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June 21, 2007

Dr. Carrol A. Thomas, Superintendent
Beaumont Independent School District
3395 Harrison Avenue
Beaumont, Texas 77706

Re: Engineering Study of South Park Middle School

Dear Dr. Thomas,

Parsons-3D/I is pleased to have the opportunity to submit to the Beaumont Independent School District (BISD) our Final Report on the results of the requested structural engineering study at South Park Middle School campus located at 4500 Highland Avenue, in Beaumont, Texas. This study was conducted by an outside engineering firm, CSF Engineers.

CSF Engineers was commissioned by Parsons-3D/I on behalf of BISD to conduct an independent engineering study of South Park Middle School to evaluate the structural condition of the buildings to aide in determining the feasibility of renovating the existing school buildings or demolish and build a totally new facility. This effort was coordinated and managed by Carlos A. Gutierrez, P.E.

CSF assigned Cory Walker as the lead on this project. Cory was introduced to representatives within the BISD Maintenance Department and an escort was assigned to assist him. An initial pre-inspection meeting was held on May 7, 2007 at the maintenance department facility followed by a facility walk-through. The building inspection was started on May 29, 2007 and completed on June 1, 2007. A subsequent visit to the campus was made, by A&R Engineering and Testing, Inc. personnel, to gather additional core samples on June 7, 2007.

Enclosed is the final report along with supporting photos, of CSF's findings for your review and consideration. Their findings indicate that the basic structure of the Main building appears to be sound and in generally good condition. It is believed that buildings built during that period were built to last much longer than today. However, if the District's intent is to retain the historical appearance and value of this building it would become difficult and more costly to renovate. After careful review of the systems that would be necessary to replace, it is apparent that the costs to renovate would be significantly greater than the cost to build new. As an example: with the roof covering system of the Main building requiring replacement based on its life cycle's expected useful life, relative condition, reported number of leaks and ponding, one of two resolutions is needed. Replacement of the existing roof covering, with more slope, would eliminate the leaks and ponding or secondly, demolish and build a new roof which would solve all roof issues. We feel that the former would be more costly due to potentially costly unknowns about the condition of the concrete and/or wood decking, until the work is started. Given the number of deficient systems and costs associated with replacements, renovating this building will be significantly higher than rebuilding new.

Another potentially major cost factor is the hazardous material and asbestos remediation needed for a renovation project versus demolition abatement for the same building. These costs can significantly increase the overall project cost as well. The bottom line is that both CSF Engineers and

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Parsons – 3D/I would recommend replacement of South Park Middle School as opposed to a renovation.

Again, Parsons-3D/I appreciates the opportunity to assist the District in its Pre-Bond initiative efforts. If there are any questions regarding this project or submittals, please contact me at 713-871-7126.

Regards,

Johnnie L. Jordan
Project Manager

cc: Carl Rabenaldt – Parsons-3D/I
Terry Ingram – BISD

111210 SteepleCrest Drive, Suite 202
Houston, Texas 77065
Phone (832) 678-2110 and Fax (832) 678-2115

Report of Findings

South Park Middle School
4500 Highland Ave.
Beaumont, Texas 77705

Prepared For:

Parsons/3D International
1900 West Loop South, Suite 400
Houston, Texas 77027

Attention: Mr. Johnnie Jordan

Cory A. Walker, BSCE, E.I.T.

STATE OF TEXAS
CARLOS A. GUTIERREZ
68320
LICENSED
PROFESSIONAL ENGINEER

Carlos A. Gutierrez, P.E.

Project No.: 1169
Date: June 13, 2007

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INTRODUCTION

Beaumont Independent School District is considering remodeling the buildings on their middle school campus located at 4500 Highland Avenue, in Beaumont, Texas. Beaumont ISD retained Parsons/3D International to design renovations for the buildings on this campus. Parsons/3D International retained CSF to evaluate the structural condition of the buildings on this campus and determine what structural repairs, if any, would be required prior to renovation of the buildings. Our investigation was conducted under the direction and supervision of Carlos A. Gutierrez, P.E. Our initial onsite walk-through was on May 7, 2007. Subsequent onsite visual inspections were performed from May 29, 2007 through June 1, 2007.

This report is based on information available to us at this time. We reserve the right to revise our opinions and conclusions, if necessary and warranted by the discovery of new or additional information.

SUMMARY

1. Visual inspection of the Main Building revealed no signs of excessive structural distress. This indicates that the building has sufficiently resisted the loads imposed on it up to this time, and that it is adequate to continue to support the service loads imposed on it by its intended use. However, since we were unable to directly observe the structural components behind the finish materials, we reserve the right to revise our conclusions based on the discovery of new or additional information. If this building is renovated, any structural building components exposed during the process should be visually inspected, checking for signs of stress and deterioration before they are covered again.

2. The primary structural components of the Homemaking Cottage, including the foundation concrete strip footings and the perimeter masonry walls have not sustained any significant damage due to deterioration, loading, or excessive deflection. These components are adequate to continue to support the service loads imposed them by the intended use of the building.

3. The Homemaking Cottage has sustained minor interior cosmetic damages due to deflections in the wood framed floor system. This deflection was likely caused or influenced by moisture from water that collects in the crawlspace of the building, along with wood creep and age.

4. If the Homemaking Cottage is renovated, we recommend that all interior finishes and partition walls be removed. Once these components are removed, the vertical alignment of the wood floor structure may be measured and it may be repaired or replaced as required.

5. The Music Building load bearing structural components are adequate to continue bearing the service loads imposed them by the intended use of the building.

6. The Music Building has sustained minor differential foundation movement since the time it was constructed, resulting in minor related cracks in the finish materials throughout the building. There are no floor slopes that warrant leveling or stabilization of the foundation at this time.

7. The Main Building, Homemaking Cottage, and the Music Building have significant and widespread cosmetic damages throughout the buildings related to age, wear, indoor environmental issues, and building envelope issues. We recommend consulting a mechanical engineer and someone specializing in building water proofing prior to any renovation of these buildings.

8. It is likely that the mechanical, electrical, and plumbing systems of all three buildings will require significant attention and/or replacement upon renovation of the buildings. Therefore, we recommend consulting a licensed MEP to evaluate these systems prior to any renovation of the buildings.

9. The sites around all the buildings do not drain properly and therefore, allow rainwater to collect along the buildings. The sites surrounding the buildings should be re-graded to promote drainage away from the buildings. A drain or pump system may have to be installed beneath the Homemaking Cottage.

10. The flat, built-up roofs over the Main Building and the Music Building appear to be old. Based on the number of ceiling stains inside these buildings, it is apparent that these roofs are in need of repair or replacement. These two roof systems also do not drain properly. The areas of these roofs that hold water should be re-sloped.

11. We visually observed materials inside the Music Building that contain asbestos. Based on the age and renovation history of the other two buildings, it is likely that they contain asbestos as well. Therefore, if the buildings are renovated, abatement of asbestos and other hazardous materials could be a factor in the renovation cost.

INVESTIGATION DATA

Background

The South Park Middle School campus consists of three permanent buildings and one portable building. The three permanent buildings are referred to by school personnel as the Main Building, the Homemaking Cottage, and the Music Building. Using information obtained from review of construction documents along with visual observations and discussion with Beaumont ISD maintenance personnel, we generated a timeline reflecting the history of these three buildings with respect to construction and renovations. The timeline shown below:

1922
- The Main Building (including the gymnasium) design drawings were sealed and submitted.

1922-23
- The Main Building and the Homemaking Cottage were constructed. The original locker rooms were in the east end of the cafeteria. The gymnasium originally had bleachers with rooms under them to accommodate the "Director" and "Directress", along with equipment storage.

1953
- The Music Building was constructed.
- The library was constructed inside the south end of the Main Building second floor.
- The structure currently containing the locker rooms and gymnasium classrooms were added to the east side of the gymnasium.
- The bleachers were removed from the gymnasium along with the rooms beneath them.
- The kitchen area was constructed inside the east end of the cafeteria where the locker rooms used to be.
- The interior of the Main Building was renovated to match the interior finishes of the new Music Building.
- Individual HVAC systems were installed in the classrooms throughout the main building.

1984

- The windows in the Main Building and Homemaking Building were replaced with aluminum frame windows.
- Track ceilings and fluorescent lighting were installed throughout the Main Building.
- The truss supporting the west end of the auditorium was re-designed and replaced.

1996

- A handicap elevator was constructed and installed at the southwest corner of the cafeteria.
- A Storage closet was constructed next to the new elevator shaft.

Beaumont ISD personnel have recently experienced problems with the buildings. Beaumont ISD maintenance and custodial personnel reported the following information to us prior to our inspection:

- The Main Building has had problems with water leaking in through the windows. This has caused cracking and spalling of some of the interior wall plaster.
- The Main Building has had problems with fungus growing on the walls inside the building.
- Termites have caused damage to the wood sub-floor inside the Main Building on the third floor.
- Water collects in the steam pipe chases under the Main Building. A pump was installed to evacuate the water from the chase system. Beaumont ISD maintenance personnel do not know where the water comes from. The steam heating system has long been abandoned. The original boiler was housed inside a structure separate from the Main building. This structure no longer exists.
- The gymnasium floor was replaced shortly after the 2005 hurricane season. Maintenance personnel observed standing water in the steam pipe chase system under the gymnasium at that time. They had the tops of the chases in the gymnasium covered with concrete before the new wood floor was installed.
- New shingles were placed on the roof of the Homemaking Cottage shortly after the 2005 hurricane season. The roof coverings of the Main Building and Music Building were not replaced at that time.

Structural Description

The information in this section of the report was obtained through review of incomplete sets of construction plans. Therefore, the accuracy of the descriptions below is limited to the accuracy and detail of the construction drawings that were available to us. Many of the details described below were confirmed by visual inspection of the building. However, most of the structural components described below are covered by finish materials and cannot be seen without conducting excavation or demolition.

Main Building

The Main Building is a three story structure with a two story auditorium and a gymnasium. The foundation is constructed from perimeter and interior reinforced concrete strip footings formed on grade. The strip footings support the perimeter and interior walls. There are also independent reinforced concrete footings supporting individual columns (inside the cafeteria). There are reinforced concrete slabs formed on grade that span in between the foundation footings on the ground floor. The perimeter and interior load-bearing walls are constructed from structural clay masonry tile. Most of the interior walls are constructed from either clay tile or gypsum tile (Pyrobar ®). However, there are some partition walls that are constructed from metal lathe supported by metal tracks and covered with plaster. The interior walls are generally finished with plaster. The perimeter wall exteriors are faced with clay masonry brick. The second floor, third floor, and roof frames are constructed from steel I-beams that span in between the structural masonry tile walls and support steel floor joists. The floor joists were covered with metal lathe and concrete slabs. Most of the floors inside the building are finished with vinyl tile or carpet.

The floors inside the classrooms on the second and third floors are built up on wood screeds laid on top of the concrete deck. Most of the ceilings are finished with acoustic ceiling tiles on suspended tracks. The ceilings inside some of the smaller rooms are finished with plaster. The roof is flat pitched with a surrounding parapet wall and is covered with a built-up bituminous membrane ballasted with gravel. There are steep-sloped roof sections along the north and south sides of the auditorium that are covered with standing seam sheet metal.

Homemaking Cottage

The Homemaking Cottage is a one story, residential style structure. The foundation is composed of concrete strip footings formed on grade. The strip footings support the perimeter and interior walls. The perimeter walls are constructed from clay masonry brick. The interior walls are constructed from lathe and plaster. The floor structure is composed of wood joists that span between the tops of the concrete strip footings. The floor joists are covered with two layers of tongue-and-groove wood planks. The ceilings in the main areas are acoustic ceiling tiles suspended on tracks. The ceilings in the closets and hallway are plaster. The roof is a sloped, gable structure covered with three-tab composition shingles. The gable walls, fascia, and soffits are finished with stucco.

Music Building

The Music Building is a one story structure. The foundation is a reinforced concrete slab formed on grade and stiffened with reinforced concrete grade beams. The perimeter and interior load-bearing walls are constructed from structural clay masonry tile. Interior partition walls are constructed from gypsum tiles (Pyrobar ®). The interior walls are generally finished with

plaster. The perimeter wall exteriors are faced with clay masonry brick. The floors inside the building are covered with carpet, vinyl tile, and asphalt tile (usually containing asbestos). The ceilings throughout the building were originally 12"x12" paper acoustic ceiling tile in the main rooms and asbestos board in the mechanical rooms. Acoustic ceiling tiles suspended on tracks were installed below most of the original acoustic ceiling tile. The mechanical room ceilings are still covered with asbestos board. The roof structure is constructed from steel bar joists topped with plywood sheathing and a 2 ½ inch concrete deck. The roof is covered with a built-up bituminous membrane ballasted with gravel.

Construction Document Review

We were provided with partial sets of architectural and engineering drawings documenting the planning and details of the Main Building, Homemaking Cottage, and the Music Building. We reviewed these plans to aid in determining the composition, configuration, locations, and orientations of the structural components that support these buildings. The available plans were scanned and saved to a computer disk. Copies of these files are available upon request.

Visual Inspection

Our onsite investigation consisted of a visual inspection of the interior and exterior of the buildings, including visual inspections of the roofs. The observations from our visual inspections were documented with photographs. Samples of the photographs, representing the typical conditions of the buildings, are included in Attachment C. Additional photographs and photo captions not included in this report are available upon request.

During our inspections of the buildings, we observed the following:

Main Building

- Hairline cracks in the foundation perimeter strip footings.
- Pooling water on the ground surfaces surrounding the building.
- Four isolated areas with small cracks in the exterior masonry brick.
- Weathered exterior woodwork on the auditorium roof overhangs.
- The roofs over the locker rooms, gymnasium north side, auditorium south office, and auditorium north room all hold water.
- Cracked and peeling paint on the interior walls throughout the building.
- A few isolated areas of fungal growth on the walls.
- Worn plaster along the bases of some of the classroom walls from desk legs rubbing against them.
- Water damaged plaster on exterior walls.
- Water damaged plaster on walls near windows.
- Water stains on the ceilings.
- Cracks in the terrazzo flooring in the cafeteria limited to isolated areas along the walls in the cafeteria.
- Isolated ceramic tile wainscot cracks on the exterior walls of the stairwells.
- Insect damaged wood sub floor in room 310.
- *We observed no significant cracks in the exterior brick veneer or any other signs of distress related to significant excessive structural deflection.*

Homemaking Cottage

- Hairline cracks in the perimeter concrete strip footings.
- Low ground areas along the building at the south half of the west elevation and the west end of the north elevation.
- One small exterior brick crack on the west elevation.
- Small interior plaster wall cracks above some of the doors.
- A few isolated plaster cracks in the interior partition walls.

- Buckled sheet vinyl flooring at the seams.
- Water damaged ceilings.
- Cracked and peeling paint on the walls.
- Two misaligned doors.
- Fungus on the plaster walls in the northwest bathroom.
- Standing water in the crawlspace.

Music Building

- Many cracks in the exterior brick veneer around the entire building. The cracks have relatively little separation.
- Rainwater pooled between the building and the surrounding concrete sidewalks on the south, west, and north sides of the building.
- Rainwater pooled on the roof.
- Plaster wall cracks at corners of doors and windows throughout the building. Most of the cracks have relatively little separation.
- Wall corner separations at various locations.
- Asphalt floor tile in some of the rooms (possibly containing asbestos).
- Asbestos ceilings in mechanical closets.
- Ceiling stains at many locations.
- Cracked and peeling paint on walls.

Geotechnical Investigation

Since Beaumont ISD maintenance personnel reported that they have to continuously pump water out from the steam pipe chases beneath the main building, we decided that it would be necessary to conduct a geotechnical investigation to determine the elevation of the local groundwater. This would allow us to determine whether or not ground water is a possible source for the water

observed in the steam pipe chases. The geotechnical investigation would also provide information necessary for the design of a new foundation system should remedial foundation repair be necessary on any of the three buildings. The geotechnical investigation was conducted by A&R Engineering and Testing on May 31, 2007. A&R Engineering and Testing had to re-conduct the drilling on June 7, 2007 due to an error in collection of the original samples. The field investigation conducted by A&R consisted of two soil borings near the Main Building drilled to approximately 20 feet below the ground surface. One boring was drilled near the southeast corner of the Main Building, and another boring was drilled near the northwest corner of the Main Building.

While onsite, the boring holes were observed to determine the elevation of any ground water in the holes. The boring logs indicate that ground water was observed at approximately 12-13 feet below the ground surface at both boring locations. Since the steam pipe chases are only two to four feet below the exterior ground surface, it is apparent that the water observed inside the steam pipe chases is not ground water.

Samples of the soil were taken from each of the borings at incremental depths and tested in the laboratory to determine characteristics of the soil and to determine foundation design specifications for this particular site. Results from the soil tests reveal that the site soils are composed of expansive clays with relatively high plasticity indices. Descriptions of the soil characteristics determined by the laboratory test procedures are included in the Geotechnical Investigation Report in Attachment B.

CONCLUSIONS

Information obtained from the research and studies described above indicate the following:

Main Building

Structural Evaluation

We acquired information from the review of a partial set of construction documents, conversation with Beaumont ISD personnel, and visual inspection of the building. All of the finish materials were in place at the time of our inspection, covering the structural, or load bearing components of the building. Therefore, we were unable to directly inspect these components. Instead, all we could do was look for signs of excessive deflection in the building structure displayed in the more brittle finish materials. Visual inspection of the building revealed no signs of excessive structural deflections. We observed only a few isolated areas of exterior hairline brick cracks along with minimal cracking in the interior ceramic tile wainscots. If the building had sustained any significant amount of differential vertical movement, we would expect these finishes to display numerous cracks with large separations, particularly at the corners of doors and windows. The foundation perimeter concrete strip footings displayed hairline cracks at regular intervals, which are consistent with normal expansion and contraction of the concrete. The lack of deflection-related damage to the building finish materials indicates that the building structure has sufficiently resisted the loads imposed on it up to this time. From our inspection and from the review of the limited construction documents that were provided to us, we see no evidence indicating that the building cannot continue to safely support the service loads imposed on it by its intended use. However, since we were unable to directly observe the

structural components, we reserve the right to revise our conclusions based on the discovery of new or additional information. If this building is renovated, any structural building components exposed during the process should be visually inspected, checking for signs of stress and deterioration before they are covered again.

Building Finishes

Although the building finishes have not suffered any significant damage from excessive structural deflections, we did observe extensive and widespread damage to the finish materials throughout the building due to numerous other causes. We observed cracked and peeling paint on many of the walls throughout the building. The paint has most likely cracked and peeled due to age. However, the paint has cracked and peeled mainly on the exterior walls, or on the interior walls close to the exterior walls. This indicates that the paint could also have been affected by temperature and humidity gradients.

We observed water damage to the plaster on the perimeter walls at multiple locations throughout the building. This damage is due to water intrusion into the building. Based on our observations, this type of damage is most common around the windows, indicating that the windows leak when it rains.

Beaumont ISD maintenance personnel reported that school personnel have complained about fungal growth on the walls inside the building. We only observed a couple isolated places where any significant amount of visible fungus was growing on the walls and/or ceiling. However, it is

possible that the reported fungus is regularly removed from the wall surfaces. Such growth could be due to indoor environmental conditions (excess humidity), or due to exterior water intrusion.

We observed multiple water stains on many of the ceilings throughout the building. Since there is no roof above the first and second floors, this indicates that there are or have been plumbing leaks at several locations inside the building. The stains on the third floor ceilings are indicative of past or present roof leaks.

Our visual observations reveal that this building is in a state of significant disrepair and therefore, will require significant evaluation, planning, and reconstruction efforts to renew it. The finishes inside the building are generally old and display significant wear. Beyond wear, the conditions described above indicate that the building has problems related to indoor environmental control as well as problems with the general building envelope. Unfortunately, these issues are beyond the scope of our knowledge and practice. Therefore, we recommend that the systems controlling the indoor environment be evaluated by a qualified professional, most likely a mechanical engineer. Likewise, should the building be renovated, we recommend that a professional experienced in building water proofing be consulted to evaluate the building envelope. Based on the damages observed throughout the building, it is likely that new mechanical systems will have to be designed to replace the existing ones. It is also likely that all the windows will have to be replaced and that supplemental water proofing procedures will have to be implemented to stop exterior water intrusion into the building.

Civil/Site Evaluation

Although no exterior elevations were measured around the building, it rained intermittently at the time of our inspection allowing us to observe that the site surrounding the building does not drain properly. Water pools in the front (west) yard, and along the south side of the building. The site should be re-graded to conduct the flow of water away from the building and surrounding site.

Steam Pipe Chases

Based on the geotechnical investigation, it is apparent that the water that collects inside the steam pipe chases under the building is not from underground. Therefore, the water must be rain/surface water entering the chases. We were informed that the steam pipe system has been abandoned for several years and that the boiler used be housed in a separate building. It is possible that the abandoned steam pipes channel surface water into the chases. These pipes should be located and capped at the building perimeter in an effort to stop the rainwater from entering the steam pipe chases.

Mechanical, Electrical, & Plumbing

Mechanical engineering, electrical engineering, and plumbing are not in our scope of knowledge, practice, and licensing. However, it is likely that the mechanical, electrical, and plumbing systems would require significant attention and/or replacement upon renovation of the building, adding significant cost to the renovation. Therefore, a licensed MEP should be consulted to evaluate these systems prior to any renovation planning.

Roof

The roof system appeared to be old with many areas where the ballast had worn thin. Based on the number of ceiling stains inside the building, the roof is also apparently in need of repair or replacement. Inspection of the roof also revealed several areas that pool with rainwater, including the roof over the locker room addition, the north side of the gymnasium, and both the north and south auditorium room additions. These areas of roof should be re-sloped to drain properly.

Abatement

This building is relatively old and has been renovated at least a few times in the past. Since the time this building was constructed, various construction materials that were once commonly used have been regarded as unsafe for building occupants. Therefore, if the building is renovated, abatement of such materials could be a factor in the planning and renovation cost.

Homemaking Cottage

Structural and Civil Evaluation

We were not provided with any construction plans for this building. Therefore, our evaluation of this building is based solely on a visual inspection. Even though the finish materials are still in place on this building, we were still able to visually inspect the primary structural components, which include the concrete strip footings and the perimeter clay masonry brick walls.

Visual inspection of this building revealed only one small crack in the perimeter masonry wall system, and only hairline cracks in the concrete foundation strip footings. The cracks observed in the strip footings are characteristic of cracks caused by expansion and contraction of the concrete and do not appear to be related to deflection of the footings. Although we did not measure floor elevations inside the building, minor cracking in the partition walls indicate that the wood framed floor system has sustained some differential vertical movement since the time it was constructed. We observed a significant amount of water in the crawlspace beneath the building. It is possible that excess moisture may have caused sagging or buckling of the wood floor joists and decking over time.

We observed low areas along the north and west elevations of the building where rainwater can collect and migrate into the crawlspace. Therefore, it is apparent that the water observed inside the crawlspace is surface rainwater. Since it is likely that this water is affecting the wood floor structure, measures should be taken to drain the crawlspace as well as the surrounding site away from the building.

Building Finishes

Like the finishes in the Main Building, the finishes inside the Homemaking Cottage are old and worn. The interior paint is peeling in many areas throughout the building. We also observed fungus on the plaster walls in the north bathroom. Based on the similarity in damages between this building and the Main Building, the same consideration should be given to this building regarding MEP and building envelope prior to any building renovation.

We observed water damaged ceilings at multiple areas inside this building. However, we were informed that a new roof covering was installed on this building in 2005. Therefore, it is apparent that the water damage on the ceilings was caused by past roof leaks and that the ceilings have simply not yet been repaired.

Building Renovation

If this building is to be renovated, we recommend that all interior finishes and partition walls be removed. At this point, the vertical alignment of the wood floor structure may be measured and it may be repaired or replaced as needed. If there is any question regarding whether or not an interior wall bears any roof load, then a structural engineer should be consulted prior to the removal of the wall in question. Based on the similarity in age between this building and the Main Building, the same consideration should be given to this building regarding abatement of hazardous materials prior to any building renovation. Based on our observations, the building concrete foundation strip footings require no stabilization or adjustment at this time.

Music Building

Structural Evaluation

Visual inspection of this building revealed signs of minor differential foundation movement including small, but numerous cracks in the exterior brick veneer, as well as similar cracks in the interior finish materials (i.e. wall plaster and the ceramic tile wainscot). Due to the limited time for our investigation, we did not conduct a floor elevation survey within this building. However, based on the small amount of separation in the cracks observed throughout the building, it is

apparent that there are no foundation slopes that would warrant foundation leveling or stabilization at this time. The only reason to consider stabilization of this foundation would be to stop the small differential vertical fluctuations in the building foundation in order to prevent future cracking of interior finish materials. However, a cheaper method of stopping cracking of future interior finish materials would be to use materials that are less brittle such as wall paneling, vinyl floor tile, carpet, and acoustic ceiling tile instead of gypsum board, ceramic tile, and plaster.

Building Finishes

It is apparent that the Main Building was renovated at the time that the Music Building was constructed. Therefore, most of the finishes inside these buildings are of similar age and composition. Like the finishes in the Main Building, the finishes inside the Music Building are old and worn. The interior paint is peeling in many areas throughout the building. We also observed interior wall cracks related to minor differential foundation movement. Based on the similarity in damages between this building and the Main Building, the same consideration should be given to this building regarding MEP and building envelope prior to any building renovation.

Abatement

Since the time this building was constructed, various construction materials that were once commonly used have been regarded as unsafe for building occupants (i.e. asbestos). We observed that asbestos board on the mechanical room ceilings. We also observed asphalt floor

tiles inside some of the rooms, which commonly contain asbestos. Therefore, if the building is renovated, abatement of such materials could be a factor in the planning and construction cost.

Roof

The roof system appeared to be old. Based on the number of ceiling stains inside the building, the roof is also apparently in need of repair or replacement. Inspection of the roof also revealed that the roof pools water on top of it. Therefore, the roof should be re-sloped to drain properly.

SCOPE OF WORK

1. Conducted a visual inspection of the building interior, exterior, and roof.

2. Reviewed available construction plans and specifications.

3. Ordered and managed a geotechnical survey.

4. Analyzed investigation data to assess the condition of the building.

ATTACHMENT B

Geotechnical Report

GEOTECHNICAL INVESTIGATION
Proposed Subsurface Exploration and Foundations Repair
Southpark Middle School - 4500 Highland Avenue
Beaumont, Texas

Reported to
CSF Consulting, LP.
Houston, Texas

Prepared by
A&R Engineering and Testing, Inc.
Houston, Texas

PROJECT NO. :0783491

June, 2007

A&R

323 Martin Street • Houston, TX 77018-3305 • 713-290-1912 • Fax: 713-290-9089

A&R ENGINEERING and TESTING

Geotechnical & Material Engineers

June 11, 2007

CSF Consulting, LP.
11210 Steeplecrest Drive, Suite 202
Houston, Texas 77065

Attention: Mr. Carlos A. Gutierrez, P.E.

Reference: Geotechnical Investigation
Proposed Subsurface Exploration and Foundations Repair
Southpark Middle School - 4500 Highland Avenue
Beaumont, Texas
A&R NO.:0783491

Dear Mr. Gutierrez:

A&R Engineering and Testing, Inc. is pleased to submit this report for the above referenced project. This study was authorized by you on May 29, 2007. This report briefly describes the procedures employed in our investigation and presents the conclusions and recommendations of our studies.

We appreciate the opportunity to work with you on this phase of the project. If you have any question concerning this report or require additional information, please contact us.

Very Truly Yours,

STATE OF TEXAS
RASMY M. HASSOUNA
81066
REGISTERED
PROFESSIONAL ENGINEER

Russ M. Hassouna, MSCE., P.E.
Principal Engineer

323 Martin Street • Houston, TX 77018-3305 • 713-290-1912 • Fax: 713-290-9089

INTRODUCTION

A&R Engineering and Testing, Inc. (A&R) hereby submits this report of Geotechnical Investigation of subsurface conditions at the site of the Proposed Subsurface Exploration and Foundations Repair for Southpark Middle School - 4500 Highland Avenue in Beaumont, Texas. **A&R's** investigation was authorized by Mr. Carlos A. Gutierrez, P.E. with CSF Consulting, LP. on May 29, 2007.

PURPOSE

The purpose of the Geotechnical Investigation was to determine the subsurface soil conditions on the site with particular reference to the design of the foundation for the structure.

FIELD INVESTIGATION

The field portion of this study was completed on the site of Southpark Middle School - 4500 Highland Avenue in Beaumont, Texas on June 07, 2007. The subsurface soil conditions were explored by advancing and sampling two (2) soil borings drilled to a depth of twenty (20) feet below existing ground surface at the exterior of the School. The approximate boring locations are shown on the attached Boring Plan, Plate No. 1.

Sample depth, description of soil and soil classification (Based on the Unified Soil Classification System) are presented on the Boring Logs, Plate Nos.2 and 3. Keys to terms and symbols used on the boring logs are shown on Plate No. 4.

The soil borings were of three-inch nominal diameter. Undisturbed samples of the soils were obtained at two (2) foot intervals continuously to a depth of twenty (20) feet. Samples of the soils were obtained by means of three-inch O.D. shelby tube sampler. All undisturbed samples were extruded mechanically from the shelby tubes in the field, wrapped in aluminum foil, and sealed in plastic bags to prevent moisture loss and disturbance. All of the samples were transported to our geotechnical laboratory for examination, testing and analysis.

LABORATORY TESTING

All field soil samples from the borings were examined and classified by a soils engineer. Laboratory tests were then performed on selected soil samples in order to evaluate and determine the physical and engineering properties of the foundation soils in accordance with the prescribed ASTM standards. Strength properties of the foundation soils were determined by means of Pocket Penetrometer and Unconfined Compression Tests performed on undisturbed samples.

The type and number of laboratory tests performed for this study are:

DESCRIPTION	NO. OF TESTS
Hand Penetrometer Test	22
Moisture Content Tests	22
Atterberg Limits	10
Unconfined Compression Tests	4
Dry Density Tests	10

The tests noted above were performed to establish the index properties and to aid in the proper classification of the subsurface soils. The test results are shown on the boring logs and are presented on Plate Nos. 2 and 3.

GENERAL SUBSURFACE CONDITIONS

The site is relatively level and the soil borings were drilled at the exterior of the existing Southpark Middle School. The surface soils were moist and firm at the time of our investigation. The specific subsurface stratigraphy as determined by the field exploration, is shown in detail on the boring logs herein. However, the stratigraphy can be generalized as follows:

Depth (FT.)	DESCRIPTION
0' - 4'	Soft to Very Stiff Gray and Dark Gray Clay to Silty Clay (CH-CL)*.
4' - 20'	Stiff to Very Stiff Light Gray and Tan Clay to Silty Clay (CH-CL).

* Classification is in accordance with the Unified Soil Classification system.

The information in this report summarizes conditions as found on the date the borings were drilled. Free groundwater was encountered at a depth of twelve (12) feet during the field drilling operation. Long term monitoring of the groundwater level was beyond the scope of this study. It should be noted that the groundwater table may be expected to fluctuate with environmental variations such as frequency and magnitude of rainfall and at the time of year when construction begins.

EXPANSIVE CLAY

The Atterberg Limit tests indicate that the Liquid Limit of the soils is in the order of 31 to 93 and the Plasticity Index (P.I.) is in the order of 16 to 69. The majority of the subsoil would then be described as expansive clays classified as "CH" having a high shrink/swell potential.

UNDERREAMED FOOTINGS

Based on the soil conditions revealed by the field soil test borings, the structure at this site can be supported on a foundation system comprised of drilled and underreamed footings bearing at a depth of eleven (11) feet below existing grade in the layer of Light Gray and Tan Clay to Silty Clay. The footings may be sized for a net allowable bearing pressure of 2,800 psf for dead load plus sustained live load. The bearing pressure contains a factor of safety of 2.5 and can be increased 25 percent for total load conditions, whichever is critical.

The plinths of underreamed footings should be reinforced with sufficient reinforcing steel to resist the potential tension force induced by swelling soils between the depth of seasonal moisture changes and the final ground surface elevation.

Caving of piers may occur during construction of the drilled piers due to the presence of Silty Clay Materials. In order to minimize the possibility of piers caving during drilled pier construction, the construction contractor should be prepared to use Cased Piers or Straight Sided Shaft Foundations if caving occur. We recommend that the drilling be performed under the supervision of a Geotechnical Engineer.

Experience indicates that underreams can be successfully installed, and based on local practice for performing underream drill piers is to utilize 3.0 to 1.0 for underream to shaft ratio. Should caving occur during belling operations, the shaft diameter may have to be increased, thereby, changing the bell to shaft ratio. If the soil conditions warrant the changing of the shaft diameter, the Structural Engineer of record should be informed about any changes because they may require a change in reinforcing steel or bell diameter. Another alternative, would be to change the typical 45 degree angle of the underream to 60 degree.

The concrete should be placed in a timely manner after drilling to minimize the potential for caving of the foundation soils. No footings should be poured without the prior approval of the Project Engineer, Architect or Owners Representative. Since the exact size and locations of the footings are not known at this time. A detailed settlement analysis was not authorized, nor performed. It is anticipated that the footings designed using the recommended allowable bearing capacity will experience small settlements that will be well within the tolerable limits for the proposed structure. A detailed settlement analysis can be performed, if desired.

SITE DRAINAGE

It is recommended that site drainage be well developed. Surface water should be directed away from the foundation soils (use a minimum slope of 5% within 10 feet of foundation). No ponding of surface water should be allowed near the structure.

VEGETATION CONTROL

We recommend trees not to be closer than half the canopy diameter of mature trees from the grade beams, typically a minimum of 20 feet. This will minimize possible foundation settlement caused by the tree root systems.

INSPECTION DURING CONSTRUCTION

The recommendations are based on the subsoils data in the field exploration and laboratory testing. Due to the geological deposition of the area, variances may occur between boring locations. Therefore, the footing excavations should be inspected under the supervision of a geotechnical engineer to confirm that the bearing soils are similar to those encountered in our field exploration and that the footing areas have been properly prepared. The geotechnical engineer should be immediately notified should any subsoil conditions be uncovered that will alter the conclusions and recommendations contained in this report. Further investigation and supplemental recommendations may be required if such a condition is encountered.

Prior to placement of concrete, the footings should be inspected to monitor that:

(1) The footing bears in the proper bearing strata at the depth recommended in this report.

(2) The footing shaft is to the proper dimensions and reinforcing steel is placed as shown on the structural drawings.

(3) The footings are concentric with the shaft and the shaft has been drilled plumb within specified tolerances.

(4) Excessive cutting, build up of cutting, and any other soft compressible materials have been removed from the bottom of the excavations.

GENERAL

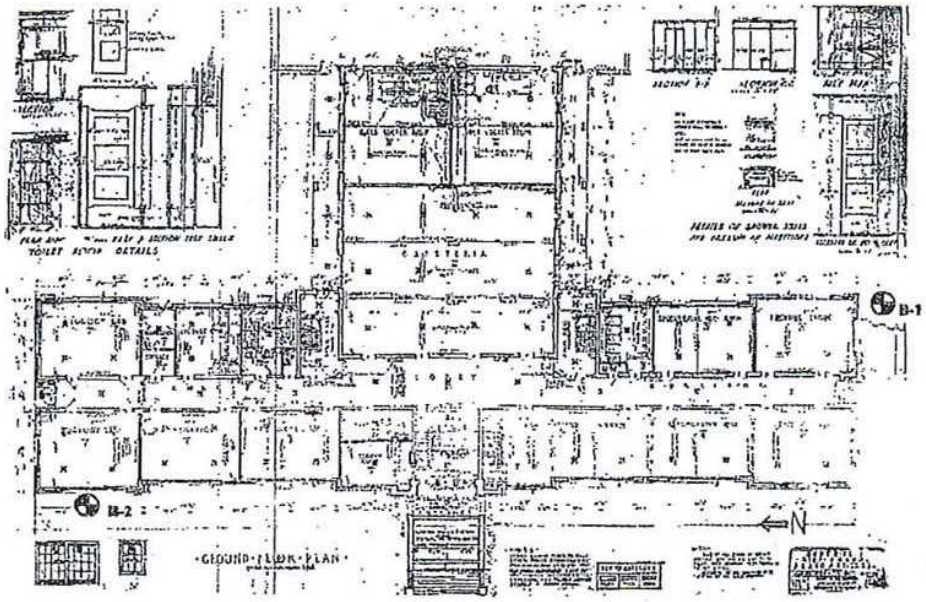
The information and recommendations contained in this report summarized conditions found at the site specified, on the date that the field exploration and soil borings were drilled. The attached boring logs are a true representation of the soils encountered at the specific boring locations on the date of field drilling and represent the stratigraphy as found during the field exploration and drilling of the subject site.

Reasonable variations from the subsurface information presented in this report are assumed. If conditions encountered during construction are significantly different than those presented in this report, A&R should be notified immediately.

In addition, the construction process may itself alter site soil conditions. Therefore, experienced personnel should observe and document the construction procedures and all conditions encountered. We would welcome the opportunity to discuss our recommendations with you and hope we may have the opportunity to provide any additional studies or services to complete this project.

The following illustrations are attached and complete this report.

	Plate
Location Plan	1
Boring Log	2 and 3
Symbols and Terms Used on Boring Log	4



Approximate Boring Locations

LOCATION
Proposed Subsurface Exploration and Foundations Repair
Southpark Middle School - 4500 Highland Avenue
Beaumont, Texas

A&R NO.07S3491

NOT TO SCALE

PLATE NO. 1

A & R Engineering and Testing, Inc.

GEOTECHNICAL & MATERIALS ENGINEERS

LOG OF BORING

PROJECT NO.: 07S3491

DRY AUGER: 0 - 20'

DATE OF BORING: 06-07-07

DEPTH (FT)	SOIL SYMBOL	BLOW PER FT.	SAMPLE	DESCRIPTION OF STRATUM	MOISTURE %	DRY DENSITY PCF	% PASS #200 SIEVE	SHEAR STRENGTH (TSF) O PENETROMETER ● UNCONFINED (0.5 1.0 1.5)	LIQUID LIMIT	PLASTICITY INDEX
1				Stiff Gray and Dark Gray Clay to Silty Clay						
2					21				31	15
3										
4					24	95				
5				Soft to Very Stiff Light Gray and Tan Clay to Silty Clay with Calcareous Nodules						
6					20				59	43
7										
8					20	82				
9										
10					25				73	54
11										
12					27	75				
13										
14					34				93	68
15					28	83				
16					30				89	69
17										
18					36	78				
19										
20					30					

PLATE NO.: 2

A & R Engineering and Testing, Inc.

GEOTECHNICAL & MATERIALS ENGINEERS

LOG OF BORING

PROJECT NO.: 07S3491

DRY AUGER: 0 - 20'

DATE OF BORING: 06-07-07

DEPTH (FT)	SOIL SYMBOL	BLOW PER FT.	SAMPLE	DESCRIPTION OF STRATUM B-2	MOISTURE %	DRY DENSITY PCF	% PASS # 200 SIEVE	SHEAR STRENGTH (TSF) O PENETROMETER ● UNCONFINED 0.5 1.0 1.5	LIQUID LIMIT	PLASTICITY INDEX
1				Soft Gray and Dark Gray Clay						
2					23			O	52	36
3				Stiff to Very Stiff Light Gray and Tan Clay to Silty Clay with Calcareous Nodules						
4					23	101		O		
5										
6					16			O	57	43
7										
8					25	94		O		
9										
10					20			O	66	53
11										
12					20	96		O		
13										
14					29			O	69	49
15					34	81		● O		
16					28			O	84	63
17										
18					29	88		O ●		
19										
20					28			O		

PLATE NO.: 3

KEY TO SOIL CLASSIFICATION AND SYMBOLS

SOIL TYPES

- Gravel (GW, GP, GM, GC)
- Sand (SW, SP)
- Silty Sand (SM)
- Clayey Sand (SC)
- Clayey Silt (ML)
- Silt (ML)
- Sandy Silt (ML)
- Silty or Sandy Clay (CL)
- Clay (CH)

CONSISTENCY OF COHESIVE SOILS

Description	Shear Strength-KSF	Penetration Resistance Blows / Ft
Very Soft	Less than 0.25	0 - 2
Soft	0.25 - 0.50	2 - 4
Firm	0.50 - 1.00	4 - 8
Stiff	1.00 - 2.00	8 - 15
VeryStiff	2.00 - 4.00	15 - 30
Hard	Greater than 4.00	> 30

RELATIVE DENSITY OF COHESIONLESS SOIL

Description	Penetration Resistance Blows / Ft	Relative Density - %
Very Loose	0 - 4	0 - 15
Loose	4 - 10	15 - 35
Medium Dense	10 - 30	35 - 65
Dense	30 - 50	65 - 85
Very Dense	> 50	85 -100

SOIL STRUCTURE

CALCAREOUS NODULES	- Nodules of Calcium Carbonate
FERROUS NODULES	- Nodules of Ferrous Material
SLICKENSIDED	- Having inclined planes of weakness that are slick and glossy
BLOCKY	- Having inclined planes of weakness that are frequent and rectangular in pattern
LAMINATED	- Composed of thin layers of varying soil type and texture
FISSURED	- Containing shrinkage cracks frequently filled with fine sand
INTERBEDDED	- Composed of alternate layers of different soil types

SAMPLE SYMBOLS

- Shelby Tube Sample
- Standard Penetration Test
- Auger or Wash Sample
- No Recovery

GROUNDWATER

(24 hr) - Water level after drilling (time increment after drilling)
- Free water observed during drilling

FAILURE DESCRIPTION (COMPRESSION TEST)

B - Bulge
S - Shear
M/S - Multiple Shear

SLS - Failure surface occuring along slickensided plane
SAS - Failure surface occuring along or in sand seam
SS - Failure surface occuring in or along other secondary structure such as calcareous pockets

PLATE NO.: 4

A&R

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