (continued)												<b>✓</b> ■	HOLE ID
i Fire						D	BORII	NG I	REC UNT	Υ	RC	OUTE	RC-20-011 POSTMILE EA
I EINIF L'A I E.		K	LE	EINFELDER Bright People. Right Solutions.		Р		ст о		RIDG	□	01 ss	12-15.5 0115000099
						В	RIDGE				PREPARI D. Ros	ED BY	DATE SHEET 3-26-21 2 of 11

ELEVATION (ft)	л DEPTH (ft)	Material Graphics	DESCRIPTION	Sample Location	Sample/Run#	Uncorr. Blows per 6 in.	Blows per foot	Recovery (%)	RQD (%)	Drill Rate (min/ft)	Drilling Method Casing Depth	Discontinuity Description  Fracture Identification: (Depth), Dip, Width, Infilling Composition, Weathering, Hardness, Healing, Roughness
		  -  -	intensely fractured SEDIMENTARY ROCK (SANDSTONE)					90	0		$\stackrel{\vee}{\wedge}$	_
	_		57.6 feet: intensely fractured		C17						>< >>< ><	_
		:::::  :::::	58.6 feet: gray and light brown; slightly weathered; moderately hard; intensely fractured					100	18			_
495	60	-	59.0 feet: Lost circulation at top of run								$\stackrel{\Diamond}{\sim}$	-
		-			C18						$\stackrel{\searrow}{\sim}$	-
											$\stackrel{\vee}{\wedge}$	-
			63.6 feet: 2" zone, decomposed; (CLAYEY GRAVEL					84	0		$\Diamond$	
490	65 -		with SAND (GC); light bluish gray; mostly fine GRAVEL; some SAND; little fines)								> <	
		:::::  :::::	moderately hard; very intensely fractured with local SANDY lean CLAY fracture infill		C19						$\Diamond$	-
		- - - - - - - - - - - - - - - - - - -									$\Diamond$	-
			68.0 feet: moderate circulation return								$\Diamond$	-
485	70	<del> </del> ::::	68.6 feet: light bluish gray to gray; slightly weathered; hard; intensely fractured		220			100	0		$\Diamond$	-
	70				C20						$\Diamond$	
7		::::  ::::	71.1 to 72.1 feet: decomposed; very soft; very intensely fractured; (Poorly-graded GRAVEL with SAND (GP); mostly angular fine GRAVEL; little SAND)					100	0		$\Diamond$	_
			, , ,		C21						$\Diamond$	-
480		<u> </u> :::::	73.6 to 74.4 feet: decomposed; very soft; very intensely fractured; (CLAYEY GRAVEL with SAND (GC); mostly fine to coarse GRAVEL; little fine to coarse SAND; little					96	0		$\Diamond$	-
	75 -	-	fines) 75.0 feet: advance HWT casing to 75.0'								$\stackrel{\Diamond}{\sim}$	7
			76.4 feet: intensely fractured		C22						$\stackrel{\vee}{\sim}$	
			78.0 to 78.6 feet: decomposed; very soft; intensely fractured; (CLAYEY GRAVEL with SAND (GC); mostly								$\stackrel{}{\diamond}$	_
			fine to coarse GRAVEL; little SAND; little fines)					100	13	4.80	>< <	(78.6'), not healed, slightly rough, Discontinuities at 70, 20, and 60
475	80		SEDIMENTARY ROCK (SANDSTONE) Fine-grained; massive; bluish gray; slightly weathered; hard; intensely fractured; quartz and calcite veining <0.1" thick locally (LANDSLIDE DEPOSIT)	(	C23						><       	degrees
475	_	_	81.1 feet: very intensely fractured; ~2,500 gallons of water used between 48.6' and 81.1' 81.2 feet: moderately fractured		C24			100	24	5.00		F: (81.2'), 45°, open, very thin, clay/iron oxide, slightly weathered, very hard, not healed, smooth
			83.2 feet: very intensely fractured; CLAYEY SAND fracture infill					100	72	4.80	$\Diamond$	F: (83.7'), 35°, open, clean, not healed,
470	85	::::	83.7 feet: moderately fractured		C25						$\Diamond$	slightly rough
			(continued)			EPOR'			OR	 D		HOLE ID <b>RC-20-011</b>
			EINFELDER		D	IST. <b>01</b>	COI	JNT'	Y <b>orte</b>	R	OUTE 1 <b>01</b>	POSTMILE EA 0115000099
			Bright People. Right Solutions.				Chai	nce	Gra	E NAME <b>de Bypa</b> PREPAR		DATE SHEET
							1401	vID⊂[	`	D. Ro	SS	3-26-21 3 of 11

465

460

455

90

95

100

105

110

DEPTH (ft)

Material Graphics

445

440

TEMPLATE:

gINT FILE:

115	, , ,	, ,				
110	(continued)					
				T TITLE ING RECOR	RD	
( KI FINIFE	NFELDER ght People. Right Solutions.		DIST. <b>01</b>	COUNTY  Del Norte	)	ROUTI <b>101</b>
\—— —				CT OR BRIDG Chance Gra		
			BRIDGE	NUMBER	PREF	ARED E
			-		D. F	Ross

Sample Locatior

DESCRIPTION

86.9 to 88.1 feet: very thin ARGILLITE interbeds: dips

88.6 feet: slightly weathered; moderately hard; intensely fractured; equip NQ core for pressure meter test; interval 88.6' to 93.6' 89.2 feet: 1" ARGILLITE interbed: dips 30°; dark gray;

91.2 to 91.4 feet: laminated ARGILLITE interbeds: 10-20°; dark gray; slightly weathered; moderately hard

remnants to 0.5": dips 20° to convolute; dark gray; slightly weathered; moderately hard; mass parts on interbeds; used ~2000 gallons between 81.1' and 93.6' 93.6 feet: advance HWT casing to 85.1'

SEDIMENTARY ROCK (ARGILLITE)
Thinly bedded with very thin interbeds of SANDSTONE;
ARGILLITE: dark gray to black, slightly weathered,
moderately hard, intensely fractured; SANDSTONE: fine
to medium grained, gray, slightly weathered, hard,
intensely fractured; quartz and calcite veining to 0.1"
thick; mass parts on existing bedding planes: dips 20°;
locally convolute (LANDSLIDE DEPOSIT)

SEDIMENTARY ROCK (SANDSTONE)
Fine to medium grained; massive; gray to bluish gray; fresh; hard; moderately fractured; quartz and calcite veining up to 0.1" thick (LANDSLIDE DEPOSIT) 101.2 feet: intensely fractured

111.3 to 112.3 feet: very intensely fractured with local Clayey SAND (SC) infill

114.3 feet: moderately weathered: soft to moderately soft:

103.6 feet: slightly fractured

107.7 feet: moderately fractured

110.4 feet: intensely fractured

93.4 to 95.1 feet: ARGILLITE interbeds, interbed

20-30°; light bluish gray to very dark gray; slightly weathered; hard; intensely fractured

SEDIMENTARY ROCK (SANDSTONE) 85.2 feet: very intensely fractured

slightly weathered; moderately hard

86.1 feet: light bluish gray

Sample/Run#

C25

C26

C27

C28

C29

C30

C31

C32

C33

C34

per 6 in.

Blows

**f**oot %)

Blows per

Recovery

100 72

84 0

100 25

63 0

100 41

100 17

100 35

100 97

90 38

100 12

%

RQD (

Drill Rate (min/ft

4.60

4.80

6.02

4.58

6.90

5.60

3.80

4.00

3.60

 $\Diamond$ 

 $\Diamond$ 

 $\Diamond$ 

 $\Diamond$ 

Drilling Method Casing Depth

 $\Diamond$ 

**Discontinuity Description** Fracture Identification: (Depth), Dip, Width, Infilling Composition, Weathering,

Hardness, Healing, Roughness

F: (84.2'), 70°, open, very thin, manganese, highly weathered, very soft, not healed, slightly rough (78.6'), not healed, slightly rough, Discontinuities at 70, 20, and 60 degrees

F: (100.4'), 20°, tight, clean, not healed, smooth

F: (101.2'), 55°, slightly open, clean, not healed, smooth

F: (101.8'), 60°, moderately open, moderately thin, calcite, slightly weathered, moderately soft, partly healed, slightly rough

F: (102.4'), 60°, moderately open, moderately thin, calcite, slightly weathered, moderately soft, partly healed, slightly rough

F: (103.6'), 15°, slightly open, clean, not healed, slightly rough

F: (105.1'), 30°, slightly open, very thin, calcite, slightly weathered, moderately soft, not healed, slightly rough F: (106.6'), slightly open, very thin,

calcite, slightly weathered, moderately soft, not healed, slightly rough, Orientation varies from 40-45 degrees F: (107.7'), 40°, slightly open, very thin, calcite, slightly weathered, moderately

soft, not healed, slightly rough F: (108.2'), 10°, slightly open, very thin, calcite, slightly weathered, moderately

soft, partly healed, slightly rough F: (108.6'), 10°, slightly open, clean, not healed, slightly rough

HOLE ID RC-20-011 **POSTMILE** 0115000099 12-15.5

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gINT FILE:

ELEVATION (ft) Sample Locatior Drill Rate (min/ft Drilling Method Casing Depth Sample/Run# DEPTH (ft) Blows per Recovery Material Graphics RQD (%) Uncorr. Blows r Hardness, Healing, Roughness very intensely fractured SEDIMENTARY ROCK (SANDSTONE) 100 12 F: (109.2'), 35°, slightly open, very thin, calcite, slightly weathered, moderately 115.6 feet: slightly weathered; moderately hard; soft, partly healed, slightly rough moderately fractured 116.2 feet: intensely fractured F: (109.6'), 5°, slightly open, very thin, C34  $\Diamond$ calcite, slightly weathered, moderately soft, partly healed, slightly rough F: (110.4'), 10°, slightly open, very thin, 118.1 feet: light gray; moderately weathered; moderately soft; very intensely fractured; mass has been partially rehealed but fragments readily with minimal pressure calcite, slightly weathered, moderately 96 0 3.40 soft, partly healed, smooth F: (100.4'), 20°, tight, clean, not healed, 435 120 smooth F: (115.6'), 55°, slightly open, clean, not healed, moderately rough C35  $\Diamond$ 121.6 to 122.9 feet: LANDSLIDE FAILURE ZONE: SANDSTONE; sheared to: (Poorly-graded GRAVEL with CLAY and SAND (GP-GC); medium dense; gray to olive gray; moist; mostly fine subangular to subrounded GRAVEL (SAND; forw.fines). F: (121.6'), 40°, slightly open, very thin, clay, very soft, not healed, smooth  $\Diamond$ F: (122.9'), 80°, open, thick, clay, very soft, not healed, moderately rough SAND; few fines) 100 0 4.00 122.9 feet: fine to coarse grained; massive; gray; slightly weathered; hard; very intensely fractured 430 C36 125 126.1 to 127.1 feet: light gray to olive gray; moderately weathered; moderately soft; very intensely fractured; with Clayey SAND (SC) infill; used ~3,000 gallons of water used between 93.6' and 126.1' 127.5 feet: intensely fractured 4.60 100 30 C37 100 27 4.50 129.0 feet: moderately fractured 425 F: (129.5'), 20°, slightly open, clean, not 130 130.0 to 130.6 feet: LANDSLIDE FAILURE ZONE: (SANDSTONE): sheared to: (Poorly-graded GRAVEL with SAND (GP); medium dense; gray; moist; mostly fine subangular GRAVEL; little coarse to fine SAND; 0.3" Lean CLAY(CL))/ seam at base of zone
130.6 feet: 1" thick calcite vein, intensely fractured
132.0 to 133.6 feet: ARGILLITE interbed remnants up to healed, slightly rough C38 F: (130.0'), 60°, slightly open, very thin, calcite, soft, not healed, slightly rough F: (130.6'), 20°, open, thin, clay, very soft, not healed, smooth 100 0 5 67 1" thick: dips 30° to convolute; dark gray; slightly weathered; moderately hard; intensely fractured; mass parts readily on bedding planes C39 135 5.22 100 25 135.6 feet: moderately fractured 136.1 feet: intensely fractured C40 137.8 to 138.2 feet: ARGILLITE interbeds, interbed remnants up to 0.5": dips  $5^\circ;$  dark gray; slightly weathered; moderately hard; very intensely fractured 100 0 6.00 C41 415 SEDIMENTARY ROCK (ARGILLITE); thinly bedded with very thin interbeds of SANDSTONE; ARGILLITE: dark gray to black, slightly weathered, moderately hard, moderately to intensely fractured; SANDSTONE: fine grained, gray, slightly weathered, hard, moderately to intensely fractured, trace quartz and calcite veining (LANDSLIDE DEPOSIT) 140 100 25 7.94 C42 94 0 7.35 C43 5.68 100 0 SEDIMENTARY ROCK (SANDSTONE) Fine-grained; massive; slightly weathered; hard; very intensely fractured; abundant chaotic quartz and calcite C44 410 (continued) REPORT TITLE HOLE ID E:KLF RC-20-011 **BORING RECORD** DIST COUNTY ROUTE POSTMILE TEMPLATE: 0115000099 **Del Norte** 101 12-15.5 KLEINFELDER PROJECT OR BRIDGE NAME Last Chance Grade Bypass Bright People. Right Solutions. **BRIDGE NUMBER** PREPARED BY D. Ross 3-26-21 5 of 11

per 6 in.

DESCRIPTION

%)

**Discontinuity Description** 

Fracture Identification: (Depth), Dip,

Width, Infilling Composition, Weathering,

ELEVATION (ft	45 50EPTH (ft)	Material Graphics	DESCRIPTION	Sample Location	Sample/Run#	Uncorr. Blows per 6 in.	Blows per foot	Recovery (%)	RQD (%)	Drill Rate (min/ft)	Drilling Method Casing Depth	Discontinuity Description Fracture Identification: (Depth), Dip, Width, Infilling Composition, Weathering, Hardness, Healing, Roughness						
			veining to 0.2" thick, localized ARGILLITE clasts to 0.2" throughout unit (LANDSLIDE DEPOSIT) SEDIMENTARY ROCK (SANDSTONE) 145.5 feet: intensely fractured; ~8,000 gallons used between 120.1' and 145.5'; no circulation return		C45			100	0	5.32	> <u>`</u>	- - -						
405	150 -			(	C46			96	27	4.80	X <x<x<x< td=""><td>- - -</td></x<x<x<>	- - -						
400	155 —		152.5 feet: moderately fractured 153.3 feet: intensely fractured 153.8 feet: moderately fractured 154.6 feet: intensely fractured 156.4 feet: moderately fractured		C47			100	65	5.80	>><>><>>	F: (153.3'), 50°, slightly open, very thin, calcite, slightly weathered, soft, partly healed, smooth F: (153.8'), 50°, slightly open, very thin, calcite, slightly weathered, moderately soft, not healed, slightly rough F: (154.8'), 40°, slightly open, very thin, calcite, slightly weathered, moderately soft, not healed, slightly rough F: (156.4'), 60°, slightly open, very thin, calcite, slightly weathered, moderately soft, partly healed, slightly rough						
395	160		159.3 feet: intensely fractured		 C48			100	37	4.70	\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	calcite, slightly weathered, moderately soft, partly healed, slightly rough F: (157.1'), 40°, slightly open, very thin, calcite, slightly weathered, moderately soft, partly healed, slightly rough F: (158.6'), 60°, slightly open, very thin, calcite, moderately weathered, soft, not healed, smooth F: (159.2'), 40°, slightly open, clean, not						
390	165	-	163.6 feet: moderately fractured		C49			100	90	4.00	>	healed, slightly rough F: (160.6'), 35°, slightly open, very thin, calcite, moderately weathered, soft, not healed, slightly rough F: (161.4'), 80°, slightly open, very thin, calcite, moderately weathered, soft, not healed, slightly rough F: (161.9'), 60°, slightly open, clean, not						
	-		166.1 feet: ~4,000 gallons water used between 145.5' and 166.1'  168.0 feet: intensely fractured  168.8 feet: moderately fractured	(	C50			100		5.10	>><>><	healed, smooth F: (164.2'), 70°, slightly open, very thin, calcite, slightly weathered, moderately soft, partly healed, slightly rough F: (165.1'), 0°, slightly open, clean, not healed, slightly rough F: (166.1'), 30°, tight, clean, not healed,						
385	170		169.5 feet: slightly fractured 170.7 feet: intensely fractured 171.0 feet: 0.5" thick calcite vein: dips 80-90° 171.3 feet: slightly fractured 172.6 feet: moderately fractured		C51						X <x<x<< td=""><td>slightly rough F: (167.1'), 60°, slightly open, very thin, calcite, slightly weathered, moderately hard, partly healed, slightly rough F: (168.2'), 65°, slightly open, very thin, calcite, slightly weathered, moderately hard, partly healed, rough F: (168.8'), 35°, slightly open, very thin,</td></x<x<<>	slightly rough F: (167.1'), 60°, slightly open, very thin, calcite, slightly weathered, moderately hard, partly healed, slightly rough F: (168.2'), 65°, slightly open, very thin, calcite, slightly weathered, moderately hard, partly healed, rough F: (168.8'), 35°, slightly open, very thin,						
380	175		174.4 feet: intensely fractured (continued)		C52	EPOR	T TIT	88	33	4.20	$\langle \diamond \times \diamond \rangle$	r. (166.6), 35 , slightly open, very thin, calcite, slightly weathered, soft, partly healed, slightly rough —						
	KLEINFELDER Bright People. Right Solutions.						NG I COI De CT O Chai	REC UNT' el No R BF	Y <b>orte</b> RIDG <b>Gra</b>	R	ED B	RC-20-011   EA						

176.4 to 170.7 fact LANDSLIDE FALURE ZONE: SAMDSTONE and ARCILLUTE interved to (Poorty-glader gary, most; most) fine subanquier GRAYEL, title fines; two consents to fine SAND)   179.2 feet; 37 Clayey SAND (SC) filled shear   179.2 feet; 37 Clayey SAND (SC) f	ELEVATION (ft)	SOEPTH (#)	Material Graphics		Sample Location	Sample/Run#	Uncorr. Blows per 6 in.	Blows per foot	Recovery (%)	RQD (%)	Drill Rate (min/ft)	Drilling Method Casing Depth	Discontinuity Description  Fracture Identification: (Depth), Dip, Width, Infilling Composition, Weathering, Hardness, Healing, Roughness
179.2   feet: 3" Clayey SAND (SC) filled shear   179.2   feet: 3" Clayey SAND (SC) filled shear   180.9 to 181.8   feet: ARSILLITE Interbeds up to 0.5"   180.9 to 181.8   feet: ARSILLITE Interbeds up to 0.5"   180.9 to 181.8   feet: ARSILLITE Interbeds up to 0.5"   180.9 to 181.8   feet: ARSILLITE Interbeds up to 0.5"   180.9 to 181.8   feet: ARSILLITE Interbeds up to 0.5"   180.9 to 181.8   180.9 to 181.8   feet: ARSILLITE Interbeds up to 0.5"   180.9 to 181.8   180.9 to 181		_		SANDSTONE and ARGILLITE sheared to: (Poorly- graded GRAVEL with CLAY (GP-GC); loose; gray to dark gray; moist; mostly fine subangular GRAVEL; little	C	C52			88		5.60	\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	calcite, slightly weathered, moderately hard, partly healed, slightly rough F: (172.6'), 30°, slightly open, very thin, calcite, slightly weathered, moderately soft, partly healed, slightly rough F: (172.9'), 10°, slightly open, very thin,
185	375	180		180.9 to 181.8 feet: ARGILLITE interbeds up to 0.5": dips 10-20°; dark gray to black; slightly weathered; moderately hard; intensely fractured; mass parts readily	C	C53			30		3.00	$\Diamond \times \Diamond \times \Diamond \times \Diamond \times \Diamond$	F: (173.4'), 40°, slightly open, very thin, calcite, slightly weathered, moderately soft, partly healed, slightly rough F: (179.7'), 70°, slightly open, very thin,
192.0 feet: very intensley fractured   192.9 feet: moderately weathered; moderately hard   192.9 feet: moderately weathered; moderately hard   195.0 feet: intensely fractured   195.0 feet: intensely fractured   195.0 feet: very intensely fractured   196.6 to 200.9 feet: ARGILLITE interbeds, interbed remnants up to 0.5°: convolute and randomly oriented with general trend: dips 50°; dark gray, slightly weathered; moderately soft to moderately hard; very intensely fractured; mass parts readily on planes   195.0 feet: Difficult drilling   195.0 feet: Diffic	370	185 -		185.8 feet: 2" ARGILLITE interbed: dips 15°; dark gray; slightly weathered; moderately hard; intensely fractured 186.3 feet: 1" ARGILLITE interbed: dips 10-15°; dark gray; slightly weathered; moderately hard; intensely	(	C54			100	17	5.70	X0X0X0X0X	F: (184.5'), 90°, slightly open, clean, not healed, slightly rough F: (184.9'), 50°, slightly open, clean, not
192.9 feet: moderately weathered; moderately hard   192.9 feet: moderately weathered; moderately hard   195.0 feet: intensely fractured   197.6 feet: very intensely fractured   198.6 to 200.9 feet: ARGILLITE interbeds, interbed remnants up to 0.5°: convolute and randomly oriented with general trend: dips 50°: dark gray, slightly weathered; moderately soft to moderately hard; very intensely fractured; mass parts readily on planes   198.5 to 200.5 feet: Difficult drilling 204.0 to 206.2 feet: localized SANDY lean CLAY (CL)   192.0   193	365	190	-		(	C55						\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	- - - -
197.6 feet: very intensely fractured  198.6 to 200.9 feet: ARGILLITE interbeds, interbed remnants up to 0.5": convolute and randomly oriented with general trend: dips 50°: dark gray; slightly weathered; moderately soft to moderately hard; very intensely fractured; mass parts readily on planes  C58  C58  C59  87.5 0 8.75  C60  C61  0 0 10.00  C62  C62  C61  DIST. COUNTY  ROUTE POSTMILE EA	360	195	=	192.0 feet: very intensley fractured 192.9 feet: moderately weathered; moderately hard	(	C56						$\Diamond \times \Diamond \times \Diamond$	- - -
355 200 198.6 to 200.9 feet: ARGILLITE interbeds, interbed remnants up to 0.5": convolute and randomly oriented with general trend: dips 50°; dark gray; slightly weathered; moderately soft to moderately hard; very intensely fractured; mass parts readily on planes  C58   C58   C58   C58   C58   C59   C60   C61   C61   C61   C61   C61   C61   C62   C62   C62   C62   C62   C62   C62   C63   C64   C64   C64   C64   C64   C65   C65			-	,	C	C57						×	- -
202.5 feet: Difficult drilling 204.0 to 206.2 feet: localized SANDY lean CLAY (CL) fracture infill  (continued)  REPORT TITLE BORING RECORD DIST. COUNTY ROUTE POSTMILE EA	355	200 -	-	198.6 to 200.9 feet: ARGILLITE interbeds, interbed remnants up to 0.5": convolute and randomly oriented with general trend: dips 50°; dark gray; slightly weathered: moderately soft to moderately hard; very								\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	- - -
REPORT TITLE BORING RECORD DIST. COUNTY ROUTE POSTMILE EA	350	205		204.0 to 206.2 feet: localized SANDY lean CLAY (CL)	(	C60 C61			0	0	10.00	, , , , , , , ,	  
BORING RECORD RC-20-011  DIST. COUNTY ROUTE POSTMILE EA		200-		(continued)									
							BORI	NG	REC				RC-20-011
KLEINFELDER		K	(LE	` EINFELDER			01	D	el N	orte		101	POSTMILE EA 0115000099
Bright People. Right Solutions.  Last Chance Grade Bypass  BRIDGE NUMBER PREPARED BY DATE SHEET							Last (	Cha	nce	Gra	de Byp PREPA	ASS RED BY	DATE SHEET 3-26-21 7 of 11

DEPTH (ft)

Material Graphics

			C64						_
345	210								_
		210.6 to 211.0 feet: ARGILLITE interbed remnants up to 0.5": convolute; dark gray; slightly weathered; moderately hard; very intensely fractured	C65		100	0	5.75	→	-
	——————————————————————————————————————	213.7 to 214.2 feet: SANDSTONE sheared to: (Poorly-graded GRAVEL with CLAY (GP-GC); dark (gray; loose; mostly GRAVEL; little fines; few coarse to	C66		100	0	7.11	\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	-
340	215	fine SAND) SEDIMENTARY ROCK (ARGILLITE); thickly bedded;	C67		60	0	5.00		-
		dark gray to black; moderately weathered; moderately hard; very intensely fractured; mass appears locally brecciated and rehealed (LANDSLIDE DEPOSIT) ~2,000 gallons water used between 206.9' and 214.5 feet; advance HWT casing to 214.5'	C68		100	0	5.79	→ X	_ _
		SEDIMENTARY ROCK (SANDSTONE) Fine-grained; massive; gray to bluish gray; slightly weathered; moderately hard; intensely fractured; chaotic	C69		100	0	4.17	$\Diamond$	_
335	220	quartz and calcite veining (LANDSLIDE DEPOSIT)  219.6 feet: 2" ARGILLITE interbed remnant: dips 30°;			100	0	5.69	$\rightarrow$	_
		dark gray; slightly weathered; moderately hard	C70						_
		222.2 feet: 4" ARGILLITE interbed: dips 10°; dark gray; slightly weathered; moderately hard; intensely fractured; $\sim\!9,\!300$ gallons water used between 214.5' and 222.2'	C71		100	0	5.26	$\Diamond$	- -
330	225	224.8 to 226.0 feet: local SANDY lean CLAY (CL) fracture infill	C/ I					$\Diamond$	_
			C72		0		6.36		
		227.1 to 228.9 feet: ARGILLITE interbeds, interbed remnants up to 2": convolute; dark gray to black; slightly weathered; moderately hard; intensely fractured with local SANDY lean CLAY (CL) infill	C73		100		7.67		_
325	230		C74		\100/	\_0_/	5.67	$\Diamond$	_
		230.1 to 230.4 feet: LANDSLIDE FAILURE ZONE: SANDSTONE and ARGILLITE sheared to: (CLAYEY SAND with GRAVEL (SC); loose; dark gray; moist; mostly coarse to medium SAND; little medium plasticity	074						F: (230.4'), 30°, open, thick, sand/clay, very soft, not healed, smooth
		fines; little fine subangular GRAVEL) SEDIMENTARY ROCK (SANDSTONE) Fine to medium grained; massive; bluish gray; slightly weathered; hard; intensely fractured; chaotic quartz and calcite veining (LANDSLIDE DEPOSIT)	C75		100	33	4.75	$\rangle\langle$	F: (232.2'), 70°, slightly open, clean, not healed, slightly rough F: (232.8'), 50°, slightly open, clean, not
320		234.4 to 236.3 feet: ARGILLITE interbeds, interbed	C76		100	17	5.00	$\nearrow$	healed, slightly rough
	235	(continued)		'				, ,	
				PORT TI		OR	D		HOLE ID RC-20-011
	121 -		O.		UNT <b>el N</b>			ROUTE <b>101</b>	POSTMILE EA 0115000099
\	KLE	EINFELDER Bright People. Right Solutions.		OJECT C					
		· · · · · · · · · · · · · · · · · · ·		IDGE NU				RED BY	DATE SHEET <b>3-26-21 8 of 11</b>

Sample Location

**DESCRIPTION** 

SEDIMENTARY ROCK (SANDSTONE)

206.9 feet: ~12,000 gallons water used between 166.1' and 206.9'

Sample/Run#

C63

Uncorr. Blows per 6 in.

Blows per foot

Recovery (%)

100 0

97

RQD (%)

0

Drill Rate (min/ft)

8.42

6.62

Drilling Method Casing Depth

Discontinuity Description

Fracture Identification: (Depth), Dip, Width, Infilling Composition, Weathering, Hardness, Healing, Roughness

ELEVATION (ft)	235 DEPTH (ft)	Material Graphics		Sample Location	Sample/Run#	Uncorr. Blows per 6 in.	Blows per foot	Recovery (%)	RQD (%)	Drill Rate (min/ft)	Drilling Method Casing Depth	
			remnants up to 3": convolute and randomly oriented; dark gray to black; slightly weathered; moderately hard;		C76			100 100	17 38	5.50	$\rightarrow$	F: (230.4'), 30°, open, thick, sand/clay, very soft, not healed, smooth
			intensely fractured SEDIMENTARY ROCK (SANDSTONE)					.00		0.00	$\langle \rangle$	
		<del> </del> ::::			C77						$\Diamond$	
	-										$\Diamond$	-
	-		238.6 feet: fine to medium grained; massive; light gray to bluish gray; slightly weathered; moderately hard;					100	60	5.12	$\rightarrow$	- (200 01) 200 11 11
315	240	<u>-</u>  ::::	moderately fractured								$\sim$	F: (239.2'), 30°, slightly open, clean, not healed, slightly rough
		<u> </u> :::::			C78						$\Diamond$	
			241.2 feet: 2" ARGILLITE interbed: convolute; dark gray; slightly weathered; moderately soft; intensely fractured								$\Diamond$	F: (241.2'), 5°, slightly open, thin, slightly weathered, moderately soft, not healed,
												slightly rough
			242.8 to 243.7 feet: ARGILLITE interbeds, interbed remnants up to 1": convolute; dark gray to black; slightly weathered; moderately hard; intensely fractured					100	0	5.61		
310		  :::::	weathered, moderately flatd, intensely fractured								$\searrow$	٦
0.0	245	-			C79						$\Diamond$	Ⅎ
		<del>-</del>  ::::									$\Diamond$	-
	-	<u> </u>	SEDIMENTARY ROCK (SANDSTONE); thinly bedded with thin interbeds ARGILLITE; SANDSTONE: fine to					100	0	7.06	$\Diamond$	-
	-	::::  ::::	medium grained, gray to dark gray, slightly weathered, moderately hard, intensely fractured; ARGILLITE: dark		C80							_
		<u> </u> ::::	gray to black, slightly weathered, moderately hard, intensely fractured: interbeds, remnants convolute and					100	0	4.69	$\nearrow 4$	_
305	250	<u> </u> :::::	randomly oriented; trace chaotic quartz and calcite veining (LANDSLIDE DEPOSIT)								$\rightarrow$	_
		::::	249.0 feet: void; circulation loss		C81						$\Diamond$	
		::::	SEDIMENTARY ROCK (SANDSTONE); fine-grained;									
		  :::::	thinly bedded; gray to dark gray; slightly weathered; moderately hard; intensely fractured; chaotic quartz and					100	9	5.00	$\Diamond$	
		  :::::	calcite veining (ĹANDSLIĎE DEPOŚIT)									7
		<b>∃</b> ∷∷:			C82						$\sim$	-
300	255	-	254.8 feet: 0.3" Lean CLAY (CL) infilled failure plane								$\Diamond$	F: (254.8'), 45°, slightly open,
			255.5 feet: 3" ARGILLITE interbed: 30°; dark gray; slightly weathered; moderately hard; intensely fractured								$\Diamond$	moderately thin, clay, very soft, not healed, smooth —
		<b>.</b>						66	0	5.56	$\Diamond$	_
		<u> </u> :::::	257.1 feet: 1" SANDY lean CLAY (CL) infilled failure plane		C83							_
295	200	: : : :			C84			100	46	4.55		F: (259.3'), 30°, slightly open, very thin,
	260		SEDIMENTARY ROCK (ARGILLITE) Very thinly to laminated with very thin to laminated					92	0	6.15		argillite, slightly weathered, moderately soft, not healed, smooth
			interbeds of SANDSTONE; ARGILLITE: dark gray to black, slightly weathered, moderately soft to moderately hard, very intensely fractured; SANDSTONE:		C85						$\Diamond$	F: (259.8'), 30°, slightly open, very thin, — argillite, slightly weathered, moderately
			fine-grained, gray, slightly weathered, moderately hard, very intensely fractured, trace chaotic quartz and calcite		၁၀၁							soft, not healed, smooth
	-		veining; rock mass in unit is moderately hard but extremely brittle (FRANCISCAN COMPLEX; BROKEN	Ħ				95	0	6.67	$\nearrow 4$	+
			FORMATION)		C86						$\langle \rangle$	4
290	265	E	(codi n								$\downarrow \diamondsuit$	_
			(continued)			EPOR				_		HOLE ID
0						BORI IST.		REC UNT			ROUTE	RC-20-011 POSTMILE EA
	K	(LE	EINFELDER			01	D	el N	orte		101	12-15.5 0115000099
			Bright People. Right Solutions.			Last (	Cha	nce	Gra	de Byp PREPAI	ass	/ DATE SHEET
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ELEVATION (ft)	26DEPTH (ff)	Material   Graphics	DESCRIPTION	Sample Location	Sample/Run#	Uncorr. Blows per 6 in.	Blows per foot	Recovery (%)	RQD (%)		Drilling Method Casing Depth	Discontinuity Description  Fracture Identification: (Depth), Dip, Width, Infilling Composition, Weathering, Hardness, Healing, Roughness
	_		SEDIMENTARY ROCK (ARGILLITE)		C87			100	0	5.94	×	- - -
285	270		SEDIMENTARY ROCK (SANDSTONE); fine-grained; moderately to thinly bedded; gray to dark gray; slightly weathered; moderately hard; moderately fractured; trace		C88			100	55	4.60	> \ \ \ \ \ \ \	F: (270.1'), 50°, slightly open, very thin, clay, very soft, not healed, slightly rough
280			chaotic quartz and calcite veining (FRANCISCAN COMPLEX; BROKEN FORMATION) 270.9 to 271.5 feet: ARGILLITE interbeds to 0.3": dips 5-10°; dark gray to black; slightly weathered; moderately hard; moderately to intensely fractured; mass readily parts on bedding planes 273.1 feet: slightly fractured					100	51	4.33	>	F: (271.5'), 10°, tight, clean, not healed, smooth F: (272.0'), 60°, slightly open, very thin, calcite, slightly weathered, moderately hard, partly healed, slightly rough F: (272.9'), 0°, tight, clean, not healed, smooth
	275 -		SEDIMENTARY ROCK (ARGILLITE); thinly bedded with thin to very thin interbeds of SANDSTONE; ARGILLITE: dark gray to black, slightly weathered, moderately hard, very intensely fractured; SANDSTONE: fine grained, gray, slightly weathered, moderately hard, very intensely fractured; chaotic quartz and calcite veining; mass parts readily on bedding planes 276.0 feet: getting approximately 80% return on circulation		C89						>X	F: (274.5'), 55°, slightly open, very thin, calcite, slightly weathered, moderately hard, partly healed, moderately rough  F: (277.0'), 90°, slightly open, clean, not healed, moderately rough
275	280	-	SEDIMENTARY ROCK (SANDSTONE) Fine to medium grained; thickly bedded; gray to bluish gray; slightly weathered; moderately hard; moderately fractured; planar to chaotic quartz veining less than 0.1" thick 278.3 feet: intensely fractured; ~3,500 gallons water used between 222.2' and 278.3' 279.6 feet: 2" ARGILLITE interbed: dips 0-10°; dark		C90			100	58	5.77	>	F: (278.5'), 20°, slightly open, clean, not healed, slightly rough  F: (280.4'), 25°, slightly open, very thin, calcite, slightly weathered, very soft,
270		-	gray; slightly weathered; moderately hard; intensely fractured 281.4 feet: slightly fractured 282.6 feet: intensely fractured 283.5 feet: moderately fractured					100	77	5.20	> > > > > > > > >	partly healed, slightly rough F: (281.4'), 40°, slightly open, very thin, silt, very soft, not healed, smooth F: (282.6'), 50°, slightly open, very thin, calcite, slightly weathered, moderately soft, partly healed, slightly rough F: (283.5'), 20°, slightly open, very thin,
	285 -	-	284.7 feet: slightly fractured 285.9 feet: intensely fractured 286.5 feet: moderately fractured		C91							silt, very soft, not healed, slightly rough F: (284.0'), 40°, slightly open, very thin, calcite, slightly weathered, moderately hard, partly healed, slightly rough F: (284.5'), 45°, slightly open, clean, not healed, smooth
265	290		288.6 feet: slightly fractured					100	80	5.60	♦ ♦ ♦ ♦ ♦	F: (285.9'), 20°, slightly open, clean, not healed, smooth F: (286.9'), slightly open, clean, not healed, slightly rough, Orientation varies from 80-90 degrees F: (288.6'), 10°, slightly open, clean, not healed, slightly rough
260			SEDIMENTARY ROCK (SANDSTONE) Thinly bedded with thin interbeds of ARGILLITE; SANDSTONE: fine grained, gray, slightly weathered to moderately weathered, moderately hard, very intensely		C92			72	0	6.82	$\langle \Diamond \times \Diamond $	F: (291.6'), 50°, slightly open, very thin, calcite, slightly weathered, moderately hard, partly healed, slightly rough F: (292.6'), 45°, slightly open, clean, not healed, smooth
260	295	::::	fractured; ARGILLITE: dark gray to black, slightly  (continued)						$\Diamond$			
	F	(LE	EINFELDER Bright People. Right Solutions.		P		NG I CO De CT O Chai	REC UNT el N R BF nce	Y <b>orte</b> RIDG <b>Gra</b>	R	ED BY	HOLE ID RC-20-011  POSTMILE 12-15.5 EA 0115000099  DATE SHEET 3-26-21 10 of 11

ELEVATION (ft)	(#) 295 295	. Material Graphics	DESCRIPTION	Sample Location	Sample/Run#	Uncorr. Blows per 6 in.	Blows per foot	Recovery (%)	RQD (%)	Drill Rate (min/ft)	Drilling Method Casing Depth	Discontinuity Description  Fracture Identification: (Depth), Dip, Width, Infilling Composition, Weathering, Hardness, Healing, Roughness
			weathered, moderately hard, very intensely fractured; quartz and calcite veining up to 0.1", mass is brittle and readily fragments SEDIMENTARY ROCK (SANDSTONE)		093 094			72 85	0	6.07	>X	- - -
255	300	-	298.6 to 299.1 feet: black; decomposed; very soft pervasively sheared to: (SANDY lean CLAY (CL); stiff; mostly fines; some coarse to fine SAND; trace subrounded fine GRAVEL); visible polished shear surfaces and shear structure		095 096			60 40	0	12.00 6.57	\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	- - -
250	305		302.3 to 302.6 feet: black; decomposed; very soft pervasively sheared to: (SANDY lean CLAY (CL); stiff; mostly fines; some coarse to fine SAND; trace subrounded fine GRAVEL) 302.6 feet: ~1,500 gallons water used between 278.3' and 302.6'; advanced HWT casing to full depth (302.6') Bottom of borehole at 302.6 ft bgs									
												- - -
245	310 -											<b>-</b> - -
240	315	-										- - -
	_											- - -
235	320 -											<b>-</b> - -
	325					EPOR						HOLE ID
	K	CLE	EINFELDER Bright People. Right Solutions.		D (P B	BORI IST. 01 ROJE(	OCT OCHAI	REC UNT el No R BF nce	Y <b>orte</b> RIDG <b>Gra</b>	R	RED BY	RC-20-011   POSTMILE

LOGG R. R DRILLI Greç	ude Ing (	d CONT		BEGIN DATE COMPLETION DATE 11-5-20 CTOR	BOREHOL 2488457 BOREHOL	7.4	28 f	t / 598	344	6.1	53 ft	NAD8		tum)		0-013 E ELEVATION ft NAVD88	
DRILLI <b>Rota</b>			OD		DRILL RIG										BOREHO <b>4.5 in</b>	LE DIAMETER	
SAMPI	LER T	TYPE		AND SIZE(S) (ID) Core (2.5")	SPT HAMN				RO-ir	nch	dror	<b>,</b>			HAMMER	EFFICIENCY,	ERi
BORE	HOLE	BAC	KF	ILL AND COMPLETION inometer; cement-bentonite		NΑ		DURI	NG [		ING	AFTE	R DRILL	ING (DATE)	TOTAL D	EPTH OF BOF	RING
ELEVATION (ft)	DEPTH (ft)			DESCRIPTION		Sample Location		Uncorr. Blows per 6 in.	Blows per foot	Recovery (%)	RQD (%)	Drill Rate (min/ft)	Drilling Method Casing Depth	Fractur Width, Inf	iscontinuity e Identifica illing Comp	Description tion: (Depth), I osition, Weath ing, Roughnes	ering,
830	0			ASPHALT CONCRETE (6") SANDY lean CLAY (CL); stiff; dark yellowish moist; some fine SAND; few fines; subangula angular GRAVEL (FILL)	r to	-	C01			20	0	1.1					- - -
825	5			SEDIMENTARY ROCK (SANDSTONE); fine-g sand; massive; gray; moderately weathered; he intensely fractured; very thin iron and manga infilling; some chaotic 0.06 to 0.13" thick qual (LANDSLIDE DEPOSIT)  Poorly-graded SAND with CLAY AND GRAV (SC); very dense; olive brown; moist; mostly medium SAND; some fine to medium GRAVE medium plasticity fines; (LANDSLIDE DEPO	ard; very nese rtz veining; EL fine to EL; few SIT)	X	S02	29 20 34	54	33	0	3.4	$\Diamond \times \Diamond \times \Diamond \times \Diamond$				- -
820	10			SEDIMENTARY ROCK (SANDSTONE); fine-g sand; massive; gray; moderately weathered; very intensely fractured; (LANDSLIDE DEPO	hard; OSIT)	V	C03	12 15	30				\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\				- -
815	15			some fine to medium angular GRAVEL; trace plasticity fines; (LANDSLIDE DEPOSIT) SEDIMENTARY ROCK (SANDSTONE); fine-g sand; massive; gray; intensely to moderately weathered; moderately hard to hard; very intefractured; (LANDSLIDE DEPOSIT)	low 		S04 C05	15		46	0	5.4	$\Diamond \Diamond $				
			⇉	SEDIMENTARY ROCK (ARGILLITE); massidark gray; decomposed; soft; very intensely f (SANDY lean CLAY with GRAVEL (CL); med moist; little fine to coarse SAND; little fine to rangular GRAVEL); (FRANCISCAN COMPLEBROKEN FORMATION)	lium stiff; nedium	X	S06	4 5 14	19	33 65	0	4.4	\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\				
810	20		-1-1-1-1	SEDIMENTARY ROCK (SANDSTONE) Fine-grained sand; massive; gray; intensely to moderately hard to hard; very intensely fractu	weathered;		C07			NID			>> >> -> ->				
	05			20.5 to 20.8 feet: ARGILLITE interbed; massi decomposed; soft; very intensely fractured 20.8 feet: intensely to moderately weathered moderately hard to hard; very thin to moderat CLAY and SILT infill; few chaotic 0.1" thick queining; (FRANCISCAN COMPLEX; BROKE FORMATION) 24.5 to 25.5 feet: moderately weathered; hard	ive; gray; tely thin uartz N		<u>S08</u>			66	0	5					
	-25-			(continued)				SEE SE					, ,		110. 2		
	F	KL	E	EINFELDER Bright People. Right Solutions.			F	Last	NG CD CT C	REC UNT el N OR BE nce	Y <b>orte</b> RIDG <b>Gra</b>	E NAME	oass	POSTMIL <b>12-15.</b>	5	EA <b>01150000</b>	
							- 1	RIDGE	: NU	INIRF	Κ.	<b>D. R</b>	RED BY		DATE <b>6-1</b>	SHEE 1-21 1 0	

805

800

DEPTH (ft)

30

35

Material Graphics

795		: : : :		]											
		H===	SEDIMENTARY ROCK (ARGILLITE) Massive; very dark gray; intensely weathered; soft to moderately soft; intensely fractured				40	0	5.6						-
			moderately soft: intensely fractured				.	Ĭ	0.0						
			36.0 to 36.2 feet: decomposed; very soft; very							$\Diamond$					
			Intensely fractured; (SANDY lean CLAY with												
			coarse SAND; few angular GRAVEL);							$\Diamond$					
		<u> </u>	moderately sort; intensely fractured 36.0 to 36.2 feet: decomposed; very soft; very intensely fractured; (SANDY lean CLAY with GRAVEL (CL); medium stiff; moist; some fine to coarse SAND; few angular GRAVEL); (FRANCISCAN COMPLEX; BROKEN FORMATION) 36.2 to 36.5 feet: SANDSTONE interbed; fine-grained	C12	2					$\triangleright \triangleleft$					
		===	sand; massive; gray							$\Diamond$					
	40		36.5 to 41.0 feet: very intensely fractured							$\triangleright \triangleleft$					
790										$\Diamond$					
		H===					80	0	8.5	$\rightarrow \bigcirc$					_
							00	١	0.5	$\Diamond$					
		H===	41.5 to 43.5 feet: decomposed; soft to very soft;	C13											
			intensely fractured; pervasively sheared to: (GRAVELLY lean CLAY with SAND (CL); stiff; moist;		3					$\Diamond$					
			I some fine to coarse angular GRAVEL: little fine to							$\triangleright \triangleleft$					
		<u> </u>	coarse SAND)				20	0	1.1						
			43.5 to 53.7 feet: intensely weathered; soft; very												
	45	<u> </u>	intensely fractured	C14	4					$\Diamond$					
785			44.0 feet: circulation loss (60 gallons)							$\triangleright \triangleleft$					
		H			-		52	0	3.4						_
							52	١	3.4						
		H <del></del> -	46.0 feet: circulation loss (60 gallons)	C15	_					$\Diamond$					_
					5										
		T								$\Diamond$					
							NR	0	4.4	$\nearrow$					
		<del> </del>								$\Diamond$					
	50			C16	3										
780										$\Diamond$					
		H===		H	7 50/6"	DEE	NID			-><					_
				<u>\S17</u>	50/6	KEF	100	0	3.2	-{>}					
		H					100	١	0.2						-
				C18	3										
							88	0	3.9						
				C19	9										
	<b>-</b> 55 <b>-</b>	<u> </u>	53.7 to 59.0 feet: moderately weathered; soft							$\Diamond$					
			(continued)												
					REPOR	TIT	LE					DLE ID	40		
				-	BORI					OUTE		RC-20-0			
	<i>(</i>				DIST. <b>01</b>		TNL'	r orte		101	POSTMILE <b>12-15.5</b>		A 011 <i>i</i>	5000099	
(		KLE	INFELDER	-					E NAME		12-10.0		<u> </u>	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	$\dashv$
			Bright People. Right Solutions.						de Byp						
	1				BRIDGE				PREPA	RED BY		DATE		SHEET	
									D. Ro	SS		6-11-	21	2 of 5	<u> </u>

Sample Location

DESCRIPTION

25.5 to 26.4 feet: intensely weathered; moderately hard;

25.3 to 20.4 feet. Interestly weathered; included aley hard, very intensely fractured 26.4 to 35.7 feet: slightly weathered; hard; intensely to moderately fractured; very thin to moderately thin CLAY and SILT infill

fractured SEDIMENTARY ROCK (SANDSTONE)

Sample/Run#

C09

C10

C11

Uncorr. Blows per 6 in.

Blows per foot

Recovery (%)

66 0

81 0

96 6.7

RQD (%)

Drill Rate (min/ft)

3.6

4.1

Drilling Method Casing Depth

Discontinuity Description

Fracture Identification: (Depth), Dip, Width, Infilling Composition, Weathering, Hardness, Healing, Roughness

	ELEVATION (ft)	от Стреттн (ft)	Material Graphics	DESCRIPTION	Sample Location	Sample/Run#	Uncorr. Blows per 6 in.	Blows per foot	Recovery (%)	RQD (%)	Drill Rate (min/ft)	Drilling Method Casing Depth	Discontinuity Description  Fracture Identification: (Depth), Dip, Width, Infilling Composition, Weathering, Hardness, Healing, Roughness
	775	-		SEDIMENTARY ROCK (ARGILLITE) 55.5 feet: calcite veins: 0 to 35°; 0.1 to 0.3" thick		C19			63	0	5.5	×	- - -
1	770	60 -		59.0 to 63.9 feet: decomposed; soft to very soft; intensely fractured; some fracture infill of: (CLAYEY SAND with GRAVEL (SC); moist; fine to coarse SAND; some medium plasticity clay; little fine to medium angular GRAVEL)		C21			86	0	2.8	X \	- - -
	76E	65		SEDIMENTARY ROCK (SANDSTONE) Fine-grained sand; massive; gray; moderately weathered; hard; intensely fractured; thin to very thin SILT and SAND infill with calcite cementation; some		C22			125	0	2.5		_ _ _
	765	-		(FRANCISCAN COMPLEX; BROKEN FORMATION)  67.5 to 67.8 feet: ARGILLITE interbed; massive; dark gray, decomposed, very soft very intensely fractured:		C24			100	0	6.6		_ _ _
-	760	70 -		pervasively sheared to: (Poorly-graded GRAVEL with SAND (GP); dense; moist; some fine to coarse SAND; angular fine to coarse GRAVEL) 67.8 to 82.0 feet: very intensely fractured	X	C26		50/4	NR 50	0	3.5		
		75	-			C28			17	0	3.6		_ _ _
	755	-	-			C30			48	0	7.2		_ _ _
-	750	80				C31			46	0	4.8		_ _ _
		85		SEDIMENTARY ROCK (SANDSTONE) Fine-grained sand; massive; gray; moderately weathered; moderately hard to hard; intensely fractured; chaotic 0.1 to 0.3" thick calcite veining; (FRANCISCAN COMPLEX; BROKEN FORMATION)		C32							_ _ _
L				(continued)		1 -	NEDO E	T T.					11015 15
							BORI	NG	REC				HOLE ID RC-20-013
		L	-	INFELDER			01 01	D	UNT <b>el N</b>	orte	)	101	POSTMILE EA 0115000099
			<i></i>	Bright People. Right Solutions.			Last (	Cha	nce	Gra	E NAME		DATE     011
		•				- 1	RIDGE	NUI	мвеі	К	D. Ro	KED BY SS	DATE SHEET <b>6-11-21 3 of 5</b>

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KLEINFELDEF Bright People. Right Solution	

ELEVATION (ft)	» DEPTH (ft)		Material Graphics		Sample Location	Sample/Run#	Uncorr. Blows per 6 in.	Blows per foot	Recovery (%)	RQD (%)	Drill Rate (min/ft)	Drilling Method	Discontinuity Description Fracture Identification: (Depth), Dip, Width, Infilling Composition, Weathering, Hardness, Healing, Roughness
745				SEDIMENTARY ROCK (SANDSTONE)		C32			46	0		$\searrow$	
				87.2 to 88.3 feet: ARGILLITE interbed; massive; dark gray; decomposed; very soft; very intensely fractived; popularly special to (Poorly graded		C33			100	13.3	4.4	$\langle \langle $	_ _ _
	90			gray; decomposed; very soft; very intensely fractured; pervasively sheared to: (Poorly-graded GRAVEL with SILT and SAND (BP-GM); dense; mostly fine to coarse angular GRAVEL; some fine to coarse SAND; little low plasticity fines) 88.3 to 95.5 feet: very intensely fractured		C34			18	0	2.2	\ \ \ \	_
740												$\Diamond$	
						C35			17	0	2.1	$\Diamond \Diamond \Diamond \Diamond$	_
												$\Diamond$	
735	95			OF Fite 400 Fife at allighth weethered intercely		C36			85	0	4.5	>< ><	-
		H:		95.5 to 100.5 feet: slightly weathered; intensely fractured; chaotic 0.1" thick calcite veins; very thin calcite cementation on fracture surfaces					96	0	2.2	$\Diamond$	
		H		cardic contentation on nature surfaces								$\Diamond$	-
		H:											_
		<u> </u>  :				C37						Š	
	400											$\Diamond$	
730	100	ΠΞ		100 5 to 100 9 foot: APCII LITE interhed: massive; dark								$\Diamond$	7
		H:		100.5 to 100.8 feet: ARGILLITE interbed; massive; dark gray; moderately weathered; soft; very intensely fractured					100	0	1.7		
		H:										Š	$\vdash$
		H:										$\Diamond$	-
			:::			C38						$\Diamond$	
105 — : : : :													
725	105	Πi										Š	7
		H:	:::	400 A to 400 F foot Oll T (MI) footbase in fill accordant		C39			80	0	4.8	$\rightarrow$	_
		H:		106.4 to 106.5 feet: SILT (ML) fracture infill; nonplastic, weak calcite cementation		039			100	20.8	11.6	$- \bigcirc$	$\vdash$
		H:		108 0 to 134 7 feet: moderately to slightly weathered; very		C40						$\Diamond$	_
		  -  :		108.0 to 134.7 feet: moderately to slightly weathered; very intensely to intensely fractured; very thin calcite infill									_
	110	<u> </u> :	:::						10	0	10.4	$\sim$	
720	1 10	$\prod$ :				C41						$\Diamond$	
		Ħ:		111.0 feet: circulation loss (60 gallons)		C42			80	0	13	$\Diamond$	
		H:				C43			90	0	15	$\Diamond$	7
		H:							100	0	5.3		-
		H				C44			NR	0	0.00	$\nearrow \langle$	-
	115	:	:::	Z = = 2D = == = 2D		C45						$ \diamondsuit $	
				(continued)		F	REPOR	ТТП	ΓLE				HOLE ID
							BORI	NG	REC UNT			OUTE	RC-20-013
	4	K	, ,	INFELDER			01	D	el N	orte		101	12-15.5 0115000099

PROJECT OR BRIDGE NAME

Last Chance Grade Bypass

BRIDGE NUMBER PREPARED BY

-- D. Ross

DATE **6-11-21** SHEET 4 of 5

7	ELEVATION (ft)	GDEPTH (ft)	. Material Graphics		Sample Location	Sample/Run#	Uncorr. Blows per 6 in.	Blows per foot	Recovery (%)	RQD (%)	Drill Rate (min/ft)	Drilling Method Casing Depth	Discontinuity Description Fracture Identification: (Depth), Dip, Width, Infilling Composition, Weathering, Hardness, Healing, Roughness
7	15		::::   -::::	SEDIMENTARY ROCK (SANDSTONE)		C46			13	0	4.7	$\Diamond$	-
									17	0	4.4	$\Diamond$	-
						C47						$\Diamond$	_
		120										$\Diamond$	_
7	10	-				C48			100	0	5.6	-\\ >\<	_
						040			80	0	3.2	$\rightarrow$	-
						C49						$\begin{array}{c} \\ \\ \\ \\ \\ \end{array} $	_
		125				C50			72	0	5.2	$\Diamond$	-
	05		: : : :    -   : : : : :			030			07	0	7.0	$\Rightarrow$	-
						C51			37	0	7.9		_
			-						NR	0	9.1	$\Rightarrow < \\ \Leftrightarrow $	_
7	00	130			H	C52 C53			NR	0	10	$\rightarrow$	-
						033			40	0	4.4	$\rightarrow$	-
[7/]						C54						$\Diamond$	_
					-	C55 C56			14	0	27 16	$\rightarrow$	_
2 6	95	135		Bottom of borehole at 134.7 ft bgs	Щ.	<u>C30</u>			00	ٽ			-
													_
													-
			_										-
9 6	90	140											_
													_
6			-										-
		<u> </u>	-										-
		145				R	EPOR	ТТІТ	ΓLE				HOLE ID
						D	EPOR BORII IST. 01	CO	UNT		F	ROUTE <b>101</b>	HOLE ID RC-20-013  POSTMILE EA 0115000099
		K	LE	EINFELDER Bright People. Right Solutions.		Р	ROJEC	T O Cha	R BF	RIDG <b>Gra</b>	E NAME <b>de Byp</b>	ass	
						В	RIDGE	NUI	MBEI	₹	PREPAR D. Ro	RED BY	DATE SHEET <b>6-11-21 5 of 5</b>

E:KLF

TEMPLATE:

gINT FILE:

LOGGED BY **BEGIN DATE** COMPLETION DATE BOREHOLE LOCATION (Lat/Long or North/East and Datum) HOLE ID **D.Sullivan** 10-26-20 11-5-20 2485183.482 ft / 5983987.610 ft NAD83 RC-20-014 DRILLING CONTRACTOR SURFACE ELEVATION BOREHOLE LOCATION (Offset, Station, Line) **CRUX Subsurface Inc.** 805.10 ft NAVD88 DRILLING METHOD DRILL RIG BOREHOLE DIAMETER **Rotary Core DMW 45** 4.5 in SAMPLER TYPE(S) AND SIZE(S) (ID) SPT HAMMER TYPE HAMMER EFFICIENCY, ERI SPT (1.4"), HQ Core (2.5") Cathead; 140 lbs / 30-inch drop GROUNDWATER DURING DRILLING AFTER DRILLING (DATE) BOREHOLE BACKFILL AND COMPLETION TOTAL DEPTH OF BORING **Not Determined Not Determined** VWP, TDR, Inclinometer; cement-bentonite 300.0 ft Sample Location Uncorr. Blows per 6 in. Rate (min/ft foot **Discontinuity Description EVATION** Sample/Run# **Drilling Method** 8 € Blows per f Fracture Identification: (Depth), Dip, Width, Infilling Composition, Weathering, Hardness, Healing, Roughness Material Graphics Recovery DESCRIPTION DEPTH ( Casing [ RQD ( ᆸ SANDY fat CLAY (CH); soft; light reddish brown and light gray; moist; mostly fines; little coarse to fine SAND; few angular GRAVEL; highly oxidized; PP = 0.5 tsf; abundant organic matter (COLLUVIUM / LANDSLIDE 670 5 0 11 8.00 0 S01 665 2 5 44 7 40 S02 3 660 15 13.60 15.0 feet: increased sand content; coarse SANDSTONE 8 44 gravel in sample shoe 4 S03 4 SEDIMENTARY ROCK (ARGILLITE)
Dark gray and dark reddish brown; decomposed; soft; very intensely fractured with clay seams; (Poorlygraded GRAVEL with CLAY and SAND (GP-GC), dark gray, wet, mostly gravel, little sand, few moderately plastic fines) (LANDSLIDE DEPOSIT) 655 20 19 33 9 20 8 S04 650 (continued) REPORT TITLE HOLE ID RC-20-014 **BORING RECORD** POSTMILE DIST. COUNTY ROUTE 0115000099 **Del Norte** 101 12-15.5 01 *KLEINFELDER* PROJECT OR BRIDGE NAME Bright People. Right Solutions. **Last Chance Grade Bypass BRIDGE NUMBER** PREPARED BY DATE

D. Ross

4-22-21

1 of 11

PLOTTED: 04/19/2022 03:25 PM BY: DSulliv	ELEVATION (ft)	DЕРТН (ft)	Material Graphics	DESCRIPTION	Sample Location	Sample/Run#	Uncorr. Blows per 6 in.	Blows per foot	Recovery (%)	RQD (%)	Drill Rate (min/ft)	Drilling Method Casing Depth	Fracture Id Width, Infilling	ontinuity Descriptions (gentifications (gentifications to general	(Depth), Dip, n, Weathering,
0.55 03	ᆸ	当 25	Gra		Sar	Sar	12 12	음 25	55 55	RQ.	6.40	Onil Cas			
04/19/2				SEDIMENTARY ROCK (ARGILLITE) 25.0 feet: increased clay content	M	S05	10					200			_
I IED:												200			_
PLO															_
	645														_
		30			M		12 14	27	61		7.20				-
					Д	S06	13								_
	640	35													
				35.0 feet: pervasively sheared to: (Lean CLAY (CL); medium stiff; dark gray; moist; mostly fines; few fine angular gravel); PP = 1.0 tsf	M	S07	8 10	18	66		8.40				
				angulai graver), i i = 1.0 Gi	/		8					M			_
															_
	005														_
	635	40	-	40.0 feet: decreased clay content			21	90/9	26		0.00	200			_
				·	Å	S08									_
[Z				41.3 feet: grayish black; slightly weathered; hard; intensely fractured; advance HWT casing to 41.3'; equip HQ core		C09			88	0	66.67				_
[CLIENT_CALTRANS (KLF MOD W DRILL RATE)2]						C10			83	0	18.89				_
W DRIL	630					CIU			91	0	11.36				_
- MOD		45				C11						$\Diamond$			
NS (KLI				46.2 feet: very intensely fractured					99	0	13.13				
ALIKA						C12									
EN- S- S-				48.0 feet: moderately weathered; advance HWT casing to 48.0'		012									
	625	50 -		49.4 feet: slightly weathered; intensely fractured					80	0	7.00				
.022.GL				50.2 feet: very thinly bedded: dips 40°											_
KAKY_						C13									_
I LIBI				53.0 feet: very intensely fractured											4
SIANDARD_GINI_LIBRARY_2022.GLB	620			53.6 feet: intensely fractured											-
ANDA	020	55		(continued)		C14			69	0	8.97	$\Diamond$			
E:KLF_0							EPOR <b>BORI</b>			OR	D_		HC R	DLE ID RC-20-014	
AIE: E		L		EINFELDER			01 01	D		orte		ROUTE <b>101</b>	POSTMILE <b>12-15.5</b>	EA <b>01</b>	15000099
gINT TEMPLATE:			<b></b> _	Bright People. Right Solutions.			ROJE( <b>Last (</b> RIDGE	Cha	nce	Gra	E NAME	D <b>ass</b> ARED BY		DATE	SHEET
_ Z Z								. INUI	VIDE	`	D. R	OSS DY		4-22-21	2 of 11

ELEVATION (ft)	прертн (#)	Material Graphics	DESCRIPTION	Sample Location		Uncorr. Blows per 6 in.	Blows per foot	Recovery (%)	RQD (%)	Drill Rate (min/ft)	Drilling Method	Discontinuity Description  Fracture Identification: (Depth), Dip, Width, Infilling Composition, Weathering, Hardness, Healing, Roughness
	-55-		SEDIMENTARY ROCK (ARGILLITE)  56.2 feet: slightly weathered; hard; very intensely fractured with Lean CLAY (CL) fracture infill  57.3 to 61.0 feet: intensely fractured with 0.1" to 0.5" SANDSTONE lenses		C14			94	23	15.22	$\begin{array}{c} \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\$	-
615	60		SANDSTONE letises		C15			98	9	3.27	\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	- - -
			61.0 feet: very intensely fractured 61.4 to 62.2 feet: calcite infill 62.2 feet: intensely fractured		C16						\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	- - -
610	65				C17			94	14	4.62	\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	-
605	70		67.0 feet: 10" SANDSTONE clast; fine-grained; very thinly bedded; dark gray; slightly weathered; hard; moderately fractured with very thin ARGILLITE interbeds 67.5 feet: moderately weathered; moderately soft; intensely fractured 68.1 feet: very intensely fractured with Lean CLAY (CL) fracture infill; SANDSTONE clasts up to 4"		C18			103	0	3.33	>	- - -
			71.2 feet: Iron oxide mineralization on some fracture surfaces 71.9 feet: intensely fractured		C19			96	15	5.45	\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	- - -
600	75		73.4 to 73.8 feet: decomposed 73.8 feet: moderately weathered; moderately soft  74.9 feet: intensely weathered; soft; very intensely fractured 75.2 feet: moderately weathered; moderately soft; intensely fractured		C20			100	13	7.31		- - -
			intensely fractured 76.0 to 77.2 feet: BASAL LANDSLIDE FAILURE ZONE: intensely weathered; soft; very intensely fractured  SEDIMENTARY ROCK (SANDSTONE) Fine to medium grained; massive; gray; slightly weathered; hard; intensely fractured; intermittent calcite veining (FRANCISCAN COMPLEX: BROKEN FORMATION)		C21			100	11	6.55	\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	- - -
595	80		78.4 feet: ARGILLITE clasts throughout rock mass, up to 0.2" 79.3 feet: slightly weathered; very hard 80.0 feet: very intensely fractured 80.4 feet: intensely fractured 81.4 feet: fine grained; moderately weathered; moderately soft; ARGILLITE interbeds and clasts 82.2 feet: moderately hard		C22			100	12	5.35		- - -
590			83.0 feet: moderately soft		C23			100	15	6.40	$-\diamondsuit$	-
	85-		(continued)									
							REPORT TITLE BORING RECORD					HOLE ID RC-20-014
KLEINFELDER						OIST. <b>01</b>	D	UNT el N	orte		ROUT 101	

BORING.

DIST. COUNTY
01 Del Norte IU.

PROJECT OR BRIDGE NAME
Last Chance Grade Bypass

PREPARED BY
D. Ross

DATE **4-22-21** SHEET
3 of 11

Z US.ZS FIMI BT. DOUBLE	ELEVATION (ft)	<sup>ភ្</sup> DEPTH (ft)	Material Graphics	DESCRIPTION	Sample Location	Sample/Run#	Uncorr. Blows per 6 in.	Blows per foot	Recovery (%)	RQD (%)	Drill Rate (min/ft)	Drilling Method Casing Depth	Discontinuity Description  Fracture Identification: (Depth), Dip, Width, Infilling Composition, Weathering, Hardness, Healing, Roughness
- LO 1 1 LD . 04/1 3/2022				84.6 feet: moderately hard SEDIMENTARY ROCK (SANDSTONE) 85.0 feet: ARGILLITE interbeds 85.6 feet: fine to medium grained 86.4 feet: slightly weathered; hard; moderately fractured 88.0 feet: intensely fractured	c	C23			100	15		> \	F: (86.4'), 45°, slightly open, clean, not healed, slightly rough
	585	90 -	-	88.6 feet: moderately fractured  90.0 feet: intensely weathered; moderately soft; very intensely fractured 90.4 feet: moderately weathered; intensely fractured	C	C24			100	50	4.40	>><>>>	F: (89.4'), 5°, moderately open, very thin, clay, soft, not healed, slightly rough F: (90.0'), 20°, moderately open, very thin, clay, soft, not healed, slightly rough
	580	95		92.6 feet: moderately hard 93.0 feet: slightly weathered; hard 93.7 feet: moderately weathered 94.0 feet: moderately fractured 95.0 feet: intensely weathered; soft; very intensely fractured; lean CLAY infilling between fractures 95.2 feet: line-grained; moderately weathered; intensely fractured 96.4 feet: intensely weathered; very intensely fractured with Lean CLAY (CL) fracture infill	C	C25			100	10	3.60	\$\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	F: (94.6'), 20°, slightly open, very thin, iron oxide, intensely weathered, moderately hard, not healed, moderately rough
	575	100		98.6 feet: moderately weathered; hard; moderately to intensely fractured 99.6 feet: moderately soft 100.6 feet: hard 101.3 feet: moderately soft	C	C26			100	40	3.40	\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	- - - -
	570	105 -		103.1 feet: hard  105.6 feet: slightly weathered; hard  106.5 feet: ARGILLITE clasts up to 0.1"	C	C27			100	60	4.00	X	F: (104.0'), 30°, slightly open, clean, not healed, slightly rough F: (105.1'), 80°, slightly open, very thin, clay/iron oxide, intensely weathered, soft, not healed, slightly rough F: (106.1'), 30°, slightly open, very thin, calcite, slightly weathered, soft, not healed, moderately rough
	565	110	-	108.6 feet: 5" ARGILLITE interbed 109.0 to 109.7 feet: zone with abundant ARGILLITE clasts up to 0.2" 109.7 feet: trace ARGILLITE clasts	C	C28			100	53	3.20	$\Diamond \times \Diamond \times \Diamond \times \Diamond$	F: (107.0'), 80°, tight, very thin, calcite, slightly weathered, moderately hard, totally healed F: (108.1'), 80°, tight, very thin, calcite, totally healed F: (108.5'), 50°, slightly open, clean, not healed, moderately rough F: (109.0'), 45°, moderately open, very
	560	-115		111.5 to 111.8 feet: zone with abundant ARGILLITE clasts up to 0.2", approximately oriented: 25°. 111.8 feet: little ARGILLITE clasts 113.3 feet: trace ARGILLITE clasts 113.6 feet: very hard; slightly fractured	C	C29			100		7.78	\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	thin, clay, soft, not healed, moderately rough F: (110.1'), 50°, slightly open, very thin, clay, soft, not healed, moderately rough F: (110.4'), 50°, slightly open, very thin, clay, soft, not healed, slightly rough
				(continued)		15	EDOD.	F T17	1 -				HOLE ID
		K	CLE	EINFELDER Bright People. Right Solutions.		D P		CT OC	JNT' El No R BF 1Ce	Y <b>orte</b> RIDG <b>Gra</b>	F	RED BY	HOLE ID   RC-20-014     POSTMILE   12-15.5   EA   0115000099     DATE   SHEET   4-22-21   4 of 11

115   SEDIMENTARY ROCK (SANDSTONE)   115.0 feet: 1" ARGILLITE bed: dips 30°   115.9 feet: 2" ARGILLITE bed: dips 20°   115.9 feet: 2" ARGILLITE bed: dips 20°   115.9 feet: 2" ARGILLITE bed: dips 20°   115.9 feet: moderately weathered; moderately hard   119.5 feet: intensely fractured   125.4 feet: intensely weathered; moderately hard   125.4 feet: intensely weathered; moderately soft; intensely to moderately weathered; moderately hard   125.4 feet: moderately weathered; moderately hard;   125.5 feet: intensely weathered; moderately hard;   126.5 feet: moderately weathered; moderately hard;   126.5 feet: moderately weathered; moderately hard;   127.5 feet: moderately weathered; moderately hard;   128.6 feet: moderately weathered; moderately hard;   129.5 feet: moderately hard;   129.5 fee	dentification: (Depth), Dip, ng Composition, Weathering, ss, Healing, Roughness
115.0 feet: 1" ARGILLITE bed: dips 30" 115.9 feet: 2" ARGILLITE bed: dips 20°  118.6 feet: moderately weathered; moderately hard  119.5 feet: intensely fractured  125  120  125  125  126  127  128.7 feet: intensely weathered; moderately soft; intensely to moderately weathered; moderately soft; intensely to moderately fractured  126.4 feet: moderately weathered; moderately hard; intensely fractured  127.1 feet: intensely weathered; moderately soft; intensely to moderately fractured  128.1 feet: intensely weathered; moderately soft; intensely to moderately fractured  128.1 feet: moderately weathered; moderately hard; intensely fractured	D°, slightly open, very thin,
clay, soft, not F: (115.1'), 25 moderately rough F: (116.3'), 25 moderately thand  118.6 feet: moderately weathered; moderately hard  119.5 feet: intensely fractured  125	healed, slightly rough  "", slightly open, very thin,
118.6 feet: moderately weathered; moderately hard  119.5 feet: intensely fractured  119.5 feet: intensely fractured  120  120  125  120  120  125  120  120	healed, slightly rough
118.6 feet: moderately weathered; moderately hard  119.5 feet: intensely fractured  119.5 feet: intensely fractured  125  125  126  127  128.6 feet: moderately weathered; moderately hard  128.6 feet: intensely fractured  128.6 feet: intensely fractured  128.6 feet: intensely fractured  128.6 feet: intensely fractured  128.6 feet: intensely weathered; moderately soft; intensely to moderately fractured  128.6 feet: intensely weathered; moderately soft; intensely to moderately fractured  128.6 feet: intensely weathered; moderately soft; intensely to moderately fractured  128.6 feet: intensely weathered; moderately soft; intensely to moderately fractured  128.6 feet: intensely weathered; moderately hard; intensely fractured	uick, clay, soft, not healed,
120 Calcite, slightly healed, slight F: (119.2'), 30 moderately the slightly rough  125 Table 125 Feet: intensely weathered; moderately soft; intensely to moderately fractured 125.4 feet: moderately weathered; moderately hard; intensely fractured 125.4 feet: moderately weathered; moderately hard; intensely fractured 125.4 feet: moderately weathered; moderately hard;	or, moderately open, clean, — noderately rough or, slightly open, very thin,
550  125  124.5 feet: intensely weathered; moderately soft; intensely to moderately fractured 125.4 feet: moderately weathered; moderately hard;	
125.4 feet: intensely weathered; moderately soft; intensely to moderately fractured 125.4 feet: moderately weathered; moderately hard; intensely froztured	in, clay, soft, not healed,
125 124.5 feet: intensely weathered; moderately soft; intensely to moderately fractured 125.4 feet: moderately weathered; moderately hard;	_
125 124.5 feet: intensely weathered; moderately soft; intensely to moderately fractured 125.4 feet: moderately weathered; moderately hard;	_
125.4 feet: moderately weathered; moderately hard;	_
intensely fractured	_
C32	_
128.3 feet: moderately soft	_
545	_
	_
130.9 feet: moderately hard	_
	_
133.2 feet: moderately soft 133.5 to 134.2 feet: intensely weathered; soft; very intensely fractured 140.4 do 1	_
134.2 to 135.3 feet: ARGILLITE interbeds: dips 60°; dark gray, slightly weathered, moderately soft to moderately hard, intensely fractured	_
	D°, slightly open, very thin,
136.9 feet: moderately hard soft, not heale	y, intensely weathered, — ed, slightly rough 5°, tight, moderately thin, —
calcite, mode totally healed	rately weathered, soft,
140 139.6 feet: moderately fractured calcite, mode	5°, slightly open, very thin, rately weathered, soft, not ly rough
F: (138.3'), 80 iron oxide, int	o°, slightly open, very thin, ensely weathered, soft, not
healed, slight   C35   C35   F: (139.6'), 60	ly rough  "O", slightly open, very thin, cite, intensely weathered,
soft, not heale : ::: 142.8 to 143.6 feet: chaotic calcite veining soft, not heale ::::	cite, intensely weathered,—ed, slightly rough  "O", slightly open, very thin,
530 Calcite, intensely fractured: ARGIL LTF interbeds  144.2 feet: moderately weathered; moderately soft; C36 100 63 6.00 healed, slight	sely weathered, soft, not — ly rough
(continued)	OLE ID
BORING RECORD I DIST. COUNTY ROUTE POSTMILE	RC-20-014 EA
KLEINFELDER  Bright People. Right Solutions.    01   Del Norte   101   12-15.5     PROJECT OR BRIDGE NAME     Last Chance Grade Bypass	0115000099
Bright People. Right Solutions.  Last Chance Grade Bypass  BRIDGE NUMBER PREPARED BY  D. Ross	DATE SHEET <b>4-22-21 5 of 11</b>

ELEVATION (ft)	SDEPTH (ft)	Material Graphics	DESCRIPTION	Sample Location	Sample/Run#	Uncorr. Blows per 6 in.	Blows per foot	Recovery (%)	RQD (%)	Drill Rate (min/ft)	Drilling Method Casing Depth	Discontinuity Description Fracture Identification: (Depth), Dip, Width, Infilling Composition, Weathering, Hardness, Healing, Roughness
	-		144.9 feet: slightly weathered SEDIMENTARY ROCK (SANDSTONE) 145.4 to 151.0 feet: trace ARGILLITE clasts up to 0.3"; moderately hard; moderately fractured  147.5 feet: slightly fractured	Ó	C36			100	63		×<>×<>×<	F: (141.3'), 30°, slightly open, very thin, calcite, intensely weathered, soft, not healed, slightly rough F: (143.4'), 70°, tight, moderately thin, calcite, intensely weathered, soft, moderately healed F: (143.6'), 80°, slightly open, very thin, clay, intensely weathered, soft, not healed, smooth
525	150 -	-	149.2 feet: moderately fractured	C	C37			100	73	4.80	$\Diamond \times \Diamond \times \Diamond \times \Diamond \times \Diamond \times \Diamond$	F: (145.7'), 70°, slightly open, very thin, calcite, slightly weathered, moderately soft, not healed, slightly rough F: (146.6'), 60°, slightly open, very thin, calcite, slightly weathered, moderately soft, not healed, slightly rough F: (147.5'), 60°, tight, moderately thin, calcite, intensely weathered, soft, totally healed F: (149.7'), 60°, slightly open, very thin,
520	155 -	-	155.1 to 158.1 feet: ARGILLITE clasts up to 0.3"		C38			100	77	4.80	×	CI, soft, not healed, moderately rough F: (151.6'), 30°, slightly open, moderately thin, calcite, slightly weathered, moderately soft, totally healed F: (152.7'), 80°, tight, moderately thick, calcite, slightly weathered, moderately soft, totally healed F: (153.4'), 60°, slightly open, clean, not healed, smooth
515	160 -	-	159.2 feet: slightly fractured 160.0 to 163.7 feet: persistent, near vertical Lean CLAY (CL) infilled fracture; moderately weathered; moderately soft 161.2 to 163.0 feet: chaotic ARGILLITE bed remnants 162.8 feet: intensely fractured		C39			100	60	4.20		F: (154.9'), 60°, slightly open, very thin, clay, not healed, moderately rough F: (155.6'), 60°, tight, very thin, calcite, slightly weathered, moderately hard, totally healed F: (157.1'), 80°, slightly open, clean, not healed, slightly rough F: (158.1'), 75°, open, clean, not healed, slightly rough F: (158.3'), 65°, tight, moderately thin, calcite, slightly weathered, moderately
510	165 -	-	SEDIMENTARY ROCK (SANDSTONE) Moderately bedded with thin to very thin interbeds, bed remnants of ARGILLITE; SANDSTONE: fine grained, moderately bedded, gray to blue gray, moderately weathered, moderately soft, intensely fractured; ARGILLITE: thin to very thinly bedded, dark gray, moderately weathered, moderately soft, intensely fractured; chaotic quartz and calcite veining up to 1" thick, locally (FRANCISCAN COMPLEX: BROKEN FORMATION) 166.6 to 167.0 feet: ARGILLITE interbeds; intensely weathered; soft; separated (SANDX) leap CLAX with		C40			100	22	5.00	×	F: (161.0'), 80°, tight, very thin, clay, soft, not healed, slightly rough
500	170 -	-	weathered; soft; sheared to: (SANDY lean CLAY with GRAVEL (CL); hard; moist; mostly fines; little fine subangular gravels; little fine grained sand); PP = 4.25 tsf 167.0 feet: moderately weathered; moderately soft 169.4 feet: slightly weathered; moderately hard; moderately fractured 169.7 feet: 1" CLAYEY GRAVEL (GC) infilled shear: dips 40° 170.5 feet: intensely fractured	(	C41			100		6.89	\$\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	F: (169.3'), 40°, slightly open, very thin, clay, soft, not healed, slightly rough F: (169.7'), 40°, wide, thick, clay/calcite, soft, not healed, smooth
500	175			(	C42			100	10	7.00	$\Diamond$	
			(continued)		R	EPOR	T TIT	LE				HOLE ID
	K	(LE	EINFELDER Bright People. Right Solutions.		D P B		CO De CT O Chai	UNT el N R BF nce	Y <b>orte</b> RIDG <b>Gra</b>	F	RED BY	12-15.5 0115000099

170 205				100 37	8.00	
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		REPOR <b>BORI</b>		LE RECOF	RD	
CALENTEL DED		IST. <b>01</b>		INTY I Norte	9	RO 10
KLEINFELDER  Bright People. Right Solutions.				R BRIDO		
	В	RIDGE	NUM	1BER	PREP <b>D. F</b>	

				_								
(ff)				ation	#	i.	b t	(č		in/ft)	ام	Discontinuity Description
é	(#)	) <sub>0</sub>	DESCRIPTION	Loca	Run	er 6	er fo	ry (%)	رة	e (mi	Metho	Fracture Identification: (Depth), Dip.
ELEVATION (ft)	DEPTH (ft)	Material Graphics	BEGGIAII TIGIT	Sample Location	Sample/Run#	Uncorr. Blows per 6 in.	Blows per foot	Recovery	RQD (%)	Drill Rate (min/ft)	Drilling Method	Fracture Identification: (Depth), Dip, Width, Infilling Composition, Weathering, Hardness, Healing, Roughness
ПЭ	175	Mat		Sar	Sar	Unc Blo	Bo			Dril	ااً ا	O
	1/5		174.6 feet: moderately weathered; moderately soft SEDIMENTARY ROCK (SANDSTONE)					100	10		$\times \langle$	_
		H	175.5 feet: very intensely fractured								$\Diamond$	_
		Н			C42						$\Diamond$	_
											Š	_
		:::;/						0.1		5.50	$\Diamond$	
495		$\prod Z$	SEDIMENTARY ROCK (SANDSTONE)	1				94	9	5.53	$\Diamond$	_
	180	H	SEDIMENTARY ROCK (SANDSTONE) Fine-grained; massive; gray to dark gray; slightly weathered; moderately hard; intensely fractured; chaotic									<del>-</del>
		Ц	quartz and calcite veining up to 0.5" thick (FRANCISCAN COMPLEX: BROKEN FORMATION)		C43						$\sim$	_
			: 181.5 feet: very intensely fractured								$[\diamondsuit]$	
		$\prod_{i=1}^{n}$						100	E0	5.71		_
		Н	182.5 feet: intensely fractured					100	56	5.71	$\searrow$	_
		Н			C44						$\Diamond$	_
490	185							100	15	6.28	$\langle \rangle$	_
			405 C feet, elimbity weethered									
		П	185.6 feet: slightly weathered								$\Diamond$	_
		Н			C45						$\Diamond$	-
		Ц::: Н:::										_
		:::									$\searrow$	
485		П						100	0	7.60	$\Diamond$	_
	190	Ħ∷∷	190.0 to 192.0 feet: chaotic quartz and calcite veining up to 1" thick								$\Diamond$	_
		Н	to 1" thick								Š	_
		∐∷∷			C46						$\Diamond$	_
			192.3 feet: moderately weathered; moderately soft; very								$\Diamond$	
		П	intensely fractured									_
480		Н	194.0 feet: slightly weathered; moderately soft to					98	0	0.00	$\mathcal{K}$	_
400	195	H	194.0 feet: slightly weathered; moderately soft to moderately hard; intensely fractured		C47			00	0	0.00	$[\diamondsuit]$	_
								99	U	0.00		_
			196.3 feet: 1" thick ARGILLITE interbed: dips 50°; slightly weathered; moderately soft								Š	
		Hiii	slightly weathered; moderately soft		C48						$\Diamond$	_
		Hiii									$\Diamond$	_
		∐:::										_
475								100	0	6.00	$\sim$	
	200	П	200.0 feet: moderately hard					100		0.00	$[\diamondsuit]$	_
		Н∷∷	200.8 feet: very intensely fractured 201.0 feet: intensely to very intensely fractured									_
		Н	201.0 leet. Intensely to very intensely fractured		C49						$\searrow$	_
					049						$\Diamond$	_
											$\Diamond$	
470		<b>П</b> :::										-
	205	:::	(continued)					100	37	8.00	$  \rangle$	
			(Conunicea)		F	REPOR	T TI	LE				HOLE ID
						<b>BORI</b>	NC			ח		RC-20-014

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235	233.7 feet: hard; moderately fractured	C5	57	1	00	60 5.20	) ) ) ) )		60°, tight, very thered, modera		_
200	(continued)										
			REPOR <b>BORI</b>			ORD			HOLE ID RC-20-014	ļ	
<i>(</i> ,	CLEINEEL DEB		DIST. <b>01</b>	COU			ROUTE <b>101</b>	POSTMILE <b>12-15.5</b>		115000099	
P	KLEINFELDER Bright People. Right Solutions.					IDGE NAM Grade By					
			BRIDGE	NUMI	3ER		ARED BY		DATE <b>4-22-21</b>	SHEET 8 of 1	1

ELEVATION (ft)	DEPTH (ft)	Material Graphics	DESCRIPTION	Sample Location	Sample/Run#	Uncorr. Blows per 6 in.	Blows per foot	Recovery (%)	(%)	Drill Rate (min/ft)	Drilling Method Casing Depth	Discontinuity Description  Fracture Identification: (Depth), Dip, Width, Infilling Composition, Weathering, Hardness, Healing, Roughness
E E	205	Mat		San	C50	Uno Blo	Bo		RQD	Dri	Drilling Casing	Tiardiioso, Fiodiing, Foodgiiioso
			204.6 feet: moderately fractured SEDIMENTARY ROCK (SANDSTONE)		030			100	37			_
			206.0 feet: moderately weathered; intensely fractured								$\searrow$	_
			206.9 to 208.4 feet: calcite rehealed brecciated zone		C50						$\Diamond$	
465			208.4 to 209.3 feet: brecciated zone; decomposed; soft; fractured to: (CLAYEY SAND with GRAVEL (SC); loose mostly fine to coarse sand; some moderate plasticity								$\Diamond$	
	210		fines; little fine gravel) 209.3 feet: slightly weathered; hard; moderately fractured					100	68	5.60		F: (210.3'), 60°, slightly open, clean, not healed, slightly rough
					C51						$\langle \rangle \langle \rangle$	F: (211.0'), 70°, tight, very thin, calcite, slightly weathered, moderately hard, — totally healed
460			212.8 feet: intensely fractured 213.3 feet: moderately fractured								>< >	F: (212.4'), 60°, tight, very thin, calcite, slightly weathered, moderately hard, totally healed
-00	215	• • •						100	55	7.78	$\bigcirc$	moderately rough F: (214.9'), 50°, tight, thin, clay,
		H:::	215.4 feet: moderately hard		C52						$\Diamond$	moderately soft, not healed, slightly rough
			216.4 feet: intensely fractured					99	34	5.63	$\Diamond$	F: (215.5'), 30°, slightly open, very thin, clay, soft, not healed, moderately rough F: (215.8'), 80°, moderately open,
		H:::	217.7 feet: moderately fractured		C53						$\Diamond$	moderately thin, calcite, decomposed, very soft, not healed, smooth
455		H:::	218.6 feet: intensely fractured								$\Diamond$	F: (217.7'), 40°, moderately open, clean,
	220	1						100	33	5.80		not healed, slightly rough F: (218.6'), 60°, slightly open,
		$H_{\cdots}^{\cdots}$										moderately thin, clay/calcite, soft, not healed, slightly rough —
					C54						$\searrow$	F: (221.1'), 60°, slightly open, very thin, calcite, decomposed, soft, not healed, —
		H:::									$\Diamond$	moderately rough F: (221.8'), 40°, tight to slightly open, —
450			223.6 feet: hard								$\Diamond$	moderately thin, calcite, decomposed, soft, partly healed, slightly rough F: (222.5'), 50°, slightly open,
430	225	<b>⊢</b> ∷ <i>},</i>	224.6 feet: moderately fractured	r				99	31	6.83	$\Diamond$	moderately thin, clay/calcite, decomposed, soft, not healed, slightly
			BRECCIATED ZONE: SANDSTONE with thin ARGILLITE interbeds brecciated to: Poorly-graded GRAVEL with SAND (GP): medium dense, gray and dark gray, dry, mostly subangular to angular gravel (rock fragments), some fine to coarse sand, locally		C55						$\Diamond$	rough F: (225.3'), 50°, moderately open, very thin, clay, soft, not healed, smooth
			(rock fragments), some fine to coarse sand, locally rehealed with chaotic quartz and calcite veining; intensely weathered to decomposed; moderately soft to soft; intensely to very intensely fractured								$\Diamond$	F: (226.1'), 60°, slightly open, moderately thin, clay, soft, not healed, moderately rough
445		<i>  <u> </u></i>	SEDIMENTARY ROCK (SANDSTONE)	H				100	48	5.80	$\rightarrow$	F: (227.8'), 60°, slightly open, very thin, clay, soft, not healed, moderately rough
445	230		Fine grained; massive; gray; slightly weathered; moderately hard; moderately to intensely fractured; chaotic quartz and calcite veining (FRANCISCAN COMPLEX: BROKEN FORMATION)								,	F: (229.2'), 60°, slightly open, very thin, clay, soft, not healed, moderately rough F: (229.7'), 60°, slightly open, very thin,
					C56						$\Diamond$	calcite, decomposed, soft, not healed, slightly rough F: (230.6'), 60°, tight, very thin, calcite, slightly weathered, moderately hard,
											$\searrow$	totally healed
440			233.7 feet: hard; moderately fractured		C57			100	60	5.20	- >< ◇	F: (231.2'), 60°, tight, very thin, calcite, slightly weathered, moderately hard, totally healed
	235		(continued)	_								
						REPOR			200			HOLE ID

	C63	100 62	5.40	rou F:	igh (262.4'), 60° composed,	soft, not healed °, tight, very thin soft, not healed	n, calcite,
(continued)							
		ORT TITLE RING RECOF		UTE P		DLE ID RC-20-014	
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KLEINFELDER Bright People. Right Solutions.		JECT OR BRIDG		S		·	
	BRID 	GE NUMBER	PREPARE <b>D. Ros</b> :			DATE <b>4-22-21</b>	SHEET 9 of 11

ELEVATION (ft)	23DEPTH (ft)	Material Graphics	DESCRIPTION	Sample Location	Sample/Run#	Uncorr. Blows per 6 in.	Blows per foot	Recovery (%)	RQD (%)	Drill Rate (min/ft)	Drilling Method	Casing Depth	Discontinuity Description  Fracture Identification: (Depth), Dip, Width, Infilling Composition, Weathering, Hardness, Healing, Roughness
			SEDIMENTARY ROCK (SANDSTONE)					100	60		×		F: (232.3'), 80°, tight, very thin, calcite, decomposed, soft, moderately healed,
		<b> </b>									$\langle \rangle$		slightly rough F: (232.7'), 80°, slightly open, very thin,
		<b> </b>	237.4 feet: slightly weathered; moderately hard; intensely		C57						$\Diamond$		calcite, decomposed, soft, not healed, slightly rough
		<del>-</del>  ::::	fractured								$\Diamond$		F: (234.4'), 70°, tight, very thin, calcite, slightly weathered, moderately hard,
435		<del> </del>	238.7 feet: moderately fractured					100	32	3.20	$\langle \rangle$		totally healed – F: (235.6'), 50°, moderately open, very
	240										×		thin, calcite, slightly weathered,
		- -  :::::			C58						$\times$		moderately soft, not healed, slightly rough —
		<b>-</b>  ∷∷:	241.7 feet: intensely fractured		030						$\Diamond$		F: (237.4'), 15°, slightly open, very thin, clay, soft, slightly rough
		<u> </u>									$\Diamond$		F: (239.5'), 60°, slightly open, very thin, calcite, decomposed, soft, not healed,
								100	52	3.80	$\Diamond$		slightly rough F: (242.3'), 60°, slightly open, very thin,
430	245		244 6 to 253 1 feet: mass brecciated and quartz and										calcite, decomposed, soft, not healed, slightly rough
	245	]:::::	244.6 to 253.1 feet: mass brecciated and quartz and calcite rehealed with abundant chaotic veining								×		_
		  :::::			C59						$\langle \rangle$		<del>-</del>
		<b>-</b>  :::::	246.8 feet: moderately fractured								$\Diamond$		F: (246.8'), 70°, moderately open, — moderately thick, clay, soft, not healed,
		<del> </del> ::::									$\Diamond$		slightly rough — F: (247.7'), 60°, moderately open, very
425			248.7 feet: hard					100	85	5.23	$\Diamond$		thin, calcite, slightly weathered, soft, not — healed, slightly rough
120	250		249.7 feet: intensely fractured								X		F: (249.7'), 60°, tight, very thin, calcite,
		- - - - - - -	250.9 feet: slightly fractured		C60						X		decomposed, soft, not healed, slightly rough
		<u> </u> ::::									$\Diamond$		F: (251.4'), 30°, tight, clean, not healed, smooth
		<u> </u> ::::									$\Diamond$		_
								100	100	6.60	$\Diamond$		F: (253.1'), 35°, tight, clay, not healed, slightly rough
420	0.55												-
	255 -	<b>-</b>			C61						×		F: (254.9'), 45°, tight, thin, calcite, slightly weathered, soft, partly healed,
		<b> </b>									$\langle \rangle$		smooth F: (255.6'), 55°, slightly open, very thin,
		<b>∃∷∷</b>									$\Diamond$		calcite, moderately weathered, soft, not healed, slightly rough
		<del>-</del>  ::::	258.1 feet: intensely fractured					100	72	12.67	$\Diamond$		_
415			ŕ		C62						$\Diamond$		_
7,5	260	<b>-</b>  ::::						100	47	7.60			- (000 0l) 50° l'. l l
		<b>-</b>  ∷∷:	260.8 feet: moderately fractured								×		F: (260.2'), 50°, slightly open, moderately thin, clay, soft, not healed,
		<u> </u> ::::			Cec						$\langle \rangle$		slightly rough F: (261.1'), 60°, tight, very thin, calcite,
		<u> </u> :::::			C63						$\Diamond$		decomposed, soft, not healed, slightly rough
											$\Diamond$		F: (262.4'), 60°, tight, very thin, calcite, decomposed, soft, not healed, slightly
410	005	]::::						100	62	5 40	$\Diamond$		rough
	-265-	•	(continued)							2.10			
1					I F	REPOR	T TI	TIF					HOLE ID

ELEVATION (ft)	DEPTH (ft)	Material Graphics	DESCRIPTION	Sample Location	Sample/Run#	Uncorr. Blows per 6 in.	Blows per foot	Recovery (%)	RQD (%)	Drill Rate (min/ft)	ing Method	Discontinuity Description  Fracture Identification: (Depth), Dip, Width, Infilling Composition, Weathering, Hardness, Healing, Roughness
	265 	$\cdots$			ues C64	Unc	Blo			Dri	\ Drilling	
			264.6 feet: slightly fractured SEDIMENTARY ROCK (SANDSTONE)  266.5 to 267.1 feet: zone with abundant healed fractures, calcite infilling, some fractures offset 266.9 to 268.6 feet: intensely fractured; local SANDY		C64			100	62		·	F: (263.0'), 50°, tight, very thin, calcite, totally healed F: (263.2'), 60°, tight, clean, not healed, slightly rough F: (264.1'), 70°, tight, slightly rough
			lean CLAY (CL) fracture infill								$\Diamond$	F: (268.5'), 85°, tight, very thin, calcite,
405			268.8 feet: slightly fractured					100	57	4.40	$\Diamond$	decomposed, soft, partly healed, moderately rough
	270		269.6 feet: moderately fractured					100	51	4.40	$\langle \langle \rangle \langle \langle \rangle \rangle$	F: (269.8'), 70°, tight, very thin, calcite, decomposed, soft, partly healed, slightly rough
					C65						$\times$	F: (271.8'), 50°, slightly open, very thin, calcite, decomposed, soft, moderately healed, slightly rough F: (273.2'), 70°, tight, moderately thick to
400			274.0 to 274.3 feet: abundant ARGILLITE clasts, up to								$\Diamond$	moderately thin, calcite, decomposed, — soft, partly healed, smooth
	275		0.1": dips 50°					100	37	5.60	$\Diamond$	F: (274.2'), 45°, tight, very thin, calcite, decomposed, soft, partly healed, slightly rough F: (274.4'), 65°, tight, very thin, calcite,
					C66						$\Diamond$	decomposed, soft, partly healed, slightly rough
	_										$\stackrel{\wedge}{\sim}$	F: (274.9'), 60°, tight, moderately thin, calcite, decomposed, soft, partly healed, smooth
395	280		279.8 feet: slightly fractured					100	93	0.00		_
			279.8 feet: slightly fractured 280.0 to 285.4 feet: few ARGILLITE clasts up to 0.3"								$\Diamond$	_
					C67						$\Diamond$	F: (281.2'), 80°, tight, very thin, calcite, decomposed, soft, partly healed, rough —
			283.0 to 300.0 feet: abundant healed fractures; 0.1" to 0.1" wide, chaotic 283.6 feet: moderately weathered; moderately hard								$\Diamond \times \Diamond$	_
390	285		284.6 feet: moderately fractured					100	100	0.00	$\Diamond$	F: (284.1'), 30°, tight, very thin, calcite, decomposed, soft, partly healed, rough
											$\langle \langle $	_
	_				C68						$\stackrel{>}{\sim}$	F: (287.1'), 30°, slightly open, moderately thin, calcite, slightly weathered, moderately soft, moderately healed, moderately rough
385	200			Н				100	77	5.00	$\Diamond$	
	290							100	' '	0.00	$\Diamond \times \Diamond$	_
					C69						) ()	F: (291.8'), 20°, moderately open, thin, clay, soft, not healed, rough F: (293.0'), 50°, slightly open, very thin,
380											$\Diamond$	calcite, decomposed, soft, not healed, slightly rough
	295	::::	(continued)	П				100	33	3.20	$  \lozenge  $	
						REPOR <b>BORI</b>			OR	D		HOLE ID RC-20-014
	1.	·			Г	DIST. <b>01</b>	СО	UNT el N	Υ	R	OUT <b>101</b>	
\	K	LE	EINFELDER Bright People. Right Solutions.		F	ROJE(	CT O	R BF nce	RIDG <b>Gra</b>	E NAME <b>de Bypa</b>		
					В	RIDGE				PREPAR D. Ro	RED E	DATE SHEET 4-22-21 10 of 11

gINT TEMPLATE:

Sample Location ELEVATION (ft) Drill Rate (min/ft) Uncorr. Blows per 6 in. Drilling Method Casing Depth Sample/Run# Blows per foot Discontinuity Description Recovery (%) DEPTH (ft) RQD (%) Fracture Identification: (Depth), Dip, Width, Infilling Composition, Weathering, Hardness, Healing, Roughness DESCRIPTION Material Graphics SEDIMENTARY ROCK (SANDSTONE) 100 33 F: (295.8'), 50°, slightly open, very thin, calcite/clay, decomposed, soft, not healed, slightly rough C70 F: (296.4'), 70°, tight, very thin, calcite, decomposed, soft, not healed, slightly 297.8 feet: intensely weathered; moderately soft to moderately hard; intensely fractured F: (299.0'), 70°, slightly open, very thin, 299.0 feet: moderately weathered; moderately hard 375 calcite, decomposed, soft, not healed, 100 100 0.00 C71 300 300.0 feet: advance HWT casing to full depth (300.0') slightly rough Bottom of borehole at 300.0 ft bgs 370 305 365 310 315 355 320 350 HOLE ID RC-20-014 REPORT TITLE **BORING RECORD** POSTMILE **12-15.5** ROUTE DIST. COUNTY Del Norte 101 0115000099 01 KLEINFELDER PROJECT OR BRIDGE NAME Last Chance Grade Bypass Bright People. Right Solutions. PREPARED BY **D. Ross** BRIDGE NUMBER DATE SHEET 4-22-21 11 of 11

EXLF

TEMPLATE:

LOGGED BY **BEGIN DATE** COMPLETION DATE BOREHOLE LOCATION (Lat/Long or North/East and Datum) HOLE ID M.Parks 11-2-20 11-18-20 2486022.874 ft / 5983827.999 ft NAD83 RC-20-015 DRILLING CONTRACTOR BOREHOLE LOCATION (Offset, Station, Line) SURFACE ELEVATION **CRUX Subsurface Inc.** 883.44 ft NAVD88 DRILLING METHOD DRILL RIG BOREHOLE DIAMETER **Rotary Core** Burley 6000 4.5 in SAMPLER TYPE(S) AND SIZE(S) (ID) SPT HAMMER TYPE HAMMER EFFICIENCY, ERI SPT (1.4"), HQ Core (2.5") Cathead; 140 lbs / 30-inch drop BOREHOLE BACKFILL AND COMPLETION GROUNDWATER DURING DRILLING AFTER DRILLING (DATE) TOTAL DEPTH OF BORING **Not Determined Not Determined** VWP, TDR, Inclinometer; cement-bentonite 301.0 ft Sample Location Rate (min/ft foot **Discontinuity Description** Sample/Run# **Drilling Method** EVATION 8 9 € Blows per Blows per Fracture Identification: (Depth), Dip, Width, Infilling Composition, Weathering, Hardness, Healing, Roughness Material Graphics DESCRIPTION Recovery DEPTH Casing [ RQD ᆸ SILTY SAND (SM); very loose to loose; dark brown; dry; 0.00 mostly fine SAND; little fines; low plasticity; high organic content (roots, tree litter at surface) (SURFACE SOIL/LANDSLIDE DEPOSIT) 880 SANDY SILT (ML); very soft; moist; mostly fines; some fine SAND; few angular GRAVEL; (COLLUVIUM/LANDSLIDE DEPOSIT) 2 33 0.00 0 S01 5 2 875 SANDY lean CLAY with GRAVEL (CL); soft to medium stiff; olive yellow; moist; mostly fines; little fine SAND; trace coarse to fine angular GRAVEL; low to medium plasticity; (COLLUVIUM/LANDSLIDE DEPOSIT) 61 0.00 2 S02 10 5 11.0 feet: circulation loss 870 23 72 0.00 9 S03 15 CLAYEY SAND (SC); medium dense; yellowish brown; moist; mostly medium to fine SAND; little fines; trace fine angular GRAVEL; decomposed fracture surfaces (COLLUVIUM/LANDSLIDE DEPOSIT)
16.0 feet: GRAVELS / COBBLES of decomposed 14 SANDSTONE with some intact rock structure 865 9 22 0.00 S04 20 5 20.0 feet: loose; reddish yellow and yellowish brown SANDY lean CLAY (CL); very stiff; yellowish brown; mostly fines; some fine SAND; trace fine angular GRAVEL; low plasticity; maganese mineralization (LANDSLIDE DEPOSIT) 860 28 61 0.00 S05 (continued) REPORT TITLE HOLE ID RC-20-015 **BORING RECORD** DIST. COUNTY ROUTE POSTMILE 0115000099 **Del Norte** 01 101 12-15.5 *KLEINFELDER* PROJECT OR BRIDGE NAME Bright People. Right Solutions. **Last Chance Grade Bypass** 

**BRIDGE NUMBER** 

PREPARED BY D. Ross

3-30-21

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KLEINFELDER Bright People. Right Solutions.	

ELEVATION (ft)	25 DEPTH (ft)	Material Graphics	DESCRIPTION .	Sample Location	Sample/Run#	Blows	Blows per foot	Recovery (%)	RQD (%)	Drill Rate (min/ft)	Drilling Method Casing Depth	Discontinuity Description  Fracture Identification: (Depth), Dip, Width, Infilling Composition, Weathering, Hardness, Healing, Roughness
			SANDY lean CLAY (CL)	<del>X</del> -	$\dashv$	8			-		.0	
			27.4 feet: decomposed ARGILLITE fragments			16					00000	_
855	30		30.0 feet: yellowish brown with dark brown GRAVEL; few fine angular ARGILLITE	\\s	:06	19 22 22	44	55	-	0.00	00000000	_ _ _
	-		SEDIMENTARY ROCK (ARGILLITE)						-		000000	_
850	-		Massive; dark gray with light olive brown; decomposed; (Clayey GRAVEL (GC); medium dense; light olive brown with very dark gray; mostly fine to coarse angular GRAVEL (ARGILLITE); some medium plasticity fines; little fine to coarse SAND) (LANDSLIDE DEPOSIT) 34.0 feet: scattered calcite veining - 0.03"	<u></u>			26	44		0.00	00000	
	35	<u>-</u>	/	\\s		13					00000	<del>-</del>
845											000000	_
	40	-	39.0 feet: very dark gray; intensely weathered; soft; very intensely fractured; pervasively sheared; advance HWT casing to 39.0'; equip HQ core 40.0 feet: slightly weathered	+	508 5	0/6" F	REF	66 100	0	3.00		_
			41.3 feet: undulating shear surfaces	e	;10;			100 100	0	16.67 5.29	♦	_
840	-		42.5 feet: crushed Lean CLAY (CL) fracture infill; iron staning on some fracture surfaces 43.4 feet: laminated; moderately soft; intensely fractured					53	0	4.67	>< >	_
	45 •		44.5 feet: intensely weathered; soft; very intensely fractured 45.0 feet: 0.5" zone: yellowish brown oxidation staining; undulating laminations: dips 60° 46.0 feet: moderately to intensely weathered; intensely fractured; up to 4" zones of red oxidation staining	С	:12			100	0	4.00	> > > > >	_
835			47.3 feet: very intensely fractured; Lean CLAY (CL) fracture infill	С	:13						>< ><	_
	50		48.6 feet: moderately soft clasts; some reddish yellow to yellowish brown oxidation staining on corestone surfaces and Lean CLAY (CL) infill	С	:14			96	0	4.00		_ _
			51.6 feet: intensely weathered; intensely fractured 52.2 feet: laminated: dips 40°; moderately weathered;	С	:15			40 96	0	3.00 5.00		<del>-</del>
830			moderately soft 53.0 feet: laminated: dips 30°; parting on bedding planes 54.0 feet: very intensely fractured	С	:16						>< >< ◇	_
	L <sub>55</sub>	<u> </u>	(aantinuad)	С	17			89	0	5.19	<b>\</b> <	
			(continued)			PORT ORIN	IG I				OUTE	HOLE ID RC-20-015 POSTMILE EA
	P	<b>KLI</b>	EINFELDER  Bright People. Right Solutions.		PR:	1 OJEC ast C	De T O Shar	R BF	orte RIDG <b>Gra</b>	E NAME de Bypa	101 ISS	12-15.5 0115000099
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200	ELEVATION (ft)	лоертн (ft)	Material Graphics		Sample Location	Sample/Run#	Uncorr. Blows per 6 in.	Blows per foot	Recovery (%)	RQD (%)	Drill Rate (min/ft)	Drilling Method Casing Depth	Discontinuity Description  Fracture Identification: (Depth), Dip, Width, Infilling Composition, Weathering, Hardness, Healing, Roughness
12021611710				54.9 feet: laminations: dips 55°SEDIMENTARY ROCK (ARGILLITE)					89	0		$\searrow$	
				56.2 feet: laminations: dips 85°		C17						$\Diamond$	_
				57.0 feet: caving noted 57.0' to 59.0'					51	0	7.18	$\bigcirc$	_
	25		邑									$\Diamond$	-
Ι,	20	-	扫	59.0 feet: sample disturbed		C18						Š	_
		60 -		·								$\rightarrow$	_
			::::	SEDIMENTARY ROCK (SANDSTONE); fine to coarse grained; massive; dark gray; slightly to moderately heathered; moderately hard; intensely fractured;								$\Diamond$	
				manganese and iron oxide on fracture surfaces; local ARGILLITE clasts up to 0.1" (LANDSLIDE DEPOSIT)		C19			89	0	2.22		
				SEDIMENTARY ROCK (ARGILLITE); very dark gray; moderately weathered; moderately hard; very intensely		C20			100	0	5.00		_
8	20		<u> </u>	fractured; with Lean CLAY (CL) frácture infill (LANDSLIDE    DEPOSIT)	H				100	14	7.39	$\triangleright$	_
		H		62.2 feet: intensely fractured; no infilling SEDIMENTARY ROCK (SANDSTONE)		C21						$\Diamond$	_
		65		Fine-grained; massive; dark gray; slightly weathered; hard; intensely fractured; manganese and iron oxide on fracture surfaces (LANDSLIDE DEPOSIT)								$\Diamond$	_
			<u> </u> ::::	fracture surfaces (LANDSLIDE DEPOSIT) 65.4 feet: bedding: dips 70°; undulatory		C22			100	0	6.67	$\Diamond$	_
									100	0	4.00		_
												$\searrow$	
8	15					C23						$\Diamond$	_
			::::									$\Diamond$	_
		70		70.1 feet: moderately hard; very intensely fractured					81	0	3.23		-
			<b> ∷∷</b>	, , , , , , , , , , , , , , , , , , , ,									_
			<u> </u> ::::			C24						$\langle \rangle$	_
7/ - 1/			<u> </u>	SEDIMENTARY ROCK (ARGILLITE)								$\Diamond$	_
( ) ( ) ( ) ( ) ( ) ( ) ( ) ( ) ( ) ( )	10			Laminated; very dark gray; moderately weathered; moderately hard; intensely fractured; (LANDSLIDE		C25					3.00	$\Diamond$	
5				DEPOSIT)							4.55		_
2		75 -				C26						$\searrow$	_
			扫										_
		-		76.4 feet: sample disturbed		C27			100 53	0	5.71 3.33		-
3				77.8 feet: rounded GRAVEL (ARGILLITE); washed from		C28			33		0.00	$\langle \rangle$	_
8	05			drilling 78.8 feet: rounded GRAVEL (ARGILLITE); washed from					80	0	6.00	Š	_
		00	===	SEDIMENTARY ROCK (SANDSTONE); clayey infill		C29			100	0	12.14	$\rightarrow$	
j )		80	]::::	Fine to medium grained; massive; very dark bluish gray; slightly weathered; hard; very intensely fractured; iron		C30			. 50			$\Diamond$	7
			::::	oxide staining on fracture surfaces and breaks; calcite on some joints (LANDSLIDE DEPOSIT)	П	00.1			100	0	3.85	$\Diamond$	
			<del> </del>	,		C31			87	0	4.62		-
	800					C32			01	U	4.02	×	-
	OUU		<u> </u>	94.0 fact: no recovery	Н						5.00		_
		85	::::	84.0 feet: no recovery		C33						$\Diamond$	
				(continued)		TR	EPOR	T TIT	ΠF				HOLE ID
							BORI	NG				OUT	RC-20-015
		L		EINFELDER			01	D	el N	orte		OUTE 101	12-15.5 0115000099
	1		` <i></i>	Bright People. Right Solutions.			Last (	Cha	nce	Gra	E NAME <b>de Byp</b> a		
						- 1	RIDGE	NUI	MBEI	₹	PREPAR <b>D. Ro</b>	RED BY	DATE SHEET 3-30-21 3 of 11

795

790

90

95

DEPTH (ft)

Material Graphics

gINT TEMPLATE:

		SEDIMENTARY ROCK (SANDSTONE) Fine-grained; very dark bluish gray; slightly weathered; moderately hard; calcite veining (FRANCISCAN COMPLEX: BROKEN FORMATION) 97.8 feet: 1" ARGILLITE bed: dips 40°	C4	5	100	0	2.86	$\Diamond$				
785		COMPLEX: BROKEN FORMATION) 97.8 feet: 1" ARGILLITE bed: dips 40°	C4	6			19.00	$\Diamond$				
	100		C4	7	100	0	1.50	$\Diamond$				_
		100.4 feet: 2" ARGILLITE bed: dips 40°	-C4		100	. 0	16.67	$\Rightarrow$				
		101.4 feet: fine to medium grained; hard 102.0 feet: 2" ARGILLITE bed: dips 40°; 70° along	04	3	100	1\/1	3.95					-
780			C4	9				$\Diamond$				1
	105							$\Diamond$				
					98	18	2.95	$\Diamond$				+
								$\Diamond$				-
775		108.4 feet: ARGILLITE interbeds undulating parallel to fractures	C5	0								
	110 - : : :	109.6 feet: ARGILLITE clasts up to 0.8" 110.0 feet: fresh; intensely fractured; calcite veining			100	12	5.86					4
			C5	1		12	0.00	$\langle \rangle$				_
								$\Diamond$				+
770		113.5 feet: very intensely fractured	C5	2	100	0	4.75	$\Diamond$				
	115	114.5 feet: intensely fractured	0.5	2				$\Diamond$				_
		(continued)		REPORT T	ITI E				Tuc	DLE ID		4
				BORING	REC				R	C-20-015		
					OUNT <b>Del N</b>			OUTE <b>101</b>	POSTMILE <b>12-15.5</b>	EA <b>01</b>	15000099	
\	KLI	EINFELDER  Bright People. Right Solutions.	Ī	PROJECT Last Ch	OR BI	RIDG	E NAME					
				BRIDGE N			PREPAR D. Ro	RED BY	,	DATE <b>3-30-21</b>	SHEET 4 of 11	
												_

Sample Location

DESCRIPTION

SEDIMENTARY ROCK (SANDSTONE)

(postulated failure zone)

86.8 to 94.0 feet: recovered ARGILLITE and SANDSTONE fragements; local Lean CLAY (CL)

SEDIMENTARY ROCK (ARGILLITE); dark gray; intensely weathered; soft; very intensely fractured; trace calcite veining; clay infills on chaotic fractures; sheared (LANDSLIDE DEPOSIT/FAILURE ZONE)

95.0 feet: moderately soft

SEDIMENTARY ROCK (SANDSTONE)

Sample/Run#

C34

C35

C36

C37

C38

C39

C40

C41

C42

C43

C44

Uncorr. Blows per 6 in.

Blows per foot

Recovery (%)

8

100 0

38 0

50

100 0

30 0

100 0

100 0

RQD (%)

0

0

Drill Rate (min/ft)

10.00

3.33

8.18

4.62

2.86

10.00

2.00

10.00

0.71

7.00

4.38

2.86

Drilling Method Casing Depth

Discontinuity Description

Fracture Identification: (Depth), Dip, Width, Infilling Composition, Weathering, Hardness, Healing, Roughness

765

760

DEPTH (ft)

120

Material Graphics

	125 :	:::  10-20°											
	I Ц:				100	0	5.71						
	□:	• • •	C5	8									
	∐:	126.5 feet: 0.75" calcite bleb											_
	:		C5	9	100	0	13.33						
	I Ц:				100	0	6.36						_
755	:	: : : 128.0 feet: 2" ARGILLITE layer: dips 10°	C6	0									
	H:	:::			100	0	1.82						_
			C6	1									
	130				50	0	2.92						$\neg$
	∐:												
	:	:::	C6	[2]									
	Ι Ц:												_
	:	· · · · · · · · · · · · · · · · · · ·			100	0	6.87						
	H:	: : : 132.5 feet: moderately hard; Lean CLAY (CL) fracture infill	C6	3				><					-
750	:	· · ·											
	H:		C6	4	100	-	0.00	$\sqrt{}$					-
	135	134.4 feet: intensely fractured			100	0	4.67	$\Diamond$					
				_									
	Ц:	∷ 135.4 feet: very intensely fractured; Lean CLAY (CL)	C6	5				$\Diamond$					
	:	Haddie Hilli											
	H:	· · ·			75	0	5.94						_
	:				13	0	3.34	$\triangleright \triangleleft$					
745	H:	:::						$\Diamond$					_
745	:		C6	6				$\triangleright \triangleleft$					
	П:	139.0 feet: fine to coarse grained; moderately weathered; moderately soft; intensely fractured; elongated ARGILLITE						$\Diamond$					
	140	:::  moderately soft; intensely fractured; elongated ARGILLITE											
	:	clasts up to 0.1" with calcite veining 140.0 feet: fine-grained; slightly weathered; hard			100	0	16.00						
	I Н <u>:</u>	• • •	C6	7									_
	E	141.0 feet: caving noted			100	0	12.73	$\Diamond$					
	H <u>-</u>	SEDIMENTARY ROCK (ARGILLITE) Very dark gray; slightly weathered; moderately hard; very intensely fractured; (FRANCISCAN COMPLEX: BROKEN	C6	8									-
	<u> </u>	intensely fractured; (FRANCISCAN COMPLEX: BROKEN FORMATION)			100	0	2.86						
740		- FORIVIATION)	C6	0									
, 10	LE	<u>-</u>											
							2.86						
	145 <u> </u>	<u></u>	C7	0			2.00	$\Diamond$					
		(continued)											
				REPORT TI	TLE	`OD	D			HOLE ID	015		
			+		UNT			OUTE	POSTMIL		EA		-
					el N			101	12-15.			5000099	
١ ١	K	LEINFELDER	Ī	PROJECT C							1		
		Bright People. Right Solutions.	L	Last Cha			de Byp	ass					
				BRIDGE NU	MBE	R	PREPAR	RED BY		DAT	E 30-21	SHEET	,
							D. Ro	55		J	)U-Z'I	5 of 1	

Sample Location

DESCRIPTION

SEDIMENTARY ROCK (SANDSTONE)

117.0 feet: very intensely fractured 117.5 feet: intensely fractured

121.0 feet: 2" Lean CLAY (CL) infilled seam

124.2 feet: ARGILLITE laminated seams: dips

121.6 feet: Lean CLAY (CL) fracture infill

123.5 feet: very intensely fractured

Sample/Run#

C52

C53

C54

C55

C56

C57

Uncorr. Blows per 6 in.

Blows per foot

Recovery (%)

100 0

100 0

100 0

100 0

100 0

100 0

RQD (%)

Drill Rate (min/ft)

4.21

4.55

20.00

4.29

6.82

Drilling Method Casing Depth

Discontinuity Description

Fracture Identification: (Depth), Dip, Width, Infilling Composition, Weathering, Hardness, Healing, Roughness

_	_						1	_						
ELEVATION (ft)	DEPTH (ft)	Material	NOITHING Sample Location	Sample/Run#	Uncorr. Blows per 6 in.	Blows per foot	Recovery (%)	RQD (%)	Drill Rate (min/ft)	Drilling Method Casing Depth	Fracture Id Width, Infilling	ontinuity Des dentification: g Compositi ss, Healing,	Depth), Dip on, Weatheri	), ing,
	145		SEDIMENTARY BOOK (ABOILLITE)	C70						$\sim$				
		=		C71					5.00					_
		-	-	C71			100	0	15.71					_
			I FILE to Hedium dialieu. Massive, verv dan diav.	C72			100		5.00	$\rightarrow$				
735			moderately weathered; moderately hard; very intensely fractured; very intensely fractured with Lean CLAY (CL) infill; calcite veining (FRANCISCAN COMPLEX: BROKEN	C73			100	17	5.00	$\Diamond$				
			FORMATION)  148.6 feet: fresh; hard; intensely fractured	C/3						$\Diamond$				_
	150	- :::	140.0 leet. fiesti, fiard, filterisery fractured				100	0	2.00					_
		_:::		C74						$\Diamond$				_
									7.33					
		7:::	152.0 feet: advance HWT casing to 134.0'	C75					1.33					
730		<b>∃</b> ∷:	:				63	21	5.00	$\rightarrow$				-
''		<b>- :::</b>	153.6 feet: fine to medium grained; massive; slightly	C76			55	-'	0.00	$\Diamond$				_
	155	_ :::	weathered; hard; intensely fractured; calcite veining (FRANCISCAN COMPLEX: BROKEN FORMATION)				100	0	1.82					_
		:::	155.0 feet: 1" quartz vein				100	U	1.02					
			156.0 feet: very intensely fractured	C77						$\langle \rangle$				_
	-	<b>⊣</b> ∷:	<u> </u>				74	0	5.00					-
				C78										_
725		_ :::	:	C79					4.44	$\rightarrow$				_
			:	0.0			100	0	5.29					
	160	<b>-</b>  :::	159.8 feet: Lean CLAY (CL) fracture infill	C80						$\Diamond$				_
			<u> </u>				100	0	5.00	$\rightarrow$				_
		<b>-</b>  ∷:	<u> </u>	C81										_
							11	0	2.78	$\Diamond$				_
720		:::	:	C82						$\Diamond$				
		<b>-</b>  :::					100	0	5.38	) (				_
	165	- ∷:	:	C83										-
		- ::: - :::	165.6 feet: thin ARGILLITE interbeds: dips 15° 166.0 feet: 0.25" ARGILLITE interbed: dips 70°	<del>C84</del>			100 100		13.33					_
		_]:::	166.5 feet: intensely fractured	C85					0.00					_
715							100	61	3.04	$\rightarrow$				
715		<b> </b> :::	:				100	01	0.04	$\Diamond$				_
			: 168.5 feet: thin ARGILLITE interbeds: dips 20°	C86						$\Diamond$				-
	170	<b>-</b>  :::	<u> </u>				100	49	6.67					_
			:	C87										_
		]:::	<u> </u>				100	0	4.76					
		<b> </b>	:	C88										_
740			]	000			100	_	50.00	<b>→</b> ઁ <b>4</b>				_
710		<b>↓</b> ∷:	:	C89			100		3.03					_
	175			C90						$\Diamond$				
	-170		(continued)											
					REPOR BORI	T TIT NG I	LE REC	OR	D			DLE ID <b>RC-20-01</b> :	5	
		_		С	IST. <b>01</b>	CO	UNT'	Y		ROUTE 101	POSTMILE <b>12-15.5</b>	EA 0	115000099	
	( <i>F</i>	<b>K</b> L	EINFELDER  Bright People. Right Solutions.	F	ROJE	ст о	R BF	RIDG	E NAME					
			bright reopie. Night solutions.		Last ( RIDGE				de By PREPA	ARED BY		DATE	SHEET	
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	03				$\Diamond$					
(continued)										
	REPORT BORII	T TITLE		D			HOLE ID RC-20-0	)15		
KI FINIFFI DED	DIST.	COUN'			ROUTE 101	POSTMILE <b>12-15.5</b>		EA <b>011</b>	500009	9
KLEINFELDER  Bright People. Right Solutions.	PROJEC Last (	CT OR E								
	BRIDGE	NUMBE	R	PREPA D. R	ARED BY		DATE 3-30-	-21	SHEET <b>7 of</b>	

ELEVATION (ft)	зоертн (ft)	Material Graphics		Sample Location	Sample/Run#	Uncorr. Blows per 6 in.	Blows per foot	Recovery (%)	RQD (%)	Drill Rate (min/ft)	Drilling Method Casing Depth	Discontinuity Description  Fracture Identification: (Depth), Dip, Width, Infilling Composition, Weathering, Hardness, Healing, Roughness
705	180	-	174.8 feet: light greenish gray; slightly weathered; very intensely fractured with Lean CLAY (CL) fracture infill; very thin calcite veining SEDIMENTARY ROCK (SANDSTONE); caving noted  177.2 feet: ARGILLITE laminations: dips 60° 177.5 feet: 0.4" calcite: dips 50°  178.5 feet: 1" ARGILLITE interbed: dips 10° 178.8 feet: intensely fractured	С	:90 :91 :92			100		4.76 7.08		- - - - -
700	185 -	-	182.8 feet: ARGILLITE laminations: dips 15-20° 183.2 feet: very dark bluish gray; 0.4" clay layer; very dark gray; moderately hard  185.0 feet: very intensely fractured with Lean CLAY (CL) infill		93			100	0	3.72	× <	- - - -
695	190	-	189.8 feet: decomposed: (SANDY lean CLAY with GRAVEL (CL); gray; moist; mostly moderate plasticity fines; some SAND; little GRAVEL)  SEDIMENTARY ROCK (SANDSTONE)		:95			100	0	5.00	X\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	- - - -
690	195 -	=	SEDIMENTARY ROCK (SANDSTONE) Fine-grained; massive; gray; slightly weathered; hard; very intensely fractured; calcite veining (FRANCISCAN COMPLEX: BROKEN FORMATION)  194.5 feet: intensely fractured  196.2 feet: 0.1" to 1" calcite vein/bleb	С	:97			100	48	4.20	\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	- - -
685	200 -	_	196.8 feet: 0.5" calcite vein: dips 30°  198.5 feet: very intensely fractured; elongated ARGILLITE clasts up to 0.1"  199.6 feet: scattered calcite veins; pockets up to 0.1"	С	:98			100	0 0	12.50 5.79	\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	- - - -
680	205		202.8 feet: 0.1" ARGILLITE interbed: dips 15°  (continued)	C´	109 101 102 103			100 100 100	0 0 0	33.33 200.00 5.26 3.00	$\Diamond \times \Diamond \times \Diamond \times \Diamond$	 
			(отшисо)		R	EPOR <b>BORI</b>	T TI	TLE <b>REC</b>	OR	D		HOLE ID RC-20-015

ELEVATION (ft)	DEPTH (ft)	Material Graphics	DESCRIPTION	Sample Location	Sample/Run#	Uncorr. Blows per 6 in.	Blows per foot	Recovery (%)	RQD (%)	Drill Rate (min/ft)	Drilling Method	Discontinuity Description Fracture Identification: (Depth), Dip, Width, Infilling Composition, Weathering Hardness, Healing, Roughness
	205	20	SEDIMENTARY ROCK (SANDSTONE) 205.0 feet: intensely fractured	0)	()	<u>в</u>	Ш	94	25		$\rightarrow$	2
			, and the second	c	C103							
675	210	_	208.4 feet: no recovery, dropped core from barrel	C	C104					3.33		
					C105			50	0	10.00	$\rightarrow$	
670	-			C	C106			64	0	3.64	$\langle \Diamond \rangle \langle \Diamond \rangle$	
	215 -		214.6 feet: 0.5" calcite bleb					21	0	4.10	$\begin{array}{c} \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\$	
665				c	C107						$\langle \Diamond \rangle \langle \Diamond \rangle$	
	220		220.0 feet: moderately weathered; moderately hard; very intensely fractured	-	C108			53	0	25.88	\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	
			222.5 feet: fine to medium grained; slightly weathered;		C109			100	0	3.33	$\stackrel{\Diamond}{\rightarrow}$	
660			intensely fractured  223.4 feet: decomposed; soft; very intensely fractured;(CLAYEY GRAVEL with SAND (GC); gray; moist; mostly GRAVEL; some medium plasticity fines; some SAND)		2111			93	0	6.67	→<	
	225 -		225.2 feet: slightly weathered; hard; very intensely fractured	П	C112					15.71 5.00	××××	
655	-	_	226.6 feet: intensely weathered; moderately hard; very intensely fractured; with Lean CLAY (CL) fracture infill	c	C114			25	0	4.44 2.94		
	230		229.4 feet: decomposed; (CLAYEY GRAVEL with SAND (GC); gray; wet; mostly GRAVEL; some fines; some SAND)		C115			100	0	5.20		
			some SAND) 230.0 feet: fine-grained; dark gray; slightly weathered; hard; intensely fractured; local Lean CLAY (CL) fracture infill 230.5 feet: moderately fractured 231.8 feet: intensely fractured	c	C116			95	0	3.45		F: (232.6'), 70°, slightly open, very thin,
650	235			C	C117						>< >>< >	clay, moderately soft, moderately healed, moderately rough
			(continued)		R	EPOR	ТТІТ	LF				HOLE ID
(	H		EINFELDER		D	BORI IST. 01	COI De	JNT JNT	Y <b>orte</b>	I	ROUTE 101	RC-20-015

PROJECT OR BRIDGE NAME

Last Chance Grade Bypass

BRIDGE NUMBER PREPARED BY

D. Ross

DATE **3-30-21**  SHEET 8 of 11

KLEINFELDER
Bright People. Right Solutions.

ELEVATION (ft)	23	SOEPTH (ft)	. Material Graphics		Sample Location	Sample/Run#	Uncorr. Blows per 6 in.	Blows per foot	Recovery (%)	RQD (%)	Drill Rate (min/ft)	Drilling Method Casing Depth	Discontinuity Description Fracture Identification: (Depth), Dip, Width, Infilling Composition, Weathering, Hardness, Healing, Roughness
	20			SEDIMENTARY ROCK (SANDSTONE) 235.4 feet: moderately weathered; very intensely fractured 236.4 feet: intensely weathered; 1" ARGILLITE clast		C118	<b>.</b>		88	0	3.89	\ \ \ \	
645				237.5 feet: decomposed; very soft; (CLAYEY SAND (SC); dark gray; moist; mostly fine to medium sand; some fines); trace calcite veining 238.0 feet: fresh; very hard; slightly fractured; calcite veining		C119	ı		83	34	3.45	$\Diamond$	
	24	10 -		SEDIMENTARY ROCK (ARGILLITE); very dark gray to black; decomposed; very soft; very intensely fractured; (Lean CLAY with SAND (CL); very dark gray; moist to wet; mostly high plasticity fines; little SAND); pervasively sheared (FRANCISCAN COMPLEX: BROKEN FORMATION)		C120	1		100	0	7.00	$\langle \diamond \rangle \langle \diamond \rangle$	_
640				240.3 feet: moderately weathered; local SANDSTONE clasts 241.0 feet: rig chatter SEDIMENTARY ROCK (SANDSTONE)		C122	!		96	0	3.85	> <	
	24	15 -		Fine-grained; dark gray; moderately weathered; moderately hard; very intensely fractured; (FRANCISCAN COMPLEX: BROKEN FORMATION) 243.0 feet: ARGILLITE clast in SANDSTONE matrix; soft 243.6 feet: slightly weathered		C123			100	0 43	8.00		
				244.5 feet: moderately weathered 246.0 feet: moderately fractured 246.6 feet: ARGILLITE clast		C125	i					$\Diamond \times \Diamond$	F: (246.2'), 50°, moderately open, moderately thin, calcite, slightly — weathered, moderately hard, not healed,
635				247.4 feet: very intensely fractured; 6"sheared ARGILLITE clast 249.0 feet: very intensely fractured		C126			100 35	0	37.50 2.11		rough F: (246.8'), 15°, moderately open, moderately thin, clay, moderately soft, not healed, smooth
	25	50 -		249.8 feet: some Lean CLAY (CL) fracture infill		C128	\ \ !		68	0	6.36	$\langle \rangle \langle \rangle \langle \rangle$	
630				251.8 feet: 2" ARGILLITE interbed; black to dark gray; slightly weathered; moderately soft		C130	1		70	0	2.80	/ / / / /	
	25	55 -		253.6 feet: decomposed; breaks down to: (Clayey SAND with GRAVEL (SC); mostly sand; some fines; some GRAVEL)  SEDIMENTARY ROCK (ARGILLITE); black to dark gray;					75	0	3.33	$\Diamond$	
				slightly to moderately weathered; moderately soft; intensely to very intensely fractured; pervasively sheared (FRANCISCAN COMPLEX: BROKEN FORMATION)		C131			69	0	4.17	$\langle \diamond \rangle \langle \diamond \rangle$	
625				\258.0 feet: drilling resistance SEDIMENTARY ROCK (SANDSTONE); fine-grained;		C132 C133 C134			100		110.00		_
	26	50		dark gray; slightly weathered; hard; intensely fractured  SEDIMENTARY ROCK (ARGILLITE); dark gray to light gray; moderately weathered; soft; very intensely fractured; calcite veining (FRANCISCAN COMPLEX: BROKEN		C135	i				11.79	$\langle \rangle \langle \rangle \langle \rangle$	
620				FORMATION) 261.6 feet: black FAILURE ZONE		C136	i		58 100	0	10.00	$\Diamond$	
620	000			Sheared to: (Fat CLAY with SAND and GRAVEL (CH); very dark gray; moist; mostly clay; little SAND; little GRAVEL); highly sheared fractures; slickened surfaces; distorted calcite pockets; trace SANDSTONE and ARGILLITE fragments up to 2"		C137	•					$\langle \diamond \rangle \langle \diamond \rangle$	
		J.U		(continued)									
				<u> </u>			EPOR BORI IST.	NG				OUTE	HOLE ID RC-20-015
		K	LE	EINFELDER Bright People. Right Solutions.		P	01 ROJE	<b>D</b>	R BF	orte RIDG		101	12-15.5 0115000099
				· · · · · · · · · · · · · · · · · · ·		В	RIDGE			_	PREPAR D. Ro	RED BY	DATE SHEET 3-30-21 9 of 11

ELEVATION (ft)		590 1990 1900 1900 1900 1900 1900 1900 1	Material Graphics		Sample Location	Sample/Run#	Uncorr. Blows per 6 in.	Blows per foot	Recovery (%)	RQD (%)	Drill Rate (min/ft)	Drilling Method Casing Depth	Discontinuity Description  Fracture Identification: (Depth), Dip, Width, Infilling Composition, Weathering, Hardness, Healing, Roughness
				FAILURE ZONE 265.2 feet: light gray; calcite blebs	¢	C137			100	0		$\stackrel{\checkmark}{\sim}$	_
				266.2 feet: ARGILLITE clasts; intensely weathered to decomposed					100	0	2.40		_
													_
61	5				c	2138							_
		270										$\Diamond$	_
			<i>!!.!:</i> :::::	SEDIMENTARY ROCK (SANDSTONE) Fine-grained; gray; intensely weathered; moderately hard;					10			ightharpoonup	_
			-	very intensely fractured; calcite veining (FRANCISCAN COMPLEX: BROKEN FORMATION)					46	0	4.47	$\Diamond$	_
61	2		-	272.8 feet: Lean CLAY (CL) fracture infill	¢	C139						$\Diamond$	_
			-									$\Diamond$	_
		275	-						83	8	3.17		_
												$\Diamond$	_
			<del> </del>	277.6 feet: 6" SANDSTONE clast	c	C140						$\Diamond$	_
60:	5			278.5 to 279.1 feet: decomposed: (CLAYEY SAND with								$\Diamond$	_
		280 -		GRAVEL (SC); very dark gray; moist to wet; mostly SAND; some fines; little GRAVEL) 279.2 feet: 1" ARGILLITE clast					99	20	7.62	$\Rightarrow$	F: (279.2'), 70°, slightly open, very thin, calcite, moderately weathered,
		200		279.4 feet: moderately hard; moderately fractured 280.2 feet: 3" ARGILLITE clasts 280.4 feet: slightly weathered; intensely fractured	C	C141						$\Diamond$	moderately hard, not healed, moderately rough
				281.2 feet: moderately weathered					90	0	4.81	$\Diamond$	F: (279.8'), 15°, slightly open, very thin, calcite, moderately weathered,
			::::		d	2142						$\Diamond$	moderately hard, not healed, moderately rough F: (280.2'), 60°, slightly open, very thin,
60	0			283.8 to 293.3 feet: 5" ARGILLITE clast; black;					83	0	4.12		clay, moderately soft, moderately healed, moderately rough
		285	-	decomposed; soft; pervasively sheared	d	2143						$\Diamond$	_
-				285.2 feet: intensely weathered; moderately hard 286.0 feet: moderately fractured; trace ARGILLITE clasts					89	13	4.69	$\Diamond$	F: (285.8'), 80°, tight, clean, not healed, — moderately rough
			 	OFFINITARY POOK (APONLITE)	c	C144						$\Diamond$	F: (286.2'), 20°, slightly open, very thin, — calcite, moderately weathered,
59	5			SEDIMENTARY ROCK (ARGILLITE) Black to very dark gray; moderately weathered; moderately soft to soft; very intensely to intensely								$\Diamond$	moderately hard, not healed, moderately — rough
				fractured; (FRANCISCAN COMPLEX: BROKEN FORMATION) 288.6 feet: 2" SANDSTONE clasts		.,,			93	19	7.22	$\Diamond$	F: (286.8'), 80°, slightly open, very thin, calcite, moderately weathered,
		290		289.0 feet: 3" SANDSTONE clast; fine grained; slightly weathered; hard; sheared contact	_	C145			100	0	4.00	$\Diamond$	moderately hard, not healed, moderately rough F: (287.4'), 25°, slightly open, very thin,
1				290.8 feet: decomposed; sheared to: (Lean CLAY with SAND (CL); very dark gray; moist; mostly fines; some SAND; trace GRAVEL)					100	U	4.00	$\Diamond$	clay, moderately weathered, moderately soft, not healed, moderately rough
						C146						$\Diamond$	
59	0			SEDIMENTARY ROCK (SANDSTONE)								$\Diamond$	
		295	::::	Fine-grained; gray to dark gray; intensely weathered; soft; very intensely fractured; (FRANCISCAN COMPLEX:								$\Diamond$	_
		110-	_	(continued)			EPOF				_		HOLE ID
						D	BOR IST.	CC	UNT	Υ	F	ROUTE	RC-20-015   POSTMILE   EA   0145000000
		K	CLE	EINFELDER Bright People. Right Solutions.		Р		CT (		RIDG	E NAME I <b>de By</b> p	101 ass	12-15.5 0115000099
	`		_			В	RIDG				PREPA D. Ro	RED BY	DATE SHEET 3-30-21 10 of 11

gINT FILE:

Sample Location ELEVATION (ft) Drill Rate (min/ft) Drilling Method Casing Depth per 6 in. Discontinuity Description Sample/Run# (%) DEPTH (ft) Blows per Fracture Identification: (Depth), Dip, Width, Infilling Composition, Weathering, Hardness, Healing, Roughness Recovery DESCRIPTION Material Graphics RQD (%) Uncorr. Blows p BROKEN FORMATION)
294.5 feet: moderately weathered; moderately hard
SEDIMENTARY ROCK (SANDSTONE) 90 33 5.43 F: (295.2'), 75°, slightly open, very thin, calcite, moderately weathered, 295.2 feet: slightly weathered; hard; moderately fractured moderately hard, not healed, moderately SEDIMENTARY ROCK (ARGILLITE); black to very dark gray; moderately weathered; moderately soft to soft; very intensely fractured; prominent high angle shear surfaces: 70° (FRANCISCAN COMPLEX: BROKEN FORMATION) 298.2 feet: decomposed: (Lean CLAY with SAND (CL); very dark gray; moist; mostly medium plasticity fines; little SAND) C147 F: (295.6'), 65°, slightly open, very thin, calcite, moderately weathered, moderately hard, not healed, moderately 585 100 0 9.29 F: (296.4'), 75°, slightly open, very thin, C148 clay, moderately soft, not healed, 300 100 0 1.3 moderately rough C149 301.0 feet: advance HWT casing to full depth (301.0') Bottom of borehole at 301.0 ft bgs 580 305 575 310 570 315 565 320 560 HOLE ID RC-20-015 REPORT TITLE BORING RECORD ROUTE DIST. COUNTY **POSTMILE** TEMPLATE: Del Norte 12-15.5 0115000099 101 01 *KLEINFELDER* PROJECT OR BRIDGE NAME **Last Chance Grade Bypass** Bright People. Right Solutions. PREPARED BY **D. Ross BRIDGE NUMBER** SHEET 3-30-21 11 of 11

LOGGI M.Pc		1	BEGIN DATE COMPLETION DATE 11-19-20 12-4-20	BOREHOL 2485154	1.42	25 ft	t / <b>59</b> 8	354	3.47	'2 ft	NAD83		um)	HOLE ID	016	
DRILLI			ACTOR ace Inc.	BOREHOL	E L	OCA	TION	Offs	et, S	ation	, Line)				ELEVATION TENAVD88	
	I <b>ry C</b> ER T	Ore YPE(S)	AND SIZE(S) (ID)  Core (2.5")	DRILL RIG Burley 5 SPT HAMM Catheau	5 <b>5-</b> 1	TYI		80-ir	nch (	dron				BOREHOL 5 in	E DIAMETER	ΞRi
BORE	HOLE	BACK	FILL AND COMPLETION  linometer; cement-bentonite		VAT		DURI	NG E		ING	AFTER	R DRILLIN Determi	` /	TOTAL DE <b>300.5 ft</b>	PTH OF BORI	ING
ELEVATION (ft)	овертн (ft)	Material Graphics	DESCRIPTION		Sample Location	Sample/Run#	Uncorr. Blows per 6 in.	Blows per foot	Recovery (%)	RQD (%)	Drill Rate (min/ft)	Drilling Method Casing Depth	Fracture Width, Infi	illing Compo	Description on: (Depth), D sition, Weatho g, Roughness	ering,
	-0-1		AGGREGATE BASE; 12" Aggregate base  SEDIMENTARY ROCK (SANDSTONE) Fine-grained; massive; red, black, gray, and ye brown; intensely weathered; very soft; very intenfractured; (LANDSLIDE DEPOSIT)	illowish nsely		S01	16 18 11	29	66	-	0.00	000000000000000000000000000000000000000				-
470	5 -											0000000000				•
465	10	- : : : : : : : : : : : : : : : : : : :	6.8 feet: intensely weathered to decomposed to soft; (CLAYEY SAND (SC); loose; wet; mo coarse sand; little medium plasticity fines; transubangular GRAVEL)	; very soft stly fine to ce fine		502	4 2 3	5	39	=	14.00	000000000000000000000000000000000000000				
	-		10.2 feet: circulation loss		X.	S03	2 2 3	5	39	-	10.00	000000000000000000000000000000000000000				
460	15 -	- - - - - - - - - - - - - - - - - - -	17.3 feet: advance HWT casing to 17.3'; equip	HO core	V.	S04	26 41	64		-	20.00	000000000000000000000000000000000000000				
455	20 -	-	18.2 feet: fine to medium grained; massive; light gray; intensely weathered; moderately intensely fractured; with CLAYEY SAND (Sinfill	nt brownish soft; very	1	205	23		58	0	9.13					
			20.5 feet: intensely fractured			206			100	0	5.60					
450	-25		(continued)			C07			. 50	J	30					
	F	< < L	EINFELDER Bright People. Right Solutions.			D		NG CO D CT O	UNT el No er BF	Y <b>orte</b> RIDGI	F	ROUTE 101	POSTMIL <b>12-15.</b> 5		016 EA 011500009	99
							RIDGE				PREPAR D. Ro	RED BY		DATE <b>4-22</b>	-21 SHEET	

U3:Z6 PM BY: DSUIII	ELEVATION (ft)	DEPTH (ft)	Material Graphics	DESCRIPTION	Sample Location	Sample/Run#	Uncorr. Blows per 6 in.	Blows per foot	Recovery (%)	RQD (%)	Drill Rate (min/ft)	Drilling Method Casing Depth	Discontinuity Description  Fracture Identification: (Depth), Dip, Width, Infilling Composition, Weathering, Hardness, Healing, Roughness
PLOTTED: 04/19/2022 03:26 PM BY: DSulli		-25		SEDIMENTARY ROCK (SANDSTONE)  26.3 feet: very intensely fractured; advance HWT casing to 26.3'		C07			24	0	5.29	>	_ _ _
	445	30 -	-		C	C09			55	0	5.79	$\Diamond$	_ _ _
		-		31.8 feet: intensely fractured; chaotic quartz and calcite veining throughout mass, up to 0.1" thick	(	C10			97	27	11.67 7.94	♦	
	440	35 -		34.8 feet: moderately fractured 35.3 feet: intensely fractured 36.0 feet: very intensely fractured 36.4 feet: intensely fractured		C11			94	0	7.57		F: (34.8'), 60°, tight, clean, not healed, slightly rough F: (35.3'), 50°, moderately open, very thin, clay/iron oxide, moderately
	435	-				C12						$\Diamond \times \Diamond \times \Diamond$	weathered, moderately hard, not healed, — slightly rough — — —
()2]	Ŧ <b>J</b> J	40 -		41.0 feet: moderately fractured 42.0 feet: intensely fractured		C13			100	31	7.59	×	- - -
IOD W DRILL RATE	430	45 -	-	43.0 feet: very intensely fractured 44.0 feet: intensely fractured					100	27	6.00	>><>>>	_ _ _
CALIKANS (NLF IV		-		46.4 feet: fine-grained; massive; light brownish gray to gray; moderately weathered; hard; intensely fractured		C14			100	9	5.33	$\langle \Diamond \times \Diamond \times \Diamond \rangle$	- - -
STANDARD_GINT_LIBRARY_2022.GLB [CLIENT_CALTRANS (KLF MOD W DRILL RATE)2]	425	50 -	-	49.0 to 51.0 feet: moderately weathered; moderately hard; very intensely fractured; with CLAYEY SAND (SC) fracture infill	C	C15							
GINI_LIBRAR1_2				51.0 feet: moderately fractured  53.4 feet: 0.5" fine SANDSTONE interbed; dark brown;		C16			100	47	7.60	$\Diamond \times \Diamond \times \Diamond$	F: (51.7'), 20°, wide, very thin, clay/magnesium, highly weathered, moderately hard, not healed, slightly rough F: (52.3'), 20°, wide, very thin,
ANDAKD	420	55		intensely weathered; soft; very intensely fractured  (continued)								$\Diamond$	clay/manganese, highly weathered, moderately hard, not healed, slightly
E:KLF	(	<i>F</i>	CLE	EINFELDER		D	EPOR BORI DIST. 01	NG CO DC CT O	UNT el No R BF	Y <b>orte</b> RIDG	E NAME	ROUTE <b>101</b>	HOLE ID RC-20-016  POSTMILE EA 0115000099
gini iemplaie:				Bright People. Right Solutions.		В	Last ( RIDGE				de Byp PREPAF D. Ro	RED BY	DATE SHEET 4-22-21 2 of 11

415

60

DEPTH (ft)

Material Graphics

İ		H	•							$\triangleright \triangleleft$			_
410	65		SEDIMENTARY ROCK (SANDSTONE); fine-grained; yellow brown and gray brown; moderately to intensely weathered; moderately soft to moderately hard; mass brecciated and partially rehealed; quartz and calcite veining to 0.1" thick (LANDSLIDE DEPOSIT) 63.0 feet: very intensely fractured	C	19	10	00 1	2	5.00	$\Diamond \times \Diamond \times \Diamond \times \Diamond \times \Diamond$			- - -
													_
		H	67.1 feet: intensely fractured			10	00 2	27	4.80	$\left[ \Diamond \right]$			_
		H								$\Diamond$			_
		H	60.1 to 60.2 foot: clightly to moderately weathered:										_
405	70	-	69.1 to 69.3 feet: slightly to moderately weathered;     moderately hard; very intensely fractured; with SILTY     SAND (SM) fracture infill     69.3 to 69.6 feet: ARGILLITE interbed: dips 20-25°;     black; slightly weathered; moderately soft to soft;     moderately fractured     70.0 feet: intensely fractured	C	20					>	F: (69.3'), 25°, healed, smooth F: (69.9'), 25°, healed, smooth	tight, very thin,	
		Hii	71.0 feet: very intensely fractured 71.0 feet: word intensely fractured 72.1 feet: moderately weathered; moderately soft;			10	00 (	0	8.89	Š			_
		Hii	intensely fractured 73.0 feet: intensely weathered; moderately soit, 173.0 feet: intensely weathered; moderately fractured	C	21			2	6.20				_
		H::	73.6 feet: intensely fractured							$\Diamond$			_
400	75	<u> </u>	74.2 feet: fresh surface; friable							$\Diamond$			_
	10		SEDIMENTARY ROCK (SANDSTONE); fine to medium grained; very thinly bedded; dark gray to black; decomposed to intensely slightly weathered; very intensely fractured; locally sheared to: (CLAYEY SAND (SC), loose to medium dense; wet; mostly fine to coarse	C	22					$\langle \diamond \rangle \langle$			-
			: sand; little medium plasticity fines); abundant ARGILLITE clasts up to 0.1"; within mass, abundant polished shears (LANDSLIDE FAILURE ZONE/ LANDSLIDE DEPOSIT)							$\sim$			
			: \77.8 feet: intensely fractured : SEDIMENTARY ROCK (SANDSTONE); fine-grained;			9	7 (	0	4.58	$\Diamond$			_
395	80		massive; gray and yellow brown; slightly weathered; moderately hard; very intensely fractured; chaotic quartz and calcite veining to 0.1" thick (LANDSLIDE DEPOSIT)	C	23					$\Diamond$			- -
						8	3 1	6	6.54	$\searrow$			_
			O4 0 feets sheetic calcite veins	C	24					$\Diamond$			_
			81.8 feet: chaotic calcite veins							$\Diamond$			
		T::	LANDSLIDE FAILURE ZONE			3	7 (	0	5.20	$\Diamond$			_
390			SANDSTONE and ARGILLITE sheared to: (Clayey SAND (SC); loose; dark gray; wet; mostly fine to coarse sand; little medium plasticity fines; trace subangular fine to	C	25								_
	<b>-</b> 85-	//	(continued)							, · •			
					REPORT BORI			ORI	)		HO <b>R</b>	LE ID <b>C-20-016</b>	
/					DIST.	COUN <b>Del</b>				OUTE <b>101</b>	POSTMILE <b>12-15.5</b>	EA <b>011</b>	5000099
	/	KL	EINFELDER Bright People. Right Solutions.		PROJEC	CT OR	BRI	DGE		_		1 2 3 2 3	
					BRIDGE				PREPAR D. Ro	RED BY		DATE 4-22-21	SHEET 3 of 11
					_ <del></del>				ט. אט	<del>33</del>		7-22 <b>-</b> 21	J 01 11

Sample Location

DESCRIPTION

SEDIMENTARY ROCK (SANDSTONE)

Sample/Run#

C16

C17

C18

Uncorr. Blows per 6 in.

Blows per foot

Recovery (%)

100 47

100

100 19

RQD (%)

0

Drill Rate (min/ft)

5.00

6.05

Drilling Method Casing Depth

 $\Diamond$ 

Discontinuity Description

Fracture Identification: (Depth), Dip, Width, Infilling Composition, Weathering, Hardness, Healing, Roughness

rough J: (53.4'), 45°, tight, very thin,

manganese, highly weathered,

moderately hard, not healed, slightly

385

380

375

90

95

100

105

DEPTH (ft)

Material Graphics

365

360

E:KLF

TEMPLATE: gINT FILE:

96 0 5.16		C3:	ily i	ips 35°; moderate ly fractured erately hard to hard	t: ARGILLITE interbed: dips 35°; model; moderately soft; intensely fractured : slightly weathered; moderately hard to	11 ww	145	44	
					(continued)		115		
REPORT TITLE HOLE ID  BORING RECORD RC-20-016									
DIST.   COUNTY   ROUTE   POSTMILE   EA	DIST. <b>01</b>						"		
PROJECT OR BRIDGE NAME  Last Chance Grade Bypass					pple. Right Solutions.		^		
BRIDGE NUMBER PREPARED BY D. Ross DATE SHEET 4-22-21 4 of 11	BRIDO								
<u> </u>									
BORING RECORD         RC-20-016           DIST.         COUNTY Del Norte         ROUTE 101         POSTMILE 12-15.5         EA 01150000           PROJECT OR BRIDGE NAME Last Chance Grade Bypass         BRIDGE NUMBER         PREPARED BY         DATE         SHEE	DIST. 01 PROJ Las				FELDER ople. Right Solutions.		K		

Sample Locatior

DESCRIPTION

coarse gravel (SANDSTONE rock fragments)) 83.7 feet: 2" soft Fat CLAY (CH) seam: dips 35-40° LANDSLIDE FAILURE ZONE

SEDIMENTARY ROCK (SANDSTONE); fine-grained; massive; gray; slightly weathered; moderately hard; intensely fractured; chaotic quartz and calcite veining 91.6 to 92.0 feet: moderately weathered; very intensely fractured; with CLAYEY SAND (SC) fracture infill 92.4 to 93.4 feet: abundant chaotic calcite veining to 0.3"

93.5 feet: 1" thick sheared ARGILLITE seam: dips 5°;

decomposed; very soft 93.8 feet: slightly weathered; moderately hard; intensely

97.1 to 97.9 feet: ARGILLITE interbed: dips 60° (top), 5°(bottom); moderately bedded; slightly weathered;

soft; very intensely fractured 97.9 feet: slightly weathered; moderately hard to hard; intensely fractured

LANDSLIDE FAILURE ZONE: SANDSTONE sheared to: (Clayey GRAVEL with SAND (GC); loose; gray to light

olive gravel (SANDSTONE fragments); little fine to coarse sand; little medium plasticity fines); chaotic; generally

fractured; chaotic quartz and calcite veining (LANDSLIDE DEPOSIT)
105.0 to 110.2 feet: minimal recovery; dominantly blocks

SEDIMENTARY ROCK (SANDSTONE)
Fine to medium grained; massive; gray to dark gray; slightly weathered; moderately hard; very intensely

94.8 feet: moderately fractured

96.0 feet: intensely fractured

clast supported 101.0 feet: rig chatter

less than 1" diameter

108 feet: circulation loss

110.2 feet: 4" calcite bleb

Sample/Run#

C25

C26

C27

C28

C29

C30

C31

C32

C33

C34

per 6 in.

Blows per

%)

Recovery

37 n

83

100 0

100 0

100 26

0

73

86 0

83 0

56 0

83 0

97 0

% RQD (

0

Drill Rate (min/ft

4.00

6.32

9.29

3.33

2.00

3.20

3.20

2.00

3.00

9.17

 $\Diamond$ 

Drilling Method Casing Depth

**Discontinuity Description** 

Fracture Identification: (Depth), Dip, Width, Infilling Composition, Weathering, Hardness, Healing, Roughness

F: (96.1'), 30°, slightly open, thin, calcite, slightly weathered, moderately hard, not

F: (96.7'), 70°, moderately open, thin,

clay, slightly weathered, very soft, not

healed, slightly rough

healed, slightly rough

PLOTTED: 04/19/2022 03:26 PM BY: DSUIIN	ELEVATION (ft)	DEPTH (ft)	Material Graphics	DESCRIPTION	Sample Location	Sample/Run#	Uncorr. Blows per 6 in.	Blows per foot	Recovery (%)	RQD (%)	Drill Rate (min/ft)	Drilling Method Casing Depth	Discontinuity Description  Fracture Identification: (Depth), Dip, Width, Infilling Composition, Weathering, Hardness, Healing, Roughness
	355	_	_	SEDIMENTARY ROCK (SANDSTONE)  116.0 feet: moderately fractured  116.8 to 118.0 feet: intensely weathered; moderately soft to very soft; very intensely fractured; brecciated with SANDY Lean CLAY (CL) infill  118.0 feet: slightly weathered; moderately hard; intensely fractured		C37			100		7.20	>	F: (115.8'), 5°, wide, very thin, clay/iron oxide, intensely weathered, soft, not healed, slightly rough — F: (116.6'), 30°, slightly open, moderately thin, clay, slightly weathered, very soft, not healed, slightly rough
	333	120 -		119.7 feet: hard; moderately fractured 120.5 feet: intensely fractured		C38			100	67	5.40	X	J: (120.5'), 80°, slightly open, moderately thin, clay, soft, not healed, slightly rough
	350	125		123.5 to 123.8 feet: convolute ARGILLITE bed remnants up to 0.5" thick; slightly weathered; moderately hard; moderately fractured 124.3 feet: intensely fractured 126.0 feet: moderately fractured 127.0 feet: intensely fractured		C39					00	×	F: (123.5'), 5°, moderately open, very thin, clay, soft, not healed, slightly rough F: (123.8'), 5°, moderately open, very thin, clay, soft, not healed, slightly rough F: (124.3'), 60°, moderately open, very thin, clay/iron oxide, soft, not healed, slightly rough F: (124.7'), 50°, moderately open, very
	345	130		127.3 to 128.2 feet: convolute ARGILLITE interbeds and bed remnants up to 0.5" thick; slightly weathered; moderately hard  128.8 to 130.5 feet: convolute ARGILLITE interbeds and bed remnants up to 0.5" thick; slightly weathered; moderately hard  129.9-130.5 feet: ARGILLITE interbeds and bed remnants to 0.2" thick: 15°; slightly weathered; moderately hard; mass parts readily on bedding planes  131.0 feet: moderately fractured  131.4 feet: 2" convolute ARGILLITE bed remnants; slightly weathered; moderately hard		C40			100	73	6.80	X	thin, clay/iron oxide, soft, not healed, slightly rough F: (125.3'), 5°, moderately open, very thin, clay, soft, not healed, slightly rough F: (125.8'), 30°, moderately open, very thin, clay, soft, not healed, slightly rough F: (126.2'), 80°, moderately open, very thin, clay, soft, not healed, slightly rough F: (126.5'), 50°, moderately open, very thin, clay, soft, not healed, slightly rough F: (127.2'), 20°, moderately open, very
GIN LIBRARY_2022:GEB [CLIENI_CALIKANS (KLF MOD W DRILL KATE)]	340	135		133.2 to 133.8 feet: abundant ARGILLITE clasts up to 0.1" 133.8 to 135.0 feet: light gray; moderately weathered; moderately soft to moderately hard; very intensely fractured; with CLAYEY SAND (SC) fracture infill  SEDIMENTARY ROCK (SANDSTONE); fine-grained; massive; light olive gray; decomposed; very soft; very intensely fractured; (CLAYEY GRAVEL with SAND (GC); loose; wet; mostly fine subangular gravel (SANDSTONE fragments); little medium plasticity fines; little fine to coarse sand); mass maintains semicoherent structure (LANDSLIDE DEPOSIT)		C42			95 100	0 0	0.00	>	thin, clay, soft, not healed, slightly rough F: (127.7'), 10°, moderately open, very thin, clay, soft, not healed, slightly rough F: (131.3'), 5°, slightly open, thin, clay, soft, not healed, slightly rough F: (131.4'), 35°, tight, thin, clay, soft, moderately healed F: (131.6'), 35°, moderately open, thin, clay, soft, not healed, slightly rough F: (131.9'), 80°, moderately open, thin, clay, soft, not healed, moderately rough F: (132.4'), 30°, moderately open, thin,
NI_LIBRART_ZUZZ.GEB [CLIENT]	335	140		LANDSLIDE FAILURE ZONE: SANDSTONE sheared to:(SANDY lean CLAY with GRAVEL (CL), stiff, olive gray, moist, mostly fines, some fine grained SAND, little fine subangular GRAVEL)  SEDIMENTARY ROCK (SANDSTONE) Fine-grained; massive; light bluish gray; moderately weathered; moderately soft to moderately hard; very intensely fractured; localized zones have been brecciated, partially rehealed; chaotic quartz and calcite veining to 0.1" (LANDSLIDE DEPOSIT) 140.2 feet: intensely fractured		C44			100		0.00	×	clay, soft, not healed, moderately rough F: (132.9'), 60°, moderately open, thin, clay, soft, not healed, moderately rough  — — — — —
				,		C45					,	$\Diamond$	-
STANDARD	330	145	::::	(continued)							$ \diamondsuit $		
gini iemplaie: e:KLF_S		H	\(\( LE	EINFELDER Bright People. Right Solutions.		P	Last (	NG CO D CT C Cha	REC UNT el N OR BF nce	Y <b>orte</b> RIDG <b>Gra</b>	E NAME de Bypa		HOLE ID RC-20-016  POSTMILE EA 0115000099
BRIG 										₹	PREPAR <b>D. Ro</b>		DATE SHEET 4-22-21 5 of 11

S 03.20 FINI BT. Doding	ELEVATION (ft)	л ОЕРТН (ft)	Material Graphics	NOITPIN Sample Location	Sample/Run#	Uncorr. Blows per 6 in.	Blows per foot	Recovery (%)	RQD (%)	Drill Rate (min/ft)	Drilling Method	Discontinuity Description Fracture Identification: (Depth), Dip, Width, Infilling Composition, Weathering, Hardness, Healing, Roughness
04/13/2022		145	-	SEDIMENTARY ROCK (SANDSTONE) 145.2 feet: very intensely fractured 146.1 feet: intensely fractured				100	33		$\Diamond$	_
PLOI IED.			<u> </u> :::::  :::::	147.0 feet: intensely weathered; soft 147.2 feet: very intensely fractured	C45						$\Diamond$	-
				148.0 feet: moderately weathered; moderately soft				100	22	0.00	$\overrightarrow{\Diamond}$	_
	325	150	-								$\Diamond$	_
				151.0 feet: intensely weathered; soft to moderately soft	C46						$\langle \rangle$	-
											$\stackrel{\vee}{\diamond}$	-
				SEDIMENTARY ROCK (SANDSTONE); fine-grained; massive; olive gray; decomposed; soft; very intensely fractured; with CLAYEY SAND (SC) infill: (CLAYEY GRAVEL with SAND (GC)); loose; wet; mostly fine				100	0	0.00	$\Diamond$	_
	320	155		medium plasticity fines: little fine to coarse sand:	C47						$\Diamond$	-
				(LANDSLIDE DÉPOSIT) 154.6 feet: 3" ARGILLITE interbed: dips 10°; decomposed; soft								
			-		C48			100	0 45	0.00	$\rightarrow$	_
	315			158.0 feet: intensely fractured to very intensely fractured 158.5 feet: 2" ARGILLITE interbed; decomposed; soft						0.00	$\diamond$	-
	010	160		160.0 feet: 1" ARGILLITE interbed remnant;	C49						$\Diamond$	-
[7			 	grained; massive; gray to light gray; slightly weathered; moderately hard; moderately fractured; chaotic quartz and calcite veining (LANDSLIDE DEPOSIT)							$\Diamond$	F: (160.9'), 75°, slightly open, very thin, calcite, moderately weathered, moderately hard, partly healed, slightly
W DNILL NATE(A)			<u>                                     </u>	,				100	22	0.00	$\rightarrow$	rough — F: (163.4'), 20°, slightly open, clean, not
	310	165		162.7 to 163.1 feet: mass has been brecciated and rehealed; chaotic ARGILLITE interbed remnants to 0.3"; slightly weathered; moderately hard 163.1 to 164.0 feet: ARGILLITE interbed: dips 25°;							$\diamond$	healed, slightly rough
			-	intensely weathered: soft: very intensely fractured	C50						$\Diamond$	-
				decomposed; very soft; pervasively sheared to: (SANDY lean CLAY (CL); soft; black; moist to wet; mostly fines: little fine to coarse sand; trace fine							$\Diamond$	-
				subangular gravel) 166.0 feet: slightly weathered; moderately hard; intensely fractured				100	17	0.00	$\neg \diamond$	-
5	305	170			054						$\Diamond$	-
1277					C51						$\Diamond$	-
5			1772	LANDSLIDE FAILURE ZONE				100	0	0.00	$\rightarrow$	
	300			SANDSTONE and ARGILLITE sheared to: (CLAYEY	C52			100		0.00	$\Diamond$	-
		1/5		(continued)	Tr	DEDOD	T TIT	15				אטן ב וס
						REPOR BORI DIST.	NG CO	REC UNT	Y		ROUTE	
I EIVIP LA I E.		K	CLE	EINFELDER Bright People. Right Solutions.	F		ст о		RIDG	E NAME		12-15.5 0115000099
				,		RIDGE				PREPA D. R	RED B	DATE SHEET 4-22-21 6 of 11

DEPTH (ft)

Material Graphics

295	180	0 -		178.9 feet: moderately fractured 179.0 feet: 3" ARGILLITE interbed: dips 35°; dark gray; decomposed; very soft  180.7 feet: intensely fractured  181.9 feet: 3" ARGILLITE interbed; slightly weathered; moderately soft; very intensely fractured 182.3 feet: 2" ARGILLITE interbed; decomposed; very	C54	1					\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	F: (178.9'), 35 Argillite, deco healed, smoot F: (179.7'), 85 healed, slightl F: (180.7'), 15 healed, rough	mposed, ver th °, slightly op y rough °, slightly op	y soft, not en, clean, no	ot _
290				182.3 feet: 2" ARGILLITE interbed; decomposed; very soft; very intensely fractured/sheared with CLAYEY SAND (SC) infill 183.3 feet: intensely fractured	C5	5		00	0 55	5.33					_
	188			185.0 feet: 3" ARGILLITE interbed: 40-60°; slightly weathered; soft; very intensely fractured; mass parts readily on bedding planes 185.2 feet: moderately hard; moderately fractured 186.4 feet: very intensely fractured 186.5 feet: 2" ARGILLITE interbed; slightly weathered; moderately soft; very intensely fractured 186.7 feet: moderately hard; moderately fractured	C50	6					>>< >> > < >> < >> < >> < >> < >> < >>	F: (185.2'), 40 slightly rough	°, tight, clea	n, not healed	, <b>–</b> – –
285	190	0 -		187.2 feet: 3" ARGILLITE interbed: 50°; slightly weathered; moderately soft; very intensely fractured; mass parts readily on bedding planes 187.4 feet: moderately hard; intensely fractured 188.1 feet: moderately fractured  190.9 to 191.9 feet: chaotic calcite veining up to 1" thick	C5 <sup>-</sup>	7	1	00	100	4.88	$\Diamond \times \Diamond \times \Diamond \times \Diamond$	F: (188.3'), 50 healed, rough F: (189.0'), 80 healed, rough F: (189.4'), 50 healed, rough	°, slightly op	en, clean, no	ot _
				SEDIMENTARY ROCK (SANDSTONE); moderately bedded with very thin interbeds of ARGILLITE; SANDSTONE: fine grained; moderately bedded; light	C5	3			0	3.00					
280	195	5		gray to gray; slightly weathered; moderately hard; very intensely fractured; ARGILLITE: very thinly bedded; dark gray to black; slightly weathered; moderately soft; very intensely fractured; chaotic quartz and calcite veining to 0.1" thick (LANDSLIDE DEPOSIT)	C5:	9		50	0	5.00					
	130			195.3 to 195.8 feet: ARGILLITE interbeds sheared to:	C6	D	1	00	0	5.00					
				(CLAYEY GRAVEL with SAND (GC); loose; dark gray; wet; mostly fine subangular gravel; little moderate plasticity fines; little fine to coarse sand) 195.8 feet: slightly weathered; moderately hard	C6	1	1	00	0	1.14	$\Diamond$				
					C6:	2	1	00	0	4.44					
275	200	0-	/ / 	SEDIMENTARY ROCK (ARGILLITE); massive; dark gray to black; decomposed; very soft to soft; very intensely fractured; pervasively sheared to: (CLAYEY SAND with GRAVEL (SM-SC); medium dense; mostly fine to coarse	C6	3	1	00	0	5.80	\\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\				-
				SAND (ARGILLITE fragments); little low to medium plasticity fines; little fine GRAVEL); convolute polished shears throughout (LANDSLIDE DEPOSIT) 200.0 feet: intensely fractured to very intensely fractured	C6	1	1	00	32	5.31					
				SEDIMENTARY ROCK (SANDSTONE) Fine grained: moderately to thinly bedded: light gray.	C6:	5	1	00	50	8.75					
270	205	5		Fine grained; moderately to thinly bedded; light gray, gray, and bluish gray; slightly weathered; moderately hard; intensely fractured; chaotic quartz and calcite veining to 0.1" thick (LANDSLIDE DEPOSIT)	C6	6	1	00	30	5.48	$\Diamond$				_
				(continued)		REPOR	ידוד ד	F				H(	OLE ID		$\dashv$
					L	BORI	NG R	REC	_		DO: :==	F	RC-20-016		
		K	LE	EINFELDER	L	DIST.  01  PROJEC	CT OF	No R BR	orte IDGE	E NAME		POSTMILE <b>12-15.5</b>	0 0	115000099	9
1.5				Bright People. Right Solutions.	-	Last ( BRIDGE			_		<b>pass</b> ARED BY		DATE	SHEET	$\dashv$
							_ 140101	اے	`	D. R			4-22-21	7 of	11

Sample Location

DESCRIPTION

local relic structure
\(\(\(\text{LANDSLIDE FAILURE ZONE}\)\)
\text{SEDIMENTARY ROCK (SANDSTONE); fine-grained; massive; gray and gray blue; slightly weathered; moderately hard; moderately fractured; chaotic quartz and calcite veining to 0.1" (LANDSLIDE DEPOSIT)
\text{176.3 feet: intensely fractured}

Sample/Run#

C53

Uncorr. Blows per 6 in.

Blows per foot

Recovery (%)

RQD (%)

100 43

100 40

Drill Rate (min/ft)

0.00

0.00

Drilling Method Casing Depth

 $\Diamond$ 

Discontinuity Description

Fracture Identification: (Depth), Dip, Width, Infilling Composition, Weathering, Hardness, Healing, Roughness

F: (175.6'), 70°, slightly open, very thin,

F: (176.6'), 85°, slightly open, clean, not

sand/silt, soft, not healed, smooth

healed, slightly rough

202 to 203 for convolute ARGELITE interbods to 707 thrick interestly weathered, very interestly 2030 for extingively weathered, very interestly 2030 for extingively weathered, moderately factured 2030 for extingively	04/13/2022 03:20 FINI BT. DOUIL	ELEVATION (ft)	д Р В В В В В В В В В В В В В В В В В В	Material Graphics	DESCRIPTION	Sample Location	Sample/Run#	Uncorr. Blows per 6 in.	Blows per foot	Recovery (%)	RQD (%)	Drill Rate (min/ft)	Drilling Method Casing Depth	Discontinuity Description Fracture Identification: (Depth), Dip, Width, Infilling Composition, Weathering, Hardness, Healing, Roughness
210.0 feet: slightly weathered; moderately hard; intensely fractured  213.0 feet: moderately fractured  213.0 feet: moderately fractured  213.0 feet: moderately fractured  214.2 feet: moderately fractured  215.2 feet: moderately fractured  216.0 feet: slightly weathered; moderately hard; intensely fractured  217.8 feet: 2" ARGILLITE interbed: dips 10"; slightly weathered; moderately soft to moderately soft to moderately with moderately moderately soft to moderately	redited. 04/18/202		205		0.75" thick; intensely weathered; soft; very intensely	(	C66			100			\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	F: (204.2'), 80°, slightly open, very thin, clay, very soft, not healed, slightly rough F: (204.5'), 85°, slightly open, very thin, sand/silt, moderately soft, not healed, slightly rough F: (205.0'), 45°, slightly open, very thin,
213.0 feet: moderately fractured  213.0 feet: moderately fractured  215.0 feet: moderately fractured  215.0 feet: moderately fractured  216.0 c69  217.8 feet: 2" ARGILLITE interbed: dips 10", slightly weathered; moderately soft to moderately weathered; moderately soft to moderately weathered; moderately soft to moderately hard; intensely fractured  226.0 c70  227.0 feet: 2" ARGILLITE interbed: dips 10", slightly to moderately weathered; moderately soft to moderately hard; intensely fractured  228.0 feet: slightly weathered; moderately soft to moderately hard; intensely fractured  229.0 feet: slightly weathered; moderately hard; intensely fractured  220.0 leave; slightly weathered; moderately hard; intensely fractured  220.0 leave; slightly weathered; moderately hard; intensely fractured intensely fractured  221.0 feet: moderately weathered; moderately hard; intensely fractured intensely fractured  222.0 feet: slightly weathered; moderately hard; intensely fractured intens		265	210	-						96			$\rangle \times \Diamond \times \Diamond \times \langle$	moderately soft, partly healed, smooth F: (205.9'), 55°, slightly open, clean, not healed, rough F: (207.4'), 55°, slightly open, clean, not
255 220  BRECCIATED ZONE: ARGILLITE interbed: dips 10°; slightly weathered; moderately soft to moderately hard; intensely fractured  C70  BRECCIATED ZONE: ARGILLITE and SANDSTONE processed and generally reflected, slightly weathered; moderately soft to moderately hard; intensely fractured  C71  BRECCIATED ZONE: ARGILLITE and SANDSTONE processed and generally reflected, slightly weathered; moderately soft to moderately hard; intensely fractured  C71  BRECCIATED ZONE: ARGILLITE and SANDSTONE processed and generally reflected, slightly weathered; moderately soft to moderately hard; intensely fractured  C71  BRECCIATED ZONE: ARGILLITE and SANDSTONE processed and generally reflected, slightly weathered; moderately hard; intensely fractured  C71  C72  SEDIMENTARY ROOK (SANDSTONE) Fine grained, thinky bedded light gary to gray, slightly weathered, moderately hard; intensely fractured, though quarty and calcite veining throughout unit (LANDSLIDE DEPOSIT)  C72  SEDIMENTARY ROOK (SANDSTONE) Fine grained, thinky bedded light gary to gray, slightly weathered, moderately hard; theready fractured 234.3 feet: 11° ARGILLITE interbed: disp 30°; slightly weathered, moderately hard (continued)  C73  SEDIMENTARY ROOK (SANDSTONE) Fine grained, thinky bedded light gary to gray, slightly weathered, moderately hard (continued)  C73  SEDIMENTARY ROOK (SANDSTONE) Fine grained, thinky weathered, moderately hard (continued)  C74  SEDIMENTARY ROOK (sandstone) Fine grained, thinky weathered, moderately hard (continued)  C75  SEDIMENTARY ROOK (sandstone) Fine grained, moderately hard (continued)  C76  SEDIMENTARY ROOK (sandstone) Fine grained, moderately hard (continued)  C77  SEDIMENTARY ROOK (sandstone) Fine grained, moderately hard (continued)  C78  SEDIMENTARY ROOK (sandstone) Fine grained, moderately hard (continued)  C79  SEDIMENTARY ROOK (sandstone) Fine grained, moderately hard (continued)  C79  SEDIMENTARY ROOK (sandstone) Fine grained, moderately hard (continued)  SEDIMENTARY ROOK (sandstone) Fine grained, moderately hard (continue		260	245		213.0 feet: moderately fractured					100	7	4.70	$\rangle$	clay, not healed, moderately rough F: (213.5'), 60°, slightly open, very thin, sand/silt, soft, not healed, slightly rough
weathered; moderately soft to moderately  255 220			215	-	217.8 feet: 2" ARGILI ITF interbed: dips 10°: slightly		C69					4.05	>	healed, moderately rough F: (215.8'), 45°, slightly open, clean, not healed, slightly rough F: (216.8'), 55°, slightly open, very thin,
BRECCIATED ZONE: ARGILLITE and SANDSTONE brecciated and generally rehealed; gray, dark gray, and gray; have		255	220 -	-	weathered; moderately soft 218.2 feet: light gray and whitish gray; slightly to moderately weathered; moderately soft to moderately	(	C70				0	4.00	>	- - -
BRECCIATED ZONE: ARGILLITE and SANDSTONE brecciated and generally rehealed; gray, dark gray, and grayish white; moderately weathered; soft to moderately hard; very intensely fractured with local SANDY CLAY (SC) infill; abundant chaotic calcite veining throughout unit (LANDSLIDE DEPOSIT)  SEDIMENTARY ROCK (SANDSTONE) Fine-grained; thinly bedded; light gray to gray; slightly weathered; moderately hard; intensely fractured, chaotic quartz and calcite veining to 0.1" thick 232.2 feet: moderately hard; intensely fractured, chaotic quartz and calcite veining to 0.1" thick 233.4 feet: 11" ARGILLITE interbed: dips 30°; slightly weathered, moderately soft, very intensely fractured 234.5 feet: slightly weathered, moderately hard  (continued)  REPORT TITLE BORING RECORD RC-20-016  DIST. COUNTY 01 Del Norte 101 POSTMILE 102-15.5 0115000099  PROJECT OR BRIDGE NAME Last Chance Grade Bypass	W DINIEL 1991 E/2]	250	_	-						100	42	4.00	>	- - -
SEDIMENTARY ROCK (SANDSTONE)  Fine-grained; thinly bedded; light gray to gray; slightly weathered; moderately hard; intensely fractured; chaotic quartz and calcite veining to 0.1" thick 232.2 feet: moderately fractured 233.4 feet: 11" ARGILLITE interbed: dips 30°; slightly weathered; moderately soft; very intensely fractured 234.3 feet: slightly weathered; moderately hard  (continued)  REPORT TITLE BORING RECORD  INC. 200-016  BORING RECORD  PROJECT OR BRIDGE NAME Last Chance Grade Bypass	2		225 =				C71						>	_ _ _ _
weathered; moderately soft; very intensely fractured 234.3 feet: slightly weathered; moderately hard  (continued)  REPORT TITLE BORING RECORD DIST. COUNTY O1 Del Norte 101 12-15.5 0115000099 PROJECT OR BRIDGE NAME Last Chance Grade Bypass		245	230 -		hard; very intensely fractured with local SANDY CLAY (SC) infill; abundant chaotic calcite veining throughout	(	C72			100	13	5.60	$\rangle \times \Diamond \times \Diamond \times \langle$	- - -
REPORT TITLE BORING RECORD  DIST. COUNTY ROUTE POSTMILE O1 Del Norte 101 12-15.5 0115000099  PROJECT OR BRIDGE NAME Last Chance Grade Bypass  DELOS CHARGE OF DELOS O	AND_CIN [ 1   1   1   1   1   1   1   1   1   1	240		<i>!//d.</i>	Fine-grained; thinly bedded; light gray to gray; slightly weathered; moderately hard; intensely fractured; chaotic quartz and calcite veining to 0.1" thick 232.2 feet: moderately fractured 233.4 feet: 11" ARGILLITE interbed: dips 30°; slightly weathered: moderately soft: very intensely fractured		C73			100	37	4.40	>	F: (233'), 55°, slightly open —
REPORT TITLE BORING RECORD  DIST. COUNTY ROUTE POSTMILE O1 Del Norte 101 12-15.5 0115000099  PROJECT OR BRIDGE NAME Last Chance Grade Bypass  DELOS CHARGE OF DELOS O	į	<u>_</u>	235	<u> </u>	• • • • • • • • • • • • • • • • • • • •								$ \vee $	_
PROJECT OR BRIDGE NAME  Last Chance Grade Bypass  BRIDGE NUMBER PREPARED BY DATE SHEET	LINE						D	BORI IST. 01	NG I	REC UNT el No	rte	Ro 1		RC-20-016 POSTMILE EA
BRIDGE NUMBER PREPARED BY DATE SHEET	I INIT	1						Last (	Cha	nce	Gra	de Bypa		
D. Ross 4-22-21   8 of 11									NUI	MBE	₹			DATE SHEET <b>4-22-21 8 of 11</b>

235

230

225

240

245

250

255

DEPTH (ft)

Material Graphics

215

210

TEMPLATE: gINT FILE:

			100	13	1.56				_
						$\triangleright \triangleleft$			
						$\Diamond$			_
259.5 feet: slightly weathered; hard; intensely fractured	CE	31				\ <u>`</u>			
260 - :::: 255.5 rect. slightly weathered, hard, interisely fractured									-
						_/^_			_
261.2 feet: ~2,500 gallons water used between 243.0'	CE	22	100	0	22.50	$\Diamond$			
		02	100		F 00	$\rightarrow \bigcirc$			_
	CE	3	100	0	5.00	$\Diamond$			
	Н.	,,,	100	4.5	0.00	<b>→</b> `<			_
			100	15	3.20				
	CE	24							_
		,4							
265 ::::						$\Diamond$			_
(continued)									
		REPOR	RT TITLE				H	OLE ID	
		BOR	ING REC	COF	RD.		F	RC-20-016	
	İ	DIST.	COUNT	Υ		ROUTE	POSTMILE	EA	
KI EINIEEL DED		01	Del N	orte	•	101	12-15.5	01	15000099
KLEINFELDER	İ	PROJE	CT OR BI	RIDG	E NAME				
Bright People. Right Solutions.		Last	Chance	Gra	de By	oass			
	İ		E NUMBE			RED BY	•	DATE	SHEET
					D. R			4-22-21	9 of 11
								•	•

Sample Location

DESCRIPTION

SEDIMENTARY ROCK (SANDSTONE)

236.0 feet: moderately fractured

238.0 feet: intensely fractured

240.1 feet: 1" calcite vein fragment

245.0 feet: intensely fractured

249.4 feet: moderately fractured

250.0 feet: intensely fractured

slightly weathered; soft

DEPOSIT)

veining, vein fragments to 0.2" thick

243.0 feet: ~7,000 gallons water used between 192.0' and 243.0'; no circulation return

243.6 to 243.8 feet: convolute ARGILLITE bed remnants to 0.5" thick; slightly weathered; moderately hard

245.5 to 250.5 feet: abundant chaotic quartz and calcite

250.6 feet: 2" sheared ARGILLITE interbed: dips 30°;

SEDIMENTARY ROCK (SANDSTONE); very thinly bedded with very thin interbeds of (ARGILLITE); SANDSTONE: fine grained; very thinly bedded; gray to dark gray; slightly weathered; moderately hard; intensely fractured; ARGILLITE: very thinly bedded; dark gray; slightly weathered; moderately soft to moderately hard; lard; ry intensely fractured; chaotic quartz and calcite veining, mass parts readily on ARGILLITE interbeds (LANDSLIDE DEPOSIT)

Fine-grained; massive; gray and bluish gray; slightly weathered; moderately hard; intensely fractured; chaotic quartz and calcite veining to 0.1" thick (LANDSLIDE

SEDIMENTARY ROCK (SANDSTONE)

255.0 feet: very intensely fractured

Sample/Run#

C73

C74

C75

C76

C77

C78

C79

C80

per 6 in. foot

Uncorr. Blows r

Blows per

(%)

Recovery

100 37

100 7

100 0

100 53

100 17

100 0

100 0

0

98

%

RQD (

Drill Rate (min/ft

4.40

5.25

4.00

4.00

5.50

4.85

4.12

Drilling Method Casing Depth

 $\Diamond$ 

 $\Diamond$ 

Discontinuity Description

Fracture Identification: (Depth), Dip, Width, Infilling Composition, Weathering, Hardness, Healing, Roughness

F: (236.0'), 55°, slightly open, clean, not

F: (236.4'), 40°, slightly open, clean, not

F: (236.7'), 45°, slightly open, very thin,

silt, very soft, not healed, slightly rough F: (238.0'), 50°, slightly open, very thin, silt, very soft, not healed, smooth

healed, slightly rough

healed, slightly rough

205

270

275

195

DEPTH (ft)

Material Graphics

gINT TEMPLATE:

195	280	_		280.8 feet: 10" ARGILLITE interbed; contact diffuse; dark gray; slightly weathered; moderately soft to soft; very intensely fractured locally to coarse sand 281.6 feet: moderately hard; intensely fractured	C90						×				<u>-</u>
190	285	· —		SEDIMENTARY ROCK (SANDSTONE); very thinly bedded with very thin interbed remnants of ARGILLITE; SANDSTONE: fine grained; very thinly bedded; gray; slightly weathered; moderately hard; very intensely fractured; ARGILLITE: very thinly bedded; dark gray to black; slightly weathered; soft; very intensely fractured LANDSLIDE FAILURE ZONE: SANDSTONE and ARGILLITE sheared to: (CLAYEY SAND with GRAVEL (SC); loose; dark gray to black; wet; mostly fine to coarse	C91			100	0	4.88	X				_
		П	· · · · · ·	sand; little moderate plasticity fines; little subangular fine to coarse gravel)	C92		•	100	0	2.22					
185	290	_		SEDIMENTARY ROCK (SANDSTONE) Fine-grained; massive; gray to dark gray; slightly weathered; moderately hard; very intensely fractured; chaotic quartz and calcite veining to 0.2" thick (FRANCISCAN COMPLEX: BRÖKEN FORMATION) 288.4 feet: 2" ARGILLITE interbed: 25°; black; slightly	C93			100	0	4.40	 				
				weathered; moderately soft to soft; very intensely fractured 288.6 feet: moderately hard; intensely fractured 290.5 feet: very intensely fractured; with local SILTY to CLAYEY SAND (SM/SC) fracture infill	C94			100	0	3.20	♦				
180				293.0 feet: intensely fractured	C95		,	100	22	4.00	\ \ \ \ \				
	<del>-</del> 295	_		(continued)							•				٦
						REPORT <b>BORIN</b>			OR	D			LE ID C-20-016		٦
		K	L	EINFELDER		DIST. <b>01</b>	COL <b>De</b>	INT'	Y orte	F	101	POSTMILE <b>12-15.5</b>	EA <b>01</b>	15000099	
				Bright People. Right Solutions.			han	ice	Gra	de Byp PREPAR D. Ro	RED BY		DATE <b>4-22-21</b>	SHEET 10 of 11	
					·				,						

Sample Location

DESCRIPTION

268.0 feet: slightly weathered; moderately hard; very intensely fractured; with SILTY SAND (SM) fracture infill

275.8 to 276.2 feet: LANDSLIDE FAILURE ZONE: SANDSTONE sheared to: (SILTY GRAVEL (GM); medium dense; gray; mostly fine to coarse angular GRAVEL; some low plasticity fines) 276.7 feet: intensely fractured

SEDIMENTARY ROCK (SANDSTONE)

274.7 feet: intensely fractured

278.0 feet: very intensely fractured

Sample/Run#

C84

C85

C86

C87

C88

C89

Uncorr. Blows per 6 in.

Blows per foot

Recovery (%)

100 15

100 0

100 0

101 0

100 0

100 25

90 0

RQD (%)

Drill Rate (min/ft)

3.20

3.20

3.93

5.56

3.85

4.80

Drilling Method Casing Depth

Discontinuity Description

Fracture Identification: (Depth), Dip, Width, Infilling Composition, Weathering, Hardness, Healing, Roughness

gINT TEMPLATE:

gINT FILE:

Sample Location ELEVATION (ft) Uncorr. Blows per 6 in. Drill Rate (min/ft) Drilling Method Casing Depth Sample/Run# Blows per foot Discontinuity Description Recovery (%) DEPTH (ft) Fracture Identification: (Depth), Dip, Width, Infilling Composition, Weathering, Hardness, Healing, Roughness DESCRIPTION Material Graphics RQD (%) SEDIMENTARY ROCK (SANDSTONE) 295.2 feet: 1" convolute ARGILLITE bed remnant: dips 100 22 60°; slightly weathered; moderately hard 295.7 feet: moderately weathered; soft to moderately soft C95 296.6 feet: slightly weathered; moderately hard 100 43 4.80 298.4 feet: moderately fractured C96 299.4 feet: intensely fractured 175 300 300.5 feet: ~3,600 gallons water used between 273.0' and 300.5'; advance HWT casing to full depth (300.5') Bottom of borehole at 300.5 ft bgs 170 305 165 310 315 155 320 150 HOLE ID **RC-20-016** REPORT TITLE **BORING RECORD** ROUTE POSTMILE DIST. COUNTY Del Norte 101 12-15.5 0115000099 01 KLEINFELDER PROJECT OR BRIDGE NAME Last Chance Grade Bypass Bright People. Right Solutions. PREPARED BY **D. Ross BRIDGE NUMBER** DATE SHEET 4-22-21 11 of 11

TEMPLATE:

gINT FILE:

LOGGED BY **BEGIN DATE** COMPLETION DATE BOREHOLE LOCATION (Lat/Long or North/East and Datum) HOLE ID D. Sullivan/C. Tipp 12-1-20 12-6-20 2488343.080 ft / 5983459.356 ft NAD83 RC-20-017 DRILLING CONTRACTOR SURFACE ELEVATION BOREHOLE LOCATION (Offset, Station, Line) CRUX Subsurface, Inc. 829.36 ft NAVD88 DRILLING METHOD DRILL RIG BOREHOLE DIAMETER **Rotary Core** Burley 6000 4.5 in SAMPLER TYPE(S) AND SIZE(S) (ID) SPT HAMMER TYPE HAMMER EFFICIENCY, ERI SPT (1.4"), HQ Core (2.5") Cathead; 140 lbs / 30-inch drop GROUNDWATER DURING DRILLING AFTER DRILLING (DATE) BOREHOLE BACKFILL AND COMPLETION TOTAL DEPTH OF BORING **Not Determined Not Determined** VWP, TDR, Inclinometer; cement-bentonite 300.0 ft Sample Location Rate (min/ft Blows per 6 in. foot **Discontinuity Description** EVATION ( Sample/Run# **Drilling Method** 8 € Blows per f Fracture Identification: (Depth), Dip, Width, Infilling Composition, Weathering, Hardness, Healing, Roughness Material Graphics Recovery DESCRIPTION DEPTH ( Casing [ RQD ( ᆸ SILTY SAND with GRAVEL (SM); dark brownish gray; moist; trace to few organics (FILL) CLAYEY GRAVEL with SAND (GC); medium dense; dark brownish gray; moist; mostly fine to coarse subangular GRAVEL; little coarse to fine SAND; little fines; low plasticity; (FILL) 825 4.5 feet: circulation loss 17 33 5.0 feet: advance HWT casing to 5.0' 9 S01 820 11 6 5 S02 6 Poorly-graded GRAVEL with CLAY AND SAND (GP-GC); dense; dark gray and light gray; moist to wet; mostly angular GRAVEL; little SAND; few fines; low plasticity; (LANDSLIDE DEPOSIT) 815 28 44 18 15 14 S03 14 810 35 44 20 24 S04 11 805 32 39 24.5 feet: increased GRAVEL content (continued) REPORT TITLE HOLE ID **BORING RECORD** RC-20-017 POSTMILE DIST. COUNTY ROUTE 0115000099 **Del Norte** 101 12-15.5 01 *KLEINFELDER* PROJECT OR BRIDGE NAME Bright People. Right Solutions. **Last Chance Grade Bypass** BRIDGE NUMBER PREPARED BY DATE SHEET

D. Ross

1 of 11

6-4-21

22 03:26 PM BY: DSu	ELEVATION (ft)	ў БЕРТН (ft)	Material Graphics	DESCRIPTION	Sample Location		Uncorr. Blows per 6 in.	Blows per foot	Recovery (%)	RQD (%)	Drill Rate (min/ft)	Drilling Method Casing Depth	Discontinuity Description Fracture Identification: (Depth), Dip, Width, Infilling Composition, Weathering, Hardness, Healing, Roughness
PLOTTED: 04/19/2022				SEDIMENTARY ROCK (SANDSTONE); fine- to medium-grained sand; massive; dark gray and light gray; slightly weathered; moderately hard; intensely to very intensely fractured; occasional calcite veining (LANDSLIDE DEPOSIT)		S05 S05	23 20 12	32	39				_
	800	30 -	-	31.0 feet: advance casing to 31.0'; equip HQ core		S06/		50/1/	NR/ 88	0	0.00	X COLLING	- -
	795	35 -		SEDIMENTARY ROCK (ARGILLITE); massive; very dark gray; decomposed; very soft; very intensely fractured; pervasively sheared to (SANDY lean CLAY (CL); medium stiff; moist; some fine to coarse SAND; trace fine gravel (LANDSLIDE DEPOSIT)		C07			61	0	2.60	$\Diamond \times \Diamond \times$	- - -
	790	40		36.7 to 37.2 feet: SANDSTONE interbed: dips 50°  SEDIMENTARY ROCK (SANDSTONE); fine-grained sand; massive; dark gray; decomposed; moderately soft; very intensely fractured; pervasively sheared to (Poorly-graded GRAVEL with SAND (GP); mostly GRAVEL; little SAND; trace fines (LANDSLIDE DEPOSIT)		C09			61	0	2.62	\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	
(KLF MOD W DRILL RATE)ZJ	785	45 -		SEDIMENTARY ROCK (ARGILLITE); massive; very dark gray; decomposed; soft; very intensely fractured; (SANDY lean CLAY with GRAVEL (CL); medium stiff; moist; little SAND; little GRAVEL (LANDSLIDE DEPOSIT)  SEDIMENTARY ROCK (SANDSTONE); fine-grained sand; massive; dark gray; decomposed; moderately hard; very intensely fractured; pervasively sheared to (Poorly-graded GRAVEL with SAND (GP)); mostly GRAVEL; little SAND; trace fines (LANDSLIDE DEPOSIT)		C10			90	0	3.00	×	- - - -
.Y_ZUZZ.GLB [CLIENI_CALIKANS (KLF	780	50 -		47.0 feet: ARGILLITE interbed; soft  47.0 feet: soft  SEDIMENTARY ROCK (ARGILLITE); massive; very dark gray; decomposed; very soft; intensely fractured; pervasively sheared to (SANDY Lean CLAY with GRAVEL (CL); medium stiff; moist; little SAND; little GRAVEL (LANDSLIDE DEPOSIT) 50.0 feet: advance HWT casing to 50.0' 53.3 to 53.6 feet: SANDSTONE interbed; moderately hard		C11			71	0	1.80	>X	- - - -
SIANDARD_GINI_LIBRARY_2022.GLB	775	-55		SEDIMENTARY ROCK (SANDSTONE) Fine-grained sand; massive; dark gray; slightly weathered; moderately hard; very intensely fractured; clay		C12			70 65	0	3.04	→ → → → → → → → → →	_ _ _
				(continued)		I F	REPOR	T TIT	ΠF				HOLE ID
TE: E:KLF							BORI DIST. 01	NG CO		Y		ROUTE <b>101</b>	POSTMILE EA 0115000099
gINT TEMPLATE:		K	LE	EINFELDER Bright People. Right Solutions.		Р	ROJE	ст о	R BF	RIDG	E NAME de Byp		
<u> </u>	,					В	RIDGE				PREPA	RED BY	DATE SHEET
d B											D. R	oss	6-4-21 2 of 11

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KLEINFELDER Bright People. Right Solutions.

ELEVATION (ft)	э Э Э Б Б Б Б Б Б Б Б Б Б Б Б Б Б Б Б Б	Material Graphics		Sample Location	Sample/Run#	Uncorr. Blows per 6 in.	Blows per foot	Recovery (%)	RQD (%)	Drill Rate (min/ft)	Drilling Method Casing Depth	Discontinuity Description  Fracture Identification: (Depth), Dip, Width, Infilling Composition, Weathering, Hardness, Healing, Roughness
			infill; scattered chaotic calcite veining (LANDSLIDE DEPOSIT) SEDIMENTARY ROCK (SANDSTONE)		C13			83	0	2.80	> - > - > - > - - - - - - - - - - - - -	- - -
770	60 -		SEDIMENTARY ROCK (ARGILLITE); massive; very dark gray; decomposed; soft; very intensely fractured; calcite veining; pervasively sheared to (SANDY lean CLAY with GRAVEL (CL)); stiff; moist; little SAND; little angular fine to coarse GRAVEL (LANDSLIDE DEPOSIT)		014			100	0	5.00	>< >>< >><	- - -
	_		61.1 to 61.4 feet: SANDSTONE interbed: slightly weathered; moderately hard; very intensely fractured		C15			100	U	5.00		- -
765	65 -		63.9 to 64.7 feet: SANDSTONE interbed: slightly weathered; moderately hard; very intensely fractured 65.3 to 67.0 feet: ARGILLITE bed: decomposed to intensely weathered; soft; very intensely fractured		C16			90	0	4.05	> > > > > >	- -
								68	0	2.42	>	- -
760	70 -				C17			100	0	8.89	\$\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	_ _
			73.0 to 73.6 feet: SANDSTONE interbed: slightly weathered; moderately hard; very intensely fractured		C18			85	0	3.16	>>	- - -
755	75 -		75.5 to 76.0 feet: calcite veining		C19			96	0	2.12	>	_
	_		77.7 to 78.3 feet: SANDSTONE interbed: slightly weathered; moderately hard; intensely fractured; planar calcite veining		C20							_ _ _
750	80 -		78.5 to 79.3 feet: SANDSTONE interbed: fresh; moderately hard; intensely fractured 79.3 feet: intensely weathered		C21			95	0	4.29 3.27	>	<b>-</b> -
			80.6 to 81.0 feet: high angle, planar calcite veining SEDIMENTARY ROCK (SANDSTONE) Very dark gray and dark gray; fresh; hard; intensely fractured; planar calcite veining (FRANCISCAN COMPLEX: BROKEN FORMATION)		C22			33	J	J.ZI		- - -
745	85										$\Diamond$	
			(continued)		F	REPOR	T TI	ΓLE				HOLE ID
0					Г	BORI IST.	NG CO	REC UNT	Υ	F	ROUTE	RC-20-017 POSTMILE EA
	K	(LE	EINFELDER Bright People. Right Solutions.		F		CT C	nce	RIDG <b>Gra</b>	E NAME	<b>ass</b> RED BY	12-15.5   0115000099

740

735

90

95

DEPTH (ft)

Material Graphics

730	100	99.0 to 99.7 feet: very intensely fractured zone with chaotic calcite veining		C26					> > > > >			-
	H::::	100.8 to 101.5 feet: planar calcite veining, locally healed										_
		SEDIMENTARY ROCK (ARGILLITE); laminated to thinly bedded with laminated to thin interbeds of SANDSTONE. ARGILLITE; thinly bedded; very dark gray; decomposed to intensely weathered; soft to moderately soft; very intensely fractured; locally sheared to: (SANDY lean CLAY (CL); stiff; moist; little SAND; trace GRAVEL); SANDSTONE: fine grained; dark gray slightly weathered;	(	C27		93	0	12.00				
725	105	SANDS I One: line grained; dark gray signity weathered; moderately hard; very intensely fractured; chaotic calcite veining (FRANCISCAN COMPLEX: BROKEN FORMATION)	C	C28		100	0	3.78				- - -
720	110		C	C29		100		4.23				-
715		SEDIMENTARY ROCK (SANDSTONE) Moderately bedded with from very thin to thin interbeds of ARGILLITE. SANDSTONE; fine-grained sand; dark gray; slightly weathered; moderately hard; intensely to very intensely fractured; chaotic and planar calcite veining;	-	030		100	0	3.65	$\Diamond$			- - -
	-113-	(continued)										
					PORT TI		OR	D		R	LE ID C-20-017	
		EINFELDER		DIS <sup>-</sup>	D	UNT el N	orte		ROUTE <b>101</b>	POSTMILE <b>12-15.5</b>	EA <b>01</b> ′	15000099
	Bright People. Right Solutions.						Gra	E NAME de Byp PREPAI	RED BY		DATE	SHEET
								D. Ro	oss		6-4-21	4 of 11

Sample Location

DESCRIPTION

 $86.6\ to\ 87.4;$  very intensely fractured zone with planar calcite veining

92.0 to 93.0 feet: ARGILLITE interbeds: laminated to thinly bedded; decomposed; soft: dips 30° to 50°  $\,$ 

SEDIMENTARY ROCK (SANDSTONE)

Sample/Run#

C22

C23

C24

C25

Uncorr. Blows per 6 in.

Blows per foot

Recovery (%)

93 0

91

95 0

100 17

100 20

RQD (%)

10

Drill Rate (min/ft)

4.60

8.00

11.05

5.11

Drilling Method Casing Depth

Discontinuity Description

Fracture Identification: (Depth), Dip, Width, Infilling Composition, Weathering, Hardness, Healing, Roughness

ELEVATION (ft)	DEPTH (ft)	Material Graphics		Sample Location	Sample/Run#	Uncorr. Blows per 6 in.	Blows per foot	Recovery (%)	RQD (%)	Drill Rate (min/ft)	Drilling Method Casing Depth	Discontinuity Description  Fracture Identification: (Depth), Dip, Width, Infilling Composition, Weathering, Hardness, Healing, Roughness
			SEDIMENTARY ROCK (SANDSTONE)  116.8 to 117.4 feet: ARGILLITE interbed: decomposed; soft; very intensely fractured		C30			100	0	3.42	>	- - -
710	120	•	118.9 to 119.1 feet: ARGILLITE interbed: decomposed; soft; very intensely fractured					92	0	12.63	×<>><	_
	_		121.3 to 121.4 feet: ARGILLITE interbed: intensely weathered; moderately soft; very intensely fractured 122.0 to 122.3 feet: ARGILLITE interbeds: decomposed; soft; very intensely fractured 122.6 to 122.8 feet: ARGILLITE interbeds: decomposed; soft; very intensely fractured		C32			100	10	4.33	$\langle \Diamond \times \Diamond \times \rangle$	
705	125		123.2 to 123.7 feet: moderately fractured					100	10	4.00	$\Diamond \times \Diamond \times \Diamond$	F: (123.6'), 35°, open, clean, not healed, moderately rough 
			127.4 to 128.3 feet: moderately weathered; moderately hard; moderately fractured 128.5 to 129.5 feet: SANDSTONE interbed: soft; very		C34			100	0	6.15	\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	F: (127.4'), 65°, open, clean, not healed, moderately rough F: (127.9'), 30°, slightly open, clean, not
700	130	•	intensely fractured; pervasively sheared  129.9 feet: 0.25" ARGILLITE interbed: decomposed; soft;  very intensely fractured  SEDIMENTARY ROCK (SANDSTONE); fine-grained  sand; massive; gray; slightly weathered; moderately hard;		C35			100		3.33	$\langle \diamond \times \diamond \times \diamond \rangle \langle \diamond \rangle \langle $	healed, moderately rough F: (128.3'), 45°, open, clean, not healed, moderately rough
	_		very intensely to moderately fractured; randomly oriented healed conjugate fractures 0.1 to 0.4" width, planar calcite infill (FRANCISCAN COMPLEX: BROKEN FORMATION)		C36			100		0.00	$\rangle \times \Diamond \times \Diamond \rangle$	F: (132.2'), 45°, open, moderately thin, calcite, moderately weathered, — moderately soft, partly healed, slightly rough —
695	135 —		134.4 to 135.2 feet: SANDSTONE bed: dips 60° top, 20°bottom: decomposed; very intensely fractured; clay infill  SEDIMENTARY ROCK (ARGILLITE); laminated to thinly					100	0	6.19		_ _
1			bedded with laminated to very thin interbeds of SANDSTONE. ARGILLITE; very dark gray; decomposed to moderately weathered; moderately soft to moderately hard; intensely to very intensely fractured; SANDSTONE: fine grained; gray; moderately weathered; moderately hard; very intensely fractured; quartz and calcite veining		C37			100	18.3	4.67	$\langle \Diamond \times \Diamond \times \rangle$	- -
690	140		(FRÁNCÍSCAN CÓMPLEX: BROKEN FORMATION)  SEDIMENTARY ROCK (ARGILLITE)  Very dark gray; decomposed to moderately weathered; moderately soft to moderately hard; very intensely to intensely fractured; chaotic calcite veining (FRANCISCAN COMPLEX: BROKEN FORMATION)		C38			68	0	8.41	$\Diamond \times \Diamond \times \Diamond$	
			143.2 feet: moderately weathered; moderately hard; intensely fractured		C39			59	0	5.00	> > > > >	- -
685	145		,		C40			75	0	10.00	$\Diamond^{<}$	
1			(continued)	EPOR <b>BORI</b>			OR			HOLE ID RC-20-017		
	k		EINFELDER			IST. <b>01</b>	CO <b>D</b>	UNT el N	Y <b>orte</b>	R	OUTE <b>101</b>	
			Bright People. Right Solutions.		В		Cha	nce	Gra	E NAME <b>de Bypa</b> PREPAF <b>D. Ro</b>	RED BY	DATE SHEET 6-4-21 5 of 11

680

675

670

665

660

655

E:KLF

TEMPLATE: gINT FILE:

150

155

160

165

DEPTH (ft)

Material Graphics

170 ————————————————————————————————————	С	49	100	56	3.67					
5 174.4 feet: 2" ARGILLITE bed: decomposed; soft; very	С	50	100	23	2.55		F: (173.0'), 45 healed, mode F: (173.5'), 40 healed, mode	rately rough °, slightly ope		_
(continued)										
		REPORT TITLE BORING RECORD					HOLE ID RC-20-017			
KI EINEEL DEB		DIST. <b>01</b>	COUNT Del N			UTE <b>)1</b>	POSTMILE <b>12-15.5</b>	EA <b>0</b> 1	15000099	
KLEINFELDER  Bright People. Right Solutions.			CT OR BI <b>Chance</b>							
		BRIDGE NUMBER			PREPARED BY <b>D. Ross</b>			DATE <b>6-4-21</b>	SHEET 6 of 11	

Sample Location

DESCRIPTION

SEDIMENTARY ROCK (ARGILLITE) 145.0 feet: decomposed to intensely weathered; soft to

noderately soft; very intensely fractured to 145.9 to 146.0 feet: 1.5" ARGILLITE bed: decomposed; soft; very intensely fractured; pervasively sheared to (SANDY lean CLAY (CL); stiff; moist; little SAND)

moderately fractured
146.3 to 147.0 feet: SANDSTONE interbed: gray;
moderately weathered; moderately hard; moderately
fractured; planar calcite veining: dips 45° to 75°, 0.1°

SEDIMENTARY ROCK (SANDSTONE); fine-grained

SEDIMENTARY ROCK (ARGILLITE)
Massive; dark gray; decomposed to intensely weathered;
soft to moderately soft; very intensely to intensely fractured; locally pervasively sheared to (SANDY lean CLAY with GRAVEL (CL); stiff; moist; little SAND; little GRAVEL) (FRANCISCAN COMPLEX: BROKEN FORMATION)

159.8 feet: calcite veining: dips 35°, 0.5" thick

soft to moderately hard

160.4 feet: calcite veining, totally healed, tight, dips  $25^\circ$  to  $65^\circ$ , 0.13 to 0.5" thick 160.6 feet: intensely to moderately weathered; moderately

164.2 feet: moderately weathered; moderately hard; increasing chaotic calcite veining 164.5 feet: moderately fractured

sand; thickly bedded; gray; moderately weathered; moderately hard; intensely to moderately fractured; planar calcite veining, 0.1" thick (FRANCISCAN COMPLEX: BROKEN FORMATION)

146.0 feet: moderately weathered; moderately hard;

Sample/Run#

C42

C43

C44

C45

C46

C47

C48

per 6 in. foot

Uncorr. Blows r

Blows per

%)

Recovery

100 30

100 13

97 0

86 0

100

78 0

42

98

%

RØD

Drill Rate (min/ft

7.62

6.14

5.13

5.45

12.50

2.56

4.23

Drilling Method Casing Depth

 $\Diamond$ 

**Discontinuity Description** 

Fracture Identification: (Depth), Dip, Width, Infilling Composition, Weathering, Hardness, Healing, Roughness

PLOTTED: 04/19/2022 03:26 PM BY: DSut	ELEVATION (ft)	DEPTH (ft)	Material Graphics	DESCRIPTION	Sample Location	Sample/Run#	Uncorr. Blows per 6 in.	Blows per foot	Recovery (%)	RQD (%)	Drill Rate (min/ft)	Drilling Method Casing Depth	Discontinuity Description Fracture Identification: (Depth), Dip, Width, Infilling Composition, Weathering, Hardness, Healing, Roughness
PLOTTED: 04/19/202		1/5		intensely fractured 174.7 feet: slickensides: dips 20° to 25°, parallel to fracture surfaces SEDIMENTARY ROCK (ARGILLITE) 175.7 feet: bedding: dips 65°; 4" layer thinly bedded; light gray ARGILLITE	C	C50			100		3.06	>X >X >X >X >X >X >X >X >X >X	F: (173.9'), 25°, slightly open, clean, not healed, moderately rough
	650	180 -		178.6 feet: intensely weathered; moderately soft; intensely fractured  180.3 feet: local SANDSTONE interbeds: gray; intensely	c	C51			100	0	3.00	$\Diamond \times \Diamond \times \Diamond$	_ _
		_		weathered; moderately hard; intensely fractured; 2 to 3" blocks  SEDIMENTARY ROCK (SANDSTONE)					98	0	2.94	>< >> >> >>	_ _ _
	645	185 -	-	Fine-grained sand; massive; gray; moderately weathered; moderately hard; intensely fractured; open vertical and horizontal fractures; few 0.1", calcite-healed fractures: dip 25° to 75° (FRANCISCAN COMPLEX: BROKEN FORMATION) 184.5 to 184.6 feet: ARGILLITE interbed: very dark gray; decomposed; soft; very intensely fractured 184.6 feet: fine- to medium-grained sand	c	C52						$\Diamond \times \Diamond \times \Diamond \times \Diamond$	_ _ _
	640	_		187.4 to 187.8 feet: ARGILLITE interbed: very dark gray; moderately soft 187.8 feet: massive; slightly weathered; intensely to moderately fractured					100	57	3.88	>\ \ \ \ \ \	F: (188.5'), 35°, open, clean, not healed,
=)2]		190 -	-		c	C53						\\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\	F: (189.2'), 65°, open, thin, calcite, fresh, soft, totally healed F: (189.8'), 35°, open, clean, not healed, moderately rough F: (191.5'), 75°, moderately wide, clean, not healed, moderately rough
(KLF MOD W DRILL KATE)ZJ	635	195 -		194.8 feet: calcite veining, planar, 0.1" thick	c	C54			100	55	1.96	\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	F: (193.3'), 55°, open, clean, not healed, moderately rough F: (194.0'), 36°, open, clean, not healed, moderately rough —
CCLIENI_CALIKANS (KLF	630	200 -							100	80	3.47		F: (196.6'), 35°, open, clean, not healed, moderately rough F: (197.0'), 65°, open, clean, not healed, slightly rough F: (198.7'), 75°, open, clean, not healed, moderately rough
STANDARD_GINT_LIBRARY_2022.GLB				200.5 feet: calcite vein: vertical; 0.1" thick 200.8 to 200.9 feet: ARGILLITE laminations  202.0 to 202.2 feet: ARGILLITE interbed: smooth polished	c	C55						\$\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	F: (199.8'), 45°, open, clean, not healed, — moderately rough F: (200.5'), 90°, moderately open, — moderately thin, calcite/clay, moderately weathered, moderately hard, moderately — healed, moderately rough
KD_GINI_LII	625		_:::::	surfaces 202.8 to 202.9 feet: ARGILLITE laminations  203.8 to 204.2 feet: ARGILLITE interbed: very dark gray; moderately weathered; moderately hard; moderately	c	C56			96	0	3.14	>\ \ \ \	F: (201.4'), 60°, open, clean, not healed, moderately rough F: (201.7'), 65°, open, clean, not healed, moderately rough
TANDA		205	<u>]::::</u> ]	fractured (continued)								$ \diamondsuit $	
E:KLP	-					D	EPOR BORI DIST. 01	NG CO D	REC UNT el N	Y <b>orte</b>		ROUTE <b>101</b>	HOLE ID   RC-20-017   POSTMILE   EA   0115000099
gini iemplaie:				EINFELDER Bright People. Right Solutions.			ROJEC Last ( RIDGE	Cha	nce	Gra	E NAME Ide Byr PREPA D. R	D <b>ass</b> RED BY	DATE SHEET <b>6-4-21 7 of 11</b>

04/18/2022 03:20 FWI BT. DOUIN		DEPTH (ft)	Material Graphics	DESCRIPTION	Sample Location	Sample/Run#	Uncorr. Blows per 6 in.	Blows per foot	Recovery (%)	RQD (%)	Drill Rate (min/ft)	Drilling Method Casing Depth	Fracture Id Width, Infilling	entinuity Desc entification: (I g Composition s, Healing, Ro	Depth), Dip, n, Weathering,
		<b>-</b> 205 - -		204.2 to 205.2 feet: ARGILLITE interbed: very dark gray; decomposed; very intensely fractured; broken to crushed relict calcite veining SEDIMENTARY ROCK (SANDSTONE) 205.2 feet: moderately weathered; moderately hard; very intensely fractured	(	C56			96	0	2.59	>> >> >>	F: (202.5'), 75° slightly weather healed, moder F: (203.4'), 45° slightly weather healed, moder	ered, moderate ately rough c, open, very te ered, moderate	ely hard, not nin, calcite,
	20	210	-		(	C57			100		5.91	$\Diamond \times \Diamond \times \Diamond $			- -
				211.0 to 211.2 feet: ARGILLITE interbed: dips 45°; very dark gray; moderately weathered; moderately soft; very intensely fractured 212.0 feet: intensely fractured 212.9 feet: calcite veining, hairline to 0.1" wide, steeply dipping 213.7 feet: 0.25" ARGILLITE interbed: dips 45°		C58			100	45	2.50	× <> × <> × <> × <> × <> × <> × <> × <>	F: (213.1'), 45° moderately rou		not healed,
6	15	215	-	215.1 to 215.4 feet: ARGILLITE interbed: dips 40°; very dark gray; intensely weathered; soft; very intensely fractured 215.4 feet: intensely weathered; moderately soft; very intensely fractured; calcite veining, hairline to 0.1" wide		C59			100	0	3.50	, , , , , , , , ,	F: (214.0'), 70° moderately rou	°, open, clean	not healed, —
6	10	220		SEDIMENTARY ROCK (ARGILLITE); thinly bedded with thin interbeds of SANDSTONE. ARGILLITE; laminated to thinly bedded; very dark gray; intensely weathered; soft to moderately soft; intensely fractured; SANDSTONE; fine-grained sand; thinly bedded; gray; intensely weathered; moderately hard; intensely fractured;		C60			100	24	5.00	>\ >\ >\ >\ >\			- - -
·-/		-		chaotic calcite veining up to 0.3" thick (FRANCISCAN COMPLEX: BROKEN FORMATION)  SEDIMENTARY ROCK (SANDSTONE); fine-grained sand; thinly bedded and massive; gray; moderately weathered; moderately hard; moderately fractured; calcite veining (FRANCISCAN COMPLEX: BROKEN FORMATION)	(	C61			100		3.57	>	F: (221.4'), 45° slightly rough	°, open, clean	not healed,
60	05	225		Thinly bedded with thin interbed remnants of SANDSTONE. ARGILLITE; laminated to thinly bedded;	. (	C62						$\Diamond \times \Diamond \times \Diamond$			- -
	00	230 -		dark gray to black; decomposed; very soft to soft; very intensely fractured; pervasively sheared to (CLAYEY GRAVEL with SAND (GC); medium dense; dry to moist; mostly subangular GRAVEL; little fine to coarse SAND; little fines); SANDSTONE: fine to medium grained; thinly bedded; gray; slightly weathered; moderately hard; intensely fractured; convolute quartz and calcite veining up to 0.1" thick (FRANCISCAN COMPLEX: BROKEN FORMATION)	(	C63			100	0	3.41	X\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\			- - -
59				231.3 to 236.4 feet: very intensely to intensely fractured; very thin SILT with SAND fracture infill		C64			100	0	3.64	$\sim$			- - -
59	95	235							100	0	4.00	$\Diamond$			
		200		(continued)		Τp	EPOR	רוד ד	TIF					DLE ID	
. E.R.L	0						BORI IST.	NG				ROUTE		C-20-017	
gin i eivirca e.	KLEINFELDER				P	<b>01</b> ROJE	DO TO	R BF	orte RIDG	E NAME	101	12-15.5		15000099	
<u>i</u>	Bright People. Right Solutions.						Last Chance Grade Bypass BRIDGE NUMBER PREPARED BY						•	DATE	SHEET
<u>.</u>							-				D. Re	oss		6-4-21	8 of 11

ELEVATION (ft)

590

585

240

245

DEPTH (ft)

Material Graphics

gINT TEMPLATE:

									$\triangleright \triangleleft$				1
	∏::::					97	0	4.06				-	
580	H::::											-	1
300	250		c	70					$\triangleright$				╛
									$\Diamond$				ı
			H			100	25	3.80				-	1
	H							0.00	$\searrow$			-	4
									$\Diamond$			_	
				71									ı
575	Hiiii			71					$\triangleright$			-	1
	255	254.4 feet: 3" convolute ARGILLITE interbed remnant: dark gray; intensely weathered; very soft; very intensely							$\Diamond$			-	4
		fractured											
						96	6	3.08	$\rightarrow$				
	H::::								$\Diamond$			-	1
	H::::	258.0 to 259.6 feet: convolute mass of ARGILLITE,							$\Diamond$			-	4
		SANDSTONE remnants up to 2": dark gray to black:		72					Š				ı
570		moderately weathered; moderately soft to moderately hard; very intensely fractured		-					$\Diamond$				1
	260								$\Diamond$			-	┪
												-	4
		SEDIMENTARY ROCK (ARGILLITE) very thinly to thinly				100	0	5.56					
		SEDIMENTARY ROCK (ARGILLITE) very thinly to thinly bedded with very thin interbeds, bed remnants of SANDSTONE. ARGILLITE; very thinly to thinly bedded;							$\Diamond$				
		dark gray to black; moderately weathered; moderately soft to moderately hard; intensely fractured; SANDSTONE:		73								-	┨
		to moderately hard; intensely fractured; SANDSTONE: fine grained; gray; slightly weathered; moderately hard; intensely fractured (FRANCISCAN COMPLEX: BROKEN	Ш									-	4
565	265	FORMATION)	c	74		82	20	2.67	$\Diamond$				
	200	(continued)											
					ORT TIT <b>RING</b>		OR				DLE ID RC-20-017		1
				DIST.	СО	UNT	Υ		ROUTE	POSTMILE	EA	45000000	1
	KLI	EINFELDER		<b>01</b> PROJ			orte RIDG	E NAME	101	12-15.5	01	15000099	+
		Bright People. Right Solutions.		Las	t Cha	nce	Gra	de Byr			DATE	CUEET	4
				BRID	GE NUI	MRF	Υ	D. R			DATE <b>6-4-21</b>	SHEET 9 of 11	
													_
													_

Sample Location

DESCRIPTION

 $236.4\ to\ 240.8\ feet:$  very intensely fractured; thin SILT and SAND fracture infill

239.5 to 240.1 feet: SANDSTONE bed remnant: fine-grained sand; slightly weathered; hard

240.9 to 242.7 feet: SANDSTONE bed remnant: fine-grained sand; gray; slightly weathered; hard; moderately fractured

SEDIMENTARY ROCK (SANDSTONE)
Fine-grained sand; massive; gray; slightly weathered;
moderately hard to hard; intensely fractured; very thin
SILT with SAND infili; discontinuous, chaotic quartz
and calcite veining (FRANCISCAN COMPLEX:
BROKEN FORMATION)
245.8 feet: very intensely fractured; very thin SILT and
SAND fracture infill

SEDIMENTARY ROCK (ARGILLITE)

Sample/Run#

**J**6:

C66

C67

C68

C69

Uncorr. Blows per 6 in.

Blows per foot

Recovery (%)

100

100 53

100 0

100 0

RQD (%)

Drill Rate (min/ft)

3.66

6.94

4.84

2.73

 $\Diamond$ 

Drilling Method Casing Depth

Discontinuity Description

Fracture Identification: (Depth), Dip, Width, Infilling Composition, Weathering, Hardness, Healing, Roughness

F: (239.7'), 39°, open, not healed,

moderately rough

ELEVATION (ft)	SDEPTH (ft)	Material Graphics	DESCRIPTION	Sample Location	Sample/Run#	Uncorr. Blows per 6 in.	Blows per foot	Recovery (%)	RQD (%)	Drill Rate (min/ft)	Drilling Method	Discontinuity Description Fracture Identification: (Depth), Dip, Width, Infilling Composition, Weathering, Hardness, Healing, Roughness
		7	SEDIMENTARY ROCK (SANDSTONE); fine-grained; massive; gray; slightly weathered; hard; intensely fractured; planar to chaotic quartz and calcite veining, to 0.1" (FRANCISCAN COMPLEX: BROKEN FORMATION) 266.5 feet: moderately fractured		C74			82	20		>	F: (267.6'), 65°, tight, very thin, calcite/quartz, slightly weathered, hard,
560	270		268.6 feet: intensely fractured 270.4 feet: 5" ARGILLITE interbed: dips 30°: very thinly		C75			100	15	3.04	$\Diamond X \Diamond X' \Diamond$	not healed, smooth F: (268.6'), 50°, tight, thin, calcite/quartz, moderately weathered, moderately hard, not healed, smooth
			bedded with interbeds of SANDSTONE black; slightly weathered; moderately soft; intensely fractured 271.4 feet: 12" ARGILLITE interbed: dips 30°: very thinly bedded with convolute bed remnants of SANDSTONE dark gray; slightly weathered; moderately hard; intensely fractured; fragmented planar quartz and calcite veining		C76			100	0	3.08	·X\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	- - -
555	275 -		274.0 feet: calcite veining to 0.5"					100	70	3.23	$\times \Diamond \times \Diamond \times$	-
			276.0 feet: moderately fractured		C77						>X	_
550	280 -		SEDIMENTARY ROCK (ARGILLITE); thinly bedded with thin interbed remnants of SANDSTONE; ARGILLITE; thinly bedded; dark gray to black; decomposed; soft; generally sheared to (CLAYEY GRAVEL with SAND (GC); medium dense; moist; mostly subangular fine to coarse GRAVEL; little fine to coarse SAND; little fines); SANDSTONE: fine grained; gray; slightly weathered; moderately hard to hard; intensely to very intensely fractured; chaotic quartz and calcite veining		C78			92	0	3.29		- - -
545	285		(FRANCÍSCAN CÓMPLEX: BROKEN FOŘMATION)		C79			100	0	3.57	$\langle \Diamond X \Diamond X \Diamond \rangle$	- -
540	_				C80			100	0	3.53	$\times \Diamond \times \Diamond \times \Diamond$	- -
	290		SEDIMENTARY ROCK (SANDSTONE) Fine-grained sand; massive; gray; slightly weathered; hard; intensely fractured; chaotic, planar and chaotic quartz and calcite veining to 0.1" (FRANCISCAN COMPLEX: BROKEN FORMATION)		C60						$\Diamond X \Diamond X \Diamond$	- - -
			290.3 feet: intensely to moderately fractured		C81			100	41	4.17	$\Diamond \times \Diamond \times \Diamond$	F: (290.5'), 45°, open, clean, not healed, moderately rough F: (291.2'), 45°, open, clean, not healed, moderately rough F: (292.3'), 75°, open, clean, not healed,
535	205				C82			100	59	3.06	$\langle \langle \rangle \langle \rangle \rangle$	moderately rough  F: (293.2'), 35°, open, clean, not healed, moderately rough
	200-		(continued)		T F	EPOR	רוד ד					HOLEID
	KLEINFELDER Bright People. Right Solutions.						NG DO CT O Cha	REC UNT' el No R BF	Y <b>orte</b> RIDG <b>Gra</b>	R		12-15.5 0115000099
b										D. Ro		6-4-21 10 of 11

ELEVATION (ft)	29DEPTH (ft)	Material Graphics	DESCRIPTION	Sample Location	Sample/Run#	Uncorr. Blows per 6 in.	Blows per foot	Recovery (%)	RQD (%)	Drill Rate (min/ft)	Drilling Method Casing Depth	Discontinuity Description  Fracture Identification: (Depth), Dip, Width, Infilling Composition, Weathering, Hardness, Healing, Roughness
530	300		SEDIMENTARY ROCK (SANDSTONE)  297.0 feet: 8" ARGILLITE interbed: dips 45° black; slightly weathered; moderately soft; intensely fractured		C82			100		6.09	>> >> >> >> >> >> >> >> >> >> >> >> >>	F: (293.8'), 35°, open, clean, not healed, moderately rough F: (295.2'), 40°, open, clean, not healed, moderately rough F: (296.5'), 55°, open, clean, not healed, moderately rough F: (298.0'), 45°, open, clean, not healed, moderately rough F: (299.0'), 38°, open, clean, not healed, moderately rough
525		-	Bottom of borehole at 300.0 ft bgs									F: (299.8'), 45°, open, clean, not healed, moderately rough  — — —
020	305	-										- - - -
520	310											- - - -
515	315	-										- - - -
510	320											- - - -
505	325	-			F	REPOR	T TI1	, LE				HOLE ID
	K	CLE	EINFELDER Bright People. Right Solutions.		F	BORI DIST. 01 PROJEC Last ( BRIDGE	CO Do CT O Cha	UNT el N R BF nce	Y <b>orte</b> RIDGE <b>Gra</b> o	R	RED BY	RC-20-017   POSTMILE

TEMPLATE:

gINT FILE:

LOGGED BY **BEGIN DATE** COMPLETION DATE BOREHOLE LOCATION (Lat/Long or North/East and Datum) HOLE ID P.Sunberg 12-15-20 12-19-20 2480954.393 ft / 5984842.403 ft NAD83 RC-20-019 DRILLING CONTRACTOR BOREHOLE LOCATION (Offset, Station, Line) SURFACE ELEVATION **CRUX Subsurface Inc.** 474.67 ft NAVD88 DRILLING METHOD DRILL RIG BOREHOLE DIAMETER **Rotary Core** Burley 55-1 4.5 in SAMPLER TYPE(S) AND SIZE(S) (ID) SPT HAMMER TYPE HAMMER EFFICIENCY, ERI SPT (1.4"), HQ Core (2.5") Cathead; 140 lbs / 30-inch drop BOREHOLE BACKFILL AND COMPLETION GROUNDWATER DURING DRILLING AFTER DRILLING (DATE) TOTAL DEPTH OF BORING **Not Determined Not Determined** VWP, TDR, Inclinometer; cement-bentonite 150.9 ft Sample Location Rate (min/ft foot **Discontinuity Description EVATION** Sample/Run# Blows per 6 in **Drilling Method** 8 € Blows per Fracture Identification: (Depth), Dip, Width, Infilling Composition, Weathering, Hardness, Healing, Roughness Material Graphics Recovery DESCRIPTION DEPTH ( Casing [ SILT with SAND (ML); medium dense; light brown with yellowish brown; moist; mostly fines; some fine SAND; low plasticity; trace angular to subangular rock fragments; decomposed sandstone; (LANDSLIDE DEPOSIT) 15 100 0.00 S01 8 470 5 SILT with GRAVEL (ML); loose; light brown and yellowish 6 100 0.00 brown; moist; mostly fines; some coarse to fine angular GRAVEL; few coarse to fine SAND; non-plastic; 2 S02 4 (LANDSLIDE DEPOSIT) 465 10 0.00 10.0 feet: advance HWT casing to 10.0' 0 0 C03 SEDIMENTARY ROCK (SANDSTONE)
Fine-grained; massive; yellowish brown; decomposed; very soft; very intensely fractured; pervasively sheared to: (SILT with GRAVEL (ML); yellowish brown; moist; mostly fines; some coarse to fine GRAVEL; few coarse to fine SAND) (LANDSLIDE DEPOSIT) 81 0 9 09 C04 100 0 3.81 C05 15 72 0 3.79 C06 93 0 7.14 C07 455 20 20.0 feet: SANDSTONE gravel fragments: fine-grained; massive; intensely weathered; moderately soft 5 15 72 0.00 5 S08 10 450 (continued) REPORT TITLE HOLE ID RC-20-019 **BORING RECORD** POSTMILE DIST COUNTY ROUTE 0115000099 **Del Norte** 01 101 12-15.5 *KLEINFELDER* PROJECT OR BRIDGE NAME Bright People. Right Solutions. **Last Chance Grade Bypass** 

**BRIDGE NUMBER** 

PREPARED BY

D. Ross

DATE

4-22-21

1 of 6

ELEVATION (ft)	(†) H	יטבאות (ת)	Material Graphics	DESCRIPTION	Sample Location	Sample/Run#	Uncorr. Blows per 6 in.	Blows per foot	Recovery (%)	RQD (%)	Drill Rate (min/ft)	Drilling Method Casing Depth	Fracture Id Width, Infilling	ontinuity Des entification: g Compositions, Healing, I	(Depth), Dip on, Weatheri	o, ing,
				SEDIMENTARY ROCK (SANDSTONE)	\  -	S09	6 8 13	21	83		0.00					_
445												×				
	30	) =		30.0 feet: low plasticity; increased GRAVEL content	(	S10	15 ( 13 50/5"	63/11	66		0.00	~				
440	35	5 _		Poorly-graded GRAVEL with SILT AND SAND (GP-GM); dense; gray to dark gray; moist to wet; mostly coarse to fine angular GRAVEL; some fines; low to	\ \ !	S11	11 13	40	72	-	0.00	×				-
				medium plasticity; sandstone and argillite rock fragments; (LANDSLIDE DEPOSIT)  SEDIMENTARY ROCK (SANDSTONE)  Thinly to moderately bedded with very thinly to thinly bedded ARGILLITE. SANDSTONE: fine grained: gray	1	C12	27		58	0	5.53	→×<				_
435	40	_		and brown; intensely weathered; moderately soft to moderately hard; intensely fractured; ARGILLITE: gray; intensely weathered; moderately soft; intensely fractured (LANDSLIDE DEPOSIT)	(	C13			100	0	5.38	\\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\				- 1
				41.3 to 41.8 feet: LANDSLIDE FAILURE ZONE: SANDSTONE sheared to: (Poorly-graded GRAVEL with SILT (GP-GM); gray; moist; mostly medium to fine, angular to subangular GRAVEL; few low plasticity fines; little coarse to fine SAND)	(	C14			100	0	3.96	>< >< ><				
430	45	5 _		43.4 to 45.5 feet: LANDSLIDE FAILURE ZONE: SANDSTONE sheared to: (SILTY GRAVEL (GM); dense; gray; moist; mostly medium to fine, angular to subangular GRAVEL; some low plasticity fines; little coarse to fine SAND)	(	S15	39 42 50/4"	92/10	80	0	3.78	$-\diamondsuit$				_
				SEDIMENTARY ROCK (SANDSTONE); thinly bedded with very thinly bedded ARGILLITE. SANDSTONE; fine grained; gray; intensely weathered; moderately hard; intensely fractured; ARGILLITE: gray; intensely weathered; moderately soft; intensely to very intensely fractured (LANDSLIDE DEPOSIT)		C16						×				
425	50		0000	asubangular GRAVEL; little coarse to fine SAND; few fines; non-plastic; (LANDSLIDE DEPOSIT)  SEDIMENTARY ROCK (SANDSTONE)  Fine-grained; massive; gray and light brown; intensely weathered; moderately soft; intensely fractured;		S17	44 50/5"	50/5	28	0	0.00 4.27	×				- -
				Illie aligulai GNAVEL, illie Coalse to illie saliu), ulps 40 [		C18 S19	50/5.5"	REF	17 100	8	36.00	> > > > > >				-
420	55	<u>,                                    </u>	::::	53.0 to 53.2 feet: LANDSLIDE FAILURE ZONE:   ARGILLITE sheared to: (SANDYSILT (ML); stiff; gray   (continued)	(	C20			. 30	_	5.76	$\Diamond$				
	152			(conunt <b>ue</b> u)			EPOR			:OP	n			DLE ID C-20-019	<u> </u>	
		L		INEEL DEP		С	IST. <b>01</b>	CO <b>D</b>	UNT el N	Y orte		ROUTE <b>101</b>	POSTMILE 12-15.5	EA		)
	KLEINFELDER Bright People. Right Solutions.						Last (	Cha	nce	Gra	E NAME <b>de By</b>	pass				
	Bright People. Right Solutions.						RIDGE 	NUI	MBEI	₹	PREPA D. R	ARED BY OSS		DATE 4-22-21	SHEET 2 of	6

ELEVATION (ft)

415

410

405

60

65

70

75

80

bedding: 25°

bedding: 25°

DEPTH (ft)

Material Graphics

395

390

E:KLF

TEMPLATE: gINT FILE:

SEDIMENTARY ROCK (ARGILLITE) Fine-grained; massive; dark gray; decomposed; very soft; very intensely fractured; (CLAYEY SAND (SC); dense; moist; mostly fine grained SAND; some moderate plasticity fines; trace fine subangular GRAVEL) (FRANCISCAN COMPLEX)		27			86	0	3.10	$\times$					- - -
	С	28			00	U	3.10	$\Diamond$					
(continued)													
			EPOR B <b>ORII</b>			OR	lD			HOLE ID RC-20-	019		
KI FINIFEL DED			IST. <b>01</b>	COL	JNT N le			OUTE <b>101</b>	POSTMILE <b>12-15.5</b>		EA <b>011</b>	5000099	
KLEINFELDER  Bright People. Right Solutions.							E NAME I <b>de Byp</b>	ass					
		В.	RIDGE 	NUN	ИВЕГ	₹	PREPAR <b>D. Ro</b>			DATE <b>4-2</b> 2		SHEET 3 of 6	
								•					_

Sample Locatior

DESCRIPTION

and light brown; moist; mostly non-plastic fines; some coarse to fine SAND; trace GRAVEL); 30°
Thinly bedded with very thinly bedded ARGILLITE.
SANDSTONE: fine grained; gray; intensely to moderately weathered; moderately hard; intensely fractured.
ARGILLITE: dark gray; intensely weathered; moderately hard; intensely fractured (LANDSLIDE DEPOSIT)
SEDIMENTARY ROCK (SANDSTONE)

62.6 to 63.2 feet: LANDSLIDE FAILURE ZONE: ARGILLITE and SANDSTONE sheared to: (Poorlygraded GRAVEL with SILT (GP-GM); gray and light

hard; very slightly fractured 64.2 to 64.7 feet: LANDSLIDE FAILURE ZONE:

brown; moist; mostly medium to fine angular gravel; few fines; low plasticity fines) 63.4 to 64.2 feet: SANDSTONE clast fine to medium

grained; massive; brown; intensely weathered; moderately

hard; very slightly fractured
64.2 to 64.7 feet: LANDSLIDE FAILURE ZONE:
ARGILLITE sheared to: (Poorly-graded GRAVEL with
SILT (GP-GM); gray, white, and light brown; moist; mostly
coarse to fine angular GRAVEL; few low plasticity fines)
SEDIMENTARY ROCK (SANDSTONE); thinly bedded
with very thinly bedded ARGILLITE. SANDSTONE: fine
grained; gray; intensely to moderately weathered;
moderately hard; intensely fractured. ARGILLITE: dark
gray; intensely weathered; moderately hard; intensely
fractured (LANDSLIDE DEPOSIT)
66.9 to 67.5 feet: LANDSLIDE FAILURE ZONE:
ARGILLITE sheared to: (Poorly-graded GRAVEL with
SILT (GP-GM); gray, white, and light brown; moist; mostly
coarse to fine angular GRAVEL; few low plasticity fines)
SEDIMENTARY ROCK (SANDSTONE); thinly bedded
with very thinly bedded ARGILLITE. SANDSTONE: fine
grained; gray; intensely to moderately weathered;
moderately hard; intensely fractured. ARGILLITE: dark
gray; intensely weathered; moderately hard; intensely
intensely fractured (LANDSLIDE DEPOSIT)
71.0 feet: 5" ARGILLITE clast
73.2 to 73.4 feet: LANDSLIDE FAILURE ZONE:
ARGILLITE sheared to: (Poorly-graded GRAVEL with
SILT (GP-GM); gray, white, and light brown; moist; mostly
coarse to fine angular GRAVEL; few low plasticity fines)
SEDIMENTARY ROCK (ARGILLITE)
Fine-grained: thinly bedded: gray to black; decomposed:

SEDIMENTARY ROCK (ARGILLITE)
Fine-grained; thinly bedded; gray to black; decomposed; very soft; isolated zones of moderately soft, very intensely sheared, some subangular to subrounded SANDSTONE

sneared, some subangular to subrounded SANDSTONE clasts, slightly weathered, moderately hard; sheared to: (Poorly-graded GRAVEL with SILT and SAND (GP-GM); moist; mostly coarse to fine subangular to angular GRAVEL; some fine to coarse SAND; little low plasticity fines) (FRANCISCAN COMPLEX)
74.0 feet: calcite vein (0.1" thick), oriented parallel to

75.0 feet: calcite vein (0.1" thick), oriented parallel to

Sample/Run#

C20

C21

C22

C23

C24

C25

C26

per 6 in.

Uncorr. Blows p

Blows per Recovery

%)

100 8

100 0

100 0

0

100

100 0

80 0

80 0

64 0

%

RQD (

Drill Rate (min/ft

2.80

3.41

3.33

4.20

3.67

4.00

1.60

 $\Diamond$ 

Drilling Method Casing Depth

**Discontinuity Description** 

Fracture Identification: (Depth), Dip,

Width, Infilling Composition, Weathering, Hardness, Healing, Roughness

Continue
KLEINFELDER Bright People. Right Solutions.

ELEVATION (#)	(ft)	(0)	DESCRIPTION	Sample Location	Run#	er 6 in.	er foot	y (%)	)	Drill Rate (min/ft)	1ethod Septh		ntinuity Descripti	
ELEVAT	орертн (	Material Graphics		Sample	Sample/Run#	Uncorr. Blows per (	Blows per	Recovery (%)	RQD (%)	Drill Rate	Drilling Method Casing Depth	Width, Infilling Hardness	entification: (Dep Composition, W s, Healing, Roug	(m), Dip, /eathering, hness
	-05-		84.6 to 85.2 feet: SANDSTONE clast; fine-grained; gray; moderately weathered; moderately soft SEDIMENTARY ROCK (ARGILLITE)		C28			86	0					
			87.0 to 87.6 feet: SANDSTONE clast; fine to medium grained; massive; dark gray; moderately weathered; moderately hard; moderately fractured		C29			85	0	3.33	>< >>			_
385	90 -		SEDIMENTARY ROCK (ARGILLITE) Very fine grained; massive; dark gray; decomposed; very soft; intensely fractured; SANDSTONE clasts up to 5": fine grained, massive, moderately weathered, moderately hard; (CLAYEY SAND with GRAVEL (SC); mostly fine sand; coarse to fine angular GRAVEL; some medium					100	0	2.60	→			-
			sand; coarse to fine angular GRAVEL; some medium plasticity fines) (FRANCISCAN COMPLEX)		C30						$\Diamond$			_
								100	0	2.67	>< -><			_
380	95				C31						$\stackrel{>}{\diamond}$			_
			96.4 feet: moderately weathered; moderately hard		C32			20	0	4.75	$\begin{array}{c} \Diamond \\ \Diamond \\ \Diamond \end{array}$			_
								29	0	1.82				_
375	100				C33			100	0	4.64				_
			101.5 feet: decomposed; very soft					80	0	5.20	$\rightarrow$			_
	_		102.8 feet: moderately weathered; moderately hard		C35									_
370	105		103.8 feet: decomposed; very soft		C36			100	0	1.80				_
								100	14	3.60				_
	_				C37			87	0	4.78	><  ><			_
365	110				C38						$\Diamond$			-
					C39			92	0	3.08	$\Rightarrow \langle$			- -
			113.4 feet: abundant calcite mineralization		C40			92	0	2.86				_
360	115				C41						$\Diamond$			_
			(continued)			EPOR							LE ID	
1						BORI IST. 01	CO	UNT			ROUTE <b>101</b>	POSTMILE 12-15.5	C-20-019 EA 01150	00099
	K		EINFELDER Bright People. Right Solutions.			ROJE( <b>Last (</b> RIDGE	Cha	nce	Gra	E NAME de Byr PREPA	DASS ARED BY			HEET
					- 1					D. R				4 of 6

(continu
KLEINFELDER Bright People. Right Solutions.

ELEVATION (ft)	115- 115-	Material		Sample Location	Sample/Run#	Uncorr. Blows per 6 in.	Blows per foot	Recovery (%)	RQD (%)	Drill Rate (min/ft)	Drilling Method Casing Depth	Discontinuity Description  Fracture Identification: (Depth), Dip, Width, Infilling Composition, Weathering, Hardness, Healing, Roughness			
			SEDIMENTARY ROCK (ARGILLITE)					100	0			_			
					C41							_			
											$\Diamond$				
			118.4 to 119.5 feet: SANDSTONE clast; fine-grained;					92	24	3.80		_			
355			118.4 to 119.5 feet: SANDSTONE clast; fine-grained; dark gray; moderately weathered; moderately hard; calcite veins throughout, randomly oriented								$\Diamond$	_			
	120										$\Diamond$	_			
				(	C42						$\diamond$	_			
		E										_			
								100	0	3.20		_			
050		==						100	U	3.20	$\Diamond$	_			
350	125	-									$\Diamond$	_			
		=		(	C43						$\Diamond$	_			
		13									$\Diamond$	_			
											$\Diamond$	_			
		==	128.4 feet: soft					100	0	3.50		_			
345	130				C44							_			
		星									$\diamond$	_			
			131.4 feet: very soft					75	0	10.50	$-\diamond$	_			
				(	C45						$\Diamond$	_			
								82	0	4.20	$-\Diamond$	_			
340	135		134.0 feet: possible artesian conditions								$\Diamond$	_			
	133				040										
					C46							_			
											><	_			
			-	+				100	0	7.78		_			
335		洼									$\Diamond$	_			
	140			1	C47						$\Diamond$	_			
				+				60	0	5.22		_			
		===			C48							_			
		-{==										_			
		-==		T	C49			71 33	0	8.57 4.00		_			
330	145		(continued)	(	C50				-		$\Diamond$				
			(continueu)		R	EPOR	T TIT	LE DE	·	n		HOLE ID RC-20-019			
					D	BORI IST.	CO	UNT	Υ		ROUTE	POSTMILE EA			
	KLEINFELDER  Bright People. Right Solutions.					01 Del Norte PROJECT OR BRIDGE N					GE NAME				
	Bright People. Right Solutions.					Last Chance Grad				PREPA	<b>oass</b> ARED BY <b>OSS</b>	DATE SHEET 4-22-21 5 of 6			
					-				D. R	oss	4-22-21 5 of 6				

ELEVATION (ft)	145 145	Material   Graphics	DESCRIPTION	_	_	Blows per foot	Recovery (%)	RQD (%)	Drill Rate (min/ft)	Drilling Method Casing Depth	Discontinuity Description Fracture Identification: (Depth), Dip, Width, Infilling Composition, Weathering, Hardness, Healing, Roughness
	_		SEDIMENTARY ROCK (ARGILLITE)  145.6 feet: soft	C5			33 100 100	0 0	2.50	\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	F: (147.7'), 20°, moderately thick, calcite — F: (148.0'), 20°, moderately open, moderately thin, clay
325	150 -	-	150.9 feet: advance HWT casing to full depth (150.9') Bottom of borehole at 150.9 ft bgs	C5:	2					$\Diamond$	-
320	155 -	_									- - -
315	160										- - -
310											- - -
010	165 -										- - - -
305	170 -	-									- - - -
300	175				REPOR	RT TI	ΓLE				HOLE ID
	K	(LE	EINFELDER Bright People. Right Solutions.		BOR DIST. 01 PROJE	ING CO D CT C Cha	UNT el No er Br nce	Y <b>orte</b> RIDGI <b>Gra</b>	R	RED BY	RC-20-019   POSTMILE

A.Ca	all		BEGIN DATE COMPLETION DATE 12-18-20 1-5-21	247683	6.94	9 ft	/ 598	605	8.16	9 ft	NAD83	,	RC-20-020
CRU	X Su	ıbsurf	ACTOR Face Inc.	BOREHOL		JCA	I ION (	Uffse	et, St	ation,	, Line)		SURFACE ELEVATION 210.43 ft NAVD88
DRILLI <b>Rota</b>			)	DRILL RIG									BOREHOLE DIAMETER 4.5 in
SAMPL	ER T	YPE(S	) AND SIZE(S) (ID)	SPT HAMI	MER								HAMMER EFFICIENCY, E
BORE	HOLE	BACK	Core (2.5") FILL AND COMPLETION Slinometer; cement-bentonite	GROUND' READING	WAT		DURII		RILL	ING		RILLING (DATE	TOTAL DEPTH OF BORI
Œ	, 10	K, IIIC	illiometer, cement-bentonite							-u	⊋.		190.0 10
ELEVATION (	ОЕРТН (#)	Material Graphics			Sample Location	Sample/Run#	Uncorr. Blows per 6 in.	Blows per foot	Recovery (%)	RQD (%)	Drill Rate (min/ft) Drilling Method	Fractu Width, In	Discontinuity Description re Identification: (Depth), D filling Composition, Weathe dness, Healing, Roughness
210	_		SANDY fat CLAY (CH); soft; gray; wet; most plasticity fines; some coarse to fine grained string subangular GRAVEL (FILL)	stly high SAND; trace							AAAAAA		
					Vs	501	2 2 3	5	11				
	5 -						2	4	28				
205					X s	602	2 2	+	20				
005	10 -		10.0 feet: advance HWT casing to 10.0'				2	6	39				
200					X	503	2 4				THAT		
			Lean to Fat CLAY (CL-CH); soft; dark grayi with yellow brown oxidation; moist to wet; n medium to high plasticity fines; little coarse grained SAND (SURFICIAL SOIL - LANDS DEPOSIT)	to fine									
195	15 -		Fat CLAY (CH); soft; light brown; wet; most plasticity fines; few fine subangular GRAVEL to fine grained SAND (LANDSLIDE DEPOSI 15.0 feet: no circulation return	tly high .; few coarse T)	\\\s	504	1 1 1	2	50				
	-						-						
190	20 -				\\s	605	2 2 3	5	55				
	25		Lean CLAY (CL); thinly layered with thin lat SILTY SAND (SM); Lean CLAY (CL): soft; brown; wet; medium plasticity; SILTY SANI loose; dark gray; wet; fine to medium grain (LANDSLIDE DEPOSIT)	D (SM):							TATATATATATA		
	<del>-</del> 25 <del>-</del>		(continued)			T=			. =		IX	· <b></b>	
						D	EPOR <b>3ORI</b> IST.	NG F	JNT	Υ	ROU		HOLE ID RC-20-020 LE EA
	H	<i>(LI</i>	EINFELDER Bright People. Right Solutions.			PI		CT O	R BR		101 E NAME de Bypass		.5 011500009
							RIDGE				PREPARED D. Ross		DATE SHEET <b>3-26-21 1 of</b>

	ELEVATION (II)	SDEPTH (ft)	Material Graphics		Sample Location	Sample/Run#	Uncorr. Blows per 6 in.	Blows per foot	Recovery (%)	RQD (%)	Drill Rate (min/ft)	Drilling Method Casing Depth	Fracture Identification Width, Infilling Com	by Description ation: (Depth), Dip, position, Weatherin ling, Roughness	g,
	85	_		CLAYEY SAND with GRAVEL (SC); medium dense; dark gray; wet; mostly coarse to fine grained SAND; little fine subangular GRAVEL; little fines (LANDSLIDE DEPOSIT)	M	S06	3 5 10	15	50						_
				Poorly-graded GRAVEL with SAND (GP); medium								0000			_
			000000000000000000000000000000000000000	dense; wet; mostly coarse to fine subangular GRAVEL; some coarse to medium grained SAND (LANDSLIDE DEPOSIT)								00000			_
1	80	30 -	00000		M	S07	3 14 13	27	28			00000			
			00000									0000			_
		+	000	CLAYEY SAND (SC); medium dense; dark gray; wet; mostly coarse to fine grained SAND: some medium								0000			-
1	75	35 -		mostly coarse to fine grained SAND; some medium plasticity fines; trace fine subangular GRAVEL (LANDSLIDE DEPOSIT)	M	S08	7 9 11	20	39			000000000000000000000000000000000000000			
												0000			
				38.0 feet: no fluid return								0000			_
1	70	40			M	S09	8 8 10	18	39						
[]												000000			
		-										2000			_
į	65	45			M	S10	10 13 7	20	39			000000			
		-										$\sim$			_
1	60	50 -	- ( · / · / · / · / · / · / · / · / · / ·	50.0 feet: equip NQ core for pressure meter test; interval from 50.0' to 55.0' SEDIMENTARY ROCK ((SANDSTONE))SEDIMENTARY ROCK (SANDSTONE)					60	60	3.40				_
				Fine-grained sand; gray; slightly weathered; moderately hard to hard; quartz and calcite veining to 0.1" (LANDSLIDE DEPOSIT) 51.8 to 57.4 feet: LANDSLIDE FAILURE ZONE: SANDSTONE sheared/brecciated to: Poorly-graded		C11						$\Diamond$			
			:::::   :::::	GRAVEL with CLAY (GP-GC): medium dense; gray; wet; mostly fine to coarse subangular GRAVEL; few fines; little fine to coarse grained SAND								$\Diamond$			_
		-55 <del>-</del>	1	(continued)	Ш										
),							EPOR <b>BORI</b>			OR	D		HOLE ID RC-20	)-020	
		1.	·				IST. <b>01</b>	CO	UNT el N	Y <b>orte</b>	F	ROUTE <b>101</b>	POSTMILE <b>12-15.5</b>	EA 0115000099	
		r	\ <u>_</u>	EINFELDER Bright People. Right Solutions.							E NAME de Byp				
						В	RIDGE					RED BY	DAT <b>3-2</b>	E SHEET 26-21 2 of 6	

US.ZO FIM BT.	ELEVATION (III)	я Э В В В В В В В В В В В В В В В В В В	Material Graphics		Sample Location	Sample/Run#	Uncorr. Blows per 6 in.	Blows per foot	Recovery (%)	RQD (%)	Drill Rate (min/ft)	Drilling Method Casing Depth	Discontinuity Description  Fracture Identification: (Depth), Dip, Width, Infilling Composition, Weathering, Hardness, Healing, Roughness
04/18	55			50.0 feet: equip HQ core for pressuremeter test; interval from 50.0' to 55.0' SEDIMENTARY ROCK ((SANDSTONE))SEDIMENTARY ROCK ((SANDSTONE)) 55.0 feet: equip HQ core; circulation loss; advance HWT casing to 49.0'		C12			48	0	9.17	\\ \\ \\ \\	_
				LANDSLIDE FAILURE ZONE: SANDSTONE and ARGILLITE sheared to: (CLAYEY GRAVEL with SAND (GC); loose; gray; moist to wet; mostly coarse to fine subangular GRAVEL; some medium plasticity fines; little coarse to fine grained SAND)		C13,			100 95	0	7.14	\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	-
1	50	60		60.0 feet: no circulation return	X	S15	6 5 10	15	NR			× < × <	-
		65		62.0 feet: becomes difficult to drill  SEDIMENTARY ROCK (ARGILLITE) Thinly bedded; gray to black; decomposed; very soft; very intensely fractured/pervasively sheared; chaotic; few subangular to rounded SANDSTONE clasts up to 3": slightly weathered; moderately hard; sheared to (CLAYEY SAND with GRAVEL (SC): dense; moist; mostly fine to coarse SAND; some medium plasticity								>X<>X<>X<	- - -
1.	45	_		fines; few subangular to rounded fine to coarse GRAVEL); (FRANCISCAN COMPLEX)		C16			97	0	4.17	$\Diamond$	- -
					Н	C17			90 95	0	8.33 14.29	$\Diamond \Diamond $	- -
1.	40	70 -		70.0 feet: equip NQ core for pressure meter test; interval 70.0-75.0'								X	- - -
:	35	75 -		75.3 to 76.7 feet: moderately weathered; moderately soft; intensely fractured; equip HQ core; circulation loss		C19			100	0	6.00	>>	- - -
1:				76.7 feet: 7" rounded SANDSTONE clast (encountered obliquely): slightly weathered; moderately hard  78.8 feet: general shear fabric: dips 80°-90°		C20						\$\\\ \\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	- - -
7707	30	80 -		80.5 feet: 6" SANDSTONE clast: slightly weathered; moderately hard		C21			83	10	7.00	$\Diamond \Diamond $	- - -
		-85										>< >>< >	_
				(continued)		Te	EDOD	ד דו	TI E				HOLE ID
		L		EINFELDER			BORI BORI DIST. 01	NG CO D	REC UNT e <b>l N</b> e	<sub>Y</sub> orte		ROUTE <b>101</b>	POSTMILE EA 0115000099
	,			Bright People. Right Solutions.			ROJEC Last ( RIDGE	Cha	nce	Gra	E NAME de Byr PREPA D. R	NRED BY	DATE SHEET 3-26-21 3 of 6

gINT FILE:

Sample Location ELEVATION (ft) Drill Rate (min/ft) Drilling Method Casing Depth per 6 in. foot Sample/Run# %) DEPTH (ft) Blows per Recovery Fracture Identification: (Depth), Dip, Width, Infilling Composition, Weathering, Hardness, Healing, Roughness DESCRIPTION Material Graphics RQD (%) SEDIMENTARY ROCK (ARGILLITE) 100 5.88 125 C22 99 0 10.00 C23 90.0 feet: 4" rounded SANDSTONE clast (encountered 83 0 10.00 120 obliquely) slightly weathered; moderately hard to hard C24 91.1 to 91.6 feet: vertical (obliquely encountered) convolute zone of ARGILLITE and SANDSTONE: slightly weathered; very intensely fractured 33 0 9.33 C25 8.00 100 0 C26 95 90 20 4.80 115 96.5 to 97.1 feet: vertical (obliquely encountered) convolute zone of ARGILLITE and SANDSTONE: slightly weathered; very intensely fractured C27 98.3 feet: 12" SANDSTONE clast: slightly weathered; hard; moderately fractured 99.3 feet: thinly bedded; gray to dark gray; decomposed; soft to very soft; very intensely fractured/pervasively sheared; chaotic; few SANDSTONE clasts to 3": slightly weathered; moderately hard to hard; sheared to: (CLAYEY SAND with GRAVEL (SC): medium dense to dense; moist; mostly fine to coarse SAND; some medium plasticity fines; few fine to coarse subangular GRAVEL); (FRANCISCAN COMPLEX) 100.0 feet: continued circulation loss 100 49 0 7 65 110 C28 42 0 8.75 C29 105 6.96 74 0 105 C30 101 0 12.86 C31 100 38 0 6.36 C32 37 0 13.33 C33 42 0 12.50 C34 (continued) HOLE ID RC-20-020 REPORT TITLE **BORING RECORD** DIST COUNTY ROUTE **POSTMILE** 0115000099 **Del Norte** 101 12-15.5 01 *KLEINFELDER* PROJECT OR BRIDGE NAME **Last Chance Grade Bypass** Bright People. Right Solutions. **BRIDGE NUMBER** PREPARED BY SHEET D. Ross 3-26-21 4 of 6

ELEVATION (ft)	115 115	Material Graphics		Sample Location	Sample/Run#	Uncorr. Blows per 6 in.	Blows per foot	Recovery (%)	RQD (%)	Drill Rate (min/ft)	Drilling Method Casing Depth	Discontinuity Description Fracture Identification: (Depth), Dip, Width, Infilling Composition, Weathering, Hardness, Healing, Roughness
95			SEDIMENTARY ROCK (ARGILLITE)		C35			68	0	7.65	Š	_
					033			44	•	40.07	$\downarrow \downarrow$	
								44	0	16.07	$\Diamond$	7
				С	36/3	7					$\Diamond$	7
												-
90	120		119.5 feet: dark gray; slightly weathered; moderately hard; intensely fractured; few SANDSTONE clasts to 3": gray; slightly weathered; hard; trace fragmented quartz veining		C38			47 83	0	20.00		-
30			slightly weathered; hard; trace fragmented quartz veining 121.0 feet: minimal to no circulation return		C39			00	U	10.07	$\sim$	-
			12 1.0 lock minima to the disculation rotatin		0.40			NR		15.00	$\Diamond$	_
					C40			77	0	15.00	$\Diamond$	
					C41						$\Diamond$	
	105	昌			C42			NR	0	14.55		
85	125				0.40			80	0	0.00	$\searrow$	٦
					C43			00	•	0.00	$\Diamond$	-
					C44			80	0	6.00	$\Diamond$	-
			127.5 feet: 6" SANDSTONE clast: slightly weathered; hard		C45			100 NR	_0_	20.00 9.44	$\Diamond$	-
			128.0 feet: gray to dark gray; decomposed; very soft; very intensely fractured/pervasively sheared; little subangular to rounded SANDSTONE clasts to 3": gray; slightly weathered; moderately hard to hard; chaotic, fragmented quartz and calcite veining; sheared to: (SANDY lean CLAY with GRAVEL (CL): stiff; moist;		C46							-
	130	<u> </u>	weathered; moderately hard to hard; chaotic, fragmented guartz and calcite veining; sheared to:					95	0	7.39	$\triangleright$	_
80			mostry lines, some line to coarse sand, little		C47						$\Diamond$	_
			subangular to rounded, fine to coarse GRAVEL)		041						$\Diamond$	
			131.8 feet: slightly weathered; moderately soft to moderately hard; very intensely fractured					100	0	9.50	$\Diamond$	
					C48							
					C49			NR		12.22	$\rangle$	7
75	135				C50			101	0	12.22	$\searrow$	-
		==	136.0 feet: decomposed; very soft; very intensely					98	0	12.73	$\Diamond$	-
		邑	136.0 feet: decomposed; very soft; very intensely fractured/pervasively sheared to (CLAYEY SAND with GRAVEL (SC): medium dense; moist to wet; mostly fine to coarse SAND; some medium plasticity fines; little fine		C51			70	0	5.33	$\Diamond$	-
			subangular GRAVEL)								$\langle \rangle$	_
					C52							_
	140										$\searrow$	
70								91	0	3.60	$\Diamond$	
											$\Diamond$	
					C53						$\Diamond$	-
		<del>                                     </del>										
											$\searrow$	
	145		(continued)								$ \diamondsuit $	
			(continued)			EPOR				.D.		HOLE ID
					D	BORI	СО	UNT	Y	R	OUTE	
	H	<i>(LE</i>	EINFELDER		P		CT C		RIDG	E NAME	101	12-15.5 0115000099
		_/	Bright People. Right Solutions.			Last (				de Bypa PREPAR	RED B	Y DATE SHEET
						-				D. Ro	ss ¯	3-26-21 5 of 6

DESCRIPTION  Sample Location  Discording Method  Casing Depth  Casing Depth  Discording Method  Casing Depth  Casi	
	-
NR 4.44	- - -
150.0 feet: advance HWT casing to full depth (150.0')	
Bottom of borehole at 150.0 ft bgs	_
	_
	_
	-
55 155 -	4
	-
	_
160	-
	-
	-
165 —	
45	_
	-
	-
	_
40 170	_
	_
	_
	-
175	
REPORT TITLE BORING RECORD REPORT TO THE POST OF THE P	DLE ID RC-20-020
KLEINFELDER  DIST. COUNTY ROUTE POSTMILE 01 Del Norte 101 12-15.5  PROJECT OR BRIDGE NAME	0115000099
Bright People. Right Solutions.  Last Chance Grade Bypass  BRIDGE NUMBER PREPARED BY  D. Ross	DATE SHEET <b>3-26-21 6 of 6</b>

LOGGED BY

P.Sunberg

BEGIN DATE

1-7-21

COMPLETION DATE

1-9-21

TEMPLATE:

gINT FILE:

DRILLING CONTRACTOR SURFACE ELEVATION BOREHOLE LOCATION (Offset, Station, Line) **CRUX Subsurface Inc.** 408.42 ft NAVD88 DRILLING METHOD DRILL RIG BOREHOLE DIAMETER **Mud Rotary** Burley 55-1 4.5 in SAMPLER TYPE(S) AND SIZE(S) (ID) SPT HAMMER TYPE HAMMER EFFICIENCY, ERI SPT (1.4"), HQ Core (2.5") Cathead; 140 lbs / 30-inch drop GROUNDWATER DURING DRILLING AFTER DRILLING (DATE) BOREHOLE BACKFILL AND COMPLETION TOTAL DEPTH OF BORING **Not Determined Not Determined** VWP, TDR, Inclinometer; cement-bentonite 150.0 ft Sample Location Rate (min/ft .0 foot **Drilling Method Discontinuity Description** Sample/Run# **EVATION** 8 € Uncorr. Blows per ( Blows per f Fracture Identification: (Depth), Dip, Width, Infilling Composition, Weathering, Hardness, Healing, Roughness Material Graphics Recovery DESCRIPTION DEPTH ( Casing [ RQD ( Ē ᆸ SANDY FAT CLAY (CH); very soft; reddish brown; moist; mostly fines; little medium to fine SAND; (COLLUVIUM / LANDSLIDE DEPOSIT) 405 5 5.0 feet: PP = 1.25 tsf 3 50 0.00 2 S01 1 400 10 CLAYEY SAND with GRAVEL (SC); very loose; olive brown; moist to wet; mostly coarse to fine SAND; little fine subangular GRAVEL; little fines; medium plasticity; 3 56 0.00 S02 (COLLUVIUM / LANDSLIDE DEPOSIT) 10.0 feet: no circulation return 395 SANDY fat CLAY with GRAVEL (CH); soft; dark gray; moist to wet; mostly fines; little fine subangular GRAVEL; little coarse to fine SAND; (LANDSLIDE DEPOSIT) 15 0.00 15.0 feet: PP = 0.5 tsf 4 31 2 S03 2 390 20 CLAYEY SAND (SC) medium dense; dark gray; wet; mostly coarse to fine SAND; little fines; few fine subangular GRAVEL; (LANDSLIDE DEPOSIT) 6 13 97 0.00 S04 385 (continued) REPORT TITLE HOLE ID RC-21-001 **BORING RECORD** DIST. COUNTY ROUTE POSTMILE 0115000099 **Del Norte** 101 12-15.5 01 *KLEINFELDER* PROJECT OR BRIDGE NAME Bright People. Right Solutions. **Last Chance Grade Bypass** BRIDGE NUMBER PREPARED BY DATE

D. Ross

4-22-21

1 of 6

BOREHOLE LOCATION (Lat/Long or North/East and Datum)

2479547.482 ft / 5984956.757 ft NAD83

HOLE ID

RC-21-001

PLOTTED: 04/19/2022 03:26 PM BY: DSullive	ELEVATION (ft)	<sup>1</sup> DЕРТН (ft)	Material Graphics	DESCRIPTION	Sample Location	Sample/Run#	Uncorr. Blows per 6 in.	Blows per foot	Recovery (%)	RQD (%)	Drill Rate (min/ft)	Drilling Method Casing Depth	Discontinuity Description  Fracture Identification: (Depth), Dip, Width, Infilling Composition, Weathering, Hardness, Healing, Roughness
4/19/202		25		CLAYEY SAND (SC) 25.0 feet: calcite fragments in sample	M	S05	3 10 14	24	40		0.00	000	_
TTED: 0												0000	_
PLC	380											0000	-
		30 -					F0/4#	DEE	100		0.00	1000	]
				30.0 feet: SANDSTONE fragment; slightly weathered, moderately hard	$\bigcap$	S06	50/1"	KEF	100		0.00	00000	-
												1000	-
	375											0000	
		35			\/		6	10	50		0.00	0000	-
					X	S07	4 6					0000	-
					M		16	32	75		0.00	0000	
	370			39.1 feet: equip HQ core SEDIMENTARY ROCK (ARGILLITE); massive; black;	A	S08	14 18		90	0	0.00	<b>V</b>	_
		40		decomposed; very soft; very intensely fractured; pervasively sheared to: clayey SAND (SC); dense; moist, mother in the decrease and little to mediate placificity.		200						$\Diamond$	+
				fines; little subangular fine gravel; some faint relic shear structure (LANDSLIDE DEPOSIT)		C09							
- RATE)2	365				M	S10	9 12	22	53		0.00		-
[CLIENT_CALTRANS (KLF MOD W DRILL RATE)2]		45			/\		10		2	0	3.25	$\Diamond$	-
KLF MOD		45	- - - - - -			C11						$\Diamond$	
TRANS (I						011						$\Diamond$	-
ENT_CAL	360				M	S12	13 10	33	0		0.00	       	-
		50		SEDIMENTARY ROCK (ARGILLITE); very fine-grained; massive; dark gray; moderately to intensely weathered;	/\	J 12	23		100	52	3.08		]
r_2022.c			 	moderately hard; intensely fractured; (LANDSLIDE DEPOSIT)  SEDIMENTARY ROCK (SANDSTONE)		C13						$\Diamond$	_
E:KLF_STANDARD_GINT_LIBRARY_2022.GLB				Fine to medium grained; massive; moderately weathered; moderately hard; moderately fractured; chaotic quartz and calcite veining to 0.1" thick (LANDSLIDE DEPOSIT)		<b>υ1</b> 3						$\Diamond$	F: (51.6'), 60°, moderately open, clean, not healed, moderately rough F: (52.3'), 50°, slightly open, clean, not
ED_GINT	355				X	S14,	50/5""	REF	70 100	50	0.00		healed, slightly rough F: (52.8'), 25°, moderately open, moderately thin, Argillite, not healed,
STANDAF		55	::::	(continued)		C15					3.00	$\Diamond$	smooth
E:KLF_8							EPOR BORI	NG	REC			OUTE	HOLE ID RC-21-001
		H	<i>(LE</i>	EINFELDER		P		DO CT O	R BF	orte RIDG	E NAME	OUTE 101	POSTMILE EA 0115000099
gINT TEMPLATE:				Bright People. Right Solutions.		В		Cha	nce	Gra	de Bypa PREPAF D. Ro	RED BY	DATE SHEET 4-22-21 2 of 6

ELEVATION (ft)	S) S) DEPTH (ft)	Material Graphics		Sample Location	Sample/Run#	Uncorr. Blows per 6 in.	Blows per foot	Recovery (%)	RQD (%)	Drill Rate (min/ft)	Drilling Method Casing Depth	
			SEDIMENTARY ROCK (SANDSTONE)  SEDIMENTARY ROCK (SANDSTONE); thinly bedded		C16			100	28	4.44	>>< >> >	F: (54.0'), 35°, open, clean, not healed, slightly rough J: (55.2'), 10°, open, clean, not healed, moderately rough F: (55.8'), 15°, slightly open, clean, not healed, moderately rough
350	60 -	•	with thin interbed remnants of ARGILLITE. SÁNDSTONE: fine grained; thinly bedded; gray to dark gray; slightly weathered; moderately hard; very intensely fractured; ARGILLITE: thinly bedded, black, decomposed, soft to very soft; very intensely fractured/sheared to: (CLAYEY SAND with Gravel (SC); medium dense; moist; mostly fine to coarse sand, little moderate plasticity fines, little		C17			100	0	3.33	$\Diamond \times \Diamond \times \Diamond$	F: (56.4'), 80°, slightly open, clean, not healed, moderately rough F: (57.1'), 50°, slightly open, clean, not healed, moderately rough
345	_		subangular fine gravel); local chaotic quartz and calcite veining. (LANDSLIDE DEPOSIT)		C18			100	0	4.48		- - -
	65 -	•	SEDIMENTARY ROCK (SANDSTONE); fine to medium grained; massive; gray; moderately weathered; moderately hard; intensely fractured; chaotic quartz and calcite veining to 0.1" thick (LANDSLIDE DEPOSIT)		C19			90	8	4.00	$\Diamond \times \Diamond \times \Diamond$	- - -
340			SEDIMENTARY ROCK (ARGILLITE); very thinly bedded; dark gray to black; decomposed; soft to very soft; very intensely fractured; pervasively sheared to: (Poorlygraded GRAVEL with CLAY and SAND (GP-GC),		010			96	0	7.14		- - -
[-/-]	70 -		dense, mostly fine subangular gravel; little fine to coarse sand; few moderate plasticity fines; trace subrounded SANDSTONE bed remnants to 2" diameter; gray; slightly weathered; moderately hard) (LANDSLIDE DEPOSIT)	•	C20						$\langle \langle \langle \langle \langle \rangle \rangle \rangle \rangle$	- - -
335	75 -	•	SEDIMENTARY ROCK (SANDSTONE); fine to medium grained; massive; gray; moderately weathered; moderately hard; intensely fractured; chaotic quartz and calcite veining to 0.1" (LANDSLIDE DEPOSIT) 73.8 feet: 2" ARGILLITE interbed: dips 35°; black; decomposed; very soft; pervasively sheared to:		C21			90	45	6.00	$\times \wedge \times \wedge$	- - -
330	_		(SANDY fat CLAY (CH); stiff; mostly fines, little fine to coarse sand) 75.8 feet: 2" ARGILLITE interbed: 50°; black; decomposed; very soft; pervasively sheared to: (SANDY fat CLAY (CH); stiff; mostly fines, little fine to coarse sand) SEDIMENTARY ROCK (ARGILLITE); very fine-grained;		C22			71	0	6.19	\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	- -
3	80 -		massive; dark gray; decomposed; very soft; very intensely fractured; pervasively sheared to: (Poorly-graded SAND with Clay and Gravel (SP-SC); medium dense; mostly fine to coarse sand; little subangular fine gravel; few moderate plasticity fines) (LANDSLIDE DEPOSIT)  SEDIMENTARY ROCK (SANDSTONE); fine-grained; dark gray; slightly weathered; moderately hard; very		C23			100	0	8.33	$\langle \Diamond \times \Diamond \times \langle \rangle \rangle$	- - -
325			intensely fractured; chaotic quartz and calcite veining to 0.2" thick (LANDSLIDE DEPOSIT)  81.1 feet: 0.5" ARGILLITE interbed: dips 30°; black; decomposed; very soft; pervasively sheared to: (Sandy Fat CLAY (CH); stiff; mostly fines, little fine to coarse sand)  81.5 feet: 2" ARGILLITE interbed: dips 20-30°; black;		C24 C25			76 100	0	6.67 9.37	$\langle \rangle \langle \Diamond \rangle \langle \Diamond \rangle$	- - -
	85		decomposed; very soft; pervasively sheared to: (SANDY Fat CLAY (CH); stiff; mostly fines, little fine	(	C26						$\Diamond$	
	K	CLE	(continued)  EINFELDER  Bright People. Right Solutions.		D		NG CO DO CT O	REC UNT' <b>el N</b> o R BF	Y <b>orte</b> RIDG	R	OUTE 101 ass	HOLE ID   RC-21-001   POSTMILE   EA   0115000099
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ELEVATION (ft)	© SDEPTH (#)	Material   Graphics	DESCRIPTION	Sample Location	Sample/Run#	Uncorr. Blows per 6 in.	Blows per foot	Recovery (%)	RQD (%)	Drill Rate (min/ft)	Drilling Method Casing Depth	Fracture Ide Width, Infilling	ntinuity Descrip ntification: (De Composition, , Healing, Rou	epth), Dip, Weathering,
320	_		to coarse sand) 82.0 feet: 1" ARGILLITE interbed: 40°; black; decomposed; very soft; pervasively sheared to: (SANDY Fat CLAY (CH); stiff; mostly fines, little fine to coarse sand) SEDIMENTARY ROCK (ARGILLITE) Moderately bedded; dark gray to black; decomposed; soft; very intensely fractured; pervasively sheared to: (CLAYEY SAND with Gravel (SC); medium dense;		C27			32	0	5.29	\$\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\			- - -
	90 -		moist; mostly fine to coarse sand; little moderate plasticity fines; little subangular to subrounded fine to coarse gravel (ARGILLITE and SANDSTONE fragments)); locally larger SANDSTONE bed remnants / clasts as noted; chaotic quartz and calcite veining to 0.1" (LANDSLIDE DEPOSIT) 88.7 feet: 4" thick SANDSTONE bed remnant/clast; gray; slightly weathered; moderately hard		C28			62	7	4.40	X			- - -
315	95 -				C29			100	0	3.60	\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\			- - -
310			96.1 to 97.0 feet: LANDSLIDE FAILURE ZONE: ARGILLITE sheared to: (SANDY lean CLAY (CL); moist; stiff; dark gray to black; mostly fines; some fine to coarse. SAND; trace subrounded fine to coarse GRAVEL)  SEDIMENTARY ROCK (ARGILLITE) Moderately bedded; dark gray to black; decomposed; soft; very intensely fractured; pervasively sheared to: (CLAYEY SAND with Gravel (SC); medium dense;		C30			100	0	4.00	$\Diamond$			- - -
	100		moist; mostly fine to coarse sand; little moderate plasticity fines; little subangular to subrounded fine to coarse gravel (ARGILLITE and SANDSTONE fragments)); locally larger SANDSTONE bed remnants / clasts as noted; chaotic quartz and calcite veining to 0.1" (FRANCISCAN COMPLEX)		C31			90	0	4.33	\$\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\			- -
305	105		100.1 feet: 7" SANDSTONE bed remnant/clast; gray; slightly weathered; moderately hard; very intensely fractured 100.6 feet: 2" SANDSTONE bed remnant/clast; gray; slightly weathered; moderately hard 103.0 feet: 8" SANDSTONE bed remnant/clast; gray; slightly weathered; moderately hard; very intensely fractured		C33			100	19	5.33	\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\			- - -
300	-		106.0 feet: 2" ARGILLITE clast; dark gray slightly weathered; moderately hard  107.3 feet: 4" SANDSTONE clast; gray and dark gray; slightly weathered; moderately hard		C34			100		6.92	\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\			- - -
	110		_		C35			33	0	7.04				- - -
295					C36			84	0	4.40				- - -
	<b>-</b> 115 <b>-</b>		(continued)	_										
						REPOR BORI DIST.	NG				ROUTE		E ID <b>C-21-001</b> EA	
	K	LE	INFELDER		P	<b>01</b> PROJEC	DO CT O	el N	orte RIDG	E NAME	101	12-15.5		5000099
		_/	Bright People. Right Solutions.				Cha	nce	Gra	de Byp PREPAF			DATE	SHEET
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03.20 TIMI B I.	ELEVA ΠΟΝ (π)	15 10 10 10 10	Material Graphics		Sample Location	Sample/Run#	Uncorr. Blows per 6 in.	Blows per foot	Recovery (%)	RQD (%)	Drill Rate (min/ft)	Drilling Method Casing Depth	Discontinuity Description Fracture Identification: (Depth), Dip, Width, Infilling Composition, Weathering, Hardness, Healing, Roughness
277777777777777777777777777777777777777	90			SEDIMENTARY ROCK (ARGILLITE)  117.4 feet: 3" SANDSTONE clast; gray; slightly weathered; moderately hard		C37			100	0	4.80	×><>< </td <td>- - -</td>	- - -
		120		SEDIMENTARY ROCK (SANDSTONE); coarse to fine-grained; thickly bedded; gray; slightly weathered; hard; moderately fractured; ARGILLITE clasts up to 0.25" (FRANCISCAN COMPLEX)  SEDIMENTARY ROCK (ARGILLITE); moderately		C39			100		6.19	$\langle \langle \rangle \langle \rangle \rangle$	F: (119.3'), 0°, open, clean, not healed, moderately rough F: (119.8'), 0°, open, clean, not healed,
	85	-		bedded; dark gray to black; decomposed; soft; very intensely fractured; pervasively sheared to: (CLAYEY SAND with Gravel (SC); medium dense; moist; mostly fine to coarse sand; little moderate plasticity fines; little subangular to subrounded fine to coarse gravel (ARGILLITE and SANDSTONE fragments)); locally larger SANDSTONE bed remnants/clasts as noted; chaotic		C40			100	0	3.79	$\times \Diamond \times \Diamond \times$	moderately rough F: (120.2'), 0°, open, clean, not healed, moderately rough —
		125		quartz and calcite veining to 0.1" (FRANCISCAN COMPLEX) 123.8 feet: pervasively sheared; 0.3" to 2" rock fragments 124.4 feet: calcite vein to 2"		C41			94	0	6.25	$\Diamond \times \Diamond \times \Diamond$	- -
2	80	_		126.0 feet: 5" SANDSTONE clast; gray; slightly weathered; moderately hard		C42			100	13	5.77	) \ \ \ \ \ \ \ \ \ \ \ \ \	F: (126.5'), 50°, moderately open, clean, not healed, moderately rough F: (126.8'), 0°, open, clean, not healed, moderately rough
		130			П	C43 C44			<ul><li>100</li><li>100</li><li>100</li></ul>	0 0	5.00 7.78 4.85	×	- - -
2	75	_		131.8 feet: 8" SANDSTONE clast; moderately weathered; moderately hard; calcite veining		C45						$\Diamond \times \Diamond \times \Diamond$	-
2		135 =				C46			100	0	5.81	> > > > > >	- - -
2	70	_				C47			95	0	6.84	X	- -
		140		SEDIMENTARY ROCK (SANDSTONE); fine to medium grained; massive; gray; moderately weathered; moderately hard; slightly fractured; trace chaotic quartz and calcite veining		C48			100	00	4.40	$\Diamond \times \Diamond \times \Diamond$	F: (139.2'), 0°, open, clean, not healed, moderately rough F: (140.3'), 0°, open, clean, not healed, moderately rough F: (141.1'), 0°, open, clean, not healed,
5	65			SEDIMENTARY ROCK (ARGILLITE) Massive; dark gray to black; decomposed; soft to very		C49			100	0	3.00	×	moderately rough F: (142.3'), 45°, slightly open, clean, not healed, moderately rough F: (143.8'), 45°, open, clean, not healed, moderately rough
SIANDARD		145	FH	soft; intensely fractured; pervasively sheared to:  (continued)	Ш							$\Diamond$	moderatery rough
	(	K	\(LE	EINFELDER  Bright People. Right Solutions.		D P B	EPOR BORI IST. 01 ROJEC Last (	NG CO DO CT O Cha	REC UNT el N R BF nce	Y <b>orte</b> RIDGI <b>Gra</b>	R	ED BY	HOLE ID   RC-21-001   POSTMILE   12-15.5   DATE   SHEET   4-22-21   5 of 6

ELEVATION (ft)	145 145	Material Graphics	DESCRIPTION	Sample Location	Sample/Run#	Uncorr. Blows per 6 in.	Blows per foot	Recovery (%)	RQD (%)	Drill Rate (min/ft)	Drilling Method Casing Depth	Discontinuity Description  Fracture Identification: (Depth), Dip, Width, Infilling Composition, Weathering, Hardness, Healing, Roughness
260	143		CLAYEY SAND with GRAVEL (SC); medium dense, moist, mostly fine to coarse sand; little medium plasticity fines, little subangular to subrounded fine to coarse gravel (moderately strong ARGILLITE and SANDSTONE clasts)); chaotic quartz and calcite veining to 0.1" thick. (FRANCISCAN COMPLEX) SEDIMENTARY ROCK (ARGILLITE)		C49			100	0		\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	
	150		148.6 feet: very intensely fractured 150.0 feet: advance HWT casing to full depth (150.0') Bottom of borehole at 150.0 ft bgs		C50			100	0	3.57	$\Diamond$	- -
255	_	-										- - -
	155 -	-										<del>-</del> -
250	160	-										- -
	_	-										- -
245	165											- - -
240	_	-										<u>-</u>
	170											- -
235	_											_ _ _
	175L	CLE	EINFELDER Bright People. Right Solutions.		P	EPOR BORI IST. 01 ROJE( Last (	NG CO D CT C Cha	UNT el No R BF nce	Y <b>orte</b> RIDG <b>Gra</b>	F	ROUTE 101 ass	HOLE ID RC-21-001 POSTMILE 12-15.5 EA 0115000099

## **APPENDIX D** Drilling Site Photographs



Geoprobe 3230 mud rotary rig on Green Diamond property. D-20-002 (B-40) Gregg Drilling



Mid-Roto Sonic 50K track rig on Green Diamond property. D-20-002 (B-40) Gregg Drilling



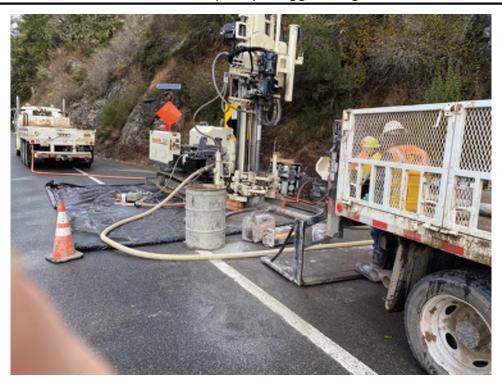
Burley 6000 helicopter access rig in State park. RC-20-005 (B-28) Crux Subsurface



CME-850 track rig on Green Diamond property. RC-20-007 (B-16) Gregg Drilling



Fraste FS250 Sonic 50K rig on northbound shoulder of Highway 101. D-20-010 (B-24) Gregg Drilling



Geoprobe 3230 air rotary rig on northbound shoulder of Highway 101. P-20-012 (VWP-2SP) Gregg Drilling



CME-850 track rig adjacent to southbound Highway 101. RC-20-013 (VWP-6) Gregg Drilling



DMW-45 helicopter access rig in State park. RC-20-014 (B-29) Crux Subsurface



Burley 55-1 track rig adjacent to northbound shoulder of Highway 101. RC-20-016 (VWP-3) Crux Subsurface



Burley 55-1 track rig adjacent to southbound Highway 101. RC-20-017 (B-18) Crux Subsurface