State of Utah

JON M. HUNTSMAN, JR.
Governor

GARY R. HERBERT
Lieutenant Governor

Department of Administrative Services
Kim Hood
Executive Director

Division of Facilities Construction and Management
David G. Buxton
Director

ADDENDUM

Date:	24 March 2009	
To:	Contractors	
From:	Brent Lloyd, DFCM – Project Manager	
Reference:	Southwest Utah Youth Center Parking Lot Improvements Youth Corrections – Cedar City, Utah DFCM Project No. 08199430	
Subject:	**Addendum No. 1**	
Pages	Addendum	3 pages
	Revised Schedule	1 page
	Revised Unit Cost Bid Sheet	3 pages
	Soils Report	26 pages
	Total	**33 pages**

Note: This Addendum shall be included as part of the Contract Documents. Items in this Addendum apply to all drawings and specification sections whether referenced or not involving the portion of the work added, deleted, modified, or otherwise addressed in the Addendum. Acknowledge receipt of this Addendum in the space provided on the Bid Form. Failure to do so may subject the Bidder to disqualification.

1.1 SCHEDULE CHANGES – Revised Bid Deadline- Wednesday, April 1, 2009 at 2:30 PM

1.2 GENERAL – See attached "Addendum No. 01"

STATE OF UTAH - DEPARTMENT OF ADMINISTRATIVE SERVICES

Division of Facilities Construction and Management

DFCM

REVISED - PROJECT SCHEDULE
PER ADDENDUM #1 – dated March 24, 2009

PROJECT NAME: **SOUTHWEST UTAH YOUTH CENTER PARKING LOT IMPROVEMENTS**
YOUTH CORRECTIONS – CEDAR CITY, UTAH

DFCM PROJECT NO. : 08199430

Event	Day	Date	Time	Place
Bidding Documents Available	Monday	March 9, 2009	2:00 PM	DFCM 4110 State Office Building SLC, UT and DFCM web site*
Mandatory Pre-bid Site Meeting	Thursday	March 12, 2009	10:00 AM	Southwest Utah Youth Center, 270 East 1600 North Cedar City, Utah
Last Day to Submit Questions	Tuesday	March 17, 2009	10:00 AM	Brent Lloyd - DFCM E-mail brentloyd@utah.gov Fax 801-538-3267
Addendum Deadline (exception for bid delays)	Thursday	March 19, 2009	2:00 PM	DFCM web site*
Prime Contractors Turn in Bid and Bid Bond	**Wednesday**	**April 1, 2009**	**2:30 PM**	DFCM 4110 State Office Building SLC, UT
Sub-contractor List Due	**Thursday**	**April 2, 2009**	**2:30 PM**	DFCM 4110 State Office Building SLC, UT Fax 801-538-3677
Project Completion Date	Tuesday	June 30, 2009		

*** DFCM's web site address is http://dfcm.utah.gov**

ADDENDUM No. 01

The following items have been brought to the attention of the owner and are being addressed in this addendum. The contractor is responsible to review and include these items in the bid.

0.2 Addendum No. 1

A. As discussed in the Pre-bid meeting on-site, the security of the facility is high priority. The contractor and sub-contractors will be required to supply the names and I.D. information of those that will be working on the site for the agency to conduct background checks prior to beginning construction.

B. At the Pre-bid meeting a question about the soils report was brought up. The soils report for this project has been included with this addendum for review by the contractor.

C. The existing storm drain located on the north side of the building will remain and be used for the drainage of that area. The project will replace the existing catch basin box with a new 2'x2' box and grate. The lines currently extend and daylight at the existing ground on the west side of the property. We will be installing catch basins at that point matching the flowline of the existing pipe. That area of the parking lot is being raised to allow the necessary cover for the pipes.

D. The detail on the sewer grinder installation is not clear about the type of pipe in the box. The requirement is for the contractor to tie onto the existing clay sewer pipe at the high side of the box change to 6" PVC SDR-35 Pipe for the installation and piping in the box and then connect back to the existing clay pipe at the outlet of the box. All pipe and fittings are to be supported as needed inside the box.

E. Bid Sheet Changes.
   1. The 12" Storm drain line was not separated from the 15". The Bid sheet has been updated to reflect this change and updated quantities.
   2. Bid item #3 is for the 3" minus gravel for the area at the northeast corner of the building. The gravel is to be place 4-6" deep throughout the area shown.
   3. Bid items 3 and 8 are the same item. We have eliminated bid item # 8. Item #3 is to remove and dispose of all vegetation and material not suitable for fill areas within the construction area.
   4. The quantities of road base and over-excavated materials have been modified to match the plans. There is an area near the existing curb to remain that will not need to be excavated or have the base removed. After the asphalt is removed it will be graded, compacted and matched into the new base and then new pavement will be installed over the base.

F. The 4" diameter conduits to be placed across the parking lot to the landscape areas are to be PVC schedule 80 or better.

G. The concrete slabs, sidewalks, curbs, etc. are to have a minimum of 6" of compacted road base below them. The cross gutter is to have a minimum of 8" of road base under them. The cost for the road base is included in the cost of the curb, slab, or cross gutter.

H. The grading for this site is to be a balance cut/fill. The existing asphalt is to be pulverized and along with the majority of the existing road base is to be stockpiled and used for fill in the new paving areas. The asphalt/base material should be mixed into the on-site material when placing in fill areas. The only import required will be the road base in the over-excavated areas.

I. The landscaping rock/block retaining wall located at the northeast corner of the lower parking area is from 0'-3' high. It can be made from rock or diamond block and does not require any special grid or installation. Its purpose is to retain the existing landscaping in that area.

J. The block wall along the west property line is to have grout in all cells that contain reinforcing.

K. The existing phone box located at the southwest portion of the new parking lot is to be relocated to the planter area to the west. This will need to be coordinated with Qwest for them to move the box. The contractor will need to excavate around the phone and gas lines. The depth of the lines is unknown and may be within the over-excavation zone.

L. The bid alternate for the landscaping is to provide (5) large decorative rocks along with a colored decorative rock 3-4" deep in the planter area shown on sheet C3. No Irrigation is involved.

M. The bid alternate for the shed will be for a 20'x 20' wood framed shed on a concrete slab. The shed can be pre-manufactured, or built in place. It is up to the contractor as to the type of construction. It should have a 8'x7' overhead garage type door along with an asphalt shingle roof and be designed for the Cedar City snow loads and the 2007 IBC. The outside can be stained or painted wood siding or other approved material.

L. The masonry wall on the west side of the property is built on top of a concrete retaining wall and footing per detail on Sheet C-6. The concrete portion of the wall will be from 4-5' tall and the cover on the footing on the low side is 6" to 2'. The footing and walls will be placed horizontally straight and step down in 8" increments as the slope of the ground falls to the north. The front portion that lies within the 25' setback from the right-of-way will be 30" tall and the rest of the wall will be 6' tall.

END OF ADDENDUM

The following REVISED BASE BID UNIT PRICE PROPOSAL shall replace Sheets 3, 4 & 5 of the BID FORM.

ADDENDUM No. 1 – REVISED BID SHEET – 3/18/2009
BASE BID UNIT PRICE PROPOSAL

This bid form is to be used in conjunction with the construction drawings prepared by InSite Engineering. Contractor to supply all necessary fittings and labor to complete the project. The items and quantities for the bid are as follows:

Base Bid

Item	Description	Unit	Estimated Quantity	Unit Price	Amount
1.	Mobilization	L.S.	1	_____	_____
2.	Remove existing curb and gutter	L.F.	830	_____	_____
3.	Remove top 6” of soil in unpaved areas	L.S.	1	_____	_____
4.	Sawcut existing asphalt	L.F.	248	_____	_____
5.	Pulverize existing asphalt	S.F.	19,151	_____	_____
6.	Remove, stockpile, replace & re-compact ex. asphalt & road base	C.Y.	425	_____	_____
7.	Remove existing sheds and misc. concrete	L.S.	1	_____	_____
8.	Not Used			_____	_____
9.	Remove and replace existing Sidewalk on 1600 N.	L.F.	12	_____	_____
10.	15” CPP storm drain pipe	L.F.	243	_____	_____
10a.	12” CPP storm drain pipe	L.F.	281	_____	_____
11.	Double curb inlet box	Each	1	_____	_____
12.	2’x2’ storm drain box	Each	4	_____	_____
13.	Remove and replace ex. storm drain box with 2’x2’ storm drain box	Each	1	_____	_____
14.	Core drill existing sump	L.S.	1	_____	_____
15.	Raise/Lower irrigation lid to grade	Each	1	_____	_____
16.	Raise/Lower valve to grade	Each	1	_____	_____
17.	Relocate existing fire hydrant	L.S.	1	_____	_____

Base Bid Continued

Item	Description	Unit	Estimated Quantity	Unit Price	Amount
18.	30” curb & gutter	L.F.	930	_____	_____
19.	6’ sidewalk	L.F.	207	_____	_____
20.	8” curb	L.F.	68	_____	_____
21.	Excavation and 24” Over ex. and re-compact	C.Y.	3,490	_____	_____
22.	8” Road Base	S.F.	27,025	_____	_____
23.	3” Asphalt paving	S.F.	32,775	_____	_____
24.	3’ Cross gutter	L.F.	382	_____	_____
25.	3” Minus Gravel (4”-6” deep)	Ton	138	_____	_____
26.	Grade existing dirt road to match	L.S.	1	_____	_____
27.	Concrete around ex. equipment	S.F.	509	_____	_____
28.	Relocate light pole	L.S.	1	_____	_____
29.	Muffin Monster grinder with accessories	L.S.	1	_____	_____
30.	Muffin Monster vault	L.S.	1	_____	_____
31.	4” drain line from Muffin Monster into ex. sewer lateral	L.S.	1	_____	_____
32.	Sewer cleanout	Each	1	_____	_____
33.	Run power for controls from Muffin Monster to control room	L.S.	1	_____	_____
34.	Parking lot striping	L.S.	1	_____	_____
35.	New sod	S.F.	2,000	_____	_____
36.	Relocate & repair sprinklers	L.S.	1	_____	_____
37.	4” PVC conduits	L.F.	388	_____	_____
38.	Rock/diamond block retaining wall	L.S.	1	_____	_____

Base Bid Continued

Item	Description	Unit	Estimated Quantity	Unit Price	Amount
39.	6” Pipe bollards	Each	4	_____	_____
40.	Parking lot signs	Each	3	_____	_____
41.	6’ Masonry Wall on Concrete Retaining Wall	L.F.	155	_____	_____

TOTAL BASE BID: _____

Where installed quantities differ from the estimated quantities, the Unit prices shall be used to determine the payment amount.

Alternate 1 Northeast Paving Area

Item	Description	Unit	Estimated Quantity	Unit Price	Amount
1.	30” curb & gutter	L.F.	80	_____	_____
2.	24” Over ex. and re-compact	C.Y.	291	_____	_____
3.	8” Road Base	S.F.	3,695	_____	_____
4.	3” Asphalt paving	S.F.	3,695	_____	_____

TOTAL ALTERNATE 1 BID: _____

Alternate 2 Entry Landscaping

Item	Description	Unit	Estimated Quantity	Unit Price	Amount
1.	Entry Landscaping	L.S.	1	_____	_____

TOTAL ALTERNATE 2 BID: _____

Alternate 3 20’ x 20’ Shed

Item	Description	Unit	Estimated Quantity	Unit Price	Amount
1.	20’x20’ shed w/overhead door	L.S.	1	_____	_____

TOTAL ALTERNATE 3 BID: _____

Geotechnical Environmental Materials Testing

Geotechnical Investigation

Proposed Southwest Utah Youth Corrections Parking Lot Improvements

270 East 1600 North Street

Cedar City, Iron County, Utah

Prepared For:

Insite Engineering
1883 West Royal Hunt Drive
Cedar City, Utah 84720

September 10, 2008

Report Number: RG0883

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September 10, 2008

Insite Engineering
1883 West Royal Hunt Drive
Cedar City, Utah 84720

Subject: Proposed Southwest Utah Youth Corrections Parking Lot Improvements
270 East 1600 North Street
Cedar City, Iron County, Utah

Enclosed is our geotechnical investigation report for the subject improvements to be constructed at the subject site in Cedar City, Utah.

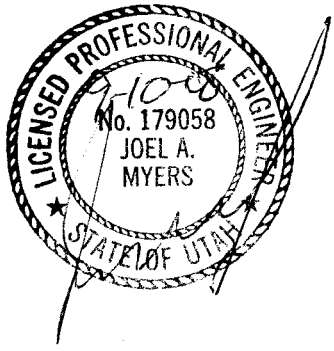
The report details our field exploration and laboratory testing program and presents our analysis, opinions and recommendations for the proposed project.

Collapsible/compressible soils were encountered which will need to be overexcavated and recompacted as outlined in this report.

We appreciate this opportunity to be of service on this phase of the project and look forward to being of service as the project progresses. If you have any questions, please contact this office at your convenience.

Sincerely,
GEM Engineering, Inc.

Joel A. Myers, P.E.
President



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APPENDICES

Appendix A

1.0 INTRODUCTION

1.1 GENERAL

This report presents the results of a geotechnical investigation performed for the proposed Southwest Utah Youth Corrections Parking Lot Improvements at 270 East 1600 North Street, Cedar City, Iron County, Utah. The study was conducted in accordance with your authorization.

The purposes of this investigation were to: (1) evaluate the general site geologic conditions and identify potential geotechnical hazards to the proposed structures; (2) evaluate the general nature and engineering properties of the subsurface soils at the site; and (3) provide recommendations and opinions regarding general site grading and the design and construction of foundations, concrete slabs-on-grade, and asphaltic concrete pavements. The investigation included a site reconnaissance, subsurface explorations, representative soil sampling, laboratory testing, engineering analyses, and preparation of this report.

The recommendations contained in this report are subject to the limitations presented in the "Limitations" section of the report. We recommend that all individuals reading this report read the limitations section of this document.

1.2 PROJECT DESCRIPTION

We understand that a paved parking lot and a 13' x 9' 33.5-ton sewer box (located off the pavement) will be constructed at the location described in Cedar City, Utah. Structural loads are expected to be low to moderate.

The proposed site plan on Plate 1 shows the approximate property boundaries with respect to the approximate trench locations.

2.0 FIELD EXPLORATION

The subsurface soil conditions were explored by excavating with a backhoe four exploratory trenches to depths of approximately 3 to 5 feet below the existing site grade. The approximate locations of these explorations are shown on Plate 1. Soils and subsurface conditions encountered in the explorations were classified, logged, and recorded at the time of excavation by our field geologist. The results of the explorations are presented on the enclosed Plates 2 through 5. A key to soil symbols and terms is found on Plate 6.

3.0 LABORATORY TESTING

Representative soil samples from the explorations were tested in the laboratory for solubility, Atterberg limits, maximum density, and consolidation behavior. Results are presented on Plates 7 and 8.

Soil samples are normally discarded 30 days after submittal of the report unless this office receives a specific request to retain the samples for a longer period.

4.0 SITE CONDITIONS

4.1 SURFACE CONDITIONS

The site is located at approximately 270 East 1600 North Street in Cedar City, Iron County, Utah, as shown on Plate 1. At the time of our investigation it contained the existing Southwest Utah Youth Corrections Building and was surrounded by a mix of existing structures and vacant land. The surface slopes to the west.

4.2 SUBSURFACE CONDITIONS

Based on the explorations performed for this investigation, the on-site soils generally consisted of loose gravelly sand and clayey sand extending to a depth of approximately 1 foot below the existing site grade. This material was underlain by medium dense to very dense gravelly sand, silty-clayey sand, and clayey sand extending to the bottoms of the trenches. Refusal was encountered in all four trenches at depths of 3 to 5 feet.

Groundwater was not encountered during the explorations. The soils were in a slightly moist condition throughout the depths explored.

The encountered subsurface conditions are described in detail on the enclosed trench logs, Plates 2 through 5. Due to the nature and depositional characteristics of the native soils, care should be taken in extrapolating subsurface conditions beyond or interpolating them between the exploration locations.

The laboratory test results indicated that the on-site soils exhibited a low to moderate solubility, a low to moderate plasticity, and a moderate to severe collapse potential.

5.0 ENGINEERING ANALYSIS AND RECOMMENDATIONS

5.1 GENERAL

Based on the subsurface conditions encountered at the site, it is our opinion that the subject site is suitable for the proposed construction provided that the recommendations contained in this report are followed. Specifically, it is our opinion that any loose surface materials are not suitable for support of the proposed structures or pavements and should be excavated and hauled off the site. Following that, the anticipated zone of overexcavation should extend a minimum of 5 feet below footings or 5 feet below the existing site grade, whichever is greater. Overexcavations may be terminated on competent, medium-dense granular soils if encountered.

The majority of the on-site soils free of organics and debris should be suitable for reuse as structural fill. However, care should be taken to remove all debris and organics from the soils that exist at the site. The proposed structure should then receive adequate support from conventional foundations established on a zone of structural fill.

It should be noted that loose, soft, and/or collapsible soils were encountered which may require stabilization prior to the placement of structural fill. If loose, soft, or pumping soils are encountered at the bottom of the overexcavations, stabilization and/or additional overexcavation will be required prior to the placement of structural fill.

Slabs-on-grade, exterior concrete flatwork, and pavements should be supported by a zone of properly placed and compacted structural fill. Overexcavations on the order of 30 inches below the supportive gravel layer or 30 inches below the existing site grade, whichever is greater, will be required. The majority of the on-site soils should be suitable for use as compacted structural fill, although up to 30% shrinkage can be expected. As an alternative, 18 inches of Type 1 pit run gravel can be substituted for the 30 inches of recompacted native soil.

Because of the flatness of the slope we recommend that the finished floor slab elevations be raised high enough to facilitate proper drainage away from the structures.

The following sections of this report present our recommendations to reduce the potential for structural damage. They contain specific opinions and recommendations concerning

construction considerations, site preparation and grading, structural fill, foundation design, retaining walls, concrete slabs-on-grade, soil corrosion, moisture protection, and structural pavement sections.

5.2 CONSTRUCTION CONSIDERATIONS

5.2.1 Foundation Systems

After overexcavation and recompaction are completed, the structure can be supported by conventional strip and/or spread footings founded on properly placed and compacted structural fill. If loose, soft, or pumping soils are encountered at the bottom of the overexcavation, stabilization will be required prior to the placement of structural fill.

5.3 EARTHWORK

5.3.1 Site Preparation and Grading

Within the areas to be graded, existing vegetation, loose soils, and debris should be removed and hauled off the site. Any undocumented fill soils and soft, loose, collapsible and/or disturbed native soils should also be excavated to expose competent, dense or medium-dense native soils. Excavations may be terminated if competent, medium-dense granular soils are encountered. A representative of this office should observe the site grading operations to verify that unsuitable soils are identified and treated as recommended below.

Overexcavations of 5 feet below footings or 5 feet below site grade, whichever is greater, are recommended based on the soil types and our laboratory consolidation tests. Slabs-on-grade, exterior concrete flatwork, and pavements should be supported by a zone of properly placed and compacted structural fill. Overexcavations on the order of 30 inches below the supportive gravel layer or 30 inches below the existing site grade, whichever is greater, will be required. Excavations may be terminated if competent, medium-dense granular soils are encountered. As an alternative to the above, 18 inches of Type 1 pit run gravel can be substituted for the 30 inches of recompacted native soils. The majority of the on-site soils should be suitable for use as compacted structural fill, although up to 30% shrinkage can be expected.

Excavations should extend laterally at least 5 feet beyond the building areas, or to a distance equal to the depth of structural fill, whichever is greater. The excavations should extend laterally at least 2 feet beyond exterior flatwork and pavement areas. The majority of the on-site soils should be reusable for compacted structural fill, although up to 30% shrinkage can be expected.

Following excavation of the unsuitable soils as described above, a representative of this office should observe the excavation bottoms prior to the continuance of grading to verify that unsuitable materials have been removed and that competent soils have been exposed. The native soils exposed after overexcavation should be scarified to a depth of 6 inches, brought to within 2 percent of the optimum moisture content for granular soils and slightly above optimum for fine-grained soils, and compacted to at least 90 percent of the maximum dry density as determined by ASTM D-1557. The site should then be brought to rough pad grade with structural fill as described in the following section.

Subgrade materials supporting slabs-on-grade, exterior concrete flatwork, and pavements should be kept moist and not be allowed to dry out and crack. If the subgrade has been disturbed or dried out prior to placement of aggregate base, the exposed soils should be moisture-conditioned and recompacted as outlined in the Structural Fill section of this report.

We recommend that a representative of this office be allowed to review the grading plans when prepared to evaluate their compatibility with our recommendations.

5.3.2 Excavations

The majority of the soils encountered in our explorations should be readily excavatable with conventional earthwork equipment. It is also possible that soft pumping soils may be encountered. Pumping soils will need to be stabilized prior to placing of structural fill. Safety of construction personnel is the responsibility of the Contractor.

5.3.3 Material Volume Changes

There will be shrinkage losses when excavating and compacting the on-site soils. An estimated average shrinkage factor of 30 percent is applicable for the loose to medium-

dense near-surface native soils. A subsidence factor of 0.1 feet should be used in all areas where the surficial soils are scarified and recompacted to a depth of 6 inches.

5.3.4 Structural Fill

All fill placed for the support of slabs-on-grade, exterior concrete flatwork, and pavements should be structural fill. Structural fill may consist of approved excavated on-site soils or imported fill materials. Structural fill should have a swell potential less than 4 percent under a 60 psf surcharge, have a solubility of less than 3 percent, be free of organics, salts, or inert materials larger than 4 inches nominal size, and be similar in gradation to the on-site soils.

Structural fill should be placed in maximum eight-inch loose lifts and compacted on a horizontal plane, unless otherwise approved by the Geotechnical Engineer. Soils in compacted fills should be compacted to at least 90 percent of the maximum dry density as determined by ASTM-D1557 for fine grained soils and 95 percent for granular soils. The moisture content should be within 2 percent of optimum for granular soils and at least 2 percent above optimum for fine-grained soils. Any imported fill materials should be approved prior to importing. Also, prior to placing any fill, the excavations should be observed by a GEM Engineering representative to observe that unsuitable materials have been removed.

5.4 FOUNDATIONS

5.4.1 Conventional Foundations

General: Conventional shallow foundations consisting of strip and/or spread footings can be utilized for the proposed structure provided that overexcavation of soils described previously is accomplished. Foundation areas should be prepared in accordance with site preparation recommendations previously provided. Exterior conventional spread foundations should be established at least 30 inches below the lowest adjacent final compacted subgrade for frost protection.

Foundations for structures established as described above may be designed for an allowable net bearing pressure of 2000 psf. The bearing pressure may be increased by one-third for seismic or wind load design.

Prior to constructing the foundations, the footing excavations should be observed by the Geotechnical Engineer to verify that the specified removals have been accomplished.

Settlement: Foundations established in accordance with the recommendations provided are estimated to be subject to less than 1½ inch of settlement if the soils beneath the overexcavation do not become moistened. We anticipate that differential settlement could be on the order of ½ the total settlement.

Resistance to Lateral Loads: Horizontal loads acting on foundations will be resisted by friction acting at the base of foundations and by passive earth pressures. If design makes use of passive earth pressures, it is important that the Geotechnical Engineer be present during any footing backfill placement.

The friction acting along the base of footings founded on suitable foundation soils may be computed by using a coefficient of friction of 0.45 with the normal dead load. An allowable lateral passive earth pressure may be computed by using an equivalent fluid weighing 291 pcf for the side of footings poured against natural soils or properly placed and compacted backfill. Passive resistance in the upper one foot should be neglected unless the surface is covered by paving or concrete slabs-on-grade. The maximum allowable passive pressure should not exceed 1,600 psf. Retaining walls may be constructed utilizing an equivalent fluid pressure of 35 (pcf).

Lateral loads acting on buried utility lines may be resisted by thrust blocks reacting against undisturbed native soil or properly placed and compacted structural fill. The above referenced allowable passive lateral earth pressure equivalent fluid density and coefficient of friction may be used for thrust block design. The values given may be increased by one-third for transient wind or seismic loads.

5.5 CONCRETE SLABS ON GRADE

Satisfactory support for concrete slabs-on-grade and exterior concrete flatwork may be provided by a 6-inch layer of compacted gravel overlying properly placed and compacted structural fill as recommended in the Site Grading section of this report. The layer of compacted gravel may consist of road base or pit-run gravel with a 2-inch maximum particle size and no more than 12 percent fines passing the No. 200 sieve. The gravel

layer should be compacted to at least 95 percent of the maximum dry density as determined by ASTM-D1557.

All concrete slabs should be designed to minimize cracking as a result of shrinkage. It is our opinion that concrete floor slabs should be reinforced in accordance with recommendations provided by the Structural Engineer. Reinforcement should be installed at mid-height in the slab unless directed otherwise by the Structural Engineer.

Special precautions must be taken during the placement and curing of all concrete slabs. Excessive slump (high water-cement ratio) of the concrete and/or improper curing procedures used during either hot or cold weather conditions could lead to excessive shrinkage, cracking or curling in the slabs. We recommend that all concrete placement and curing operations be performed in accordance with the American Concrete Institute (ACI) Manual.

5.6 SOIL CORROSION

Based on similar studies performed in the area, the on-site soils contain salts in sufficient concentration to be considered corrosive to both concrete and metal. Therefore, all concrete in contact with the on-site soils and used in stemwalls should contain Type V or equivalent sulfate-resistant cement, and should be placed with a maximum four inch slump. Special protection to buried metal pipes and water lines should be considered for long term performance of these underground utilities. Consideration should be given to cathodic protection of buried metal pipes, or to the use of PVC pipe where permitted by local building codes.

5.7 MOISTURE PROTECTION AND DRAINAGE

It is imperative that precautions are taken during and after construction to eliminate, or at least minimize, saturation of foundation soils. Overwetting the soils prior to or during construction may result in softening and pumping, causing equipment mobility problems and difficulty in achieving compaction. Positive drainage should be established away from the exterior walls of the structure. The recommended minimum slope is five percent (5%) in landscape area and two percent (2%) in pavement areas, for a minimum distance of 10 feet from the structure. Roof runoff and other sources of moisture should not be allowed to infiltrate the soils in the vicinity of, or upslope from, the structure.

Outlets to roof drains should be constructed to drain through the curb and gutter to the street. No roof moisture should infiltrate the soils beneath the foundations.

All utility trenches leading into the structure should be backfilled with compacted non-pervious fill. Special care should be taken during installation of sub floor sewer and water lines to reduce the possibility of future subsurface saturation.

Landscape watering adjacent to the structures should be eliminated. As an additional protection a concrete slab could be placed around the structure to facilitate drainage away from the structure as described above. Any planters adjacent to the structure should have sealed bottoms. Desert landscaping techniques should be utilized.

5.8 ASPHALTIC CONCRETE PAVEMENTS

Asphaltic concrete pavement sections were developed for non-dedicated areas. In developing our recommendations, we have assumed that: (1) a minimum of 24 inches of Type 1 gravel (3-inch minus pit run) will be provided beneath the pavement section; (2) a Traffic Index value of 6.5 for automobile traffic and parking areas is appropriate; and (3) an R-value of 35 is representative of recompacted native soils. The following table presents the minimum recommended structural pavement sections:

Asphaltic Concrete Pavements

Traffic Condition	Assumed Traffic Index (T.I.)	Asphalt Thickness (Inches)	Road Base Thickness (Inches)	Compacted Type 1 Gravel (Inches)
Modereate Traffic/Parking	6.5	3	8	18

Asphalt and aggregate base material should conform to local requirements. All base material should be compacted to at least (95%) of the maximum dry density (ASTM D-1557). Asphalt should be compacted to minimum of (97%) of the Marshall maximum density. Asphaltic concrete and base materials should be tested prior to delivery to the site and during placement to determine conformance with the project specifications.

It is important that parking area grades be set to provide positive drainage to suitable drainage structures. A desirable slope for drainage in paved areas is two percent.

6.0 CLOSURE

6.1 LIMITATIONS

The recommendations contained in this report are based on the field explorations, laboratory tests, and our understanding of the proposed construction. The subsurface data used in the preparation of this report were obtained from the explorations made during this investigation. It is possible that variations in the soil and groundwater conditions could exist elsewhere on the site. The nature and extent of variations may not be evident until construction occurs. If any conditions are encountered at the site which are different from those described in this report, our firm should be immediately notified so that we may make any necessary revisions to recommendations contained in this report. In addition, if the scope of the proposed construction changes from that described in this report, our firm should likewise be notified.

This report was prepared in accordance with the generally accepted standard of practice at the time the report was written. No warranty, express or implied, is made. It is the Client's responsibility to see that all parties to the project, including the Designer, Contractor, Subcontractors, etc., are made aware of this report in its entirety. The use of information contained in this report for bidding purposes should be done at the Contractor's option and risk.

6.2 ADDITIONAL SERVICES

The recommendations made in this report are based on the assumption that an adequate program of tests and observations will be made during the construction to verify compliance with the recommendations. These tests and observations should include, but not necessarily be limited to, the following:

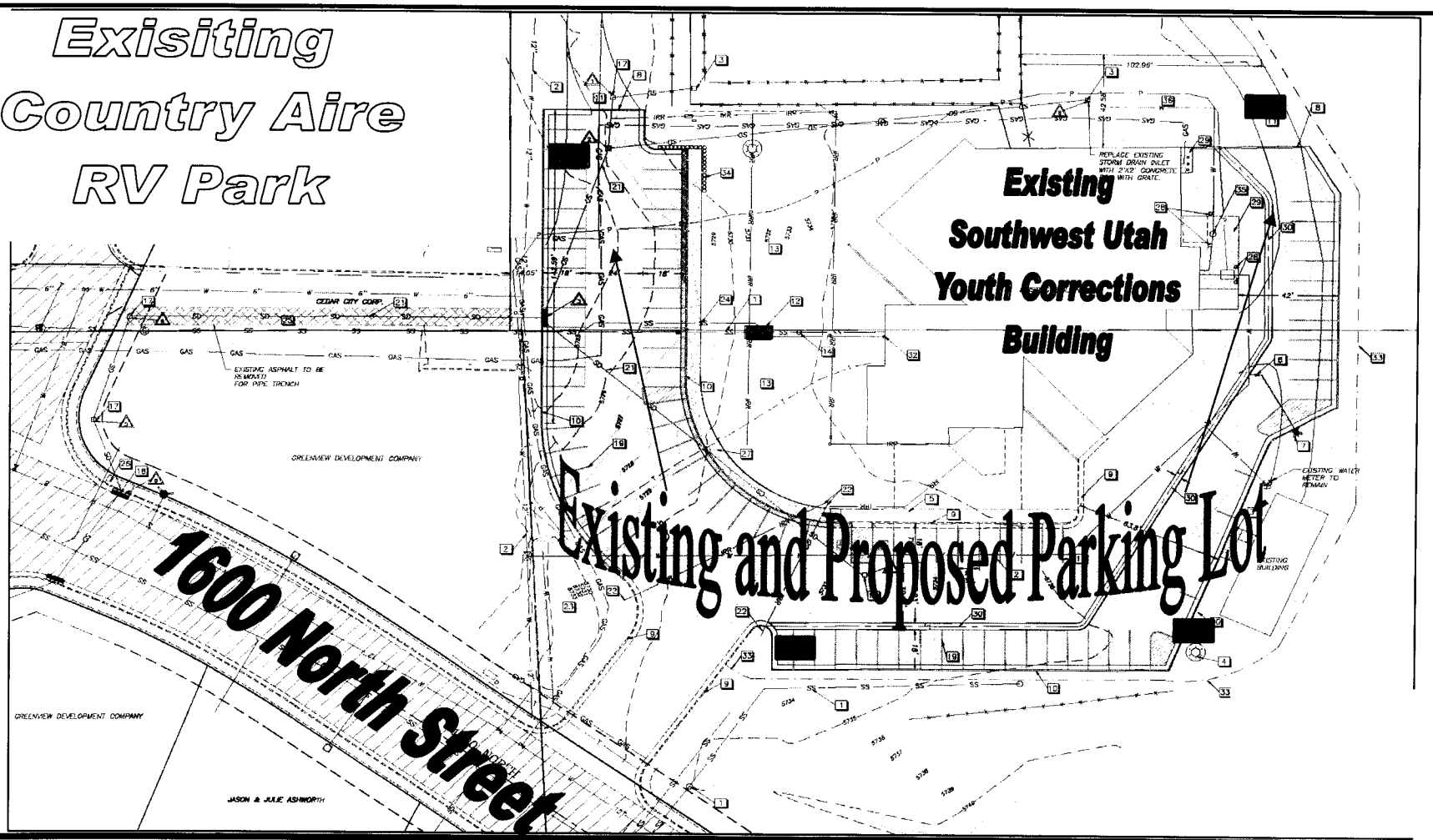
- Observations and testing during site preparation, earthwork and structural fill placement
- Observations of footing excavations
- Consultation as may be required during construction

We also recommend that project plans and specifications be reviewed by us to verify compatibility with our conclusions and recommendations. Additional information concerning the scope and cost of these services can be obtained from our office.

Key
- Approximate Trench Location
- Approximate Sewer Box Location

Site Plan

North ↑ Not to Scale



GEM ENGINEERING, INC.
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Site Plan

Southwest Ut. Youth Corrections Parking Lot Improvements,
270 East 1600 North Street,
Cedar City, Iron County, Utah

Plate
1

Date Excavated: 8/21/2008 Elev: Not Measured

Location: see plate 1

TRENCH NO. T-1

Depth (ft.)	Field Moisture %	Dry Density (pcf)	Other Tests *	Samples	SYMBOL +	SOIL DESCRIPTION	MOISTURE	CONSISTENCY
0					SM	(SM) - Gravelly Sand.	Slightly Moist	Loose
						- Light Brown		Dense
			SOL AT,P		SM-SC	(SM-SC) - Silty-Clayey Sand with Gravel.		Dense to Very Dense
5						- Caliche observed within layer. - Light Gray Brown		
						Bottom @ 5 feet.		
10								
15								
20								

* Other Tests: C = Consolidation, AT = Atterberg, S = Shear, G = Grain Size, E = Expansion, SOL = Solubility, DS = Direction Shear, P = Proctor

+ Sample Type: ■ = Drive Sample, □ = Bulk Sample, ☒ = No Recovery

Notes:
- No groundwater encountered.
- No caving of sidewalls.

Project:

SW Ut. Youth Corr. Parking Lot Improvements,
270 East 1600 North Street,
Cedar City, Iron County, Utah

GEM ENGINEERING, INC

Plate: 2

Date Excavated: 8/21/2008

Elev: Not Measured

Location: see plate 1

TRENCH NO. T-2

Depth (ft.)	Field Moisture %	Dry Density (pcf)	Other Tests *	Samples	SYMBOL +	SOIL DESCRIPTION	MOISTURE	CONSISTENCY
0						(SM) - Clayey Sand with Gravel.	Slightly Moist	Loose
						- Light Olive Brown		Dense to Very Dense
			SOL AT			(SM) - Clayey Sand with Gravel.		
						- Light Red Gray		
5						Refusal @ 4 feet.		
10								
15								
20								

* Other Tests: C = Consolidation, AT = Atterberg, S = Shear, G = Grain Size, E = Expansion, SOL = Solubility, DS = Direction Shear, P = Proctor

+ Sample Type: ■ = Drive Sample; □ = Bulk Sample; ☒ = No Recovery

Notes:
- No groundwater encountered.
- No caving of sidewalls.

Project:

SW Ut. Youth Corr. Parking Lot Improvements,
270 East 1600 North Street,
Cedar City, Iron County, Utah

GEM ENGINEERING, INC

Plate: 3

Date Excavated: 8/21/2008

Elev: Not Measured

Location: see plate 1

TRENCH NO. T-3

Depth (ft.)	Field Moisture %	Dry Density (pcf)	Other Tests *	Samples	SYMBOL +	SOIL DESCRIPTION	MOISTURE	CONSISTENCY
0					SM	(SM) - Gravelly Sand with Clay.	Slightly Moist	Loose
						- Brown		Medium Dense
					SM	(SM) - Gravelly Sand.		
	6.3	94.5	AT, C	■		- Light Red Brown		
5						Bottom @ 5 feet.		
10								
15								
20								

* Other Tests: C = Consolidation, AT = Atterberg, S = Shear, G = Grain Size, E = Expansion, SOL = Solubility, DS = Direction Shear, P = Proctor

+ Sample Type: ■ = Drive Sample; □ = Bulk Sample; ⊠ = No Recovery

Notes:
- No groundwater encountered.
- No caving of sidewalls.

Project:

SW Ut. Youth Corr. Parking Lot Improvements,
270 East 1600 North Street,
Cedar City, Iron County, Utah

GEM ENGINEERING, INC

Plate: 4

Date Excavated: 8/21/2008

Elev: Not Measured

Location: see plate 1

TRENCH NO. T-4

Depth (ft.)	Field Moisture %	Dry Density (pcf)	Other Tests *	Samples	SYMBOL +	SOIL DESCRIPTION	MOISTURE	CONSISTENCY
0			SOL AT			(SM) - Clayey Sand with Gravel. - Some caliche was observed within trench. - Light Gray Brown	Slightly Moist	Loose Dense to Very Dense
5						Refusal @ 3 feet.		
10								
15								
20								

* Other Tests: C = Consolidation, AT = Atterberg, S = Shear, G = Grain Size, E = Expansion, SOL = Solubility, DS = Direction Shear, P = Proctor

\+ Sample Type: ■ = Drive Sample; □ = Bulk Sample; ☒ = No Recovery

Notes:
- No groundwater encountered.
- No caving of sidewalls.

Project:

SW Ut. Youth Corr. Parking Lot Improvements,
270 East 1600 North Street,
Cedar City, Iron County, Utah

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Plate: 5

THE UNIFIED SOIL CLASSIFICATION SYSTEM

MAJOR DIVISIONS			Group	Symbol	TYPICAL NAMES
COARSE GRAINED SOILS More than 50% of material is larger than the No. 200 sieve.	**GRAVELS** More than 50 % of coarse part is larger than the No. 4 sieve.	**CLEAN GRAVELS** Little or no fines	GW		Well graded gravels, gravel sand mixtures, little or no fines
			GP		Poorly graded gravels/gravel sand mixtures
		GRAVELS WITH FINES Appreciable amount of fines	GM		Silty gravels, gravel-sand-silt mixtures
			GC		Clayey gravels, gravel-clay-sand mixtures
	SANDS More than 50 % of coarse part is smaller than the No. 4 sieve.	**CLEAN SANDS** Little or no fines	SW		Well graded sands, gravely sands, little or no fines
			SP		Poorly graded sands or gravely sands, little or no fines
		SANDS WITH FINES Appreciable amount of fines	SM		Silty sands, sand-silt mixtures
			SC		Clayey sands, sand clay mixtures
FINE GRAINED SOILS More than 50% of material is smaller than the No. 200 sieve.	**SILTS AND CLAYS** Liquid limit less than 50		ML		Inorganic silts and very fine sands, rock flour, silty or clayey fine sands or clayey silts with low plasticity
			CL-ML		Inorganic clay-silt mixture and very fine sand, silty or clayey fine sands or clayey silts with low plasticity.
			CL		Inorganic clays of low to medium plasticity, gravely Claus, sandy clays, silty clays, lean clays
			OL		Organic silts and organic silty clays of low plasticity
	SILTS AND CLAYS Liquid limit greater than 50		MH		Inorganic silts, micaceous or diatomaceous fine sandy or silty soils, elastic silts
			CH		Inorganic clays of high plasticity, fat clays
			OH		Organic clays or medium to high plasticity, organic silts
	HIGHLY ORGANIC SOILS		PT		Peat and other highly organic silts

Project:

Southwest Utah Youth Corrections Parking Lot Improvements,
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Southwest Utah Youth Corrections Parking Lot Improvements,
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Table # 1: Solubility Analysis

Sample Location	Soil Classification / Description	Percent Soluble by Weight
T-1 @ 4 feet	Silty-Clayey Sand	< 1
T-2 @ 3 feet	Clayey Sand	1.47
T-4 @ 2 feet	Clayey Sand	< 1

Table # 2 Atterberg Limits

Sample Location	UCS Type	Percent Passing # 4 Sieve	Percent Passing # 10 Sieve	Percent Passing # 40 Sieve	Percent Passing # 200 Sieve	Liquid Limit	Plastic Limit	Plasticity Index
T-1 @ 4'	SM-SC	58.1	46.7	39.9	20.3	22	17	5
T-2 @ 3'	SC	71.7	58.9	47.2	34.4	23	14	10
T-3 @ 4'	SM	72.2	58.9	52.4	25.5	--	--	Non-Plastic
T-4 @ 2'	SC	64.8	54.9	45.4	32.1	27	16	12

Table #3 Maximum Density Test Summary

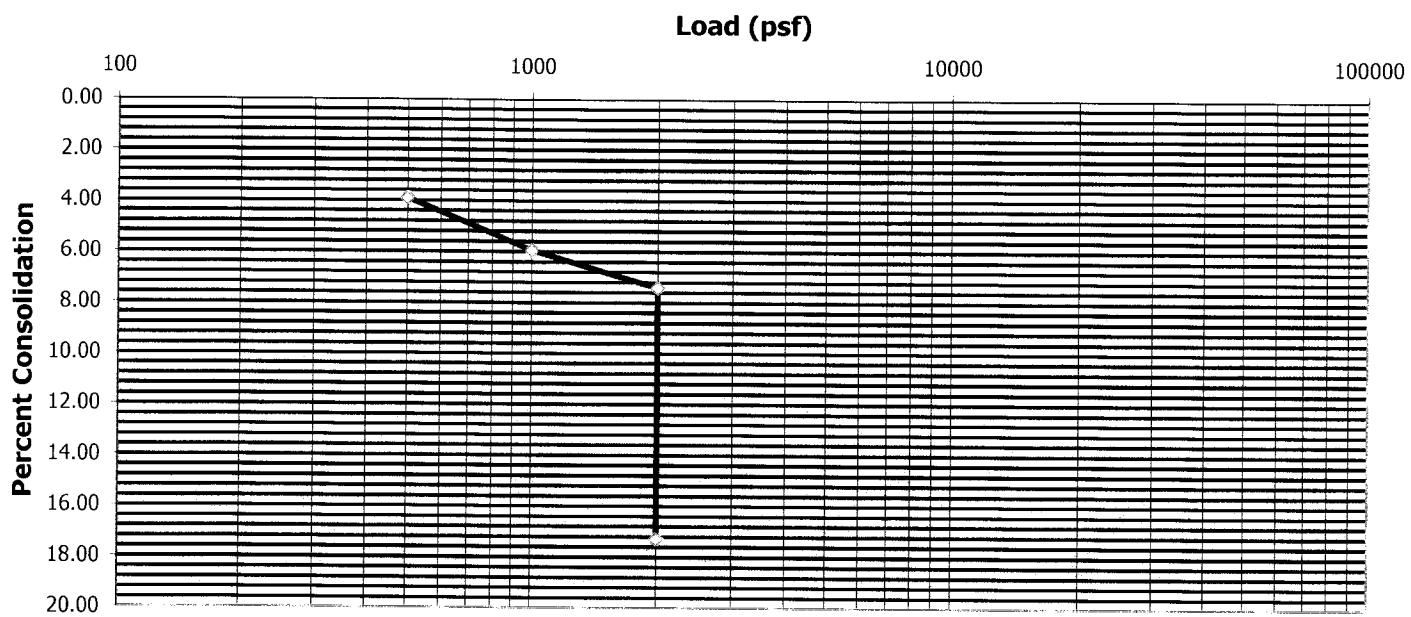
Sample Location	Soil Classification / Description	Maximum Dry Density (pcf)	Optimum Moisture (%)
T-1 @ 4 feet	Silty-Clayey Sand	133.5	7.0
T-4 @ 2 feet	Clayey Sand w/ Gravel	134.5	6.5

Plate: 7

Set Value
0.0792

Consolidation Test Data

Load	Displacement	Calculated %
500	0.1182	3.90
1000	0.1387	5.95
2000	0.1534	7.42
2000	0.2521	17.29



SAMPLE LOCATION T-3 @ 4', Water added at 2000 psf

Project:

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Plate: 8