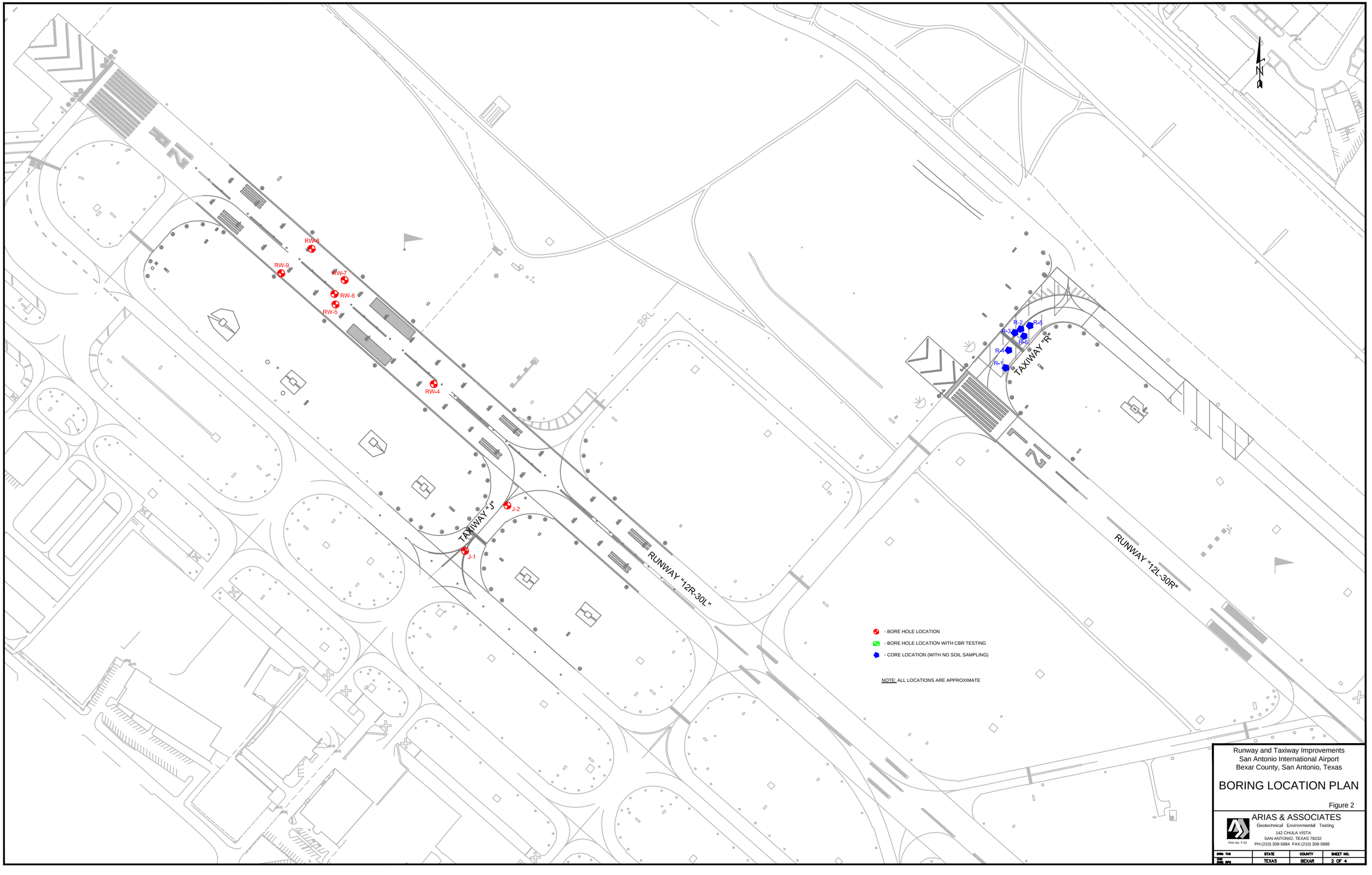


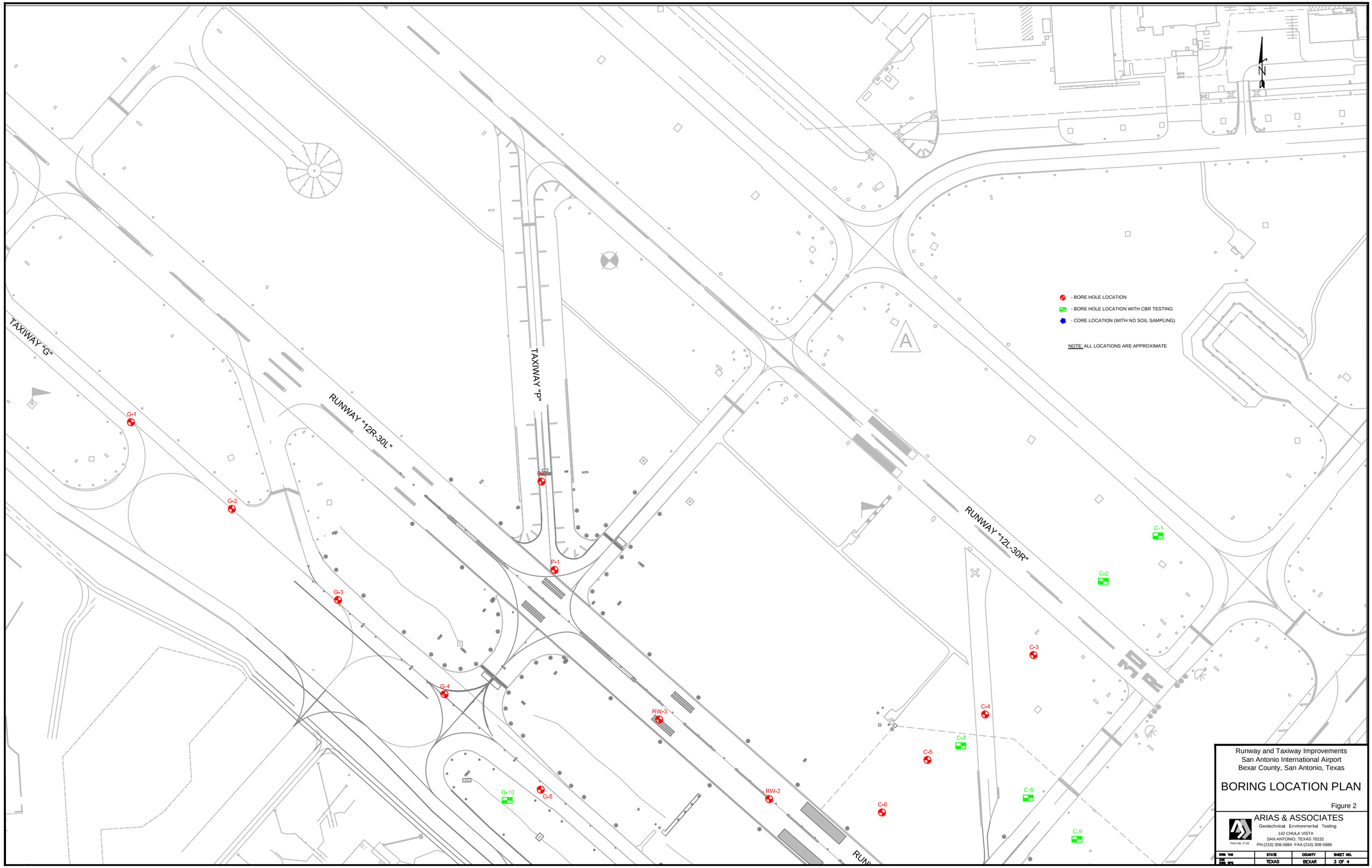
Runway and Taxiway Improvements
San Antonio International Airport
Bexar County, San Antonio, Texas

BORING LOCATION PLAN

Figure 2

ARIAS & ASSOCIATES
Geotechnical Environmental Testing
142 CHULA VISTA
SAN ANTONIO, TEXAS 78232
PH:(210) 308-5884 FAX:(210) 308-5886
Firm No. F-32

DRN. TAS	STATE	COUNTY	SHEET NO.
CHK. DWG. RPH	TEXAS	BEXAR	2 OF 4



Runway and Taxiway Improvements
San Antonio International Airport
Bexar County, San Antonio, Texas

BORING LOCATION PLAN

Figure 2

ARIAS & ASSOCIATES
Geotechnical Environmental Testing
142 CHULA VISTA
SAN ANTONIO, TEXAS 78232
PH:(210) 308-5884 FAX:(210) 308-5886
Firm No. F-32

STATE	COUNTY	SHEET NO.
TEXAS	BEXAR	3 OF 4

Table 3: Existing Pavement Thickness

General Area Description	Boring No.	Approximate Concrete Thickness, inches	Sub-Base Description
Twy G	G1 and G2	17.5 to 18	20" to 24" CTB
	G3 thru G9	16.5 to 18	10" to 19" CTB
Twy J	J1 and J2	17	8.5" to 9" CTB
Twy N	N1 thru N 4	16 to 19	11" to 17" CTB
	N5 thru N8	16 to 17	2.5" to 3" HMA
Rwy 12R	RW 1 thru RW 3	15 to 16.5	3" to 3.5" HMA
	RW 4 thru RW 9	15 to 17.5	9" to 12" CTB
Twy E	F1, F2, E7	16 to 17	2" to 3.5" of HMA
	E8	16	10.5" CTB
Twy R	R1 thru R6	17 to 18	Subbase layer not observed

Six of the recovered concrete cores selected by Kimley-Horn were packaged and sent to the University of Toronto to provide specialized testing to review the concrete for Alkali-Silica Reactivity (ASR). We understand that the results of ASR testing will be submitted directly to Kimley-Horn as a separate report.

Site Stratigraphy and Engineering Properties

The soil conditions encountered in the soil borings varied across the site. The natural soils encountered in the borings generally consisted of highly plastic (CH) clays near the surface and transitioned into low plasticity (CL) clays overlying clayey sands (SC) and clayey gravels (GC). A very hard partially cemented marlstone was encountered below about 8 to 20 feet at a few of the boring locations. Variable types of fill material consisting of clays, sand, and gravel were encountered in 13 of the 58 borings provided as part of this study. The thickness of the observed soil layers varied with location. The generalized subsurface stratigraphy and the engineering properties of each soil stratum encountered at this site are summarized in the table below.

Boring Log No. G1

Project: **Runway and Taxiway Improvements (2012)**
at San Antonio International Airport
San Antonio, Texas

Sampling Date: 3/10/13

Location: See Boring Location Plan

Backfill: Backfill and patched

Soil Description	Depth (ft)	SN	WC	PL	LL	PI	N	-200
18" Concrete		CC	7					
24" Cement Treated Base	2							
FAT CLAY (CH), stiff, dark brown, with sand	4	SS	30	28	84	56	12	77
CLAYEY GRAVEL (GC), medium dense, tan	6	SS	29				28	
-very dense below 8'	8	SS		20	67	47	50/6"	
Borehole terminated at 9.5 feet								

Groundwater Data:
First encountered during drilling: 3.5-ft depth
After : 8.4-ft depth

Field Drilling Data:
Logged By: R. Arizola
Driller: Eagle Drilling, Inc.
Equipment: Truck-mounted drill rig

Single flight auger: 0 - 9.5 ft

Nomenclature Used on Boring Log

Concrete Core (CC)
Split Spoon (SS)
Water encountered during drilling
Delayed water reading

WC = Water Content (%)
PL = Plastic Limit
LL = Liquid Limit
PI = Plasticity Index
N = SPT Blow Count
-200 = % Passing #200 Sieve

2012-955.GPJ 5/9/13 (BORING LOG SA12-02.ARIASSA12-01.GDT.LIBRARY2012-02.GLB)

Arias & Associates, Inc.

Job No.: 2012-955

Boring Log No. G4

Project: **Runway and Taxiway Improvements (2012)**
at San Antonio International Airport
San Antonio, Texas

Sampling Date: 3/13/13

Location: See Boring Location Plan

Backfill: Backfill and patched

Soil Description	Depth (ft)	SN	WC	PL	LL	PI	N
18" Concrete		CC					
11" Cement Treated Base	2						
CLAYEY GRAVEL (GC), medium dense to dense, light tan, (possibly fill)	4	SS	6				43
	6	SS	7	15	30	15	19
FAT CLAY (CH), very stiff, dark brown and tan, with gravel	8	SS	30				22
-hard below 8'	10	SS	15	22	53	31	52
Borehole terminated at 10 feet							

Groundwater Data:
During drilling: Not encountered

Field Drilling Data:
Logged By: L. Perez
Driller: Accu Drilling
Equipment: Truck-mounted drill rig

Single flight auger: 0 - 10 ft

Nomenclature Used on Boring Log

Concrete Core (CC) Split Spoon (SS)

WC = Water Content (%)
PL = Plastic Limit
LL = Liquid Limit
PI = Plasticity Index
N = SPT Blow Count

2012-955.GPJ 5/9/13 (BORING LOG SA12-02.ARIASSA12-01.GDT.LIBRARY2012-02.GLB)

Arias & Associates, Inc.

Job No.: 2012-955

Boring Log No. G5

Project: **Runway and Taxiway Improvements (2012) at San Antonio International Airport San Antonio, Texas**

Sampling Date: 3/13/13

Location: See Boring Location Plan

Backfill: Backfill and patched

Soil Description	Depth (ft)	SN	WC	PL	LL	PI	PP	N	DD	Uc
16.5" Concrete										
19" Cement Treated Base	2	CC								
FAT CLAY (CH), stiff, dark brown	4	SS	32					11		
		T	31				3.0		87	1.75
-with gravel below 6'	6									
LEAN CLAY (CL), very stiff, tan, with calcarous deposits		T	31	29	74	45	4.0			
	8									
		T	21				4.5+		110	4.41
	10									
Borehole terminated at 10 feet										

Groundwater Data:
During drilling: Not encountered

Field Drilling Data:
Logged By: L. Perez
Driller: Accu Drilling
Equipment: Truck-mounted drill rig

Single flight auger: 0 - 10 ft

Nomenclature Used on Boring Log

Concrete Core (CC) | Split Spoon (SS) | Thin-walled tube (T)

WC = Water Content (%)
PL = Plastic Limit
LL = Liquid Limit
PI = Plasticity Index
PP = Pocket Penetrometer (tsf)
N = SPT Blow Count
DD = Dry Density (pcf)
Uc = Compressive Strength (tsf)

Arias & Associates, Inc.

Job No.: 2012-955

2012-955.GPJ 5/9/13 (BORING LOG SA12-02.ARIASSA12-01.GDT.LIBRARY2012-02.GLB)

Boring Log No. J1

Project: **Runway and Taxiway Improvements (2012) at San Antonio International Airport San Antonio, Texas**

Sampling Date: 3/13/13

Location: See Boring Location Plan

Backfill: Backfill and patched

Soil Description	Depth (ft)	SN	WC	PL	LL	PI	N	-200
17" Concrete		CC						
9" Cement Treated Base	2							
10" Crushed Limestone Aggregate Base		SS	6				**50/6"	
FILL: FAT CLAY (CH), stiff, dark brown, sandy	4							
		SS	27	23	68	45	11	60
FAT CLAY (CH), very stiff, tan, with calcareous deposits	6							
		SS	23				16	
	8							
		SS	23	20	58	38	23	80
	10							
Borehole terminated at 10 feet								

Groundwater Data:
During drilling: Not encountered

Field Drilling Data:
Logged By: R. Arizola
Driller: Eagle Drilling, Inc.
Equipment: Truck-mounted drill rig

Single flight auger: 0 - 10 ft

Nomenclature Used on Boring Log

Concrete Core (CC) Split Spoon (SS)

WC = Water Content (%)
PL = Plastic Limit
LL = Liquid Limit
PI = Plasticity Index
N = SPT Blow Count

** = Blow Counts During Seating Penetration
-200 = % Passing #200 Sieve

2012-955.GPJ 5/9/13 (BORING LOG SA12-02.ARIASSA12-01.GDT.LIBRARY2012-02.GLB)

Arias & Associates, Inc.

Job No.: 2012-955

Boring Log No. J2

Project: **Runway and Taxiway Improvements (2012) at San Antonio International Airport San Antonio, Texas**

Sampling Date: 3/13/13

Location: See Boring Location Plan

Backfill: Backfill and patched

Soil Description	Depth (ft)	SN	WC	PL	LL	PI	PP	N	-200	DD	Uc
17" Concrete		CC									
8.5" Cement Treated Base	2		11								
10" Crushed Limestone Aggregate Base											
FAT CLAY (CH), stiff, dark brown	4	SS	31					11			
		T	36				2.8			85	1.77
-tan and brown, with gravel, below 6'	6										
CLAYEY GRAVEL (GC), loose, tan and brown	8	T	19	23	69	46	3.3		60		
LEAN CLAY (CL), very stiff, light tan, with calcareous deposits	10	T	22				4.3				
Borehole terminated at 10 feet											

Groundwater Data:
During drilling: Not encountered

Field Drilling Data:
Logged By: L. Perez
Driller: Accu Drilling
Equipment: Truck-mounted drill rig

Single flight auger: 0 - 10 ft

Nomenclature Used on Boring Log

Concrete Core (CC) | Split Spoon (SS) | Thin-walled tube (T)

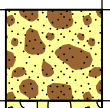
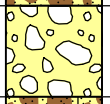
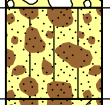
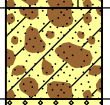
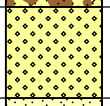
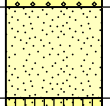
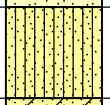
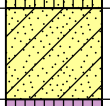
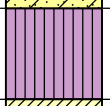
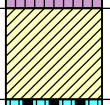
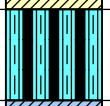
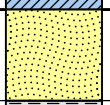
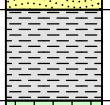
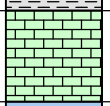
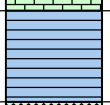
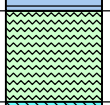
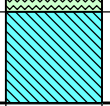
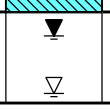
WC = Water Content (%)
PL = Plastic Limit
LL = Liquid Limit
PI = Plasticity Index
PP = Pocket Penetrometer (tsf)
N = SPT Blow Count
-200 = % Passing #200 Sieve
DD = Dry Density (pcf)
Uc = Compressive Strength (tsf)

Arias & Associates, Inc.

Job No.: 2012-955

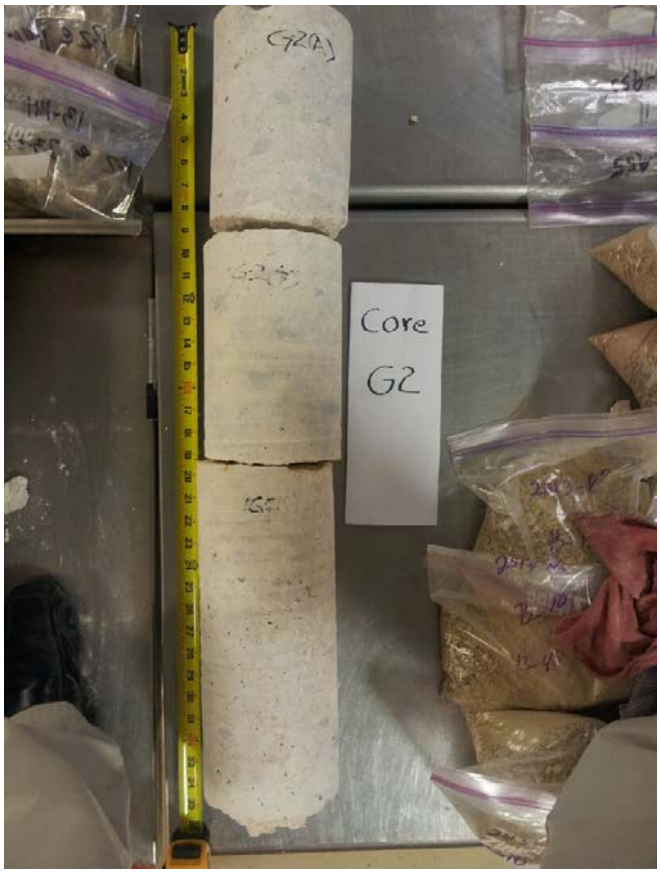
2012-955.GPJ 5/9/13 (BORING LOG SA12-02.ARIASSA12-01.GDT.LIBRARY2012-02.GLB)

KEY TO CLASSIFICATION SYMBOLS USED ON BORING LOGS

MAJOR DIVISIONS			GROUP SYMBOLS		DESCRIPTIONS
COARSE-GRAINED SOILS More Than Half of Material LARGER Than No. 200 Sieve size	GRAVELS More Than Half of Coarse Fraction is LARGER Than No. 4 Sieve Size	Clean Gravels (Little or no Fines)	GW		Well-Graded Gravels, Gravel-Sand Mixtures, Little or no Fines
			GP		Poorly-Graded Gravels, Gravel-Sand Mixtures, Little or no Fines
		Gravels With Fines (Appreciable Amount of Fines)	GM		Silty Gravels, Gravel-Sand-Silt Mixtures
			GC		Clayey Gravels, Gravel-Sand-Clay Mixtures
	SANDS More Than Half of Coarse Fraction is SMALLER Than No. 4 Sieve Size	Clean Sands (Little or no Fines)	SW		Well-Graded Sands, Gravelly Sands, Little or no Fines
			SP		Poorly-Graded Sands, Gravelly Sands, Little or no Fines
		Sands With Fines (Appreciable Amount of Fines)	SM		Silty Sands, Sand-Silt Mixtures
			SC		Clayey Sands, Sand-Clay Mixtures
FINE-GRAINED SOILS More Than Half of Material is SMALLER Than No. 200 Sieve Size	SILTS & CLAYS	Liquid Limit Less Than 50	ML		Inorganic Silts & Very Fine Sands, Rock Flour, Silty or Clayey Fine Sands or Clayey Silts with Slight Plasticity
			CL		Inorganic Clays of Low to Medium Plasticity, Gravelly Clays, Sandy Clays, Silty Clays, Lean Clays
	SILTS & CLAYS	Liquid Limit Greater Than 50	MH		Inorganic Silts, Micaceous or Diatomaceous Fine Sand or Silty Soils, Elastic Silts
			CH		Inorganic Clays of High Plasticity, Fat Clays
FORMATIONAL MATERIALS	SANDSTONE				Massive Sandstones, Sandstones with Gravel Clasts
	MARLSTONE				Indurated Argillaceous Limestones
	LIMESTONE				Massive or Weakly Bedded Limestones
	CLAYSTONE				Mudstone or Massive Claystones
	CHALK				Massive or Poorly Bedded Chalk Deposits
	MARINE CLAYS				Cretaceous Clay Deposits
	GROUNDWATER				Indicates Final Observed Groundwater Level Indicates Initial Observed Groundwater Location

Arias & Associates, Inc.

G1



G2

ARIAS & ASSOCIATES, INC.
Geotechnical • Environmental • Testing
TBPE Registration No. F-32
142 Chula Vista
San Antonio, Texas 78232
Office: (210) 308-5884 Fax: (210) 308-5886

CORE PHOTOS

Runway and Taxiway Improvements (2012)
San Antonio International Airport
San Antonio, Texas

Date: April 28, 2013	Job No.: 2012-955
Drawn By: TAS	Checked By: AS
Approved By: RPG	Scale: N.T.S.

Appendix E

G3

G4

ARIAS & ASSOCIATES, INC.
Geotechnical • Environmental • Testing
TBPE Registration No. F-32
142 Chula Vista
San Antonio, Texas 78232
Office: (210) 308-5884 Fax: (210) 308-5886

CORE PHOTOS

Runway and Taxiway Improvements (2012)
San Antonio International Airport
San Antonio, Texas

Date: April 28, 2013	Job No.: 2012-955
Drawn By: TAS	Checked By: AS
Approved By: RPG	Scale: N.T.S.

Appendix E

G5

G6

ARIAS & ASSOCIATES, INC.
Geotechnical • Environmental • Testing
TBPE Registration No. F-32
142 Chula Vista
San Antonio, Texas 78232
Office: (210) 308-5884 Fax: (210) 308-5886

CORE PHOTOS

Runway and Taxiway Improvements (2012)
San Antonio International Airport
San Antonio, Texas

Date: April 28, 2013	Job No.: 2012-955
Drawn By: TAS	Checked By: AS
Approved By: RPG	Scale: N.T.S.

Appendix E

G9

J1

ARIAS & ASSOCIATES, INC.
Geotechnical • Environmental • Testing
TBPE Registration No. F-32
142 Chula Vista
San Antonio, Texas 78232
Office: (210) 308-5884 Fax: (210) 308-5886

CORE PHOTOS

Runway and Taxiway Improvements (2012)
San Antonio International Airport
San Antonio, Texas

Date: April 28, 2013	Job No.: 2012-955
Drawn By: TAS	Checked By: AS
Approved By: RPG	Scale: N.T.S.

Appendix E

J2

P1

ARIAS & ASSOCIATES, INC.
Geotechnical • Environmental • Testing
TBPE Registration No. F-32
142 Chula Vista
San Antonio, Texas 78232
Office: (210) 308-5884 Fax: (210) 308-5886

CORE PHOTOS

Runway and Taxiway Improvements (2012)
San Antonio International Airport
San Antonio, Texas

Date: April 28, 2013	Job No.: 2012-955
Drawn By: TAS	Checked By: AS
Approved By: RPG	Scale: N.T.S.

Appendix E