

**CITY OF BROKEN ARROW, OKLAHOMA
ENGINEERING/CONSTRUCTION DEPARTMENT**

APPLICATION FOR APPROVAL OF CHANGE OF PLANS

Name: Nienhuis Park Basketball and Tennis Courts
Contractor: Builders Unlimited, Inc.

Contract Number: 156024A

Location: Nienhuis Park, Broken Arrow - OK

Date: June 16, 2016

Change Order Number: 01

Approval is requested for the following major changes:

1. Total Number of Days Added by this Change Order:
 - Proposal Request #1 - Additional 14 days will be added to accomidate work
2. Proposal Request #1 - Due to soft subgrades that exhibit extensive pumping, rutting, and unstability under the tennis court areas, this proposal addresses remediation of subgrade for suitable use. The proposal follows guidelines set forth by the geotechnical engineer that was retained for investigation. The extents effected will be overexcavated to suitable bearing material and backfilled with appropiate backfill utilizing offsite and onsite materials.

See attached for Support Documents

Additions to the original contract:

Item #	Item	Unit	Price	Quantity	Amount
CO1-1	Subgrade Modifications - Tennis Courts	LS	\$46,729.96	1.00	\$46,729.96
					\$0.00
				Total Additions:	\$46,729.96

Deletions to the original contract:

Item #	Item	Unit	Price	Quantity	Amount
					\$0.00
				Total Deletions:	\$0.00

This Change Order is a Net Overrun: \$46,729.96

Total Previous Change Orders	\$0.00
Total Cost of Change Orders	\$46,729.96
Original Contract Amount	\$345,699.00
Percent Change In Contract Amount	13.52%

Submitted: _____ Engineer Date: _____

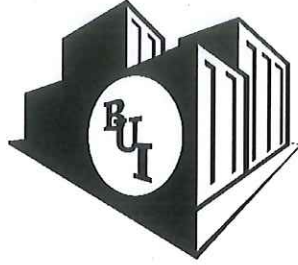
Approved: _____ Contractor Date: _____

Recommended/Approved: _____ Director, Engr. & Const. Date: _____

Approved: _____ City Manager Date: _____

This change order brings the project up to date on all issues of cost increases and time increases as of: 06/16/16

This change was approved at the City Council/BAMA meeting held on: _____
Original Clerk---Original Contractor---Original File---Copy to Finance



BUILDERS UNLIMITED, INC.
GENERAL CONTRACTOR

Change Proposal 2 (Revision 2)

June 16, 2016

Project: Nienhuis Park Tennis and Basketball Courts

Owner: City of Broken Arrow
485 N. Poplar Avenue
Broken Arrow, OK 74012

Architect: Planning Design Group
5314 South Yale Avenue, Suite 710
Tulsa, OK 74135

Contractor: Builders Unlimited, Inc.
4677 S. 83rd E. Ave.
Tulsa, Ok. 74145

Builder's Unlimited, Inc. submits the following owner requested change proposal. The proposal is to excavate & remove unsuitable soils, place and compact to proper density suitable soils in areas identified in the field as unsuitable. The scope of the change is to remove 1,293 cubic yards (1293 Square Yards 3feet deep) of unsuitable materials, replace and re-compact approved select fill. The price below is inclusive of all labor, equipment, materials, overhead, bonding and insurance required to complete this change. We will be requesting 14 days added to the contract for this change due to the unforeseen delays it has caused on our next pay application. Per your request I have attached a breakdown of the costs. **In order to meet the maximum change amount of 15% of the original contract we are willing to complete this change by reducing our profit margin to just under 2% of the change. We are planning on having equipment delivered to project 6/20/16 to begin work and take advantage of the good weather. Please advise if we should hold off on starting until full approval has been attained.**

Total: \$46,729.96

Jimmy Boyd
Project Manager
Builders Unlimited, Inc.

Nienhuis Park Tennis and Basketball Unsuitable Soil Breakdown REV 2

Equipment	Units	Cost/Hour	Total Hours	
Trucking	3	\$80.00	40	\$9,600.00
Dozer	1	\$75.65	80	\$6,052.00
Roller	1	\$67.35	80	\$5,388.00
Excavator	1	\$86.00	40	\$3,440.00

Materials	Units	Cost	Quantity	
Select Fill Import	CY	\$25.00	400	\$10,000.00
fuel	Gal	\$2.40	1000	\$2,400.00

Labor	Number	Cost/Hour	Total Hours	
Operator	2	\$27.00	80	\$4,320.00
laborer	2	\$18.00	80	\$2,880.00

Sub-Contractor				
Testing				\$735.00

Sub total				\$44,815.00
Overhead and Profit				\$775.20
Bonds and Insurance				\$1,139.76
TOTAL				\$46,729.96



Construction Materials Testing • Special Inspections • Geotechnical Engineering

June 2, 2016

Builders Unlimited, Inc.
 Attn: Mr. Jimmy Boyd
 4677 South 83rd East Avenue
 Tulsa, OK 74145
 Jboyd.bui@gmail.com

Re: Report of Recommendation for Subgrade Stabilization
 Nienhuis Park Basketball & Tennis Court
 Broken Arrow, Oklahoma
 AIMRIGHT Project No. 1835-16

Mr. Boyd:

Thank you for the opportunity to allow AIMRIGHT Testing and Engineering (AIMRIGHT) to investigate your concerns and provide geotechnical recommendations related to stabilizing the subgrade on the Nienhuis Park Basketball & Tennis Courts project.

AIMRIGHT Field personnel performed a subgrade evaluation on May 26, 2016. Evaluation consisted of a proofroll and performing Dynamic Cone Penetrometer (DCP) testing at depths of 0.0 to 5.0 feet below existing subgrade elevation throughout a section of the tennis courts (see attached test location plan). Proofrolling indicated severe rutting and pumping conditions. Test pits excavated in 3 locations on the North section of the tennis court revealed very soft, very moist and unstable soils near the surface and at approximately 36 inches below existing subgrade elevation.

Laboratory Testing

Laboratory tests were conducted on collected soil samples in general accordance with the American Association of State and Highway Transportation Officials (AASHTO) standards. The laboratory testing performed consisted of Liquid and Plastic Limit Determinations (AASHTO T89 and T90) and Sieve Analysis of Material Finer than No. 200 (AASHTO T11) testing. The results of the laboratory testing indicate that the exposed final soil subgrade is generally comprised of lean to fat clay with varying amounts of sand. The AASHTO group classification for the soils sampled was determined to be A-7 as illustrated in the following table:

Sample Location No.	Sample Depth (ft.)	AASHTO Classification	% Finer than	% Finer than	Atterberg Limits		
			No. 40 Sieve (%)	No. 200 Sieve (%)	LL (%)	PL (%)	PI (%)
1	0 to 1	A-7-6(26)	94.3	92.3	49	24	25
2	0 to 1	A-7-6(30)	94.6	93	51	22	29
3	0 to 1	A-7-6(24)	88.8	87.1	48	22	26

AIMRIGHT recommends the following alternate pavement subgrade preparation to help mitigate the unstable subgrade soils;

Option 1

- Undercut the unstable material down to a more suitable material and backfill with select fill. Based on the materials exposed during the excavation of the test pits, the upper 36 inches consist of a medium brown lean clay with trace organics. Below the unstable material, a mottled yellowish brown fat clay with shale fragments was encountered from 3 to 5 feet, at the maximum depths of the test pits. Based on DCP data, this material is suitable bearing material. Fill placement should be done in 9 inch lifts compacted to a minimum of 95 percent of standard proctor maximum dry density. Soil should be moisture conditioned to within ± 2 percentage points of optimum moisture
- Fill material to be placed in structural and paved areas should be select material - free of organics, foreign debris, or any other deleterious non-soil materials and should be composed of non-plastic to fairly low plasticity sandy clay, clayey sand, well-graded sand, silty sand or well-graded gravel meeting the following requirements:

Minimum Percent Finer than No. 200 Sieve	Maximum Liquid Limit (%)	Plasticity Index (PI)
15	40	5-18

Option 2

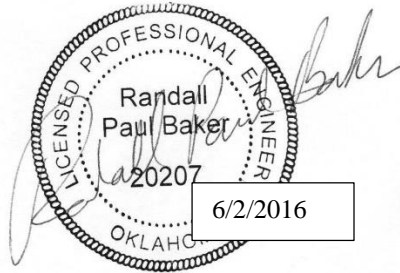
- Undercut an additional 12 inches of subgrade soils and remove in its entirety from the tennis court footprint.
- Treat the subgrade soils with 14 to 17 percent flyash, based on the soil dry unit weight, and compact to a minimum of 95 percent of standard proctor maximum dry density. Soil should be moisture conditioned to within ± 2 percentage points of optimum moisture. Proof rolling should be performed so as to aid in evaluating the performance of the flyash treatment. An AIMRIGHT representative should be retained and be onsite to witness the proof rolling. All proof rolling should be performed utilizing a fully loaded tandem rear axle dump truck with a minimum weight of 25 tons.
- Once soil treatment/stabilization has been performed, a Type 2 Geogrid, such as BX Type 2 Geogrid by Alliance Geosynthetics, or a similar product, should be installed as per the manufacturer's recommendation. Geogrid should be overlapped a minimum of 2 feet at all joints. (See attached product data sheet for type 2 geogrid)
- Following placement of geogrid, 12 inches of ODOT Type "A" Aggregate should be placed to secure the geogrid into place. Aggregate should be moisture conditioned and compacted to 95 percent of standard proctor maximum dry density. Aggregate base should be installed in 2 lifts no greater than 6 inches in thickness

Regardless of the thoroughness of the geotechnical report, there is always a possibility that subsurface conditions will be different from those at a specific location and that conditions will not be as anticipated by the designers or contractors. If conditions are different than what is anticipated, AIMRIGHT should be contacted immediately to reevaluate and be given a chance to alter these recommendations, if needed. Please do not hesitate to contact us with any concerns or questions regarding this recommendation.

Respectfully submitted,
AIMRIGHT Testing & Engineering, LLC
CA No. 5794 (exp. 6/30/16)



Randall Baker, PE
Engineering Manager





Product Specification – BX Type 2 Geogrid

DISCLAIMER: Alliance Geosynthetics reserves the right to change its product specifications at any time and without notice. It is the user's responsibility to ensure that this specification is current and that the specified product is appropriate for the application being considered.

Product Type: Integrally formed biaxial geogrid
 Polymer: Polypropylene
 Load Transfer Mechanism: Positive mechanical interlock
 Standard Roll Size: 13 ft x 246 ft (355 SY per roll)

Product Properties

Index Properties	Test method	Units	MD value ¹	XMD value ¹
Index Properties				
• Aperture dimensions	Direct measurement ²	in.	1.0	1.4
• Minimum rib thickness	Direct measurement ²	in.	0.05	0.05
• Tensile strength @ 2% strain	ASTM D6637-01	lb/ft	410	620
• Tensile strength @ 5% strain	ASTM D6637-01	lb/ft	810	1,340
• Ultimate tensile strength	ASTM D6637-01	lb/ft	1,310	1,970
Structural integrity				
• Junction efficiency	GRI-GG2-05	%	93	
• Flexural stiffness	ASTM D5732-01	mg-cm	750,000	
• Aperture stability	US Army COE ³	N-m/deg	0.65	
Durability				
• Resistance to installation damage (SW/SP/GP soil)	ASTM D6637-01	%	95/93/90	
• Resistance to long-term degradation	ASTM D6637-01	%	100	
• Resistance to UV degradation	ASTM D4355-05	%	100	

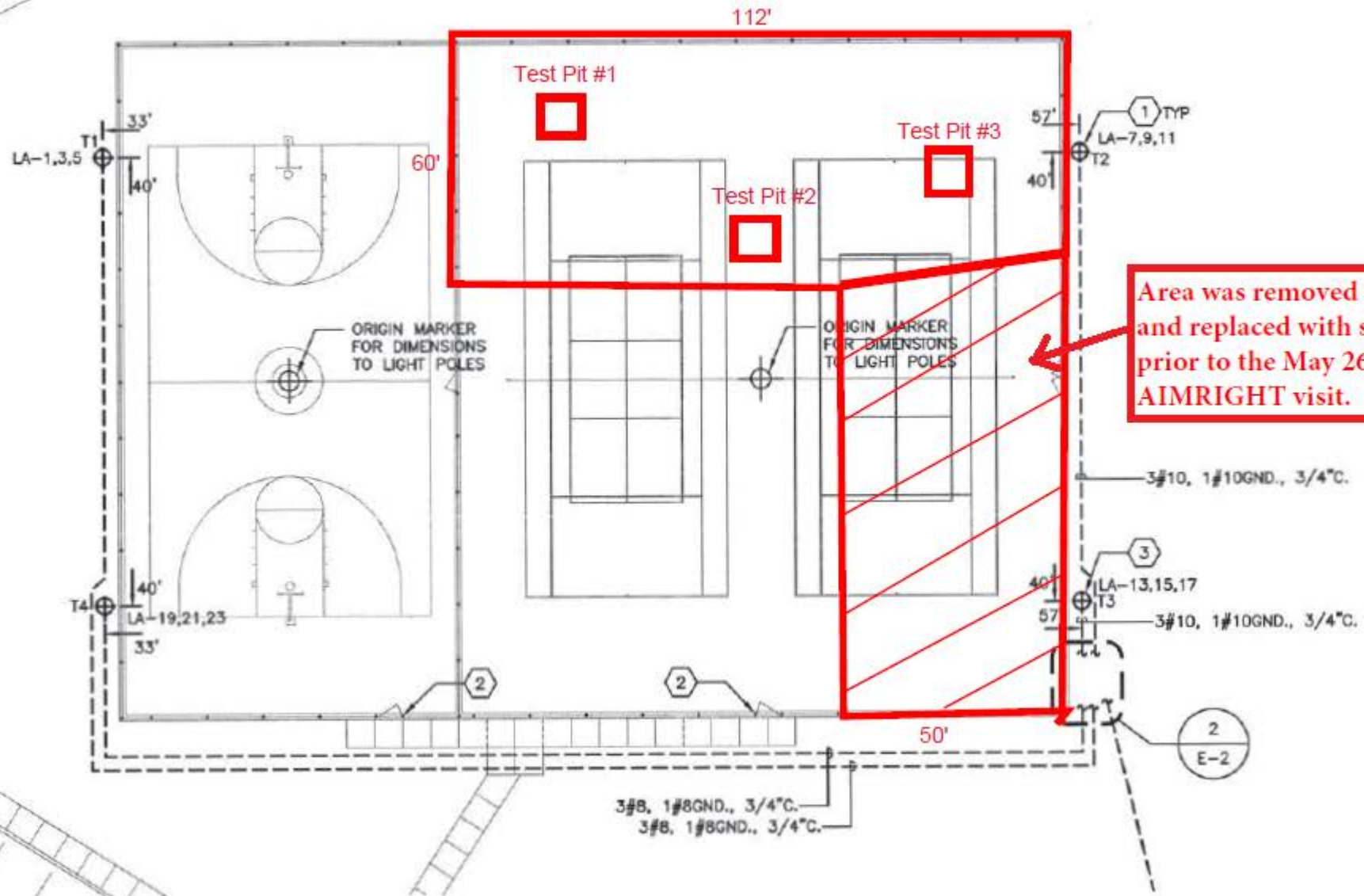
Notes:

1. Unless indicated otherwise, values shown are Minimum Average Roll Values (MARV) in accordance with ASTM D4759-01
2. Direct Caliper Measurement.
3. Resistance to in-plane rotational movement measured by applying a 20 kg-cm moment to the central junction of a 9 in. x 9 in. sample restrained along its perimeter in accordance with the US Army Corps of Engineers' prescribed methodology for the measurement of torsional rigidity.

Updated November 2014

TEST LOCATION PLAN

1835052616DCP



North



- Test Pit #1- 18'S @ 98'W of NE Corner
- Test Pit #2- 51'S @ 59'W of NE Corner
- Test Pit #3- 24'S @ 45'W of NE Corner