EARTHWORKS ENGINEERING GROUP, L.L.C.
7901 LORRAINE CT NE, ALBUQUERQUE, NM 87113
505-899-4886 • 505-899-4861 (FAX)

GEOTECHNICAL INVESTIGATION

JACONA COLLECTION CENTER
POJOQUE, NEW MEXICO

EEG Project No.: A15-296

Prepared for:

SANTA FE COUNTY c/o RISKIN ASSOCIATES

Prepared by

Lee Hopkins, Geologist

Earthworks Engineering Group, LLC.

May 29, 2015

Reviewed by

Dave Liebelt, P.E.

DAVID K. LIEBELT
NEW MEXICO
14069
REGISTERED PROFESSIONAL ENGINEER

SUMMARY

The information presented in this section is a partial summary intended for reference use only. This information is intended for use only in conjunction with the complete geotechnical investigation report. Significant information contained in the complete geotechnical report may not be present here.

ON-SITE SOILS

The test holes encountered soils consisting of thickly bedded layers of fine grained silty sand and lean sandy clay. The sands were loose to medium dense as measured by SPT and medium moist to slightly moist. The clays were medium stiff to stiff as measured by SPT and slightly moist. The soils were underlain by soft bedrock, the surface of which was encountered at depths of fifteen feet to twenty feet in the test holes. The bedrock consisted of interbedded layers of lightly cemented sandstone and shale. Groundwater was not encountered in the test holes.

REMEDIAL EARTHWORK

A building pad for the waste collection center should be constructed by excavating existing soils as necessary to allow for the placement of a minimum of three feet of engineered fill beneath all foundations and floor slabs. Soil removal should extend a minimum of three feet laterally beyond foundation edges. In addition the excavation sidewalls behind the retaining walls should be benched back at a 1.5:1 slope (horizontal:vertical) the full height of the wall. The building pad may then be brought to design grade with engineered fill. Excavated site sands are suitable for reuse as engineered fill beneath foundations and slabs. Excavated site clay soils will need to be blended with imported non-plastic clean sands, crusher fines, or base course in order to meet the specifications for engineered fill. A preliminary blend ratio of 50/50 is recommended pending laboratory results on soil blends. This office must perform inspections and testing during earthwork construction as detailed in the Earthwork Section of this report and the attached Earthwork Certification Checklist.

FOUNDATIONS AND SLABS

An IBC Seismic Site Soils Classification of **C** may be utilized for design purposes.

A Subgrade Modulus (K_v) of 150 pci is recommended for design of concrete slabs-on-grade subject to wheel loads.

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INTRODUCTION

This report presents the results of our geotechnical investigation and recommendations for design and construction of the proposed Jacona Waste Collection Center to be constructed on the south side of NM-502 near Pojoque in Santa Fe County, New Mexico.

The investigation was performed to determine the site subsurface conditions, and based on the conditions encountered, develop geotechnical recommendations for:

- Foundation Design
- Slabs-on-Grade
- Retaining Walls
- Site Grading
- Earthwork Construction
- On-Site Pavements

The conclusions and recommendations presented are based on information provided by the client regarding the proposed construction, subsurface conditions disclosed by the test holes, laboratory testing, and the local standards of our profession at the time this report was prepared. It is assumed that all recommendations herein will be followed.

PROJECT DESCRIPTION

The project will consist of construction of a new solid waste and recyclables collection center on an undeveloped parcel, for Santa Fe County residential customers.

We understand the main building will consist of a high-bay single story structure steel frame structure. An adjacent, lower "tunnel" section for loading waste trucks will consist of cast-in-place concrete retaining walls supporting a steel frame structure.

For the purposes of this report, column and strip loads (dead + live) were estimated as not exceeding 28 kips and 5 kips per linear foot. If actual loads are significantly different than those assumed, this office should be contacted to verify the recommendations presented herein remain applicable.

If structure loads or configuration differ from those indicated in this report, this office should be notified.

SOIL CONDITIONS

To explore the site subsurface conditions five test holes were excavated on the property with a truck-mounted CME Model 55 drill rig using hollow stem auger drilling techniques. Standard penetration testing was performed with a cathead-assisted SPT safety hammer (140 lb. /30 inch free-fall).

The approximate test hole locations are presented on the attached Site Plan, Figure 1. Detailed logs of the test holes are presented on Figures 2 through 6. Soil Index test results are summarized on Table 5.

The test holes encountered soils consisting of thickly bedded layers of fine grained silty sand and lean sandy clay. The sands were loose to medium dense as measured by SPT and medium moist to slightly moist. The clays were medium stiff to stiff as measured by SPT and slightly moist. The soils were underlain by soft bedrock, the surface of which was encountered at depths of fifteen feet to twenty feet in the test holes. The bedrock consisted of interbedded layers of lightly cemented sandstone and shale.

Groundwater was not encountered in the test holes to the maximum depth of exploration, approximately thirty-one feet.

Excavated site sands are suitable for reuse as engineered fill. Excavated site clay soils will need to be blended with imported non-plastic clean sands, crusher fines, or base course in order to meet the specifications for engineered fill. A preliminary blend ratio of 50/50 is recommended pending laboratory results on soil blends; further consultation between this office and the excavation/grading contractor will be required in this regard. Material specifications for engineered fill are detailed in the Earthwork section of this report.

Our assessment of the site subsurface conditions is based on the test holes which allow observation of a very small portion of the soils below the site. Significant variation in subsurface conditions may occur across the site that was not disclosed by the test holes.

FOUNDATION RECOMMENDATIONS

SEISMIC DESIGN

An IBC Seismic Site Soils Classification of **C** may be utilized for design purposes.

FROST DEPTH

A design value of 24 inches should be used for frost depth.

REMEDIAL EARTHWORK

A building pad for the waste collection center should be constructed by excavating existing soils as necessary to allow for the placement of a minimum of three feet of engineered fill beneath all foundations and floor slabs. Soil removal should extend a minimum of three feet laterally beyond foundation edges. In addition the excavation sidewalls behind the retaining walls should be benched back at a 1.5:1 slope (horizontal:vertical) the full height of the wall. The building pad may then be brought to design grade with engineered fill. This office must perform inspections and testing during construction.

FOUNDATIONS

Provided that the recommendations herein are followed particularly those concerning earthwork, grading, drainage and landscaping, the waste collection center may be supported on conventional shallow foundations with concrete slab-on-grade ground floors. All foundations should be embedded a minimum of 24 inches below grade. The following allowable bearing capacities may be utilized for different foundation widths:

(Anticipated Steel Building Foundations)			(Anticipated Retaining Wall Foundations)	
12 inches	24 inches	36 inches	48 inches	≥60 inches
2000 psf	2500 psf	3000 psf	3500 psf	4000 psf

Table 1: Recommended Allowable Bearing Capacities for Shallow Foundations

The allowable bearing capacity values presented herein may be increased by one-third for short term loading conditions due to wind and earthquakes. Foundations should be designed by a qualified structural engineer.

Lateral foundation loads will be resisted by a combination of passive soil pressure against the sides of foundations and friction along the base. A passive soil resistance of 300 pounds per cubic foot may be utilized for design. Frictional resistance may be determined by multiplying foundation dead load by a coefficient of friction of 0.40.

CONCRETE SLABS-ON-GRADE

Concrete floor slabs should be supported on a minimum thickness of three feet of properly compacted granular engineered fill as detailed in the Foundation and Earthwork Sections of this report.

A Subgrade Modulus (K_v) of 150 pci is recommended for design of slabs subject to wheel loads.

Concrete slabs-on-grade should be designed by a qualified structural engineer. Concrete floors should be designed, constructed and jointed as discussed in the ACI Committee Report 302.1R-04 "Guide for Concrete Floor and Slab Construction" and/or 302.2R-06 "Guide for Concrete Slabs that Receive Moisture-Sensitive Flooring Materials." If moisture-sensitive floorings are planned, the slab should be underlain by an impermeable moisture vapor barrier. If a moisture barrier is utilized, the slab reinforcement should be designed to resist shrinkage and curling. Vapor barriers should conform to an ASTM E 1745 Class A material, with a minimum 10-mil thickness. Vapor barriers should be installed in accordance with ASTM E 1643. Care should be taken during construction to minimize damage to the vapor barrier.

Concrete slabs-on-grade and exterior flatwork should be isolated from all utility lines. Some movement should be expected to occur between the building and adjacent exterior concrete flatwork. Joints and cracks in concrete flatwork should be sealed as discussed in the Maintenance section of this report.

DIFFERENTIAL MOVEMENT

Foundations designed and constructed as described herein are not anticipated to experience differential movement of more than two inches. This estimate is implicit in the method used to calculate the allowable bearing capacities and also relies on the assumption the site soils will not be allowed to increase in moisture content and that all recommendations presented in this report will be fully implemented, particularly those regarding earthwork, drainage, grading, and landscaping. Additional movement and distress may occur if the soils are allowed to increase in moisture content or if the recommendations presented herein are not followed.

RETAINING WALLS

Retaining walls constructed in association with this project are not anticipated to exceed twenty feet in height. The values presented below do not include hydrostatic pressures.

The backside of retaining walls should be waterproofed to prevent moisture infiltration. A french drain or gravel-packed weep holes should be installed behind the wall to help prevent hydrostatic forces from developing. Water should drain rapidly.

Clay soils should be removed laterally from behind retaining walls; we recommend the excavation sidewalls behind the retaining walls should be benched back at a 1.5:1 slope (horizontal:vertical) the full height of the wall. Retaining walls should be backfilled with an approved engineered fill material. Care should be taken during compaction of retaining wall backfill to avoid stressing and deflecting the walls.

Assuming granular backfill and no hydrostatic pressures, the retaining walls may be designed to resist Active Earth Pressure calculated as an equivalent fluid pressure from a fluid having a unit weight of 35 pounds per cubic foot. If the wall is restrained against rotating the wall should be designed for an At-Rest Earth Pressure calculated as an equivalent fluid pressure from a fluid having a unit weight of 50 pounds per cubic foot.

If foundation or wheel loads are anticipated within five feet of the top of the wall, additional lateral forces on walls due to these surcharge loads may be calculated using a lateral earth pressure coefficient (K_a) of 0.28 for unrestrained walls, and a lateral earth pressure coefficient (K_o) of 0.44 for restrained walls.

Retaining wall foundations should be designed and constructed as described in the Foundation Recommendations section of this report. The base of retaining wall foundations should be embedded a minimum of twenty-four inches below lowest adjacent grade. Wall movement will be resisted by Passive Earth Pressure at the toe calculated as an equivalent fluid pressure from a fluid having a unit weight of 300 pounds per cubic foot. Friction along the base can be calculated as the normal force multiplied by a friction factor of 0.40.

PAVEMENTS

ASPHALT PAVEMENTS

We anticipate the site driveways and main parking areas will have asphalt pavement sections. The pavement section(s) presented below are based on NMSHTD design procedures.

Based on the conditions encountered in the test holes, on-site soils are classified as AASHTO A-4, A-6, and A-7-6 soils. An estimated R-Value of 30 was utilized for design of onsite asphalt pavements. The following additional design values were utilized:

Design Life	20-Years
Serviceability Index	1.5
Regional Factor	2.0
Asphalt Structural Coefficient	0.40
Aggregate Base Course Structural Coefficient	0.10

Table 2: Assumed Asphalt Pavement Design Coefficients

Daily 18-kip Equivalent Single Axle Loads (ESALs) of 5.0 and 2.0 were estimated for site pavements supporting trash trucks and customer traffic, respectively. If actual traffic loads are anticipated to differ from these assumptions, this office should be contacted for additional recommendations. The following asphalt pavement sections are recommended:

Area	Pavement Section	SN	Daily ESALS
Truck Lanes/Driveways	4 in. Asphalt over 6 in. ABC	2.2	≤ 5.0
Customer Lanes/Parking	3 in. Asphalt over 4 in. ABC	1.6	≤ 2.0

Table 3: Recommended Asphalt Pavement Sections

The site clay soils (AASHTO Class A-6 and A-7-6) are poor for pavement support. These soils, where encountered at finished pavement subgrade, will need to be undercut to a depth of eighteen inches and replaced with select fill with a minimum R-Value of 30, under the direction of this office.

Prior to constructing pavements, the ground surface should be prepared and compacted as detailed in the Earthwork section of this report. The site should be graded to prevent saturation of pavement subgrade soils. The soils ability to support pavement will be significantly reduced should they become wetted.

Aggregate Base course and Sub-Base/Select Fill should be compacted to a minimum of 95% of maximum density as determined by ASTM D-1557. Asphaltic Concrete should exhibit a minimum Marshall stability of 1800 pounds and should be compacted to between 93% and 97% of maximum theoretical density.

Periodic pavement maintenance will be required over the design life. Crack cleaning and sealing should be performed to extend pavement life. Seal coating may also be desired after the pavement has been in service for several years to improve appearances and increase pavement life.

CONCRETE PAVEMENTS AND EXTERIOR FLATWORK

We anticipate site development will include relatively small areas of concrete flatwork and pavements such as sidewalks, patios, and dumpster islands. Concrete slabs and exterior flatwork should be isolated from all utility lines. Some movement should be expected to occur between the building and adjacent exterior concrete flatwork. Joints and cracks in concrete flatwork should be sealed as discussed in the Maintenance section of this report.

Sidewalks and other areas of concrete flatwork that will not experience vehicular traffic should be a minimum of 4-inches in thickness. Concrete pavements in front of dumpsters and truck docks should be a minimum of 6-inches in thickness, conform to an approved minimum 4000 psi mix design, and be minimally reinforced with #4 steel reinforcing bars at 12-inches on center. Concrete pavements should be underlain by a minimum of 8-inches of aggregate base course.

All exterior concrete (exposed to weather) should conform to an approved air entrained mix design having between 4.5% and 7.5% air.

EARTHWORK

STRIPPING AND GRUBBING

Prior to performing earthwork, all borrow and fill areas should be stripped of vegetation and deleterious materials. All strippings should be hauled offsite or utilized in landscaped areas. All existing fill, utilities, debris, septic systems, remnant structures, and disturbed soil should be removed from below the proposed structures.

NATURAL GROUND PREP

We anticipate the site soils may be excavated with conventional earthwork equipment. Following all cut earthwork, the natural soils should be scarified to a depth of eight inches and moisture conditioned to optimum moisture content (+/- 3%). The surface of the natural soils should then be compacted to a minimum of 95% of maximum dry density as determined by ASTM D-1557.

ENGINEERED FILL SPECIFICATIONS

Excavated site sands are suitable for reuse as engineered fill. Excavated site clay soils will need to be blended with imported non-plastic clean sands, crusher fines, or base course in order to meet the specifications for engineered fill. A preliminary blend ratio of 50/50 is recommended pending laboratory results on soil blends; further consultation between this office and the excavation/grading contractor will be required in this regard. Sieve analysis and Atterberg Limits tests will be required prior to acceptance of proposed fill.

Engineered fill soil should have a Plasticity Index of ten or less and should not contain any frozen, organic, or decomposable material. Cobbles, boulders and rock fragments should not be placed within engineered fills. Engineered fill should meet the following gradation:

U.S. SIEVE SIZE	%-PASSING
1½ -INCH	100
NO. 4	70-100
NO. 200	20-40

Table 4: Fill Specifications

FILL PLACEMENT AND COMPACTION

Engineered fill should be stockpiled on site, moisture conditioned, and blended to a homogeneous mixture prior to use. Engineered fill should be placed in horizontal lifts a maximum of eight inches in loose thickness, moisture conditioned to optimum moisture content (+/- 3%), and mechanically compacted. Lift thickness may need to be reduced based on the size of the compaction equipment utilized. All engineered fill should be compacted to a minimum of 95% of maximum dry density as determined by ASTM D-1557.

UTILITIES

Care should be taken when installing utilities that the prepared building pad is not overly disturbed. Trenches should be no wider than is necessary for proper installation of utilities. Utility line trenches should not be located parallel and below/immediately adjacent to foundations.

If water or sewer line leaks occur, differential movement of the structure may result. Prior to backfilling utility line trenches, all water and sewer lines should be pressure checked for leaks. Any leaks found should be repaired.

The excavation spoils may be reused as trench backfill provided that cobbles, boulders and rock fragments are not placed within pipe bedding or pipe backfills.

To reduce the possibility of breaking utility lines, compaction of pipe backfill should be performed with light, hand-operated equipment. In order to achieve compaction, it will be necessary to place backfill in thinner lifts than would normally be necessary. The fill soils in trenches should be compacted to a minimum of 95% of maximum dry density as determined by ASTM D-1557, except where applying this compactive effort may damage pipes or insulation, in which case the backfill should be compacted to a minimum 90%.

FOUNDATION EXCAVATIONS

Caving and raveling of excavation sidewalls should be expected. Prior to pouring concrete, foundation excavations should be cleaned of any slough, loose soil, or debris. Footing excavations should be scarified and moisture conditioned to optimum moisture content (+/- 3%). Foundation excavations should be compacted to a minimum of 95% of maximum dry density as determined by ASTM D-1557.

OBSERVATION AND TESTING

Compaction testing must be performed by this office during earthwork construction to verify the compaction requirements outlined in this report have been met.

Modified Proctor testing (ASTM D-1557) will be necessary to determine the maximum dry density and optimum moisture content of the natural soils at the base of excavations. The surface of natural soils should be tested for compaction prior to placing engineered fill.

Engineered fill material should be approved by this office prior to use. Following acceptance of the fill material, Modified Proctor testing (ASTM D-1557) will be necessary to determine the maximum dry density and optimum moisture content. Compaction testing should be performed on engineered fill at a minimum of every other lift until finished grade is reached.

Testing of utility line trenches for compaction should be performed at a minimum of every foot of compacted backfill thickness.

The base of footing excavations and finished pad grade should be tested prior to placing reinforcement and pouring concrete. Compaction testing cannot be performed if reinforcement has been installed and will need to be removed to perform testing.

EARTHWORK CERTIFICATION

An earthwork certification letter may be requested **prior to** placing concrete.

Earthwork certification will only be provided if all recommendations presented herein are followed. It is up to the client to read and understand the recommendations prior to starting construction. Earthworks Engineering Group will answer all questions the client may have concerning these recommendations.

Earthwork certification will be valid for five days following the last inspection by this office. Foundations should be poured during this time period. The site must be re-inspected if foundations are not poured during this time period or if site conditions change for any reason following the previous inspection.

DRAINAGE, GRADING, AND LANDSCAPING

Site grading should comply with the 2009 IBC Section 1804.3. A grading and drainage plan should be designed by a qualified civil engineer.

To reduce the risk of moisture induced movement the site should be graded to rapidly drain away from structures. We suggest a minimum five percent gradient within at least the first ten feet away from structures in areas not protected by sidewalks and pavement. Planters and sidewalks should not "dam" water adjacent to structures.

Roof gutters and downspouts should be utilized on the building(s). Down spouts should discharge down slope and well away from building(s). Splash blocks should be utilized below down spouts. Surface water should run off rapidly.

Landscaping adjacent to structures should be designed and constructed to minimize the potential for wetting of soils supporting the proposed facilities. We suggest utilizing a xeriscape design. Watering should be carefully controlled to prevent over watering. Sprinkler lines and drip irrigation mains should be located a minimum of five feet away from foundations.

If onsite leach fields or stormwater ponding areas are required, they should be located downhill from and as far away from structures as possible, a minimum of twenty feet.

Permanent, non-retained slopes should be graded to a maximum slope of 3:1 horizontal to vertical for gross slope stability.

All earth slopes will require protection from erosion.

This office should review site grading and drainage plans to evaluate conformance with the recommendations presented herein.

SHORING

All trenches greater than five feet in depth must be sloped, shored or braced, or otherwise supported according to OSHA Construction and Safety Standards. Temporary construction excavations should be sloped no steeper than 1½:1 (horizontal: vertical). If deeper excavations are required, this office should be contacted for supplemental recommendations.

Limited raveling of slopes will occur particularly as the exposed soils dry out. Material excavated from the trench or spoil must be placed away from the edge of the excavation. The spoil should be retained in an effective manner such that no loose material can fall into the excavation. Heavy equipment and material stockpiles should be located a minimum of five feet from the top of slope.

The above information is intended to provide only general guidelines. This office is not responsible for excavation safety. Temporary construction excavations should be evaluated by the contractor's competent person. Design of safe excavations should conform to the regulations set forth in 29 CFR 1926 Subpart P by the contractor or their designated engineer of record.

MAINTENANCE

Performance of structures depends not only on proper design and construction, but also on an ongoing foundation maintenance program. A properly designed foundation may still experience distress from incorrectly controlled water sources, improper drainage, and landscaping. The owner should perform a yearly inspection to observe for necessary maintenance and repair.

Positive drainage should be provided away from the structure over the life of the building. A minimum slope of five percent within the first ten feet of the structure should be maintained. Flowerbeds and landscaping that requires irrigation should not be installed adjacent to structures. Walkways and borders that dam water adjacent to foundations should be eliminated.

Depressions and excavations should be backfilled with compacted, non-swelling, relatively-impervious soils such as clayey sands.

Gutters and downspouts should be installed to control roof drainage. Downspouts should discharge a minimum of ten feet away from structures. Area drains may be installed around structures to improve drainage. Discharge pipes should slope a minimum of 1/8th inch vertical per foot of horizontal pipe. Drainage sewers and discharge channels should be kept free of debris.

Water bills should be monitored for unexplained increases in usage. Higher than normal water usage may indicate a leaking utility line. If a leaking line is suspected, utility lines should be pressure checked for leaks.

Expansion joints within exterior concrete flatwork should be filled with a flexible joint sealer to minimize water infiltration.

Some minor cracking of new concrete foundations, concrete flatwork, and interior dry wall is normal. This is a result of concrete shrinkage as it cures, "settling in" of the new structure, drying of timbers used in construction, etc. Normally the majority of this movement should cease within the first year following construction. However, depending on the structure and site conditions, movement may continue at a slow rate for several years. If cracks tend to open and close, increase significantly within a short period of time, or resume after a period of relative inactivity, it is recommended that this office be contacted to review the situation.

CLOSURE

The recommendations presented in this report are based upon the subsurface conditions disclosed by the test holes. Soil and groundwater conditions may vary between test holes and with time. This office may change the recommendations presented herein based on the conditions encountered during construction.

Prior to performing earthwork, a meeting between the client, this office, and the earthwork contractor should be arranged to discuss the earthwork and foundation recommendations and testing requirements of this project. The purpose of this meeting is to assure that recommendations and requirements are implemented and to minimize delays and expenses during construction.

In order to verify the recommendations presented herein are followed this office must perform field inspections and earthwork Proctor and compaction testing. If this office is not utilized to perform these services, the client agrees to assume all risk for post-construction movement and distress.

This report reflects our interpretation of the site subsurface conditions. We strongly recommend that prior to bidding all contractors perform their own subsurface investigation to form their own opinion of the site soil, rock and groundwater conditions. Should contractors elect to use this report for construction, bidding or estimating purposes, they do so at their own risk.

As this report makes recommendations concerning prudent landscaping and site maintenance, the property owner/manager should be given access to this report and the recommendations herein.

The staff of Earthworks Engineering Group, LLC is available for supplemental consultation as necessary at (505) 899-4886.

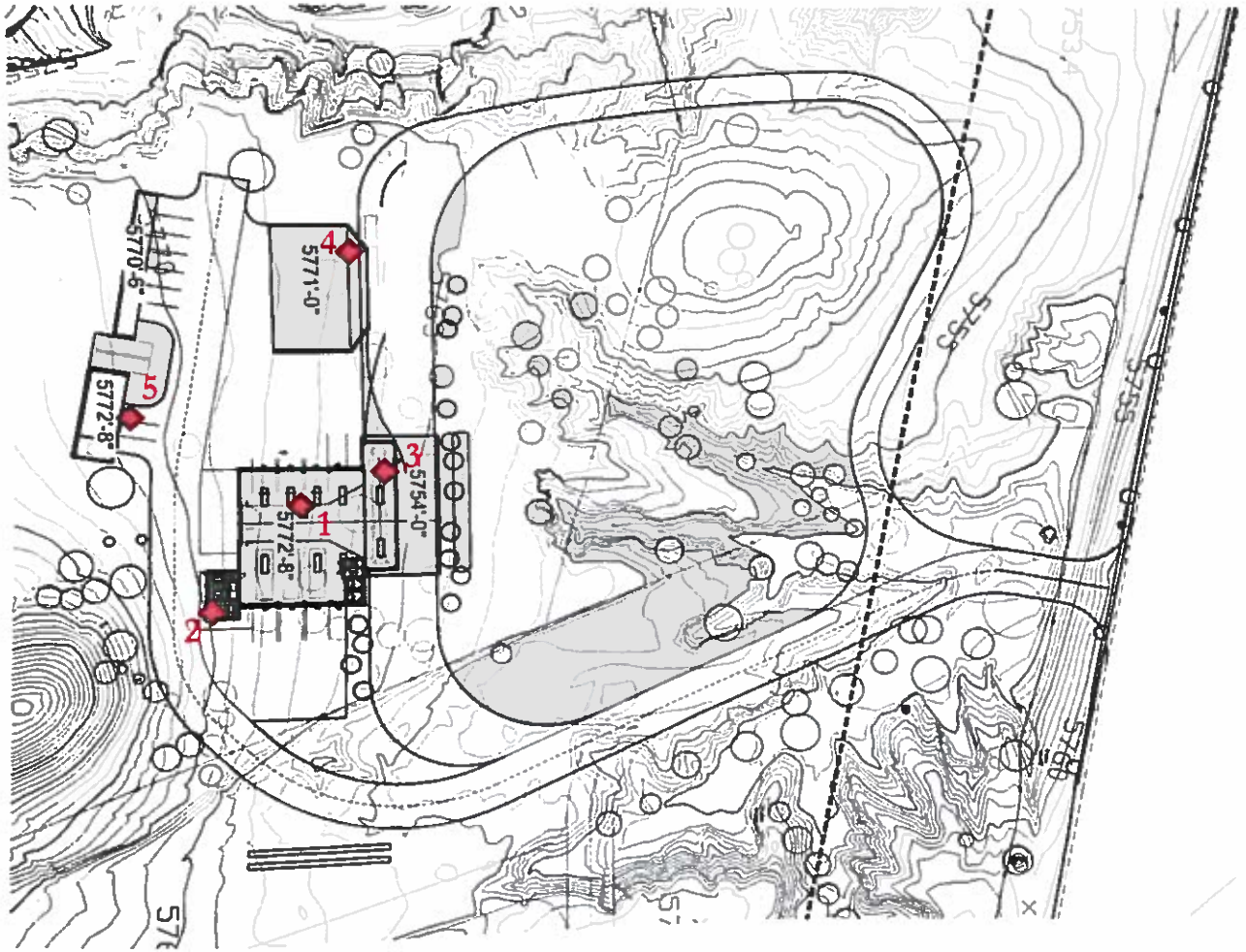
LABORATORY TEST RESULTS

Test Hole	Depth (feet)	Dry Density (pcf)	Moisture Content (%)	Liquid Limit	Plasticity Index	Percent Passing - U.S. Sieve Numbers									
						1-1/2"	3/4"	3/8"	No. 4	No. 8	No. 16	No. 30	No. 50	N0. 100	No. 200
1	0		5.4				100	98	96	93	89	85	76	61	33.7
	2		9.4						100	99	98	97	95	92	80.8
	5		8.1	34	12					100	99	99	97	94	76.0
	10		4.9							100	99	98	93	70	39.5
	15		3.2				100	99	98	98	98	97	90	60	23.4
	16		1.6				100	95	88	73	54	40	31	21	11.5
	20		12.1				100	98	96	95	93	91	86	80	63.0
	25		4.2				100	92	86	83	80	77	70	55	39.2
	30		5.6					100	98	97	95	93	84	52	28.2
2	0		5.8				100	99	96	93	90	87	81	68	34.8
	2		2.4					100	95	90	80	69	56	41	21.1
	5		3.7				100	99	96	90	81	69	57	46	25.2
	10		3.2					100	98	95	87	77	65	51	23.2
	15		2.5			100	93	89	83	77	68	56	44	34	18.1
	16		12.7				100	99	97	97	96	94	89	84	74.8
	20		6.9						100	98	95	92	82	48	25.0
3	0		4.1			100	96	95	93	90	87	83	77	64	41.4
	2		11.0	44	18							100	99	97	90.5
	5		8.4						100	99	98	96	93	85	68.8
	10		4.8				100	99	99	98	98	97	94	82	46.5
	15		3.9				100	99	99	99	98	95	89	67	32.3
	20		9.2				100	94	92	90	89	88	87	83	57.0
4	0		9.8						100	99	98	97	94	87	65.6
	2		8.8	43	16					100	99	99	98	94	79.3
	5		9.7									100	99	97	82.5
	10		4.3									100	99	90	44.6
5	0		6.6				100	96	94	92	89	87	80	68	41.3
	2		5.3						100	99	96	92	86	74	52.1
	5		9.0	33	12					100	98	97	94	87	72.1
	10		3.2				100	99	97	95	90	84	73	60	27.0

Table 5. - Summary of Laboratory Test Results

Jacona Waste Transfer Station, Pojoaque, NM

Site Plan



*Not To Scale

◆ Test Hole Locations

Project No.: A15-296

Earthworks Engineering Group, LLC

Figure 1

LOG OF TEST HOLE NO.: 1

Project:	Jacona Waste Transfer Station
Date Drilled:	4.30.15
Drilling Method:	3.25" I D Hollow Stem Auger
Surface Elevation:	Not Available
Depth to Groundwater:	Not Encountered
Bottom of Hole:	31.5 ft

*Notes: anticipate ±12 ft. cut to lower level and ±5 ft. fill to upper level

Depth (feet)	N-Value (blows/ft)	Sample Type	Unified Class.	Description	Dry Density (pcf)	Moisture Content (%)
			SM	SAND, silty, fine to medium grained, medium moist, brown		5.4
2	7	S	CL	CLAY, silty, slightly sandy, fine grained, light-brown, medium stiff, slightly moist		9.4
5	7	S				8.1
10	8	S	SM	SAND, silty, fine to medium grained, medium moist, loose, light-brown		4.9
15	23	S		- fine to coarse grained, medium dense, slightly moist, reddish-brown		3.2
			SM	SANDSTONE, lightly cemented, weathered to gravel		1.6
20	105	S	SHALE	SHALE, lightly cemented, CLAY, fine grained, hard, slightly moist, brown		12.1
25	120	S	SM	SANDSTONE, lightly cemented, SAND, silty, dense, medium moist, pale-brown		4.2
30	106	S				5.6
				Bottom of Test Hole at 31.5 Feet		

LOG OF TEST HOLE NO.: 2

Project:	Jacona Waste Transfer Station
Date Drilled:	4.30.15
Drilling Method:	3.25" I D Hollow Stem Auger
Surface Elevation:	Not Available
Depth to Groundwater:	Not Encountered
Bottom of Hole:	21.5 ft

*Notes: anticipate ±13 ft. cut to lower level and ±4 ft. fill to upper level

Depth (feet)	N-Value (blows/ft)	Sample Type	Unified Class.	Description	Dry Density (pcf)	Moisture Content (%)
		B	SM	SAND, silty, fine to medium grained, moist, brown,		5.8
2	17	S		medium dense, fine to coarse grained		2.4
5	17	S				3.7
10	18	S				3.2
				- gravel lenses at 13 ft		
15	37	S		- dense		2.5
			CL	SHALE, lightly cemented, CLAY, hard, slightly moist, brown		12.7
20	90	S	SM	SANDSTONE, lightly cemented, SAND, silty, dense, moist, light-brown		6.9
				Bottom of Test Hole at 21.5 Feet		
25						
30						

LOG OF TEST HOLE NO.: 3

Project:	Jacona Waste Transfer Station
Date Drilled:	4.30.15
Drilling Method:	3.25" I D Hollow Stem Auger
Surface Elevation:	Not Available
Depth to Groundwater:	Not Encountered
Bottom of Hole:	21.5 ft

*Notes: anticipate ±11 ft. cut to lower level and ±6 ft. fill to upper level

Depth (feet)	N-Value (blows/ft)	Sample Type	Unified Class.	Description	Dry Density (pcf)	Moisture Content (%)
			SM	SAND, silty, fine to medium grained, medium moist, brown		4.1
2	11	S	CL	CLAY, slightly sandy, fine grained, medium moist, stiff, light-brown		11.0
5	13	S				8.4
10	12	S	SM	SAND, silty, fine to medium grained, slightly moist, medium dense, light-brown		4.8
15	17	S				3.9
20	100	S	CL	SHALE, lightly cemented, CLAY, hard, slightly moist, pale-brown		9.2
				Bottom of Test Hole at 21.5 Feet		
25						
30						

LOG OF TEST HOLE NO.: 4

Project:	Jacona Waste Transfer Station
Date Drilled:	4.30.15
Drilling Method:	3.25" I D Hollow Stem Auger
Surface Elevation:	Not Available
Depth to Groundwater:	Not Encountered
Bottom of Hole:	11.5 ft

*Notes: anticipate ±4 ft. fill to grade

Depth (feet)	N-Value (blows/ft)	Sample Type	Unified Class.	Description	Dry Density (pcf)	Moisture Content (%)
0		B	SM	SAND, silty, fine to medium grained, medium moist, brown		9.8
2	21	S	CL	CLAY, slightly sandy, fine grained, slightly moist, very stiff, brown		8.8
5	18	S				9.7
10	90	S	SM	SANDSTONE, lightly cemented, SAND, silty, dense, slightly moist, pale-brown		4.3
				Bottom of Test Hole at 11.5 Feet		
15						
20						
25						
30						

LOG OF TEST HOLE NO.: 5

Project:	Jacona Waste Transfer Station
Date Drilled:	4.30.15
Drilling Method:	3.25" I D Hollow Stem Auger
Surface Elevation:	Not Available
Depth to Groundwater:	Not Encountered
Bottom of Hole:	11.5 ft

*Notes: anticipate ±1.5 ft. fill to grade

Depth (feet)	N-Value (blows/ft)	Sample Type	Unified Class.	Description	Dry Density (pcf)	Moisture Content (%)
		B	SM	SAND, silty, fine to medium grained, medium moist, brown		6.6
2	9	S	CL	CLAY, sandy, fine grained, slightly moist, stiff, light-brown		5.3
5	14	S				9.0
10	13	S	SM	SAND, silty, fine to medium grained, slightly moist, medium dense, light-brown		3.2
				Bottom of Test Hole at 11.5 Feet		
15						
20						
25						
30						

EARTHWORK CERTIFICATION CHECKLIST

Client: Santa Fe County EEG Project No. (GT): A15-296

Project: Jacona Waste Collection Center EEG Project No: (MT):

It is the responsibility of the owner and the contractor to fully read and understand the complete geotechnical investigation report and recommendations made therein. The following checklist is a summary of steps necessary in order to receive earthwork certification by Earthworks Engineering Group, LLC.

SCHEDULING

Call a minimum of 2 days prior to starting earthwork, to arrange for the pickup and testing of proctor sample(s). Call a minimum of 1 day prior to starting earthwork, to schedule natural ground prep inspection and initial compaction testing. Call 24 hours in advance to schedule testing once earthwork has commenced.

EARTHWORK COMPACTION TESTING

Pass?

1. Have Proctor Test Results for onsite and/or import soils:_____ ☐
2. Test Base of Excavations/Natural Ground Preparation:_____ ☐
3. Test During Placement of Engineered Fill (Test @ 1 Ft Min. Intervals):_____ ☐
4. Test Bottom of Footing Excavations Prior to Steel Placement:_____ *EXTERIOR FTGS* ☐ *INTERIOR FTGS* ☐
5. Test Plumbing Trench Backfill (Test @ 1 Ft. Min. Intervals):_____ ☐
6. Test Finished Pad Grade (After Footing Excavation & Trench Backfill):_____ ☐
7. **BEFORE PLACING CONCRETE, GET CERTIFICATION LETTER:**_____ ☐

Figure 7