SGR-16
SSCL-SR-1202

Engineers, Geologists, Chemists, Water Planners, Hygienists and Environmental Scientists

Raba-Kistner Consultants, Inc.

12821 W. Golden Lane
P.O. Box 690287, San Antonio, TX 78269-0287
(512) 699-9090 FAX (512) 699-6426

FAXED (8/2/91) (214-333-6605)

DESIGN MEMORANDUM

TO: Hugh Kelly

FROM: Scot Harrell CLS FOR

DATE: August 2, 1991

RE: CBR Testing - Flexible Base
Superconducting Super Collider
Waxahachie, Texas

Presented below are the results of the California bearing Ratio testing conducted on the on-site excavated Austin Chalk proposed for use as flexible base and/or embankment construction materials:

Material Gradation:

40% passing 3/4 in. sieve and retained on 3/8 in. sieve
15% retained on No. 4 sieve
22.5% retained on No. 40 sieve
22.5% passing No. 40 sieve
100% total

Results of Previous Moisture-Density Relationship:

Maximum Dry Density = 117.0 pcf
Optimum Moisture Content = 12.5%

Remolded Specimen Moisture-Density:

Dry Density = 109.7 pcf (93.8% of maximum dry density)
Moisture Content = 12.4%

California Bearing Ratio Results:

CBR = 11.8
Percent Swell = 0
Final Moisture Content = 17.6% (top 1 in.)
= 16.0% (middle 1 in.)

Please call should you have questions concerning the above data.

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FAX TO: 214-333-6605
(FAX Number)

SGR-16

FAX COVER LETTER

DATE: 8-2-91 RE:

TIME:

PLEASE DELIVER THE FOLLOWING INFORMATION TO Hugh Kelly

FROM Scot Harrell/Chris Schultz TITLE

NUMBER OF PAGES BEING TRANSMITTED, INCLUDING THIS PAGE: 2

IF YOU DO NOT RECEIVE ALL PAGES CALL: (512) 699-9090

OUR FAX NUMBER IS: (512) 699-6426.

COMMENTS:

IMPORTANT: THIS MESSAGE IS INTENDED ONLY FOR THE USE OF THE INDIVIDUAL OR ENTITY TO WHICH IT IS ADDRESSED AND MAY CONTAIN INFORMATION THAT IS PRIVILEGED, CONFIDENTIAL AND EXEMPT FROM DISCLOSURE UNDER APPLICABLE LAW. IF THE READER OF THIS MESSAGE IS NOT THE INTENDED RECIPIENT, OR THE EMPLOYEE OR AGENT RESPONSIBLE FOR DELIVERING THE MESSAGE TO THE INTENDED RECIPIENT, YOU ARE HEREBY NOTIFIED THAT ANY DISSEMINATION, DISTRIBUTION OR COPYING OF THIS COMMUNICATION IS STRICTLY PROHIBITED. IF YOU HAVE RECEIVED THIS COMMUNICATION IN ERROR, PLEASE NOTIFY US IMMEDIATELY BY TELEPHONE, AND RETURN THE ORIGINAL MESSAGE TO US AT THE ABOVE ADDRESS VIA REGULAR POSTAL SERVICE. THANK YOU.

LOG OF BORING NO. PBC-1
S.S.C. - CHANNEL RELOCATION OF CREEK

Raba-Kistner Consultants, Inc.

DRILLING METHOD: Hollow Stem Auger and Core

LOCATION: N6805366.97 / E2452680.02

DEPTH, FT | DESCRIPTION OF MATERIAL | BLOWS PER FT | UNIT DRY WEIGHT, pcf | ⊗ UNCONF. COMPRESSION, tsf (10 20 30 40 50 60 70) | PLASTIC LIMIT — WATER CONTENT — LIQUID LIMIT (10 20 30 40 50 60 70) | X-200

SURFACE ELEVATION: 666.10'

CLAY, Stiff to Very Stiff, Brown with traces of calcareous nodules and roots
- tan, slightly moist at 2.8'
- hard at 3.9' (3.9)

LIMESTONE, Weathered, Soft, Tannish-Brown, Slightly Moist with some intermittent clay and argillaceous seams and numerous partings
- light tan below 5'
- 45 degree closed fracture at 5.5'

⊗ 1.8
⊗ 2.0
⊗ 3.2

START: 10:30 AM
END: 11:15 AM

GEOLOGIST:
KEVIN L. WOOSTER
DRILL CREW:
JAY CROMEANS
BEN CROMEANS
JOSE PARILLOS

Core Run #	Core Depth (ft)	% Rec.	% RQD
1	4.0-9.0	60	0
2	9.0-10.0	90	83

DEPTH DRILLED: 10.0'	DEPTH TO WATER: Dry	PROJ. No. ASA91-020-00
DATE DRILLED: 9-5-91	DATE MEASURED: 9-5-91	PLATE 2

LOG OF BORING NO. PBC-2
S.S.C. - CHANNEL RELOCATION OF CREEK

Raba-Kistner Consultants, Inc.

DRILLING METHOD: Hollow Stem Auger and Core

LOCATION: N6804989.99 / E2452695.01

DEPTH, FT	DESCRIPTION OF MATERIAL SURFACE ELEVATION: 666.50'	BLOWS PER FT	UNIT DRY WEIGHT, pcf	⊗ UNCONF. COMPRESSION, tsf (10 20 30 40 50 60 70)	PLASTIC LIMIT — WATER CONTENT — LIQUID LIMIT (10 20 30 40 50 60 70)	X-200
	CLAY, Hard, Brown, Slightly Moist with traces of calcareous nodules and roots - tan clay, dry at 1.2' (1.5)			⊗ 4.5		
5	LIMESTONE, Weathered, Tan and Light Gray - soft with some intermittent partings to 3'					
10	- medium hard with fewer partings, more widely spaced from 3' to 6' - 45 degree closed fractures at 3.6' and 5.3' - slightly argillaceous, soft, tan to brown with multiple partings from 7.5' to 8' - 80 degree closed fracture at 9'					
15						
20	START: 11:30 AM END: 12:30 PM					
25	GEOLOGIST: KEVIN L. WOOSTER DRILL CREW: JAY CROMEANS BEN CROMEANS JOSE PARILLOS					
30						
35						
40						
45						
50						

Core Run #	Core Depth (ft)	% Rec.	% RQD
1	1.5-6.5	88	44
2	6.5-10.0	97	55

DEPTH DRILLED: 10.0'	DEPTH TO WATER: Dry	PROJ. No. ASA91-020-00
DATE DRILLED: 9-5-91	DATE MEASURED: 9-5-91	PLATE 3

LOG OF BORING NO. PBC-3
S.S.C. - CHANNEL RELOCATION OF CREEK

Raba-Kistner Consultants, Inc.

DRILLING METHOD: Hollow Stem Auger and Core

LOCATION: N6804669.97 / E2452959.99

DEPTH, FT | DESCRIPTION OF MATERIAL | BLOWS PER FT | UNIT DRY WEIGHT, pcf | UNCONF. COMPRESSION, tsf (10 20 30 40 50 60 70) | PLASTIC LIMIT — WATER CONTENT — LIQUID LIMIT (10 20 30 40 50 60 70) | X-200

SURFACE ELEVATION: 660.60'

CLAY, Very Stiff to Hard, Brown to Dark Brown, Slightly Moist with traces of calcareous nodules and roots
- more tan below 3.3'
- hard at 4.5'
- tan with caliche pockets and traces of limestone gravel and fragments at 5.3'

(5.5)

LIMESTONE, Weathered, Argillaceous, Very Soft, Tan to White

UNCONF. COMPRESSION, tsf: 2.3, 2.2, 2.8, 3.3

START: 12:50 PM
END: 1:40 PM

GEOLOGIST:
KEVIN L. WOOSTER
DRILL CREW:
JAY CROMEANS
BEN CROMEANS
JOSE PARILLOS

Core Run #	Core Depth (ft)	% Rec.	% RQD
1	5.5-10.0	11	0

DEPTH DRILLED: 10.0'	DEPTH TO WATER: Dry	PROJ. No. ASA91-020-00
DATE DRILLED: 9-5-91	DATE MEASURED: 9-5-91	PLATE 4

LOG OF BORING NO. PBC-4
S.S.C. - CHANNEL RELOCATION OF CREEK

Raba-Kistner Consultants, Inc.

DRILLING METHOD: Hollow Stem Auger and Core

LOCATION: N6804389.96 / E2453249.96

DEPTH, FT | DESCRIPTION OF MATERIAL | BLOWS PER FT | UNIT DRY WEIGHT, pcf | ⊗ UNCONF. COMPRESSION, tsf (10 20 30 40 50 60 70) | PLASTIC LIMIT — WATER CONTENT — LIQUID LIMIT (10 20 30 40 50 60 70) | X-200

SURFACE ELEVATION: 656.40'

CLAY, Very Stiff to Hard, Dark Brown, Slightly Moist with traces of calcareous nodules and roots
- more tan below 3'
- drier below 4.5'

(4.8)

LIMESTONE, Weathered, Soft, White to Tan
- argillaceous with numerous partings, tan to tannish-brown from 6.4' to 7.6'
- light gray to whitish-tan below 7.6'
- intermittent partings from 8' to 10'

⊗ 2.8
⊗ 2.5
⊗ 2.3
⊗ 2.0

START: 1:50 PM
END: 2:15 PM

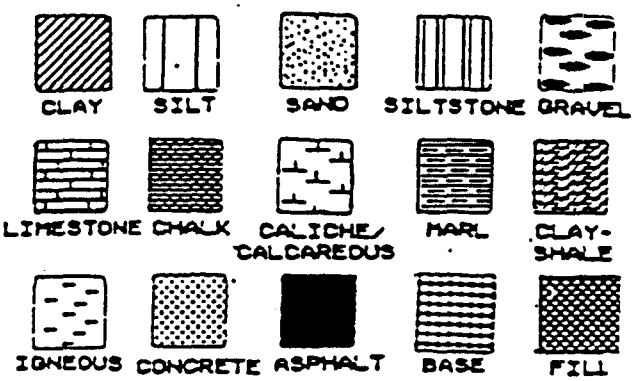
GEOLOGIST:
KEVIN L. WOOSTER
DRILL CREW:
JAY CROMEANS
BEN CROMEANS
JOSE PARILLOS

Core Run #	Core Depth (ft)	% Rec.	%RQD
1	5.0-10.0	90	37

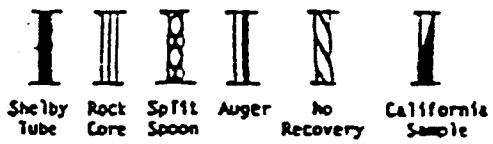
DEPTH DRILLED: 10.0'	DEPTH TO WATER: Dry	PROJ. No. ASA91-020-00
DATE DRILLED: 9-5-91	DATE MEASURED: 9-5-91	PLATE 5

SYMBOLS AND TERMS USED ON BORING LOGS

SOIL OR ROCK TYPES
(shown in symbols column)



SAMPLER TYPES
(shown in sample column)



STRENGTH TEST RESULTS

- Pocket Penetrometer
- Torvane
- Unconfined Compression

TRIAXIAL COMPRESSION

- Unconsolidated-undrained
- Consolidated-undrained
- C Cohesion (Total)
- Angle of Internal Friction (Total)
- C′ Cohesion (Effective)
- Angle of Internal Friction (Effective)

NOTE: Values symbolized on boring logs represent shear strengths unless otherwise noted.

TERMS DESCRIBING CONSISTENCY, CONDITION OR TEXTURE

Terms used in this report to describe soils with regard to their consistency or conditions are in general accordance with the discussion presented in Article 45 of SOIL MECHANICS IN ENGINEERING PRACTICE, Terzaghi and Peck, John Wiley & Sons, Inc. 1967, using the most reliable information available from the field and laboratory investigations. Terms used for describing soils according to their texture or grain size distribution are in accordance with the UNIFIED SOIL CLASSIFICATION SYSTEM, as described in Technical Memorandum No. 3-357, Waterways Experiment Station, March 1953.

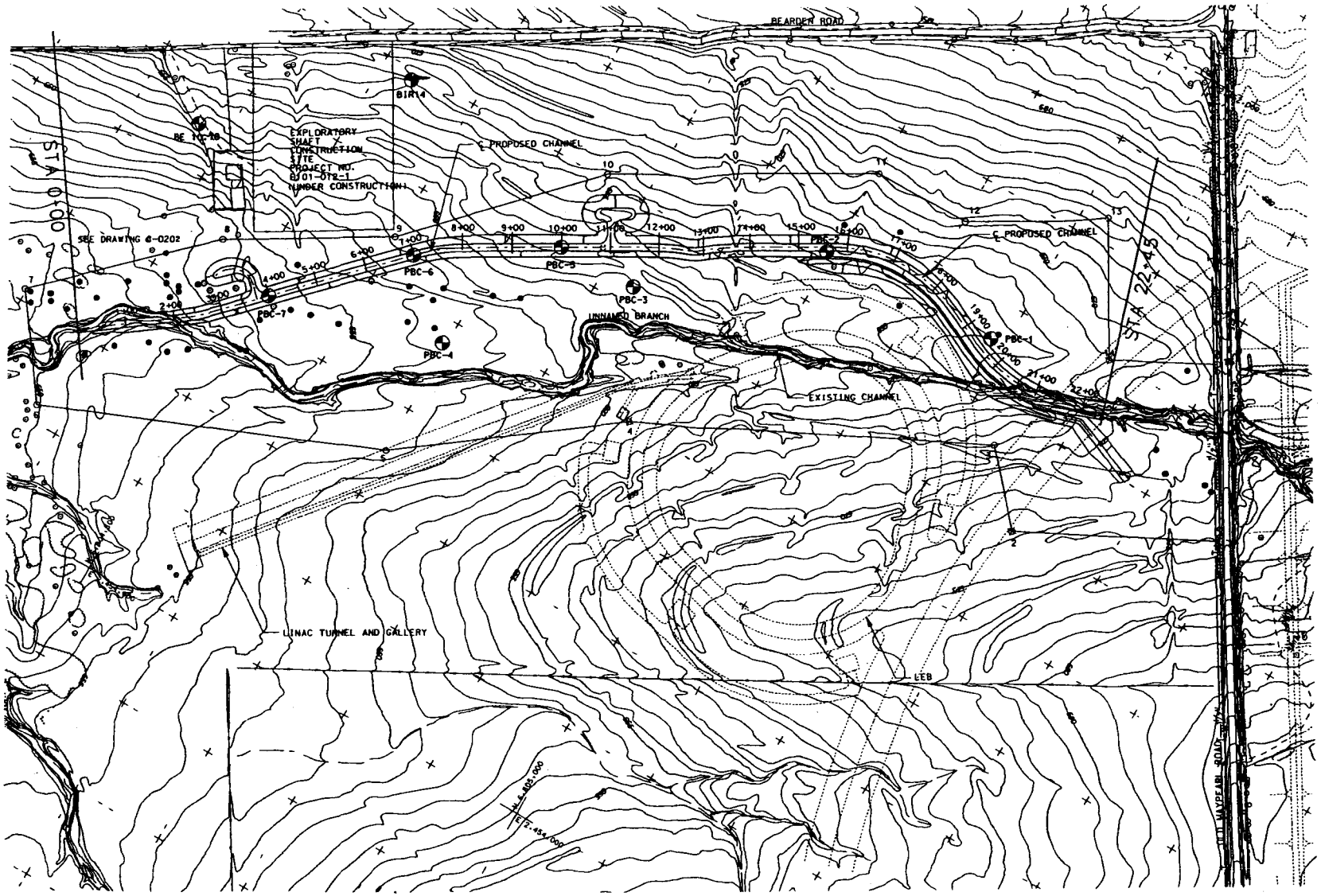
TERMS CHARACTERIZING SOIL STRUCTURE

Slickensided	having inclined planes of weakness that are slick and glossy in appearance
Fissured	containing shrinkage cracks, frequently filled with fine sand or silt; usually more or less vertical
Laminated	composed of thin layers of varying colors and texture
Interbedded	composed of alternate layers of different soil types
Calcareous	containing appreciable quantities of calcium carbonate
Well graded	having wide range in grain sizes and substantial amounts of all intermediate particle sizes
Poorly graded	predominantly of one grain size, or having a range of sizes with some intermediate size missing

TERMS DESCRIBING CONSISTENCY OR CONDITION

RELATIVE DENSITY		COHESIVE STRENGTH			PLASTICITY	
Penetration Resistance, blows per ft	Relative Density	Penetration Resistance, blows per ft	Consistency	Cohesion TSF	Plasticity Index	Degree of Plasticity
0-4	Very loose	0-2	Very Soft	0-0.125	0-5	None
4-10	Loose	2-4	Soft	0.125-0.25	5-10	Low
10-30	Medium Dense	4-8	Firm	0.25-0.5	10-20	Moderate
30-50	Dense	8-15	Stiff	0.5-1.0	20-40	Plastic
>50	Very Dense	15-30	Very Stiff	1.0-2.0	>40	Highly Plastic
		>30	Hard	>2.0		

NOTE: Slickensided and fissured clays may have lower unconfined compressive strengths than shown above because of planes of weakness or cracks in the soil. The consistency ratings of such soils are based on penetrometer readings.



SOIL BORING LOCATIONS

	N	E	ELEV
PBC-1	6805366.97	2452680.02	666.1
PBC-2	6804989.99	2452695.01	666.5
PBC-3	6804669.97	2452959.99	660.6
PBC-4	6804389.96	2453249.96	656.4
PBC-5	6804501.78	2452963.79	662.0
PBC-6	6804250.05	2453124.89	657.5
PBC-7	6804040.64	2453339.71	654.2
BIR14	6806066	2452821	667.5
BE10	6803739	2453109	662.2

DOCUMENT CONTROL No. C32-003420

REV.	DATE	BY	SUB.	APP.	DESCRIPTION	REV.	DATE	BY	SUB.	APP.	DESCRIPTION

DRAWN: N. KELLY
DESIGN: P. ARDONLAP
CHECKED: J. COTTER
IN CHARGE: M. TASAR
DATE: 11-1-91

SUPERCONDUCTING SUPER COLLIDER LABORATORY

THE PB/MK TEAM
A JOINT VENTURE OF PARSONS BRINCKERHOFF AND MORRISON KNUDSEN

SUBMITTED
APPROVED

WEST CAMPUS STREAM RELOCATION
SOIL BORING PLAN
EXHIBIT No. 1
GEOTECHNICAL

SCALE: 1" = 100'
PROJECT NUMBER: I-355
DRAWING NO. G-001 | REV. | PAGE 1

/usr5/i355/i355sb01.dgn
12-NOV-1991 17:57
file

SGR - 18

Report of Analysis

Consulting Geotechnical, Materials and Environmental Engineers
Geologists, Scientists and Chemists

Raba-Kistner
Consultants, Inc.

P.O. Box 690287, San Antonio, TX 78269-0287
12821 W. Golden Lane, San Antonio, TX 78249
(512) 699-9090

To: PB/MK

Project No.: ASA91-020-00
Assignment No.: 6-3065
Purchase order/Release No.:
Date Received: 9-9-91
Page 1 of 2 Date: 9-26-91

Sample Type/Sample Loc: Soil
Date Collected: 9-5-91
Date Completed: 9-26-91
Collected By: RKCI

TEST METHODS:

TEST	PREPARATION/DATE	ANALYSIS/DATE
pH		150.1 / 9-12-91
Chloride	300.0,11.7/9-23-91	300.0 / 9-23-91
Sulfate	300.0,11.7/9-23-91	300.0 / 9-23-91

All soil and sludge results are reported on the dry-weight basis. Methods are from EPA SW 846 and EPA 600/4-79-20 or as listed.

By Earl S. Moore
Earl S. Moore
Organic Section Manager

By Elvin J. Chavez
Elvin J. Chavez
Inorganic Section Manager

By
Thomas P. Fox
Vice-President, Chemistry

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Test Results:

Analyte	Detection Limit	6-3065-1 (PBC-1,S-1 0-1.5')	6-3065-2 (PBC-3,S-1 0-1.5')	6-3065-3 (PBC-3,S-3 3-4.5')	6-3065-4 (PBC-4,S-2 1.5-3')
pH		7.75	7.59	7.68	7.63
Chloride, (mg/kg)	1	14	9	10	11
Sulfate, (mg/kg)	1	27	12	9	17