C•F•Z Group, LLC
Coltrane•Fernandez•Zavala
Landscape Architects
7410 John Smith, #208
San Antonio, Texas 78229
210-366-1911

ADDENDUM NO. 07

PROJECT NAME: McAllister Park
TCI PROJECT NO.: 40-00375
DATE: March 11, 2015

To: All Prime Contract Bidders and all others to whom drawings and specifications have been issued.

This Addendum forms a part of the Contract Documents. This Addendum modifies and supplements the Contract Documents as follows for the above mentioned project. All other provisions of the Documents remain unchanged.

GENERAL CHANGES

Item No.1: Clarification on Unit Pricing
See updated 025 City of San Antonio Unit Pricing form

Item No. 2: Project budget
Due to the addition of Turkey Roost and Optimist trails, the project construction budget has been increased to $950,000.

Item No. 3: Deadline for questions
The deadline for questions was **Friday, March 6** at **4 pm.** CFZ Group is no longer taking questions pertaining to this project.

Item No. 4: See attached RFI #004 for questions that were submitted prior to the deadline.

CHANGES TO SPECIFICATIONS

N/A

CHANGES TO DRAWINGS

Item No. 5: Turkey Roost and Optimist Trails
Add sheets C-2.0, C-3.0, L2.19, L2.20, L2.21, L2.22 and L5.7, issued March 11, 2015, to the drawing set. Sheets C-2.0 and C-3.0 **do not** replace previously issued sheets C-2.0 and C-3.0.

Item No. 6: Civil sheet C-1.0
Add sheet C-1.0, issued March 11, 2015, to the drawing set. Sheet C-1.0 **does not** replace previously issued sheet C-1.0.

END OF ADDENDUM No. 07 **3/11/15**

City of San Antonio

TRANSPORTATION AND CAPITAL IMPROVEMENTS

RECEIPT OF ADDENDUM NUMBER(S) **07** IS HEREBY ACKNOWLEDGED FOR PLANS AND

SPECIFICATIONS FOR CONSTRUCTION OF **MCALLISTER PARK RENOVATIONS 40-00375**

FOR WHICH BIDS WILL BE OPENED ON **MARCH 17, 2015**

THIS ACKNOWLEDGEMENT MUST BE SIGNED AND RETURNED WITH THE BID PACKAGE.

Company Name: _____

Address: _____

City/State/Zip Code: _____

Date: _____

_____
Signature

_____
Print Name/Title

ADDENDUM #7

Attachment 1

CITY OF SAN ANTONIO

025

UNIT PRICING FORM

McAllister Park Improvements

PROJECT NO: 40-00375

This project is NOT a Unit Bid Price basis award.
This Form is NOT used to tabulate the total bid/proposal amount.
The unit prices shown herein may be used by the City of San Antonio to change the scope intended for this project and/or the final contract amount by "additions-to" or "deletions-form" the scope of work, at the sole discretion of the City.
The City will only accept bid amount annotations to the hundredths. Any amount annotation extended beyond three decimal points will be truncated to two decimal points in the City's favor.
Any blank unit prices shall be tabulated and evaluated as and at "no cost" to the City.

ITEM NO.	ITEM DESCRIPTION	UNIT OF MEASURE	UNIT BID PRICE AMOUNT
1	GC - MOBILIZATION & PREPARING R.O.W.	LS	$
2	GC - BONDS	LS	$
3	GC - CONSTRUCTION CONTINGENCY	LS	$
4	GC - INSURANCE	LS	$
5	CONCRETE REMOVAL	S.F.	$
6	ASPHALT REMOVAL - TRAIL	S.F.	$
7	ASPHALT REMOVAL - PARKING LOT	S.F.	$
8	CONCRETE CURB	L.F.	$
9	CONCRETE SIDEWALKS	S.Y.	$
10	WOOD BOLLARD	EA.	$
11	CONSTRUCTION SIGNAGE	EA.	$
12	TRAIL SIGNAGE	EA.	$
13	TOPSOIL	C.Y.	$
14	2”-2 ½” CALIPER LIVE OAK	EA.	$
15	SEEDING	S.F.	$
16	PAVILION	EA.	$
17	PICNIC SHELTER	EA.	$
18	RESTROOM STRUCTURE	EA.	$
19	TRASH RECEPTACLE	EA.	$
20	BARBECUE GRILL	EA.	$
21	CONCRETE TABLE/BENCHES	EA.	$
22	CONCRETE PAD (RESTROOM)	EA.	$
23	POLE LIGHT TYPE P1	EA.	$
24	POLE LIGHT TYPE P2	EA.	$
25	IN-GROUND PULL BOX	EA.	$
26	UNDERGROUND ELECTRICAL CONDUIT & WIRE, TYPE 100N	L.F.	$
27	UNDERGROUND ELECTRICAL CONDUIT & WIRE, CONDUIT #C1	L.F.	$
28	UNDERGROUND ELECTRICAL CONDUIT & WIRE, CONDUIT #C3	L.F.	$
29	MOST DEPENDABLE FOUNTAIN COMPLETE WITH ½” COLD WATER LINE	L.F.	$
30	¾” COLD WATER LINE, 24” BELOW GRADE	L.F.	$
31	1” COLD WATER LINE, 24” BELOW GRADE	L.F.	$

GENERAL NOTES:

1. ALL UNIT BID PRICES FOR PAVEMENTS AND WALKS TO INCLUDE COST OF SUB BASE.

CITY OF SAN ANTONIO

025

UNIT PRICING FORM

McAllister Park Improvements

PROJECT NO: 40-00375

32	AUTO-FILL ASSEMBLY FOR EXISTING WILDLIFE DRINKING TROUGH	EA.	$
33	WILDLIFE DRINKING TROUGH, COMPLETE	EA.	$
34	TRIAX TX5 GEOGRID BASE REINFORCING	S.Y.	$
35	STRIPING	L.F.	$
36	WHEEL STOP	EA.	$
37	ADA/HANDICAP PARKING SIGN	EA.	$
38	12” GABION MATTRESS	S.Y.	$
39	FLEXIBLE BASE	S.Y.	$
40	HOT MIX ASPHALT CONCRETE PAVEMENT - TRAIL	S.Y.	$
41	HOT MIX ASPHALT CONCRETE PAVEMENT - PARKING LOT	S.Y.	$
42	PRIME COAT	GAL.	$
43	TACK COAT	GAL.	$
44	REMOVAL OF EXISTING SOIL (PAVILION)	C.Y.	$
45	REMOVAL OF EXISTING SOIL (PICNIC SHELTER)	C.Y.	$
46	REINFORCED CONCRETE SLAB (PAVILION)	C.Y.	$
47	REINFORCED CONCRETE SLAB (PICNIC SHELTER)	C.Y.	$
48	COMPACTED SELECT FILL MATERIAL (PAVILION)	C.Y.	$
49	COMPACTED SELECT FILL MATERIAL (PICNIC SHELTER)	C.Y.	$
50	MOISTURE BARRIER (PAVILION)	C.Y.	$
51	STRATUM I SOILS (PAVILION)	C.Y.	$
52	STRATUM I SOILS (PICNIC SHELTER)	C.Y.	$
53	CONCRETE FLAT WORK	C.Y.	$
54	PORTABLE RESTROOM FOOTINGS	EA.	$
55	TRAIL SEGMENTS REPAIR, ASPHALT	S.F.	$

_____ hereby certifies that the unit prices shown herein this form are the unit prices intended for this project work and used to determine this bid proposal. The unit prices shown are 'complete-in-place' and include, but are not limited to; all necessary superintendence, labor, machinery, equipment, tools, materials, mobilization, insurance, overhead and any other miscellaneous items and cost required to complete the unit bid item.

It is further understood that the unit prices shown herein may be used by the City of San Antonio to change the scope intended for this project and/or the final contract amount by "additions-to" or "deletions-form" the scope of work, at the sole discretion of the City of San Antonio.

_____ agrees to the terms, conditions, and requirements of the bidder's bid proposal.

Signed: _____ Date: _____

Title

GENERAL NOTES:

1. ALL UNIT BID PRICES FOR PAVEMENTS AND WALKS TO INCLUDE COST OF SUB BASE.

ADDENDUM #7

Attachment 2

1. Civil Drawing Sheet C-9.0 Stated Geo Report Dated November 3rd Job # 2014-536 - 2014 We have no Such report. Add # 4 Has Two Reports Dated November 17th & October 31st One Reference the Trail Borings, the other report reference Pavilion Structure we see no borings at this location. are we Missing a report we need more information on Parking area & Slabs.
   Response: See attached Geotechnical Report 2014-536_Final Report, dated November 3, 1014.

2. Civil Drawing C-9.0 Shows Lime treated Sub Grade + Tenssar Traix Tx5 Geo Grid Geo report say do one or the Other , Which is it?
   Response: Tensar Triax Tx Geo grid should be used for new asphalt trails. Per geotechnical report Table 4, Note 6, lime-treated subgrade is not required to be installed with geo grid.

3. Spec Book Sheet 014000-2 1.6A Owner Will Employ Independent Testing? Add # 5 Item # 10 Contractor Responsible for Testing?
   Response: The contractor is responsible for testing.

4. At Parking Areas, Are all Bollards Post to Be Set In concrete 5'6"X 30"?
   Response: See revised detail 7/L5.1.

5. After removing and disposing of the existing asphalt and base comprising the existing trail it appears we will have to cut out an additional 4 - 5 inches of soil to accommodate the replacement trail configuration. If this results in excess soil will we be allowed to dispose of it on site?
   Response: Excess soil may be disposed of on-site. A suitable location will be determined.

6. Structural Plan sheet S 1.1 Section V paragraph A states that we are to remove surficial Stratum I clayey soils down to competent Marlstone. There are no borings shown in the Geotechnical report for this location and Boring B1 which appears to be the closest shows no Marlstone. Please specify how many feet of existing soils are required to be removed and replaced with structural fill.
   Response: See attached Geotechnical Report 2014-536_Final Report, dated November 3, 1014.

7. Sheet C – 5.1
   Proposed Playground Sidewalk Section as indicated on plan. Is this to be constructed and what does it connect with?
   Response: Disregard the concrete sidewalks associated with proposed playground on sheet C-5.1. Landscape sheet L2.15 shows correct sidewalks at this location.

8. Proposed Equipment Building Pad as indicated on plan. I did not find a structural foundation plan for this proposed structure. What type of building structure is to be constructed? Please clarify.
   Response: This is the slab with restroom & drinking fountain. Refer to sheet L2.15.

RFI #004

Attachment 1

Geotechnical Engineering Study

McAllister Park Improvements
San Antonio, Texas

Arias Job No. 2014-536

ARIAS
GEOPROFESSIONALS

Prepared For

City of San Antonio

November 3, 2014

ARIAS GEOPROFESSIONALS

142 Chula Vista, San Antonio, Texas 78232 • Phone: (210) 308-5884 • Fax: (210) 308-5886

November 3, 2014
Arias Job No. 2014-536 via Email: carlos.mendez@SanAntonio.Gov

Mr. Carlos Mendez, AIA
City of San Antonio (CoSA)
506 Dolorosa, Suite 103
San Antonio, Texas 78283

RE: Geotechnical Engineering Study
McAllister Park Improvements
San Antonio, Texas

Dear Mr. Mendez:

This report presents the results of a Geotechnical Engineering Study for the proposed addition of a new shade structure, a portable restroom and several parking areas to be located within McAllister Park at 13102 Jones Maltsberger Road in San Antonio, Texas. This study was performed as described in Arias Proposal No. 2014-536 (revised September 9, 2014). Our services were provided as part of the current on-call contract for Geotechnical Engineering and Construction Materials Testing Services between the CoSA and Arias and Associates, Inc. (Arias) and were authorized on October 3, 2014 by e-mail authorization from Mr. Arthur M. Rossman at the Office of the City Architect.

The purpose of this geotechnical engineering study was to establish pavement and foundation engineering properties of the subsurface soils and groundwater conditions present at the site. The scope of the study is to provide geotechnical engineering criteria for use by design engineers in preparing the foundation and pavement designs. Our findings and recommendations should be incorporated into the design and construction documents for the proposed development.

The long-term success of the project will be affected by the quality of materials used for construction and the adherence of the construction activity to the project plans and specifications. The quality of construction can be evaluated by implementing Quality Assurance (QA) testing. As the Geotechnical Engineer of Record (GER), we recommend that the earthwork and foundation construction be tested and observed by Arias in accordance with the report recommendations. A summary of our qualifications to provide QA testing is discussed in the “Quality Assurance Testing” section of this report. Furthermore, a message to the Owner with regard to QA testing is provided in the ASFE publication included in Appendix E.

ARIAS
GEOPROFESSIONALS
142 Chula Vista, San Antonio, Texas 78232 • Phone: (210) 308-5884 • Fax: (210) 308-5886

Thank you for the opportunity to be of service to you.

Sincerely,

Arias & Associates, Inc.
TBPE Registration No: F-32

STATE OF TEXAS
WAYNE A. ALLICK, JR.
114901
LICENSED
PROFESSIONAL ENGINEER

11-3-14

Wayne A. Allick, Jr., P.E.
Geotechnical Engineer

Rene P. Gonzales, P.E.
Senior Geotechnical Engineer

REPORT FORMAT INFORMATION

To improve clarity in the intent of our geotechnical recommendations for this project, the report is organized into two separate, but equally important sections.

Section I – *Synopsis* is a summary of our geotechnical recommendations specific to this project.

Section II - The *Main Report* contains more detailed information including foundation and pavement design parameters and site work recommendations.

A study of both of the above referenced sections is recommended for the Project Team Members. Arias cautions that Section I is a consolidated quick reference overview of the more detailed geotechnical recommendations contained in Section II and should not be utilized exclusively from the remainder of the report.

TABLE OF CONTENTS

Page

INTRODUCTION LETTER

REPORT FORMAT INFORMATION ……i
SECTION I: SYNOPSIS I-1
SECTION II: MAIN REPORT II-1

PROJECT AND SITE DESCRIPTION II-1

SOIL BORINGS AND LABORATORY TESTS II-1

Sulfate Test Results II-2

SUBSURFACE CONDITIONS II-2

Site Stratigraphy and Engineering Properties II-3

Groundwater II-3

Subsurface Variations II-4

MOISTURE VARIATIONS AND ESTIMATED MOVEMENT II-4

FOUNDATION DESIGN CONSIDERATIONS (PAVILION STRUCTURE) II-4

Recommended Foundation Types II-4

Stiffened Beam and Slab-on-Grade Foundation Recommendations (Option A) II-5

Stiffened Slab-on-Grade Foundation II-5

Footing Foundations Recommendations for use with Soil Supported Slab-on-Grade (Option B) II-7

Void Space (Spread Footing Option) II-8

Preliminary Flatwork Considerations (Options A and B) II-8

Design Measures to Reduce Changes in Soil Moisture II-8

IBC Site Classification and Seismic Design Coefficients II-9

PAVEMENT RECOMMENDATIONS II-10

Rigid Concrete Pavement Joints II-11

Performance Considerations II-11

Pavement Subgrade and Section Materials II-11

ADDITIONAL DESIGN CONSIDERATIONS II-13

TABLE OF CONTENTS

Page

Utilities II-13

Control and Construction Joints II-13

CONSTRUCTION CRITERIA II-14

Site Preparation II-14

Drainage II-14

Earthwork and Foundation Acceptance II-15

Trench Excavations II-15

GENERAL COMMENTS II-16

Geotechnical Design Review II-16

Subsurface Variations II-16

Quality Assurance Testing II-16

Standard of Care II-17

APPENDIX A: FIGURES AND SITE PHOTOGRAPHS A-1

APPENDIX B: BORING LOGS AND KEY TO CLASSIFICATION SYMBOLS B-1

APPENDIX C: LABORATORY AND FIELD TEST PROCEDURES C-1

APPENDIX D: ASFE INFORMATION – GEOTECHNICAL REPORT D-1

APPENDIX E: PROJECT QUALITY ASSURANCE E-1

Tables

Table 1: Project Description I-1

Table 2: Existing Conditions at Time of Geotechnical Study I-1

Table 3: Pavilion & Portable Restroom Support Pad Recommendations for 1-inch PVR I-2

Table 4: Recommended Pavement Sections I-3

Table 5: Preliminary Project Compaction, Moisture and Testing Requirements I-4

Table 6: Fill Requirements for Grade Increases I-5

Table 7: Approximate Field Boring Locations II-1

Table 8: Sulfate Test Results II-2

TABLE OF CONTENTS

Page

Table 9: Generalized Soil Conditions II-3

Table 10: BRAB and WRI Foundation Design Criteria II-5

Table 11: PTI Slab-on-Grade Soil Design Criteria (3rd Edition) II-6

Table 12: Allowable Bearing Pressure and Beam Penetration II-7

Table 13: Seismic Design Parameters II-10

Table 14: Pavement Design Assumptions II-10

Table 15: Pavement Subgrade and Section Materials II-12

Table 16: Site Work (Non Structural/General Fill) Requirements II-14

SECTION I: SYNOPSIS

This synopsis includes a brief description of the project, subsurface findings, preferred foundation type, generalized earthwork requirements for pad, and specific items of concern from a geotechnical standpoint for consideration during the design, construction, and maintenance phases of this project.

Table 1: Project Description

Project:	McAllister Park Improvements
Project Location:	13102 Jones Maltsberger Road San Antonio, Texas
Proposed Development:	• New pavilion structure • Portable restroom slab • New pavement areas
Preferred Foundation Type:	Stiffened slab-on-grade foundation
Improved Site Condition (Design PVR):	1 inch

Table 2: Existing Conditions at Time of Geotechnical Study

Ground Cover:	Native grass cover
Predominant Soil Types:	Predominately Marlstone overlain with Predominately FAT CLAY (CH), LEAN CLAY (CL), and Clayey Gravel with Sand (GC)
Plasticity Index (PI): Range	8 – 47
Groundwater Depth Measured:	No groundwater encountered during the site exploration
Estimated Existing Potential Vertical Rise (PVR):	Approximately 1½ - 3 inches (Estimated Range Over All Borings; Approximately 1½ inches at B-1)

Table 3: Pavilion & Portable Restroom Support Pad Recommendations for 1-inch PVR

Recommended Foundation Type:	Stiffened Beam and Slab-on-Grade or Spread Footings with Soil Supported Floor Slab
Site Improvement Method:	• Remove all of the surficial Stratum I soils down to competent Marlstone • Replace with onsite Milled Marlstone and/or Imported Select Fill meeting the criteria presented below.
Desired Improved Site Condition (PVR):	1 inch
Removal:	• Topsoil/vegetation • Stratum I – Surficial Clayey Soils
Proof roll:	Exposed Limestone or Marlstone Subgrade
Select Fill:	Onsite Milled MARLSTONE: • maximum of 25% passing #200 sieve • minimum of 15% retained on #4 sieve • maximum particle size of 3 inches • PI = 5 to 20 and/or Crushed Limestone Material: TxDOT Item 247, Type A, Grade 1 or 2
Working Surface Thickness:	12 inches
Working Surface Select Granular Fill:	Crushed Limestone Material: TxDOT Item 247, Type A, Grade 1 or 2

Notes:

1. **It should be noted that the recommendations contained herein for the proposed pavilion and restroom structures are based on Boring B-1, which denoted low plasticity marlstone at relatively shallow depths. However, some of the other borings in other areas of the project site encountered higher plasticity clayey marls and clays. Should these type materials be encountered in the pavilion, restroom or other structure areas, we should be contacted immediately in order to review and revise our recommendations.**
2. The pad improvements will be used with a slab-on-grade foundation system designed for a PVR of approximately 1-inch or less.
3. Following stripping operations, remove/undercut existing Stratum I soils from beneath the foundation area to expose the underlying marlstone bedrock. Removal should extend laterally to provide at least a 5-foot overbuild beyond the pavilion perimeter and to the width of any adjacent sidewalks wider than five (5) feet.
4. The exposed marlstone subgrade should be thoroughly proof rolled with at least a 20 ton roller or heavily loaded dump truck weighing at least 20 tons. A minimum of 30 passes should be performed with passes alternating in directions perpendicular to each other. Any area that yields under the roller loading should be undercut to the depth specified by the geotechnical engineer and replaced with compacted select fill as outlined in Table 5. If deleterious material, rubble, or debris is encountered, they should be removed to firmer materials and disposed of properly. The void should then be replaced with properly compacted select fill. It is important that the site preparation operations be observed and tested by one of our representatives to verify that these recommendations are followed.
5. Undercutting of the marlstone will require rock excavation techniques: milling, saw cutting, ripping, hoe-ramming, or other suitable means and methods determined by the Contractor. The resulting material can be used for select fill under the pavilion, flatwork or pavements provided it meets the requirements in the table above.
6. If the milled marlstone is broken down to a fine material similar to silt, it is expected to be sensitive to moisture changes and may tend to “pump” under compaction equipment. It may be necessary to allow time for some curing between lifts to allow the compacted material to stabilize.

7. The select fill should be placed in maximum 8-inch loose lifts and compacted as specified in SECTION I, Table 5 (Project Compaction, Moisture and Testing Requirements).

8. For construction equipment access, and to help provided a more “all-weather” working surface, we recommend that the pavilion pad be completed using at least 12 inches of granular select fill consisting of compacted crushed limestone base meeting requirements of 2004 TXDOT Item 247, Type A, Grade 1 or 2.

9. A horizontal barrier should extend at least 10 feet horizontally beyond the perimeter of the foundation. The barrier can consist of concrete or asphalt paving, concrete flatwork or at least 24” of compacted onsite or import clay (PI between 15 and 35) over 15-mil PVC/HDPE sheeting. The PVC/HDPE sheeting should be attached to the perimeter grade beam using mastic. All joints within the pavement, flatwork, and at pavement/flatwork interfaces should be sealed. Any landscaping located within 10 feet of the structure foundation should be placed in watertight above-grade planter boxes with drainage discharge on top of adjacent flatwork/paving. We recommend that the perimeter grade beam be constructed to a depth of at least 24 inches to aid in reducing the potential for moisture fluctuation beneath the pad. The final grade beam depth and recommended construction should be determined by the structural engineer. The slab vapor retarder plastic should be extended from beneath the slab down the inside face (pavilion pad side) of the grade beam trench.

Table 4: Recommended Pavement Sections

Layer	Material	Flexible Asphaltic Concrete		Rigid Concrete			
		Light Duty	Medium Duty	Light Duty		Medium Duty	
Surface	HMAC/PCC	2”	3”	5”	6”	6”	7”
Base	Flexible Base	8”	12”	--	--	--	--
Subgrade	Lime Treatment (See Note 6)	6”	6”	6”	--	6”	--
	Moisture Conditioned	--	--	--	6”	--	6”

Notes:

1. Pavements founded on top of clayey soils will be subject to PVR soil movements estimated and presented in this report (*i.e.,* about 1½ to 3 -inches). These potential soil movements are typically activated to some degree during the life of the pavement. Consequently, pavements can be expected to crack and require periodic maintenance. Periodic/preventative maintenance and repair should be planned for to reduce deterioration of the pavement structure while aiding to preserve the investment.

2. Light duty areas include parking and drive lanes that are subjected to passenger vehicle traffic only.

3. Medium duty areas include entrance aprons and drives into the site, single access route drive lanes to parking areas, and areas where passenger vehicular traffic is concentrated with occasional single-unit trucks.

4. Heavy duty areas (not shown in Table 4) include areas subjected to 18-wheel tractor trailers, frequent truck traffic, trash collection vehicles, dumpster pads including loading and unloading areas, and areas where truck turning and maneuvering may occur. **Eight (8)-inch thick concrete pavement is recommended for heavy duty areas.**

5. During the paving life, maintenance to seal surface cracks within concrete or asphalt paving and to reseal joints within concrete pavement should be undertaken to achieve the desired paving life. Perimeter drainage should be controlled to reduce the influx of surface water from areas surrounding the paving. Water penetration into base or subgrade materials, sometimes due to irrigation or surface water infiltration

leads to pre-mature paving degradation. Curbs should be used in conjunction with paving to reduce potential for infiltration of moisture into the base course. Curbs should extend the full depth of the base course and should extend at least 3 inches into the underlying clayey subgrade. The base layer should be tied into the area inlets to drain water that may collect in the base.

6. For flexible asphalt pavements only, Tensar TX-140 geogrid installed over a 6-inch moisture conditioned and compacted subgrade can be used in lieu of a lime-treated subgrade. Geogrid should be installed as per the manufacturer's guidelines. Furthermore, the geogrid supplier's technical representative should be present to instruct the workforce on proper geogrid installation.

7. Material specifications, construction considerations, and pavement section requirements are presented in the "Pavement Subgrade and Section Materials" included in Table 15.

8. The subgrade materials should be tested for soluble sulfate content before using the lime treatment as an option. The subgrade soil should have a soluble sulfate content of less than 500 PPM.

Table 5: Preliminary Project Compaction, Moisture and Testing Requirements

Description	Material	Percent Compaction	Optimum Moisture Content	Testing Requirement
		According to Standard Proctor ASTM D 698 (Except as noted)		
Pavilion Pad Area	Exposed Marlstone Bedrock Subgrade at base of excavation	Proof roll		Observation
	Select Fill: (Crushed Limestone Base or Onsite Millings Meeting Requirements outlined previously in Table 3)	≥ 98%	-2% to +3%	1 per 5,000 SF; min. 3 per lift
Pavement Areas	Exposed Marlstone Subgrade	Proof roll		Observation
	Scarified On-site Soil (Subgrade)	≥ 95%	0% to +4%	1 per 5,000 SF; min. 3 tests
	General Fill (Onsite Material)	≥ 95%	0% to +4%	1 per 5,000 SF; min. 3 per lift
	Base Material	≥ 95% **(ASTM D 1557)**	±3%	1 per 5,000 SF; min. 3 per lift
	Hot-mix asphaltic concrete	91% to 95% Theoretical Lab Density (TEX 207 F)	Not applicable	1 per 5,000 SF; min. 3 per lift
Non-Structural Areas (Outside Pavilion Pad and Pavement Areas)	General Fill (On-site Material)	≥ 95%	-2% to +3%	1 per 5,000 SF; min. 3 per lift

Table 6: Fill Requirements for Grade Increases

General fill type	Material free of roots, debris and other deleterious material with a maximum particle size of 3 inches; on-site clays having CBR $\geq$ 3 may be used. Imported fill materials used under pavements should have a CBR value of at least 3 and a soluble sulfate content of less than 500 PPM.
Minimum general fill thickness	As required to achieve grade
Maximum general fill loose lift thickness	8 inches
General fill compaction and moisture criteria	ASTM D 698 $\geq$ 95% compaction at 0 to +4 from optimum

SECTION II: MAIN REPORT

PROJECT AND SITE DESCRIPTION

The proposed project will consist of new pavement areas, a pavilion structure, and portable restroom support slab within McAllister Park at 13102 Maltsberger Road in San Antonio, Texas. Schematic plans provided to us indicate new pavement parking areas along Buckhorn Lane, the Lower Baseball Field, Upper Bee Tree Soccer Field, and at the Dog Park. A Site Vicinity Map is provided as Figure 1 in Appendix A.

We understand that preliminary plans are being considered to support the proposed structure on a stiffened slab-on-grade foundation. *We are assuming that the acceptable design PVR for the slab-on-grade foundation for a pad of this type is on the order of 1-inch. If a 1-inch PVR is not acceptable, consideration should be given to a foundation system consisting of a structurally suspended floor slab supported on deep drilled piers, and we should be contacted for additional recommendations. If any of the above information or assumptions are incorrect, we should be notified immediately in order to review the impact on our recommendations.*

SOIL BORINGS AND LABORATORY TESTS

As requested, six (6) soil borings were drilled and sampled to depths between about 8½ to 28½ feet at the approximate locations shown on the Boring Location Plan provided as Figure 2 in Appendix A. The boring depth was measured from below the existing ground surface elevation on October 13, 2014. The borings were sampled in accordance with ASTM D 1587 procedures for Split Spoon sampling techniques as described in Appendix C. A truck-mounted drill rig using continuous flight auger, and the sampling tool noted was used to secure the subsurface soil samples.

Table 7: Approximate Field Boring Locations

BORING ID:	Depth	Latitude	Longitude	Location
B-1	28.5	29.5528	98.4447	Near proposed pavilion at the Dog Park
B-2	10	29.5556	98.4441	Proposed parking area Southeast of the Dog Park
B-3	8.5	29.5532	98.4452	Within the Dog Park
B-4	8.5	29.7800	98.4455	Near proposed Play Area at the Dog Park
B-5	8.5	29.5583	98.4441	Parking area at Upper Bee Tree Soccer Field
B-6	10	29.5585	98.4496	Near Upper Baseball Field Parking Lot

Material classifications and borehole logging were conducted during the exploration by our engineering technician working under the supervision of our Geotechnical Engineer. Final classifications, as seen on the boring logs included in Appendix B, were determined in the laboratory based on laboratory and field test results and applicable ASTM procedures.

As a supplement to the field exploration, laboratory testing to determine water content, Atterberg Limits, and percent passing the US Standard No. 200 sieve was performed. The laboratory results are reported in the attached boring logs included in Appendix B. A key to the terms and symbols used on the logs is also included in Appendix B. The laboratory testing for this project was done in accordance with applicable ASTM procedures with the specifications and definitions for these tests listed in the Appendix C**.** Remaining soil samples recovered from this exploration will be routinely discarded following submittal of this report.

Sulfate Test Results

Laboratory testing was conducted on four (4) selected samples recovered from the borings to determine the soluble sulfate content. Testing was performed in general accordance with TxDOT test method Tex-145-E "Determining Sulfate Content in Soils." The results indicate that the soluble sulfate contents of the samples tested range from about 120 to 300 parts per million (ppm). The results are indicative of relatively low soluble sulfate content at this site. Therefore, lime or cement stabilization of the onsite soils can be considered for this site. A summary of the soluble sulfate test results is provided in the table below.

Table 8: Sulfate Test Results

Boring No.	Approx. Sample Depth (ft.)	Material Description	Sulfate Result (ppm)
B-1	0 - 2	Clayey Gravel with Sand (GC)	140
B-2	0 - 2	Sandy FAT CLAY (CH)	140
B-4	0 – 2	FAT CLAY (CH)	300
B-5	0 – 2	LEAN CLAY (CL)	120

Note: Approximate sample depth is referenced from the existing ground surface at the time of the geotechnical field exploration performed on October 13, 2014.

SUBSURFACE CONDITIONS

Generalized stratigraphy and groundwater conditions encountered are discussed in the following sections. The subsurface and groundwater conditions are based on conditions encountered at the boring locations to the depths explored.

Site Stratigraphy and Engineering Properties

The generalized subsurface stratigraphy encountered at this site is summarized in the table below. The presence and thickness of the various subsurface materials can be expected to vary away from the exploration location. The descriptions generally conform to the Unified Soils Classification System.

Table 9: Generalized Soil Conditions

Stratum	Depth (ft.)	Material Type	PI range	No. 200 range	N range
Pavement	0 -1	Asphalt/crushed stone base material (**Boring B-5 & B-6 Only**)	--	--	--
I	0 - 4.5	FAT CLAY with Sand (CH);stiff to hard, dark brown **(Not Enountered at B-1 & B-6)**	41 - 47	50 - 51	14 - 38
II	0.5 – 7.5 to 2 – 10	CLAYEY GRAVEL with Sand (GC); dark brown, medium dense to dense **(Boring B-1 & B-6 Only)** LEAN CLAY (CL); tan, hard to very hard with calcareous deposits and gravel **(Boring B-5 & B-6 Only)**	18 - 42	17 - 87	23 – 44
III	2 – 6 to 29	**Clayey Marl to Marlstone**, tan, tan and white, moderately weathered to hard **(Not Encountered at B-6)**	8 - 29	--	50/5”–**10/0”

Where:
Depth - Depth from existing ground surface at the time of geotechnical study, feet
PI - Plasticity Index, %
No. 200 - Percent passing #200 sieve, %
N - Standard Penetration Test (SPT) N-value, blows per foot
* - Only one (1) test
** - Blow counts during seating penetration

Groundwater

A dry soil sampling method was used to obtain the soil samples at the project site. No groundwater was observed while performing the borings. The soil sampling activities were performed on October 13, 2014. The open boreholes were backfilled using soil cuttings generated from the drilling process.

Groundwater levels will often change significantly over time and should be verified immediately prior to construction. Water levels in open boreholes may require several hours to several days to stabilize depending on the permeability of the soils. Groundwater levels at this site may differ during construction because fluctuations in groundwater levels can result

from seasonal conditions, rainfall, drought, or temperature effects. Pockets or seams of gravels, sands, silts or open fractures and joints can store and transmit "perched" groundwater flow or seepage.

Subsurface Variations

Soil and groundwater conditions may vary between the sample boring locations. Transition boundaries or contacts, noted on the boring logs to separate material types, are approximate. Actual contacts may be gradual and vary at different locations. The contractor should verify that similar conditions exist throughout the proposed area of excavation. If different subsurface conditions or highly variable subsurface conditions are encountered during construction, we should be contacted to evaluate the significance of the changed conditions relative to our recommendations.

MOISTURE VARIATIONS AND ESTIMATED MOVEMENT

Structural damage can be caused by volume changes in clay soils. Clays can shrink when they lose water and swell (grow in volume) when they gain water. The potential for expansive clays to shrink and swell is typically related to the Plasticity Index (PI). Clays with a higher PI generally have a greater potential for soil volume changes due to moisture content variations. The soils found at this site are capable of swelling and shrinking in volume dependent on potentially changing soil water content conditions during or after construction. The term swelling soils implies not only to the tendency to increase in volume when water is available, but also to decrease in volume or shrink if water is removed.

The measured PIs of the near-surface soil samples obtained at this site suggest that the soils have a high potential for shrinking and swelling due to fluctuations in soil moisture content. Several methods exist to evaluate swell potential of expansive clay soils. One method for estimating potential heave is to utilize TXDOT method (Tex 124-E). Using the TXDOT method, we estimate that the existing PVR is approximately **1½ – 3 *inches*** at this site considering the existing dry soil moisture conditions at the time of the sampling activities. It should be noted that this estimate is based on the existing moisture conditions present at the time of our study.

It has been our experience that the PVR method can sometimes underestimate the potential shrink/swell movements. Fluctuations in the soil moisture content generated from climatic conditions (*i.e.*, droughts or floods) or as a result of development (*e.g.*, irrigation of landscaping in the immediate vicinity of the pad, poor surface drainage, leaking plumbing or water lines) may result in greater shrink/swell movements than calculated.

FOUNDATION DESIGN CONSIDERATIONS

Recommended Foundation Types

Several foundation options are anticipated for consideration to support the proposed pavilion and portable restroom structure in the vicinity of Boring B-1 based on the subsurface

conditions encountered at the location of Boring B-1. We have provided recommendations in this report for:

- Option A: a stiffened beam and slab-on-grade;
- Option B: a grade-supported slab with isolated spread footings.

It should be noted that the recommendations contained herein for the proposed pavilion and restroom structures are based on Boring B-1, which denoted low plasticity marlstone at relatively shallow depths. However, some of the other borings in other areas of the project site encountered higher plasticity clayey marls and clays. Should these type materials be encountered in the pavilion, restroom or other structure areas, we should be contacted immediately in order to review and revise our recommendations.

Stiffened Beam and Slab-on-Grade Foundation Recommendations (Option A)

Stiffened Slab-on-Grade Foundation

A slab-on-grade foundation is generally used to support relatively light structures upon expansive soils where soil conditions are relatively uniform, and where uplift and settlement can be tolerated. The intent of a stiffened beam and slab-on-grade foundation is to allow the structure and foundation to move up and down with soil movements while providing sufficient stiffness to limit differential movements within the superstructure to an acceptable magnitude.

A slab-on-grade foundation may be utilized for the proposed pavilion and portable restroom structure provided it is designed specifically for these conditions and the pads and/or site is improved as outlined in the previous report section.

There are various design methods for use by the structural engineer to select the grade beams depths and beam spacing for the project. The foundation may be designed using the Pavilion Research Board No. 33 (BRAB Report) as a guideline. Alternatively, the foundation may be designed based on the Design of Slab-On-Ground Foundations published by the Wire Reinforcement Institute, Inc. (WRI August 1981). Provided in the following table are design criteria for both methods.

Table 10: BRAB and WRI Foundation Design Criteria

Design Method	BRAB	WRI
Design PVR	1”	1”
Climatic Rating (Cw) – San Antonio, Texas	17	17
Effective Plasticity Index	25	25
Support Index (C)	0.89	--
Soil/Climatic Rating Factor (1-C)	--	0.11
Unconfined Compressive Strength (tsf)	1.5	--

Note: The above design values assume that the pavilion pad has been improved as outlined in this report for an approximate 1-inch design PVR.

A stiffened beam and slab type foundation may also be designed using the 3rd Edition of the Design of Post-Tensioned Slabs-on-Ground published by the Post-Tensioning Institute. These values were estimated from the "VOLFLO" computer program in consideration of the soil conditions in the pavilion area. Provided subsequently in Table 9 are preliminary design criteria for this method.

Table 11: PTI Slab-on-Grade Soil Design Criteria (3rd Edition)

Design PVR	1-inch
Depth to Constant Soil Suction	5 to 7 feet or depth to marlstone
Constant Soil Suction	3.8 pF
Edge Moisture Variation Distance **Center Lift, e_m** **Edge Lift, e_m**	 9.0 feet 5.0 feet
Differential Soil Movement **Center Lift, y_m** **Edge Lift, y_m**	 1.0 inch 1.3 inches
Coefficient of Slab-Subgrade Friction, μ	0.75

Note: The above design values assume that the pavilion pad has been improved as outlined in this report for a design PVR of 1-inch.

Arias is providing design values for BRAB, WRI, and PTI methods for the Structural Engineer's consideration and possible use. Arias recommends the final design methodology for the planned foundations be selected by the project Structural Engineer based on his knowledge and experience with similar foundation conditions once the final geotechnical study is performed.

Grade beams should extend at least 18 inches below final grade. **It is important that all grade beams for a particular pavilion bear in a similar material (i.e. all on compacted select fill or all on undisturbed marlstone).** Some of the marlstone rock may have to be removed to meet this criterion in some cases. In no case should any pavilion or structure be partially supported on select fill and partially on supported on undisturbed marlstone. The grade beams should be designed for the allowable soil bearing capacity provided in Table 10 subsequently. Grade beams may be thickened and widened at concentrated loads to serve as spread footings.

Table 12: Allowable Bearing Pressure and Beam Penetration

Allowable Bearing Pressure	2,500 psf
Bearing Stratum at Bottom of Grade Beams	For a particular structure; the beams should all bear on similar materials, (i.e. all on crushed limestone compacted select fill or all on undisturbed marlstone)
Min. Penetration of Beams Below Final Grade for Bearing Pressure Requirements	18 inches

Note: Actual beam depth should be determined by structural engineer. Minimum penetration below final grade is necessary to reduce scour potential and the potential for water penetration under the foundation.

The thickness of the slab and the amount of steel reinforcement should be selected by the project structural engineer to resist the proposed structural loads. Based on the pavilion pad recommendations for reducing the PVR to approximately 1-inch, a modulus of subgrade reaction (k-value) of 200 pci may be used for design of the floor slab. This value is for a 1-foot square plate and should be corrected for the size and shape of the loaded area accordingly.

We recommend that at least a 10-mil vapor retarder be used under the slab. The vapor retarder should conform to ASTM E1745, Class C or better and shall have a maximum water vapor permeance of 0.044 perms when tested in accordance with ASTM E96. A 10 mil Stego Wrap by Stego Industries LLC or other similar products meeting these requirements would be acceptable.

Footing Foundations Recommendations for use with Soil Supported Slab-on-Grade (Option B)

Conventional continuous wall and isolated spread footing foundations may be used if all of the near surface clay soils are removed down to marlstone bedrock and replaced with inert select fill. For concentrated point loads such as column loads, isolated spread footings may be used to support the load. Linear wall loads may be supported on continuous spread footings.

Spread footings should bear at least 24 inches below final grade. Footings should have a minimum width of 24 inches. **It is important that all footings for a particular structure (the pavilion or the portable restroom slab) bear in a similar material (i.e. all on compacted select fill or all on undisturbed marlstone).** The intent of bearing the footings in similar material is to allow for a more uniform support while reducing differential settlement of the foundations. Some of the marlstone rock may have to be removed to meet this criterion in some cases. In no cases, should any structure be partially supported on select fill and partially supported on undisturbed marlstone.

Spread footings can be sized using a total loading bearing pressure of 2,500 psf. Continuous spread footings can be sized using an allowable bearing pressure of 2,500 psf. The total load bearing pressures provided above include a factor of safety against bearing

failure of at least 3. By using the noted bearing pressures and assuming proper footing construction, post-construction settlements should be approximately one (1) inch or less. The settlement response of the footings will be highly dependent upon the quality of construction.

Footings should be spaced such that their edge-to-edge spacing is no less than two footing widths. If footings are spaced closer than recommended herein, we should be contacted to determine if a reduction in bearing capacity is needed.

Preliminary Flatwork Considerations (Options A and B)

Minor differential movements between the planned structure and abutting sidewalks should be expected if the flatwork is supported on similar pavilion pad conditions. Thus, we recommend that the flatwork be supported entirely on the improved pavilion and portable restroom pad. Flatwork supported on unimproved, natural site conditions will result in flatwork movements on the order of the magnitudes reported in the PVR section that can result in significant cracking, joint separations, and a reversal in drainage as discussed subsequently.

We recommend that the flatwork and the pavilions and portable restroom be designed to include details that permit foundation movements without resulting in vertical separations and without distressing either element. Control joints should be included that include steel reinforcing to prevent vertical shear, but to allow bending.

The flatwork and abutting sidewalks should be designed and constructed to allow for positive drainage to be maintained away from the pavilion and portable restroom foundation. The planned site grading should allow for potential future differential movements, and should never be allowed to reach a level condition or negative slope that promotes drainage toward the foundation. This reversal in drainage can direct moisture into the pavilion envelope and can become a constant nuisance and maintenance issue. If the potential differential movements cannot be tolerated, the Owner may wish to consider extending the foundation pad beneath the planned sidewalks and incorporate the flatwork as part of the foundation system.

Design Measures to Reduce Changes in Soil Moisture

Measures to reduce future moisture fluctuations of the soils under the floor slab must be considered. Movements of foundation soil can be effectively reduced by providing horizontal and/or vertical moisture barriers around the edge of the slab. Typically the moisture barriers would consist of concrete flatwork or asphalt or concrete pavement placed adjacent to the edge of the pad, or a deepened perimeter grade beam or a clay cap as previously discussed in this report.

Although subgrade modification through excavation and replacement is recommended to reduce potential soil-related foundation movements, the design and construction of a grade-supported foundation should also include the following elements:

- Roof drainage should be controlled by gutters and carried well away from the pavilion structure. The ground surface adjacent to the pad perimeter should be sloped and maintained a minimum of 5% grade away from the pad for 10 feet to result in positive surface flow or drainage away from the pad perimeter.

- Hose bibs, sprinkler heads, and other external water connections should be placed well away from the foundation perimeter such that surface leakage cannot readily infiltrate into the subsurface or compacted fills placed under the proposed foundations and slabs.
- No trees or other vegetation over 6 feet in height shall be planted within 15 feet of the structure unless specifically accounted for in the foundation design.
- Utility bedding should not include gravel within 4 feet of the perimeter of the foundation. Compacted clay or flowable fill trench backfill should be used in lieu of permeable bedding materials between 2 feet inside the pad to a distance of 4 feet beyond the exterior of the pad edge to reduce the potential for water to infiltrate within utility bedding and backfill material.
- Paved areas around the pad are helpful in maintaining equilibrium within the soil water content. If possible, pavement and sidewalks should be located immediately adjacent to the pad.
- Flower beds and planter boxes should be piped or water tight to prevent water infiltration under the pad. Experience indicates that landscape irrigation is a common source of foundation movement problems and pavement distress.
- Site work excavations should be protected and backfilled without delay to reduce changes in the natural moisture regime.

See SECTION II: ADDITIONAL DESIGN CONSIDERATIONS for further discussion of utilities and control and construction joints.

Global stability analysis was not within our scope of work for this study. If retaining walls are utilized the wall designer will need to perform all stability analyses (i.e. bearing capacity, sliding, overturning, and stability, etc.) as required for proper design. Once the retaining wall layout and details are known, Arias should be contacted to perform additional borings as part of the final study and to provide appropriate parameters for design.

IBC Site Classification and Seismic Design Coefficients

Section 1613 of the International Pavilion Code (2012) requires that every structure be designed and constructed to resist the effects of earthquake motions, with the seismic design category to be determined in accordance with Section 1613 or ASCE 7. Site classification according to the International Pavilion Code (2012) is based on the soil profile encountered to the 100-foot depth. The stratigraphy at the site location was explored to the approximate 29 foot depth.

Clays having similar consistency were extrapolated to be present between the 38 and 100-foot depths. On the basis of the site class definitions included in the 2012 Code and the encountered generalized stratigraphy, we characterize the site as Site Class C.

Seismic design coefficients were determined using the on-line software, Seismic Hazard Curves and Uniform Response Spectra, version 3.1.0, dated July 11, 2013 accessed at (http://earthquake.usgs.gov/designmaps/us/application.php). Analyses were performed considering the 2012 International Pavilion Code. Input included GPS coordinates 29.55 degrees, -98.44 degrees and Site Class C. Seismic design parameters for the site are summarized in the following table.

Table 13: Seismic Design Parameters

Site Classification	F_a	F_v	S_s	S_1
C	1.2	1.7	0.077g	0.030g

Where: Fa = Site coefficient
Fv = Site coefficient
Ss = Mapped spectral response acceleration for short periods
S_1 = Mapped spectral response acceleration for a 1-second period

PAVEMENT RECOMMENDATIONS

Accumulation of water beneath the pavement surface course can cause progressive and rapid deterioration of the pavement section. Similarly, pavement surfaces should be well drained to eliminate ponding with a two-percent minimum slope, as possible. The pavement recommendations were prepared in accordance with the 1993 AASHTO Guide for the Design of Pavement Structures for asphalt and the ACI Design Guide 330R for concrete parking lots. The following design parameters and assumptions were used in our analysis:

Table 14: Pavement Design Assumptions

Traffic Load for Light Duty Pavement	15,000 equivalent single axle loads (ESALs)
Traffic Load for Medium Duty Pavement	50,000 equivalent single axle loads (ESALs)
Daily Truck Traffic vehicle with at least 6 Wheels	One (1) Truck 5 days per Week
Concrete Compressive Strength	3,500 psi
Raw Subgrade California Bearing Ratio (CBR)	2 for compacted Clay subgrade
Raw Subgrade Modulus of Subgrade Reaction, k in pci	75 for compacted Claysubgrade

Options for section thickness for flexible and rigid pavements are provided in Table 4 (Recommended Pavement Sections). Note that the truck lane traffic sections correspond to only one heavy-duty truck per day. If more heavy-duty truck traffic is anticipated, we should be contacted to provide additional recommendations.

A truck traffic section is recommended for use at loading docks, entrances, driveways, dumpster pads and channeled traffic areas. Areas subjected to truck traffic stopping, starting, loading, unloading or turning should not utilize asphalt pavement. For these areas, an 8-inch concrete section should be used.

Rigid Concrete Pavement Joints

Placement of expansion joints in concrete paving on potentially expansive subgrade or on granular subgrade subject to piping often results in horizontal and vertical movement at the joint. Many times, concrete spalls adjacent to the joint and eventually a failed concrete area results. This problem is primarily related to water infiltration through the joint.

One method to mitigate the problem of water infiltration through the joints is to eliminate all expansion joints that are not absolutely necessary. It is our opinion that expansion or isolation joints are needed only adjacent where the pavement abuts intersecting drive lanes and other structures. Elimination of all expansion joints within the main body of the pavement area would significantly reduce access of moisture into the subgrade. Regardless of the type of expansion joint sealant used, eventually openings in the sealant occur resulting in water infiltration into the subgrade.

The use of sawed and sealed joints should be designed in accordance with current Portland Cement Association (PCA) or American Concrete Institute (ACI) guidelines. Research has proven that joint design and layout can have a significant effect on the overall performance of concrete pavement.

Recommendations presented herein are based on the use of reinforced concrete pavement. Local experience has shown that the use of distributed steel placed at a distance of 1/3 slab thickness from the top is of benefit in crack control for concrete pavements. Improved crack control also reduces the potential for water infiltration.

Performance Considerations

Our pavement recommendations have been developed to provide an adequate structural thickness to support the anticipated traffic volumes. Some shrink/swell movements due to moisture variations in the underlying soils, or potential movement from settling utility backfill material, should be anticipated over the life of the pavements. The owner should recognize that over a period of time, pavements may crack and undergo some deterioration and loss of serviceability. We recommend the project budgets include an allowance for maintenance such as patching of cracks or occasional overlays over the life of the pavement.

Pavement Subgrade and Section Materials

Recommendations for subgrade preparation in the planned pavement areas, as well as for the pavement section materials, are provided in the table below.

Table 15: Pavement Subgrade and Section Materials

Subgrade Preparation Prior to Pavement Section Construction	
Minimum undercut depth	6 inches or as needed to remove organics and existing pavement/foundations
Reuse excavated soils	Provided they are free of roots and debris and meet the material requirements for their intended use
Horizontal extent for undercut	2 feet beyond the paving limits
Exposed subgrade (before lime-treatment or moisture conditioning)	Proof roll (See Note 3, Table 3) with rubber tired vehicle weighting at least 20 tons such as a loaded dump truck with Geotechnical Engineer's representative present during proof rolling
Pumping/rutting areas discovered during proof rolling	Remove to firmer materials and replace with compacted general or select fill under direction of Geotechnical Engineer's representative

Fill Requirements for Grade Increases	
General fill type	Material free of roots, debris and other deleterious material with a maximum particle size of 3 inches; on-site clays having CBR $\geq$ 3 may be used. Imported fill materials used under pavements should have a CBR value of at least 3 and a soluble sulfate content of less than 500 PPM.
Minimum general fill thickness	As required to achieve grade
Maximum general fill loose lift thickness	8 inches
General fill compaction and moisture criteria	ASTM D 698 $\geq$ 95% compaction at 0 to +4 from optimum
Subgrade Treatment Option - Moisture Conditioning	
Depth of moisture conditioning	9 inches (disk in place and moisture condition)
Compaction and moisture criteria	ASTM D 698 $\geq$ 95% compaction at 0 to +4 from optimum

Subgrade Treatment Option – Lime Treatment	
Treatment depth	6 inches
Treatment type	Hydrated lime
Application rate (estimated)	6 - 8% by dry weight
Soil dry unit weight (estimated)	105 pcf but may be variable
Determination of application rate	The actual application rate should be determined by laboratory testing of soil samples taken after the pavement subgrade elevation has been achieved. The quantity of lime should be sufficient to result in a pH of at least 12.4 when tested in accordance with ASTM C 977, Appendix XI. Alternately, the optimum lime content may be determined through Atterberg limits testing on treated samples with varying percentages of lime. Additional sulfate testing of the exposed subgrade should be performed prior to the use of lime, cement or other calcium-based treatment agents.
Treatment procedure	TxDOT Item 260 and 264
Treatment layer compaction and moisture criteria	ASTM D 698 ≥ 95% compaction at 0 to +4 from optimum
Pavement Section Materials	
Flexible Base Material Type	TxDOT Item 247, Type A, Grade 1 or 2
Maximum Flexible Base Loose Lift Thickness	8 inches
Hot Mix Asphaltic Concrete (HMAC) Type	TxDOT Standard Specifications Item 340 Type D (PG 76 or higher grade binder)
Portland cement concrete (PCC)	28-day compressive strength of 3,500 psi; 5 inch slump
In-Place Density and Moisture Verification Testing	
Testing frequency (Subgrade)	1 test per 5,000 square feet per lift with minimum of 3 tests per lift

To aid in preventing degradation of the prepared subgrade, paving preferably should be placed within 14 days. If pavement placement is delayed, protection of the subgrade surface with an emulsion-based sealer should be considered. Alternately, the paving section could be slightly overbuilt so blading performed to remove distressed sections does not reduce the treated subgrade thickness.

ADDITIONAL DESIGN CONSIDERATIONS

Utilities

Utilities which go through the slab and beams should be designed with some flexibility to allow free movement in the lines as a result of potential soil shrinkage or swelling.

Control and Construction Joints

Concrete, mortar, grout, and concrete or clay masonry units as well as numerous other construction materials shrink and swell upon a loss or gain of moisture. Accordingly, material

volume changes or potential foundation movements can cause wall or slab cracking to occur. In general, however, unsightly cracking can normally be eliminated by controlling crack locations and making them inconspicuous so that they do not detract from the appearance of the pad. Crack control should typically be implemented in the overall pad design by the implementation of control or contraction joints in the structure at proper intervals.

CONSTRUCTION CRITERIA

Site Preparation

Strip away any existing asphalt, concrete, topsoil, grass, organics, and deleterious debris as needed and dispose outside of the pad, pavement and other structural areas. Undercut to the required depth and extent as noted in the main report. Additional excavation may be required to accommodate the required select fill thickness, or as required, to remove existing utilities or foundations. Additional excavation may also be necessary due to encountering deleterious materials such as buried debris and/or rubble, or undesirable soft and wet subgrade conditions. The site representative of the geotechnical engineer should observe undercutting operations.

After the surface materials are removed, the exposed subgrade surface should be proof-rolled with a heavily loaded dump truck weighing at least 20 tons as outlined in Table 3. Any areas which excessively yield or pump under the wheel loading should be undercut to the depth specified by the geotechnical engineer's representative and replaced with compacted select fill to existing grade as specified. The voids in undercut areas below the required select fill thickness can be backfilled and compacted with on-site general fill materials.

Table 16: Site Work (Non Structural/General Fill) Requirements

Stripping Depth	6 inch minimum or as needed to remove any existing asphalt, concrete, and vegetation
Non Structural/General Fill Type	On-site material free of roots, debris and other deleterious material with a maximum particle size of 4 inches
Maximum Non Structural/General Fill Loose Lift Thickness	8 inches

The backfill should be placed and compacted in accordance with the General Fill requirements in Table 6. At least one density test should be conducted per 5,000 square feet of pad per lift of prepared fill and subgrade or a minimum of three density tests should be taken per lift within the pad area.

Drainage

Good positive drainage during and after construction is very important to reduce expansive soil volume changes that can detrimentally affect the performance of the planned development. Proper attention to surface and subsurface drainage details during the design

and construction phase of development can aid in preventing many potential soil shrink-swell related problems during and following the completion of the project.

Earthwork and Foundation Acceptance

Exposure to the environment may weaken the materials at the foundation bearing level if the excavation remains open for long periods of time. Therefore, it is recommended that all foundation excavations be extended to final grade and constructed as soon as possible in order to reduce potential damage to the bearing materials. If bearing materials are exposed to severe drying or wetting, the unsuitable material must be re-conditioned or removed as appropriate and replaced with compacted fill, prior to concreting. The foundation bearing level should be free of loose soil, ponded water or debris and should be observed prior to concreting by the geotechnical engineer or his representative.

Foundation concrete should not be placed on materials that have been disturbed by rainfall or seepage. If the bearing materials are softened by surface water intrusion during exposure or by desiccation, the unsuitable materials must be removed from the foundation excavation and replaced with compacted select fill prior to placement of concrete.

Subgrade preparation and fill placement operations should be monitored by the geotechnical engineer or their representative. As a guideline, at least one in-place density test should be performed for each 5,000 sq. ft. of compacted surface per lift or a minimum of three tests per lift. Any areas not meeting the required compaction should be recompacted and retested until compliance is met.

Trench Excavations

Excavations should comply with OSHA Standard 29CFR, Part 1926, Subpart P and all State of Texas and local requirements. Trenches 20 feet deep or greater require that the protective system be designed by a registered professional engineer. A trench is defined as a narrow excavation in relation to its depth. In general, the depth is greater than the width, but the bottom width of the trench is not greater than 15 feet. Trenches greater than 5 feet in depth require a protective system such as trench shields, trench shoring, or sloping back the excavation side slopes.

The Contractor's "Competent Person" shall perform daily inspections of the trench to verify that the trench is properly constructed and that surcharge and vibratory loads are not excessive, that excavation spoils are sufficiently away from the edge of the trench, proper ingress and egress into the trench is provided and all other items are performed as outlined in these OSHA regulations. It is especially important for the inspector to observe the effects of changed weather conditions, surcharge loadings, and cuts into adjacent backfills of existing utilities. The flow of water into the base and sides of the excavation and the presence of any surface slope cracks should also be carefully monitored by the Trench Safety Engineer.

Although the geotechnical report provides an indication of material types to be anticipated, actual subsurface and groundwater conditions will vary along the trench route. The "Competent Person" must evaluate the materials and groundwater in the trench excavation at the time of construction to verify that proper sloping or shoring measures are performed.

Appendix B to the OSHA regulations has sloping and benching requirements for short-term trench exposure for various material types up to the maximum allowable 20-foot depth requirement.

GENERAL COMMENTS

The scope of this study is to provide geotechnical engineering criteria for use by design engineers in preparing the foundation and pavement designs. Environmental studies of any kind were not a part of our scope of work or services even though we are capable of providing such services.

This report was prepared as an instrument of service for this project exclusively for the use of the City of San Antonio and the project design team. If the development plans change relative to pad or overall site layout, size, or anticipated loads or if different subsurface conditions are encountered, we should be informed and retained to ascertain the impact of these changes on our recommendations. We cannot be responsible for the potential impact of these changes if we are not informed.

Geotechnical Design Review

Arias should be given the opportunity to review the design and construction documents. The purpose of this review is to check to see if our geotechnical recommendations are properly interpreted into the project plans and specifications. Please note that design review was not included in the authorized scope and additional fees may apply.

Subsurface Variations

Subsurface and groundwater conditions may vary between the sample boring locations. Transition boundaries or contacts, noted on the boring logs to separate material types, are approximate. Actual contacts may be gradual and vary at different locations. The contractor should verify that similar conditions exist throughout the proposed area of excavation. If different subsurface conditions or highly variable subsurface conditions are encountered during construction, we should be contacted to evaluate the significance of the changed conditions relative to our recommendations.

Quality Assurance Testing

The long-term success of the project will be affected by the quality of materials used for construction and the adherence of the construction to the project plans and specifications. As Geotechnical Engineer of Record (GER), we should be engaged by the Owner to provide Quality Assurance (QA) testing. Our services will be to evaluate the degree to which constructors are achieving the specified conditions they're contractually obligated to achieve,

and observe that the encountered materials during earthwork for foundation and pavement installation are consistent with those encountered during this study. In the event that Arias is not retained to provide QA testing, we should be immediately contacted if differing subsurface conditions are encountered during construction. Differing materials may require modification to the recommendations that we provided herein. A message to the Owner with regard to the project QA is provided in the ASFE publication included in Appendix E.

Arias has an established in-house laboratory that meets the standards of the American Standard Testing Materials (ASTM) specifications of ASTM E-329 defining requirements for Inspection and Testing Agencies for soil, concrete, steel and bituminous materials as used in construction. We maintain soils, concrete, asphalt, and aggregate testing equipment to provide the testing needs required by the project specifications. All of our equipment is calibrated by an independent testing agency in accordance with the National Bureau of Standards. In addition, Arias is accredited by the American Association of State Highway & Transportation Officials (AASHTO), the United States Army Corps of Engineers (USACE) and the Texas Department of Transportation (TxDOT), and also maintains AASHTO Materials Reference Laboratory (AMRL) and Cement and Concrete Reference Laboratory (CCRL) proficiency sampling, assessments and inspections.

Furthermore, Arias employs a technical staff certified through the following agencies: the National Institute for Certification in Engineering Technologies (NICET), the American Concrete Institute (ACI), the American Welding Society (AWS), the Precast/Prestressed Concrete Institute (PCI), the Mine & Safety Health Administration (MSHA), the Texas Asphalt Pavement Association (TXAPA) and the Texas Board of Professional Engineers (TBPE). Our services are conducted under the guidance and direction of a Professional Engineer (P.E.) licensed to work in the State of Texas, as required by law.

Standard of Care

Subject to the limitations inherent in the agreed scope of services as to the degree of care and amount of time and expenses to be incurred, and subject to any other limitations contained in the agreement for this work, Arias has performed its services consistent with that level of care and skill ordinarily exercised by other professional engineers practicing in the same locale and under similar circumstances at the time the services were performed.

Information about this geotechnical report is provided in the ASFE publication included in Appendix D.

APPENDIX A: FIGURES AND SITE PHOTOGRAPHS

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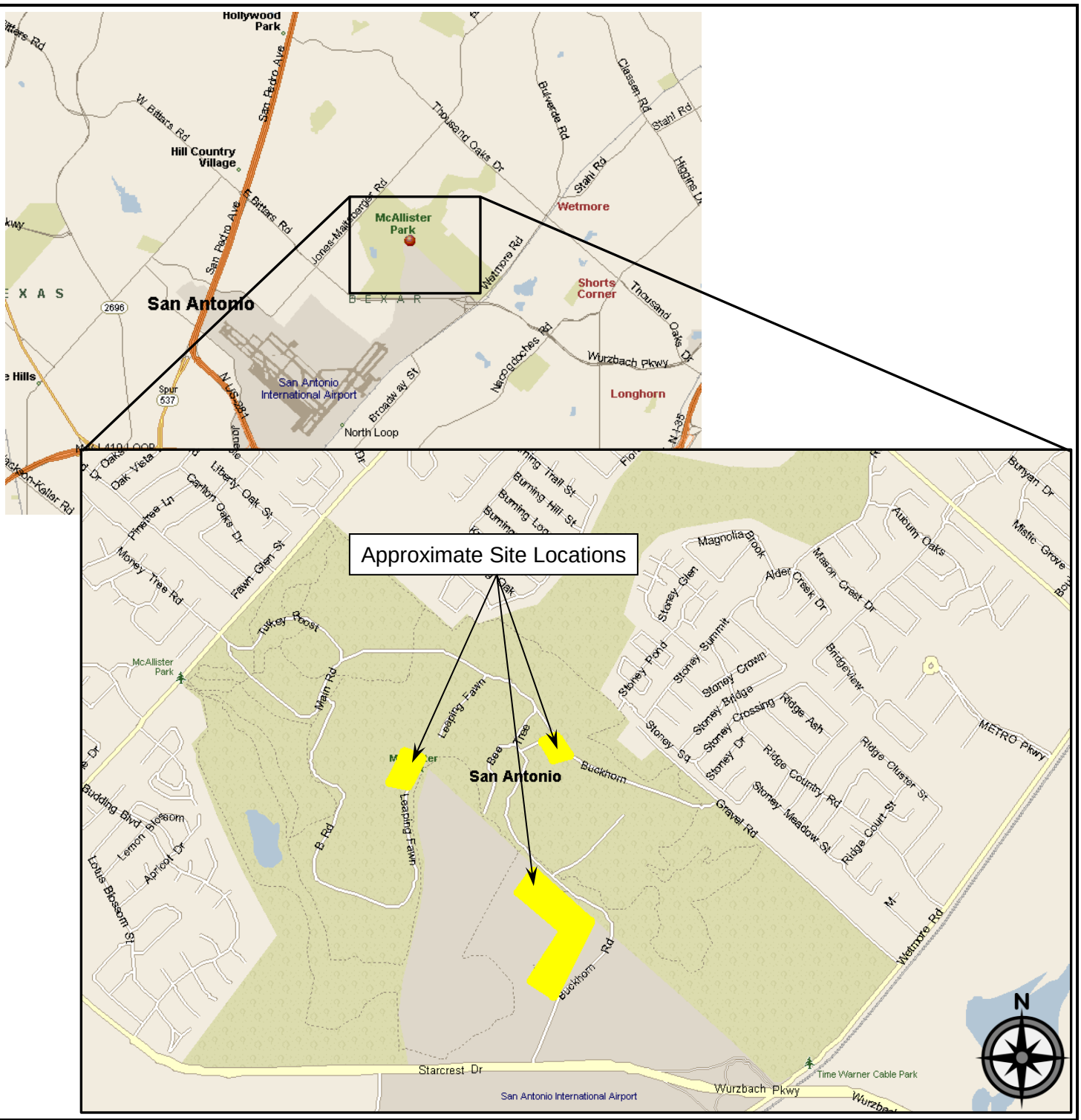

ARIAS GEOPROFESSIONALS
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VICINITY MAP

McAllister Park Improvements
San Antonio, Texas

Date: October 29, 2014	Job No.: 2014-536
Drawn By: TAS	Checked By: WAA
Approved By: CMS	Scale: N.T.S.

Figure 1

DISCLAIMER: This drawing is for illustration only and should not be used for design or construction purposes. All locations are approximate.

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BORING LOCATION PLAN

McAllister Park Improvements
San Antonio, Texas

Date: October 29, 2014	Job No.: 2014-536
Drawn By: TAS	Checked By: WAA
Approved By: CMS	Scale: N.T.S.

REVISIONS:

No.:	Date:	Description:

Figure 2

DISCLAIMER: This drawing is for illustration only and should not be used for design or construction purposes. All locations are approximate.

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Photo 1 – View looking towards the northwest at the drilling operations of Boring B-1.

Photo 2 – View looking towards the west at the approximate location of Boring B-2.

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SITE PHOTOS

McAllister Park Improvements
San Antonio, Texas

Date: October 29, 2014	Job No.: 2014-536
Drawn By: TAS	Checked By: WAA
Approved By: CMS	Scale: N.T.S.

Appendix A

DISCLAIMER: This drawing is for illustration only and should not be used for design or construction purposes. All locations are approximate.

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Photo 3 – View looking towards the northwest at the drilling operations of Boring B-3.

Photo 4 – View looking towards the northeast at the drilling operations of Boring B-4.

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SITE PHOTOS

McAllister Park Improvements
San Antonio, Texas

Date: October 29, 2014	Job No.: 2014-536
Drawn By: TAS	Checked By: WAA
Approved By: CMS	Scale: N.T.S.

Appendix A

DISCLAIMER: This drawing is for illustration only and should not be used for design or construction purposes. All locations are approximate.

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Photo 5 – View looking towards the southeast at the drilling operations of Boring B-5.

Photo 6 – View looking towards the northeast at the approximate area of Boring B-6.

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SITE PHOTOS

McAllister Park Improvements
San Antonio, Texas

Date: October 29, 2014	Job No.: 2014-536
Drawn By: TAS	Checked By: WAA
Approved By: CMS	Scale: N.T.S.

Appendix A

DISCLAIMER: This drawing is for illustration only and should not be used for design or construction purposes. All locations are approximate.

APPENDIX B: BORING LOGS AND KEY TO CLASSIFICATION SYMBOLS

Boring Log No. B-1

Project: **McAllister Park Improvements**
McAllister Park
San Antonio, Texas

Location: See Boring Location Plan

Sampling Date: 10/13/14

Coordinates: N29°33'10.2" W98°26'41"

Backfill: Cuttings

Soil Description	Depth (ft)	SN	WC	PL	LL	PI	N	-200
CLAYEY GRAVEL with Sand (GC), dense, dark brown		SS	5	22	64	42	35	17
MARLSTONE, hard, tan and white		SS	5	16	25	9	**20/0"	
	5	SS	7				**20/0"	
		SS		17	25	8	**50/4"	
		SS	7				**50/3"	
	10	GB		16	25	9		
		SS	8				**50/0"	
	15							
		SS	11				**50/1"	
	20							
		SS					**50/1"	
	25							
		SS	9				**10/0"	
Borehole terminated at 28.5 feet								

Groundwater Data:
During drilling: Not encountered

Field Drilling Data:
Coordinates: Hand-held GPS Unit
Logged By: W. Persyn
Driller: Eagle Drilling, Inc.
Equipment: Truck-mounted drill rig

Single flight auger: 0 - 28.5 ft

Nomenclature Used on Boring Log

Split Spoon (SS)
Grab Sample (GB)

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

2014-536.GPJ 11/3/14 (BORING LOG SA12-02,ARIASSA12-01.GDT,LIBRARY2013-01.GLB)

Boring Log No. B-2

Project: **McAllister Park Improvements**
McAllister Park
San Antonio, Texas

Sampling Date: 10/13/14

Coordinates: N29°33'20.3" W98°26'38.8"

Location: See Boring Location Plan

Backfill: Cuttings

Soil Description	Depth (ft)	SN	WC	PL	LL	PI	N	-200
SANDY FAT CLAY (CH), stiff, dark brown		SS	10	23	64	41	14	51
	2							
		SS	8				18	
	4							
CLAYEY MARL to MARLSTONE, hard, tan and white								
possibly weathered between 4.5' - 6.5'		SS	6	21	44	23	63	
	6							
Iron oxide trace below 6'								
very hard below 6.5'		SS					50/5"	
	8							
		SS	11				**50/5"	
	10							
Borehole terminated at 10 feet								

Groundwater Data:
During drilling: Not encountered

Field Drilling Data:
Coordinates: Hand-held GPS Unit
Logged By: W. Persyn
Driller: Eagle Drilling, Inc.
Equipment: Truck-mounted drill rig

Single flight auger: 0 - 10 ft

Nomenclature Used on Boring Log

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

Arias & Associates, Inc.

Job No.: 2014-536

Boring Log No. B-3

Project: **McAllister Park Improvements**
McAllister Park
San Antonio, Texas

Location: See Boring Location Plan

Sampling Date: 10/13/14

Coordinates: N29°33'11.7" W98°26'42.9"

Backfill: Cuttings

Soil Description	Depth (ft)	SN	WC	PL	LL	PI	N	-200
GRAVELLY FAT CLAY (CH) with sand, hard, dark brown		SS	12	22	66	44	38	50
	2							
MARLSTONE, tan		SS					**50/5"	
	4							
		SS	4	15	26	11	**10/0"	
	6							
		SS					**50/2"	
	8							
		SS	8				**50/3"	
Borehole terminated at 8.7 feet								

Groundwater Data:
During drilling: Not encountered

Field Drilling Data:
Coordinates: Hand-held GPS Unit
Logged By: R. Arizola
Driller: Eagle Drilling, Inc.
Equipment: Truck-mounted drill rig

Single flight auger: 0 - 8.6 ft

Nomenclature Used on Boring Log

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

2014-536.GPJ 11/3/14 (BORING LOG SA12-02,ARIASSA12-01.GDT,LIBRARY2013-01.GLB)

Boring Log No. B-4

Project: **McAllister Park Improvements**
McAllister Park
San Antonio, Texas

Location: See Boring Location Plan

Sampling Date: 10/13/14

Coordinates: N29°33'13.8" W98°26'43.9"

Backfill: Cuttings

Soil Description	Depth (ft)	SN	WC	PL	LL	PI	N
FAT CLAY (CH), very stiff, dark brown		SS	10	25	72	47	22
	2						
CLAYEY MARL to MARLSTONE, hard, tan		SS	6	20	49	29	**10/0"
	4						
		SS	3	19	35	16	**10/0"
	6						
		SS					**50/1"
	8						
		SS	4				**10/0"
Borehole terminated at 8.5 feet							

Groundwater Data:
During drilling: Not encountered

Field Drilling Data:
Coordinates: Hand-held GPS Unit
Logged By: R. Arizola
Driller: Eagle Drilling, Inc.
Equipment: Truck-mounted drill rig

Single flight auger: 0 - 8.5 ft

Nomenclature Used on Boring Log

Split Spoon (SS)

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

** = Blow Counts During Seating Penetration

Arias & Associates, Inc.

Job No.: 2014-536

2014-536.GPJ 11/3/14 (BORING LOG SA12-02.ARIASSA12-01.GDT.LIBRARY2013-01.GLB)

Boring Log No. B-5

Project: **McAllister Park Improvements**
McAllister Park
San Antonio, Texas

Location: See Boring Location Plan

Sampling Date: 10/13/14

Coordinates: N29°33'29.9" W98°26'39"

Backfill: Cuttings

Soil Description	Depth (ft)	SN	WC	PL	LL	PI	N	-200
ASPHALT, 8-Inches								
BASE, 4-Inches								
LEAN CLAY (CL) trace gravel and calcareous material, hard, tan		SS	16	23	41	18	33	87
	2							
		SS	17				44	
	4							
		SS	15				43	
	6							
MARLSTONE, hard, tan		SS	18				50/6"	
	8							
		SS					**10/0"	

Borehole terminated at 8.5 feet

Groundwater Data:
During drilling: Not encountered

Field Drilling Data:
Coordinates: Hand-held GPS Unit
Logged By: R. Arizola
Driller: Eagle Drilling, Inc.
Equipment: Truck-mounted drill rig

Single flight auger: 0 - 8.5 ft

Nomenclature Used on Boring Log

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

2014-536.GPJ 11/3/14 (BORING LOG SA12-02,ARIASSA12-01.GDT,LIBRARY2013-01.GLB)

Arias & Associates, Inc.

Job No.: 2014-536

Boring Log No. B-6

Project: **McAllister Park Improvements**
McAllister Park
San Antonio, Texas

Sampling Date: 10/13/14

Coordinates: N29°33'30.7" W98°26'58.9"

Location: See Boring Location Plan

Backfill: Cuttings

Soil Description	Depth (ft)	SN	WC	PL	LL	PI	N	-200
BASE, 6-Inches								
CLAYEY GRAVEL with Sand (GC), medium dense, dark brown	2	SS	5	22	62	40	23	22
LEAN to FAT CLAY (CH-CL) with calcareous deposits and gravel, tan with reddish brown	4	SS	11	19	50	31	34	
	6	SS	6				42	
	8	SS					39	
	10	SS	4	17	39	22	36	

Borehole terminated at 10 feet

Groundwater Data:
During drilling: Not encountered

Field Drilling Data:
Coordinates: Hand-held GPS Unit
Logged By: R. Arizola
Driller: Eagle Drilling, Inc.
Equipment: Truck-mounted drill rig

Single flight auger: 0 - 10 ft

Nomenclature Used on Boring Log

Split Spoon (SS)

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

-200 = % Passing #200 Sieve

Arias & Associates, Inc.

Job No.: 2014-536

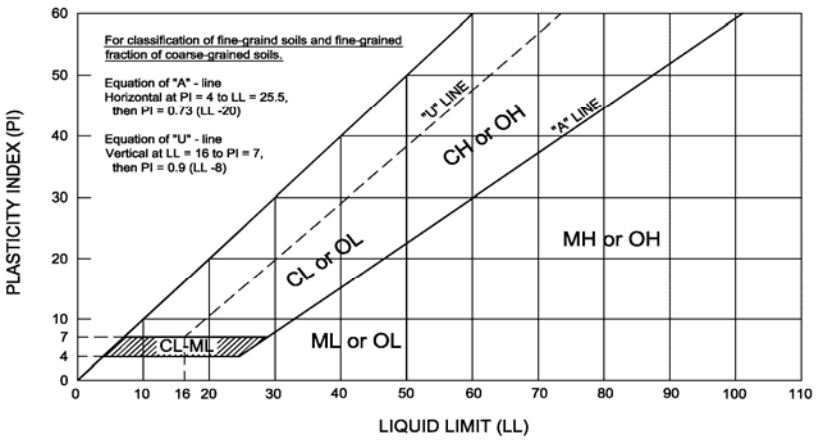
KEY TO TERMS AND SYMBOLS USED ON BORING LOGS

MAJOR DIVISIONS					GROUP SYMBOLS	DESCRIPTIONS
COARSE-GRAIND 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
GINE-GRAIND SOILS	More than half of material 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

Density of Granular Soils	
Number of Blows per ft., N	Relative Density
0 - 4	Very Loose
4 - 10	Loose
10 - 30	Medium
30 - 50	Dense
Over 50	Very Dense

Consistency and Strength of Cohesive Soils		
Number of Blows per ft., N	Consistency	Unconfined Compressive Strength, q_u (tsf)
Below 2	Very Soft	Less than 0.25
2 - 4	Soft	0.25 - 0.5
4 - 8	Medium (Firm)	0.5 - 1.0
8 - 15	Stiff	1.0 - 2.0
15 - 30	Very Stiff	2.0 - 4.0
Over 30	Hard	Over 4.0

PLASTICITY CHART (ASTM D 2487-11)



KEY TO TERMS AND SYMBOLS USED ON BORING LOGS

TABLE 1 Soil Classification Chart (ASTM D 2487-11)

Criteria of Assigning Group Symbols and Group Names Using Laboratory Tests[A]				Soil Classification	
				Group Symbol	Group Name[B]
COARSE-GRAIND SOILS	Gravels (More than 50% of coarse fraction retained on No. 4 sieve)	Clean Gravels (Less than 5% fines[C])	Cu ≥ 4 and 1 ≤ Cc ≤ 3[D]	GW	Well-Graded Gravel[E]
			Cu < 4 and/or [Cc < or Cc > 3][D]	GP	Poorly-Graded Gravel[E]
		Gravels with Fines (More than 12% fines[C])	Fines classify as ML or MH	GM	Silty Gravel[E,F,G]
			Fines classify as CL or CH	GC	Clayey Gravel[E,F,G]
More than 50% retained on No. 200 sieve	Sands (50% or more of coarse fraction passes No. 4 sieve)	Clean Sands (Less than 5% fines[H])	Cu ≥ 6 and 1 ≤ Cc ≤ 3[D]	SW	Well-Graded Sand[I]
			Cu < 6 and/or [Cc < or Cc > 3][D]	SP	Poorly-Graded Sand[I]
		Sands with Fines (More than 12% fines[H])	Fines classify as ML or MH	SM	Silty Sand[F,G,I]
			Fines classify as CL or CH	SC	Clayey Sand[F,G,I]
FINE-GRAINED SOILS	Silts and Clays	inorganic	PI > 7 and plots on or above "A" line[J]	CL	Lean Clay[K,L,M]
	Liquid limit less than 50		PI < 4 or plots below "A" line[J]	ML	Silt[K,L,M]
		organic	Liquid limit - oven dried / Liquid & #10 < 0.75	OL	Organic Clay[K,L,M,N] / Organi Silt[K,L,M,O]
50% or more passes the No. 200 sieve	Silts and Clays	inorganic	PI plots on or above "A" line	CH	Fat Clay[K,L,M]
	Liquid limit 50 or more		PI plots on or above "A" line	MH	Elastic Silt[K,L,M]
		organic	Liquid limit - oven dried / Liquid & #10 < 0.75	OH	Organic Clay[K,L,M,P] / Organic Silt[K,L,M,Q]
HIGHLY ORGANIC SOILS	Primarily organic matter, dark in color, and organic odor			PT	Peat

[A] Based on the material passing the 3-inch (75mm) sieve
[B] If field sample contained cobbles or boulders, or both, add "with cobbles or boulders, or both" to group name
[C] Gravels with 5% to 12% fines require dual symbols:
- GW-GM well-graded gravel with silt
- GW-GC well-graded gravel with clay
- GP-GM poorly-graded gravel with silt
- GP-GC poorly-graded gravel with clay

[D] $Cu = D_{60}/D_{10}$ $\quad Cc = \dfrac{(D_{30})^2}{D_{10} \times D_{60}}$

[E] If soil contains ≥ 15% sand, add "with sand" to group name
[F] If fines classify as CL-ML, use dual symbol GC-GM, or SC-SM
[G] If fines are organic, add "with organic fines" to group name
[H] Sand with 5% to 12% fines require dual symbols:
- SW-SM well-graded sand with silt
- SW-SC well-graded sand with clay
- SP-SM poorly-graded sand with silt
- SP-SC poorly-graded sand with clay

[I] If soil contains ≥ 15% gravel, add "with gravel" to group name
[J] If Atterberg limits plot in hatched area, soil is a CL-ML, silty clay
[K] If soil contains 15% to < 30% plus No. 200, add "with sand" or "with gravel," whichever is predominant
[L] If soil contains ≥ 30% plus No. 200, predominantly sand, add "sandy" to group name
[M] If soil contains ≥ 30% plus No. 200, predominantly gravel, add "gravelly" to group name
[N] PI ≥ 4 and plots on or above "A" line
[O] PI < 4 or plots below "A" line
[P] PI plots on or above "A" line
[Q] PI plots below "A" line

TERMINOLOGY

Boulders	Over 12-inches (300mm)	**Parting**	Inclusion < 1/8-inch thick extending through samples
Cobbles	12-inches to 3-inches (300mm to 75mm)	**Seam**	Inclusion 1/8-inch to 3-inches thick extending through sample
Gravel	3-inches to No. 4 sieve (75mm to 4.75mm)	**Layer**	Inclusion > 3-inches thick extending through sample
Sand	No. 4 sieve to No. 200 sieve (4.75mm to 0.075mm)		
Silt or Clay	Passing No. 200 sieve (0.075mm)		
Calcareous	Containing appreciable quantities of calcium carbonate, generally nodular		

Stratified	Alternating layers of varying material or color with layers at least 6mm thick
Laminated	Alternating layers of varying material or color with the layers less than 6mm thick
Fissured	Breaks along definite planes of fracture with little resistance to fracturing
Slickensided	Fracture planes appear polished or glossy sometimes striated
Blocky	Cohesive soil that can be broken down into small angular lumps which resist further breakdown
Lensed	Inclusion of small pockets of different soils, such as small lenses of sand scattered through a mass of clay
Homogeneous	Same color and appearance throughout

KEY TO TERMS AND SYMBOLS USED ON BORING LOGS

Hardness Classification of Intact Rock

Class	Hardness	Field Test	Approximate Range of Uniaxial Compression Strength kg/cm² (tons/ft²)
I	Extremely hard	Many blows with geologic hammer required to break intact specimen.	> 2,000
II	Very hard	Hand held specimen breaks with hammer end of pick under more than one blow.	2,000 – 1,000
III	Hard	Cannot be scraped or pealed with knife, hand held specimen can be broken with single moderate blow with pick.	1,000 – 500
IV	Soft	Can just be scraped or peeled with knife. Indentations 1mm to 3mm show in specimen with moderate blow with pick.	500 – 250
V	Very soft	Material crumbles under moderate blow with sharp end of pick and can be peeled with a knife, but is too hard to hand-trim for triaxial test specimen.	250 – 10

Rock Weathering Classifications

Grade	Symbol	Diagnostic Features
Fresh	F	No visible sign of Decomposition or discoloration. Rings under hammer impact.
Slightly Weathered	WS	Slight discoloration inwards from open fractures, otherwise similar to F.
Moderately Weathered	WM	Discoloration throughout. Weaker minerals such as feldspar decomposed. Strength somewhat less than fresh rock, but cores cannot be broken by hand or scraped by knife. Texture preserved.
Highly Weathered	WH	Most minerals somewhat decomposed. Specimens can be broken by hand with effort or shaved with knife. Core stones present in rock mass. Texture becoming indistinct, but fabric preserved.
Completely Weathered	WC	Minerals decomposed to soil, but fabric and structure preserved (Saprolite). Specimens easily crumbled or penetrated.
Residual Soil	RS	Advanced state of decomposition resulting in plastic soils. Rock fabric and structure completely destroyed. Large volume change.

Rock Discontinuity Spacing

Description for Structural Features: Bedding, Foliation, or Flow Banding	Spacing	Description for Joints, Faults or Other Fractures
Very thickly (bedded, foliated, or banded)	More than 6 feet	Very widely (fractured or jointed)
Thickly	2 – 6 feet	Widely
Medium	8 – 24 inches	Medium
Thinly	2½ – 8 inches	Closely
Very thinly	¾ – 2½ inches	Very closely
Description for Micro-Structural Features: Lamination, Foliation, or Cleavage	**Spacing**	**Descriptions for Joints, Faults, or Other Fractures**
Intensely (laminated, foliated, or cleaved)	¼ – ¾ inch	Extremely close
Very intensely	Less than ¼ inch	

Engineering Classification for in Situ Rock Quality

RQD %	Velocity Index	Rock Mass Quality
90 – 100	0.80 – 1.00	Excellent
75 – 90	0.60 – 0.80	Good
50 – 75	0.40 – 0.60	Fair
25 – 50	0.20 – 0.40	Poor
0 – 25	0 – 0.20	Very Poor

APPENDIX C: LABORATORY AND FIELD TEST PROCEDURES

FIELD AND LABORATORY EXPLORATION

The field exploration program included drilling at selected locations within the site and intermittently sampling the encountered materials. The boreholes were drilled using single flight auger (ASTM D 1452). Samples of encountered materials were obtained using a split-barrel sampler while performing the Standard Penetration Test (ASTM D 1586). The sample depth interval and type of sampler used is included on the soil boring log. Arias' field representative visually logged each recovered sample and placed a portion of the recovered sampled into a plastic bag for transport to our laboratory.

SPT N values and blow counts for those intervals where the sampler could not be advanced for the required 18-inch penetration are shown on the soil boring log. If the test was terminated during the 6-inch seating interval or after 10 hammer blows were applied used and no advancement of the sampler was noted, the log denotes this condition as blow count during seating penetration.

Arias performed soil mechanics laboratory tests on selected samples to aid in soil classification and to determine engineering properties. Tests commonly used in geotechnical exploration, the method used to perform the test, and the column designations on the boring log where data are reported are summarized as follows:

Test Name	Test Method	Log Designation
Water (moisture) content of soil and rock by mass	ASTM D 2216	WC
Liquid limit, plastic limit, and plasticity index of soils	ASTM D 4318	PL, LL, PI
Amount of material in soils finer than the No. 200 sieve	ASTM D 1140	-200
Determining Sulfate Content in Soils	Tex-145-E	n/a

The laboratory results are reported on the soil boring logs.

APPENDIX D: ASFE INFORMATION – GEOTECHNICAL REPORT

Important Information about Your

Geotechnical Engineering Report

Subsurface problems are a principal cause of construction delays, cost overruns, claims, and disputes.

While you cannot eliminate all such risks, you can manage them. The following information is provided to help.

Geotechnical Services Are Performed for Specific Purposes, Persons, and Projects

Geotechnical engineers structure their services to meet the specific needs of their clients. A geotechnical engineering study conducted for a civil engineer may not fulfill the needs of a construction contractor or even another civil engineer. Because each geotechnical engineering study is unique, each geotechnical engineering report is unique, prepared *solely* for the client. No one except you should rely on your geotechnical engineering report without first conferring with the geotechnical engineer who prepared it. *And no one — not even you* — should apply the report for any purpose or project except the one originally contemplated.

Read the Full Report

Serious problems have occurred because those relying on a geotechnical engineering report did not read it all. Do not rely on an executive summary. Do not read selected elements only.

A Geotechnical Engineering Report Is Based on A Unique Set of Project-Specific Factors

Geotechnical engineers consider a number of unique, project-specific factors when establishing the scope of a study. Typical factors include: the client's goals, objectives, and risk management preferences; the general nature of the structure involved, its size, and configuration; the location of the structure on the site; and other planned or existing site improvements, such as access roads, parking lots, and underground utilities. Unless the geotechnical engineer who conducted the study specifically indicates otherwise, do not rely on a geotechnical engineering report that was:

- not prepared for you,
- not prepared for your project,
- not prepared for the specific site explored, or
- completed before important project changes were made.

Typical changes that can erode the reliability of an existing geotechnical engineering report include those that affect:

- the function of the proposed structure, as when it's changed from a parking garage to an office building, or from a light industrial plant to a refrigerated warehouse,
- elevation, configuration, location, orientation, or weight of the proposed structure,
- composition of the design team, or
- project ownership.

As a general rule, *always* inform your geotechnical engineer of project changes—even minor ones—and request an assessment of their impact. *Geotechnical engineers cannot accept responsibility or liability for problems that occur because their reports do not consider developments of which they were not informed.*

Subsurface Conditions Can Change

A geotechnical engineering report is based on conditions that existed at the time the study was performed. *Do not rely on a geotechnical engineering report* whose adequacy may have been affected by: the passage of time; by man-made events, such as construction on or adjacent to the site; or by natural events, such as floods, earthquakes, or groundwater fluctuations. *Always* contact the geotechnical engineer before applying the report to determine if it is still reliable. A minor amount of additional testing or analysis could prevent major problems.

Most Geotechnical Findings Are Professional Opinions

Site exploration identifies subsurface conditions only at those points where subsurface tests are conducted or samples are taken. Geotechnical engineers review field and laboratory data and then apply their professional judgment to render an opinion about subsurface conditions throughout the site. Actual subsurface conditions may differ—sometimes significantly—from those indicated in your report. Retaining the geotechnical engineer who developed your report to provide construction observation is the most effective method of managing the risks associated with unanticipated conditions.

A Report's Recommendations Are *Not* Final

Do not overrely on the construction recommendations included in your report. *Those recommendations are not final,* because geotechnical engineers develop them principally from judgment and opinion. Geotechnical engineers can finalize their recommendations only by observing actual

subsurface conditions revealed during construction. *The geotechnical engineer who developed your report cannot assume responsibility or liability for the report's recommendations if that engineer does not perform construction observation.*

A Geotechnical Engineering Report Is Subject to Misinterpretation

Other design team members' misinterpretation of geotechnical engineering reports has resulted in costly problems. Lower that risk by having your geotechnical engineer confer with appropriate members of the design team after submitting the report. Also retain your geotechnical engineer to review pertinent elements of the design team's plans and specifications. Contractors can also misinterpret a geotechnical engineering report. Reduce that risk by having your geotechnical engineer participate in prebid and preconstruction conferences, and by providing construction observation.

Do Not Redraw the Engineer's Logs

Geotechnical engineers prepare final boring and testing logs based upon their interpretation of field logs and laboratory data. To prevent errors or omissions, the logs included in a geotechnical engineering report should *never* be redrawn for inclusion in architectural or other design drawings. Only photographic or electronic reproduction is acceptable, *but recognize that separating logs from the report can elevate risk.*

Give Contractors a Complete Report and Guidance

Some owners and design professionals mistakenly believe they can make contractors liable for unanticipated subsurface conditions by limiting what they provide for bid preparation. To help prevent costly problems, give contractors the complete geotechnical engineering report, *but* preface it with a clearly written letter of transmittal. In that letter, advise contractors that the report was not prepared for purposes of bid development and that the report's accuracy is limited; encourage them to confer with the geotechnical engineer who prepared the report (a modest fee may be required) and/or to conduct additional study to obtain the specific types of information they need or prefer. A prebid conference can also be valuable. *Be sure contractors have sufficient time* to perform additional study. Only then might you be in a position to give contractors the best information available to you, while requiring them to at least share some of the financial responsibilities stemming from unanticipated conditions.

Read Responsibility Provisions Closely

Some clients, design professionals, and contractors do not recognize that geotechnical engineering is far less exact than other engineering disciplines. This lack of understanding has created unrealistic expectations that have led to disappointments, claims, and disputes. To help reduce the risk of such outcomes, geotechnical engineers commonly include a variety of explanatory provisions in their reports. Sometimes labeled "limitations" many of these provisions indicate where geotechnical engineers' responsibilities begin and end, to help others recognize their own responsibilities and risks. *Read these provisions closely.* Ask questions. Your geotechnical engineer should respond fully and frankly.

Geoenvironmental Concerns Are Not Covered

The equipment, techniques, and personnel used to perform a *geoenvironmental* study differ significantly from those used to perform a *geotechnical* study. For that reason, a geotechnical engineering report does not usually relate any geoenvironmental findings, conclusions, or recommendations; e.g., about the likelihood of encountering underground storage tanks or regulated contaminants. *Unanticipated environmental problems have led to numerous project failures.* If you have not yet obtained your own geoenvironmental information, ask your geotechnical consultant for risk management guidance. *Do not rely on an environmental report prepared for someone else.*

Obtain Professional Assistance To Deal with Mold

Diverse strategies can be applied during building design, construction, operation, and maintenance to prevent significant amounts of mold from growing on indoor surfaces. To be effective, all such strategies should be devised for the *express purpose* of mold prevention, integrated into a comprehensive plan, and executed with diligent oversight by a professional mold prevention consultant. Because just a small amount of water or moisture can lead to the development of severe mold infestations, a number of mold prevention strategies focus on keeping building surfaces dry. While groundwater, water infiltration, and similar issues may have been addressed as part of the geotechnical engineering study whose findings are conveyed in this report, the geotechnical engineer in charge of this project is not a mold prevention consultant; ***none of the services performed in connection with the geotechnical engineer's study were designed or conducted for the purpose of mold prevention. Proper implementation of the recommendations conveyed in this report will not of itself be sufficient to prevent mold from growing in or on the structure involved.***

Rely, on Your ASFE-Member Geotechncial Engineer for Additional Assistance

Membership in ASFE/The Best People on Earth exposes geotechnical engineers to a wide array of risk management techniques that can be of genuine benefit for everyone involved with a construction project. Confer with your ASFE-member geotechnical engineer for more information.

ASFE
The Best People on Earth

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APPENDIX E: PROJECT QUALITY ASSURANCE

A Message to Owners

Construction materials engineering and testing (CoMET) consultants perform quality-assurance (QA) services to evaluate the degree to which constructors are achieving the specified conditions they're contractually obligated to achieve. Done right, QA can save you time and money; prevent unanticipated-conditions claims, change orders, and disputes; and reduce short-term and long-term risks, especially by detecting molehills before they grow into mountains.

Done right, QA can save you time and money; prevent claims and disputes; and reduce risks. Many owners don't do QA right because they follow bad advice.

Many owners don't do QA right because they follow bad advice; e.g., "CoMET consultants are all the same. They all have accredited facilities and certified personnel. Go with the low bidder." But there's no such thing as a standard QA scope of service, meaning that – to bid low – each interested firms *must* propose the cheapest QA service it can live with, jeopardizing service quality and aggravating risk for the entire project team. Besides, the advice is based on misinformation.

Fact: ***Most CoMET firms are not accredited***, and the quality of those that are varies significantly. Accreditation – which is important – nonetheless means that a facility met an accrediting body's minimum criteria. Some firms practice at a much higher level; others just barely scrape by. And what an accrediting body typically evaluates – management, staff, facilities, and equipment – can change substantially before the next review, two, three, or more years from now.

Most CoMET firms are not accredited. It's dangerous to assume CoMET personnel are certified.

Fact: ***It's dangerous to assume CoMET personnel are certified.*** Many have no credentials at all; some are certified by organizations of questionable merit, while others have a valid certification, but *not* for the services they're assigned.

Some CoMET firms – the "low-cost providers" – *want* you to believe that price is the only difference between QA providers. It's not, of course. Firms that sell low price typically lack the facilities, equipment, personnel, and insurance quality-oriented firms invest in to achieve the reliability concerned owners need to achieve quality in quality assurance.

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Firms that sell low price typically lack the facilities, equipment, personnel, and insurance quality-oriented firms invest in to achieve the reliability concerned owners need to achieve quality in quality assurance.

To derive maximum value from your investment in QA, require the CoMET firm's project manager to serve actively on the project team from beginning to end, a level of service that's relatively inexpensive and can pay huge dividends. During the project's planning and design stages, experienced CoMET professionals can help the design team develop uniform technical specifications and establish appropriate observation, testing, and instrumentation procedures and protocols. They can also analyze plans and specs much as constructors do, looking for the little errors, omissions, conflicts, and ambiguities that often become the basis for big extras and big claims. They can provide guidance about operations that need closer review than others, because of their criticality or potential for error or abuse. They can also relate their experience with the various constructors that have expressed interest in your project.

To derive maximum value, require the project manager to serve actively on the project team from beginning to end.

CoMET consultants' construction-phase QA services focus on two distinct issues: those that relate to geotechnical engineering and those that relate to the other elements of construction.

The geotechnical issues are critically important because they are essential to the "observational method" geotechnical engineers use to significantly reduce the amount of sampling they'd otherwise require. They apply the observational method by developing a sampling plan for a project, and then assigning field representatives to ensure samples are properly obtained, packaged, and transported. The engineers review the samples and, typically, have them tested in their own laboratories. They use the information they derive to characterize the site's subsurface and develop *preliminary* recommendations for the structure's foundations and for the specifications of various "geo" elements, like excavations, site grading, foundation-bearing grades, and roadway and parking-lot preparation and surfacing.

Geotechnical engineers cannot finalize their recommendations until they or their field representatives are on site to observe what's excavated to verify that the subsurface conditions the engineers predicted are those that actually exist.

When unanticipated conditions are observed, recommendations and/or specifications should be modified.

Responding to client requests, many geotechnical-engineering firms have expanded their field-services mix, so they're able to perform overall construction QA, encompassing – in addition to geotechnical issues – reinforced concrete, structural steel, welds, fireproofing, and so on. Unfortunately, that's caused some confusion. Believing that all CoMET consultants are alike, some owners take bids for the overall CoMET package, including the geotechnical field observation. *Entrusting geotechnical field observation to someone other than the geotechnical engineer of record (GER) creates a significant risk.*

Geotechnical engineers cannot finalize their recommendations until they are on site to verify that the subsurface conditions they predicted are those that actually exist. Entrusting geotechnical field observation to someone other than the geotechnical engineer of record (GER) creates a significant risk.

GERs have developed a variety of protocols to optimize the quality of their field-observation procedures. Quality-focused GERs meet with their field representatives before they leave for a project site, to brief them on what to look for and where, when, and how to look. (***No one can duplicate this briefing***, because no one else knows as much about a project's geotechnical issues.) And once they arrive at a project site, the field representatives know to maintain timely, effective communication with the GER, because that's what the GER has trained them to do. By contrast, it's extremely rare for a different firm's field personnel to contact the GER, even when they're concerned or confused about what they observe, because they regard the GER's firm as "the competition."

Divorcing the GER from geotechnical field operations is almost always penny-wise and pound-foolish. Still, because owners are given bad advice, it's commonly done, helping to explain why ***"geo" issues are the number-one source of construction-industry claims and disputes.***

Divorcing the GER from geotechnical field operations is almost always penny-wise and pound-foolish, helping to explain why "geo" issues are the number-one source of construction-industry claims and disputes.

To derive the biggest bang for the QA buck, identify three or even four quality-focused CoMET consultants. (If you don't know any, use the "Find a Geoprofessional" service available free at www.asfe.org.) Ask about the firms' ongoing and recent projects and the clients and client representatives involved; *insist upon receiving verification of all claimed accreditations, certifications, licenses, and insurance coverages.*

Insist upon receiving verification of all claimed accreditations, certifications, licenses, and insurance coverages.

Once you identify the two or three most qualified firms, meet with their representatives, preferably at their own facility, so you can inspect their laboratory, speak with management and technical staff, and form an opinion about the firm's capabilities and attitude.

Insist that each firm's designated project manager participate in the meeting. You will benefit when that individual is a seasoned QA professional familiar with construction's rough-and-tumble. Ask about others the firm will assign, too. There's no substitute for experienced personnel who are familiar with the codes and standards involved and know how to:

- read and interpret plans and specifications;
- perform the necessary observation, inspection, and testing;
- document their observations and findings;
- interact with constructors' personnel; and
- respond to the unexpected.

Important: Many of the services CoMET QA field representatives perform – like observing operations and outcomes – require the good judgment afforded by extensive training and experience, especially in situations where standard operating procedures do not apply. You need to know who will be exercising that judgment: a 15-year "veteran" or a rookie?

Many of the services CoMET QA field representatives perform require good judgment.

Also consider the tools CoMET personnel use. Some firms are passionate about proper calibration; others, less so. Passion is a good thing! Ask to see the firm's calibration records. If the firm doesn't have any, or if they are not current, be cautious. *You cannot trust test results derived using equipment that may be out of calibration.* Also ask a firm's representatives about their reporting practices, including report distribution, how they handle notifications of nonconformance, and how they resolve complaints.

Scope flexibility is needed to deal promptly with the unanticipated.

For financing purposes, some owners require the constructor to pay for CoMET services. ***Consider an alternative approach*** so you don't convert the constructor into the CoMET consultant's client. If it's essential for you to fund QA via the constructor, have the CoMET fee included as an allowance in the bid documents. This arrangement ensures that you remain the CoMET consultant's client, and it prevents the CoMET fee from becoming part of the constructor's bid-price competition. (Note that the International Building Code (IBC) *requires the owner to pay* for Special Inspection (SI) services commonly performed by the CoMET consultant as a service separate from QA, to help ensure the SI services' integrity. Because failure to comply could result in denial of an occupancy or use permit, having a contractual agreement that conforms to the IBC mandate is essential.)

If it's essential for you to fund QA via the constructor, have the CoMET fee included as an allowance in the bid documents. Note, too, that the International Building Code (IBC) requires the owner to pay for Special Inspection (SI) services.

CoMET consultants can usually quote their fees as unit fees, unit fees with estimated total (invoiced on a unit-fee basis), or lump-sum (invoiced on a percent-completion basis referenced to a schedule of values). No matter which method is used, estimated quantities need to be realistic. Some CoMET firms lower their total-fee estimates by using quantities they know are too low and then request change orders long before QA is complete.

Once you and the CoMET consultant settle on the scope of service and fee, enter into a written contract. Established CoMET firms have their own contracts; most owners sign them. Some owners prefer to use different contracts, but that can be a mistake when the contract was prepared for construction services. *Professional services are different.* Wholly avoidable problems occur when a contract includes provisions that don't apply to the services involved and fail to include those that do.

Some owners create wholly avoidable problems by using a contract prepared for construction services.

This final note: CoMET consultants perform QA for owners, not constructors. While constructors are commonly allowed to review QA reports as a *courtesy*, you need to make it clear that constructors do *not* have a legal right to rely on those reports; i.e., if constructors want to forgo their own observation and testing and rely on results derived from a scope created to meet *only* the needs of the owner, they *must do so at their own risk*. In all too many cases where owners have not made that clear, some constructors have alleged that they did have a legal right to rely on QA reports and, as a result, the CoMET consultant – not they – are responsible for their failure to deliver what they contractually promised to provide. The outcome can be delays and disputes that entangle you and all other principal project participants. Avoid that. Rely on a CoMET firm that possesses the resources and attitude needed to manage this and other risks as an element of a quality-focused service. Involve the firm early. Keep it engaged. And listen to what the CoMET consultant says. A good CoMET consultant can provide great value.

For more information, speak with your ASFE-Member CoMET consultant or contact ASFE directly.

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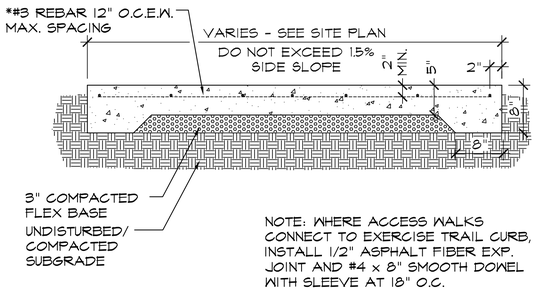
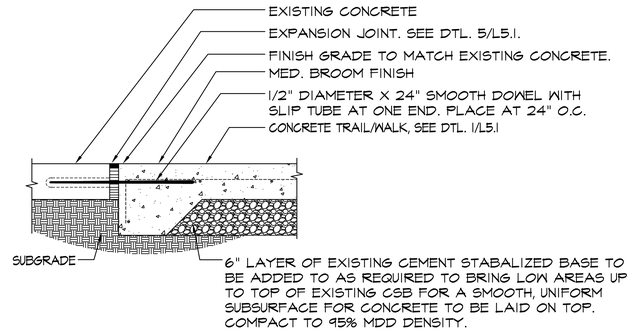
RFI #004

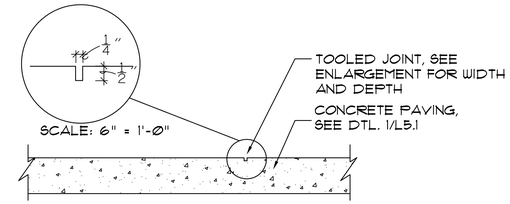
Attachment 2



1 CONCRETE SIDEWALK
SCALE: 1"=1'-0"

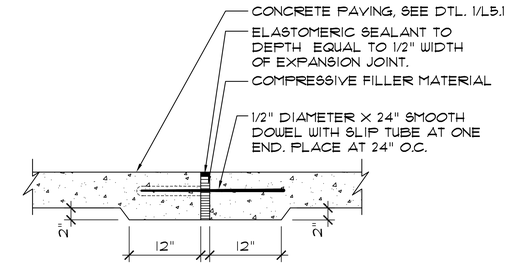


2 NEW CONCRETE @ EXISTING CONCRETE
SCALE: 1"=1'-0"

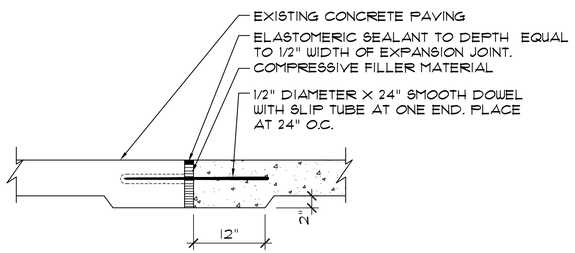


NOTE:
1. LOCATE CONTROL JOINTS THROUGHOUT CONCRETE PAVING AT SPACING NOT TO EXCEED WIDTH OF WALK. SPACE CONTRACTION JOINTS EQUIDISTANT BETWEEN EXPANSION JOINTS OR AS INDICATED ON PLAN. MAXIMUM SPACING BETWEEN EXPANSION JOINTS SHALL NOT BE MORE THAN 30' O.C. SPACING TO BE COORDINATED WITH WIDTH OF PAVING

3 TOOLED CONTROL JOINT
SCALE: 1"=1'-0"



4 EXPANSION JOINT
SCALE: 1"=1'-0"

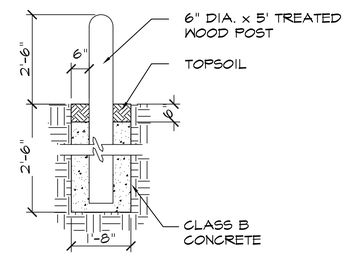


5 EXPANSION JOINT @ EXISTING CONCRETE
SCALE: 1"=1'-0"

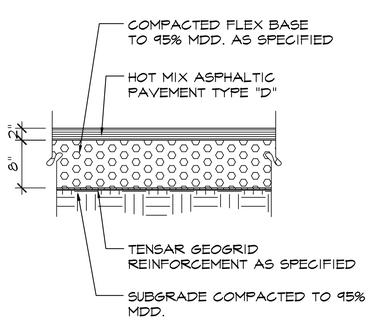
NOT USED

6 POST AND CABLE FENCE
SCALE: 1/2"=1'-0"

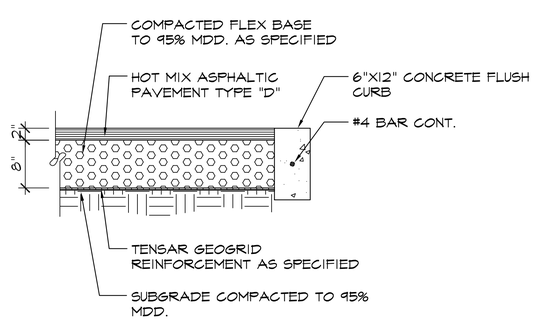
7



7 BOLLARD POST
SCALE: 1/2"=1'-0"

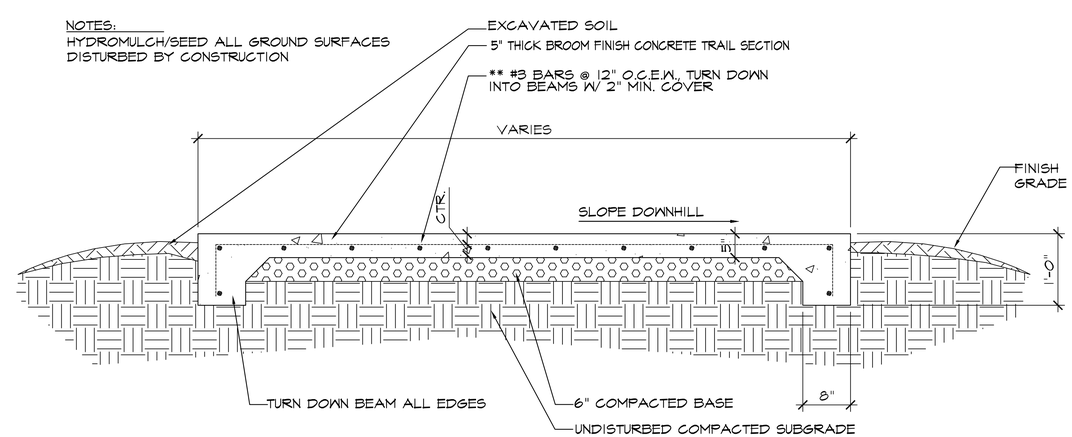


8 ASPHALT TRAIL
SCALE: 1"=1'-0"



9 ASPHALT TRAIL W/ FLUSH CURB
SCALE: 1"=1'-0"

NOTES:
HYDROMULCH/SEED ALL GROUND SURFACES DISTURBED BY CONSTRUCTION



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STATE OF TEXAS
ALBERT B. FERNANDEZ
1218
REGISTERED LANDSCAPE ARCHITECT
03/11/2015

CITY OF SAN ANTONIO 2012-2017 BOND PROGRAM
MCALLISTER PARK IMPROVEMENTS
WBS NO. 40-00375
13102 Jones Maltsberger Rd, San Antonio, TX 78247

CITY OF SAN ANTONIO
TRANSPORTATION & CAPITAL IMPROVEMENTS

DRAWN: SDT
CHECKED: ABF
DATE: 03-11-15
JOB NO. 12-783
REVISIONS :
5 02/16/15 ADDENDUM NO. 5
7 03/11/15 ADDENDUM NO. 7

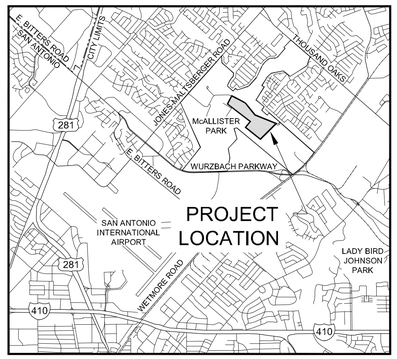
SHEET TITLE
HARDSCAPE DETAILS

SHEET NO.
L5.1
SHEET ____ OF ____

FILE: L5.DWG DATE:

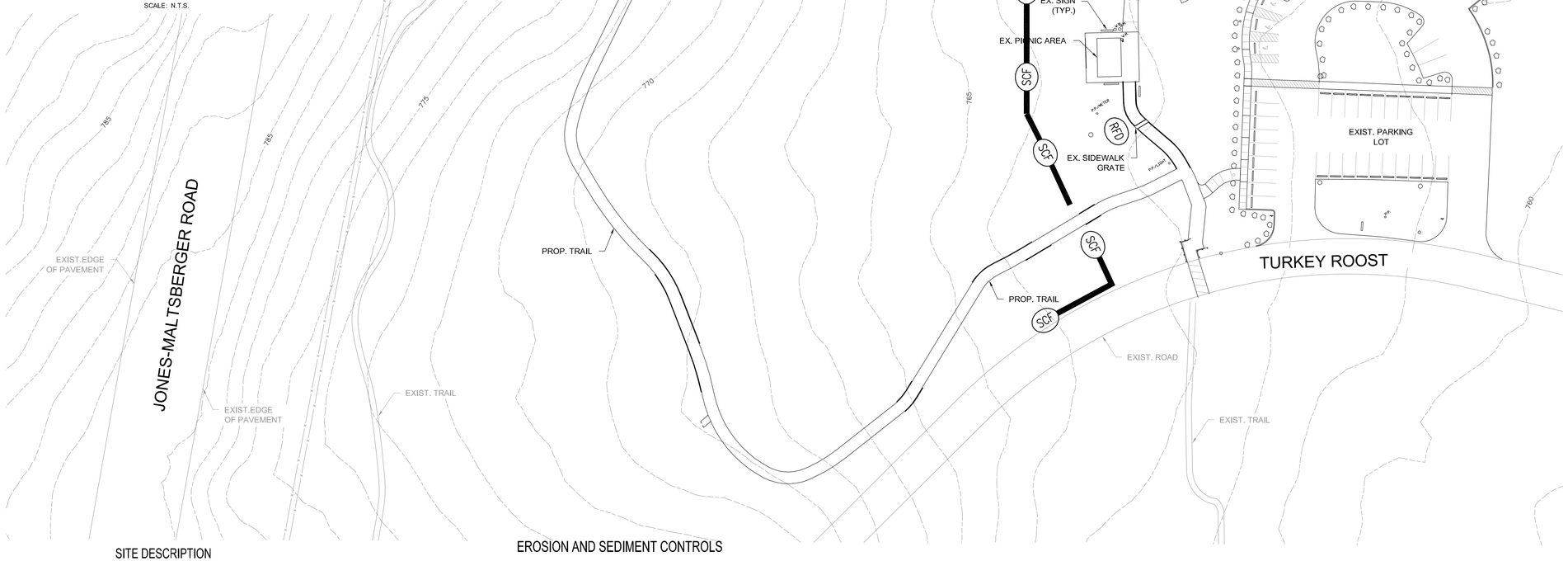
ADDENDUM #7

Attachment 3



LOCATION MAP

SCALE: N.T.S.



EROSION AND SEDIMENT CONTROLS

PREPARED BY:

BAIN MEDINA BAIN, INC.
ENGINEERS & SURVEYORS
7073 San Pedro Avenue
San Antonio, Texas 78216
210/494-7223
TBPE Registration No. F-1712
TBPLS Registration No. 10020900

40 0 20 40 80

SCALE: 1" = 40'

LEGEND

- EXISTING POWER POLE, LIGHT POLE
- EXISTING GUY WIRE
- EXISTING GUARD POST
- EXISTING TREE
- EXISTING SIGN
- EXISTING TRASH CAN
- EXISTING SANITARY SEWER CLEAN-OUT
- EXISTING SANITARY SEWER MANHOLE
- EXISTING WIRE FENCE
- 673 EXISTING CONTOURS
- EXISTING LOT LINES
- I.V. EXISTING IRRIGATION CONTROL VALVE
- 732.32 EXISTING ELEVATIONS
- FLOW ARROWS
- SCF SILT CONTROL FENCE
- RFD ROCK FILTER DAM

SITE DESCRIPTION

PROJECT LIMITS: McALLISTER PARK . 13102 JONES-MALTSBERGER

PROJECT DESCRIPTION: CONSTRUCTION OF VARIOUS PARKING LOTS, PAVILIONS, AND TRAIL RECONSTRUCTION

MAJOR SOIL DISTURBING ACTIVITIES: SOIL DISTURBING ACTIVITIES WILL INCLUDE PREPARING SITE CLEARING, GRUBBING AND EXCAVATION, PARKING LOT, AND CONCRETE PAVEMENT, EROSION AND SEDIMENT CONTROLS TO BE INSTALLED.

TOTAL PROJECT AREA: 984 ACRES

TOTAL AREA TO BE DISTURBED: 4.83 ACRES (0.50%)

WEIGHTED RUNOFF COEFFICIENT (AFTER CONSTRUCTION): 0.96

EXISTING CONDITION OF SOIL & VEGETATIVE COVER AND % OF EXISTING VEGETATIVE COVER: PATRICK SOILS (PaB), 1-3% SLOPES RARELY FLOODED

NAME OF RECEIVING WATERS: SALADO CREEK

SOIL STABILIZATION PRACTICES:

- ___ TEMPORARY SEEDING
- X PERMANENT PLANTING, SODDING, OR SEEDING
- ___ MULCHING
- ___ SOIL RETENTION BLANKET
- X BUFFER ZONES
- X PRESERVATION OF NATURAL RESOURCES

OTHER: Disturbed areas on which constructionhas ceased (TGMD or PERM) shall be stabilized within 14 days unless activities are scheduled to resume and do within 21 days

STRUCTURAL PRACTICES:

- X SILT FENCES
- ___ HAY BALES
- ___ ROCK BERMS
- ___ DIVERSION, INTERCEPTOR, OR PERIMETER DIKES
- ___ DIVERSION DIKE AND SWALE COMBINATIONS
- ___ PIPE SLOPE DRAINS
- ___ PAVED FLUMES
- ___ ROCK BEDDING AT CONSTRUCTION EXIT
- ___ TIMBER MATTING AT CONSTRUCTION EXIT
- ___ CHANNEL LINERS
- ___ SEDIMENT TRAPS
- ___ SEDIMENT BASINS
- ___ STORM INLET SEDIMENT TRAP
- ___ STONE OUTLET STRUCTURES
- ___ CURBS AND GUTTERS
- ___ STORM SEWERS
- ___ VELOCITY CONTROL DEVICES

NARRATIVE - SEQUENCE OF CONSTRUCTION (STORM WATER MANAGEMENT) ACTIVITIES:

The order of activities will be as follows:

1. Install controls.
2. Clear, grub and excavate.
3. Construct trail and picnic pads.
4. When all construction activity is complete and the site is stabilized and approved by the project engineer, remove all temporary structural controls and reseed any areas disturbed by their removal.
5. The contractor is responsible for implementing and maintaining the storm water pollution prevention plan.

STORM WATER MANAGEMENT: Storm water drainage will be conveyed by paved area.

NON-STORM WATER DISCHARGE: None.

OTHER EROSION AND SEDIMENT CONTROLS:

MAINTENANCE: All erosion and sediment controls will be maintained in good working order. If a repair is necessary, it will be done at the earliest date possible, but no later than 7 calendar days after the surrounding exposed ground has dried sufficiently to prevent further damage from heavy equipment. The areas adjacent to creeks and drainageways shall have priority followed by devices protecting storm sewer inlets.

INSPECTION: An inspection will be performed by a CITY inspector every week as well as after every half inch or more of rain (as recorded on a non-freezing rain gauge to be located at the Project Site). An Inspection and Maintenance Report will be made per each Inspection. Based on the Inspection results, the controls shall be revised per the Inspection report.

WASTE MATERIALS: All waste materials will be collected and stored in a securely lidded metal dumpster. The dumpster will meet all state and local city solid waste management regulations. All trash and construction debris from the site will be deposited in the dumpster. The dumpster will be emptied as necessary or as required by local regulations and the trash will be hauled to a local dump. No construction waste material will be buried on site.

HAZARDOUS WASTE (INCLUDING SPILL REPORTING): At a minimum, any products in the following categories are considered to be hazardous: paints, acids for cleaning, masonry surfaces, cleaning solvents, asphalt products, chemical additives for soil stabilization or concrete curing compounds and additives. In the event of a hazardous material spill, the spill coordinator shall be contacted immediately.

SANITARY WASTE: All sanitary waste will be collected from portable units as necessary, or as required by local regulations by a Licensed Sanitary Waste Management Contractor.

OFFSITE VEHICLE TRACKING:

- ___ HAUL ROADS DAMPENED FOR DUST CONTROL
- ___ LOADED HAUL TRUCKS TO BE COVERED WITH TARPAULIN
- X EXCESS DIRT ON ROAD REMOVED DAILY
- ___ STABILIZED CONSTRUCTION ENTRANCE

PERMITS:

REMARKS: Disposal areas, stockpiles, and haul roads shall be constructed in a manner that will minimize and control the amount of sediment that may enter receiving waters. Disposal areas shall not be located in any wetland, waterbody or streambed. Construction staging areas and vehicle maintenance areas shall be constructed by the Contractor in a manner to minimize the runoff of pollutants.

OWNERS CERTIFICATION

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

SIGNATURE DATE

CONTRACTOR'S CERTIFICATION

I certify under penalty of law that I understand the terms and conditions of the general National Pollutant Discharge Elimination System (NPDES) permit that authorizes the storm water discharges associated with industrial activity from the construction site identified as part of this certification plan.

SIGNATURE (CONTRACTOR) DATE

C•F•Z Group LLC
Engineers • Surveyors • Planners
Landscape Architecture & Planning
4242 Medical Drive, Suite 5200
San Antonio, Texas 78229
210-366-1911/210-366-0044 fax

CITY OF SAN ANTONIO 2012-2017 BOND PROGRAM
MCALLISTER PARK IMPROVEMENTS
WBS NO. 40-00375
13102 Jones Maltsberger Rd, San Antonio, TX 78247

CITY OF SAN ANTONIO
TRANSPORTATION & CAPITAL IMPROVEMENTS

DRAWN: ML
CHECKED: LC
DATE: 11/19/14
JOB NO. C-1381
REVISIONS :

SHEET TITLE

TURKEY ROOST TRAIL - STORM WATER POLLUTION PREVENTION PLAN

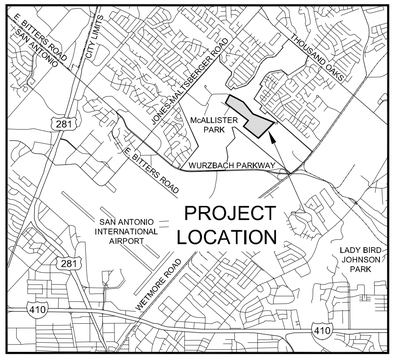
SHEET NO.

C-2.0

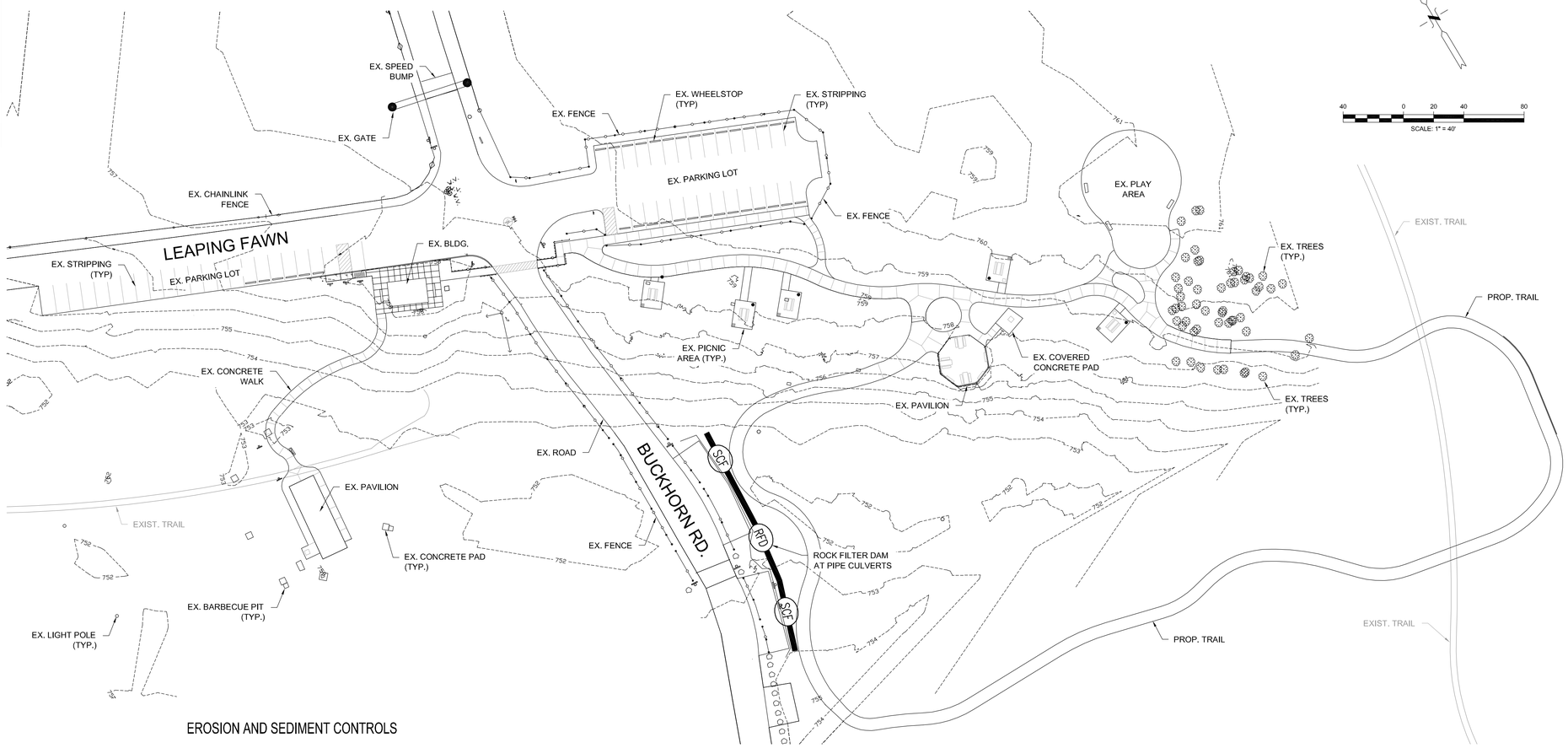
SHEET ____ OF ____

Date: Mar 11, 2015, 4:33pm User ID: LCarter
File: W:\Work\C-1381 CoSA Bond - McAllister Park\Design\Civil\Construction Documents\TURKEY ROOST TRAIL - SW3P.dwg

PREPARED BY:
BAIN MEDINA BAIN, INC.
ENGINEERS & SURVEYORS
7073 San Pedro Avenue
San Antonio, Texas 78216
210/494-7223
TBPE Registration No. F-1712
TBPLS Registration No. 10020900



LOCATION MAP
SCALE: N.T.S.



LEGEND

- EXISTING POWER POLE, LIGHT POLE
- EXISTING GUY WIRE
- EXISTING GUARD POST
- EXISTING TREE
- EXISTING SIGN
- EXISTING TRASH CAN
- EXISTING SANITARY SEWER CLEAN-OUT
- EXISTING SANITARY SEWER MANHOLE
- EXISTING WIRE FENCE
- EXISTING CONTOURS
- EXISTING LOT LINES
- I.V. EXISTING IRRIGATION CONTROL VALVE
- 730.32 EXISTING ELEVATIONS
- FLOW ARROWS
- SCF SILT CONTROL FENCE
- RFD ROCK FILTER DAM

EROSION AND SEDIMENT CONTROLS

SITE DESCRIPTION

PROJECT LIMITS: McALLISTER PARK . 13102 JONES-MALTSBERGER

PROJECT DESCRIPTION: CONSTRUCTION OF VARIOUS PARKING LOTS, PAVILIONS, AND TRAIL RECONSTRUCTION

MAJOR SOIL DISTURBING ACTIVITIES: SOIL DISTURBING ACTIVITIES WILL INCLUDE PREPARING SITE CLEARING, GRUBBING AND EXCAVATION, PARKING LOT, AND CONCRETE PAVEMENT. EROSION AND SEDIMENT CONTROLS TO BE INSTALLED.

TOTAL PROJECT AREA: 984 ACRES

TOTAL AREA TO BE DISTURBED: 4.83 ACRES (0.50%)

WEIGHTED RUNOFF COEFFICIENT (AFTER CONSTRUCTION): 0.96

EXISTING CONDITION OF SOIL & VEGETATIVE COVER AND % OF EXISTING VEGETATIVE COVER: PATRICK SOILS (PaB), 1-3% SLOPES RARELY FLOODED

NAME OF RECEIVING WATERS: SALADO CREEK

SOIL STABILIZATION PRACTICES:

- ___ TEMPORARY SEEDING
- ✓ PERMANENT PLANTING, SODDING, OR SEEDING
- ___ MULCHING
- ___ SOIL RETENTION BLANKET
- ___ BUFFER ZONES
- ✓ PRESERVATION OF NATURAL RESOURCES

OTHER: Disturbed areas on which constructionhas ceased (TGMD or PERM) shall be stabilized within 14 days unless activities are scheduled to resume and do within 21 days

STRUCTURAL PRACTICES:

- ✓ SILT FENCES
- ___ HAY BALES
- ___ ROCK BERMS
- ___ DIVERSION, INTERCEPTOR, OR PERIMETER DIKES
- ___ DIVERSION DIKE AND SWALE COMBINATIONS
- ___ PIPE SLOPE DRAINS
- ___ PAVED FLUMES
- ___ ROCK BEDDING AT CONSTRUCTION EXIT
- ___ TIMBER MATTING AT CONSTRUCTION EXIT
- ___ CHANNEL LINERS
- ___ SEDIMENT TRAPS
- ___ SEDIMENT BASINS
- ___ STORM INLET SEDIMENT TRAP
- ___ STONE OUTLET STRUCTURES
- ___ CURBS AND GUTTERS
- ___ STORM SEWERS
- ___ VELOCITY CONTROL DEVICES

NARRATIVE - SEQUENCE OF CONSTRUCTION (STORM WATER MANAGEMENT) ACTIVITIES:

The order of activities will be as follows:

1. Install controls.
2. Clear, grub and excavate.
3. Construct trail and picnic pads.
4. When all construction activity is complete and the site is stabilized and approved by the project engineer, remove all temporary structural controls and reseed any areas disturbed by their removal.
5. The contractor is responsible for implementing and maintaining the storm water pollution prevention plan.

STORM WATER MANAGEMENT: Storm water drainage will be conveyed by paved area.

NON-STORM WATER DISCHARGE: None.

OTHER EROSION AND SEDIMENT CONTROLS:

MAINTENANCE: All erosion and sediment controls will be maintained in good working order. If a repair is necessary, it will be done at the earliest date possible, but no later than 7 calendar days after the surrounding exposed ground has dried sufficiently to prevent further damage from heavy equipment. The areas adjacent to creeks and drainageways shall have priority followed by devices protecting storm sewer inlets.

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- ✓ EXCESS DIRT ON ROAD REMOVED DAILY
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PERMITS:

REMARKS: Disposal areas, stockpiles, and haul roads shall be constructed in a manner that will minimize and control the amount of sediment that may enter receiving waters. Disposal areas shall not be located in any wetland, waterbody or streambed. Construction staging areas and vehicle maintenance areas shall be constructed by the Contractor in a manner to minimize the runoff of pollutants.

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SIGNATURE DATE

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I certify under penalty of law that I understand the terms and conditions of the general National Pollutant Discharge Elimination System (NPDES) permit that authorizes the storm water discharges associated with industrial activity from the construction site identified as part of this certification plan.

SIGNATURE (CONTRACTOR) DATE

C•F•Z Group LLC
Civil • Structural • Zoning
Landscape Architecture & Planning
4242 Medical Drive, Suite 5200
San Antonio, Texas 78229
210-366-1911/210-366-0044 fax

CITY OF SAN ANTONIO 2012-2017 BOND PROGRAM
MCALLISTER PARK IMPROVEMENTS
WBS NO. 40-00375
13102 Jones Maltsberger Rd, San Antonio, TX 78247

CITY OF SAN ANTONIO
TRANSPORTATION & CAPITAL IMPROVEMENTS

DRAWN: ML
CHECKED: LC
DATE: 11/19/14
JOB NO. C-1381
REVISIONS :

SHEET TITLE
OPTIMIST TRAIL - STORM WATER POLLUTION PREVENTION PLAN

SHEET NO.
C-3.0

SHEET ____ OF ____

Date: Mar 11, 2015, 4:34pm User ID: LCarter
File: W:\Work\C-1381 CoSA Bond - McAllister Park\Design\Civil\Construction Documents\OPTIMIST TRAIL - SWSP.dwg

TURKEY ROOST TRAIL

TREE STAND DELINEATION

Total existing canopy on project site:	52,129 SF
80% Required to be protected:	41,703 SF
Existing canopy to be removed	184 SF
Total square footage of canopy to remain:	51,945 SF (99.6%)

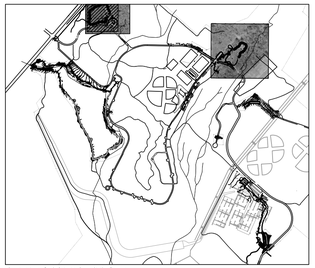
*1 heritage trees located on-site.
Tree #101

TREE CANOPY REQUIREMENTS

Total site square footage:	73,482 SF
25% Canopy required:	18,371 SF
Existing canopy to remain:	51,945 SF
Total canopy provided:	51,945 SF (70.7%)

KEYED NOTES

1. Demolish existing asphalt trail & remove base material.
2. Existing asphalt trail to remain
3. Existing concrete to remain
4. New 8' wide asphalt trail. See detail 8/L5.1.
5. New 8' wide asphalt trail w/ concrete curb. See detail 9/L5.1. See Site Plan for location of curb
6. Metal sidewalk grate. See detail 1/L5.7.



LOCATION MAP
NTS

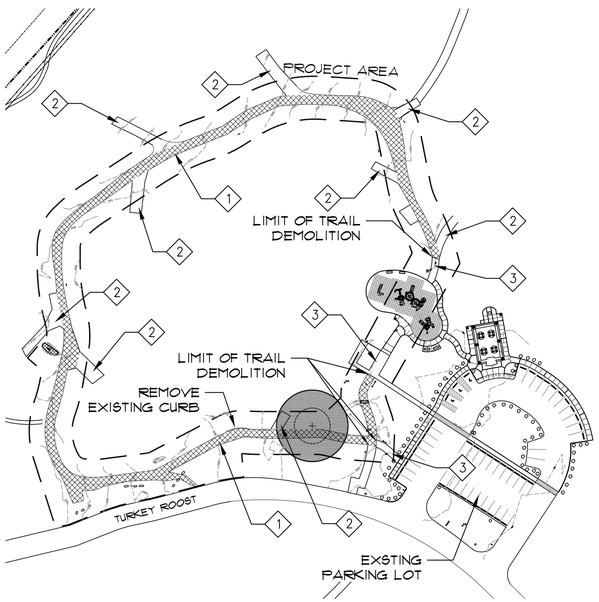
NOTES:
1. ALL BIDS SHALL INCLUDE UNIT PRICING FOR ALL PROJECT COMPONENTS. BIDS NOT INCLUDING UNIT PRICING MAY NOT BE ACCEPTED.
2. REFER TO SHEET L1.0, L2.0, L3.0 AND L4.0 FOR DEMOLITION, CONSTRUCTION, TREE PRESERVATION AND PLANTING NOTES.
3. CONTRACTOR SHALL FIELD VERIFY START/STOP POINTS OF TRAIL DEMOLITION/RECONSTRUCTION.
4. CONTRACTOR SHALL FIELD VERIFY START/STOP POINTS OF CONCRETE CURB ALONG TRAILS.
5. ALL DISTURBED AREAS SHALL BE RE-VEGETATED WITH SHADE SEED MIX.
6. NEW TRAILS SHALL HAVE POSITIVE DRAINAGE.

LEGEND

- ASPHALT TRAIL & BASE TO BE REMOVED
- PROPOSED ASPHALT TRAIL
- EXISTING TREES TO REMAIN
- EXISTING TREES TO BE REMOVED
- EXISTING HERITAGE TREE TO REMAIN
- PROJECT AREA

1 TREE PRESERVATION PLAN
1"=40'-0"

0 40 80 120
1'=40'-0"



2 DEMOLITION PLAN
1"=80'-0"

0 80 160 240
1'=80'-0"

C•F•Z Group LLC
Civil Engineers • Surveyors • Planners
Landscape Architecture & Planning
4242 Medical Drive, Suite 5200
San Antonio, Texas 78229
210-366-1911/210-366-0044 fax

STATE OF TEXAS
ALBERT B. FERNANDEZ, JR.
1218
REGISTERED LANDSCAPE ARCHITECT
2/23/2015

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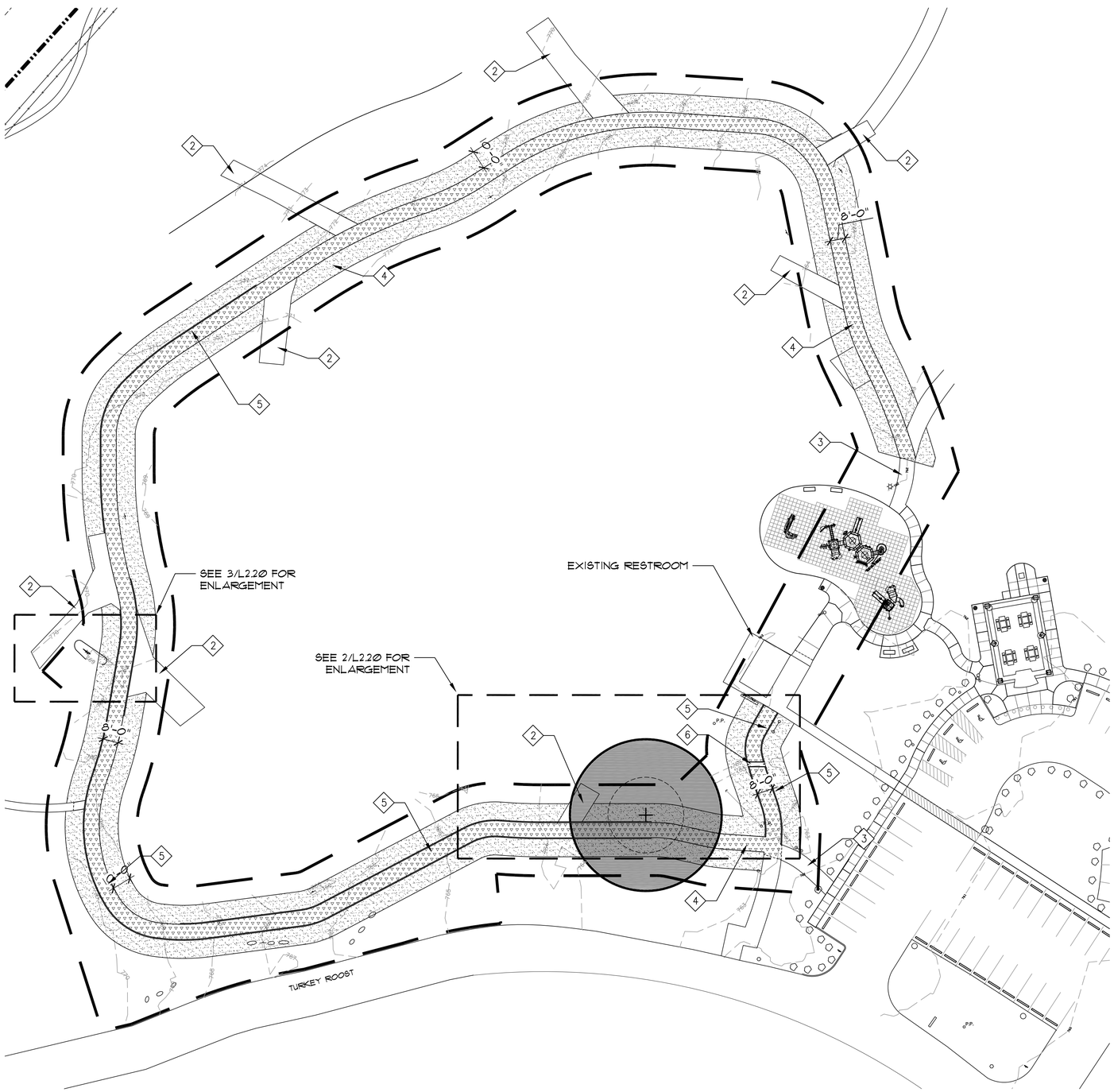
CITY OF SAN ANTONIO
TRANSPORTATION & CAPITAL IMPROVEMENTS

DRAWN: SDT
CHECKED: ABF
DATE: 02-23-15
JOB NO. 12-783
REVISIONS :

SHEET TITLE
ADD. ALTERNATE #1: TURKEY ROOST TRAIL

SHEET NO.
L2.19
SHEET ____ OF ____

FILE:
DATE:



1 SITE PLAN
1"=30'-0"

0 30 60 90
1'=30'-0"

KEYED NOTES

1. Demolish existing asphalt trail & remove base material.
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3. Existing concrete to remain
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5. New 8' wide asphalt trail w/ concrete curb. See detail 9/L5.1. See Site Plan for location of curb
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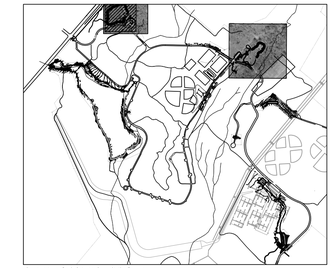

LOCATION MAP
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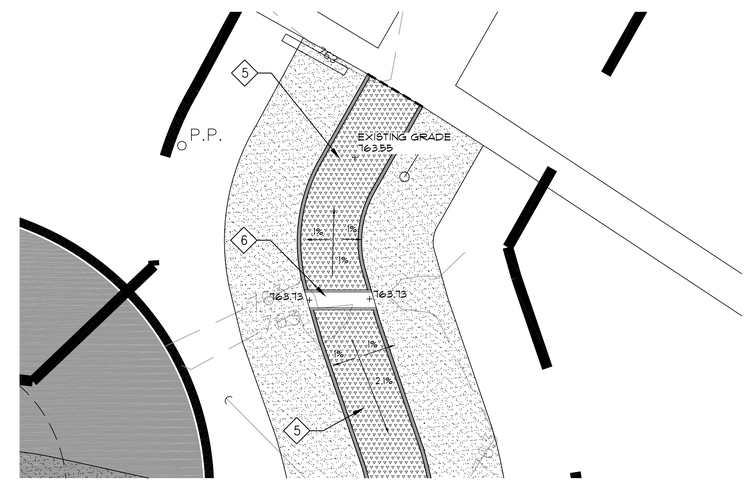
5. ALL DISTURBED AREAS SHALL BE RE-VEGETATED WITH SHADE SEED MIX.
6. NEW TRAILS SHALL HAVE POSITIVE DRAINAGE.

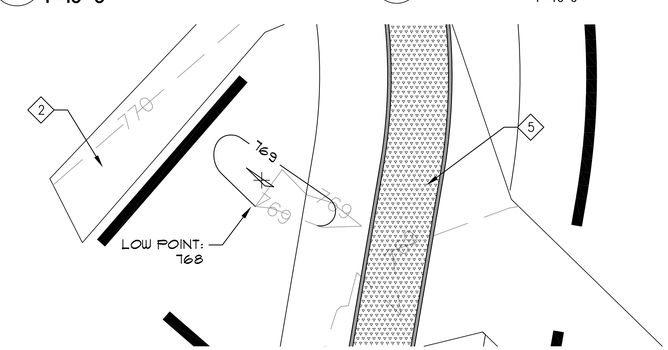
LEGEND

- PROPOSED ASPHALT TRAIL
- EXISTING HERITAGE TREE TO REMAIN
- PROJECT AREA
- EXISTING CONTOUR
- PROPOSED CONTOUR
- SHADE SEED MIX



2 ENALGED SITE PLAN
1"=10'-0"

0 10 20 30
1'=10'-0"



3 ENALGED SITE PLAN
1"=10'-0"

0 10 20 30
1'=10'-0"

C•F•Z Group LLC
Cultures • Forms • Zones
Landscape Architecture & Planning
4242 Medical Drive, Suite 5200
San Antonio, Texas 78229
210-366-1911/210-366-0044 fax

STATE OF TEXAS
ALBERT B. FERNANDEZ, JR.
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MCALLISTER PARK IMPROVEMENTS
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13102 Jones Maltsberger Rd, San Antonio, TX 78247

CITY OF SAN ANTONIO
TRANSPORTATION & CAPITAL IMPROVEMENTS

DRAWN: SDT
CHECKED: ABF
DATE: 02-23-15
JOB NO. 12-783
REVISIONS :

SHEET TITLE
ADD. ALTERNATE #1: TURKEY ROOST TRAIL

SHEET NO.
L2.20
SHEET ____ OF ____

FILE:
DATE:

OPTIMIST TRAIL

TREE STAND DELINEATION

Total existing canopy on project site:	28,939 SF
80% Required to be protected:	7,235 SF
Existing canopy to be removed	0 SF
Total square footage of canopy to remain:	28,939 SF (100%)

*6 heritage trees located on-site.
Tree #521, #581, #622, #635, #657, #687

TREE CANOPY REQUIREMENTS

Total site square footage:	32,072 SF
25% Canopy required:	8,018 SF
Existing canopy to remain:	28,939 SF
Total canopy provided:	28,939 SF (90%)

KEYED NOTES

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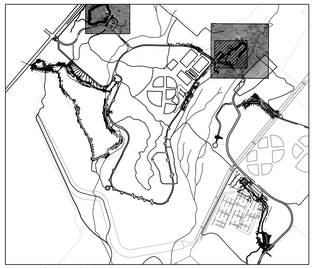

LOCATION MAP
NTS

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LEGEND

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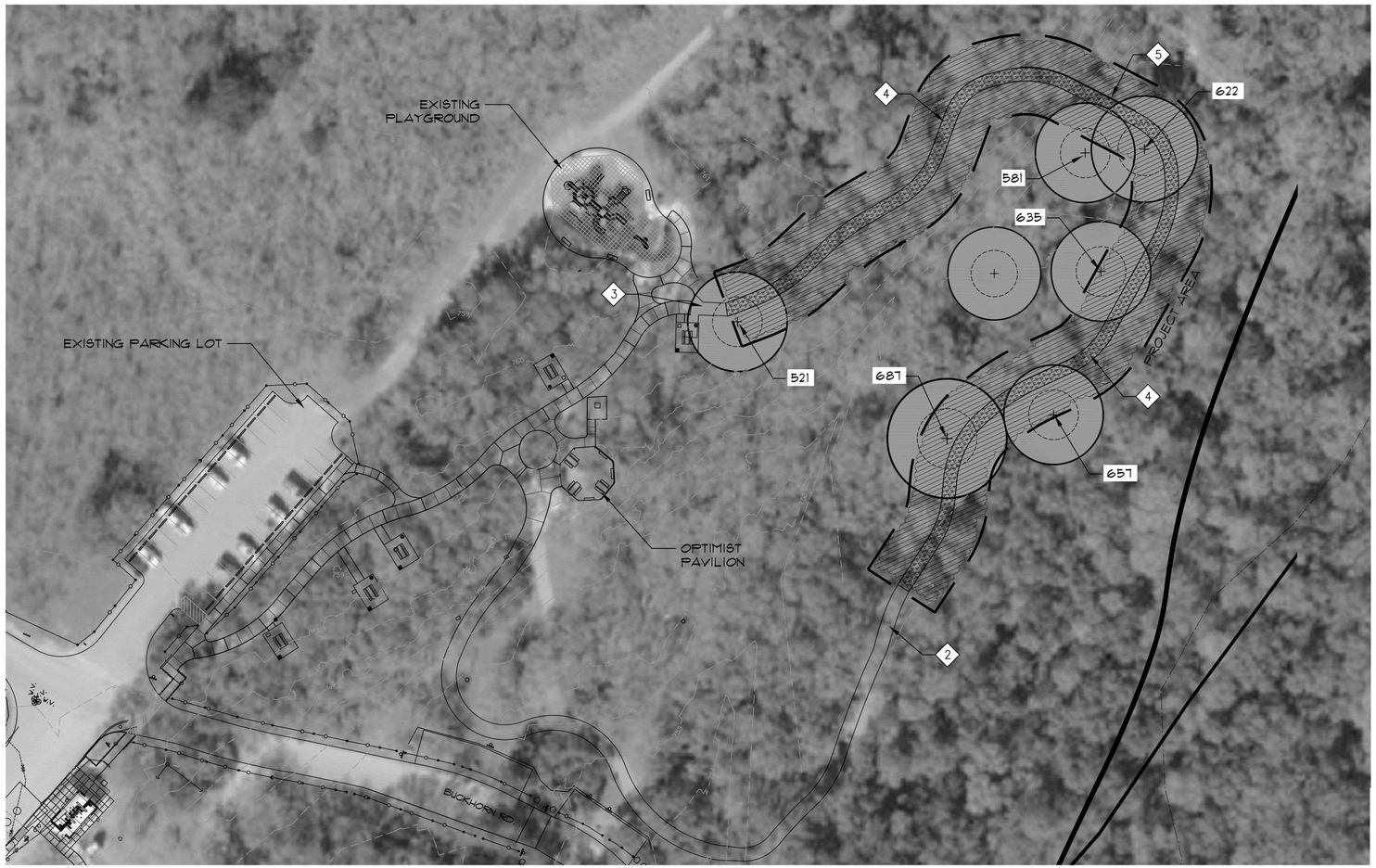
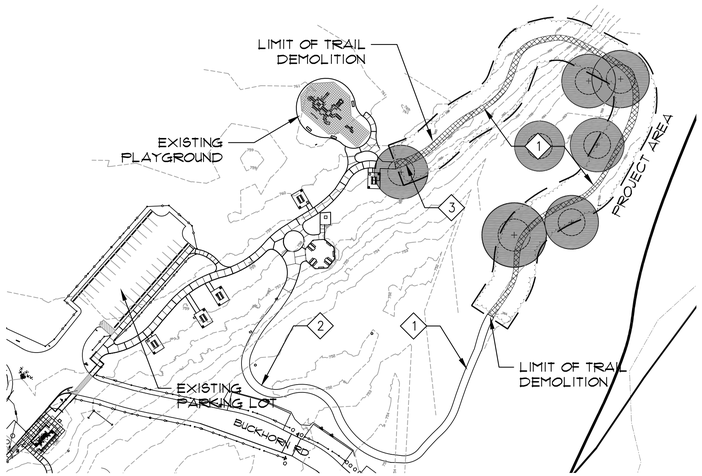
- PROPOSED ASPHALT TRAIL
- EXISTING TREES TO REMAIN
- EXISTING TREES TO BE REMOVED
- EXISTING HERITAGE TREE TO REMAIN
- PROJECT AREA
- EXISTING CONTOUR



1 SITE PLAN
1"=40'-0"



2 DEMOLITION PLAN
1"=80'-0"

FILE:

DATE:

C•F•Z Group LLC
Conservation • Recreation • Parks
Landscape Architecture & Planning
4242 Medical Drive, Suite 5200
San Antonio, Texas 78229
210-366-1911/210-366-0044 fax

STATE OF TEXAS
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CITY OF SAN ANTONIO
TRANSPORTATION & CAPITAL IMPROVEMENTS

DRAWN:	SDT
CHECKED:	ABF
DATE:	02-23-15
JOB NO.	12-783
REVISIONS :	

SHEET TITLE
ADD. ALTERNATE #2 OPTIMIST TRAIL

SHEET NO.
L2.21
SHEET ____ OF ____

NOTES:

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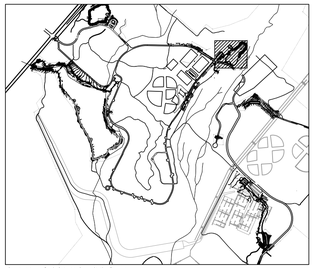

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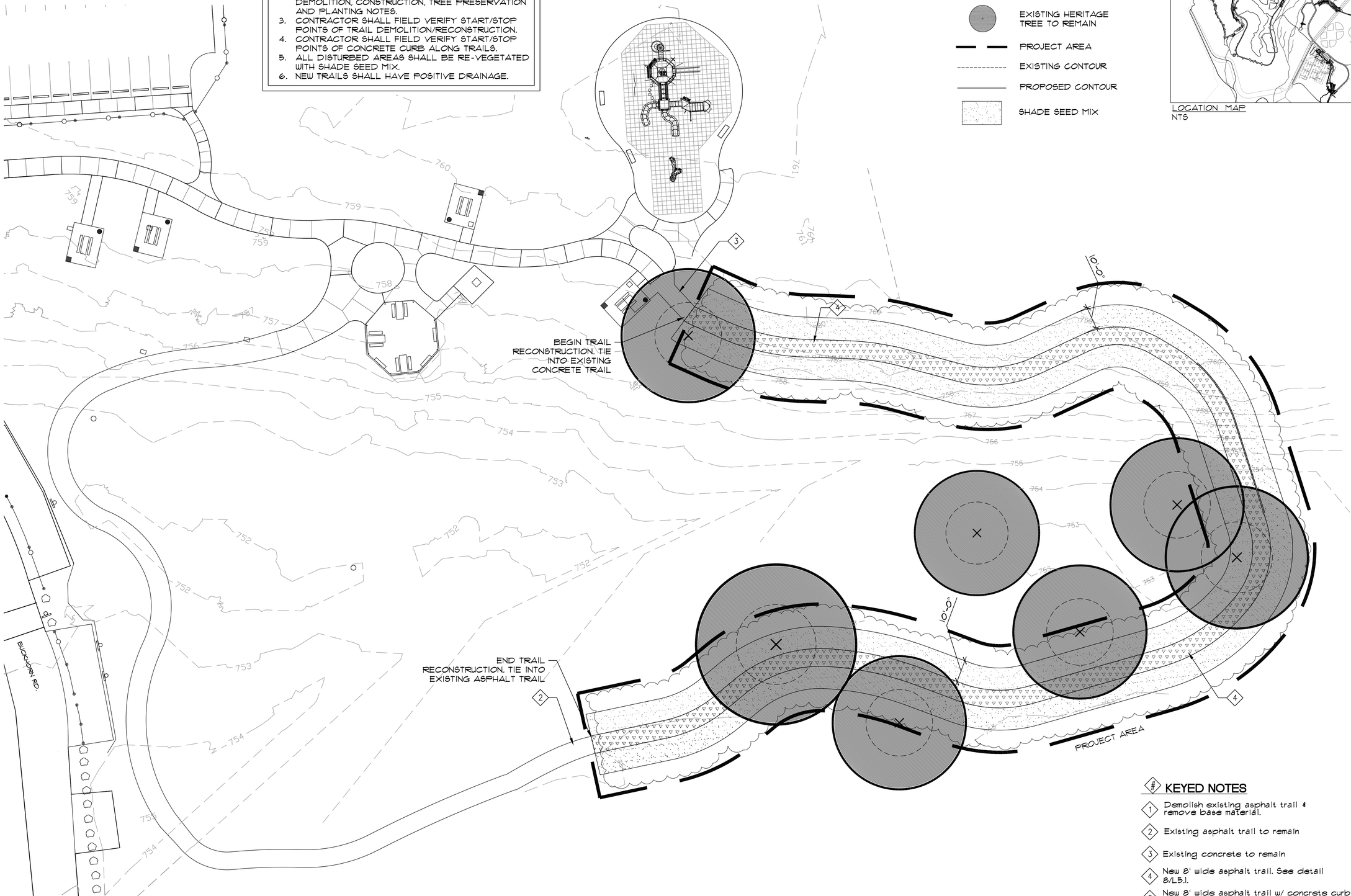
NTS



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6. Metal sidewalk grate. See detail 1/L5.7.

1 LANDSCAPE PLAN
1"=20'-0"

0 20 40 60
1'=20'-0"

C•F•Z Group LLC
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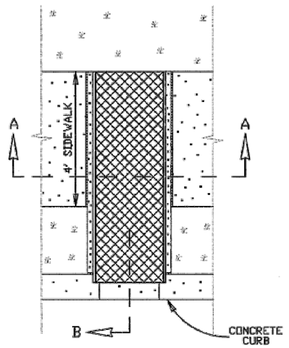
REVISIONS :	

SHEET TITLE
ADD. ALTERNATE #2 OPTIMIST TRAIL

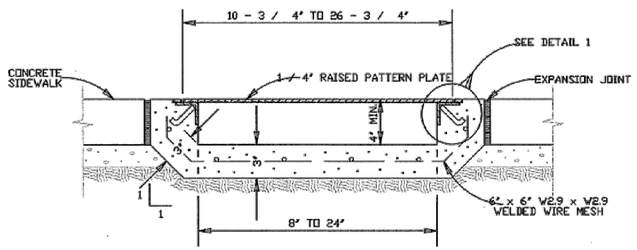
SHEET NO.
L2.22
SHEET ____ OF ____

FILE:
DATE:



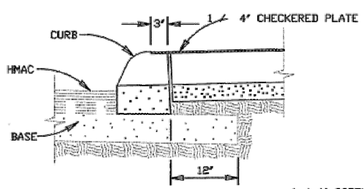
CONCRETE SIDEWALK DRAIN DETAIL

SCALE : 1"=2'



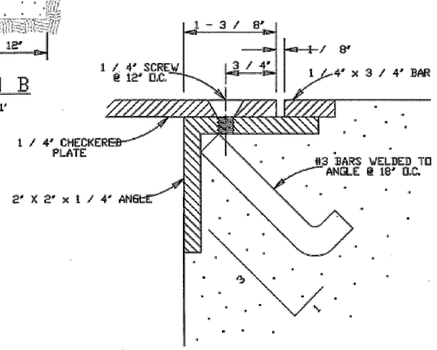
SECTION A-A

SCALE=1 : 6



SECTION B

SCALE : 1"=1'



DETAIL 1

SCALE=1 : 1

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Landscape Architecture & Planning
4242 Medical Drive, Suite 5200
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210-366-1911/210-366-0044 fax

STATE OF TEXAS
ALBERT B. FERNANDEZ JR.
1218
REGISTERED LANDSCAPE ARCHITECT
11/20/2014

CITY OF SAN ANTONIO 2012-2017 BOND PROGRAM
MCALLISTER PARK IMPROVEMENTS
WBS NO. 40-00375
13102 Jones Maltsberger Rd, San Antonio, TX 78247

CITY OF SAN ANTONIO
TRANSPORTATION & CAPITAL IMPROVEMENTS

DRAWN: SDT
CHECKED: ABF
DATE: 11-20-14
JOB NO. 12-783
REVISIONS :
1 03/11/15 ADDENDUM NO. 7

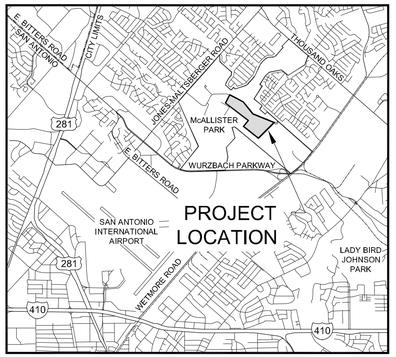
SHEET TITLE
HARDSCAPE DETAILS

SHEET NO.
L5.7
SHEET ____ OF ____

FILE: L5.DWG DATE:

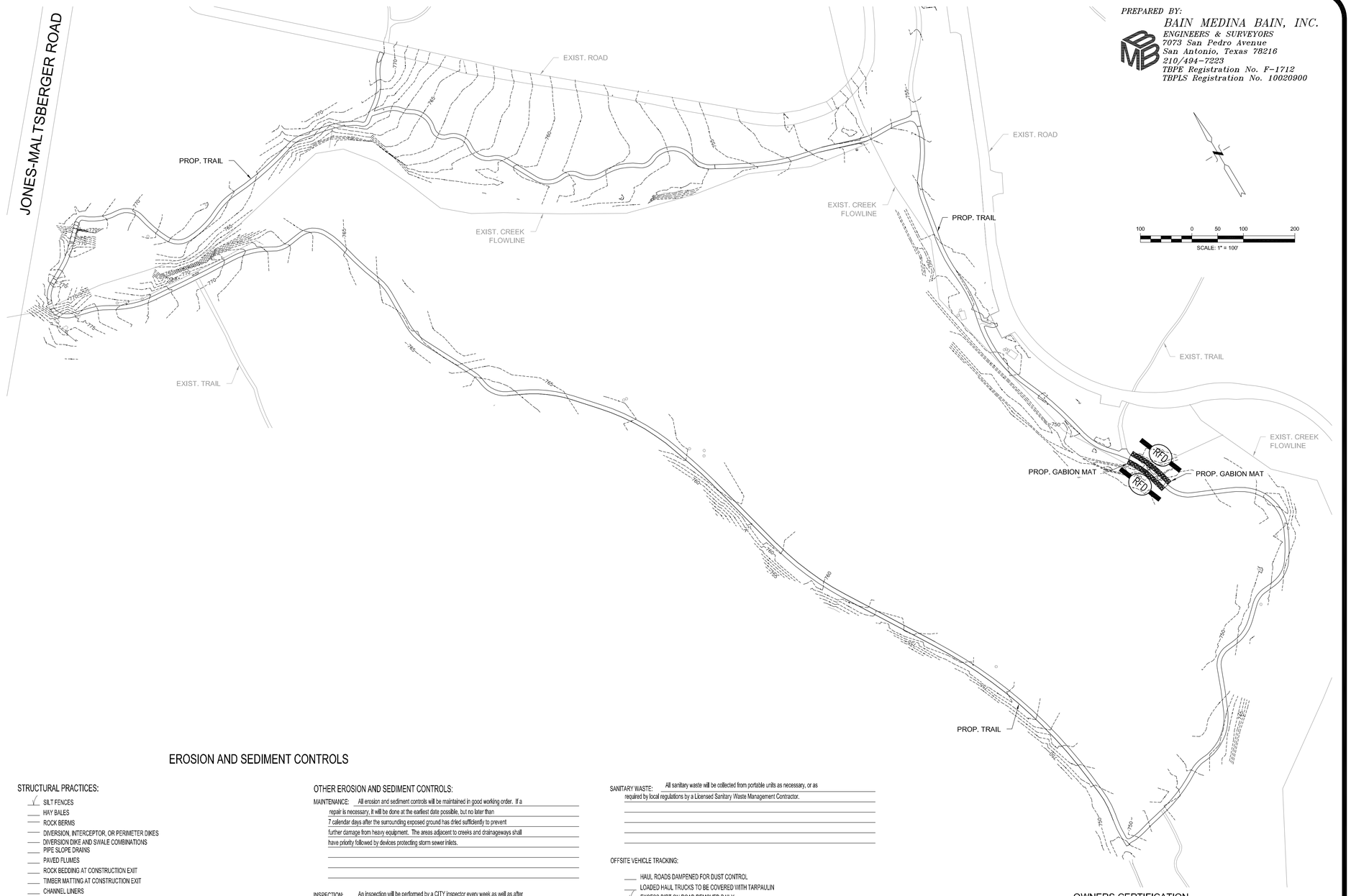
ADDENDUM #7

Attachment 4



LOCATION MAP

SCALE: N.T.S.



PREPARED BY:

BAIN MEDINA BAIN, INC.
ENGINEERS & SURVEYORS
7073 San Pedro Avenue
San Antonio, Texas 78216
210/494-7223
TBPE Registration No. F-1712
TBPLS Registration No. 10020900

LEGEND

- EXISTING POWER POLE, LIGHT POLE
- EXISTING GUY WIRE
- EXISTING GUARD POST
- EXISTING TREE
- EXISTING SIGN
- EXISTING TRASH CAN
- EXISTING SANITARY SEWER CLEAN-OUT
- EXISTING SANITARY SEWER MANHOLE
- EXISTING WIRE FENCE
- EXISTING CONTOURS
- EXISTING LOT LINES
- I.V. EXISTING IRRIGATION CONTROL VALVE
- 730.12 EXISTING ELEVATIONS
- FLOW ARROWS
- SCF SILT CONTROL FENCE
- RFD ROCK FILTER DAM

SITE DESCRIPTION

PROJECT LIMITS: McALLISTER PARK . 13102 JONES-MALTSBERGER

PROJECT DESCRIPTION: CONSTRUCTION OF VARIOUS PARKING LOTS, PAVILIONS, AND TRAIL RECONSTRUCTION

MAJOR SOIL DISTURBING ACTIVITIES: SOIL DISTURBING ACTIVITIES WILL INCLUDE PREPARING SITE CLEARING, GRUBBING AND EXCAVATION, PARKING LOT, AND CONCRETE PAVEMENT, EROSION AND SEDIMENT CONTROLS TO BE INSTALLED.

TOTAL PROJECT AREA: 984 ACRES

TOTAL AREA TO BE DISTURBED: 4.83 ACRES (0.50%)

WEIGHTED RUNOFF COEFFICIENT (AFTER CONSTRUCTION): 0.96

EXISTING CONDITION OF SOIL & VEGETATIVE COVER AND % OF EXISTING VEGETATIVE COVER: PATRICK SOILS (PaB), 1-3% SLOPES RARELY FLOODED

NAME OF RECEIVING WATERS: SALADO CREEK

SOIL STABILIZATION PRACTICES:

- ___ TEMPORARY SEEDING
- X PERMANENT PLANTING, SODDING, OR SEEDING
- ___ MULCHING
- ___ SOIL RETENTION BLANKET
- ___ BUFFER ZONES
- X PRESERVATION OF NATURAL RESOURCES

OTHER: Disturbed areas on which construction has ceased (TGMD or PERM) shall be stabilized within 14 days unless activities are scheduled to resume and do within 21 days

EROSION AND SEDIMENT CONTROLS

STRUCTURAL PRACTICES:

- X SILT FENCES
- ___ HAY BALES
- ___ ROCK BERMS
- ___ DIVERSION, INTERCEPTOR, OR PERIMETER DIKES
- ___ DIVERSION DIKE AND SWALE COMBINATIONS
- ___ PIPE SLOPE DRAINS
- ___ PAVED FLUMES
- ___ ROCK BEDDING AT CONSTRUCTION EXIT
- ___ TIMBER MATTING AT CONSTRUCTION EXIT
- ___ CHANNEL LINERS
- ___ SEDIMENT TRAPS
- ___ SEDIMENT BASINS
- ___ STORM INLET SEDIMENT TRAP
- ___ STONE OUTLET STRUCTURES
- ___ CURBS AND GUTTERS
- ___ STORM SEWERS
- ___ VELOCITY CONTROL DEVICES

NARRATIVE - SEQUENCE OF CONSTRUCTION (STORM WATER MANAGEMENT) ACTIVITIES:

The order of activities will be as follows:

1. Install controls.
2. Clear, grub and excavate.
3. Construct trail.
4. When all construction activity is complete and the site is stabilized and approved by the project engineer, remove all temporary structural controls and reseed any areas disturbed by their removal.
5. The contractor is responsible for implementing and maintaining the storm water pollution prevention plan.

STORM WATER MANAGEMENT: Storm water drainage will be conveyed by paved area.

NON-STORM WATER DISCHARGE: None.

OTHER EROSION AND SEDIMENT CONTROLS:

MAINTENANCE: All erosion and sediment controls will be maintained in good working order. If a repair is necessary, it will be done at the earliest date possible, but no later than 7 calendar days after the surrounding exposed ground has dried sufficiently to prevent further damage from heavy equipment. The areas adjacent to creeks and drainageways shall have priority followed by devices protecting storm sewer inlets.

INSPECTION: An inspection will be performed by a CITY inspector every week as well as after every half inch or more of rain (as recorded on a non-freezing rain gauge to be located at the Project Site). An inspection and Maintenance Report will be made per each Inspection. Based on the inspection results, the controls shall be revised per the inspection report.

WASTE MATERIALS: All waste materials will be collected and stored in a securely lidded metal dumpster. The dumpster will meet all state and local city solid waste management regulations. All trash and construction debris from the site will be deposited in the dumpster. The dumpster will be emptied as necessary or as required by local regulations and the trash will be hauled to a local dump. No construction waste material will be buried on site.

HAZARDOUS WASTE (INCLUDING SPILL REPORTING): At a minimum, any products in the following categories are considered to be hazardous: paints, acids for cleaning, masonry surfaces, cleaning solvents, asphalt products, chemical additives for soil stabilization or concrete curing compounds and additives. In the event of a hazardous material spill, the spill coordinator shall be contacted immediately.

SANITARY WASTE: All sanitary waste will be collected from portable units as necessary, or as required by local regulations by a Licensed Sanitary Waste Management Contractor.

OFFSITE VEHICLE TRACKING:

- ___ HAUL ROADS DAMPENED FOR DUST CONTROL
- ___ LOADED HAUL TRUCKS TO BE COVERED WITH TARPAULIN
- X EXCESS DIRT ON ROAD REMOVED DAILY
- ___ STABILIZED CONSTRUCTION ENTRANCE

PERMITS:

REMARKS: Disposal areas, stockpiles, and haul roads shall be constructed in a manner that will minimize and control the amount of sediment that may enter receiving waters. Disposal areas shall not be located in any wetland, waterbody or streambed. Construction staging areas and vehicle maintenance areas shall be constructed by the Contractor in a manner to minimize the runoff of pollutants.

OWNERS CERTIFICATION

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

SIGNATURE DATE

CONTRACTOR'S CERTIFICATION

I certify under penalty of law that I understand the terms and conditions of the general National Pollutant Discharge Elimination System (NPDES) permit that authorizes the storm water discharges associated with industrial activity from the construction site identified as part of this certification plan.

SIGNATURE (CONTRACTOR) DATE

C•F•Z Group LLC
Culture • Research • Design
Landscape Architecture & Planning
4242 Medical Drive, Suite 5200
San Antonio, Texas 78229
210-366-1911/210-366-0044 fax

CITY OF SAN ANTONIO 2012-2017 BOND PROGRAM
MCALLISTER PARK IMPROVEMENTS
WBS NO. 40-00375
13102 Jones Maltsberger Rd, San Antonio, TX 78247

CITY OF SAN ANTONIO
TRANSPORTATION & CAPITAL IMPROVEMENTS

DRAWN: ML
CHECKED: LC
DATE: 11/19/14
JOB NO. C-1381
REVISIONS :

SHEET TITLE

AL BECKEN TRAIL - STORM WATER POLLUTION PREVENTION PLAN

SHEET NO.

C-1.0

SHEET ____ OF ____

Date: Mar 11, 2015, 4:34pm User ID: LCarter
File: W:\Work\C-1381 CoSA Bond - McAllister Park\Design\Civil\Construction Documents\AL BECKEN TRAIL - SWSP.dwg